

The Australian Integrated Marine Observing System (IMOS) – a resource for modellers

IMOS is a 5-year (2006-2011) AUD \$92M project established by the Australian National Collaborative Research Infrastructure Strategy (NCRIS), universities and government agencies and overseas partners. IMOS is a nationally distributed set of equipment established and maintained at sea, providing streams of oceanographic data and information services that collectively contribute to meeting the needs of marine research in both open oceans and coastal oceans around Australia. If sustained in the long term it will permit identification and management of **climate change** in the marine environment.

The IMOS strategic goal is to assemble and provide free, open and timely access to streams of data that support research on the role of the oceans in the climate system, and the impact of major boundary currents on continental shelf environments, ecosystems and biodiversity.

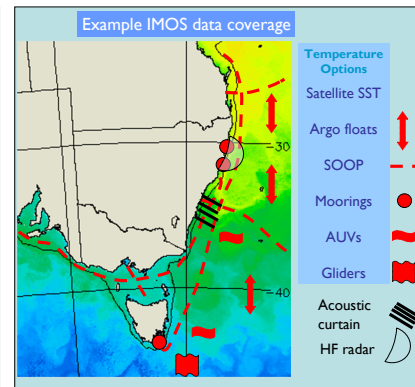
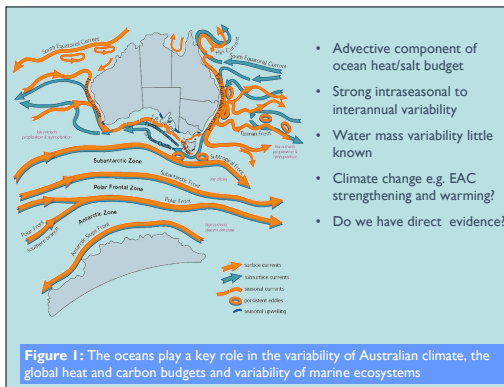


Science Nodes provide the scientific rationale

There are 5 Science Nodes, responsible for identifying the scientific objectives, assessments of progress and promoting use of the data. The Bluewater and Climate Node addresses the open, bluewater oceans around Australia providing data streams that support research on the role of the oceans in the climate system. Four Coastal Nodes in Queensland, New South Wales, South Australia and Western Australia address regional issues including change in the major boundary currents and their impacts on shelf-ecosystems and biodiversity (Figure 1).

National Facilities and Operators

IMOS Infrastructure is largely centred around the generation of time series data from national Facilities, each of which provides equipment and/or services named Facilities, which are run by one or more existing scientific agencies or departments named Operators. Facilities will have the responsibility for operating and maintaining equipment, and making high quality time series data available in real time and quality controlled mode to the marine community.



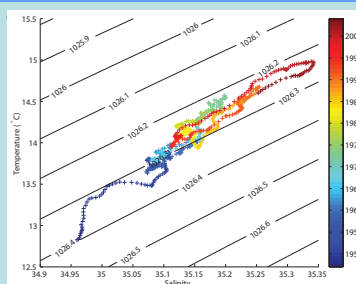
IMOS Nodes:

- Bluewater and Climate** supports research into climate change and its impacts on all timescales, by focussing on the physical and dynamical state of the ocean. Biogeochemical observations will play a role.
- GBROOS Great Barrier Reef Ocean Observation System** – understanding the physical environment which governs the GBR region, and how it is changing.
- NSW IMOS New South Wales IMOS** – focusing on the East Australia Current, and its impact on shelf ecosystems.
- SAIMOS Southern Australia IMOS** – explore the nature and dynamics of ecosystems in the region of Kangaroo Island-Eyre Peninsula and the Bonney Coast.
- WAIMOS Western Australia IMOS** – focussing on the Leeuwin Current and its impact on shelf ecosystems.

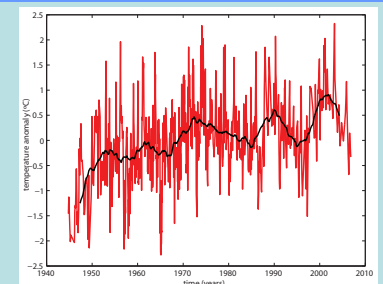
IMOS Facilities:

- Argo Australia** – a fleet of ~300 profiling floats observing ocean physics to 2000 m, part of a larger global program (www.argo.int)
- Enhancement of Measurements on Ships of Opportunity (SOOP)** – a set of underway observing systems for physical, chemical and biological oceanography on volunteer observing ships.
- Southern Ocean Time Series** – a set of moored biogeochemical and ocean weather instruments in the Sub Antarctic Zone.
- Australian National Facility for Gliders** – a multi-sensor system similar to a Argo float, which can traverse as well as profile, and is operated from a land base.
- Australian National Autonomous Underwater Vehicle (AUV) Facility** – used for high resolution surveys of benthic habitats.
- Australian National Mooring Network** – a network of national reference stations, plus regional moorings on shelves and slopes.
- Australian Coastal Ocean Radar Network** – for high resolution mapping of coastal currents.
- Australian Acoustic Tagging and Monitoring System** – curtains of receivers to monitor movements of tagged marine animals.
- Facility for Automated Intelligent Monitoring of Marine Systems** – a communications system on the barrier reef, facilitating the delivery of data from sensors to the scientists in real time.
- eMarine Information Infrastructure (eMII)** – responsible for hosting, managing, distributing and archiving IMOS data.
- Enhancing Access to Australian Ocean Remote Sensing Data** – to make Satellite products to support research in Australia's regional waters.

IMOS data for climate change studies – Maria Island (Tasmania) National Reference Station

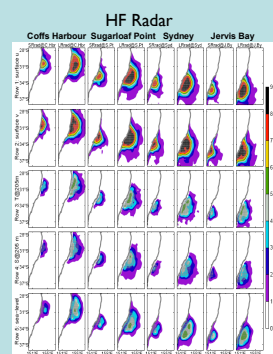


Decadal change in T/S relationship

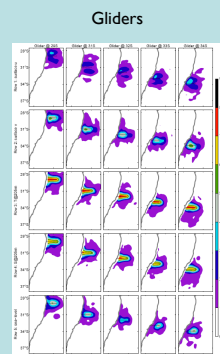


Decadal change in T anomaly

OSSE studies of IMOS HF Radar and Glider data for BlueLink Operational Modelling

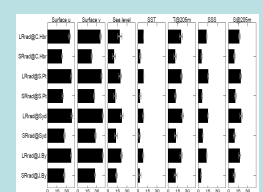


HF radars are assumed to measure daily-mean surface velocity every day with no data gaps; and with no restrictions on deployment locations. LRad: long range; SRad: short range

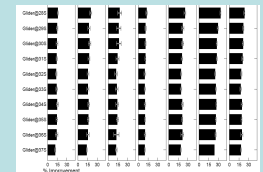


Gliders are assumed to "fly" along a fixed latitude with no deviation from path within 200 km of the coast with a repeat cycles of 2-weeks.

Relative benefits – HF Radar



Relative benefits - Gliders



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ACKNOWLEDGEMENTS

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IMOS data available
www.imos.org.au/emii.html