Collecting data from the vast global oceans has long been a challenge. With the advent of polar orbiting earth observing satellites in the late 1970s, repeated global coverage data was available for the first time, revolutionising our view of the oceans, and providing a picture of both spatial and temporal variability. The IMOS Satellite Remote Sensing Facility collects, processes and provides access to satellite products for coastal, ocean and climate applications.

SRS Infrastructure

There are a number of reception stations around Australia which acquire data from environmental satellites. IMOS has provided a new antenna situated at the Australian Institute of Marine Science in Townsville, and upgraded the existing Tasmanian Earth Resources Satellite Station antenna on Droughty Hill near Hobart.

SRS has installed two Sun X4500 40 tera-byte file servers, one in Canberra and one in Melbourne and added 16 terabytes to the iVEC super computer in Perth. These storage facilities hold sea surface temperature and ocean colour datasets. Each server can be accessed via the internet using recognised data transfer protocols. The SRS Facility has also developed an access portal called the Australian Oceans Distributed Active Archive Centre (AO-DAAC) to allow easy access to the datasets. Figure 1 shows a screen shot of the current AO-DAAC interface.

The interface is designed to be as simple and intuitive as possible to allow easy access to data. The interface is a preliminary version and a more refined version is being developed.

SRS is also working with the IMOS eMarine Information Infrastructure (eMII) facility to lead the development of a web based system to access the marine data products obtained from the integrated reception systems.

Figure 1. The AO-DAAC web portal can be accessed from http://imos.org.au/srs_data.html.

SRS Data

A 14 day composite 1 km resolution sea surface temperature (SST) product derived from the AVHRR satellite instrument by the Bureau of Meteorology is currently available. Some new daily and nightly SST products will soon be available based on the Global High Resolution Sea Surface Temperature Pilot Project (GHRSST-PP) specification. These datasets include error estimation fields.

Ocean colour data from the MODIS Aqua and Terra satellites is also available through SRS.

Figure 2. A sea surface temperature map for 1 May 2009 taken from the AO-DAAC Bureau of Meteorology legacy 14 day mosaic dataset. Red = warm, blue = cool.

Applications of data

Satellite sea surface temperature helps identify different bodies of water (or water masses) and their distribution associated with ocean currents. The sea surface temperature (along with wind speed) also dictates the nature of the interaction between the ocean and atmosphere, and hence the feedback of changes in ocean currents and heat content on our climate.

Ocean colour can be used to determine the concentration and distribution of phytoplankton in surface waters, and how this varies with time. It can also be used to detect sediment load in the waters.

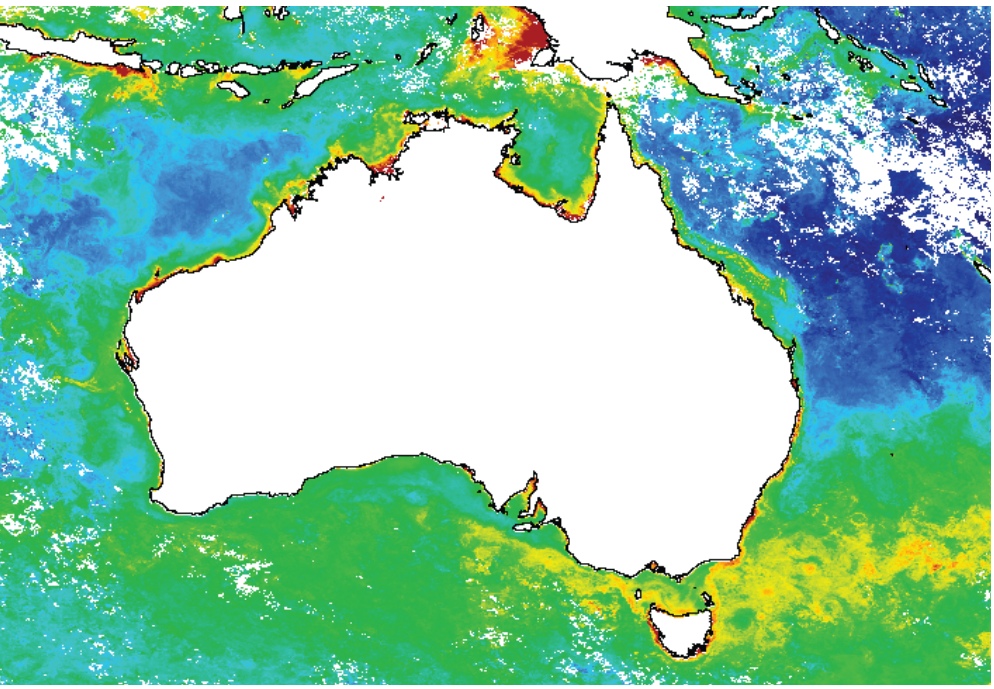

Figure 3. An ocean colour image showing phytoplankton interactions with ocean currents around Australia. Blue = low chlorophyll, red = high.

High resolution SST data complements data from other IMOS facilities, such as Argo, which have coarser horizontal resolution, but adds the dimension of depth. In addition, the satellite ocean colour data provides spatial context to the fluorescence data from gliders.

Focus and priorities

The key priority for the SRS Facility is to provide high resolution satellite data products for the Australian region. These products are useful in a wide range of applications, including seasonal ocean forecasting, monitoring regional currents, fisheries, environmental protection, offshore industries, research into climate variability, and search and rescue.

Partners

- Australian Institute of Marine Science
- Bureau of Meteorology
- CSIRO Marine and Atmospheric Research
- Geoscience Australia
- iVec Western Australia
- Curtin University of Technology
- Australian Research Collaboration Service
- University of Tasmania

www.imos.org.au

IMOS
Integrated Marine Observing System

An Australian Government Initiative
National Collaborative Research Infrastructure Strategy

More information

IMOS Satellite Remote Sensing
http://imos.org.au/srs.html

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