

Coastal CRC partners are: Brisbane City Council, Central Queensland University, Curtin University of Technology, CSIRO, Defence Science and Technology Organisation, Griffith University, Geoscience Australia, The University of Queensland, James Cook University, Queensland Department of Primary Industries, Queensland Environmental Protection Agency, Queensland Department of Natural Resources and Mines, The University of Western Australia



Opportunities for involvement

The Coastal CRC welcomes inquiries from interested parties. For further information about the project, please visit the website www.coastal.crc.org.au or contact us on the details below.

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Multibeam sonar head mounted on boat
Source: DSTO

Information about the CRC and its programs

The Coastal Cooperative Research Centre provides decision-making tools and knowledge necessary for the effective management and ecosystem health of Australia's coastal zone. The research and development program is a joint venture between the Australian government, statutory agencies, state and local government authorities, universities, scientific institutions and private companies.

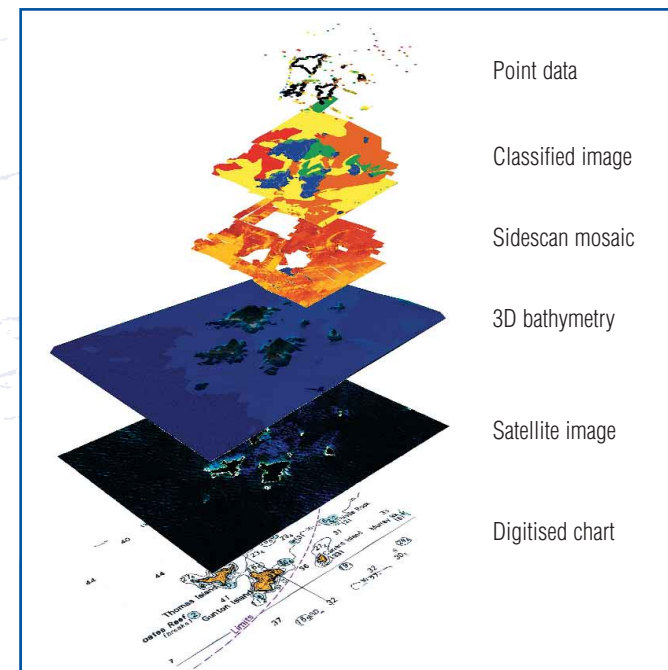
The Coastal CRC's vision is to improve the social, economic and environmental condition of Australia's coastal areas. It is managed by a Board of Directors and involves coastal researchers, planners, educators and managers. Our goal is to bridge the gaps between science and the community, and between science and policy, planning and decision-making. Collaborative project teams undertake interdisciplinary science at selected coastal areas using participatory approaches with stakeholders.

Coastal Water Habitat Mapping Project

Technology for the rapid and cost effective assessment of shallow marine habitats

The Coastal Water Habitat Mapping (CWHM) Project is an initiative of the Coastal CRC and its partner organisations. The three-year multi-million dollar project will develop and apply technologies for rapid and cost effective assessment of shallow water marine habitats around Australia and overseas. The project is a joint venture between scientists, universities, government agencies and private enterprise, and constitutes an extension to the Coastal CRC. It is an Australia-wide initiative, with substantial research and development being undertaken in Cockburn Sound and the Recherche Archipelago in Western Australia. Study sites are also located in New South

Wales and Queensland, and are planned for other regions. These sites represent a wide range of the coastal-benthic marine ecosystems found in Australia. The project constitutes the largest single program of shallow water benthic habitat mapping in Australia. It involves substantial research effort, an extensive equipment inventory and innovative data management and processing. Together with the Coastal CRC's established capacity in ecosystem health monitoring, science for coastal planning and community engagement, it will establish benchmarks in shallow water habitat mapping, a field of growing focus in Australia.



Using and complementing existing data
Source: Andy Bickers and Katrina Baxter

Value of Australia's marine and coastal environments

Coastal areas provide some of the world's most diverse and productive resources, including highly complex ecosystems. Coastal resources and landscapes are valued for the social, environmental and economic benefits they provide. However, in many areas, there is a lack of basic information about habitat distribution and biodiversity. The research and technology outputs from this project will equip managers with the ability to synthesise comprehensive information on benthic habitats for best practice integrated coastal management.

The project builds on a broad base of skills, technology and experience in the assessment of shallow marine water habitats, combining expertise in:

- Acoustic technology
- Video imaging and interpretation
- Biological assessment
- Geomorphological interpretation, and
- Stakeholder engagement and toolkit development

Various government agencies, private companies, research organisations and interest groups are involved in all stages of the project's development, field trials, analysis and application.

Project partners

The Coastal Water Habitat Mapping Project involves personnel from Curtin University of Technology, The University of Western Australia, Geoscience Australia, Defence Science and Technology Organisation, Griffith University, James Cook University, CSIRO Land and Water, and Fisheries Research Development Corporation.

The following industry partners are a key to the success of the project: Fugro Survey Pty Ltd; Reson Inc; Sonar Data Pty Ltd; and the Georeality Group. The industry partners bring a range of specialist skills and technology to the project.

Key benefits

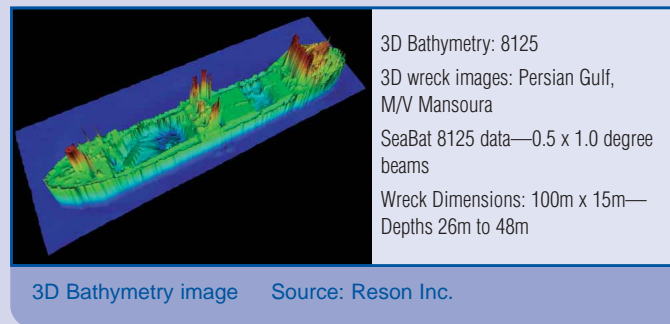
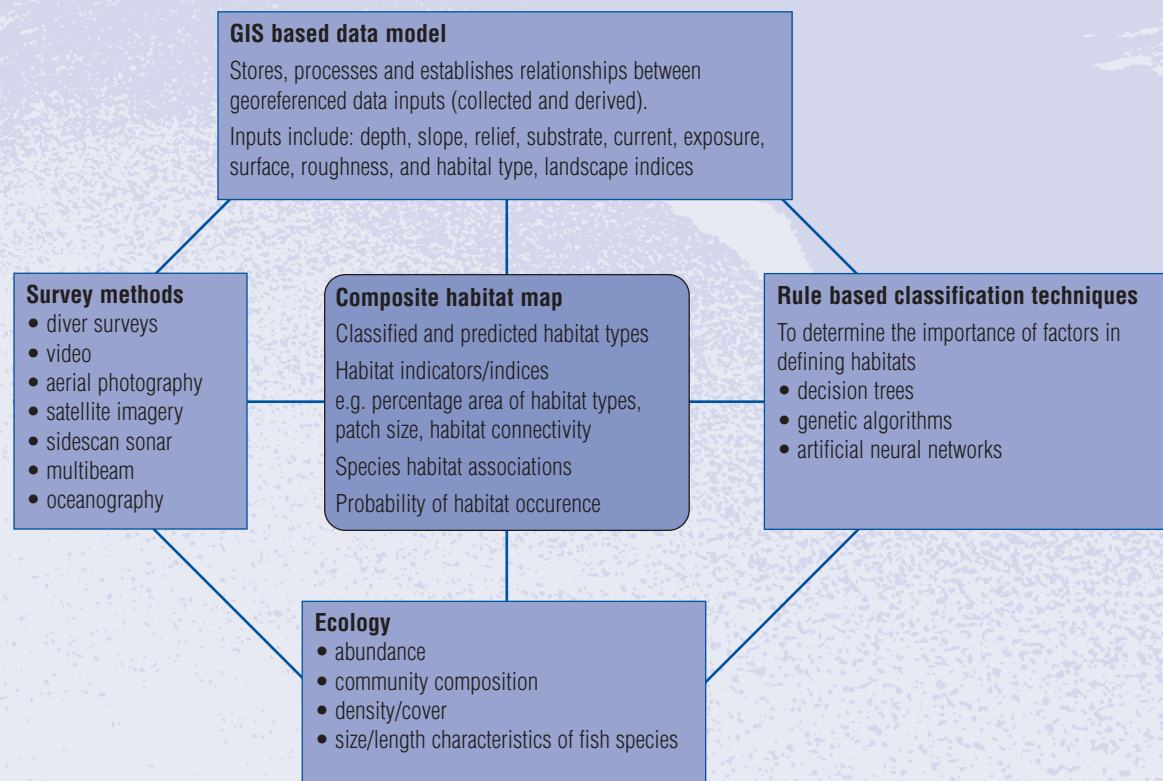
Decision-making for coastal and catchment management requires rapid, cost-effective and broad-scale assessments of human impacts on shallow coastal waters. To effectively manage coastal benthic habitats, assessment and monitoring techniques need to provide integration across a combination of broad scale coverage and selective fine-scale analysis. Techniques should be readily deployed, low-cost and provide useful data for assessment and ongoing monitoring. This project will develop substantial improvements to traditional direct sampling techniques which are often slow and costly.

Habitat mapping is a relatively underdeveloped field, in Australia and elsewhere. The project will significantly enhance national shallow water habitat mapping capability and provide the guidelines for the range of techniques and interpretations available for use. It will allow a sustained program of development, refinement and evaluation of acoustic mapping techniques linked with video and other methods. A variety of habitat regimes such as the spatial and temporal variability of habitats and their impact on fisheries productivity will be involved.

By measuring the extent and variability of coastal benthic habitats, the project will provide important indicators of marine biodiversity. This is essential for the assessment of environmental change. The indicators will ensure consistent guidelines for habitat assessment, classification and monitoring are available and used.

The ability to interpret shallow water coastal habitat will assist organisations such as the Australian Defence Force, which requires real-time identification of seafloor condition and risk. Fast, low cost and accurate positioning will also help coastal managers to more accurately map Representative Marine Protected Areas throughout Australia and to monitor environmental impacts.

Framework to identify potential marine habitat distribution
Applied to the Recherche Archipelago
Source: Euan Harvey



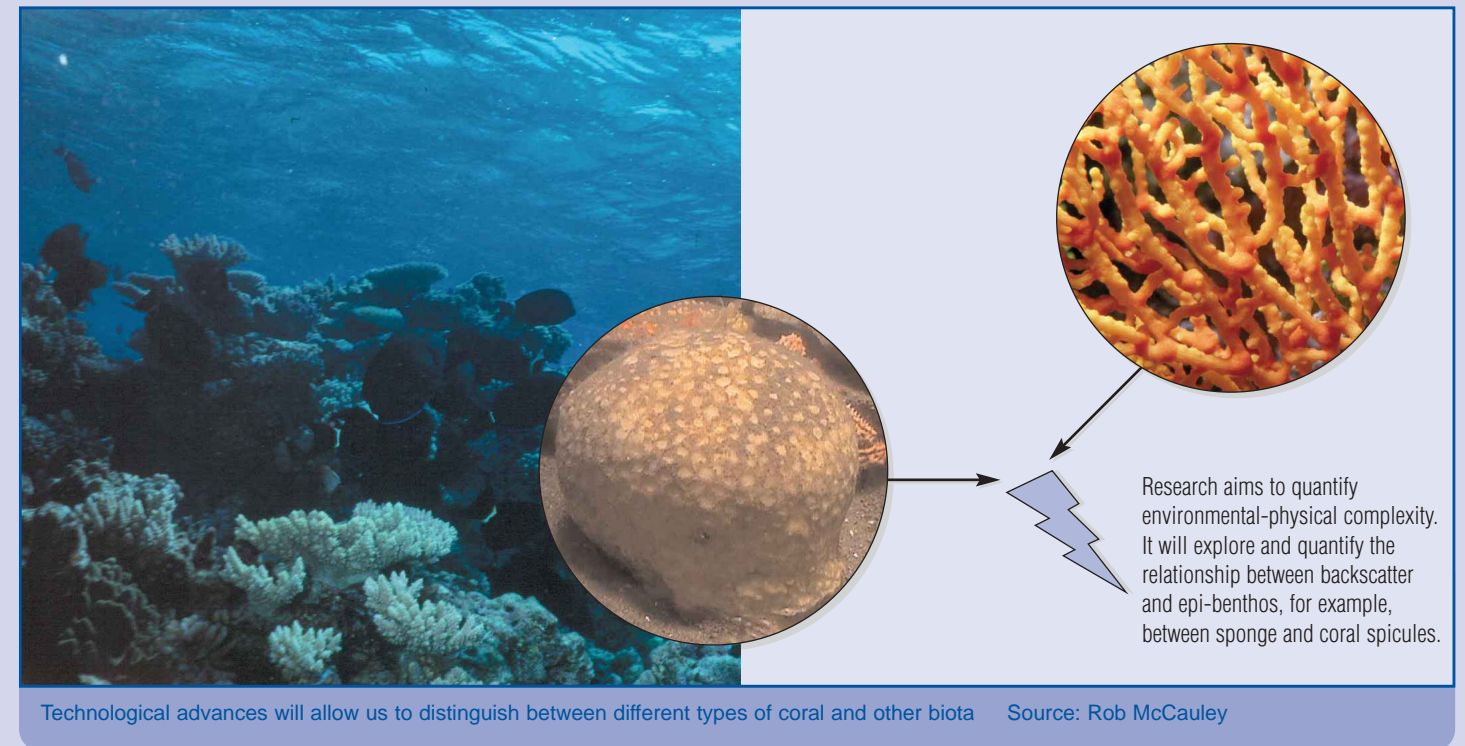
Commercialisation

The project, with its partner organisations, will actively seek opportunities for commercialisation. Commercial services include:

- Participating (either solely or in partnerships) in 'demonstration' projects to test technology in practical and commercial applications
- Facilitating training for coastal managers such as workshops and short courses
- Providing a 'consulting' service for shallow water marine habitat assessment, and
- Leasing of equipment

Technology

- Three major active acoustic instrument types will be used in the project: echo sounders; side scan sonars; and a specialised multibeam sonar system optimised for high definition sensing in shallow water.
- A range of stereo video instruments, coupled with sophisticated image processing software will be used to monitor and quantify marine biota in selected shallow water sites.
- The acoustic and video tools will be integrated with available aerial imagery, where water depth and clarity allows images of the seabed to be gained.
- A suite of geomorphological tools will be used in selected sites to characterise near-surface seabed geology.



Project Outputs

Current approaches used to map and monitor coastal environments can be significantly improved when used in conjunction with remote sensing techniques. While the techniques are not new, they may not have been previously used in this manner or at this scale to map and monitor the state of coastal ecosystems. One key output will be the development of a 'toolkit of techniques and interpretation'. The toolkit will provide an effective suite of decision tools to monitor progress towards sustainability. It will provide guidelines for a range of techniques and interpretations available for use, and include:

- A database driven 'chooser' program which allows potential users to select specific technologies to suit their management requirements
- A series of completed habitat mapping programs
- Techniques and software suited for commercialisation
- Techniques to provide shallow water classification by interfacing relevant biological information together with the technical outputs from related sub-projects, and
- Available technologies and interpretations that allow cost-effective habitat classification, geomorphic process changes and performance measurement at a regional scale

