INSTITUTE FOR MARINE & ANTARCTIC STUDIES
OCEANS & CRYOSPHERE
RESEARCH CAPABILITY

The Oceans and Cryosphere Centre combines three main research capability areas.

They are Antarctic and Ocean policy and law, oceanography (physical, bio-geochemical and geophysics), and Antarctic science (sea-ice, ice shelf and ice sheet research). Many of the studies we undertake in science and policy have global scale and frequently contribute to the latest climate change assessments used in the reports of the Inter-governmental Panel for Climate Change and in the Antarctic Treaty Consultative Meetings. In oceanography, we focus on observational oceanography and ocean modelling. We lead Australian university research in blue-water oceanography and postgraduate research training. We work in the Antarctic, Southern and temperate oceans of the world. The cryosphere studies cover sea-ice biogeochemistry and sea ice-ocean interactions, ice shelf dynamics and ice shelf-ocean processes.

Antarctic and ocean policy and law

The IMAS Antarctic and ocean governance theme supports research in law, the social sciences and the humanities. This research explores the legal and governance challenges surrounding Antarctica and the Southern Ocean plus insights from the humanities on the history and culture of these areas. It involves national and international collaborations and crosses disciplines.

Policy assessments

We have the capability to integrate science, resource and environmental management and the broad social sciences with interests in Antarctica and Southern Ocean. The tools we use are symposia, scenario planning, and expertise in institutional analysis, and national and international legal frameworks (treaties and other legal instruments). These assessments often result in position statements and reports.

Symposia

We organise and run symposia and "round table" discussions and meetn"

circulation of the Southern Ocean including the Antarctic Circumpolar Current and its changes. We have the capability to deploy instrumentation, moorings, autonomous floats, gliders and undertake ship-based measurements. We do this observational work with our collaborators. Ocean modelling is an essential part of understanding the observed changes and understanding the processes that control the large scale circulation and how the ocean would evolve. We want to know if the changing oceans and sea-ice are influenced by humans.

Ocean Voyages and Observational Oceanography

We measure the ocean circulation and its changing state. To measure ocean changes and circulation we deploy autonomous instruments (shown to the left), ocean gliders, and undertake measurements from ships. We also utilise data from instrumented elephant seals that fill many spatio-temporal gaps in our observational coverage around the Antarctic margin. We measure a wide range of physical and chemical properties, such as temperature, salinity, oxygen, nutrients and other biogeochemcial tracers through the water column. These measurements tell us about ocean currents, their past evolution, mixing processes and biological productivity in the ocean. We know the ocean state is changing and these measurements help us to understand how the oceans are changing and also to confirm theories about ocean circulation and the role played by ocean mixing.

UN VERSITY *of*
TAS