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THE ROYAL SWEDISH ACADEMY OF SCIENCES

# The Ocean in a +2°C world

## *-An analytical perspective*

**Date:** 22 February 2018 (full day)  
**Venue:** The Beijer Hall, The Royal Swedish Academy of Sciences,  
Lilla Frescativägen 4A, Stockholm  
**Host:** The Environmental Committee of the Royal Swedish Academy of Sciences



Photo: Martin Jakobsson

Global warming is a great challenge for humankind. Most countries have therefore signed an agreement to reduce carbon dioxide emissions in order to keep and the average atmospheric temperature increase from ever reaching 2 °C, preferentially staying below 1.5 °C. Less discussed is that the ocean warming accounts for more than 90% of the total energy stored from global warming from 1971 to 2010 (IPCC AR5). This large change will continue in the future as long as the concentrations of greenhouse gases continue to increase. The atmospheric temperature will most likely continue to rise, but what will the effects in the ocean be? Temperature fronts will change as will the vertical ocean stratification with likely impacts on ocean currents. These and other changes related to an ocean warming will affect the ecosystem, including carbon fluxes within the ocean and exchange with the atmosphere.

In this symposium we will address the potential evolution of the ocean in warming climate. We will learn from the geological past as well as from the present knowledge in oceanography, carbon- and ecosystem sciences and numerical modelling.

### **Lectures by:**

- Stephanie Dutkiewicz, Massachusetts Institute of Technology, USA
- Kristina M. Gjerde, IUCN Global Marine and Polar Programme
- Christoph Heinze, University of Bergen, Norway
- Sverker Jagers, University of Gothenburg, Sweden
- Larry Mayer, University of New Hampshire, USA
- Paul Pearson, Cardiff University, UK
- Peter Schlosser, Columbia University, USA

The symposium is free of charge and open to the public but registration is required for all participants. Limited number of seats. For more information and registration please visit [www.kva.se/ocean](http://www.kva.se/ocean).

***This symposium is funded by Bolin Centre for Climate Research and Baltic Sea Centre at Stockholm University, Centre for Collective Action Research (CeCAR) at University of Gothenburg and the Royal Swedish Academy of Sciences.***



**08.30 Registration**

Morning session

*Chair: Helen Coxall, Stockholm University*

**09.00 Introduction**

*Göran K. Hansson, Secretary General, The Royal Swedish Academy of Sciences  
Martin Jakobsson, Chair, The Environmental Committee, The Royal Swedish  
Academy of Sciences*

*Jonas Björck, Director, Division for Research Policy, Ministry of Education and  
Research*

**09.30 Ocean temperatures and carbon cycling: lessons from the warm world of the Eocene (34 to 56 million years ago)**

*Paul Pearson, Cardiff University, UK*

**10.00 Discussions**

**10.15 Coffee/tea**

**10.45 Comprehensive and Sustained Ocean Observations:  
An Essential Component of Understanding Global Change**

*Larry Mayer, University of New Hampshire, USA*

**11.15 Discussions**

**11.30 A 5 °C Arctic in a 2 °C World**

*Peter Schlosser, Lamont Doherty Earth Observatory, USA*

**12.00 Discussions**

**12.15 Lunch wrap**

Afternoon session

*Chair: Øyvind Paasche, University of Bergen, Norway*

**13.15 Introduction**

**13.30 Phytoplankton in a changing world**

*Stephanie Dutkiewicz, Massachusetts Institute of Technology, USA*

**14.00 Discussions**

**14.15 Ocean Carbon Cycle in a high CO<sub>2</sub> world**

*Christoph Heinze, University of Bergen, Norway*

**14.45 Discussions**

**15.00 Coffee/tea**

**15.30 Challenge of sustaining marine biodiversity in a changing ocean:  
A role for international law**

*Kristina Maria Gjerde, IUCN Global Marine and Polar Programme, USA*

**16.00 Discussions**

**16.15 Why we should not trust in voluntary action when it comes to  
overcoming climate change**

*Sverker Jagers, University of Gothenburg, Sweden*

**16.45 Discussions**

**17.00 Concluding remarks**

*Leif Anderson, Vice Chair, The Environmental Committee, The Royal Swedish  
Academy of Sciences*