

**International Ocean Colour Science  
Meeting 2013**

Advancing Global  
Ocean Colour  
Observations

**SUBMITTED ABSTRACTS**

**Topical Area**

**Data infrastructure, formats and distribution**

# Data infrastructure, formats and distribution

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Edward	King	CSIRO Marine & Atmospheric Research	Ocean Colour in Australia's Integrated Marine Observing System
Constant	Mazeran	ACRI-ST	Marine collaborative ground segment: overview of the ocean colour radiometry platform

## The SENTINEL-3 Payload Data Ground Segment

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The Sentinel-3 PDGS is part of the GMES Space Component which is responsible for providing EO data capable of supporting the GMES Services, to the GMES Service Component. In this context the Sentinel-3 PDGS will be in charge of executing all functions allowing the exploitation of the Sentinel-3 data, i.e. acquisition, processing, archiving and dissemination of data from the OLCI (Ocean and Land Colour instrument), the SLSTR (Sea and Land Surface Temperature Radiometer), the SRAL (Synthetic Aperture Radar Altimeter), the MWR (Microwave Radiometer) instruments, and the GNSS and DORIS assembly embarked on the Sentinel-3 satellite.

The Sentinel-3 Payload Data Ground Segment will consist of different centres with specific functionalities:

- **Core Ground Station** providing acquisition and Near-Real-Time LAND Processing functionality;
- **Land Centre(s)** providing Offline (Short-Time-Critical & Non-Time-Critical) L1 & LAND L2 Processing, User Interface and Long Term archiving for LAND products functionalities;
- **Marine Centre** providing Near-Real-Time and Offline L0/L1 & Marine L2 Processing, Mission Planning, Auxiliary Data Coordination, User Interface, Mission Performance Monitoring and Long Term archiving for MARINE products functionalities;
- **Mission Performance Centre** performing activities related to the performance of the Sentinel-3 mission products.

Circulation, Short Term Archiving, Online Archiving and Monitoring functionality are common to all Centres.

This poster provides an overview of the Sentinel-3 Payload Data Ground Segment, with its different centres and functionalities.

# Ocean Colour in Australia's Integrated Marine Observing System

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## Summary

Satellite ocean colour data play an important part in Australia's flagship program to provide infrastructure to support marine research, the Integrated Marine Observing System (IMOS). The program includes multiple activities aimed at improving the availability and quality of ocean colour data in the Australasian region. The work involves the development of a bio-optical database of Australian waters, the deployment of two autonomous radiometers on research vessels to continually acquire underway spectra of above water-leaving radiance, sky radiance and downwelling irradiance, and also support for the operation of Lucinda Jetty Coastal Observatory. In addition, an ocean colour production system, based on SeaDAS software, has been developed using national eResearch infrastructure and used to process the Australian 1km SeaWiFS archive and MODIS Aqua archives to standard products. This system, together with the growing collection of in-situ data provides the capability to support characterization of globally sourced ocean colour products in the Australian bluewater ocean, and the development of regionally tuned products in optically complex waters.

## Introduction

IMOS is part of a major government investment since 2007 intended to provide science-driven research infrastructure. It is a collaborative national system aimed at sustained observing at ocean-basin and regional scales, and including physical, chemical and biological variables. It includes coastal radar installations, gliders, coastal and deep-water moorings, an AUV, animal tagging, support for Australia's contribution to ARGO, and a remote sensing component. All data collected with IMOS funding is made freely available via a data management facility and portal.

The remote sensing facility within IMOS supports production and validation of SST and ocean colour for the Australian region, satellite altimetry/calval activity, the operation of parts of a direct broadcast reception network, and a capability for the storage and management of large remote sensing data sets. The ocean colour investment is further comprised of a set of activities designed to pursue a strategy of providing quality characterized products for Case 1 waters around Australia, and progressively building the capacity to support customized regional product development in Case 2 waters.

## Bio-Optical Database of Australian Waters

The development of a bio-optical database of Australian waters, bringing together both historical and contemporary in-situ measurements, is a critical step in improving the capability to characterize the quality of ocean colour products around Australia, and to develop new regional products. Data collected by several agencies and institutions since late 1990s is being organized into a consistent framework for this purpose [1]. In addition to local research use, where the observations conform to the requirements of NASA and ESA, they are being provided to SEABASS and Mermaid databases to help improve global algorithm development.

### Underway Radiometers on Ships

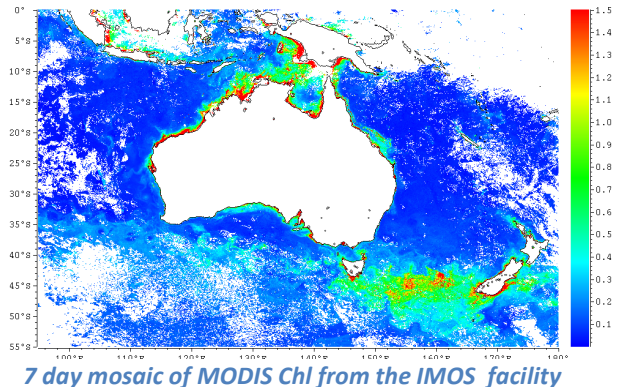
Radiometers are being deployed on research vessels to autonomously acquire underway spectra of above water-leaving radiance, sky radiance and downwelling irradiance, adding to the in-situ data pool [2]. These enable testing of atmospheric correction algorithms and, whenever bio-optical sampling is performed on the vessels, provide a full characterization of the light field. The first instrument has been operating successfully since late 2011.

### Lucinda Jetty Coastal observatory

The 5km long Lucinda Jetty is located in NE Australia and protrudes into the lagoon of the Great Barrier Reef [3]. The coastal observatory is equipped with instrumentation to regularly acquire above water radiometry, in-water optics and information on weather, sky and sea conditions. The observatory is intended as a long term monitoring site, a platform for instrument cross calibration, and as a source of match-up data for cal/val. In 2011, the instrumentation was removed from the site the day prior to its destruction by cyclone Yasi. The observatory is expected to return to operation in the first half of 2013.

### National Ocean Colour Production Facility

IMOS supports a national archive of MODIS and SeaWiFS Level-0 data based at the National Computational Infrastructure eResearch facility. This system permits ocean colour data production to take place locally in Australia, enabling reprocessing as calibration evolves, and full time and space resolution to be retained in products. Users can obtain data easily without having to download it from overseas or process it themselves. Furthermore, a match up database for cal/val work is readily available, and the storage and management of the entire data set and processing chain in one location facilitates development and testing of regionally tuned products.



### Conclusion

The IMOS investment in ocean colour is enabling a national approach, leading to efficiencies in data management and processing supporting research in the Indian and Southern Oceans. Multiple research projects are now making use of this capability which is unique within Australia. By improving support for in-situ data acquisition and management, IMOS is simplifying the task of undertaking further research and development in ocean colour in the Australian region.

### Acknowledgement

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### References

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# MARINE COLLABORATIVE GROUND SEGMENT: OVERVIEW OF THE OCEAN COLOUR RADIOMETRY PLATFORM

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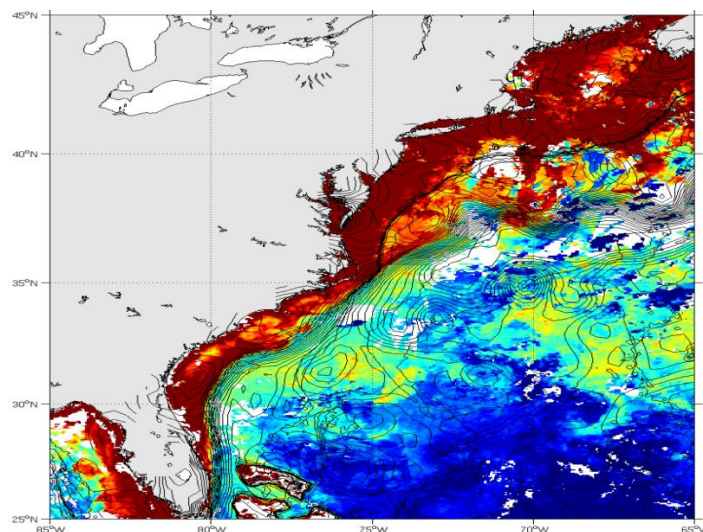
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MCGS (Marine Collaborative Ground Segment) is a project aimed at making the most of ESA Sentinels satellites' potential for users driven services based on high level products. MCGS addresses the need of the European Space Agency to build up data processing centers in conjunction with the Copernicus Program for the provision of services to local and national, public and private European institutions or entities involved in marine activities. For its innovative content, MCGS has been nominated by the professional clusters "pole Mer PACA", "pole Mer Bretagne" & "Aerospace Valley".

Lead by ACRI-ST and involving 8 French organisations specialised in space oceanography (ACRI-ST, CLS, IFREMER, SHOM, GIS-COOC/LOV, GIS-BRETEL, LEGOS, AS+), MCGS is developing satellite-based services through three dedicated processing centres, complementing the Sentinel "core products", in a collaborative approach with ESA/EUMETSAT: an ocean colour radiometry platform (Sentinel-3 and Sentinel-2), a topography platform (Sentinel-3), and a wind/wave/current platform (Sentinel-1). It will provide environmental information for operational monitoring & support, optimisation of human and material means, respect of regulation at sea and coastal areas.

This presentation will give an overview of the ocean colour radiometry platform, in term of data management, complementary and tailored processing, targeted services and demonstration products.



Example of MCGS precursor service in support to oceanographic campaign: chlorophyll map from GlobColour off the US East coast in 2012, with overlaid Sea surface height from AVISO, as used for Tara Oceans