9 Ocean Observations, Assessment, and Prediction (OOAP)

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9.1 Overview

The Ocean Observations, Assessment, and Prediction (OOAP) Program houses capability in ocean-related research about climate variability, climate processes and drivers, ocean prediction, and coastal and shelf ocean dynamics. It is part of CMAR's joint operation with the Bureau, the Centre for Australian Weather and Climate Research (CAWCR), and comprises 51 CSIRO staff and 12 Bureau staff providing a high quality national research capability for ocean observations in support of climate research and ocean forecasting.

The Program provides fundamental knowledge of the variability of the ocean on all time scales, from the surface to the deep ocean and from the tropics to Antarctica. A variety of observations, models, and analyses are used to discover new insights into the nature, causes, and consequences of variability and change in the ocean. The group works closely with scientists in and outside of CSIRO to improve the understanding and simulation of the interactions of the ocean with the atmosphere, land, hydrosphere, and cryosphere in the coupled Earth system.

OOAP contributes directly to the development and testing of model parameterisations and data assimilation tools across the CAWCR programs. This capability underpins the development of earth system models (ACCESS) in the Earth System Modelling (ESM) program and practical prediction systems based on improved model and data assimilation systems (BLUElink). Our close links to the Climate Variability and Change program (CVC) and to climate modelling in the ESM Program provide an integrated research capability that is unique internationally and directly links changes in the oceans with their impact on Australia's terrestrial climate. Furthermore, our researchers are exploiting rapid advances in ocean observations, data assimilation techniques, and high performance computing to deliver timely and comprehensive information about the ocean state. These scientific advances enhance maritime safety, deliver a competitive edge to the Royal Australian Navy, and provide improved warning of natural hazards associated with the ocean.

The Program provides the national capability to observe and forecast Australia's ocean shelf and blue-water oceans. The research is distinguished from other groups in Australia by its multidisciplinary breadth, blue-water observing capacity, access to sophisticated infrastructure, and depth of knowledge of our oceans. OOAP researchers take advantage of Australia's geographical position to tackle problems of global relevance in the tropical oceans, the subtropical Indian and Pacific, and the Southern Ocean. The Program has established strong collaborative relationships with overseas researchers and with Australian universities and plays a prominent role in training young scientists. The staff are highly regarded overseas for their achievements in observing, understanding, and predicting Australia's oceans. Evidence of the impact of our work includes high productivity and citation rates (e.g., Dr Steve Rintoul, has 2341 citations in the peer-reviewed literature), numerous national and international awards for program staff (e.g., Drs' Trevor McDougall and Rintoul are Fellows of the Australian Academy of Sciences), and the large number of international panels and working groups that are led by OOAP scientists.

The OOAP Program addresses two of Australia's four National Research Priorities: An Environmentally Sustainable Australia (environmental monitoring and climate change); and Safeguarding Australia (national security). It also underpins domestic policies on climate change through the National Framework for Australian Climate Change Science. The OOAP capability enables research addressing international research priorities, for example as articulated in the Summary for Policymakers of the 2007 Intergovernmental Panel on Climate Change (IPCC) and the objectives of the Climate Variability and Predictability Program (CLIVAR) of the World Climate Research Program.

The research undertaken by OOAP scientists specifically addresses CSIRO's strategic goals in the Marine Outcome Domain.