

## Sustainable Ports

Is it possible for ports to develop so that nature and the environment benefit? Building with Nature provides openings here. EcoShape is looking at how this works in various pilot projects in the Dutch Wadden area.

salt marsh naturally, providing important resting and feeding grounds for a range of wading birds. Over a period of three years, the project will look at the best location to deposit the sediment, how it spreads and how it contributes to the development of the salt marsh. The partners are Fryske Gea and the Harlingen municipal authority, and the Waddenfonds is contributing to the financing.

## Koehoal salt-marsh development using a Sludge Motor

In the Koehoal salt-marsh development project in Friesland, EcoShape is looking at whether clean sludge from the port of Harlingen can be used in a 'Sludge Motor' to extend a salt marsh. The clean sludge will be deposited in a carefully selected location from where the current will take it to the salt marsh. This will lead to the creation of a Sludge Motor that will deliver extra sediment to the salt marsh. As a result, young salt marshes and sludge banks will be added to the



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For more information on the EcoShape projects check [www.ecoshape.nl](http://www.ecoshape.nl)

# EcoShape Building with Nature

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# Foreword

Building with Nature is the planning, design, construction and maintenance approach that draws as much as possible on ecosystem services and delivers as many ecosystem services as possible. Ecosystem services are the benefits that nature generates for society, as when dunes act as coastal defences and when rivers provide leisure facilities and serve as a source of food. The aim of the Building with Nature programme, which is implemented by the Ecoshape foundation, is to encourage the use of Building with Nature in hydraulic engineering solutions. That is why Ecoshape develops knowledge in pilot projects, distributing it to everyone involved in hydraulic engineering projects. Building with Nature still looked like a distant dream some years ago, but

it has been standing practice in the United States since 7 October 2015, when the White House issued instructions to all federal departments to include ecosystem services from then on in all their decision-making processes. We can safely assume that this good example will be followed up and so it has become even more urgent to develop the knowledge required. This brochure will provide you with an impression of our programme's activities. We believe we can make a positive contribution to the successful implementation of Building with Nature!



Henk Nieboer,  
Ecoshape Director

## Mangrove restoration in Indonesia

The coast of North Java in Indonesia is suffering from severe erosion. In the Demak district near Semarang, an Ecoshape consortium led by Wetlands International is working with the Indonesian Ministry of Marine Affairs and Fisheries and Public Works on the restoration of mangroves on the coast. Mangroves supply a range of ecosystem services. They prevent further erosion of the coast, improving flood risk management as a result, and

open up opportunities for the economic and social re-development of the area. Mangrove restoration in Demak involves the use of a series of relatively cheap wooden barriers that capture sediment by reducing the impact of waves behind them. The result is a sheltered area where mangroves can recover. In addition, the partners are developing sustainable forms of aquaculture behind the mangroves with the aim of generating sustainable income for the local people.



## Natural Flood Defences

Using Building with Nature in the design of water defences provides multiple benefits. In addition to flood risk management, opportunities are also created for, among other things, leisure, nature development and food production. Ecoshape is engaged in a range of pilot projects, developing knowledge about Building with Nature in the design of flood defences.

## Sand Motor

The maintenance of the Dutch coast consists, broadly speaking, of a five-year cycle of sand nourishment. Is it possible to make savings in this area, and to make maintenance more natural and sustainable while generating added value for leisure activities? Ecoshape is studying these questions in collaboration with Rijkswaterstaat and the Provincial Authority of South Holland in the Sand Motor project. In 2011, to the south of The Hague, a large sand bank was created that will be spread along the coastline by the wind, waves and currents over a period of about twenty years. It will supply the beaches and dunes with new sand in a natural way, providing protection against sea-level rise and, at the same time, creating extra space for nature and leisure activities. Large numbers of people have already discovered the Sand Motor as a place to spend their leisure time and nature is flourishing.



## Sustainable Delta Cities

By 2030, 80% of the global population will be living in delta cities and coastal areas. As a result of climate change, pressure on those cities is increasing, with major social and economic effects as a result. Building with Nature offers concrete solutions for climate adaptation by improving flood risk management and the habitability of delta cities.

## Case Stadswerven Dordrecht

The project Stadswerven is located in the town of Dordrecht. It is a former business area which will be transformed into a housing area. At the shore of the river Merwede Building with Nature concepts are used for the design of a public park with a strong water and shore related ecosystem, thereby creating opportunities for nature and recreation. Partners is the municipality of Dordrecht.

