



## MAPPING THE DEEP: VICTORIA'S SEAFLOOR REVEALED

New coastal mapping research is helping Victorians learn more about the geography and biology of our state, and helping plan for the conservation of spectacular underwater landscapes.

A team lead by Dr Daniel Ierodiaconou from Deakin University's School of Life and Environmental Sciences has now mapped 600 000 hectares of Victoria's coast from Anglesea to the 12 Apostles.

Technology developed over the past ten years has allowed Daniel's team to map in detail previously unexplored seafloor, which in turn provides a better understanding of the geophysics, topography and biology of the seafloor.

The images captured using sonar technology, towed video cameras and remotely operated vehicles reveal spectacular, previously unknown gardens of coloured sponges, forests of seaweed and seagrass meadows.

"People are really surprised by the features we've mapped – volcanic cones, lava flows and river systems that extend from what is now our coast," says Daniel.

"The study is also helping us identify critical habitat for marine organisms, which will help us to make more-informed decisions to ensure we manage marine reserves and fisheries for future generations."

This first ever detailed mapping of Victoria's seafloor comes 200 years after Matthew Flinders took basic readings from his boat in 1802.

"The results will redefine conservation planning, improve fisheries management and improve infrastructure planning to limit impacts on the environment," says Daniel.

To this end, the data being captured is being shared with other researchers, the commercial fishing industry and government agencies.

But the mapping has uncovered more than rich information on the lives of the 12 000 plant and animal species living on our coast – it has also led to valuable discoveries about the historical and cultural history of the area.

### A WINDOW ON THE PAST

Less than 15 000 years ago you could walk to Tasmania. Now the flooded terrain is being revealed.

Daniel's work is uncovering lost river systems and lagoons that would have supported Aboriginal communities before sea levels rose at the end of the last ice age.

The images of the seafloor also provide a snapshot in time, providing data that can help assess future impacts associated with climate change and other human activities.

The project can also help answer a range of questions about Victoria's natural history. For example, geneticists from Charles Darwin University were struggling to understand the distribution and population structure of a native freshwater crayfish (*Engaeus sericatus*) in Victoria. However, the genetic variations all begin to make sense when you can see that the animals were all living in extended river systems under what is now Bass Strait.





Dr Daniel Ierodiaconou



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### SURPRISING HISTORICAL FIND

But the findings go beyond natural history. Daniel's team have also uncovered some surprising features of cultural interest.

One example is the discovery of an early casualty of World War II – the United States merchant ship, the *MS City of Rayville*, which was sunk by a German mine off Cape Otway in 1940.

These kinds of discoveries hold cultural and historical significance for researchers and the public as Victorians gain a better understanding of their coastal environment.

### WHAT'S NEXT?

The research project, which received funding from the Australian Government, is a joint initiative of Deakin University, Fugro Survey Pty Ltd, the Australian Maritime College and the Victorian Partnership for Advanced Computing.

The area mapped so far only covers 12 per cent of the coast. It's now hoped that more funding will be obtained so that the mapping can continue to complete Victoria's entire coast.

### REFERENCES:

- D Ierodiaconou, S Burq, L Laurenson, M Reston, (2007). Marine habitat mapping using multibeam data, georeferenced video and image classification techniques: A case study in south-west Victoria. *Journal of Spatial Sciences*, 52, 93–104.
- M B Shultz, D Ierodiaconou, S A Smith, P Horwitz, A M M Richardson, K A Crandall, C M Austin, (2008). Sea-level changes and palaeo-ranges: Reconstruction of ancient shorelines and river drainages and the phylogeography of the Australian land crayfish *Engaeus sericatus* Clark (Decapoda: Parastacidae). *Molecular Ecology*, 17, 5291–5314.

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