

# Preface



In 1948, Harald Ulrik Sverdrup left his position as director of the Scripps Institution of Oceanography in La Jolla, California, to become the first director of the Norwegian Polar Institute. The NPI was a renamed continuation of what until then had been an Arctic-focused institute with a strong emphasis on topographical and geological mapping. Together with a new director, the institute got a broadened scientific scope, especially in geophysics, and its purview became bi-polar.

The early part of Sverdrup's illustrious career included being the chief scientist on Amundsen's *Maud* expedition through the North-East Passage, which was completed in September 1925, 75 years ago. The Fram Museum and the Norwegian Polar Institute decided to collaborate on celebrating the expedition's anniversary, and felt an international symposium in Sverdrup's honour was appropriate.

The theme of the symposium was the role of the ocean–sea ice–atmospheric interaction in polar and sub-polar climate. We believe this theme would have been very much at Sverdrup's heart. Although his main publications were in physical oceanography, he had worked with Ahlmann on air–ice interaction on Spitsbergen, and studied ice–ocean interaction both in the Arctic and the Antarctic. And he surely would have wanted to contribute to the current discussions of the role of the oceans in climate change.

Why is the symposium theme important? Predicting future climate change is one of the major challenges for human society at present. To model with confidence effects of changes in greenhouse gases requires models that can reproduce known past climate changes. Although much is still unknown, evidence suggests that natural surface temperature changes have at times occurred as rapidly as 1 °C per decade, lasting for several decades. Such rapid climate changes may reflect changes in ocean circulation. Predicting future changes demands an intimate understanding of oceanic, sea ice and atmospheric processes, and their interactions.



H. U. Sverdrup in his office at Norwegian Polar Institute headquarters at 1 Observatoriegata, Oslo, in 1956. (NPI Picture Library.)

As a result of the advection of heat by the North Atlantic Current (part of the Gulf Stream), north-western Europe is 5 - 10 °C warmer than its latitude would indicate. The ocean circulation is partly driven by density differences, the so-called thermohaline circulation. Coupled atmosphere–ocean models suggest that greenhouse warming may lead to dramatic weakening of the Atlantic thermohaline circulation.

Within the venue of the symposium a workshop was therefore arranged to move forward an international effort to investigate whether changes in the North Atlantic Current and potentially a rapid climate cooling of north-west Europe could occur in response to changes in the circulation of the Arctic and Subarctic seas. This ASOF (Arctic/Subarctic Ocean Fluxes) programme addresses the role of high latitude oceans in decadal climate variability and how to achieve flux measurements across the main gateways to and from the Arctic Ocean. See <http://asof.npolar.no/about.html> for more information about the programme.

The symposium was arranged at relatively short notice. Even so it attracted 70 participants from 10 countries. Thirty-eight papers and posters were presented, 15 of which were subsequently submitted to *Polar Research*. The symposium, which took place from 21 to 24 September 2000 at the Polar Environmental Centre in Tromsø, was preceded by a reception at the Fram Museum in Bygdøy, Oslo. High points of the reception were addresses by the (then) Norwegian Minister of the Environment Siri Bjerke and Professor Walter Munk. These two pieces open this issue. While former Minister Bjerke's speech adopts a political perspective on climate change in the north, Professor Munk—one of Sverdrup's early students—offers uniquely personal glimpses into Harald Ulrik Sverdrup's life. A paper by E. P. Jones then presents an overview of some of the central ideas and questions about Arctic Ocean circulation. Most of the remaining 13 articles tackle more particular aspects of the facet of the symposium's theme concerning North Atlantic and Arctic Ocean circulation.

The editor would like to thank Leif Anderson, Bob Dickson, Peter Haugan, Peter Jones, Jens Meincke and others who helped enormously by suggesting potential reviewers. We are especially grateful to the referees themselves. Though by no means problem-free, peer-review is the best method we have for controlling the quality of scientific publications. Repeating a measure first taken in the last pages of the 1999 volume of *Polar Research*, this issue concludes with a list of the scientists who have served as referees for the journal in the last two years.

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