Themes: Climate & sea ice

Is Antarctic sea ice becoming younger?

Context

In the last decade, Antarctica experienced the three lowest sea ice extents ever recorded within the satellite era. These extreme losses may suggest a longer term decline that could have important consequences on the rest of the climate. Our current understanding of recent and projected sea ice changes in the pack is lacking. In particular, the age of sea ice is an important indicator of its health, but hasn't yet been considered in past studies investigating Antarctic sea ice trends.

Project description

The aim of the project is to estimate the evolution in the age of sea ice from remote sensing data and a selection of Representative Concentration Pathway (RCP) scenarios from a global climate model. You will implement a simple algorithm to track sea ice age based on sea ice concentration and velocity fields. The analysis will consist of studying how warming and changes in sea ice drift affect the spatial patterns of the pack. Your thesis will provide valuable information on how the age of the ice is projected to evolve, and notably, how the multi-year pack responds to anthropogenic forcing.

Observation of Antarctic sea ice concentration during a loss event in June 2023. Your work will investigate whether the age of the ice has also changed, as this is an indicator for long-term decline.

Student profile

An interest in climate, oceanography or atmospheric sciences will be appreciated.

The work will be conducted in Python. It will notably build upon the class project conducted within the Climate Modelling unit.

Guidance and mentoring on the technical aspects of the work, data analysis and fundamental science will be provided.

The project tasks will aim to advance your skills in algorithm implementation, data analysis and creativity.

For students of Applied Earth Sciences, Aerospace Engineering, Mathematics or Computer Science

Faculty of Civil Engineering and Geosciences

TUDelft

Delft University of Technology