

# Marker Wadden

## The making of a new bird paradise

### History

#### • Markermeer

The Markermeer (Lake Marken) is one of the largest fresh water lakes in Europe and is recognized as Natura 2000 area. It was created in 1976 with the construction of the Houtribdijk, a dike connecting Enkhuizen and Lelystad.

#### • Mud problem

Since 1976, thick yoghurt-like silt has appeared on the bottom of the Markermeer. This layer of mud smothers all the soil life. Moreover, the layer of mud already starts to move at wind force three, making the Markermeer an immense bath with turbid water for a large part of the year.

#### • Ecological situation

The realisation of the Houtribdijk isolated the Markermeer from the IJsselmeer and the Wadden Sea. This caused degradation of the ecosystem and accumulation of mud within the lake. Degradation resulted in increasing disappearance of benthos, a lack of vegetation growth and thus created a poor habitat for a healthy fish population. All these changes together had and still have a negative impact on characteristic bird species of the Markermeer area.

### Dream

Natuurmonumenten as nature conservation organization aims to solve the enormous mud problems in the Markermeer. Therefore they developed the extraordinary idea of building the Marker Wadden, a string of new islands and coastal habitats in the Markermeer. These are located along at the east side of the Markermeer. Supported by contributions of the Dutch Postcode Lottery Dream Fund and in pro-active cooperation with other stakeholders, 10.000 hectares are designated as water and nature area.

#### • New nature

In the first phase of the project, mud will be used to build 1000 hectares of new atolls consisting of shallow lagoons, mud flats, large reed fields, and beaches. Also an underwater landscape of mud trenches and deeper sand pits is created. To protect the Marker Wadden against erosion by the dominant south-western winds, an artificial reef construction will be developed.

#### • Ecological recovery

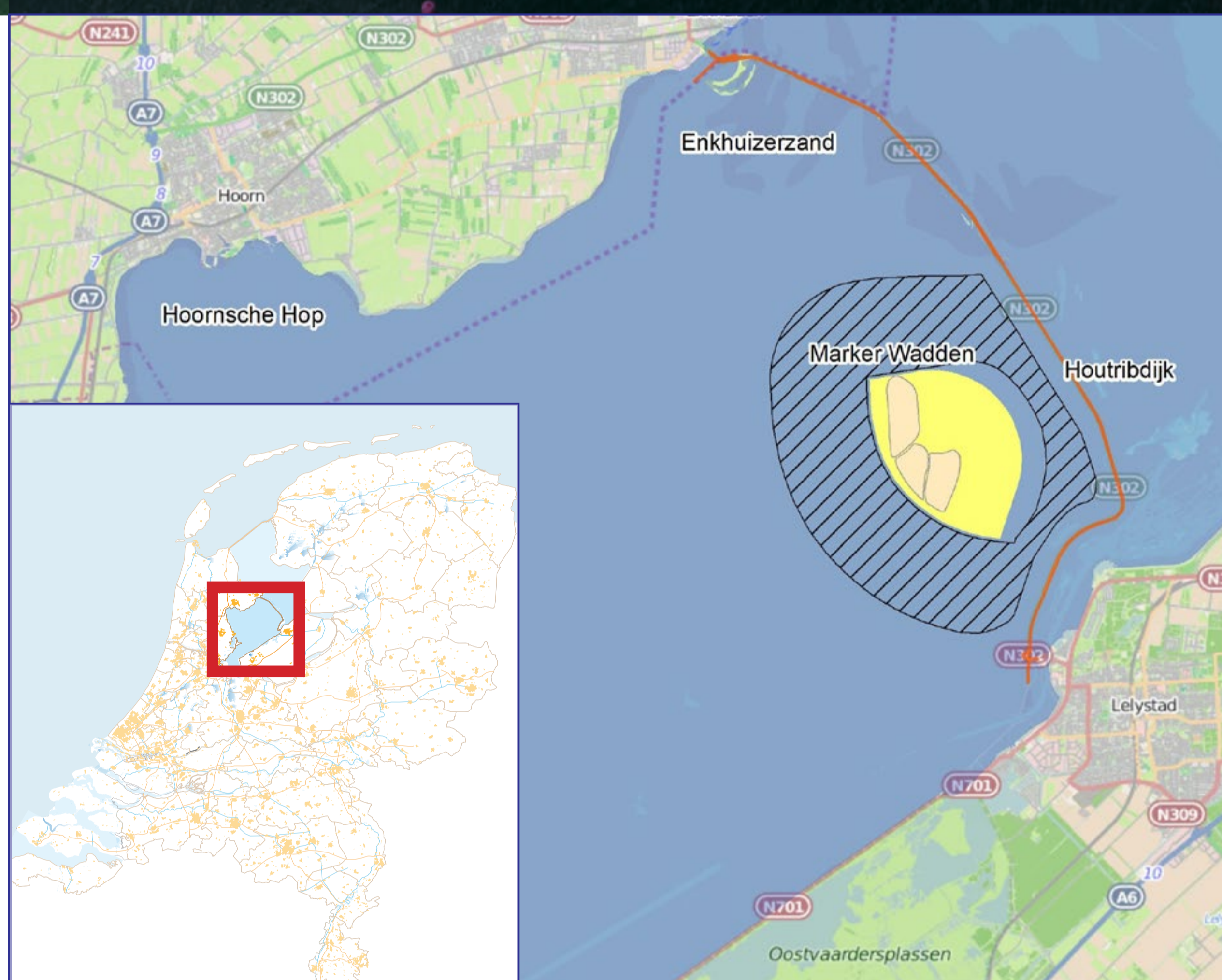
The development of the Marker Wadden diminishes the problem of floating mud throughout the Markermeer. By doing this the ecological status of the lake will be improved. Flora and fauna, mussels, zooplankton, benthos and fish (Spiering) will thrive, reinforcing the ecosystems' functioning!

#### • Bird paradise

In this new nature paradise, the White-tailed sea eagle, the Osprey, the Red-crested pochard, the Black stork and the Dalmatian pelican will hopefully reclaim their breeding grounds in the Netherlands.

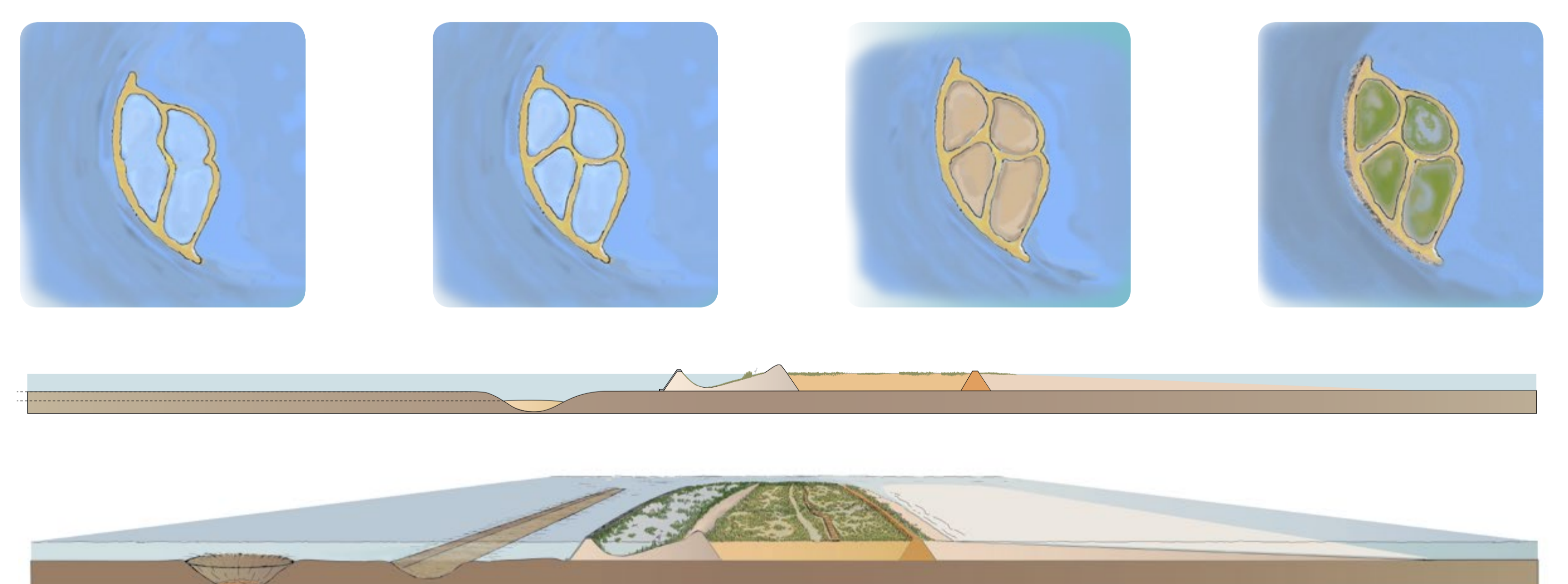
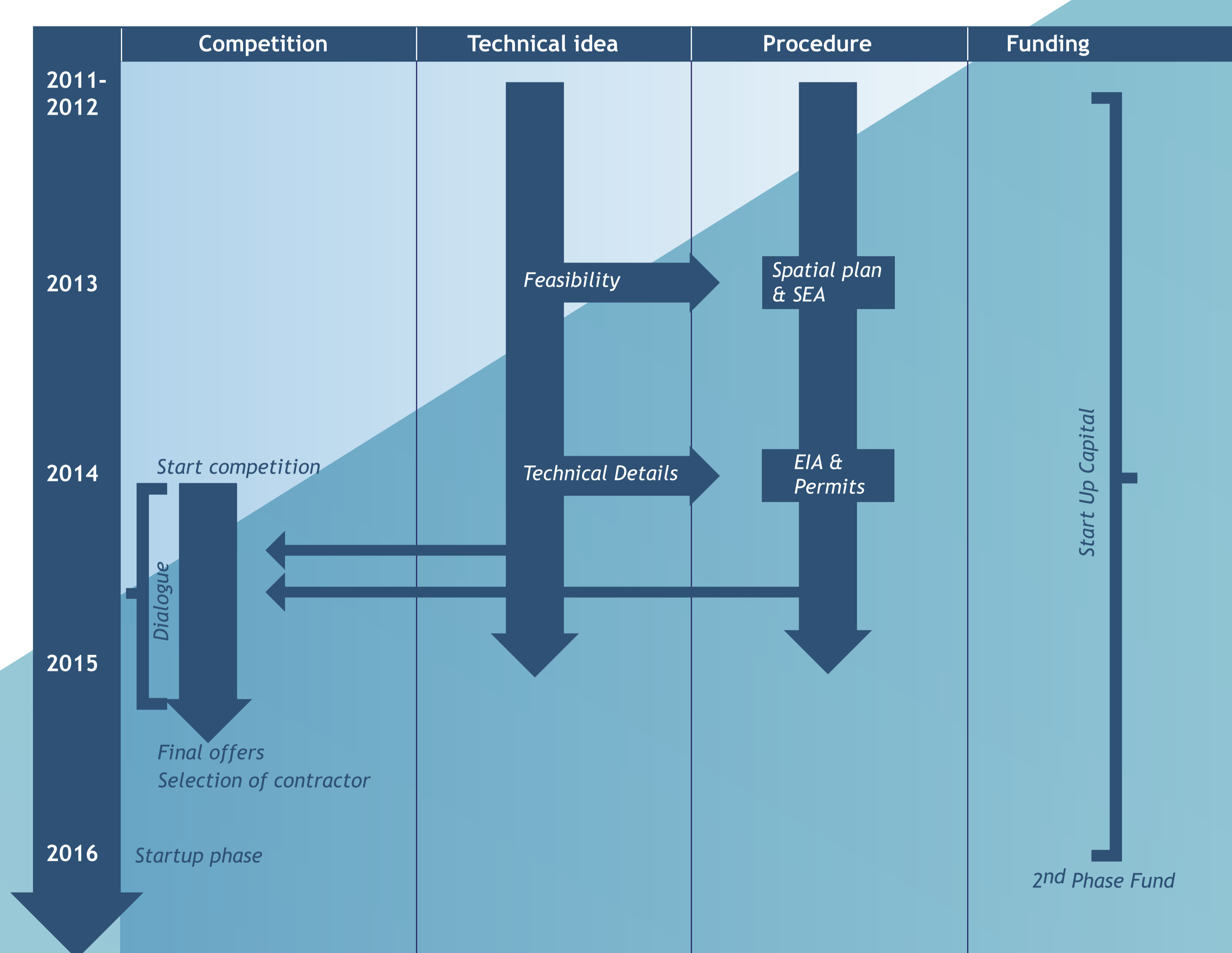
#### • Recreation area

They not only create new nature but also offer experience for water sports enthusiasts and holiday-makers. By doing this, the economic value of the area increases and the local economy around the Markermeer will benefit.



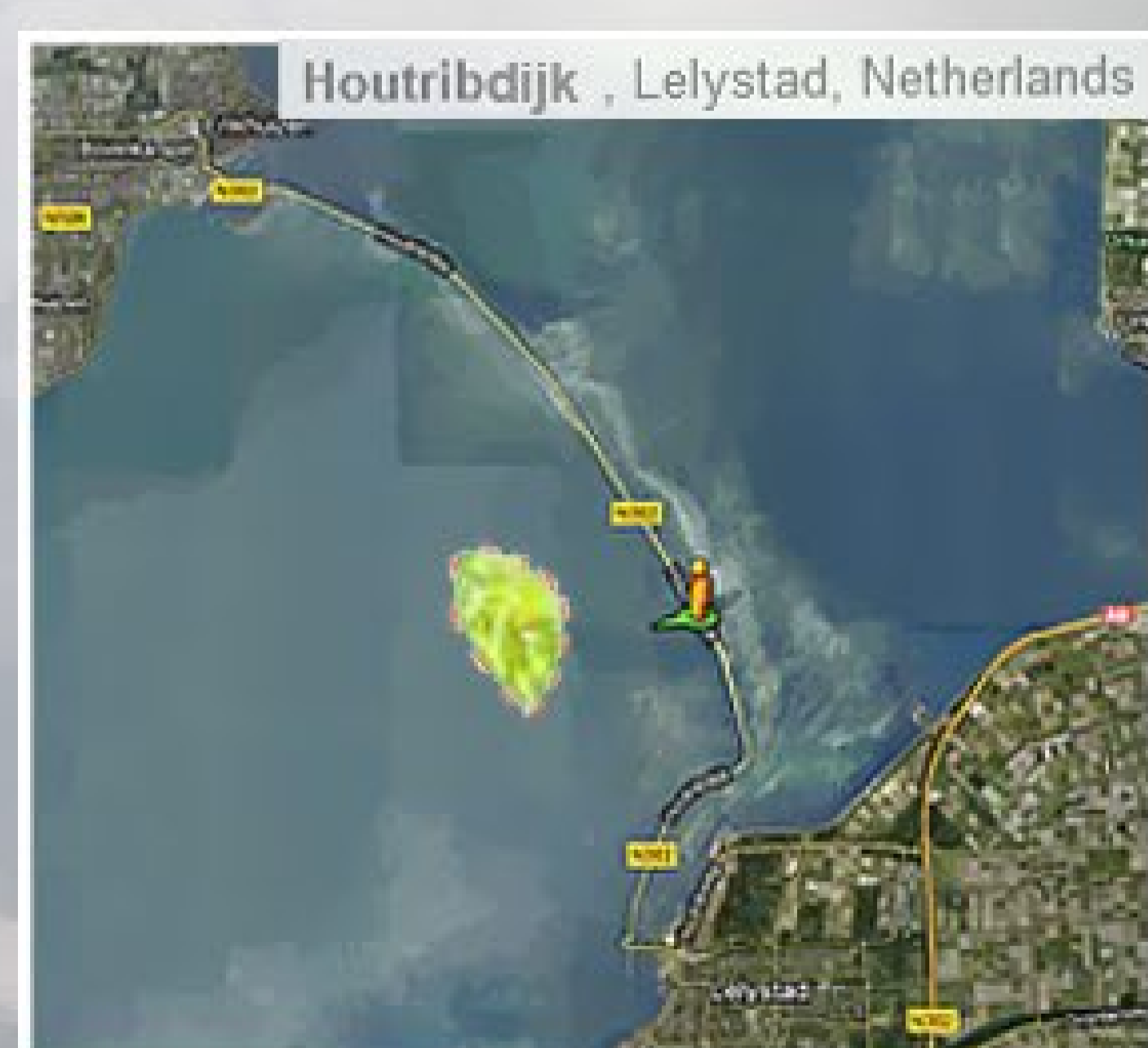
### Process

To make Marker Wadden become reality, Natuurmonumenten focused on both stakeholder management and fund raising. Royal HaskoningDHV was asked to assist and take care of the technical and procedural side of the project. In close cooperation with the Ministry of Infrastructure and Environment, Natuurmonumenten and Royal HaskoningDHV are currently working on the selection of a contractor to build the 1st phase of the Marker Wadden.



### Technical approach

- The atoll consists of a reef structure and smaller compartments which are mainly build with sandy material.
- Shallow lagoons and marshes are created by filling the compartments of the first atoll with the mud and other soil materials from the Markermeer lake bed.
- By digging trenches, sediment will accumulate naturally in these depressions. The collected mud is transported hydraulically via pipeline to the compartments where it is used to develop the mud flats and reed fields within the atolls.



### The Next Step

- The realization and construction works of the Marker Wadden will start in 2016. The following steps will be implemented:
  - Mining of sand for building the reef and the compartments,
  - At the same time the mud accumulation trenches will be made,
  - As soon as the first compartment is ready for use, accumulated mud will be transported to build the lagoons, reed fields, shallow water areas and mud flats.
- Since there is still a lack of knowledge on specific topics monitoring will be started as soon as the realization of the project starts.
- Continued fund raising will be carried out in order to come to the next step in the development of the Marker Wadden.

Marker Wadden will be extracting and salvaging mud in a novel way. A project with international standing, both for nature itself and for Dutch hydraulic engineering: Building with nature!

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