Rapid oyster reef restoration gives hope for repairing the sea

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After a century of functional extinction on the Australian mainland, a Flat oyster reef has been successfully restored along a metropolitan
Adelaide coastline.

Research by University of Adelaide marine scientists has revealed that the astonishing ecological recovery occurred within two and a half years of the reef being constructed, providing hope for the future of marine ecosystems around the world.

The results of the reef restoration have been published in *Restoration Ecology*.

"In late 2020, 14 limestone boulder reefs were constructed along the busiest coastline in South Australia, and it took just two and a half years for the habitat to become a thriving marine metropolis," says Dr. Dominic McAfee of the University of Adelaide's School of Biological Sciences.

"The rate of recovery of this particular restoration shows that even heavily degraded marine systems can retain a latent resilience that enables us to achieve rapid environmental recoveries through effective restoration efforts."

With no functional Flat oyster reef ecosystems on the Australian mainland, Dr. McAfee's research team used local rocky reef ecosystems and Australia's sole remaining Flat oyster reef, located in Tasmania, as reference models.

"At the restored reef, we have observed densities of restored native adult Flat oysters that exceeded densities observed on the Tasmanian natural reef," says Dr. McAfee.

"Communities of macroinvertebrates on the reef restoration represented approximately 60% of the biodiversity observed on healthy rocky reef reference systems, while ecological functions, such as filter feeding, are
demonstrably increasing.

"The rate of recovery of this benthic ecosystem demonstrates the latent resilience of degraded oyster communities and the capacity for effective marine restorations to achieve rapid ecological recoveries."

While oyster reefs were once common along Australia's southern coastline and created temperate reef ecosystems, they have become increasingly rare around the world.

"Destructive human activities, like seafloor dredging, which razes entire marine communities, have turned seafloors into structurally simplified habitats with little settlement substrata or localized adult oysters to seed recovery," says Dr. McAfee.

"Globally, 85% of oyster reefs have been lost, and on many coastlines these ecosystems were near obliterated."

The reefs are particularly important for the function oysters play in the ecosystem.

"Oysters are ecological superheroes that function like trees in a forest or coral in tropical seas," says Dr. McAfee.

"They provide habitat for many other marine animals, boost fish production, protect shorelines from stormy seas, and even clean the water with their filter feeding."

Dr. McAfee says the results of this project will have implications for lost oyster-reef ecosystems around the country.

"We've lost oyster reefs over thousands of kilometers of Australian coastline. This rapid recovery shows we can bring them back rapidly and
can serve as a template for other projects on how to bring these reefs back," Dr. McAfee says.


Provided by University of Adelaide


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