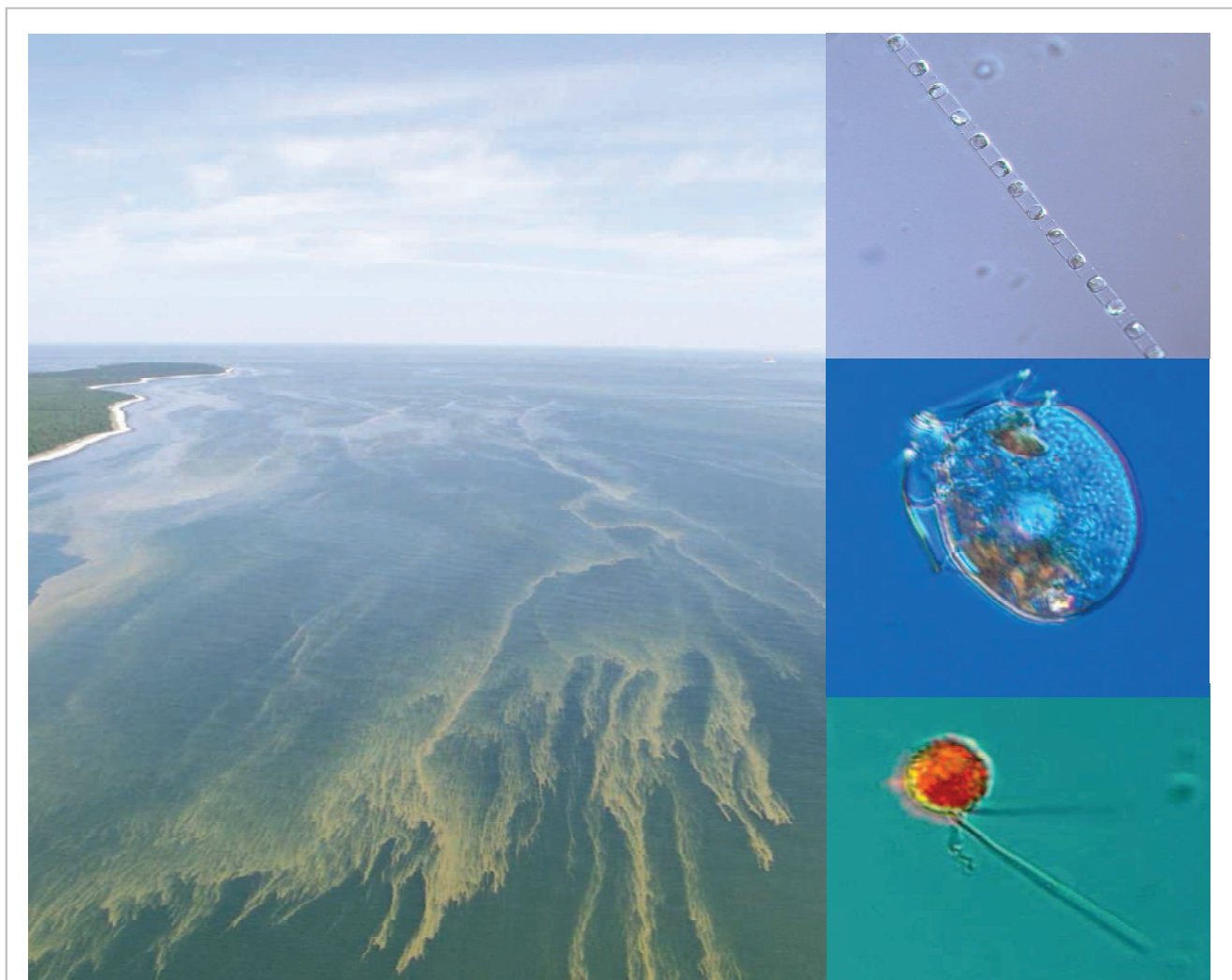


Marie Johansen, Pia Andersson

## **Reports Oceanography RO no. 40**

### **Long term trends in the seas surrounding Sweden**

#### **Part two – Pelagic biology**







**Long term trends in the seas  
surrounding Sweden  
Part two – Pelagic biology**

Marie Johansen  
Pia Andersson

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# CONTENTS

|                                                           |            |
|-----------------------------------------------------------|------------|
| <b>PREFACE</b>                                            | <b>9</b>   |
| <b>1 ABSTRACT</b>                                         | <b>10</b>  |
| <b>2 INTRODUCTION</b>                                     | <b>11</b>  |
| 2.1 Importance of long term trends                        | 11         |
| 2.2 Phytoplankton                                         | 11         |
| <b>3 METHODOLOGY</b>                                      | <b>12</b>  |
| 3.1 Data used                                             | 12         |
| 3.2 Sea basin areas                                       | 12         |
| 3.3 Sampling methods                                      | 14         |
| 3.4 Analysis and calculations                             | 14         |
| 3.5 Statistical tests                                     | 16         |
| 3.6 Box plots                                             | 16         |
| <b>4 RESULTS</b>                                          | <b>17</b>  |
| 4.1 Trends in figures and tables                          | 17         |
| 4.2 General results                                       | 17         |
| 4.2.1 Total phytoplankton                                 | 19         |
| 4.2.2 Different phytoplankton groups                      | 19         |
| 4.2.3 Toxic species                                       | 20         |
| 4.2.4 Chl- <i>a</i> and secchi depth                      | 20         |
| <b>5 DISCUSSION AND CONCLUSIONS</b>                       | <b>21</b>  |
| <b>6 REFERENCES</b>                                       | <b>22</b>  |
| <b>APPENDIX A</b>                                         | <b>23</b>  |
| Table with area and stations                              | 23         |
| <b>APPENDIX B</b>                                         | <b>25</b>  |
| Trend analysis, equations                                 | 25         |
| <b>APPENDIX C</b>                                         | <b>27</b>  |
| Monthly occurrence of phytoplankton                       | 27         |
| <b>APPENDIX D</b>                                         | <b>31</b>  |
| Scatter plots of total phytoplankton                      | 31         |
| <b>APPENDIX E</b>                                         | <b>52</b>  |
| Scatter plots of abundance and biovolume of phytoplankton | 52         |
| <b>APPENDIX F</b>                                         | <b>128</b> |
| Scatter plots of different toxic species or genus         | 128        |

|                                     |            |
|-------------------------------------|------------|
| <b>APPENDIX G</b>                   | <b>148</b> |
| Species occurrence list             | 148        |
| <b>APPENDIX H</b>                   | <b>163</b> |
| Figures of chl- <i>a</i> and secchi | 163        |
| <b>APPENDIX I</b>                   | <b>215</b> |
| Tables of chl- <i>a</i> and secchi  | 215        |
| <b>APPENDIX J</b>                   | <b>255</b> |
| SMHI publications                   | 255        |

## **PREFACE**

This work is part of a short series of reports with the aim of presenting long-term oceanographic data from Swedish waters. The focus of part one was on nutrient data (Andersson & Andersson 2006), part two on the physical oceanographic conditions such as temperature, salinity, oxygen waves and sea level (still in preparation), while this, the third part, focuses on marine biological data. Data have mainly been collected within the National Marine Monitoring Programme by SMHI, SMF (Stockholm Marine Research Centre) and UMF (Umeå Marine Research Centre). This report has been financed by SMHI.

# 1 ABSTRACT

This work presents trends in the phytoplankton community. Data on the occurrence of both chlorophyll *a* (hereafter Chl *a*) as well as phytoplankton community structure and biovolume are presented. Water transparency in terms of Secchi depth is also presented, as a secondary effect of phytoplankton occurrence. Due to differing water characteristics, 14 sea areas have been selected to represent the waters surrounding Sweden. These areas are identical to the ones chosen in the earlier nutrient report to facilitate comparison. In this report all available data up to and including 2008 are presented as graphs and tables. Each variable is divided into three different seasons: spring, summer and autumn. Trends are only shown for comparable depths. A classical linear regression method is used for phytoplankton groups, Chl *a* and Secchi depth. The trend magnitude and significance are also calculated for Chl *a* and Secchi depth. An overview of the results are presented for Chl *a* and Secchi depth.

The data presented in this report encourage further development of phytoplankton indicators that not only consider total biovolume or Chl *a* but rather consider different groups or species in the future. These changes can be important indicators for both eutrophication but can also enhance the understanding of food web interactions.



## 2 INTRODUCTION

### 2.1 Importance of long term trends

Ever since the 1960s, problems with eutrophication have been in focus. Attention has been drawn to nutrient inputs and their effect on plant growth in the sea. It was realised that excess nutrient loading can cause massive phytoplankton blooms. The secondary effect of these blooms is anoxic conditions at the bottom due to breakdown of the dead organic material from the blooms (HELCOM 2009). The first convention of the Helsinki Commission (HELCOM) was signed in 1974 by the then seven Baltic coastal states, including Sweden, which included an agreement to decrease nutrient inputs to the sea.

Long time series of Chl *a* and phytoplankton occurrence are therefore important assets to the work associated with eutrophication such as the EU Water Framework Directive (WFD), the Marine Strategy Framework Directive (MSFD) and also for regional monitoring to evaluate natural variability and trends in the phytoplankton community.

Today work continues to try to reduce the problems of eutrophication. Long time series and estimates of the typical occurrence of phytoplankton before the onset of eutrophication would be of great interest. A lot of effort has been made to find reference values, i.e. typical estimates of phytoplankton concentrations from the time before the onset of large-scale eutrophication. However, little data is available on phytoplankton occurrence before the 1960s. The few data collected in earlier years were sampled differently and are not easily compared with more recent samples. It is therefore almost impossible to predict the occurrence, structure or biovolume of the phytoplankton community before eutrophication started. This report will therefore focus on data collected regularly after the onset of large-scale eutrophication, from 1978 until 2008.

### 2.2 Phytoplankton

Phytoplankton are dependent on nutrient availability, irradiance as well as grazing pressure from for example zooplankton for their occurrence and growth. All phytoplankton contain different pigments but Chl *a* is present in all species and therefore sometimes used as a proxy for phytoplankton occurrence. The occurrence and biovolume of phytoplankton in the temperate regions show seasonal patterns as the sun changes its path. The normal pattern is one of low occurrence and biomass during winter when irradiance is low, and the phytoplankton is unable to grow even when there is an excess of nutrients. The winter period is followed by a more or less intense and often short-lived spring bloom as soon as the irradiance is sufficient to allow for a net growth. The summer period following the spring bloom mainly consists of a community of small and numerous flagellates, together with coccoid picoplankton that can survive on the recycled nutrients that remain above the pycnocline. Autumn is characterized by a second bloom, when high windstress brings nutrients from the deep to the surface layer. This bloom is usually less intense but generally prevails a bit longer than the spring bloom. Wind stress and currents can also create upwelling situations with nutrient addition to the surface layer that promote short lived blooms in between the ordinary bloom periods.

The sea areas around Sweden have very different characteristics: salinity for example varies from almost oceanic conditions in the Skagerrak to nearly limnic conditions in the Bothnian Bay in the far northern part of the Baltic. This salinity gradient is the major factor that leads to a natural difference in phytoplankton species composition in the waters around Sweden. The species diversity along the coastline adds up to several hundred species in total.

Phytoplankton occurrence can be presented

in different ways: data on Chl *a* usually serve as a proxy of the total phytoplankton biomass occurrence. It can serve as a rough estimation but does not give any information on the species composition. The counts of cell numbers of different species give a better description of the community structure but do not consider the difference in cell size and thereby volume between different species. The estimate of the cell biovolume of different species from size measurements gives a better description of the contribution by different species to the total biovolume of the community.

Some phytoplankton species have properties that make them harmful in different ways: some species produce substances harmful to humans and other animals. The cyanobacteria *Nodularia spumigena* for example produces a toxin called nodularin. This toxin can damage the livers of small children and animals if water containing

high cell numbers is ingested. Other toxic species can induce a toxic effect for human or animals only when they are accumulated in grazers such as mussels which are then consumed. Several of these types of phytoplankton occur in Swedish waters. The most regularly occurring group is the dinoflagellate genus *Dinophysis*. This genus produces a diarrhetic toxin that can cause stomach ache and vomiting. Another similar group is the dinoflagellate genus *Alexandrium*. This genus produces a neurotoxin (saxitoxin) that can lead to paralysis and eventually death from respiratory failure. Other phytoplankton have spines of different shapes that can cause fish kills by clogging the gills. Harmful algae are monitored regularly to give an early warning of their occurrence above predefined abundance thresholds to prevent for example the harvest of mussels containing toxins. Mussels available for general purchase in Sweden have always been analysed for toxins and are safe to eat.

### 3 METHODOLOGY

#### 3.1 Data used

SMHI is the Swedish National Oceanographic Data Centre (NODC) for marine data collected from various platforms (vessels, buoys, etc.). The NODC is also the national data host for national and regional marine monitoring data commissioned by the Swedish Environmental Protection Agency (EPA). The phytoplankton, Chl *a* and Secchi data used in the report are stored in the Swedish ocean data archive SHARK (Svenskt HavsARKiv) and can be retrieved from SMHI, the Swedish National Oceanographic Data Centre (NODC) at [www.smhi.se](http://www.smhi.se). Data used in this report come mainly from the Swedish national monitoring programme. A few exceptions are coastal stations on the Swedish west coast. Some of the data in the data archive dates back to the beginning of the 20th century. These data have however been excluded in this report as these early data were sampled and analysed in different ways. This report uses data that have been collected from 1978 until 2008.

#### 3.2 Sea basin areas

The seas surrounding Sweden have been divided into 14 areas, comparable with the previous report on nutrients (see figure 1). The partition into areas is an attempt to present areas with similar water characteristics. In dividing these areas, consideration was taken of the water characteristics, amount of data available and existing area divisions made by both SMHI and HEL-COM. Each area is represented by one or more stations (see Appendix A Table 4 for a complete overview). While the principle focus is on the offshore basins, two areas represent the coastal regime: one is on the east coast and other on the west coast.





### 3.3 Sampling methods

The sampling procedures for phytoplankton, Chl *a* and Secchi depth have followed the guidelines in the Manual for Marine Monitoring in HELCOM's COMBINE Programme (HELCOM 1988). Sampling frequency is mainly monthly or at some high frequency stations bi-weekly.

Phytoplankton samples have been collected with a hose as recommended by Lindahl (1986). Different depth intervals have been sampled depending on the station. The standard sampling depth intervals have been 0-10 metres and 10-20 metres with a few exceptions (see table 1 for further details). Only samples from comparable depth intervals are presented in each graph.

The Chl *a* samples have been collected with a hose from 0-10 metres and occasionally from 0-20 metres. Samples have, in some areas, been taken from discrete depths only and then integrated with linear interpolation to represent the sampled water column.

### 3.4 Analysis and calculations

Phytoplankton samples have been counted using the Utermöhl technique (Utermöhl 1958) in accordance with the Manual for Marine Monitoring in the COMBINE programme of HELCOM (HELCOM 1988). Species identification is based upon a range of identification literature and several checklists (Edler et al. 1984; Hällfors, G., 2004 among others). Autotrophic picoplankton has not been included in this material as it not part of the regular national monitoring and data is scarce. The samples analysed had a volume between 10 and 50 ml. At least 50 cells of dominant species have been counted or a total of 500 cells of different species have been counted in each sample, to ensure a statistical sound dataset, all in agreement with the recommendations of the Manual for Marine Monitoring in the COMBINE Programme of HELCOM (HELCOM 1988). Biovolume calculations have been made in accordance with the recommendations of Olenina et al. (2006) and later by using the PEG biovolume file (PEG BIVOL\_2009

and previous versions). Datasets lacking substantial parts of biovolume calculations for an extensive period have been excluded from the calculations. The data have been divided into three different seasons, namely spring, summer and autumn. The intervals for area 1-3 (the Swedish West coast) have been defined as February until April for spring, May until July for summer and August until September for autumn. The seasons have been adjusted to one month later for areas 4-14 (see table 2 for an overview).

The data in this report is from several different institutes. All results have, when possible, been kept in their original form. Only minor additions have been made when only a few biovolume calculations have been missing. When phytoplankton data have been changed it has been in accordance with the latest PEG-biovolume file (PEG BIOVOL\_2009). Species with uncertain trophic status that have sometimes been recorded as both autotrophic and heterotrophic have been kept in the dataset assuming that they are autotrophic. Random samples have been checked to investigate the possible impact of these species, and these uncertain organisms added up at the most to 5% of the total community. All clearly heterotrophic species have been excluded in the dataset. The species have been divided into four different groups for simplistic reasons. The only exception is the graphs presenting toxic species. Three natural groups were chosen; diatoms, dinoflagellates and cyanobacteria and the fourth, is a more artificial group consisting mainly of small flagellates from different classes.

Chl *a* has been analyzed using standard methods, as described in the Manual for Marine Monitoring in the COMBINE Programme of HELCOM (HELCOM 1988). Ethanol has been used as means of extraction.



| Area | Spring         | Summer      | Autumn             |
|------|----------------|-------------|--------------------|
| 1-3  | February-April | May-July    | August-October     |
| 4-14 | March-May      | June-August | September-November |

Table 2. The seasonal time periods of the different areas.

### 3.5 Statistical tests

Statistical tests performed on phytoplankton data.

A parametric linear regression has been applied to the total phytoplankton occurrence in the different areas (see appendix D). No statistical analyses have been made on the different groups of phytoplankton but graphs are shown with trend lines.

Statistical tests were performed on Chl *a* content and Secchi depth. When the amount of data points was sufficient, both a linear regression and non-linear (non-parametric) analysis have been applied on the data sets to analyse the last 15 years for possible trends. A linear regression was used where data were normally distributed and otherwise a non-parametric method, the Mann-Kendall test was applied. To disregard the effects of seasonal changes, the seasonal Kendall method, closely linked to the Mann-Kendall method, was used. Further discussion can be found in Hirsch et al, 1994. See also the previous report in this series (Andersson & Andersson 2006) for further details on the statistical background.

### 3.6 Box plots

To facilitate comparisons between areas, all areas are presented in one figure as box plots. Secchi, Chl *a* hose data from 0-10 m and Chl *a* hose data from 0-20 m is presented for the spring, summer and autumn seasons (see Andersson and Andersson, 2006 for further details on box plots).

## 4 RESULTS

### 4.1 Trends in figures and tables

In appendix **C**, the monthly average abundance (cells \* l<sup>-1</sup>) for area 1 and biovolume occurrence (µm<sup>3</sup> \* l<sup>-1</sup>) for areas 2-14 of phytoplankton between the years 1999-2008 are presented. Four different groups have been selected and are presented namely diatoms (class diatomophyceae), dinoflagellates (class dinophyceae), cyanobacteria (class cyanophyceae) and a last group that includes small flagellates and autotrophic ciliates (classes chlorophyceae, chrysophyceae cryptophyceae, prasinophyceae and prymnesiophyceae among others).

In appendix **D**, the seasonal occurrence of total phytoplankton abundance (cells \* l<sup>-1</sup>) and biovolume (µm<sup>3</sup> \* l<sup>-1</sup>) from integrated samples (0-10 m and 0-20 m) taken by hose are presented. The seasons are spring, summer and autumn for the different regions. A regression line is presented and the statistical evaluation for each plot is presented in a table (table 6).

In Appendix **E**, figures of phytoplankton abundance (cells \* l<sup>-1</sup>) and biovolume (µm<sup>3</sup> \* l<sup>-1</sup>) are presented as scatter plots. Four different groups have been selected and are presented separately, namely diatoms (class diatomophyceae), dinoflagellates (class dinophyceae), cyanobacteria (class cyanophyceae) and a last group including small flagellates and autotrophic ciliates (class chlorophyceae, chrysophyceae cryptophyceae, prasinophyceae and prymnesiophyceae among others). Each figure represents the different groups for an area and specific season. All data from comparable depths from each area are presented in one graph and the timescales in the x axes have subsequently been adjusted for the time span of the specific area. A trend line indicates the trend for each group of phytoplankton in the scatter plot.

In Appendix **F**, figures showing the occurrence of toxic species are presented. The dataset included are from 1999 until 2008. The species are presented where they frequently occur. Data are presented for combinations of different areas to represent the Swedish west coast (area 1-3), the Baltic proper (area 5-11) and the Gulf of Bothnia (area 12-13).

In Appendix **G**, a table presents the areas where all recorded phytoplankton species have been observed during the period from 1999 to 2008.

In Appendix **H**, figures of the parameters for each area are presented as time series. Chl *a* (bottle, hose 0-10 metres and 0-20 metres) and Secchi are presented separately and each figure is also divided into the seasons spring, summer and autumn. Most data from each area is presented, hence the time series vary in length.

In Appendix **I**, every area and every parameter is presented in separate tables. In a table, the mean, standard deviation, minimum value, maximum value and number of observations for each year is presented, divided into spring, summer and autumn measurements. The number of observations reflects the amount of values available for the specific area, year, season and parameter. Below the values of 2008, the mean, max and min of the values from the 15 year period is presented. At the bottom of the table the results of the trend analysis are presented.

### 4.2 General results

To get an overview, a table that includes information about the significant trends has been put together (table 3). The overview presents six parameters, divided into spring, summer and autumn for all areas. The magnitudes of the slopes are however not presented in any way in the table.

Table 3. The parameters, divided into spring, summer, autumn for all areas. The arrows indicate significant trends, where upwards indicate a positive trend and downwards indicate a negative trend. The thin arrows indicate that the trend is close to being significant. The thicker arrows indicate significance (p value < 0.05). To be a significant trend for Chl a and Secchi, the slope direction of both the linear regression and non-parametric method must be the same.

|                            |        | Skagerrak and Kattegat |   |   |   |   |   |   |   |   |    | Baltic Proper |    | Bothnian Sea |    |
|----------------------------|--------|------------------------|---|---|---|---|---|---|---|---|----|---------------|----|--------------|----|
|                            |        | Area                   |   |   |   |   |   |   |   |   |    |               |    |              |    |
| Parameter                  |        | 1                      | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11            | 12 | 13           | 14 |
| Chl-a Bottle<br>0-10 m     | Spring |                        |   |   |   |   |   |   |   | ↑ |    |               |    |              |    |
|                            | Summer |                        |   |   | ↑ |   |   |   |   |   |    |               |    |              |    |
|                            | Autumn | ↓                      |   |   |   |   |   |   | ↑ |   |    |               |    |              |    |
| Chl-a Hose<br>0-10 m       | Spring |                        |   |   |   |   |   |   |   |   |    |               |    | ↑            | ↑  |
|                            | Summer |                        | ↓ |   |   |   |   |   |   |   |    |               |    | ↑            | ↑  |
|                            | Autumn |                        |   | ↓ |   |   |   |   |   |   | ↑  |               |    |              | ↑  |
| Chl-a Hose<br>0-20 m       | Spring |                        |   |   |   |   |   |   |   |   |    |               |    |              |    |
|                            | Summer |                        |   |   |   |   |   |   |   |   |    |               |    |              |    |
|                            | Autumn |                        |   |   |   |   |   |   |   |   |    |               |    |              |    |
| Secchi                     | Spring |                        |   |   |   |   |   |   |   |   |    |               |    |              |    |
|                            | Summer |                        |   |   |   |   |   |   |   |   |    |               |    |              |    |
|                            | Autumn |                        |   |   |   |   |   |   |   |   |    |               |    | ↓            | ↓  |
| Phytoplankton<br>Abundance | Spring |                        |   |   |   |   |   |   |   | ↑ | ↑  |               |    |              |    |
|                            | Summer |                        | ↓ |   |   |   |   |   |   |   |    | ↑             |    |              |    |
|                            | Autumn |                        | ↓ |   |   |   |   |   |   |   |    |               |    |              |    |
| Phytoplankton<br>biovolume | Spring |                        |   |   |   |   |   |   |   |   |    |               |    | ↑            | ↑  |
|                            | Summer |                        |   |   |   |   |   |   |   |   |    |               |    |              |    |
|                            | Autumn |                        | ↓ |   |   |   |   |   |   |   | ↓  | ↑             |    |              |    |



### 4.2.1 Total phytoplankton

The monthly occurrence of different groups between the different areas is also quite clear with an overall dominance of diatoms almost all through the year along the Swedish west coast. The Baltic proper presents a bit more complex phytoplankton community with dinoflagellates predominantly found in the beginning of the year, cyanobacteria found during summer and diatoms found in autumn and winter. The northern part of the Baltic Proper and the Bay of Bothnia have a slight increase in diatoms during spring, otherwise flagellates are more common in most part of the year.

The total abundance (cells \* l<sup>-1</sup>) of phytoplankton decreases both in summer and in autumn in the Skagerrak open sea (area 2) whereas biovolume (µm<sup>3</sup> \* l<sup>-1</sup>) only shows a negative trend in autumn.

An overall negative trend is shown in the southern Baltic Sea (area 5 and 6) for both abundance and biovolume of phytoplankton during the spring period whereas only abundance decreases during autumn.

The western part of the Baltic Sea (area 10) shows a positive trend in abundance during spring but a decrease in biovolume during summer and autumn. The western coastal part of the Baltic Sea (area 11) shows a slight positive trend of both abundance and biovolume during summer.

The Gulf of Bothnia (area 13 and 14) shows an increase in biovolume during spring.

### 4.2.2 Different phytoplankton groups

Some indications of trends in the phytoplankton community structure are highlighted although no statistical analyses have been performed on this data.

The Skagerrak area and inside the Skerries (areas 1 and 2) present a decrease in the abundance and biovolume of small flagellates and others, the fourth group that was selected. This is more evident during summer and autumn. There is also a marked decrease in biovolume of diatoms, dinoflagellates and others during autumn in the Skagerrak area (area 2). In the Kattegat area small flagellates (others) decrease in abundance or biovolume in autumn whereas dinoflagellates and diatoms increase in numbers during the same period.

The Arkona basin (area 5) presents a trend towards a decrease of abundance and biovolume of diatoms, dinoflagellates and small flagellates (others) during autumn. The Bornholm basin (area 6) only shows a decrease in both abundance and biovolume of small flagellates (others) during autumn.

The eastern Gotland basin (area 9) shows a decrease in abundance of cyanobacteria during summer but an increase of dinoflagellates during the same period. Small flagellates also show a decrease during autumn.

The northern Baltic proper shows an increase in abundance of dinoflagellates during spring but a decrease during summer and autumn.

An increase in cyanobacteria biovolume is evident in the eastern coastal area (area 11).

The Gulf of Bothnia (areas 13 and 14) has been sampled at different depths during different periods. Looking at the most recent years, when sampling has been from 0 to 10 metres, some trends can be evaluated.

The Bothnian Sea (area 13) shows an increase in diatoms abundance and biovolume during spring. Small flagellates (others) show a decrease in abundance both in spring and autumn. Cyanobacteria decrease during summer whereas dinoflagellates increase in autumn.

The Bothnian Bay (area 14) shows an increase of

both abundance and biovolume of dinoflagellates and diatoms during spring. Small flagellates and others (others) are however decreasing during autumn.

### 4.2.3 Toxic species

The west coast (areas 1-3) shows a decrease in the toxic dinoflagellate genus *Alexandrium* during autumn. The dinoflagellate species *Dinophysis acuminata* and *D. acuta* both seem to decrease during spring and the former during autumn and the latter during summer. The toxin-producing dinoflagellate *Protoceratium reticulatum* shows a decrease during both spring and summer.

The Baltic proper (areas 4-10) also shows a decrease of *Dinohysis acuminata* during summer and a slight increase of cells of the cyanobacteria species *Nodularia spumigena* during summer.

The Gulf of Bothnia (areas 13 and 14) present a slight decrease of the toxin-producing dinoflagellate genus *Alexandrium* during autumn and the species *Dinohysis acuminata* during autumn.

autumn in the northern Baltic Proper (area 10) and upward trends during spring and summer for the Gulf of Bothnia (area 13 and 14) as well as during autumn in the Bothnian Bay (area 14). The trend analyses seen in figure 189 in appendix I and table 14 in appendix J indicate upward trends in the western Gotland basin (area 8) during spring and autumn, however, since the data is very scarce, these trends have been disregarded in the overview table 3 above.

The amount of hose 0-20 metres data is very scarce and no trends are present.

For the scarce Secchi data, there are only downward trends in the Gulf of Bothnia (areas 13 and 14) during autumn.

### 4.2.4 Chl-a and secchi depth

As can be seen in the figures and tables of Chl *a* in appendices H and I, the data is scarce, preventing possible detection of more trends. With the current bottle dataset, there is a downward trend inside the Skerries (area 1) during autumn and an upward trend during summer in the Sound (area 4). There are almost significant upward trends in area 9 during spring as well as during autumn for both area 8 and 9.

For the hose data 0-10 metres, there is a downward trend in the Skagerrak open sea (area 2) during summer and an almost significant downward trend during autumn in the Kattegat (area 3). There is an upward trend during

## 5 DISCUSSION AND CONCLUSIONS

The monthly occurrence of phytoplankton presented in appendix C is quite consistent with the predicted occurrence of phytoplankton over the year. An overall low biovolume during winter is evident and the selection to exclude this period is somewhat supported. The winter period is however interesting as some production is evident in some areas. The winter period can in the future be interesting to evaluate.

Bloom occasions can easily be overlooked in a monthly sampling frequency, especially the short-lived spring bloom or blooms caused by upwelling situations. Blooms are sampled on occasions leading to a natural high biomass and abundance. The dataset can thereby be quite heterogeneous with considerable yearly differences in magnitude between data points that can cause some difficulties in the evaluation of the dataset. Longer time series can partly reduce this problem.

Chl *a* and total biovolume of phytoplankton are both used to assess the status of the seas surrounding Sweden. The results in this report suggest however that these factors are sometimes not concurrent. On a couple of occasions they contradict each other as is seen in the Baltic proper (the northern Baltic proper, area 10 and in the eastern Gotland basin area 9). The results further imply that phytoplankton biovolume is possibly a more sensitive indicator as trends are more easily found. The Baltic Proper in particular presents few trends in Chl *a* concentrations.

Changes in the occurrence of total phytoplankton can sometimes be explained by changes in different groups as seen in the dataset and pointed out in the results. On the other hand changes in time of different groups can be evident without changes in the total biovolume or abundance of phytoplankton. These results can be as important as changes in the total abundance and biovolume as it implies that the community structure is changing.

Few changes in the occurrence of different toxic species are evident from the dataset but it is still important to further investigate the occurrence of these species as time series will increase in the future and lead to a better understanding of the dynamics of these harmful species.

The scarce data on Secchi depth is partly due to the fact that this parameter requires sampling during the light period which is not the case on many occasions especially during the winter period. This is probably the reason that few trends were found in the dataset of this parameter.

The data presented in this report encourage further development of phytoplankton indicators that not only consider total biovolume or Chl *a* but rather consider different groups or species in the future. The succession of different species or groups can be important indicators for eutrophication but can also enhance the understanding of for example food web interactions.

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## APPENDIX A

### Table with area and stations

The seas surrounding Sweden has been divided into 14 sea areas. The waters surrounding Sweden vary in character and the partition into areas attempt to present an area with similar water characteristics. Each area is represented

by one or more stations. In table 4, each area with corresponding station is listed together with a geographical description of where the area is situated. Table 5 shows each station presented with its corresponding station code and the coordinates.

| Area                   | 1                                   | 2             | 3              | 4            | 5                | 6                  | 7                               | 8                         | 9                         | 10                         | 11                       | 12            | 13               | 14               |
|------------------------|-------------------------------------|---------------|----------------|--------------|------------------|--------------------|---------------------------------|---------------------------|---------------------------|----------------------------|--------------------------|---------------|------------------|------------------|
| Geography              | The west-coast, inside the skerries | The Skagerrak | The Kattegat   | The Sound    | The Arkona Basin | The Bornholm Basin | The south-eastern Baltic Proper | The Western Gotland Basin | The Eastern Gotland Basin | The Northern Baltic Proper | The eastern coastal area | The Åland Sea | The Bothnian Sea | The Bothnian Bay |
| Phytoplankton Stations | Ålsbäck<br>Havstensfjord            | Å17<br>Släggö | Anholt E       |              | BY2              | BY5                |                                 |                           | BY15                      | BY31                       | B1                       |               | C3 US5B/C1       | F9/A13           |
| Chla                   | Ålsbäck                             | Å13           | Anholt E       | W Landskrona | BY1              | BY4                | BCS III-10                      | BY32                      | BY10                      | BY29                       | B1                       | F64           | US5B             | F9               |
| Secchi depth Stations  | Havstensfjord                       | Å15           | Fladen         |              | BY2              | BY5                | PI-P1                           | BY38                      | BY15                      | BY31                       |                          |               | SR5/C4           | F3/A5            |
|                        |                                     | Å17           | GF4            |              |                  | BY39               |                                 |                           | BY20                      |                            |                          |               | US3/C6           |                  |
|                        |                                     | HS5           | Kullen         |              |                  | Hanöbukten         |                                 |                           |                           |                            |                          |               | C3               |                  |
|                        |                                     | M6            | St Middelgrund |              |                  |                    |                                 |                           |                           |                            |                          |               |                  |                  |
|                        |                                     | TH6           |                |              |                  |                    |                                 |                           |                           |                            |                          |               |                  |                  |
|                        |                                     | P2            |                |              |                  |                    |                                 |                           |                           |                            |                          |               |                  |                  |
|                        |                                     | Släggö        |                |              |                  |                    |                                 |                           |                           |                            |                          |               |                  |                  |

Table 4. The different parameters for the areas and the stations included in each area.

| Stations       | Station code | Latitude |         | Longitude |         |
|----------------|--------------|----------|---------|-----------|---------|
|                |              | Degrees  | Minutes | Degrees   | Minutes |
| Alsbäck        | FIBG 26      | 58       | 19.4    | 11        | 32.8    |
| Havstensfjord  | FIBO 46      | 58       | 18.75   | 11        | 46.4    |
| Å13            | SKEX 14      | 58       | 20.2    | 11        | 2       |
| Å15            | SKEX 16      | 58       | 17.7    | 10        | 51      |
| Å17            | SKEX 18      | 58       | 16.5    | 10        | 30.8    |
| HS5            | SKEX 69      | 57       | 44.2    | 10        | 00.4    |
| M6             | SKNX 21      | 58       | 10      | 9         | 30      |
| TH6            | SKNX 40      | 58       | 8       | 9         | 11      |
| P2             | SKEX 23      | 57       | 52      | 11        | 18      |
| Släggö         | FIBG 27      | 58       | 15.5    | 11        | 26.0    |
| Anholt E       | KAEX 29      | 56       | 40.0    | 12        | 07.0    |
| Fladen         | KANX 25      | 57       | 11.5    | 11        | 40.0    |
| GF4            | KANX 02      | 57       | 33      | 11        | 31.5    |
| Kullen         | KAEX 33      | 56       | 14      | 12        | 22.2    |
| St Middelgrund | KAEX 30      | 56       | 34      | 12        | 13      |
| W Landskrona   | SOCX 39      | 55       | 52.0    | 12        | 45.0    |
| BY1            | BPSA 02      | 55       | 0       | 13        | 18      |
| BY2            | BPSA 03      | 55       | 0       | 14        | 5       |
| BY4            | BPSB 06      | 55       | 23      | 15        | 20      |
| BY5            | BPSB 07      | 55       | 15      | 15        | 59      |
| BY39           | BPSE 49      | 56       | 7       | 16        | 32      |
| Hanöbukten     | BPSH 05      | 55       | 37      | 14        | 52      |
| BCS III-10     | BPSE 11      | 55       | 33.3    | 18        | 24      |
| PL-P1          | BPSG 71      | 54       | 50      | 19        | 20      |
| BY32           | BPWX 38      | 58       | 1       | 17        | 59      |
| BY38           | BPWX 45      | 57       | 7       | 17        | 40      |
| BY10           | BPEX 13      | 56       | 38      | 19        | 35      |
| BY15           | BPEX 21      | 57       | 20      | 20        | 3       |
| BY20           | BPEX 26      | 58       | 0       | 19        | 53      |
| BY29           | BPNX 35      | 58       | 53      | 20        | 19      |
| BY31           | BPNX 37      | 58       | 35      | 18        | 14      |
| B1             | BPNX 01      | 58       | 48.0    | 17        | 37.00   |
| F64            | GBAX 02      | 60       | 11      | 19        | 9       |
| US5B           | GBSX 26      | 62       | 34.2    | 19        | 58.5    |
| SR5/C4         | GBSX 07      | 61       | 5       | 19        | 35      |
| US3/C6         | GBSX 27      | 62       | 45      | 19        | 12      |
| C3             | GBSX 31      | 62       | 39.17   | 18        | 57.14   |
| F9             | GBBX 43      | 64       | 42.5    | 22        | 4       |
| F3/A5          | GBBX 45      | 65       | 10      | 23        | 14      |

Table 5. Each station with its station code and coordinates.

## APPENDIX B

### Trend analysis, equations

#### General calculations

The equation for calculating the mean values of Chl-a and Secchi depth is:

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i$$

Where  $x$  is a vector with measurements and  $n$  is the length of  $x$ . (MATLAB function: mean.) The median value is used to produce boxplots and is the numerical value that is situated in the middle of a dataset of descending values. The median is the middle value if the length of the dataset is uneven and is the mean of the two values in the middle if the length of the dataset is even. (MATLAB function: median). A distance regularly coupled to the median value, is the inter quartile distance. This distance is calculated by subtracting the lower quartile, the 25<sup>th</sup> percentile, from the higher quartile, the 75<sup>th</sup> percentile.

The equation for the standard deviation is (MATLAB function: std):

$$std = \left( \frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2 \right)^{1/2}$$

#### Linear regression

In this report, two different approaches to analyze the data for trends have been used. One was to find the coefficients of a polynomial  $p(x)$  of degree  $n$  that fits the data,  $p(x(i))$  to  $y(i)$ , in a least squares sense. The result  $p$  is a row vector of length  $n+1$  containing the polynomial coefficients in descending powers. The equation to find the coefficients of a polynomial is:

$$p(x) = p_1 x^n + p_2 x^{n-1} + \dots + p_n x + p_{n+1}$$

In a polynomial of the first degree ( $n = 1$ ),  $p_1$  gives the slope of the linear regression

(MATLAB function: polyfit). To plot the linear regression line and to create the 95% confidence intervals of the line, the MATLAB function polyconf, that evaluates the polynomial at each value of  $x$ , was used. The function polyconf uses input created by polyfit and assumes that the errors in the data input to polyfit are independent normal with constant variance.

#### Non-parametric method

The second approach to analyze the data for trends was to apply the non-parametric seasonal Kendall method. Let the time series of the data set be  $x_1, x_2, x_3, \dots, x_n$ . To see how the values are related to each other, they are combined in all possible variations of pairs of the dataset  $(x_j, x_k)$  where  $k > j$  and compare the number of pairs where  $x_k > x_j$  (positive trend) to the number of pairs where  $x_k < x_j$  (negative trend). The test quantity is  $S = (\text{the amount of pairs } (x_j, x_k) \text{ where } x_k > x_j) - (\text{the amount of pairs } (x_j, x_k) \text{ where } x_k < x_j)$ . This can be expressed by a sgn-function:

$$\text{sgn}(x_k - x_j) = \begin{cases} 1, & x_k - x_j > 0; \\ 0, & x_k - x_j = 0; \\ -1, & x_k - x_j < 0; \end{cases}$$

The test quantity  $S$  is defined as

$$S = \sum_{j=1}^{n-1} \sum_{k=j+1}^n \text{sgn}(x_k - x_j)$$

The seasonal Kendall method extracts the effect of variance between seasons by comparing measurements within a season. In this report, a monthly mean value each year has been used when applying seasonal Kendall to the data. The test quantity for each month then becomes:

$$S_i = \sum_{j=1}^{n_i-1} \sum_{k=j+1}^{n_i} \text{sgn}(x_k - x_j)$$

and the variance becomes:



$$Var[S_i] = \frac{n_i(n_i - 1)(2n_i + 5) - \sum t_i(t_i - 1)(2t_i + 5)}{18}$$

where  $t_i$  is the amount of pairs  $(x_j, x_k)$  are 'tied values', that is they have the same value ( $x_k - x_j = 0$ ). The total test quantity:

$$S_{total} = \sum S_i$$

is for large data sets (large value of  $n$ ) approximately normally distributed and the variance then becomes:

$$Var(S_{total}) = \sum_i Var(S_i)$$

To see if there is an indication of a trend, a hypothesis test is carried out. The null hypothesis,  $H_0$ , that there is no trend is assumed to be true until a test rejects the null hypothesis. The alternative hypothesis,  $H_1$ , that there is a trend, is the opposite of the null hypothesis. In  $H_1$ , the trend can be both positive and negative, hence a two sided hypothesis (Sprent). To test the null hypothesis, the approximately normally distributed 'real' test quantity  $Z$  is calculated:

$$Z = \frac{S_{total}}{\sqrt{Var(S_{total})}}$$

From the test quantity  $Z$ , a  $P$  value can be calculated. To calculate  $P$ ,  $Z$  is assumed to be normally distributed. The area or cumulative distribution,  $F(Z)$ , under the standardized normal distribution curve for  $Z \leq Z_F$  such that the probability  $P(Z < Z_F) = F(Z)$ .

$$P = F(Z) = \int_{-\infty}^Z \frac{1}{\sqrt{2\pi}} e^{-z^2/2} dz$$

The value of  $P$  is affected by the sign of  $Z$  since there is a summation from  $-\infty$  to  $Z$  in the equation. Since  $H_1$  is a two sided hypothesis, (there is a positive or negative trend) the resulting  $P$  value should be doubled. If  $Z$  is negative (in MATLAB:  $P = normcdf(Z) * 2$ ):

$$P = F(Z) * 2$$

If  $Z$  is positive (in MATLAB:  $P = (1 - normcdf(Z)) * 2$ ):

$$P = (1 - F(Z)) * 2$$

If there is a trend, the magnitude of the trend is calculated. This is used by the Kendall slope estimator  $B$ . The magnitude of the trend is expressed in the form of a slope, but that does not imply that the trend is linear. For every pair within each month,  $i = 1, 2, 3, \dots, 12$  ( $x_{ij}, x_{ik}$ ) where  $k > j$ , the quota

$$b_{ijk} = \frac{(x_k - x_j)}{k - j}$$

is calculated which is equivalent to the direction coefficient (slopes) between time  $j$  and  $k$ . All slopes for all the months are sorted in order of magnitude. The Kendall slope estimate  $B$  is the median of these  $b_{ijk}$  values. To receive an error estimate, a confidence interval of the  $B$  value is calculated. The level of confidence is set to 95%, which implies that estimated error of the slope estimation is within 5%. To extract the upper and lower bounds of the confidence interval, a trend  $\delta$ , is subtracted from the data material. The upper bound is received by subtracting a negative  $\delta$  in case of a significant negative trend in the data material, a positive  $\delta_0$  is subtracted if no trend is detected until the data material produces a trend with a  $P$  value as close as possible under 0.025. The upper bound is then the value of  $\delta_0$ . The lower bound is similarly calculated, but here the  $P$  value is raised to 0.975. This is how the confidence interval of 95% is produced which gives the error marginal of the estimated slope of the trend. If the signs of the upper and lower bound values differ, the zero level lies within the upper and lower bounds, which indicates that there is no trend present.



## **APPENDIX C**

### **Monthly occurrence of phytoplankton**

In the following bar graphs the monthly average occurrence of phytoplankton between 1999 and 2008 are presented. Abundance (cells \* l<sup>-1</sup>) are presented for area 1 and biovolume (µm<sup>3</sup> \* l<sup>-1</sup>) for area 2-14. Different groups of phytoplankton are presented.

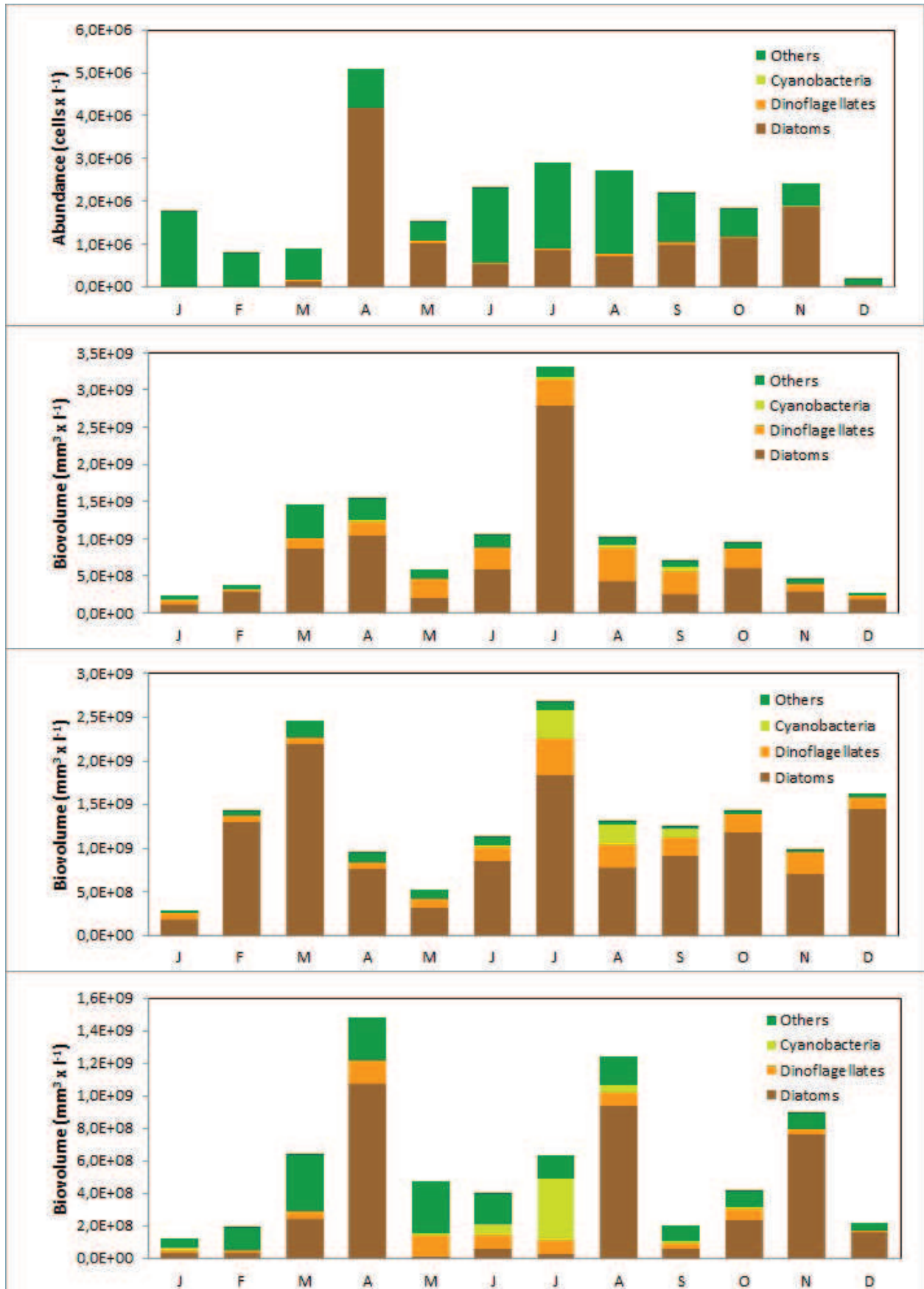


Figure 2. a.) inside the skerries b.) The Skagerrak c.) the Kattegat and d.) the Arkona basin (area 1, 2, 3 and 5) The monthly average biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) and abundance ( $\text{cells} \times \text{l}^{-1}$ ) mean occurrence of different phytoplankton groups during 1999 and 2008.

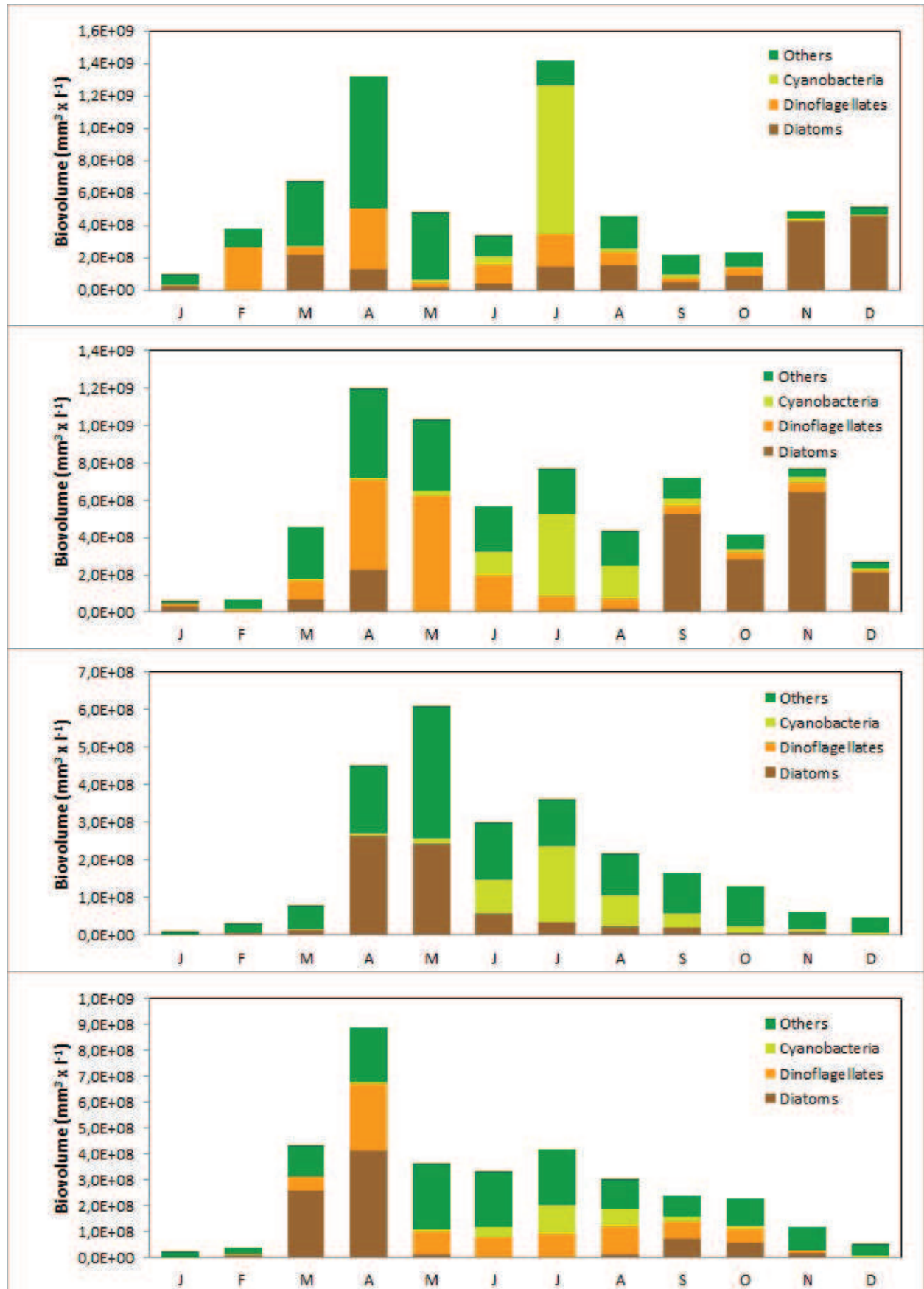


Figure 3. a.) The Bornholm basin, b.) The eastern Gotland basin c.) The northern Baltic proper and d.) the eastern coastal areas (area 6,9,10 and 11). Monthly average biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) mean occurrence of different phytoplankton groups during 1999 and 2008.

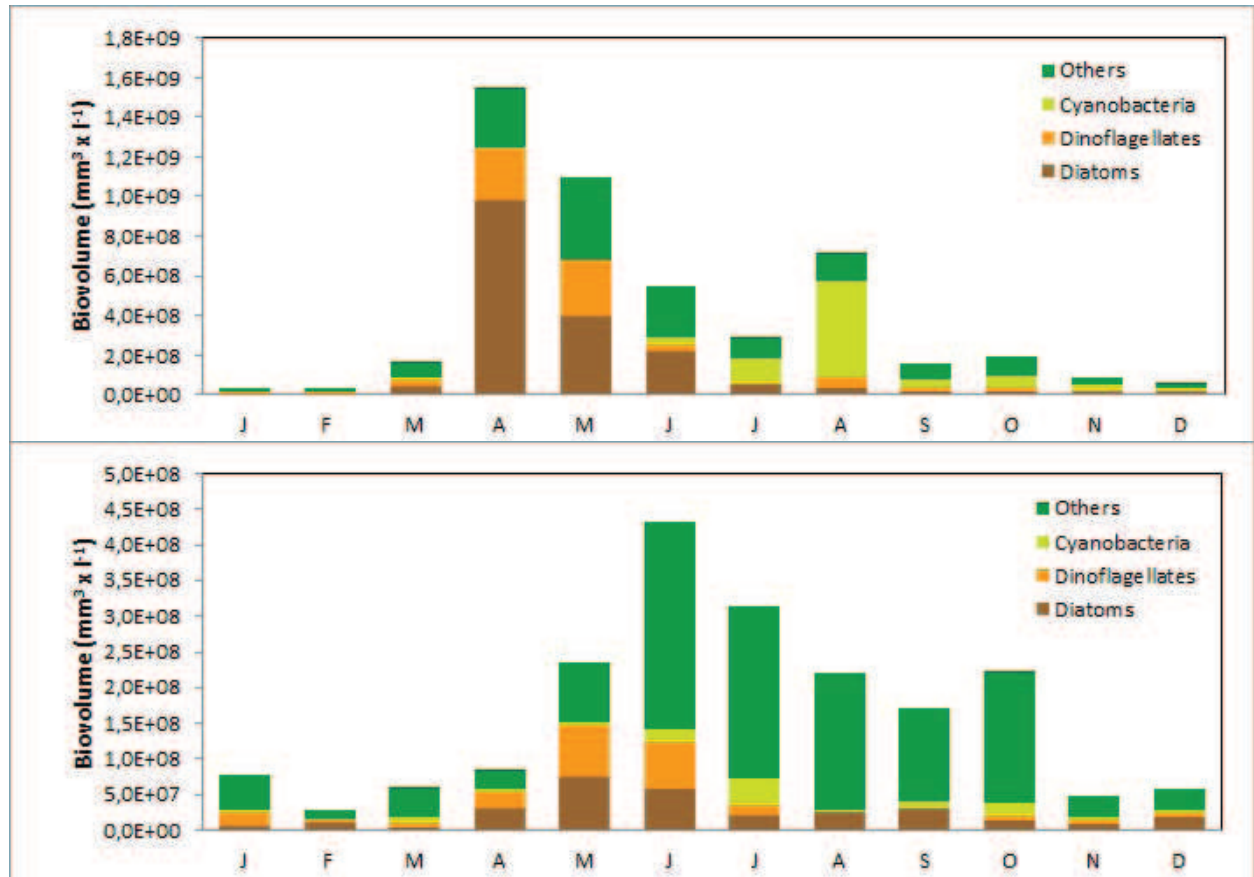


Figure 4. a.) The Bothnian Sea and the b.) Bothnian Bay (area 13 and 14) Monthly average biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) mean occurrence of different phytoplankton groups during 1999 and 2008.

## **APPENDIX D**

### **Scatter plots of total phytoplankton**

The seasonal occurrence of the total occurrence of phytoplankton abundance (cells \* l<sup>-1</sup>) and biovolume (µm<sup>3</sup> \* l<sup>-1</sup>) from integrated samples taken by hose are presented. The depth intervals are from comparable depths as the depths sampled for Chl-a (0-10m and 0-20m). The seasons are spring, summer and autumn for different regions. A regression line is presented and the statistical evaluation for each plot is presented in a table (table 6) at the end of the appendix.

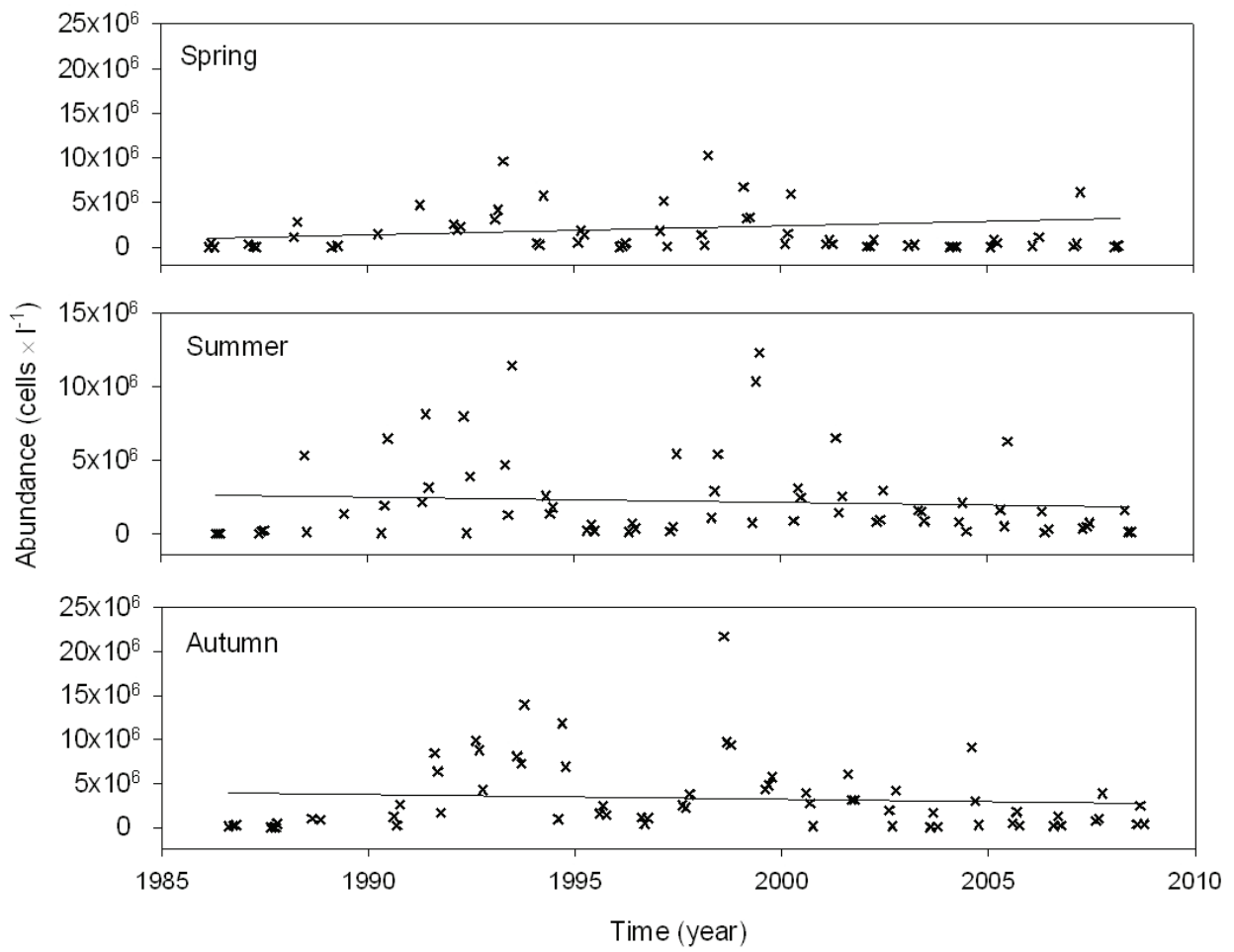


Figure 5. The west-coast inside the skerries, Area 1. Phytoplankton occurrence (cells  $\times$  l $^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (February to april), summer (May to July) and autumn (August to October). The black line represents the linear regression fit for the whole period.

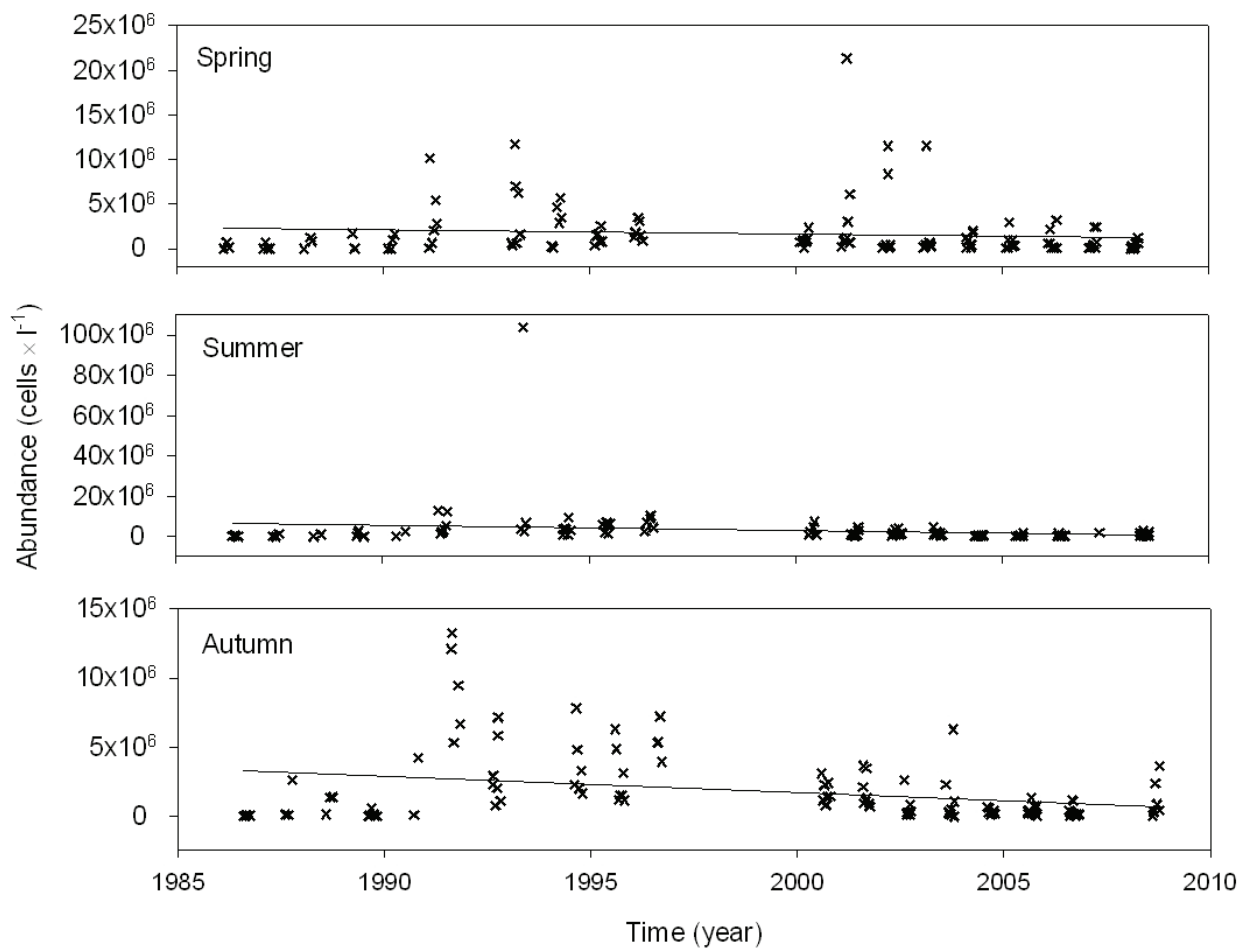


Figure 6. The Skagerrak, Area 2. Phytoplankton occurrence (cells × l<sup>-1</sup>) from integrated samples (0-10m) taken by hose during spring (February to april), summer (May to July) and autumn (August to October). The black line represents the linear regression fit for the whole period.



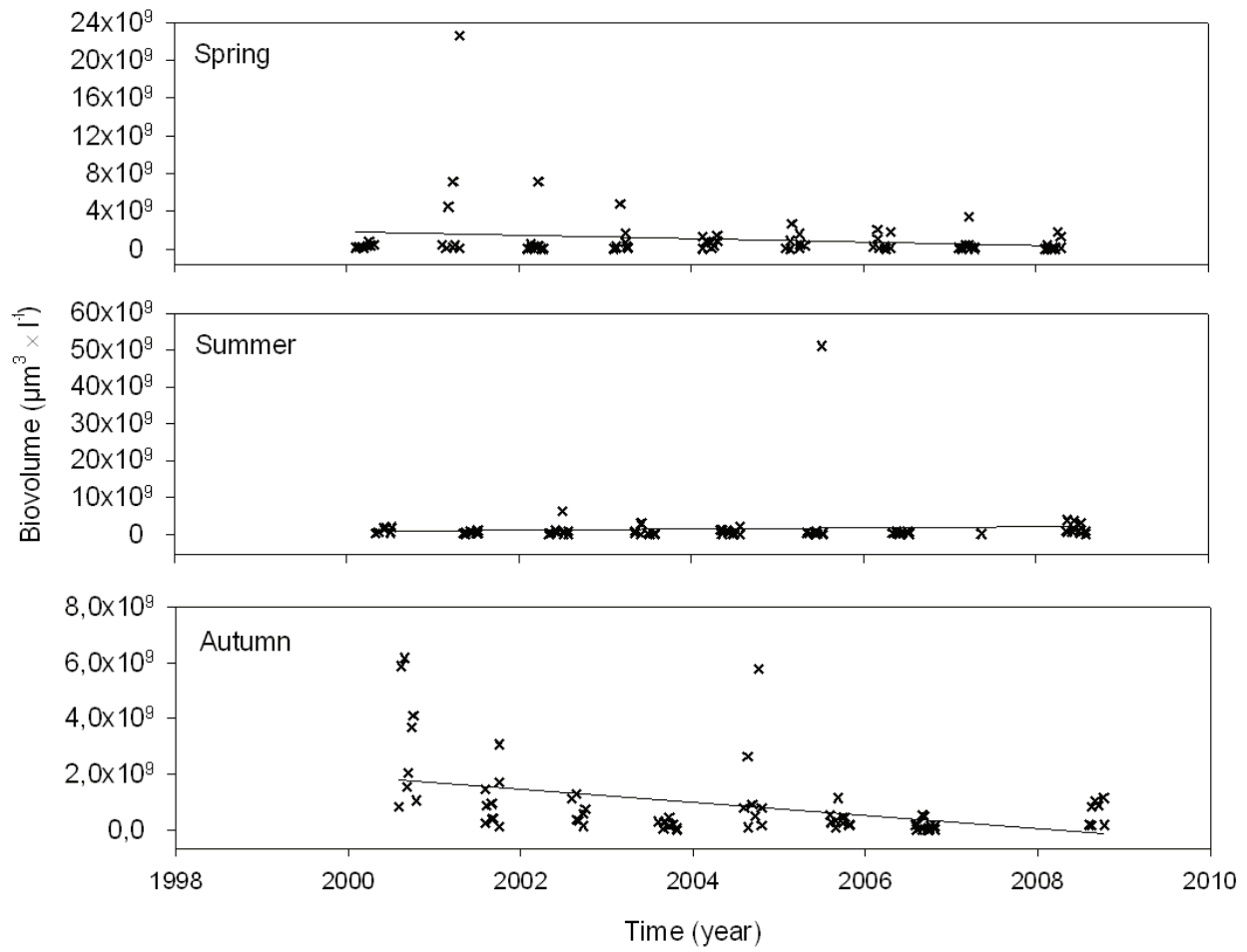


Figure 7. The Skagerrak, Area 2, Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (February to april), summer (May to July) and autumn (August to October). The black line represents the linear regression fit for the whole period.

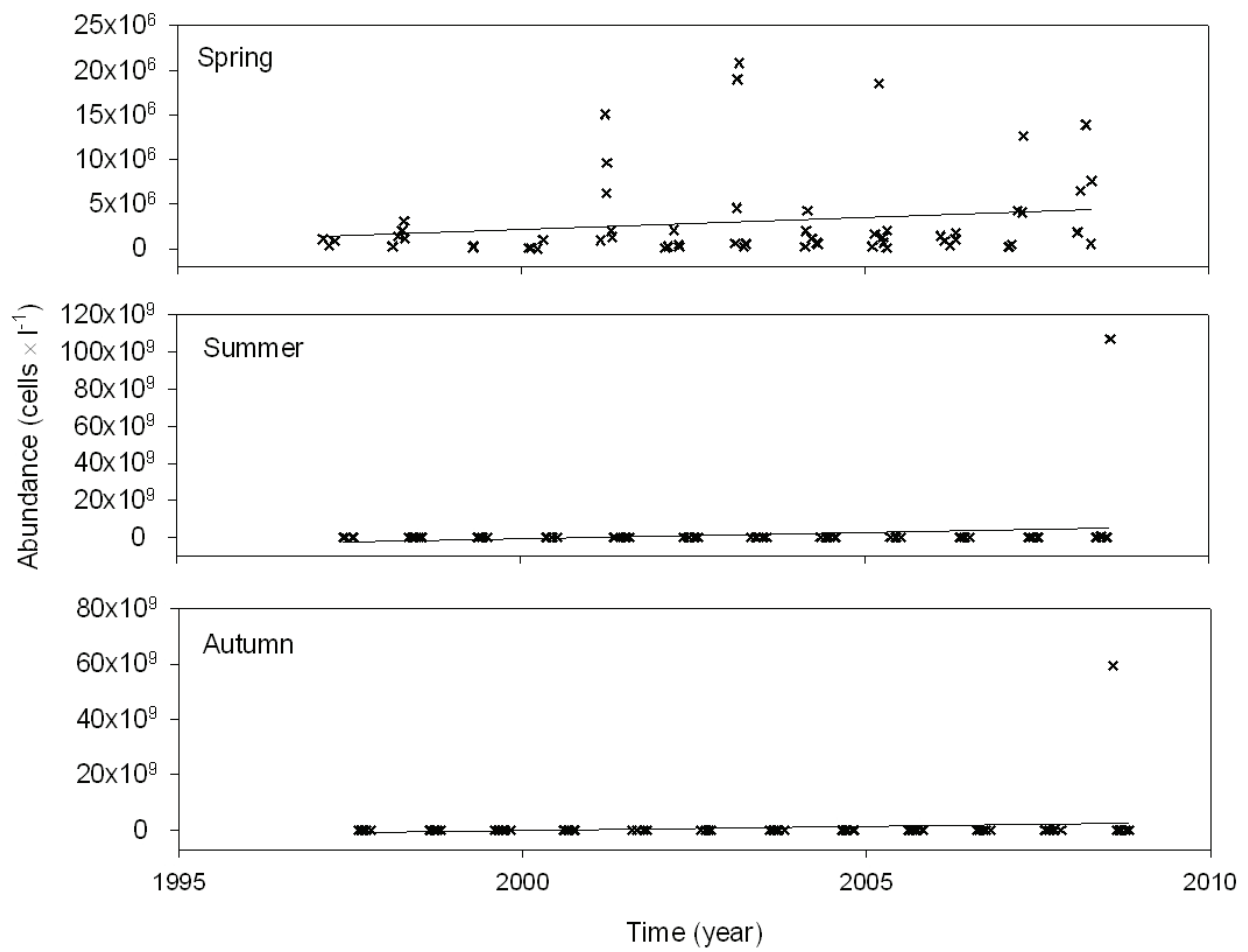


Figure 8. The Kattegat, Area 3. Phytoplankton occurrence (cells  $\times$  l $^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (February to april), summer (May to July) and autumn (August to October). The black line represents the linear regression fit for the whole period.

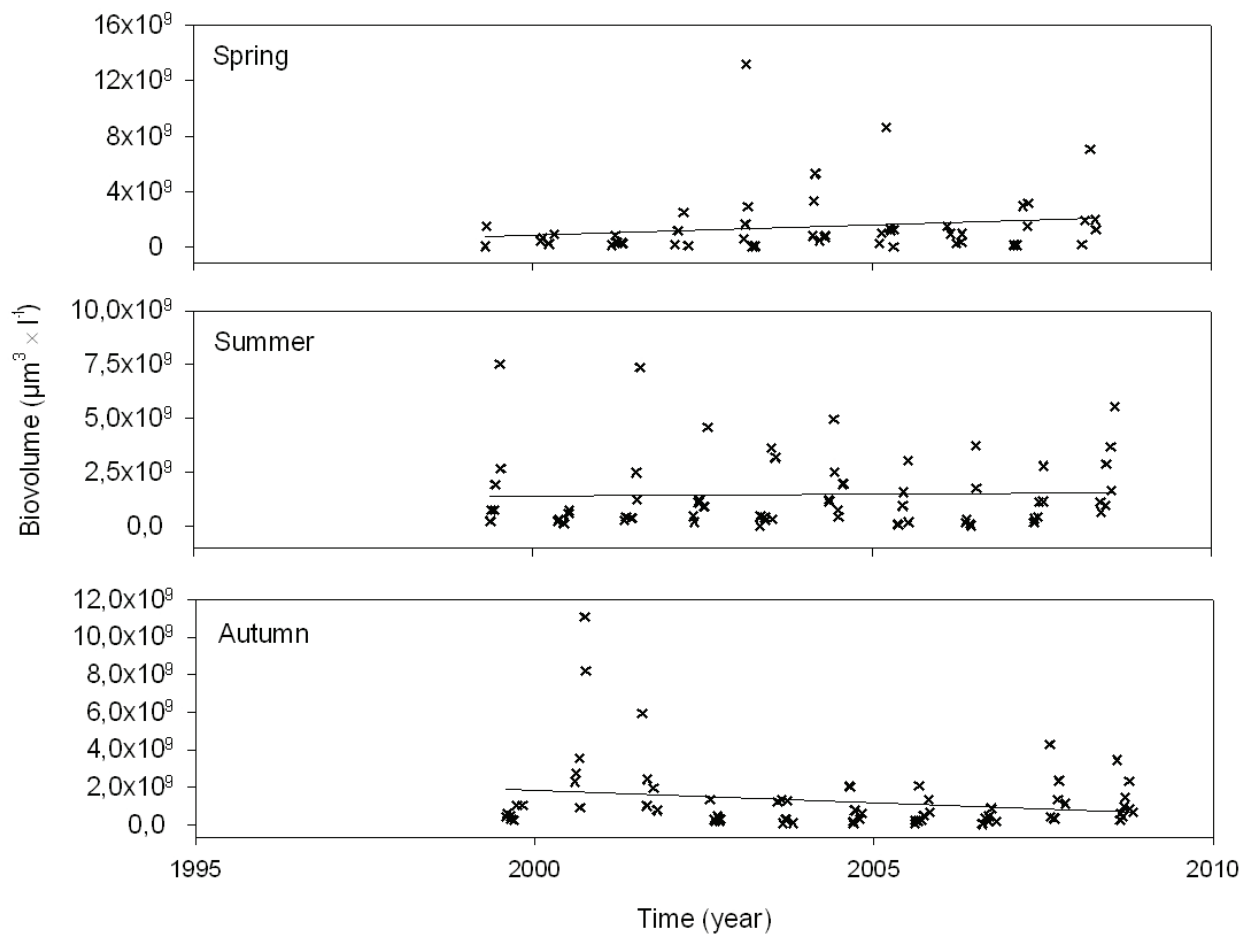


Figure 9. The Kattegat, Area 3. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (February to april), summer (May to July) and autumn (August to October). The black line represents the linear regression fit for the whole period.

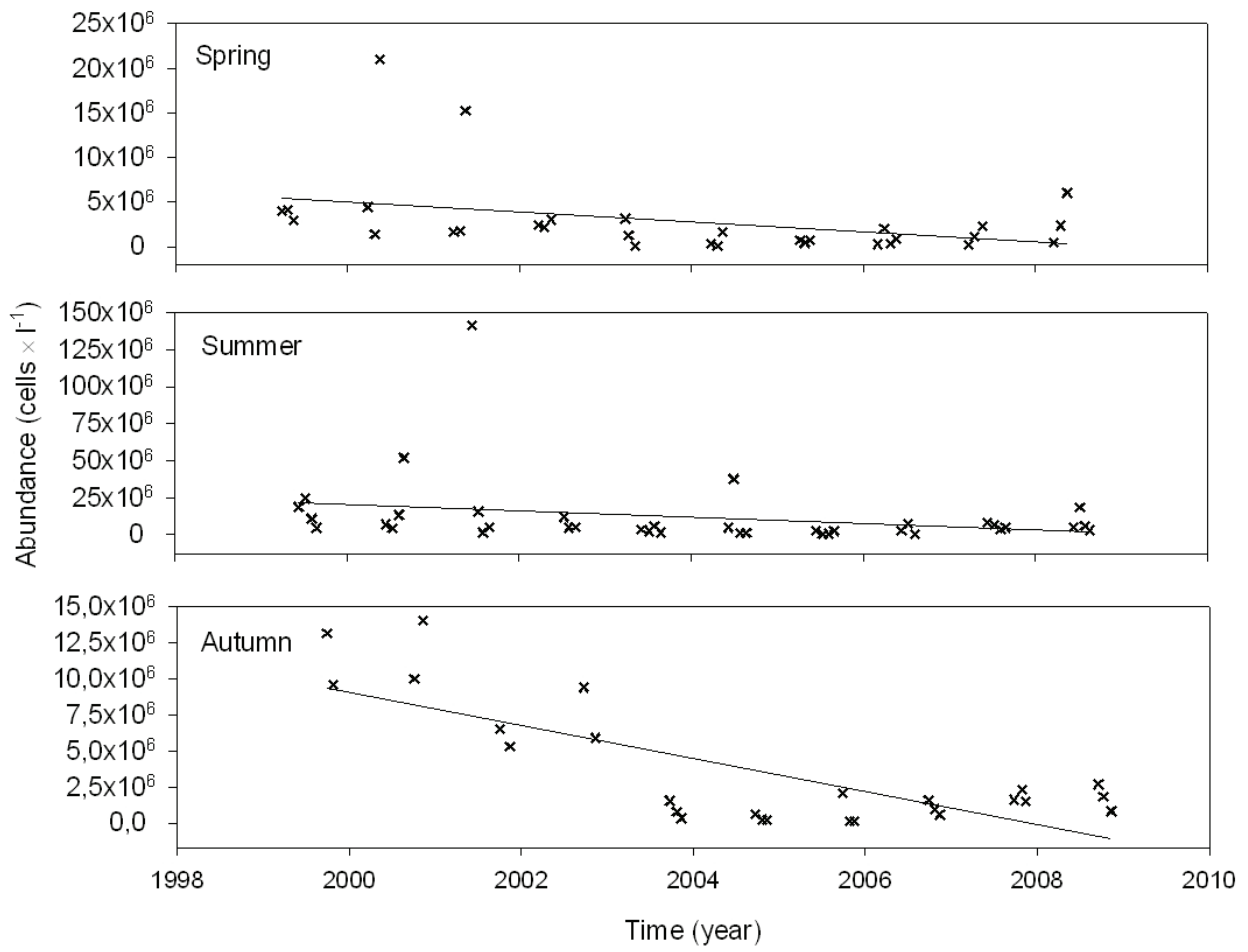


Figure 10. The Arkona Basin, Area 5. Phytoplankton occurrence (cells \* l<sup>-1</sup>) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

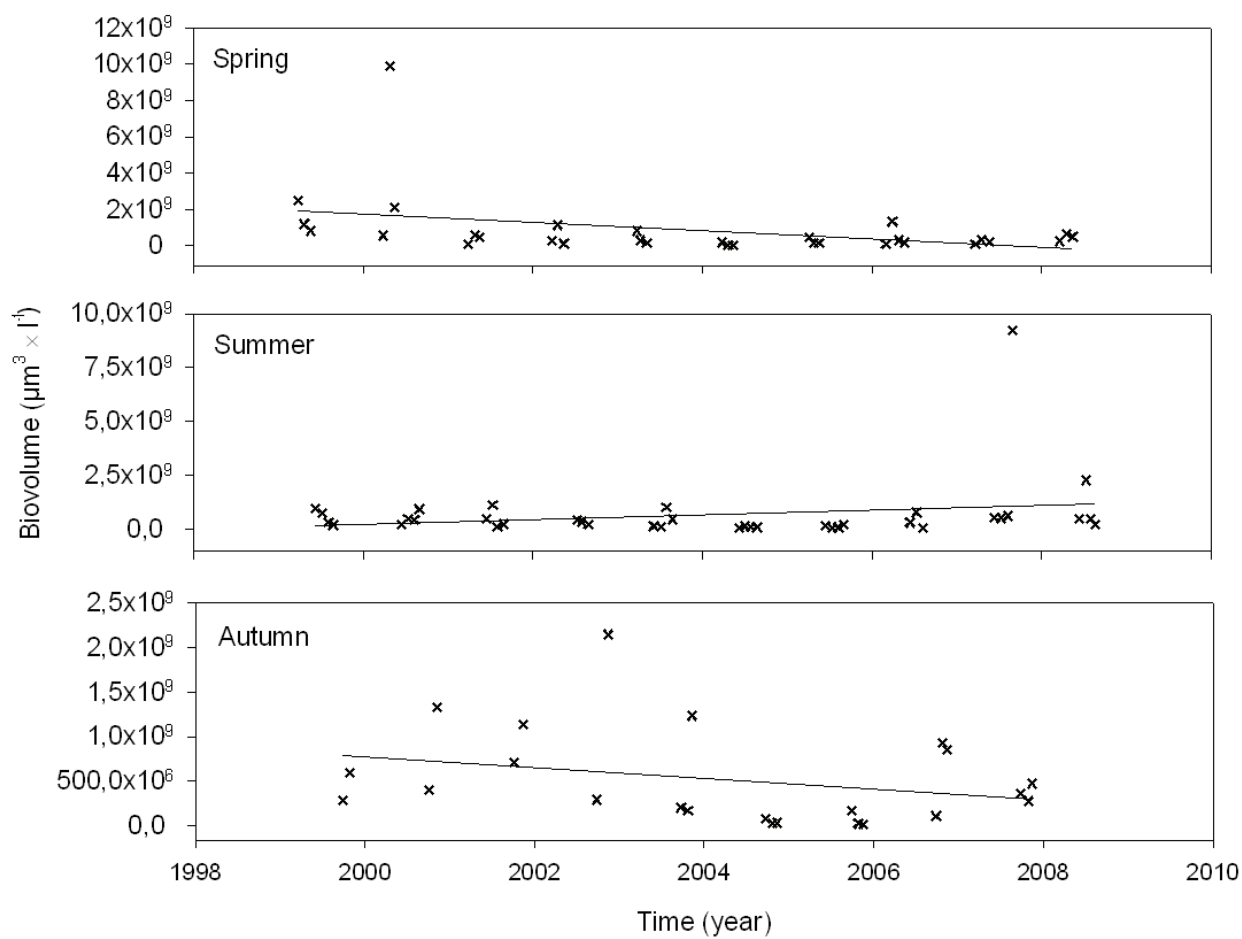


Figure 11. The Arkona Basin, Area 5. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

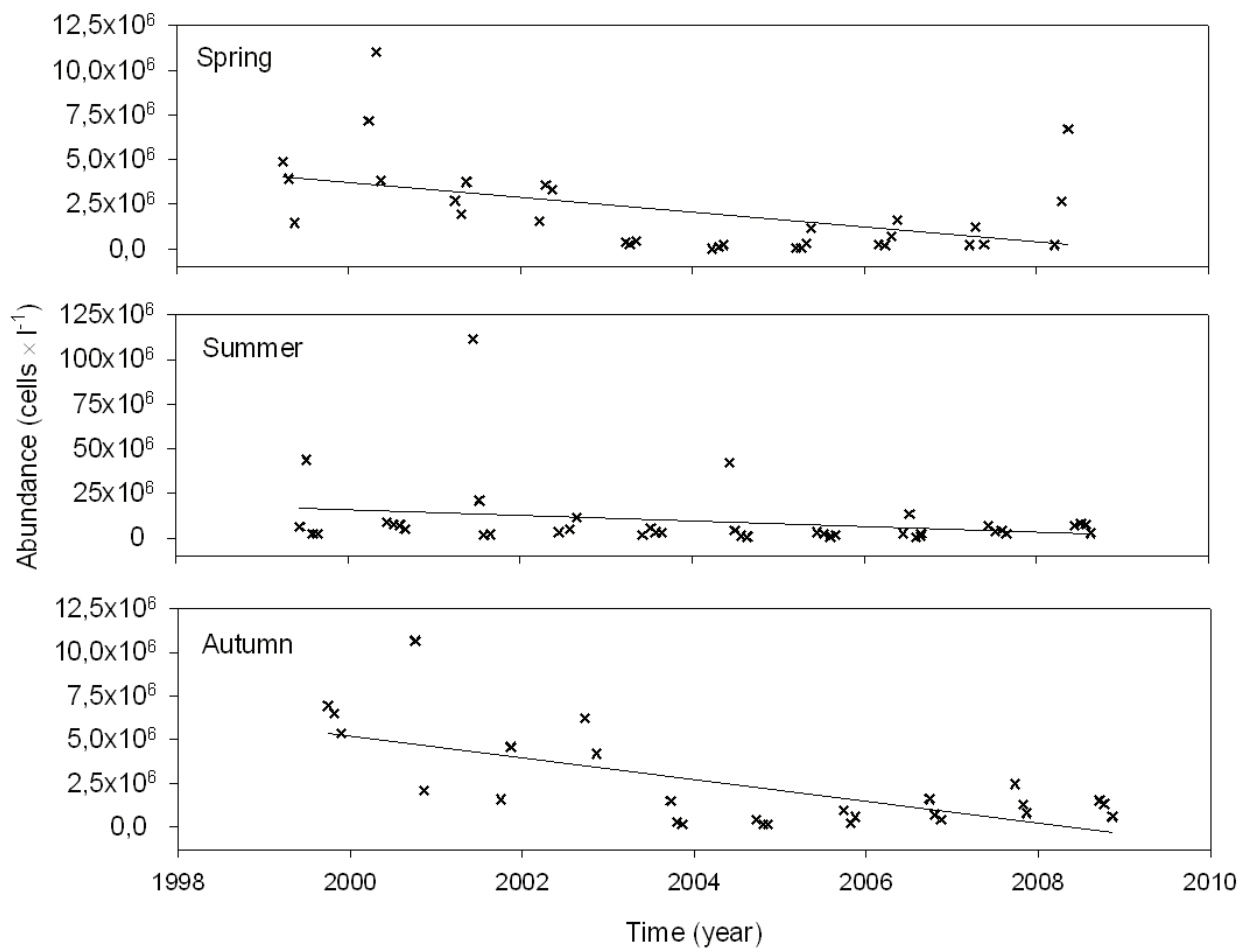


Figure 12. The Bornholm Basin, Area 6. Phytoplankton occurrence (cells \* l<sup>-1</sup>) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

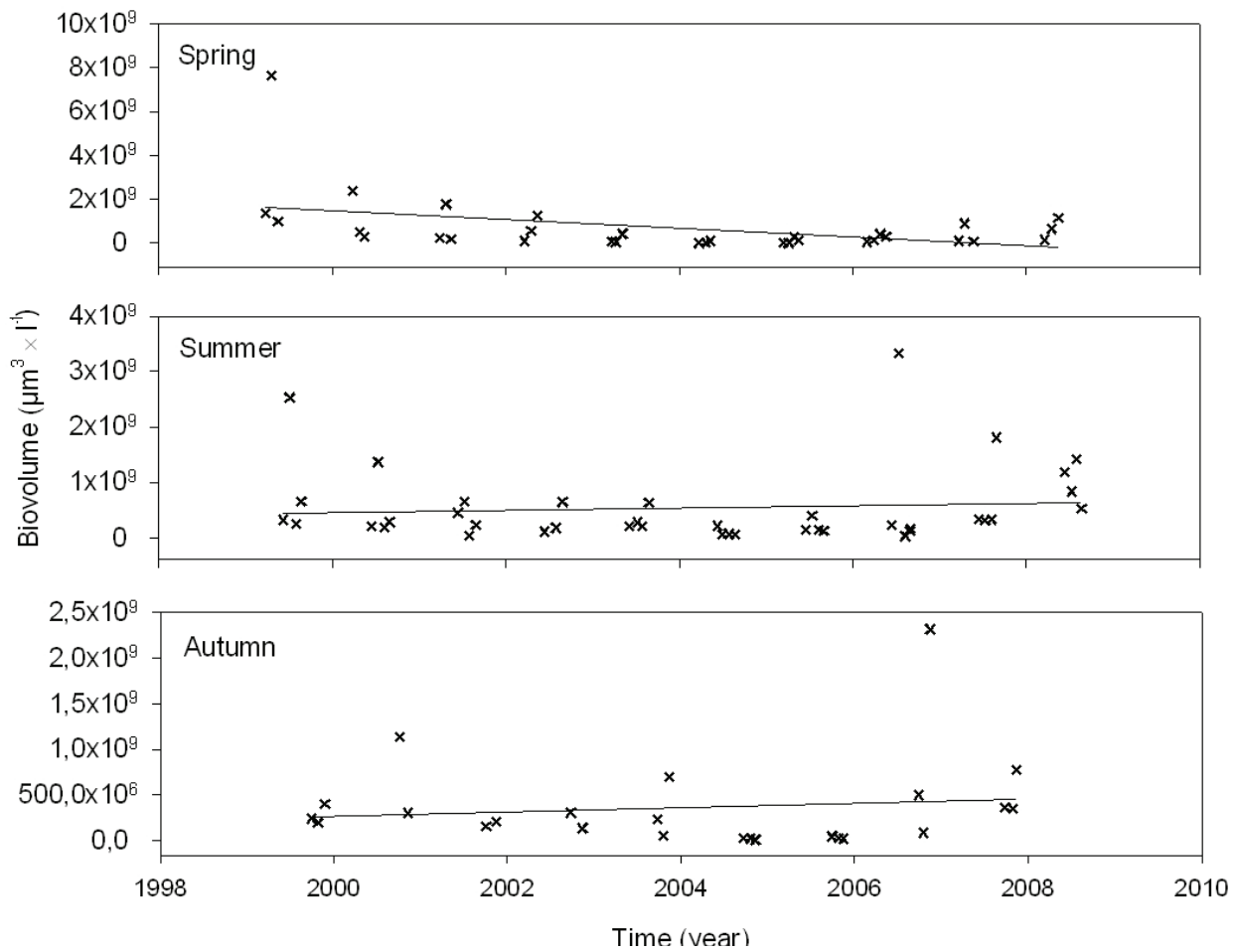


Figure 13. The Bornholm Basin, Area 6. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

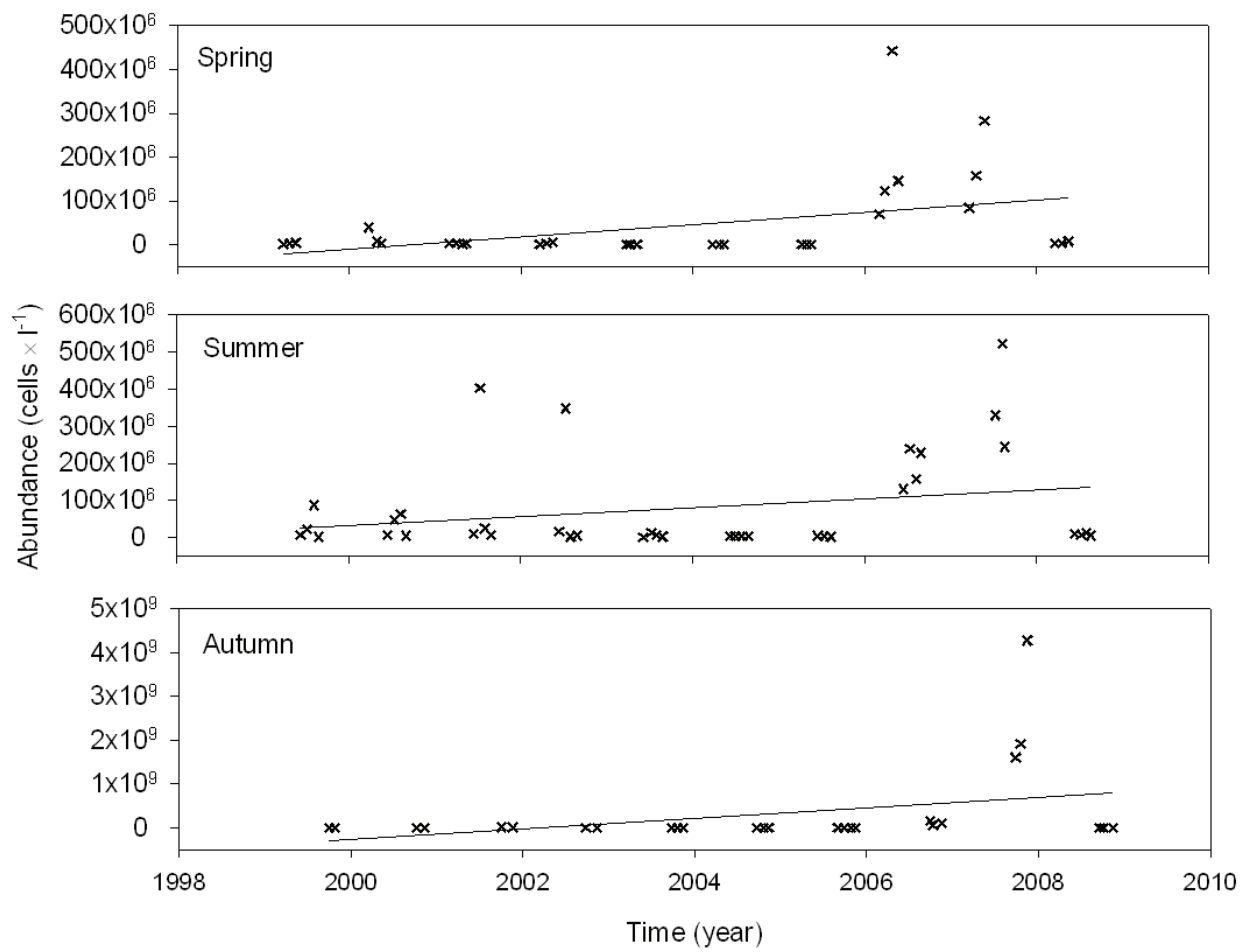


Figure 14. The Eastern Gotland Basin, Area 9. Phytoplankton occurrence (cells \* l<sup>-1</sup>) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.



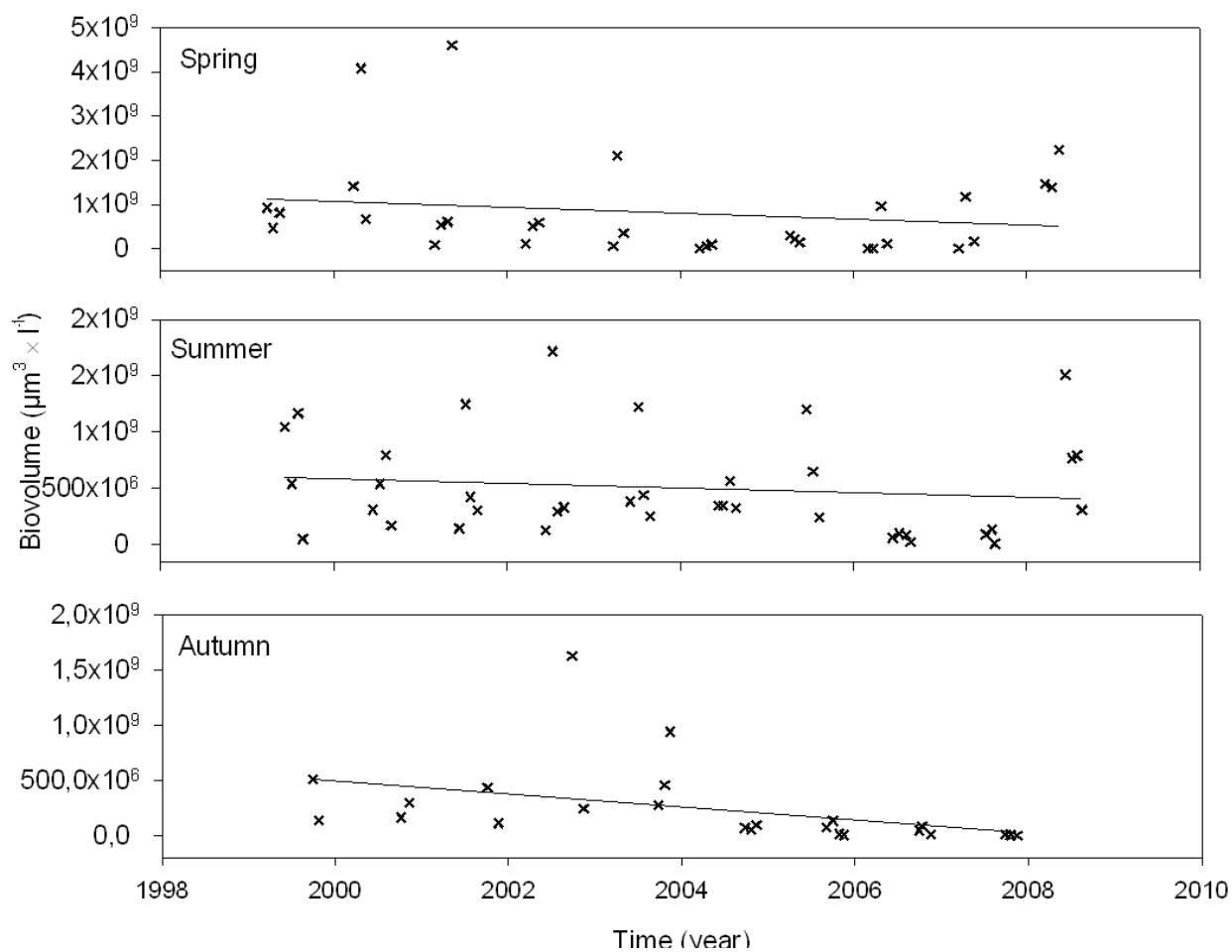


Figure 15. The Eastern Gotland Basin, Area 9. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

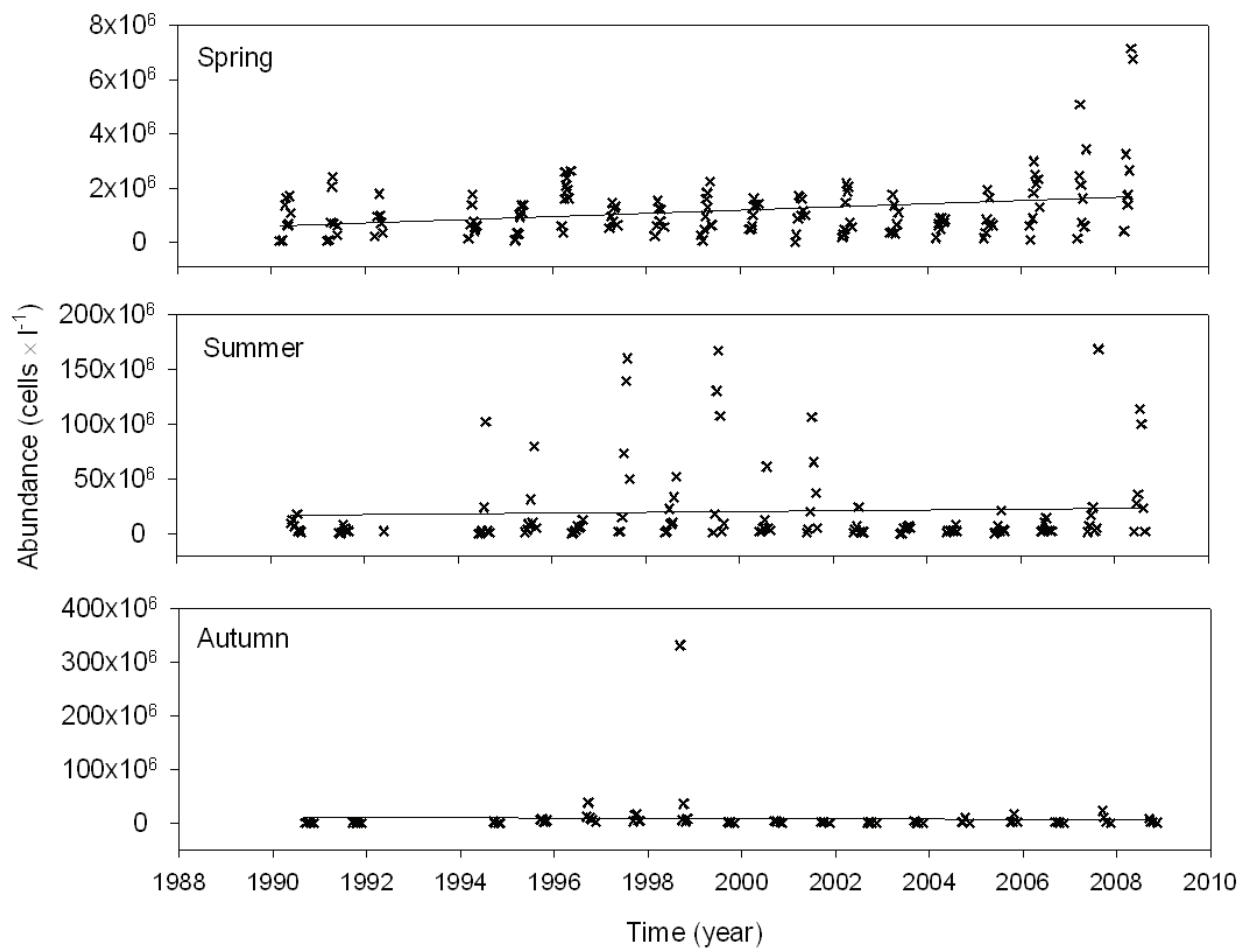


Figure 16. The Northern Baltic Proper, Area 10. Phytoplankton occurrence (cells × l<sup>-1</sup>) from integrated samples (0-20m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

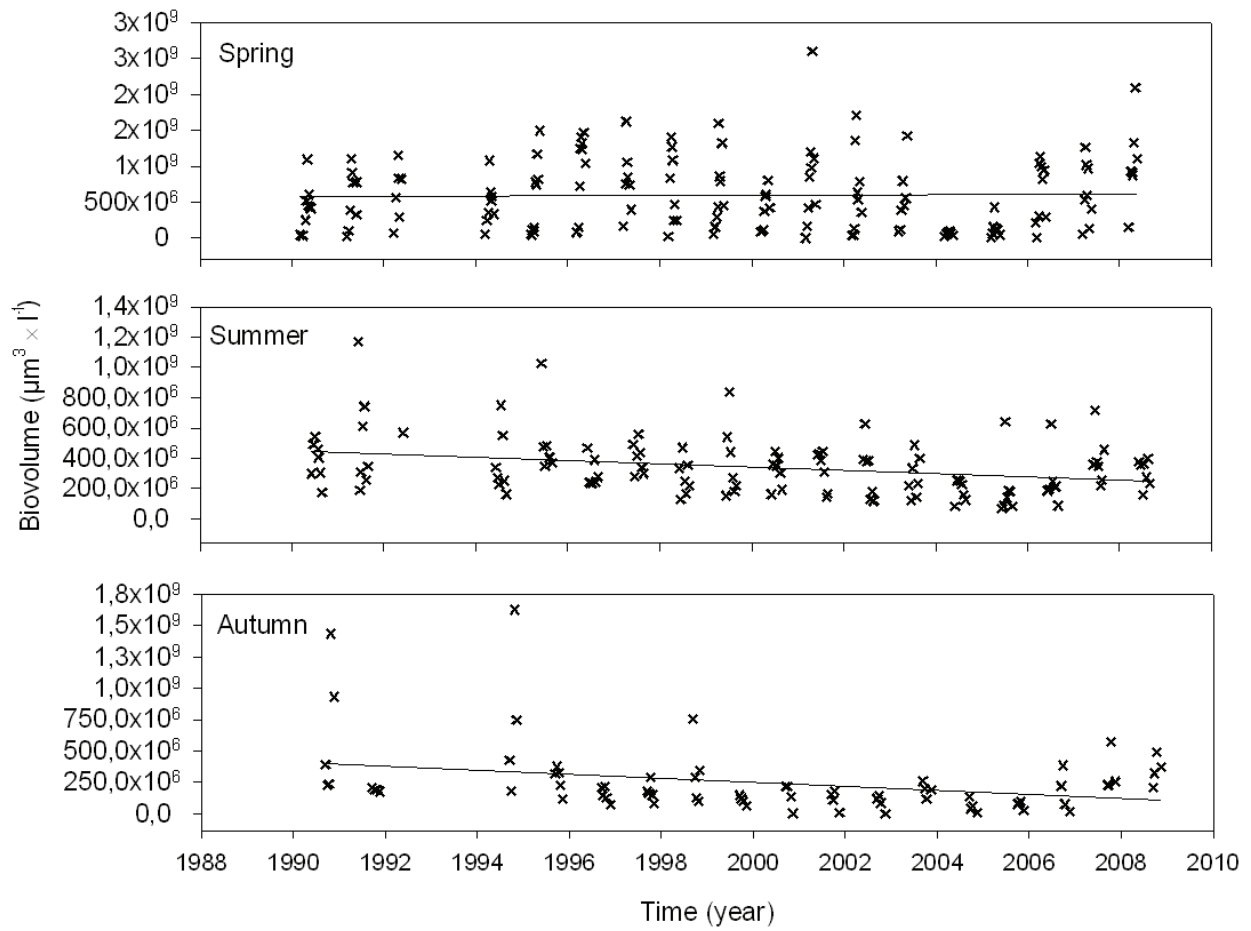


Figure 17. The Northern Baltic Proper, Area 10. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-20m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

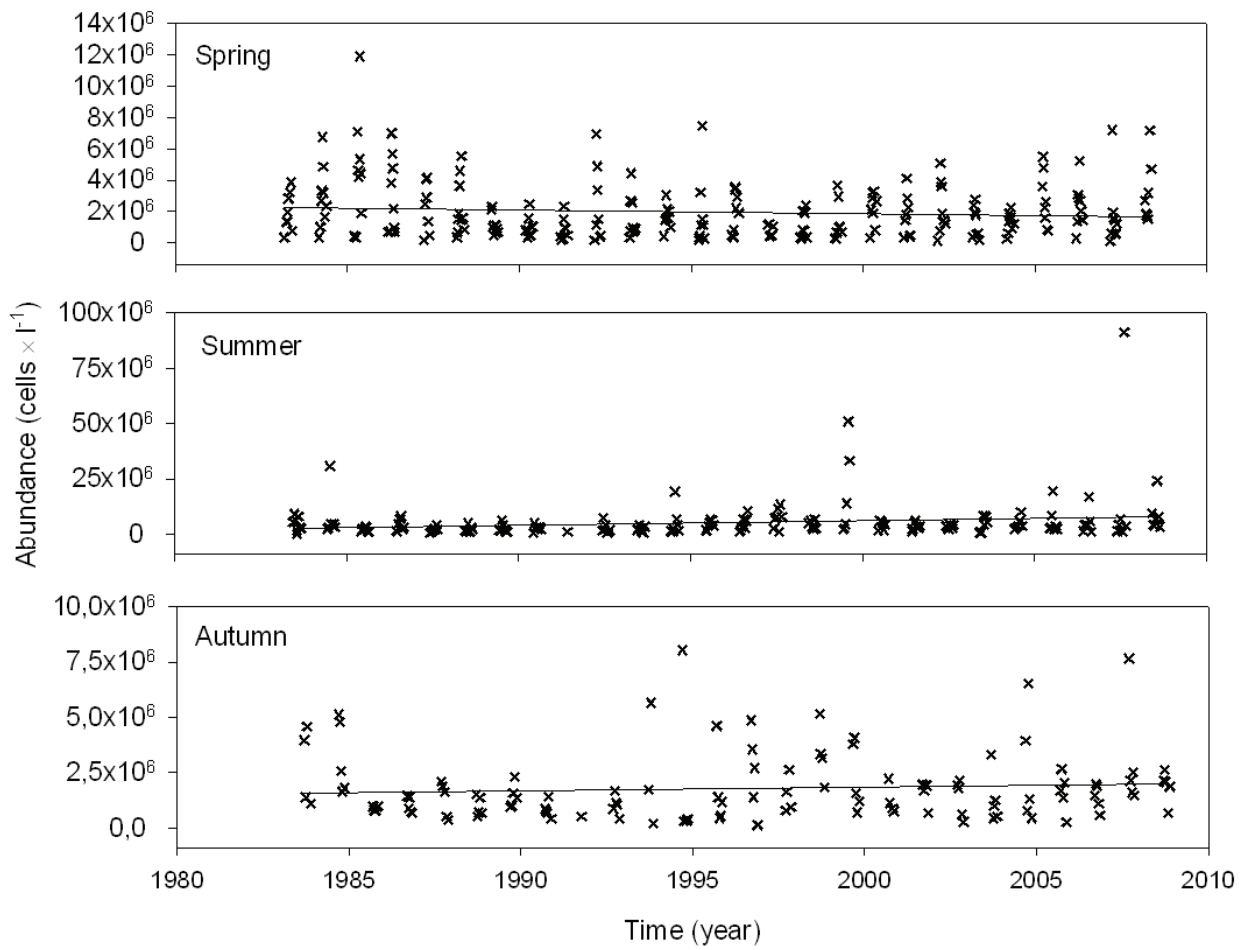


Figure 18. The Eastern coastal area, Area 11. Phytoplankton occurrence (cells  $\times l^{-1}$ ) from integrated samples (0-20m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

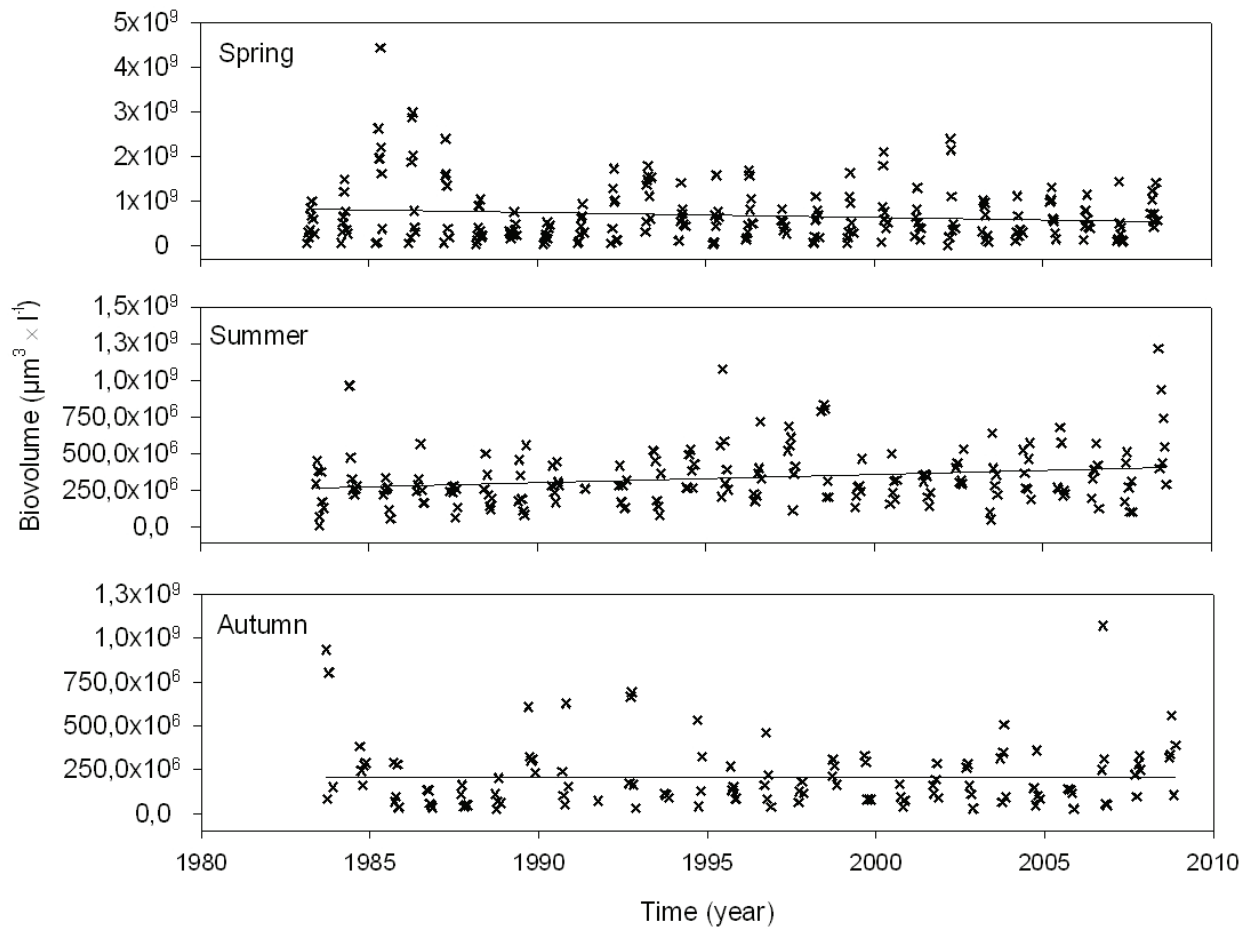


Figure 19. The Eastern coastal area, Area 11. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-20m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

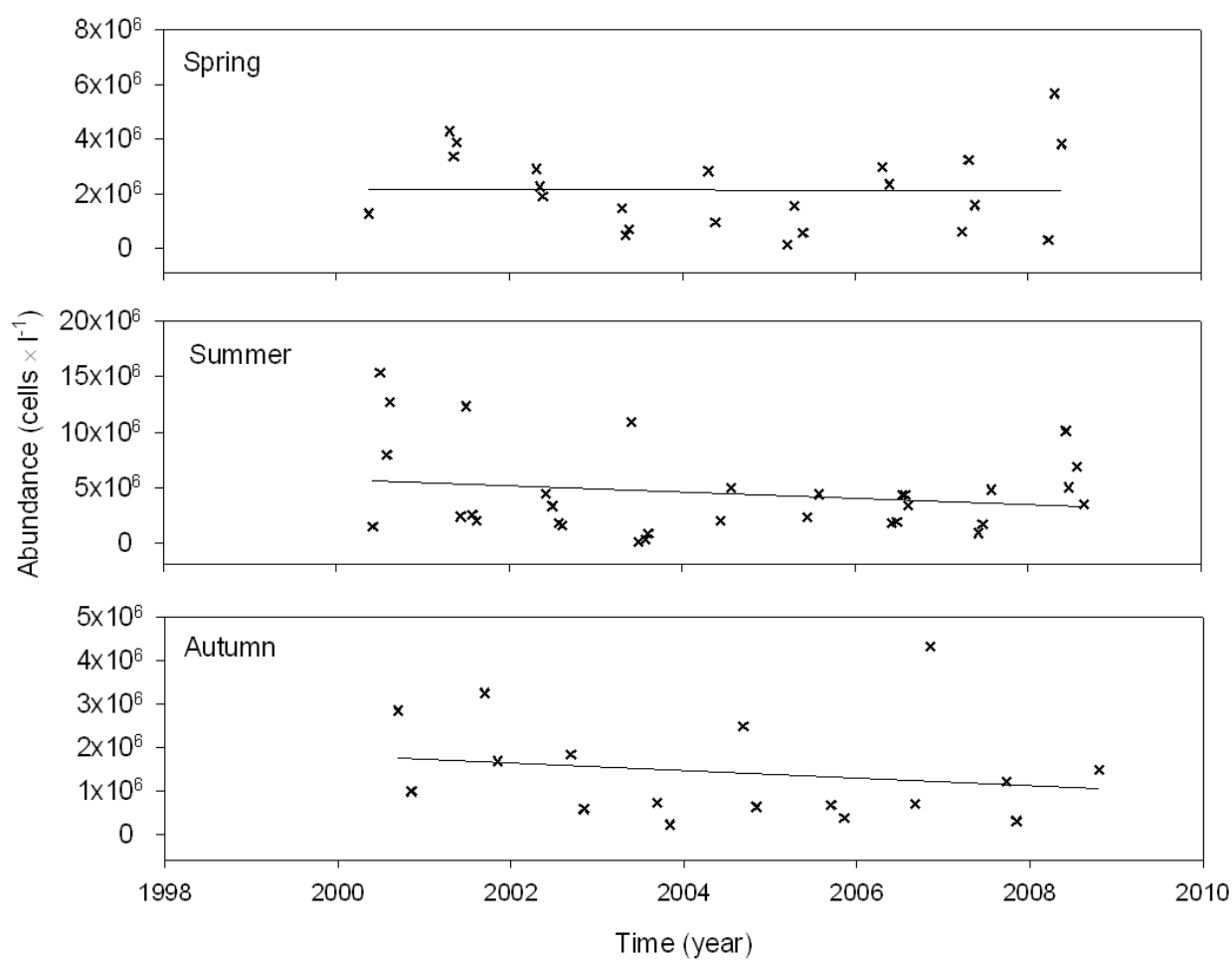


Figure 20. The Bothnian Sea, Area 13. Phytoplankton occurrence (cells  $\times$  l $^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

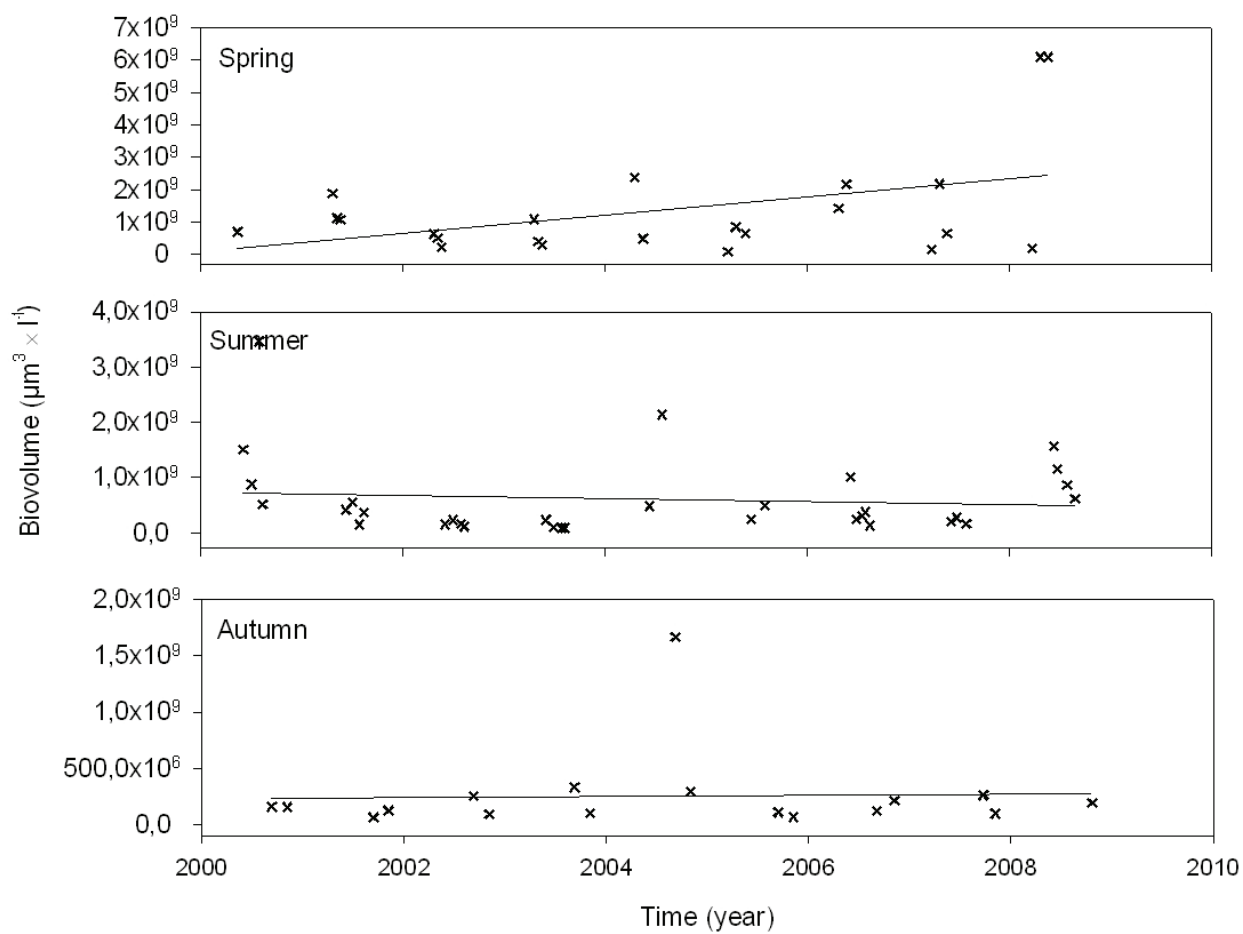


Figure 21. The Bothnian Sea, Area 13. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

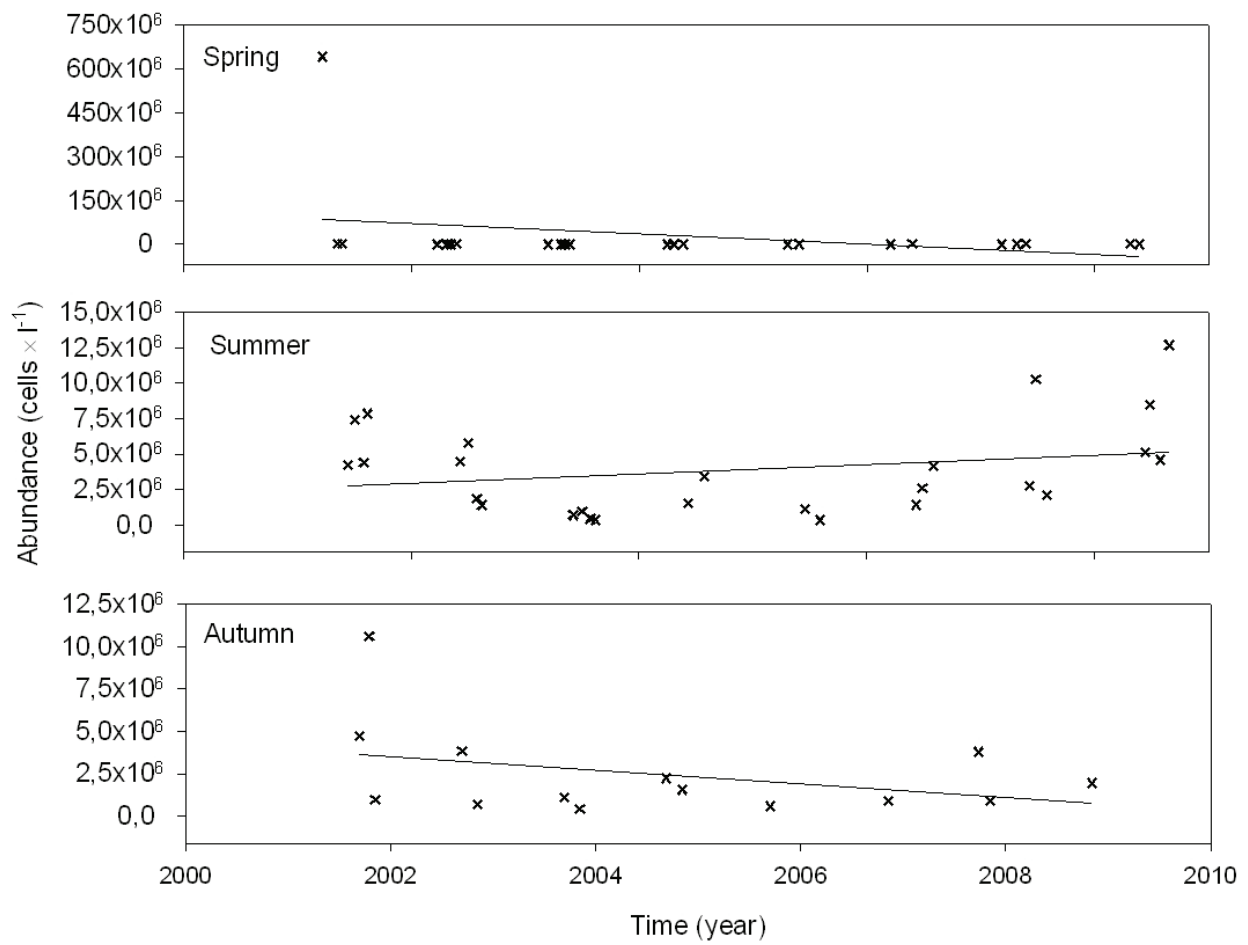


Figure 22. The Bothnian Bay, Area 14. Phytoplankton occurrence (cells  $\times l^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.



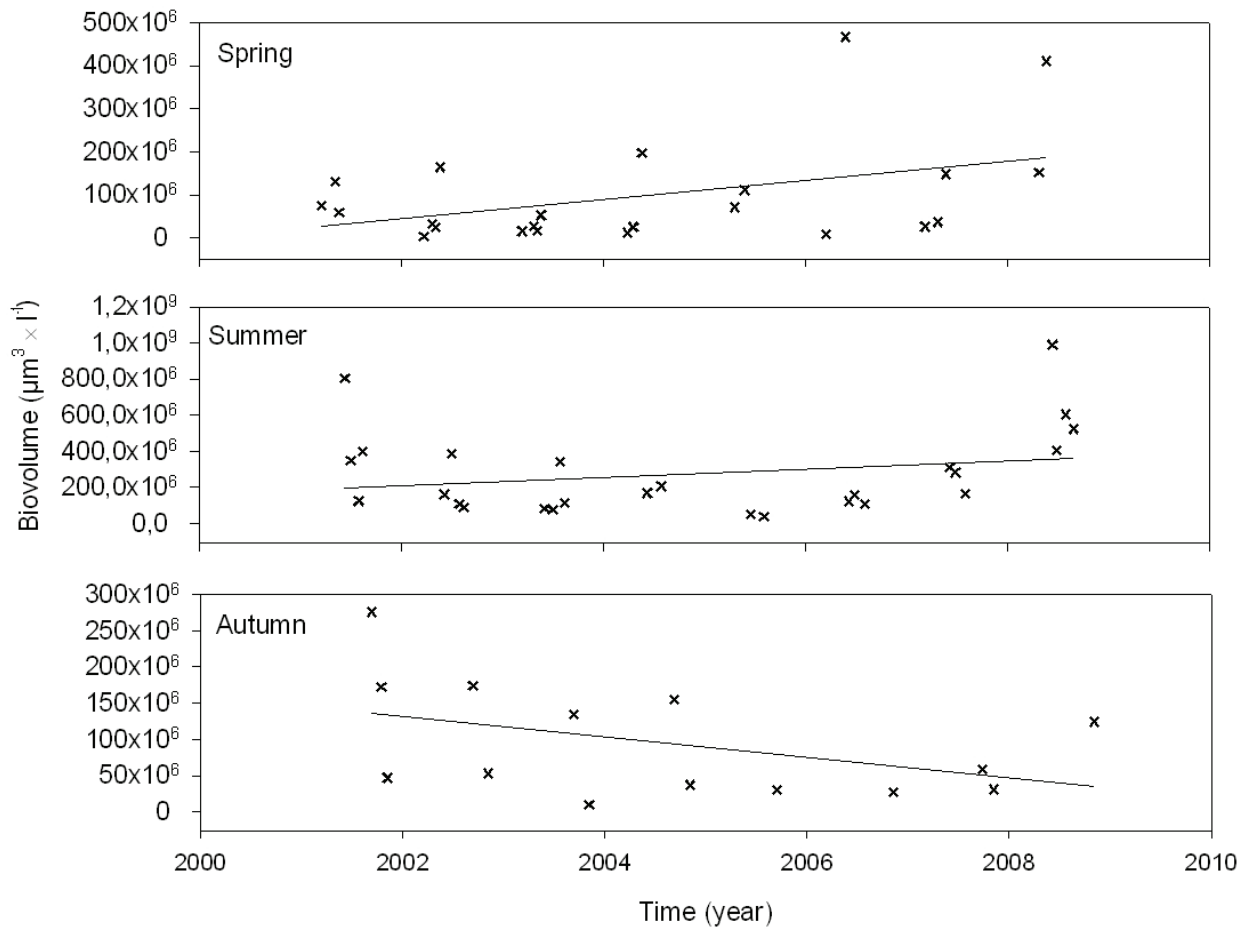


Figure 23. The Bothnian Bay, Area 14. Phytoplankton biovolume ( $\mu\text{m}^3 \times \text{l}^{-1}$ ) from integrated samples (0-10m) taken by hose during spring (March to May), summer (June to August) and autumn (September to November). The black line represents the linear regression fit for the whole period.

|         | Season | Parameter | R2   | F     | p    | n   | Trend |
|---------|--------|-----------|------|-------|------|-----|-------|
| Area 1  | Spring | Abundance | 0,02 | 1,19  | 0,28 | 61  |       |
|         | Summer | Abundance | 0,01 | 0,42  | 0,52 | 66  |       |
|         | Autumn | Abundance | 0,01 | 0,45  | 0,50 | 66  |       |
| Area 2  | Spring | Abundance | 0,01 | 1,35  | 0,25 | 124 |       |
|         | Summer | Abundance | 0,03 | 4,06  | 0,05 | 119 | ↓     |
|         | Autumn | Abundance | 0,10 | 13,34 | 0,00 | 118 | ↓     |
|         | Spring | Biovolume | 0,03 | 2,30  | 0,13 | 77  |       |
|         | Summer | Biovolume | 0,00 | 0,35  | 0,56 | 77  |       |
|         | Autumn | Biovolume | 0,19 | 15,49 | 0,00 | 70  | ↓     |
| Area 3  | Spring | Abundance | 0,03 | 1,82  | 0,18 | 61  |       |
|         | Summer | Abundance | 0,04 | 2,81  | 0,10 | 78  |       |
|         | Autumn | Abundance | 0,03 | 2,14  | 0,15 | 82  |       |
|         | Spring | Biovolume | 0,03 | 1,46  | 0,23 | 53  |       |
|         | Summer | Biovolume | 0,00 | 0,07  | 0,79 | 66  |       |
|         | Autumn | Biovolume | 0,05 | 3,24  | 0,08 | 70  |       |
| Area 5  | Spring | Abundance | 0,14 | 4,70  | 0,04 | 31  | ↓     |
|         | Summer | Abundance | 0,07 | 2,75  | 0,11 | 38  |       |
|         | Autumn | Abundance | 0,58 | 33,47 | 0,00 | 26  | ↓     |
|         | Spring | Biovolume | 0,14 | 4,63  | 0,04 | 31  | ↓     |
|         | Summer | Biovolume | 0,04 | 1,69  | 0,20 | 38  |       |
|         | Autumn | Biovolume | 0,09 | 1,97  | 0,17 | 23  |       |
| Area 6  | Spring | Abundance | 0,22 | 8,38  | 0,01 | 32  | ↓     |
|         | Summer | Abundance | 0,06 | 2,34  | 0,13 | 40  |       |
|         | Autumn | Abundance | 0,45 | 20,61 | 0,00 | 27  |       |
|         | Spring | Biovolume | 0,18 | 6,42  | 0,02 | 32  |       |
|         | Summer | Biovolume | 0,01 | 0,29  | 0,59 | 40  |       |
|         | Autumn | Biovolume | 0,02 | 0,38  | 0,54 | 24  |       |
| Area 9  | Spring | Abundance | 0,17 | 6,31  | 0,02 | 32  | ↑     |
|         | Summer | Abundance | 0,07 | 2,55  | 0,12 | 38  |       |
|         | Autumn | Abundance | 0,13 | 3,77  | 0,06 | 27  |       |
|         | Spring | Biovolume | 0,03 | 0,94  | 0,34 | 32  |       |
|         | Summer | Biovolume | 0,02 | 0,65  | 0,43 | 38  |       |
|         | Autumn | Biovolume | 0,17 | 4,37  | 0,05 | 24  | ↓     |
| Area 10 | Spring | Abundance | 0,10 | 15,40 | 0,00 | 148 | ↑     |
|         | Summer | Abundance | 0,00 | 0,38  | 0,54 | 120 |       |
|         | Autumn | Abundance | 0,00 | 0,07  | 0,79 | 73  |       |
|         | Spring | Biovolume | 0,00 | 0,03  | 0,86 | 148 |       |
|         | Summer | Biovolume | 0,10 | 12,68 | 0,00 | 120 | ↓     |
|         | Autumn | Biovolume | 0,10 | 7,60  | 0,01 | 73  | ↓     |
| Area 11 | Spring | Abundance | 0,01 | 1,94  | 0,17 | 219 |       |
|         | Summer | Abundance | 0,03 | 6,09  | 0,01 | 174 | ↑     |
|         | Autumn | Abundance | 0,01 | 0,79  | 0,38 | 119 |       |
|         | Spring | Biovolume | 0,01 | 3,30  | 0,07 | 219 |       |
|         | Summer | Biovolume | 0,05 | 9,55  | 0,00 | 174 | ↑     |
|         | Autumn | Biovolume | 0,00 | 0,00  | 0,96 | 119 |       |
| Area 13 | Spring | Abundance | 0,00 | 0,00  | 0,97 | 23  |       |
|         | Summer | Abundance | 0,04 | 1,27  | 0,27 | 32  |       |
|         | Autumn | Abundance | 0,04 | 0,55  | 0,47 | 17  |       |
|         | Spring | Biovolume | 0,19 | 4,90  | 0,04 | 23  | ↑     |
|         | Summer | Biovolume | 0,01 | 0,33  | 0,57 | 32  |       |
|         | Autumn | Biovolume | 0,00 | 0,02  | 0,88 | 17  |       |
| Area 14 | Spring | Abundance | 0,09 | 2,11  | 0,16 | 23  |       |
|         | Summer | Abundance | 0,06 | 1,64  | 0,21 | 26  |       |
|         | Autumn | Abundance | 0,13 | 1,81  | 0,20 | 14  |       |
|         | Spring | Biovolume | 0,18 | 4,46  | 0,05 | 23  | ↑     |
|         | Summer | Biovolume | 0,06 | 1,43  | 0,24 | 26  |       |
|         | Autumn | Biovolume | 0,19 | 2,89  | 0,11 | 14  |       |

Table 6. Trends of total phytoplankton occurrence in each area for spring, summer and autumn. The R squared value is presented and number of samples and p-value where a value below 0,05 is highlighted as being significant and an arrow indicate if the significant trend is positive or negative.

## **APPENDIX E**

### **Scatter plots of abundance and biovolume of phytoplankton**

In the following figures abundance (cells \* l<sup>-1</sup>) and biovolume (μm<sup>3</sup> \* l<sup>-1</sup>) of each group of phytoplankton is presented for specific areas, season and comparable depth interval. Each season has been assigned three months with spring starting in February for area 1-3 and one month later, in area 5-14. The following seasons, summer and autumn, includes three months each.

All data is presented for each area and the time scale on the x-axis have been adjusted to represent the longest time scale of sampling for the specific area. Each black dot represents a sampling occasion and the line represents the trend of the time series.

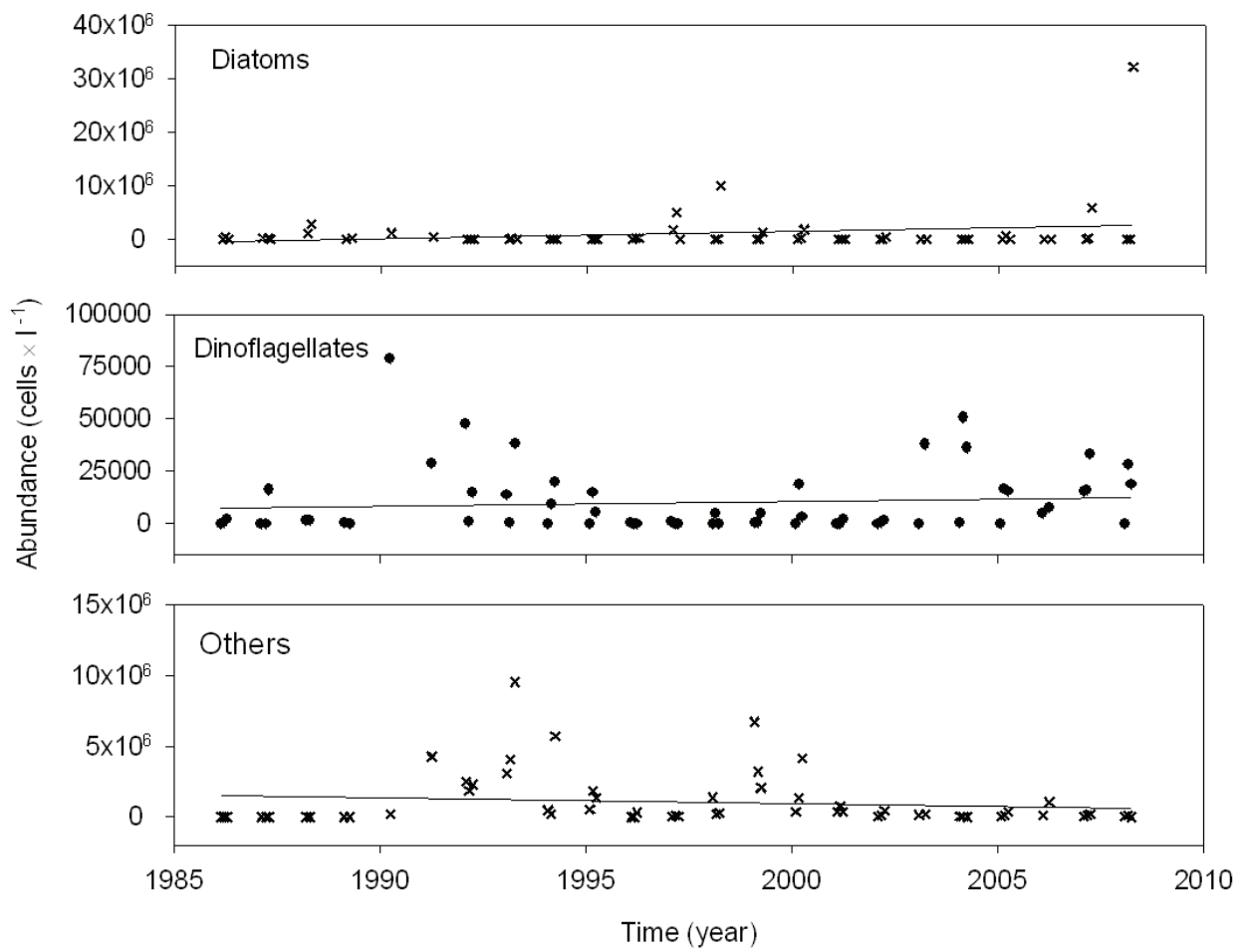


Figure 24. The west-coast inside the skerries, Area 1, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (February to April). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

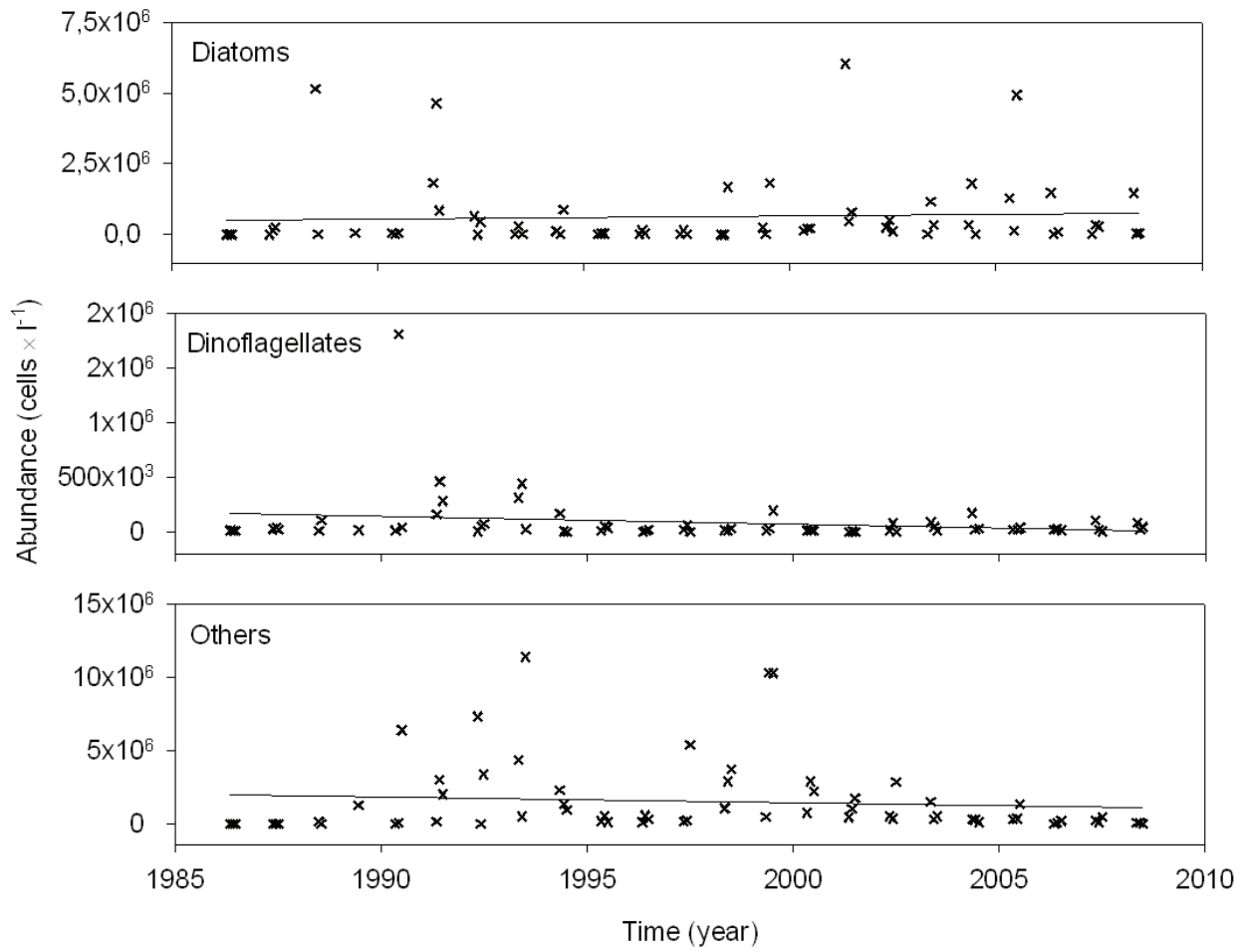


Figure 25. The west-coast inside the skerries, Area 1, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

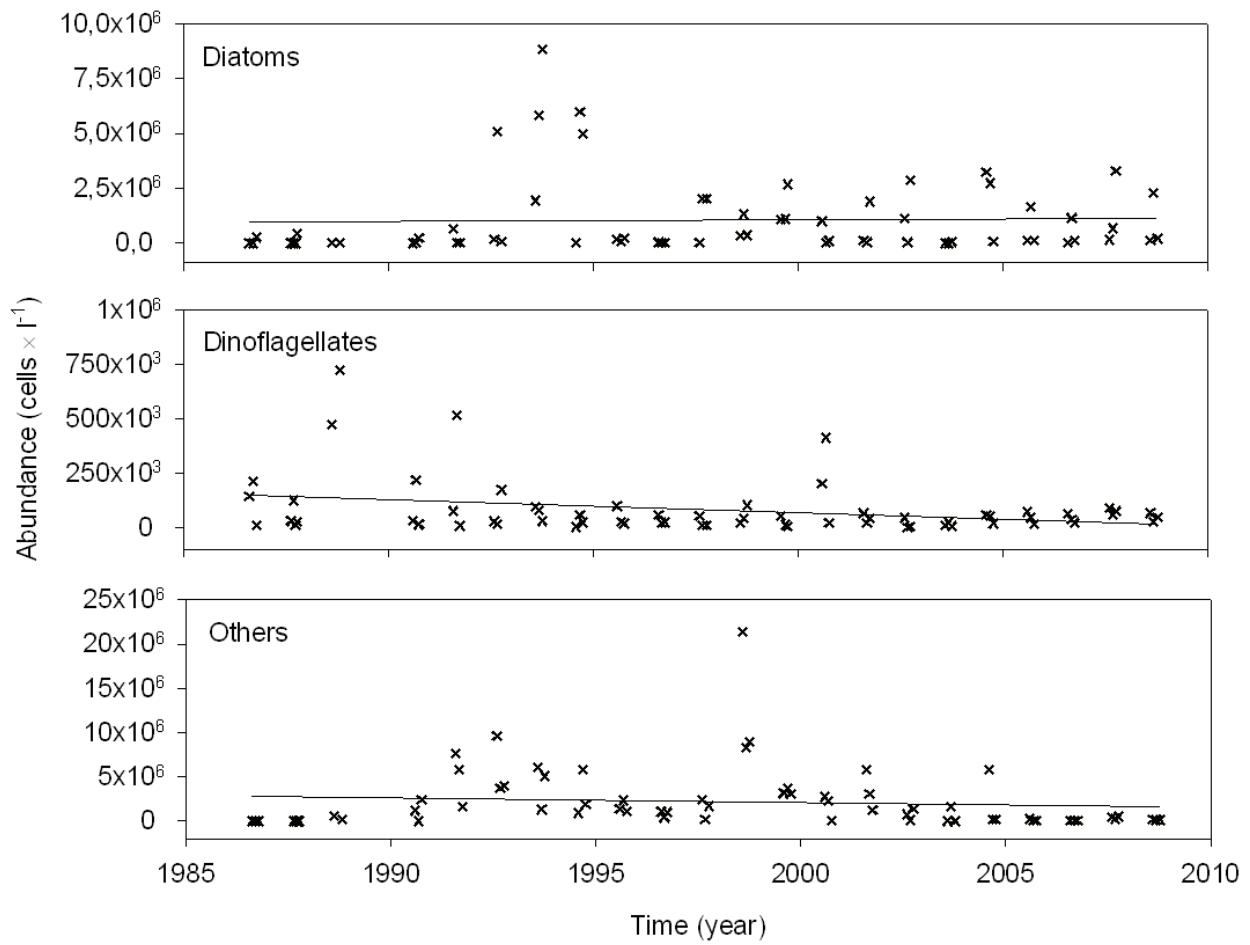


Figure 26. The west-coast inside the skerries, Area 1, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (August to October). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

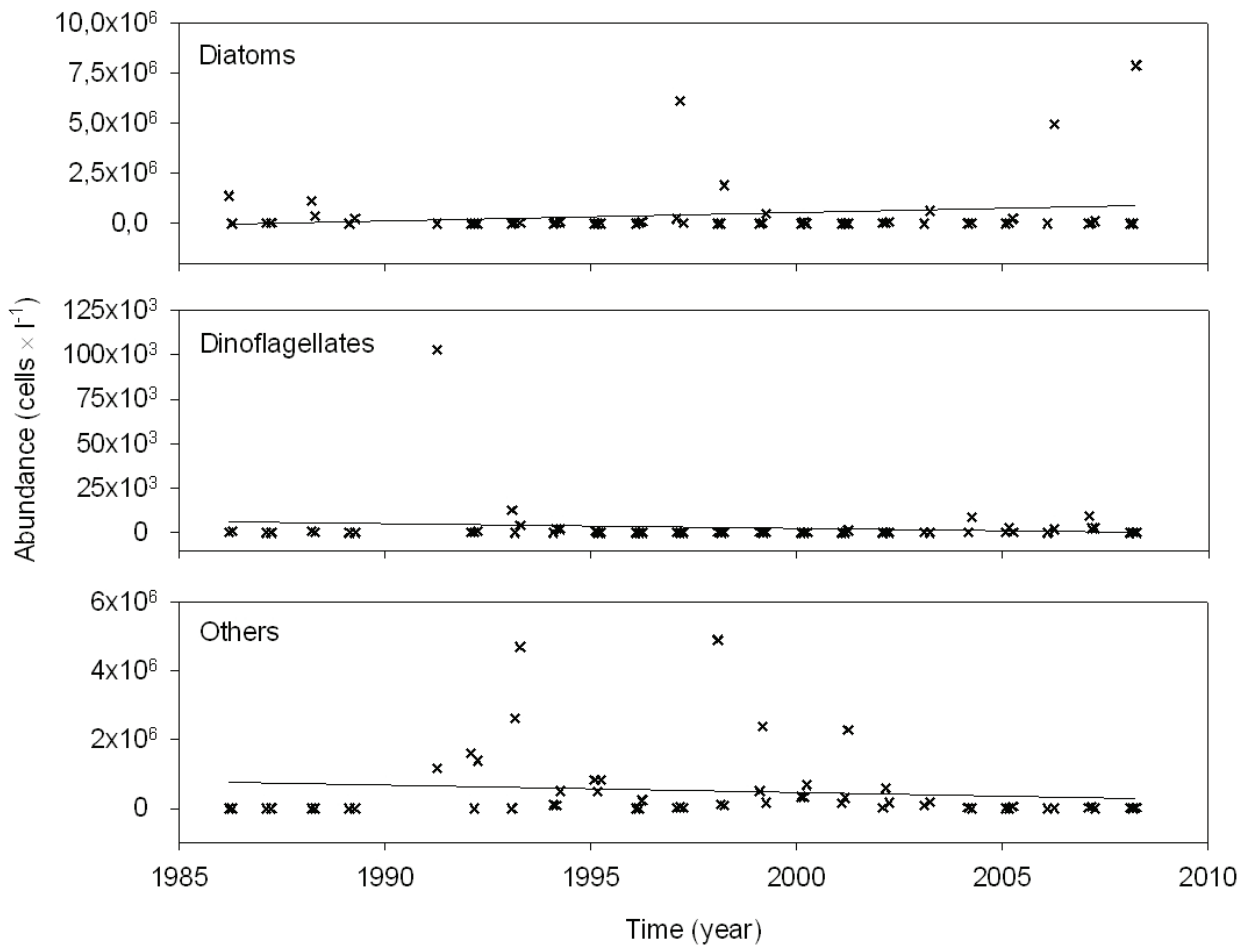


Figure 27. The west-coast inside the skerries, Area 1, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (10-20m) taken by hose. The seasonal interval is spring (February to April). The black line represents the linear regression fit for the whole period.

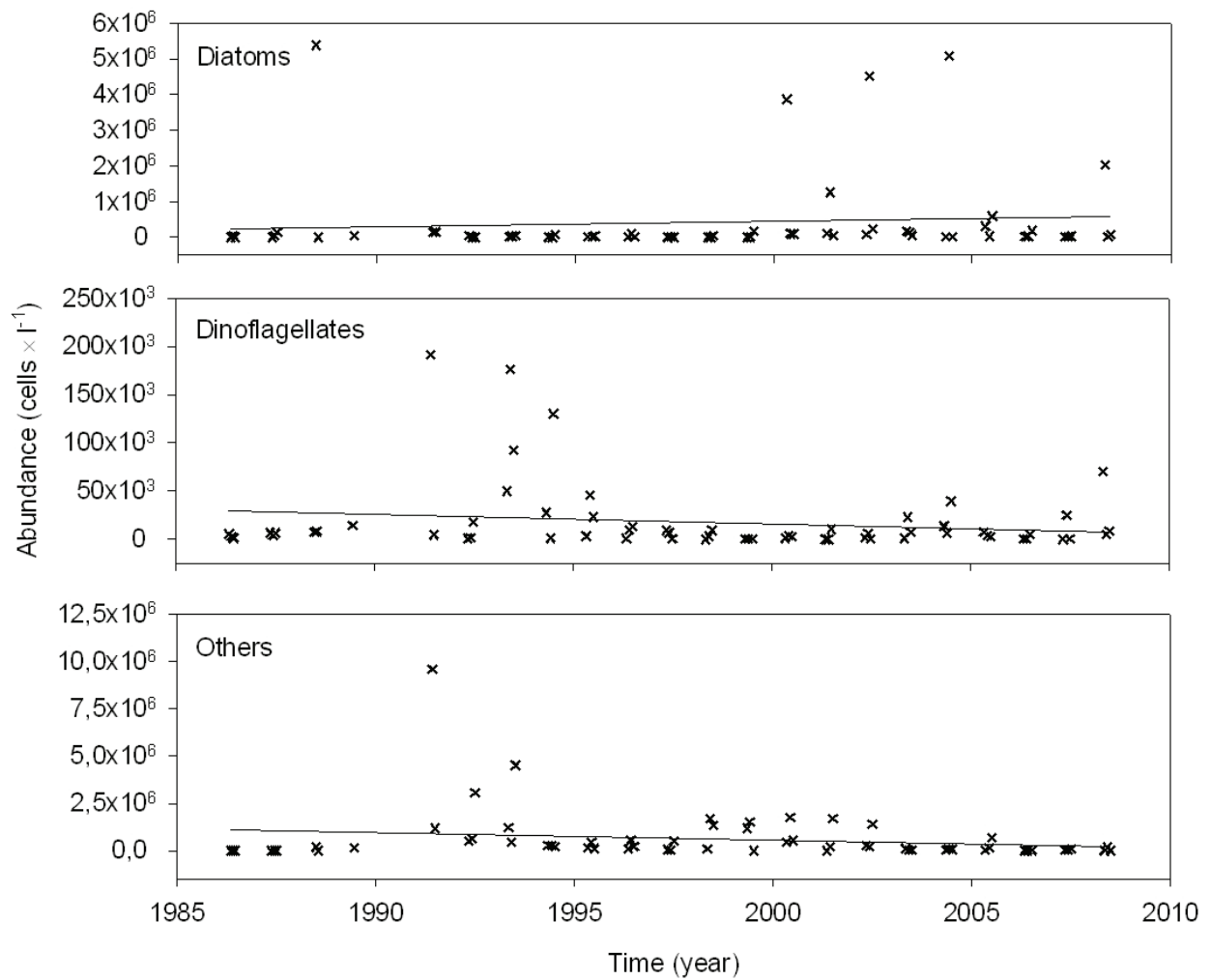


Figure 28. The west-coast inside the skerries, Area 1, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (10-20m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



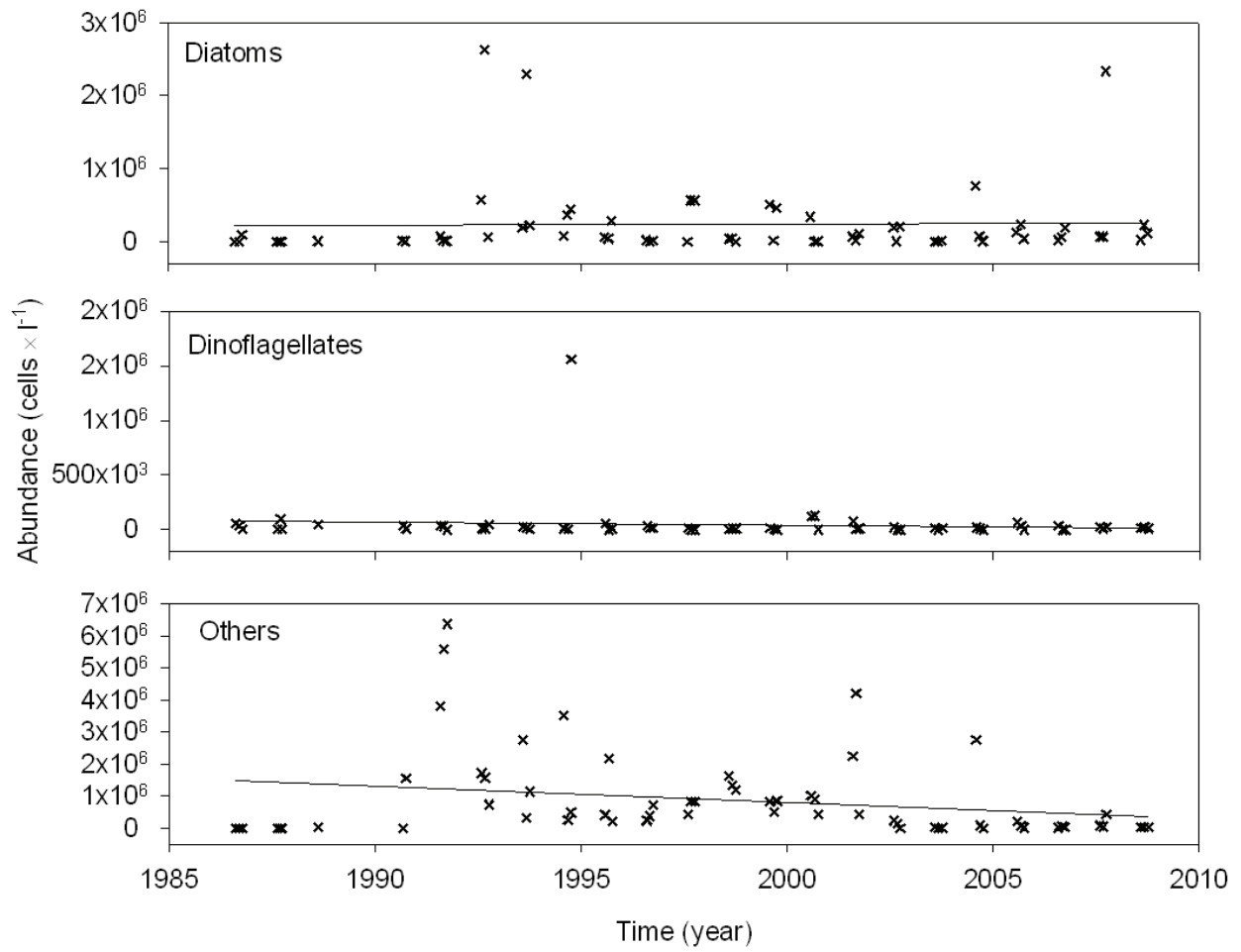


Figure 29. The west-coast inside the skerries, Area 1, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (10-20m) taken by hose. The seasonal interval is autumn (August to October). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

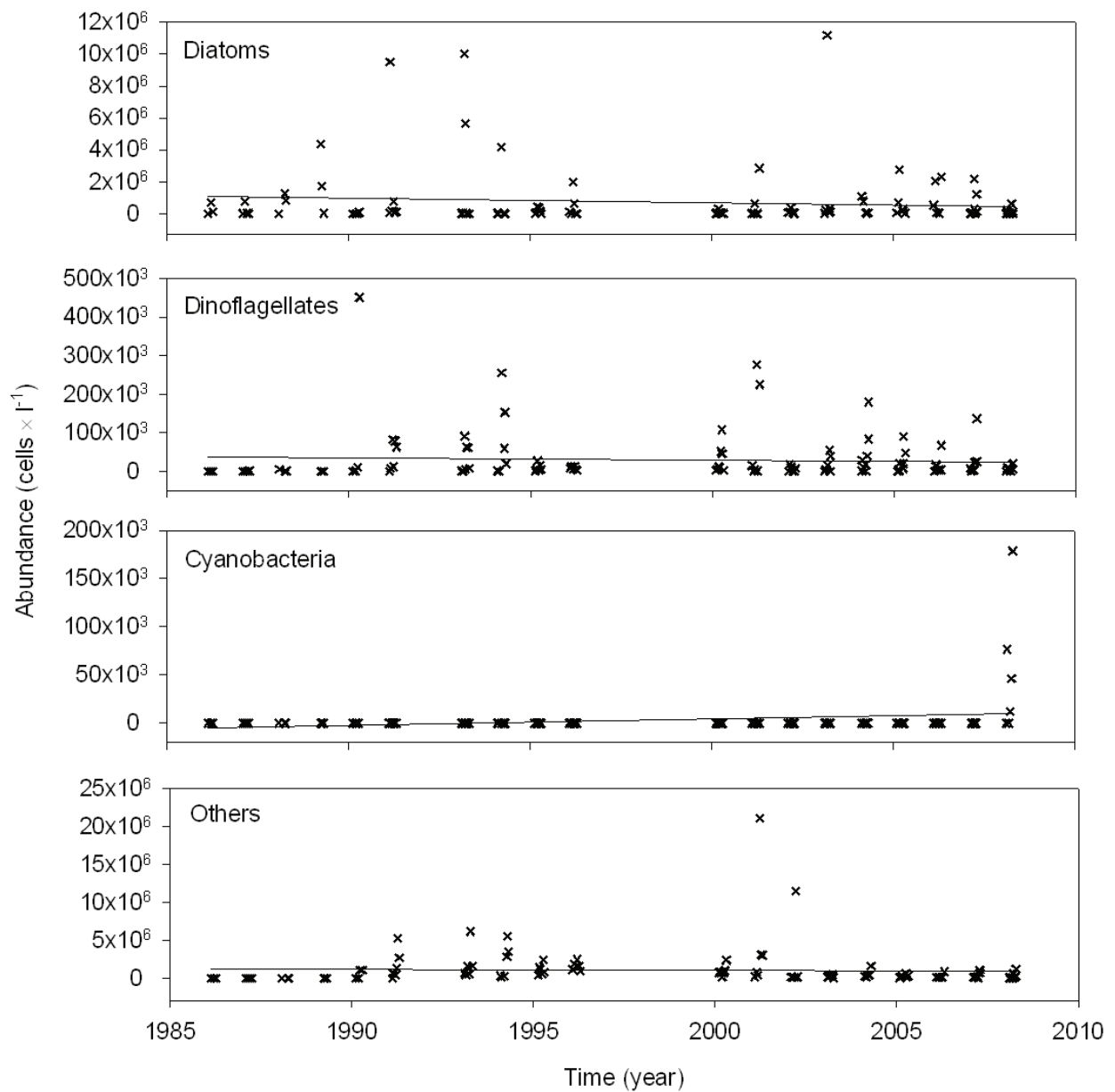


Figure 30. The Skagerrak, Area 2, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (February to April). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

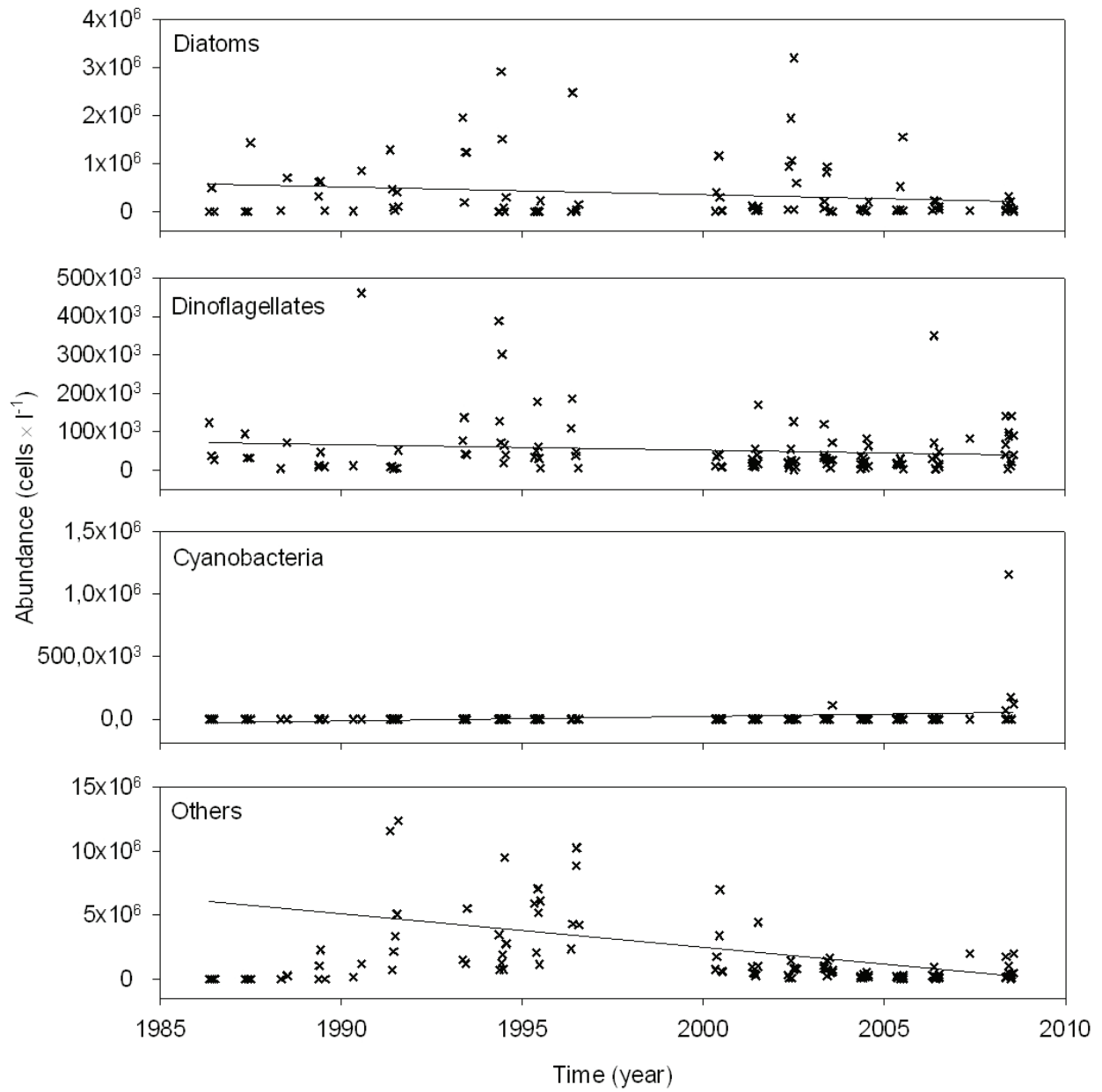


Figure 31. The Skagerrak, Area 2, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

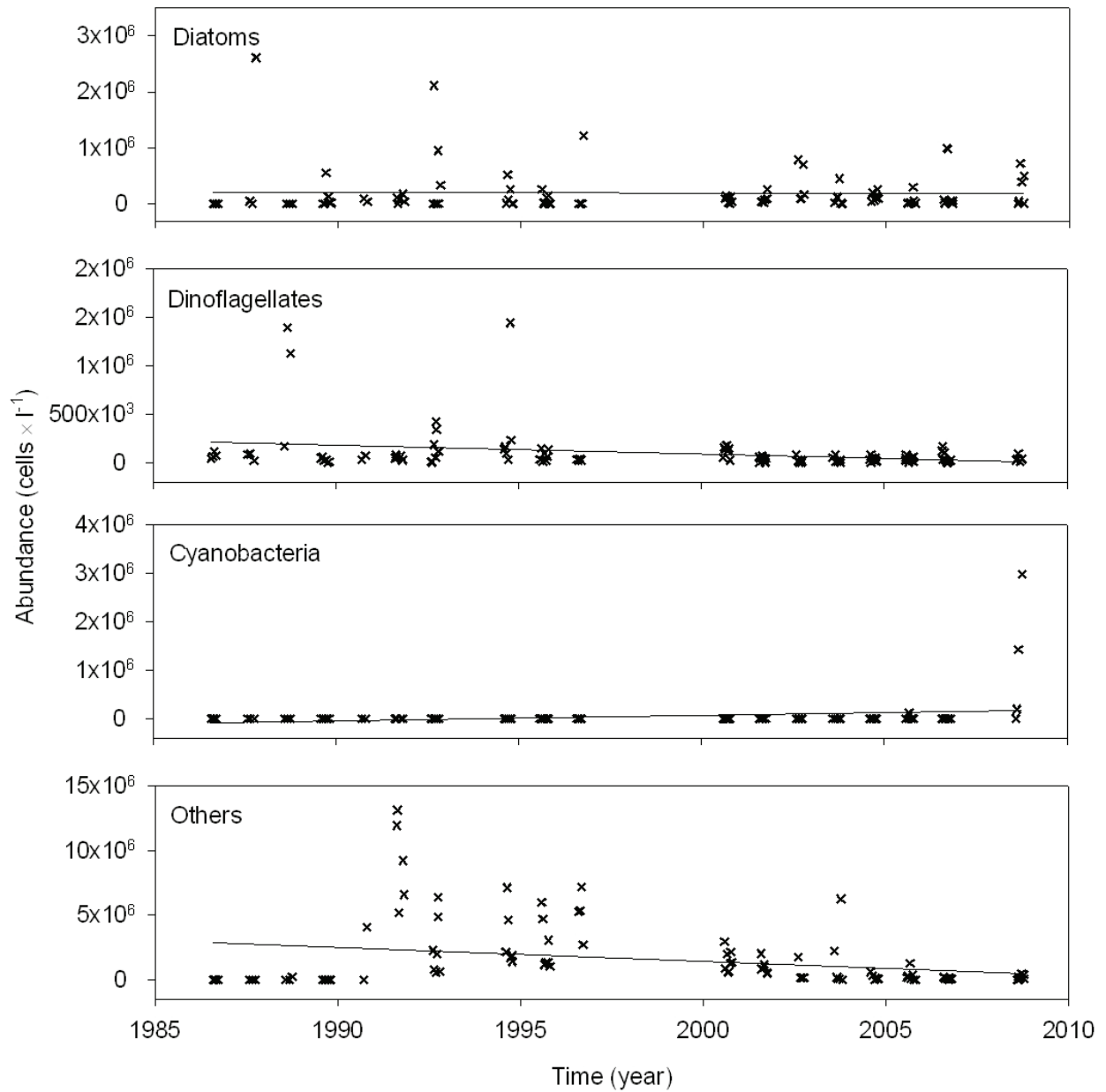


Figure 32. The Skagerrak, Area 2, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (August to October). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

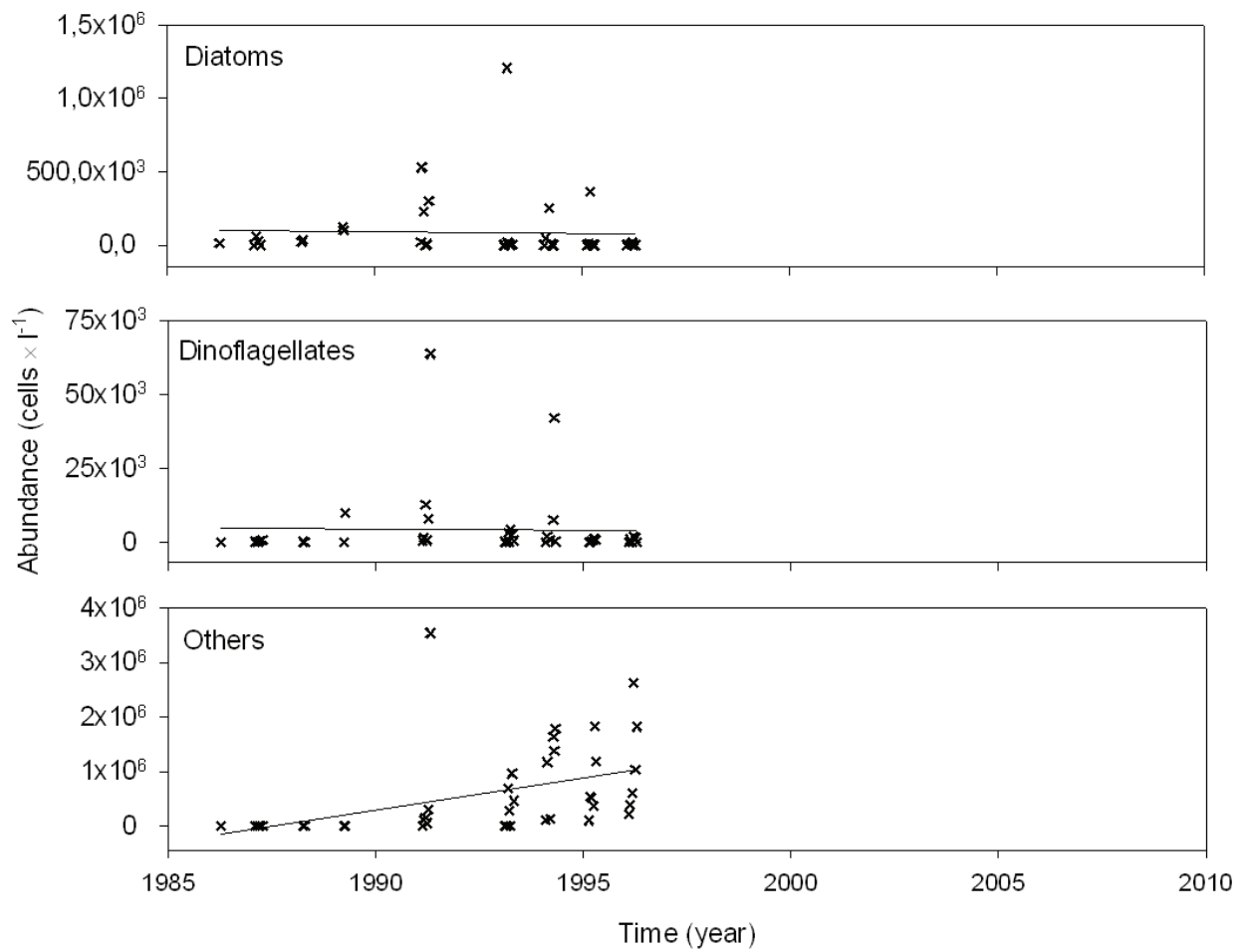


Figure 33. The Skagerrak, Area 2, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (10-20m) taken by hose. The seasonal interval is spring (February to April). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

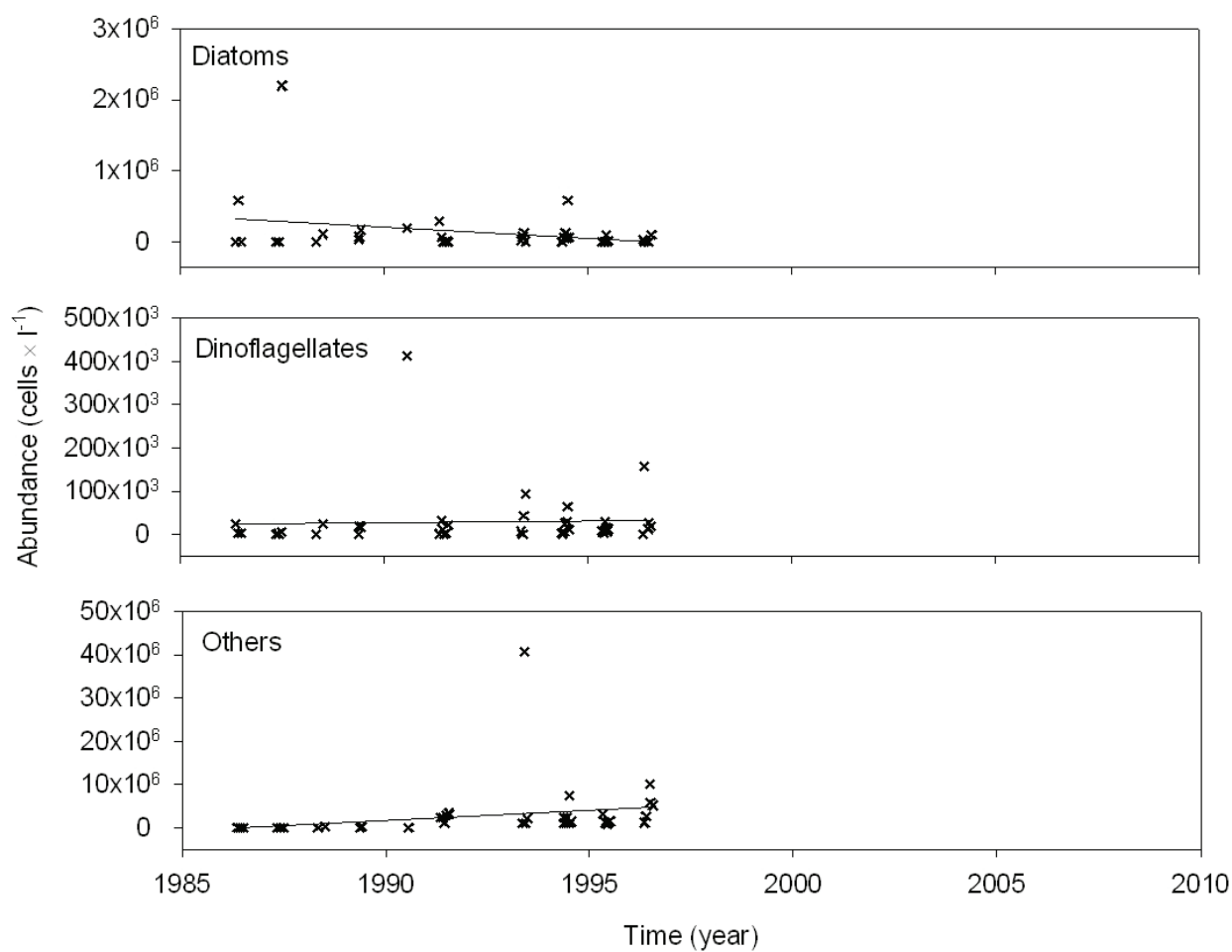


Figure 34. The Skagerrak, Area 2, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (10-20m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

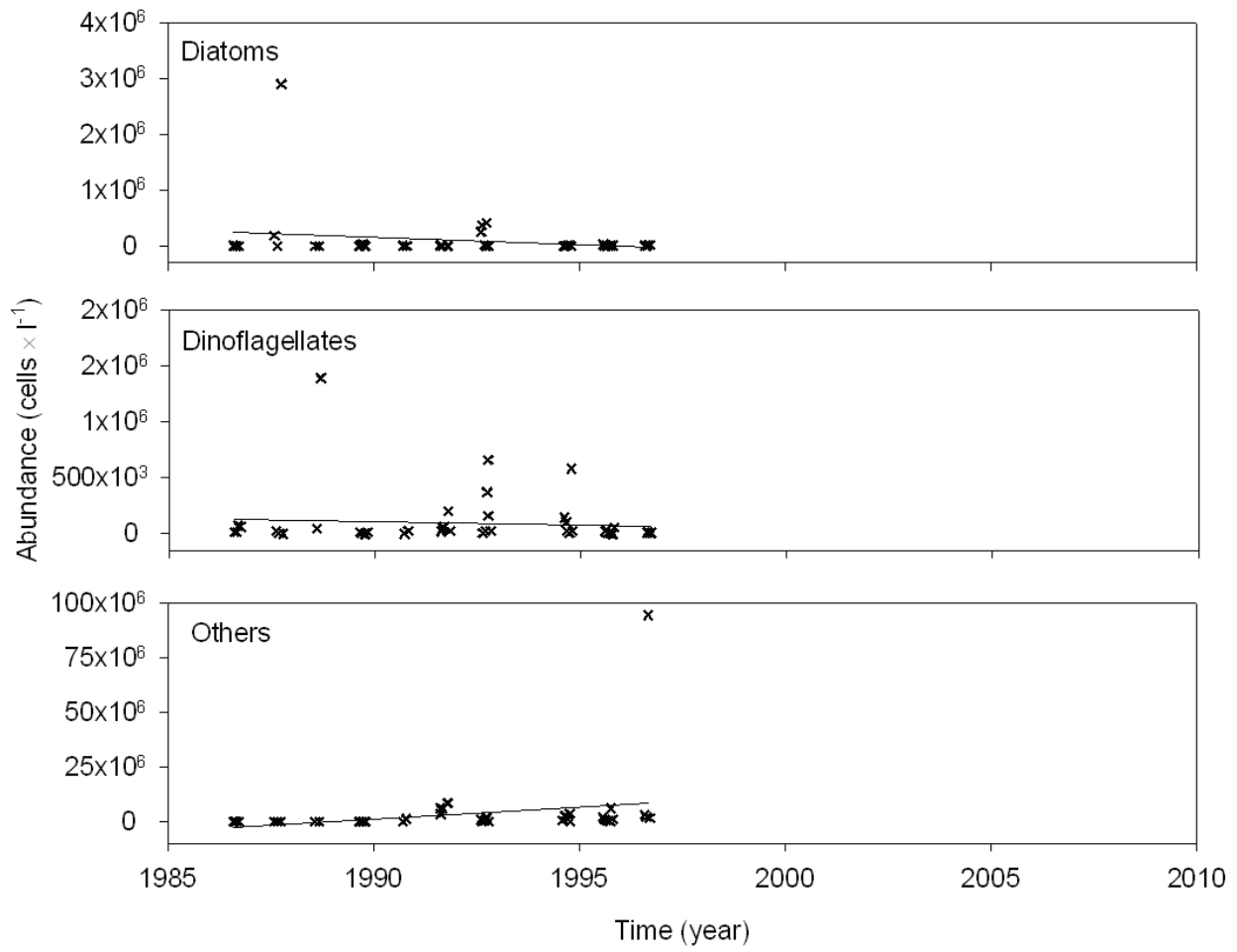


Figure 35. The Skagerrak, Area 2, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (10-20m) taken by hose. The seasonal interval is autumn (August to October). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

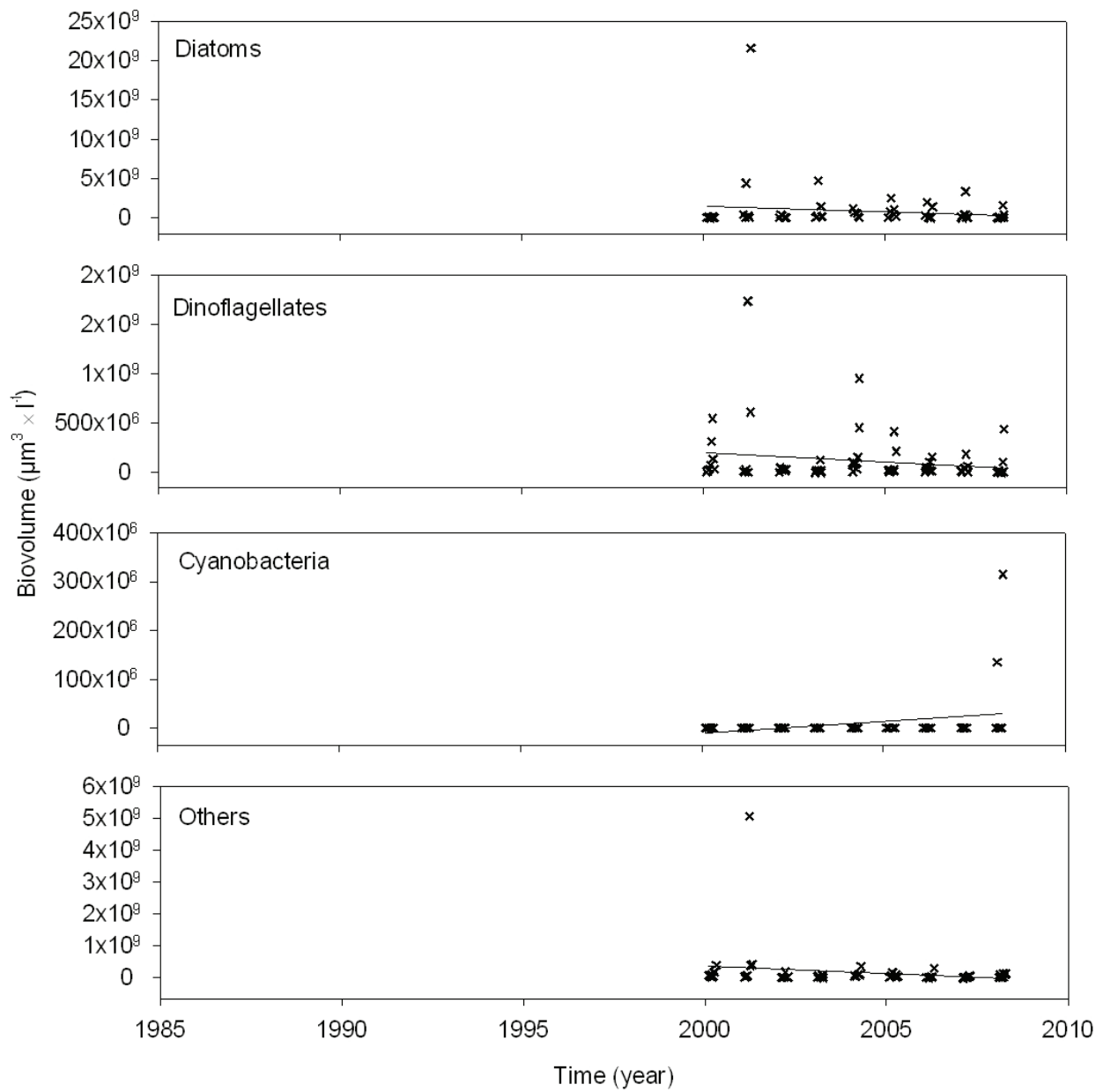


Figure 36. The Skagerrak, Area 2, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (February to April). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



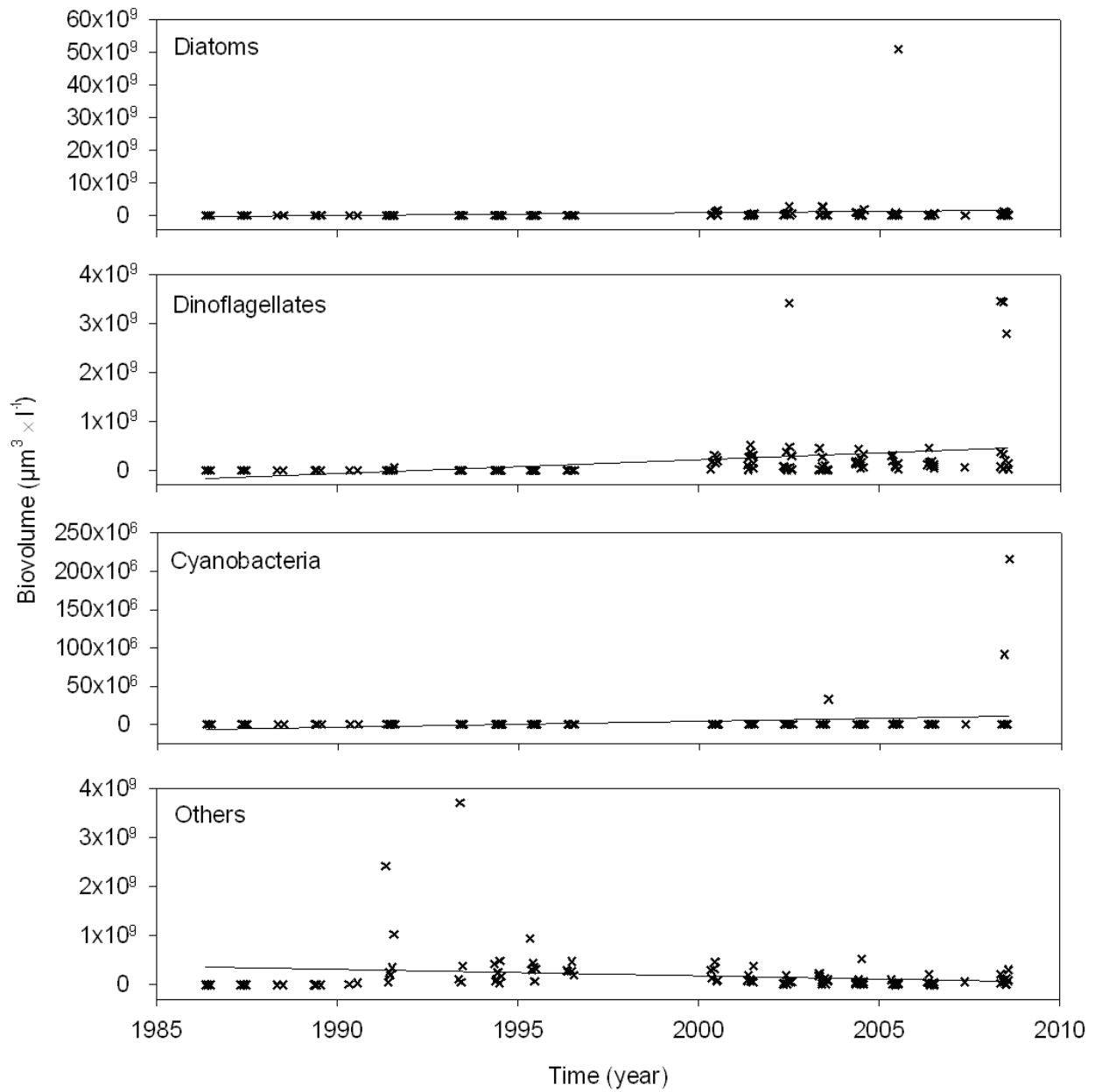


Figure 37. The Skagerrak, Area 2, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (00-10m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

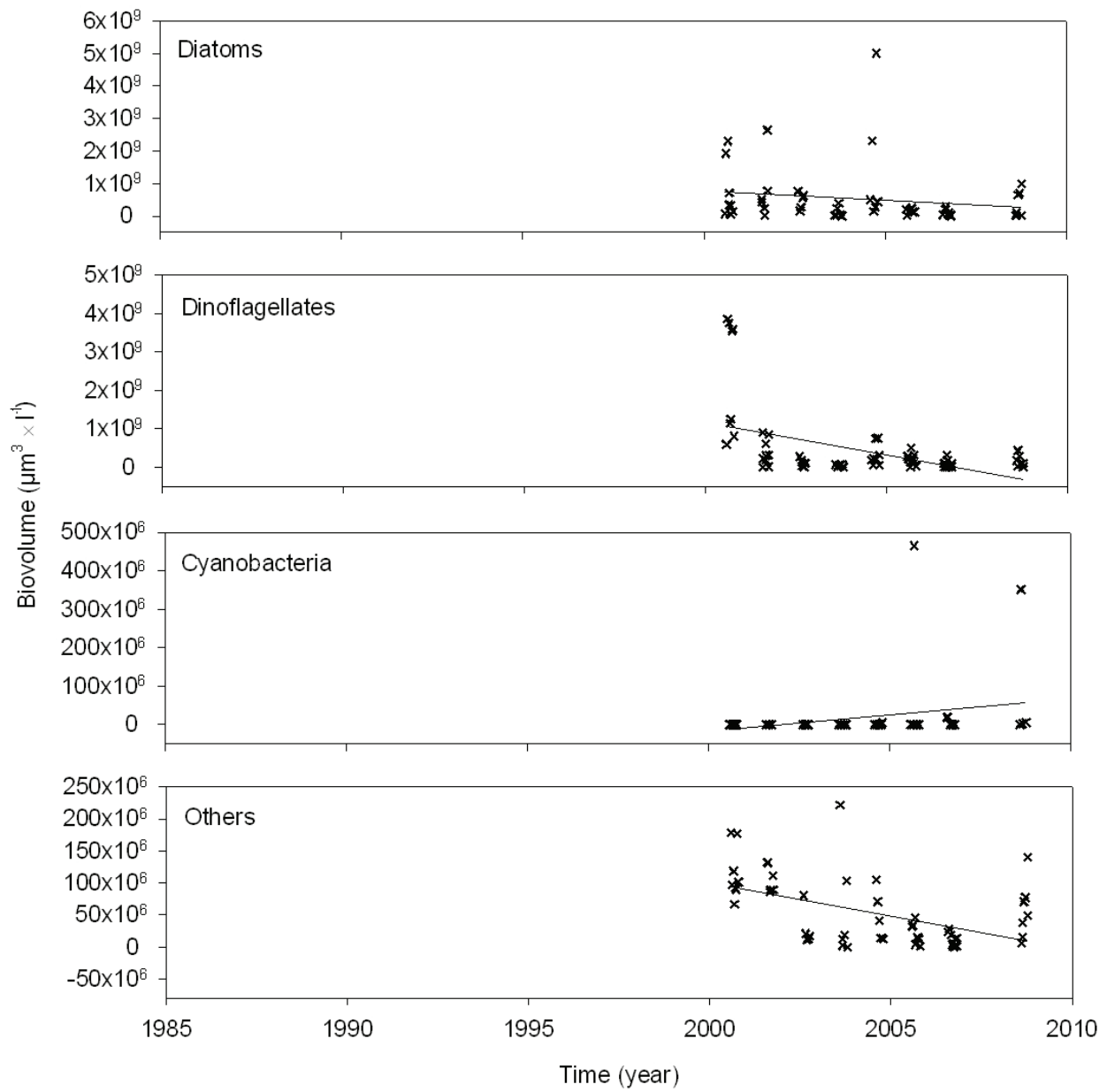


Figure 38. The Skagerrak, Area 2, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (August to October). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

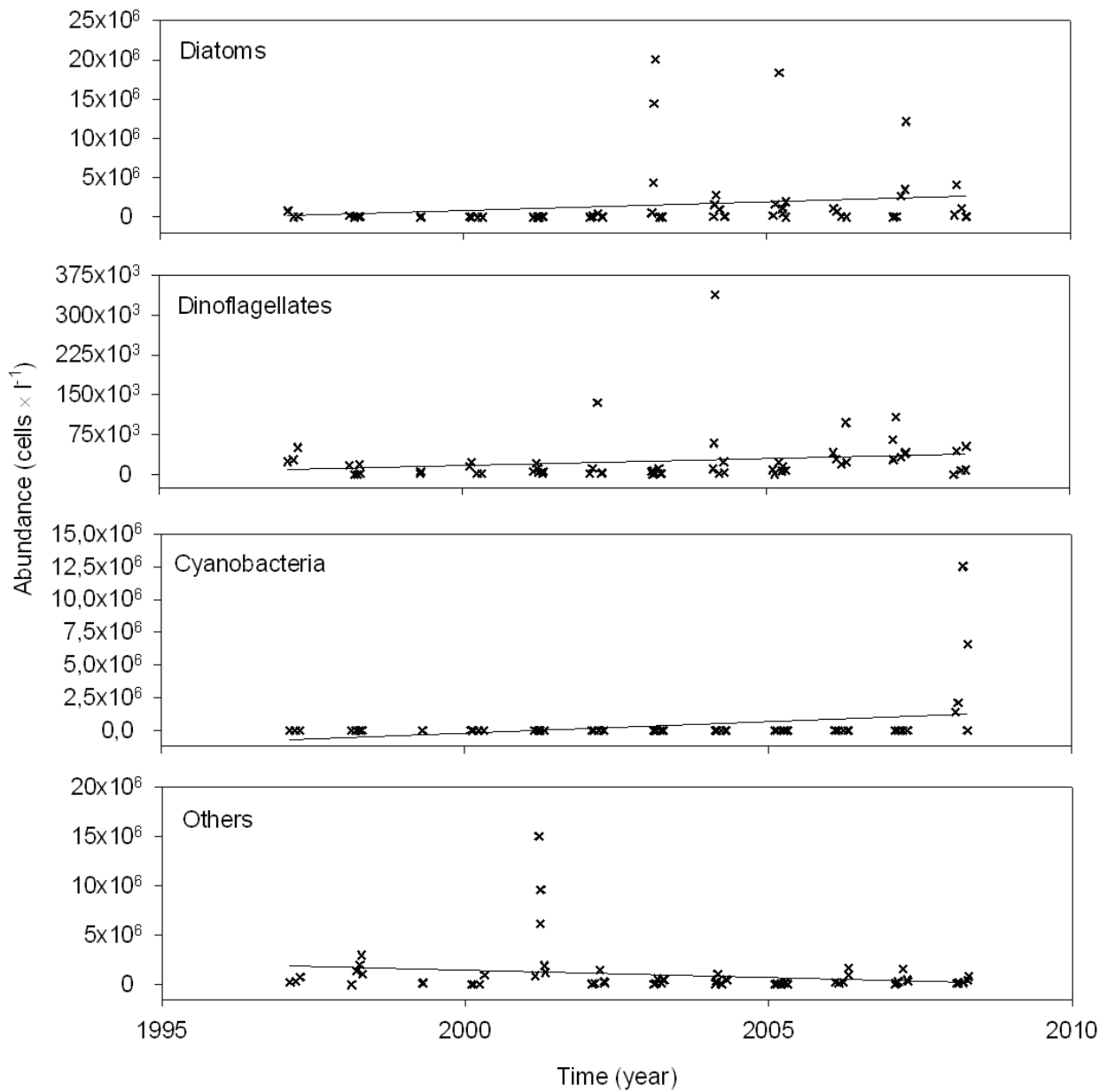


Figure 39. The Kattegat, Area 3, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (February to April). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

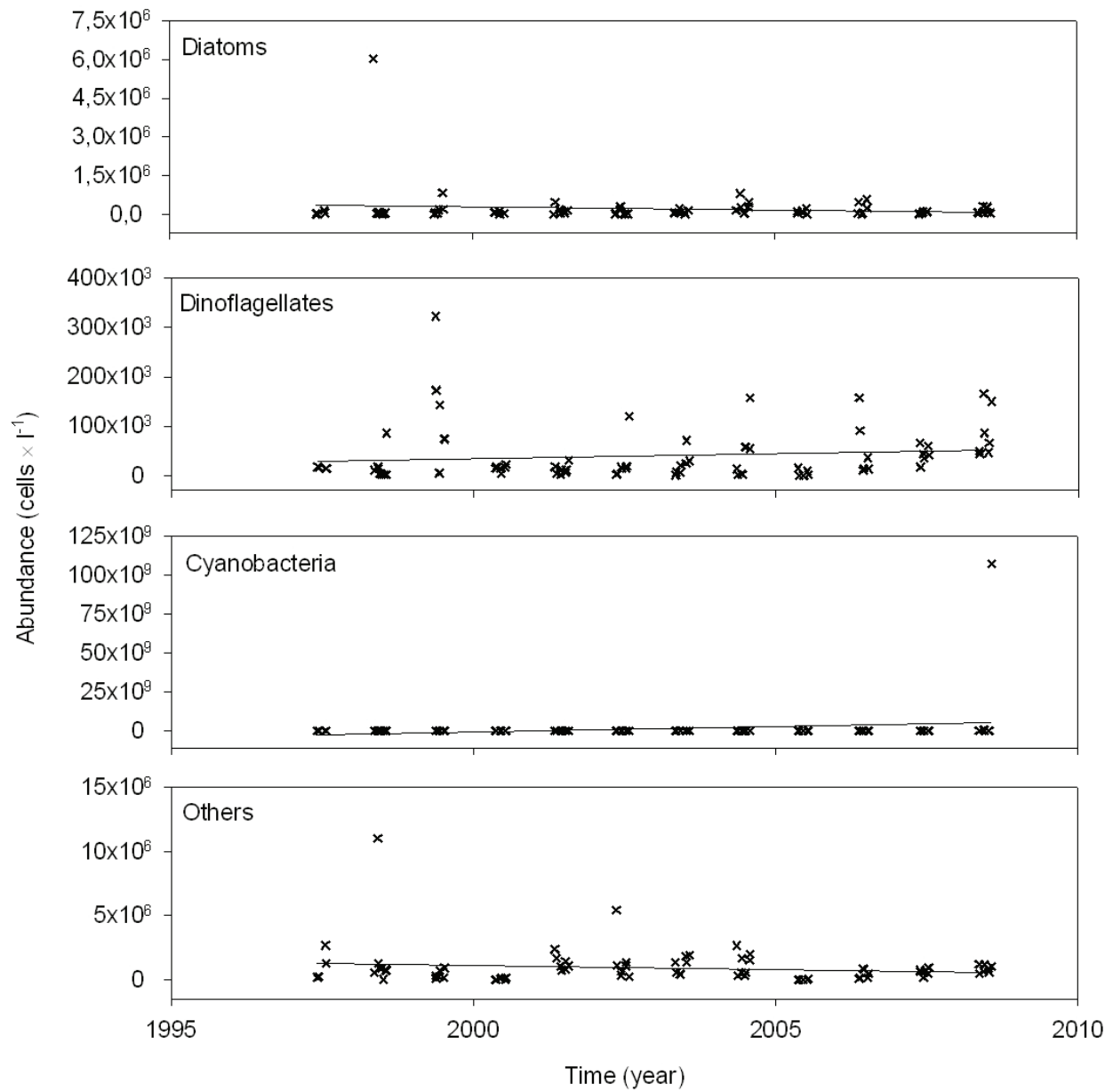


Figure 40. The Kattegat, Area 3, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

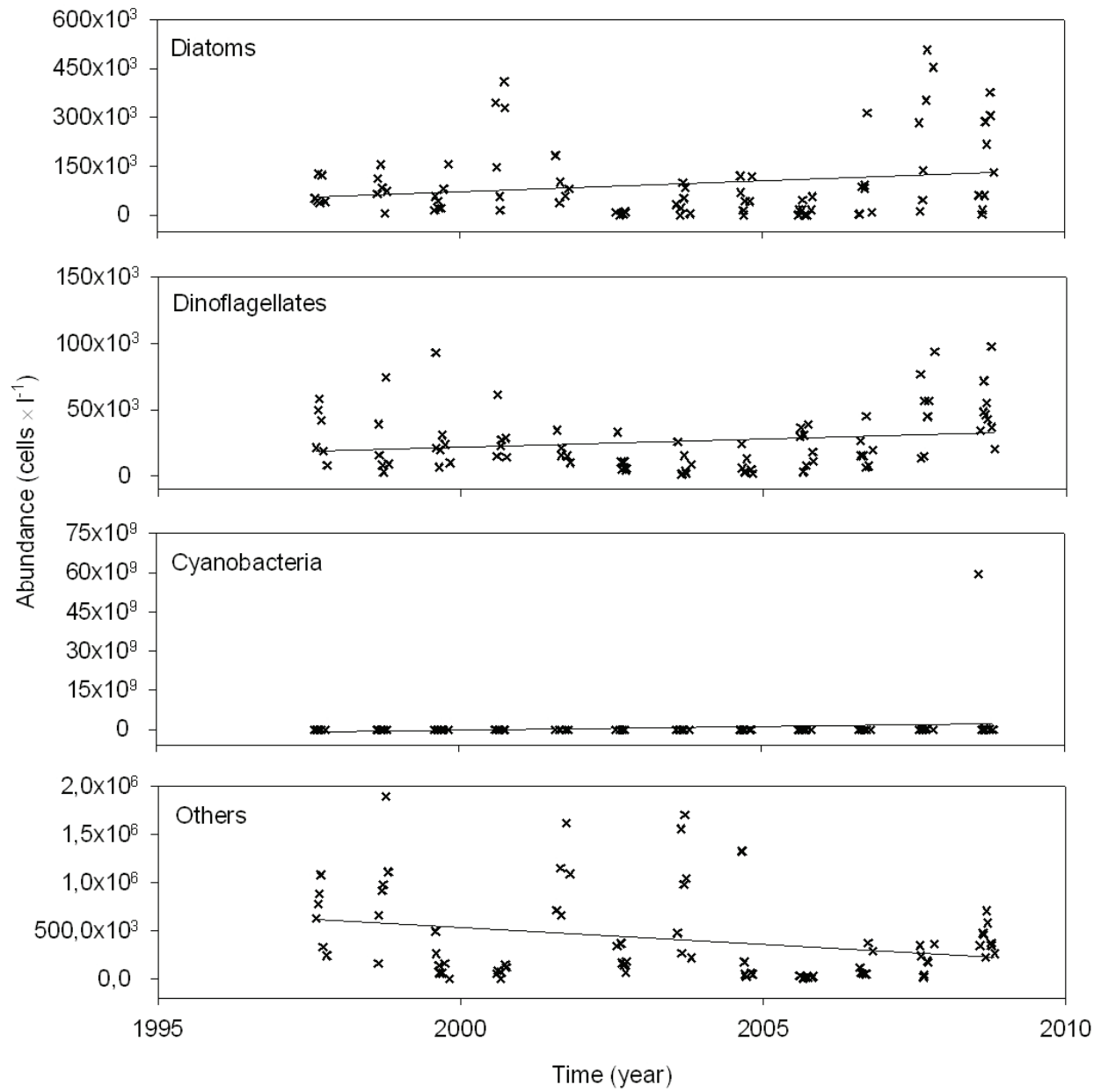


Figure 41. The Kattegat, Area 3, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (August to October). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

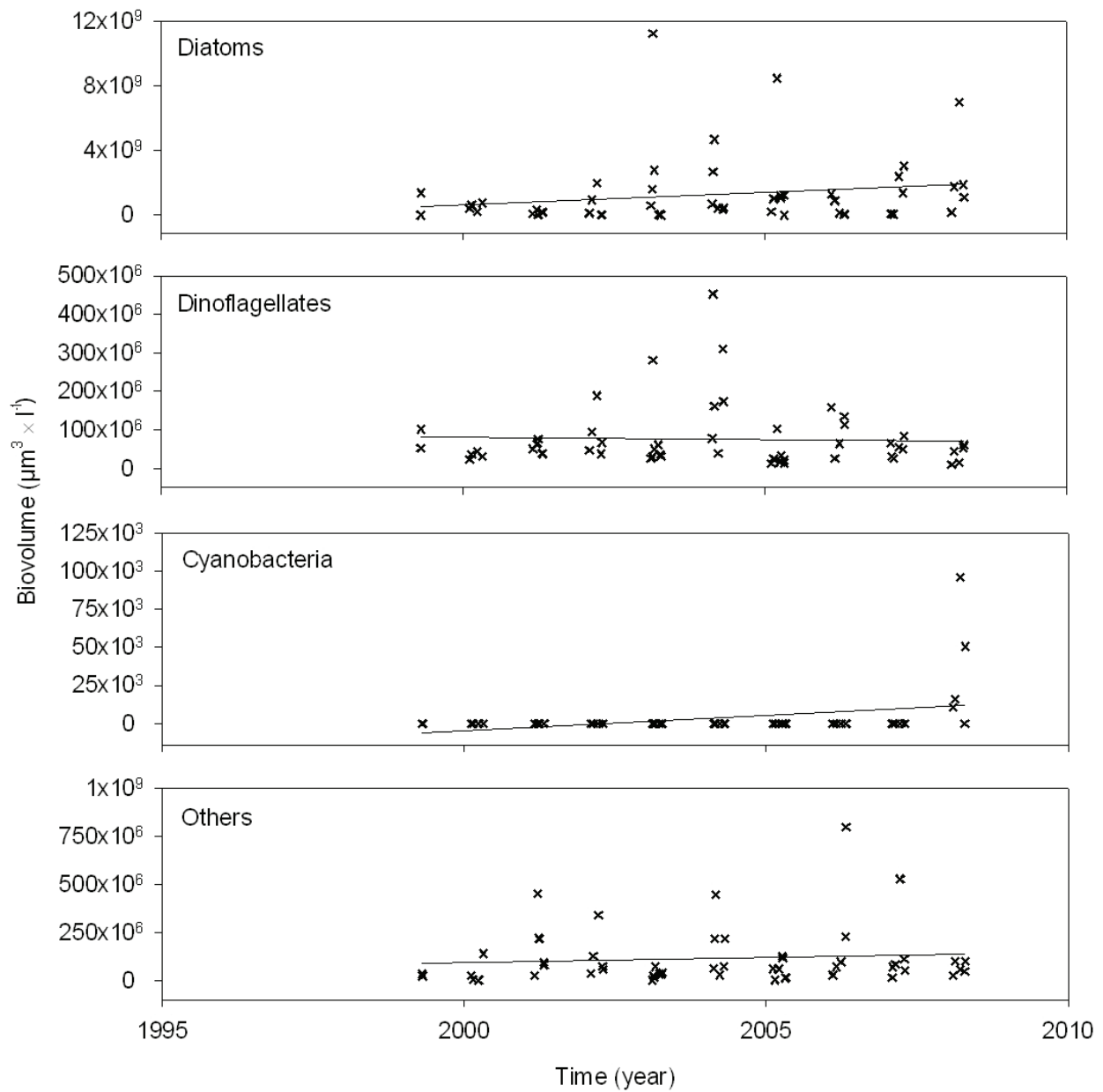


Figure 42. The Kattegat, Area 3, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (February to April). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

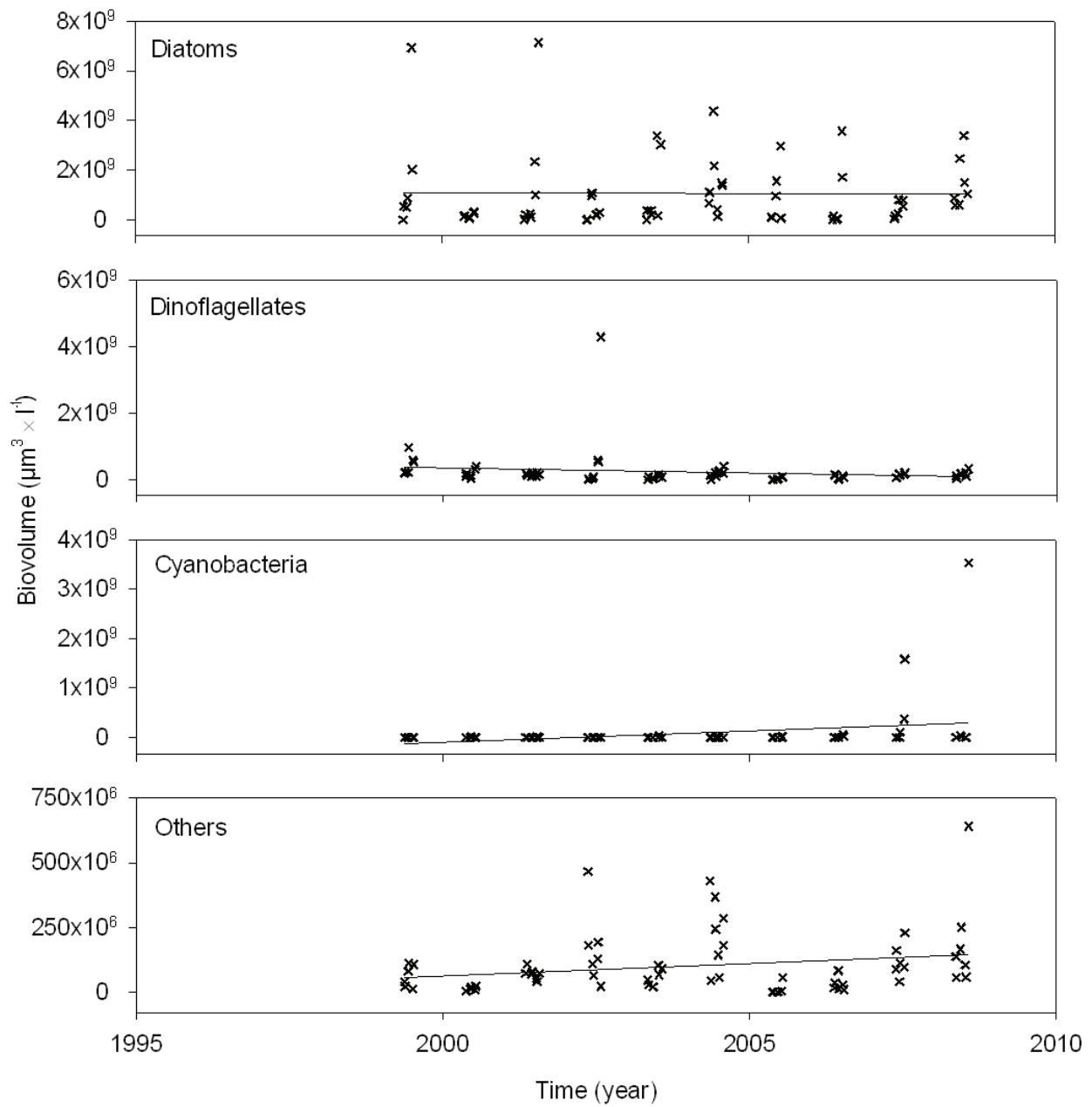


Figure 43. The Kattegat, Area 3, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

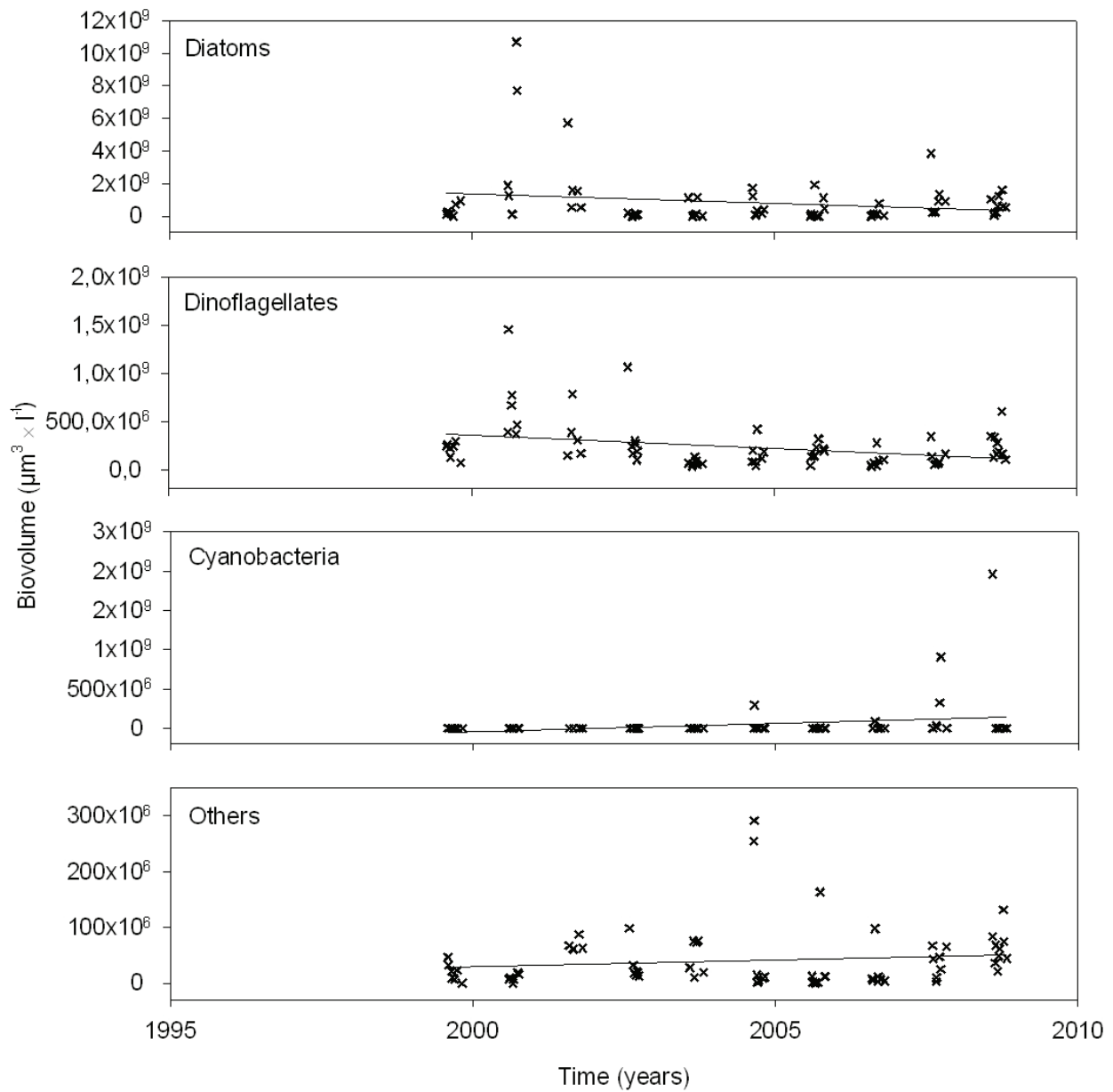


Figure 44. The Kattegat, Area 3, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (August to October). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



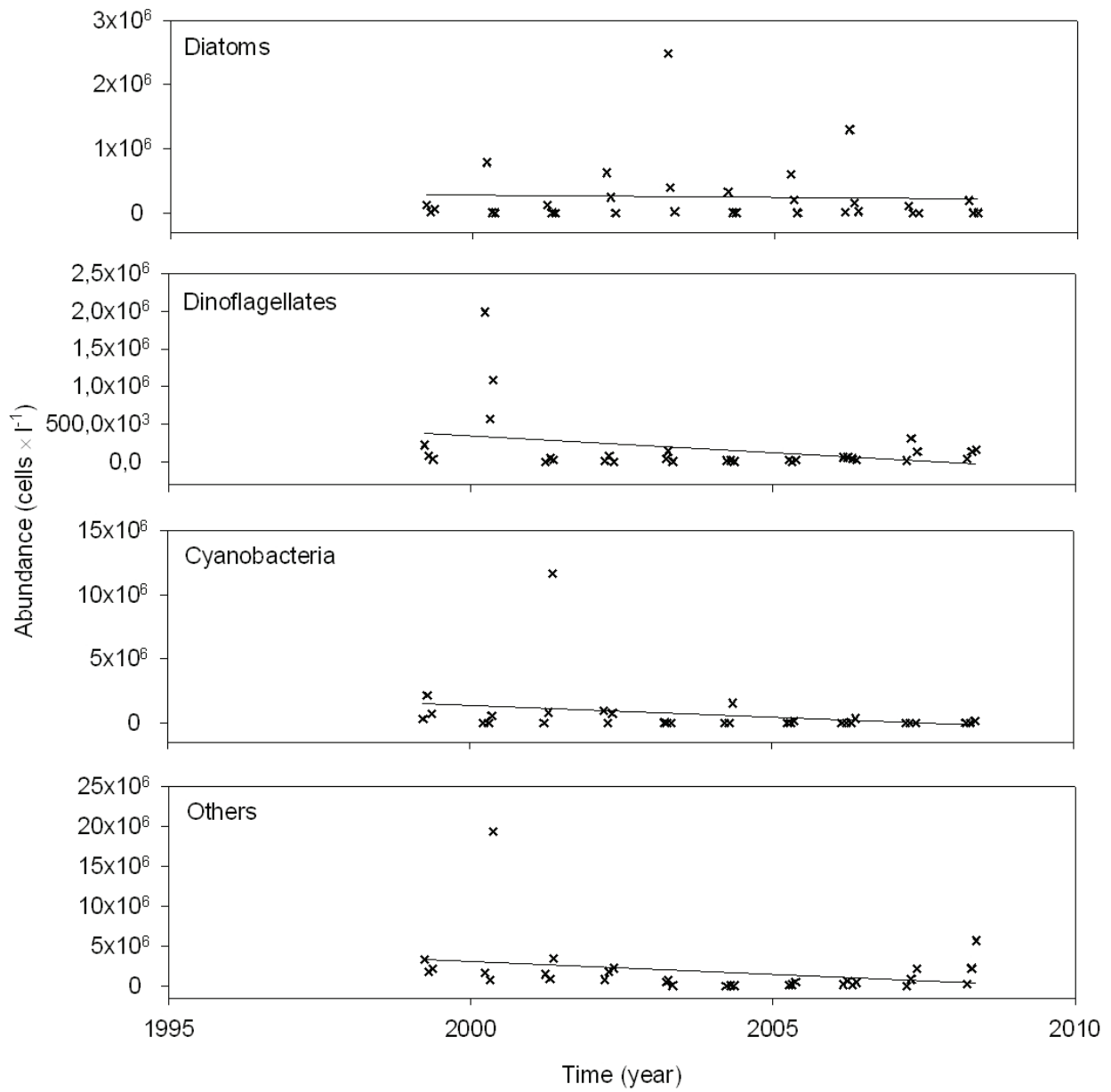


Figure 45. The Arkona Basin, Area 5, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

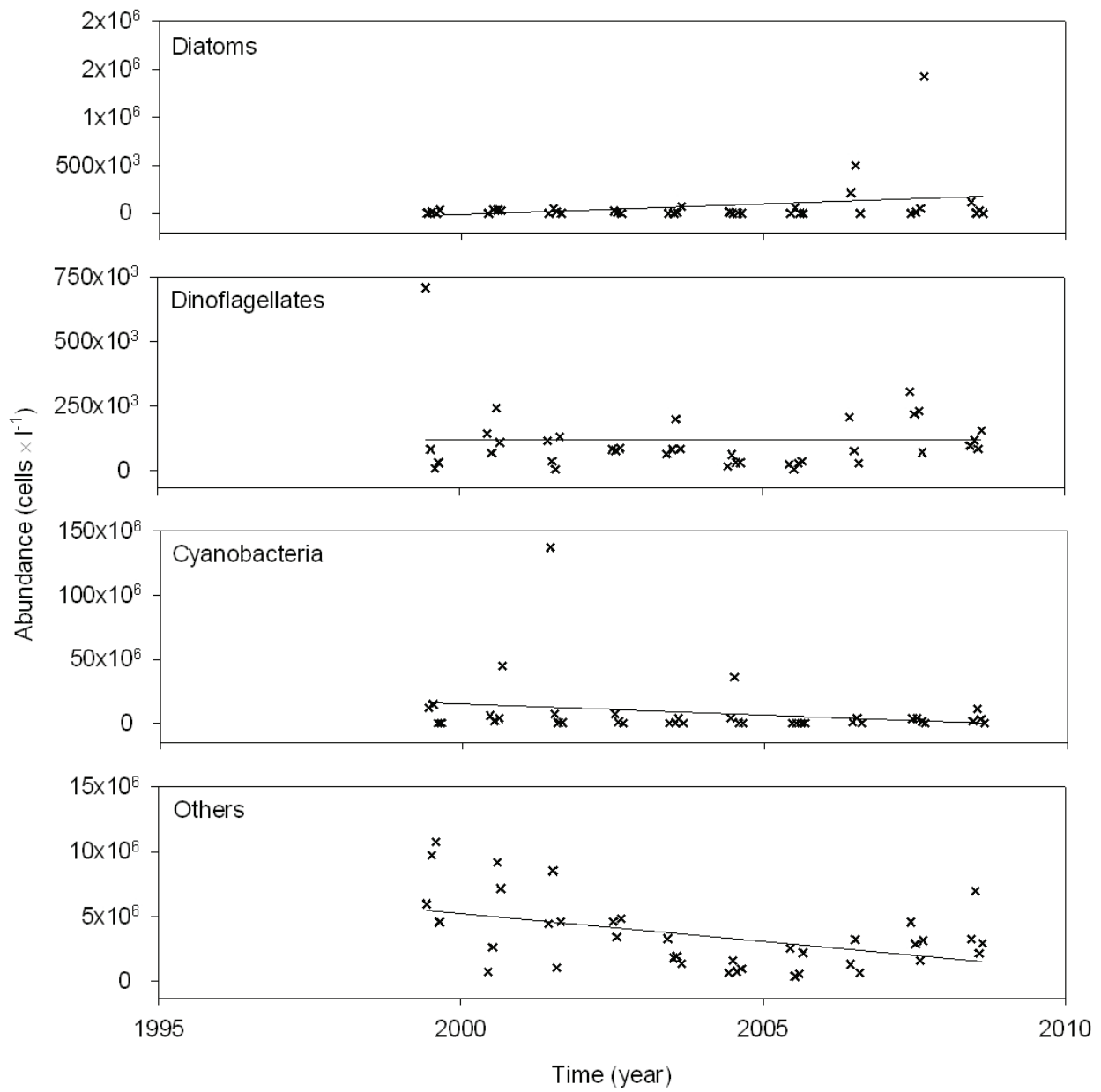


Figure 46. The Arkona Basin, Area 5, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

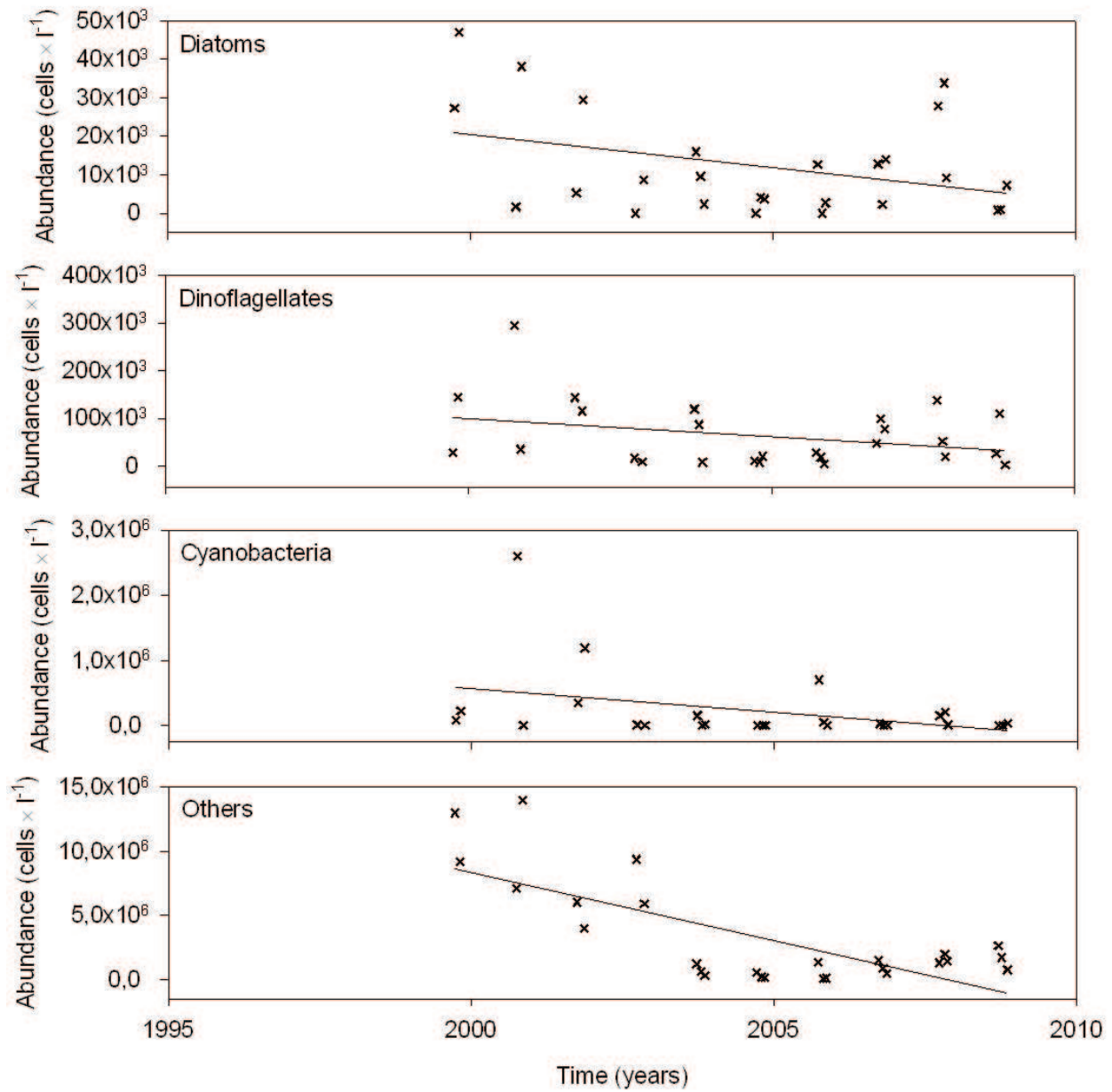


Figure 47. The Arkona Basin, Area 5, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

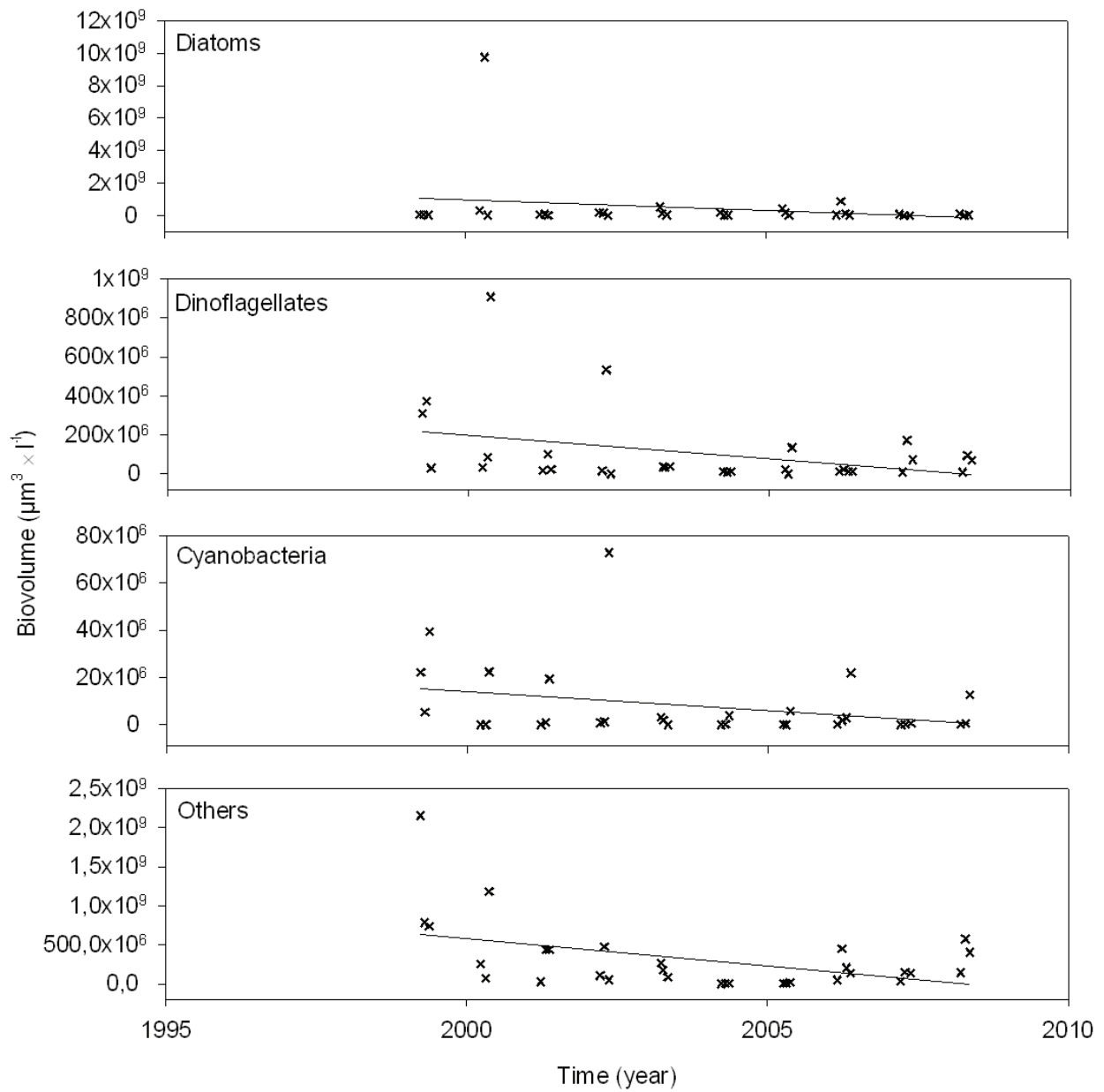


Figure 48. The Arkona Basin, Area 5, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

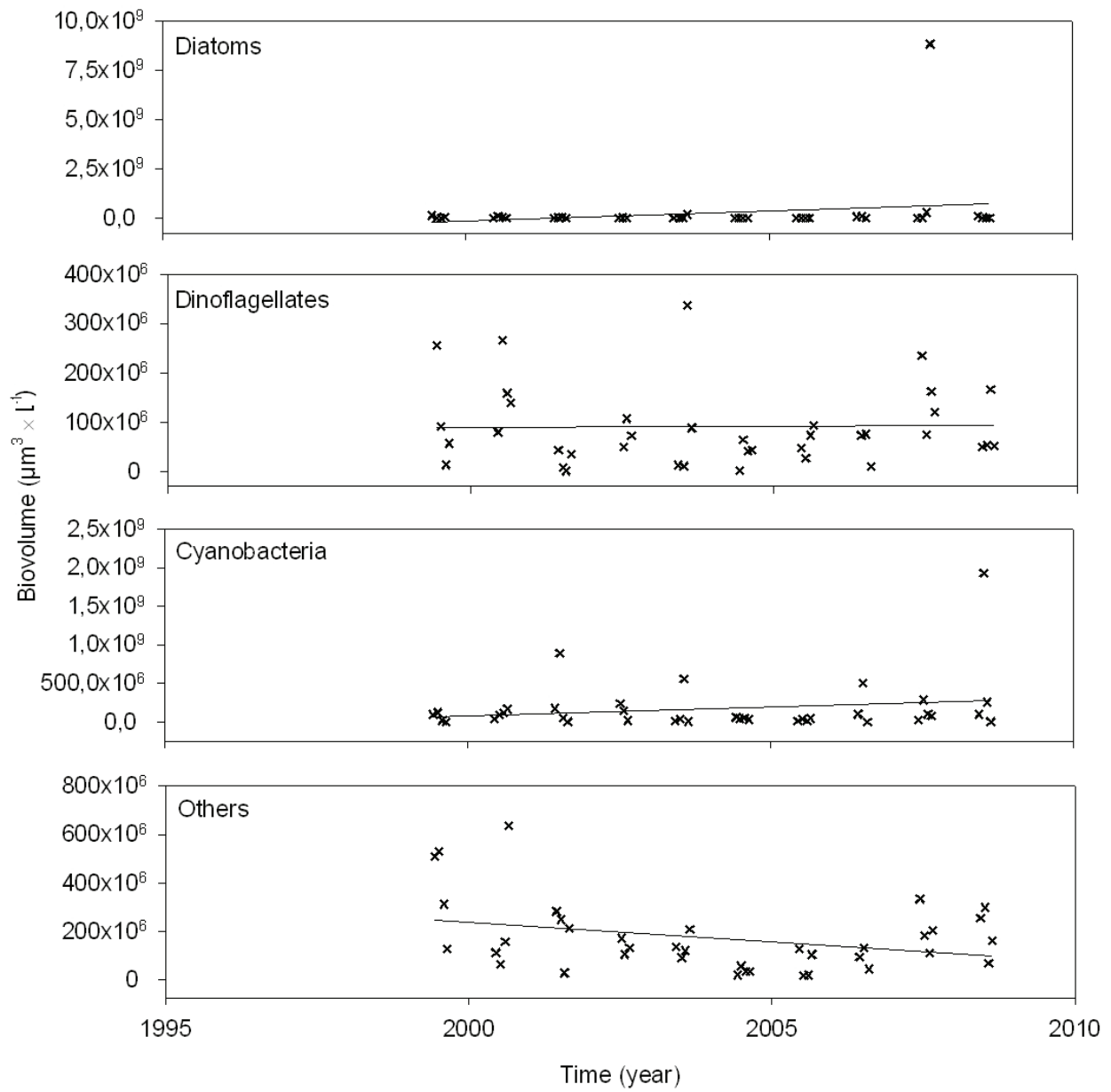


Figure 49. The Arkona Basin, Area 5, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (May to July). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

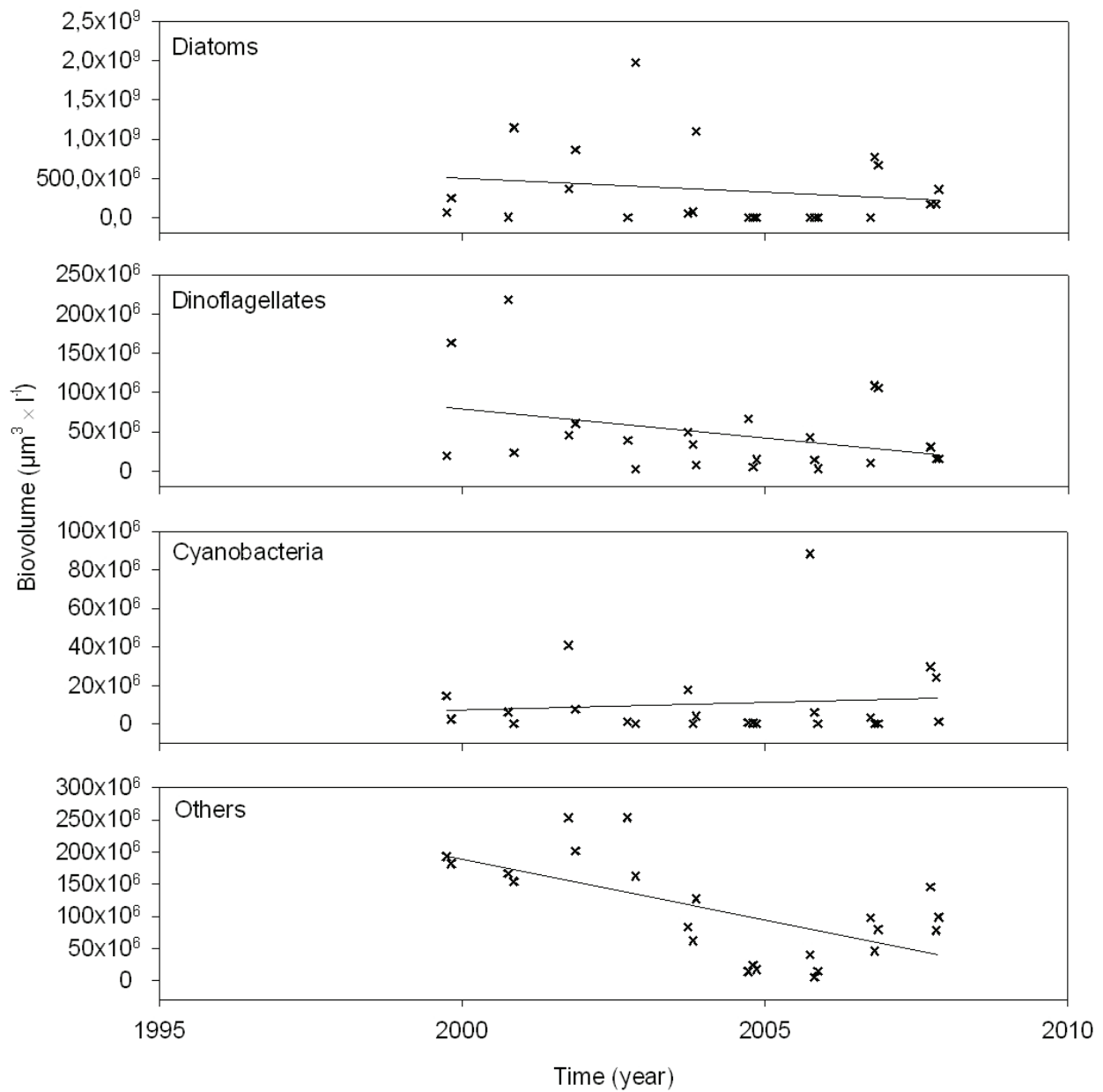


Figure 50. The Arkona Basin, Area 5, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

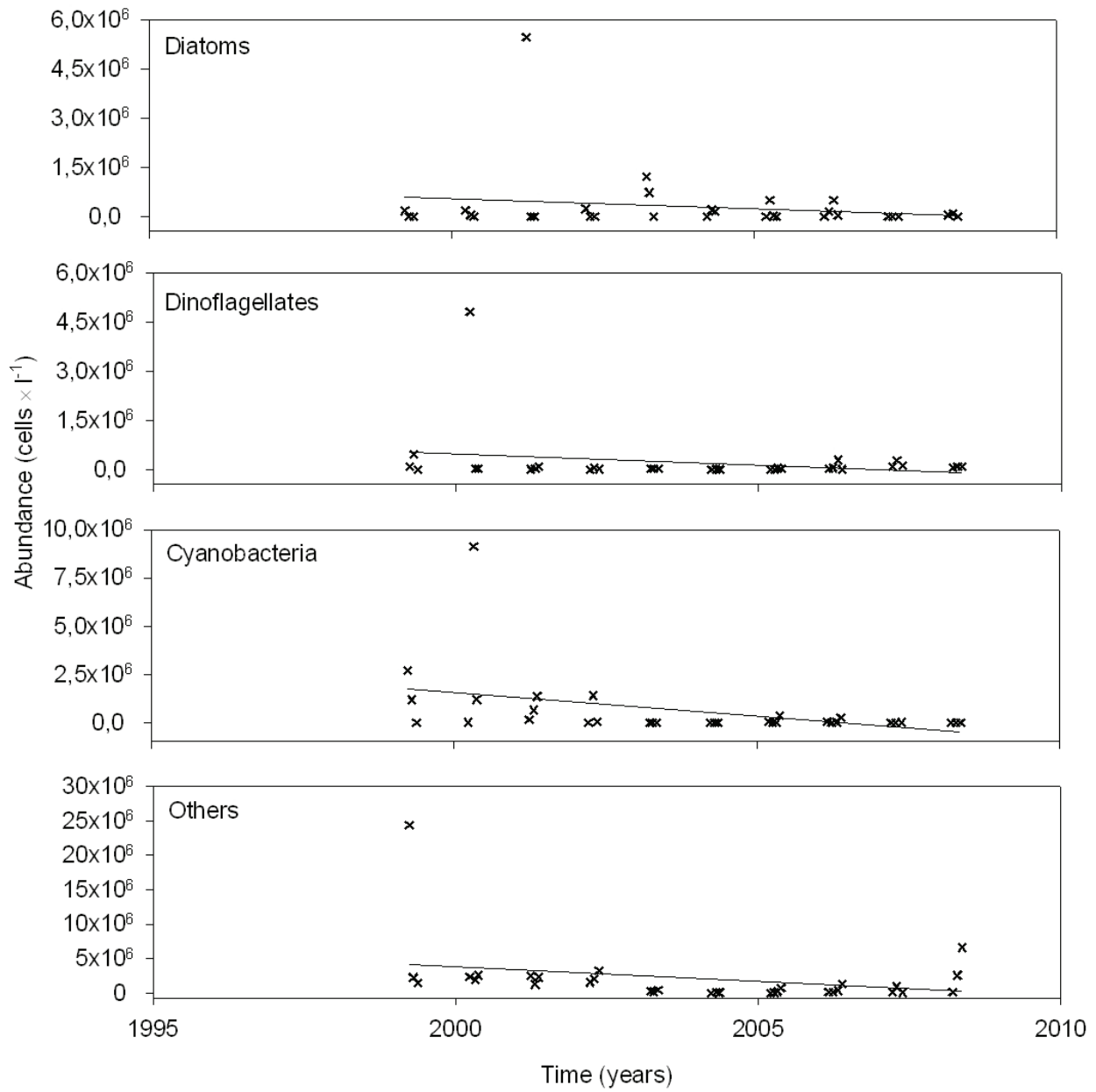


Figure 51. The Bornholm Basin, Area 6, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

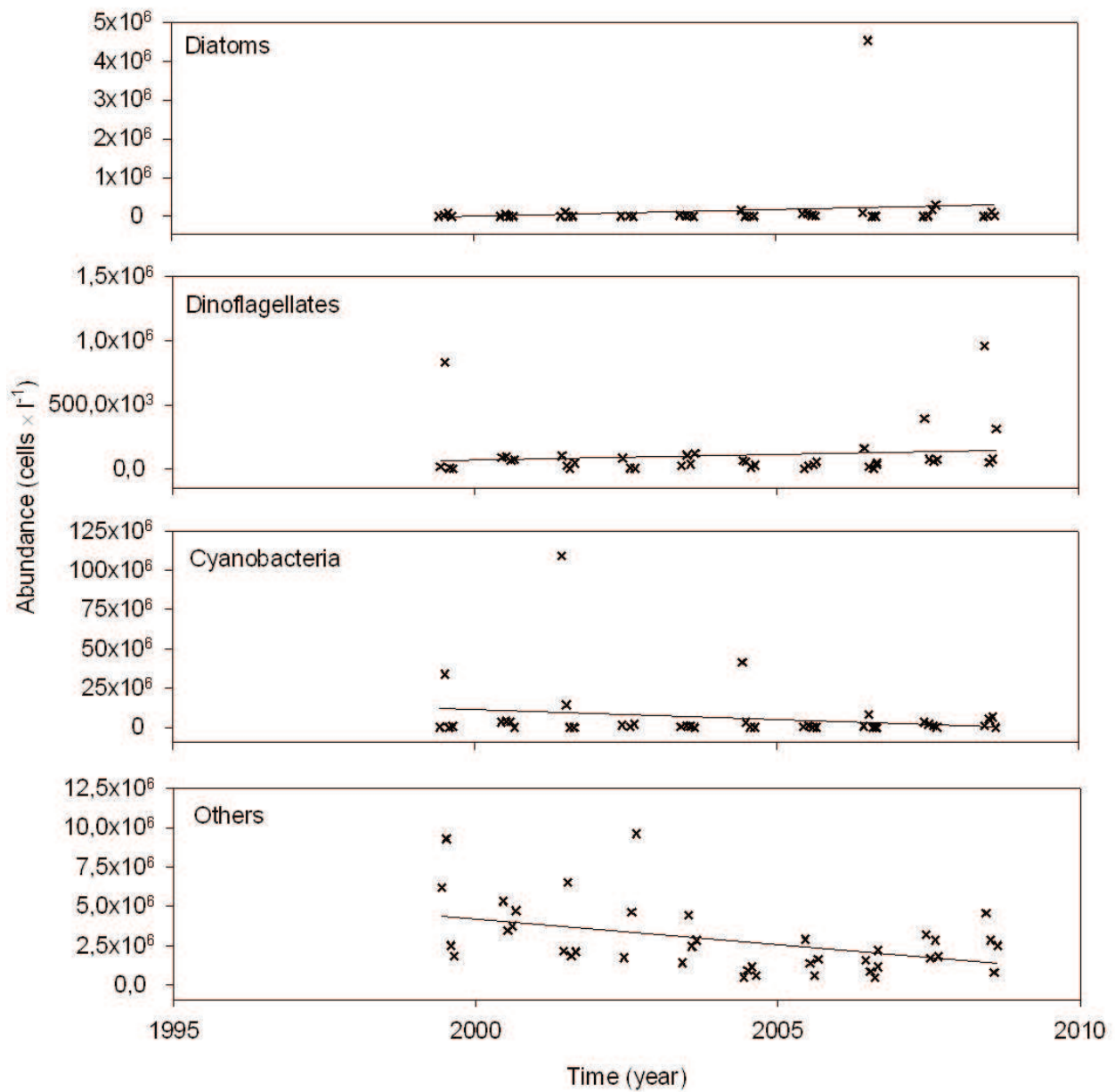


Figure 52. The Bornholm Basin, Area 6, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



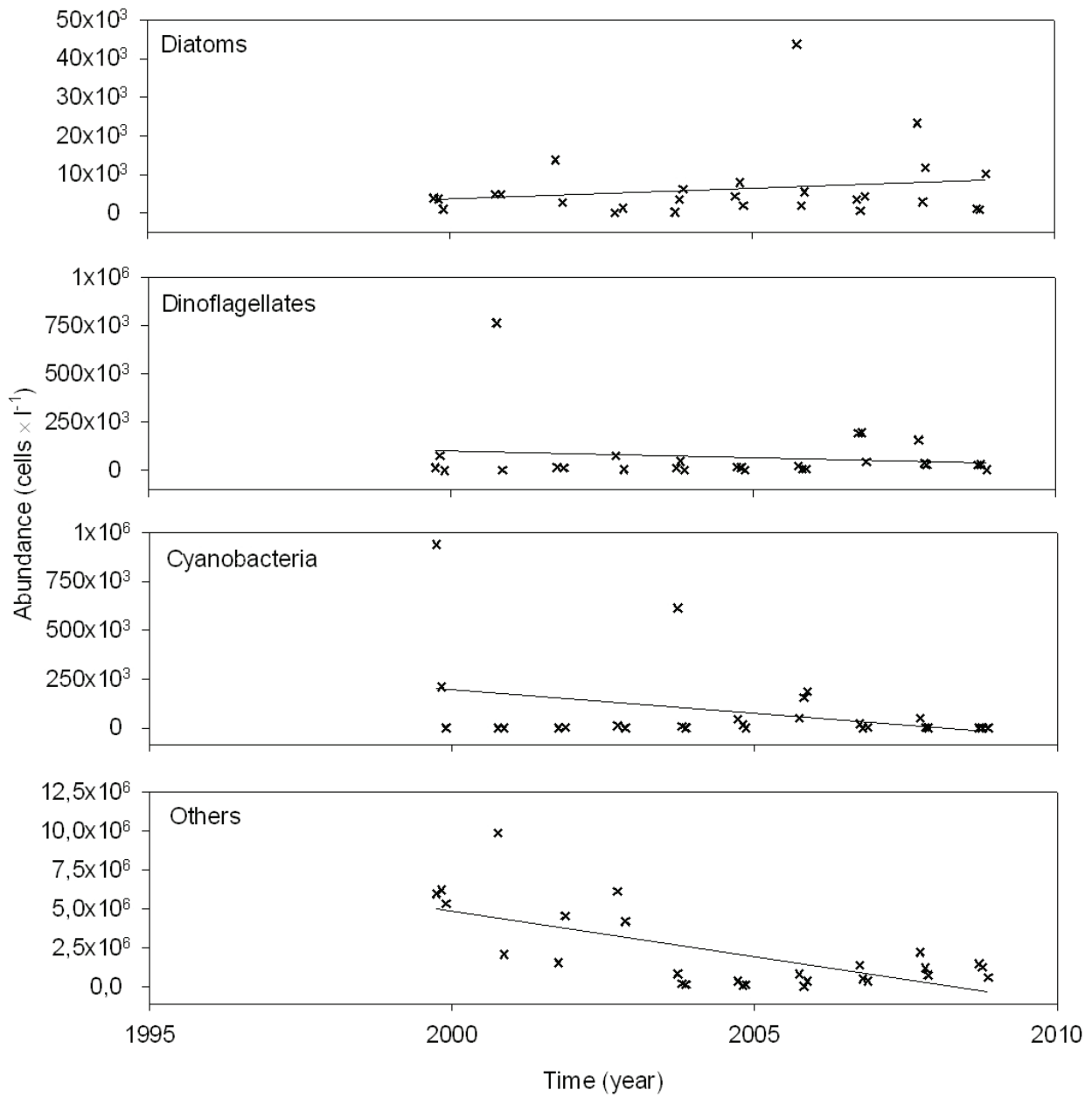


Figure 53. The Bornholm Basin, Area 6, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

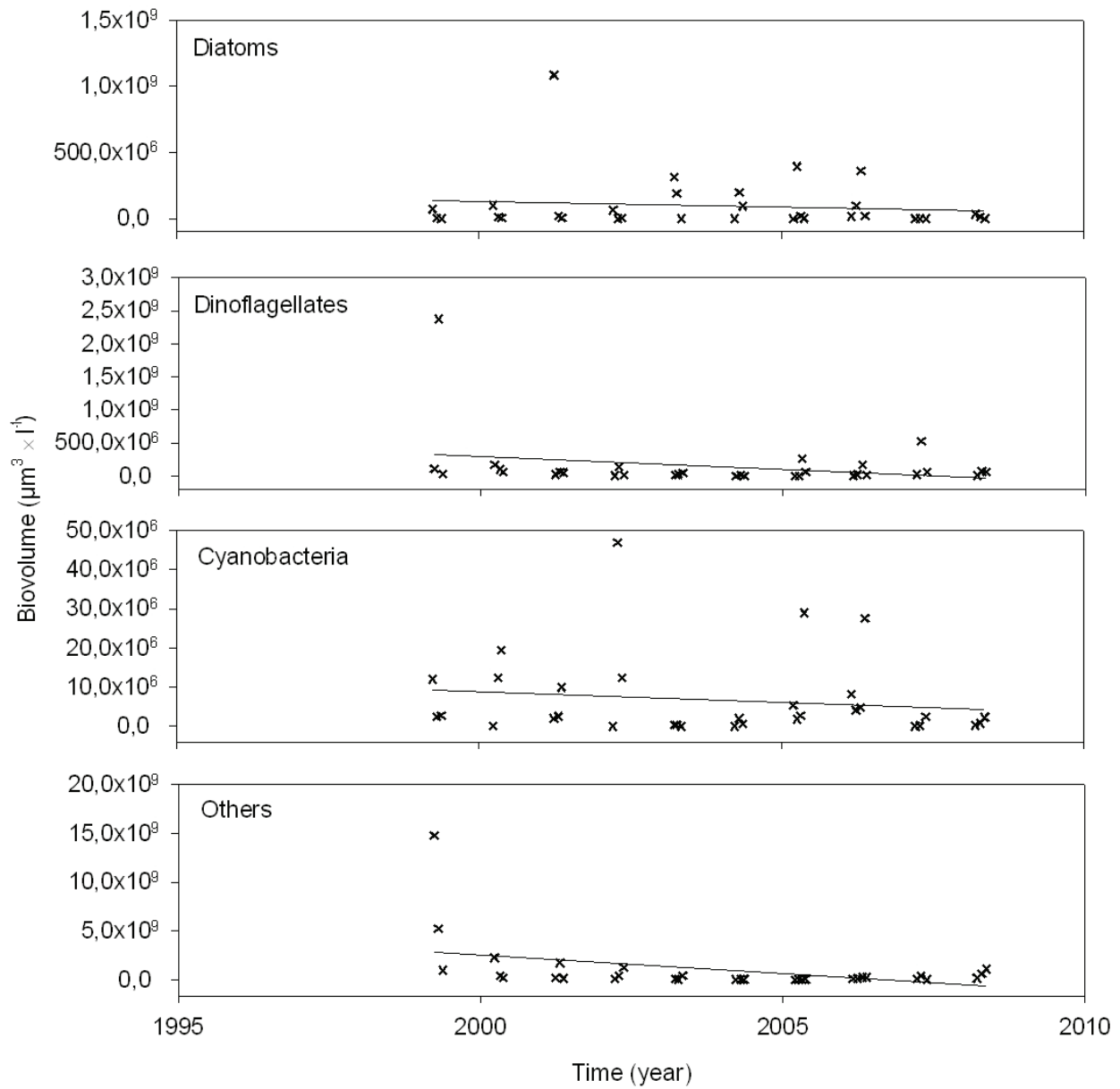


Figure 54. The Bornholm Basin, Area 6, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

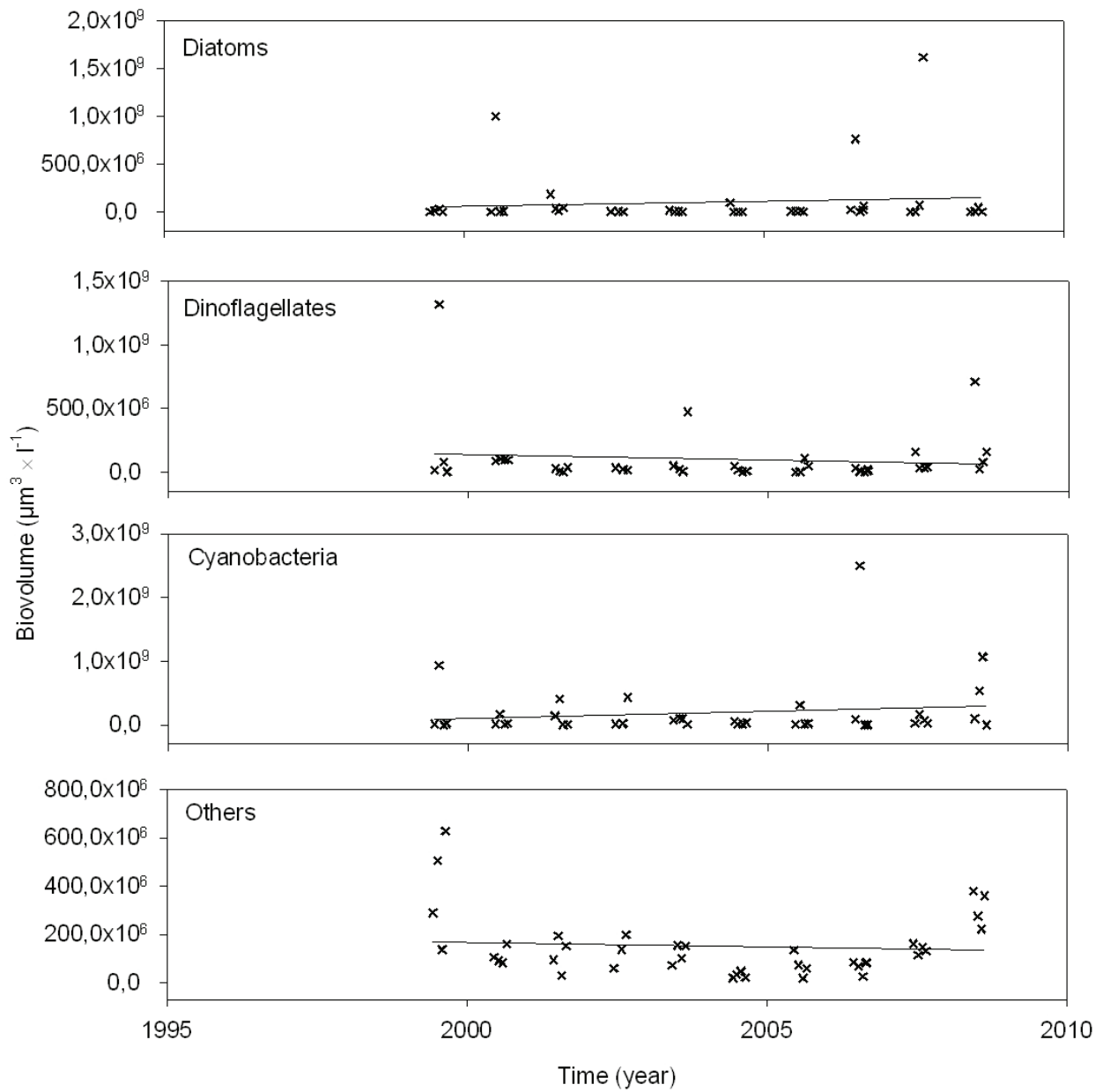


Figure 55. The Bornholm Basin, Area 6, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

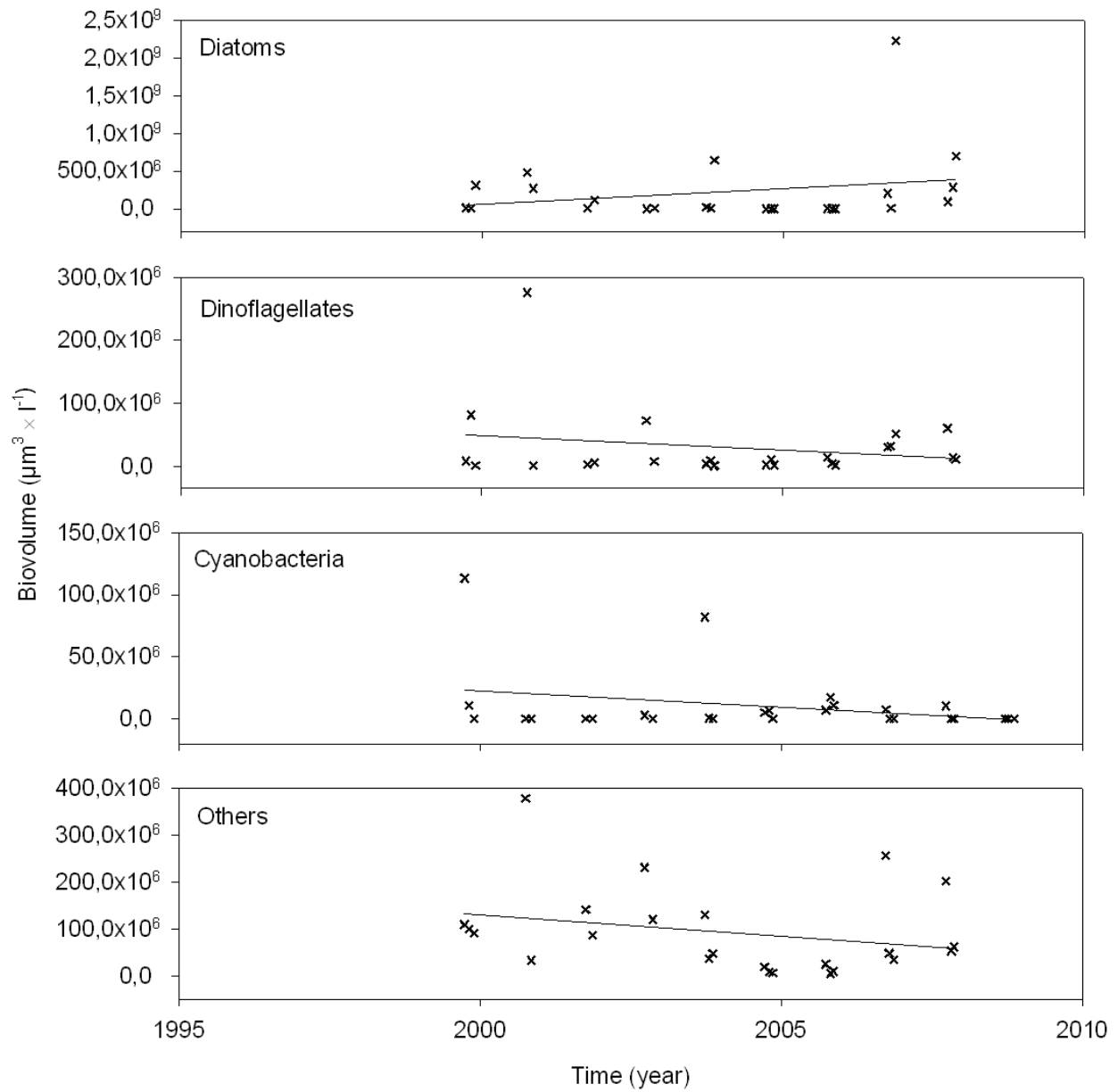


Figure 56. The Bornholm Basin, Area 6, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

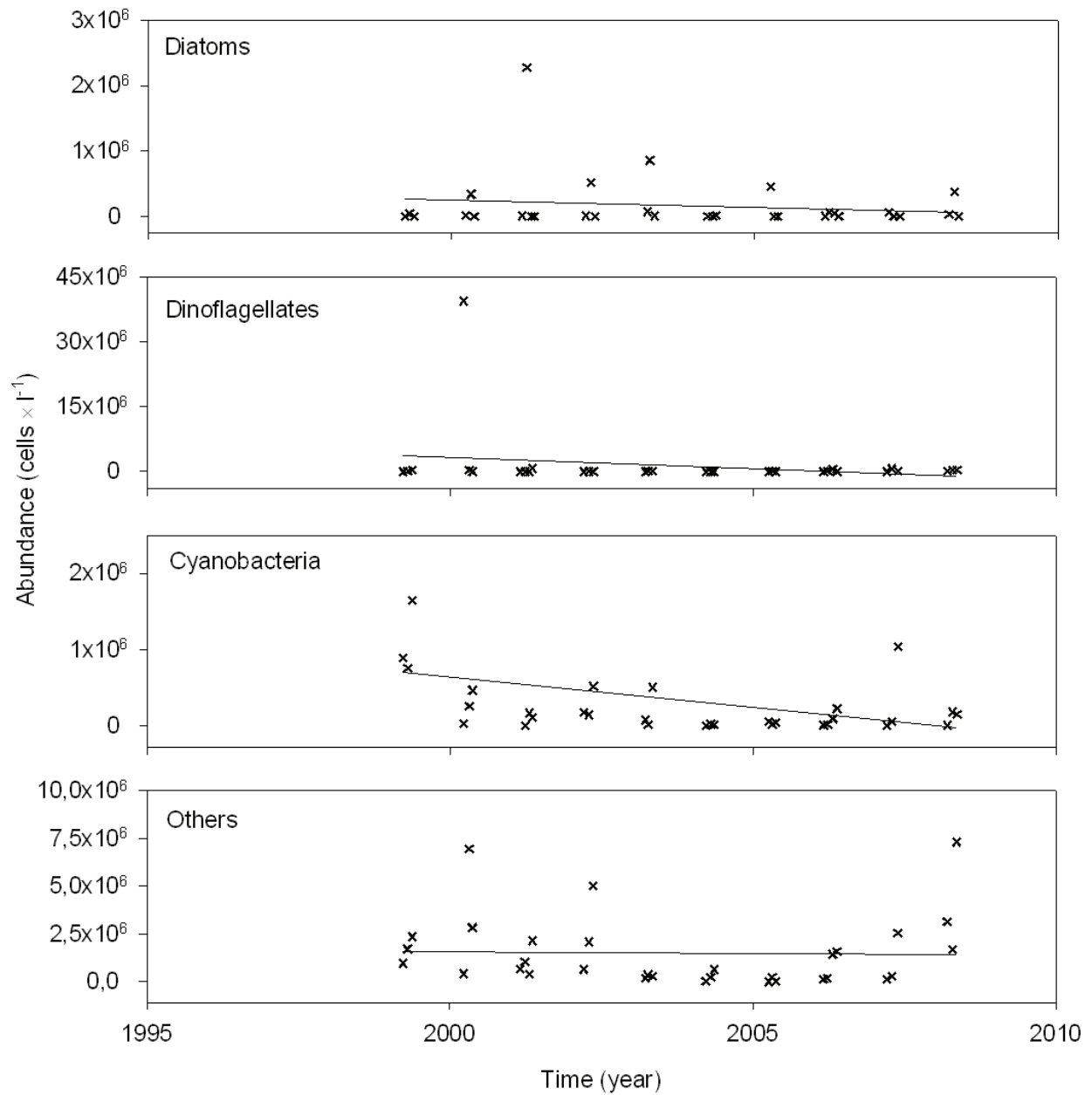


Figure 57. The Eastern Gotland Basin, Area 9, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

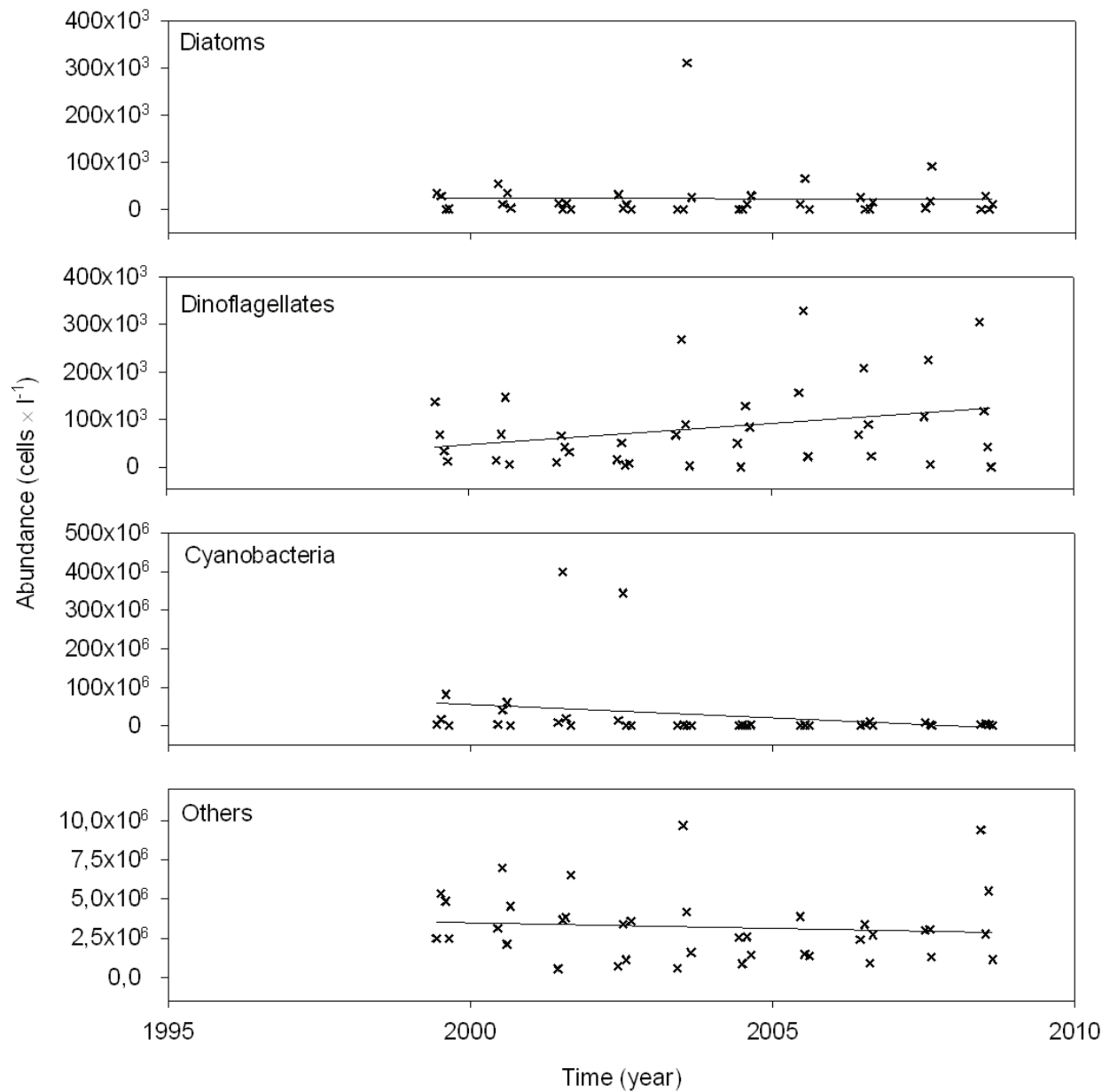


Figure 58. The Eastern Gotland Basin, Area 9, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

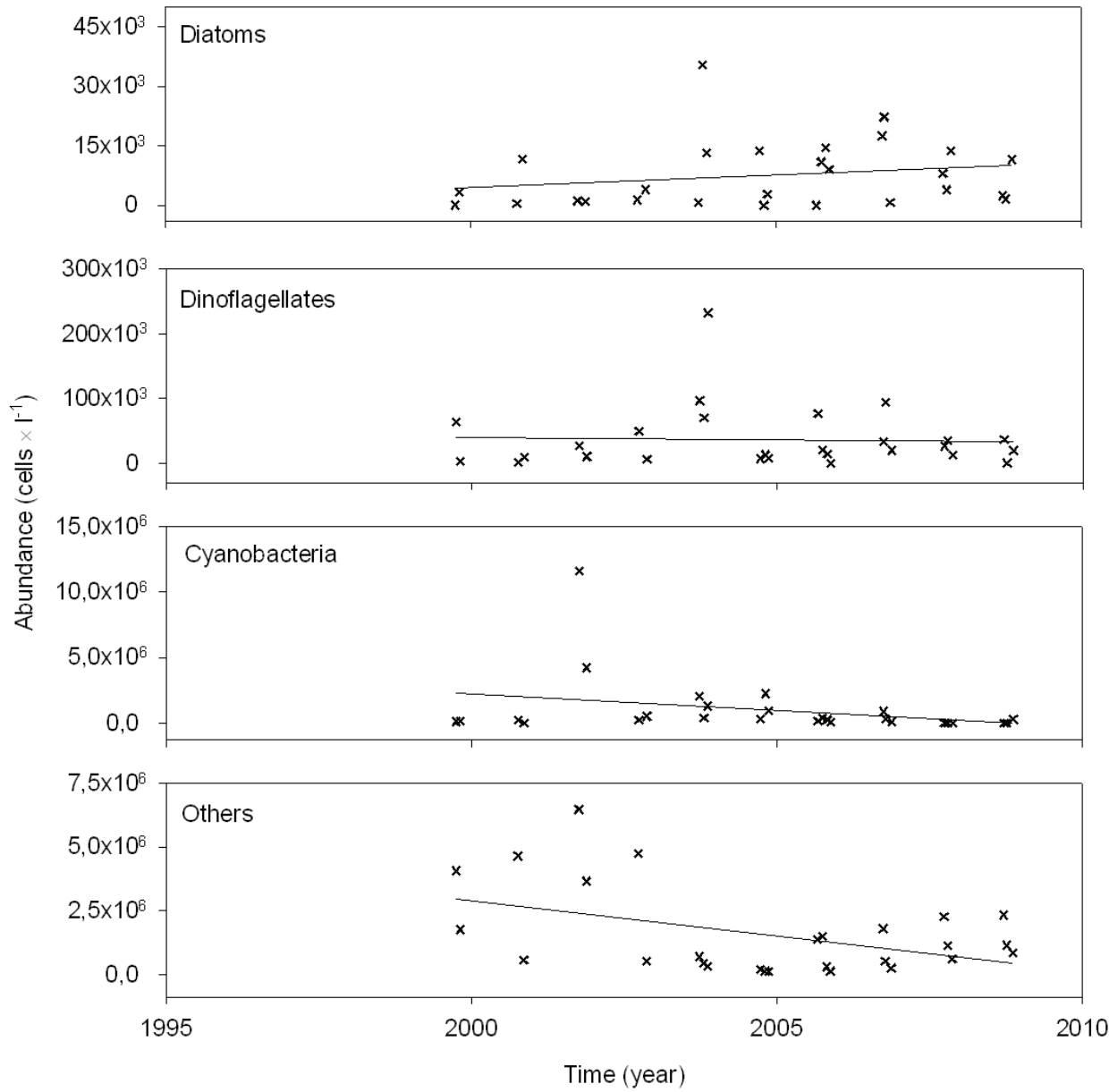


Figure 59. The Eastern Gotland Basin, Area 9, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

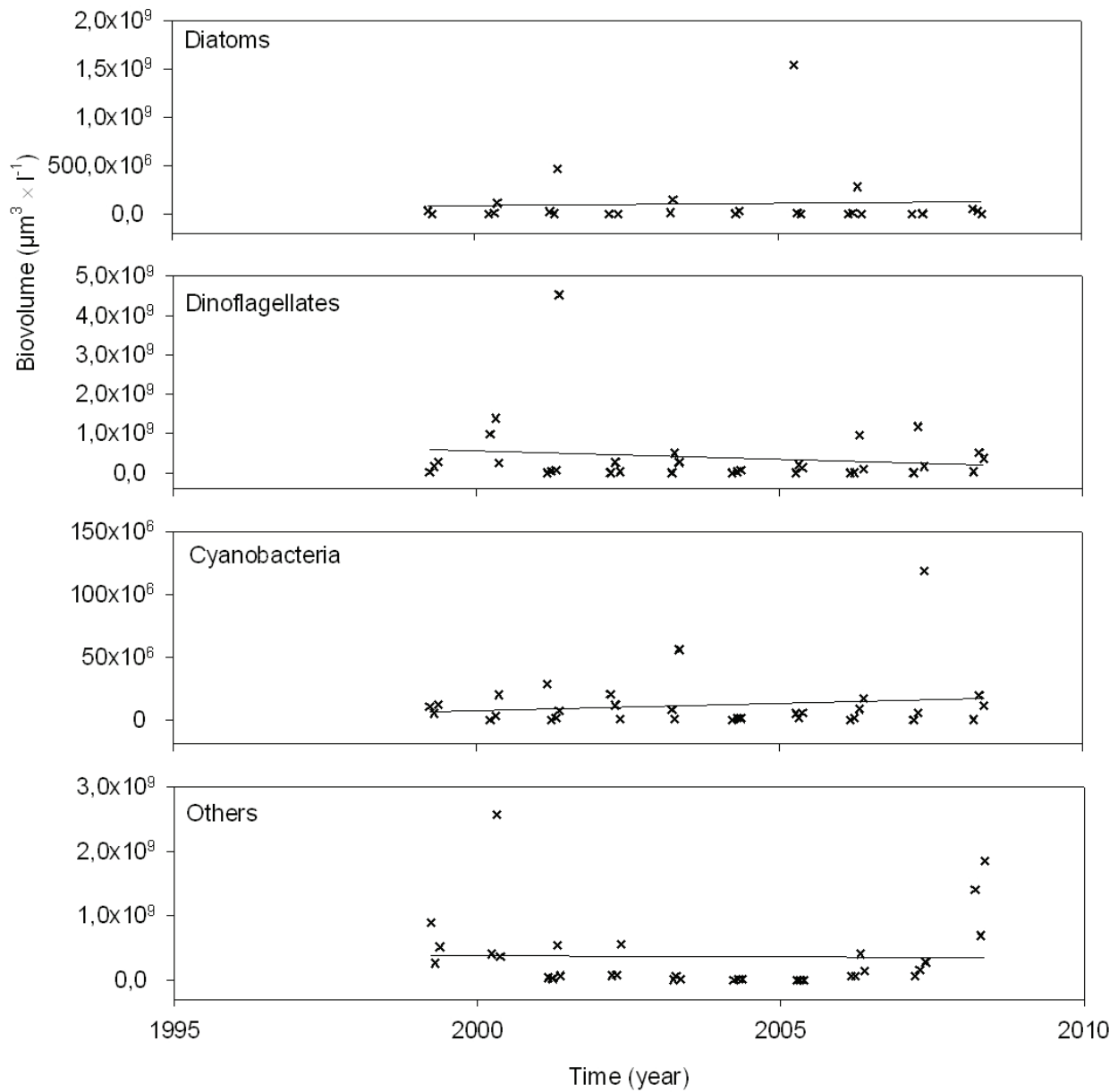


Figure 60. The Eastern Gotland Basin, Area 9, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



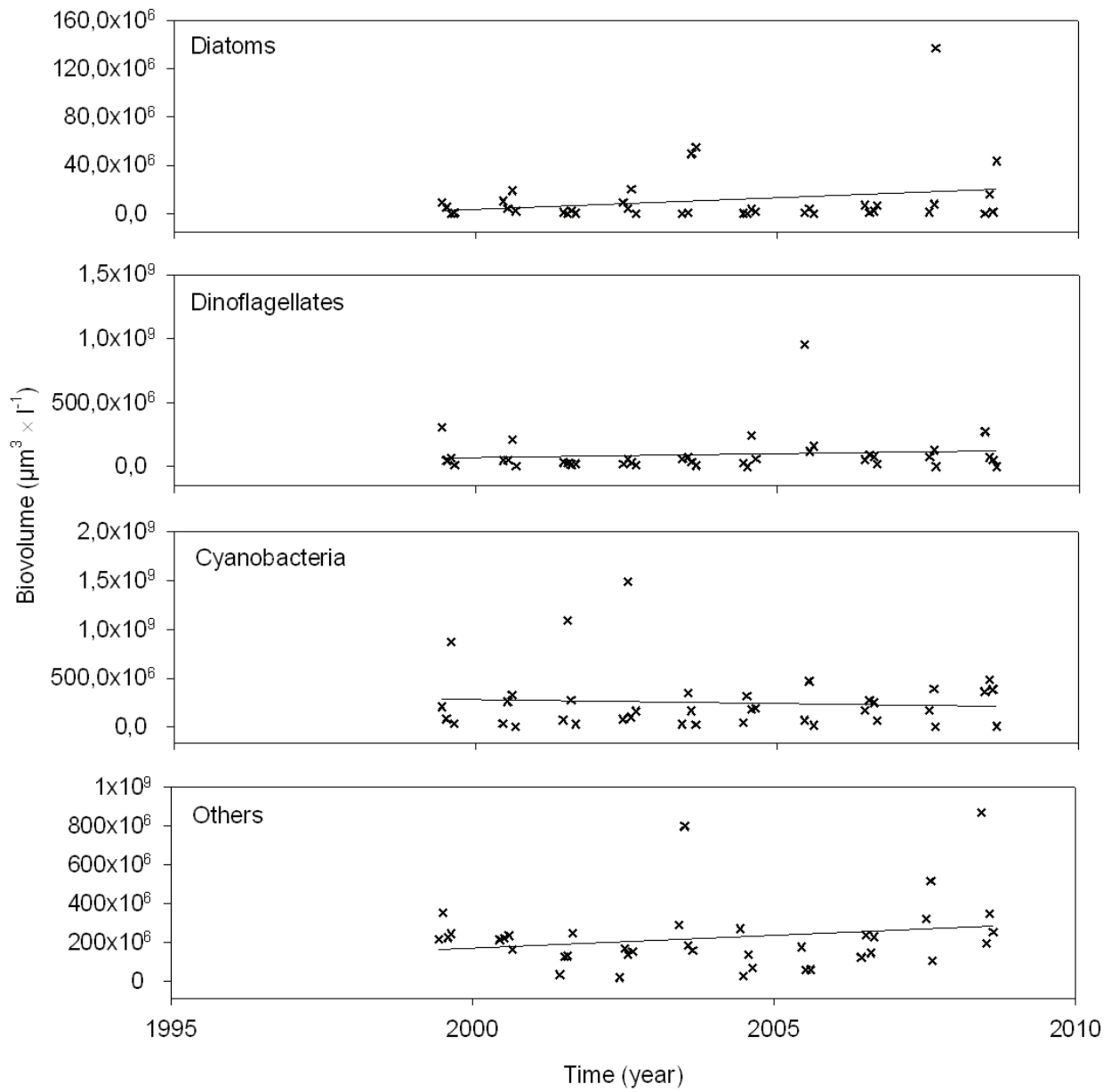


Figure 61. The Eastern Gotland Basin, Area 9, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

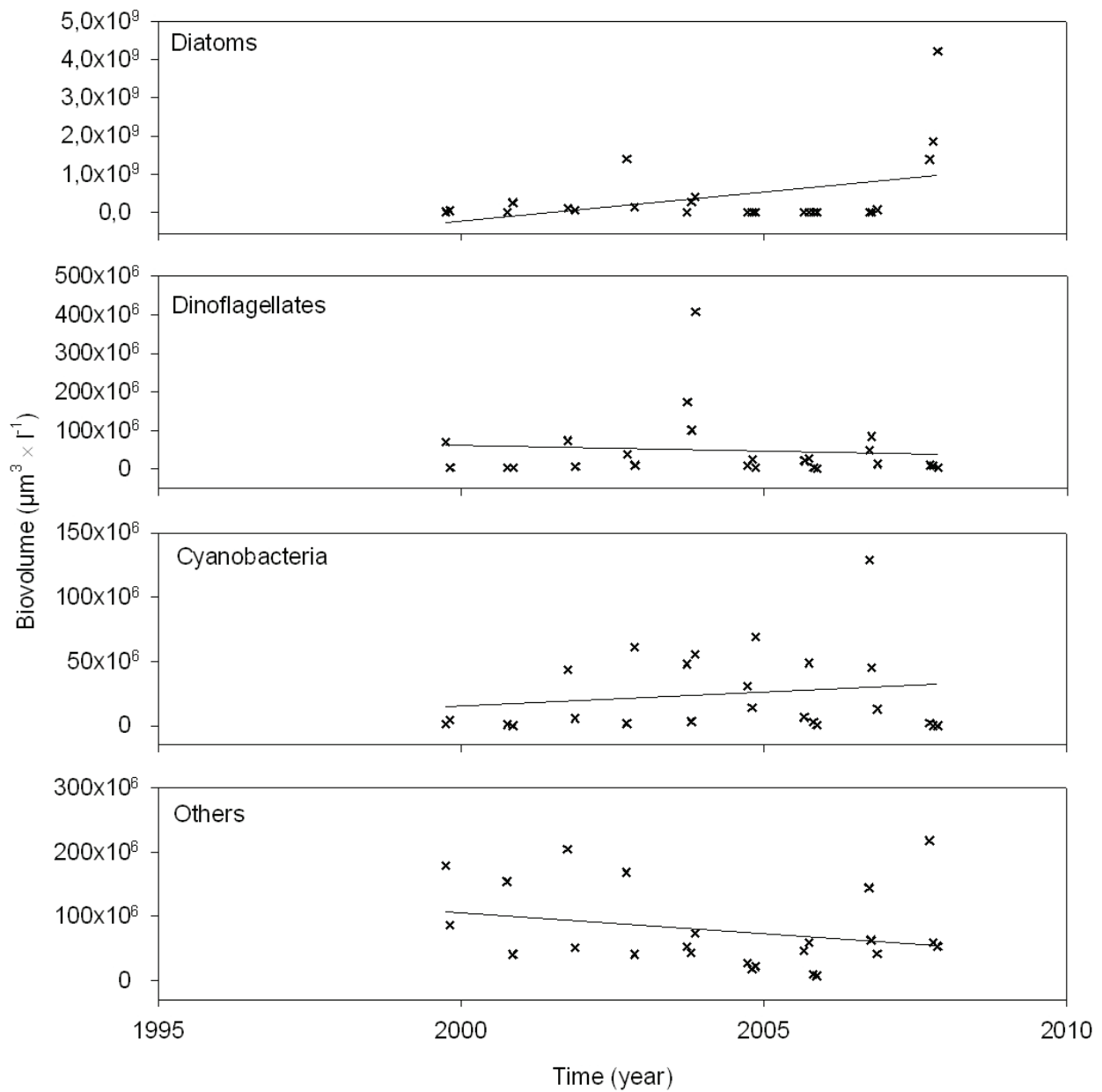


Figure 62. The Eastern Gotland Basin, Area 9, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

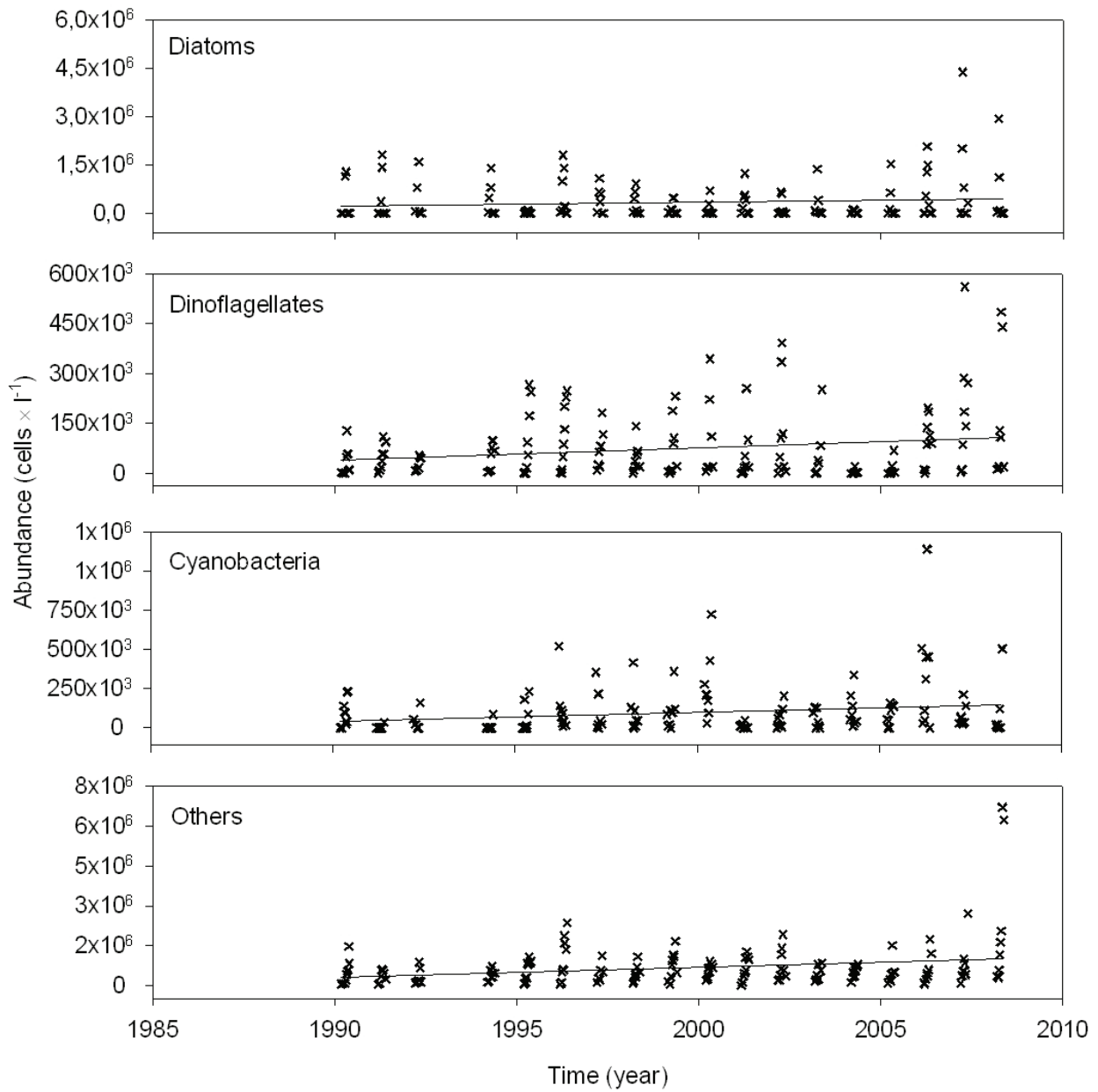


Figure 63. The Northern Baltic Proper, Area 10, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-20m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

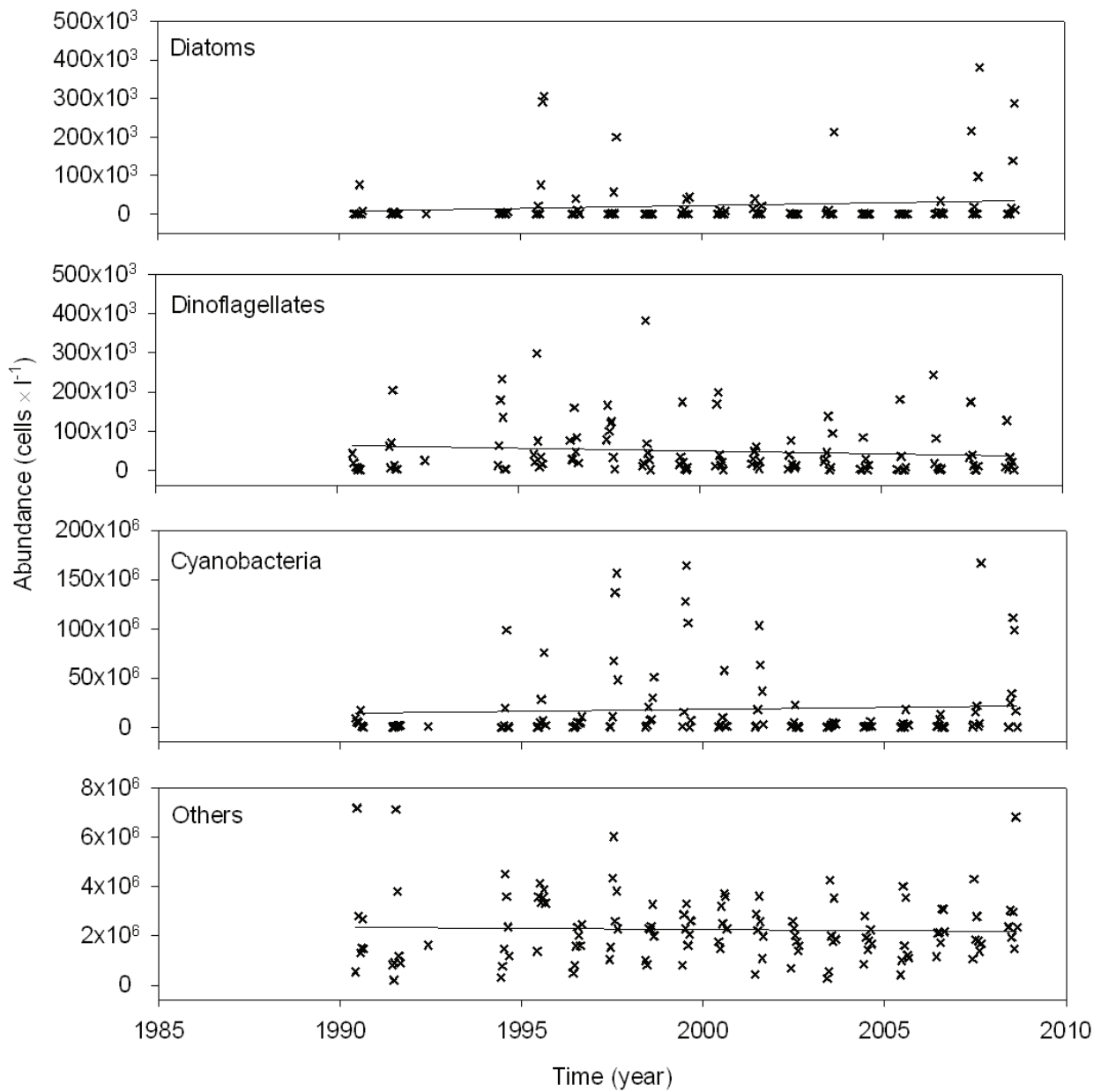


Figure 64. The Northern Baltic Proper, Area 10, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-20m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

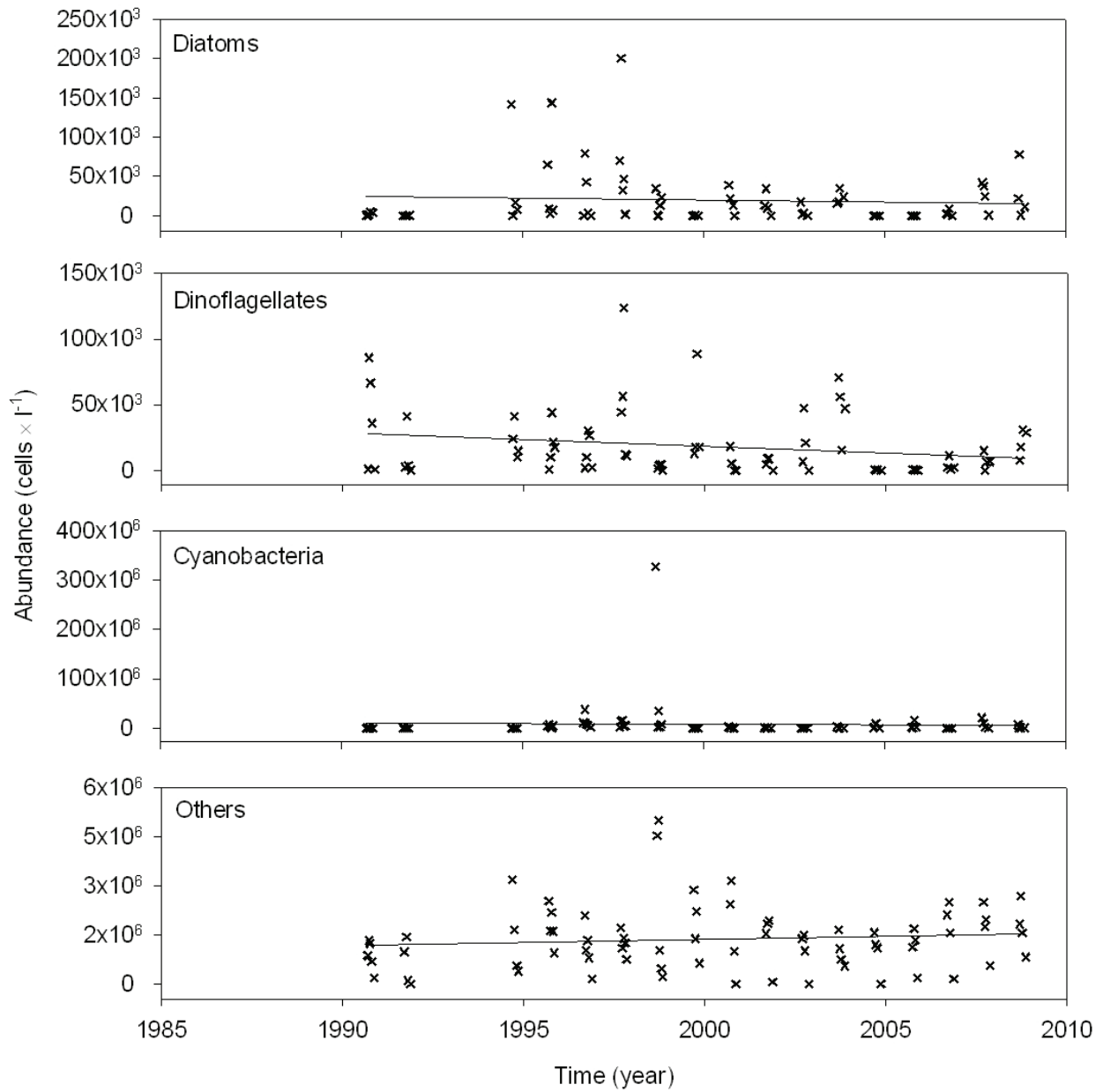


Figure 65. The Northern Baltic Proper, Area 10, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-20m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

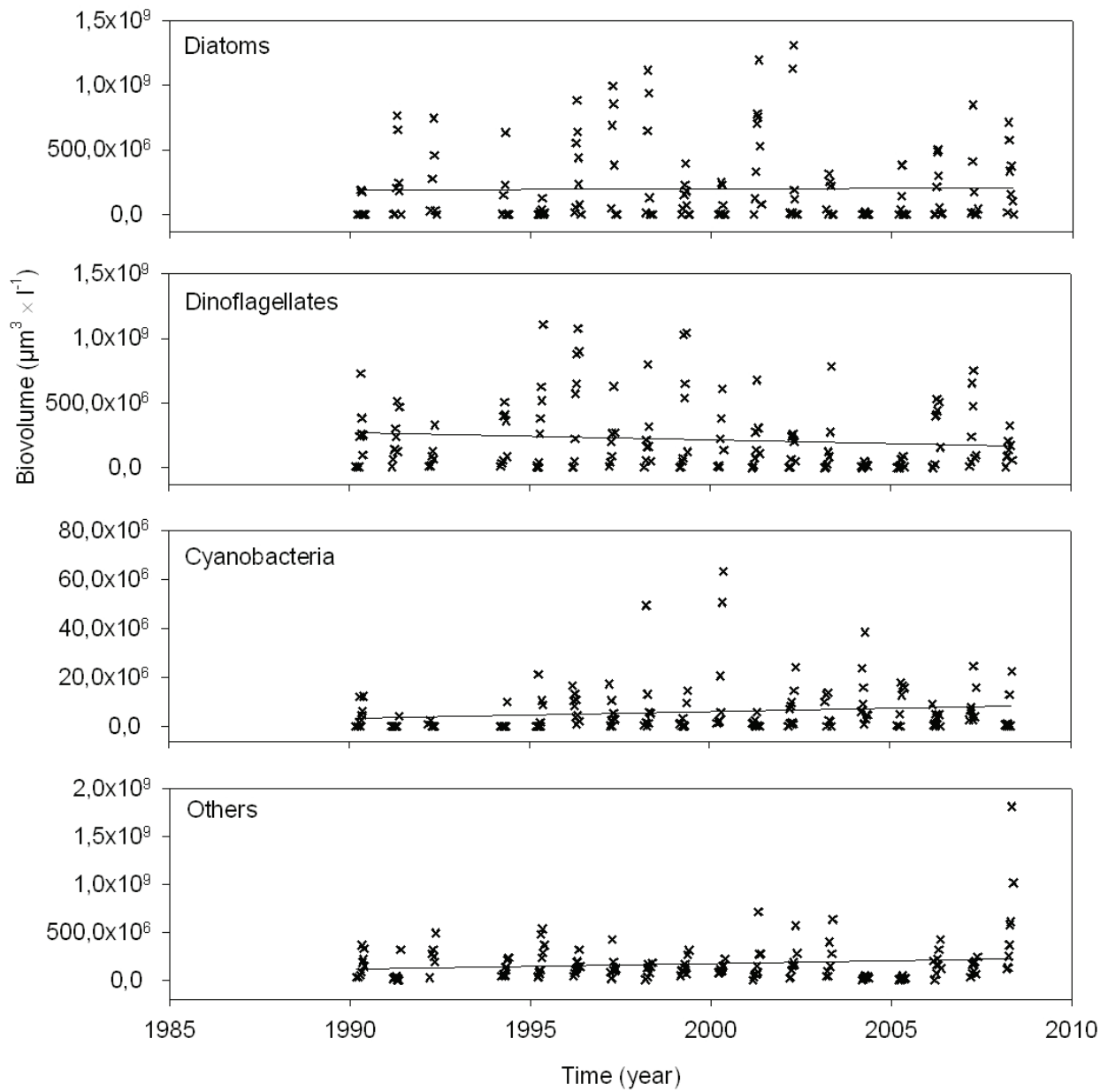


Figure 66. The Northern Baltic Proper, Area 10, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-20m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

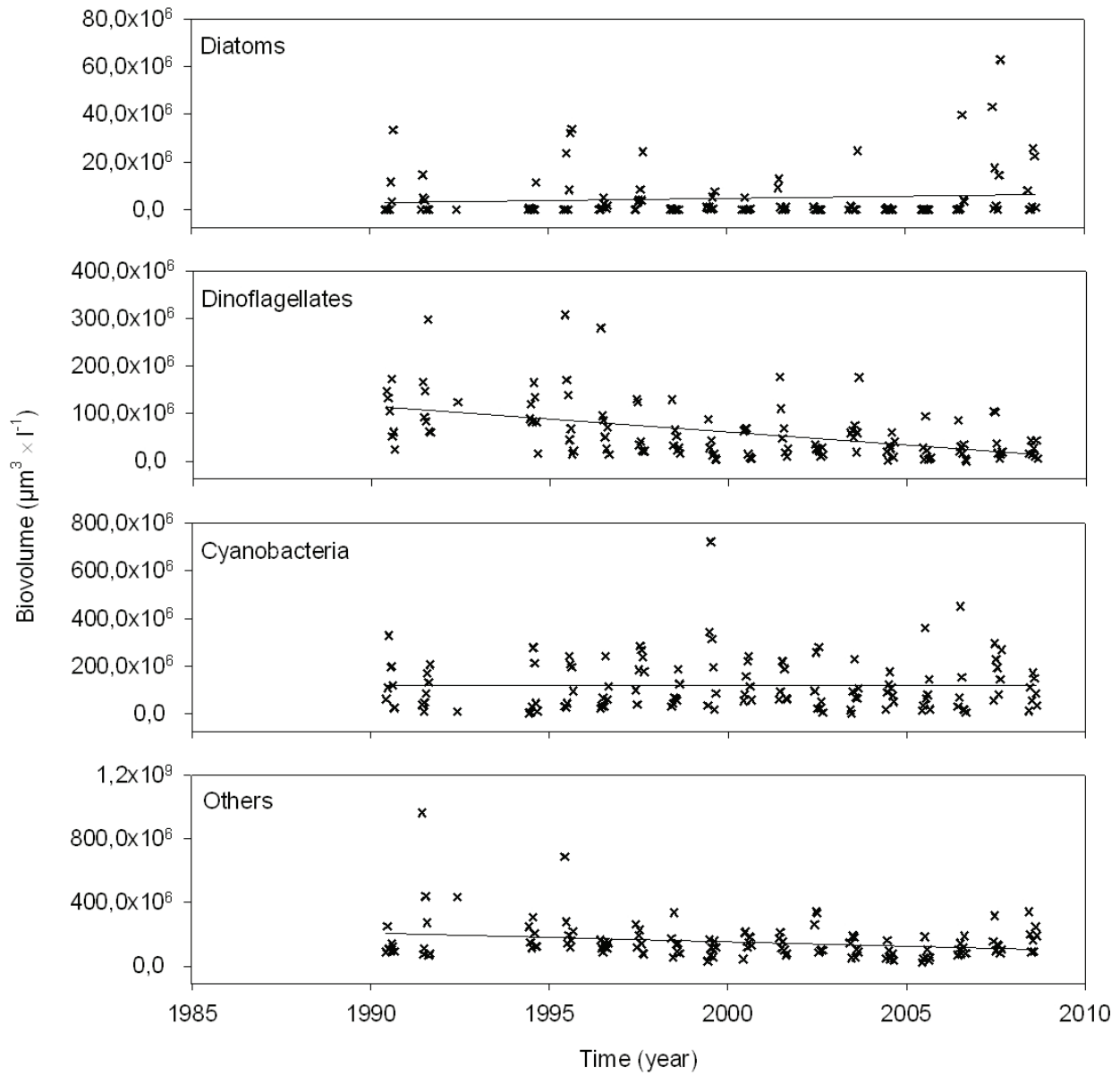


Figure 67. The Northern Baltic Proper, Area 10, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-20m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

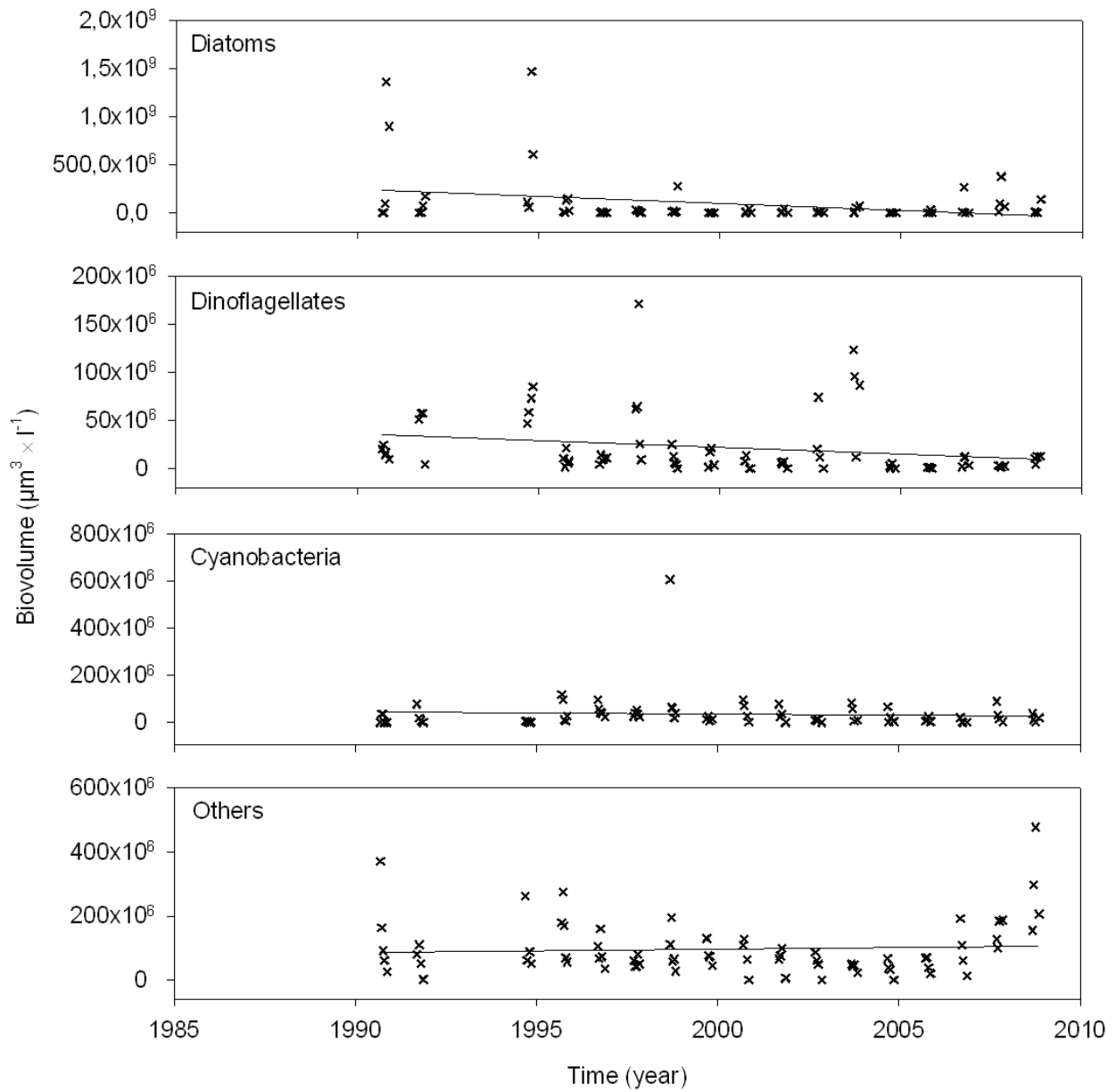


Figure 68. The Northern Baltic Proper, Area 10, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-20m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



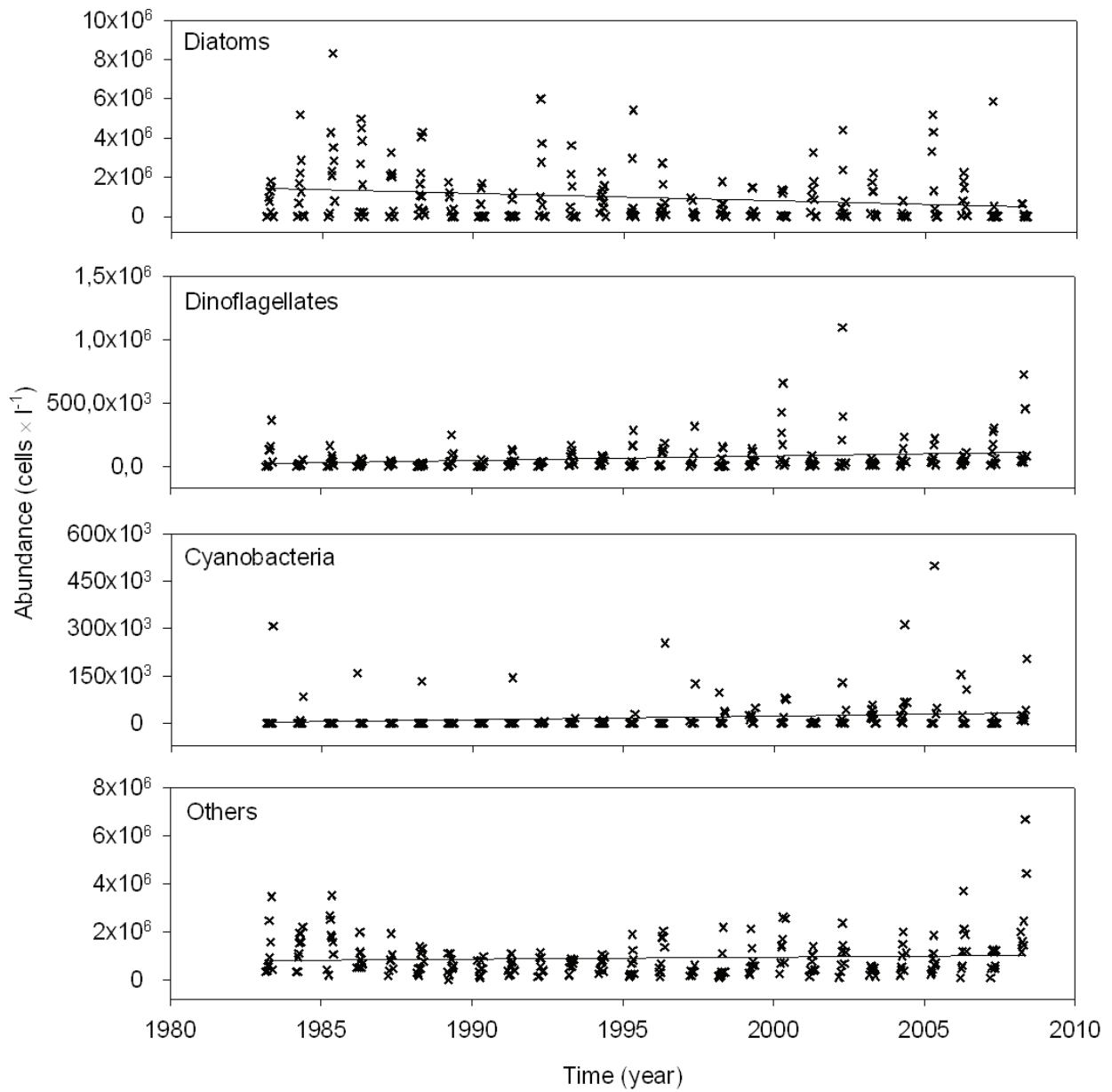


Figure 69. The Eastern coastal area, Area 11, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

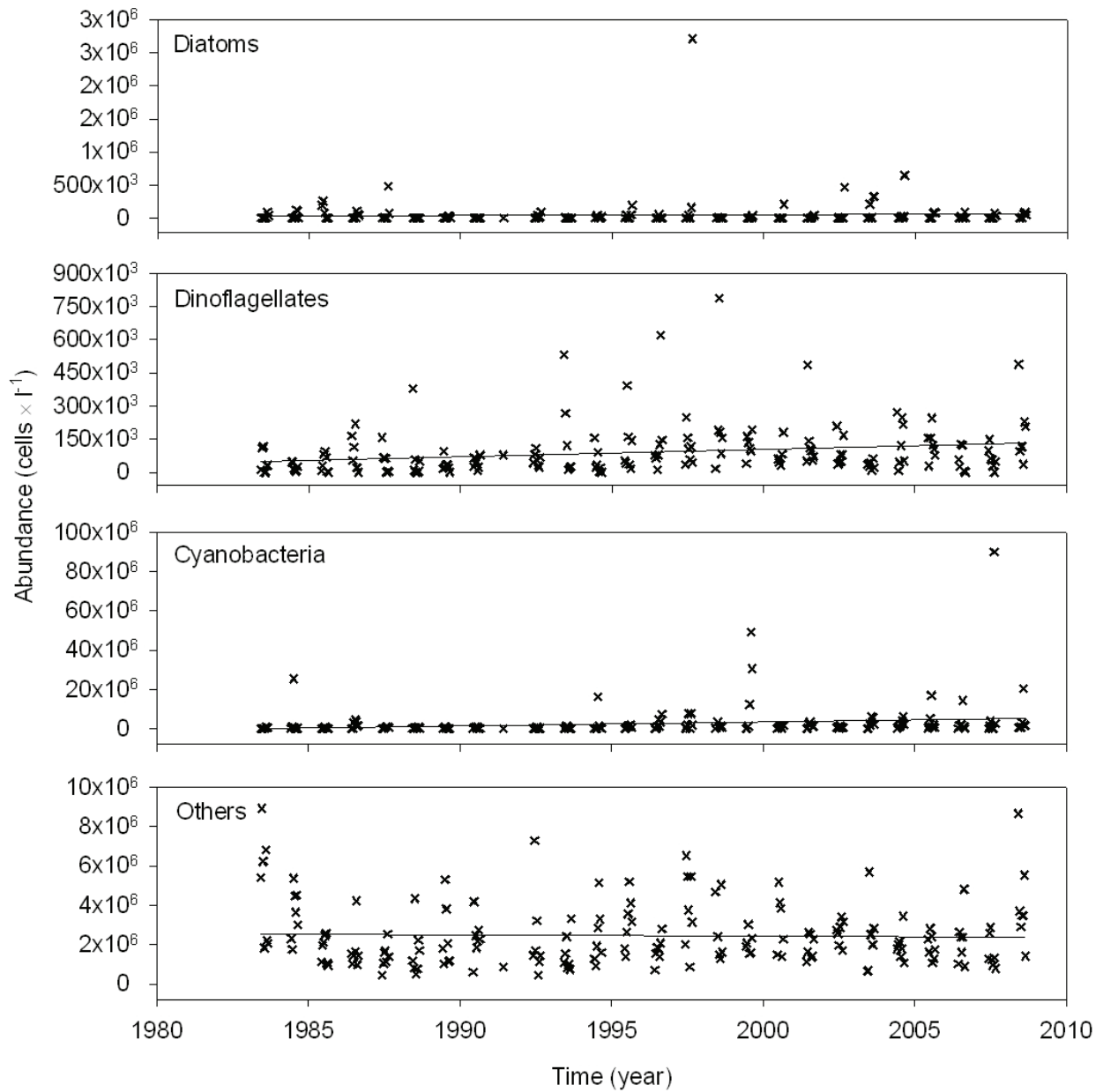


Figure 70. The Eastern coastal area, Area 11, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

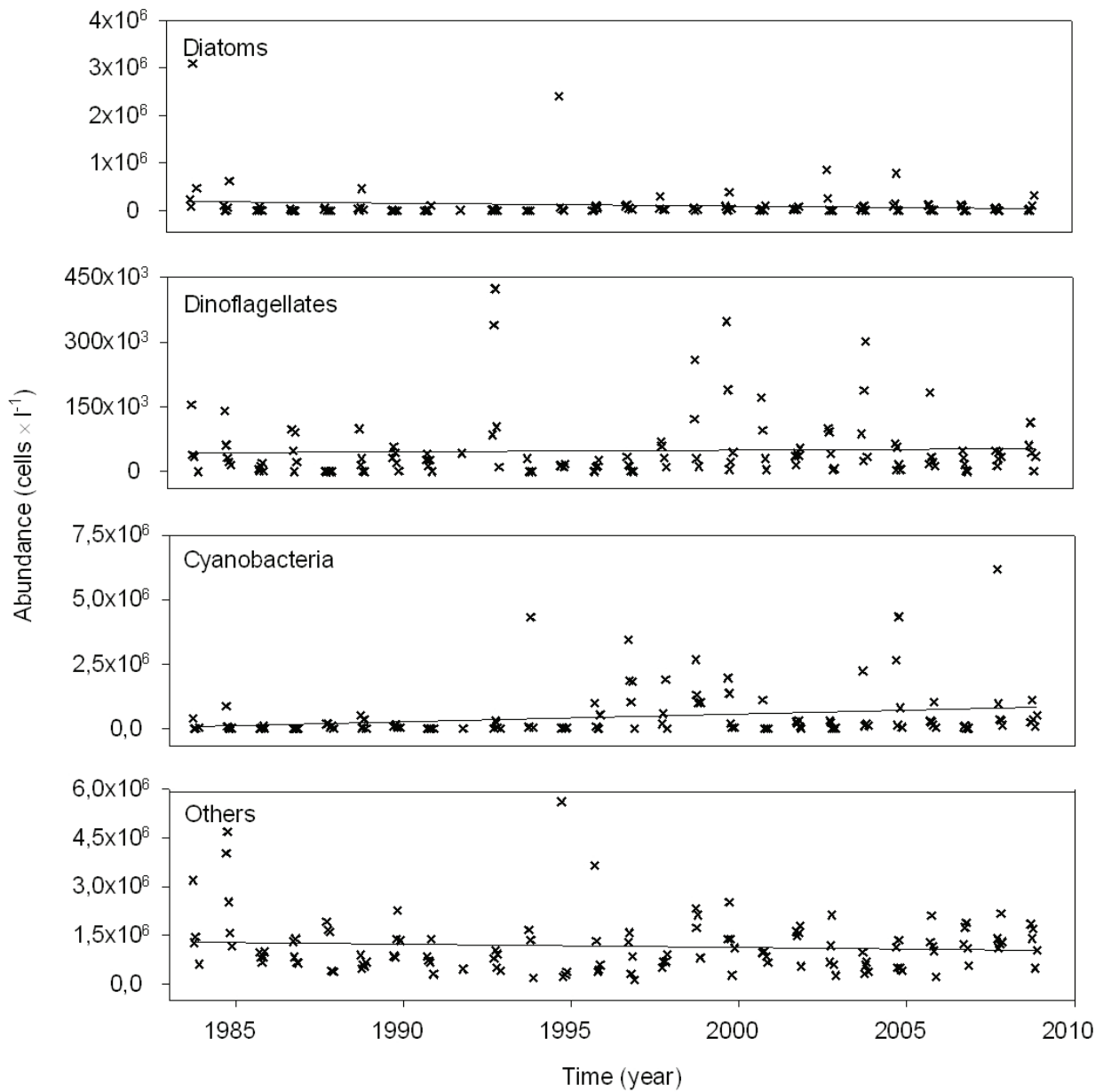


Figure 71. The Eastern coastal area, Area 11, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

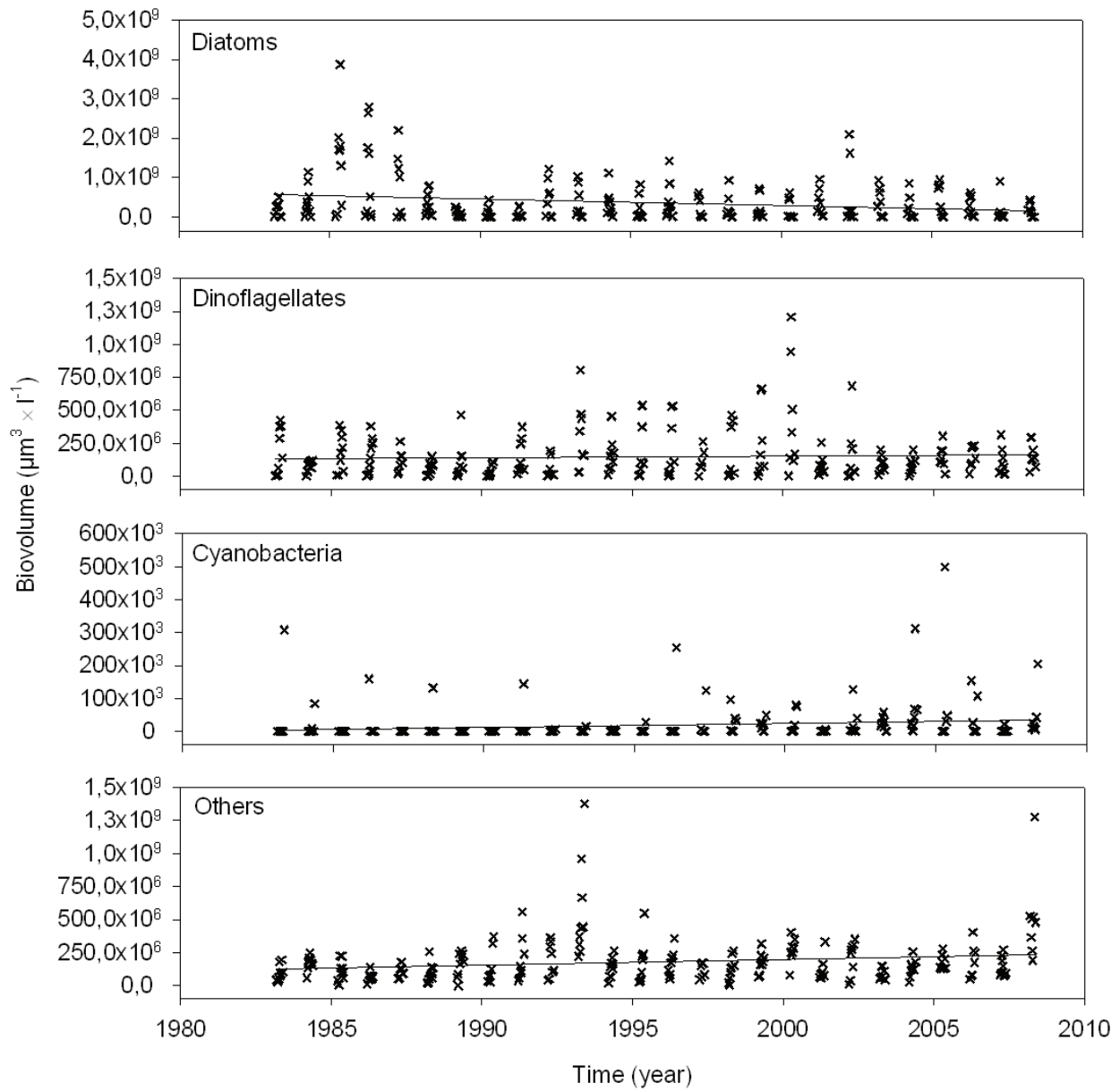


Figure 72. The Eastern coastal area, Area 11, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

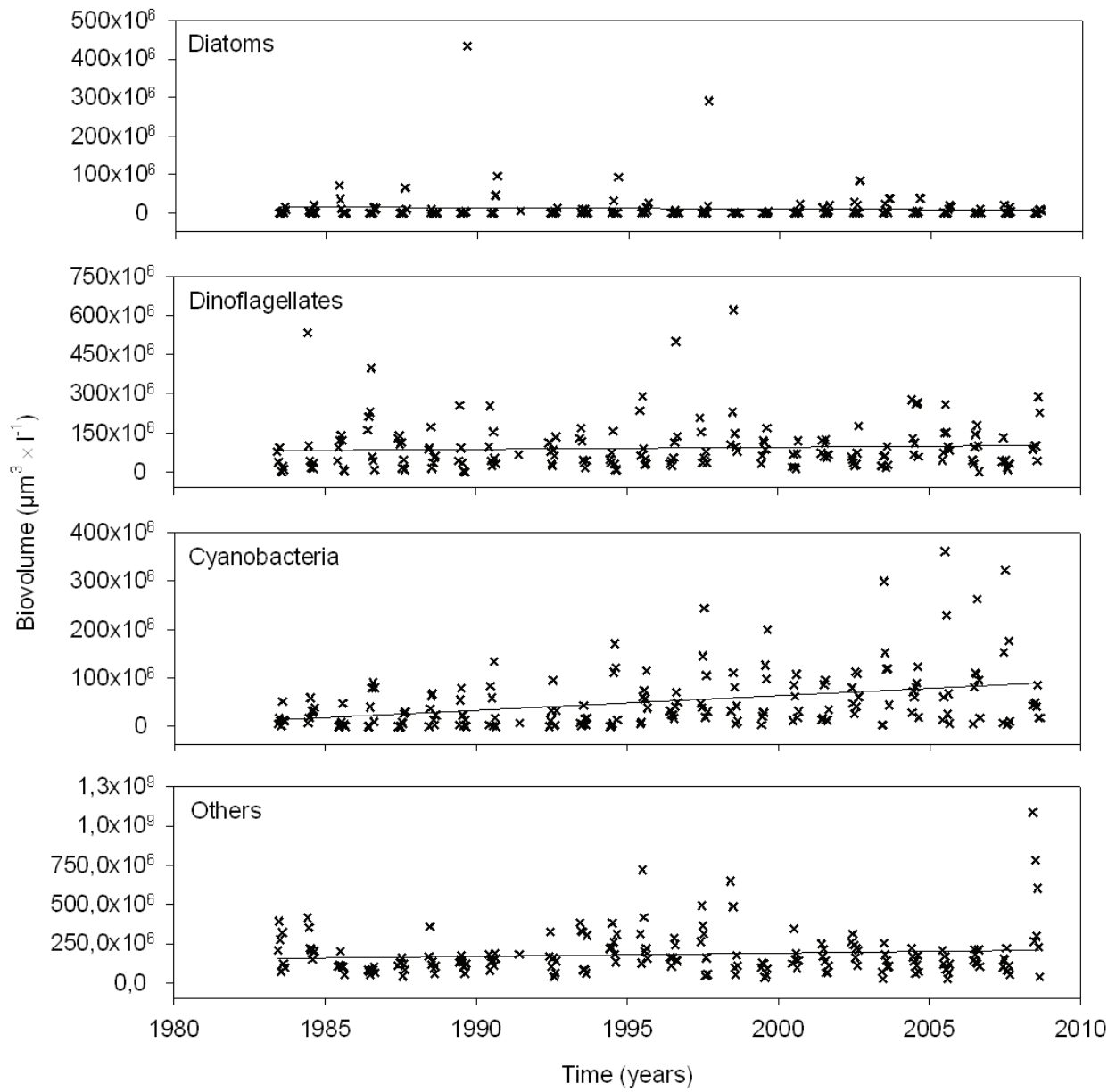


Figure 73. The Eastern coastal area, Area 11, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

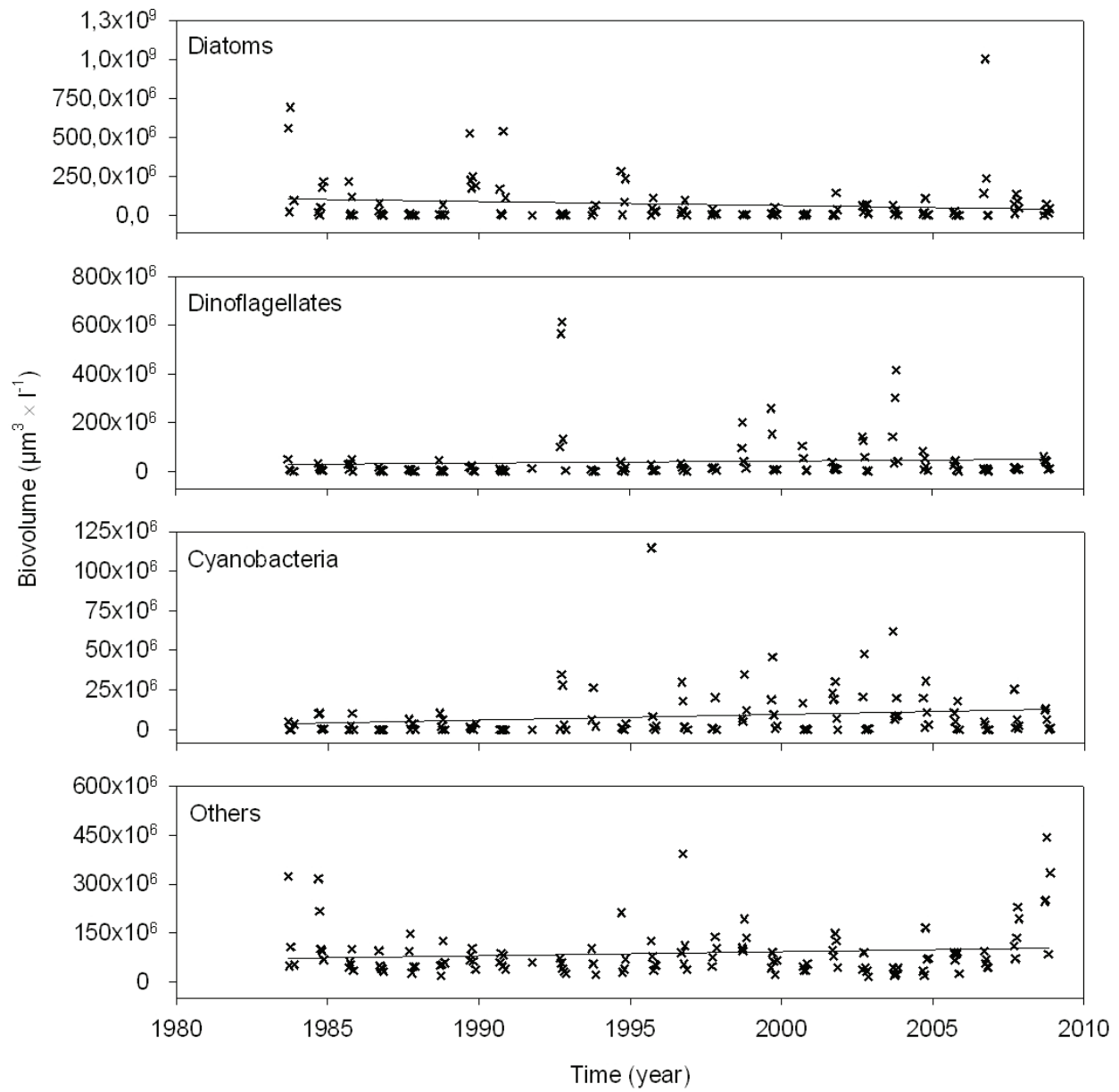


Figure 74. The Eastern coastal area, Area 11, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

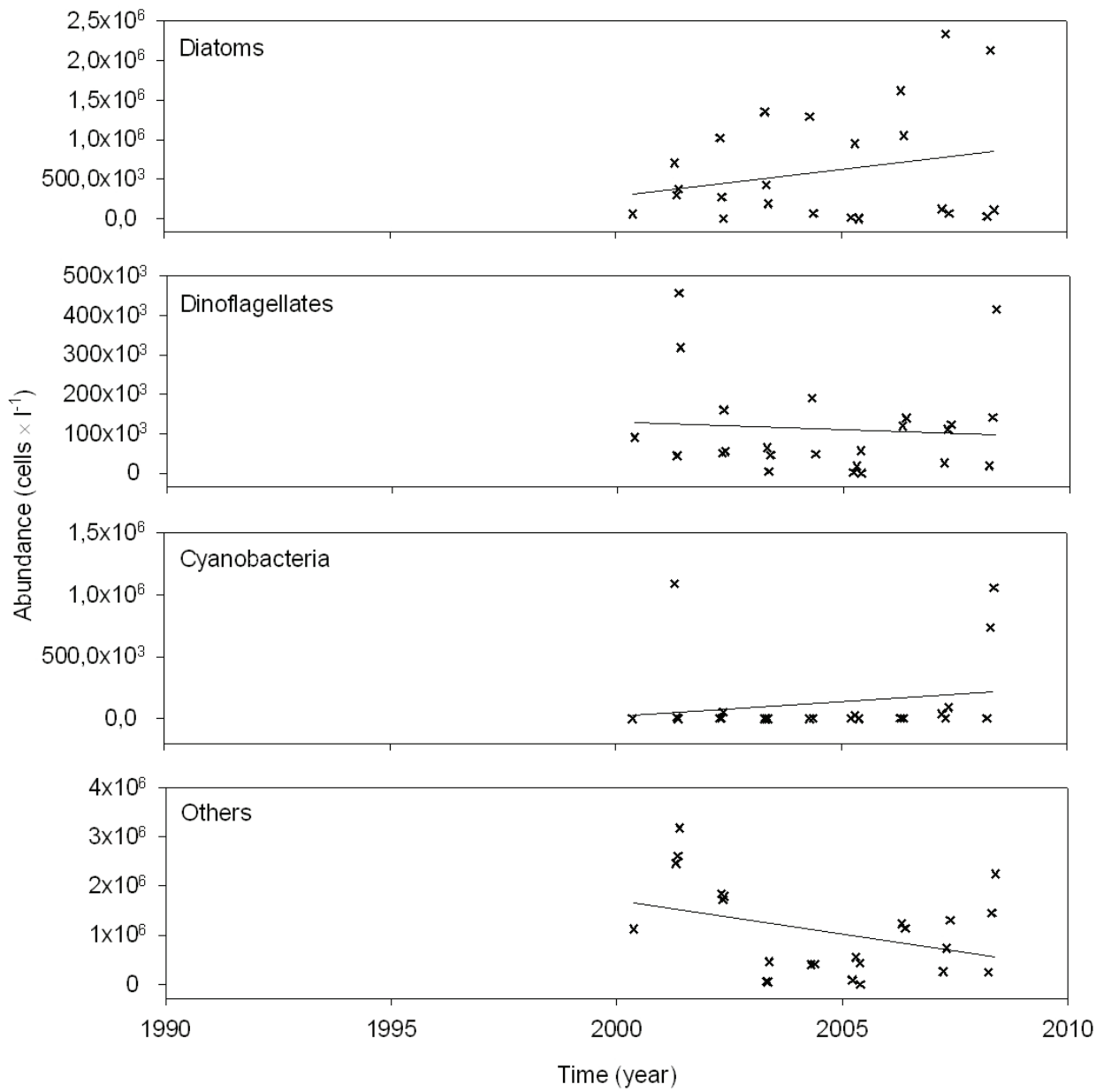


Figure 75. The Bothnian Sea, Area 13, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

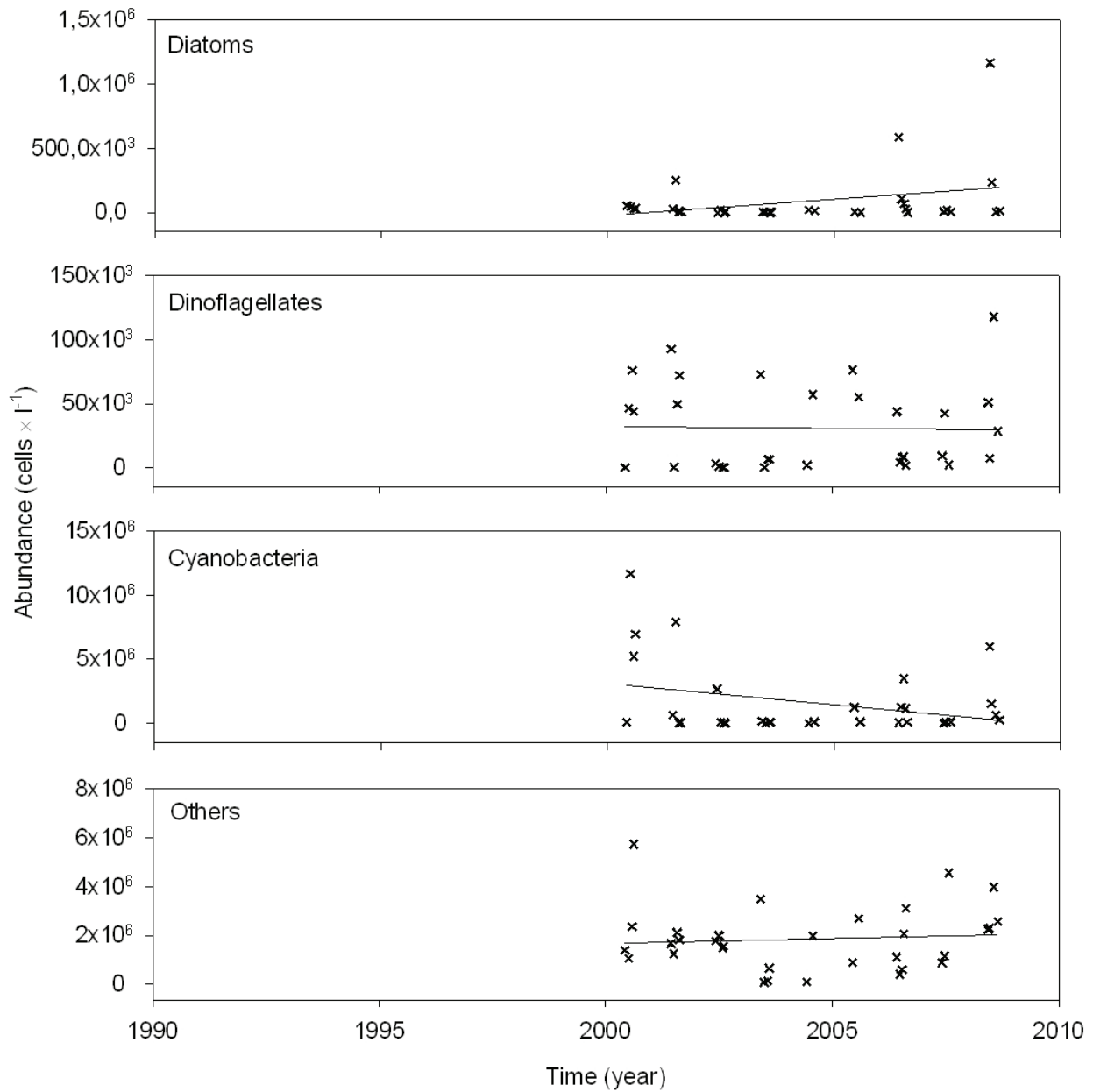


Figure 76. The Bothnian Sea, Area 13, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



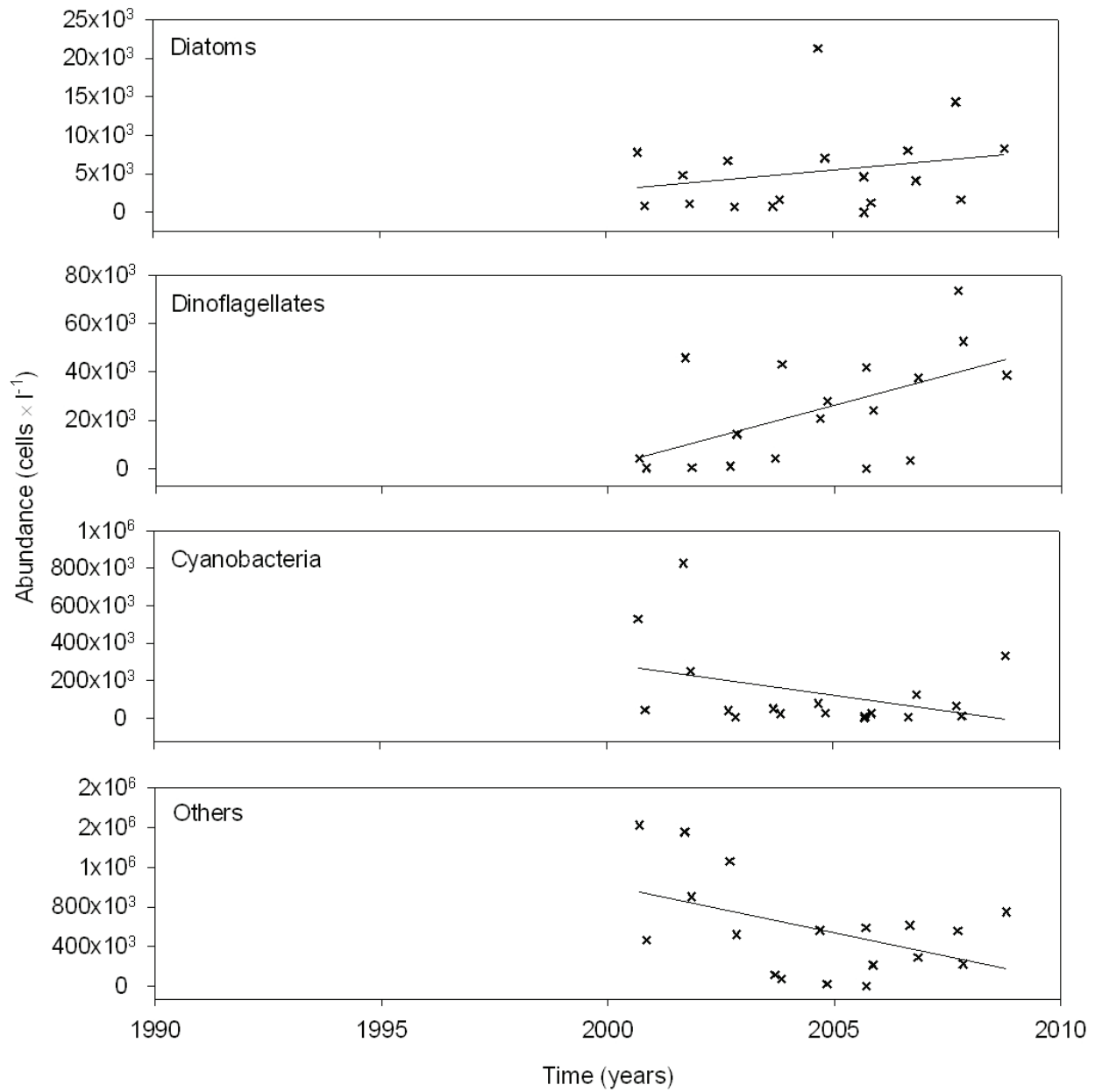


Figure 77. The Bothnian Sea, Area 13, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

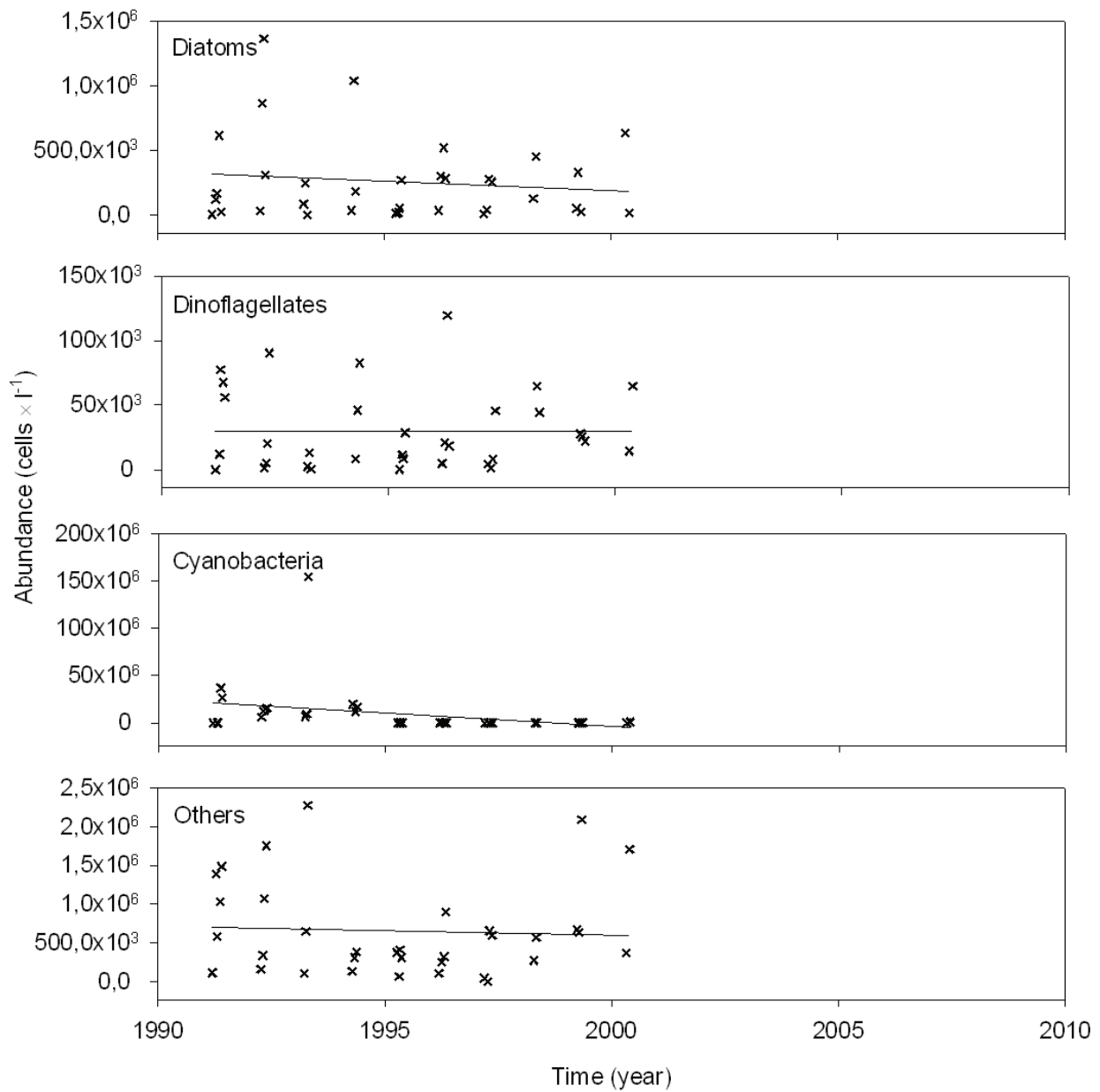


Figure 78. The Bothnian Sea, Area 13, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

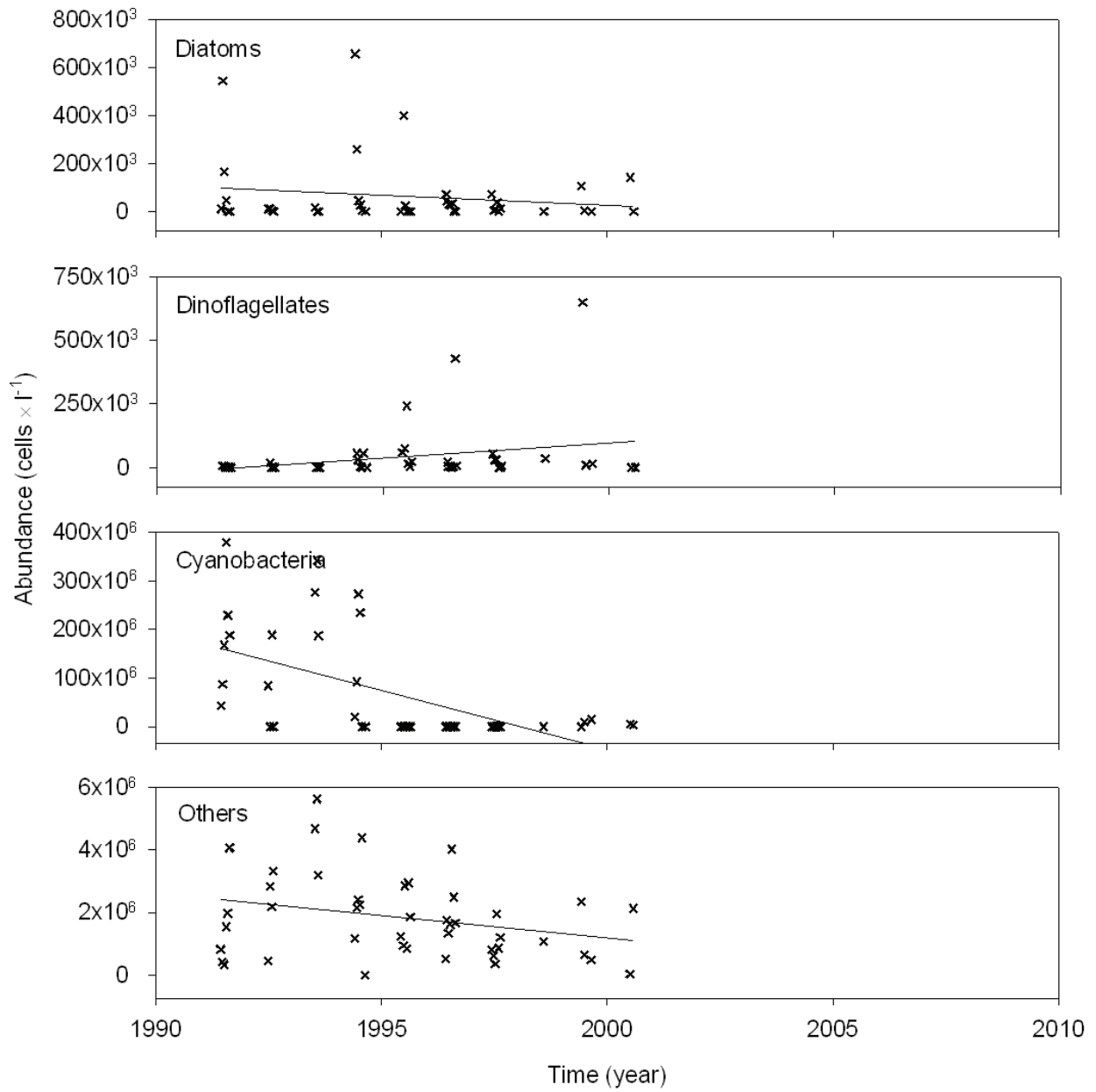


Figure 79. The Bothnian Sea, Area 13, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

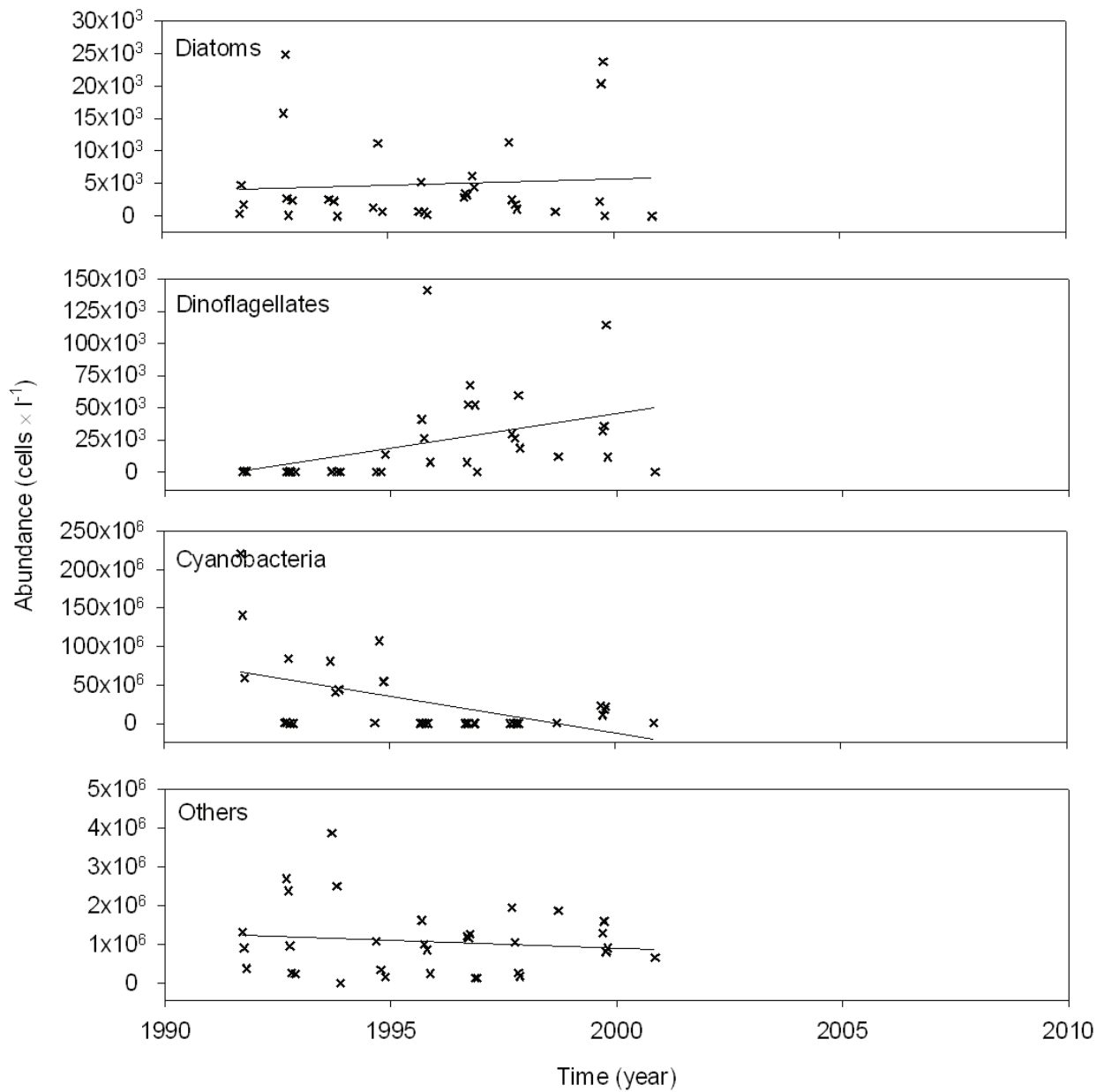


Figure 80. The Bothnian Sea, Area 13, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

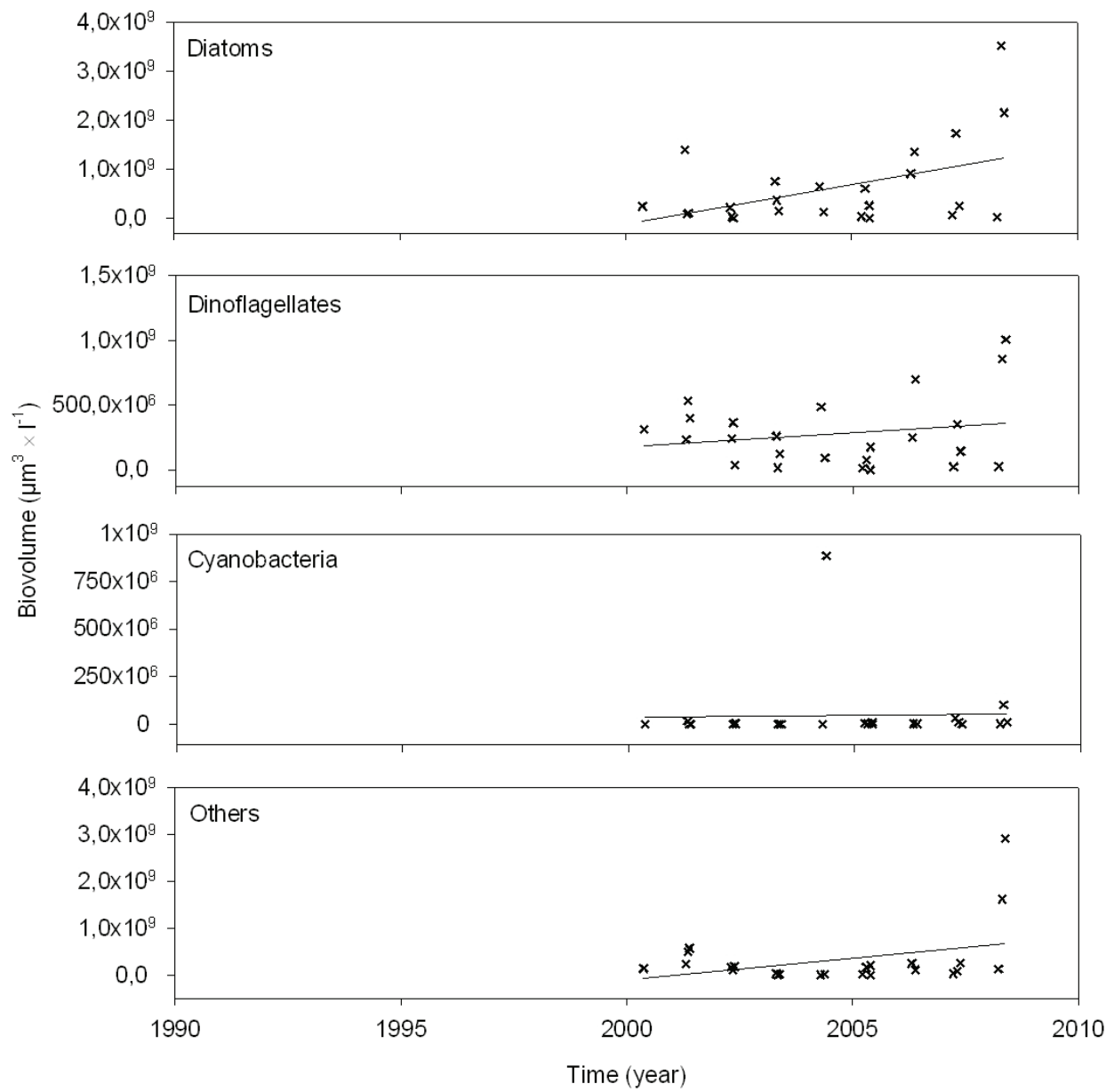


Figure 81. The Bothnian Sea, Area 13, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

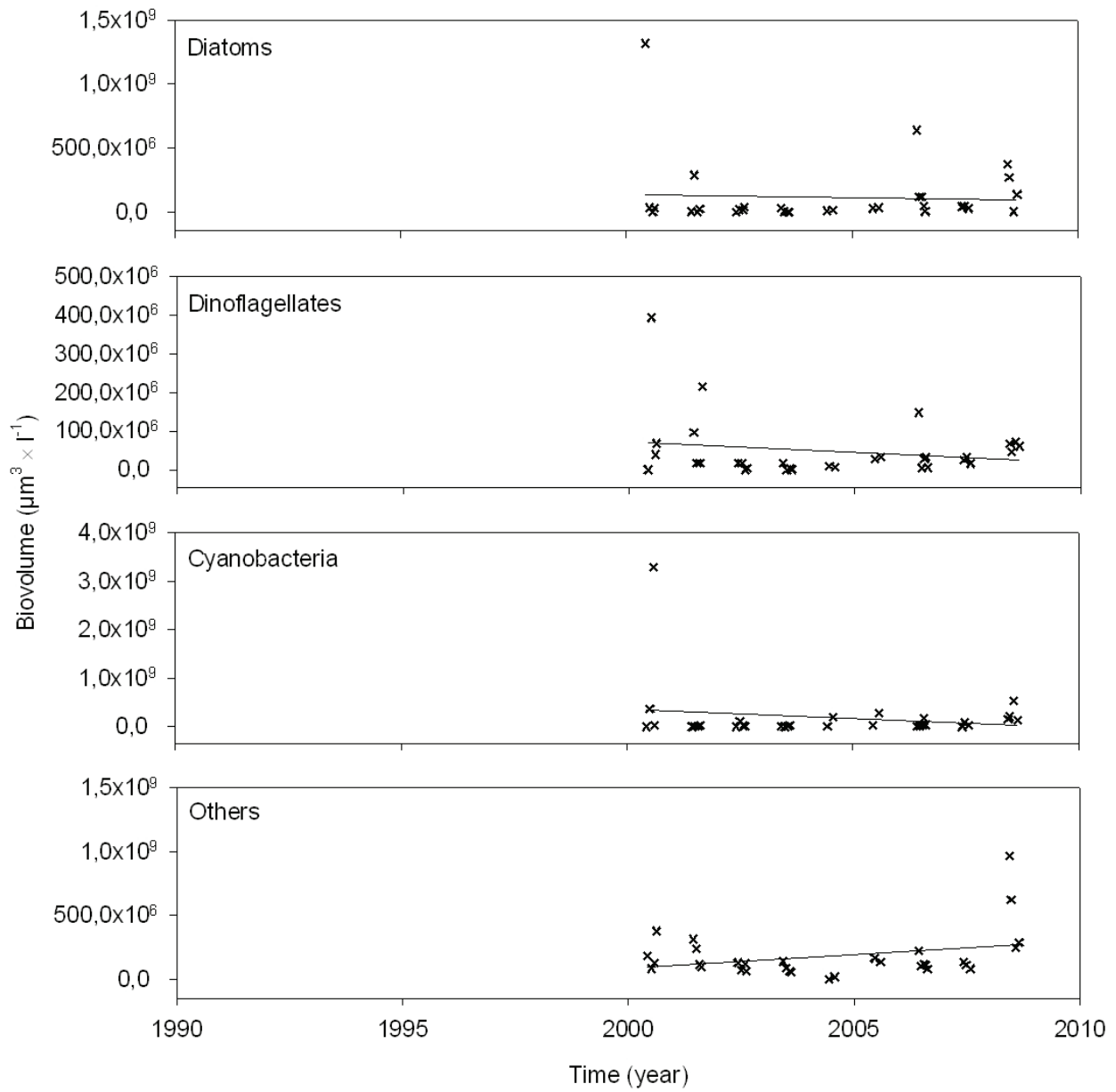


Figure 82. The Bothnian Sea, Area 13, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

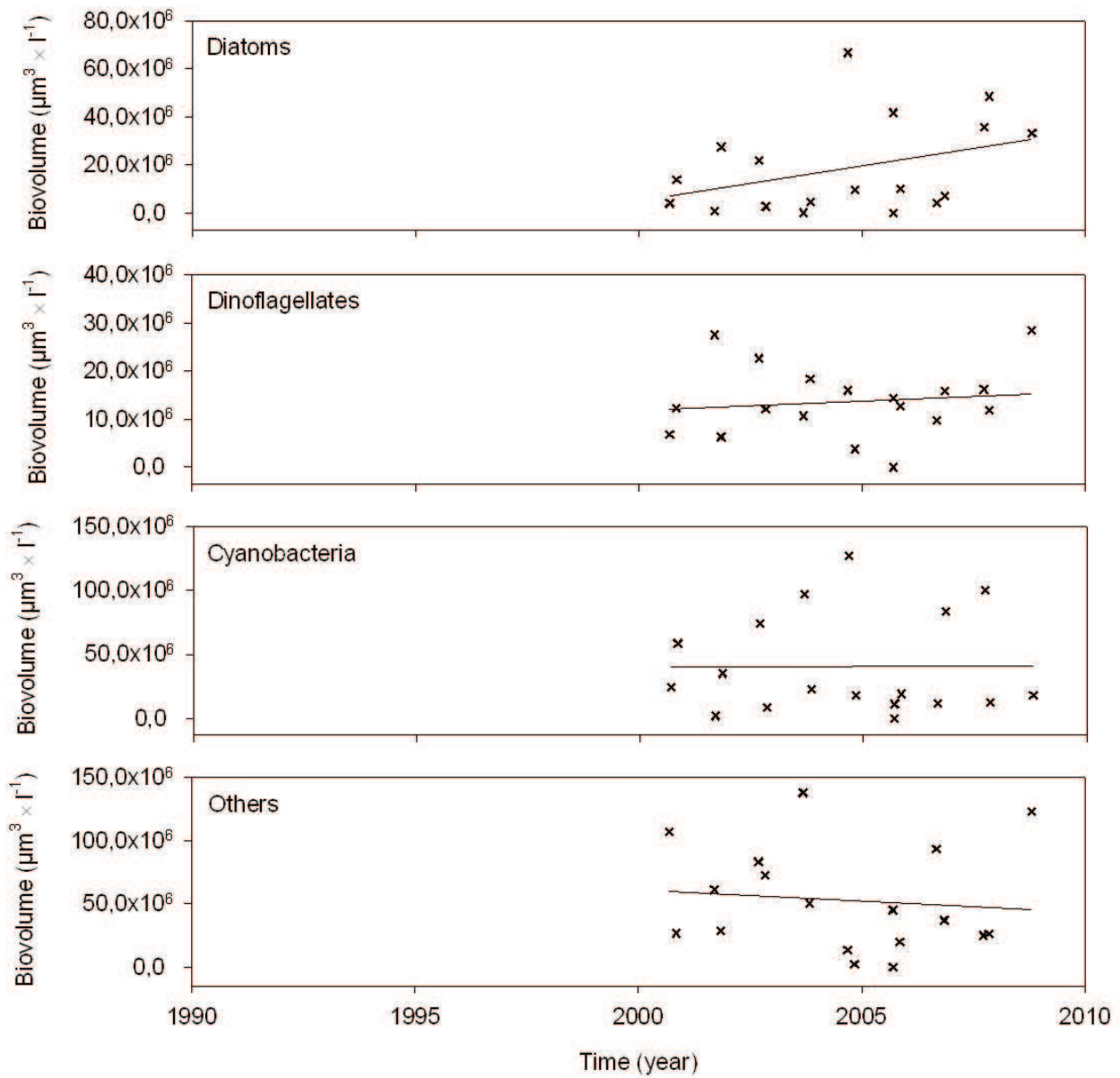


Figure 83. The Bothnian Sea, Area 13, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples (0-10m) taken by hose. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

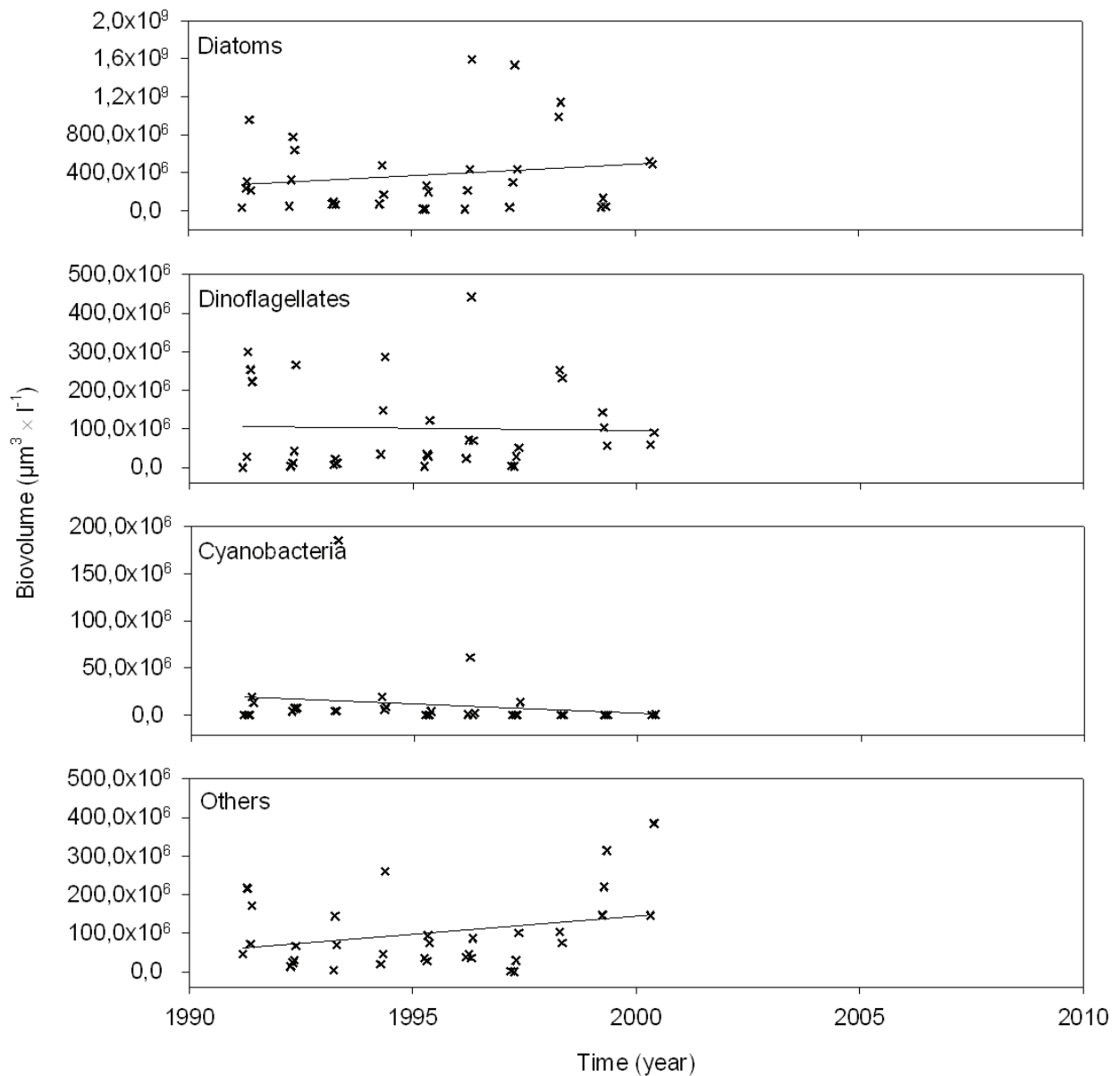


Figure 84. The Bothnian Sea, Area 13, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



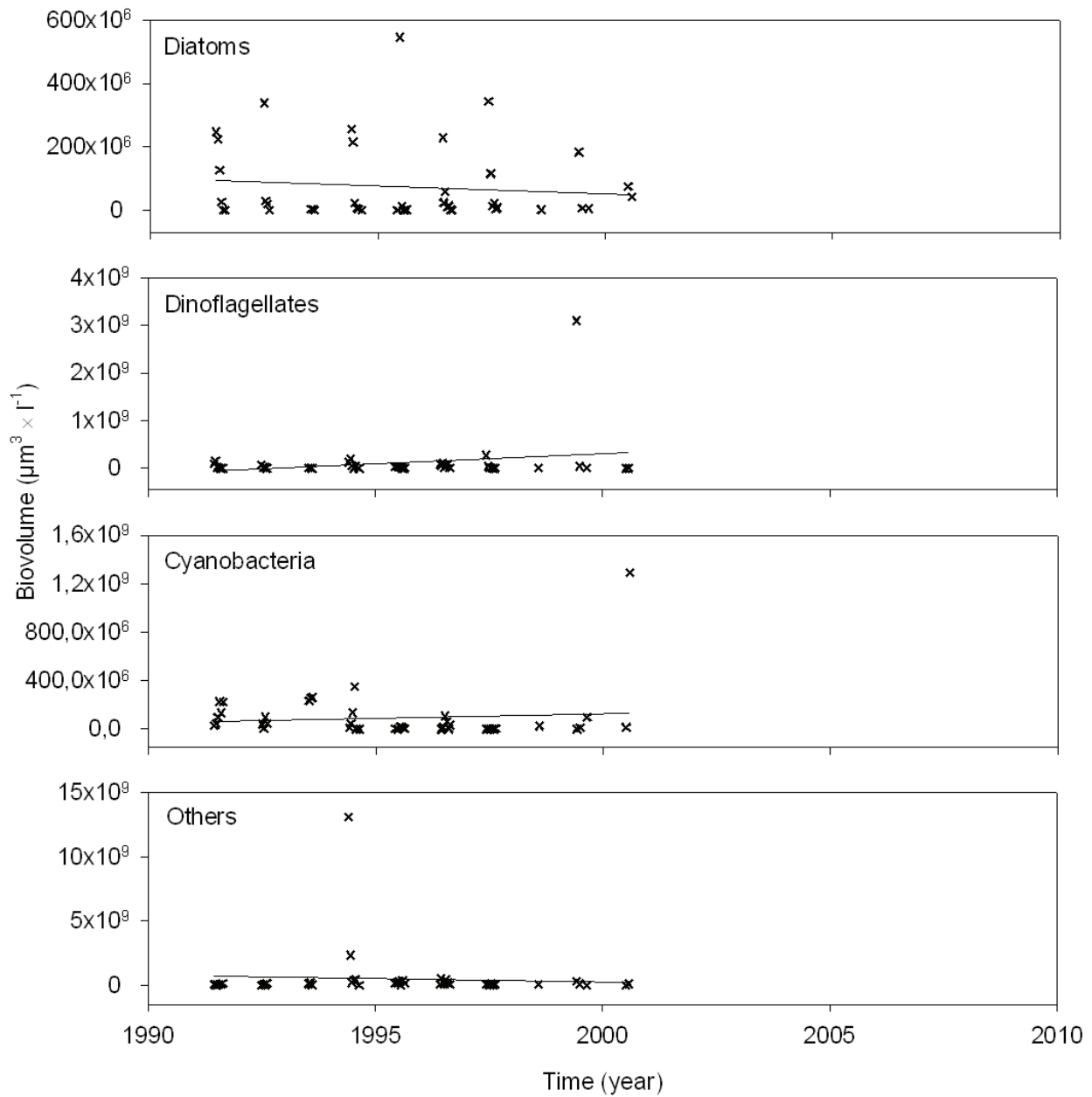


Figure 85. The Bothnian Sea, Area 13, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

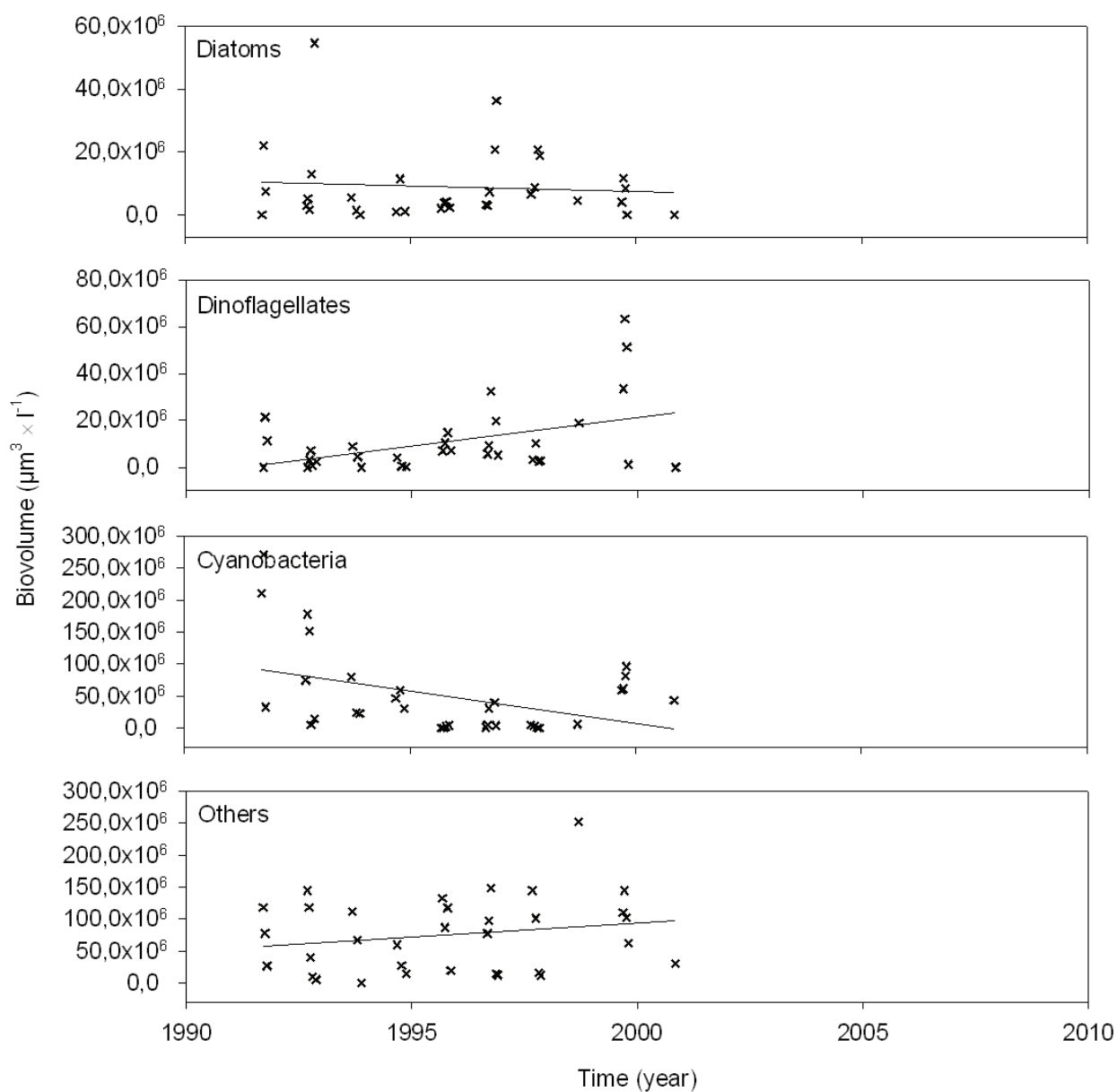


Figure 86. The Bothnian Sea, Area 13, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

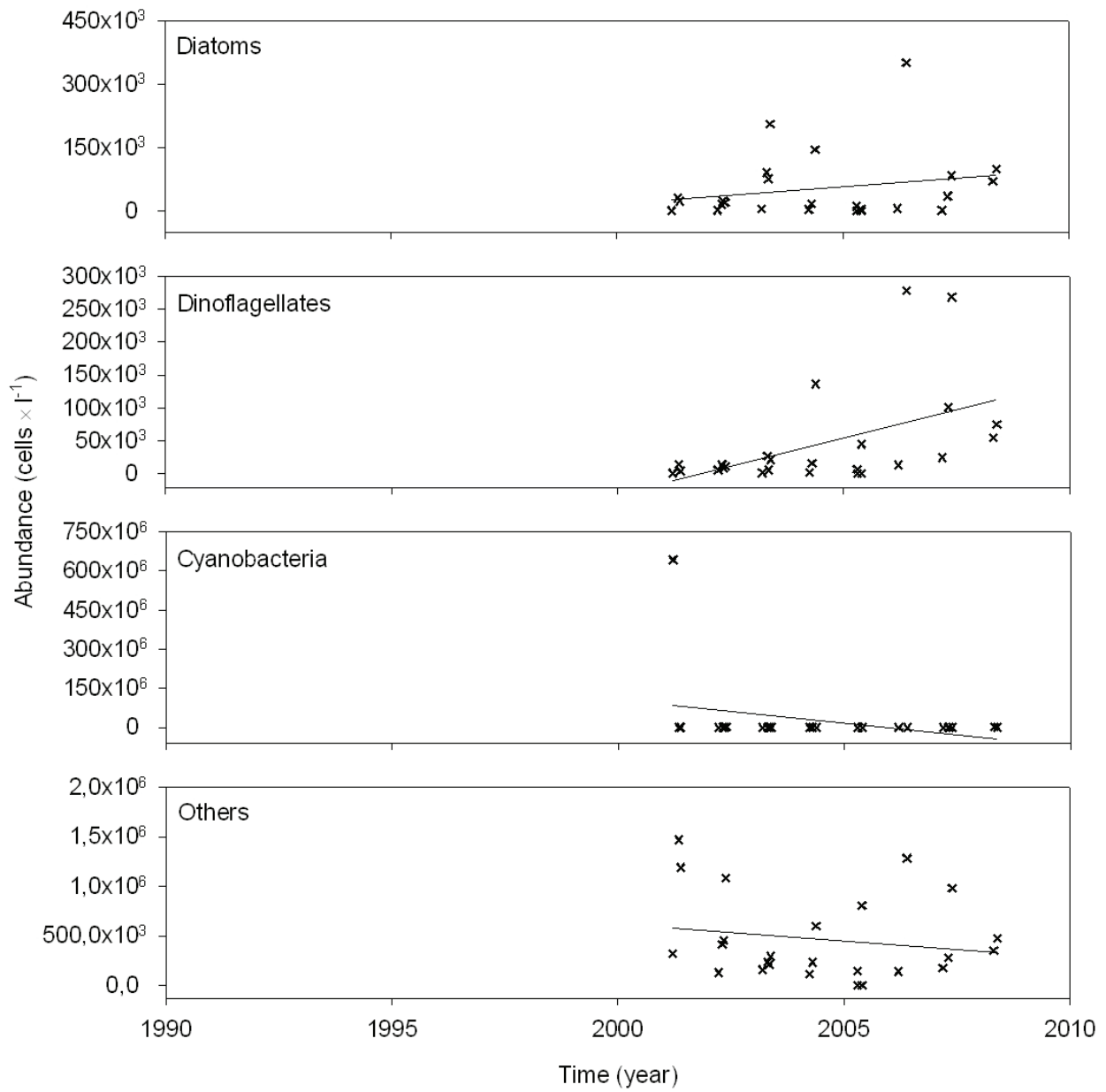


Figure 87. The Bothnian Bay, Area 14, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose (0-10m) during 2001 to 2008. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

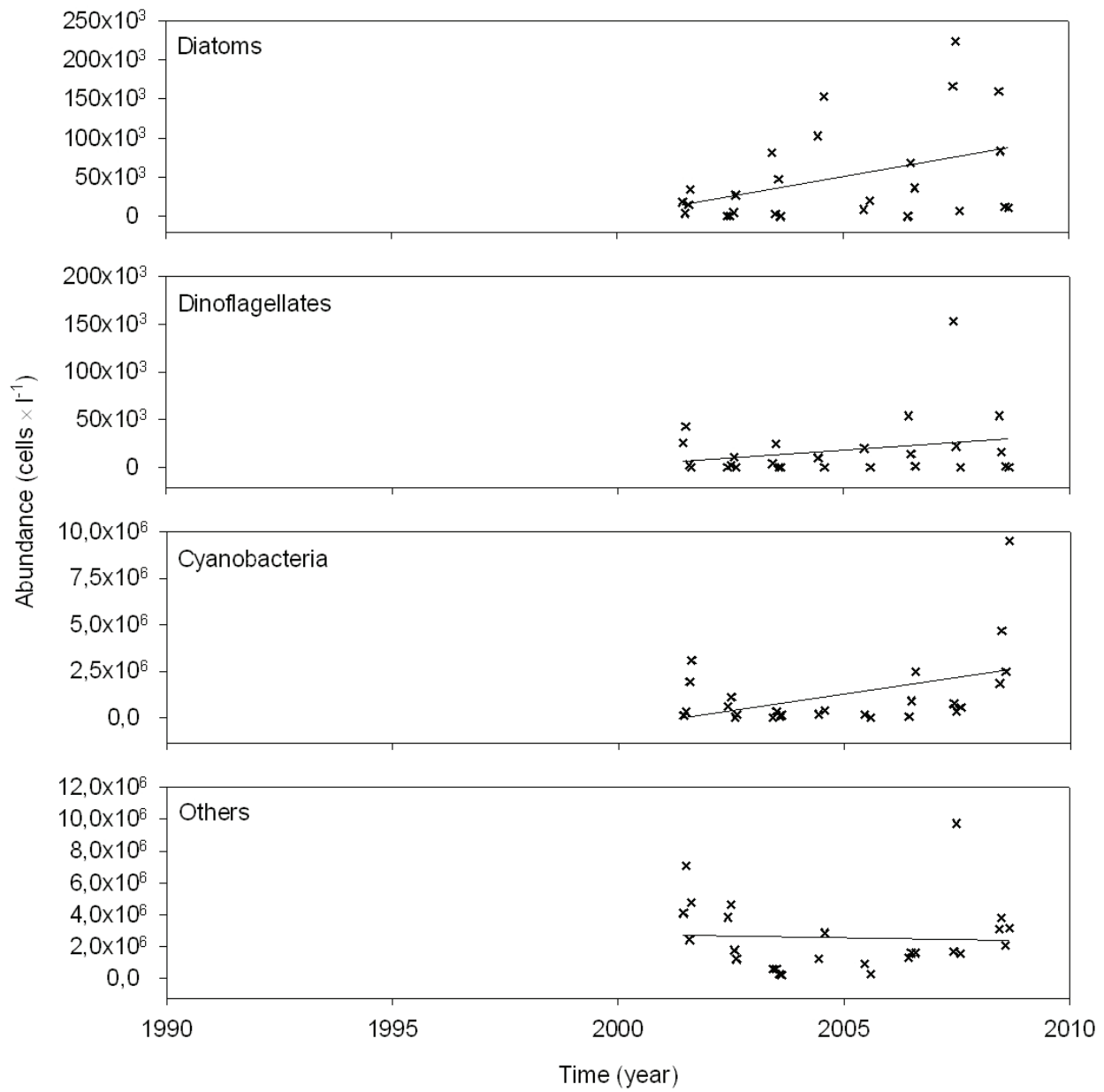


Figure 88. The Bothnian Bay, Area 14, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose (0-10m) during 2001 to 2008. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

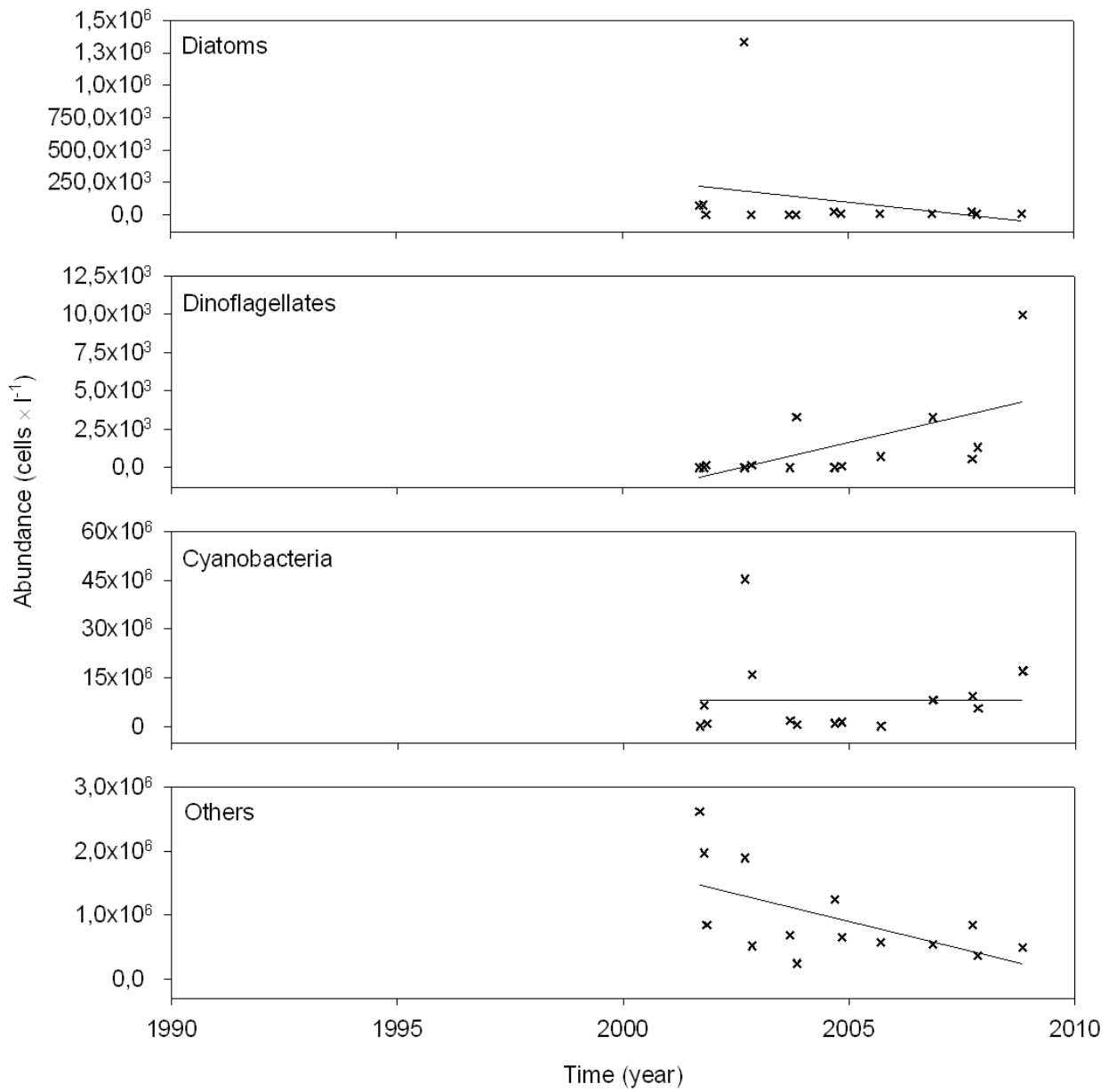


Figure 89. The Bothnian Bay, Area 14, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose (0-10m) during 2001 to 2008. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

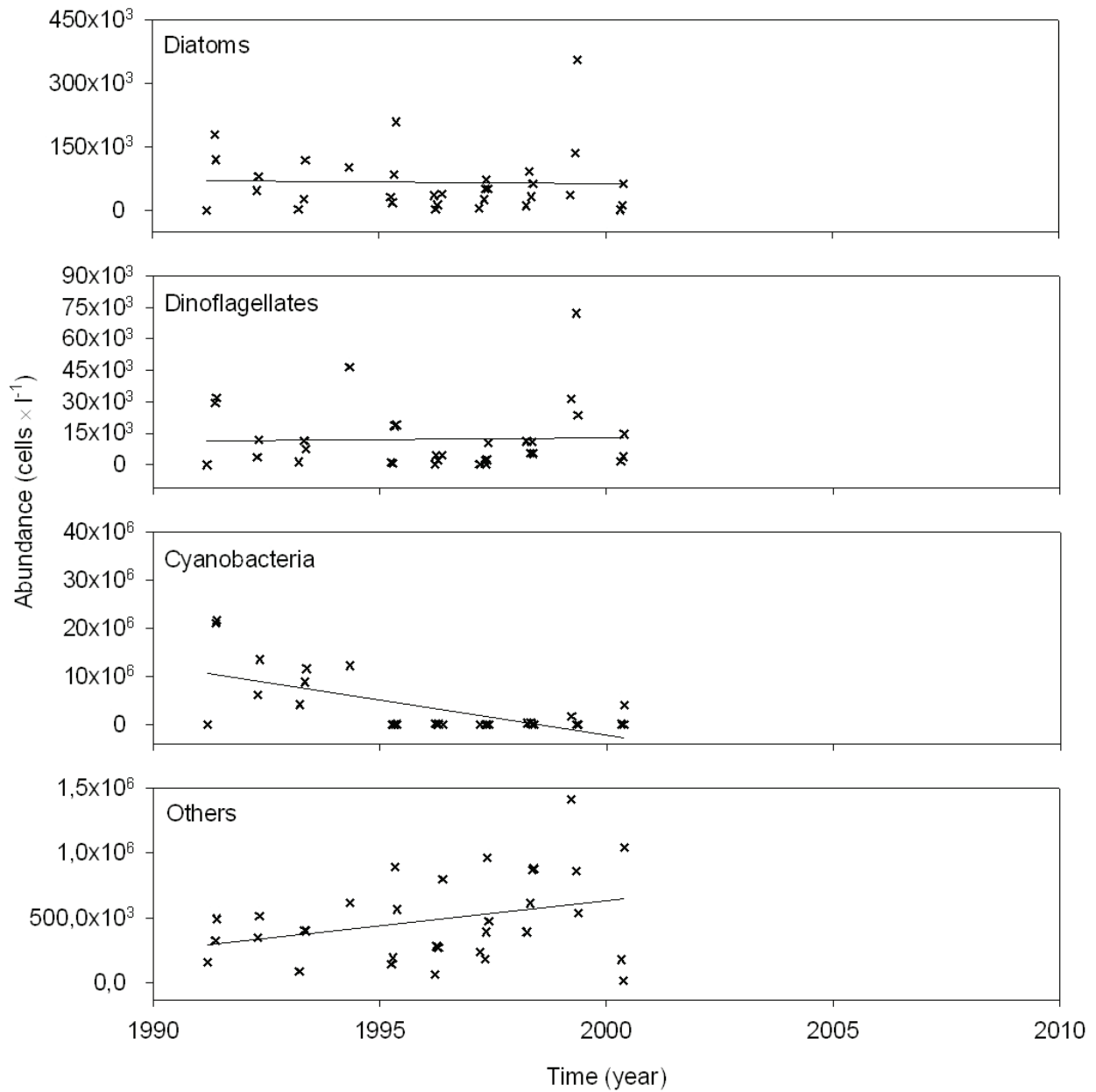


Figure 90. The Bothnian Bay, Area 14, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

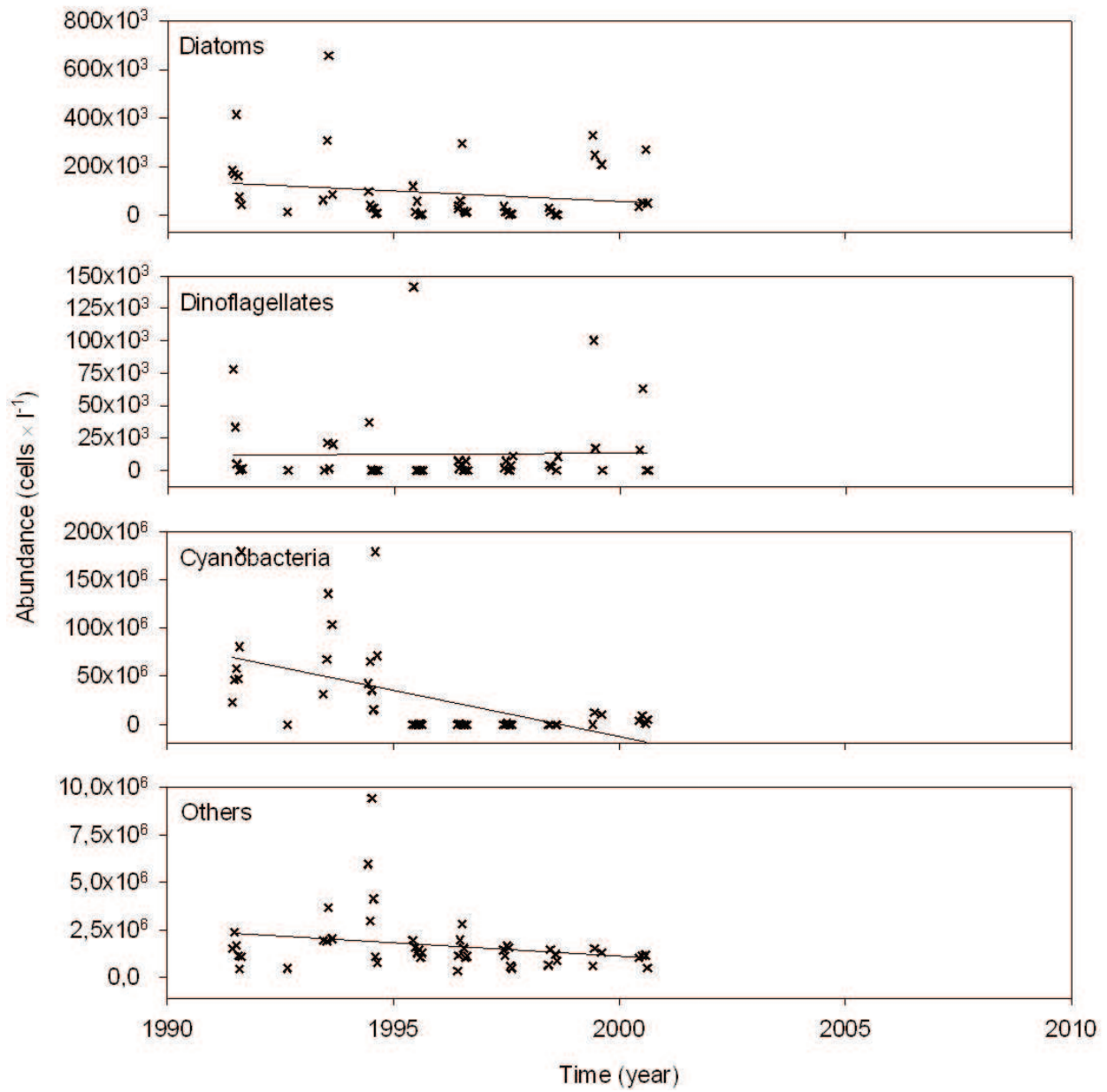


Figure 91. The Bothnian Bay, Area 14, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

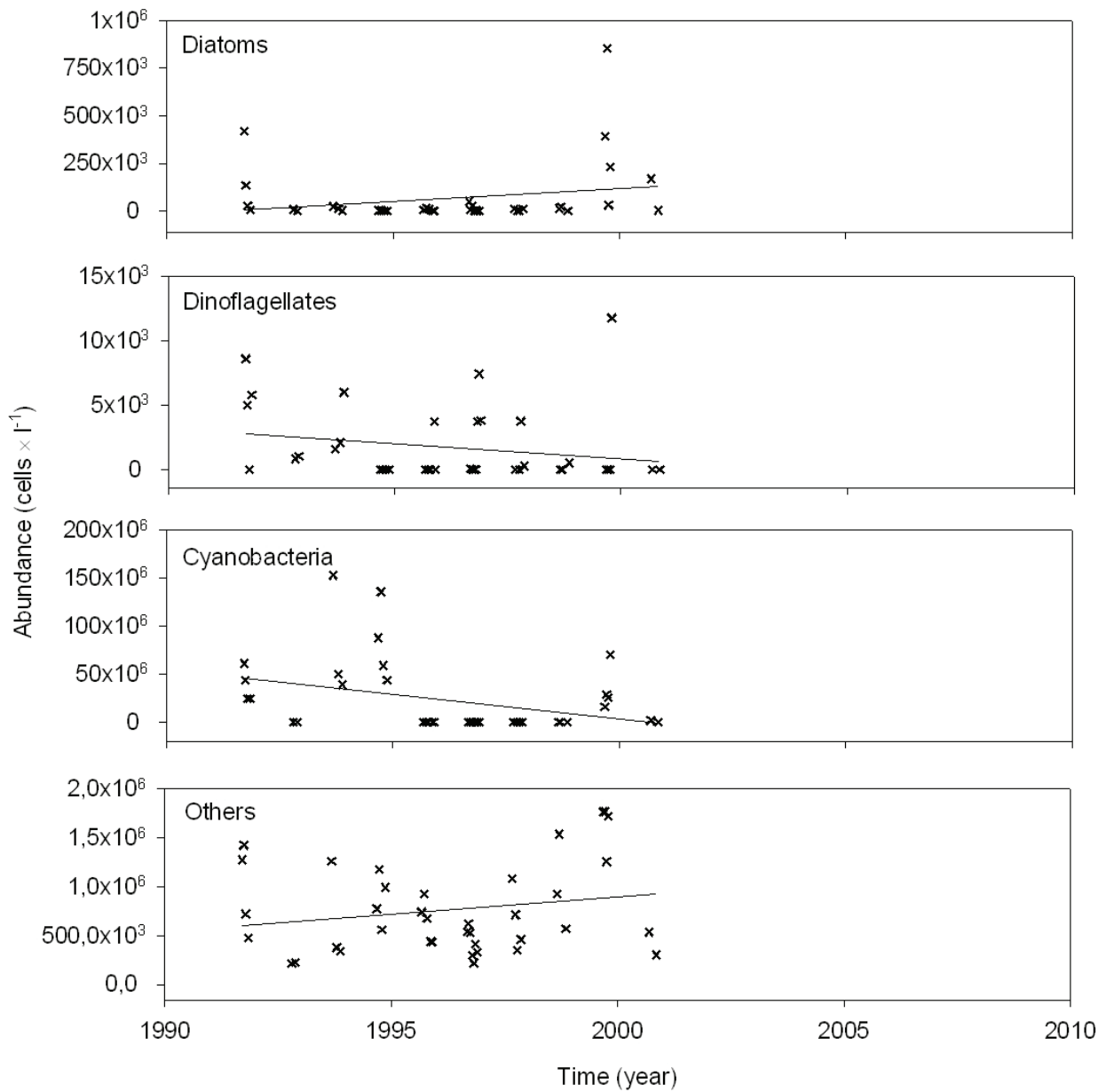


Figure 92. The Bothnian Bay, Area 14, Abundance of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.



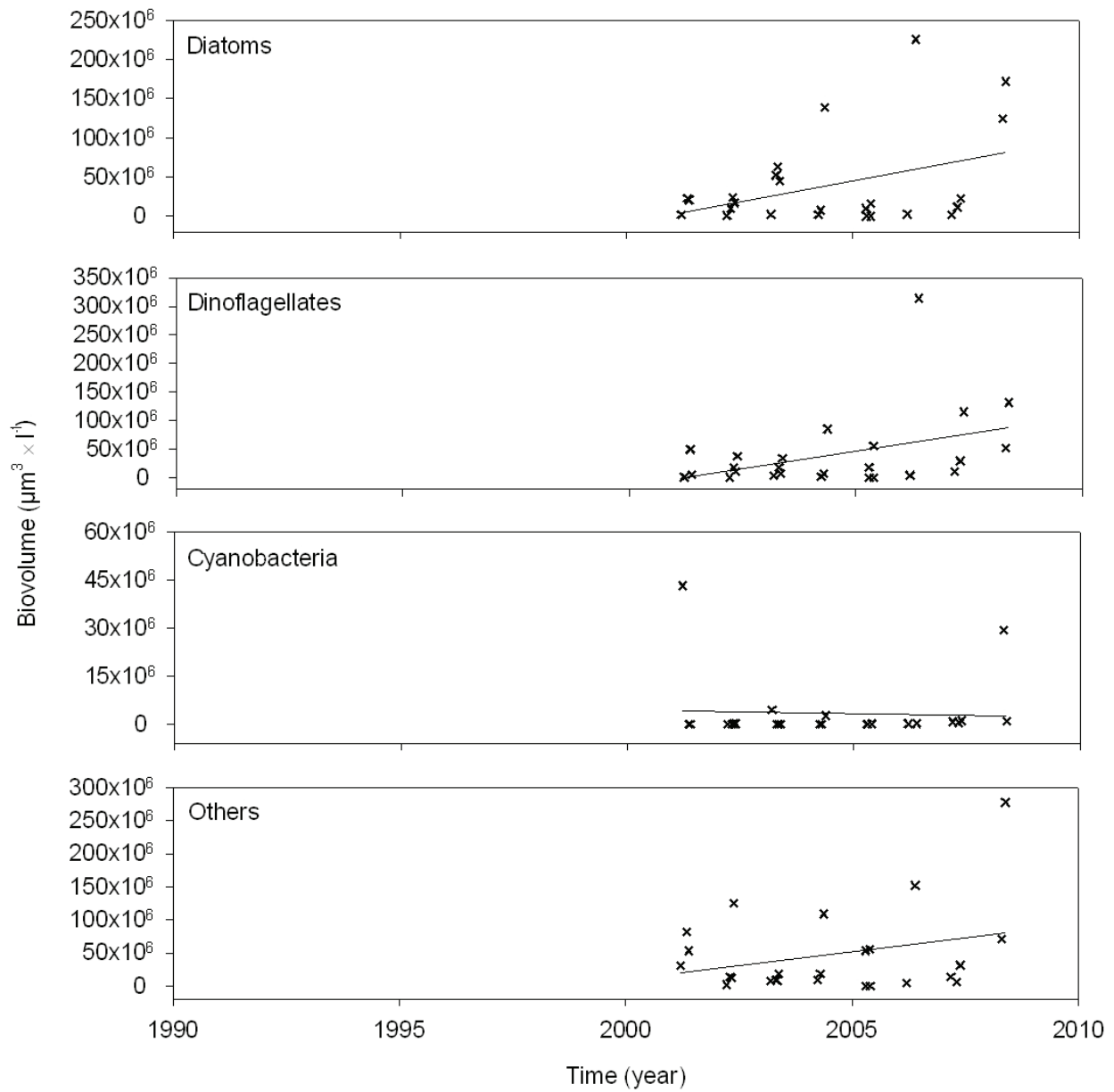


Figure 93. The Bothnian Bay, Area 14, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose (0-10m) during 2001 to 2008. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

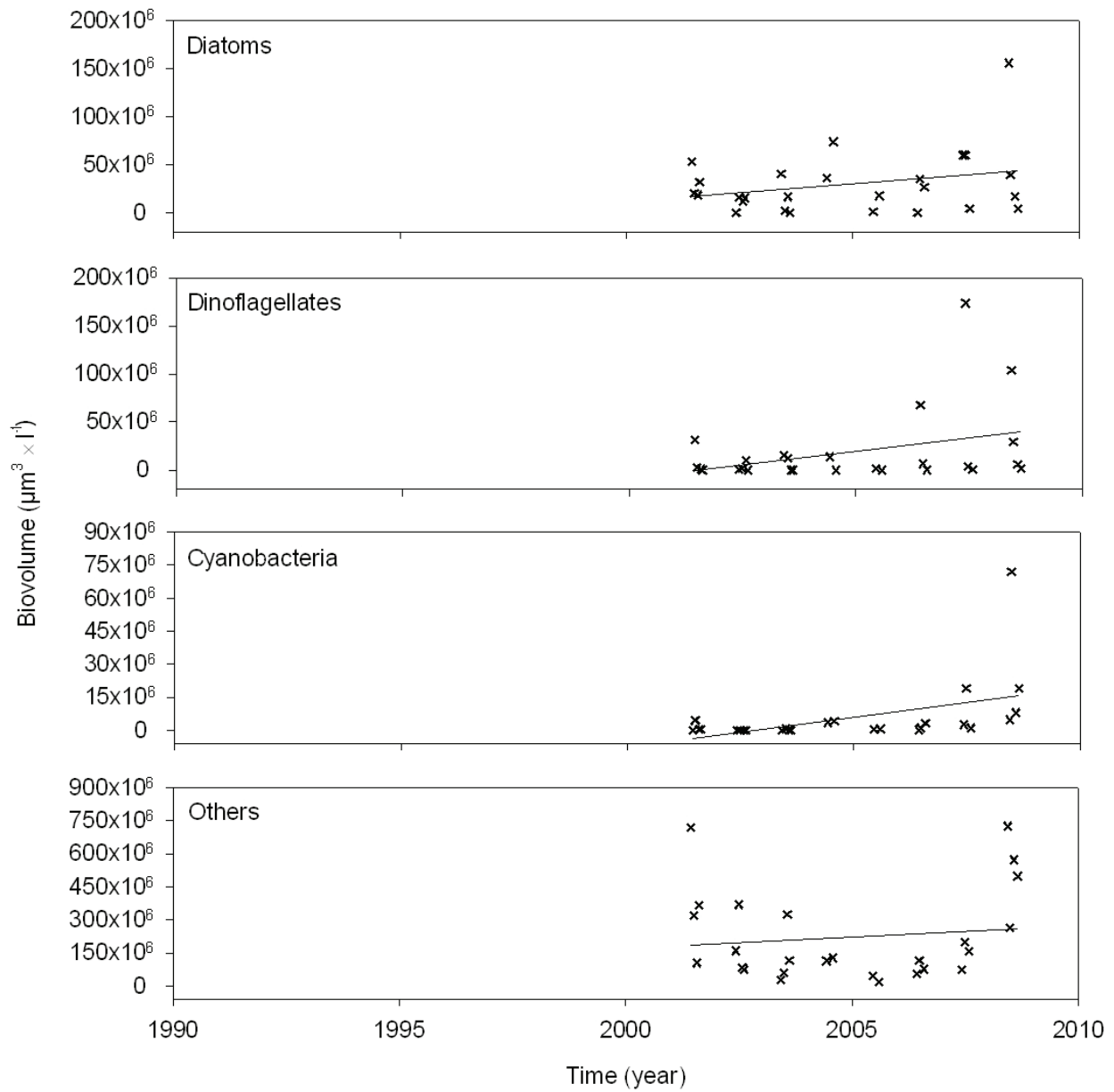


Figure 94. The Bothnian Bay, Area 14, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose (0-10m) during 2001 to 2008. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

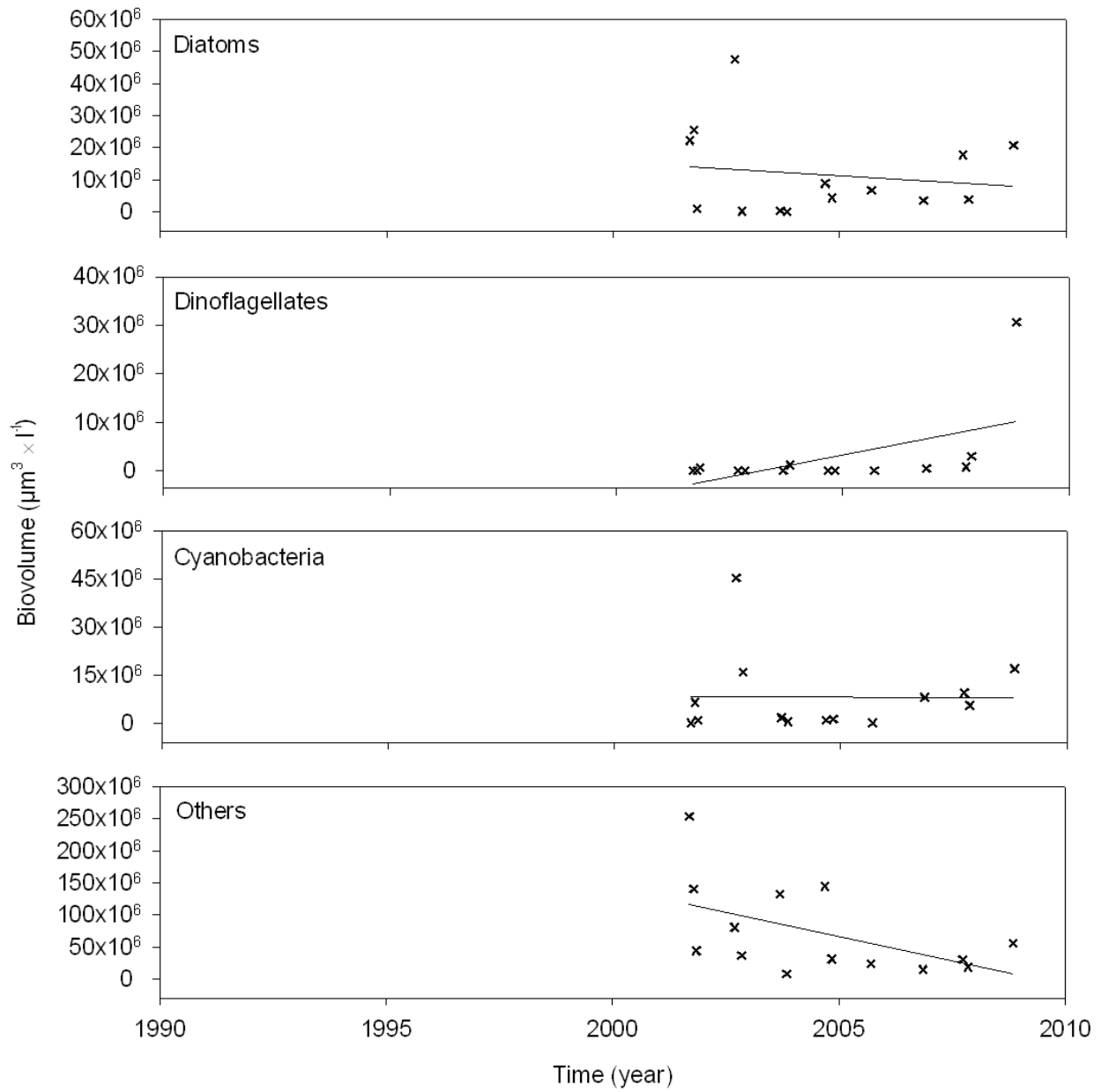


Figure 95. The Bothnian Bay, Area 14, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose (0-10m) during 2001 to 2008. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

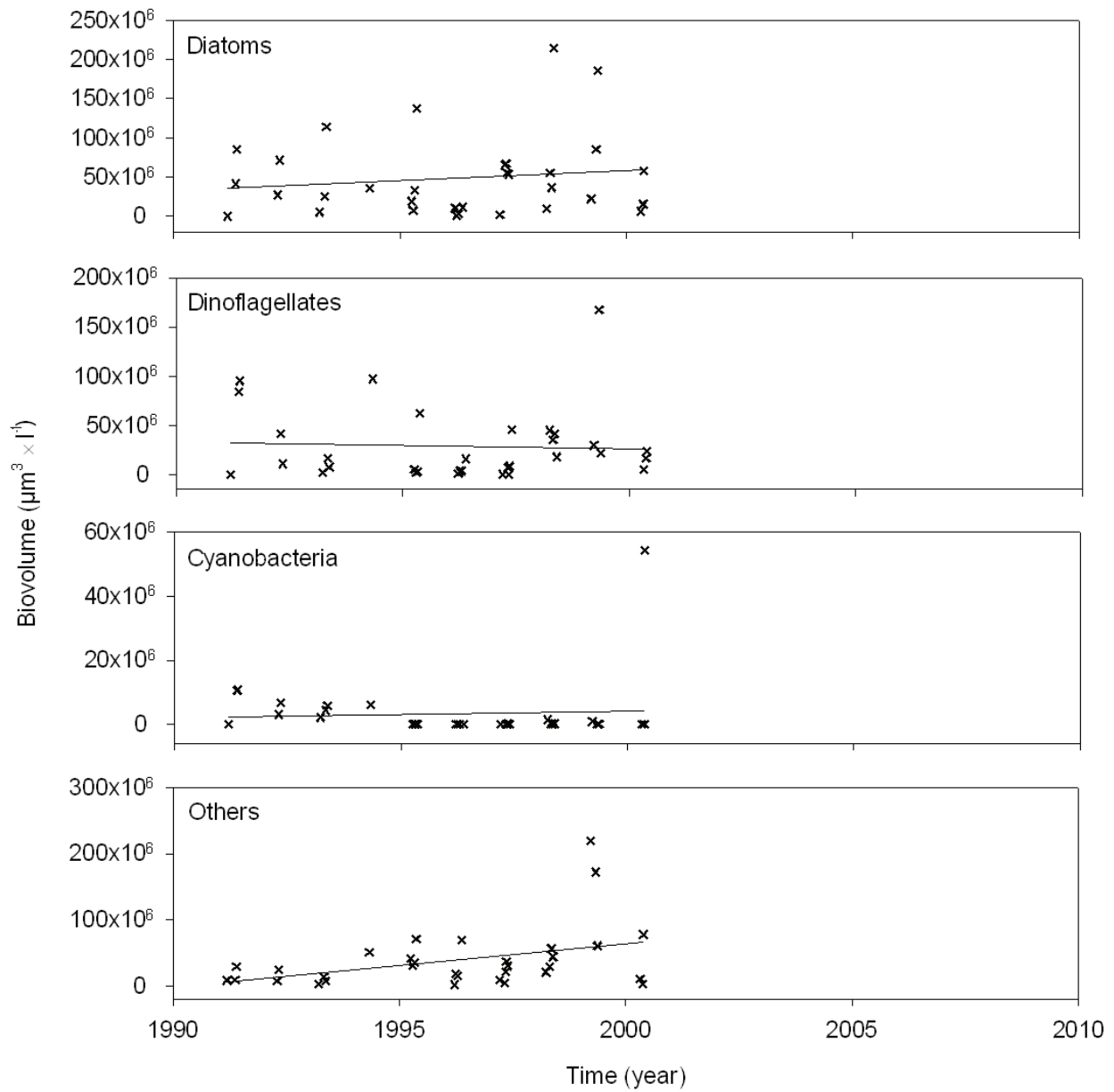


Figure 96. The Bothnian Bay, Area 14, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is spring (March to May). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

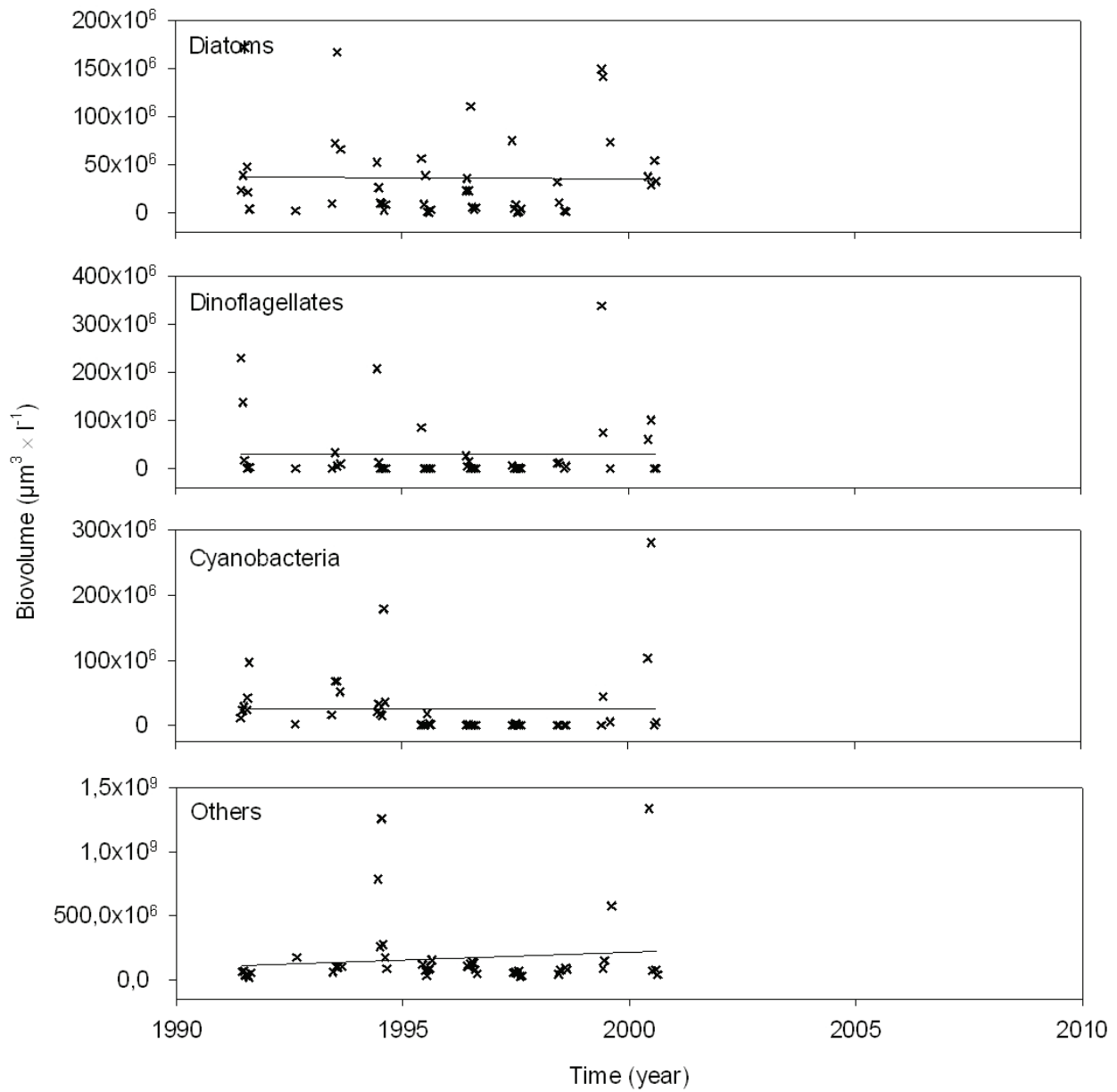


Figure 97. The Bothnian Bay, Area 14, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is summer (June to August). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

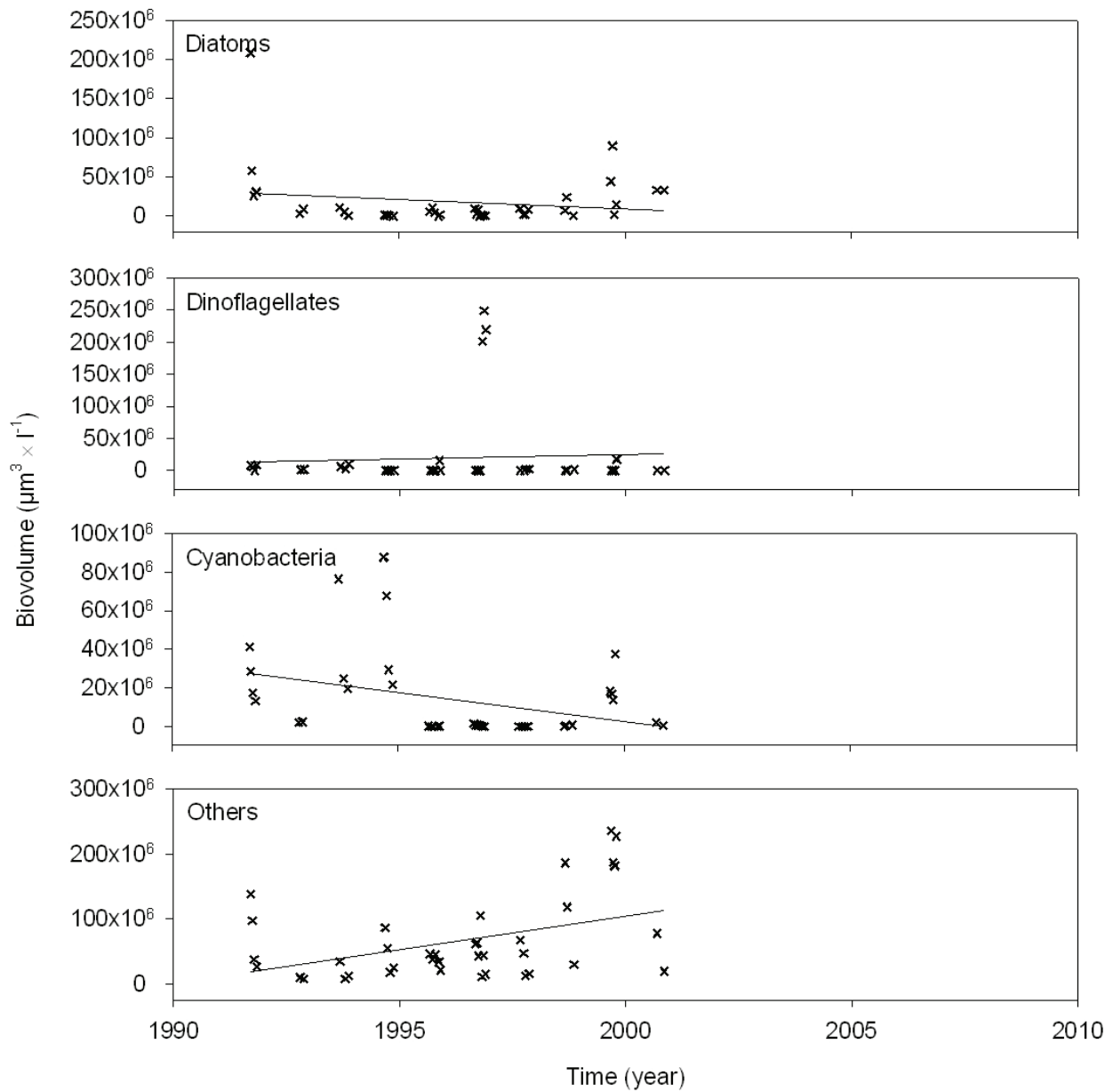


Figure 98. The Bothnian Bay, Area 14, Biovolume of diatoms, dinoflagellates, cyanobacteria and other phytoplankton respectively from integrated samples taken by hose 0-14m during 1995 to 1999 and 0-20m during 1999 to 2000. The seasonal interval is autumn (September to November). Each dot represent one sampling occasion. The black line represents the linear regression fit for the whole period.

## **APPENDIX F**

### **Scatter plots of different toxic species or genus**

Each scatter plot presents observations (cells x l<sup>-1</sup>) made of a toxic species or genus between 1999 and 2008. Different areas have been combined to represent the Swedish west coast (area 1-3) the Baltic proper (area 5-11) and the Gulf of Bothnia (area 12-13). A linear trend is presented together with 95% confidence interval.

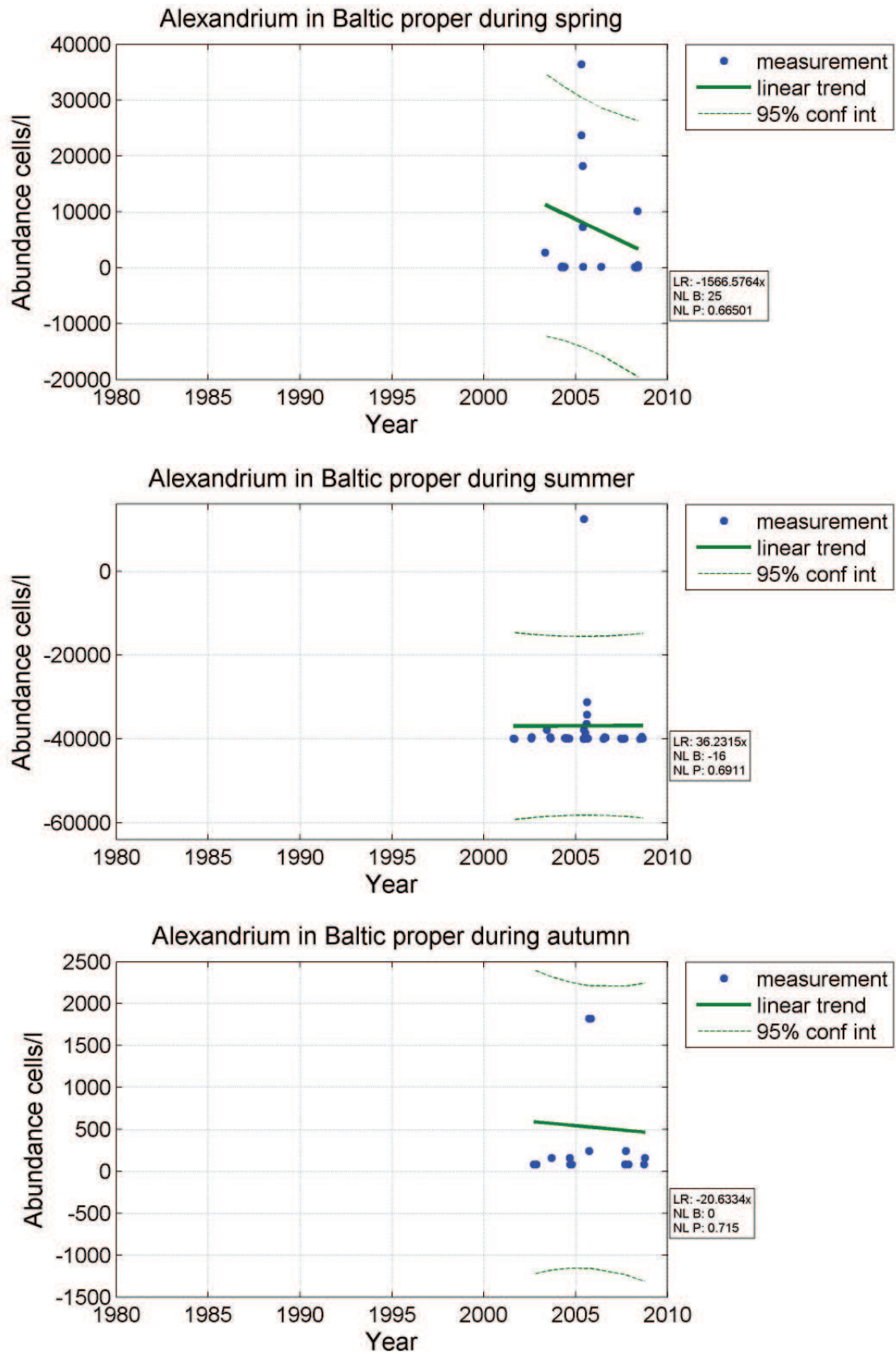


Figure 99. Seasonal occurrence of the dinoflagellate genus *Alexandrium* spp. in the Baltic Proper between the years 1994 and 2008. The genus can produce a paralytic toxin called saxitoxin. Green line indicates trend and dotted lines present the 95% confidence interval.



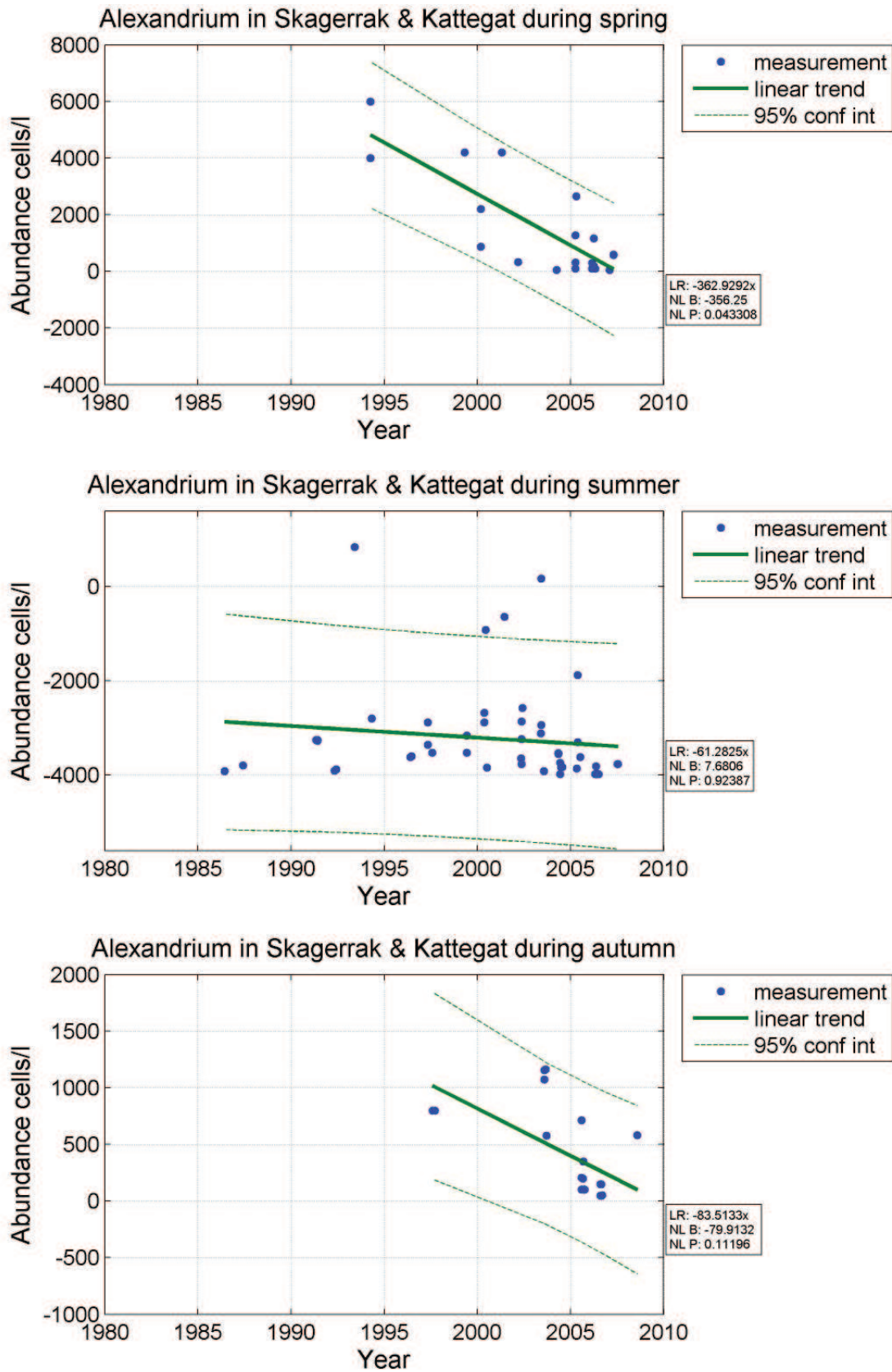


Figure 100. Seasonal occurrence of the dinoflagellate genus *Alexandrium* spp. along the Swedish west coast between the years 2000 and 2010. The genus can produce a paralytic toxin called saxitoxin. Green line indicates trend and dotted lines present the 95% confidence interval.

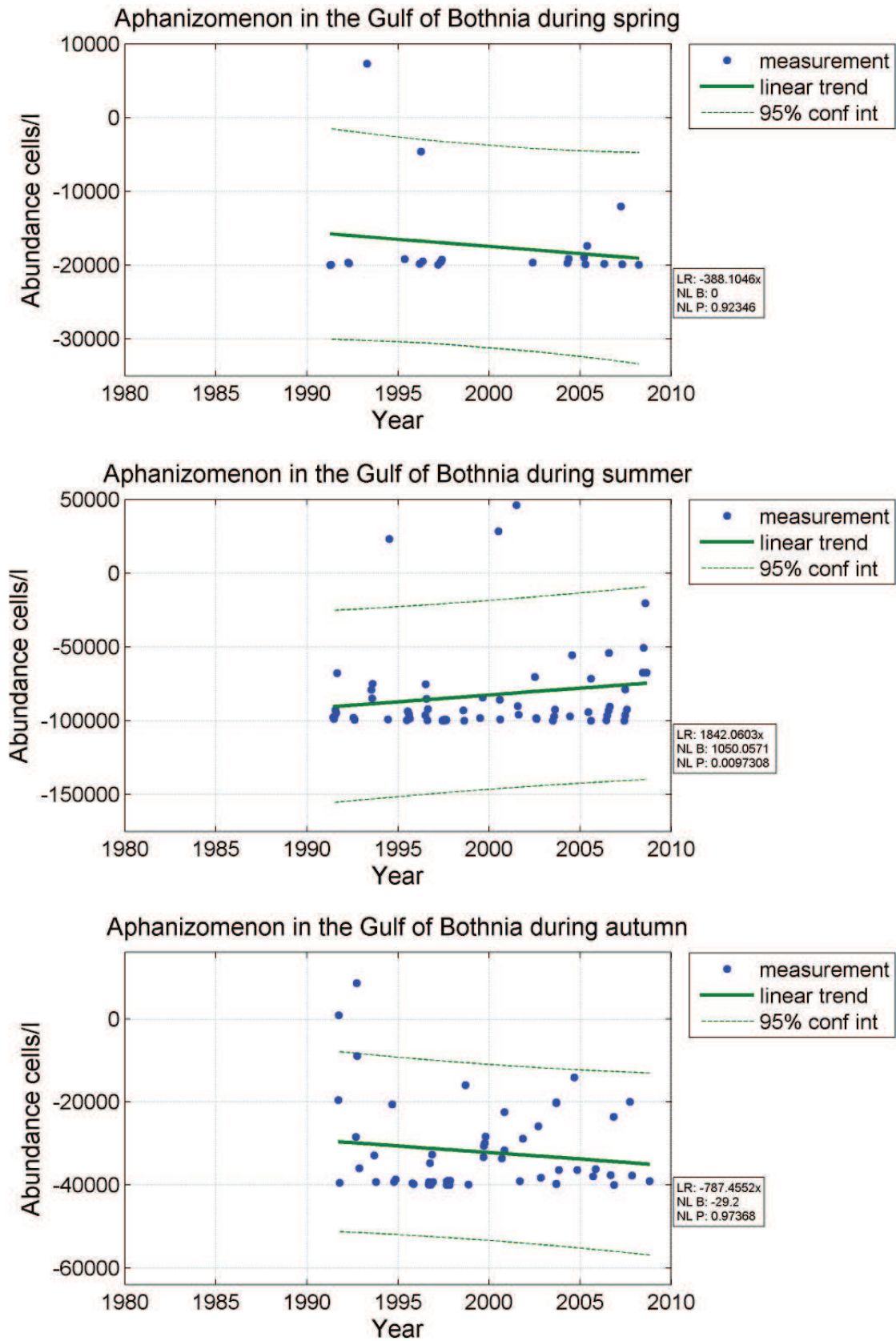


Figure 101. Seasonal occurrence of the cyanobacterium genus *Aphanizomenon* spp. in the Gulf of Bothnia between the years 1992 and 2008. The genus can produce a paralytic toxin called saxitoxin Green line indicate trend and dotted lines present the 95% confidence interval.

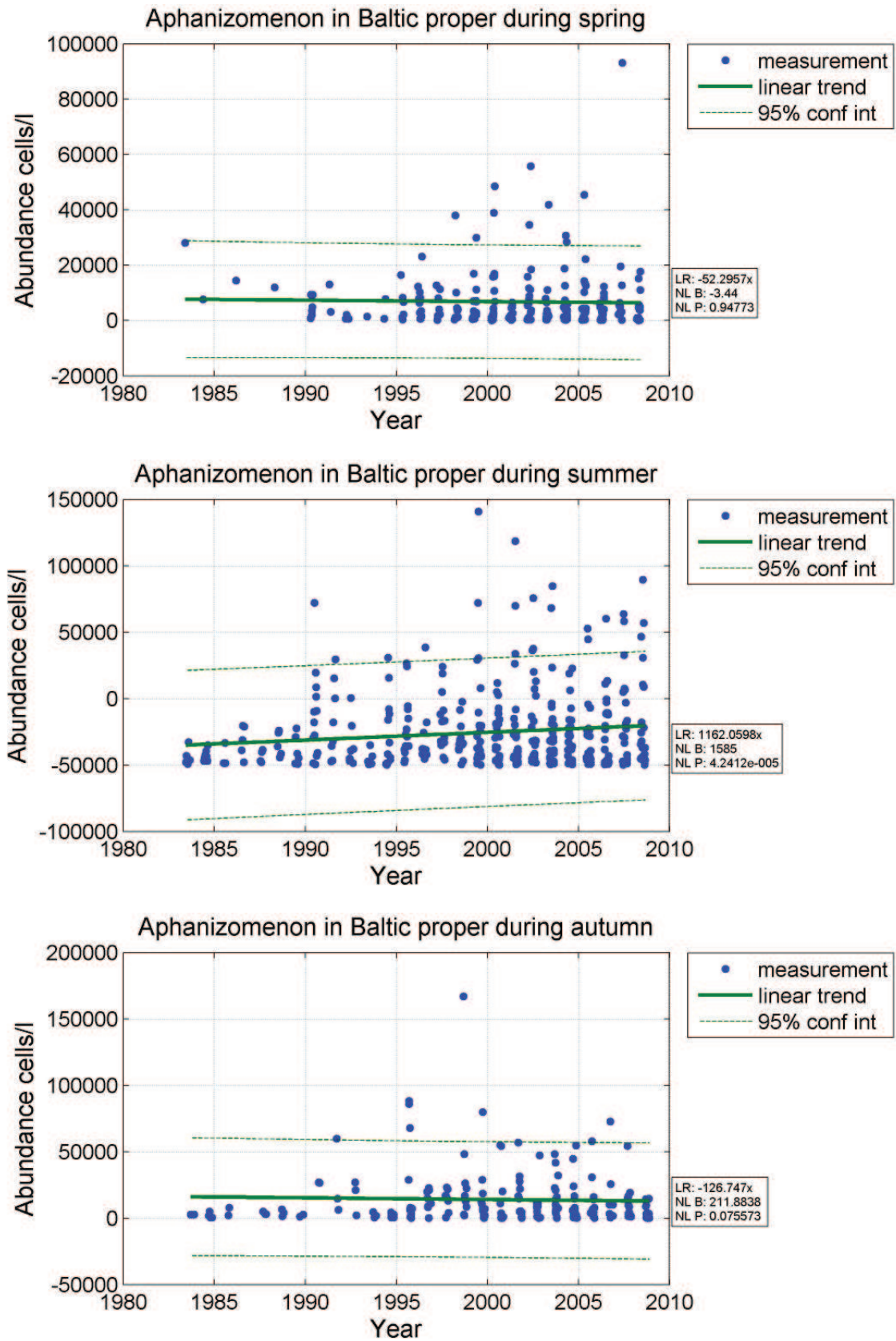


Figure 102. Seasonal occurrence of the cyanobacterium genus *Aphanizomenon* spp. in the Baltic proper between the years 1990 and 2008. The genus can form massive blooms in summer. Green line indicate trend and dotted lines present the 95% confidence interval.



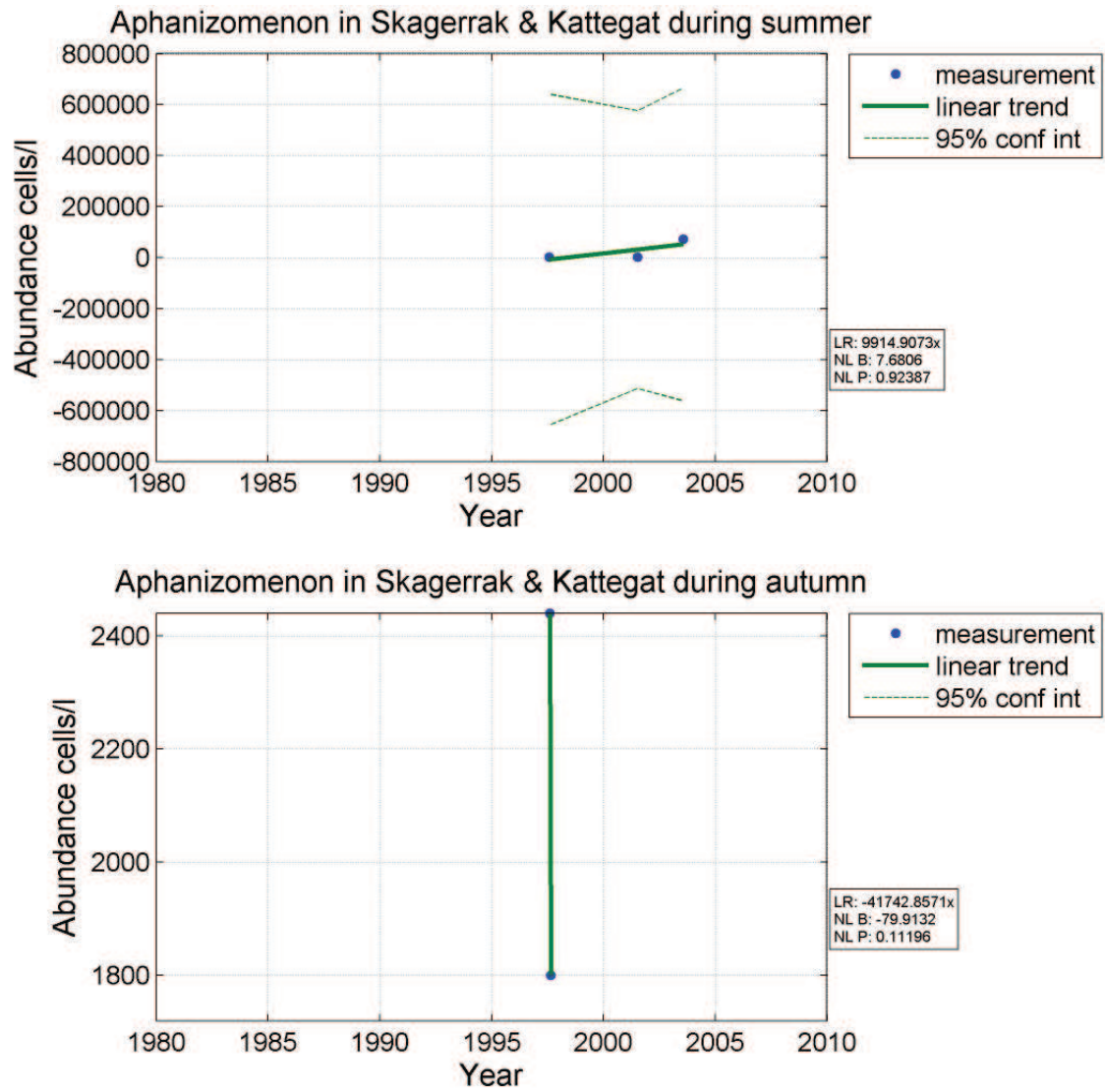


Figure 103. Seasonal occurrence of the cyanobacterium genus *Aphanizomenon* spp. along the Swedish west coast between the years 1999 and 2008. The genus can form massive blooms in summer. Green line indicate trend and dotted lines present the 95% confidence interval.

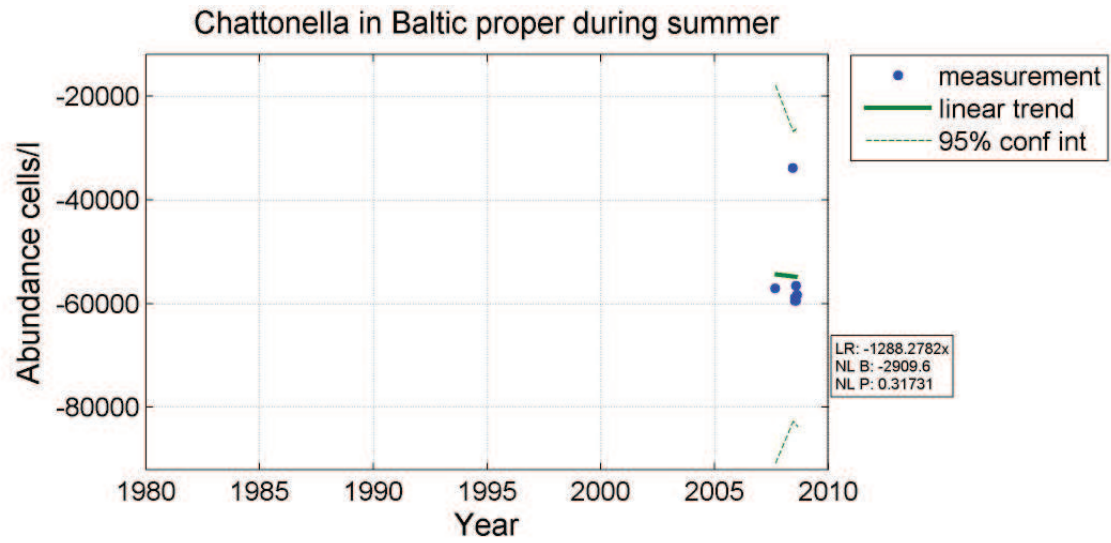


Figure 104. Seasonal occurrence of the raphidophyte genus *Chattonella* spp. in the Baltic proper between the years 2006 and 2008. The genus has been recorded to cause fish kills. Green line indicate trend and dotted lines present the 95% confidence interval.

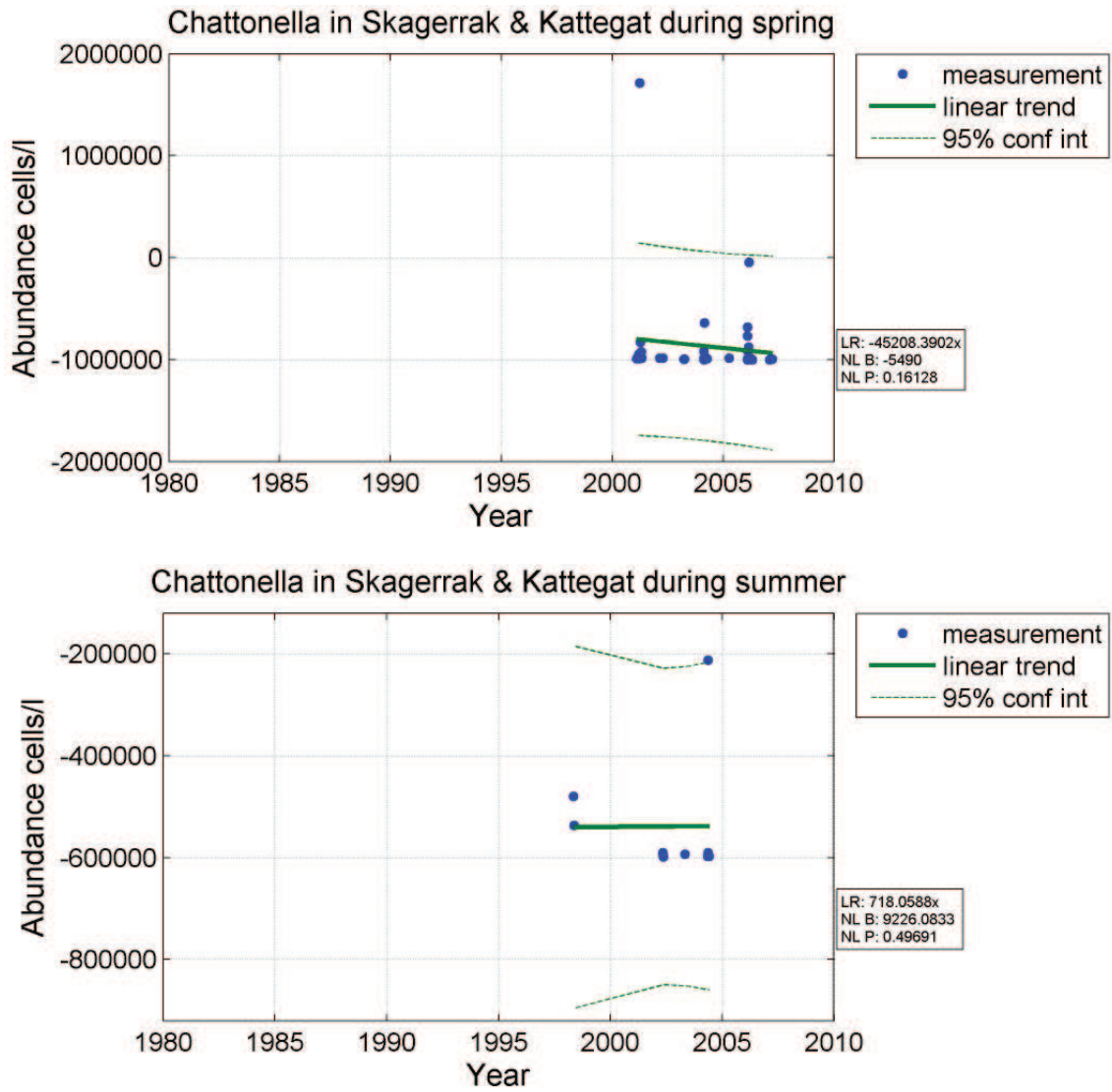


Figure 105. Seasonal occurrence of the raphidophyte genus *Chattonella* spp. along the Swedish west coast between the years 2001 and 2008. The genus has been recorded to cause fish kills. Green line indicate trend and dotted lines present the 95% confidence interval.

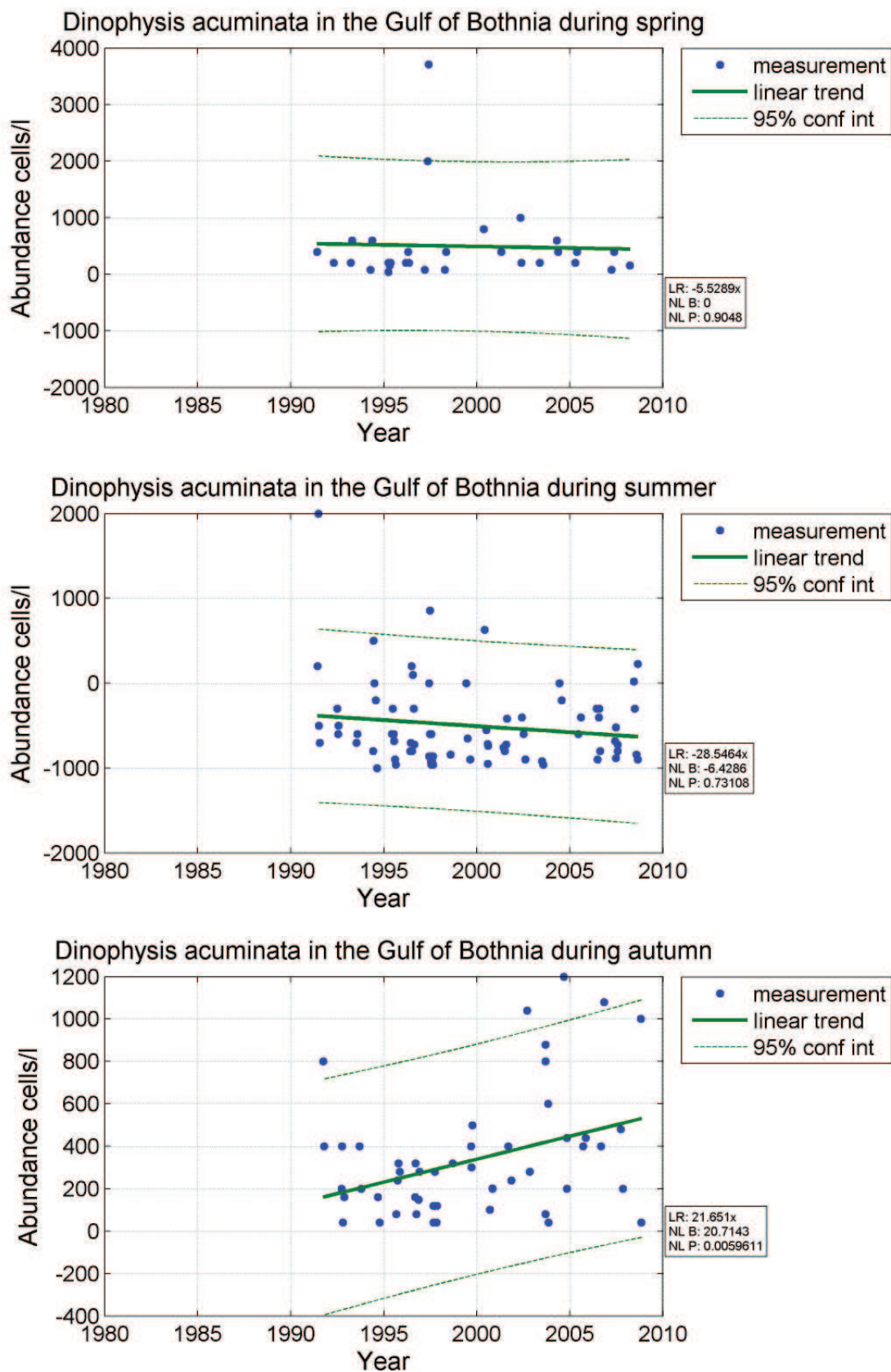


Figure 106. Seasonal occurrence of the dinoflagellate species *Dinophysis acuminata* in the Gulf of Bothnia between the years 1992 and 2008. The species produce diarrhoeic toxins that cause vomiting and stomach ache in humans. Green line indicate trend and dotted lines present the 95% confidence interval.



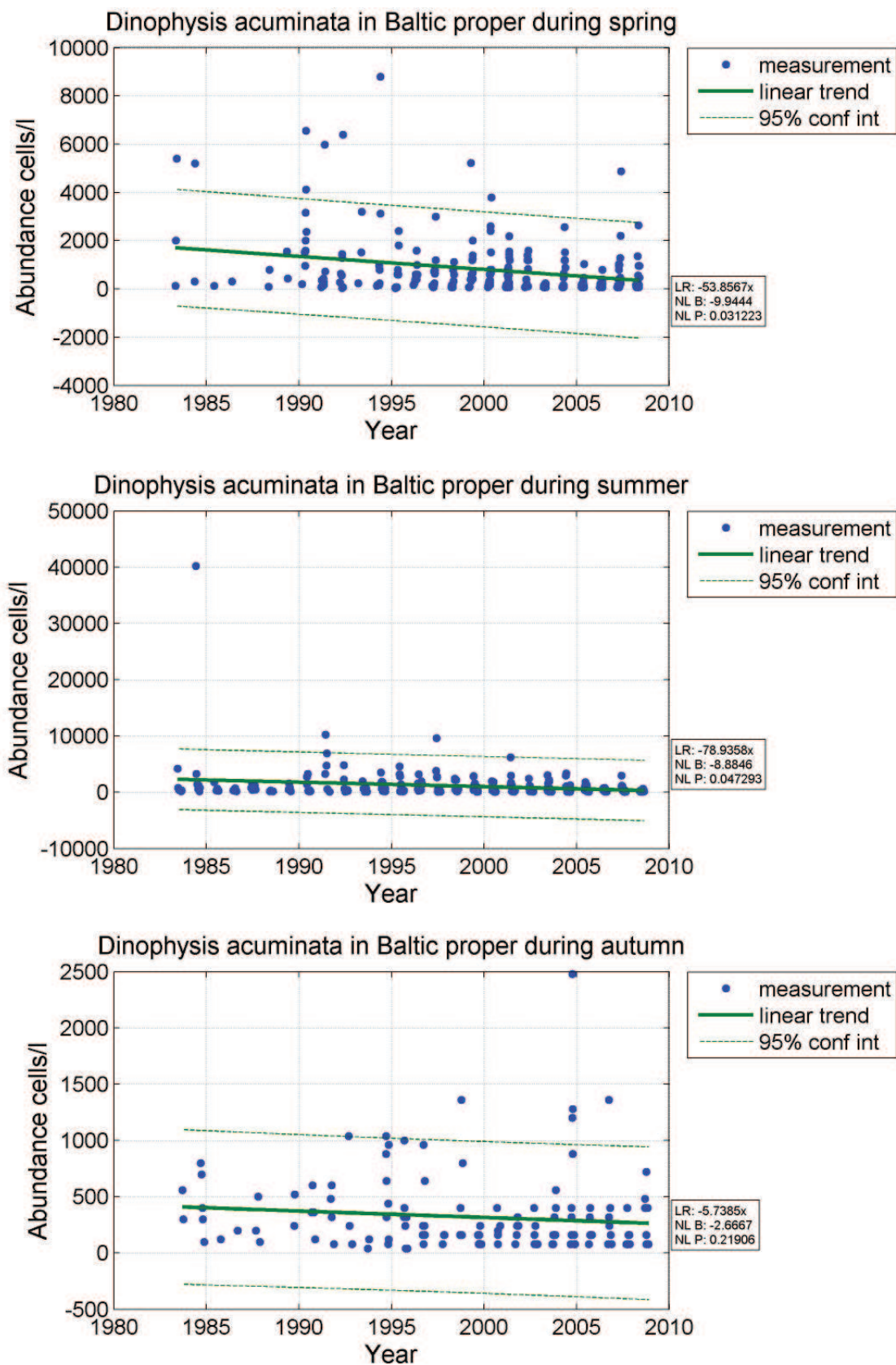


Figure 107. Seasonal occurrence of the dinoflagellate species *Dinophysis acuminata* in the Baltic Proper between the years 1987 and 2008. The species produce diarrhetic toxins that cause vomiting and stomach ache in humans. Green line indicate trend and dotted lines present the 95% confidence interval.



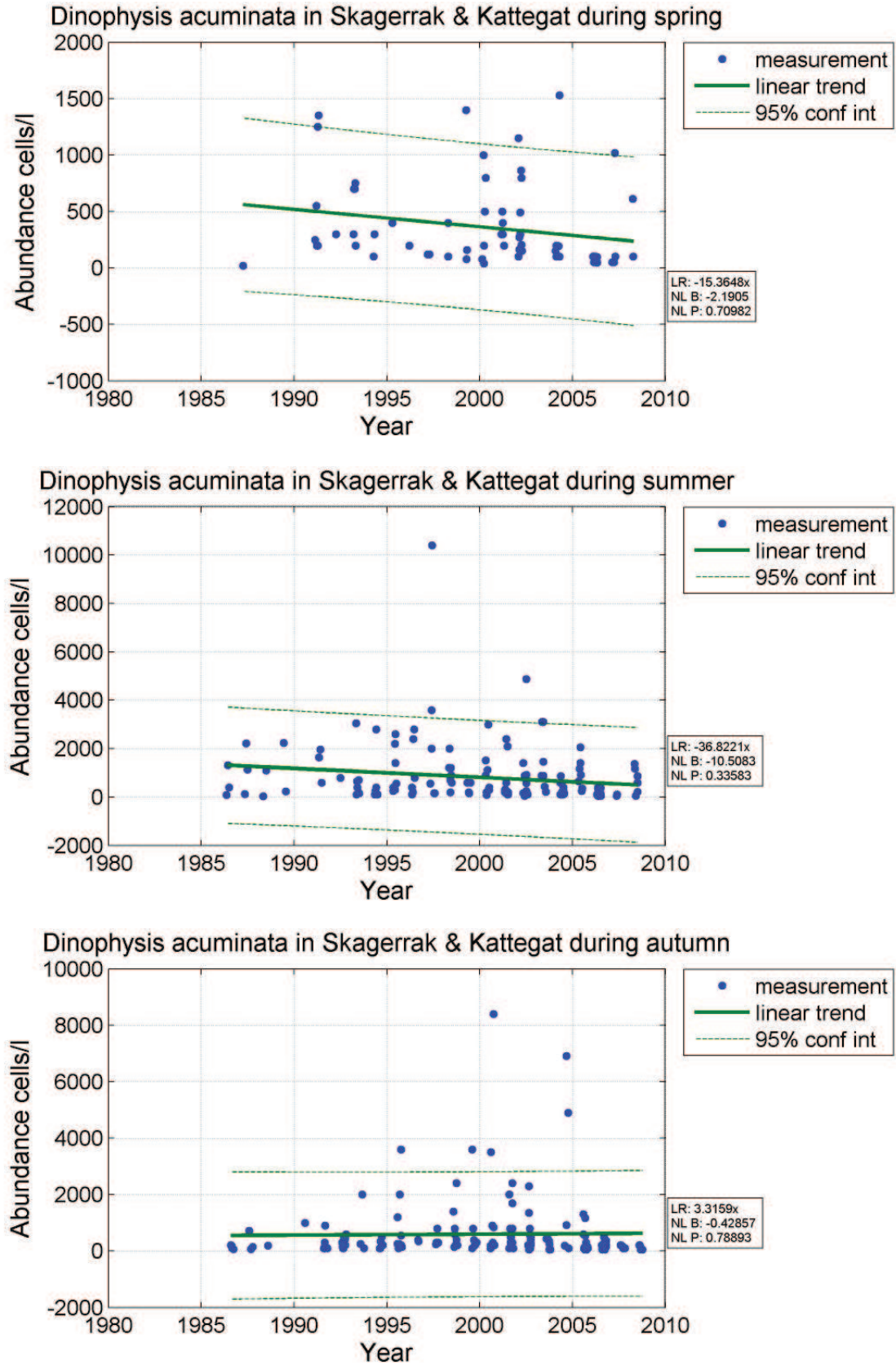


Figure 108. Seasonal occurrence of the dinoflagellate species *Dinophysis acuminata* along the Swedish west coast between the years 1987 and 2008. The species produce diarrhetic toxins that cause vomiting and stomach ache in humans. Green line indicate trend and dotted lines present the 95% confidence interval.

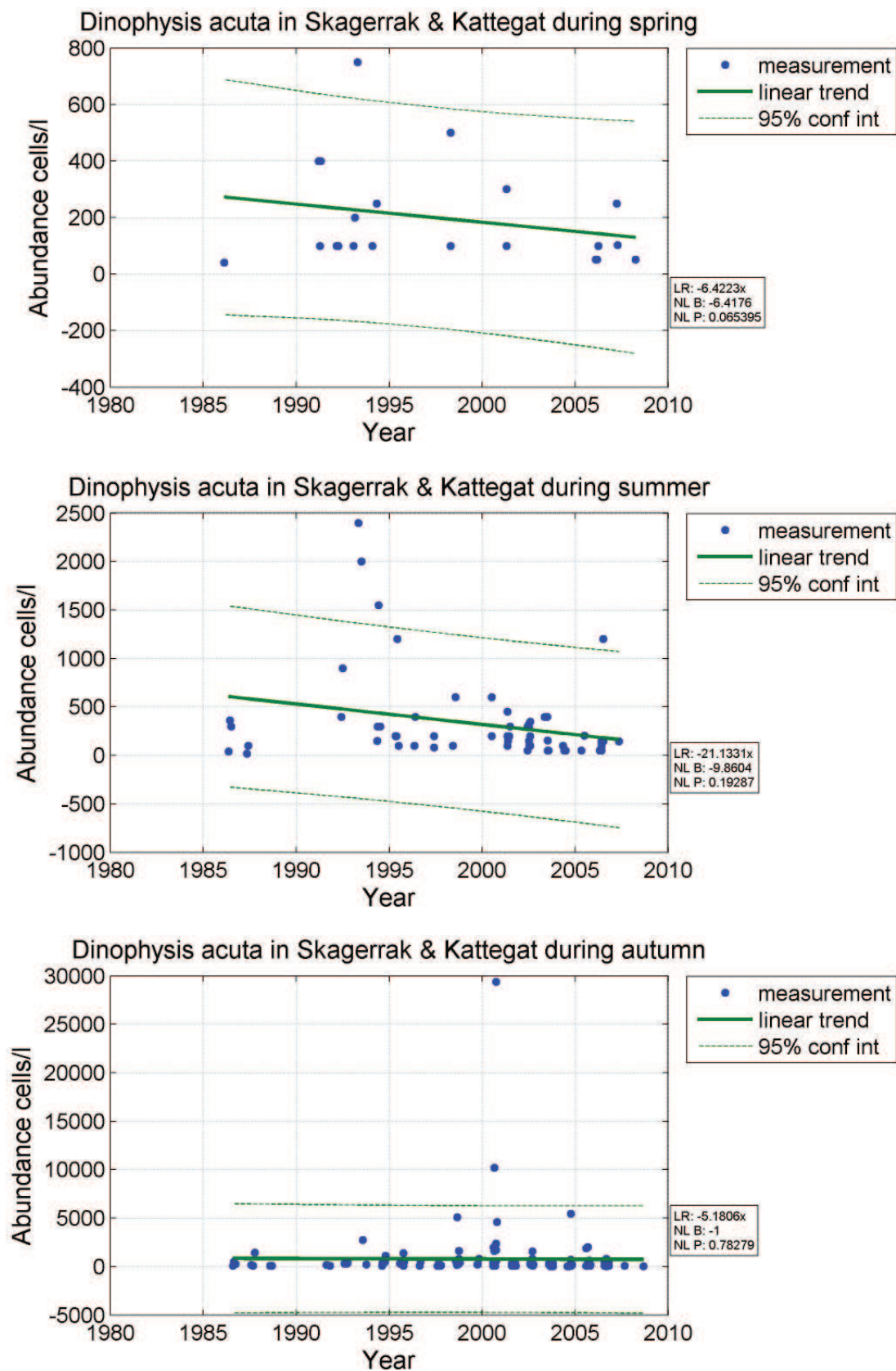


Figure 109. Seasonal occurrence of the dinoflagellate species *Dinophysis acuta* along the Swedish west coast between the years 1987 and 2008. The species produce diarrhetic toxins that cause vomiting and stomach ache in humans. Green line indicate trend and dotted lines present the 95% confidence interval.

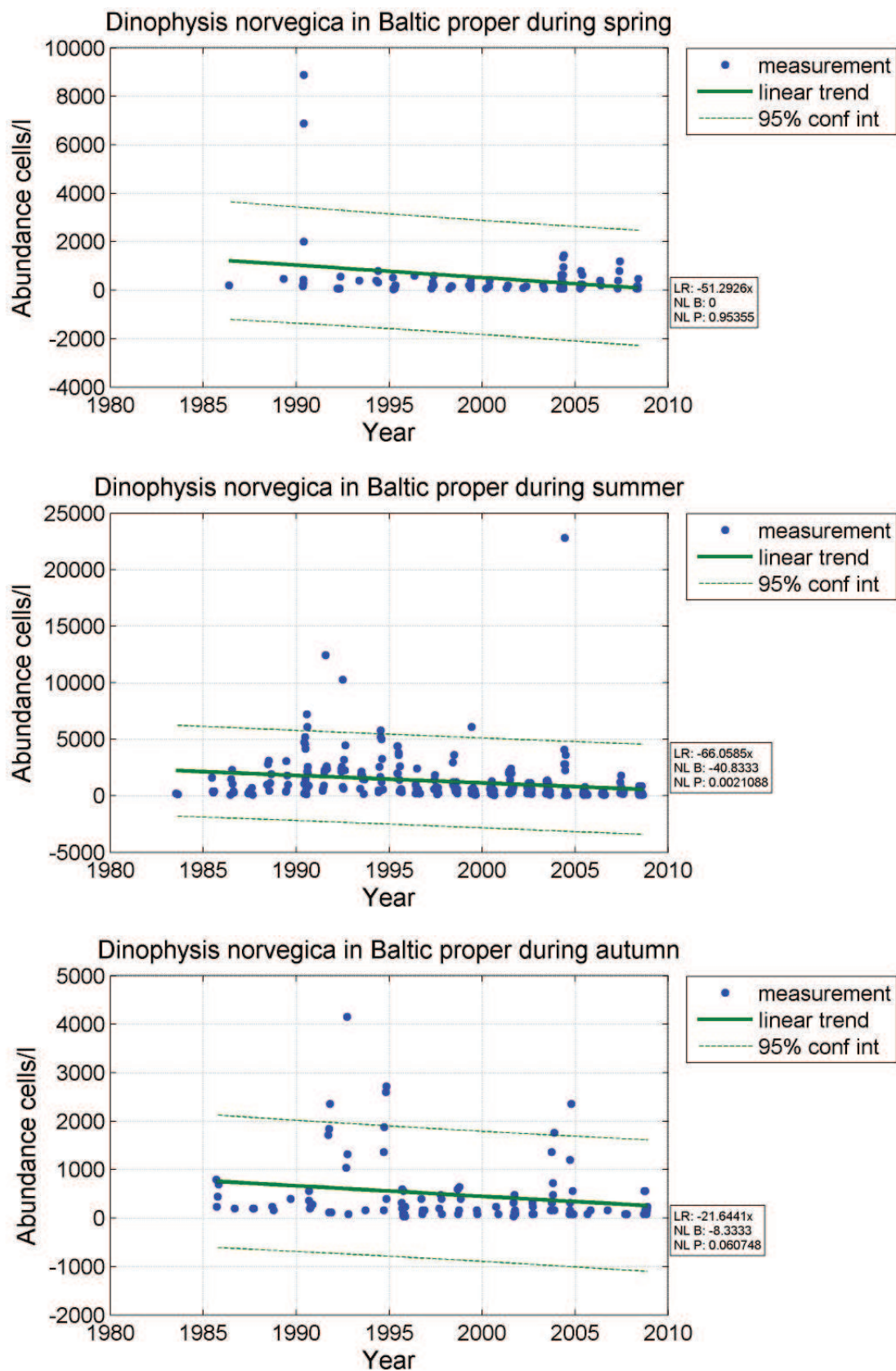


Figure 110. Seasonal occurrence of the dinoflagellate species *Dinophysis norvegica* in the Baltic Proper between the years 1988 and 2008. The species produce diarrhetic toxins that cause vomiting and stomach ache in humans. Green line indicate trend and dotted lines present the 95% confidence interval.



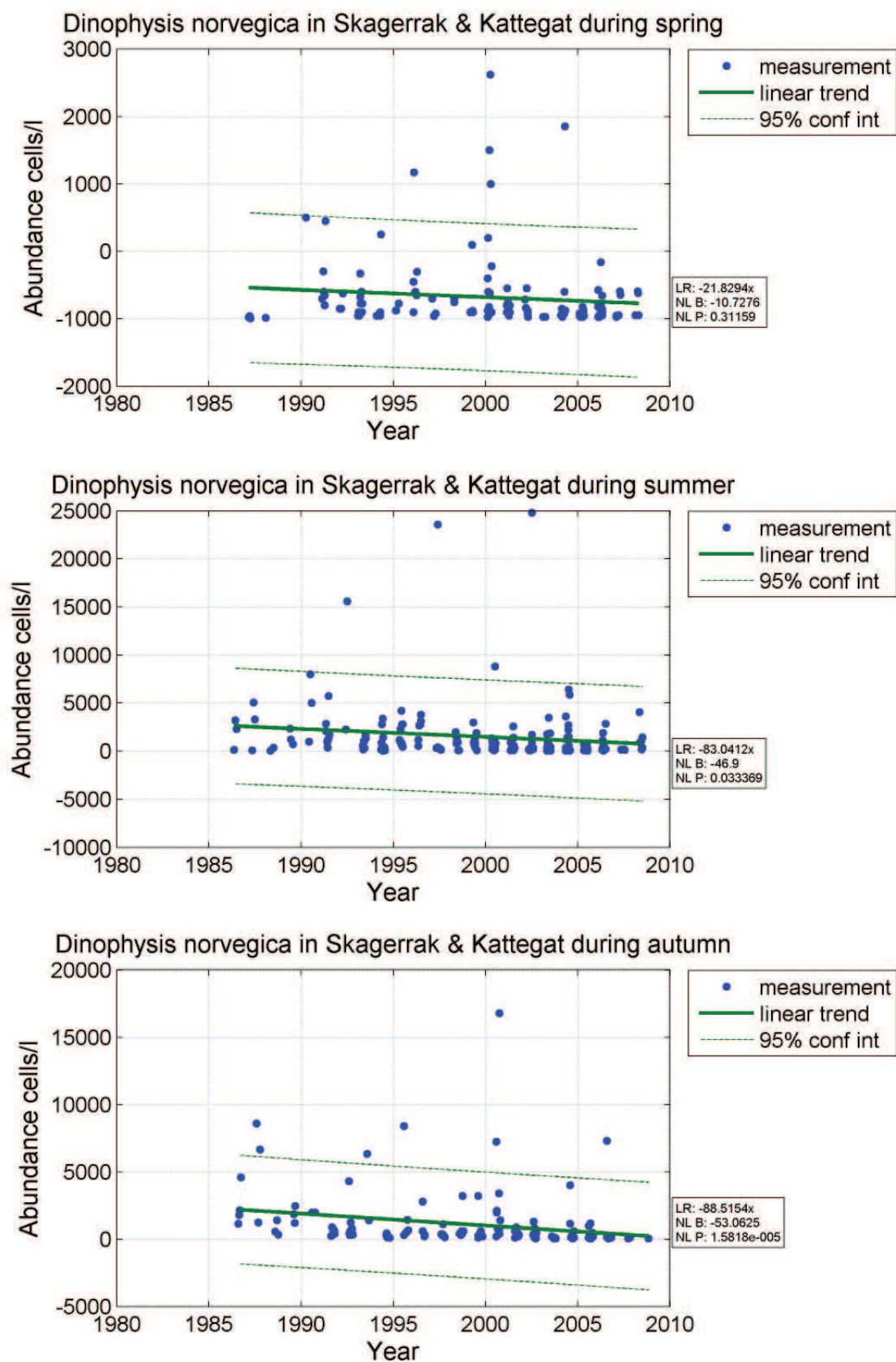


Figure 111. Seasonal occurrence of the dinoflagellate species *Dinophysis norvegica* along the Swedish west coast between the years 1988 and 2008. The species produce diarrhetic toxins that cause vomiting and stomach ache in humans. Green line indicate trend and dotted lines present the 95% confidence interval.

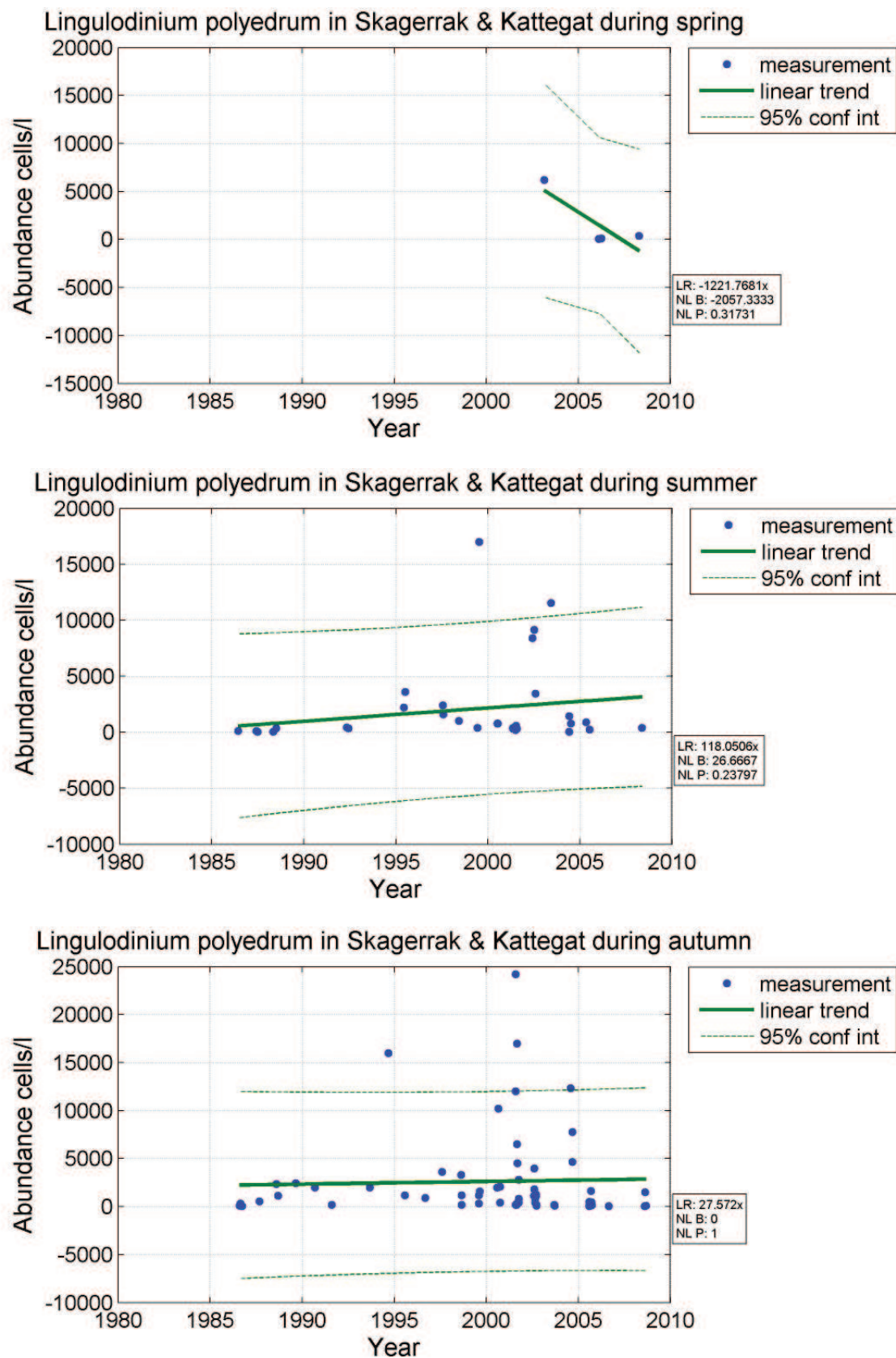


Figure 112. Seasonal occurrence of the dinoflagellate species *Lingulodinium polyedrum* along the Swedish west coast between the years 2001 and 2008. The species produce yessotoxin with so far unknown toxicity. Green line indicate trend and dotted lines present the 95% confidence interval.

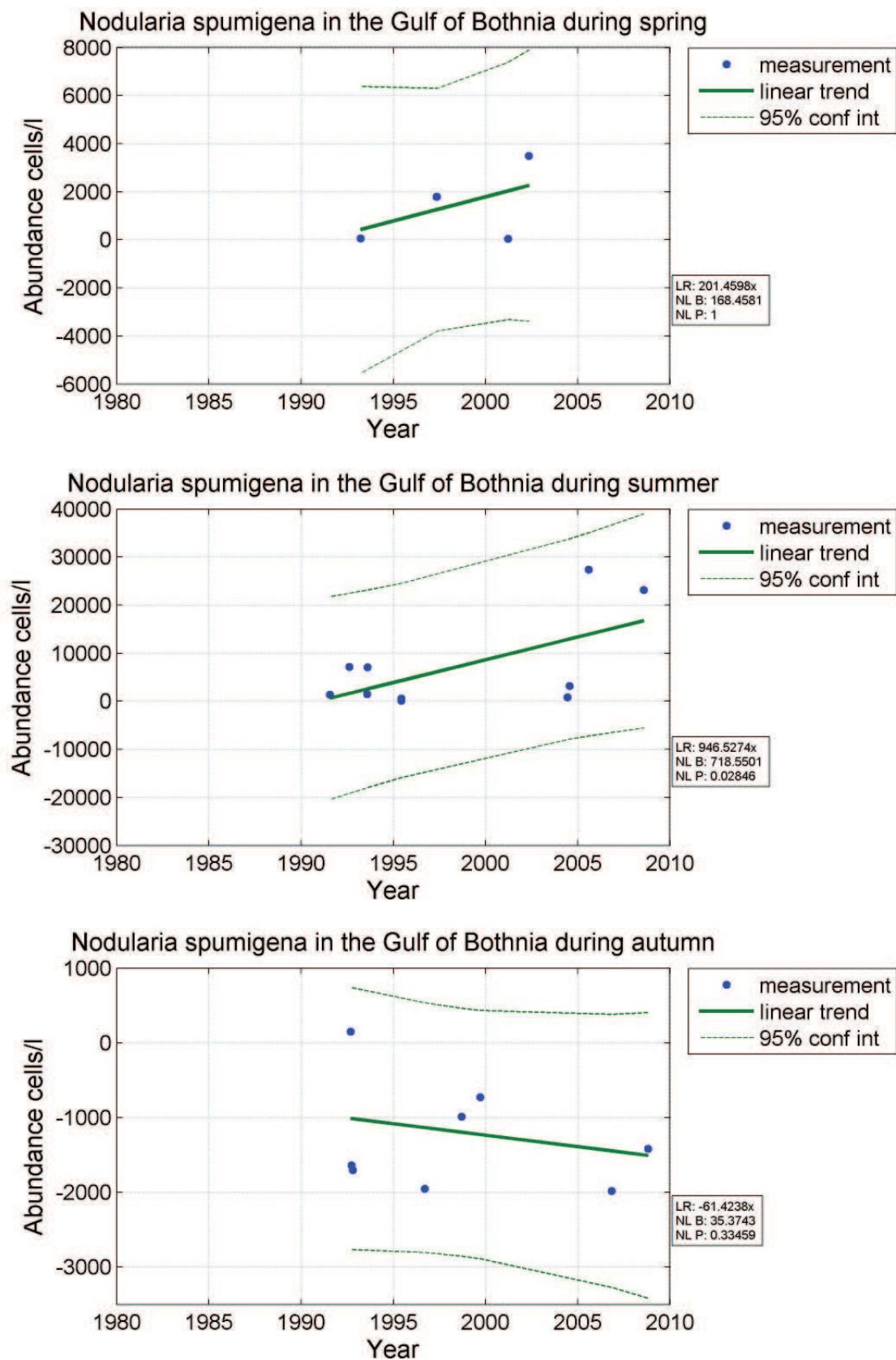


Figure 113. Seasonal occurrence of the cyanobacterium species *Nodularia spumigena* in the Gulf of Bothnia between the years 1992 and 2008. The species produce the toxin nodularin that cause liver damage in humans and animals. Green line indicate trend and dotted lines present the 95% confidence interval.



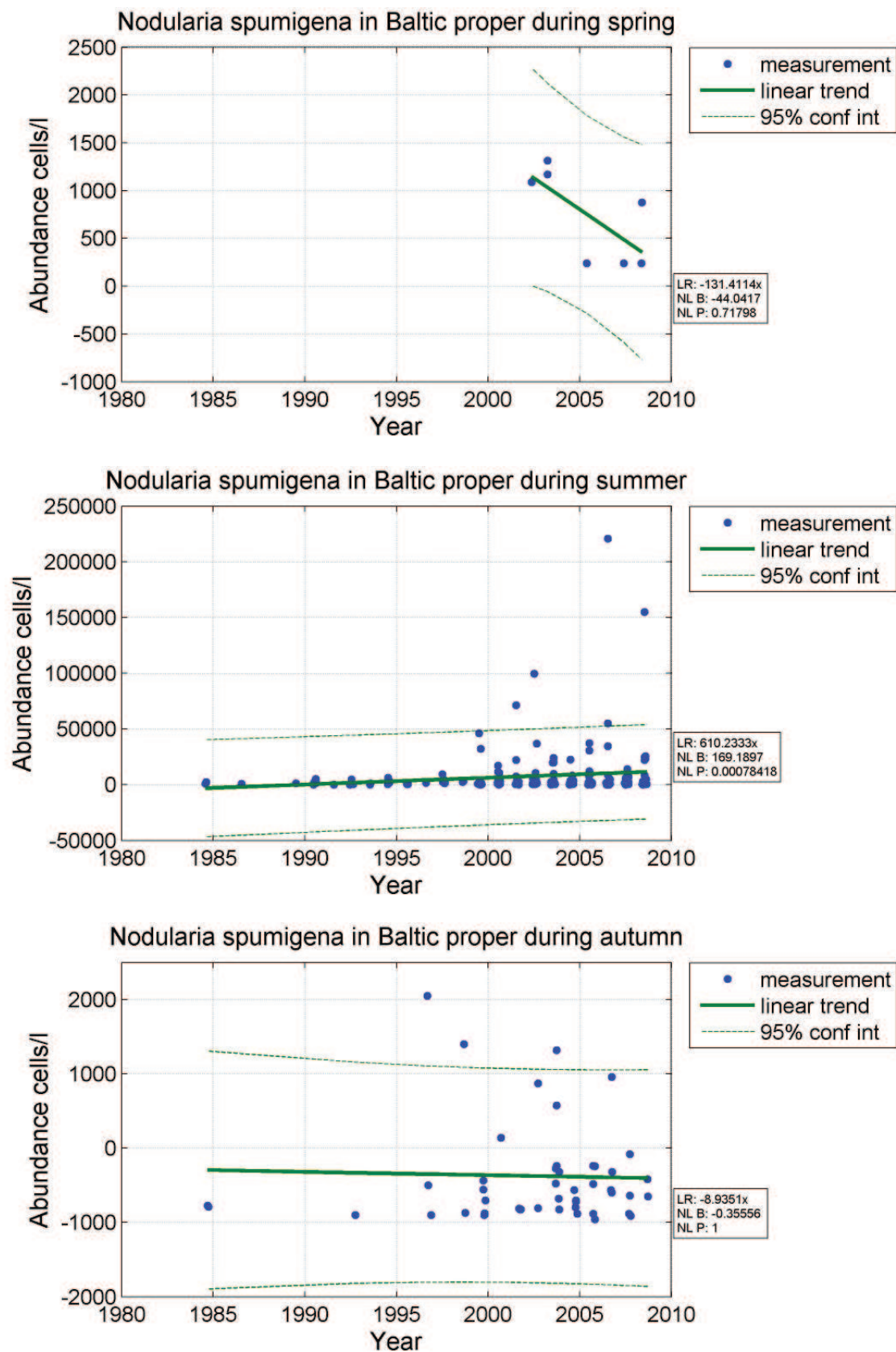


Figure 114. Seasonal occurrence of the cyanobacterium species *Nodularia spumigena* in the Baltic Proper between the years 1990 and 2008. The species produce the toxin nodularin that cause liver damage in humans and animals. Green line indicate trend and dotted lines present the 95% confidence interval.

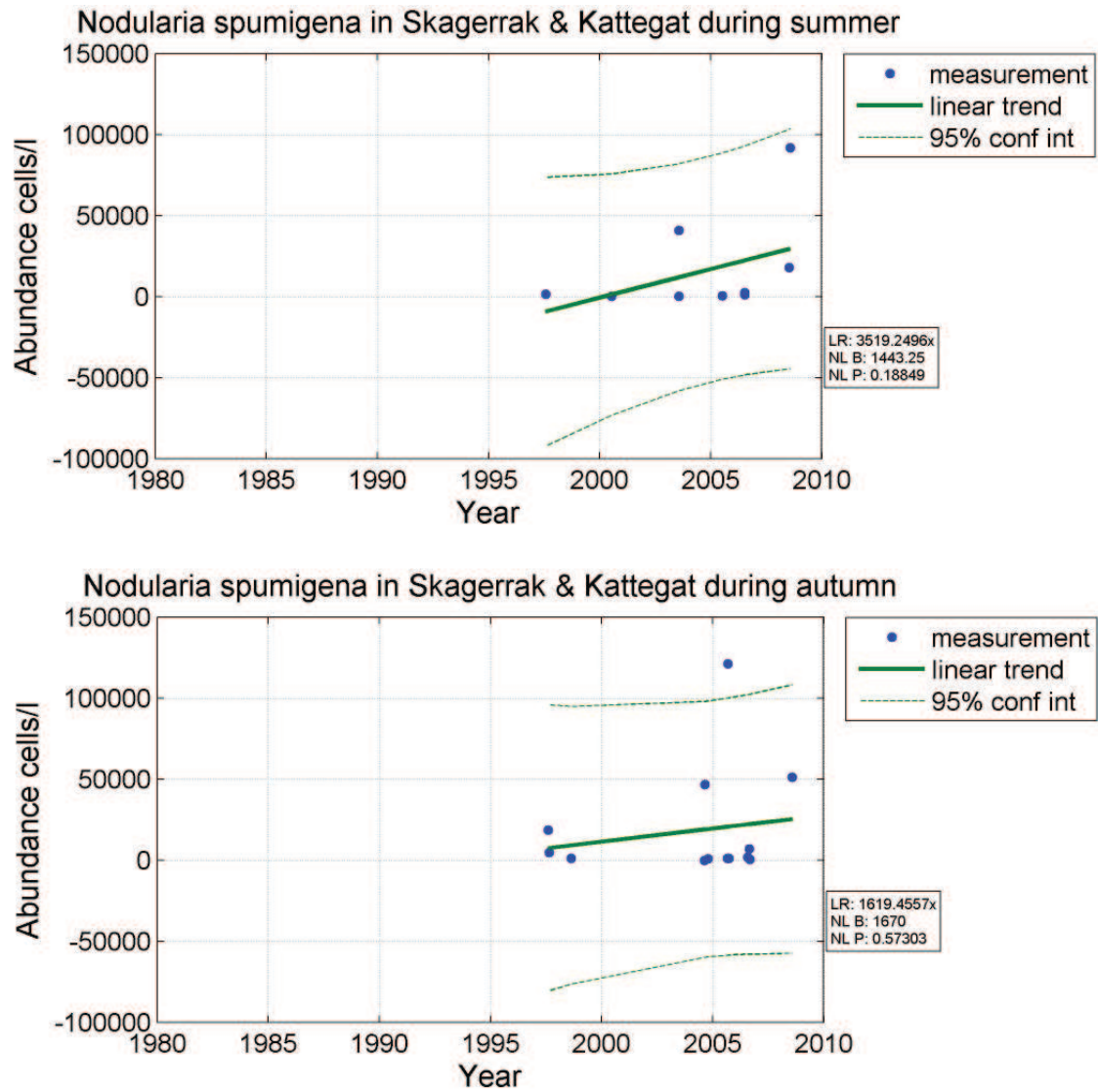


Figure 115. Seasonal occurrence of the cyanobacterium species *Nodularia spumigena* in the Baltic Proper between the years 1990 and 2008. The species produce the toxin nodularin that cause liver damage in humans and animals. Green line indicate trend and dotted lines present the 95% confidence interval.



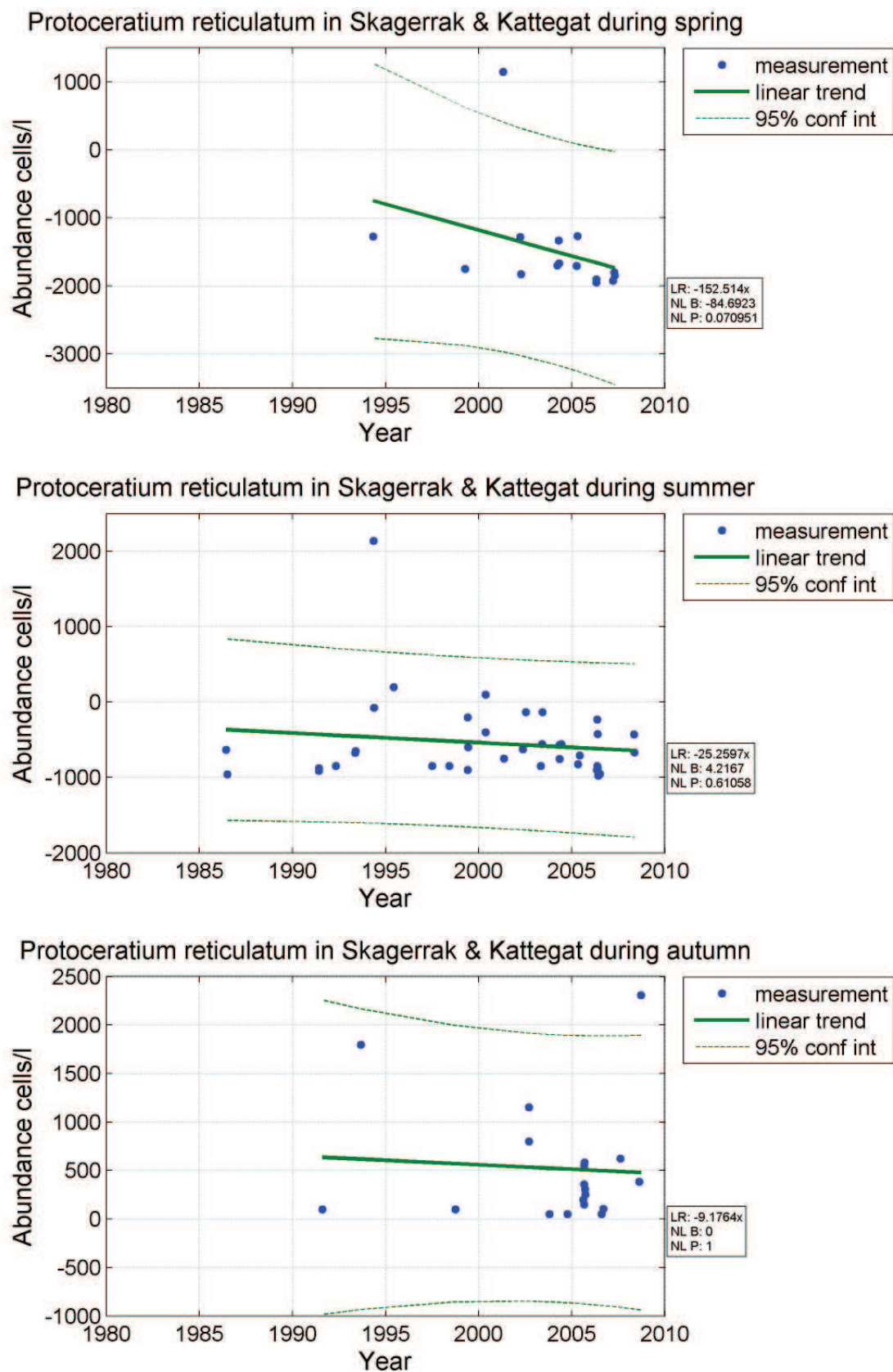


Figure 116. Seasonal occurrence of the dinoflagellate species *Protoceratium reticulatum* along the Swedish west coast between the years 1992 and 2008. The species produce the toxin nodularin that cause liver damage in humans and animals. Green line indicate trend and dotted lines present the 95% confidence interval.

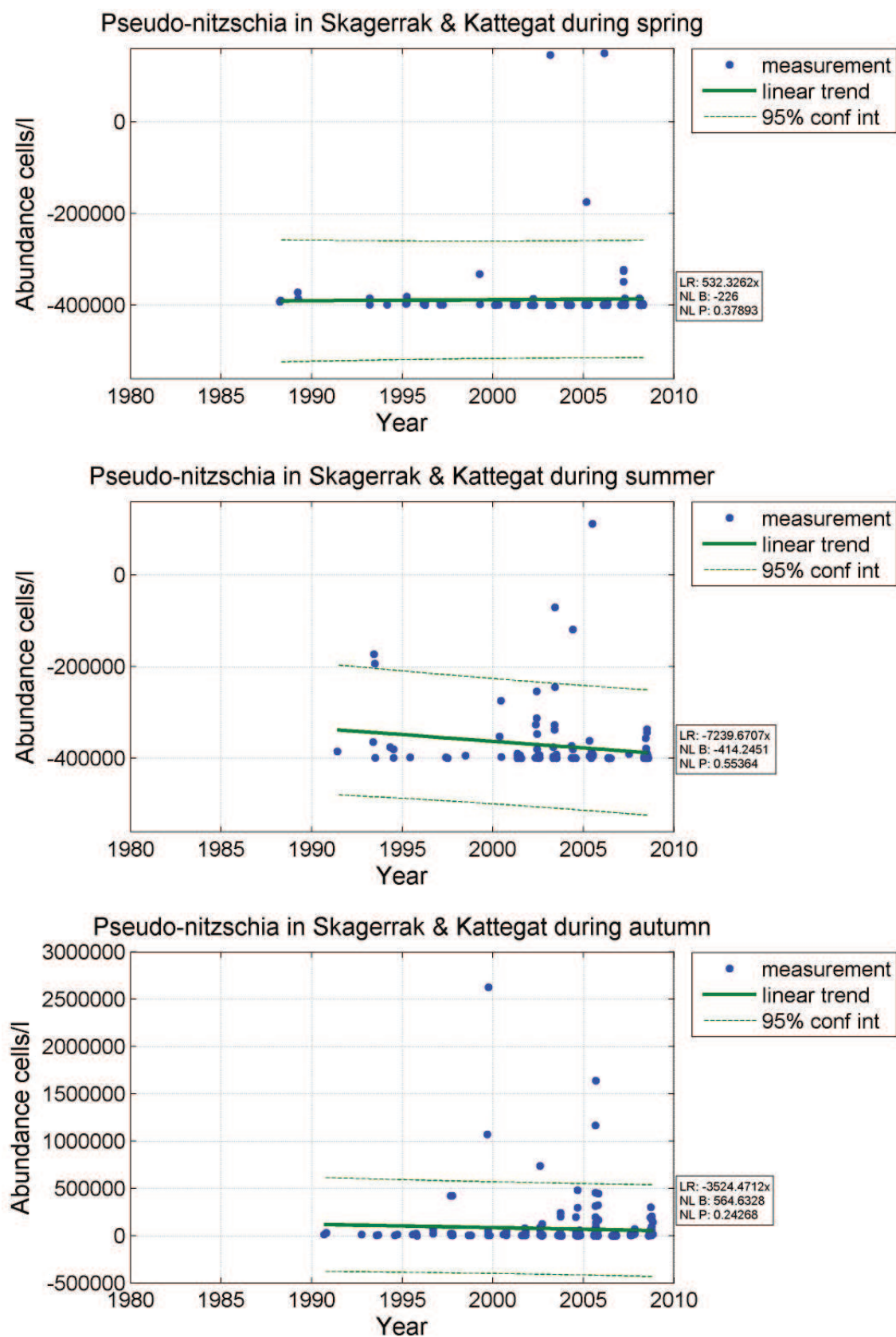


Figure 117. Seasonal occurrence of the diatom genus *Pseudo-nitzschia* spp. along the Swedish west coast between the years 1992 and 2008. The genus can produce the toxin domoic acid that is a neurotoxin that cause short term memory loss, brain damage and death. Green line indicate trend and dotted lines present the 95% confidence interval.

## **APPENDIX G**

### **Species occurrence list**

Present a table containing all observed phytoplankton between 1999 and 2008 and in which area they have been observed.

Table 7. Occurrence and spatial distribution of all species recorded between the years 1999 and 2008. 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| KLASS          | Species                    | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|----------------|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Diatomophyceae | Achnanthes taeniata        |           |           |           | X         | X         | X         | X          | X          | X          | X          |
| Diatomophyceae | Actinocyclus otonarius     |           |           | X         | X         | X         | X         | X          | X          |            |            |
| Diatomophyceae | Actinocyclus spp           |           |           | X         | X         | X         | X         | X          | X          | X          | X          |
| Diatomophyceae | Actinocyclus senarius      |           |           |           | X         |           |           |            |            |            |            |
| Diatomophyceae | Amphiprora paludosa        |           | X         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Amphora spp                | X         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Asterionella formosa       | X         |           |           | X         |           |           |            |            | X          | X          |
| Diatomophyceae | Asterionellopsis glacialis | X         | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Atttheya decora            |           |           | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Atttheya longicornis       | X         | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Atttheya septentrionalis   | X         | X         | X         |           |           |           |            | X          | X          |            |
| Diatomophyceae | Aulacoseira granulata      |           |           | X         | X         | X         | X         | X          |            |            | X          |
| Diatomophyceae | Aulacoseira spp            | X         |           |           |           |           |           |            |            |            | X          |
| Diatomophyceae | Bacillariales spp          |           | X         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Bacteriastrium hyalinum    | X         | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Centrales spp              | X         | X         | X         | X         | X         | X         | X          | X          | X          | X          |
| Diatomophyceae | Cerataulina pelagica       | X         | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros affinis        | X         | X         | X         |           |           | X         |            |            |            |            |
| Diatomophyceae | Chaetoceros anastomosans   |           | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros borealis       |           |           | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros brevis         | X         | X         | X         | X         |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros calcitrans     |           |           | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros ceratosporus   | X         | X         | X         | X         | X         | X         |            |            | X          | X          |
| Diatomophyceae | Chaetoceros circinalis     |           | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros concavicornis  |           | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros constrictus    | X         | X         | X         | X         |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros confortus      | X         | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros convolutus     | X         | X         | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros coronatus      | X         |           | X         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros crinitus       |           | X         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros curvisetus     | X         | X         | X         |           |           |           |            |            | X          |            |
| Diatomophyceae | Chaetoceros danicus        | X         | X         | X         | X         | X         | X         | X          | X          | X          | X          |
| Diatomophyceae | Chaetoceros debilis        | X         | X         | X         | X         |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros decipiens      | X         | X         | X         | X         |           |           |            |            |            |            |

| KLASS          | Species                      | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|----------------|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Diatomophyceae | Chaetoceros densus           |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros diadema          | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros didymus          | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros impressus        |           | x         | x         | x         | x         | x         | x          | x          | x          |            |
| Diatomophyceae | Chaetoceros ingolfianus      |           | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros laciniosus       | x         | x         | x         | x         |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros lorenzianus      | x         | x         | x         |           | x         |           |            |            |            |            |
| Diatomophyceae | Chaetoceros minimus          | x         |           | x         |           |           |           | x          | x          |            |            |
| Diatomophyceae | Chaetoceros muelleri         |           |           | x         |           |           |           |            |            | x          |            |
| Diatomophyceae | Chaetoceros pseudobrevis     |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros pseudocrinatus   |           | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros relacini         |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros seiracanthus     |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros similis          | x         | x         | x         | x         | x         | x         | x          | x          |            | x          |
| Diatomophyceae | Chaetoceros simplex          | x         | x         | x         | x         | x         |           |            |            |            |            |
| Diatomophyceae | Chaetoceros socialis         | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros solitary         |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros spp              | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Diatomophyceae | Chaetoceros subtilis         | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Diatomophyceae | Chaetoceros tenuissimus      | x         | x         | x         | x         |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros teres            |           |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Chaetoceros thronsenii       | x         | x         | x         | x         | x         | x         | x          | x          |            |            |
| Diatomophyceae | Chaetoceros wighamii         |           | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Diatomophyceae | Cocconeis scutellum          | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Cocconeis spp                |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Coccinodiscus centralis      | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Coccinodiscus commutatus     |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Coccinodiscus concinnus      | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Coccinodiscus granii         |           |           | x         | x         | x         | x         | x          | x          |            |            |
| Diatomophyceae | Coccinodiscus radiatus       | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Coccinodiscus spp            | x         | x         | x         | x         | x         | x         | x          | x          |            |            |
| Diatomophyceae | Coccinodiscus wailesii       | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Cyclotella choctawhatcheeana |           |           |           |           |           |           |            |            |            | x          |
| Diatomophyceae | Cyclotella meneghiniana      |           |           |           |           |           | x         |            |            | x          |            |

| KLASS          | Species                      | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|----------------|------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Diatomophyceae | Cyclotella spp               | x         |           |           |           |           |           |            |            |            | x          |
| Diatomophyceae | Cylindrotheca closterium     | x         | x         | x         | x         |           | x         | x          | x          | x          | x          |
| Diatomophyceae | Dactylosolen fragilissimus   | x         | x         | x         | x         | x         |           |            |            |            |            |
| Diatomophyceae | Dactylosolen phuketensis     | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Detonula confervacea         | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Detonula pumila              | x         | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Diatoma tenuis               |           |           | x         | x         |           |           |            | x          |            | x          |
| Diatomophyceae | Diploneis spp                |           |           |           | x         |           |           |            |            |            |            |
| Diatomophyceae | Ditylum brightwellii         | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Entomoneis spp               | x         |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Eucampia groenlandica        |           | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Eucampia zodiacus            | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Fragilaria crotonensis       |           |           |           |           |           |           |            |            |            | x          |
| Diatomophyceae | Fragilaria heidenii          |           |           |           |           |           | x         |            |            |            |            |
| Diatomophyceae | Fragilaria spp               |           |           |           |           |           |           |            |            | x          | x          |
| Diatomophyceae | Grammatophora marina         |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Guinardia delicatula         | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Guinardia flaccida           | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Guinardia spp                | x         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Guinardia striata            |           | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Gyrosigma fasciola           |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Gyrosigma spp                | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Lauderia annulata            | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Lennoxia faveolata           | x         |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Leptocylindrus danicus       | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Leptocylindrus mediterraneus |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Leptocylindrus minimus       | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Licmophora abbreviata        |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Licmophora spp               | x         | x         | x         |           |           |           |            | x          |            |            |
| Diatomophyceae | Lioloma elongatum            |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Lithodesmium undulatum       |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Melosira arctica             | x         |           |           | x         | x         | x         | x          | x          | x          | x          |
| Diatomophyceae | Navicula directa             | x         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Navicula spp                 | x         | x         |           |           |           |           |            |            |            |            |

| KLASS          | Species                              | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|----------------|--------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Diatomophyceae | Navicula tansitans                   |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Navicula transitans                  | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Navicula vanhoeffenii                |           |           |           |           |           |           |            |            | x          |            |
| Diatomophyceae | Nitzschia acicularis                 | x         |           |           |           |           |           |            |            |            | x          |
| Diatomophyceae | Nitzschia aff. americana             |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Nitzschia frigida                    |           |           |           |           |           |           | x          | x          |            | x          |
| Diatomophyceae | Nitzschia longissima                 | x         | x         | x         |           |           |           |            |            | x          | x          |
| Diatomophyceae | Nitzschia paleacea                   |           |           |           |           | x         |           |            |            |            |            |
| Diatomophyceae | Nitzschia reversa                    | x         |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Nitzschia sigmoidea                  |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Nitzschia spp                        | x         | x         | x         | x         | x         | x         |            |            |            |            |
| Diatomophyceae | Odontella aurita                     | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Odontella mobiliensis                |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Odontella regia                      | x         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Odontella sinensis                   | x         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Paralia sulcata                      | x         | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Pennales spp                         | x         | x         | x         |           |           |           |            |            |            | x          |
| Diatomophyceae | Phaeodactylum tricornutum            | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Plagiotropis/Tropidoneis spp         |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pleurosigma clevei                   |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pleurosigma spp                      | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Porosira glacialis                   | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Proboscia alata                      | x         | x         | x         | x         |           |           |            |            |            |            |
| Diatomophyceae | Pseudobodo spp.                      |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pseudodiffugia spp                   | x         |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pseudo-nitzschia calliantha          | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pseudo-nitzschia delicatissima       |           | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Pseudo-nitzschia delicatissima-group | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pseudo-nitzschia pseudodelicatissima |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pseudo-nitzschia pungens             | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Pseudo-nitzschia seriata-group       | x         | x         | x         | x         | x         |           |            |            |            |            |
| Diatomophyceae | Pseudo-nitzschia spp                 | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Rhizosolenia hebetata                | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Rhizosolenia imbricata               | x         | x         | x         |           |           |           |            |            |            |            |

| KLASS          | Species                       | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|----------------|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Diatomophyceae | Rhizosolenia pungens          | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Rhizosolenia setigera         | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Rhizosolenia spp              | x         |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Rhizosolenia styliformis      |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Rhoicosphenia abbreviata      | x         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Skeletonema costatum          | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Diatomophyceae | Stellarima stellaris          |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Stephanopyxis turris          |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Striatella unipunctata        | x         | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Synedra ulna                  |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Tabellaria spp                | x         |           |           |           |           |           |            |            | x          |            |
| Diatomophyceae | Thalassionema nitzschioides   | x         | x         | x         | x         | x         |           |            |            |            |            |
| Diatomophyceae | Thalassionema spp             | x         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira angulata        | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira anguste-lineata | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira baltica         |           |           |           | x         | x         | x         | x          | x          | x          | x          |
| Diatomophyceae | Thalassiosira constricta      |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira decipiens       | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira delicatula      |           |           | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira eccentrica      |           | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira gravida         |           | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira hyalina         |           | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira lacustris       | x         | x         |           |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira levanderi       | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Diatomophyceae | Thalassiosira minima          | x         |           |           |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira nordenskiöldii  | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira punctigera      | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira rotula          | x         | x         | x         |           |           |           |            |            |            |            |
| Diatomophyceae | Thalassiosira spp             | x         | x         | x         | x         | x         | x         |            |            | x          | x          |
| Diatomophyceae | Thalassiothrix longissima     | x         | x         |           | x         | x         |           |            |            | x          |            |
| Dinophyceae    | Akashiwo sanguinea            | x         | x         | x         | x         | x         |           |            |            | x          |            |
| Dinophyceae    | Alexandrium minutum           | x         | x         | x         |           |           |           | x          |            |            |            |
| Dinophyceae    | Alexandrium ostenfeldii       | x         | x         | x         |           |           |           | x          | x          |            |            |
| Dinophyceae    | Alexandrium pseudogonyaulax   |           | x         | x         |           |           |           |            |            |            |            |



| KLASS       | Species                     | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|-------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Dinophyceae | Alexandrium spp             | x         | x         | x         | x         | x         |           |            |            |            |            |
| Dinophyceae | Alexandrium tamarense       | x         | x         | x         |           | x         |           |            |            |            |            |
| Dinophyceae | Alexandrium/Fragilidium spp | x         |           |           |           |           |           |            |            |            |            |
| Dinophyceae | Amphidinium spp             | x         | x         | x         | x         | x         | x         |            |            | x          |            |
| Dinophyceae | Amylax triacantha           | x         | x         | x         | x         | x         | x         | x          | x          |            |            |
| Dinophyceae | Ceratium arietinum          |           |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Ceratium furca              | x         | x         | x         | x         | x         |           |            |            |            |            |
| Dinophyceae | Ceratium fusus              | x         | x         | x         | x         |           |           |            |            |            |            |
| Dinophyceae | Ceratium horridum           | x         | x         | x         | x         |           |           |            |            |            |            |
| Dinophyceae | Ceratium lineatum           | x         | x         | x         |           |           | x         |            |            |            |            |
| Dinophyceae | Ceratium longipes           | x         | x         | x         | x         | x         |           |            |            |            |            |
| Dinophyceae | Ceratium macroceros         | x         | x         | x         |           | x         |           |            |            |            |            |
| Dinophyceae | Ceratium tripos             | x         | x         | x         | x         |           | x         |            |            |            |            |
| Dinophyceae | Cladopyxis setifera         |           |           |           | x         |           | x         |            |            |            |            |
| Dinophyceae | Cochlodinium helix          | x         |           |           |           |           |           |            |            |            |            |
| Dinophyceae | Dinophyceae spp             | x         |           |           | x         | x         | x         |            | x          | x          | x          |
| Dinophyceae | Dinophysis acuminata        | x         | x         | x         | x         | x         | x         | x          | x          | x          |            |
| Dinophyceae | Dinophysis acuta            | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Dinophysis dens             | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Dinophysis norvegica        | x         | x         | x         | x         | x         | x         | x          | x          |            |            |
| Dinophyceae | Dinophysis spp              | x         |           | x         | x         |           |           |            |            |            |            |
| Dinophyceae | Diplopsalopsis orbicularis  |           |           |           |           |           | x         |            |            |            |            |
| Dinophyceae | Dissodinium pseudolunula    |           | x         |           |           |           |           |            |            |            |            |
| Dinophyceae | Durinskia baltica           |           |           |           | x         | x         | x         |            |            |            |            |
| Dinophyceae | Fragilidium spp             |           |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Fragilidium subglobosum     | x         |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Glenodinium spp             |           |           | x         |           |           |           | x          | x          | x          | x          |
| Dinophyceae | Gonyaulax digitale          | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gonyaulax spinifera         |           |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gonyaulax spp               | x         | x         | x         | x         | x         | x         |            |            | x          |            |
| Dinophyceae | Gonyaulax verior            | x         | x         | x         | x         |           | x         | x          | x          |            |            |
| Dinophyceae | Gymnodiniales spp           | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Dinophyceae | Gymnodinium chlorophorum    |           | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gymnodinium elongatum       |           | x         |           |           |           |           |            |            |            |            |

| KLASS       | Species                     | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|-------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Dinophyceae | Gymnodinium galeatum        | x         |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gymnodinium halophilum      |           |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gymnodinium lohmannii       | x         |           |           |           |           |           |            |            |            |            |
| Dinophyceae | Gymnodinium micrum          |           |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gymnodinium simplex         | x         | x         | x         | x         | x         | x         | x          |            | x          |            |
| Dinophyceae | Gymnodinium spp             | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Dinophyceae | Gymnodinium verruculosum    | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gyrodinium estuariale       | x         |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gyrodinium flagellare       | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Gyrodinium spp              | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Dinophyceae | Heterocapsa cf. minima      | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Heterocapsa minima          | x         | x         | x         | x         | x         |           |            |            |            |            |
| Dinophyceae | Heterocapsa rotundata       | x         | x         | x         | x         | x         |           | x          | x          | x          | x          |
| Dinophyceae | Heterocapsa spp             | x         | x         | x         | x         | x         | x         |            |            |            |            |
| Dinophyceae | Heterocapsa triquetra       | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Dinophyceae | Karenia mikimotoi           | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Karenia spp                 | x         |           |           |           |           |           |            |            |            |            |
| Dinophyceae | Karlodinium micrum          | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Katodinium spp              |           | x         | x         |           |           |           |            |            | x          | x          |
| Dinophyceae | Lessardia elongata          | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Lingulodinium polyedrum     | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Lingulodinium spp           | x         |           |           |           |           |           |            |            |            |            |
| Dinophyceae | Micracanthodinium claytonii | x         |           | x         |           |           |           | x          | x          |            |            |
| Dinophyceae | Micracanthodinium setiferum | x         | x         |           | x         | x         | x         |            |            |            |            |
| Dinophyceae | Nematopsis vigilans         | x         |           |           |           | x         |           |            |            |            |            |
| Dinophyceae | Oblea rotunda complex       | x         | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Oxytoxum criophilum         | x         |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Oxytoxum gracile            |           | x         | x         |           |           |           |            |            |            |            |
| Dinophyceae | Oxytoxum spp                | x         |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Peridinales spp             | x         | x         | x         | x         | x         | x         |            |            | x          |            |
| Dinophyceae | Peridiniella catenata       |           |           | x         | x         | x         | x         | x          | x          | x          | x          |
| Dinophyceae | Peridiniella danica         |           |           | x         |           |           |           |            |            |            |            |
| Dinophyceae | Peridiniopsis balticum      |           |           |           |           |           |           |            |            | x          |            |
| Dinophyceae | Peridinium spp              |           |           |           |           |           |           |            |            | x          |            |

| KLASS         | Species                     | AREA 1 | AREA 2 | AREA 3 | AREA 5 | AREA 6 | AREA 9 | AREA 10 | AREA 11 | AREA 13 | AREA 14 |
|---------------|-----------------------------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|
| Dinophyceae   | Phalacroma rotundatum       | x      | x      | x      | x      | x      | x      | x       | x       | x       |         |
| Dinophyceae   | Prorocentrum aporum         |        |        | x      |        |        |        |         |         |         |         |
| Dinophyceae   | Prorocentrum balticum       |        | x      |        | x      | x      |        |         |         |         |         |
| Dinophyceae   | Prorocentrum lima           | x      |        |        |        |        |        |         |         |         |         |
| Dinophyceae   | Prorocentrum micans         | x      | x      | x      | x      |        | x      |         |         |         |         |
| Dinophyceae   | Prorocentrum minimum        | x      | x      | x      | x      | x      | x      | x       | x       |         |         |
| Dinophyceae   | Prorocentrum redfieldii     | x      |        | x      |        |        |        |         |         |         |         |
| Dinophyceae   | Prorocentrum spp            |        |        | x      |        |        |        |         |         |         |         |
| Dinophyceae   | Prorocentrum triestinum     | x      |        | x      |        |        |        |         |         |         |         |
| Dinophyceae   | Protoceratium reticulatum   | x      | x      | x      |        |        |        | x       | x       |         |         |
| Dinophyceae   | Protoperdinium breve        |        | x      | x      |        |        |        |         |         |         |         |
| Dinophyceae   | Pyrophacus horologicum      | x      |        |        |        |        |        | x       | x       |         |         |
| Dinophyceae   | Scrippsiella malmogiense    |        |        |        | x      | x      | x      | x       | x       | x       | x       |
| Dinophyceae   | Scrippsiella spp            | x      | x      | x      | x      | x      |        |         |         |         |         |
| Dinophyceae   | Scrippsiella trochoidea     |        | x      | x      | x      | x      |        |         |         |         |         |
| Dinophyceae   | Scrippsiella trochoidea     |        | x      | x      | x      |        |        |         |         |         |         |
| Dinophyceae   | Scrippsiella-complex spp    | x      | x      | x      | x      |        |        |         |         |         |         |
| Dinophyceae   | Scrippsiella-group spp      | x      | x      | x      | x      |        |        |         |         |         |         |
| Dinophyceae   | Torodinium robustum         | x      | x      | x      |        |        |        |         |         |         |         |
| Dinophyceae   | Torodinium spp              |        |        | x      |        |        |        |         |         |         |         |
| Dinophyceae   | Torodinium spp              | x      | x      |        |        |        |        |         |         |         |         |
| Dinophyceae   | Warnowia polyphemus         | x      |        |        |        |        |        |         |         |         |         |
| Chrysophyceae | Actinomonas spp             | x      |        |        |        |        |        |         |         |         |         |
| Chrysophyceae | Apedinella radians          | x      | x      |        | x      |        |        |         |         |         |         |
| Chrysophyceae | Apedinella spinifera        | x      |        | x      |        |        |        |         |         |         |         |
| Chrysophyceae | Chrysophyceae spp           |        |        |        |        |        |        |         |         |         |         |
| Chrysophyceae | Dinobryon balticum          | x      | x      | x      | x      | x      | x      | x       | x       | x       | x       |
| Chrysophyceae | Dinobryon divergens         |        | x      |        |        |        |        |         |         |         |         |
| Chrysophyceae | Dinobryon faculiferum       | x      | x      | x      | x      | x      | x      | x       | x       | x       | x       |
| Chrysophyceae | Dinobryon spp               | x      |        | x      | x      | x      | x      | x       | x       | x       | x       |
| Chrysophyceae | Meringosphaera mediterranea |        |        |        |        |        |        |         |         |         |         |
| Chrysophyceae | Ochromonadales spp          |        |        |        |        |        |        |         |         | x       |         |
| Chrysophyceae | Ochromonas spp              |        |        |        |        |        |        |         |         |         |         |
| Chrysophyceae | Ollicola vangoorii          |        | x      | x      |        |        |        |         |         |         |         |

| KLASS            | Species                       | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|------------------|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Chrysophyceae    | Paulinella ovalis             | x         |           | x         |           |           |           |            |            |            |            |
| Chrysophyceae    | Pedinella hexacostata         |           |           |           |           |           |           |            |            | x          | x          |
| Chrysophyceae    | Pedinellales spp              |           |           |           |           |           |           |            |            | x          | x          |
| Chrysophyceae    | Pseudopedinella cf. pyriforme | x         |           |           |           |           |           |            |            |            |            |
| Chrysophyceae    | Pseudopedinella elastica      |           |           |           |           |           |           |            |            | x          |            |
| Chrysophyceae    | Pseudopedinella pyriforme     |           | x         | x         |           | x         | x         | x          | x          | x          |            |
| Chrysophyceae    | Pseudopedinella spp           | x         | x         | x         | x         | x         | x         | x          |            | x          |            |
| Chrysophyceae    | Pseudopedinella tricornata    | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Chrysophyceae    | Uroglena spp                  |           |           |           |           |           |           | x          | x          | x          |            |
| Chrysophyceae    | Uroglena/Lepidochrysis spp    |           |           |           |           |           |           | x          |            |            |            |
| Prymnesiophyceae | Acanthoica quattrosipina      |           | x         |           |           |           |           |            |            |            |            |
| Prymnesiophyceae | Chrysochromulina spp          | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Prymnesiophyceae | Emiliania huxleyi             | x         | x         | x         |           |           |           |            |            |            |            |
| Prymnesiophyceae | Haptophyceae spp              |           |           |           |           |           |           |            |            |            |            |
| Prymnesiophyceae | Haptophyte spp                |           |           |           |           |           |           |            |            | x          | x          |
| Prymnesiophyceae | Pavlova spp                   |           |           | x         |           |           |           |            |            |            |            |
| Prymnesiophyceae | Phaeocystis cells             |           |           | x         |           |           |           |            |            |            |            |
| Prymnesiophyceae | Phaeocystis colony cells      |           |           | x         |           |           |           |            |            |            |            |
| Prymnesiophyceae | Phaeocystis pouchetii         | x         |           |           |           |           |           |            |            |            |            |
| Prymnesiophyceae | Phaeocystis spp               |           | x         |           |           |           |           |            |            |            |            |
| Prymnesiophyceae | Phaeocystis swimmers          |           |           |           |           |           |           |            |            |            |            |
| Prymnesiophyceae | Pleurochrysis carterae        |           |           | x         | x         | x         | x         | x          |            |            |            |
| Prymnesiophyceae | Pleurochrysis spp             |           |           |           | x         | x         | x         |            |            |            |            |
| Prymnesiophyceae | Prymnesium spp                |           |           | x         |           |           |           |            |            | x          |            |
| Raphidophyceae   | Chattonella cf. verruculosa   | x         | x         | x         |           |           |           |            |            |            |            |
| Raphidophyceae   | Chattonella spp               | x         | x         | x         |           |           |           |            |            |            |            |
| Raphidophyceae   | Chattonella verruculosa       |           | x         | x         |           |           |           |            |            |            |            |
| Raphidophyceae   | Heterosigma akashiwo          |           | x         | x         |           |           |           |            |            |            |            |
| Raphidophyceae   | Heterosigma spp               | x         | x         | x         |           |           |           |            |            |            |            |
| Chlorophyceae    | Chlamydomonas spp             |           |           |           |           |           |           |            |            |            |            |
| Chlorophyceae    | Chlorophyceae spp             |           |           |           |           |           |           |            |            | x          | x          |
| Chlorophyceae    | Coccolid spp                  | x         |           |           |           |           |           |            |            | x          | x          |
| Chlorophyceae    | Coelastrum astroideum         |           |           | x         | x         |           |           |            |            |            |            |
| Chlorophyceae    | Desmodesmus maximus           |           |           |           |           |           | x         |            |            |            |            |

| KLASS          | Species                                 | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|----------------|-----------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Chlorophyceae  | Eutramorus spp                          |           |           |           |           |           |           |            |            |            | x          |
| Chlorophyceae  | Monoraphidium contortum                 |           |           |           | x         | x         | x         | x          | x          | x          | x          |
| Chlorophyceae  | Monoraphidium minutum                   |           |           |           |           |           |           | x          | x          |            | x          |
| Chlorophyceae  | Oocystis borgei                         |           |           |           |           |           |           |            |            | x          | x          |
| Chlorophyceae  | Oocystis lacustris                      |           |           |           |           |           |           |            |            | x          | x          |
| Chlorophyceae  | Oocystis spp                            |           |           | x         | x         | x         | x         | x          | x          | x          | x          |
| Chlorophyceae  | Oocystis submarina                      |           |           |           | x         | x         | x         | x          | x          |            |            |
| Chlorophyceae  | Pediastrum boryanum                     |           |           |           | x         |           | x         |            |            |            |            |
| Chlorophyceae  | Pediastrum duplex                       |           |           |           |           |           | x         |            |            |            |            |
| Chlorophyceae  | Planctonema lauterbornii                |           |           | x         | x         | x         | x         |            |            |            |            |
| Chlorophyceae  | Planctonema spp                         |           |           |           | x         | x         | x         |            |            |            |            |
| Chlorophyceae  | Planctonema lauterbornii                |           |           | x         |           |           |           |            |            |            |            |
| Chlorophyceae  | Quadracoccus euryhalinus                |           |           | x         |           |           |           |            |            |            |            |
| Chlorophyceae  | Scenedesmus acutus                      |           |           |           |           |           |           |            |            |            | x          |
| Chlorophyceae  | Scenedesmus ecoris                      |           |           |           |           |           |           |            |            |            | x          |
| Chlorophyceae  | Scenedesmus obliquus                    |           |           |           |           |           |           |            |            |            | x          |
| Chlorophyceae  | Scenedesmus spp                         |           | x         |           | x         |           | x         |            |            | x          | x          |
| Prasinophyceae | Cybor/Pachysph/Ptero spp                | x         | x         | x         |           |           |           |            |            |            |            |
| Prasinophyceae | Cymbomonas tetramitiformis              |           | x         | x         |           |           |           |            | 1X         |            |            |
| Prasinophyceae | Cymbomonas/Pachysphaera/Pterosperma spp |           |           |           |           |           |           |            |            |            |            |
| Prasinophyceae | Halosphaera spp                         | x         | x         |           |           |           |           |            |            |            |            |
| Prasinophyceae | Halosphaera viridis                     |           | x         |           |           |           |           |            |            |            |            |
| Prasinophyceae | Heterophrys myriapoda                   |           |           | x         |           |           |           |            |            |            |            |
| Prasinophyceae | Mantoniella squamata                    |           | x         | x         |           |           |           |            |            | x          |            |
| Prasinophyceae | Micromonas pusilla                      |           |           | x         |           |           |           |            |            | x          |            |
| Prasinophyceae | Micromonas spp                          | x         | x         |           |           |           |           |            |            |            |            |
| Prasinophyceae | Nephroselmis pyriformis                 |           |           | x         |           |           |           |            |            |            |            |
| Prasinophyceae | Nephroselmis spp                        | x         |           | x         | x         | x         | x         |            |            | x          |            |
| Prasinophyceae | Pachysphaera spp                        |           | x         |           |           |           |           |            | 1X         |            |            |
| Prasinophyceae | Prasinophyceae spp                      |           |           | x         |           |           |           |            |            | x          |            |
| Prasinophyceae | Pseudoscurfieldia marina                |           |           | x         |           |           |           |            |            |            |            |
| Prasinophyceae | Pterosperma spp                         |           |           | x         |           |           |           |            |            |            |            |
| Prasinophyceae | Pterosperma vanhoefenii                 | x         | x         | x         |           |           |           |            |            |            |            |
| Prasinophyceae | Pyramimonas disomata                    | x         |           | x         |           |           |           |            |            |            |            |

| KLASS            | Species                     | AREA 1 | AREA 2 | AREA 3 | AREA 5 | AREA 6 | AREA 9 | AREA 10 | AREA 11 | AREA 13 | AREA 14 |
|------------------|-----------------------------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|
| Prasinophyceae   | Pyramimonas longicauda      |        | X      |        |        |        |        |         |         |         |         |
| Prasinophyceae   | Pyramimonas spp             | X      | X      | X      | X      | X      | X      | X       | X       | X       | X       |
| Prasinophyceae   | Pyramimonas virginica       | X      | X      | X      | X      | X      | X      | X       | X       | X       | X       |
| Cryptophyceae    | Cryptomonadales spp         | X      | X      | X      | X      | X      | X      | X       | X       | X       | X       |
| Cryptophyceae    | Cryptomonas spp             | X      | X      | X      |        |        |        |         | X       | X       | X       |
| Cryptophyceae    | Cryptophyceae spp           | X      | X      | X      |        |        |        |         |         | X       | X       |
| Cryptophyceae    | Hemiselmis spp              | X      | X      | X      | X      | X      | X      |         |         | X       |         |
| Cryptophyceae    | Hemiselmis virescens        | X      | X      | X      | X      | X      | X      | X       | X       | X       | X       |
| Cryptophyceae    | Hemiselmis/Plagioselmis sp. |        |        | X      |        |        |        |         |         |         |         |
| Cryptophyceae    | Plagioselmis prolonga       | X      | X      | X      | X      | X      | X      | X       | X       | X       | X       |
| Cryptophyceae    | Plagioselmis spp            | X      |        | X      |        |        |        |         |         |         |         |
| Cryptophyceae    | Rhodomonas marina           |        |        | X      |        |        |        |         |         |         |         |
| Cryptophyceae    | Rhodomonas salina           |        |        | X      |        |        |        |         |         |         |         |
| Cryptophyceae    | Rhodomonas spp              | X      | X      |        |        |        |        |         |         | X       | X       |
| Cryptophyceae    | Teleaulax acuta             | X      | X      | X      | X      | X      | X      |         |         | X       | X       |
| Cryptophyceae    | Teleaulax amphioxeia        | X      | X      | X      | X      | X      | X      |         |         | X       | X       |
| Cryptophyceae    | Teleaulax spp               | X      | X      | X      | X      | X      | X      | X       | X       |         | X       |
| Dictyochophyceae | Dictyocha fibula            |        | X      | X      |        |        |        |         |         |         |         |
| Dictyochophyceae | Dictyocha naked             |        |        | X      |        |        |        |         |         |         |         |
| Dictyochophyceae | Dictyocha speculum          | X      | X      | X      |        |        |        |         |         |         |         |
| Dictyochophyceae | Verrucophora farcimen       |        |        | X      |        |        |        |         |         |         |         |
| Euglenophyceae   | Euglena spp                 | X      | X      |        |        |        |        |         |         |         |         |
| Euglenophyceae   | Eutreptiella braarudii      | X      | X      | X      |        |        |        |         |         |         |         |
| Euglenophyceae   | Eutreptiella gymnastica     | X      |        | X      | X      | X      | X      | X       | X       |         |         |
| Euglenophyceae   | Eutreptiella spp            | X      | X      | X      | X      | X      | X      | X       | X       | X       |         |
| Nostocophyceae   | Anabaena baltica            |        |        | X      |        |        | X      |         |         |         |         |
| Nostocophyceae   | Anabaena cylindrica         |        |        |        | X      |        |        |         |         |         |         |
| Nostocophyceae   | Anabaena flos-aquae         |        |        |        | X      |        |        | X       |         |         |         |
| Nostocophyceae   | Anabaena lemmermannii       |        |        |        | X      |        | X      |         | X       |         |         |
| Nostocophyceae   | Anabaena spiroides          |        |        |        | X      |        | X      |         | X       |         |         |
| Nostocophyceae   | Anabaena spp                |        | X      | X      | X      | X      | X      | X       | X       | X       | X       |
| Nostocophyceae   | Aphanizomenon flos-aquae    |        |        |        |        |        |        |         |         |         |         |
| Nostocophyceae   | Aphanizomenon gracile       |        |        |        |        |        |        | X       |         |         |         |
| Nostocophyceae   | Aphanizomenon spp           |        | X      | X      | X      | X      | X      | X       | X       | X       |         |

| KLASS          | Species                     | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|----------------|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Nostocophyceae | Aphanocapsa incerta         |           |           |           |           | x         | x         |            |            |            |            |
| Nostocophyceae | Aphanocapsa spp             | x         |           | x         | x         |           | x         |            |            | x          | x          |
| Nostocophyceae | Aphanothece bachmannii      |           |           |           | x         |           | x         |            |            |            |            |
| Nostocophyceae | Aphanothece paralleloformis |           |           |           | x         |           | x         |            |            |            |            |
| Nostocophyceae | Aphanothece spp             |           |           | x         | x         |           | x         | x          |            | x          | x          |
| Nostocophyceae | Chroococcales spp           |           |           |           |           |           | x         |            |            | x          | x          |
| Nostocophyceae | Chroococcus limneticus      |           |           |           |           |           | x         |            |            |            |            |
| Nostocophyceae | Chroococcus spp             |           |           |           |           |           |           |            |            | x          |            |
| Nostocophyceae | Coelomoron pusillum         |           |           |           |           | x         | x         |            |            |            |            |
| Nostocophyceae | Coelosphaerium minutissimum |           |           |           |           |           |           |            |            |            | x          |
| Nostocophyceae | Coelosphaerium spp          |           |           |           |           |           |           |            |            | x          |            |
| Nostocophyceae | Cyanobacteria filaments     |           |           | x         |           |           |           |            |            |            |            |
| Nostocophyceae | Cyanodictyon balticum       |           |           |           | x         | x         | x         |            |            |            |            |
| Nostocophyceae | Cyanodictyon imperfectum    |           |           |           | x         | x         | x         |            |            | x          | x          |
| Nostocophyceae | Cyanodictyon planctonicum   |           |           |           | x         | x         | x         |            |            | x          | x          |
| Nostocophyceae | Cyanodictyon spp            |           |           |           | x         | x         | x         | x          |            | x          | x          |
| Cyanophyceae   | Cyanophyceae spp            | x         |           |           |           |           |           |            |            | x          | x          |
| Nostocophyceae | Lemmermanniella pallida     |           |           |           | x         |           | x         |            |            |            |            |
| Nostocophyceae | Lemmermanniella spp         |           |           |           | x         |           | x         |            |            |            | x          |
| Nostocophyceae | Merismopedia spp            | x         |           | x         |           |           |           |            |            | x          | x          |
| Nostocophyceae | Merismopedia tenuissima     |           |           |           | x         |           |           |            |            |            |            |
| Nostocophyceae | Microcystis spp             |           |           |           |           |           | x         |            |            | x          | x          |
| Nostocophyceae | Microcystis viridis         |           |           |           |           |           |           |            |            |            |            |
| Nostocophyceae | Nodularia spp               |           |           |           |           |           |           |            |            | x          |            |
| Nostocophyceae | Nodularia spumigena         | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Nostocophyceae | Phormidium spp              |           |           |           |           |           | x         |            |            |            |            |
| Nostocophyceae | Planktolyngbya spp          |           |           |           |           | x         | x         |            |            |            |            |
| Nostocophyceae | Planktolyngbya subtilis     |           |           |           |           |           |           |            |            | x          | x          |
| Nostocophyceae | Planktothrix agardhii       |           |           |           |           |           | x         |            |            |            |            |
| Nostocophyceae | Pseudanabaena limnetica     |           |           |           |           |           | x         | x          | x          |            |            |
| Nostocophyceae | Pseudanabaena spp           |           | x         | x         | x         | x         | x         |            |            |            | x          |
| Nostocophyceae | Romeria spp                 |           |           |           |           |           |           |            |            | x          | x          |
| Nostocophyceae | Snowella atomus             |           |           |           | x         |           |           |            |            |            |            |
| Nostocophyceae | Snowella litoralis          |           |           |           |           | x         |           |            |            |            |            |

| KLASS             | Species                  | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|-------------------|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Nostocophyceae    | Snowella septentrionalis |           |           |           | x         | x         | x         |            |            | x          | x          |
| Nostocophyceae    | Snowella spp             |           |           |           | x         | x         | x         |            |            | x          | x          |
| Nostocophyceae    | Synechococcus spp        |           |           |           |           |           |           |            |            | x          | x          |
| Nostocophyceae    | Woronichinia compacta    |           |           |           |           |           | x         |            |            | x          | x          |
| Nostocophyceae    | Woronichinia elorantae   |           |           |           | x         | x         | x         |            |            | x          | x          |
| Nostocophyceae    | Woronichinia spp         |           |           |           | x         | x         | x         | x          | x          | x          | x          |
| Choanoflagellidea | Monosiga spp             |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Balanion comatum         |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Cordonellopsis spp       |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Daturella spp            | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Didinium spp             | x         |           |           |           |           |           |            |            |            |            |
| Ciliophora        | Eutintinnus spp          |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Helicostomella spp       | x         |           |           |           |           |           |            |            |            |            |
| Ciliophora        | Helicostomella subulata  | x         | x         | x         |           |           |           |            |            |            |            |
| Ciliophora        | Laboea strobila          | x         | x         | x         |           |           |           |            |            |            |            |
| Ciliophora        | Leegaardiella spp        |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Leegaardiella ovalis     |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Leegaardiella sol        | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Leegaardiella ovalis     | x         |           |           |           |           |           |            |            |            |            |
| Ciliophora        | Lohmanniella oviformis   | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Lohmanniella spp         |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Mesodinium rubrum        | x         | x         | x         | x         | x         | x         | x          | x          | x          | x          |
| Ciliophora        | Parafavella spp          | x         |           |           |           |           |           |            |            |            |            |
| Ciliophora        | Prostomes spp            | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Scuticociliate spp       |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Stenosemella spp         | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Strobilidium sphaericum  |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Strobilidium spp         |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Strombidinopsis spp      |           | x         | x         |           |           |           |            |            |            |            |
| Ciliophora        | Strombidium chlorophilum | x         | x         | x         |           |           |           |            |            |            |            |
| Ciliophora        | Strombidium lynni        |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Strombidium/Tontonia spp |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Tiarina fusus            | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora        | Tintinnid spp            | x         | x         | x         |           |           |           |            |            |            |            |



| KLASS                                                         | Species                 | AREA<br>1 | AREA<br>2 | AREA<br>3 | AREA<br>5 | AREA<br>6 | AREA<br>9 | AREA<br>10 | AREA<br>11 | AREA<br>13 | AREA<br>14 |
|---------------------------------------------------------------|-------------------------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
| Ciliophora                                                    | Tintinnids spp          |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora                                                    | Tintinnopsis spp        | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora                                                    | Tintinnopsis tubulosa   |           |           | x         |           |           |           |            |            |            |            |
| Ciliophora                                                    | Tontonia spp            | x         |           | x         |           |           |           |            |            |            |            |
| Ciliophora                                                    | Uronema spp             |           |           | x         |           |           |           |            |            |            |            |
| Charophyceae                                                  | Closterium acutum       |           |           |           | x         |           |           |            |            |            |            |
| Charophyceae                                                  | Closterium spp          |           |           |           |           | x         |           |            |            |            |            |
| Charophyceae                                                  | Elakatothrix gelatinosa |           |           |           |           |           |           |            |            |            | x          |
| Charophyceae                                                  | Euastrum spp            |           |           |           |           |           |           |            |            | x          |            |
| Charophyceae                                                  | Koliella spiculiformis  |           |           |           |           |           |           |            |            | x          |            |
| Kinetoplastidea                                               | Rhynchobodo sp.         |           |           | x         |           |           |           |            |            |            |            |
| Number off phytoplankton species found during 1999 until 2008 |                         | 259       | 245       | 324       | 150       | 127       | 145       | 97         | 103        | 134        | 119        |

## APPENDIX H

### Figures of chl-a and secchi

In the following figures, the parameters are presented as time series. Each parameter is divided into spring, summer and autumn figures. For area 1 to 3, the spring months are February through April, the summer months the next three following months and the autumn months the three months after that. For area 4 to 14, the spring months are March through May, the summer months the next three following months and the autumn months the three months after that.

All data from each area is presented hence the time series vary in length. When the amount of data points is sufficient, both a linear regression and non-linear (non-parametric) analysis have been supplied on the data sets to analyse the last 15 years (19794 to 2008) for possible trends.

The black dots in the figures represent each observation. The black line is the yearly mean of the season and the dashed black lines represent the standard deviation of the mean values. The red line displays the maximum observations and the blue the minimum observations. In the case there are sufficient data to analyse for trends. There is a green line representing the best fit of a linear regression of the first order for the last 15 years. The dashed green lines represent the 95% confidence interval for the linear trend. The inserted text box in most figures gives some indication as to if there is a significant trend present. In the first part of the text box, with the letters LR, the inclination of the linear regression line is presented followed by the letter x. The y value of where the line crosses the y-axis is not included in the text box. If LR is positive, the direction of the line is positive and vice versa. The two following numbers in the text box belong to the non-linear seasonal Mann-Kendall analysis. To find the slope of a possible trend, all the differences between two observations in all the data are sorted from the highest negative

difference to the highest positive difference. The B value is the median value of all the differences. The NL P value is the significance of the trend. If the NL P value is less than 0.05, the trend is significant. There are two additional values connected to the Mann-Kendall slope value B that is excluded from the figures, but included in tables in the following appendix. The two values represent the 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the two values differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the LR and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

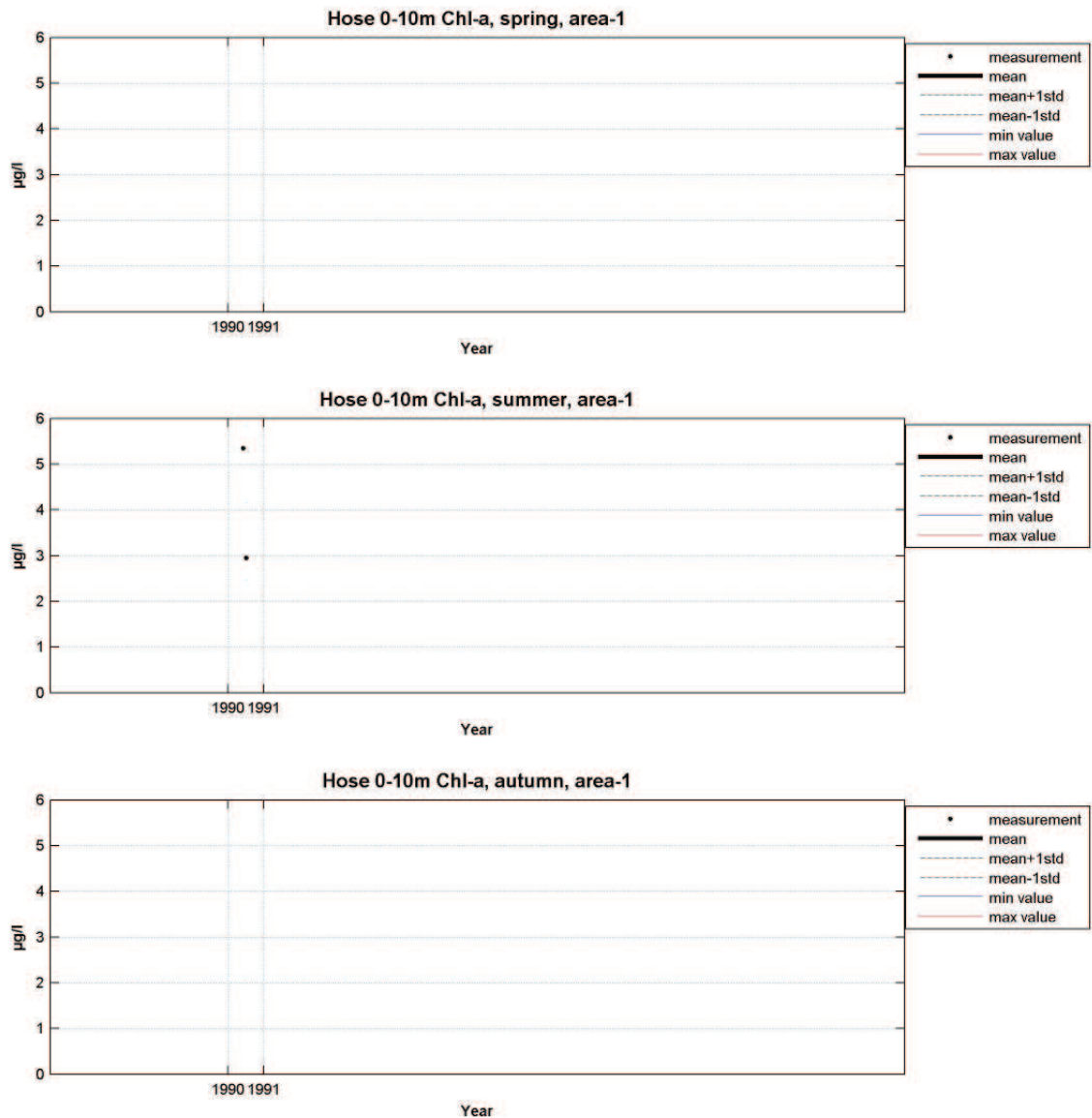


Figure 118. The west-coast inside the skerries, Area 1, Chl a from integrated samples taken by hose (0-10 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

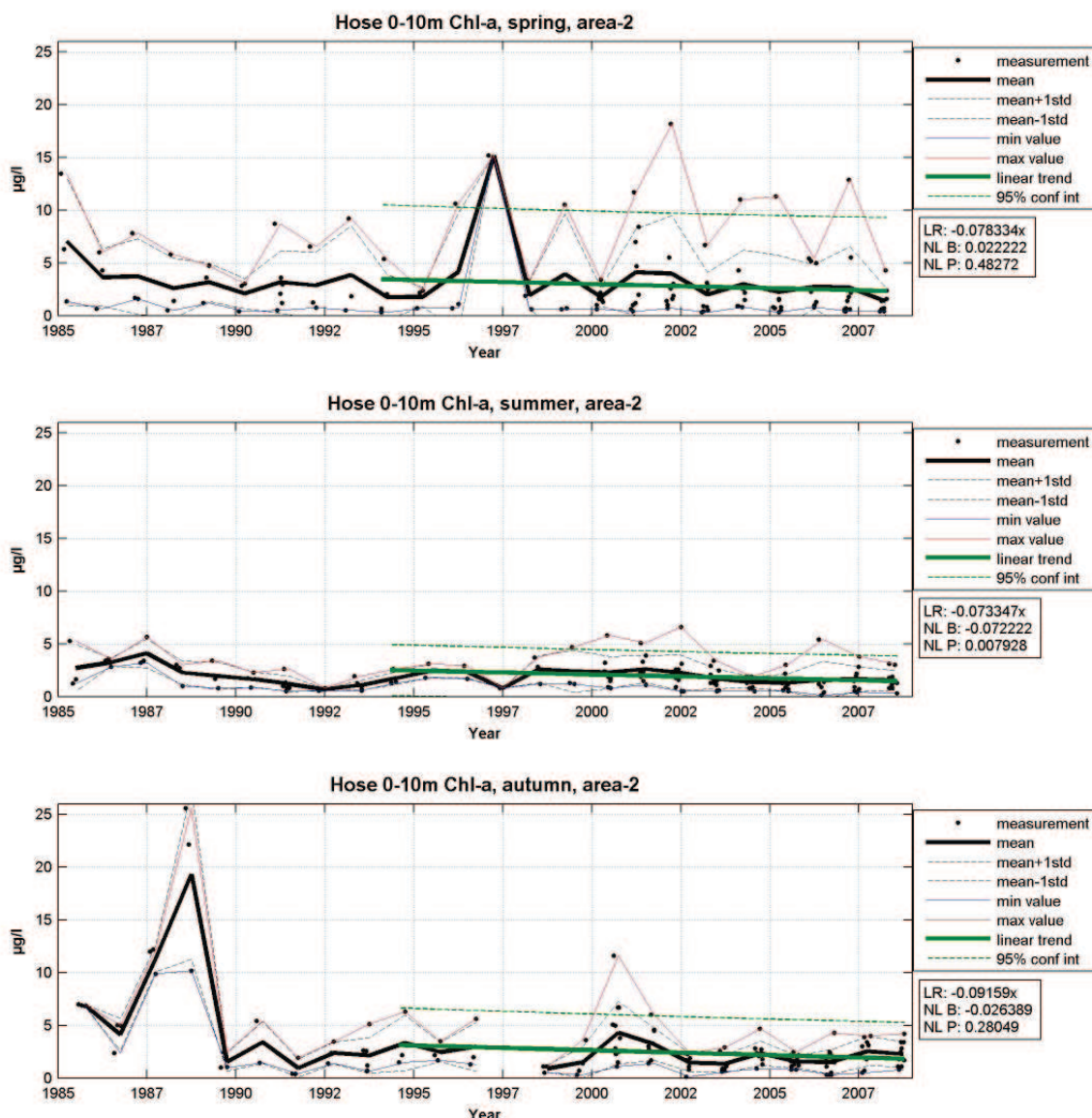


Figure 119. The Skagerrak, Area 2, Chl a from integrated samples taken by hose (0-10 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

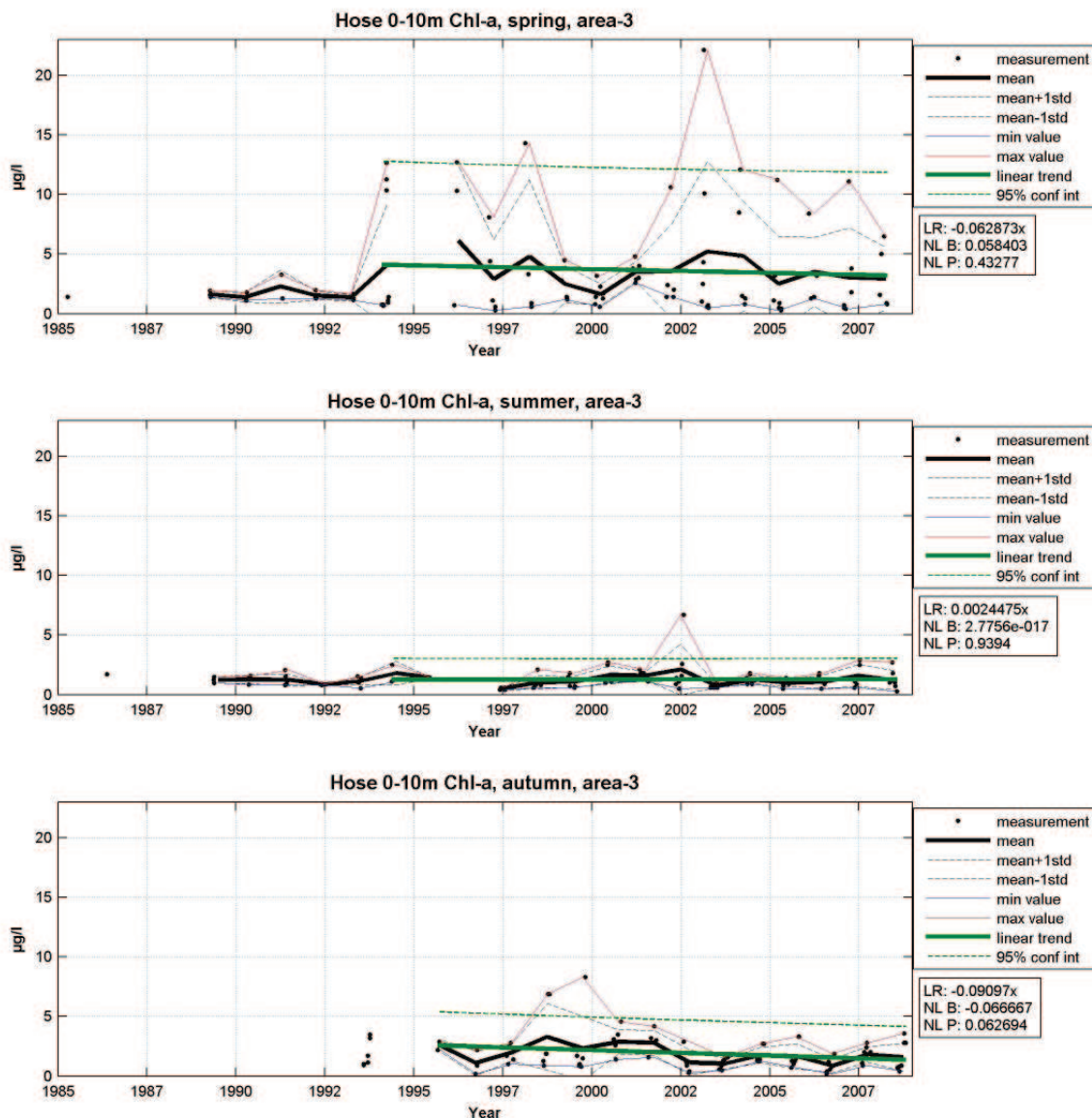


Figure 120. The Kattegat, Area 3, Chl a from integrated samples taken by hose (0-10 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean +/- 1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



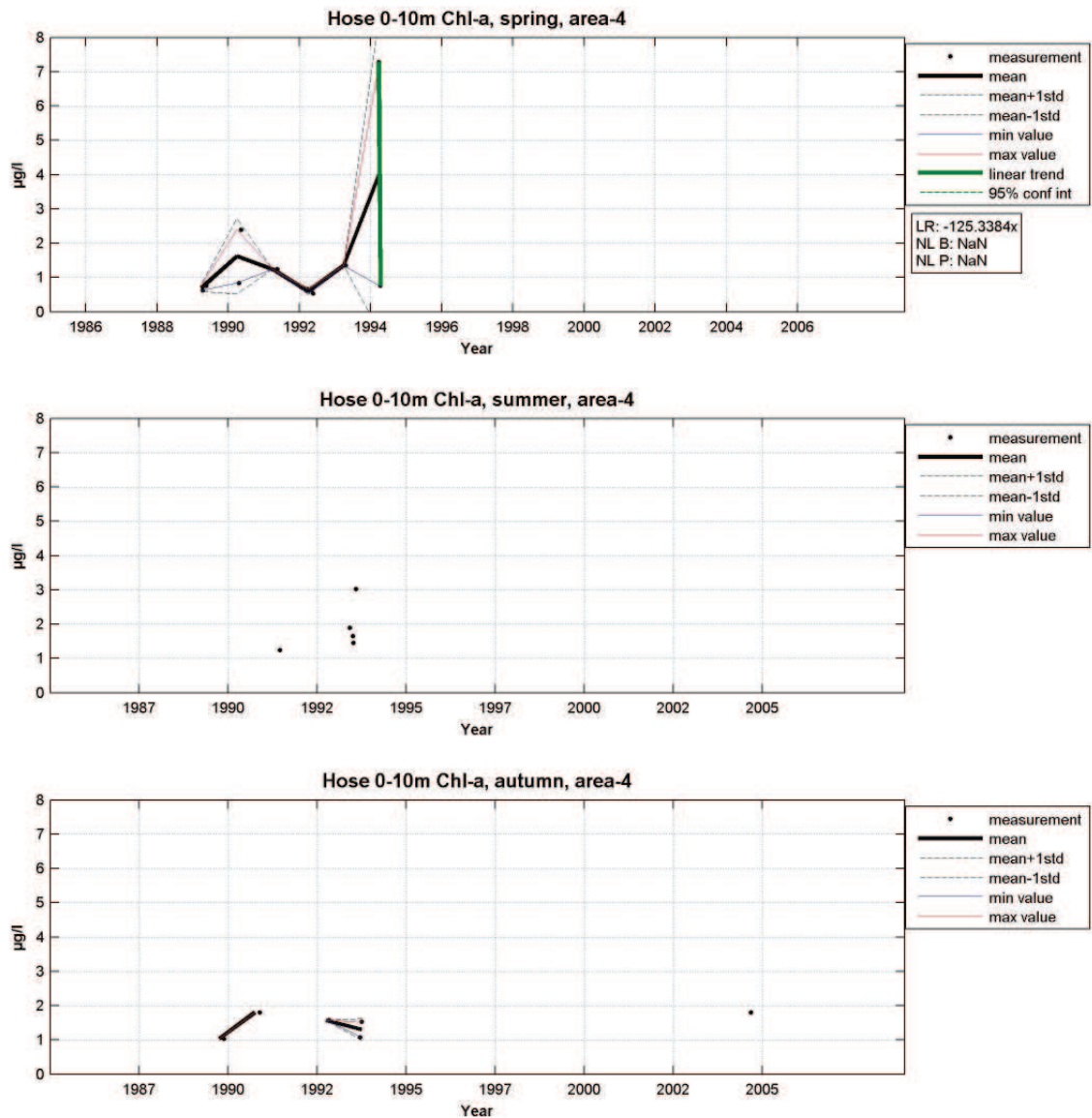


Figure 121. The Sound, Area 4, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

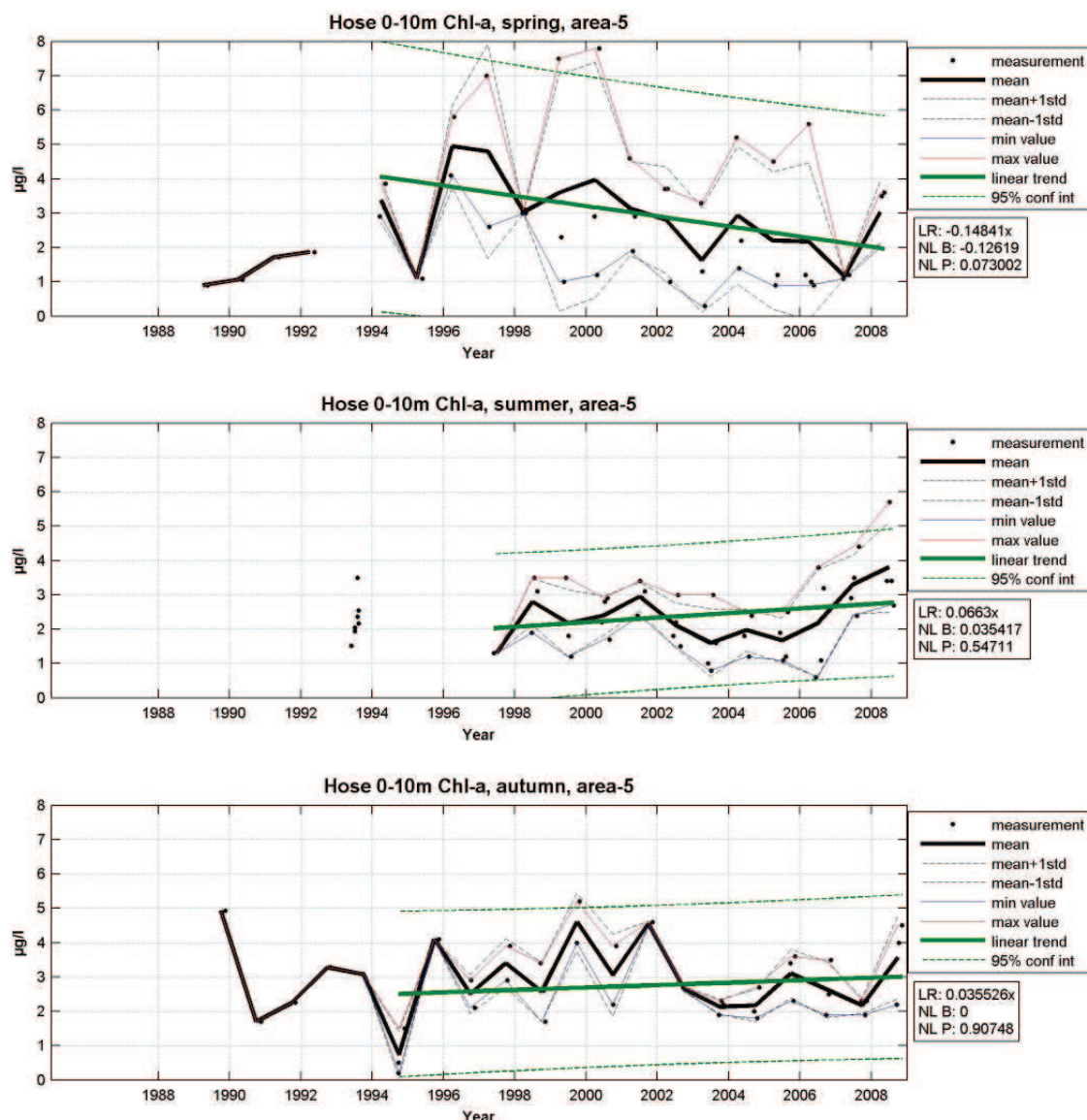


Figure 122. The Arkona Basin, Area 5, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

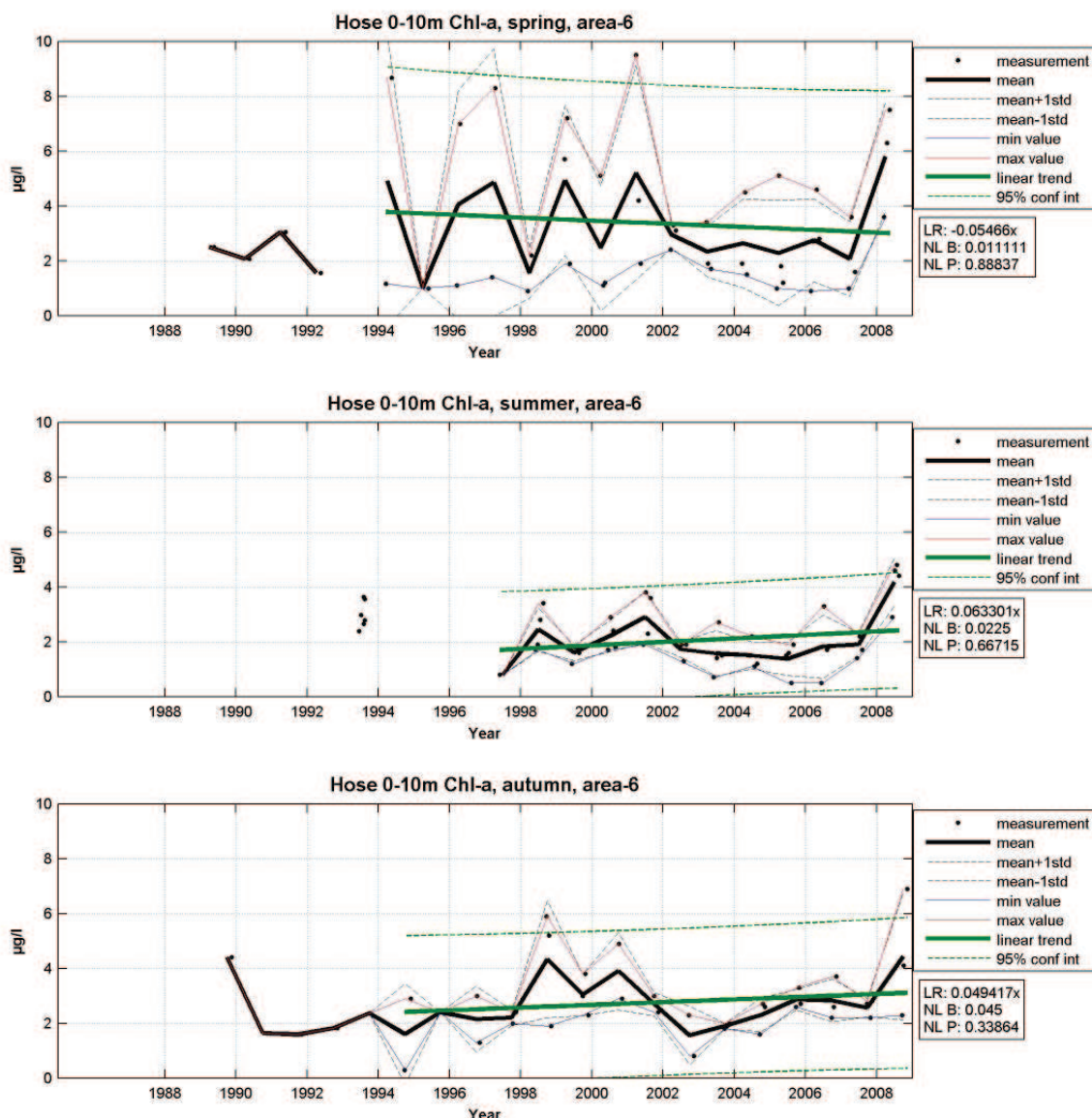


Figure 123. The Bornholm Basin, Area 6, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



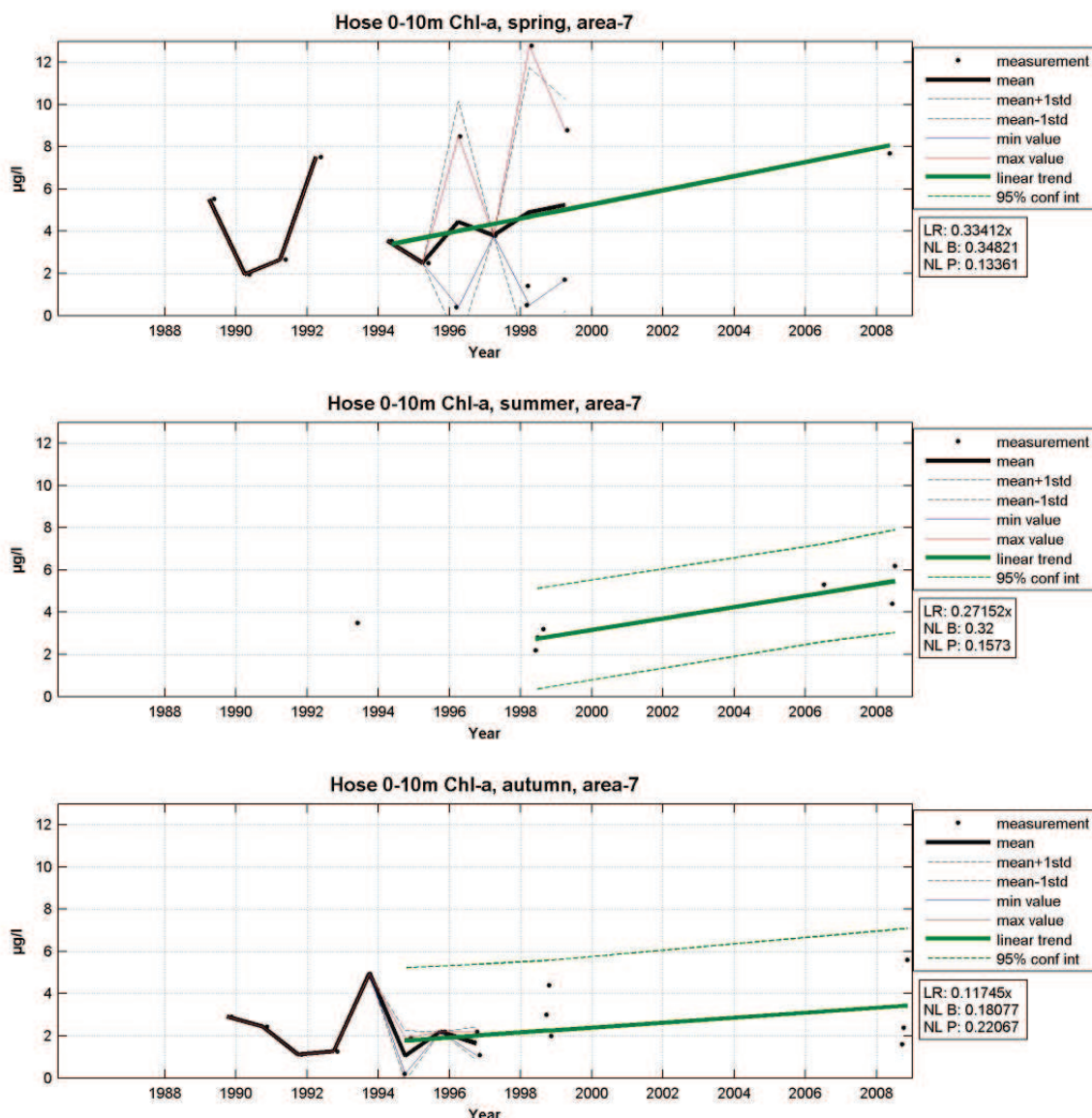


Figure 124. The South-eastern Baltic Proper, Area 7, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

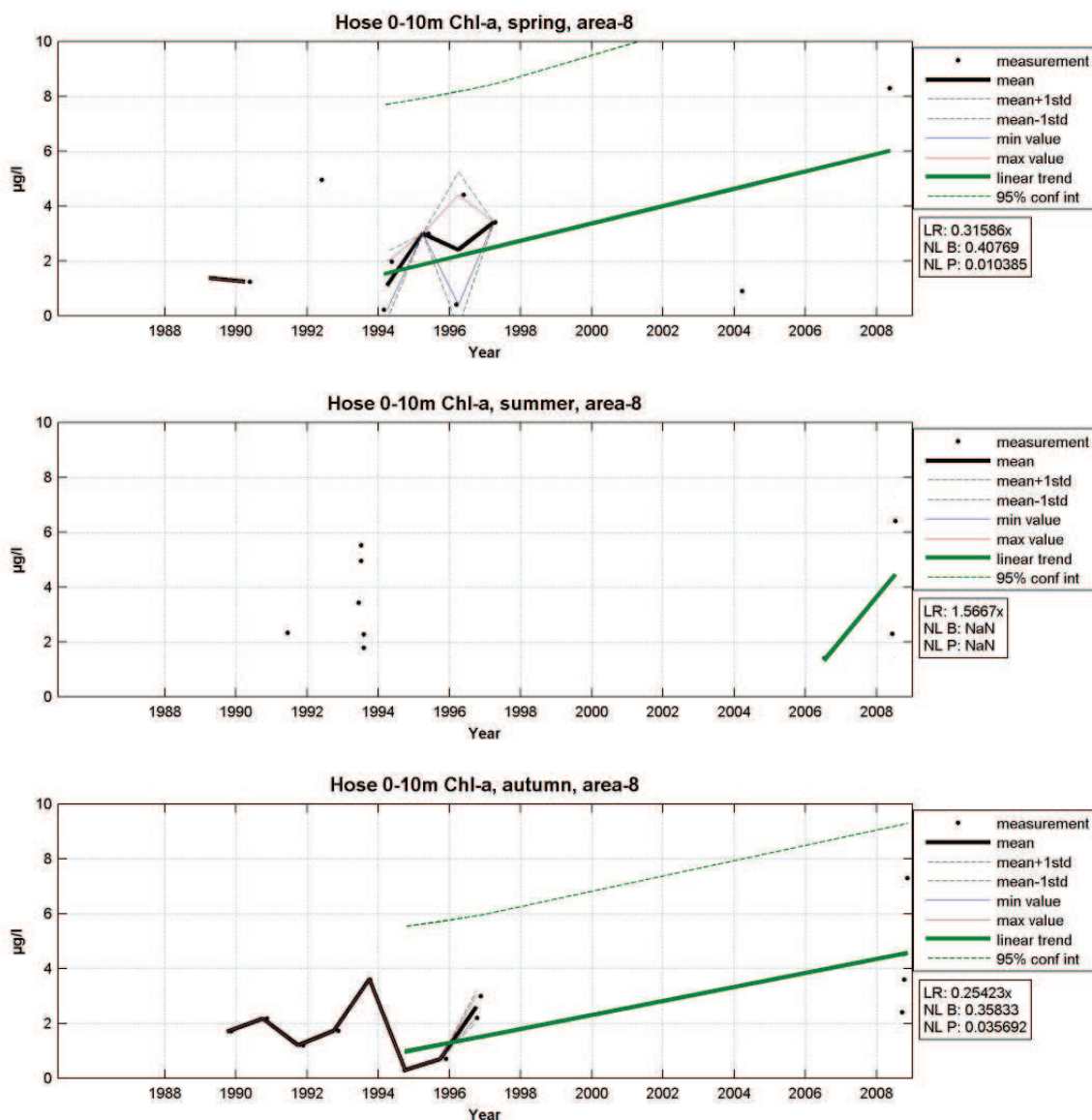


Figure 125. The Western Gotland Basin, Area 8, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

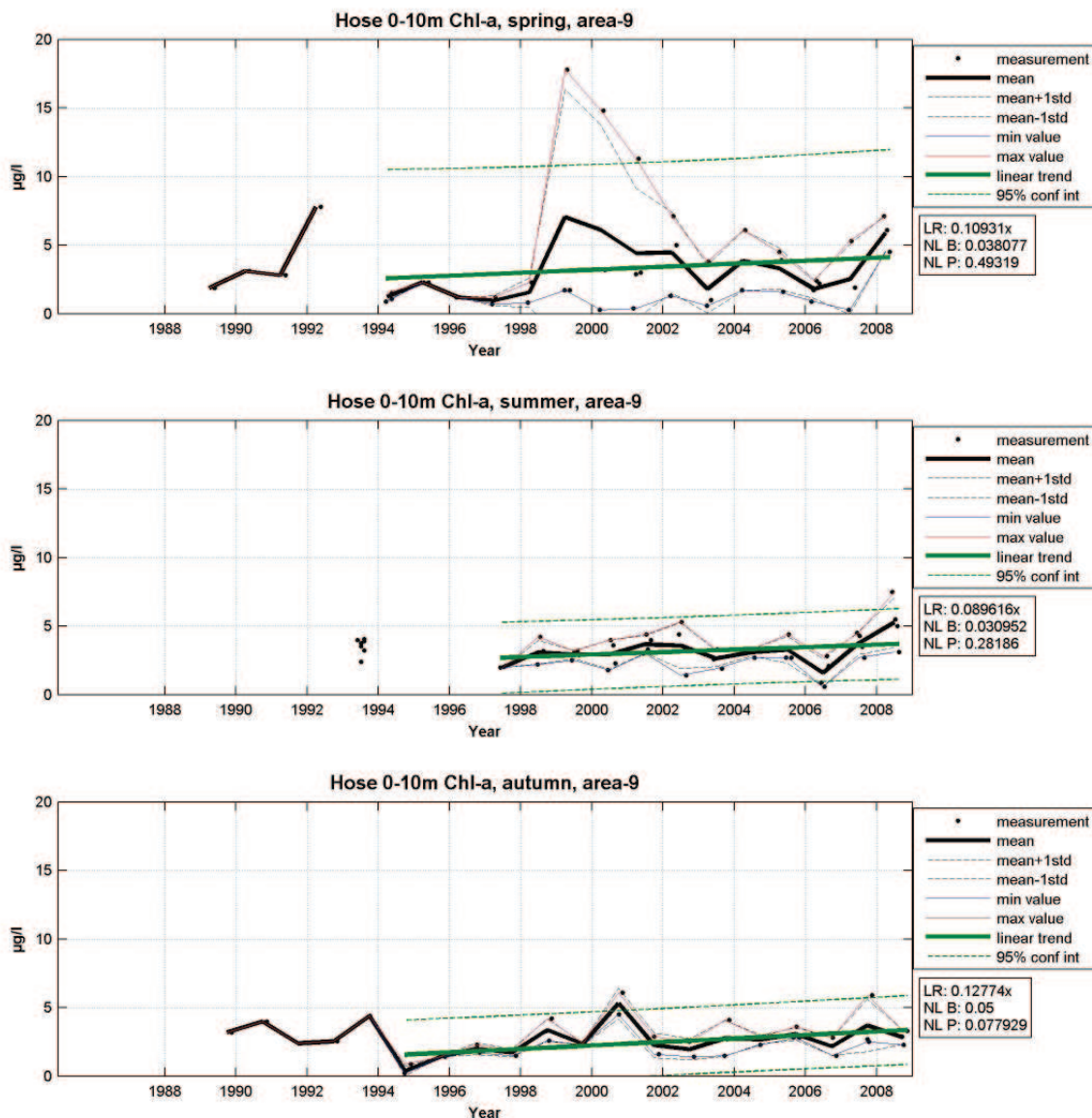


Figure 126. The Eastern Gotland Basin, Area 9, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

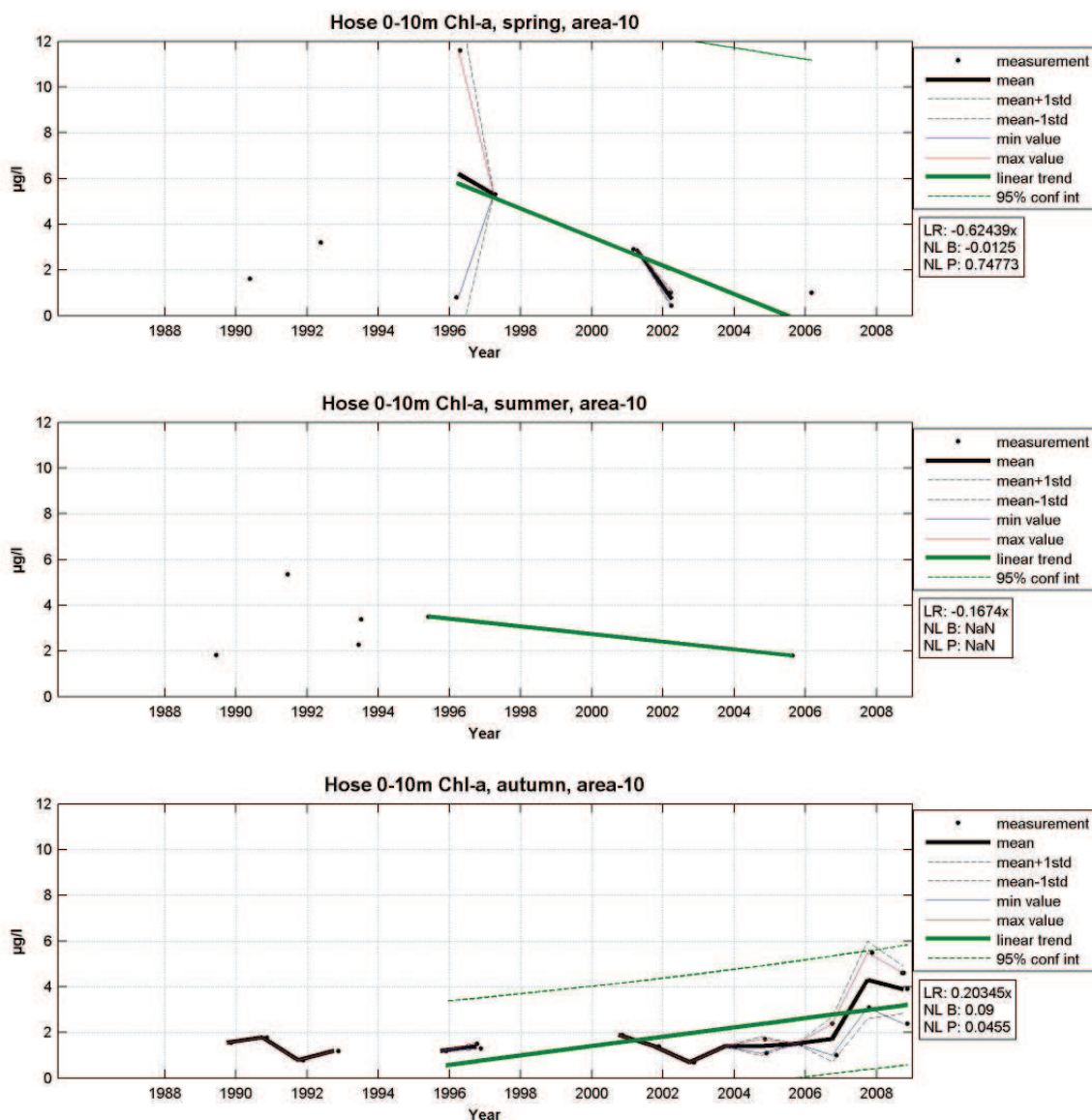


Figure 127. The Northern Baltic Proper, Area 10, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



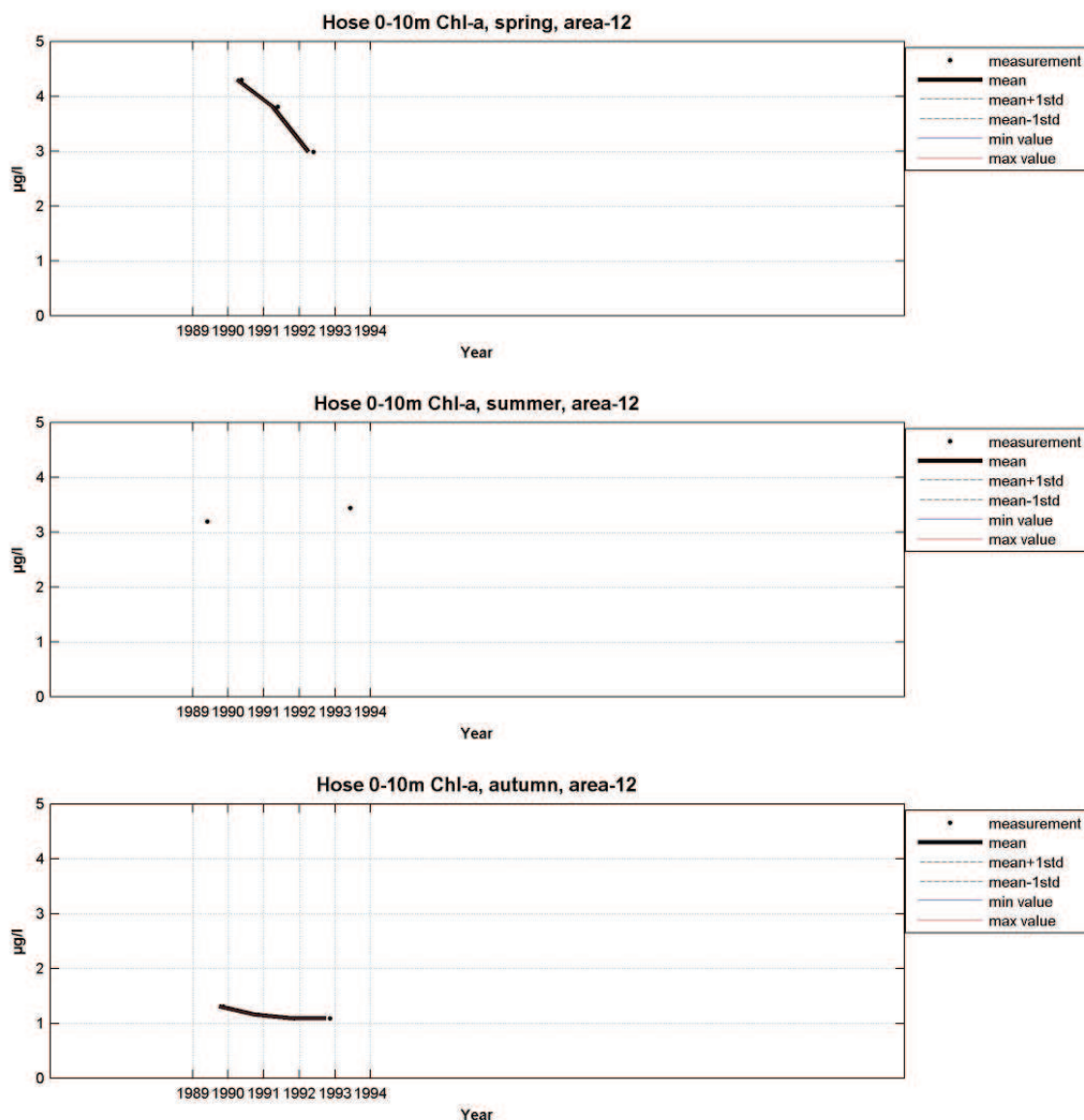


Figure 128. The Åland Sea, Area 12, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

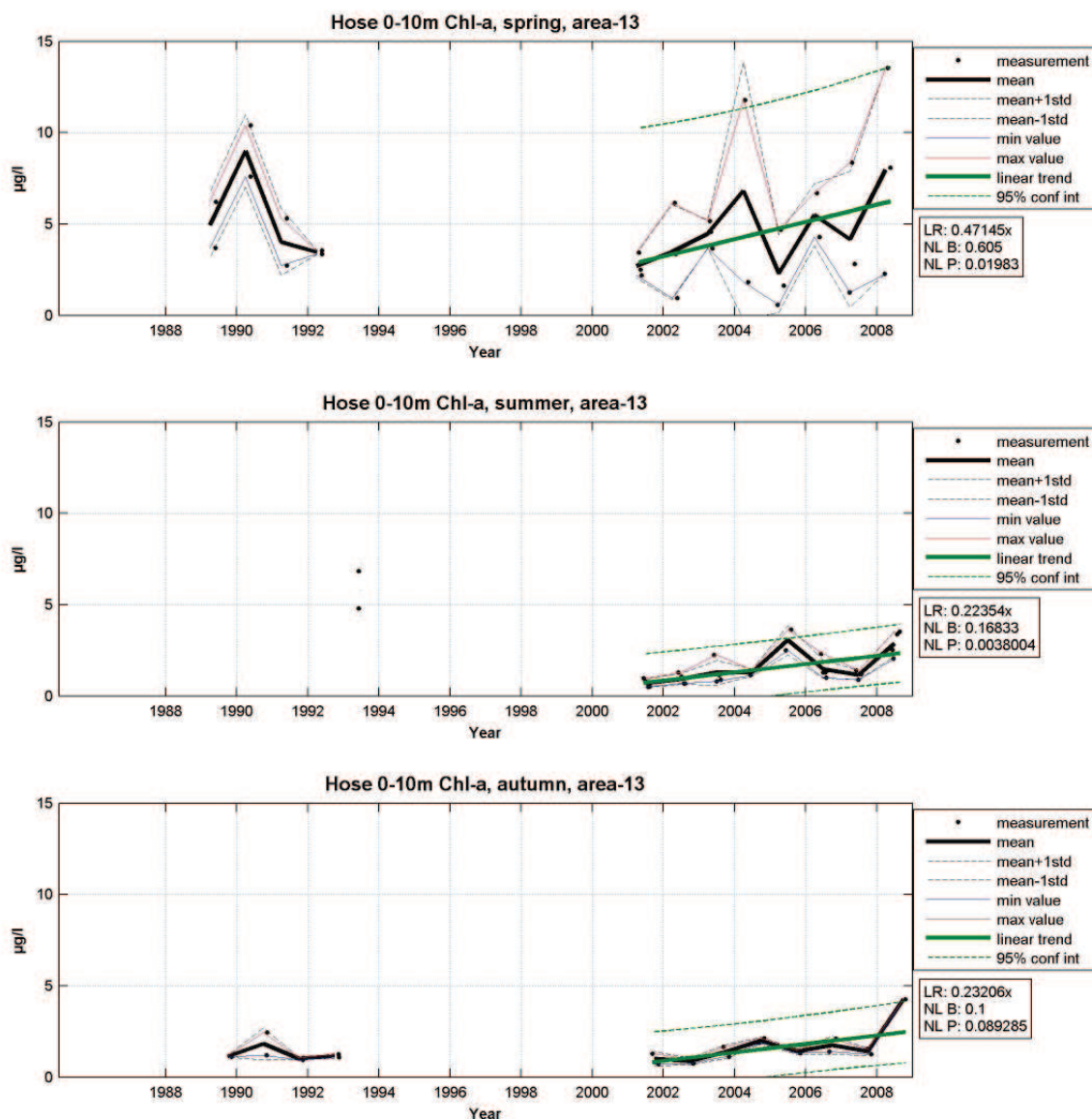


Figure 129. The Bothnian Sea, Area 13, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

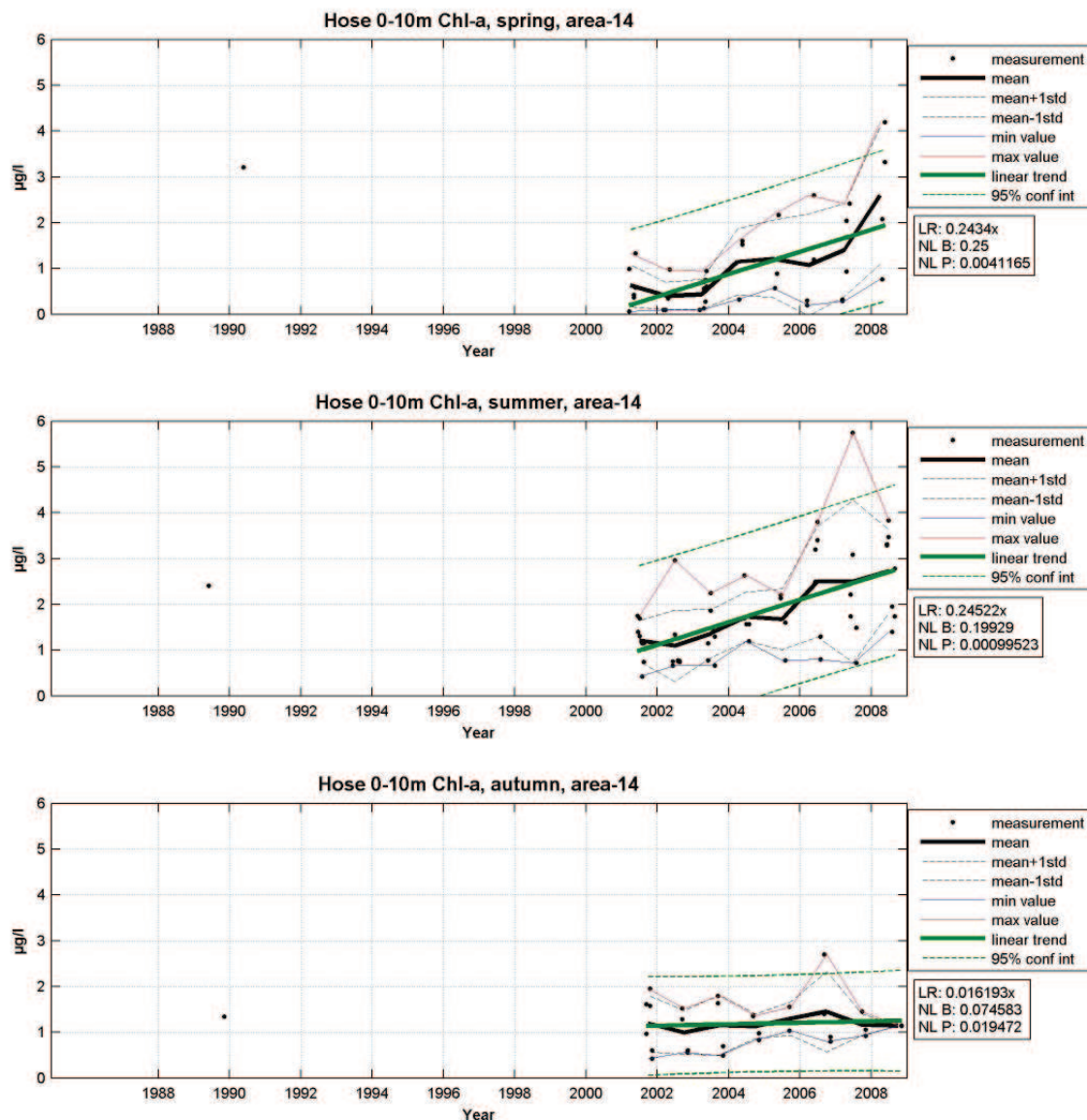


Figure 130. The Bothnian Bay, Area 14, Chl a from integrated samples taken by hose (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

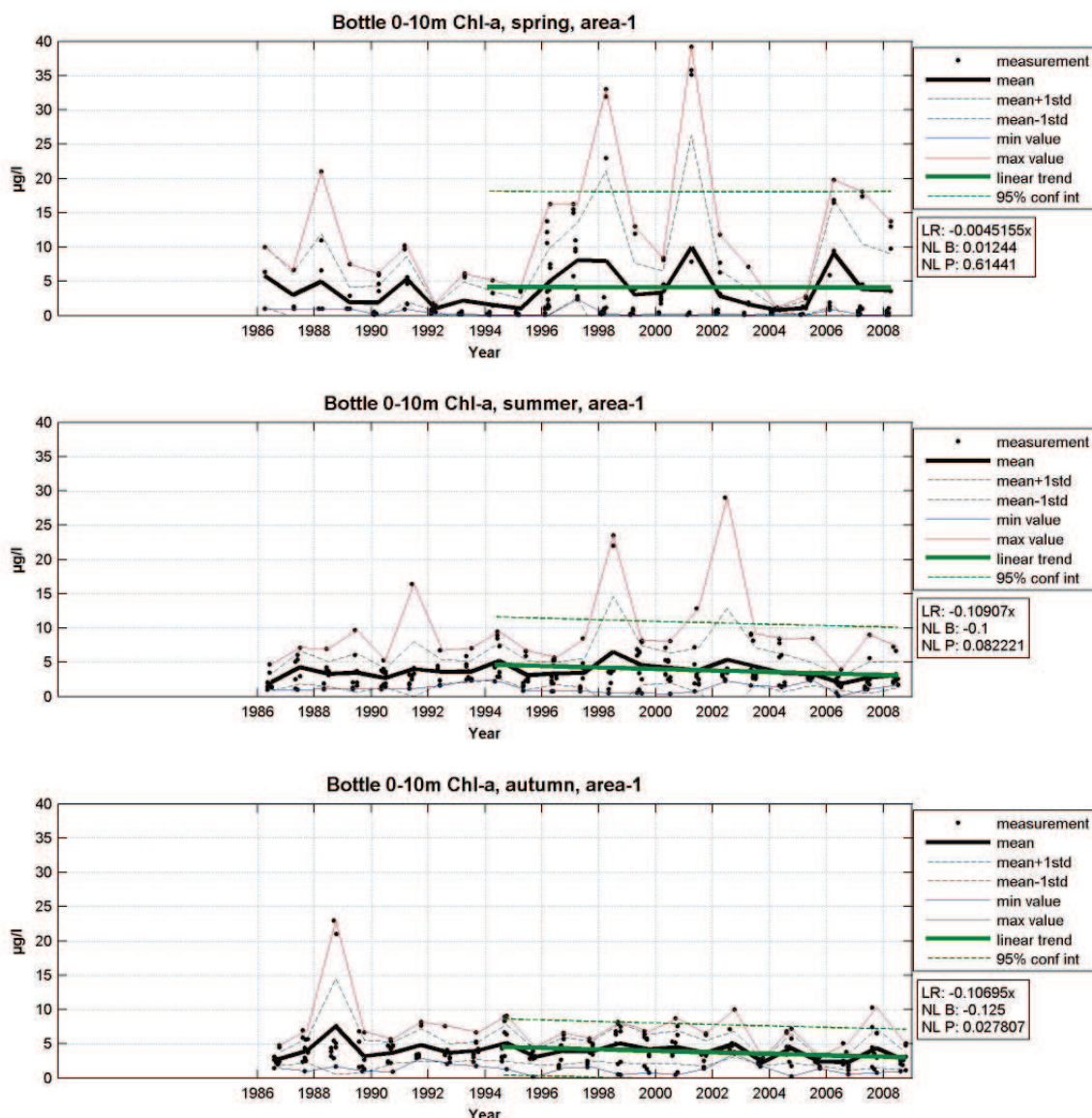


Figure 131. The west-coast inside the skerries, Area 1, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



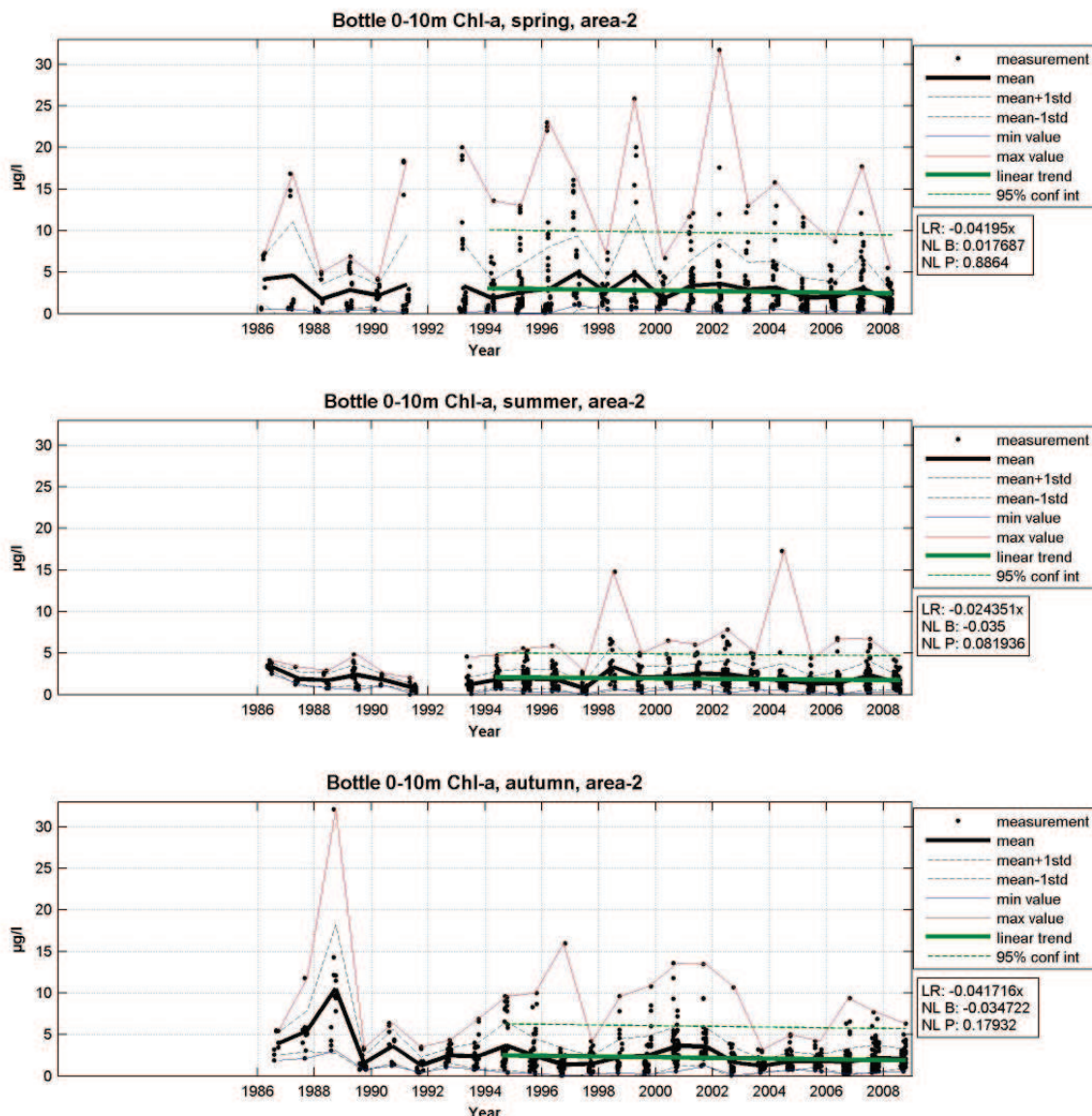


Figure 132. The Skagerrak, Area 2, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean +/- 1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

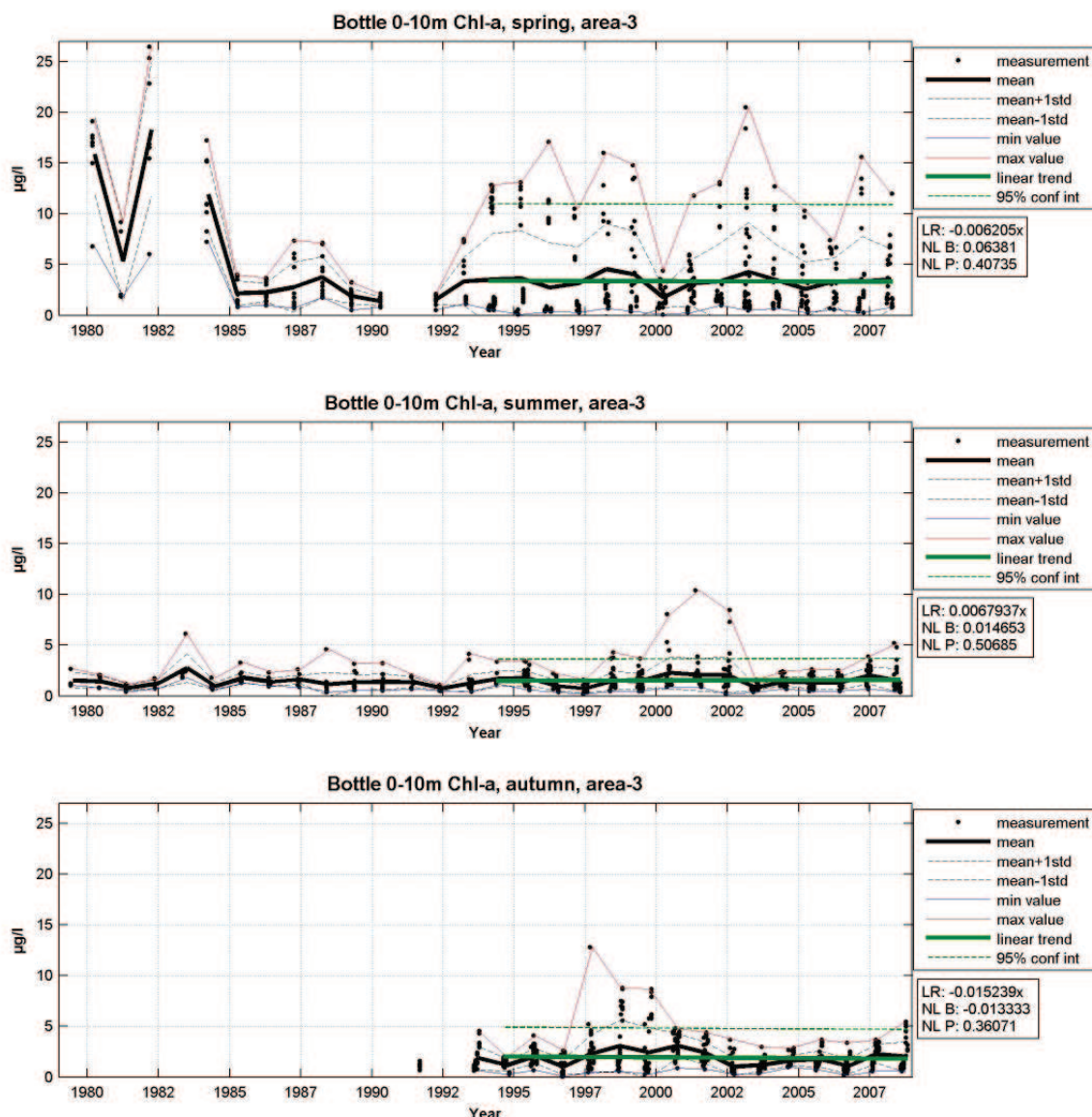


Figure 133. The Kattegat, Area 3, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

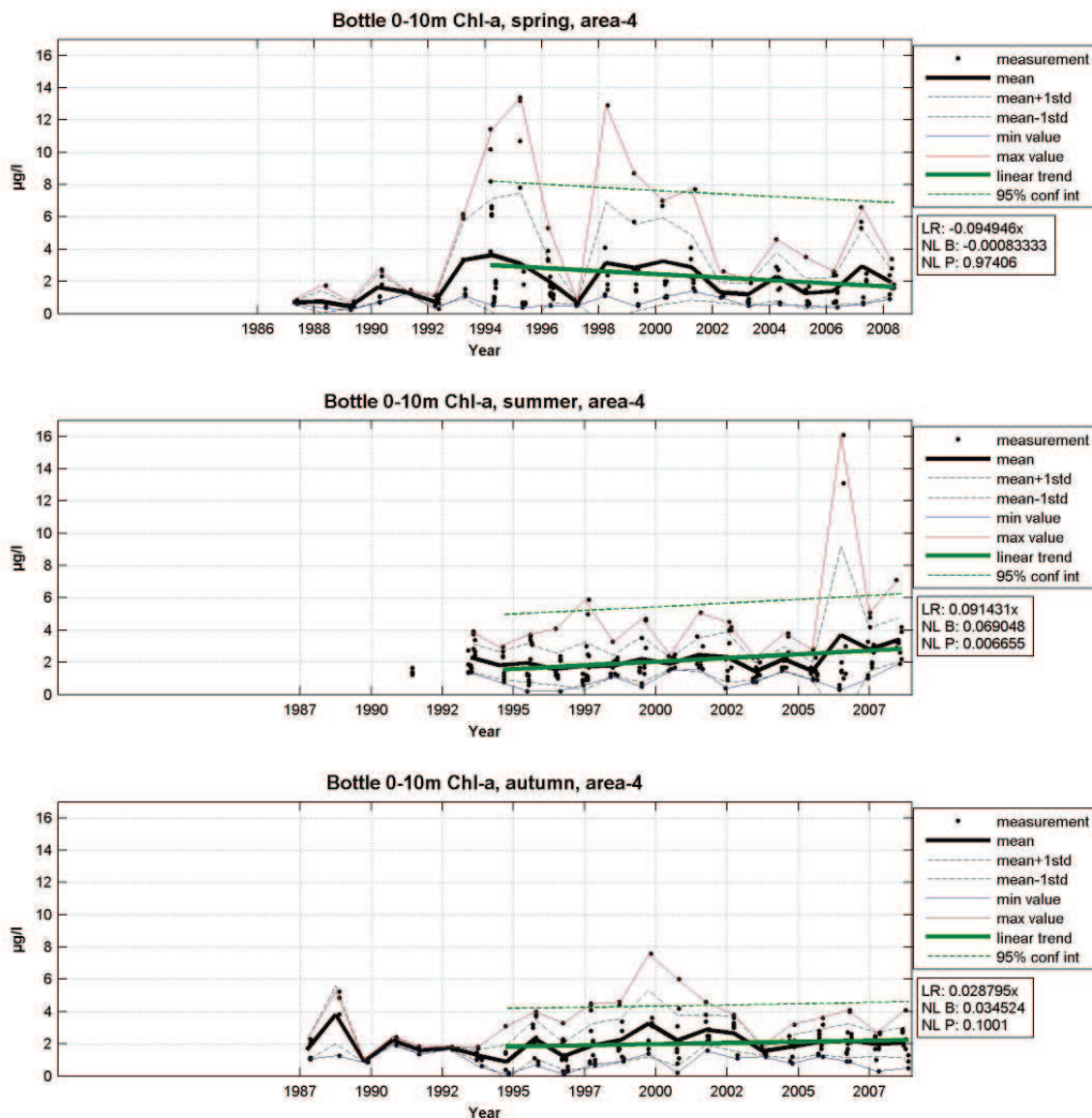


Figure 134. The Sound, Area 4, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



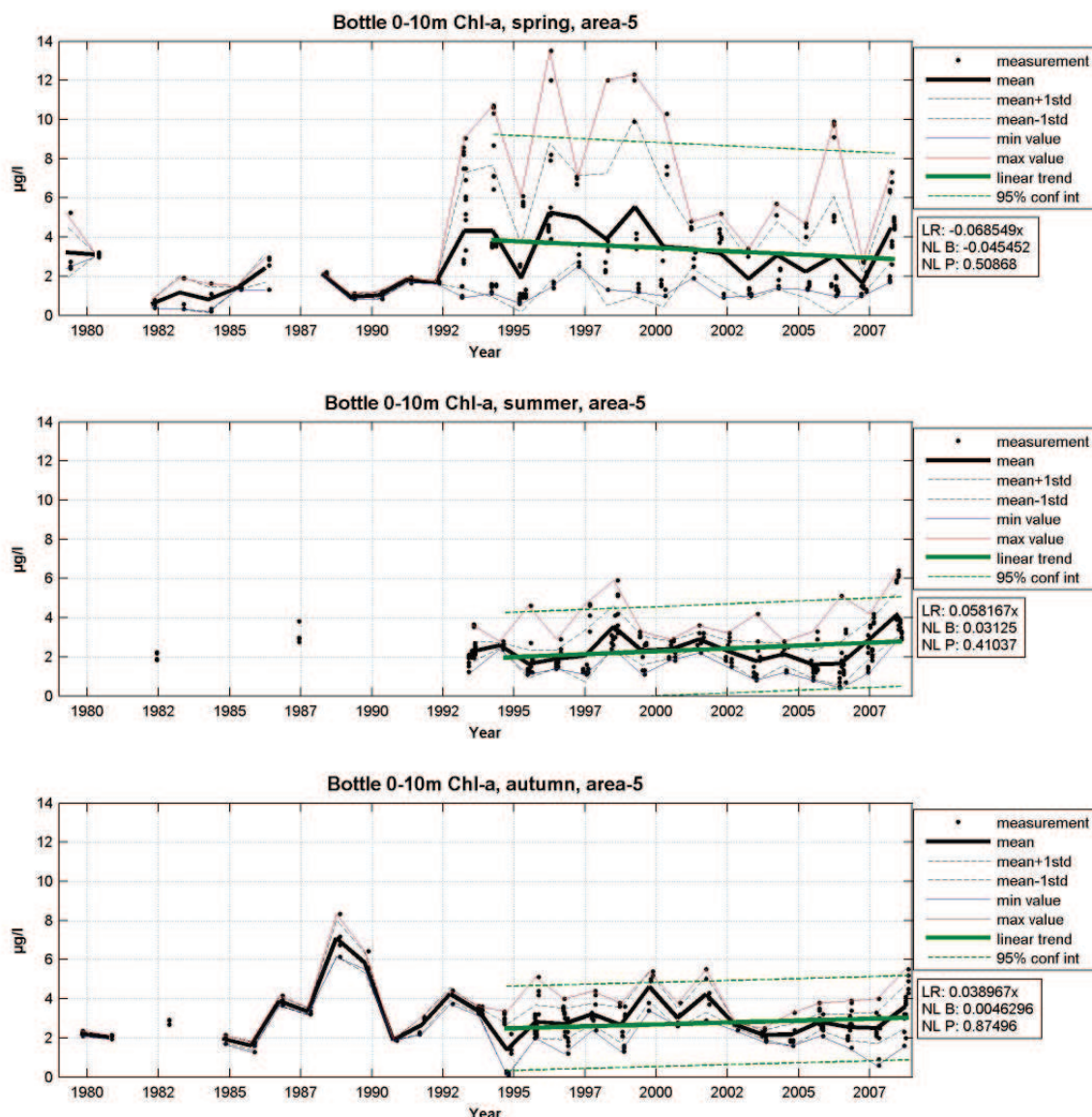


Figure 135. The Arkona Basin, Area 5, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

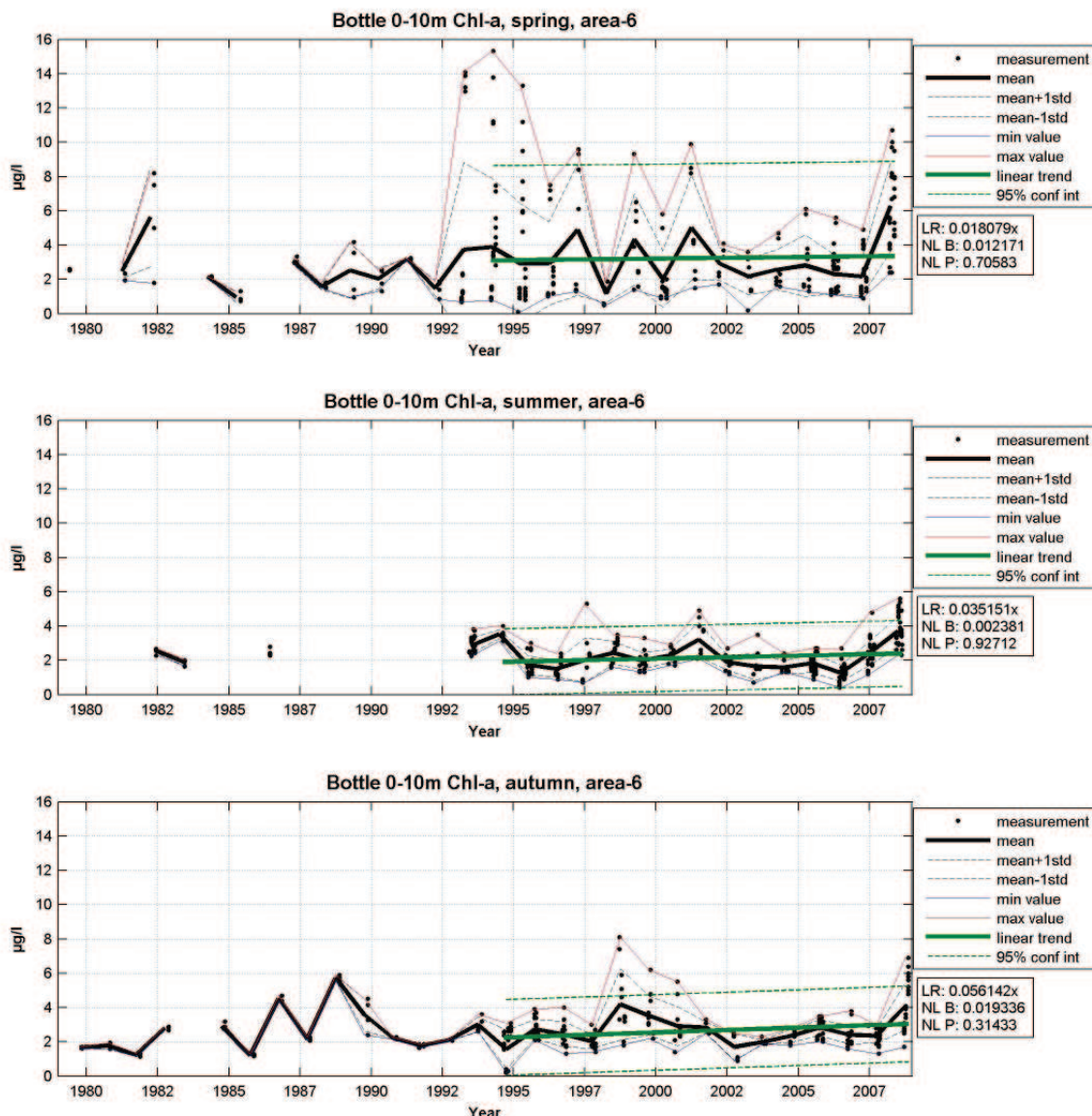


Figure 136. The Bornholm Basin, Area 6, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

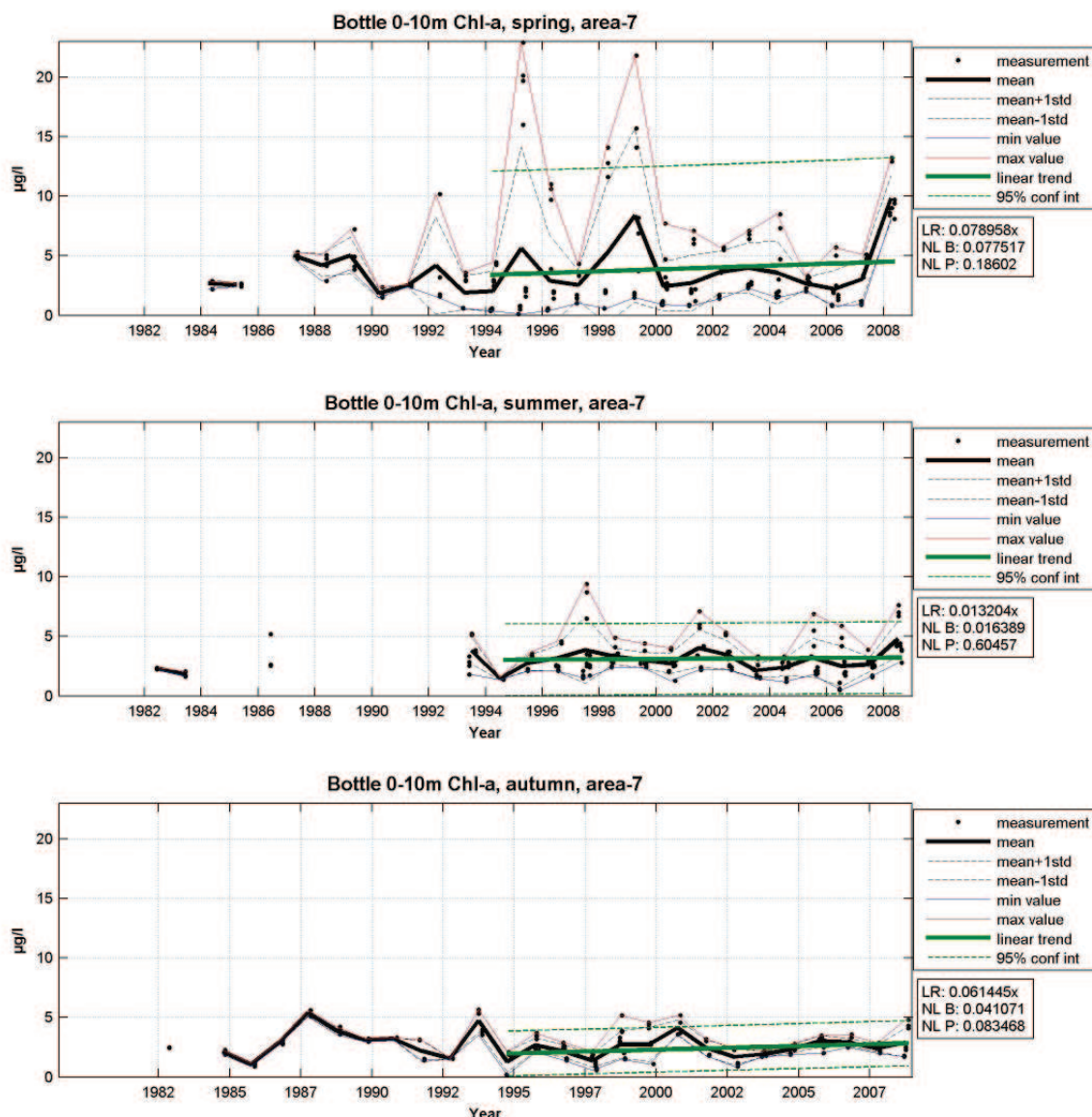


Figure 137. The South-eastern Baltic Proper, Area 7, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



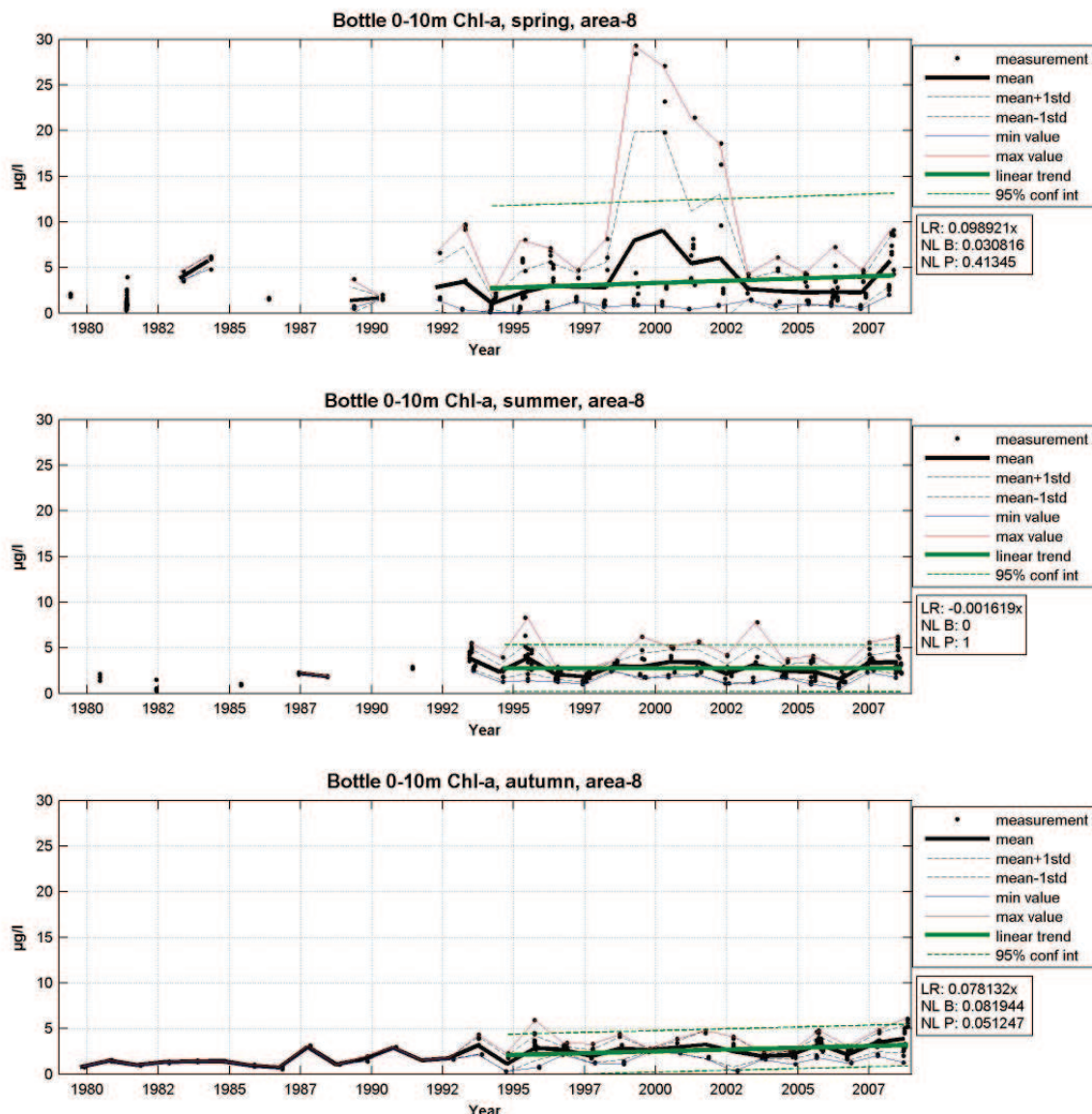


Figure 138. The Western Gotland Basin, Area 8, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

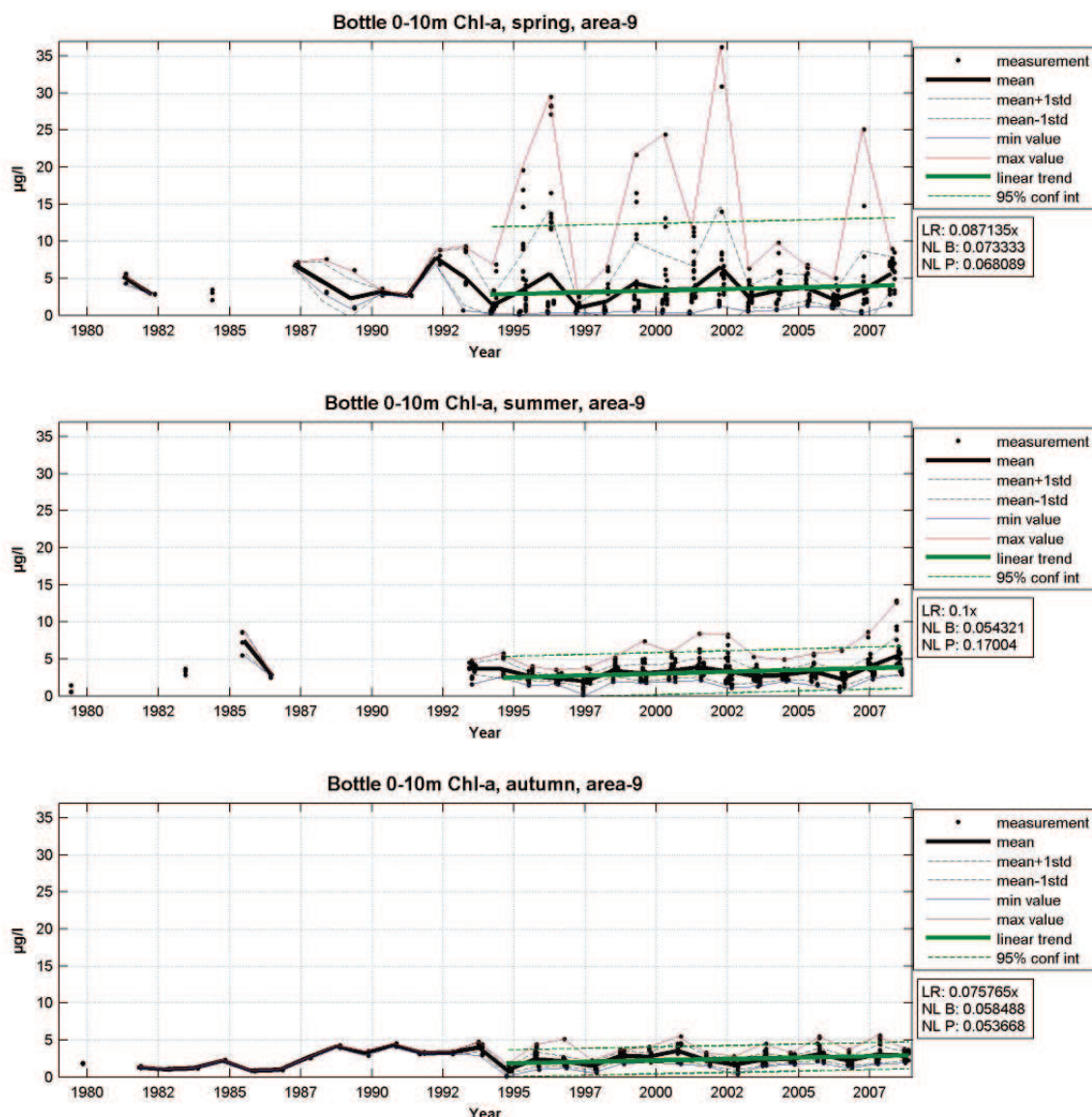


Figure 139. The Eastern Gotland Basin, Area 9, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



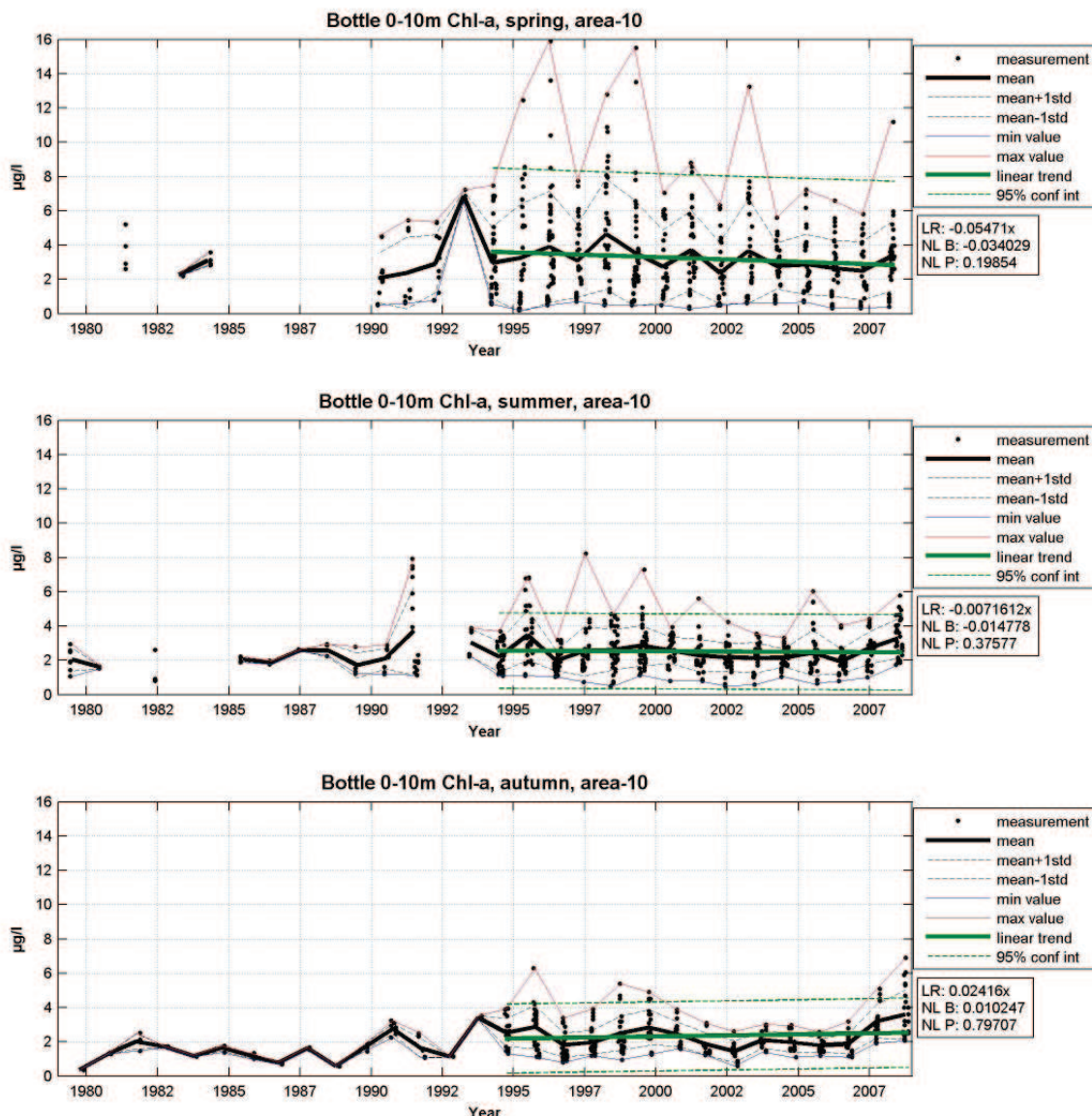


Figure 140. The Northern Baltic Proper, Area 10, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

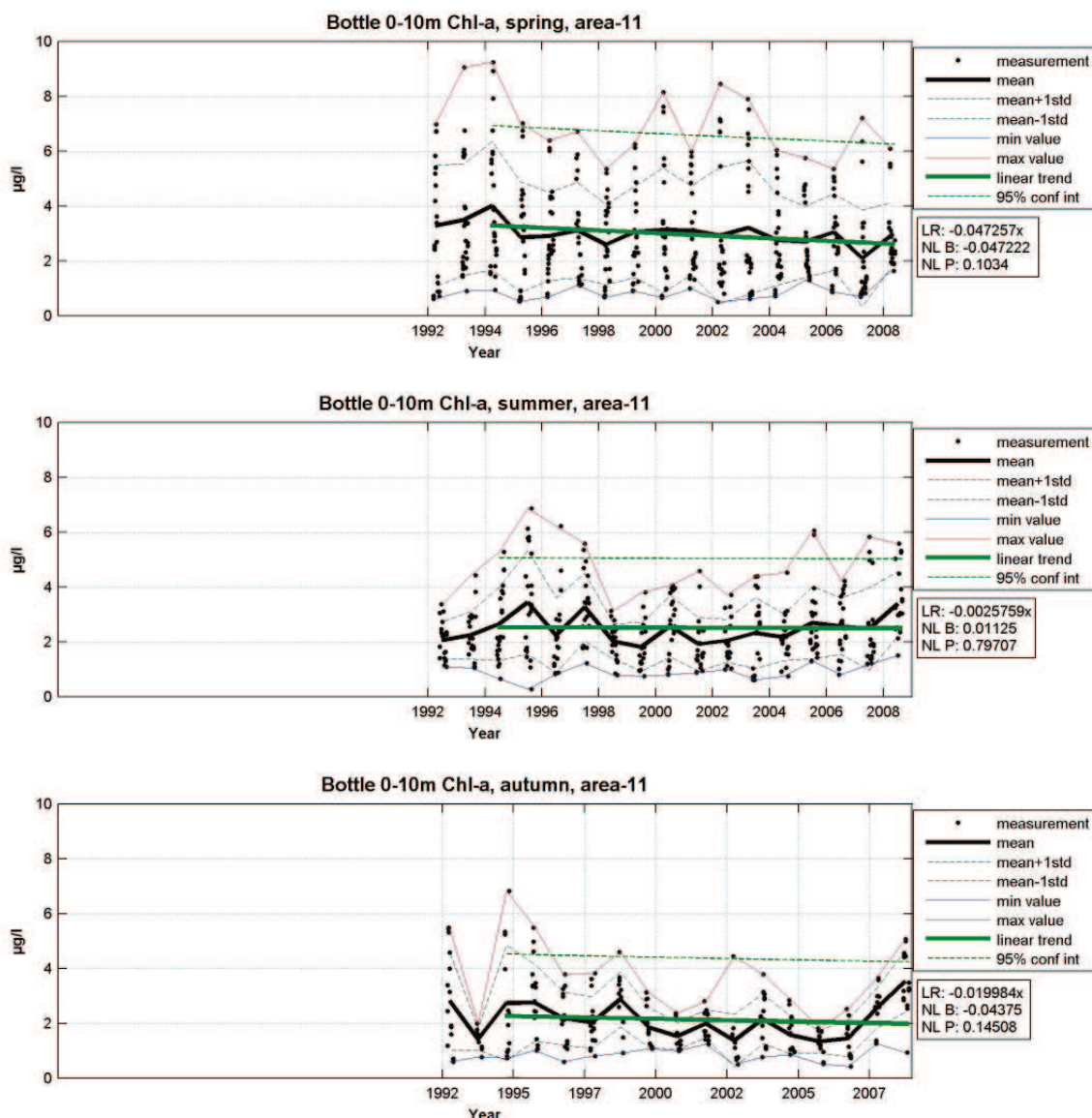


Figure 141. The Eastern coastal area, Area 11, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

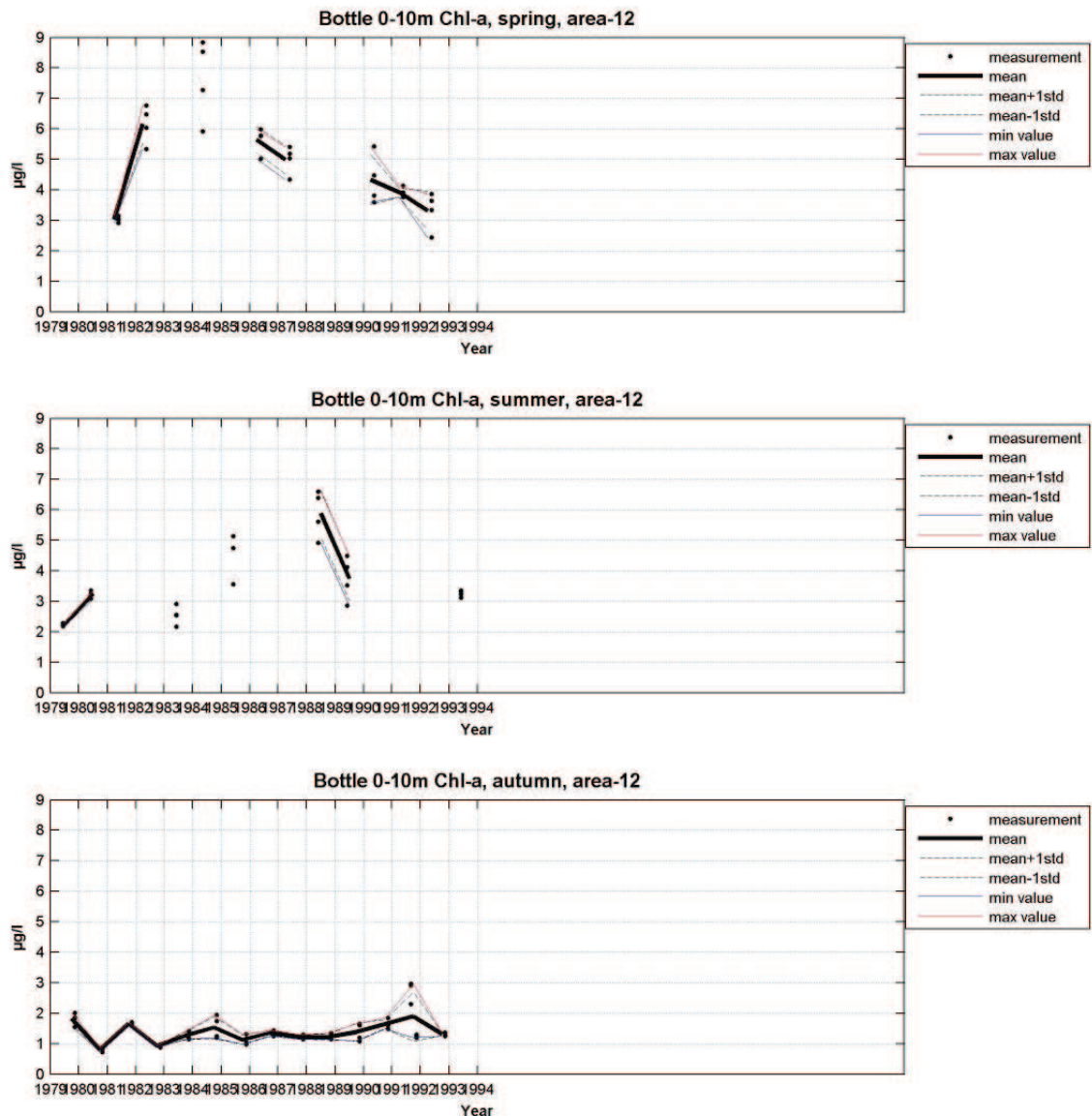


Figure 142. The Åland Sea, Area 12, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.



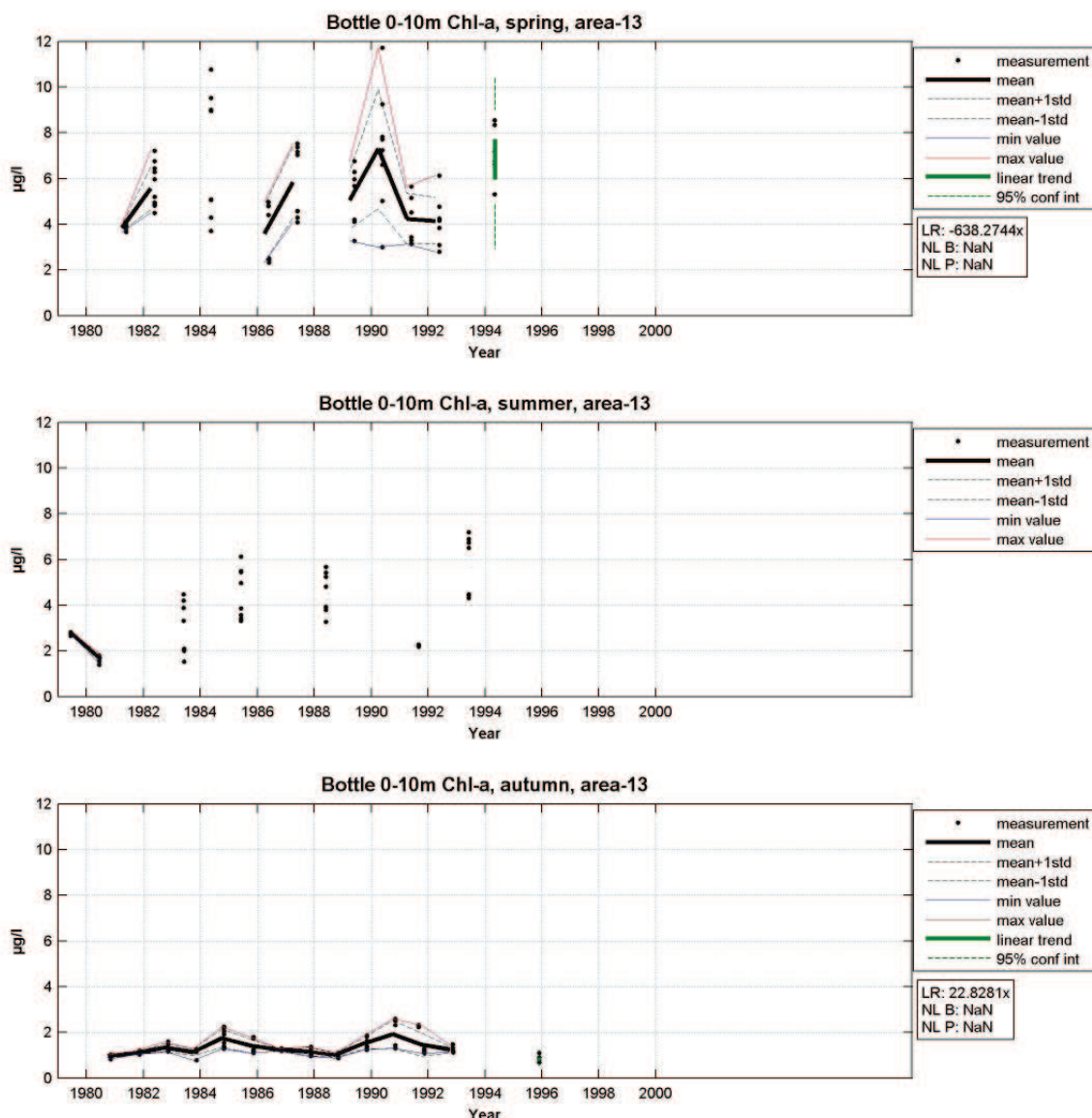


Figure 143. The Bothnian Sea, Area 13, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

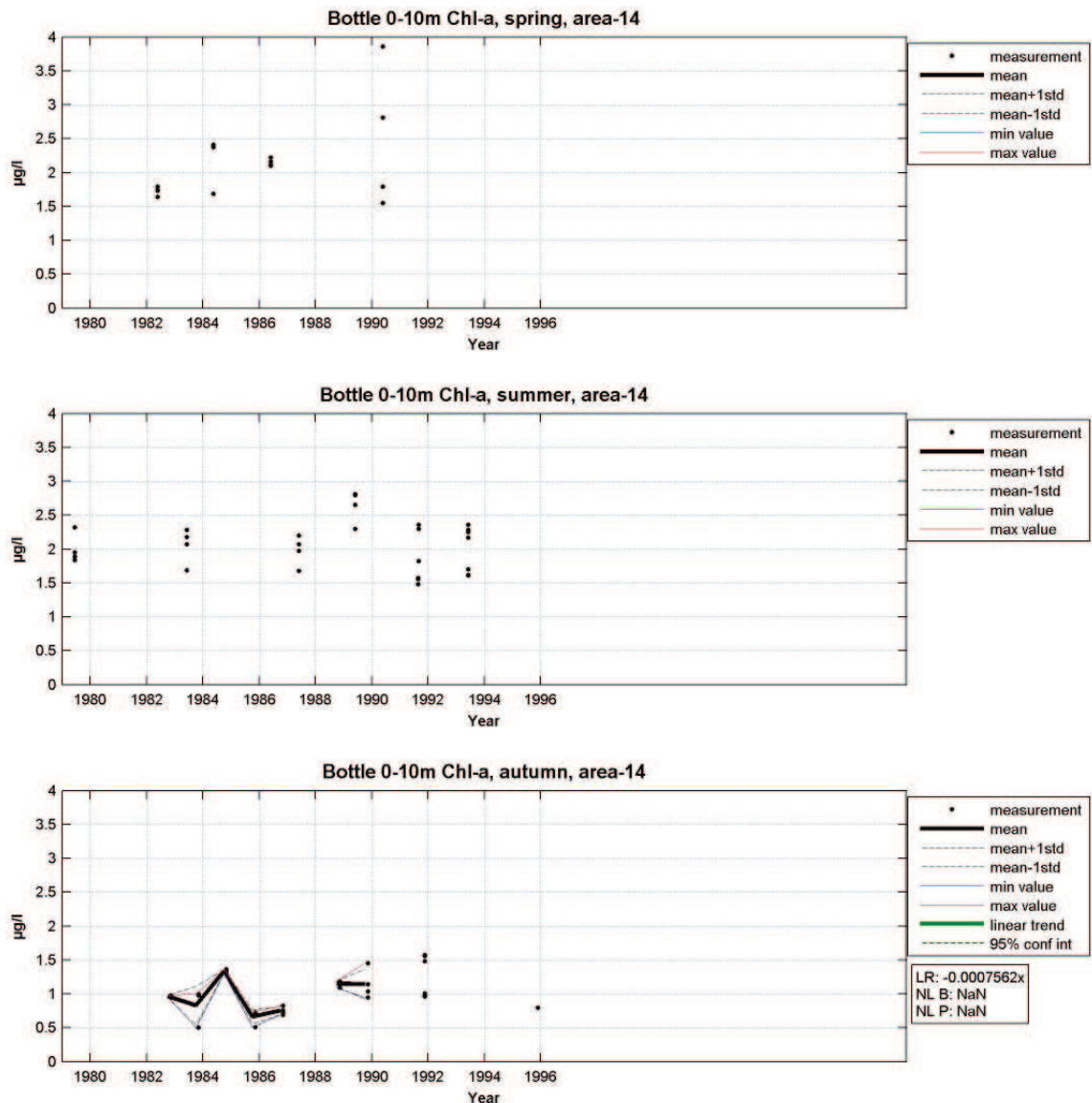


Figure 144. The Bothnian Bay, Area 14, Chl a from integrated bottles from discrete depths (0-10 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

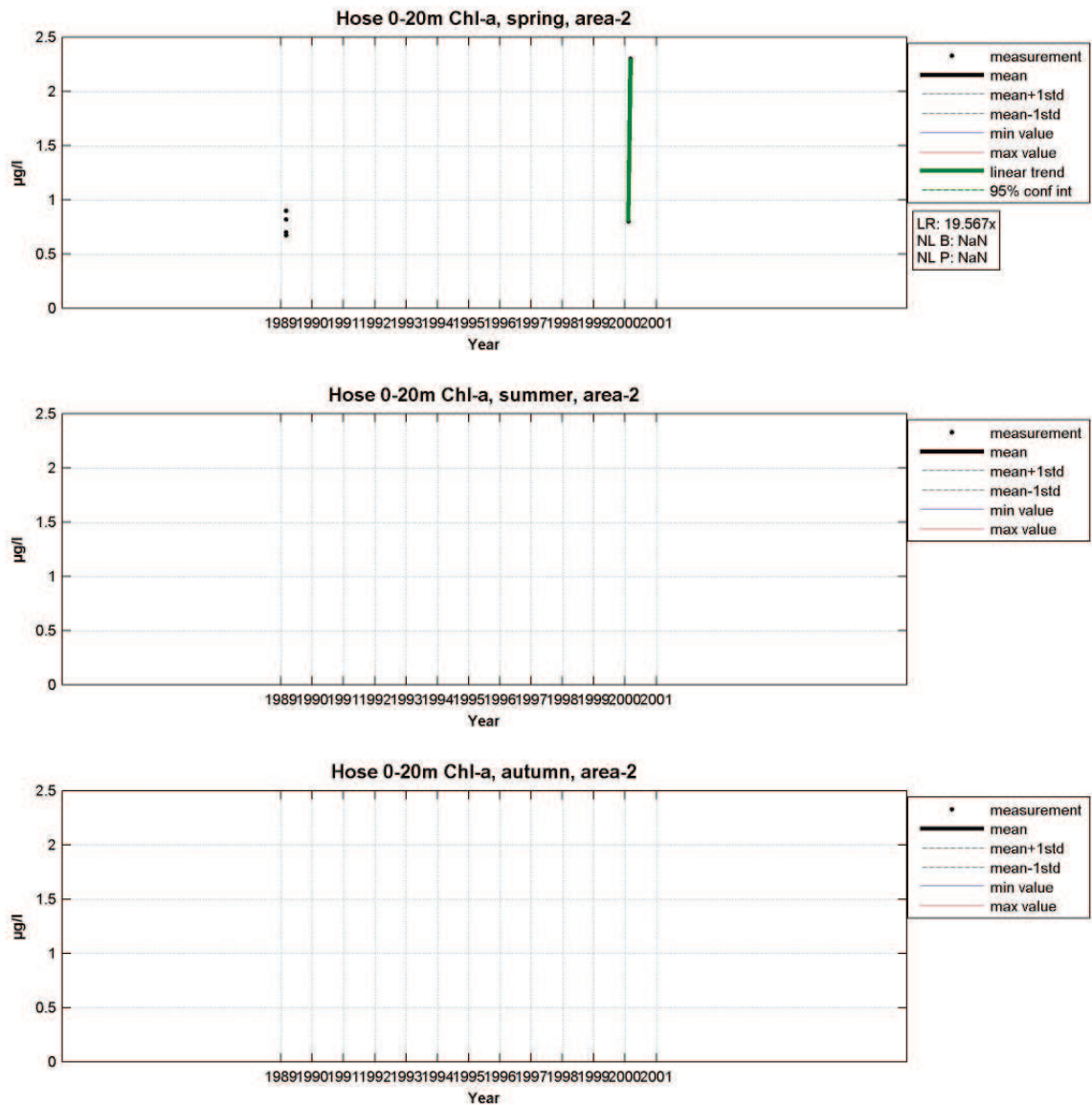


Figure 145. The Skagerrak, Area 2, Chl a from integrated samples taken by hose (0-20 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean +/- 1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

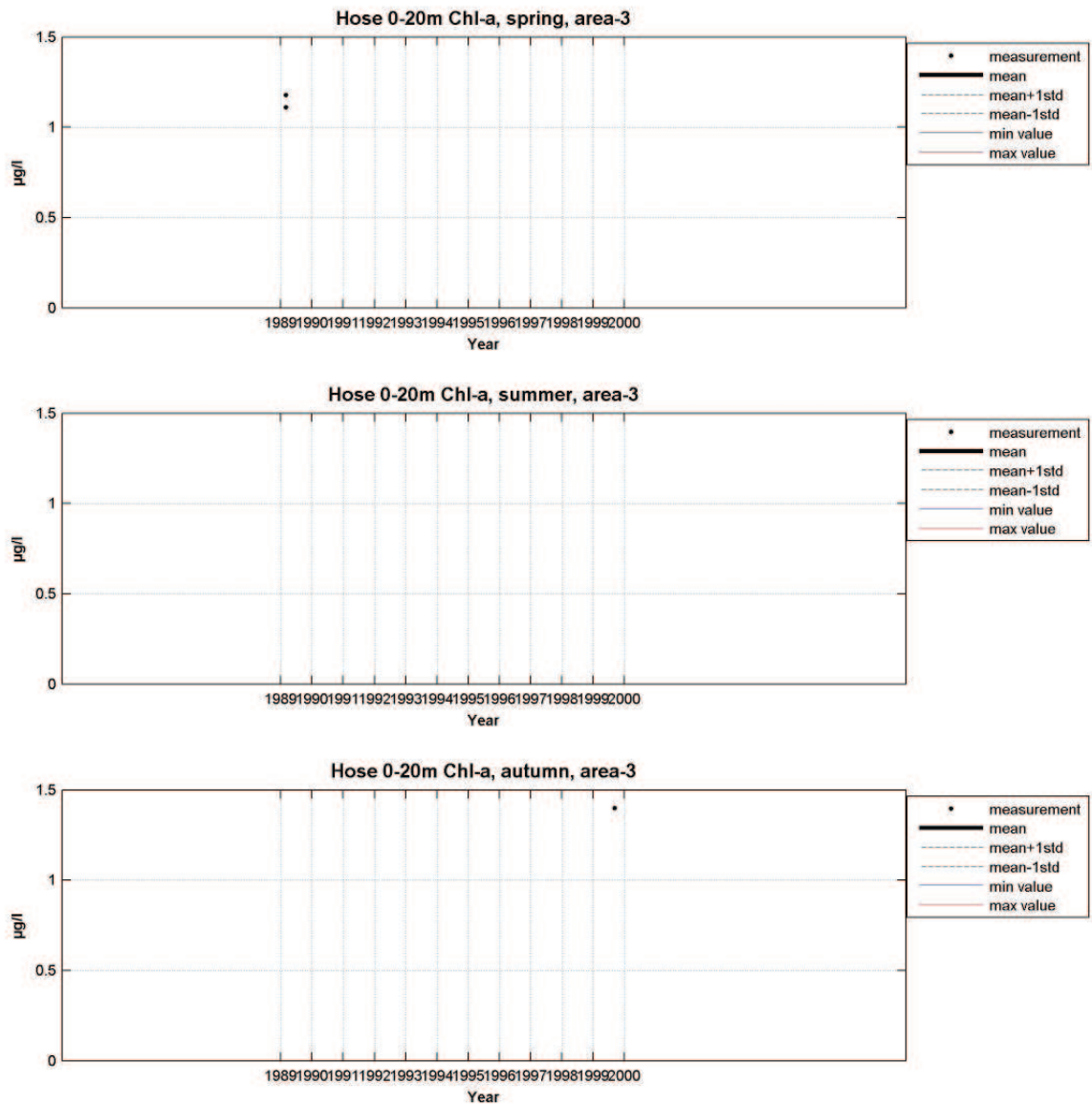


Figure 146. The Kattegat, Area 3, Chl a from integrated samples taken by hose (0-20 meters) during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



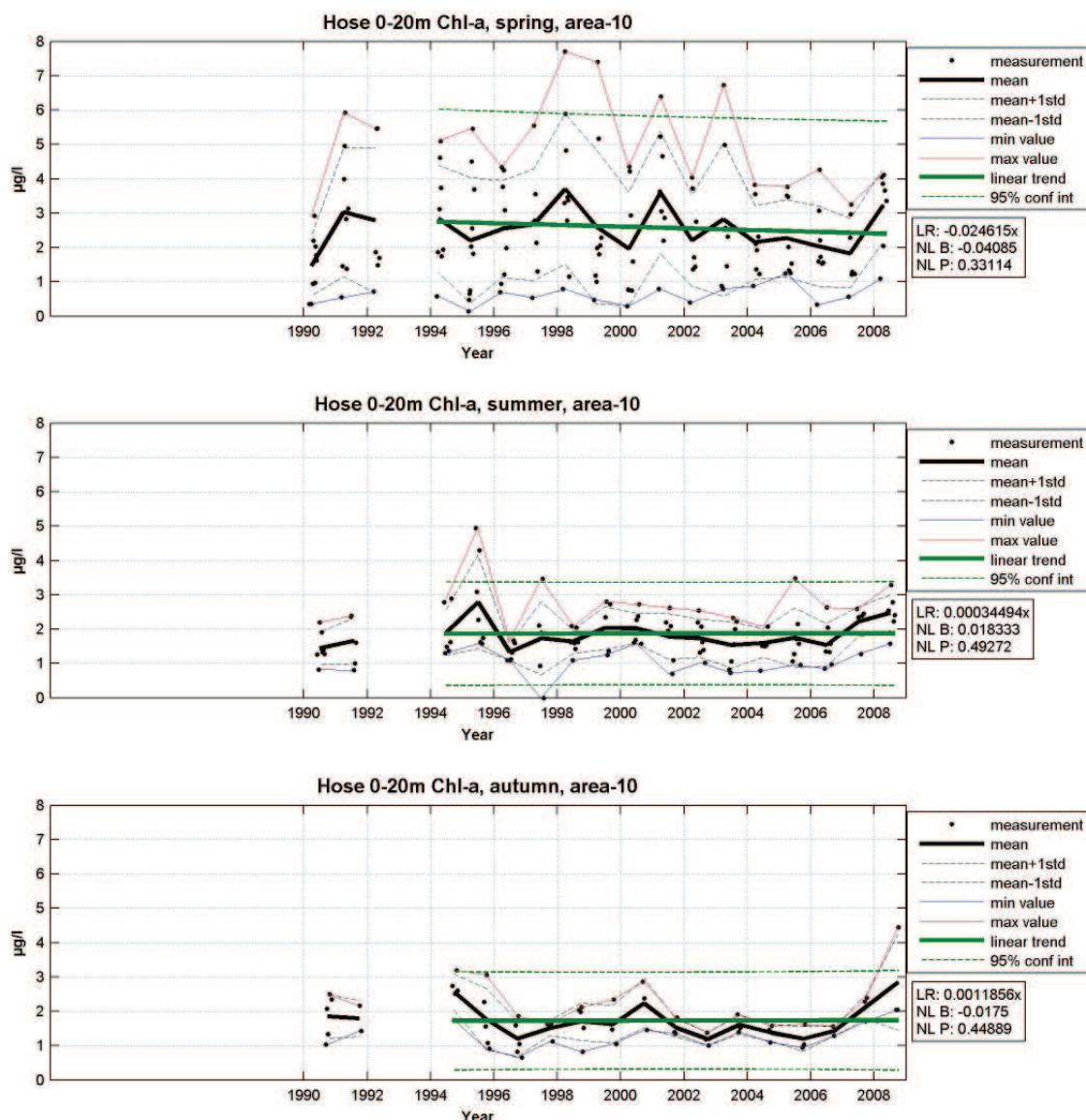


Figure 147. The Northern Baltic Proper, Area 10, Chl a from integrated samples taken by hose (0-20 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



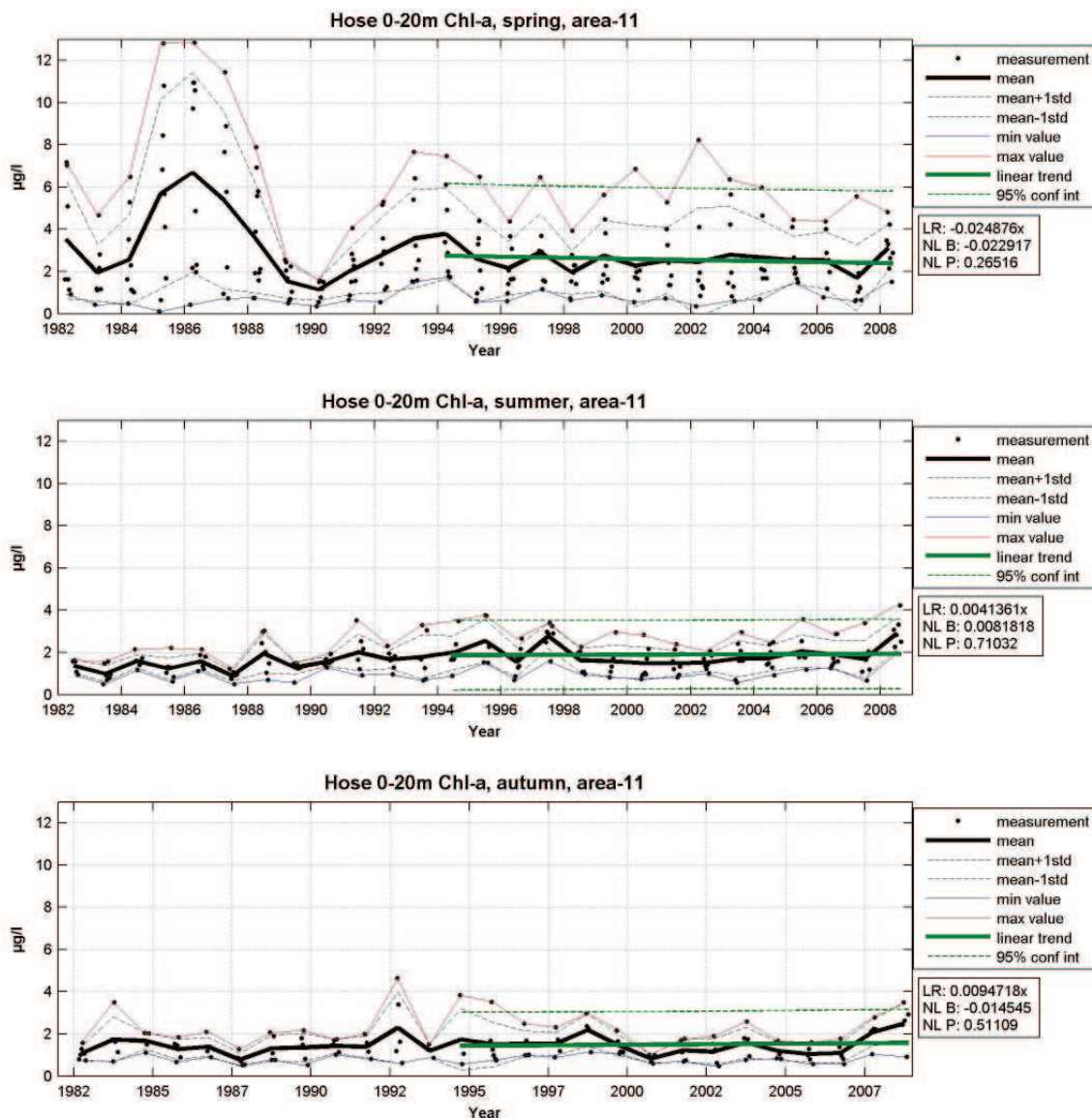


Figure 148. The Eastern coastal area, Area 11, Chl a from integrated samples taken by hose (0-20 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

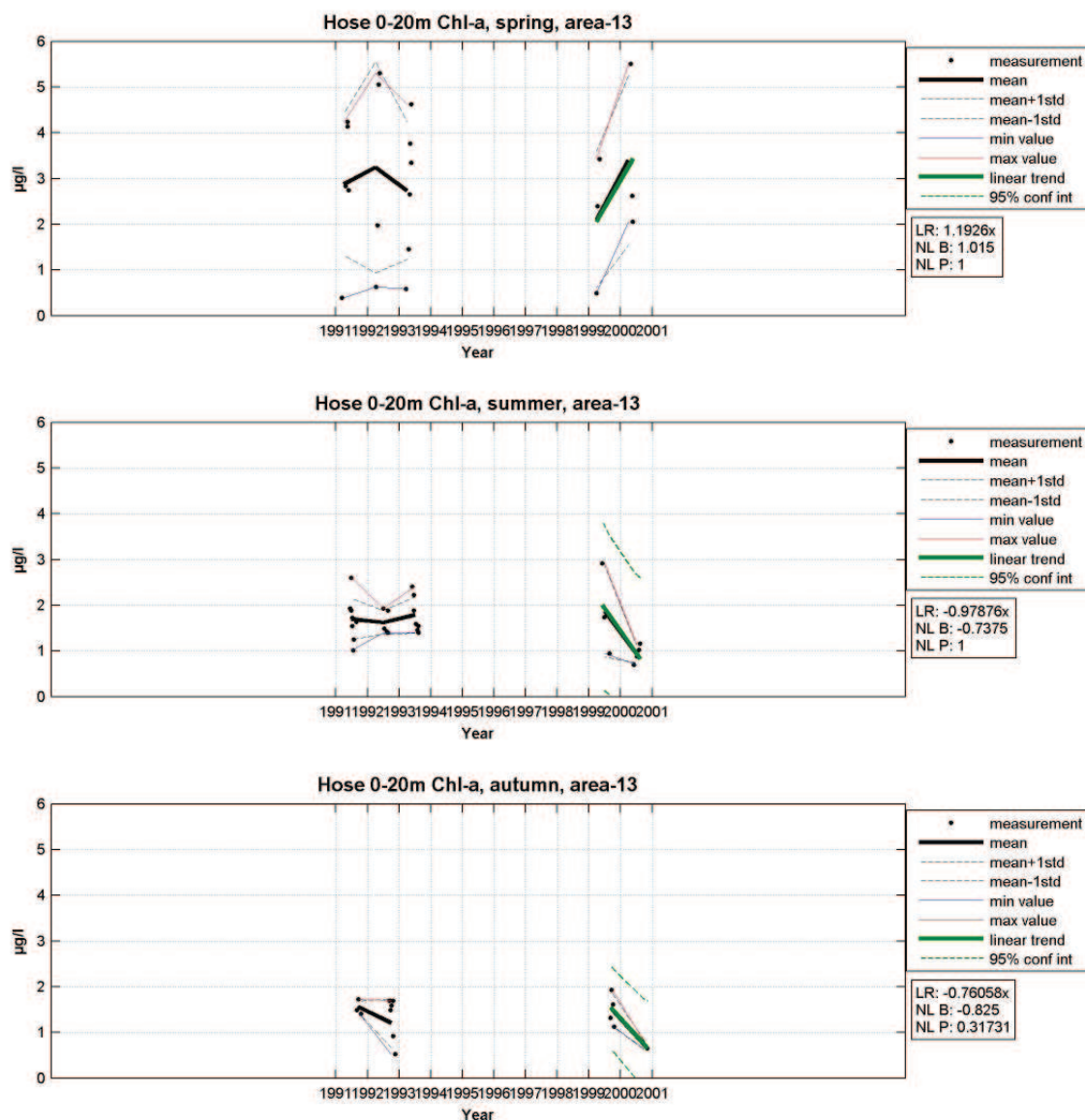


Figure 149. The Bothnian Sea, Area 13, Chl a from integrated samples taken by hose (0-20 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

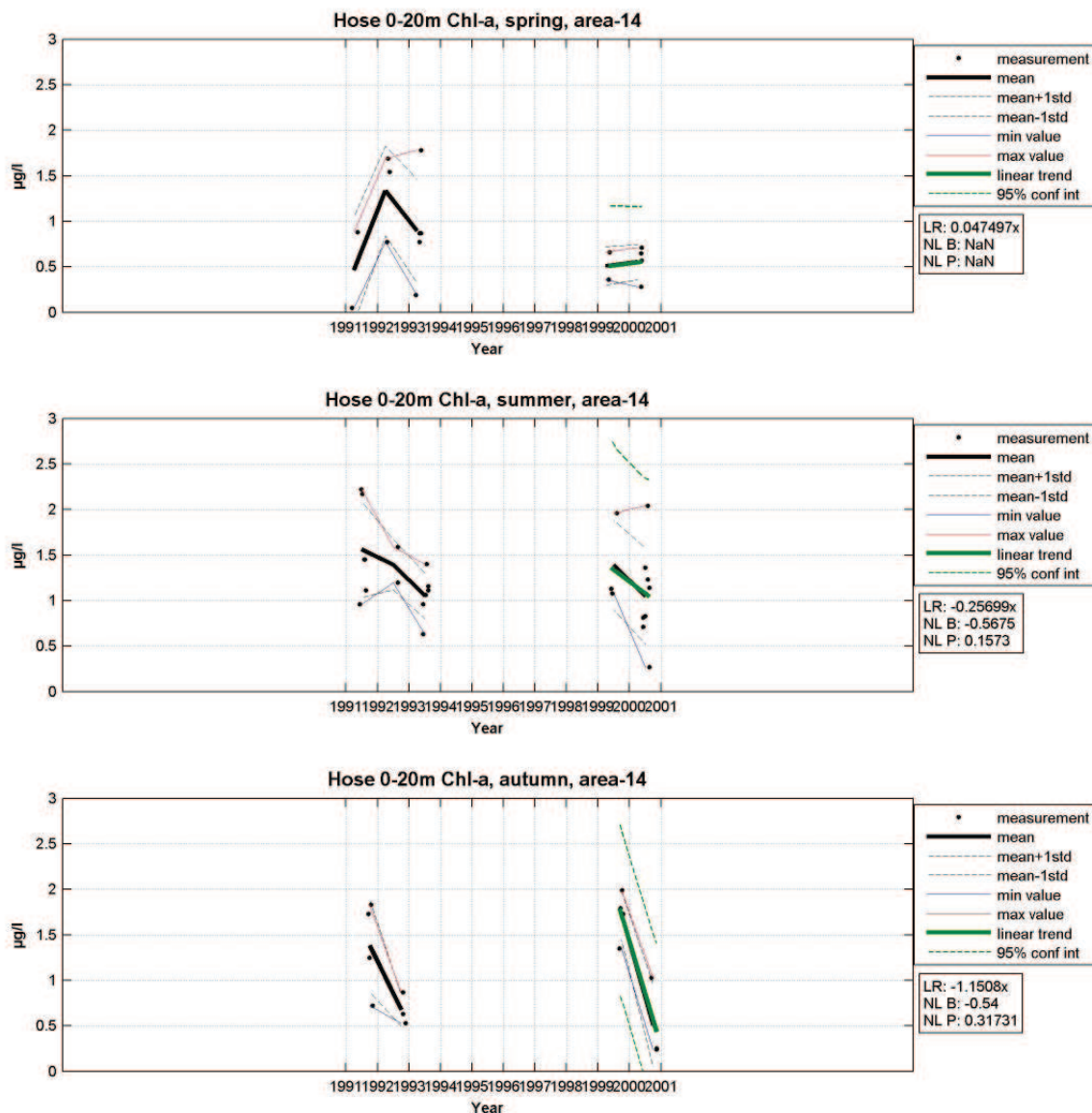


Figure 150. The Bothnian Bay, Area 14, Chl a from integrated samples taken by hose (0-20 meters) during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



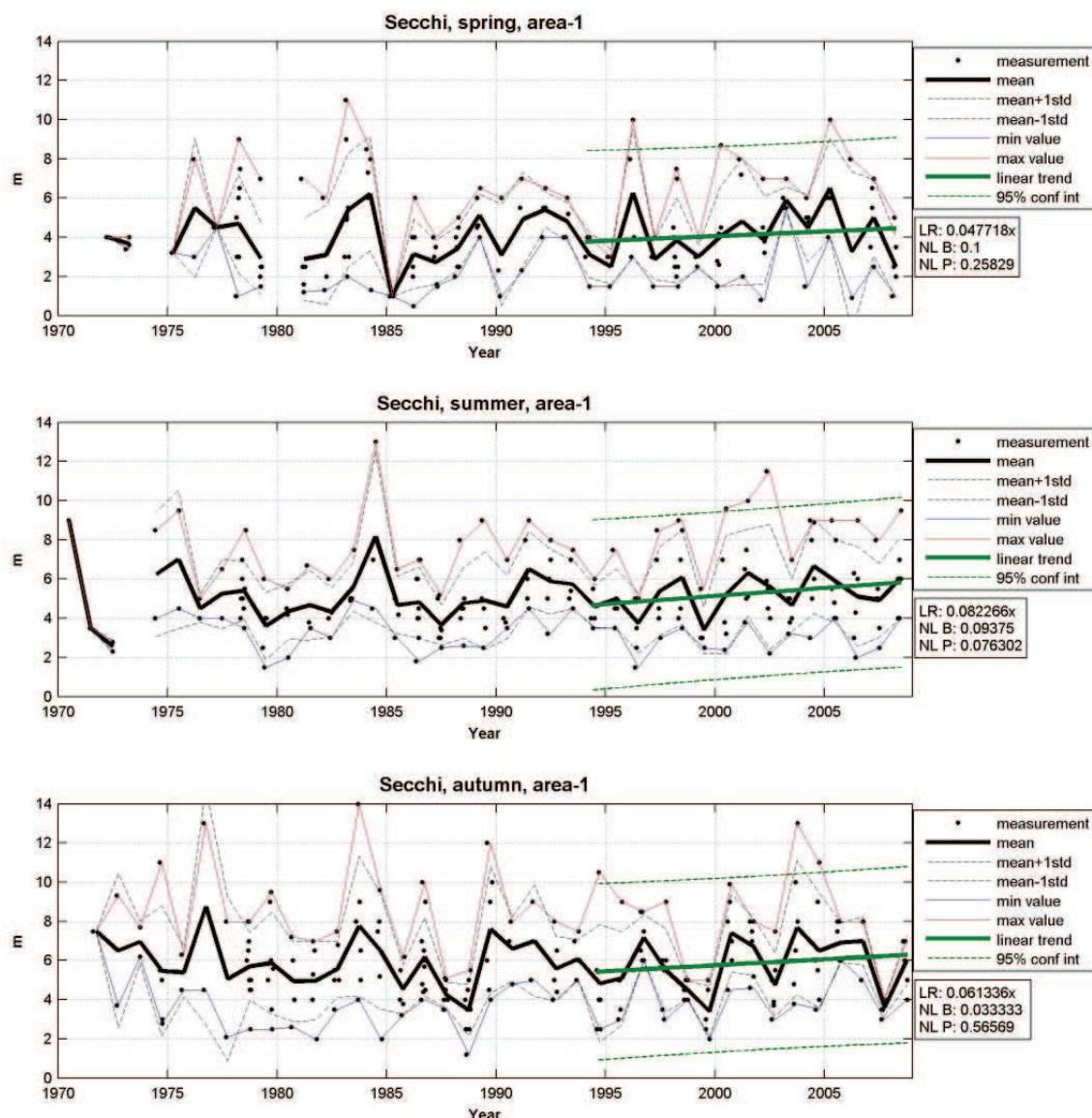


Figure 151. The west-coast inside the skerries, Area 1, Secchi depth during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean +/- 1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

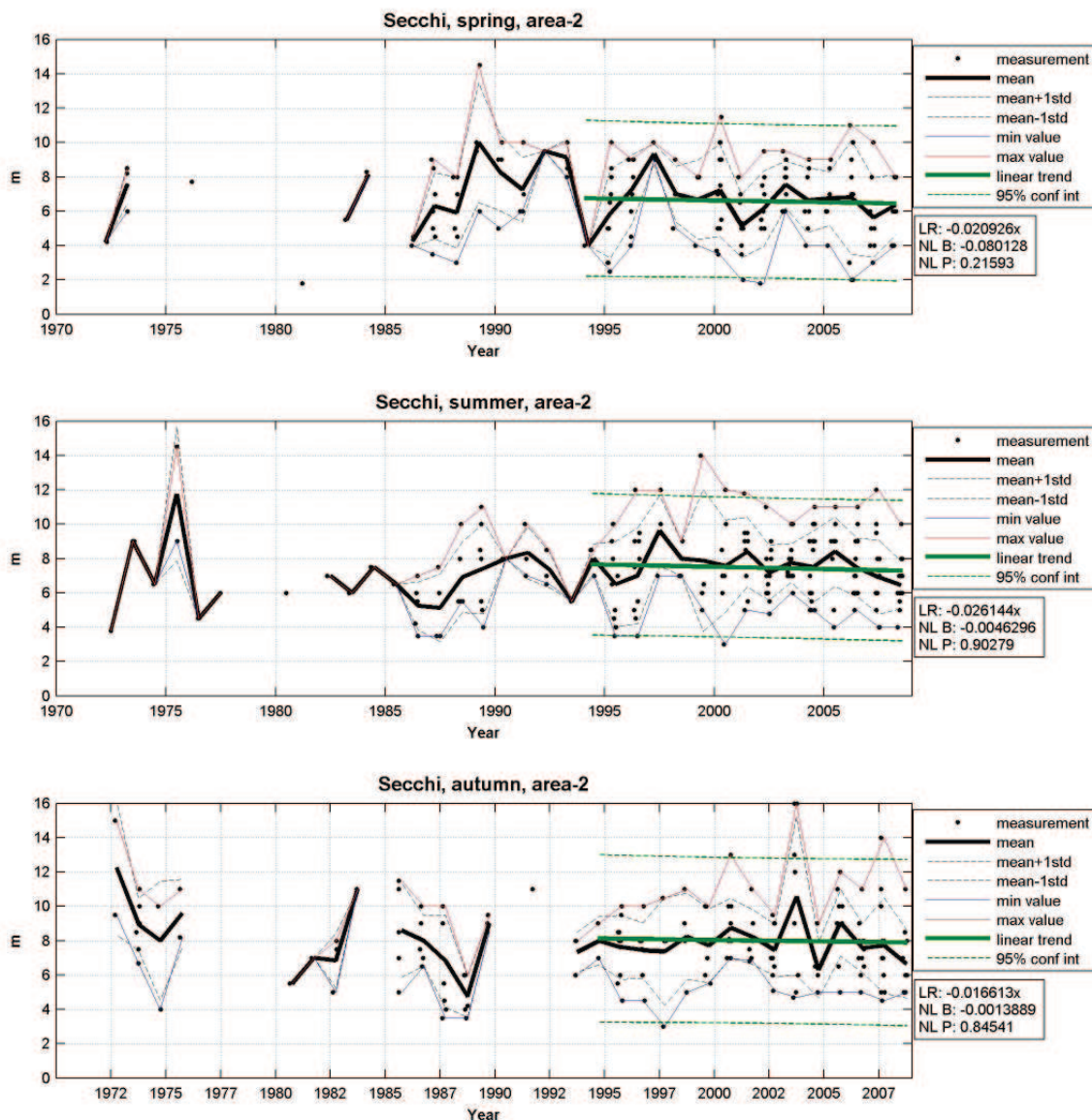


Figure 152. The Skagerrak, Area 2, Secchi depth during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean +/- 1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

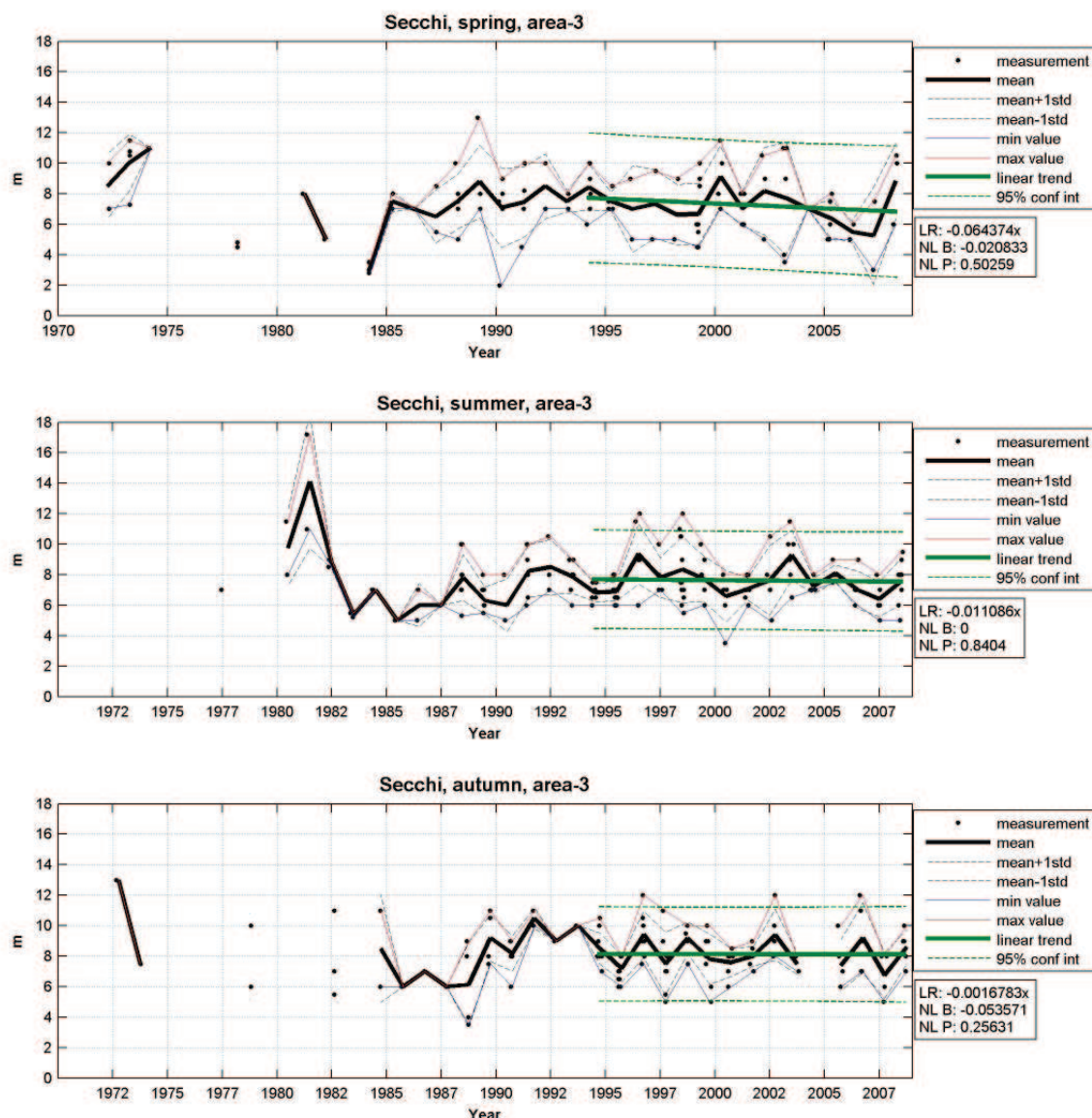


Figure 153. The Kattegat, Area 3, Secchi depth during spring (February to april), summer (May to July) and autumn (August to October). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



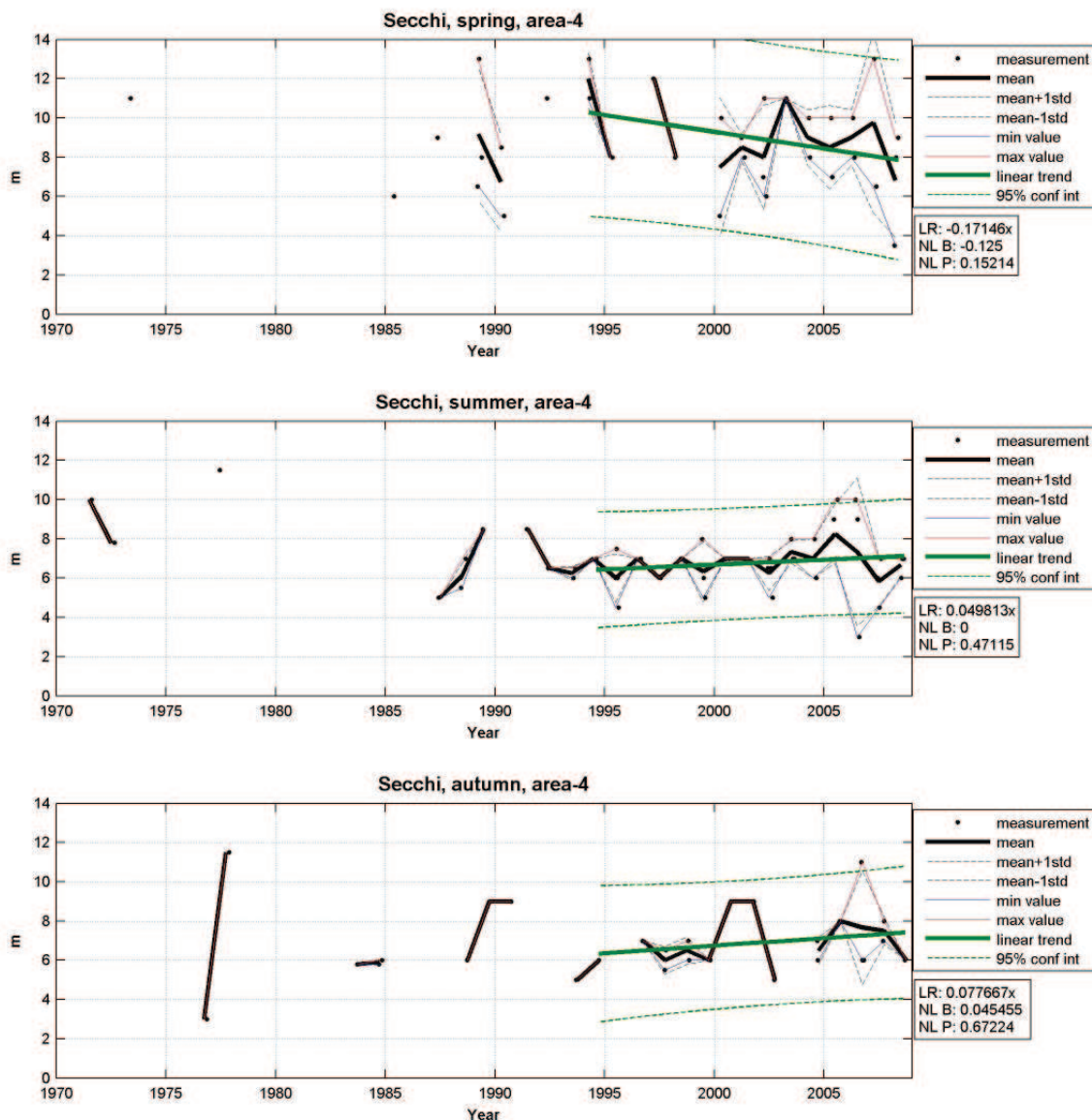


Figure 154. The Sound, Area 4, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean +/- 1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

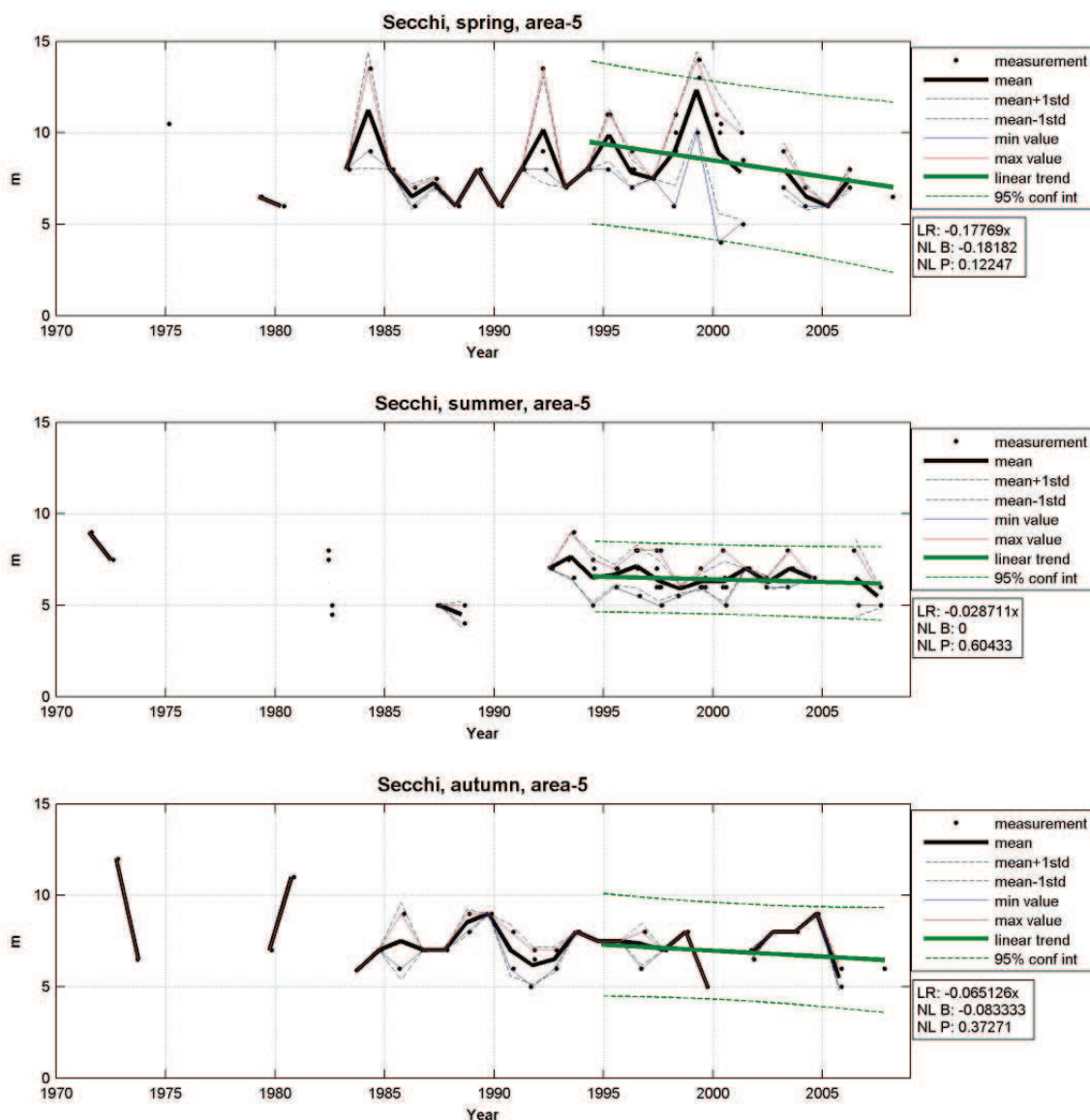


Figure 155. The Arkona Basin, Area 5, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



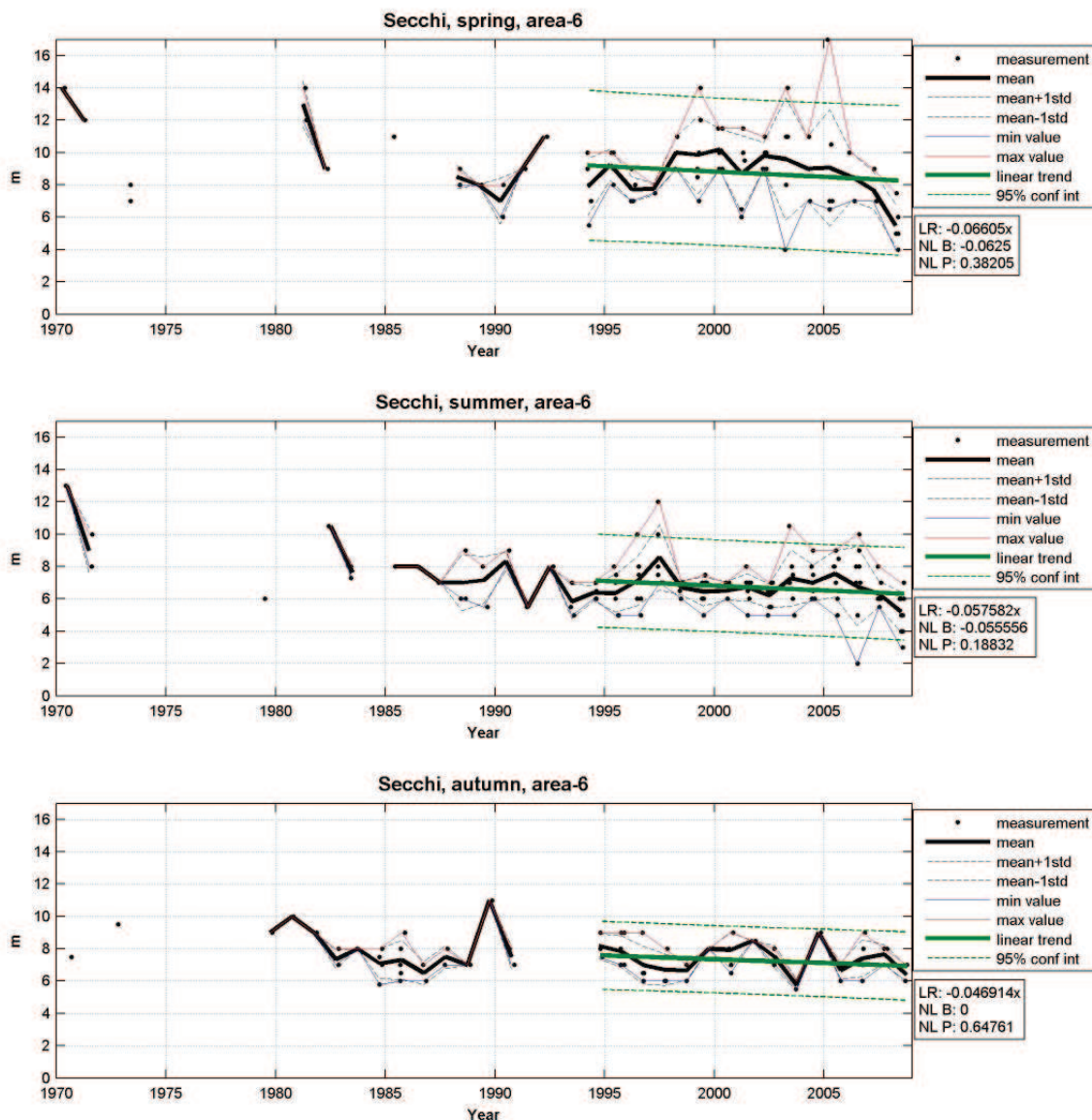


Figure 156. The Bornholm Basin, Area 6, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

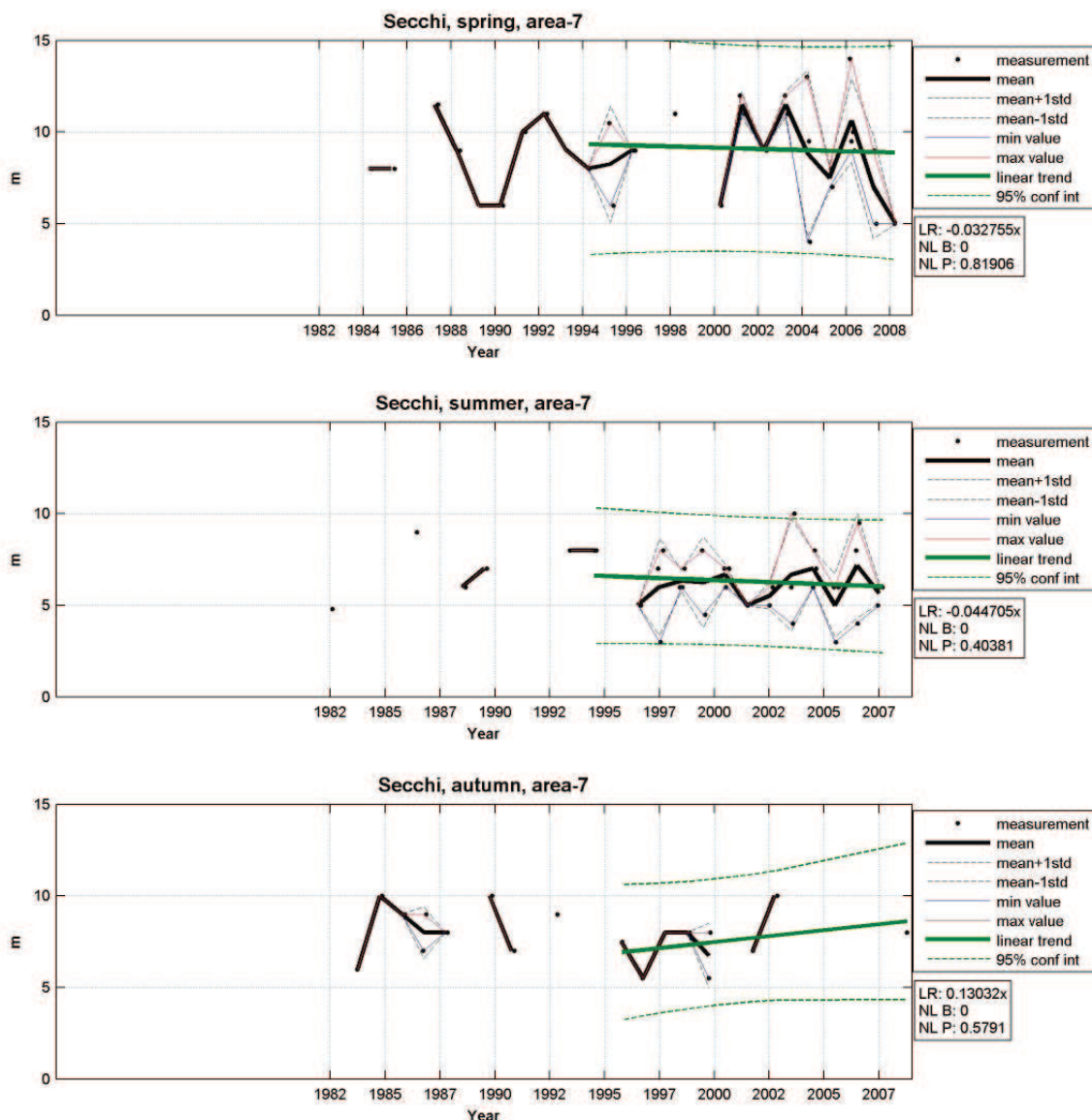


Figure 157. The South-eastern Baltic Proper, Area 7, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

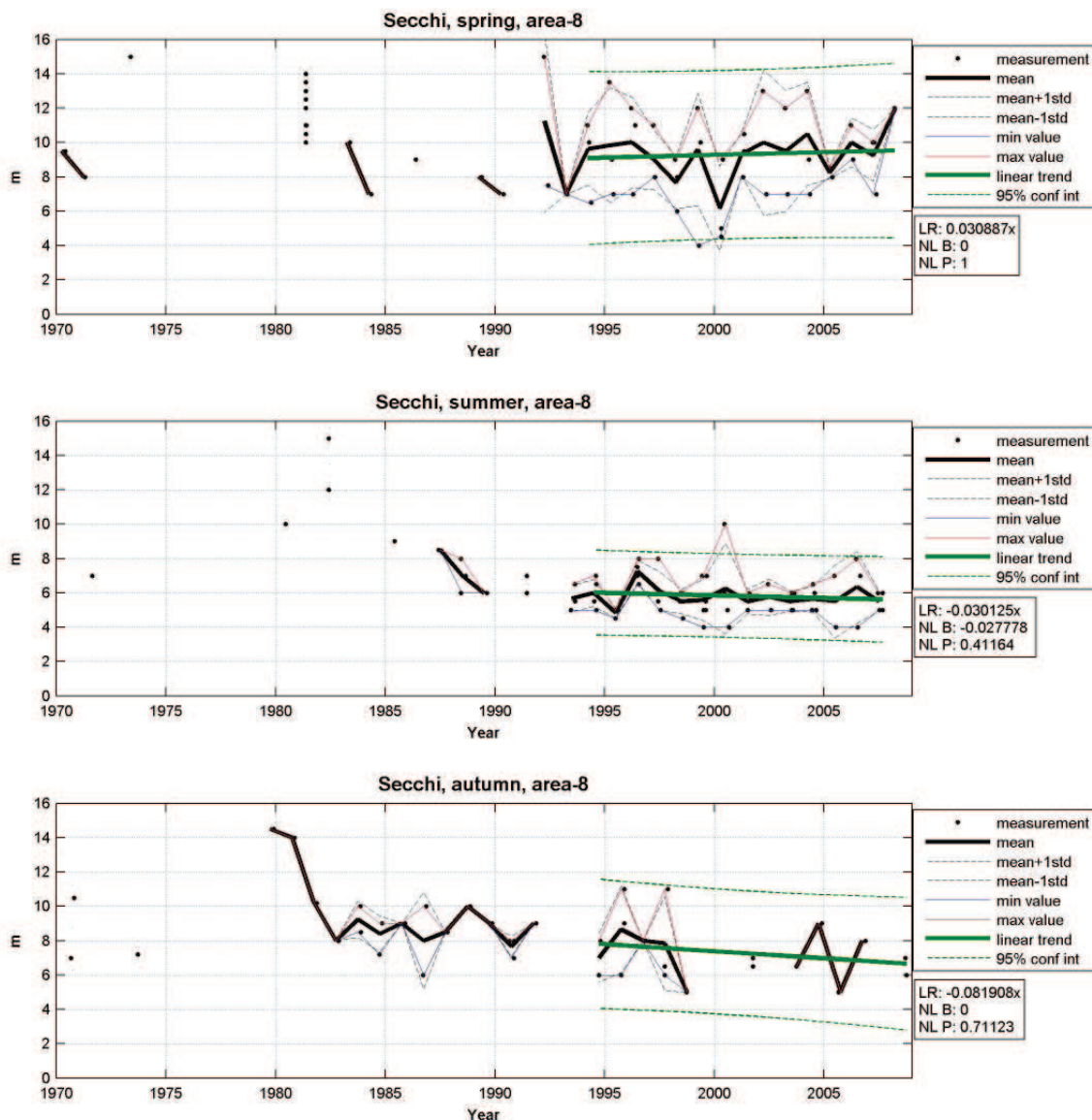


Figure 158. The Western Gotland Basin, Area 8, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

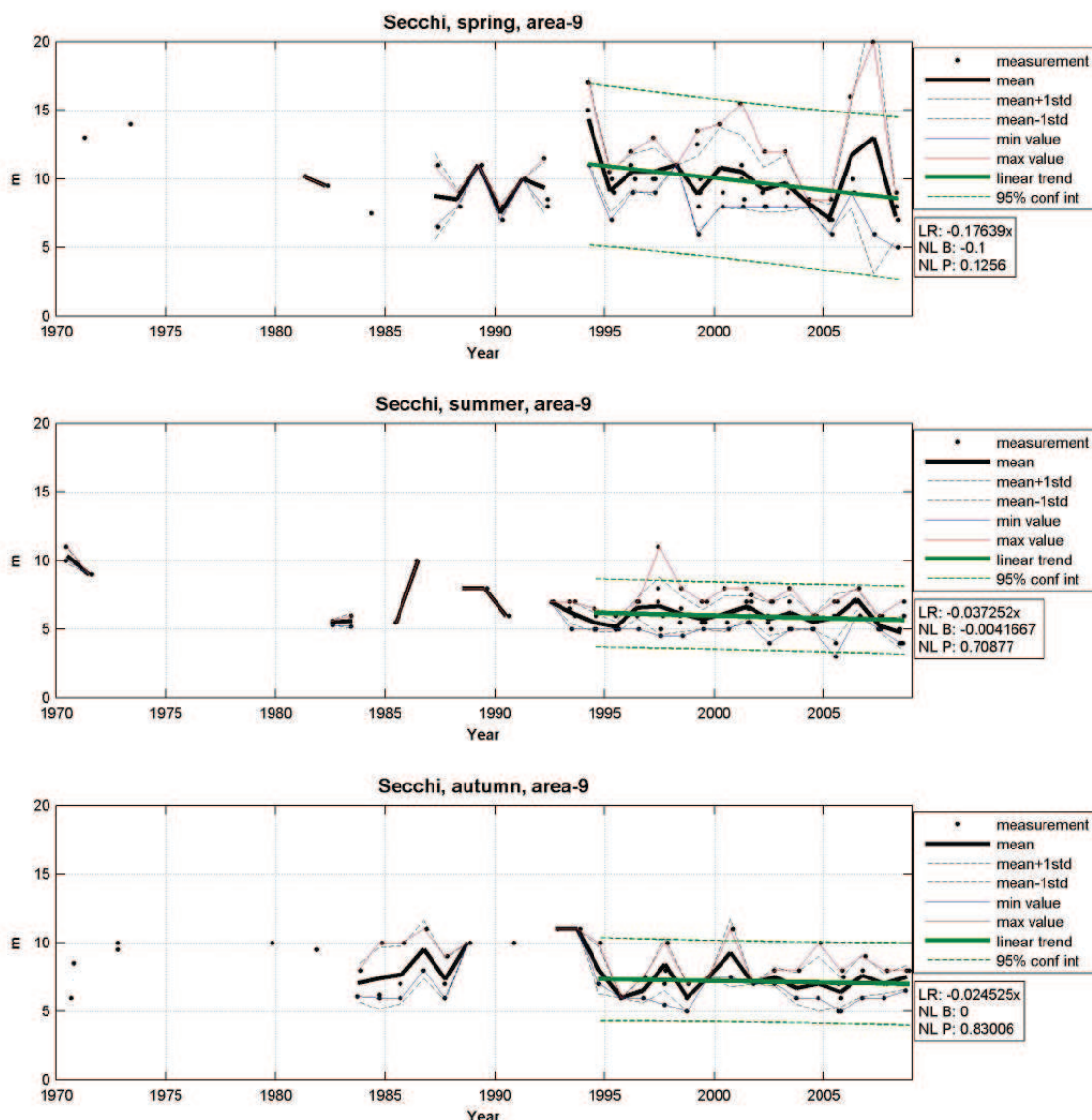


Figure 159. The Eastern Gotland Basin, Area 9, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



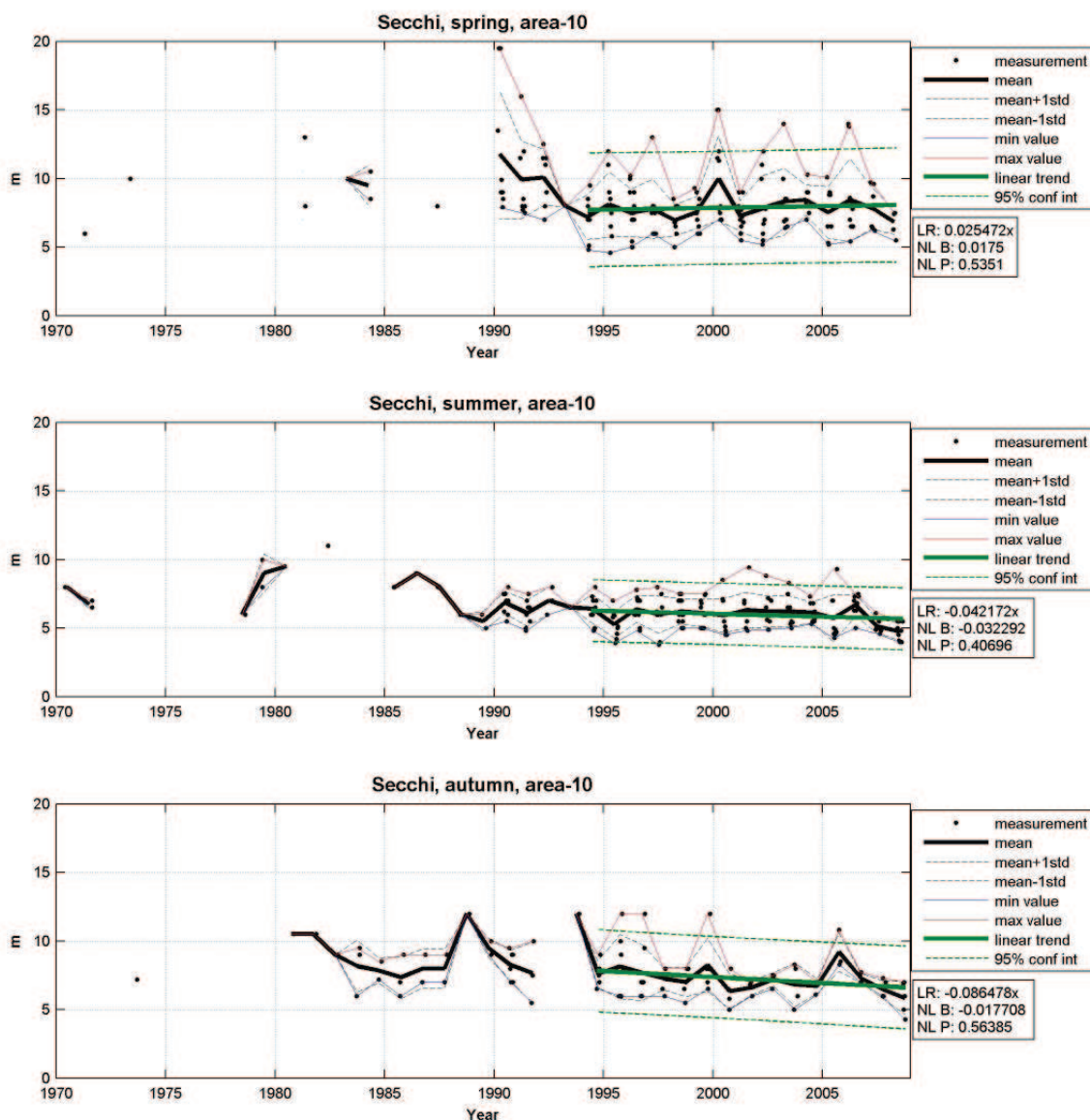


Figure 160. The Northern Baltic Proper, Area 10, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

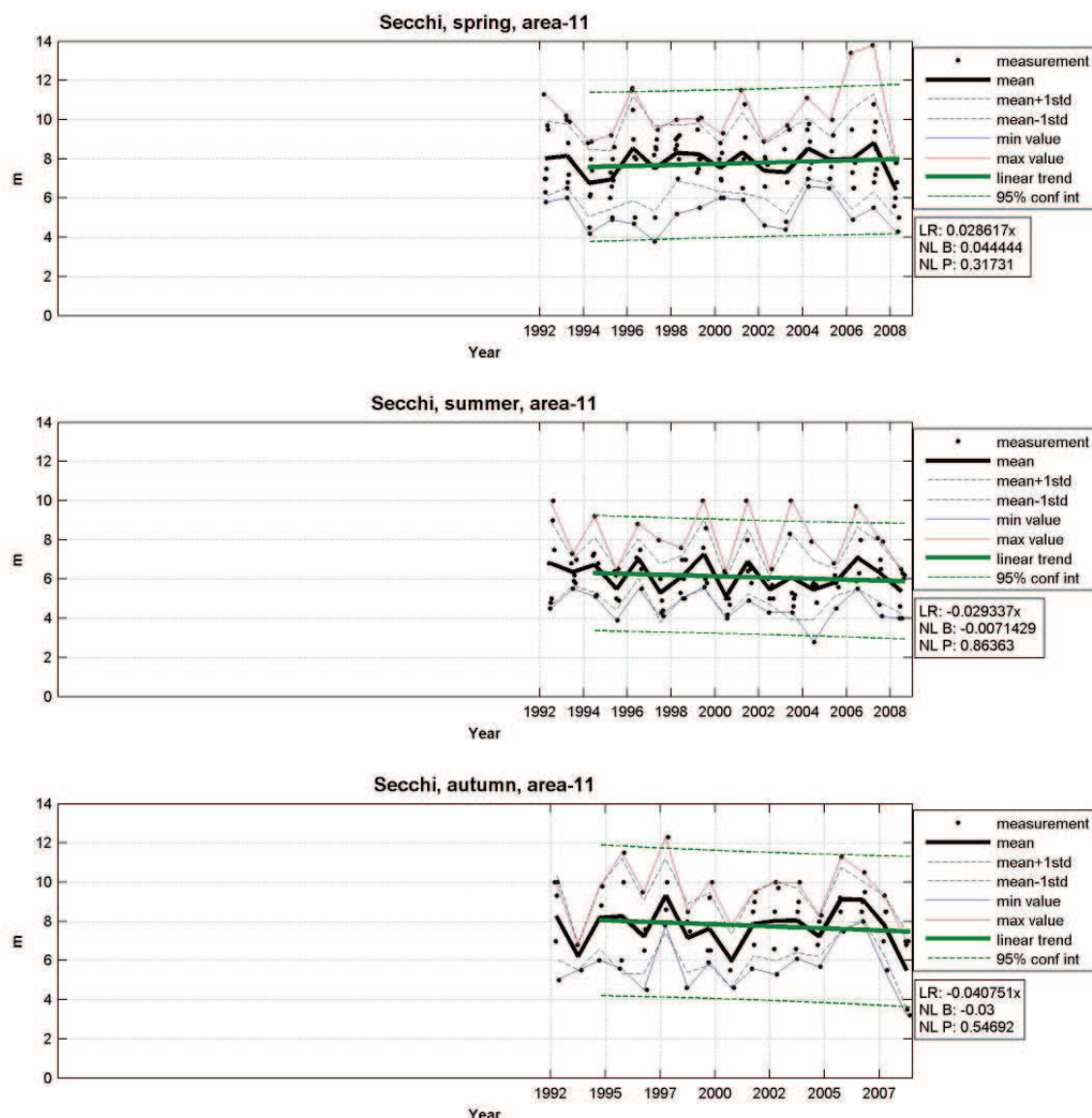


Figure 161. The Eastern coastal area, Area 11, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

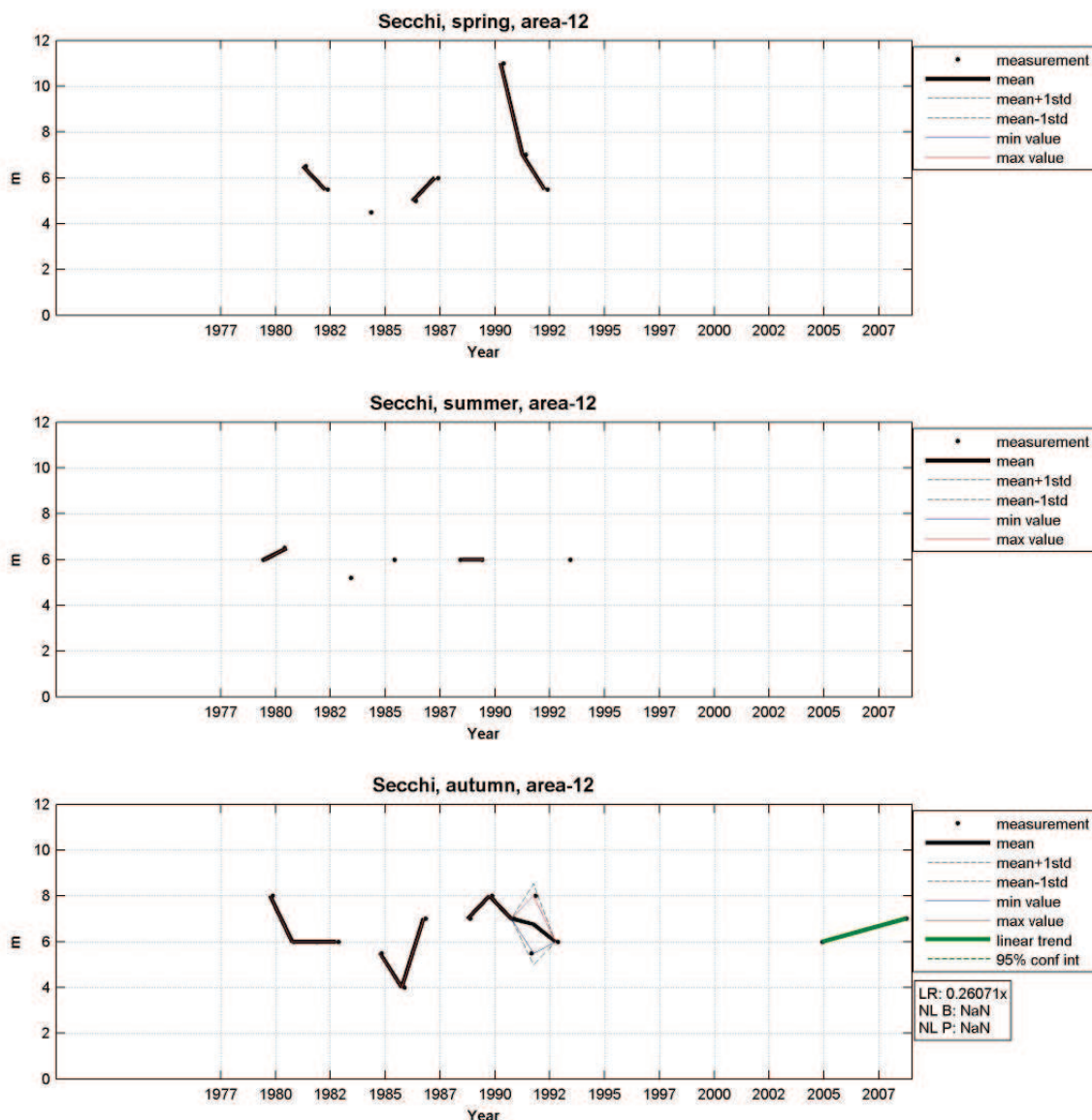


Figure 162. The Åland Sea, Area 12, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values  $< 0.05$  indicate significance.

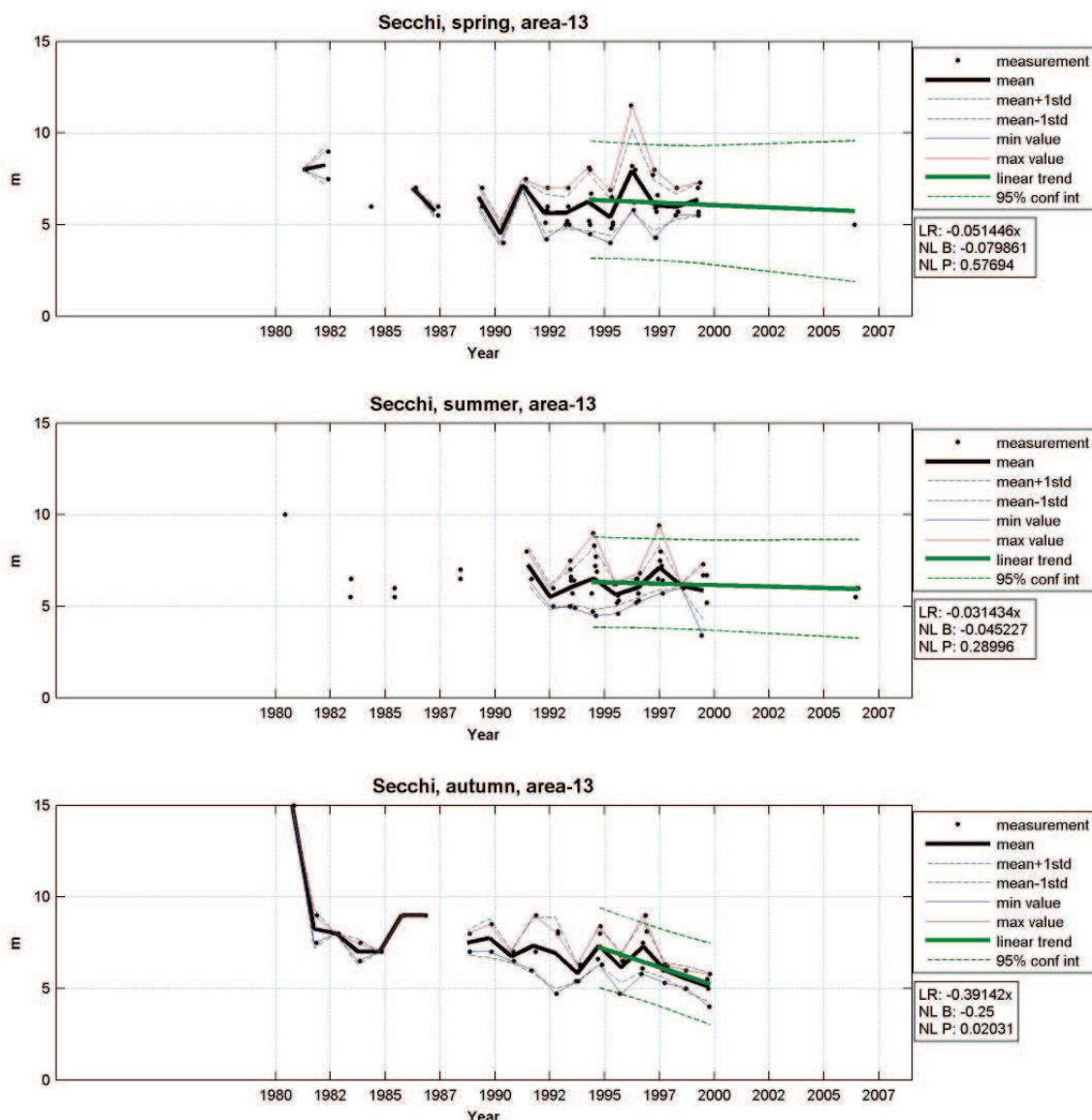


Figure 163. The Bothnian Sea, Area 13, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean +/- 1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.



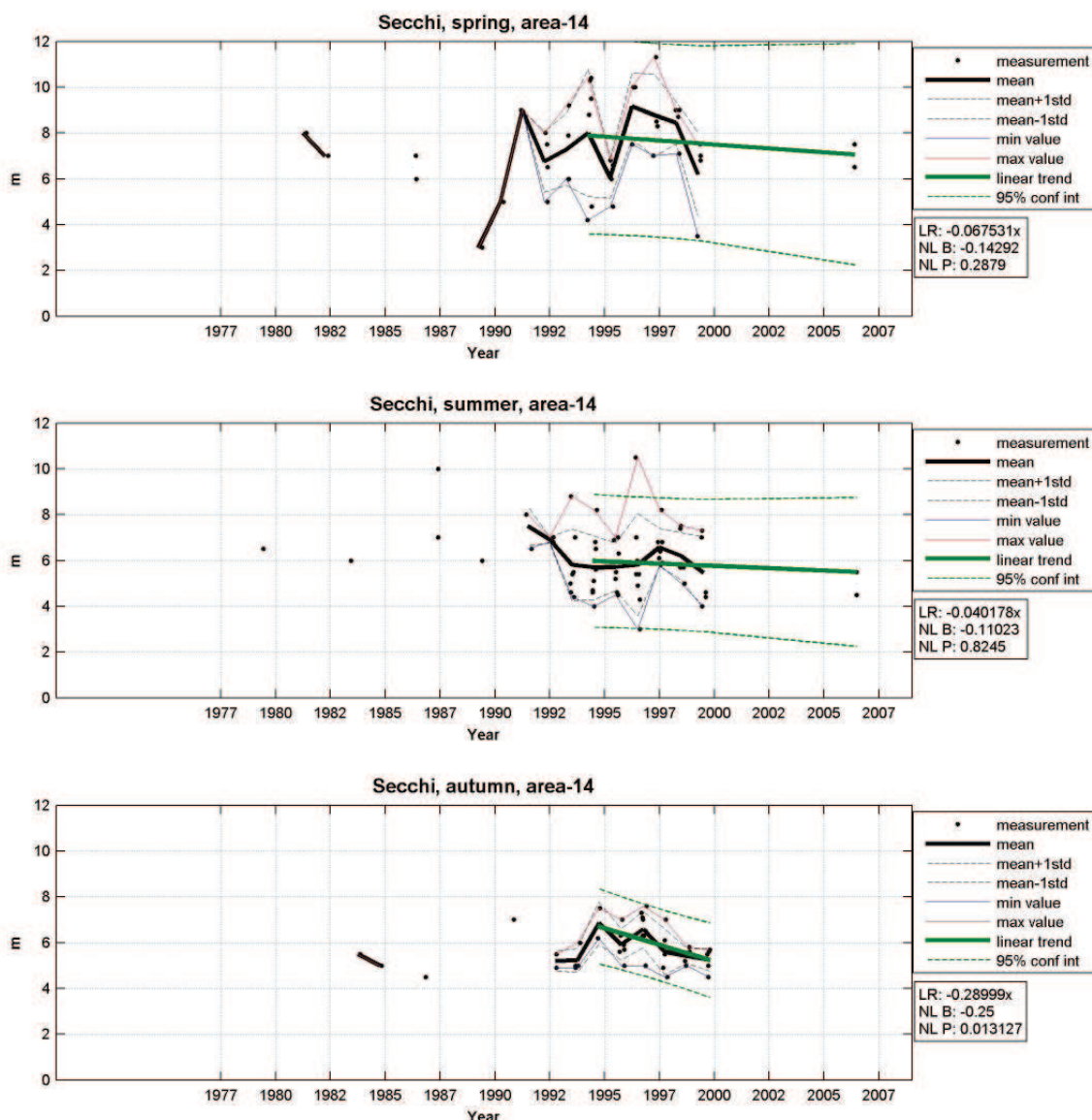


Figure 164. The Bothnian Bay, Area 14, Secchi depth during spring (March to May), summer (June to August) and autumn (September to November). The black dots are the measurements. The black line is the yearly seasonal mean and the dashed line black line is the mean  $\pm$  1 std. The red line represents the maximum value during the season and the blue the minimum values. The green line represents the linear regression fit between 1994 to 2008 with green dashed lines as the 95% confidence interval. The box contains three values LR=the slope of the linear regression line (1st order), NL B=the median slope of the non linear Seasonal Kendall equation and NL P=the probability that there is a significant trend, using linear method. NL P-values < 0.05 indicate significance.

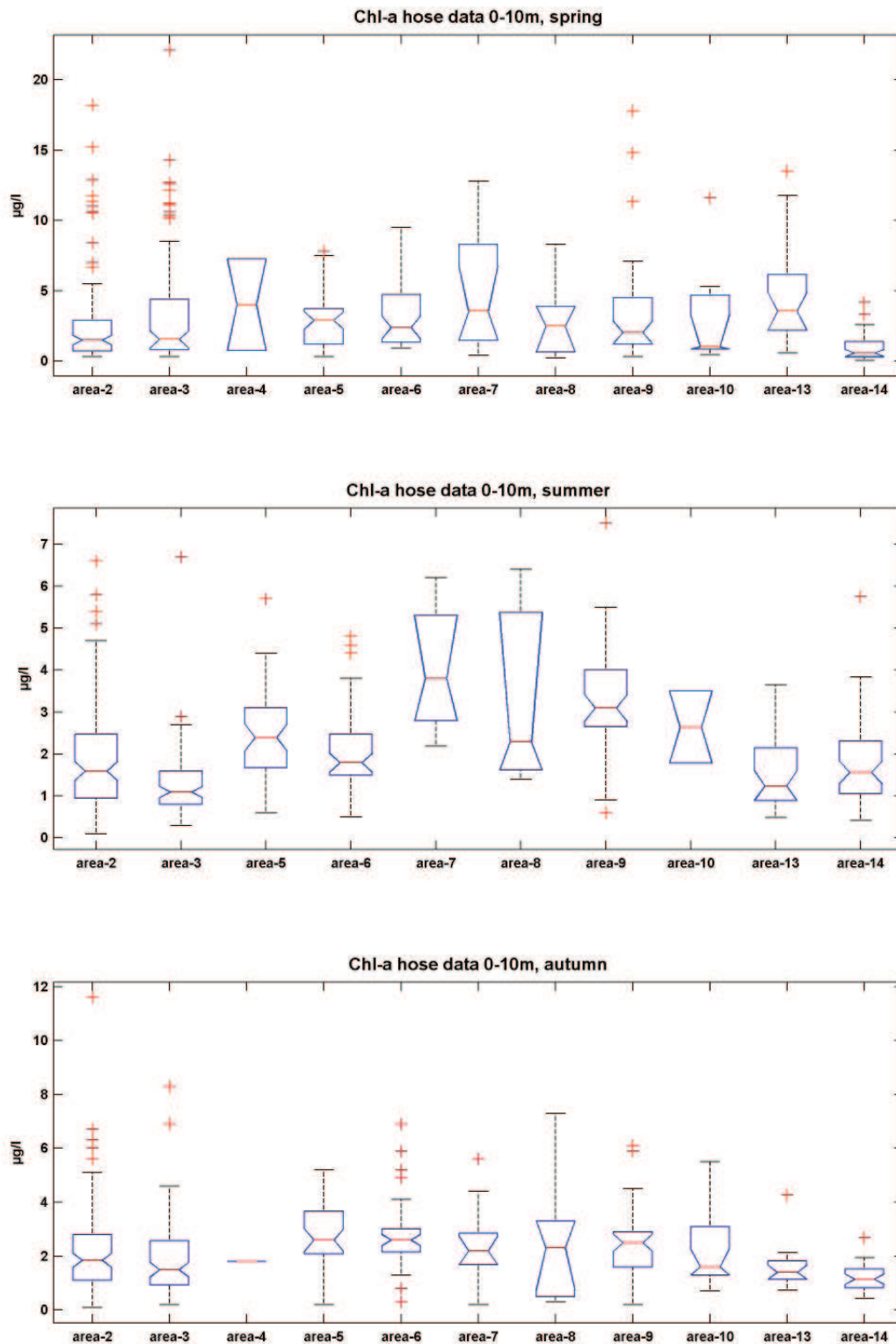


Figure 165. Integrated samples of Chl a collected by hose (0-10m) for the areas divided into spring, summer and autumn box plots. The box has lines at the lower quartile, median and upper quartile values. The whiskers are lines extending from each end of the box to show the extent of the rest of the data. Maximum whisker length is 1.5 times the inter quartile range. The red plus signs above and below the box are outliers which are data with values beyond the ends of the whiskers. The figures are presented as notched box plots. Boxes whose notches do not overlap indicate with 95% confidence that the true medians do differ.

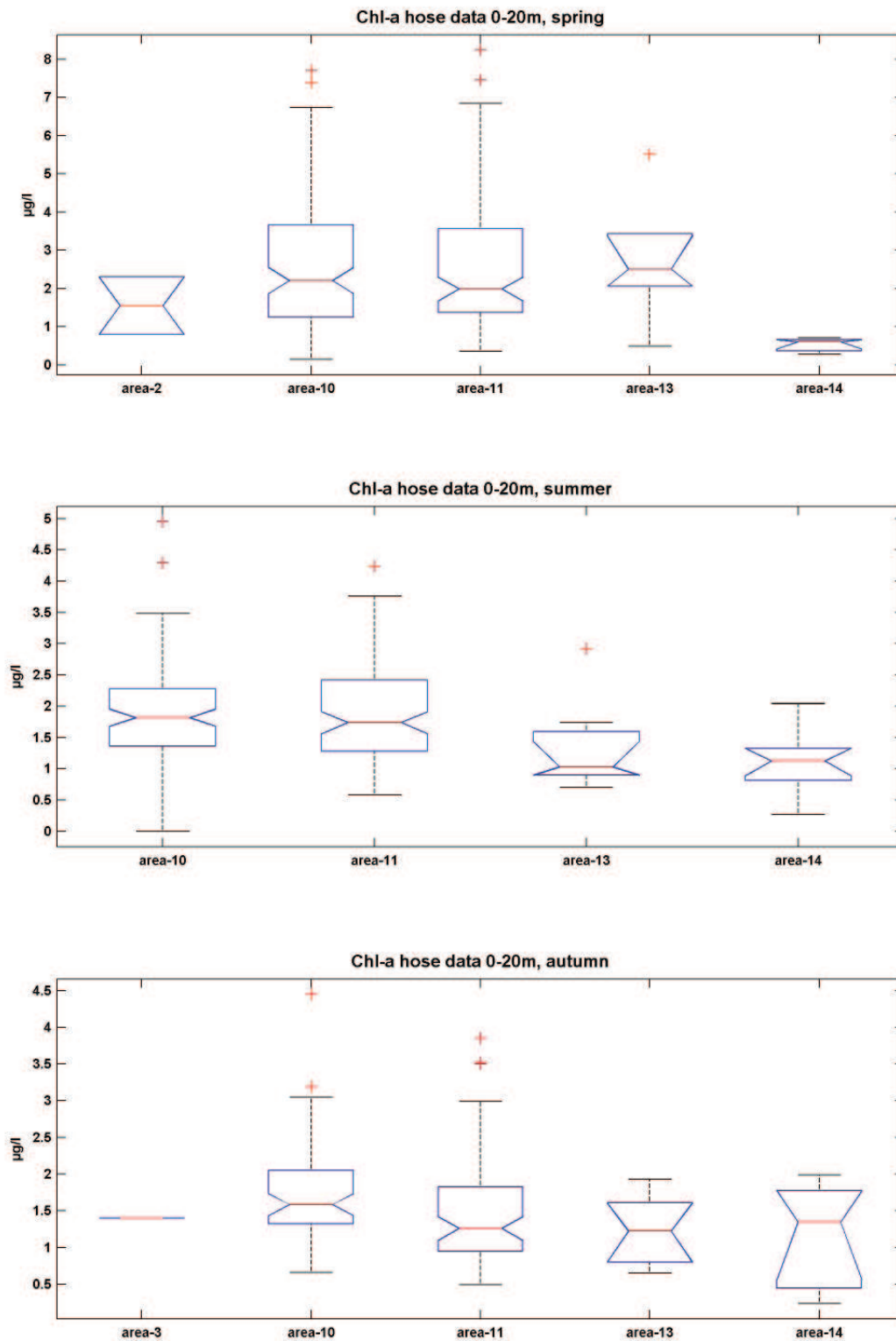


Figure 166. Integrated samples of Chl a collected by hose (0-10m) for the areas divided into spring, summer and autumn box plots. The box has lines at the lower quartile, median and upper quartile values. The whiskers are lines extending from each end of the box to show the extent of the rest of the data. Maximum whisker length is 1.5 times the inter quartile range. The red plus signs above and below the box are outliers which are data with values beyond the ends of the whiskers. The figures are presented as notched box plots. Boxes whose notches do not overlap indicate with 95% confidence that the true medians do differ.

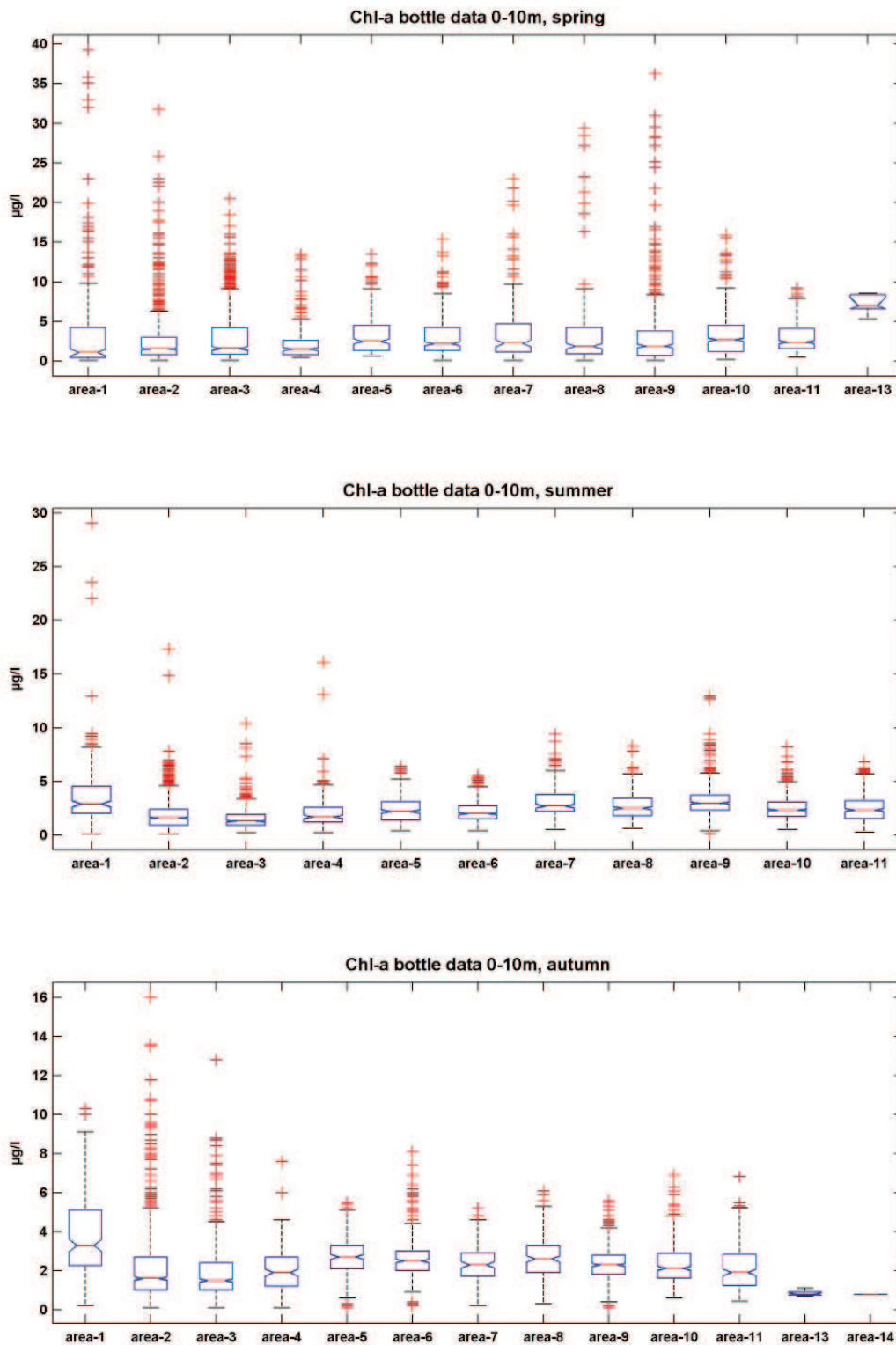


Figure 167. All Chl a values from integrated bottles from discrete depths (0-10m) for the areas divided into spring, summer and autumn box plots. The box has lines at the lower quartile, median and upper quartile values. The whiskers are lines extending from each end of the box to show the extent of the rest of the data. Maximum whisker length is 1.5 times the inter quartile range. The red plus signs above and below the box are outliers which are data with values beyond the ends of the whiskers. The figures are presented as notched box plots. Boxes whose notches do not overlap indicate with 95% confidence that the true medians do differ.

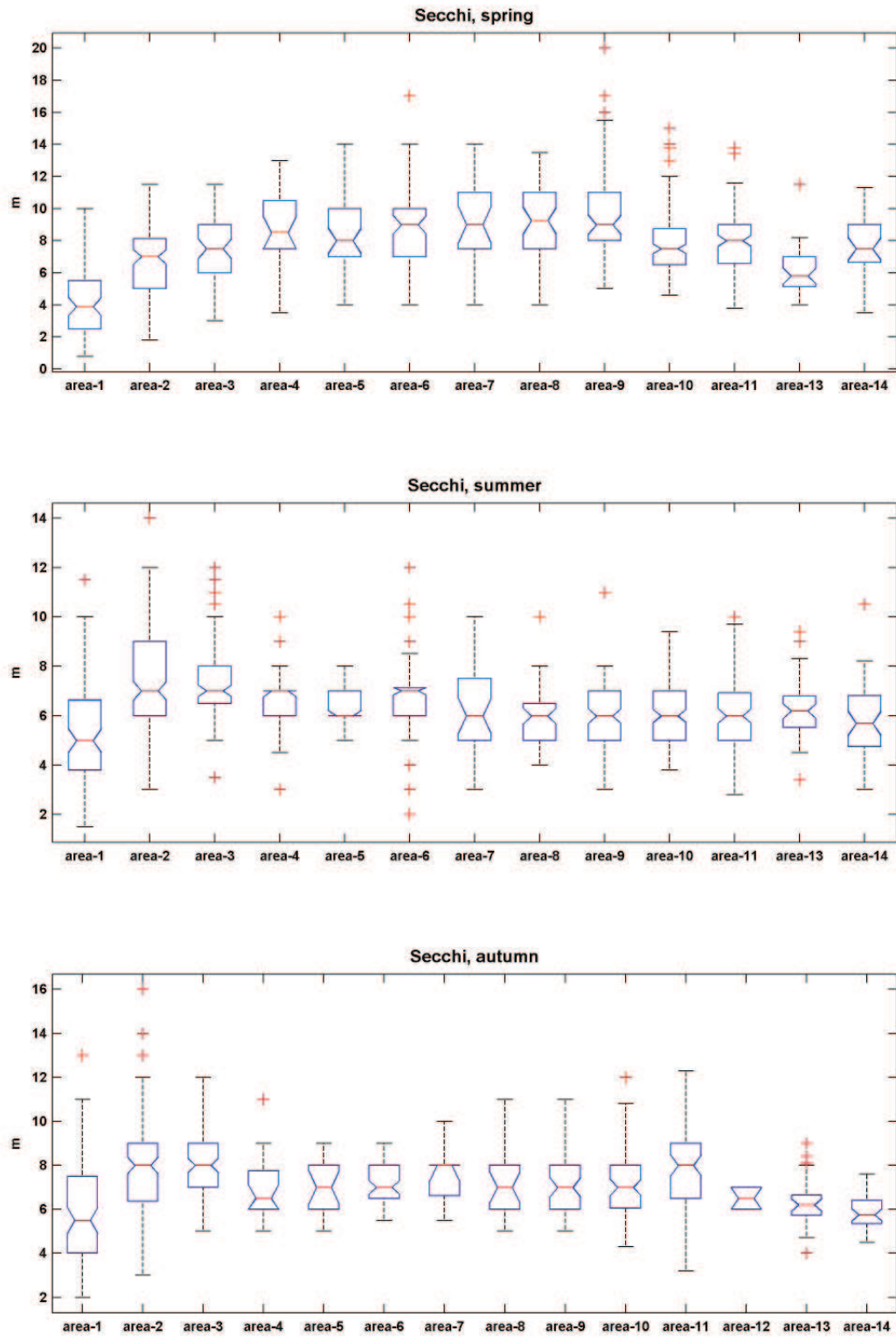


Figure 168. Secchi depth for the areas divided into spring, summer and autumn box plots. The box has lines at the lower quartile, median and upper quartile values. The whiskers are lines extending from each end of the box to show the extent of the rest of the data. Maximum whisker length is 1.5 times the inter quartile range. The red plus signs above and below the box are outliers which are data with values beyond the ends of the whiskers. The figures are presented as notched box plots. Boxes whose notches do not overlap indicate with 95% confidence that the true medians do differ.



## APPENDIX I

### Tables of chl-a and secchi

In the following tables, the last 15 years (1994 to 2008) of the used parameters are presented year by year. Each table contains the spring, summer and autumn values. For area 1 to 3, the spring months are February through April, the summer months the next three following months and the autumn months the three months after that. For area 4 to 14, the spring months are March through May, the summer months the next three following months and the autumn months the three months after that.

Every area and every parameter is presented in separate tables. In a table, the mean, standard deviation, minimum value, maximum value and number of observations for each year is presented. The number of observations reflects the amount of values available for the specific area, year, season and parameter. Below the values of 2008, the mean, max and min of the values from the 15 year period is presented. When the amount of data points is sufficient, both a linear regression and non-linear (non-parametric) analysis have been supplied on the data sets to analyse the last 15 years for possible trends.

At the bottom of the table results from the trend analysis is presented. Linear trend is the resulting value of a linear regression of the first order. The value gives the inclination of the linear regression line. If LR is positive, the direction of the line is positive and vice versa. The remaining four values come from the non-linear seasonal Mann-Kendall analysis. To find the slope of a possible trend, all the differences between two observations in all the data are sorted from the highest negative difference to the highest positive difference. The B value (NL B) is the median value of all the differences. The NL P value is the significance of the trend. If the NL P value is less than 0.05, the trend is significant. There are two additional values connected to the

Mann-Kendall slope value B. The two values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend. The choice of a critical p-value to determine whether the result is judged "statistically significant" is left to the researcher. It is common to declare a result significant if the p-value is less than 0.05.

Table 8. The west-coast inside the skerries, Area 1. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 1= Alsäck, Havstensfjord |                    |       |         |                    |             |              |                    |         |            |             |              |      |           |
|-------------------------------|--------------------|-------|---------|--------------------|-------------|--------------|--------------------|---------|------------|-------------|--------------|------|-----------|
| AREA 1                        | Spring, Hose 0-10m |       |         | Summer, Hose 0-10m |             |              | Autumn, Hose 0-10m |         |            |             |              |      | no of obs |
|                               | mean               | 1 std | min     | max                | no of obs   | mean         | 1 std              | min     | max        | no of obs   | 1 std        | min  | max       |
| Chl-a                         | 1994               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1995               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1996               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1997               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1998               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1999               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2000               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2001               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2002               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2003               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2004               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2005               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2006               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2007               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2008               |       |         |                    |             |              |                    |         |            |             |              |      |           |
| Extreme values:               | mean mean          |       | min min | max max            |             | mean mean    |                    | min min | max max    |             | mean mean    |      | min min   |
|                               | ND                 |       | ND      | ND                 |             | ND           |                    | ND      | ND         |             | ND           |      | ND        |
| Trend analysis                | Linear trend       | NL B  | NL P    | 90 conf up         | 90 conf low | Linear trend | NL B               | NL P    | 90 conf up | 90 conf low | Linear trend | NL B | NL P      |
|                               |                    |       |         |                    |             |              |                    |         |            |             |              |      |           |
| Area 1= Alsäck, Havstensfjord |                    |       |         |                    |             |              |                    |         |            |             |              |      |           |
| AREA 1                        | Spring, Hose 0-20m |       |         | Summer, Hose 0-20m |             |              | Autumn, Hose 0-20m |         |            |             |              |      | no of obs |
|                               | mean               | 1 std | min     | max                | no of obs   | mean         | 1 std              | min     | max        | no of obs   | 1 std        | min  | max       |
| Chl-a                         | 1994               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1995               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1996               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1997               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1998               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 1999               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2000               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2001               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2002               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2003               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2004               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2005               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2006               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2007               |       |         |                    |             |              |                    |         |            |             |              |      |           |
|                               | 2008               |       |         |                    |             |              |                    |         |            |             |              |      |           |
| Extreme values:               | mean mean          |       | min min | max max            |             | mean mean    |                    | min min | max max    |             | mean mean    |      | min min   |
|                               | ND                 |       | ND      | ND                 |             | ND           |                    | ND      | ND         |             | ND           |      | ND        |
| Trend analysis                | Linear trend       | NL B  | NL P    | 90 conf up         | 90 conf low | Linear trend | NL B               | NL P    | 90 conf up | 90 conf low | Linear trend | NL B | NL P      |
|                               |                    |       |         |                    |             |              |                    |         |            |             |              |      |           |



Table 9. The Skagerrak, Area 2. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If P > 0.05, there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 2 = A13, A15, A17, HS5, M6, TH6, P2, Slaggo |                    |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|--------------------------------------------------|--------------------|--------------|-------|--------------------|------------|-------------|--------------------|--------|---------|------------|-------------|--------------|------------|---------|------------|-------------|-----------|-----|
| AREA 2                                           | Spring, Hose 0-10m |              |       | Summer, Hose 0-10m |            |             | Autumn, Hose 0-10m |        |         | Hose 0-10m |             |              | Hose 0-10m |         |            | no of obs   | no of obs |     |
|                                                  | mean               | 1 std        | min   | max                | no of obs  | mean        | 1 std              | min    | max     | no of obs  | mean        | 1 std        | min        | max     | 1 std      |             |           | min |
| Chl-a                                            | 1994               | 1.76         | 2.14  | 0.31               | 5.38       | 5           | 1.74               | 0.61   | 1.32    | 2.63       | 4           | 3.33         | 2.61       | 1.48    | 6.32       | 3           | 3         |     |
|                                                  | 1995               | 1.77         | 0.93  | 0.70               | 2.40       | 3           | 2.47               | 0.65   | 1.80    | 3.10       | 3           | 2.47         | 0.93       | 1.70    | 3.50       | 3           | 3         |     |
|                                                  | 1996               | 4.13         | 5.60  | 0.70               | 10.60      | 3           | 2.33               | 0.60   | 1.70    | 2.90       | 3           | 2.97         | 2.31       | 1.30    | 5.60       | 3           | 3         |     |
|                                                  | 1997               | 15.20        | 0.00  | 15.20              | 15.20      | 1           | 0.80               | 0.00   | 0.80    | 0.80       | 1           | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 1998               | 1.93         | 1.35  | 0.60               | 3.30       | 3           | 2.57               | 1.27   | 1.20    | 3.70       | 3           | 0.90         | 0.35       | 0.50    | 1.10       | 3           | 3         |     |
|                                                  | 1999               | 3.93         | 5.69  | 0.60               | 10.50      | 3           | 2.40               | 1.99   | 1.20    | 4.70       | 3           | 1.50         | 1.47       | 0.30    | 3.60       | 4           | 4         |     |
|                                                  | 2000               | 1.79         | 0.90  | 0.60               | 3.40       | 9           | 2.29               | 1.52   | 0.80    | 5.80       | 9           | 4.31         | 2.96       | 1.10    | 11.60      | 12          | 12        |     |
|                                                  | 2001               | 4.11         | 4.08  | 0.40               | 11.70      | 9           | 2.61               | 1.27   | 1.10    | 5.10       | 9           | 3.21         | 1.51       | 1.40    | 6.00       | 9           | 9         |     |
|                                                  | 2002               | 3.99         | 5.52  | 0.70               | 18.20      | 9           | 2.25               | 1.69   | 0.50    | 6.60       | 11          | 1.47         | 0.84       | 0.10    | 2.40       | 7           | 7         |     |
|                                                  | 2003               | 2.01         | 2.08  | 0.30               | 6.70       | 9           | 1.69               | 0.93   | 0.50    | 3.40       | 11          | 1.37         | 0.84       | 0.60    | 2.90       | 9           | 9         |     |
|                                                  | 2004               | 2.98         | 3.21  | 0.80               | 11.00      | 9           | 1.36               | 0.53   | 0.50    | 1.90       | 11          | 2.34         | 1.16       | 0.90    | 4.70       | 8           | 8         |     |
|                                                  | 2005               | 2.23         | 3.47  | 0.30               | 11.30      | 9           | 1.30               | 0.82   | 0.50    | 3.00       | 9           | 1.55         | 0.57       | 0.80    | 2.50       | 11          | 11        |     |
|                                                  | 2006               | 2.74         | 2.09  | 0.80               | 5.40       | 8           | 1.57               | 1.77   | 0.10    | 5.40       | 7           | 1.54         | 1.18       | 0.30    | 4.30       | 12          | 12        |     |
|                                                  | 2007               | 2.65         | 3.92  | 0.40               | 12.90      | 10          | 1.64               | 1.16   | 0.40    | 3.80       | 9           | 2.55         | 1.38       | 0.50    | 4.00       | 8           | 8         |     |
|                                                  | 2008               | 1.37         | 1.29  | 0.40               | 4.30       | 9           | 1.55               | 0.92   | 0.30    | 3.10       | 10          | 2.28         | 1.16       | 0.80    | 4.20       | 10          | 10        |     |
| Extreme values:                                  |                    | mean         | mean  | min                | min        | max         | mean               | mean   | min     | min        | max         | mean         | mean       | min     | min        | max         |           |     |
|                                                  |                    | 3.51         |       | 0.30               | 18.20      |             | 1.90               |        | 0.10    | 6.60       |             | 2.27         |            | 0.10    | 11.60      |             |           |     |
| Trend analysis                                   |                    | Linear trend | NL B  | NL P               | 90 conf up | 90 conf low | Linear trend       | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B       | NL P    | 90 conf up | 90 conf low |           |     |
|                                                  |                    | -0.07833     | 0.022 | 0.48272            | 0.08152    | -0.02381    | -0.07335           | -0.072 | 0.00793 | -0.03333   | -0.12083    | -0.09159     | -0.026     | 0.28049 | 0.01857    | -0.09000    |           |     |
| Area 2 = A13, A15, A17, HS5, M6, TH6, P2, Slaggo |                    |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
| AREA 2                                           | Spring, Hose 0-20m |              |       | Summer, Hose 0-20m |            |             | Autumn, Hose 0-20m |        |         | Hose 0-20m |             |              | Hose 0-20m |         |            | Hose 0-20m  |           |     |
|                                                  | Chl-a              | 1994         | ND    | ND                 | ND         | ND          | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 1995               | ND           | ND    | ND                 | ND         | ND          | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 1996               | ND           | ND    | ND                 | ND         | ND          | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 1997               | ND           | ND    | ND                 | ND         | ND          | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 1998               | ND           | ND    | ND                 | ND         | ND          | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 1999               | ND           | ND    | ND                 | ND         | ND          | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 2000               | 1.55         | 1.06  | 0.80               | 2.30       | 2           | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |
|                                                  | 2001               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|                                                  | 2002               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|                                                  | 2003               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|                                                  | 2004               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|                                                  | 2005               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|                                                  | 2006               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|                                                  | 2007               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
|                                                  | 2008               |              |       |                    |            |             |                    |        |         |            |             |              |            |         |            |             |           |     |
| Extreme values:                                  |                    | mean         | mean  | min                | min        | max         | mean               | mean   | min     | min        | max         | mean         | mean       | min     | min        | max         |           |     |
|                                                  |                    | 1.55         |       | 0.80               | 2.30       |             | ND                 |        | ND      | ND         | ND          | ND           |            | ND      |            | max max     |           |     |
| Trend analysis                                   |                    | Linear trend | NL B  | NL P               | 90 conf up | 90 conf low | Linear trend       | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B       | NL P    | 90 conf up | 90 conf low |           |     |
|                                                  |                    | 19.56696     | ND    | ND                 | ND         | ND          | ND                 | ND     | ND      | ND         | ND          | ND           | ND         | ND      | ND         | ND          | ND        |     |



Table 10. The Kartegat, Area 3. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 3 = Anholt, Fladen, GF4, Kullen, St. Middelgrund |                       |       |         |            |                       |              |       |         |                       |             |              |        |         |            |             |           |
|-------------------------------------------------------|-----------------------|-------|---------|------------|-----------------------|--------------|-------|---------|-----------------------|-------------|--------------|--------|---------|------------|-------------|-----------|
| AREA 3<br>Chl-a                                       | Spring,<br>Hose 0-10m |       |         |            | Summer,<br>Hose 0-10m |              |       |         | Autumn,<br>Hose 0-10m |             |              |        |         |            |             |           |
|                                                       | mean                  | 1 std | min     | max        | no of obs             | mean         | 1 std | min     | max                   | no of obs   | mean         | 1 std  | min     | max        | no of obs   | no of obs |
| 1994                                                  | ND                    | ND    | ND      | ND         | 10                    | ND           | ND    | ND      | ND                    | 2           | ND           | ND     | ND      | ND         | 2           | 0         |
| 1995                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 2           | 2,55         | 0,49   | 2,20    | 2,20       | 2,90        | 2         |
| 1996                                                  | 6,10                  | 6,31  | 0,70    | 12,70      | 4                     | ND           | ND    | ND      | ND                    | 0           | 1,10         | 1,01   | 0,20    | 2,20       | 2,20        | 3         |
| 1997                                                  | 2,90                  | 3,34  | 0,30    | 8,10       | 5                     | 0,50         | 0,12  | 0,40    | 0,60                  | 4           | 1,98         | 0,72   | 1,00    | 2,80       | 2,80        | 6         |
| 1998                                                  | 4,78                  | 6,46  | 0,60    | 14,30      | 4                     | 1,03         | 0,54  | 0,60    | 2,10                  | 6           | 3,30         | 2,81   | 0,90    | 6,90       | 6,90        | 6         |
| 1999                                                  | 2,48                  | 1,53  | 1,20    | 4,50       | 4                     | 1,07         | 0,45  | 0,60    | 1,80                  | 7           | 2,34         | 2,67   | 0,80    | 8,30       | 8,30        | 7         |
| 2000                                                  | 1,61                  | 0,90  | 0,60    | 3,20       | 7                     | 1,65         | 0,75  | 1,00    | 2,70                  | 6           | 2,87         | 1,02   | 1,40    | 4,60       | 4,60        | 7         |
| 2001                                                  | 3,52                  | 0,83  | 2,60    | 4,80       | 6                     | 1,59         | 0,34  | 1,10    | 2,10                  | 7           | 2,80         | 1,03   | 1,60    | 4,20       | 4,20        | 5         |
| 2002                                                  | 3,56                  | 3,96  | 1,40    | 10,60      | 5                     | 2,11         | 2,13  | 0,50    | 6,70                  | 7           | 1,14         | 1,05   | 0,30    | 2,90       | 2,90        | 5         |
| 2003                                                  | 5,23                  | 7,55  | 0,50    | 22,10      | 8                     | 0,74         | 0,16  | 0,60    | 1,00                  | 7           | 1,06         | 0,41   | 0,50    | 1,60       | 1,60        | 7         |
| 2004                                                  | 4,85                  | 4,61  | 0,80    | 12,10      | 6                     | 1,28         | 0,34  | 0,90    | 1,80                  | 8           | 1,76         | 0,65   | 1,30    | 2,70       | 2,70        | 7         |
| 2005                                                  | 2,51                  | 3,96  | 0,30    | 11,20      | 7                     | 0,98         | 0,33  | 0,50    | 1,40                  | 6           | 1,68         | 1,03   | 0,70    | 3,30       | 3,30        | 8         |
| 2006                                                  | 3,50                  | 2,89  | 1,30    | 8,40       | 5                     | 1,08         | 0,55  | 0,50    | 1,80                  | 6           | 0,87         | 0,57   | 0,20    | 1,90       | 1,90        | 7         |
| 2007                                                  | 3,05                  | 4,15  | 0,40    | 11,10      | 6                     | 1,60         | 0,92  | 0,60    | 2,90                  | 6           | 1,83         | 0,64   | 0,90    | 2,80       | 2,80        | 8         |
| 2008                                                  | 2,96                  | 2,62  | 0,80    | 6,50       | 5                     | 1,21         | 0,79  | 0,30    | 2,70                  | 7           | 1,59         | 1,16   | 0,40    | 3,60       | 3,60        | 9         |
| Extreme values:                                       | mean mean             |       | min min | max max    |                       | mean mean    |       | min min | max max               |             | mean mean    |        | min min | max max    |             |           |
|                                                       | 3,65                  |       | 0,30    | 22,10      |                       | 1,29         |       | 0,30    | 6,70                  |             | 1,92         |        | 0,20    | 8,30       |             |           |
| Trend analysis:                                       | Linear trend          | NL B  | NL P    | 90 conf up | 90 conf low           | Linear trend | NL B  | NL P    | 90 conf up            | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |           |
|                                                       | -0.06287              | 0.058 | 0.43277 | 0.21000    | -0.03750              | 0.00245      | 0.000 | 0.93940 | 0.05000               | -0.04375    | -0.09097     | -0.067 | 0.06269 | -0.00667   | -0.14394    |           |

| Area 3 = Anholt, Fladen, GF4, Kullen, St. Middelgrund |                       |       |         |            |                       |              |       |         |                       |             |              |       |         |            |             |           |
|-------------------------------------------------------|-----------------------|-------|---------|------------|-----------------------|--------------|-------|---------|-----------------------|-------------|--------------|-------|---------|------------|-------------|-----------|
| AREA 3<br>Chl-a                                       | Spring,<br>Hose 0-20m |       |         |            | Summer,<br>Hose 0-20m |              |       |         | Autumn,<br>Hose 0-20m |             |              |       |         |            |             |           |
|                                                       | mean                  | 1 std | min     | max        | no of obs             | mean         | 1 std | min     | max                   | no of obs   | mean         | 1 std | min     | max        | no of obs   | no of obs |
| 1994                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 1995                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 1996                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 1997                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 1998                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 1999                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2000                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2001                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | 1,40         | 0,00  | 1,40    | 1,40       | 1           | 1         |
| 2002                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2003                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2004                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2005                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2006                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2007                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| 2008                                                  | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           | 0         |
| Extreme values:                                       | mean mean             |       | min min | max max    |                       | mean mean    |       | min min | max max               |             | mean mean    |       | min min | max max    |             |           |
|                                                       | ND                    |       | ND      | ND         |                       | ND           |       | ND      | ND                    |             | 1,40         |       | 1,40    | 1,40       |             |           |
| Trend analysis:                                       | Linear trend          | NL B  | NL P    | 90 conf up | 90 conf low           | Linear trend | NL B  | NL P    | 90 conf up            | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |           |
|                                                       | ND                    | ND    | ND      | ND         | ND                    | ND           | ND    | ND      | ND                    | ND          | ND           | ND    | ND      | ND         | ND          |           |



| Area 5 = BY1, BY2 |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
|-------------------|-----------------------|-------|---------------|---------------|-----------------------|-----------------|-------|---------------|-----------------------|----------------|-----------------|-------|---------------|---------------|----------------|----------------|----------------|-----------|
| AREA 5<br>Chl-a   | Spring,<br>Hose 0-20m |       |               |               | Summer,<br>Hose 0-20m |                 |       |               | Autumn,<br>Hose 0-20m |                |                 |       | no of obs     | max           | 1 std          | min            | max            | no of obs |
|                   | mean                  | 1 std | min           | max           | no of obs             | mean            | 1 std | min           | max                   | no of obs      | mean            | 1 std |               |               |                |                |                |           |
| 1994              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 1995              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 1996              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 1997              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 1998              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 1999              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2000              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2001              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2002              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2003              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2004              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2005              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2006              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2007              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| 2008              |                       |       |               |               |                       |                 |       |               |                       |                |                 |       |               |               |                |                |                |           |
| Extreme values:   | mean mean<br>ND       |       | min min<br>ND | max max<br>ND |                       | mean mean<br>ND |       | min min<br>ND | max max<br>ND         |                | mean mean<br>ND |       | min min<br>ND | max max<br>ND |                | min min<br>ND  | max max<br>ND  |           |
| Trend analysis    | Linear trend          | NL B  | NL P          | 90 conf<br>up | 90 conf<br>low        | Linear trend    | NL B  | NL P          | 90 conf<br>up         | 90 conf<br>low | Linear trend    | NL B  | NL P          | 90 conf<br>up | 90 conf<br>low | 90 conf<br>low | 90 conf<br>low |           |



Table 12. The Bornholm Basin, Area 6. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval for the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 6 = BY4, BY5, BY39, Hanobukten |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
|-------------------------------------|-------|--------------------|-------|---------|--------------------|-----------|---------|--------------------|---------|---------|-----------|---------|-------|---------|---------|-----------|--------------|-------|---------|------------|-------------|--|
| AREA 6                              | Chl-a | Spring, Hose 0-10m |       |         | Summer, Hose 0-10m |           |         | Autumn, Hose 0-10m |         |         | 1 std     |         |       | min     |         |           | max          |       |         | no of obs  |             |  |
|                                     |       | mean               | 1 std | min     | max                | no of obs | mean    | 1 std              | min     | max     | no of obs | mean    | 1 std | min     | max     | no of obs | mean         | 1 std | min     | max        | no of obs   |  |
| 1994                                |       | 4.92               | 5.31  | 1.16    | 8.67               | 2         | ND      | ND                 | ND      | ND      | 0         | 1.60    | 1.84  | 0.30    | 2.90    | 2         | 2.40         | 0.00  | 2.40    | 3.00       | 1           |  |
| 1995                                |       | 1.00               | 0.00  | 1.00    | 1.00               | 1         | ND      | ND                 | ND      | ND      | 0         | 2.15    | 1.20  | 1.30    | 2.00    | 2         | 2.15         | 1.20  | 1.30    | 3.00       | 2           |  |
| 1996                                |       | 4.05               | 4.17  | 1.10    | 7.00               | 2         | ND      | ND                 | ND      | ND      | 0         | 2.20    | 0.28  | 2.00    | 2.40    | 2         | 4.33         | 2.14  | 1.90    | 5.90       | 3           |  |
| 1997                                |       | 4.85               | 4.88  | 1.40    | 8.30               | 2         | 0.80    | 0.00               | 0.80    | 0.80    | 1         | 2.20    | 0.28  | 2.00    | 2.40    | 2         | 3.03         | 0.75  | 2.30    | 3.80       | 3           |  |
| 1998                                |       | 1.55               | 0.92  | 0.90    | 2.20               | 2         | 2.45    | 0.79               | 1.70    | 3.40    | 4         | 2.20    | 0.56  | 1.70    | 2.90    | 4         | 3.90         | 1.41  | 2.90    | 4.90       | 2           |  |
| 1999                                |       | 4.93               | 2.73  | 1.90    | 7.20               | 3         | 1.60    | 0.28               | 1.20    | 1.80    | 4         | 2.90    | 0.94  | 1.90    | 3.80    | 4         | 2.70         | 0.42  | 2.40    | 3.00       | 2           |  |
| 2000                                |       | 2.47               | 2.28  | 1.10    | 5.10               | 3         | 2.20    | 0.56               | 1.70    | 2.90    | 4         | 1.55    | 1.06  | 0.80    | 2.30    | 4         | 1.90         | 0.10  | 1.80    | 2.00       | 3           |  |
| 2001                                |       | 5.20               | 3.90  | 1.90    | 9.50               | 3         | 2.90    | 0.94               | 1.90    | 3.80    | 4         | 2.30    | 0.61  | 1.60    | 2.70    | 4         | 2.87         | 0.38  | 2.60    | 3.30       | 3           |  |
| 2002                                |       | 2.93               | 0.47  | 2.40    | 3.30               | 3         | 1.73    | 0.29               | 1.30    | 1.90    | 4         | 2.83    | 0.78  | 2.20    | 3.70    | 3         | 2.57         | 0.32  | 2.20    | 2.80       | 3           |  |
| 2003                                |       | 2.33               | 0.93  | 1.70    | 3.40               | 3         | 1.58    | 0.83               | 0.70    | 2.70    | 4         | 4.43    | 2.32  | 2.30    | 6.90    | 3         | mean mean    |       | min min | max max    |             |  |
| 2004                                |       | 2.63               | 1.63  | 1.50    | 4.50               | 3         | 1.50    | 0.50               | 1.10    | 2.20    | 4         | 2.72    |       | 0.30    | 6.90    |           | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |  |
| 2005                                |       | 2.28               | 1.91  | 1.00    | 5.10               | 4         | 1.38    | 0.61               | 0.50    | 1.90    | 4         | 0.04942 |       | 0.33864 | 0.10000 | -0.02500  | 0.04942      |       | 0.33864 | 0.10000    | -0.02500    |  |
| 2006                                |       | 2.75               | 1.51  | 0.90    | 4.60               | 4         | 1.83    | 1.15               | 0.50    | 3.30    | 4         |         |       |         |         |           |              |       |         |            |             |  |
| 2007                                |       | 2.07               | 1.36  | 1.00    | 3.60               | 3         | 1.90    | 0.42               | 1.40    | 2.30    | 4         |         |       |         |         |           |              |       |         |            |             |  |
| 2008                                |       | 5.80               | 2.00  | 3.60    | 7.50               | 3         | 4.18    | 0.87               | 2.90    | 4.80    | 4         |         |       |         |         |           |              |       |         |            |             |  |
| Extreme values:                     |       | 3.32               |       | 0.90    | 9.50               |           | 2.00    |                    | 0.50    | 4.80    |           | 2.72    |       | 0.30    | 6.90    |           | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |  |
| Trend analysis                      |       | -0.05466           | 0.011 | 0.88837 | 0.10000            | -0.10000  | 0.06330 | 0.023              | 0.66715 | 0.08750 | -0.05000  | 0.04942 | 0.045 | 0.33864 | 0.10000 | -0.02500  | 0.04942      | 0.045 | 0.33864 | 0.10000    | -0.02500    |  |
| Area 6 = BY4, BY5, BY39, Hanobukten |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| AREA 6                              | Chl-a | Spring, Hose 0-20m |       |         | Summer, Hose 0-20m |           |         | Autumn, Hose 0-20m |         |         | 1 std     |         |       | min     |         |           | max          |       |         | no of obs  |             |  |
|                                     |       | mean               | 1 std | min     | max                | no of obs | mean    | 1 std              | min     | max     | no of obs | mean    | 1 std | min     | max     | no of obs | mean         | 1 std | min     | max        | no of obs   |  |
| 1994                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 1995                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 1996                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 1997                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 1998                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 1999                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2000                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2001                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2002                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2003                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2004                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2005                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2006                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2007                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| 2008                                |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| Extreme values:                     |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |
| Trend analysis                      |       |                    |       |         |                    |           |         |                    |         |         |           |         |       |         |         |           |              |       |         |            |             |  |

Table 13. The South eastern Baltic proper, Area 7. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 7 = BCS III, PLP1 |                    |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|------------------------|--------------------|--------------|-------|--------------------|------------|-------------|--------------------|-------|---------|------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 7                 | Spring, Hose 0-10m |              |       | Summer, Hose 0-10m |            |             | Autumn, Hose 0-10m |       |         |            |             |              |       |         |            |             |
|                        | Chl-a              | mean         | 1 std | min                | max        | no of obs   | mean               | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |
|                        | 1994               | 3.55         | 0.00  | 3.55               | 3.55       | 1           | ND                 | ND    | ND      | ND         | 0           | 1.05         | 1.20  | 0.20    | 1.90       | 2           |
|                        | 1995               | 2.50         | 0.00  | 2.50               | 2.50       | 1           | ND                 | ND    | ND      | ND         | 0           | 2.20         | 0.00  | 2.20    | 2.20       | 1           |
|                        | 1996               | 4.45         | 5.73  | 0.40               | 8.50       | 2           | ND                 | ND    | ND      | ND         | 0           | 1.65         | 0.78  | 1.10    | 2.20       | 2           |
|                        | 1997               | 3.80         | 0.00  | 3.80               | 3.80       | 1           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 1998               | 4.90         | 6.86  | 0.50               | 12.80      | 3           | 2.73               | 0.50  | 2.20    | 3.20       | 3           | 3.13         | 1.21  | 2.00    | 4.40       | 3           |
|                        | 1999               | 5.25         | 5.02  | 1.70               | 8.80       | 2           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2000               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2001               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2002               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2003               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2004               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2005               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2006               | ND           | ND    | ND                 | ND         | 0           | 5.30               | 0.00  | 5.30    | 5.30       | 1           | ND           | ND    | ND      | ND         | 0           |
|                        | 2007               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                        | 2008               | 7.70         | 0.00  | 7.70               | 7.70       | 1           | 5.30               | 1.27  | 4.40    | 6.20       | 2           | 3.20         | 2.12  | 1.60    | 5.60       | 3           |
| Extreme values:        |                    | mean         |       | min                | max        |             | mean               |       | min     | max        |             | mean         |       | min     | max        |             |
|                        |                    | 4.59         |       | 0.40               | 12.80      |             | 4.44               |       | 2.20    | 6.20       |             | 2.25         |       | 0.20    | 5.60       |             |
| Trend analysis         |                    | Linear trend | NL B  | NL P               | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                        |                    | 0.33412      | 0.348 | 0.13361            | 2.15000    | 0.10000     | 0.27152            | 0.320 | 0.15730 | ND         | 0.19000     | 0.11745      | 0.181 | 0.22067 | 0.37500    | -0.06667    |
| Area 7 = BCS III, PLP1 |                    |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
| AREA 7                 | Spring, Hose 0-20m |              |       | Summer, Hose 0-20m |            |             | Autumn, Hose 0-20m |       |         |            |             |              |       |         |            |             |
|                        | Chl-a              | mean         | 1 std | min                | max        | no of obs   | mean               | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |
|                        | 1994               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 1995               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 1996               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 1997               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 1998               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 1999               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2000               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2001               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2002               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2003               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2004               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2005               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2006               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2007               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                        | 2008               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
| Extreme values:        |                    | mean         |       | min                | max        |             | mean               |       | min     | max        |             | mean         |       | min     | max        |             |
|                        |                    | ND           |       | ND                 | ND         |             | ND                 |       | ND      | ND         |             | ND           |       | 0.00    | 0.00       |             |
| Trend analysis         |                    | Linear trend | NL B  | NL P               | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                        |                    |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |



Table 14. The Western Gotland Basin, Area 8. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is a certain trend. If otherwise, there is a significant trend.

| Area 8 = BY32, BY38 |                    |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|---------------------|--------------------|--------------|-------|--------------------|------------|-------------|--------------------|-------|---------|------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 8              | Spring, Hose 0-10m |              |       | Summer, Hose 0-10m |            |             | Autumn, Hose 0-10m |       |         |            |             |              |       |         |            |             |
|                     | Chl-a              | mean         | 1 std | min                | max        | no of obs   | mean               | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |
|                     | 1994               | 1,10         | 1,24  | 0,22               | 1,97       | 2           | ND                 | ND    | ND      | ND         | 0           | 0,30         | 0,00  | 0,30    | 0,30       | 2           |
|                     | 1995               | 3,00         | 0,00  | 3,00               | 3,00       | 1           | ND                 | ND    | ND      | ND         | 0           | 0,70         | 0,00  | 0,70    | 0,70       | 1           |
|                     | 1996               | 2,40         | 2,83  | 0,40               | 4,40       | 2           | ND                 | ND    | ND      | ND         | 0           | 2,60         | 0,57  | 2,20    | 3,00       | 2           |
|                     | 1997               | 3,40         | 0,00  | 3,40               | 3,40       | 1           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 1998               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 1999               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2000               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2001               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2002               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2003               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2004               | 0,90         | 0,00  | 0,90               | 0,90       | 1           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2005               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2006               | ND           | ND    | ND                 | ND         | 0           | 1,40               | 0,00  | 1,40    | 1,40       | 1           | ND           | ND    | ND      | ND         | 0           |
|                     | 2007               | ND           | ND    | ND                 | ND         | 0           | ND                 | ND    | ND      | ND         | 0           | ND           | ND    | ND      | ND         | 0           |
|                     | 2008               | 8,30         | 0,00  | 8,30               | 8,30       | 1           | 4,35               | 2,90  | 2,30    | 6,40       | 2           | 4,43         | 2,55  | 2,40    | 7,30       | 3           |
| Extreme values:     |                    | mean mean    |       | min min            | max max    |             | mean mean          |       | min min | max max    |             | mean mean    |       | min min | max max    |             |
|                     |                    | 3,18         |       | 0,22               | 8,30       |             | 2,88               |       | 1,40    | 6,40       |             | 2,01         |       | 0,30    | 7,30       |             |
| Trend analysis      |                    | Linear trend | NL B  | NL P               | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                     |                    | 0.31586      | 0.408 | 0.01039            | 1.21500    | 0.09000     | 1.56669            | ND    | ND      | ND         | ND          | 0.25423      | 0.358 | 0.03569 | 2.30000    | 0.15000     |
| Area 8 = BY32, BY38 |                    |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
| AREA 8              | Spring, Hose 0-20m |              |       | Summer, Hose 0-20m |            |             | Autumn, Hose 0-20m |       |         |            |             |              |       |         |            |             |
|                     | Chl-a              | mean         | 1 std | min                | max        | no of obs   | mean               | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |
|                     | 1994               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 1995               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 1996               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 1997               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 1998               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 1999               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2000               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2001               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2002               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2003               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2004               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2005               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2006               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2007               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
|                     | 2008               |              |       |                    |            |             |                    |       |         |            |             |              |       |         |            |             |
| Extreme values:     |                    | mean mean    |       | min min            | max max    |             | mean mean          |       | min min | max max    |             | mean mean    |       | min min | max max    |             |
|                     |                    | ND           |       | ND                 | ND         |             | ND                 |       | ND      | ND         |             | ND           |       | ND      | ND         |             |
| Trend analysis      |                    | Linear trend | NL B  | NL P               | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |

Table 15. The Eastern Gotland Basin, Area 9. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 9 = BY10, BY15, BY20 |       |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|---------------------------|-------|--------------------|-------|---------|------------|-------------|--------------------|-------|---------|------------|-------------|--------------------|-------|---------|------------|-------------|
| AREA 9                    | Chl-a | Spring, Hose 0-10m |       |         |            | no of obs   | Summer, Hose 0-10m |       |         |            | no of obs   | Autumn, Hose 0-10m |       |         |            | no of obs   |
|                           |       | 1 std              | min   | max     | mean       |             | 1 std              | min   | max     | mean       |             | 1 std              | min   | max     | mean       |             |
|                           | 1994  | 1.23               | 0.29  | 0.90    | 1.51       | 4           | ND                 | ND    | ND      | 0          | 0.38        | 0.35               | 0.20  | 0.90    | 4          |             |
|                           | 1995  | 2.30               | 0.00  | 2.30    | 2.30       | 1           | ND                 | ND    | ND      | 0          | 1.40        | 0.00               | 1.40  | 1.40    | 1          |             |
|                           | 1996  | 1.20               | 0.00  | 1.20    | 1.20       | 1           | ND                 | ND    | ND      | 0          | 2.00        | 0.42               | 1.70  | 2.30    | 2          |             |
|                           | 1997  | 0.95               | 0.35  | 0.70    | 1.20       | 2           | 2.00               | 0.00  | 2.00    | 1          | 1.70        | 0.28               | 1.50  | 1.90    | 2          |             |
|                           | 1998  | 1.55               | 1.06  | 0.80    | 2.30       | 2           | 3.10               | 0.84  | 2.20    | 4          | 3.37        | 0.80               | 2.60  | 4.20    | 3          |             |
|                           | 1999  | 7.07               | 9.30  | 1.70    | 17.80      | 3           | 2.93               | 0.31  | 2.50    | 4          | 2.35        | 0.07               | 2.30  | 2.40    | 2          |             |
|                           | 2000  | 6.10               | 7.67  | 0.30    | 14.80      | 3           | 2.93               | 1.04  | 1.80    | 4          | 5.30        | 1.13               | 4.50  | 6.10    | 2          |             |
|                           | 2001  | 4.40               | 4.75  | 0.40    | 11.30      | 4           | 3.68               | 0.64  | 3.00    | 4          | 2.25        | 0.92               | 1.60  | 2.90    | 2          |             |
|                           | 2002  | 4.47               | 2.94  | 1.30    | 7.10       | 3           | 3.58               | 1.69  | 1.40    | 4          | 1.95        | 0.78               | 1.40  | 2.50    | 2          |             |
|                           | 2003  | 1.80               | 1.74  | 0.60    | 3.80       | 3           | 2.63               | 0.57  | 1.90    | 4          | 2.77        | 1.30               | 1.50  | 4.10    | 3          |             |
|                           | 2004  | 3.87               | 2.20  | 1.70    | 6.10       | 3           | 3.10               | 0.28  | 2.70    | 4          | 2.67        | 0.32               | 2.30  | 2.90    | 3          |             |
|                           | 2005  | 3.33               | 1.53  | 1.60    | 4.50       | 3           | 3.27               | 0.98  | 2.70    | 3          | 3.07        | 0.46               | 2.80  | 3.60    | 3          |             |
|                           | 2006  | 1.80               | 0.67  | 0.90    | 2.40       | 4           | 1.60               | 1.03  | 0.60    | 4          | 2.17        | 0.65               | 1.50  | 2.80    | 3          |             |
|                           | 2007  | 2.50               | 2.55  | 0.30    | 5.30       | 3           | 3.75               | 0.82  | 2.70    | 4          | 3.70        | 1.91               | 2.50  | 5.90    | 3          |             |
|                           | 2008  | 5.90               | 1.31  | 4.50    | 7.10       | 3           | 5.28               | 1.81  | 3.10    | 4          | 2.83        | 0.50               | 2.30  | 3.30    | 3          |             |
| Extreme values:           |       | mean               |       | min     | max        |             | mean               |       | min     | max        |             | mean               |       | min     | max        |             |
|                           |       |                    |       | 0.30    | 17.80      |             | 3.15               |       | 0.60    | 7.50       |             | 2.53               |       | 0.20    | 6.10       |             |
| Trend analysis            |       | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low |
|                           |       | 0.10931            | 0.038 | 0.49319 | 0.16000    | -0.04615    | 0.08962            | 0.031 | 0.28186 | 0.15625    | -0.02500    | 0.12774            | 0.050 | 0.07793 | 0.13333    | 0.00000     |
| Area 9 = BY10, BY15, BY20 |       |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
| AREA 9                    | Chl-a | Spring, Hose 0-20m |       |         |            | no of obs   | Summer, Hose 0-20m |       |         |            | no of obs   | Autumn, Hose 0-20m |       |         |            | no of obs   |
|                           |       | 1 std              | min   | max     | mean       |             | 1 std              | min   | max     | mean       |             | 1 std              | min   | max     | mean       |             |
|                           | 1994  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 1995  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 1996  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 1997  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 1998  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 1999  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2000  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2001  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2002  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2003  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2004  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2005  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2006  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2007  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
|                           | 2008  |                    |       |         |            |             |                    |       |         |            |             |                    |       |         |            |             |
| Extreme values:           |       | mean               |       | min     | max        |             | mean               |       | min     | max        |             | mean               |       | min     | max        |             |
|                           |       | ND                 |       | ND      | ND         |             | ND                 |       | ND      | ND         |             | ND                 |       | min min | max max    |             |
| Trend analysis            |       | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend       | NL B  | NL P    | 90 conf up | 90 conf low |



Table 16. The Northern Baltic Proper, Area 10. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If P > 0.05, there is no significant trend. If the sign of the linear trend and NL B differ, there is a significant trend.

| Area 10 = BY29, BY31 |                       |       |      |                       |             |          |                       |      |         |             |         |       |      |         |             |            |             |           |  |
|----------------------|-----------------------|-------|------|-----------------------|-------------|----------|-----------------------|------|---------|-------------|---------|-------|------|---------|-------------|------------|-------------|-----------|--|
| AREA 10<br>Chl-a     | Spring,<br>Hose 0-10m |       |      | Summer,<br>Hose 0-10m |             |          | Autumn,<br>Hose 0-10m |      |         | 1 std       |         |       | min  |         |             | max        |             | no of obs |  |
|                      | mean                  | 1 std | min  | max                   | no of obs   | mean     | 1 std                 | min  | max     | no of obs   | mean    | 1 std | min  | max     | no of obs   | max        | no of obs   |           |  |
| 1994                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | ND      | ND    | ND   | ND      | 0           | ND         | 0           |           |  |
| 1995                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | ND      | ND    | ND   | ND      | 0           | ND         | 0           |           |  |
| 1996                 | 6.20                  | 7.64  | 0.80 | 11.60                 | 2           | ND       | ND                    | ND   | ND      | 0           | 1.20    | 0.00  | 1.20 | 1.20    | 1           | 1.20       | 1           |           |  |
| 1997                 | 5.30                  | 0.00  | 5.30 | 5.30                  | 1           | ND       | ND                    | ND   | ND      | 0           | 1.40    | 0.14  | 1.30 | 1.50    | 2           | 1.50       | 2           |           |  |
| 1998                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | ND      | ND    | ND   | ND      | 0           | ND         | 0           |           |  |
| 1999                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | ND      | ND    | ND   | ND      | 0           | ND         | 0           |           |  |
| 2000                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | 1.90    | 0.00  | 1.90 | 1.90    | 1           | 1.90       | 1           |           |  |
| 2001                 | 2.90                  | 0.00  | 2.90 | 2.90                  | 1           | ND       | ND                    | ND   | ND      | 0           | 1.40    | 0.00  | 1.40 | 1.40    | 1           | 1.40       | 1           |           |  |
| 2002                 | 0.73                  | 0.39  | 0.45 | 1.00                  | 2           | ND       | ND                    | ND   | ND      | 0           | 0.70    | 0.00  | 0.70 | 0.70    | 1           | 0.70       | 1           |           |  |
| 2003                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | 1.40    | 0.00  | 1.40 | 1.40    | 1           | 1.40       | 1           |           |  |
| 2004                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | 1.40    | 0.42  | 1.10 | 1.70    | 2           | 1.70       | 2           |           |  |
| 2005                 | ND                    | ND    | ND   | ND                    | 0           | 1.79     | 0.00                  | 1.79 | 1.79    | 1           | 1.50    | 0.00  | 1.50 | 1.50    | 1           | 1.50       | 1           |           |  |
| 2006                 | 1.00                  | 0.00  | 1.00 | 1.00                  | 1           | ND       | ND                    | ND   | ND      | 0           | 1.70    | 0.99  | 1.00 | 2.40    | 2           | 2.40       | 2           |           |  |
| 2007                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | 4.30    | 1.70  | 3.10 | 5.50    | 2           | 5.50       | 2           |           |  |
| 2008                 | ND                    | ND    | ND   | ND                    | 0           | ND       | ND                    | ND   | ND      | 0           | 3.88    | 1.04  | 2.40 | 4.60    | 4           | 4.60       | 4           |           |  |
| Extreme values:      | mean                  | min   | max  | max                   | 90 conf low | mean     | min                   | max  | max     | 90 conf low | mean    | min   | max  | max     | 90 conf low | 90 conf up | 90 conf low |           |  |
|                      | 3.23                  |       | 0.45 | 11.60                 |             | 2.65     |                       | 1.79 | 3.50    |             | 1.89    |       | 0.70 | 5.50    |             | 0.26667    | 0.01429     |           |  |
| Trend analysis       | -0.62439              | NL B  | NL P | 0.42000               | -2.17500    | -0.16740 | NL B                  | NL P | ND      | ND          | 0.20345 | NL B  | NL P | 0.04550 | 0.26667     | 0.01750    | -0.01429    |           |  |
|                      |                       |       |      |                       |             |          |                       |      |         |             |         |       |      |         |             |            |             |           |  |
| Area 10 = BY29, BY31 |                       |       |      |                       |             |          |                       |      |         |             |         |       |      |         |             |            |             |           |  |
| AREA 10<br>Chl-a     | Spring,<br>Hose 0-20m |       |      | Summer,<br>Hose 0-20m |             |          | Autumn,<br>Hose 0-20m |      |         | 1 std       |         |       | min  |         |             | max        |             | no of obs |  |
|                      | mean                  | 1 std | min  | max                   | no of obs   | mean     | 1 std                 | min  | max     | no of obs   | mean    | 1 std | min  | max     | no of obs   | max        | no of obs   |           |  |
| 1994                 | 2.83                  | 1.57  | 0.58 | 5.09                  | 8           | 1.91     | 0.67                  | 1.30 | 2.89    | 7           | 2.56    | 0.52  | 1.75 | 3.19    | 5           | 3.19       | 5           |           |  |
| 1995                 | 2.21                  | 1.83  | 0.15 | 5.45                  | 10          | 2.79     | 1.37                  | 1.58 | 4.95    | 7           | 1.77    | 0.89  | 0.91 | 3.05    | 5           | 3.05       | 5           |           |  |
| 1996                 | 2.54                  | 1.41  | 0.70 | 4.34                  | 9           | 1.33     | 0.24                  | 1.09 | 1.67    | 7           | 1.20    | 0.52  | 0.66 | 1.87    | 5           | 1.87       | 5           |           |  |
| 1997                 | 2.66                  | 1.62  | 0.54 | 5.54                  | 7           | 1.74     | 1.07                  | 0.00 | 3.46    | 7           | 1.51    | 0.22  | 1.13 | 1.64    | 5           | 1.64       | 5           |           |  |
| 1998                 | 3.70                  | 2.19  | 0.79 | 7.71                  | 9           | 1.64     | 0.35                  | 1.09 | 2.09    | 7           | 1.70    | 0.54  | 0.83 | 2.12    | 5           | 2.12       | 5           |           |  |
| 1999                 | 2.60                  | 2.24  | 0.48 | 7.40                  | 9           | 2.03     | 0.62                  | 1.25 | 2.80    | 7           | 1.62    | 0.54  | 1.05 | 2.34    | 4           | 2.34       | 4           |           |  |
| 2000                 | 1.96                  | 1.65  | 0.30 | 4.35                  | 8           | 2.02     | 0.44                  | 1.58 | 2.72    | 7           | 2.23    | 0.72  | 1.45 | 2.86    | 3           | 2.86       | 3           |           |  |
| 2001                 | 3.60                  | 1.78  | 0.79 | 6.39                  | 8           | 1.78     | 0.66                  | 0.70 | 2.62    | 7           | 1.52    | 0.26  | 1.35 | 1.82    | 3           | 1.82       | 3           |           |  |
| 2002                 | 2.20                  | 1.34  | 0.40 | 4.04                  | 7           | 1.74     | 0.54                  | 1.02 | 2.54    | 7           | 1.19    | 0.19  | 1.00 | 1.38    | 3           | 1.38       | 3           |           |  |
| 2003                 | 2.82                  | 2.24  | 0.80 | 6.73                  | 7           | 1.54     | 0.67                  | 0.73 | 2.33    | 7           | 1.61    | 0.27  | 1.40 | 1.91    | 3           | 1.91       | 3           |           |  |
| 2004                 | 2.15                  | 1.07  | 0.88 | 3.83                  | 8           | 1.60     | 0.42                  | 0.80 | 2.08    | 7           | 1.38    | 0.25  | 1.10 | 1.58    | 3           | 1.58       | 3           |           |  |
| 2005                 | 2.27                  | 1.12  | 1.24 | 3.76                  | 8           | 1.75     | 0.87                  | 0.96 | 3.48    | 7           | 1.20    | 0.37  | 0.95 | 1.62    | 3           | 1.62       | 3           |           |  |
| 2006                 | 2.04                  | 1.18  | 0.34 | 4.26                  | 8           | 1.54     | 0.62                  | 0.86 | 2.64    | 7           | 1.43    | 0.14  | 1.29 | 1.56    | 3           | 1.56       | 3           |           |  |
| 2007                 | 1.83                  | 1.01  | 0.57 | 3.25                  | 7           | 2.21     | 0.44                  | 1.27 | 2.59    | 7           | 2.14    | 0.37  | 1.72 | 2.40    | 3           | 2.40       | 3           |           |  |
| 2008                 | 3.17                  | 1.07  | 1.09 | 4.11                  | 8           | 2.47     | 0.52                  | 1.58 | 3.28    | 7           | 2.85    | 1.39  | 2.04 | 4.45    | 3           | 4.45       | 3           |           |  |
| Extreme values:      | mean                  | min   | max  | max                   | 90 conf low | mean     | min                   | max  | max     | 90 conf low | mean    | min   | max  | max     | 90 conf low | 90 conf up | 90 conf low |           |  |
|                      | 2.57                  |       | 0.15 | 7.71                  |             | 1.87     |                       | 0.00 | 4.95    |             | 1.73    |       | 0.66 | 4.45    |             | 0.01750    | -0.06000    |           |  |
| Trend analysis       | -0.02461              | NL B  | NL P | 0.02667               | -0.08929    | 0.00034  | NL B                  | NL P | 0.04800 | -0.01611    | 0.00119 | NL B  | NL P | 0.44889 | 0.01750     | 0.01750    | -0.06000    |           |  |



Area 11 = B1

|                  |                               |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|------------------|-------------------------------|-------|---------|------------|-------------|-----------|-------------------------------|-------|---------|------------|-------------|-----------|-------------------------------|-------|---------|------------|-------------|
| AREA 11<br>Chl-a | Spring,<br>Hose 0-10m<br>mean | 1 std | min     | max        |             | no of obs | Summer,<br>Hose 0-10m<br>mean | 1 std | min     | max        |             | no of obs | Autumn,<br>Hose 0-10m<br>mean | 1 std | min     | max        | no of obs   |
|                  | 1994                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 1995                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 1996                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 1997                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 1998                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 1999                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2000                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2001                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2002                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2003                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2004                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2005                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2006                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2007                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
|                  | 2008                          |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
| Extreme values:  |                               |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |
| Trend analysis   | mean mean                     |       | min min | max max    |             |           | mean mean                     |       | min min | max max    |             |           | mean mean                     |       | min min | max max    |             |
|                  | ND                            |       | ND      | ND         |             |           | ND                            |       | ND      | ND         |             |           | ND                            |       | ND      | ND         |             |
| Trend analysis   | Linear trend                  | NL B  | NL P    | 90 conf up | 90 conf low |           | Linear trend                  | NL B  | NL P    | 90 conf up | 90 conf low |           | Linear trend                  | NL B  | NL P    | 90 conf up | 90 conf low |
|                  |                               |       |         |            |             |           |                               |       |         |            |             |           |                               |       |         |            |             |

Area 11 = B1

|                  |                               |        |         |            |             |           |                               |       |         |            |             |           |                               |        |         |            |             |
|------------------|-------------------------------|--------|---------|------------|-------------|-----------|-------------------------------|-------|---------|------------|-------------|-----------|-------------------------------|--------|---------|------------|-------------|
| AREA 11<br>Chl-a | Spring,<br>Hose 0-20m<br>mean | 1 std  | min     | max        |             | no of obs | Summer,<br>Hose 0-20m<br>mean | 1 std | min     | max        |             | no of obs | Autumn,<br>Hose 0-20m<br>mean | 1 std  | min     | max        | no of obs   |
|                  | 1994                          | 3.78   | 2.16    | 1.72       | 7.46        | 8         | 1.99                          | 0.80  | 0.89    | 3.49       | 7           | 1.74      | 1.45                          | 0.57   | 3.85    | 4          |             |
|                  | 1995                          | 2.58   | 2.02    | 0.57       | 6.50        | 9         | 2.55                          | 1.01  | 1.50    | 3.76       | 6           | 1.50      | 1.05                          | 0.74   | 3.52    | 6          |             |
|                  | 1996                          | 2.16   | 1.27    | 0.61       | 4.37        | 9         | 1.56                          | 0.70  | 0.71    | 2.67       | 7           | 1.54      | 0.61                          | 0.99   | 2.50    | 5          |             |
|                  | 1997                          | 2.91   | 1.83    | 1.16       | 6.47        | 7         | 2.78                          | 0.60  | 1.59    | 3.39       | 7           | 1.53      | 0.54                          | 0.89   | 2.32    | 5          |             |
|                  | 1998                          | 1.95   | 1.03    | 0.64       | 3.93        | 9         | 1.63                          | 0.56  | 0.96    | 2.28       | 7           | 1.29      | 0.77                          | 1.14   | 2.99    | 4          |             |
|                  | 1999                          | 2.75   | 1.68    | 0.87       | 5.63        | 8         | 1.58                          | 0.75  | 0.82    | 2.96       | 6           | 1.44      | 0.48                          | 1.06   | 2.18    | 5          |             |
|                  | 2000                          | 2.27   | 1.93    | 0.54       | 6.85        | 8         | 1.49                          | 0.78  | 0.75    | 2.83       | 7           | 0.83      | 0.21                          | 0.61   | 1.02    | 4          |             |
|                  | 2001                          | 2.52   | 1.55    | 0.72       | 5.28        | 8         | 1.72                          | 0.59  | 0.83    | 2.40       | 7           | 1.22      | 0.51                          | 0.70   | 1.78    | 5          |             |
|                  | 2002                          | 2.45   | 2.59    | 0.35       | 8.24        | 8         | 1.52                          | 0.38  | 0.99    | 2.08       | 7           | 1.16      | 0.60                          | 0.49   | 1.91    | 5          |             |
|                  | 2003                          | 2.80   | 2.28    | 0.60       | 6.37        | 8         | 1.71                          | 0.86  | 0.58    | 2.95       | 7           | 1.57      | 0.74                          | 0.77   | 2.60    | 5          |             |
|                  | 2004                          | 2.69   | 1.75    | 0.68       | 5.97        | 8         | 1.72                          | 0.59  | 0.92    | 2.50       | 7           | 1.20      | 0.41                          | 0.82   | 1.67    | 5          |             |
|                  | 2005                          | 2.55   | 1.13    | 1.49       | 4.45        | 8         | 2.07                          | 0.76  | 1.20    | 3.56       | 7           | 1.05      | 0.41                          | 0.57   | 1.60    | 5          |             |
|                  | 2006                          | 2.54   | 1.35    | 0.78       | 4.39        | 7         | 1.90                          | 0.69  | 1.27    | 2.89       | 7           | 1.10      | 0.47                          | 0.58   | 1.77    | 5          |             |
|                  | 2007                          | 1.70   | 1.57    | 0.60       | 5.56        | 9         | 1.69                          | 0.89  | 0.67    | 3.40       | 7           | 2.08      | 0.63                          | 1.05   | 2.78    | 5          |             |
|                  | 2008                          | 3.12   | 1.08    | 1.50       | 4.83        | 8         | 2.89                          | 0.76  | 1.96    | 4.24       | 7           | 2.49      | 0.96                          | 0.93   | 3.50    | 5          |             |
| Extreme values:  |                               |        |         |            |             |           |                               |       |         |            |             |           |                               |        |         |            |             |
| Trend analysis   | mean mean                     |        | min min | max max    |             |           | mean mean                     |       | min min | max max    |             |           | mean mean                     |        | min min | max max    |             |
|                  | 2.58                          |        | 0.35    | 8.24       |             |           | 1.90                          |       | 0.58    | 4.24       |             |           | 1.51                          |        | 0.49    | 3.85       |             |
| Trend analysis   | Linear trend                  | NL B   | NL P    | 90 conf up | 90 conf low |           | Linear trend                  | NL B  | NL P    | 90 conf up | 90 conf low |           | Linear trend                  | NL B   | NL P    | 90 conf up | 90 conf low |
|                  | -0.02488                      | -0.023 | 0.26516 | 0.00545    | -0.07146    |           | 0.00414                       | 0.008 | 0.71032 | 0.05369    | -0.03167    |           | 0.00947                       | -0.015 | 0.51109 | 0.02833    | -0.05111    |



Table 18. The Bothnian Sea, Area 13, Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 13 = US5B, SR5, C4, US3, C6, C3 |                       |       |         |            |                       |       |         |            |                       |       |         |            |             |            |             |             |
|--------------------------------------|-----------------------|-------|---------|------------|-----------------------|-------|---------|------------|-----------------------|-------|---------|------------|-------------|------------|-------------|-------------|
| AREA 13<br>Chl-a                     | Spring,<br>Hose 0-10m |       |         |            | Summer,<br>Hose 0-10m |       |         |            | Autumn,<br>Hose 0-10m |       |         |            | no of obs   |            |             |             |
|                                      | mean                  | 1 std | min     | max        | mean                  | 1 std | min     | max        | mean                  | 1 std | min     | max        | no of obs   | max        | min         | no of obs   |
| 1994                                 | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | 0           | ND         | ND          | 0           |
| 1995                                 | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | 0           | ND         | ND          | 0           |
| 1996                                 | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | 0           | ND         | ND          | 0           |
| 1997                                 | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | 0           | ND         | ND          | 0           |
| 1998                                 | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | 0           | ND         | ND          | 0           |
| 1999                                 | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | 0           | ND         | ND          | 0           |
| 2000                                 | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | ND                    | ND    | ND      | ND         | 0           | ND         | ND          | 0           |
| 2001                                 | 2.71                  | 0.66  | 2.18    | 3.45       | 0.69                  | 0.23  | 0.49    | 0.97       | 1.01                  | 0.40  | 0.73    | 1.29       | 4           | 1.01       | 0.40        | 2           |
| 2002                                 | 3.48                  | 2.60  | 0.95    | 6.15       | 0.93                  | 0.30  | 0.68    | 1.29       | 0.88                  | 0.18  | 0.75    | 1.00       | 4           | 0.88       | 0.18        | 2           |
| 2003                                 | 4.46                  | 0.75  | 3.66    | 5.16       | 1.28                  | 0.66  | 0.81    | 2.24       | 1.38                  | 0.38  | 1.11    | 1.65       | 4           | 1.38       | 0.38        | 2           |
| 2004                                 | 6.81                  | 7.04  | 1.83    | 11.79      | 1.29                  | 0.20  | 1.15    | 1.43       | 2.01                  | 0.19  | 1.87    | 2.14       | 2           | 2.01       | 0.19        | 2           |
| 2005                                 | 2.29                  | 2.13  | 0.57    | 4.67       | 3.07                  | 0.81  | 2.50    | 3.64       | 1.41                  | 0.13  | 1.31    | 1.50       | 2           | 1.41       | 0.13        | 2           |
| 2006                                 | 5.50                  | 1.70  | 4.30    | 6.70       | 1.46                  | 0.49  | 1.00    | 2.30       | 1.75                  | 0.49  | 1.40    | 2.10       | 5           | 1.75       | 0.49        | 2           |
| 2007                                 | 4.15                  | 3.73  | 1.27    | 8.36       | 1.16                  | 0.25  | 0.89    | 1.39       | 1.40                  | 0.21  | 1.25    | 1.55       | 3           | 1.40       | 0.21        | 2           |
| 2008                                 | 7.96                  | 5.63  | 2.28    | 13.53      | 2.87                  | 0.70  | 2.05    | 3.52       | 4.26                  | 0.00  | 4.26    | 4.26       | 4           | 4.26       | 0.00        | 1           |
| Extreme values:                      | mean                  | mean  | min     | max        | mean                  | mean  | min     | max        | mean                  | mean  | min     | max        |             | mean       | min         |             |
|                                      | 4.67                  |       | 0.57    | 13.53      | 1.59                  |       | 0.49    | 3.64       | 1.76                  |       | 0.73    | 4.26       |             |            |             |             |
| Trend analysis                       | Linear trend          | NL B  | NL P    | 90 conf up | Linear trend          | NL B  | NL P    | 90 conf up | Linear trend          | NL B  | NL P    | 90 conf up | 90 conf low | 90 conf up | 90 conf low | 90 conf low |
|                                      | 0.47145               | 0.605 | 0.01983 | 1.23000    | 0.22354               | 0.168 | 0.00380 | 0.32000    | 0.23206               | 0.100 | 0.08928 | 0.19000    | 0.10500     | 0.19000    | 0.02000     | 0.02000     |

| Area 13 = US5B, SR5, C4, US3, C6, C3 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
|--------------------------------------|-----------------------|-------|---------|------------|-----------------------|--------|---------|------------|-----------------------|--------|---------|------------|-------------|------------|-------------|-------------|
| AREA 13<br>Chl-a                     | Spring,<br>Hose 0-20m |       |         |            | Summer,<br>Hose 0-20m |        |         |            | Autumn,<br>Hose 0-20m |        |         |            | no of obs   |            |             |             |
|                                      | mean                  | 1 std | min     | max        | mean                  | 1 std  | min     | max        | mean                  | 1 std  | min     | max        | no of obs   | max        | min         | no of obs   |
| 1994                                 | ND                    | ND    | ND      | ND         | ND                    | ND     | ND      | ND         | ND                    | ND     | ND      | ND         | 0           | ND         | ND          | 0           |
| 1995                                 | ND                    | ND    | ND      | ND         | ND                    | ND     | ND      | ND         | ND                    | ND     | ND      | ND         | 0           | ND         | ND          | 0           |
| 1996                                 | ND                    | ND    | ND      | ND         | ND                    | ND     | ND      | ND         | ND                    | ND     | ND      | ND         | 0           | ND         | ND          | 0           |
| 1997                                 | ND                    | ND    | ND      | ND         | ND                    | ND     | ND      | ND         | ND                    | ND     | ND      | ND         | 0           | ND         | ND          | 0           |
| 1998                                 | ND                    | ND    | ND      | ND         | ND                    | ND     | ND      | ND         | ND                    | ND     | ND      | ND         | 0           | ND         | ND          | 0           |
| 1999                                 | 2.10                  | 1.49  | 0.49    | 3.43       | 1.87                  | 1.00   | 0.94    | 2.92       | 1.50                  | 0.35   | 1.13    | 1.93       | 3           | 1.50       | 0.35        | 4           |
| 2000                                 | 3.40                  | 1.85  | 2.06    | 5.51       | 0.94                  | 0.20   | 0.70    | 1.16       | 0.73                  | 0.11   | 0.65    | 0.80       | 4           | 0.73       | 0.11        | 2           |
| 2001                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| 2002                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| 2003                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| 2004                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| 2005                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| 2006                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| 2007                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| 2008                                 |                       |       |         |            |                       |        |         |            |                       |        |         |            |             |            |             |             |
| Extreme values:                      | mean                  |       | min     | max        | mean                  |        | min     | max        | mean                  |        | min     | max        |             | mean       | min         |             |
|                                      | 2.75                  |       | 0.49    | 5.51       | 1.40                  |        | 0.70    | 2.92       | 1.11                  |        | 0.65    | 1.93       |             |            |             |             |
| Trend analysis                       | Linear trend          | NL B  | NL P    | 90 conf up | Linear trend          | NL B   | NL P    | 90 conf up | Linear trend          | NL B   | NL P    | 90 conf up | 90 conf low | 90 conf up | 90 conf low | 90 conf low |
|                                      | 1.19263               | 1.015 | 1.00000 | ND         | -0.97876              | -0.738 | 1.00000 | ND         | -0.76058              | -0.825 | 0.31731 | ND         | -1.63000    | 0.19000    | -0.82500    | -0.82500    |



Table 19. The Bothnian Bay, Area 14. Chl a hose data from 1-10m and 0-20 meters respectively during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 14 = F9, F3, A5 |                       |       |         |            |                       |              |       |         |                       |             |              |       |         |            |             |
|----------------------|-----------------------|-------|---------|------------|-----------------------|--------------|-------|---------|-----------------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 14<br>Chl-a     | Spring,<br>Hose 0-10m |       |         |            | Summer,<br>Hose 0-10m |              |       |         | Autumn,<br>Hose 0-10m |             |              |       |         |            |             |
|                      | mean                  | 1 std | min     | max        | no of obs             | mean         | 1 std | min     | max                   | no of obs   | mean         | 1 std | min     | max        | no of obs   |
| 1994                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           |
| 1995                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           |
| 1996                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           |
| 1997                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           |
| 1998                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           |
| 1999                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           |
| 2000                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND    | ND      | ND                    | 0           | ND           | ND    | ND      | ND         | 0           |
| 2001                 | 0.63                  | 0.46  | 0.06    | 1.33       | 6                     | 1.20         | 0.45  | 0.42    | 1.75                  | 8           | 1.19         | 0.61  | 0.42    | 1.95       | 6           |
| 2002                 | 0.40                  | 0.29  | 0.10    | 0.98       | 7                     | 1.09         | 0.78  | 0.66    | 2.96                  | 8           | 1.00         | 0.48  | 0.56    | 1.52       | 4           |
| 2003                 | 0.43                  | 0.33  | 0.10    | 0.94       | 8                     | 1.36         | 0.53  | 0.66    | 2.25                  | 8           | 1.16         | 0.66  | 0.49    | 1.80       | 4           |
| 2004                 | 1.15                  | 0.72  | 0.32    | 1.60       | 3                     | 1.73         | 0.54  | 1.19    | 2.63                  | 5           | 1.13         | 0.27  | 0.83    | 1.36       | 4           |
| 2005                 | 1.21                  | 0.85  | 0.57    | 2.17       | 3                     | 1.68         | 0.66  | 0.77    | 2.20                  | 4           | 1.30         | 0.37  | 1.04    | 1.56       | 2           |
| 2006                 | 1.08                  | 1.11  | 0.20    | 2.60       | 4                     | 2.50         | 1.21  | 0.80    | 3.80                  | 6           | 1.45         | 0.87  | 0.80    | 2.70       | 4           |
| 2007                 | 1.40                  | 1.01  | 0.29    | 2.42       | 6                     | 2.50         | 1.78  | 0.72    | 5.75                  | 6           | 1.17         | 0.23  | 0.92    | 1.45       | 4           |
| 2008                 | 2.59                  | 1.50  | 0.76    | 4.20       | 4                     | 2.72         | 0.91  | 1.40    | 3.83                  | 8           | 1.15         | 0.01  | 1.14    | 1.15       | 2           |
| Extreme values:      | mean mean             |       | min min | max max    |                       | mean mean    |       | min min | max max               |             | mean mean    |       | min min | max max    |             |
|                      | 1.11                  |       | 0.06    | 4.20       |                       | 1.85         |       | 0.42    | 5.75                  |             | 1.19         |       | 0.42    | 2.70       |             |
| Trend analysis       | Linear trend          | NL B  | NL P    | 90 conf up | 90 conf low           | Linear trend | NL B  | NL P    | 90 conf up            | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                      | 0.24340               | 0.250 | 0.00412 | 0.36200    | 0.06333               | 0.24522      | 0.199 | 0.00100 | 0.33000               | 0.07375     | 0.01619      | 0.075 | 0.01947 | 0.11500    | 0.02167     |

| Area 14 = F9, F3, A5 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
|----------------------|-----------------------|-------|---------|------------|-----------------------|--------------|--------|---------|-----------------------|-------------|--------------|--------|---------|------------|-------------|
| AREA 14<br>Chl-a     | Spring,<br>Hose 0-20m |       |         |            | Summer,<br>Hose 0-20m |              |        |         | Autumn,<br>Hose 0-20m |             |              |        |         |            |             |
|                      | mean                  | 1 std | min     | max        | no of obs             | mean         | 1 std  | min     | max                   | no of obs   | mean         | 1 std  | min     | max        | no of obs   |
| 1994                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND     | ND      | ND                    | 0           | ND           | ND     | ND      | ND         | 0           |
| 1995                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND     | ND      | ND                    | 0           | ND           | ND     | ND      | ND         | 0           |
| 1996                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND     | ND      | ND                    | 0           | ND           | ND     | ND      | ND         | 0           |
| 1997                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND     | ND      | ND                    | 0           | ND           | ND     | ND      | ND         | 0           |
| 1998                 | ND                    | ND    | ND      | ND         | 0                     | ND           | ND     | ND      | ND                    | 0           | ND           | ND     | ND      | ND         | 0           |
| 1999                 | 0.51                  | 0.21  | 0.36    | 0.66       | 2                     | 1.39         | 0.49   | 1.08    | 1.96                  | 3           | 1.72         | 0.27   | 1.35    | 1.99       | 4           |
| 2000                 | 0.55                  | 0.19  | 0.28    | 0.71       | 4                     | 1.05         | 0.53   | 0.27    | 2.04                  | 8           | 0.51         | 0.45   | 0.24    | 1.03       | 3           |
| 2001                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| 2002                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| 2003                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| 2004                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| 2005                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| 2006                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| 2007                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| 2008                 |                       |       |         |            |                       |              |        |         |                       |             |              |        |         |            |             |
| Extreme values:      | mean mean             |       | min min | max max    |                       | mean mean    |        | min min | max max               |             | mean mean    |        | min min | max max    |             |
|                      | 0.53                  |       | 0.28    | 0.71       |                       | 1.22         |        | 0.27    | 2.04                  |             | 1.11         |        | 0.24    | 1.99       |             |
| Trend analysis       | Linear trend          | NL B  | NL P    | 90 conf up | 90 conf low           | Linear trend | NL B   | NL P    | 90 conf up            | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |
|                      | 0.04750               | ND    | ND      | ND         | ND                    | -0.25699     | -0.568 | 0.15730 | ND                    | -0.79000    | -1.15079     | -0.540 | 0.31731 | ND         | -0.54000    |

Table 20. The west-coast inside the skerries, Area 1. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 1= Alsäck, Havstensfjord |                      |       |         |                      |             |              |                      |         |            |             |              |        |         |            |             |           |
|-------------------------------|----------------------|-------|---------|----------------------|-------------|--------------|----------------------|---------|------------|-------------|--------------|--------|---------|------------|-------------|-----------|
| AREA 1                        | Spring, Bottle 0-10m |       |         | Summer, Bottle 0-10m |             |              | Autumn, Bottle 0-10m |         |            |             |              |        |         |            |             |           |
| Chl-a                         | mean                 | 1 std | min     | max                  | no of obs   | mean         | 1 std                | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | no of obs |
| 1994                          | 1,57                 | 2,00  | 0,13    | 5,17                 | 11          | 5,22         | 2,61                 | 2,23    | 9,45       | 12          | 5,13         | 2,69   | 1,30    | 9,10       | 12          | 12        |
| 1995                          | 1,00                 | 1,42  | 0,10    | 4,20                 | 16          | 3,10         | 2,05                 | 0,90    | 6,70       | 12          | 3,11         | 1,08   | 0,20    | 4,60       | 12          | 12        |
| 1996                          | 4,97                 | 4,78  | 0,10    | 16,30                | 20          | 3,36         | 1,63                 | 0,80    | 5,70       | 16          | 3,96         | 1,95   | 1,50    | 6,60       | 12          | 12        |
| 1997                          | 8,08                 | 5,47  | 2,40    | 16,30                | 12          | 3,47         | 2,15                 | 0,80    | 8,50       | 12          | 3,91         | 1,48   | 1,60    | 5,80       | 12          | 12        |
| 1998                          | 7,97                 | 13,11 | 0,20    | 33,00                | 12          | 6,52         | 8,12                 | 0,50    | 23,50      | 11          | 5,07         | 2,87   | 0,50    | 8,20       | 12          | 12        |
| 1999                          | 3,04                 | 4,63  | 0,10    | 13,00                | 12          | 4,58         | 2,87                 | 0,50    | 8,20       | 12          | 4,23         | 2,12   | 0,80    | 6,80       | 12          | 12        |
| 2000                          | 3,37                 | 3,17  | 0,30    | 8,40                 | 12          | 4,22         | 2,19                 | 0,40    | 8,10       | 12          | 4,47         | 2,41   | 0,50    | 8,70       | 12          | 12        |
| 2001                          | 10,00                | 16,27 | 0,10    | 39,20                | 12          | 3,87         | 3,29                 | 0,80    | 12,90      | 12          | 3,64         | 1,84   | 1,40    | 6,50       | 12          | 12        |
| 2002                          | 2,85                 | 3,75  | 0,30    | 11,80                | 12          | 5,37         | 7,47                 | 2,30    | 29,00      | 12          | 5,00         | 1,84   | 3,60    | 10,00      | 12          | 12        |
| 2003                          | 1,66                 | 2,33  | 0,10    | 7,10                 | 8           | 4,38         | 2,73                 | 1,60    | 9,20       | 12          | 2,28         | 0,43   | 1,70    | 3,00       | 12          | 12        |
| 2004                          | 0,83                 | 0,26  | 0,30    | 1,20                 | 12          | 3,43         | 2,75                 | 1,40    | 8,40       | 12          | 4,37         | 2,11   | 0,30    | 7,20       | 12          | 12        |
| 2005                          | 1,14                 | 1,02  | 0,10    | 2,80                 | 12          | 3,28         | 1,67                 | 2,40    | 8,50       | 12          | 2,38         | 0,58   | 1,40    | 3,20       | 12          | 12        |
| 2006                          | 9,10                 | 7,74  | 0,90    | 19,80                | 8           | 1,92         | 1,05                 | 0,10    | 4,00       | 12          | 2,35         | 1,17   | 0,60    | 5,10       | 12          | 12        |
| 2007                          | 3,84                 | 6,61  | 0,10    | 18,10                | 12          | 2,78         | 2,30                 | 1,10    | 9,00       | 12          | 4,34         | 2,84   | 0,80    | 10,30      | 12          | 12        |
| 2008                          | 3,71                 | 5,28  | 0,10    | 13,80                | 12          | 3,11         | 1,89                 | 1,70    | 7,30       | 12          | 2,58         | 1,27   | 1,00    | 5,10       | 12          | 12        |
| Extreme values:               | mean                 |       | min     | max                  |             | mean         |                      | min     | max        |             | mean         |        | min     | max        |             |           |
|                               | 4,21                 |       | 0,10    | 39,20                |             | 3,91         |                      | 0,10    | 29,00      |             | 3,79         |        | 0,20    | 10,30      |             |           |
| Trend analysis                | Linear trend         | NL B  | NL P    | 90 conf up           | 90 conf low | Linear trend | NL B                 | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |           |
|                               | -0.00452             | 0.012 | 0.61441 | 0.03929              | -0.02500    | -0.10907     | -0.100               | 0.08222 | -0.00357   | -0.17812    | -0.10695     | -0.125 | 0.02781 | -0.03000   | -0.22500    |           |



Table 21. The Skagerrak, Area 2. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 2 = A13, A15, A17, HS5, M6, TH6, P2, Slaggo |                         |       |         |            |                         |              |        |         |                         |             |              |        |         |            |             |           |
|--------------------------------------------------|-------------------------|-------|---------|------------|-------------------------|--------------|--------|---------|-------------------------|-------------|--------------|--------|---------|------------|-------------|-----------|
| AREA 2<br>Chl-a                                  | Spring,<br>Bottle 0-10m |       |         |            | Summer,<br>Bottle 0-10m |              |        |         | Autumn,<br>Bottle 0-10m |             |              |        |         |            |             |           |
|                                                  | mean                    | 1 std | min     | max        | no of obs               | mean         | 1 std  | min     | max                     | no of obs   | mean         | 1 std  | min     | max        | no of obs   | no of obs |
| 1994                                             | 1,86                    | 2,17  | 0,29    | 13,62      | 59                      | 1,86         | 0,97   | 0,70    | 4,70                    | 44          | 3,65         | 2,93   | 0,40    | 9,60       | 39          |           |
| 1995                                             | 2,55                    | 3,33  | 0,10    | 13,00      | 64                      | 1,94         | 1,22   | 0,30    | 5,60                    | 76          | 2,44         | 2,08   | 0,30    | 10,00      | 52          |           |
| 1996                                             | 2,94                    | 5,14  | 0,10    | 23,00      | 64                      | 1,82         | 1,17   | 0,40    | 5,90                    | 56          | 1,39         | 1,97   | 0,10    | 16,00      | 68          |           |
| 1997                                             | 4,94                    | 4,45  | 1,00    | 16,10      | 44                      | 0,75         | 0,80   | 0,10    | 2,80                    | 24          | 1,46         | 1,02   | 0,20    | 4,20       | 48          |           |
| 1998                                             | 2,59                    | 1,67  | 0,50    | 7,40       | 33                      | 3,33         | 2,83   | 0,70    | 14,80                   | 27          | 2,29         | 2,24   | 0,40    | 9,60       | 33          |           |
| 1999                                             | 4,83                    | 7,12  | 0,50    | 25,90      | 27                      | 2,06         | 1,37   | 0,30    | 5,00                    | 27          | 2,48         | 2,36   | 0,20    | 10,80      | 42          |           |
| 2000                                             | 1,76                    | 1,18  | 0,60    | 6,70       | 60                      | 2,17         | 1,24   | 0,70    | 6,50                    | 45          | 3,63         | 2,43   | 0,60    | 13,60      | 60          |           |
| 2001                                             | 3,36                    | 3,15  | 0,40    | 12,10      | 49                      | 2,53         | 1,19   | 0,80    | 6,00                    | 45          | 3,55         | 2,32   | 1,20    | 13,50      | 46          |           |
| 2002                                             | 3,58                    | 5,43  | 0,20    | 31,70      | 45                      | 2,44         | 1,73   | 0,20    | 7,80                    | 57          | 1,63         | 1,86   | 0,10    | 10,70      | 36          |           |
| 2003                                             | 2,92                    | 3,28  | 0,20    | 13,00      | 45                      | 1,95         | 1,04   | 0,60    | 5,00                    | 56          | 1,22         | 0,71   | 0,40    | 3,20       | 48          |           |
| 2004                                             | 3,12                    | 3,23  | 0,60    | 15,80      | 48                      | 1,62         | 2,15   | 0,50    | 17,30                   | 63          | 1,81         | 1,10   | 0,80    | 5,00       | 51          |           |
| 2005                                             | 1,93                    | 2,40  | 0,20    | 11,60      | 57                      | 1,33         | 0,88   | 0,20    | 4,40                    | 54          | 1,83         | 0,73   | 0,60    | 4,20       | 69          |           |
| 2006                                             | 2,01                    | 1,80  | 0,40    | 8,70       | 55                      | 1,45         | 1,36   | 0,10    | 6,80                    | 54          | 1,72         | 1,62   | 0,30    | 9,40       | 75          |           |
| 2007                                             | 3,04                    | 3,83  | 0,20    | 17,70      | 60                      | 2,32         | 1,70   | 0,30    | 6,70                    | 54          | 2,16         | 1,61   | 0,40    | 7,70       | 69          |           |
| 2008                                             | 1,60                    | 1,25  | 0,10    | 5,50       | 57                      | 1,42         | 0,91   | 0,30    | 4,20                    | 69          | 2,11         | 1,17   | 0,60    | 6,30       | 63          |           |
| Extreme values:                                  | mean mean               |       | min min | max max    |                         | mean mean    |        | min min | max max                 |             | mean mean    |        | min min | max max    |             |           |
|                                                  | 2,87                    |       | 0,10    | 31,70      |                         | 1,93         |        | 0,10    | 17,30                   |             | 2,22         |        | 0,10    | 16,00      |             |           |
| Trend analysis                                   | Linear trend            | NL B  | NL P    | 90 conf up | 90 conf low             | Linear trend | NL B   | NL P    | 90 conf up              | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |           |
|                                                  | -0.04195                | 0.018 | 0.88640 | 0.09167    | -0.05979                | -0.02435     | -0.035 | 0.08194 | -0.00262                | -0.07593    | -0.04172     | -0.035 | 0.17932 | 0.00937    | -0.07861    |           |

Table 22. The Kartegat, Area 3. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 3 = Anholt, Fladen, GF4, Kullen, St. Middelgrund |                      |       |         |                      |             |              |                      |         |            |             |              |        |         |            |             |
|-------------------------------------------------------|----------------------|-------|---------|----------------------|-------------|--------------|----------------------|---------|------------|-------------|--------------|--------|---------|------------|-------------|
| AREA 3                                                | Spring, Bottle 0-10m |       |         | Summer, Bottle 0-10m |             |              | Autumn, Bottle 0-10m |         |            |             |              |        |         |            |             |
| Chl-a                                                 | mean                 | 1 std | min     | max                  | no of obs   | mean         | 1 std                | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   |
| 1994                                                  | 3.53                 | 4.53  | 0.51    | 12.85                | 68          | 1.71         | 0.75                 | 1.15    | 3.37       | 8           | 1.18         | 0.56   | 0.30    | 1.96       | 32          |
| 1995                                                  | 3.66                 | 4.69  | 0.10    | 13.10                | 32          | 1.73         | 0.71                 | 0.60    | 3.50       | 36          | 2.07         | 0.73   | 0.70    | 4.10       | 44          |
| 1996                                                  | 2.75                 | 4.42  | 0.40    | 17.10                | 39          | 0.98         | 0.52                 | 0.40    | 2.20       | 24          | 1.02         | 0.81   | 0.10    | 2.60       | 35          |
| 1997                                                  | 3.14                 | 3.60  | 0.30    | 10.50                | 24          | 0.72         | 0.40                 | 0.20    | 1.60       | 23          | 2.32         | 1.91   | 0.50    | 12.80      | 48          |
| 1998                                                  | 4.56                 | 4.50  | 0.70    | 16.00                | 25          | 1.53         | 0.92                 | 0.50    | 4.30       | 35          | 3.08         | 2.54   | 0.60    | 8.80       | 36          |
| 1999                                                  | 4.01                 | 4.25  | 0.40    | 14.80                | 29          | 1.49         | 0.74                 | 0.50    | 3.70       | 30          | 2.43         | 2.45   | 0.30    | 8.70       | 38          |
| 2000                                                  | 1.75                 | 0.98  | 0.10    | 4.40                 | 33          | 2.27         | 1.59                 | 0.90    | 8.10       | 27          | 3.11         | 1.18   | 0.90    | 4.80       | 33          |
| 2001                                                  | 3.17                 | 2.30  | 0.30    | 11.80                | 33          | 2.08         | 1.61                 | 0.90    | 10.40      | 33          | 2.36         | 1.04   | 0.80    | 4.40       | 36          |
| 2002                                                  | 3.36                 | 3.75  | 1.00    | 13.10                | 27          | 2.08         | 1.75                 | 0.20    | 8.50       | 33          | 1.02         | 0.83   | 0.30    | 3.70       | 33          |
| 2003                                                  | 4.29                 | 4.86  | 0.50    | 20.50                | 42          | 0.82         | 0.24                 | 0.40    | 1.60       | 33          | 1.20         | 0.54   | 0.40    | 3.00       | 36          |
| 2004                                                  | 3.45                 | 3.44  | 0.70    | 12.70                | 29          | 1.43         | 0.45                 | 0.70    | 2.40       | 36          | 1.65         | 0.52   | 1.00    | 2.90       | 36          |
| 2005                                                  | 2.58                 | 2.69  | 0.30    | 10.30                | 33          | 1.31         | 0.60                 | 0.50    | 2.60       | 27          | 1.76         | 0.80   | 0.70    | 3.70       | 39          |
| 2006                                                  | 3.33                 | 2.28  | 0.60    | 7.40                 | 23          | 1.35         | 0.64                 | 0.50    | 2.50       | 27          | 1.08         | 0.74   | 0.20    | 3.40       | 39          |
| 2007                                                  | 3.38                 | 4.38  | 0.30    | 15.60                | 30          | 2.03         | 0.84                 | 0.70    | 3.90       | 27          | 2.28         | 0.93   | 0.60    | 3.70       | 39          |
| 2008                                                  | 3.57                 | 2.97  | 0.80    | 12.00                | 24          | 1.49         | 1.16                 | 0.40    | 5.20       | 33          | 2.03         | 1.48   | 0.60    | 5.50       | 39          |
| Extreme values:                                       | mean                 |       | min     | max                  |             | mean         |                      | min     | max        |             | mean         |        | min     | max        |             |
|                                                       | 3.37                 |       | 0.10    | 20.50                |             | 1.54         |                      | 0.20    | 10.40      |             | 1.91         |        | 0.10    | 12.80      |             |
| Trend analysis                                        | Linear trend         | NL B  | NL P    | 90 conf up           | 90 conf low | Linear trend | NL B                 | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |
|                                                       | -0.00621             | 0.064 | 0.40735 | 0.18185              | -0.04771    | 0.00679      | 0.015                | 0.50685 | 0.06389    | -0.01944    | -0.01524     | -0.013 | 0.36071 | 0.02942    | -0.05067    |



Table 23. The Sound, Area 4. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 4 = W. Landskrona |                      |        |                      |            |                      |              |       |         |            |             |              |       |         |            |             |
|------------------------|----------------------|--------|----------------------|------------|----------------------|--------------|-------|---------|------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 4                 | Spring, Bottle 0-10m |        | Summer, Bottle 0-10m |            | Autumn, Bottle 0-10m |              |       |         |            |             |              |       |         |            | no of obs   |
| Chl-a                  | mean                 | 1 std  | min                  | max        | no of obs            | mean         | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        |             |
| 1994                   | 3,63                 | 3,51   | 0,53                 | 11,45      | 20                   | 1,82         | 0,86  | 0,78    | 2,97       | 8           | 0,89         | 1,06  | 0,10    | 3,10       | 8           |
| 1995                   | 3,10                 | 4,39   | 0,40                 | 13,40      | 20                   | 1,97         | 1,20  | 0,20    | 3,70       | 16          | 2,31         | 1,21  | 0,70    | 4,00       | 15          |
| 1996                   | 2,00                 | 1,31   | 0,50                 | 5,30       | 16                   | 1,58         | 1,00  | 0,20    | 4,10       | 12          | 1,23         | 0,84  | 0,10    | 3,30       | 19          |
| 1997                   | 0,68                 | 0,13   | 0,50                 | 0,80       | 8                    | 1,78         | 1,46  | 0,60    | 5,90       | 19          | 1,88         | 1,37  | 0,70    | 4,50       | 16          |
| 1998                   | 3,14                 | 3,77   | 1,10                 | 12,90      | 9                    | 1,79         | 0,65  | 1,10    | 3,30       | 12          | 2,23         | 1,36  | 0,90    | 4,60       | 11          |
| 1999                   | 2,84                 | 2,69   | 0,50                 | 8,70       | 9                    | 2,20         | 1,41  | 0,50    | 4,70       | 12          | 3,27         | 2,08  | 1,40    | 7,60       | 7           |
| 2000                   | 3,26                 | 2,69   | 1,00                 | 7,00       | 9                    | 1,93         | 0,38  | 1,50    | 2,50       | 12          | 2,20         | 1,58  | 0,20    | 6,00       | 12          |
| 2001                   | 2,88                 | 2,03   | 1,40                 | 7,70       | 9                    | 2,48         | 1,04  | 1,60    | 5,10       | 12          | 2,87         | 0,92  | 1,60    | 4,60       | 9           |
| 2002                   | 1,32                 | 0,63   | 1,00                 | 2,60       | 6                    | 2,34         | 1,56  | 0,40    | 4,50       | 12          | 2,63         | 1,08  | 1,10    | 3,80       | 9           |
| 2003                   | 1,20                 | 0,68   | 0,50                 | 2,20       | 8                    | 1,43         | 0,53  | 0,80    | 2,30       | 12          | 1,54         | 0,25  | 1,20    | 1,90       | 9           |
| 2004                   | 2,30                 | 1,51   | 0,60                 | 4,60       | 9                    | 2,21         | 0,77  | 1,50    | 3,80       | 12          | 1,82         | 0,75  | 0,80    | 3,20       | 12          |
| 2005                   | 1,26                 | 0,95   | 0,50                 | 3,50       | 9                    | 1,48         | 0,57  | 0,90    | 2,80       | 12          | 2,12         | 0,80  | 1,20    | 3,60       | 12          |
| 2006                   | 1,41                 | 0,85   | 0,40                 | 2,60       | 9                    | 3,70         | 5,48  | 0,30    | 16,10      | 11          | 2,19         | 1,05  | 0,90    | 4,10       | 12          |
| 2007                   | 2,94                 | 2,31   | 0,60                 | 6,60       | 9                    | 2,80         | 1,35  | 1,00    | 5,10       | 12          | 1,98         | 0,73  | 0,30    | 2,70       | 12          |
| 2008                   | 1,96                 | 0,84   | 0,90                 | 3,40       | 8                    | 3,38         | 1,34  | 1,90    | 7,10       | 12          | 2,08         | 0,97  | 0,50    | 4,10       | 12          |
| Extreme values:        | mean                 |        | min                  | max        |                      | mean         |       | min     | max        |             | mean         |       | min     | max        |             |
|                        | 2,26                 |        | 0,40                 | 13,40      |                      | 2,19         |       | 0,20    | 16,10      |             | 2,08         |       | 0,10    | 7,60       |             |
|                        | Linear trend         | NL B   | NL P                 | 90 conf up | 90 conf low          | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
| Trend analysis         | -0.09495             | -0.001 | 0.97406              | 0.04687    | -0.06333             | 0.09143      | 0.069 | 0.00665 | 0.13958    | 0.02619     | 0.02880      | 0.035 | 0.10010 | 0.08333    | 0.00000     |

Table 24. The Arkona Basin, Area 5. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 5 = BY1, BY2 |                      |              |        |                      |            |             |                      |       |         |            |             |              |       |         |            |             |
|-------------------|----------------------|--------------|--------|----------------------|------------|-------------|----------------------|-------|---------|------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 5            | Spring, Bottle 0-10m |              |        | Summer, Bottle 0-10m |            |             | Autumn, Bottle 0-10m |       |         |            |             |              |       |         |            |             |
|                   | Chl-a                | mean         | 1 std  | min                  | max        | no of obs   | mean                 | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |
|                   | 1994                 | 4.31         | 3.36   | 1.12                 | 10.70      | 27          | 2.59                 | 0.15  | 2.38    | 2.79       | 8           | 1.39         | 1.33  | 0.10    | 3.34       | 24          |
|                   | 1995                 | 1.90         | 1.72   | 0.60                 | 6.10       | 28          | 1.63                 | 0.73  | 1.10    | 4.60       | 24          | 2.83         | 0.85  | 2.00    | 5.10       | 20          |
|                   | 1996                 | 5.25         | 3.56   | 1.40                 | 13.50      | 16          | 1.90                 | 0.47  | 1.40    | 2.90       | 12          | 2.72         | 0.80  | 1.20    | 4.00       | 20          |
|                   | 1997                 | 4.98         | 2.17   | 2.50                 | 7.10       | 8           | 2.06                 | 1.32  | 1.10    | 4.70       | 16          | 3.23         | 0.54  | 2.40    | 4.40       | 16          |
|                   | 1998                 | 3.89         | 3.38   | 1.30                 | 12.00      | 8           | 3.55                 | 1.07  | 2.40    | 5.90       | 16          | 2.67         | 0.92  | 1.30    | 3.80       | 12          |
|                   | 1999                 | 5.54         | 4.57   | 1.20                 | 12.30      | 9           | 2.31                 | 0.74  | 1.10    | 3.30       | 12          | 4.62         | 0.74  | 3.40    | 5.40       | 9           |
|                   | 2000                 | 3.53         | 3.10   | 1.00                 | 10.30      | 12          | 2.38                 | 0.43  | 1.80    | 2.90       | 12          | 3.02         | 0.49  | 2.60    | 3.80       | 5           |
|                   | 2001                 | 3.40         | 0.97   | 1.90                 | 4.80       | 9           | 2.89                 | 0.41  | 2.20    | 3.60       | 12          | 4.23         | 0.93  | 2.90    | 5.50       | 6           |
|                   | 2002                 | 3.17         | 1.66   | 0.90                 | 5.20       | 9           | 2.30                 | 0.55  | 1.50    | 3.20       | 12          | 2.70         | 0.15  | 2.40    | 2.80       | 6           |
|                   | 2003                 | 1.86         | 1.05   | 1.00                 | 3.40       | 9           | 1.79                 | 0.97  | 0.80    | 4.20       | 12          | 2.16         | 0.22  | 1.80    | 2.50       | 9           |
|                   | 2004                 | 3.07         | 1.72   | 1.40                 | 5.70       | 9           | 2.14                 | 0.57  | 1.20    | 2.80       | 12          | 2.17         | 0.58  | 1.60    | 3.30       | 9           |
|                   | 2005                 | 2.24         | 1.32   | 1.30                 | 4.70       | 12          | 1.60                 | 0.71  | 0.80    | 3.30       | 21          | 2.82         | 0.43  | 2.10    | 3.80       | 18          |
|                   | 2006                 | 3.05         | 3.02   | 1.00                 | 9.90       | 21          | 1.66                 | 1.12  | 0.40    | 5.10       | 24          | 2.56         | 0.68  | 1.50    | 3.90       | 18          |
|                   | 2007                 | 1.63         | 0.60   | 1.00                 | 2.80       | 18          | 2.90                 | 0.97  | 1.20    | 4.20       | 24          | 2.50         | 0.81  | 0.60    | 4.00       | 18          |
|                   | 2008                 | 4.47         | 1.74   | 1.70                 | 7.30       | 18          | 4.19                 | 1.15  | 2.90    | 6.40       | 24          | 3.60         | 1.11  | 1.60    | 5.50       | 18          |
| Extreme values:   |                      | mean         |        | min                  | max        |             | mean                 |       | min     | max        |             | mean         |       | min     | max        |             |
|                   |                      | 3.49         |        | 0.60                 | 13.50      |             | 2.39                 |       | 0.40    | 6.40       |             | 2.88         |       | 0.10    | 5.50       |             |
| Trend analysis    |                      | Linear trend | NL B   | NL P                 | 90 conf up | 90 conf low | Linear trend         | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                   |                      | -0.06855     | -0.045 | 0.50868              | 0.05556    | -0.17614    | 0.05817              | 0.031 | 0.41037 | 0.08750    | -0.02083    | 0.03897      | 0.005 | 0.87496 | 0.06500    | -0.04844    |



Table 25. The Bornholm Basin, Area 6. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 6 = BY4, BY5, BY39, Hanöbukten |                         |       |         |            |             |              |                         |         |            |             |              |       |                         |            |             |      |       |     |     |           |  |
|-------------------------------------|-------------------------|-------|---------|------------|-------------|--------------|-------------------------|---------|------------|-------------|--------------|-------|-------------------------|------------|-------------|------|-------|-----|-----|-----------|--|
| AREA 6<br>Chl-a                     | Spring,<br>Bottle 0-10m |       |         |            |             |              | Summer,<br>Bottle 0-10m |         |            |             |              |       | Autumn,<br>Bottle 0-10m |            |             |      |       |     |     |           |  |
|                                     | mean                    | 1 std | min     | max        | no of obs   | mean         | 1 std                   | min     | max        | no of obs   | mean         | 1 std | min                     | max        | no of obs   | mean | 1 std | min | max | no of obs |  |
| 1994                                | 3.89                    | 4.01  | 0.79    | 15.33      | 31          | 3.53         | 0.25                    | 3.12    | 4.00       | 8           | 1.57         | 1.12  | 0.20                    | 3.10       | 31          |      |       |     |     |           |  |
| 1995                                | 2.92                    | 3.49  | 0.10    | 13.30      | 31          | 1.74         | 0.56                    | 1.00    | 3.00       | 28          | 2.74         | 0.57  | 2.10                    | 3.90       | 26          |      |       |     |     |           |  |
| 1996                                | 2.94                    | 2.43  | 1.00    | 7.50       | 17          | 1.51         | 0.48                    | 0.90    | 2.40       | 12          | 2.44         | 0.74  | 1.30                    | 4.00       | 19          |      |       |     |     |           |  |
| 1997                                | 4.90                    | 3.83  | 1.30    | 9.60       | 8           | 2.01         | 1.30                    | 0.70    | 5.30       | 12          | 2.02         | 0.42  | 1.40                    | 3.00       | 19          |      |       |     |     |           |  |
| 1998                                | 1.17                    | 0.51  | 0.50    | 1.90       | 9           | 2.44         | 0.67                    | 1.60    | 3.50       | 19          | 4.19         | 2.08  | 1.80                    | 8.10       | 12          |      |       |     |     |           |  |
| 1999                                | 4.33                    | 2.66  | 1.40    | 9.30       | 9           | 1.98         | 0.48                    | 1.30    | 3.30       | 21          | 3.53         | 1.14  | 2.20                    | 6.20       | 12          |      |       |     |     |           |  |
| 2000                                | 2.02                    | 1.65  | 0.90    | 5.80       | 18          | 2.27         | 0.38                    | 1.70    | 2.90       | 18          | 2.93         | 1.15  | 1.40                    | 5.50       | 12          |      |       |     |     |           |  |
| 2001                                | 5.02                    | 3.08  | 1.50    | 9.90       | 9           | 3.22         | 0.99                    | 2.10    | 4.90       | 12          | 2.83         | 0.31  | 2.50                    | 3.30       | 6           |      |       |     |     |           |  |
| 2002                                | 2.90                    | 0.94  | 1.70    | 4.10       | 6           | 1.88         | 0.43                    | 1.20    | 2.70       | 12          | 1.70         | 0.77  | 0.90                    | 2.50       | 6           |      |       |     |     |           |  |
| 2003                                | 2.17                    | 1.05  | 0.20    | 3.60       | 9           | 1.64         | 0.78                    | 0.70    | 3.50       | 11          | 1.99         | 0.13  | 1.90                    | 2.30       | 9           |      |       |     |     |           |  |
| 2004                                | 2.57                    | 1.16  | 1.60    | 4.70       | 9           | 1.60         | 0.38                    | 1.30    | 2.40       | 12          | 2.34         | 0.37  | 1.80                    | 2.80       | 9           |      |       |     |     |           |  |
| 2005                                | 2.81                    | 1.79  | 1.30    | 6.10       | 15          | 1.83         | 0.54                    | 0.90    | 2.70       | 32          | 2.82         | 0.46  | 2.00                    | 3.50       | 30          |      |       |     |     |           |  |
| 2006                                | 2.31                    | 1.15  | 1.10    | 5.60       | 36          | 1.26         | 0.48                    | 0.40    | 2.70       | 36          | 2.43         | 0.54  | 1.60                    | 3.80       | 27          |      |       |     |     |           |  |
| 2007                                | 2.17                    | 1.12  | 0.90    | 4.90       | 27          | 2.41         | 0.69                    | 1.20    | 4.80       | 36          | 2.34         | 0.41  | 1.30                    | 3.00       | 27          |      |       |     |     |           |  |
| 2008                                | 6.27                    | 2.59  | 2.40    | 10.70      | 27          | 3.69         | 0.89                    | 2.30    | 5.60       | 36          | 4.06         | 1.37  | 1.70                    | 6.90       | 27          |      |       |     |     |           |  |
| Extreme values:                     | mean                    |       | min     | max        |             | mean         |                         | min     | max        |             | mean         |       | min                     | max        |             |      |       |     |     |           |  |
|                                     | 3.23                    |       | 0.10    | 15.33      |             | 2.20         |                         | 0.40    | 5.60       |             | 2.66         |       | 0.20                    | 8.10       |             |      |       |     |     |           |  |
| Trend analysis                      | Linear trend            | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B                    | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P                    | 90 conf up | 90 conf low |      |       |     |     |           |  |
|                                     | 0.01808                 | 0.012 | 0.70583 | 0.09286    | -0.08333    | 0.03515      | 0.002                   | 0.92712 | 0.04444    | -0.03333    | 0.05614      | 0.019 | 0.31433                 | 0.06032    | -0.01667    |      |       |     |     |           |  |

Table 26. The South eastern Baltic Proper, Area 7. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 7 = BCS III, PI-P1 |                         |       |         |             |                         |              |       |         |                         |              |              |       |         |             |              |
|-------------------------|-------------------------|-------|---------|-------------|-------------------------|--------------|-------|---------|-------------------------|--------------|--------------|-------|---------|-------------|--------------|
| AREA 7<br>Chl-a         | Spring,<br>Bottle 0-10m |       |         |             | Summer,<br>Bottle 0-10m |              |       |         | Autumn,<br>Bottle 0-10m |              |              |       |         |             |              |
|                         | mean                    | 1 std | min     | max         | no of obs               | mean         | 1 std | min     | max                     | no of obs    | mean         | 1 std | min     | max         | no of obs    |
| 1994                    | 2.03                    | 1.68  | 0.39    | 4.43        | 16                      | 1.46         | 0.09  | 1.36    | 1.58                    | 4            | 1.30         | 0.83  | 0.20    | 2.10        | 12           |
| 1995                    | 5.63                    | 8.50  | 0.10    | 22.90       | 16                      | 2.79         | 0.64  | 2.10    | 3.60                    | 8            | 2.71         | 0.58  | 2.10    | 3.70        | 12           |
| 1996                    | 2.90                    | 3.86  | 0.40    | 11.00       | 16                      | 3.16         | 1.07  | 2.10    | 4.60                    | 11           | 2.18         | 0.53  | 1.40    | 2.90        | 12           |
| 1997                    | 2.54                    | 1.26  | 1.00    | 4.30        | 8                       | 3.86         | 2.78  | 1.50    | 9.40                    | 16           | 1.39         | 0.55  | 0.60    | 2.20        | 16           |
| 1998                    | 5.14                    | 5.83  | 0.60    | 14.10       | 9                       | 3.34         | 0.69  | 2.40    | 4.90                    | 12           | 2.75         | 1.15  | 1.50    | 5.20        | 12           |
| 1999                    | 8.39                    | 7.28  | 1.50    | 21.80       | 9                       | 3.01         | 0.65  | 2.40    | 4.40                    | 9            | 2.76         | 1.42  | 1.10    | 4.60        | 9            |
| 2000                    | 2.43                    | 2.05  | 0.90    | 7.70        | 12                      | 2.73         | 0.85  | 1.30    | 4.00                    | 12           | 4.13         | 0.65  | 3.60    | 5.20        | 6            |
| 2001                    | 2.73                    | 2.35  | 0.80    | 7.10        | 12                      | 4.02         | 1.56  | 2.20    | 7.10                    | 12           | 2.45         | 0.68  | 1.80    | 3.20        | 6            |
| 2002                    | 3.63                    | 1.75  | 1.40    | 5.70        | 9                       | 3.43         | 1.18  | 2.20    | 5.30                    | 12           | 1.70         | 0.70  | 0.90    | 2.40        | 6            |
| 2003                    | 3.98                    | 2.11  | 2.30    | 7.10        | 9                       | 2.13         | 0.61  | 1.50    | 3.30                    | 12           | 1.92         | 0.22  | 1.70    | 2.20        | 9            |
| 2004                    | 3.58                    | 2.66  | 1.50    | 8.50        | 9                       | 2.40         | 0.75  | 1.20    | 3.30                    | 12           | 2.34         | 0.34  | 1.90    | 2.80        | 9            |
| 2005                    | 2.70                    | 0.50  | 2.00    | 3.30        | 9                       | 3.23         | 1.60  | 1.80    | 6.90                    | 12           | 3.03         | 0.48  | 2.00    | 3.50        | 9            |
| 2006                    | 2.19                    | 1.57  | 0.80    | 5.70        | 12                      | 2.50         | 1.70  | 0.50    | 5.90                    | 12           | 2.92         | 0.35  | 2.50    | 3.60        | 9            |
| 2007                    | 3.06                    | 1.67  | 0.90    | 5.10        | 9                       | 2.65         | 0.61  | 1.60    | 3.90                    | 12           | 2.43         | 0.27  | 2.00    | 2.90        | 9            |
| 2008                    | 9.81                    | 1.90  | 8.10    | 13.20       | 9                       | 4.78         | 1.47  | 2.80    | 7.60                    | 12           | 2.89         | 1.21  | 1.70    | 4.80        | 9            |
| Extreme values:         | mean                    |       | min     | max         |                         | mean         |       | min     | max                     |              | mean         |       | min     | max         |              |
|                         | 4.05                    |       | 0.10    | 22.90       |                         | 3.03         |       | 0.50    | 9.40                    |              | 2.46         |       | 0.20    | 5.20        |              |
| Trend analysis          | Linear trend            | NL B  | NL P    | 90% conf up | 90% conf low            | Linear trend | NL B  | NL P    | 90% conf up             | 90% conf low | Linear trend | NL B  | NL P    | 90% conf up | 90% conf low |
|                         | 0.07896                 | 0.078 | 0.18602 | 0.16667     | -0.02963                | 0.01320      | 0.016 | 0.60457 | 0.10052                 | -0.05937     | 0.06145      | 0.041 | 0.08347 | 0.10000     | 0.00486      |



Table 27. The Western Gotland Basin, Area 8. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 8 = BY32, BY38 |                      |              |       |         |            |                      |              |       |         |            |                      |              |       |         |            |             |
|---------------------|----------------------|--------------|-------|---------|------------|----------------------|--------------|-------|---------|------------|----------------------|--------------|-------|---------|------------|-------------|
| AREA 8              | Spring, Bottle 0-10m |              |       |         |            | Summer, Bottle 0-10m |              |       |         |            | Autumn, Bottle 0-10m |              |       |         |            |             |
|                     | Chl-a                | mean         | 1 std | min     | max        | no of obs            | mean         | 1 std | min     | max        | no of obs            | mean         | 1 std | min     | max        | no of obs   |
|                     | 1994                 | 1.05         | 0.65  | 0.10    | 2.17       | 26                   | 2.36         | 0.80  | 1.28    | 3.93       | 8                    | 1.12         | 0.88  | 0.30    | 2.30       | 16          |
|                     | 1995                 | 2.17         | 2.39  | 0.10    | 8.00       | 24                   | 3.87         | 1.65  | 1.40    | 8.30       | 20                   | 2.86         | 1.35  | 0.70    | 5.90       | 20          |
|                     | 1996                 | 3.00         | 2.66  | 0.40    | 7.10       | 16                   | 2.09         | 0.55  | 1.30    | 2.90       | 16                   | 2.67         | 0.39  | 2.10    | 3.40       | 16          |
|                     | 1997                 | 2.90         | 1.51  | 1.30    | 4.70       | 8                    | 1.81         | 0.58  | 1.00    | 2.60       | 16                   | 1.98         | 0.69  | 1.20    | 3.30       | 12          |
|                     | 1998                 | 2.83         | 2.75  | 0.70    | 8.10       | 9                    | 2.97         | 0.45  | 2.40    | 3.60       | 12                   | 2.82         | 1.29  | 1.10    | 4.40       | 9           |
|                     | 1999                 | 7.96         | 11.90 | 0.90    | 29.30      | 9                    | 2.94         | 1.46  | 1.70    | 6.20       | 12                   | 2.65         | 0.18  | 2.40    | 2.80       | 6           |
|                     | 2000                 | 9.06         | 10.92 | 0.80    | 27.10      | 9                    | 3.44         | 1.34  | 1.80    | 5.10       | 12                   | 2.97         | 0.69  | 2.30    | 3.90       | 6           |
|                     | 2001                 | 5.45         | 5.73  | 0.40    | 21.40      | 12                   | 3.42         | 1.38  | 2.00    | 5.70       | 12                   | 3.25         | 1.56  | 1.70    | 4.80       | 6           |
|                     | 2002                 | 6.04         | 7.03  | 0.80    | 18.60      | 9                    | 2.12         | 1.11  | 1.10    | 4.20       | 12                   | 2.48         | 1.65  | 0.30    | 4.10       | 9           |
|                     | 2003                 | 2.66         | 1.12  | 1.40    | 4.30       | 9                    | 3.13         | 2.00  | 1.20    | 7.80       | 9                    | 1.97         | 0.28  | 1.60    | 2.40       | 9           |
|                     | 2004                 | 2.43         | 2.12  | 0.80    | 6.10       | 9                    | 2.45         | 0.73  | 1.70    | 3.70       | 12                   | 2.12         | 0.42  | 1.10    | 2.60       | 12          |
|                     | 2005                 | 2.28         | 1.42  | 1.00    | 4.40       | 12                   | 2.39         | 1.01  | 1.00    | 4.10       | 18                   | 3.25         | 0.88  | 1.80    | 4.80       | 24          |
|                     | 2006                 | 2.31         | 1.48  | 0.80    | 7.20       | 24                   | 1.53         | 0.57  | 0.60    | 2.70       | 24                   | 2.13         | 0.65  | 1.20    | 3.10       | 18          |
|                     | 2007                 | 2.27         | 1.51  | 0.50    | 4.70       | 18                   | 3.35         | 0.80  | 2.30    | 5.60       | 24                   | 3.45         | 0.97  | 2.00    | 4.80       | 12          |
|                     | 2008                 | 5.69         | 2.64  | 2.00    | 9.10       | 18                   | 3.40         | 1.26  | 1.70    | 6.20       | 24                   | 3.86         | 1.50  | 1.30    | 6.10       | 17          |
| Extreme values:     |                      | mean         |       | min     | max        |                      | mean         |       | min     | max        |                      | mean         |       | min     | max        |             |
|                     |                      | 3.87         |       | 0.10    | 29.30      |                      | 2.75         |       | 0.60    | 8.30       |                      | 2.64         |       | 0.30    | 6.10       |             |
|                     |                      | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low          | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low          | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
| Trend analysis      |                      | 0.09892      | 0.031 | 0.41345 | 0.14500    | -0.04444             | -0.00162     | 0.000 | 1.00000 | 0.07083    | -0.06222             | 0.07813      | 0.082 | 0.05125 | 0.14444    | 0.01042     |

Table 28. The Eastern Gotland Basin, Area 9. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 9 = BY10, BY15, BY20 |                         |       |         |                         |             |              |                         |         |            |             |              |       |         |            |             |           |
|---------------------------|-------------------------|-------|---------|-------------------------|-------------|--------------|-------------------------|---------|------------|-------------|--------------|-------|---------|------------|-------------|-----------|
| AREA 9<br>Chl-a           | Spring,<br>Bottle 0-10m |       |         | Summer,<br>Bottle 0-10m |             |              | Autumn,<br>Bottle 0-10m |         |            | min         |              |       | max     |            |             | no of obs |
|                           | mean                    | 1 std | min     | max                     | no of obs   | mean         | 1 std                   | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |           |
| 1994                      | 1,35                    | 1,36  | 0,27    | 6,87                    | 46          | 3,70         | 1,26                    | 2,55    | 5,75       | 12          | 0,93         | 0,46  | 0,10    | 1,80       | 24          |           |
| 1995                      | 3,31                    | 4,75  | 0,10    | 19,60                   | 43          | 2,72         | 0,62                    | 1,40    | 4,00       | 32          | 2,42         | 0,95  | 1,00    | 4,40       | 36          |           |
| 1996                      | 5,60                    | 8,67  | 0,40    | 29,50                   | 44          | 2,36         | 0,42                    | 1,60    | 3,50       | 36          | 2,16         | 0,66  | 1,20    | 5,10       | 32          |           |
| 1997                      | 1,07                    | 0,63  | 0,40    | 2,70                    | 31          | 1,98         | 0,80                    | 0,10    | 3,80       | 36          | 1,53         | 0,55  | 0,60    | 2,30       | 48          |           |
| 1998                      | 1,85                    | 1,95  | 0,40    | 6,50                    | 27          | 3,40         | 0,74                    | 1,90    | 5,20       | 37          | 2,87         | 0,56  | 1,80    | 3,70       | 26          |           |
| 1999                      | 4,32                    | 5,57  | 0,60    | 21,70                   | 27          | 3,09         | 1,12                    | 1,80    | 7,40       | 36          | 2,77         | 0,64  | 2,00    | 4,10       | 18          |           |
| 2000                      | 3,47                    | 4,75  | 0,40    | 24,40                   | 33          | 3,37         | 1,01                    | 1,90    | 5,90       | 36          | 3,53         | 1,25  | 1,80    | 5,50       | 18          |           |
| 2001                      | 3,53                    | 3,18  | 0,30    | 11,80                   | 36          | 3,87         | 1,29                    | 2,10    | 8,40       | 36          | 2,31         | 0,68  | 1,50    | 3,30       | 15          |           |
| 2002                      | 6,53                    | 8,33  | 1,20    | 36,20                   | 27          | 3,32         | 1,80                    | 1,10    | 8,30       | 36          | 1,69         | 0,76  | 0,40    | 2,80       | 18          |           |
| 2003                      | 2,50                    | 1,52  | 0,50    | 6,30                    | 27          | 2,68         | 0,88                    | 1,30    | 5,30       | 36          | 2,39         | 0,80  | 1,50    | 4,50       | 27          |           |
| 2004                      | 3,32                    | 2,32  | 0,70    | 9,80                    | 27          | 2,82         | 0,60                    | 2,00    | 4,90       | 36          | 2,41         | 0,44  | 1,70    | 3,30       | 27          |           |
| 2005                      | 3,76                    | 1,76  | 1,30    | 6,80                    | 27          | 3,30         | 1,22                    | 1,40    | 5,70       | 29          | 3,08         | 0,84  | 1,90    | 5,50       | 33          |           |
| 2006                      | 2,11                    | 0,99  | 1,00    | 5,00                    | 36          | 2,29         | 1,07                    | 0,60    | 6,10       | 36          | 2,22         | 0,63  | 1,20    | 3,70       | 27          |           |
| 2007                      | 3,38                    | 5,28  | 0,30    | 25,10                   | 27          | 3,95         | 1,32                    | 2,30    | 8,60       | 36          | 3,05         | 1,22  | 1,80    | 5,60       | 27          |           |
| 2008                      | 5,61                    | 2,29  | 1,40    | 9,00                    | 26          | 5,48         | 2,74                    | 2,90    | 12,90      | 36          | 2,88         | 0,59  | 1,90    | 3,80       | 27          |           |
| Extreme values:           | mean                    |       | min     | max                     |             | mean         |                         | min     | max        |             | mean         |       | min     | max        |             |           |
|                           | 3,45                    |       | 0,10    | 36,20                   |             | 3,22         |                         | 0,10    | 12,90      |             | 2,42         |       | 0,10    | 5,60       |             |           |
| Trend analysis            | Linear trend            | NL B  | NL P    | 90 conf up              | 90 conf low | Linear trend | NL B                    | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |           |
|                           | 0.08714                 | 0.073 | 0.06809 | 0.15238                 | 0.00588     | 0.10000      | 0.054                   | 0.17004 | 0.09048    | -0.00694    | 0.07577      | 0.058 | 0.05367 | 0.12083    | 0.01167     |           |



Table 29. The Northern Baltic Proper, Area 10. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 10 = BY29, BY31 |                      |        |         |            |                      |              |        |         |                      |             |              |       |         |            |             |
|----------------------|----------------------|--------|---------|------------|----------------------|--------------|--------|---------|----------------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 10              | Spring, Bottle 0-10m |        |         |            | Summer, Bottle 0-10m |              |        |         | Autumn, Bottle 0-10m |             |              |       |         |            |             |
| Chl-a                | mean                 | 1 std  | min     | max        | no of obs            | mean         | 1 std  | min     | max                  | no of obs   | mean         | 1 std | min     | max        | no of obs   |
| 1994                 | 2.97                 | 2.08   | 0.56    | 7.47       | 40                   | 2.22         | 0.89   | 1.11    | 3.71                 | 29          | 2.52         | 0.83  | 1.30    | 3.94       | 23          |
| 1995                 | 3.25                 | 3.15   | 0.20    | 12.44      | 33                   | 3.48         | 1.46   | 1.10    | 6.85                 | 41          | 2.86         | 1.25  | 1.10    | 6.28       | 31          |
| 1996                 | 3.91                 | 3.25   | 0.50    | 15.90      | 51                   | 1.98         | 0.61   | 1.03    | 3.20                 | 41          | 1.80         | 0.72  | 0.79    | 3.40       | 35          |
| 1997                 | 3.09                 | 2.14   | 0.70    | 7.74       | 33                   | 2.55         | 1.43   | 0.73    | 8.23                 | 30          | 1.97         | 0.70  | 1.20    | 3.90       | 39          |
| 1998                 | 4.64                 | 3.23   | 0.50    | 12.80      | 39                   | 2.61         | 1.18   | 0.50    | 4.70                 | 45          | 2.49         | 1.00  | 0.95    | 5.40       | 33          |
| 1999                 | 3.56                 | 3.08   | 0.50    | 15.50      | 45                   | 2.86         | 1.17   | 1.13    | 7.30                 | 45          | 2.84         | 1.03  | 1.25    | 4.90       | 24          |
| 2000                 | 2.74                 | 2.13   | 0.50    | 7.04       | 33                   | 2.59         | 0.76   | 0.81    | 3.94                 | 33          | 2.46         | 0.71  | 1.60    | 3.89       | 18          |
| 2001                 | 3.71                 | 2.31   | 0.30    | 8.81       | 39                   | 2.29         | 0.95   | 0.81    | 5.61                 | 33          | 1.86         | 0.64  | 1.23    | 3.10       | 15          |
| 2002                 | 2.36                 | 1.80   | 0.50    | 6.32       | 36                   | 2.18         | 0.81   | 0.50    | 4.23                 | 33          | 1.43         | 0.63  | 0.60    | 2.61       | 18          |
| 2003                 | 3.67                 | 3.04   | 0.61    | 13.25      | 30                   | 2.14         | 0.90   | 0.58    | 3.54                 | 30          | 2.11         | 0.46  | 1.40    | 3.00       | 21          |
| 2004                 | 2.77                 | 1.34   | 0.61    | 5.59       | 33                   | 2.15         | 0.53   | 1.05    | 3.30                 | 33          | 1.97         | 0.59  | 1.10    | 2.96       | 21          |
| 2005                 | 2.88                 | 1.75   | 0.68    | 7.23       | 33                   | 2.44         | 1.32   | 0.65    | 6.02                 | 33          | 1.79         | 0.40  | 1.20    | 2.57       | 18          |
| 2006                 | 2.64                 | 1.65   | 0.31    | 6.59       | 39                   | 1.93         | 0.73   | 0.79    | 4.04                 | 32          | 1.88         | 0.58  | 1.10    | 3.20       | 24          |
| 2007                 | 2.50                 | 1.68   | 0.33    | 5.80       | 27                   | 2.72         | 0.93   | 1.01    | 4.42                 | 33          | 3.20         | 0.98  | 1.93    | 5.10       | 26          |
| 2008                 | 3.32                 | 2.00   | 0.40    | 11.20      | 33                   | 3.27         | 1.14   | 1.73    | 5.79                 | 33          | 3.58         | 1.43  | 2.06    | 6.90       | 24          |
| Extreme values:      | mean                 |        | min     | max        |                      | mean         |        | min     | max                  |             | mean         |       | min     | max        |             |
|                      | 3.20                 |        | 0.20    | 15.90      |                      | 2.49         |        | 0.50    | 8.23                 |             | 2.32         |       | 0.60    | 6.90       |             |
| Trend analysis       | Linear trend         | NL B   | NL P    | 90 conf up | 90 conf low          | Linear trend | NL B   | NL P    | 90 conf up           | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                      | -0.05471             | -0.034 | 0.19854 | 0.01517    | -0.09631             | -0.00716     | -0.015 | 0.37577 | 0.02292              | -0.05579    | 0.02416      | 0.010 | 0.79707 | 0.05556    | -0.03937    |

238



Table 31. The Bothnian Sea, Area 13. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 13 = US5B, SR5 C4, US3 C6, C3 |                      |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|------------------------------------|----------------------|--------------|------|---------|------------|-------------|--------------|-------|---------|----------------------|-------------|-----------|--------------|-------|---------|----------------------|-------------|-----------|--------------|-------|---------|------------|-------------|-----------|
| AREA 13                            | Spring, Bottle 0-10m |              |      |         |            |             |              |       |         | Summer, Bottle 0-10m |             |           |              |       |         | Autumn, Bottle 0-10m |             |           |              |       |         |            |             |           |
|                                    | mean                 | 1 std        | min  | max     |            | no of obs   | mean         | 1 std | min     | max                  |             | no of obs | mean         | 1 std | min     | max                  |             | no of obs | mean         | 1 std | min     | max        |             | no of obs |
| Chl-a                              | 1994                 | 7,13         | 1,21 | 5,30    | 8,55       | 6           | ND           | ND    | ND      | ND                   | ND          | 0         | ND           | ND    | ND      | ND                   | ND          | 0         | ND           | ND    | ND      | ND         | ND          | 0         |
|                                    | 1995                 | ND           | ND   | ND      | ND         | 0           | ND           | ND    | ND      | ND                   | ND          | 0         | 0            | 0,84  | 0,13    | 0,70                 | 1,10        | 8         |              |       |         |            |             |           |
|                                    | 1996                 | ND           | ND   | ND      | ND         | 0           | ND           | ND    | ND      | ND                   | ND          | 0         | 0            | ND    | ND      | ND                   | ND          | 0         | ND           | ND    | ND      | ND         | ND          | 0         |
|                                    | 1997                 | ND           | ND   | ND      | ND         | 0           | ND           | ND    | ND      | ND                   | ND          | 0         | 0            | ND    | ND      | ND                   | ND          | 0         | ND           | ND    | ND      | ND         | ND          | 0         |
|                                    | 1998                 | ND           | ND   | ND      | ND         | 0           | ND           | ND    | ND      | ND                   | ND          | 0         | 0            | ND    | ND      | ND                   | ND          | 0         | ND           | ND    | ND      | ND         | ND          | 0         |
|                                    | 1999                 | ND           | ND   | ND      | ND         | 0           | ND           | ND    | ND      | ND                   | ND          | 0         | 0            | ND    | ND      | ND                   | ND          | 0         | ND           | ND    | ND      | ND         | ND          | 0         |
|                                    | 2000                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2001                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2002                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2003                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2004                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2005                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2006                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2007                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
|                                    | 2008                 |              |      |         |            |             |              |       |         |                      |             |           |              |       |         |                      |             |           |              |       |         |            |             |           |
| Extreme values:                    |                      | mean mean    |      | min min | max max    |             | mean mean    |       | min min | max max              |             |           | mean mean    |       | min min | max max              |             |           | mean mean    |       | min min | max max    |             |           |
|                                    |                      | 7,13         |      | 5,30    | 8,55       |             | ND           |       | ND      | ND                   |             |           | 0,84         |       | 0,70    | 1,10                 |             |           |              |       |         |            |             |           |
| Trend analysis                     |                      | Linear trend | NL B | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up           | 90 conf low |           | Linear trend | NL B  | NL P    | 90 conf up           | 90 conf low |           | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |           |
|                                    |                      | -638,27438   | ND   | ND      | ND         | ND          | ND           | ND    | ND      | ND                   | ND          | ND        | 22,82813     | ND    | ND      | ND                   | ND          | ND        | 22,82813     | ND    | ND      | ND         | ND          | ND        |

Table 32. The Bothnian Bay, Area 14. Chl a from discrete depths (0-10m) sampled with bottles bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 14 = F9, F3, A5 |                      |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|----------------------|----------------------|--------------|---------|---------|------------|-------------|----------------------|---------|---------|------------|-------------|--------------|----------------------|---------|------------|-------------|--------------|---------|---------|------------|-------------|
| AREA 14              | Spring, Bottle 0-10m |              |         |         |            |             | Summer, Bottle 0-10m |         |         |            |             |              | Autumn, Bottle 0-10m |         |            |             |              |         |         |            |             |
| Chl-a                | mean                 | 1 std        | min     | max     | no of obs  | mean        | 1 std                | min     | max     | no of obs  | mean        | 1 std        | min                  | max     | no of obs  | mean        | 1 std        | min     | max     | no of obs  |             |
|                      | 1994                 | ND           | ND      | ND      | ND         | 0           | ND                   | ND      | ND      | ND         | 0           | ND           | ND                   | ND      | ND         | 0           | ND           | ND      | ND      | 0          |             |
|                      | 1995                 | ND           | ND      | ND      | ND         | 0           | ND                   | ND      | ND      | ND         | 0           | ND           | ND                   | ND      | ND         | 0           | 0,80         | 0,00    | 0,80    | 0,80       |             |
|                      | 1996                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         | 4          |             |
|                      | 1997                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 1998                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 1999                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2000                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2001                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2002                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2003                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2004                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2005                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2006                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2007                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
|                      | 2008                 |              |         |         |            |             |                      |         |         |            |             |              |                      |         |            |             |              |         |         |            |             |
| Extreme values:      |                      | mean mean    | min min | max max |            |             | mean mean            | min min | max max |            |             | mean mean    | min min              | max max |            |             | mean mean    | min min | max max |            |             |
|                      |                      | ND           | ND      | ND      | ND         |             | ND                   | ND      | ND      | ND         |             | ND           | ND                   | ND      | ND         |             | 0,80         | 0,80    | 0,80    |            |             |
| Trend analysis       |                      | Linear trend | NL B    | NL P    | 90 conf up | 90 conf low | Linear trend         | NL B    | NL P    | 90 conf up | 90 conf low | Linear trend | NL B                 | NL P    | 90 conf up | 90 conf low | Linear trend | NL B    | NL P    | 90 conf up | 90 conf low |
|                      |                      | ND           | ND      | ND      | ND         | ND          | ND                   | ND      | ND      | ND         | ND          | ND           | ND                   | ND      | ND         | ND          | -0.00076     | ND      | ND      | ND         | ND          |

Table 33. The west-coast inside the skerries, Area 1. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval for the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 1= Alsäck, Havstensfjord |              |       |         |            |             |              |       |         |            |             |              |       |         |            |             |
|-------------------------------|--------------|-------|---------|------------|-------------|--------------|-------|---------|------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 1                        | Spring       |       |         |            | Summer      |              |       |         | Autumn     |             |              |       |         |            | no of obs   |
| Secchi                        | mean         | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        |             |
| 1994                          | 3,1          | 1,2   | 1,5     | 4,0        | 4           | 4,6          | 1,1   | 3,5     | 6,0        | 5           | 4,8          | 3,0   | 2,5     | 10,5       | 6           |
| 1995                          | 2,5          | 0,9   | 1,5     | 3,0        | 3           | 5,0          | 1,5   | 3,5     | 7,5        | 5           | 5,1          | 2,4   | 3,0     | 9,0        | 5           |
| 1996                          | 6,3          | 3,3   | 3,0     | 10,0       | 4           | 3,8          | 1,5   | 1,5     | 5,0        | 6           | 7,2          | 1,2   | 6,0     | 8,5        | 6           |
| 1997                          | 2,9          | 1,0   | 1,5     | 4,0        | 4           | 5,4          | 2,3   | 3,0     | 8,5        | 5           | 5,5          | 2,1   | 3,0     | 9,0        | 6           |
| 1998                          | 3,8          | 2,2   | 1,5     | 7,5        | 9           | 6,1          | 2,4   | 3,5     | 9,0        | 6           | 4,5          | 0,4   | 4,0     | 5,0        | 6           |
| 1999                          | 3,0          | 0,6   | 2,5     | 4,0        | 5           | 3,4          | 1,2   | 2,5     | 5,5        | 5           | 3,4          | 1,3   | 2,0     | 5,0        | 5           |
| 2000                          | 4,1          | 2,5   | 1,5     | 8,7        | 6           | 5,2          | 3,0   | 2,4     | 9,6        | 5           | 7,4          | 2,0   | 4,5     | 9,9        | 6           |
| 2001                          | 4,8          | 3,2   | 2,0     | 8,0        | 4           | 6,3          | 2,2   | 3,8     | 10,0       | 6           | 6,7          | 1,5   | 4,6     | 8,0        | 6           |
| 2002                          | 3,9          | 2,2   | 0,8     | 7,0        | 5           | 5,6          | 3,2   | 2,2     | 11,5       | 6           | 4,8          | 1,6   | 3,0     | 7,5        | 6           |
| 2003                          | 5,9          | 0,7   | 5,5     | 7,0        | 5           | 4,7          | 1,3   | 3,2     | 7,0        | 6           | 7,7          | 3,4   | 3,8     | 13,0       | 6           |
| 2004                          | 4,5          | 1,7   | 1,5     | 6,0        | 5           | 6,7          | 2,4   | 3,0     | 9,0        | 6           | 6,5          | 2,9   | 3,5     | 11,0       | 6           |
| 2005                          | 6,5          | 2,5   | 4,0     | 10,0       | 4           | 5,9          | 2,1   | 4,0     | 9,0        | 6           | 6,9          | 1,0   | 6,0     | 8,0        | 6           |
| 2006                          | 3,3          | 4,1   | 0,9     | 8,0        | 3           | 5,1          | 2,5   | 2,0     | 9,0        | 6           | 7,0          | 1,2   | 5,0     | 8,0        | 5           |
| 2007                          | 5,0          | 1,9   | 2,5     | 7,0        | 5           | 4,9          | 1,9   | 2,5     | 8,0        | 6           | 3,6          | 0,4   | 3,0     | 4,0        | 5           |
| 2008                          | 2,5          | 1,5   | 1,0     | 5,0        | 6           | 6,1          | 2,1   | 4,0     | 9,5        | 6           | 6,0          | 1,3   | 4,0     | 7,0        | 6           |
| Extreme values:               | mean         |       | min     | max        |             | mean         |       | min     | max        |             | mean         |       | min     | max        |             |
|                               | 4,1          |       | 0,8     | 10,0       |             | 5,2          |       | 1,5     | 11,5       |             | 5,8          |       | 2,0     | 13,0       |             |
| Trend analysis                | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                               | 0.04772      | 0.100 | 0.25829 | 0.22917    | -0.01923    | 0.08227      | 0.094 | 0.07630 | 0.19643    | 0.00667     | 0.06134      | 0.033 | 0.56569 | 0.20000    | -0.05556    |



Table 34. The Skagerrak, Area 2. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 2 = A13, A15, A17, HS5, M6, TH6, P2, Slaggo |              |        |         |            |             |              |        |         |            |             |              |        |         |            |             |
|--------------------------------------------------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|
| AREA 2                                           | Spring       |        |         | Summer     |             |              | Autumn |         |            | min         |              |        | max     |            |             |
| Secchi                                           | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   |
| 1994                                             | 4.0          | 0.0    | 4.0     | 4.0        | 1           | 8.0          | 0.9    | 7.0     | 8.5        | 3           | 8.0          | 1.4    | 7.0     | 9.0        | 2           |
| 1995                                             | 5.9          | 2.6    | 2.5     | 10.0       | 10          | 6.5          | 2.5    | 3.5     | 10.0       | 11          | 7.6          | 1.9    | 4.5     | 10.0       | 9           |
| 1996                                             | 7.3          | 2.0    | 4.0     | 9.0        | 9           | 7.0          | 2.8    | 3.5     | 12.0       | 11          | 7.4          | 1.6    | 4.5     | 10.0       | 8           |
| 1997                                             | 9.3          | 0.6    | 9.0     | 10.0       | 3           | 9.6          | 2.1    | 7.0     | 12.0       | 4           | 7.4          | 3.1    | 3.0     | 10.5       | 4           |
| 1998                                             | 7.0          | 1.6    | 5.0     | 9.0        | 4           | 8.0          | 1.0    | 7.0     | 9.0        | 5           | 8.3          | 2.5    | 5.0     | 11.0       | 4           |
| 1999                                             | 6.7          | 2.3    | 4.0     | 8.0        | 3           | 7.9          | 4.1    | 5.0     | 14.0       | 4           | 7.7          | 2.2    | 5.5     | 10.0       | 5           |
| 2000                                             | 7.2          | 2.7    | 3.5     | 11.5       | 12          | 7.6          | 2.7    | 3.0     | 12.0       | 8           | 8.7          | 1.7    | 7.0     | 13.0       | 11          |
| 2001                                             | 5.1          | 1.9    | 2.0     | 8.0        | 9           | 8.4          | 2.0    | 5.0     | 11.8       | 10          | 8.2          | 1.6    | 6.8     | 11.0       | 6           |
| 2002                                             | 6.1          | 2.2    | 1.8     | 9.5        | 9           | 7.2          | 1.6    | 4.8     | 11.0       | 16          | 7.5          | 1.5    | 5.1     | 9.5        | 9           |
| 2003                                             | 7.6          | 1.4    | 6.0     | 9.5        | 9           | 7.7          | 1.1    | 6.0     | 10.0       | 15          | 10.6         | 4.6    | 4.7     | 16.0       | 10          |
| 2004                                             | 6.6          | 1.9    | 4.0     | 9.0        | 7           | 7.5          | 2.1    | 5.0     | 11.0       | 18          | 6.3          | 1.6    | 5.0     | 9.0        | 5           |
| 2005                                             | 6.8          | 1.6    | 4.0     | 9.0        | 8           | 8.4          | 2.0    | 4.0     | 11.0       | 12          | 9.0          | 1.9    | 5.0     | 12.0       | 11          |
| 2006                                             | 6.8          | 3.3    | 2.0     | 11.0       | 10          | 7.5          | 1.7    | 5.0     | 11.0       | 15          | 7.6          | 1.4    | 5.0     | 11.0       | 15          |
| 2007                                             | 5.6          | 2.3    | 3.0     | 10.0       | 8           | 6.9          | 2.2    | 4.0     | 12.0       | 16          | 7.7          | 2.8    | 4.5     | 14.0       | 12          |
| 2008                                             | 6.4          | 1.7    | 4.0     | 8.0        | 11          | 6.5          | 1.4    | 4.0     | 10.0       | 16          | 6.7          | 2.0    | 5.0     | 11.0       | 10          |
| Extreme values:                                  | mean mean    |        | min min | max max    |             | mean mean    |        | min min | max max    |             | mean mean    |        | min min | max max    |             |
|                                                  | 6.6          |        | 1.8     | 11.5       |             | 7.6          |        | 3.0     | 14.0       |             | 7.9          |        | 3.0     | 16.0       |             |
|                                                  | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |
| Trend analysis                                   | -0.02093     | -0.080 | 0.21593 | 0.01429    | -0.17424    | -0.02614     | -0.005 | 0.90279 | 0.10000    | -0.11250    | -0.01661     | -0.001 | 0.84541 | 0.08750    | -0.12500    |



Table 35. The Kartegat, Area 3. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 3 = Anholt, Fladen, GF-4, Kullen, St. Middelgrund |              |        |         |            |             |              |       |         |            |             |              |        |         |            |             |           |
|--------------------------------------------------------|--------------|--------|---------|------------|-------------|--------------|-------|---------|------------|-------------|--------------|--------|---------|------------|-------------|-----------|
| AREA 3                                                 | Spring       |        |         |            | Summer      |              |       |         | Autumn     |             |              |        |         |            |             |           |
| Secchi                                                 | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | no of obs |
| 1994                                                   | 8,4          | 1,5    | 6,0     | 10,0       | 7           | 6,8          | 0,6   | 6,0     | 7,5        | 6           | 8,5          | 1,0    | 7,0     | 10,5       | 11          | 11        |
| 1995                                                   | 7,5          | 0,6    | 7,0     | 8,5        | 5           | 6,9          | 0,6   | 6,0     | 8,0        | 13          | 7,2          | 0,8    | 6,0     | 8,0        | 11          | 11        |
| 1996                                                   | 7,0          | 2,8    | 5,0     | 9,0        | 2           | 9,4          | 2,0   | 6,0     | 12,0       | 7           | 9,4          | 1,5    | 7,5     | 12,0       | 7           | 7         |
| 1997                                                   | 7,3          | 2,3    | 5,0     | 9,5        | 3           | 7,8          | 1,3   | 7,0     | 10,0       | 5           | 7,5          | 2,1    | 5,0     | 11,0       | 7           | 7         |
| 1998                                                   | 6,6          | 2,0    | 5,0     | 9,0        | 4           | 8,3          | 2,2   | 5,5     | 12,0       | 12          | 9,2          | 1,0    | 7,5     | 10,0       | 5           | 5         |
| 1999                                                   | 6,7          | 2,0    | 4,5     | 10,0       | 9           | 7,7          | 1,5   | 6,0     | 10,0       | 7           | 7,8          | 1,6    | 5,0     | 10,0       | 8           | 8         |
| 2000                                                   | 9,1          | 2,0    | 7,0     | 11,5       | 4           | 6,6          | 1,7   | 3,5     | 8,0        | 6           | 7,6          | 0,9    | 6,0     | 8,5        | 6           | 6         |
| 2001                                                   | 7,0          | 1,2    | 6,0     | 8,0        | 4           | 7,1          | 0,7   | 6,0     | 8,0        | 7           | 8,0          | 0,6    | 7,0     | 9,0        | 7           | 7         |
| 2002                                                   | 8,2          | 2,8    | 5,0     | 10,5       | 3           | 7,6          | 2,3   | 5,0     | 10,5       | 4           | 9,4          | 1,7    | 8,0     | 12,0       | 5           | 5         |
| 2003                                                   | 7,7          | 3,7    | 3,5     | 11,0       | 5           | 9,3          | 1,6   | 6,5     | 11,5       | 7           | 7,5          | 0,7    | 7,0     | 8,0        | 2           | 2         |
| 2004                                                   | 7,0          | 0,0    | 7,0     | 7,0        | 1           | 7,3          | 0,5   | 7,0     | 8,0        | 4           | ND           | ND     | ND      | ND         | 0           | 0         |
| 2005                                                   | 6,4          | 1,3    | 5,0     | 8,0        | 6           | 8,1          | 0,5   | 7,5     | 9,0        | 5           | 7,4          | 1,7    | 6,0     | 10,0       | 5           | 5         |
| 2006                                                   | 5,5          | 0,7    | 5,0     | 6,0        | 2           | 7,0          | 1,2   | 6,0     | 9,0        | 5           | 9,2          | 2,3    | 7,0     | 12,0       | 5           | 5         |
| 2007                                                   | 5,3          | 3,2    | 3,0     | 7,5        | 2           | 6,4          | 1,1   | 5,0     | 8,0        | 5           | 6,8          | 1,5    | 5,0     | 8,0        | 4           | 4         |
| 2008                                                   | 8,8          | 2,5    | 6,0     | 10,5       | 3           | 7,6          | 1,5   | 5,0     | 9,5        | 8           | 8,6          | 1,1    | 7,0     | 10,0       | 5           | 5         |
| Extreme values:                                        | mean         |        | min     | max        |             | mean         |       | min     | max        |             | mean         |        | min     | max        |             |           |
|                                                        | 7,2          |        | 3,0     | 11,5       |             | 7,6          |       | 3,5     | 12,0       |             | 8,1          |        | 5,0     | 12,0       |             |           |
| Trend analysis                                         | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |           |
|                                                        | -0.06437     | -0.021 | 0.50259 | 0.06667    | -0.16667    | -0.01109     | 0.000 | 0.84040 | 0.06250    | -0.09167    | -0.00168     | -0.054 | 0.25631 | 0.03030    | -0.12500    |           |

244



Table 37. The Arkona Basin, Area 5. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 5 = BY1, BY2 |      |              |        |         |            |             |              |        |         |            |             |              |        |         |            |             |
|-------------------|------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|
| AREA 5            |      | Spring       |        |         | Summer     |             |              | Autumn |         |            | Winter      |              |        | Trend   |            |             |
| Secchi            |      | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   |
|                   | 1994 | 8,0          | 0,0    | 8,0     | 8,0        | 1           | 6,5          | 1,3    | 5,0     | 7,5        | 3           | 7,5          | 0,0    | 7,5     | 7,5        | 1           |
|                   | 1995 | 9,9          | 1,4    | 8,0     | 11,0       | 4           | 6,7          | 0,6    | 6,0     | 7,0        | 3           | 7,5          | 0,0    | 7,5     | 7,5        | 1           |
|                   | 1996 | 7,8          | 0,8    | 7,0     | 9,0        | 6           | 7,1          | 1,2    | 5,5     | 8,0        | 4           | 7,3          | 1,2    | 6,0     | 8,0        | 3           |
|                   | 1997 | 7,5          | 0,0    | 7,5     | 7,5        | 1           | 6,3          | 1,1    | 5,0     | 8,0        | 9           | 7,0          | 0,0    | 7,0     | 7,0        | 1           |
|                   | 1998 | 9,0          | 1,9    | 6,0     | 11,0       | 5           | 5,9          | 0,2    | 5,5     | 6,0        | 5           | 8,0          | 0,0    | 8,0     | 8,0        | 1           |
|                   | 1999 | 12,3         | 2,1    | 10,0    | 14,0       | 3           | 6,3          | 0,4    | 6,0     | 7,0        | 5           | 5,0          | 0,0    | 5,0     | 5,0        | 2           |
|                   | 2000 | 8,9          | 3,3    | 4,0     | 11,0       | 4           | 6,3          | 1,1    | 5,0     | 8,0        | 5           | ND           | ND     | ND      | ND         | 0           |
|                   | 2001 | 7,8          | 2,6    | 5,0     | 10,0       | 3           | 7,0          | 0,0    | 7,0     | 7,0        | 2           | 6,8          | 0,3    | 6,5     | 7,0        | 3           |
|                   | 2002 | ND           | ND     | ND      | ND         | 0           | 6,3          | 0,4    | 6,0     | 6,5        | 2           | 8,0          | 0,0    | 8,0     | 8,0        | 1           |
|                   | 2003 | 8,0          | 1,4    | 7,0     | 9,0        | 2           | 7,0          | 1,0    | 6,0     | 8,0        | 3           | 8,0          | 0,0    | 8,0     | 8,0        | 1           |
|                   | 2004 | 6,5          | 0,7    | 6,0     | 7,0        | 2           | 6,5          | 0,0    | 6,5     | 6,5        | 1           | 9,0          | 0,0    | 9,0     | 9,0        | 1           |
|                   | 2005 | 6,0          | 0,0    | 6,0     | 6,0        | 1           | ND           | ND     | ND      | ND         | 0           | 5,5          | 0,7    | 5,0     | 6,0        | 2           |
|                   | 2006 | 7,5          | 0,7    | 7,0     | 8,0        | 2           | 6,5          | 2,1    | 5,0     | 8,0        | 2           | ND           | ND     | ND      | ND         | 0           |
|                   | 2007 | ND           | ND     | ND      | ND         | 0           | 5,5          | 0,7    | 5,0     | 6,0        | 2           | 6,0          | 0,0    | 6,0     | 6,0        | 1           |
|                   | 2008 | 6,5          | 0,0    | 6,5     | 6,5        | 1           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           |
| Extreme values:   |      | mean         |        | min     | max        |             | mean         |        | min     | max        |             | mean         |        | min     | max        |             |
|                   |      | 8,1          |        | 4,0     | 14,0       |             | 6,5          |        | 5,0     | 8,0        |             | 7,1          |        | 5,0     | 9,0        |             |
| Trend analysis    |      | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |
|                   |      | -0.17769     | -0.182 | 0.12247 | 0.00000    | -0.25000    | -0.02871     | 0.000  | 0.60433 | 0.05556    | -0.09722    | -0.06513     | -0.083 | 0.37271 | 0.05556    | -0.18182    |

Table 38. The Bornholm Basin, Area 6. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 6 = BY4, BY5, BY39, Hanöbukten |              |        |         |            |             |              |        |         |            |             |              |       |         |            |             |
|-------------------------------------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|-------|---------|------------|-------------|
| AREA 6                              | Spring       |        |         | Summer     |             |              | Autumn |         |            | Winter      |              |       | Total   |            |             |
| Secchi                              | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |
| 1994                                | 7,9          | 1,7    | 5,5     | 10,0       | 5           | 6,4          | 0,5    | 6,0     | 7,0        | 4           | 8,2          | 0,8   | 7,5     | 9,0        | 3           |
| 1995                                | 9,3          | 1,0    | 8,0     | 10,0       | 4           | 6,4          | 1,2    | 5,0     | 8,0        | 7           | 7,8          | 1,0   | 7,0     | 9,0        | 6           |
| 1996                                | 7,7          | 0,8    | 7,0     | 9,0        | 7           | 7,1          | 1,5    | 5,0     | 10,0       | 8           | 7,0          | 1,2   | 6,0     | 9,0        | 5           |
| 1997                                | 7,8          | 0,4    | 7,5     | 8,0        | 2           | 8,6          | 2,0    | 7,0     | 12,0       | 6           | 6,7          | 1,0   | 6,0     | 8,0        | 5           |
| 1998                                | 10,0         | 1,0    | 9,0     | 11,0       | 3           | 6,7          | 0,4    | 6,0     | 7,0        | 5           | 6,7          | 0,6   | 6,0     | 7,0        | 3           |
| 1999                                | 9,9          | 2,4    | 7,0     | 14,0       | 7           | 6,5          | 0,9    | 5,0     | 7,5        | 10          | 8,0          | 0,0   | 8,0     | 8,0        | 2           |
| 2000                                | 10,2         | 1,3    | 9,0     | 11,5       | 5           | 6,5          | 0,6    | 6,0     | 7,0        | 4           | 7,9          | 1,1   | 6,5     | 9,0        | 7           |
| 2001                                | 8,7          | 2,4    | 6,0     | 11,5       | 5           | 6,7          | 0,8    | 5,0     | 8,0        | 9           | 8,5          | 0,0   | 8,5     | 8,5        | 1           |
| 2002                                | 9,8          | 0,8    | 9,0     | 11,0       | 5           | 6,2          | 0,8    | 5,0     | 7,0        | 10          | 7,5          | 0,7   | 7,0     | 8,0        | 2           |
| 2003                                | 9,6          | 3,8    | 4,0     | 14,0       | 5           | 7,3          | 1,7    | 5,0     | 10,5       | 7           | 5,8          | 0,4   | 5,5     | 6,0        | 2           |
| 2004                                | 9,0          | 2,0    | 7,0     | 11,0       | 3           | 7,0          | 1,1    | 6,0     | 9,0        | 8           | 9,0          | 0,0   | 9,0     | 9,0        | 1           |
| 2005                                | 9,1          | 3,6    | 6,5     | 17,0       | 8           | 7,6          | 1,5    | 5,0     | 9,0        | 8           | 6,7          | 0,5   | 6,0     | 7,0        | 6           |
| 2006                                | 8,5          | 1,5    | 7,0     | 10,0       | 5           | 6,8          | 2,4    | 2,0     | 10,0       | 9           | 7,4          | 1,1   | 6,0     | 9,0        | 5           |
| 2007                                | 7,7          | 1,2    | 7,0     | 9,0        | 3           | 6,3          | 0,8    | 5,5     | 8,0        | 8           | 7,7          | 0,6   | 7,0     | 8,0        | 3           |
| 2008                                | 5,5          | 1,3    | 4,0     | 7,5        | 5           | 5,2          | 1,2    | 3,0     | 7,0        | 10          | 6,4          | 0,5   | 6,0     | 7,0        | 5           |
| Extreme values:                     | mean         |        | min     | max        |             | mean         |        | min     | max        |             | mean         |       | min     | max        |             |
|                                     | 8,7          |        | 4,0     | 17,0       |             | 6,7          |        | 2,0     | 12,0       |             | 7,4          |       | 5,5     | 9,0        |             |
| Trend analysis                      | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |
|                                     | -0.06605     | -0.063 | 0.38205 | 0.07143    | -0.22222    | -0.05758     | -0.056 | 0.18832 | 0.00000    | -0.10714    | -0.04691     | 0.000 | 0.64761 | 0.04167    | -0.10000    |



Table 39. The South eastern Baltic Proper, Area 7. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 7 = BCS III, PLP1 |              |       |         |            |             |              |       |         |            |             |              |       |         |             |
|------------------------|--------------|-------|---------|------------|-------------|--------------|-------|---------|------------|-------------|--------------|-------|---------|-------------|
| AREA 7                 | Spring       |       |         |            | Summer      |              |       |         | Autumn     |             |              |       |         |             |
| Secchi                 | mean         | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   | mean         | 1 std | min     | max         |
| 1994                   | 8,0          | 0,0   | 8,0     | 8,0        | 1           | 8,0          | 0,0   | 8,0     | 8,0        | 2           | ND           | ND    | ND      | ND          |
| 1995                   | 8,3          | 3,2   | 6,0     | 10,5       | 2           | ND           | ND    | ND      | ND         | 0           | 7,5          | 0,0   | 7,5     | 7,5         |
| 1996                   | 9,0          | 0,0   | 9,0     | 9,0        | 2           | 5,0          | 0,0   | 5,0     | 5,0        | 1           | 5,5          | 0,0   | 5,5     | 5,5         |
| 1997                   | ND           | ND    | ND      | ND         | 0           | 6,0          | 2,6   | 3,0     | 8,0        | 3           | 8,0          | 0,0   | 8,0     | 8,0         |
| 1998                   | 11,0         | 0,0   | 11,0    | 11,0       | 1           | 6,3          | 0,6   | 6,0     | 7,0        | 3           | 8,0          | 0,0   | 8,0     | 8,0         |
| 1999                   | ND           | ND    | ND      | ND         | 0           | 6,3          | 2,5   | 4,5     | 8,0        | 2           | 6,8          | 1,8   | 5,5     | 8,0         |
| 2000                   | 6,0          | 0,0   | 6,0     | 6,0        | 1           | 6,7          | 0,6   | 6,0     | 7,0        | 3           | ND           | ND    | ND      | ND          |
| 2001                   | 11,5         | 0,7   | 11,0    | 12,0       | 2           | 5,0          | 0,0   | 5,0     | 5,0        | 1           | 7,0          | 0,0   | 7,0     | 7,0         |
| 2002                   | 9,0          | 0,0   | 9,0     | 9,0        | 1           | 5,5          | 0,7   | 5,0     | 6,0        | 2           | 10,0         | 0,0   | 10,0    | 10,0        |
| 2003                   | 11,5         | 0,7   | 11,0    | 12,0       | 2           | 6,7          | 3,1   | 4,0     | 10,0       | 3           | ND           | ND    | ND      | ND          |
| 2004                   | 8,8          | 4,5   | 4,0     | 13,0       | 3           | 7,0          | 1,0   | 6,0     | 8,0        | 3           | ND           | ND    | ND      | ND          |
| 2005                   | 7,5          | 0,7   | 7,0     | 8,0        | 2           | 5,0          | 1,7   | 3,0     | 6,0        | 3           | ND           | ND    | ND      | ND          |
| 2006                   | 10,6         | 2,3   | 9,0     | 14,0       | 4           | 7,2          | 2,8   | 4,0     | 9,5        | 3           | ND           | ND    | ND      | ND          |
| 2007                   | 7,0          | 2,8   | 5,0     | 9,0        | 2           | 5,7          | 0,6   | 5,0     | 6,0        | 3           | ND           | ND    | ND      | ND          |
| 2008                   | 5,0          | 0,0   | 5,0     | 5,0        | 1           | ND           | ND    | ND      | ND         | 0           | 8,0          | 0,0   | 8,0     | 8,0         |
| Extreme values:        | mean         |       | min     | max        |             | mean         |       | min     | max        |             | mean         |       | min     | max         |
|                        | 8,7          |       | 4,0     | 14,0       |             | 6,2          |       | 3,0     | 10,0       |             | 7,6          |       | 5,5     | 10,0        |
|                        | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up  |
| Trend analysis         | -0.03275     | 0.000 | 0.81906 | 0.18750    | -0.22222    | -0.04471     | 0.000 | 0.40381 | 0.00000    | -0.20000    | 0.13032      | 0.000 | 0.57910 | 0.14286     |
|                        |              |       |         |            |             |              |       |         |            |             |              |       |         | 90 conf low |
|                        |              |       |         |            |             |              |       |         |            |             |              |       |         | 0.00000     |

Table 40. The Western Gotland Basin, Area 8. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 8 = BY32, BY38 |         |       |         |         |             |              |        |         |         |            |           |             |         |         |             |
|---------------------|---------|-------|---------|---------|-------------|--------------|--------|---------|---------|------------|-----------|-------------|---------|---------|-------------|
| AREA 8              | Spring  |       |         | Summer  |             |              | Autumn |         |         | no of obs  |           |             | max     |         |             |
| Secchi              | mean    | 1 std | min     | mean    | 1 std       | min          | mean   | 1 std   | min     | max        | no of obs | max         | min     | max     | no of obs   |
| 1994                | 9,6     | 2,1   | 6,5     | 11,0    | 4           | 6,0          | 5,0    | 7,0     | 5       | 7,0        | 5         | 7,0         | 1,4     | 6,0     | 8,0         |
| 1995                | 9,8     | 3,3   | 7,0     | 13,5    | 3           | 4,8          | 4,5    | 5,0     | 3       | 8,7        | 3         | 8,7         | 2,5     | 6,0     | 11,0        |
| 1996                | 10,0    | 2,6   | 7,0     | 12,0    | 3           | 7,3          | 6,5    | 8,0     | 4       | 8,0        | 4         | 8,0         | 0,0     | 8,0     | 8,0         |
| 1997                | 9,0     | 1,7   | 8,0     | 11,0    | 3           | 6,1          | 5,0    | 8,0     | 5       | 7,8        | 5         | 7,8         | 2,8     | 6,0     | 11,0        |
| 1998                | 7,7     | 1,5   | 6,0     | 9,0     | 3           | 5,5          | 4,5    | 6,0     | 4       | 5,0        | 4         | 5,0         | 0,0     | 5,0     | 5,0         |
| 1999                | 9,6     | 3,3   | 4,0     | 12,0    | 5           | 5,6          | 4,0    | 7,0     | 6       | ND         | 6         | ND          | ND      | ND      | ND          |
| 2000                | 6,2     | 2,5   | 4,5     | 9,0     | 3           | 6,3          | 4,0    | 10,0    | 4       | ND         | 4         | ND          | ND      | ND      | ND          |
| 2001                | 9,3     | 1,3   | 8,0     | 10,5    | 3           | 5,5          | 5,0    | 6,0     | 2       | 6,8        | 2         | 6,8         | 0,4     | 6,5     | 7,0         |
| 2002                | 10,0    | 4,2   | 7,0     | 13,0    | 2           | 5,8          | 5,0    | 6,5     | 2       | ND         | 2         | ND          | ND      | ND      | ND          |
| 2003                | 9,5     | 3,5   | 7,0     | 12,0    | 2           | 5,5          | 5,0    | 6,0     | 4       | 6,5        | 4         | 6,5         | 0,0     | 6,5     | 6,5         |
| 2004                | 10,5    | 3,0   | 7,0     | 13,0    | 4           | 5,6          | 5,0    | 6,5     | 4       | 9,0        | 4         | 9,0         | 0,0     | 9,0     | 9,0         |
| 2005                | 8,3     | 0,4   | 8,0     | 8,5     | 2           | 5,5          | 4,0    | 7,0     | 2       | 5,0        | 2         | 5,0         | 0,0     | 5,0     | 5,0         |
| 2006                | 10,0    | 1,4   | 9,0     | 11,0    | 2           | 6,3          | 4,0    | 8,0     | 3       | 8,0        | 3         | 8,0         | 0,0     | 8,0     | 8,0         |
| 2007                | 9,3     | 1,5   | 7,0     | 10,0    | 4           | 5,5          | 5,0    | 6,0     | 4       | ND         | 4         | ND          | ND      | ND      | ND          |
| 2008                | 12,0    | 0,0   | 12,0    | 12,0    | 1           | ND           | ND     | ND      | 0       | 6,7        | 0         | 6,7         | 0,6     | 6,0     | 7,0         |
| Extreme values:     | mean    | 1 std | min     | max     | 90 conf low | Linear trend | NL B   | NL P    | max     | 90 conf up | max       | 90 conf low | min     | max     | 90 conf low |
|                     | 9,4     |       | 4,0     | 13,5    | -0,08333    | -0,03013     | -0,028 | 0,41164 | 10,0    | 0,04167    | 10,0      | -0,08333    | 5,0     | 11,0    | -0,15625    |
| Trend analysis      | 0,03089 | 0,000 | 1,00000 | 0,07143 | -0,08333    | -0,03013     | -0,028 | 0,41164 | 0,04167 | 0,04167    | -0,08333  | -0,08333    | 0,71123 | 0,06818 | -0,15625    |



Table 41. The Eastern Gotland Basin, Area 9. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 9 = BY10, BY15, BY20 |              |        |         |            |             |              |        |         |            |             |              |       |         |            |             |           |
|---------------------------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|-------|---------|------------|-------------|-----------|
| AREA 9                    | Spring       |        |         | Summer     |             |              | Autumn |         |            |             |              |       |         |            |             | no of obs |
| Secchi                    | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std | min     | max        | no of obs   |           |
| 1994                      | 14,3         | 3,1    | 11,0    | 17,0       | 3           | 5,5          | 0,7    | 5,0     | 6,5        | 5           | 8,0          | 1,7   | 7,0     | 10,0       | 3           | 3         |
| 1995                      | 9,1          | 1,5    | 7,0     | 10,5       | 4           | 5,2          | 0,4    | 5,0     | 6,0        | 6           | 6,0          | 0,0   | 6,0     | 6,0        | 3           | 3         |
| 1996                      | 10,5         | 1,3    | 9,0     | 12,0       | 4           | 6,6          | 0,8    | 5,0     | 7,0        | 7           | 6,5          | 0,9   | 6,0     | 7,5        | 3           | 3         |
| 1997                      | 10,5         | 1,7    | 9,0     | 13,0       | 4           | 6,7          | 2,1    | 4,5     | 11,0       | 8           | 8,4          | 1,9   | 5,5     | 10,0       | 6           | 6         |
| 1998                      | 11,0         | 0,0    | 11,0    | 11,0       | 3           | 6,1          | 1,3    | 4,5     | 8,0        | 5           | 6,0          | 1,0   | 5,0     | 7,0        | 3           | 3         |
| 1999                      | 8,9          | 2,8    | 6,0     | 13,5       | 9           | 5,7          | 0,8    | 5,0     | 7,0        | 10          | 7,5          | 0,0   | 7,5     | 7,5        | 1           | 1         |
| 2000                      | 10,8         | 2,9    | 8,0     | 14,0       | 5           | 6,1          | 1,3    | 5,0     | 8,0        | 4           | 9,3          | 2,5   | 7,5     | 11,0       | 2           | 2         |
| 2001                      | 10,5         | 2,7    | 8,0     | 15,5       | 6           | 6,7          | 0,8    | 5,5     | 8,0        | 10          | 7,0          | 0,0   | 7,0     | 7,0        | 1           | 1         |
| 2002                      | 9,2          | 1,6    | 8,0     | 12,0       | 5           | 5,7          | 1,2    | 4,0     | 7,0        | 9           | 7,5          | 0,7   | 7,0     | 8,0        | 2           | 2         |
| 2003                      | 9,7          | 2,1    | 8,0     | 12,0       | 3           | 6,2          | 1,3    | 5,0     | 8,0        | 5           | 6,7          | 1,2   | 6,0     | 8,0        | 3           | 3         |
| 2004                      | 8,3          | 0,4    | 8,0     | 8,5        | 2           | 5,5          | 0,5    | 5,0     | 6,0        | 6           | 7,0          | 2,0   | 6,0     | 10,0       | 4           | 4         |
| 2005                      | 7,1          | 1,0    | 6,0     | 8,5        | 4           | 5,9          | 1,7    | 3,0     | 7,0        | 7           | 6,4          | 1,1   | 5,0     | 8,0        | 9           | 9         |
| 2006                      | 11,7         | 3,8    | 9,0     | 16,0       | 3           | 7,2          | 0,8    | 6,0     | 8,0        | 6           | 7,6          | 1,5   | 6,0     | 9,0        | 5           | 5         |
| 2007                      | 13,0         | 9,9    | 6,0     | 20,0       | 2           | 5,3          | 0,5    | 5,0     | 6,0        | 7           | 7,0          | 0,7   | 6,0     | 8,0        | 5           | 5         |
| 2008                      | 7,3          | 1,7    | 5,0     | 9,0        | 4           | 4,8          | 1,2    | 4,0     | 7,0        | 8           | 7,5          | 0,9   | 6,5     | 8,0        | 3           | 3         |
| Extreme values:           | mean         |        | min     | max        |             | mean         |        | min     | max        |             | mean         |       | min     | max        |             |           |
|                           | 10,1         |        | 5,0     | 20,0       |             | 5,9          |        | 3,0     | 11,0       |             | 7,2          |       | 5,0     | 11,0       |             |           |
| Trend analysis            | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low |           |
|                           | -0.17639     | -0.100 | 0.12560 | 0.00000    | -0.23077    | -0.03725     | -0.004 | 0.70877 | 0.06250    | -0.10417    | -0.02453     | 0.000 | 0.83006 | 0.03846    | -0.03846    |           |

Table 42. The Northern Baltic Proper, Area 10. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 10 = BY29, BY31 |  |              |       |         |            |             |              |        |         |            |             |              |        |           |             |
|----------------------|--|--------------|-------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|--------|-----------|-------------|
| AREA 10              |  | Spring       |       | Summer  |            | Autumn      |              | 1 std  |         | min        |             | max          |        | no of obs |             |
| Secchi               |  | mean         | 1 std | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min       | max         |
| 1994                 |  | 7,2          | 1,6   | 4,8     | 9,5        | 8           | 6,4          | 1,1    | 4,8     | 8,0        | 9           | 7,6          | 1,0    | 6,5       | 9,0         |
| 1995                 |  | 8,1          | 2,4   | 4,6     | 12,0       | 9           | 5,3          | 1,0    | 3,9     | 7,0        | 9           | 8,1          | 2,3    | 6,0       | 12,0        |
| 1996                 |  | 7,5          | 1,7   | 5,0     | 10,2       | 13          | 6,4          | 1,0    | 4,8     | 7,8        | 10          | 7,7          | 2,1    | 6,0       | 12,0        |
| 1997                 |  | 7,8          | 2,2   | 6,0     | 13,0       | 9           | 6,0          | 1,4    | 3,8     | 8,0        | 9           | 7,3          | 0,8    | 6,0       | 8,0         |
| 1998                 |  | 7,0          | 1,1   | 5,0     | 8,5        | 10          | 6,2          | 0,9    | 5,0     | 7,5        | 13          | 7,0          | 1,1    | 5,5       | 8,0         |
| 1999                 |  | 7,5          | 1,2   | 6,0     | 9,3        | 10          | 6,1          | 1,0    | 5,0     | 7,5        | 11          | 8,3          | 1,9    | 6,5       | 12,0        |
| 2000                 |  | 10,0         | 3,1   | 7,0     | 15,0       | 11          | 5,9          | 1,2    | 4,5     | 8,5        | 11          | 6,3          | 1,3    | 5,0       | 8,0         |
| 2001                 |  | 7,3          | 1,1   | 5,5     | 9,0        | 11          | 6,3          | 1,3    | 4,8     | 9,4        | 10          | 6,6          | 0,5    | 6,0       | 7,0         |
| 2002                 |  | 7,8          | 2,4   | 5,2     | 12,0       | 10          | 6,2          | 1,1    | 4,9     | 8,8        | 11          | 7,2          | 0,5    | 6,5       | 7,5         |
| 2003                 |  | 8,3          | 2,4   | 6,4     | 14,0       | 9           | 6,2          | 1,1    | 5,0     | 8,3        | 9           | 6,8          | 1,6    | 5,0       | 8,3         |
| 2004                 |  | 8,4          | 1,1   | 7,0     | 10,3       | 7           | 6,1          | 0,8    | 5,3     | 7,3        | 8           | 6,7          | 0,5    | 6,1       | 7,0         |
| 2005                 |  | 7,5          | 1,9   | 5,2     | 10,1       | 8           | 5,7          | 1,7    | 4,3     | 9,3        | 9           | 9,2          | 1,4    | 8,3       | 10,8        |
| 2006                 |  | 8,4          | 3,0   | 5,4     | 14,0       | 10          | 6,7          | 0,8    | 5,0     | 7,5        | 8           | 7,3          | 0,4    | 7,0       | 7,7         |
| 2007                 |  | 7,9          | 1,5   | 6,2     | 9,7        | 7           | 5,1          | 0,5    | 4,6     | 6,1        | 7           | 6,5          | 0,6    | 6,0       | 7,3         |
| 2008                 |  | 6,8          | 0,9   | 5,5     | 7,5        | 5           | 4,8          | 0,6    | 4,0     | 5,5        | 9           | 5,8          | 1,2    | 4,3       | 7,0         |
| Extreme values:      |  | mean         | min   | max     | 90 conf up | 90 conf low | mean         | min    | max     | 90 conf up | 90 conf low | mean         | min    | max       | max         |
|                      |  | 7,8          | 4,6   | 15,0    | 0,06444    | -0,02500    | 6,0          | 3,8    | 9,4     | 0,02014    | -0,08667    | 7,2          | 4,3    | 12,0      |             |
| Trend analysis       |  | Linear trend | NL B  | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P      | 90 conf low |
|                      |  | 0.02547      | 0.017 | 0.53510 | 0.06444    | -0.02500    | -0.04217     | -0.032 | 0.40696 | 0.02014    | -0.08667    | -0.08648     | -0.018 | 0.56385   | -0.08939    |



Table 43. The Eastern coastal area, Area 11. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90 conf low values represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 11 = B1    |     |         |       |            |             |              |          |         |            |             |              |        |         |             |
|-----------------|-----|---------|-------|------------|-------------|--------------|----------|---------|------------|-------------|--------------|--------|---------|-------------|
| AREA 11         |     | Spring  |       |            |             | Summer       |          |         |            | Autumn      |              |        |         | no of obs   |
| Secchi          |     | 1 std   | min   | max        | no of obs   | mean         | 1 std    | min     | max        | no of obs   | mean         | 1 std  | min     | max         |
| 1994            | 6,8 | 1,7     | 4,2   | 8,9        | 9           | 6,7          | 1,4      | 5,1     | 9,2        | 7           | 8,2          | 1,6    | 6,0     | 9,8         |
| 1995            | 6,9 | 1,5     | 4,9   | 9,2        | 9           | 5,5          | 1,0      | 3,9     | 6,5        | 6           | 8,3          | 2,9    | 5,6     | 11,5        |
| 1996            | 8,6 | 2,7     | 4,7   | 11,6       | 8           | 7,0          | 1,0      | 5,5     | 8,8        | 7           | 7,2          | 1,9    | 4,5     | 9,5         |
| 1997            | 7,5 | 2,2     | 3,8   | 9,5        | 7           | 5,3          | 1,5      | 4,1     | 8,0        | 6           | 9,3          | 1,9    | 7,8     | 12,3        |
| 1998            | 8,3 | 1,4     | 5,2   | 10,0       | 9           | 6,1          | 1,1      | 5,0     | 7,6        | 7           | 7,2          | 1,7    | 4,6     | 8,5         |
| 1999            | 8,2 | 1,6     | 5,5   | 10,1       | 8           | 7,3          | 1,8      | 5,6     | 10,0       | 6           | 7,6          | 1,8    | 5,9     | 10,0        |
| 2000            | 7,5 | 1,2     | 6,0   | 9,3        | 8           | 5,1          | 0,9      | 4,0     | 6,4        | 7           | 6,0          | 1,3    | 4,6     | 7,8         |
| 2001            | 8,3 | 2,1     | 5,9   | 11,5       | 8           | 6,9          | 1,7      | 4,9     | 10,0       | 7           | 7,9          | 1,6    | 5,6     | 9,5         |
| 2002            | 7,4 | 1,4     | 4,6   | 8,9        | 7           | 5,4          | 0,7      | 4,3     | 6,5        | 7           | 8,0          | 2,0    | 5,3     | 10,0        |
| 2003            | 7,3 | 2,1     | 4,4   | 9,7        | 7           | 6,1          | 2,2      | 4,3     | 10,0       | 7           | 8,0          | 1,6    | 6,1     | 10,0        |
| 2004            | 8,5 | 1,6     | 6,6   | 11,1       | 8           | 5,5          | 1,5      | 2,8     | 7,9        | 7           | 7,2          | 1,0    | 5,7     | 8,3         |
| 2005            | 8,0 | 1,2     | 6,5   | 10,0       | 8           | 5,8          | 0,7      | 4,5     | 6,8        | 7           | 9,1          | 1,6    | 7,5     | 11,3        |
| 2006            | 8,0 | 2,6     | 4,9   | 13,4       | 8           | 7,1          | 1,6      | 5,5     | 9,7        | 6           | 9,1          | 1,0    | 8,0     | 10,5        |
| 2007            | 8,8 | 2,5     | 5,5   | 13,8       | 9           | 6,3          | 1,5      | 4,1     | 8,1        | 7           | 7,8          | 1,5    | 5,5     | 9,3         |
| 2008            | 6,4 | 1,4     | 4,3   | 8,0        | 8           | 5,4          | 1,1      | 4,0     | 6,5        | 7           | 5,5          | 2,0    | 3,2     | 7,0         |
| mean            |     |         | min   | max        |             | mean         |          | min     | max        |             | mean         |        | min     | max         |
| 7,8             |     |         | 3,8   | 13,8       |             | 6,1          |          | 2,8     | 10,0       |             | 7,8          |        | 3,2     | 12,3        |
| Extreme values: |     |         |       | 90 conf up | 90 conf low | Linear trend | NL B     | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up  |
| Trend analysis  |     | 0.02862 | 0.044 | 0.31731    | 0.12500     | -0.03667     | -0.02934 | 0.86363 | 0.05000    | -0.07500    | -0.04075     | -0.030 | 0.54692 | 0.07500     |
|                 |     |         |       |            |             |              |          |         |            |             |              |        |         | 90 conf low |
|                 |     |         |       |            |             |              |          |         |            |             |              |        |         | -0.15417    |

Table 44. The Åland Sea, Area 12. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 12 = F64   |        |              |      |         |            |             |              |      |         |            |             |              |        |         |            |             |              |      |         |            |             |
|-----------------|--------|--------------|------|---------|------------|-------------|--------------|------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|------|---------|------------|-------------|
| AREA 12         | Spring |              |      |         |            |             | Summer       |      |         |            |             |              | Autumn |         |            |             |              |      |         |            |             |
| Secchi          | mean   | 1 std        | min  | max     | no of obs  | mean        | 1 std        | min  | max     | no of obs  | mean        | 1 std        | min    | max     | no of obs  | mean        | 1 std        | min  | max     | no of obs  |             |
| 1994            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 1995            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 1996            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 1997            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 1998            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 1999            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2000            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2001            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2002            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2003            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2004            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | 6,0          | 0,0    | 6,0     | 6,0        | 0           | 0,0          | 6,0  | 6,0     | 1          |             |
| 2005            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2006            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2007            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | ND           | ND     | ND      | 0          | ND          | ND           | ND   | ND      | 0          |             |
| 2008            | ND     | ND           | ND   | ND      | 0          | ND          | ND           | ND   | ND      | 0          | ND          | 7,0          | 0,0    | 7,0     | 7,0        | 0           | 0,0          | 7,0  | 7,0     | 1          |             |
| Extreme values: |        | mean mean    |      | min min | max max    |             | mean mean    |      | min min | max max    |             | mean mean    |        | min min | max max    |             | mean mean    |      | min min | max max    |             |
|                 |        | ND           |      | ND      | ND         |             | ND           |      | ND      | ND         |             | ND           |        | ND      | ND         |             | 6,5          |      | 6,0     | 7,0        |             |
| Trend analysis  |        | Linear trend | NL B | NL P    | 90 conf up | 90 conf low | Linear trend | NL B | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B | NL P    | 90 conf up | 90 conf low |
|                 |        | ND           | ND   | ND      | ND         | ND          | ND           | ND   | ND      | ND         | ND          | 0.26071      | ND     | ND      | ND         | ND          | 0.26071      | ND   | ND      | ND         | ND          |



| Area 13 = US5B, SR5_C4, US3_C6, C3 |              |        |         |            |             |              |        |         |            |             |              |        |         |            |             |  |
|------------------------------------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--|
| AREA 13                            |              | Spring |         |            |             |              |        | Summer  |            |             |              |        |         | Autumn     |             |  |
| Secchi                             | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   |  |
| 1994                               | 6.3          | 1.6    | 4.5     | 8.1        | 6           | 6.5          | 1.7    | 4.5     | 9.0        | 9           | 7.3          | 1.0    | 6.3     | 8.4        | 4           |  |
| 1995                               | 5.4          | 1.0    | 4.0     | 6.9        | 7           | 5.6          | 0.6    | 4.6     | 6.3        | 7           | 6.1          | 0.8    | 4.7     | 6.8        | 5           |  |
| 1996                               | 7.9          | 2.3    | 5.8     | 11.5       | 5           | 6.0          | 0.5    | 5.2     | 6.8        | 9           | 7.3          | 1.3    | 5.8     | 9.0        | 5           |  |
| 1997                               | 6.1          | 1.4    | 4.3     | 8.0        | 8           | 7.1          | 1.2    | 5.7     | 9.4        | 8           | 6.0          | 0.4    | 5.3     | 6.3        | 5           |  |
| 1998                               | 6.0          | 0.7    | 5.5     | 7.0        | 4           | 6.1          | 0.1    | 6.0     | 6.2        | 2           | 5.5          | 0.7    | 5.0     | 6.0        | 2           |  |
| 1999                               | 6.4          | 0.9    | 5.5     | 7.3        | 4           | 5.9          | 1.6    | 3.4     | 7.3        | 5           | 5.1          | 0.8    | 4.0     | 5.8        | 4           |  |
| 2000                               | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           |  |
| 2001                               | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           |  |
| 2002                               | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           |  |
| 2003                               | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           |  |
| 2004                               | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           |  |
| 2005                               | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           |  |
| 2006                               | 5.0          | 0.0    | 5.0     | 5.0        | 1           | 5.8          | 0.3    | 5.5     | 6.0        | 3           | ND           | ND     | ND      | ND         | 0           |  |
| 2007                               |              |        |         |            |             |              |        |         |            |             |              |        |         |            |             |  |
| 2008                               |              |        |         |            |             |              |        |         |            |             |              |        |         |            |             |  |
| Extreme values:                    | mean mean    |        | min min | max max    |             | mean mean    |        | min min | max max    |             | mean mean    |        | min min | max max    |             |  |
|                                    | 6.1          |        | 4.0     | 11.5       |             | 6.2          |        | 3.4     | 9.4        |             | 6.2          |        | 4.0     | 9.0        |             |  |
| Trend analysis                     | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low |  |
|                                    | -0.05145     | -0.080 | 0.57694 | 0.07500    | -0.21000    | -0.03143     | -0.045 | 0.28996 | 0.02727    | -0.14583    | -0.39142     | -0.250 | 0.02031 | -0.08333   | -0.37500    |  |



Table 46. The Bothnian Bay, Area 14. Secchi depth at the surface and at the bottom during spring, summer and winter. Yearly seasonal mean, standard deviation, minimum value, maximum value and number of observations are presented. Below the value of 2008, a mean, a maximum and a minimum value for the entire 15 year period is presented. Results from the trend analysis are presented at the bottom of the table. Linear trend gives the slope of a linear regression of the first order. The remaining four values come from the non-parametric seasonal Mann-Kendall analysis. The slope of a possible trend is the NL B value. The NL P value is the significance of the trend. The 90% confidence interval represent the upper and lower 90% confidence interval for the B (Mann-Kendall slope) value. If the sign of the upper and lower confidence interval differ, there is no trend. If  $P > 0.05$ , there is no significant trend. If the sign of the linear trend and NL B differ, there is no certain trend. If otherwise, there is a significant trend.

| Area 14 = F9, F3, A5 |    |              |        |         |            |             |              |        |         |            |             |              |        |           |            |             |
|----------------------|----|--------------|--------|---------|------------|-------------|--------------|--------|---------|------------|-------------|--------------|--------|-----------|------------|-------------|
| AREA 14              |    | Spring       |        | Summer  |            | Autumn      |              | 1 std  |         | min        |             | max          |        | no of obs |            | no of obs   |
| Secchi               |    | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min     | max        | no of obs   | mean         | 1 std  | min       | max        |             |
| 1994                 |    | 8,0          | 2,8    | 4,2     | 10,4       | 6           | 5,7          | 1,4    | 4,0     | 8,2        | 8           | 6,9          | 0,9    | 6,2       | 7,5        | 2           |
| 1995                 |    | 6,1          | 0,9    | 4,8     | 6,8        | 4           | 5,7          | 1,0    | 4,5     | 7,0        | 7           | 5,9          | 0,7    | 5,0       | 7,0        | 6           |
| 1996                 |    | 9,2          | 1,4    | 7,5     | 10,0       | 3           | 5,8          | 2,2    | 3,0     | 10,5       | 8           | 6,6          | 0,8    | 5,0       | 7,6        | 9           |
| 1997                 |    | 8,8          | 1,8    | 7,0     | 11,3       | 4           | 6,6          | 0,8    | 5,8     | 8,2        | 7           | 5,6          | 1,0    | 4,5       | 7,0        | 5           |
| 1998                 |    | 8,5          | 0,9    | 7,1     | 9,0        | 4           | 6,2          | 1,0    | 5,0     | 7,5        | 6           | 5,4          | 0,3    | 5,0       | 5,8        | 5           |
| 1999                 |    | 6,2          | 1,8    | 3,5     | 7,5        | 4           | 5,5          | 1,6    | 4,0     | 7,3        | 5           | 5,3          | 0,5    | 4,5       | 5,7        | 5           |
| 2000                 | ND |              | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND        | ND         | 0           |
| 2001                 | ND |              | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND        | ND         | 0           |
| 2002                 | ND |              | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND        | ND         | 0           |
| 2003                 | ND |              | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND        | ND         | 0           |
| 2004                 | ND |              | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND        | ND         | 0           |
| 2005                 | ND |              | ND     | ND      | ND         | 0           | ND           | ND     | ND      | ND         | 0           | ND           | ND     | ND        | ND         | 0           |
| 2006                 |    | 7,0          | 0,7    | 6,5     | 7,5        | 2           | 5,0          | 0,7    | 4,5     | 5,5        | 2           | ND           | ND     | ND        | ND         | 0           |
| 2007                 |    |              |        |         |            |             |              |        |         |            |             |              |        |           |            |             |
| 2008                 |    |              |        |         |            |             |              |        |         |            |             |              |        |           |            |             |
| Extreme values:      |    | mean mean    |        | min min | max max    |             | mean mean    |        | min min | max max    |             | mean mean    |        | min min   | max max    |             |
|                      |    | 7,7          |        | 3,5     | 11,3       |             | 5,8          |        | 3,0     | 10,5       |             | 5,9          |        | 4,5       | 7,6        |             |
| Trend analysis       |    | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P    | 90 conf up | 90 conf low | Linear trend | NL B   | NL P      | 90 conf up | 90 conf low |
|                      |    | -0.06753     | -0.143 | 0.28790 | 0.35000    | -0.63333    | -0.04018     | -0.110 | 0.82450 | 0.26000    | -0.22250    | -0.28999     | -0.250 | 0.01313   | -0.23333   | -0.33750    |

## APPENDIX J

### SMHI publications

#### Earlier issues published in RO

1 Lars Gidhagen, Lennart Funkquist and Ray Murthy (1986)  
Calculations of horizontal exchange coefficients using Eulerian time series current meter data from the Baltic Sea.

2 Thomas Thompson (1986)  
Ymer-80, satellites, arctic sea ice and weather.

3 Stig Carlberg et al (1986)  
Program för miljö kvalitetsövervakning - PMK.

4 Jan-Erik Lundqvist och Anders Omstedt (1987)  
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5 Stig Carlberg, Sven Engström, Stig Fonselius, Håkan Palmén, Eva-Gun Thelén, Lotta Fyrberg och Bengt Yhlen (1987)  
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6 Jorge C. Valderama (1987)  
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7 Stig Carlberg, Sven Engström, Stig Fonselius, Håkan Palmén, Eva-Gun Thelén, Lotta Fyrberg, Bengt Yhlen och Danuta Zagradkin (1988).  
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8 Bertil Håkansson (1988)  
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9 Stig Carlberg, Sven Engström, Stig Fonselius, Håkan Palmén, Eva-Gun Thelén, Lotta Fyrberg,

Bengt Yhlen, Danuta Zagradkin, Bo Juhlin och Jan Szaron (1989)

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10 L. Fransson, B. Håkansson, A. Omstedt och L. Stehn (1989)  
Sea ice properties studied from the ice-breaker Tor during BEPERS-88.

11 Stig Carlberg, Sven Engström, Stig Fonselius, Håkan Palmén, Lotta Fyrberg, Bengt Yhlen, Bo Juhlin och Jan Szaron (1990)  
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Program för miljö kvalitetsövervakning - PMK. Utsjöprogram under 1989.

14 Lars Andersson, Stig Carlberg, Lars Edler, Elisabet Fogelqvist, Stig Fonselius, Lotta Fyrberg, Marie Larsson, Håkan Palmén, Björn Sjöberg, Danuta Zagradkin, och Bengt Yhlen (1992)  
Haven runt Sverige 1991. Rapport från SMHI, Oceanografiska Laboratoriet, inklusive PMK - utsjöprogrammet. (The conditions of the seas around Sweden. Report from the activities in 1991, including PMK - The National Swedish Programme for Monitoring of Environmental Quality Open Sea Programme.)

15 Ray Murthy, Bertil Håkansson and Pekka Alenius (ed.) (1993)  
The Gulf of Bothnia Year-1991 - Physical transport experiments.

- 16 Lars Andersson, Lars Edler and Björn Sjöberg (1993)  
The conditions of the seas around Sweden.  
Report from activities in 1992.
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A coupled ice-ocean model supporting winter navigation in the Baltic Sea.  
Part 1. Ice dynamics and water levels.
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RCO – Rossby Centre regional Ocean climate model: model description (version 1.0) and first results from the hindcast period 1992/93.  
<sup>1</sup> Rossby Centre, SMHI <sup>2</sup> James Rennell Division, Southampton Oceanography Centre, <sup>3</sup> Department of Meteorology, Stockholm University
- 27 H. E. Markus Meier (1999)  
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36 Bertil Håkansson

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Philip Axe, Kari Eilola, Bengt Karlson (2007)  
Swedish National Report on Eutrophication  
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37 Lennart Funkquist and Eckhard Kleine  
(2007) An introduction to HIROMB, an  
operational baroclinic model for the Baltic Sea

38 Philip Axe (2008)

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