ClimeMarine

MARINE SPATIAL PLANNING IN A CHANGING CLIMATE

The ClimeMarine project encourages ecosystem-based management of the Swedish sea with consideration of climate change; through close contact with stakeholders and decision-makers.

Marine spatial planning promotes the sustainable use of the sea, by assigning human activities to specific zones and through area-based regulations.

Many activities share the sea, but space is limited. Marine spatial planning provides guidance on the best use of any given sea area, and helps bring stakeholders together to resolve conflicts.

For more information on Swedish Marine Spatial Planning: https://www.havochvatten.se/en/eu-and-international/marine-spatial-planning.html

Climate change will have an enormous impact on the marine environment, and planners are recommended to:

- Be aware how climate change will affect different areas of the sea in different ways.
- Plan marine activities to make sure the cumulative environmental impact takes climate change into account.
- Plan with adaptive management, as the best available data is continually improving.

ClimeMarine project is funded by:

FORMAS

ClimeMarine project partners:

Swedish Agency for Marine and Water Management

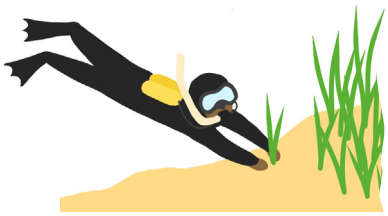
UNIVERSITY OF GOTHENBURG

SGU Geological Survey of Sweden

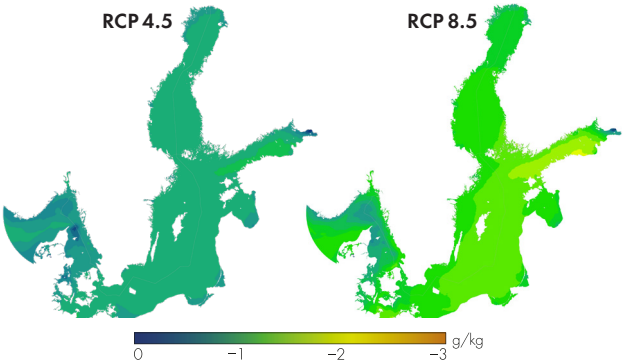
SMHI

SALINITY

By the end of the century, the decrease in average annual surface salinity in the Baltic Sea is 0.85 g/kg (RCP 4.5) and 1.3 g/kg (RCP 8.5). There is large uncertainty due to uncertain global mean sea level rise and changes in the hydrological cycle.



»I love diving in eelgrass, but it is sensitive to salinity. I hope the surviving eelgrass areas in the south will be protected in the future! «

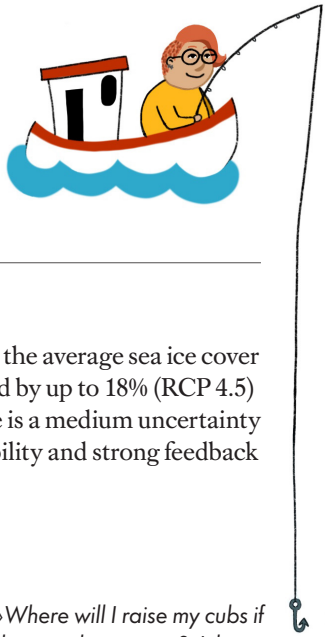


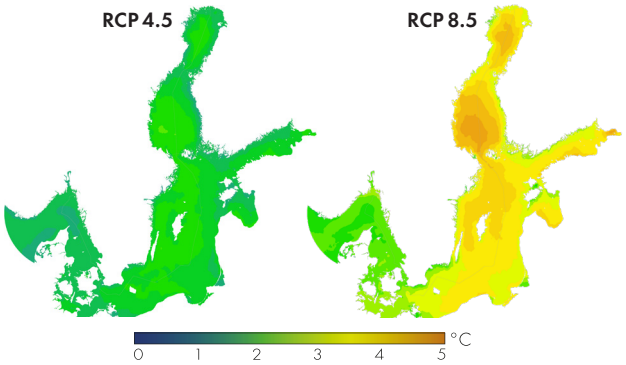
Decrease in average annual surface salinity by the end of the century under RCP 4.5 and RCP 8.5 in the sea surrounding Sweden.

SURFACE WATER TEMPERATURE

By the end of the century, the increase in average summer surface water temperature in the Baltic Sea is 2.0°C (RCP 4.5) and 3.3°C (RCP 8.5). The climate change signal in temperature is larger than the uncertainty.

»I've been fishing the same species of fish here my whole life. Climate change will likely replace them, so I hope to get a permit to fish the new species and that we protect the others! «

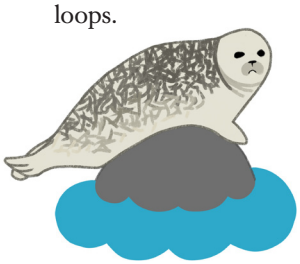




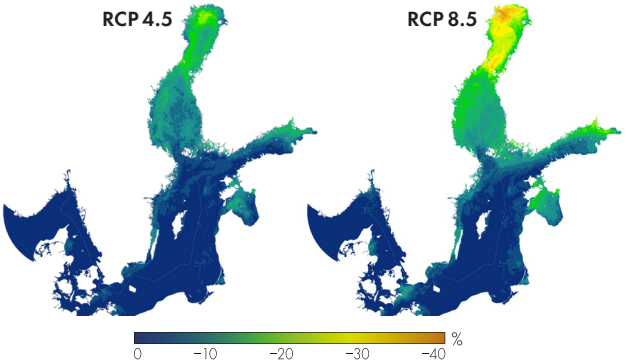
Increase in average summer surface water temperature by the end of the century under RCP 4.5 and RCP 8.5 in the sea surrounding Sweden.

ICE COVER

By the end of the century, the average sea ice cover in the Baltic Sea is reduced by up to 18% (RCP 4.5) and 30% (RCP 8.5). There is a medium uncertainty due to high natural variability and strong feedback loops.



»Where will I raise my cubs if the ice disappears? I hope the humans better protect the last of my habitat!«



Reduction of average winter sea ice cover by the end of the century under RCP 4.5 and RCP 8.5 in the sea surrounding Sweden.

DEFINITIONS

RCPs (Representative Concentration Pathways) are a standardized way to simulate future climate change in a moderate mitigation scenario (RCP 4.5) and a fossil fuel driven scenario (RCP 8.5).

Uncertainty measures the range of possible outcomes. Temperature is rising. How much it's rising depends on today's decisions. A large uncertainty includes the risk of large changes. ClimeMarine shows the uncertainty as two distinct scenarios and as a range of climate change.

REFERENCES

Gröger et *al.*, Summer hydrographic changes in the Baltic Sea, Kattegat and Skagerrak projected in an ensemble of climate scenarios downscaled with a coupled regional ocean–sea ice–atmosphere model. *Clim Dyn* **53**, 5945–5966 (2019). https://doi.org/10.1007/s00382-019-04908-9
Metadata available at dataportal.se

www.smhi.se/research/climemarine