Scientists making waves with wireless ocean monitoring

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The Great Barrier Reef and other sensitive environments could in future be managed with the help of a marine wireless network developed by University of Queensland (UQ)-led research.

The $2.7 million Smart Environment Monitoring and Analysis Technology will enable environmental managers and researchers to use real-time information sent to their laptops from underwater sensors, and to command the system remotely so it is adapted to their immediate needs.

Queensland Premier Anna Bligh announced a $1.1 million boost for the project - which includes researchers from Australia and Italy - from the National and International Research Alliances Program.

Early work will include a pilot network of underwater sensors at Heron Island and Moreton Bay in Queensland, and Lake Como and Portofino in Italy. The pilot will be the basis of a more elaborate network as the three-year project proceeds.

Project leader Associate Professor Ron Johnstone, of UQ's Centre for Marine Studies, said fist-sized sensors will report initially on marine or coastal habitat health, light, temperature, turbidity and salinity. They would later report on coral pigment levels and on biofilms on underwater surfaces such as rocks and dead corals.

“We want to bring about a fundamental shift in our capacity to manage

marine and coastal ecosystems," Dr Johnstone said.

"Central to this project is the use of radio underwater. These signals will relay data and user dialogue between the underwater sensors and the surface network. The surface network will connect to the internet which will carry the data to users, allowing them to interact with the sensors in the field from their desktops.

"This technology could also apply to dams, transport networks, power distribution networks, industrial processes, and other complex process systems that currently involve substantial costs for monitoring.

"We'll develop a wireless system that is cost-effective, and simple to set up and use. We won't reinvent existing technologies or methods, but will instead build on and complement relevant work that is already underway in areas such as the Great Barrier Reef."

Welcoming the government's funding, UQ Vice-Chancellor Professor Paul Greenfield said the project had great potential to dramatically improve responses to global warming.

"Accurate and timely measurement of marine environments is vital to good management of our oceans and waterways, and hence to the state of our terrestrial environments, economies and health," Professor Greenfield said.

The project team is from UQ's Centre for Marine Studies and School of Information Technology and Electrical Engineering; Politecnico di Milano; Politecnico di Torino; Torino Foundation; Danish Hydraulics Group Australia; the Queensland Cyber Infrastructure Foundation and James Cook University. It is also supported by the Australian Research Council Research Network on Intelligent Sensors, Sensor Networks and Information Processing.

Professor Greenfield said the Italian collaborators are experts in network systems design and areas of sensor technology.

“This complements the IT and network expertise in Queensland and also utilises our leading-edge knowledge of the environmental application and implementation of such systems.”

Provided by University of Queensland