

## Dynamics of Antarctic Circumpolar Current, Weddell Gyre and sea ice distribution

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The Southern Ocean has played an important role in the evolution of the global climate system. Area of sea ice shows a large seasonal variation in the Southern Ocean. The Southern Ocean circulation is dominated by the Antarctic Circumpolar Current (ACC), the world's longest and largest current system. The Weddell Gyre is a large clockwise gyre in the Southern Ocean, and contribute sea ice distribution in the Atlantic and Indian sectors of the Southern Ocean. Sea ice coverage on sea surface strongly affects the climate of the Southern Hemisphere through its impacts on the energy and gas budget, on the atmospheric circulation, on the hydrological cycle, and on the biological productivity. We plan to reveal the dynamics of Southern Ocean subsystems and those interaction with global climate change by modern oceanographical observations, sediment trap experiments, paleoceanographic approach in piston and drilling cores, and climate model experiments.

Keywords: Southern Ocean, Antarctic Circumpolar Current, Weddell Gyre, sea ice, climate change