



Ministry of Infrastructure
and Water Management

Coastal Genesis 2.0

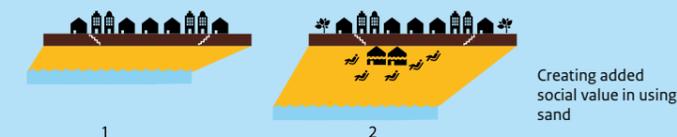
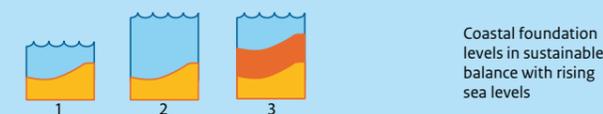
Knowledge for a safe coast



Coastal Genesis 2.0

Sandy coast

The climate is changing. Land is subsiding. This has consequences for how we manage the Dutch coast. We need to consider now how to continue to manage our coast with sand nourishment after 2020, to guarantee the safety of the Netherlands in the future.



Within the Coastal Genesis 2.0 programme we aim to collect knowledge that will enable us to optimise the maintenance and management of our sandy coast after 2020. This does not only concern the safety of people protected by the coast but also focuses on coastal economy and ecology.

Coastal Genesis 2.0 arose from the Sand Decision in the Delta Programme. The infographic presents the main choices for long-term coastal policy.

Research

How much, where and when?

Sand nourishment has proven itself to be an effective and sustainable method to counter the effects of coastal erosion. Rijkswaterstaat has been implementing sand nourishment for many years and aims to further improve this approach to address rising sea levels.

The Coastal Genesis 2.0 programme aims to answer three questions: How much sand will be needed in the long term to ensure that our coastal foundation keeps pace with sea level rises? Where and when will that sand be needed? And what is the best way to add this to the coast?

We are conducting research into this between 2015 to 2028. An interim result in the form of policy advice will be issued in 2020.

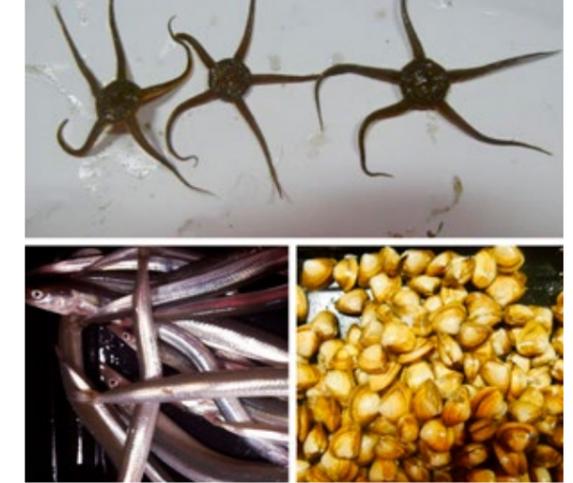
We are using the following research lines for this:

Long-term coastal research

This research line concerns additional monitoring and model development to gain more insight into tidal inlet behaviour and sediment transport in deeper water. Determining and validating the boundaries of the coastal foundation, mapping out sea-level rise and land subsidence also form components of the long-term coastal research.

Pilot sand nourishment outer delta Ameland Inlet

Within this research line, Rijkswaterstaat is investigating a new coastal management method to prevent coastal erosion. We will be depositing approximately 5 million cubic metres of sand on the Ameland Inlet seabed. The currents will ensure a natural distribution of the sand



Ecological monitoring

There are various reasons for ecological research in the Ameland Inlet. First, researchers aim to establish the starting situation (baseline measurement) in order to determine the effects of the planned nourishment on the Ameland Inlet ecology. Furthermore, little is known about ecosystem functioning in tidal inlets. This Ameland Inlet research should make clear how marine animal populations recover following the pilot nourishment. This research will also expand our ecological and morphological knowledge of outer deltas. Ultimately, the research should provide insight into the most appropriate level and location for such nourishment in order to minimise ecological impact.

Data management plays an important role in the development of these research lines. After all, it is important that all those involved (both nationally and internationally) can access the data collected in Coastal Genesis 2.0. All parties are making agreements regarding accessing, saving, sharing and archiving data, so that we can ensure that the research data are accessible and available for everyone. Various online environments will be designed to allow everyone to make optimum use of the wealth of data collected. The conducted research is based on 'learning by doing'. This means that we gain experience with possible strategies within other projects and our own pilot nourishment.

Financing and organisation

Coastal Genesis 2.0 arose from the 2015 Delta Programme. The Ministry of Infrastructure, Public Works and Water Management is the principal. Coastal Genesis 2.0 is part of the National Water and Climate Knowledge and Innovation Programme (NKWK). The research lines are largely financed by the Ministry of Infrastructure, Public Works and Water Management, Rijkswaterstaat and partly by partners in government, the corporate sector and knowledge institutes.



The 2017 measurement campaign in the Ameland Inlet

Rijkswaterstaat is conducting measurements for the long-term coastal research. Data from the many and diverse measurements should ensure validation of the morphodynamic models. Further calibration and optimisation of these data can enable more accurate 'prediction' of the effects of changing weather influences, such as strong storms on sediment transport. The results of the measurements using 5 large measurement frames will lay the foundation for the hydrodynamic research. These measurement frames are combined with instruments to collect and map water levels, currents and sediment transport data, and record images of the seabed shapes. Tracer studies have also been conducted for the SEAWAD programme, in which researchers distribute magnetic, fluorescent sand and measurement buoys in the water to monitor sediment

flows. As well as measurements in the Ameland Inlet, measurements will also be conducted in the deeper foreshore (between minus 12 and minus 20 metres).

Ecological baseline measurement: better understanding of the mysterious environment

There is still little known about marine life in the Ameland Inlet. These kinds of areas are rather difficult to access because of the strong currents and shoals. It is an environment in which marine animals need to adapt quickly in response to dynamic wave and current conditions. Assigned by Rijkswaterstaat, research was undertaken into the marine animals and fish living in this tidal inlet. Further research needs to take place to clarify how sand nourishment will further influence seabed-dwelling communities.

Collaboration

Sharing knowledge and data

Many people are collaborating within Coastal Genesis 2.0, including PhD students from the universities of Delft, Utrecht and Twente (SEAWAD), researchers from Deltares research institute, and employees from Rijkswaterstaat, Rijksrederij, Ministry of Infrastructure, Public Works and Water Management, and local and provincial authorities. Knowledge will also be exchanged with NKWK, the Delta Programme and the research projects ShoreScape (building and sand protection in the dune area), PROCOAST (coastal research near the Petten coast) and Interreg Building with Nature (a European knowledge programme with, among others, Norway, Germany, Sweden, Belgium, Denmark and Scotland).



Coastal Genesis 2.0 progress

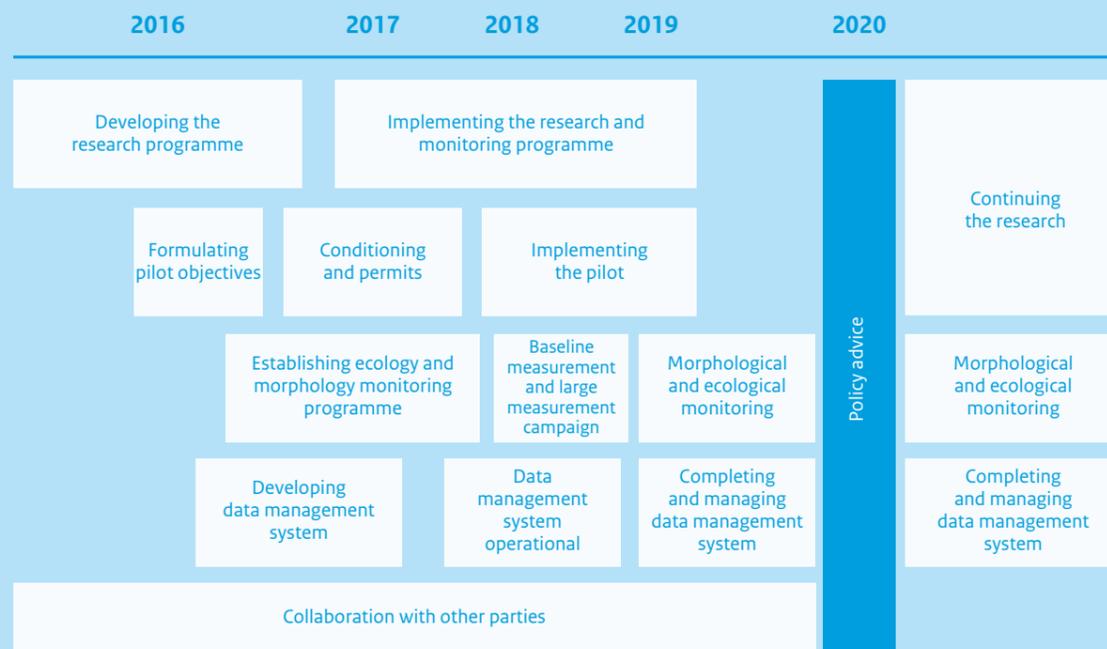
Schedule

September 2017 : Baseline measurement along Dutch coast
 2018 : Pilot nourishment Ameland Inlet
 2019 : Delivery of research report
 2020 : Advice regarding coastal policy

The programme is running on schedule for the research report and advice to be presented to the Ministry of Infrastructure, Public Works and Water Management by 2020.

More information

If you would like more information about Coastal Genesis 2.0, please contact: carola.van.gelder-maas@rws.nl or visit helpdeskwater.nl/kustgenesez



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