



ReefSystems

Innovative solutions to stimulate biodiversity

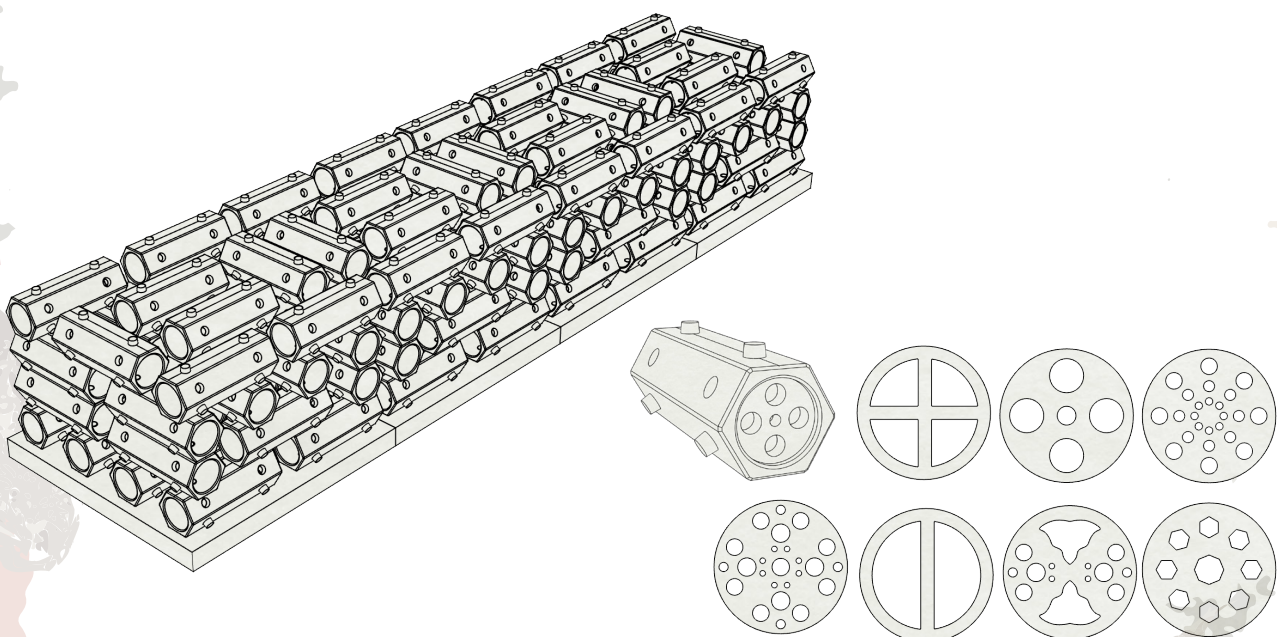


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Artificial reef installations restore damaged ecosystems by attracting marine life and stimulating biodiversity in the area. The Modular Sealife System (MOSES) is a modular building system to construct eco-inclusive maritime constructions such as submerged breakwaters, anchoring for aquaculture or riverbank reinforcements. After installation these structures function as artificial reef for different forms of marine life to find food, shelter and a safe space to reproduce. The outside surface has a rough texture, which functions as hard substrate for shellfish, sponges and corals to grow on. The inside has a smooth surface, in order for it to stay accessible for marine life and not become overgrown. To create different microhabitats, the modules can be modified with different dividers, wherein smaller fish can hide from bigger predators. This results in one MOSES-installation being a successful habitat for a wide variety of species.



Proof of concept

The MOSES-module in the photos below has been placed in the North Sea Channel for 12 days. In this period the module has become overgrown with algae. We have also spotted one mitten crab, several mussels, numerous tube worms and a high amount of various organisms, which serves as food for fish and other marine creatures.



Pilot installations at Haringvliet

In collaboration with Wageningen Universiteit & Research (WUR), Sportvisserij Nederland and Bureau Waardenburg 30 modules have been installed in Haringvliet, the Netherlands in June 2019. The artificial reefs are currently being monitored periodically by researchers from WUR and the first research results are promising. With the eDNA research technique they have successfully identified 17 different fish species that are actively using the reef, as well as mussels. These mussels have a filtering effect on the water and thereby improving the quality, which is obligatory due to European standards.

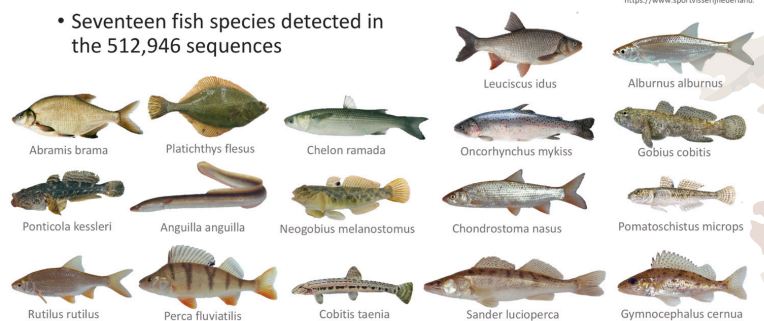


1 year after installation

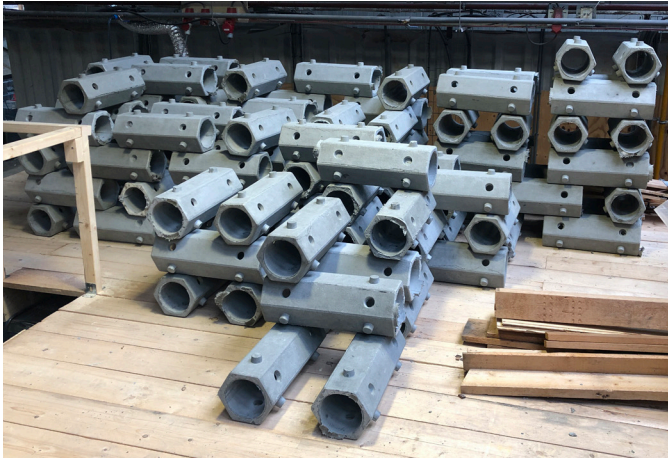
Detected fish species

Results

- Seventeen fish species detected in the 512,946 sequences



Detected fish species (eDNA research)



Production process

The modules are produced with glass fibre reinforced concrete. This innovative method allows the production of thin strong products, suitable for the marine environment. The modular system enables the construction of maritime structures of similar size and strength with 40% less materials compared to traditional methods. With the use of blast furnace cement and recycled concrete we are able to reduce our CO₂-emissions with 50%.

Installation process

The Modular Sealife System can be installed in various ways. Structures can be built up on a frame on land or on a ship, where after they can be submerged using a crane. With lifting balloons, it would be possible to transport the complete structure through the water. For more stability and weight is also possible to replace the iron frame with a stelcon plate.



Reef installation in Amsterdam



Reef installation in IJmuiden

Shimoni, Kenya



Haringvliet, the Netherlands



Community involvement

For installations on locations with limited resources MOSES can be built up underwater. This stimulates the economy by involving the local community.

Transportation

For orders from outside the Netherlands the modules will be transported on pallets to the specific location. The cargo can be transported FOB or CIF.

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