Sea Ice Physics

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Title: Visual sea ice observations on icebreakers: A comparison of data collected by non-experts with professional observers.

Data: Visual sea ice observations during MOSAIC

Visual sea ice observations on icebreakers: A comparison of data collected by non-experts with professional observers.

In order to improve our understanding of the polar sea ice zones, **sea ice and snow conditions are regularly recorded by doing visual observations from the ships bridge. With those observations we contribute to the longest and most consistent ship- based observation data base for the Antarctic and Arctic.**

The procedure itself is very simple and can be done from every ship that reaches the sea ice zones in both hemispheres. Every hour, a scientist identifies the total sea ice concentration, the three most dominant ice classes and their sea ice and snow characteristics, and inserts these data into a standardized protocol. This information is combined with a picture taken (see example) and meteorological records.

On board of the research icebreaker *Polarstern*, visual sea ice observations are carried out by scientists. They receive a short introduction, but are not experts in sea ice. This leads to the fact that the assessment of the ice situation can vary strongly from observer to observer, even if the ice conditions remain the same.

To better estimate the associated error, simultaneous observations of experts with non-experts were conducted on the MOSAiC expedition. Within the scope of this master thesis, these observations will be compared with each other, if necessary with the help of satellite data. The goal is to better quantify the error inherent in the ship observations obtained to date.

What you need:

Some programming experience, or experience in evaluation of data sets is necessary. It is of advantage if the student has already participated in an expedition to the Arctic or Antarctic and is familiar with the sea ice observation protocol.

What you will learn:

Insights are provided on the standardized collection of environmental parameters, and their susceptibility to error by observers. Furthermore, the student has the opportunity to work with the supervisor on suggestions for improving existing protocols. Furthermore, an insight into the different satellites used for the monitoring of the polar regions will be given.

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