Scientists discover unusual underwater rivers along Australia's coastline

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Scientists from The University of Western Australia have discovered underwater rivers along most of Australia's continental shelf that are unique and do not occur at this scale anywhere else in the world. The research has been published today in *Nature Scientific Reports*.

The discovery was made using UWA-operated ocean gliders -

autonomous underwater vehicles that propel themselves through the water and collect important data about our oceans. The gliders are also part of the national Integrated Marine Observing System.

The underwater rivers form in winter months and are currently at their peak. They occur when heat loss causes shallower water to cool, resulting in dense water forming in the inner shelf. The water then flows offshore along the seabed and forms the underwater river.

Dr Tanziha Mahjabin, who completed the research as part of her UWA PhD thesis, said the work was the result of a huge amount of data collected using the Integrated Marine Observing System.

"The data spanned more than a decade and is the equivalent to spending more than 2500 days at sea," she said.

"We were able to examine data from different areas of Australia and also look at the seasonal variability."

Professor Chari Pattiaratchi from UWA's Oceans Graduate School and Oceans Institute said usually satellites were used to track surface features such as river plumes, but because the water flow was below the surface it was undetected until ocean gliders were deployed.

"This is the most significant discovery for coastal oceanography in recent decades, not only in Australia but globally," Professor Pattiaratchi said.

UWA co-author Dr Yasha Hetzel said simultaneous cooling of near-shore waters across the whole of Australia from heat loss had not been documented before.

"The coastal ocean is the receiving basin for suspended and dissolved

matter that includes nutrients, plant and animal matter and pollutants and represents an important component of the ocean environment, connecting the land to the deeper ocean," he said.

The scientists say the study highlights the importance of underwater rivers, which are a significant conduit transporting pollutants and plant and animal matter offshore.

More information: Tanziha Mahjabin et al. Occurrence and seasonal variability of Dense Shelf Water Cascades along Australian continental shelves, *Scientific Reports* (2020). DOI: 10.1038/s41598-020-66711-5

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