

A large pool of freshwater is building up in the Arctic

Recent observations of Arctic Ocean outflow in the Fram Strait suggest that freshwater is piling up in the Arctic Ocean. A change in wind direction could release the largest amount of freshwater through Fram Strait ever recorded.



Photo: Rudi

Caeyers

The freshwater transport from the Arctic to lower latitudes is one of the main ways of the Arctic to interact with the global climate system.

The effect of such a release of freshwater depends on the final magnitude and nature of the release.

“The effects this release will have on the climate processes are in the focus of ongoing research. But it will certainly affect the processes behind deep water formation in the Northern North Atlantic” said co-leader of iAOOS Norway, Dr. Edmond Hansen.

Historic data and modeling studies show that a release of the fresh water pool is likely to happen at some stage in the near future.

“The freshwater is believed to be one of the factors modulating the deep water formation in the subpolar gyres, and hence the northward transport of oceanic heat, which in turn is very important for the climate in the Northern regions”, Hansen continued.

More freshwater in, but not out

Observations done by The Norwegian Polar Institute (NPI) across the Arctic Ocean outflow region in Fram Strait since 1997 have been extended through IPY within the IPY-project iAOOS.

“New investigations of the observed data reveal that the southward transport of freshwater through Fram Strait stays at a constant level, despite the fact that increased Arctic river runoff and sea ice melt have added much extra freshwater to the Arctic system over the past twenty to thirty years”, Hansen said.

The observations in Fram Strait show that the extra freshwater has not been exported south, although some transport may have occurred through the Canadian Archipelago.

The scientists conclude that the extra freshwater is being stored internally in the Arctic Ocean. This is verified by US scientists, who report that an anomalously large amount of freshwater is building up in the Beaufort Gyre. Historical observations have shown that this freshwater storage at some point will be released, and flushed through the Canadian Archipelago and Fram Strait.

Global effects?

The Arctic climate is a very complex system, which interacts with the global climate in an even more complex way.

“Increasing air and ocean temperatures, increased river runoff and a disappearing summer sea ice cover are changes that are likely to modify the physical processes of the Arctic Ocean and its interaction with the global climate system”, Hansen said.

“One such interaction is exactly the export of freshwater southward through the Canadian Archipelago and Fram Strait, between Greenland and Svalbard”, he continued.

As a result of the efforts made in developing monitoring systems for the Arctic during IPY, the scientists have a unique opportunity to document the freshwater release from Arctic Ocean.

“At the observation site in the Fram Strait, we are in the best position available to observe, document and analyze the extraordinary event a freshwater storage release would be”, Hansen concluded.

About the project

The main objective of the IPY project iAOOS Norway (integrated Arctic Ocean Observation System) is to better understand the interactions and processes in the Arctic. iAOOS-Norway builds on, and supplements, other ongoing components of this observation system, such as [DAMOCLES](http://www.damocles-eu.org/) (<http://www.damocles-eu.org/>) and NABOS. The Arctic has been peppered with instruments that are central components in an integrated Arctic Ocean Observation System (AOOS). The aim is to improve both operational and climate forecasting in the Arctic region. For more information please [visit this web site](#).

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On February 25th 2009, the IPY Joint Committee will release a report on 'The State of Polar Research'. In the lead-up to this event, major IPY research projects are releasing information for the press, and making themselves available for media enquiries. A wide range of projects will be profiled reflecting the diversity of IPY. For more information, please visit http://www.ipy.org/index.php?ipy/detail/feb09_projects/