

SMHI

SUMMARY ANNUAL REPORT 2015

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DIRECTOR GENERAL'S OUTLOOK

» 2015 has been referred to as the super environment year. During the year decisions were made on, among other things, the UN's sustainable development goals (SDGs), where climate action is an area which has been identified. Towards the end of the year countries across the globe also agreed on a climate agreement. Both these decisions have a large impact on how SMHI will operate over the coming years. This also illustrates how dependent our operations are on global developments.«

Over the past year SMHI participated in the preparations for a new cycle in the UN's climate panel IPCC, in GEO's and WMO's congresses and in the annual meetings which we have within the European collaborations in which Sweden participates.

The European meteorological institutes have together started a more strategic discussion on how the European cooperation should be structured in the long run. Meteorology is a crystal clear example of a science which is unhindered by borders between countries. Despite this, a large part of meteorological work in Europe is organisationally characterised by national borders, even though naturally there are several examples of functioning collaborations. The discussions of 2015 have showed that there is a need of more collaboration by combining our resources.

For a few years Nordic countries have prepared more advanced cooperation on meteorological forecasts and shared computer capacity. In 2015 the work has intensified and several legal and financial investigations have been conducted. In December my Nordic colleagues and I signed a declaration of intent on proceeding with plans to combine our resources so that by 2022 we have developed operations with a joint forecasting model and super computer. The work should be seen against the backdrop of ongoing discussions throughout Europe on using our joint resources in a better manner.

During the year SMHI also started an aid project in the form of courses on climate change and climate adaptation for participants from eastern and western Africa. This is the first step of a strategic investment in climate adaptation within the aid area.

It is easy to get caught up in the major future characteristics, but at the same time we should not forget that we are already now providing data to different players in society for decisions on major and minor issues. During the year we have reported over 2,000 forecasts in Swedish Radio's P1 and participated in approximately 17,000 radio broadcasts in P4. Our warning operations have sent a total of 2,700 warnings.

Data collection and forecasts within meteorology, hydrology and oceanography require major resources and investments in infrastructure. During 2015 we continued to invest in our radar facilities and other observation systems, while EUMETSAT at European level is now entering an intense investment period for new satellites.

The focus on climate and climate adaptation has become even more clear over the past year. SMHI has helped to increase knowledge of the climate adaptation area by means of government assignments and collaboration with other agencies. During the autumn we presented analyses by county with downscaled climate scenarios, which were developed in consultation with, among others, the county administrative boards. The reports attracted significant media attention and they will



become an important tool. Other government assignments addressed torrential rain in Sweden as well as extreme sea levels. SMHI also had a special assignment on knowledge dissemination ahead of the climate negotiations in Paris. During the year a decision was made on the Swedish National Knowledge Centre for Climate Change Adaptation being made permanent at SMHI.

During the year government employers have developed a strategy with the vision “Employers for the future – the Government’s expertise develops society.” SMHI is and will remain an important cog of the State’s work in Sweden. We have a long-standing tradition as an agency and in many cases have been a driving force for developing new work methods. During 2015 we started a

pilot project on the digital workplace which again illustrates that we are at the forefront of developing our line of business. During the year we also started strategic work on the agency’s position in 2025.

SMHI reports strong results for the past year. The financial results of the operations have had an upswing over recent years, which is very positive. SMHI’s research department is successful at conducting research which is important for society which is financed both nationally and by international financiers.

Copernicus is a European project which involves together collecting, sharing and using environmental data in Europe. SMHI has been highly successful in the application phase and has been identified as a supplier in a number of areas.

Rolf Brennerfelt
Director General

SOCIETY AND SAFETY

The Core Services Department is responsible for the meteorological, hydrological and oceanographic infrastructure in Sweden. The operations cover everything from measuring and collecting data to calculating, storing and processing the information. Data then becomes statistics and information, which forms the bases for socially important analyses, for example, in order to achieve national environmental objectives. Delivering data on which to base decisions is key. Forecasting and warning operations have a direct impact on the vulnerability of society. The work on climate adaptation is important, both for the current and future society and has been assigned greater importance over recent years. The work includes compiling and conveying information and knowledge. Collaboration with other agencies and institutes is very important, both nationally and internationally. Since 2013 SMHI has been identified as a national supplier of aviation weather services and the work is progressing towards more collaboration, primarily within northern Europe. The department also handles SMHI's representation within international organisations, for example, the European weather centre ECMWF and the European satellite collaboration EUMETSAT, as well as SMHI's referral management. Many other agencies seek SMHI's expertise. Through their various assignments, SMHI develops and delivers a broad spectrum of products and services. Assignments may range from providing data and analyses, to developing customised systems, and operating and managing them around the clock, all year round.

WEATHER SERVICES FROM HIGH RESOLUTION MODEL

During 2015 the long-standing collaboration with the Norwegian Meteorological Institute has had an impact on several weather services. SMHI and the Norwegian Meteorological Institute utilise a new joint high resolution meteorological model and shared computer resources for forecast production. Now several of SMHI's existing weather services are based on data and forecasts from the high resolution model, which provides more details and captures the local weather during, for example, torrential rain and strong winds. The services have also been adapted to function well for mobile online readers as well. Cooperation with the Norwegian institute has been successful and work is ongoing to extend the cooperation to all Nordic countries.

NORDIC COOPERATION WITHIN AVIATION WEATHER

Since 2013 SMHI has cooperated with the Danish Meteorological Institute (DMI) for the aviation weather service. Their production is coordinated and the institutes serve as backup for each other. The cooperation has been successful and is now being extended to include more Nordic and Baltic countries. The aviation weather services in Sweden, Norway, Denmark, Finland, Iceland, Estonia and Latvia work under the name the Northern Europe Aviation Met Consortium (NAMCon) in order to together, cost-efficiently and with continued high quality, deliver the aviation weather products which are required in accordance with national and international provisions.

The conditions for aviation weather services in Europe will change over the coming years. The requirements for coordination are increasing and the trend is moving from product-focused deliveries towards more data-centred deliveries. In a future European airspace everyone should be able to access the same weather data, in the right format, from the same source. At the same time strict requirements are imposed on higher cost-efficiency. The cooperation within NAMCon should ensure that participating countries can deliver in the best manner in the future as well.

SMHI and the Finnish Meteorological Institute (FMI) have previously produced two similar aviation weather maps but by means of the cooperation during 2015 it was agreed to produce one map and thereby streamline the work with retained quality. Within NAMCon work has also taken place on verification of airport forecasts, the development of a joint online portal for aviation weather and joint interpretation of international regulations. During 2016 the work will continue on coordination of warnings for air traffic as well as review of the distribution of forecast production between countries.

COLLABORATION WITH THE FINNISH METEOROLOGICAL INSTITUTE ON ICE

During 2015 work continued on developing a joint production system for the ice service together with the Finnish Meteorological Institute (FMI). SMHI operated the system already in the 2014/2015 season. The system has now been improved further and for the upcoming season of 2015/2016 the Finnish colleagues will also operate the system. The next step of the cooperation is to review the opportunities for joint daily production from the season 2017/2018, with the aim of running the operational service more efficiently and creating space for new development.

COLLECTIVE VIEW OF CLIMATE CHANGES AND CLIMATE ADAPTATION

2015 was an important year for the climate as the international climate negotiations COP21 were held in Paris. During the year SMHI has actively worked to disseminate information on climate changes with a focus

on the target groups decision-makers, officials and the interested public. The combination of SMHI's knowledge dissemination of the climate scenarios from Rosby Centre, the work as the national contact point within IPCC as well as the work within the Swedish National Knowledge Centre for Climate Change Adaptation has been a success factor for providing an overall view of climate change and climate adaptation.

The work is also important for attaining the national environmental objective "Reduced climate impact."

SUPPORTS THE GOVERNMENT IN THE UN'S CLIMATE NEGOTIATIONS

During the year SMHI has supported the Government with expert knowledge within science-related issues in connection with the UN's climate negotiations. It covers collaboration in a European expert group which supports the EU's actions in negotiations and participation in the Swedish delegation during climate negotiation meetings. Among other things, SMHI has contributed with scientific climate expertise to the discussion on global warming of max two degrees and with results from research and systematic climate monitoring for the negotiations. The year was characterised by continued talks on a new global climate agreement. The new agreement was renegotiated at the climate meeting COP21, which was held in Paris in December.

IPCC, A NATIONAL ASSIGNMENT

SMHI is a national contact point for the UN's climate panel IPCC. During the year work has focused on further communication of the results from IPCC's reports, among other things, by lectures and translation of the reports. SMHI has also participated in the work group the Future of IPCC and in two decision-making meetings, regarding the structure of work as well as election of chairperson and bureau ahead of the upcoming evaluation cycle. The bureau is staffed by people from all corners of the globe and the election was preceded by a number of meetings with representatives from the member states which submitted candidates for the post of chairperson.

Sweden has also contributed to IPCC's work through participation of Swedish experts at a number of IPCC's expert meetings/workshops, and through contributions to IPCC's Trust Fund and programmes for information dissemination.

MORE DATA AND TOOLS WITHIN THE MARINE ENVIRONMENT

Sweden faces several challenges for attaining the national environmental objectives related to water, "Flourishing lakes and streams," "Zero eutrophication," "A balanced marine environment" as well as "Flourishing coastal areas and archipelagos." This applies to both eutrophication, water quality and water resources. SMHI should contribute to fulfilment of the objectives and ensure that

the work goes hand in hand with needs within international directives. In the endeavour towards sustainable utilisation, SMHI is an important supplier of data, tools and expertise, both for national and international recipients. All data is freely available online and is also appreciated by an interested public.

During 2015 both the access to data and tools have improved. The portal Vattenwebb, which collects the services with the aim of supporting work within the Water Framework Directive, has been redesigned and has been adapted to mobile online readers. There is also a new map of Sweden in the Vattenwebb portal, with an overview of the current hydrological situation with daily updates. Within the marine environment SMHI is continuing the work on national environmental monitoring, both sampling, analysis and data hosting. SMHI primarily supports the Swedish Agency for Marine and Water Management, for the work on fulfilling the Marine Strategy Framework Directive. The assignments cover, for example, evaluation of the coastal and marine environment, as well as development and evaluation of methods and indicators.

SUPERVISION AND ANALYSES WITHIN AIR QUALITY

The national environmental objective "Clean air" entails that the air should be so clean that human health as well as animals, plants and cultural values are not injured or damaged. This is not currently the case in many places in Sweden. The air may be polluted and result in health problems and shorter life expectancy of human beings. SMHI has the knowledge to develop and use models to produce decision-making data and increase understanding of processes in the atmosphere which affect the air quality. SMHI's model system can be used for estimates of the air quality on all geographic scales and for most types of sources. It enables estimates within a broad spectrum of issues such as the effect of motor traffic on air concentration on a busy street, spill-over estimates of suspected or potential radioactive emissions as well as estimates of human exposure from air emissions of shipping. SMHI also assists agencies, county administrative boards, municipalities and trade and industry with storage and visualisation opportunities of data, emission stock-taking and consulting within model usage and interpretation of model results.

RESEARCH AND DEVELOPMENT

SMHI conducts applied and problem-oriented research and development to accomplish its assignment and support the needs of society. Through research, SMHI can provide better data on which to base decisions, apply research results from international collaborations, and develop competence to handle the major issues of the future, especially the social challenges related to climate and environmental matters. SMHI's research mainly focuses on development and application of estimation models, and development of analyses and products based on remote sensing from satellites and radars, and from different types of local data.

A large part of SMHI's research is funded via national research programmes and through the EU's Framework Programme for Research and Innovation, Horizon 2020. Research and model development largely take place in international consortiums where SMHI has a strong position, for example, as chairperson in the consortium for the climate model EC-Earth and as project manager for important areas within the development of the weather forecast model HARMONIE. One strength of SMHI's research is our combined competence in meteorology, hydrology, oceanography and climate issues. Many of the important issues are not isolated to one area, but concern several areas. Climate change is one such area.

SMHI's research and development require vast computer resources in the form of powerful super computers. SMHI uses both Swedish and international super computers for many of the estimates which are required within the research. SMHI's research makes large amounts of data available, for example, from climate modelling through the data node within the Earth System Grid Federation, ESGF, and through download services for hydrological data. This is highly beneficial for society within and outside Sweden, as data becomes available for further research, for studies of climate effects and climate adaptation, and also in regions with limited resources and opportunities to produce own estimates.

SEVERAL NEW VERSIONS OF ESTIMATION MODELS WITHIN METEOROLOGY

Development of the estimation model HARMONIE takes place in a European consortium where SMHI is one of the participants. There are two versions of the model, one for operational weather forecast production and one for high resolution regional climate modelling.

Remote sensing measurements from radars and satellites contribute with important information about the weather. During 2015 researchers have worked on using a further satellite-based instrument, IASI, which provides high resolution information on temperature and

humidity. As one of the first countries in Europe, observations from weather radars and land-based GPS stations are now also used in the operational model. All these new observation types have the opportunity to provide a better description of humidity in the model. An improved description of humidity is essential for rain forecasts.

SURFEX is the surface model of HARMONIE. It has been developed in close collaboration between SMHI and Météo-France and version 8 was released during the year. It contains new processes linked to vegetation and snow. It provides improvements in simulations of the energy exchange between the atmosphere and surface, and more realistic melting of snow and consequently drainage to streams.

In order to make probability forecasts, researchers at SMHI are developing an ensemble prediction system, EPS, where several different forecasts describe several possible weather trends. The ensemble prediction system HarmonEPS has been created from the base model HARMONIE.

HOST FOR PROJECT OFFICE WITHIN THE WORLD CLIMATE RESEARCH PROGRAMME

SMHI is one of the initiators of the CORDEX cooperation which is a global initiative which develops knowledge on regional downscaling of global climate scenarios. Under the authority of the World Climate Research Programme (WCRP), since 2015 SMHI has been a host for an international project office for regional climate modelling within CORDEX. The office supports the development of climate models and estimates of the future climate and also promotes the collaboration between different regions and countries. There is specific focus on supporting developing countries to expand their knowledge.

During the initial operating years of the office, several activities of a coordinating and supportive nature have been conducted in South America, the Caribbean, Africa and Asia. Knowledge expansion efforts have been made for different technologies and tools to analyse climate scenarios and how climate information can be communicated to different senders.

SEVERAL REGIONAL CLIMATE SIMULATIONS

The number of regional climate model simulations conducted at SMHI is continuing to increase. SMHI has now performed over 140 high resolution regional simulations across large parts of the globe, based on several different global climate models and several different scenarios, within the framework of the CORDEX cooperation for regional climate simulations. This material is unique.

The regional climate simulations form the basis of SMHI's map service for climate scenarios. The map service enables both decision-makers and the public to research the climate change.

HYDROLOGICAL MODELLING FOR LARGE PARTS OF THE WORLD

HYPEWEB provides users with modelled water-related information like drainage, flow and soil moisture for large parts of the world. The hydrological information is openly accessible through an online interface. During the year SMHI has supplemented the website with information from new model areas and from new model versions. For the recently added model areas, the Arctic, La Plata, the Niger River and India, data is available for the long-term mean values, historical time scale and future climate effects, as well as a model evaluation.

The use of HYPEWEB is increasing since the information started to be made openly available. During the year approximately 2,000 users visited the website, which can be accessed on hypeweb.smhi.se, in total roughly 4,600 times.

FUTURE CLIMATE IN THE BALTIC SEA REGION

The Baltic Sea Region will become significantly warmer in the future. Researchers from SMHI have contributed with capital to the book BACCII, Second Assessment of Climate Change for the Baltic Sea Basin. It is a summary of the climate of the Baltic Sea Region, with descriptions of how the climate in the area has changed since the large

glaciation disappeared approximately 12,000 years ago, up until now. Researchers present how the climate will change until the year 2100, based on the expected global climate change and model estimates of the Baltic Sea Region. BACCII can be used as knowledge and decision-making data in environment and climate-related contexts.

AIR QUALITY IN THE ARCTIC

Restrictions on emissions of the climate pollutants soot and methane could slow down climate change in the Arctic. The results could appear faster than what restrictions on carbon dioxide emissions could attain. It will also have major side effects in the form of improved air quality. Researchers have come to this conclusion in the first major mapping of the impact on the Arctic climate based on regional emissions of climate pollutants. Pollutants included in the study were soot, sulphur dioxide, nitrogen dioxide, volatile organic compounds, organic carbon and tropospheric ozone.

The study shows that the major contributors to climate change in the Arctic are emissions from Asian countries, due to the high quantities of emissions. However, measured per amount of pollution released, the climate in the Arctic is most sensitive to emissions within the area around the Arctic.

PROFESSIONAL SERVICES

SMHI Professional services offer the market a wide range of industry-specific and customer-integrated services, both for trade and industry and society. The services are based on experiences and expert knowledge within all of SMHI's expertise areas and cooperation with external partners. The customer benefit is higher safety, sustainability and safer decisions, both in Sweden and internationally.

During the year the operations have been developed and customised within several areas. Another step has been taken in order to match the internal organisation with the external market in an even better manner. The objective is to increase the capacity which creates even more benefit in the customers' operations. Several market areas have shown a very good increase in receipts and improvements in the result and some continue to be restructured. An initiative to establish SMHI more strongly in the international aid work has also been initiated.

THE AIR QUALITY SYSTEM AIRVIRO CONTINUES TO DEVELOP

The online air quality management system Airviro has attained a new, more modern interface and is now even more easy to work with owing to a clearer work flow. The new version Airviro 4.0 is already used by several customers. Airviro has a modular structure and modern databases which make the system useful within several areas. For example, now both hydrological and oceanographic data is collected and now the Airviro interface is being developed to the new hydrological model HYPE for the Estonian Environmental Research Centre (EERC). The centre now uses Airviro for the national Estonian air quality work and soon there will also be the opportunity of collection and analysis for water. The new module in Airviro is expected to be completed at the start of 2016.

Another Airviro module is being developed in cooperation with Singapore's meteorological institute. The module handles real-time supervision of observation

data and visualisation of fields. The module interpolates between measurement data from the stations and develops a field with values over an entire geographical area.

The work with Airviro has also facilitated the development of the air quality management tool SIMAIR 2, which is based on Airviro. SIMAIR is used by many Swedish municipalities for estimating air quality data which is compared with limit values for air quality and then reported to the Swedish Environmental Protection Agency.

Airviro is being developed in cooperation with the partner Apertum IT AB.

EXPANDED OFFER WITHIN ANALYSIS AND MOVING IMAGES

The expansion of consulting operations for consumer-focused companies is continuing. It is based on analysis of the weather's impact on sales and by forecasting and understanding the weather's impact, conditions are created for, for example, optimising the flow of goods, stock levels, order processes and campaigns.

Moving graphics and images are an appreciated element for consumers. Concepts for presentation of weather in moving format have been developed in order to meet new needs and habits. Where now we cannot only offer our customers moving films with or without speech, but the meteorologist also personally presents the weather in front of the camera. This paves the way for new business opportunities digitally and towards small TV channels.

STRENGTHENED ACCIDENT PREPAREDNESS IN KUWAIT

The Kuwait National Guard visited Stockholm and Norrköping in connection with SMHI's course on preparedness systems for nuclear accidents. The visit was highly appreciated. Seatrack Gulf has also been further developed for the same customer, a tool for tracking oil emissions in the sea. The tool has a new model, which provides a more precise description of flow conditions, and is translated to Arabic.

A GLOBAL LEADER WITHIN WEATHER SERVICES FOR MERCHANT SHIPPING

SMHI belongs to one of the five leading players in the global market for weather-related services within merchant shipping. Owing to important sales partners out in the world, the establishment has developed positively in two important markets, China and Denmark. The development of services also focuses on the continuation of global merchant shipping. This continues to exhibit an increasing demand for systems which document the vessel's performance in terms of speed, fuel and a range of other data which is reported manually or automatically. The trend is that to a higher degree this is now also governed by regulations for documentation of

the individual vessel's energy consumption and emissions. Even the need of systems which optimise the course and speed and utilise the wind, waves and flows in the best manner is increasing.

There is also a global situation in which expertise within navigation, weather and shipping on board the vessel and within the organisation on land is generally worse now than ten years ago. Consequently there is also a need of well-functioning and integrated decision-making systems.

WIND POWER PRODUCTION REDUCTION DUE TO ICE

One problem that can occur in windmills in cold climates is that ice formation on the rotors can cause a reduction in power production. SMHI has participated in several research projects which have focused on the possibility of forecasting the production reduction due to ice. Based on results of the projects, together with customers SMHI Professional Services has created a commercial product aimed at forecasting the reduction in production. The product was launched for evaluation by the first customer during the winter of 2014/2015. The outcome of the evaluation showed that the product adds value to decisions related to wind power. The forecasts were provided to the market during the winter season of 2015/2016.

COURSES WITHIN CLIMATE IN BOTSWANA

SMHI has been involved in cooperation with the Department of Meteorological Services in Botswana since 2007. Together with the institute, knowledge and technology for, among other things, observations, climate information and weather forecasts have been developed, based on the needs of users within different social sectors.

During the year SMHI has conducted courses on climate change and how adaptation to new conditions should take place.

By means of exchange with a parallel project being managed together with Botswana's Department of Water Affairs and the Stockholm International Water Institute (SIWI), forecasts and warnings for the water sector have also been improved by better utilisation of meteorological information.

STUDIES OF WATER BALANCE IN ARAB COUNTRIES

Heating of the Earth has a large impact on both rain and evaporation, and thereby on flow in floods and formation of groundwater. This was the starting point of SMHI's work on valuation of the access to water, in a region which covers the League of Arab States, from Mauritania in the west to Oman in the east. In this part of the world, fresh water is already a scarce resource. The work started in 2011 under the authority of the UN body ESCWA, with support from Sida. During 2015 SMHI's collaboration ended through participation in the project's final conference in Beirut, Lebanon. SMHI has worked with

climate models and simulations with hydrological models in order to study the water balance. Valuable results in the form of so-called 'climate indicators' have been developed and have provided supporting material to collaboration partners for advanced studies. An example of such an indicator is the change in the number of days in a consecutive period without rain, change in frequency of extreme squalls and in the number of nights when the temperature does not fall below 20 degrees.

An important reason for the project has been that the League of Arab States wants to be able to provide a collective contribution to the work within the UN's climate panel and have the opportunity to act based on a joint stance in international climate negotiations, for example, COP21 in Paris. The project is referred to as the Regional Initiative for the Assessment of the Impact of Climate Change on Water Resources and Socioeconomic Vulnerability in the Arab Region (RICCAR).

FOCUS COPERNICUS

Greater information on the environment is decisive for sustainable development. It provides an understanding of how the Earth and its climate is changing, the role which human activities play in these changes and how they will impact the everyday life of human beings. In order to take the correct measures it is necessary that decision-makers, companies, and citizens are provided with reliable and up-to-date information on the environmental condition of the Earth. This information is provided by Copernicus, a European system for monitoring the Earth, previously known as GMES (Global Monitoring for Environment and Security).

Copernicus consists of a complex set of systems which collect data from multiple sources: earth observation satellites and in situ sensors such as ground stations, airborne and sea-borne measurement systems. For a while Copernicus has also covered dynamic modelling. Copernicus processes data and provides users with more reliable and up-to-date information within six thematic areas: land, marine, atmosphere, climate change, emergency management and security. It supports a wide range of applications, including environment protection, management of urban areas, regional and local planning, agriculture, forestry, fisheries, health, transport, climate change, sustainable development, civil protection and tourism.

The main users of Copernicus services are policymakers and public authorities who need the information to develop environmental legislation and policies or to take critical decisions in the event of an emergency, such as a natural disaster or a humanitarian

crisis. The Copernicus programme is coordinated and managed by the European Commission. The development of the observation infrastructure is performed under the aegis of the European Space Agency (ESA) and EUMETSAT for the space component and of the European Environment Agency (EEA) and the Member States for the in situ component.

Based on the Copernicus services and on the data collected through the satellite systems and other high resolution satellites, many value-added services can be developed and tailored to specific public or commercial needs, resulting in new business opportunities. During 2014 Sentinel-1A was sent up, a satellite which SMHI is using for, among other things, a better survey of ice and oil emissions in the Baltic Sea. In June 2015 Sentinel-2A was sent up, which will contribute to better land surveying, for example, of farming and forest land. All data produced within Copernicus will be open data which can freely be used by everyone.

SMHI has been very successful in the introduction of the operational phase of Copernicus which was started in 2014 and where a number of procurements of services have been conducted through the European centre ECMWF, the European research centre JRC and the company Mercator Ocean.

Areas in Copernicus within which SMHI works:

- EFAS, the European Flood Awareness System
 - hydrological warnings.
- Marine Services – observations and forecasts.
- Atmosphere Monitoring Services – forecasts of the atmosphere's chemical composition.
- Climate services.

ABOUT SMHI

SMHI, the Swedish Meteorological and Hydrological Institute, is Sweden's expert agency within meteorology, hydrology, oceanography and climatology. We contribute to good social planning and a safe and sustainable society. Communicating warnings and weather forecasts, around the clock, all year round, is an important assignment for us. We work for the entire society – for private persons, agencies and companies.

The weather, water and climate are global issues. SMHI has extensive collaborations with both Swedish agencies, international organisations and researchers.

We collect data from the air, lakes, waterways and seas. The data is stored and processed in powerful computers. With advanced mathematical models and analysis methods, our experts produce forecasts, monitor the development of the climate and environment and supply the society with qualified decision data.

Our customised services, products and decision data are used by agencies, municipalities and trade and industry – for example, within the energy sector, media and transport sector.

SMHI conducts applied research in meteorology, hydrology, oceanography and the climate. Knowledge, models and tools which describe processes in the atmosphere, sea and on land are needed so that SMHI can produce decision data with practical social benefit for many areas in society.

SMHI has an annual turnover of SEK 700 million and has approximately 600 employees. The main office is located in Norrköping. SMHI also has offices in Malmö, Gothenburg, Stockholm and Sundsvall.