

Focus on Remote Sensing

Coral reefs are complex systems affected by a large number of natural and anthropogenic processes operating across many scales.



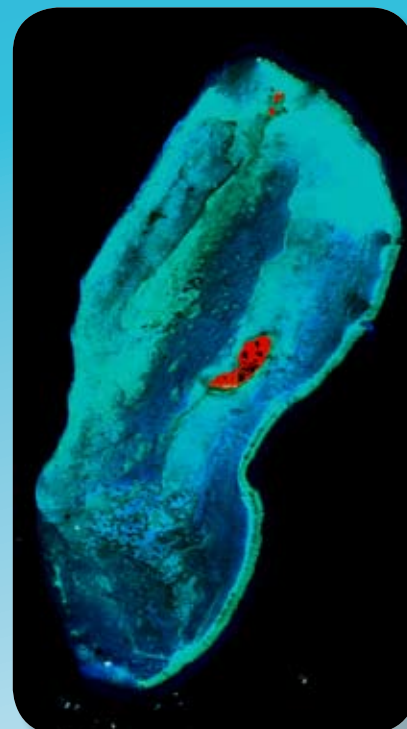
Remote Sensing Working Group fieldwork, Bolinao, Philippines.
Photo: Yanneck Meunier

To manage coral reefs effectively, managers need spatially-explicit information to guide and support decisions, whether designing Marine Protected Areas, monitoring the health of coral reefs or providing early warning systems to identify major sources of stress. Remote sensing provides the only practical way to measure

meaningful large scale variations to coral reefs.

The Coral Reef Targeted Research & Capacity Building for Management (CRTR) Program's Remote Sensing Working Group is developing multi-scale physical and biological observing systems for coral reefs with the aim of improving the efficiency of coral reef management. There are three major objectives:

1. To provide better information for managers by developing and testing the tools necessary to measure and monitor the status of coral reef ecosystems at multiple ecological, spatial and temporal scales.
2. To improve the use of spatial information by developing the application of remote sensing products for conservation science and spatial decision-making.
3. To critically examine the cost-effectiveness of new methods to ensure that overselling of remote sensing technology does not occur.



Remote sensing can easily show coral formations fringing seaward from volcanic islands in the Pacific. Source: NASA

The Coral Reef Targeted Research & Capacity Building for Management Program (CRTR) is a leading international coral reef research initiative that provides a coordinated approach to credible, factual and scientifically-proven knowledge for improved coral reef management.

The CRTR Program is a proactive research and capacity building partnership that aims to lay the foundation in filling crucial knowledge gaps in the core research areas of Coral Bleaching, Connectivity, Coral Diseases, Coral Restoration and Remediation, Remote Sensing and Modeling and Decision Support.

Each of these research areas are facilitated by Working Groups underpinned by the skills of many of the world's leading coral reef researchers. The CRTR also supports four Centers of Excellence in priority regions, serving as important regional centers for building confidence and skills in research, training and capacity building.

The CRTR Program is a partnership between the Global Environment Facility, the World Bank, The University of Queensland (Australia), the United States National Oceanic and Atmospheric Administration (NOAA) and approximately 50 research institutes and other third parties around the world.

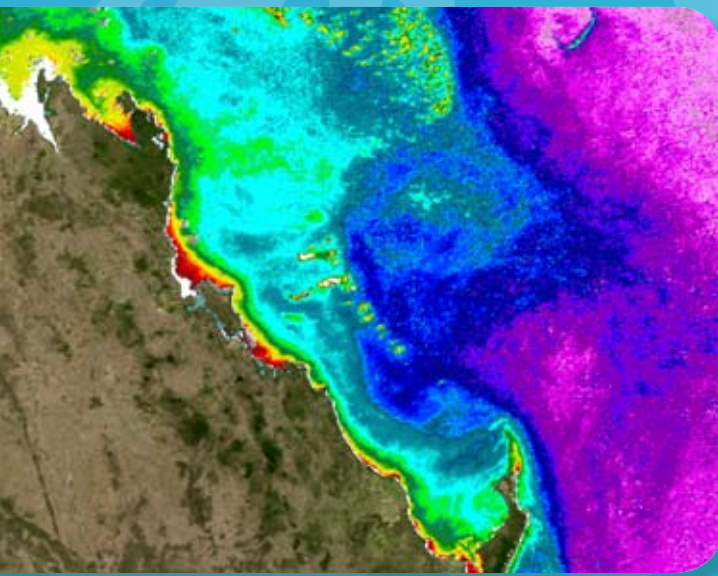


Local community representative is validating satellite image of coral reef, Vitu Levu, Fiji. Photo: Chris Roelfsema

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Oceanographic patterns are clearly evident from the remote sensing of Chlorophyll a concentrations along the Great Barrier Reef, Australia. Source: NASA



Research highlights from the Group include:

Links to global satellite data

Coral reef managers and researchers can now access near-real-time global satellite data on factors affecting coral reefs via a new Data Resources web-portal. Developed by Coral Reef Watch, National Oceanic and Atmospheric Administration (NOAA), the web-portal organises and lists data freely available over the web. The portal includes links to resources relating to sea surface temperature and derivatives, ocean colour, ocean surface winds, ocean surface currents, true colour imagery, global precipitation, sea surface topography, cloud cover and ultraviolet radiation.

The information includes a range of data formats to meet a variety of user needs. Further contributions are welcome.



The Data Resources web-portal can be found at http://coralreefwatch.noaa.gov/crtr/data_resources.html

Mapping and monitoring toolkit

An online toolkit is showing managers, scientists and technicians working in coastal marine environments how to use remote sensing images to map and monitor changes to coastal ecosystem health.

The Coastal Remote Sensing toolkit helps select appropriate data and an appropriate technique to then map and monitor coral reefs, seagrass beds and water quality.

The toolkit is focused on coastal water bodies, seagrass beds, coral reefs, and mangroves; however, the Group plans to extend the toolkit in the future to cover all other coastal ecosystems.

The Coastal Remote Sensing toolkit can be found at:

<http://www.gpa.uq.edu.au/CRSSIS/tools/rstoolkit/>



Hurricane Dean makes landfall along the Yucatan Peninsula on August 21, 2007. Source: NASA

Remote sensing software available to developing countries

The Group is nearing completion of its decision-support and analysis software to monitor the health of coral reefs using remote sensing. The software will be available to students and scientists in developing countries – giving them free access to industry-standard methods for modelling light interactions in natural waters.

Development of the beta-version of the software is near completion, while the development of the decision support tool is currently in progress – being refined by application to sensitivity analysis to accurately detect coral bleaching.



Participants of a Capacity Building Workshop learn to use remote sensing as a decision support tool. Photo: Robert Canto

Further Information

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