

Expedition to unravel coastal seafloor's ancient secrets

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The JOIDES Resolution, one of the world's largest research vessels will be travelling up the NW coast, drilling cores at different latitudes to piece together a full record of ancient conditions. Credit: International Ocean Discovery Program (IODP)

International scientists who set sail from Fremantle today will use cutting edge technologies to peer 5 million years into the past to find clues about our future climate.

The eight-week \$20 million Indonesian Throughflow expedition, part of the International Ocean Discovery Program, will drill up to 1km into the seabed at six locations between the Houtman Abrolhos Islands (29°S) and the Rowley Shoals (18°S).

The 32 scientists onboard the JOIDES Resolution research vessel will examine the drilled cores, using the sediments and fossils within to identify the age of the layers and the processes that shaped their content.

Expedition co-Chief, University of Melbourne palaeoceanographer Associate Professor Stephen Gallagher says current records for the northwest (NW) shelf only go back a few hundred thousand years or provide only a partial record.

"With this expedition, we'll know for the first time what the upper half to 1km of this whole region of WA looks like," A/Prof Gallagher says.

This data will help answer questions about ancient conditions in the NW, including the origins and age of its reefs.

"Before we start answering the question of how reefs are going to react in the future, we really have to know what created them in the first place," A/Prof Gallagher says.

He says a version of the modern reef-forming Leeuwin current—which brings heated water from the Pacific down the NW coast via the Indonesian Throughflow—may have influenced the NW for more than a million years.

The scientists will be looking for evidence of this current and other reef-forming conditions in the drilled cores.

If they found fossils of Indo-Pacific origin it would indicate the warm

southward current was flowing, whereas spherical carbonate grains called ooids would signal the warm, shallow, carbonate-saturated oceanic conditions ideal for reef formation.

Unusual oil and gas origins

The expedition will also be investigating records of abnormal sea level changes on the NW shelf, information which may be useful to the oil and gas industry.

"The region just dropped 500m to 1km in a few million years, which is really amazing," A/Prof Gallagher says.

He says climatic or tectonic boundary processes that typically cause sea level variations cannot account for the magnitude of this rapid drop.

"There's some pretty unusual things going on," A/Prof Gallagher says.

"We have records that suggest Australia perhaps rode over a massive hole in the mantle and then sunk...But we're not really sure."

Provided by Science Network WA

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