



Do you have an affinity with water and the oceans? Are you interested in unlocking nature's secrets and solving important problems in Marine Science and Technology? If so, you may wish to undertake further study and research with Curtin's Centre for Marine Science and Technology.

### Overview

Seventy one percent of the Earth's surface is covered by water. The deepest point in the ocean is over two kilometres deeper than Mt Everest is high. There is still a great deal we need to learn and understand about the science of water and the oceans in order to utilise and manage this important resource.

Have you ever wanted to walk on water? Some of our students and scientists have - on frozen water that is... in the icy climes of Antarctica as shown in the image above.

The Centre for Marine Science and Technology (CMST) is a multi-disciplinary research group located at Curtin University of Technology, and is devoted to the development of technical ocean related skills in Australia. The Centre has earned a reputation as a high quality marine technology research and development facility responsive to industry and government needs.

CMST conducts research in the following areas:

- \* Marine Acoustics - e.g. developing equipment which uses underwater sound to perform centimetre accurate measurements of shipwrecks.
- \* Surface Vessels - e.g. measuring ship motions on vessels such as the catamaran ferries manufactured by Austal Ships.
- \* Yacht Technology - e.g. supporting the campaigns of several America's Cup syndicates with hydrodynamics testing and performance prediction.
- \* Marine Bioacoustics - e.g. assessing the effect of marine seismic surveys on marine animals such as whales and fish.
- \* Underwater Technology - e.g. developing underwater stereoscopic video cameras for use on underwater remotely operated vehicles.
- \* Antarctic Science - e.g. developing equipment for measuring sea ice thickness.

Physicists play an important role in Marine Science by measuring, analysing and predicting physical processes, developing hardware and software to aid marine research tasks and assessing the environmental impact of human activities.

Marine Science research may be undertaken by third year and honours science undergraduates with the relevant prerequisites in physics. More substantial research projects are available in PhD or MSc (Research) programs, which may be undertaken by honours graduates from relevant disciplines. Postgraduate coursework studies in Marine Science, including Masters and short courses, are available through the Centre and the Department of Applied Physics.



# Marine Science and Technology

## Research Facilities

CMST's array of specialist equipment and facilities allow its students and staff to conduct a wide range of marine based research.

- \* An 8 metre research catamaran, the 'Educat'
- \* Underwater sea noise recorders and other data logging equipment
- \* Underwater 3D and 2D, video and still cameras
- \* A TSS 335B ship motions sensor for use in full-scale ship and yacht trials
- \* HPASS High Precision Acoustic Surveying System
- \* Waterfront Research Facility at Jervis Bay

## Highlighted publications

R D McCauley, et al (2000) 'Marine seismic surveys: analysis and propagation of air-gun signals; and effects of exposure on humpback whales, sea turtles, fishes and squid' prepared for the Australian Petroleum Production Exploration Association.

D Harris, et al (2000) 'Towards Predicting Downwind Performance of Yachts on Following Seas', 7<sup>th</sup> International Conference on Stability of Ships and Ocean Vehicles, Launceston, Tasmania.

## Why Marine Science?

Most Australians live close to the ocean and are increasingly using the sea for recreation, industry and research.

Marine Science and Technology is a major field of Australian scientific endeavour. With one of the world's largest Exclusive Economic Zones surrounding our coastline, Australia has a major commitment to the study of ocean related technologies. Western Australia is undergoing rapid growth in marine science and technology, illustrated by expanding offshore oil and gas developments, a burgeoning ship-building industry, local Royal Australian Navy ships and facilities, and major environmental and resource studies of the continental shelf. These projects and others will continue to create positions in industry and government for staff with marine science experience.

## National and International links

Western Australian Maritime Museum,  
Australian Antarctic Division,  
MARINTEK (Norway),  
Scripps Institution of Oceanography (USA), etc

CMST has a strong tradition of national and international collaboration. Examples of Curtin Marine Science collaboration include:

- \* Work on the dynamics of large cargo vessels with the Norwegian research institute MARINTEK
- \* Collaboration on the Acoustic Thermometry of Ocean Climate project led by a multi-national consortium
- \* Preparatory work for the Nuclear Test Ban Treaty project led by the United Nations
- \* Development of yacht sail imaging software for the oneAustralia America's Cup Syndicate and the Australian Yachting Federation, coaches of the Australian Olympic Yachting Team

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