

Impact of land use in focus

Australian Institute of Marine Science researchers are studying the impact of human activities, such as land-based pollution and habitat destruction, on the ecology and biogeochemistry of important habitats and species in tropical coastal waters. Their research findings have the potential to impact all of us now and into the future

THE Australian Institute of Marine Science (AIMS) brings together some of the world's best expertise and capacity in marine science.

Its research findings potentially impact on the lives of all of us and so visitors to the North Queensland Field Days are urged to take an interest by visiting the AIMS stall during the event.

Since the main AIMS laboratories opened at Cape Ferguson, 50km from Townsville, about 30 years ago, AIMS researchers have built international reputations in three broad areas of science – coastal processes, marine biodiversity and conservation, and marine biotechnology.

The Coastal Processes Group at AIMS draws upon a unique combination of strengths in physical and biological oceanography, as well as biogeochemistry.

It focuses on the coastal zone, where land meets sea, a place where multiple environmental impacts are imposed on an area already subject to rapid ecological change. AIMS supports research into the impact of human activities (land-based pollution, habitat destruction, etc.) on the ecology and biogeochemistry of important habitats and species in tropical

coastal waters. Much of this research is commissioned by clients with a commercial or regulatory interest.

Some of the projects now running in the Coastal Processes Group are:

■ **Continental Shelf Biogeochemistry:** The continental shelf is a repository for river borne materials, which include natural and contaminant elements. AIMS supports research into the carbon, nitrogen, and phosphorus cycles, hydrocarbons, trace elements and pesticides.

Natural radioisotopes provide tracers for water and sediment movements across the shelf to the continental slope. Current tasks include sediment fluxes on the North West Shelf, natural hydrocarbon and ground water seeps in the Timor Sea and studies of land-based pollution of the Great Barrier Reef Lagoon, and the Gulf of Papua.

■ **Biological impacts of Excess Nutrients in Marine Ecosystems:** Public concern has been expressed about water quality in some inshore sections of the GBRWHA due to increasing levels of dissolved and particulate nutrients found in coastal rivers. AIMS supports research into the ecology and nutrient cycles of marine ecosystems adjacent to modified catchments. These areas are being compared

with similar ones adjacent to unmodified catchments in order to detect the biological impacts of higher nutrient levels upon individuals, species and communities.

■ **Bioindicators of Sublethal Stress in Marine Organisms:** Chronic impacts arising from shore-based human activities are difficult to detect through surveys of abundance or condition. Physiological markers have more potential to reveal environmental stress and this project seeks sensitive biomarkers to determine baselines for future monitoring.

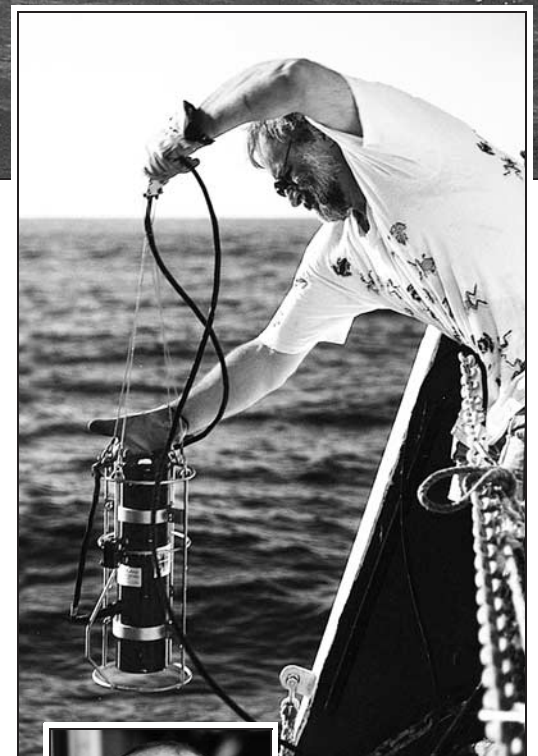
Biomarkers are being developed currently for animals from riverine, lagoonal and coastal reef habitats in North Queensland, seeking evidence of pressure from land-based pollution.

■ **Coastal Environments in Northern Australia and South East Asia:** AIMS supports multi-disciplinary research in the coastal zone to improve food security and environmental quality for coastal communities reliant upon marine resources.

Studies of mangroves, prawn and fish stocks, and water quality contribute to coastal management plans, impact assessments and community-based developments. Much of the work is done collaboratively with other research providers and/or community support.



AT SEA . . . the AIMS research vessel Lady Basten in the field



ABOVE: AIMS scientist John Carleton deploys a radiometer at sea
LEFT: AIMS chief executive officer Professor Stephen Hall