Climate proof sea defences with a green twist

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Sturdier protection is vital to defend coastal areas from the expected sea level rise associated with global warming. But nature's protection also needs to be part of the equation.

Coastal areas offer great challenges when balancing the need to protect natural habitats, with the requirement of human and economic activities. Dikes, for example, may not constitute the solutions of the future. That's because they usually mean destroying the vulnerable habitats of seaside plants and animals. Other coastal features such as harbours need to remain accessible for shipping. Meanwhile, waterways have to be dredged. But these activities are usually harmful to nature.

The EU funded Theseus project is thus gathering all relevant scientific knowledge to develop a systematic approach to deliver a safe, natural and climate-proof European coast. This is no mean feat. The EU coastline extends over 17,000 kilometres. It is home to 70 million inhabitants. The estimated value of the assets within 500 meters from the coast rises to a staggering 1,000 billion Euros.

The Scheldt estuary has been used one of the test cases of the project. It is the passageway to the sea from the harbour of Antwerp in Belgium. It pours out into the North Sea in the south-western region of The Netherlands. Many innovative measures have been taken there both to protect nature in the estuary and to keep the Antwerp harbour accessible for large ships. "In the Scheldt estuary the material we dredge up from the main shipping channel is since 2010 no longer deposited in the secondary channels. Instead we add it to the edges of existing tidal flats," ecological Engineer Leo Adriaanse tells youris.com. He is also a senior advisor for Rijkswaterstaat, the Dutch governmental organisation for water management.

This approach has many advantages. "In this fashion we create low-dynamic, shallow water areas, beneficial for fauna development," he adds, "also, we'll try to enlarge the estuary in some places to allow the water more space. We intend to realign some existing dikes in order to let the water flow in freely." Behind those old dikes, Adriaanse explains, new ones will be built. In this fashion the rising sea can gradually fill in the space between the old and the new dike by depositing silt. In time, the result will be a very strong defence against the sea. At the same time, a brackish marshland where nature can restore itself.

Some experts welcome this innovative solution. "Yes, it's a good idea not to disturb natural side gullies," says Jean Berlamont, professor of hydraulics at the University of Leuven in Belgium, and a specialist of the Scheldt estuary. "What's more, shallow areas are perfect to make waves

dissipate their destructive power gradually , so enlarging them by redistributing dredged up silt is both good for nature and safety," he adds.

But other are doubtful of whether this approach will be that beneficial. "I think dredging is always detrimental for nature, never mind how you do it," comments Beatrice Claus, a biologist working for the World Wildlife Fund in Hamburg , Germany, and an expert on the Elbe estuary. "And isn't it a bit strange to destroy nature in one spot, and then clumsily try to recreate it in another? As far as I'm concerned this ever deeper dredging should simply stop," she tells youris.com.

What Claus does like, however, is the fact that the Dutch no longer choose the simplest solution anymore—that is raising the existing dikes. "If only [German] authorities would do that," she says, "[It is] so much better for the environment." This solution may, however, not be that easy to adapt to other coastal areas. To implement this solution, she notes: "you need flood planes for safety, and near Hamburg space is at a premium."

More information: www.theseusproject.eu/

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