



Media Release

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WA-first artificial reef expands as coastal erosion research continues at the snorkellers' paradise

A West Australian-first artificial reef installed off C.Y. O'Connor Beach nearly three years ago for coastal erosion research has blossomed into a snorkellers' paradise.

The North Coogee engineered fringing reef is covered in macroalgae, seaweed and mussels, with underwater surveys recording twice the number of visiting fish species observed in the area before the reef's installation.

The City of Cockburn, in partnership with global marine and subsea services company MMA Offshore, doubled the reef's 135 concrete bomboras modules to 270 in November 2024.

Preliminary findings from research completed by The University of Western Australia (UWA) Oceans Institute indicates the reef has contributed to a 10 per cent reduction in wave height, while also reducing wave energy reaching the shoreline by 20 per cent, since its installation in March 2022.

City of Cockburn Coastal Technical Officer Chris Beaton said the interim research results were pleasing as the City continued to mimic nature as a way to help create resilient coastlines.

"Interim research results indicate the structures are having a positive effect on wave energy at C.Y. O'Connor Beach and we look forward to continuing to monitor the changing erosion rate over the next several years," Mr Beaton said.

"The reef has become a thriving habitat, with 57 species of fish observed, compared to just 29 before it was installed, plus 56 non-fish species including mollusc, starfish, sea urchin, anemone and jellyfish.

"Not only has the reef become a habitat for locally-occurring sea life and a valuable recreational asset for our community, the proliferation of marine flora and seaweed on the bomboras will increase its ability to reduce wave energy.



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“The City is exploring opportunities to continue monitoring impacts to coastal processes following the addition of the new bomboras modules.”

C.Y. O’Connor Beach is an erosion hotspot which has suffered the loss of more than 50m of shoreline over the past 20 years.

Research Associate Justin Geldard from The University of Western Australia Oceans Institute said preliminary research on the reef was promising.

“Early indications pointing to signs of wave attenuation as a result of the reef trial are promising but while wave attenuation is an important component of reducing coastal erosion, its causes at any particular site are usually due to a combination of factors,” Mr Geldard said.

“These can include coastal sand loss that cannot be solely addressed by local erosion mitigation measures.

“This is why it’s typical for multiple solutions to be necessary to address coastal erosion which can include a combination of recurring sand nourishment teamed with coastal structures.

“In the North Coogee scenario, the aim of the reef structures is to reduce the need, frequency and cost of sand nourishment in the future. Ongoing research will help gain further insights into this possibility.”

The reef has been designed by MMA Offshore with concrete bomboras constructed locally by Action Solution in Jandakot.

MMA Offshore Project Engineer Chloe Williams said the company’s tank testing at UWA demonstrated rows of fringing reefs could reduce wave energy.

“Testing showed rows are very effective at mimicking how natural reefs attenuate wave energy,” Ms Williams said.

“Nature-inspired solutions are critical tools for coastal engineers in the fight against erosion. The reef structures we deploy build what would take nature thousands of years to establish.



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“The mussels and seaweed that have colonised the C.Y. O’Connor Beach reef help improve its performance for wave attenuation as well as cleaning the seawater, providing a nursery for juvenile fish. Additionally, it’s a great place to snorkel.”

City of Cockburn Mayor Logan Howlett said the project’s second stage would comprise three new rows of 3.5-tonne bombora modules adjacent to the current reef structure, closer to the shoreline, making it even easier for people to access for snorkelling and diving.

“Installing the reef is the City’s response to community wishes for us to consider other options to protect our coast rather than traditional hard structures like rock walls and groynes,” Mayor Howlett said.

“The project also demonstrates how partnerships between all levels of government, private enterprise and the tertiary education sector can help devise solutions to the urgent issue of coastal erosion being felt in WA, around the country and throughout the world.

“We hope the results of this project will help other communities and local governments to look at new ways of addressing problems related to climate change.”

Stage two of the \$802,260 reef expansion was funded by the City along with a \$600,000 grant from the Coastal and Estuarine Risk Mitigation Program, part of the Australian Government’s National Emergency Management Agency funded by the Emergency Response Fund.

The project’s \$565,000 first stage was made possible with \$350,000 from the City, and \$214,349 from the State Government’s 2020-2021 Coastal Adaptation & Protection Grants program.

The UWA research team received a \$433,540 Australian Research Council Linkage Project grant and an additional \$150,000 from Subcon (now MMA Offshore) to establish a multifaceted research program to optimise the design of artificial reefs for coastal protection applications.

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