

Dr Robin Beaman at work in the Operations Room on the RV *Southern Surveyor*.

Charting the depths

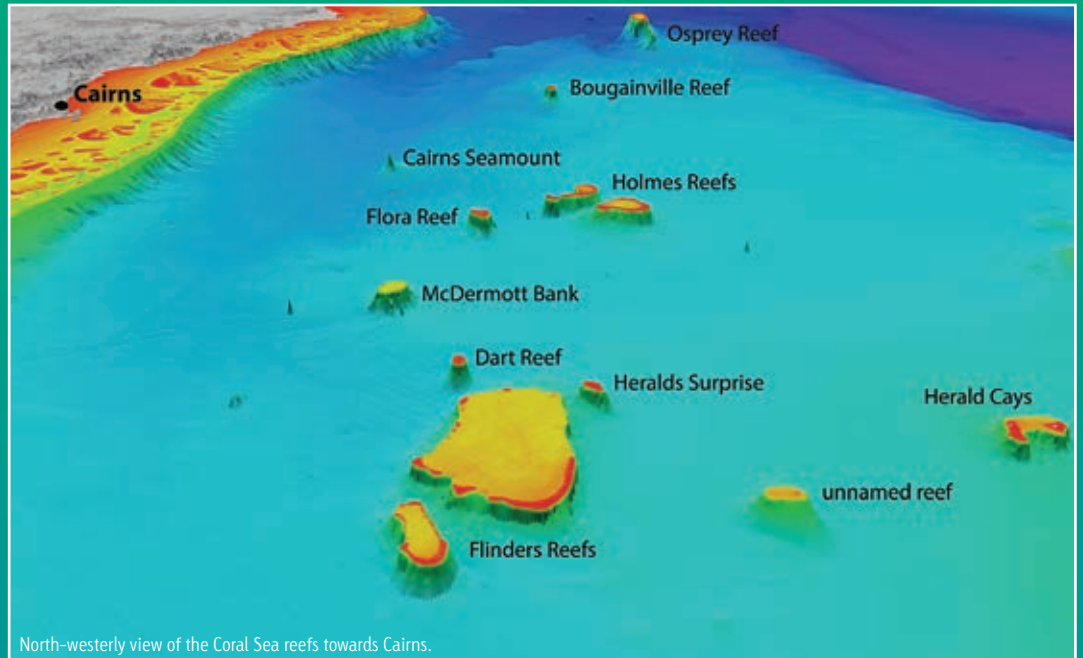
Looking where few have looked before, a JCU researcher has completed detailed 3D depth maps of Australia's Coral Sea reefs.

Dr Robin Beaman's work has shed new light on the likely distribution of coral diversity and sea life in the area.

Mapping these offshore reefs has always been a challenge, because their remote locations and shallow nature has meant it has been difficult to use modern surveying techniques, such as vessel-mounted echo sounders.

Instead, Dr Beaman has worked with the German Earth observation company, EOMAP and used satellite imagery to develop 3D bathymetry (or depth) data over a large group of Coral Sea reefs.

"These reefs lie in clear, sunlit waters, so the Landsat8 images



North-westerly view of the Coral Sea reefs towards Cairns.



The RV *Southern Surveyor* berthed at Cairns prior to the submerged reefs expedition to the deep Great Barrier Reef.

were able to provide high-resolution data down to a depth of about 50 metres," he said.

“By refining the satellite data and merging it with existing data, I've produced 3D depth maps for these reefs. That gives us a much more detailed picture than was previously available.”

The project focused on the reefs on the Queensland Plateau, which lie within the waters of the Coral Sea Commonwealth Marine Reserve.

While many of the largest reefs have been progressively mapped by the Royal Australian Navy using their LADS airborne lidar bathymetry system, there are still large areas of shallow reefs with no detailed depth data over them.

"The Flinders Reefs, about 230km offshore from Townsville, were an ideal place to start, being close to the Australian mainland and lacking an accurate 3D map," Dr Beaman said.



Lowering the Conductivity/Temperature/Depth profiler in the Coral Sea on the RV *Southern Surveyor*.

"These are reefs that grew upwards from tilted continental blocks created when Gondwana was breaking up. The 3D images we now have of North and South Flinders Reefs are really stunning, showing classic atoll shapes with a shallow coral rim around a deeper lagoon.

"With this new 3D information we can now better predict where coral diversity is located around the edge of these reefs, because we know where we're likely to find the shallow and deeper coral communities," he said.

See page 18 for details of the book *Southern Surveyor - Stories from onboard Australia's ocean research vessel* upon which Dr Beaman conducted geoscience research in the deep Great Barrier Reef and Coral Sea. ©

Photos and images: www.deepreef.org



Science team on the RV *Southern Surveyor* during the expedition to explore submerged reefs on the deep Great Barrier Reef.



Deploying the Sirius Autonomous Underwater Vehicle from the RV *Southern Surveyor* off the Ribbon Reefs