

# Freshwater reserves under the sea

October 24 2019

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Professor Adrian Werner, from Flinders University's College of Science and Engineering, will speak at the Australasian Groundwater Conference on mining and groundwater management. Credit: Flinders University

Research at Flinders University is investigating and locating vital

freshwater hidden beneath the sea.

Flinders University Professor of Hydrogeology Adrian Werner is making important advances in assessing freshwater reservoirs that exist beneath the ocean, potentially providing innovative answers to escalating global water supply issues.

He is among several speakers at the Australasian Groundwater Conference being held at the Brisbane Convention & Exhibition Centre from 24-27 November.

"Since the late 1960s, [groundwater](#) scientists have been intrigued by evidence of freshwater beneath the sea, and in the following decades, understanding subsea fresh groundwater has advanced and is now understood to be a global phenomenon," he says.

"I've been studying the extent of freshwater under the sea, through my Australian Research Council Future Fellowship, and have made significant inroads into our current knowledge of offshore freshwater."

The work involving offshore aquifers has led to the publication of seven significant papers that cover a range of issues—from improving methods of obtaining offshore freshwater estimates, to better understanding how onshore events influence and affect subsea freshwater aquifers.

Several severe recent water shortages in [coastal cities](#) around the globe—including Cape Town during 2018—have raised the possibility of accessing offshore freshwater, even if only as an emergency measure.

However, Professor Werner warns that current knowledge of the extent of offshore freshwater is limited, and questions already exist whether humans are drawing on offshore freshwater reserves while pumping fresh groundwater from coastal aquifers.

"Our research is addressing whether we are already accessing offshore freshwater or whether this is a largely untapped resource that is yet to be exploited," he says.

Two papers have focused on offshore freshwater in key Australian coastal [aquifer](#) systems—in Perth and the lower southeast of South Australia.

"These are the first two attempts to study Australian offshore aquifers, and we found considerable offshore freshwater resources in both cases.

"These are ancient bodies of freshwater that are either in balance with onshore aquifer conditions or are in the process of depleting," explains Professor Werner.

He says another exciting area of research has been studying delicate freshwater resources on small islands, including Pacific nations where sea-level rise threatens their water supplies.

"We uncovered major revelations about Kiribati's freshwater resources that have implications for groundwater management more generally."

As well, Professor Warner recently completed an ARC Linkage project with the SA Government looking at the groundwater in floodplains adjacent to the River Murray.

"We made some remarkable discoveries about freshwater next to the river in otherwise saline aquifers that defies accepted knowledge on aquifer-river interactions," says Professor Werner, who was recently identified by *The Australian* newspaper as Australia's research field leader in Hydrology and Water Resources.

**More information:** Andrew C. Knight et al. Combined geophysical

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Provided by Flinders University

Citation: Freshwater reserves under the sea (2019, October 24) retrieved 27 April 2024 from

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