'Extreme' corals could hold key to species survival

February 8 2016, by Marea Martlew

An example of the type of coral found in mangrove environments. Credit: Emma Camp

After months of planning there is one thing even the most prepared expedition leader can't control: the weather. For UTS marine biologist,

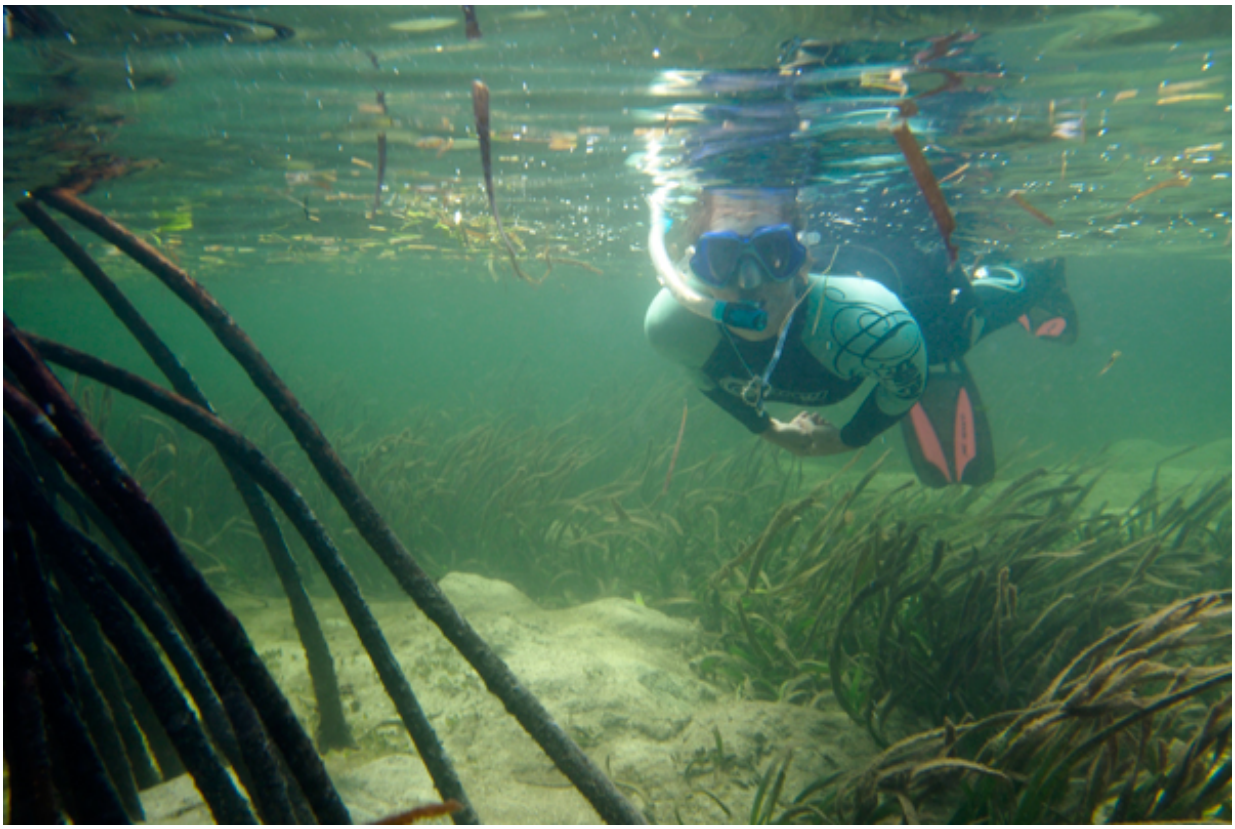
Associate Professor David Suggett, the stakes are high. He and a team of his researchers have only one week to locate and sample as many coral species as they can from a New Caledonian reef ecosystem with very special conditions.

"The corals we are looking for thrive in relatively acidic and hot mangrove waters; visibility is not great so they often go unnoticed. But that's why we're going there, we want to examine these unique coral populations to understand how corals can adapt and thrive to extreme environments that potentially represent the future for many reefs worldwide," Associate Professor Suggett says.

"Whilst we will also be using our research to better understand how corals have evolved to very different conditions in New Caledonia compared to the neighbouring Great Barrier Reef, it will critically inform the sort of habitats in Australian waters that may similarly harbour coral populations already adapted to extremes."

The expedition, a first for UTS, is a joint initiative with researchers from the IRD (Institute of Research for Development), a French research organisation with a long history of biodiversity and natural resource research in the Pacific region.

Dr Riccardo Rodolfo-Metalpa, a New Caledonian based marine biologist and senior scientist with the IRD, says the collaboration is an opportunity to collect baseline data that will fill some very big knowledge gaps, contributing to major initiatives in common to both countries.



Emma Camp sampling for corals a in mangrove environment. Credit: Emma Camp

"We will examine sites where the coral reefs are still untouched and not suffering from human-generated pollution," he says. "Despite the fact that among the 800 coral species described in the world, more than 401 were identified in New Caledonia by the IRD we are only starting to really uncover the diversity and abundance of corals here and, importantly, whether these corals are resilient to human stressors, including climate change."

Dr Emma Camp was awarded an Endeavour Research Fellowship to work with Associate Professor Suggett and his team in the Coral Ecophysiology Processes Team in the UTS Plant Functional Biology and

Climate Change Cluster (C3).

Her previous research was the first to show compelling evidence that seagrass and mangrove habitats neighbouring coral reefs worldwide can harbour a relatively broad diversity of coral species, despite their typically unfavourable environmental conditions for coral growth.

"Global research predicts a poor future for reefs. An important step in reef management is therefore identifying 'refuges' that will enable coral populations to thrive as most reef environments decline," she says.

"Samples collected on this expedition will help determine whether coral populations from mangrove waters are genetically identical as those from the neighbouring reef and therefore give new insight as to whether corals can keep pace with climate change. Alternatively, if these are genetically unique populations that have become effectively 'future proofed' they bring new value to local management and conservation strategies."

Associate Professor Suggett also emphasises that the project will have benefits beyond "the science of these fascinating systems" and says the collaboration with IRD as well as the level of local support has been phenomenal.

"Our work in the region is targeted to both the local government and local communities that depend on the reefs. Working with local organisations will enable us to directly pass on new knowledge of the reefs and how they function, and therefore build further capacity for our Pacific neighbours to manage for the impact of climate change on their natural resources."

The team will be in New Caledonia until 15 February.