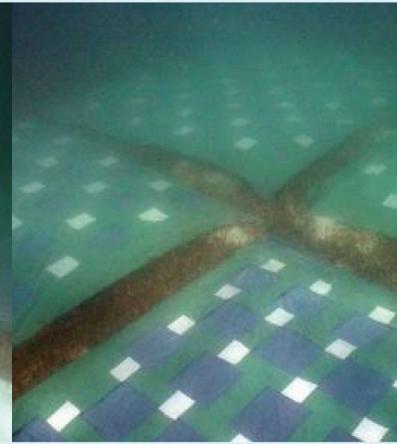


Over one-half
of the world's population lives
within **100 kilometres**
of the sea.

Coral Reef Targeted Research & Capacity Building for Management Remote Sensing Working Group

The role of remote sensing in supporting coral reef management



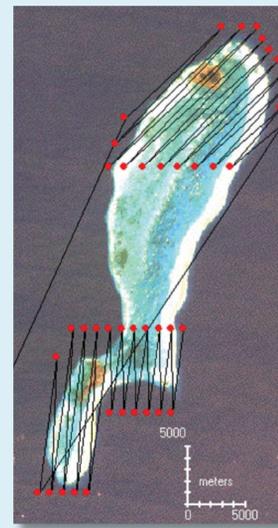
Goals

Until now, the remote sensing of coral reefs has been conducted on an ad-hoc basis with little consistency or general insight into its limitations. We know that some aspects of coral reef health can be resolved on shallow reefs (for example, in French Polynesia) but we cannot predict whether this would be a realistic expectation in, say, Jamaica, where coral reefs have a different structure and species composition, are located in deeper water, and where light penetration is slightly reduced because of higher suspended sediment concentrations in the water column.

Without a generic understanding of the limitations of reef remote sensing, the technology may continue to be oversold or deployed for unrealistic management objectives, resulting in an inappropriate use of financial resources. The CRTR Remote Sensing Working Group (RSWG) aims to improve both the science and application of remote sensing to address management concerns.

The RSWG has four main goals with its Targeted Research:

1. **Creating decision-support and analysis software for monitoring the health of coral reefs using remote sensing.**
2. **Developing methods to detect changes in the coastal environment.**
3. **Applying remote sensing to the inventory, monitoring, and management of biodiversity of coral reefs (and associated systems).**
4. **Creating an Ocean Atlas and tools to help as an early warning, and to manage impacts from coral bleaching.**



Implications for Coral Reef Management

Coral reefs are complex systems, affected by multiple natural and human processes. Remote sensing provides the only practical way to measure meaningful large-scale variations.

Recent developments in remote sensing should make reef management more cost-effective. Remote sensing data can:

- Provide better information for managers by developing and testing the tools needed to measure and monitor the status of coral reef ecosystems at various spatial and temporal scales.
- Improve the use of spatial information by developing the application of remote sensing products for conservation science and spatial decision-making.
- Critically examine the cost-effectiveness of new methods to ensure the best use of information.

Progress to date

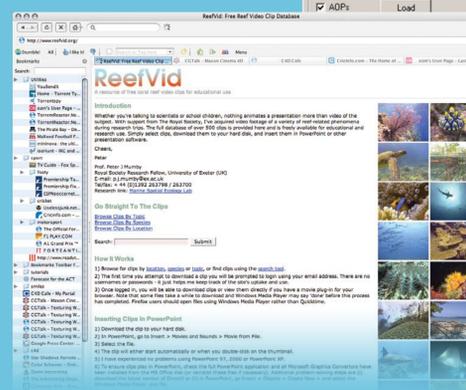
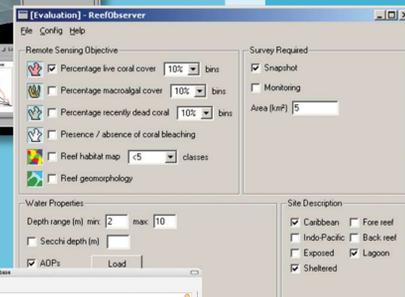
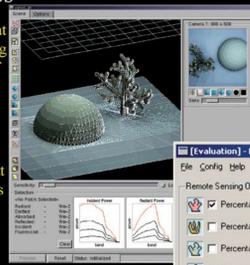
We have already begun making progress towards several of our goals. In this second year of the program we have:

- **developed a Radiosity model that propagates incoming radiation to scale of coral polyps, have identified levels of cloud and optical water properties that reduce radiant stress, and have begun modelling the dynamics of radiant stress**
- **begun monitoring coral cover in selected areas, and through application of a rapid reef assessment**
- **started identifying "good" fish habitat through the use of remote sensing. We are also identifying nursery habitat (based on the red alga, *Laurencia*) for Caribbean lobster and grouper**
- **begun detecting changes in habitat from archived imagery**
- **started modelling the grazing of invertebrates & fishes**
- **established a website www.reefvid.org which offers over 500 free video clips of coral reef phenomena for educational purposes.**

Also, in the first two years of the program, the working group has engaged and is supporting 5 international PhD students to work with coral reef remote sensing as a dedicated area of specialisation.

Main outcomes

- Radiosity model that propagates incoming radiation to scale of coral polyps
- Identify levels of cloud and optical water properties that reduce radiant stress
- Model dynamics of radiant stress



More information

The University of Queensland is the Project Executing Agency (PEA). More information about the CRTR Program can be obtained from the PEA:

C/O Center for Marine Studies
The University of Queensland
St Lucia QLD 4072
Australia

Telephone: +61 7 3365 4333
Email: info@gefcoral.org

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 40 research institutes and other third parties around the world. The four sites or Centers of Excellence are **Southeast Asia**: Marine Science Institute of Bolinao, University of the Philippines; **East Africa**: Institute of Marine Sciences, University of Dar es Salaam, Zanzibar, Tanzania; **Mesoamerica/Western Caribbean**: Unidad Academica Puerto Morelos, Universidad Nacional Autonoma de Mexico, Mexico; and **Australasia/South Pacific**: Heron Island Research Laboratory, Centre for Marine Studies, The University of Queensland, Australia.