

Deltares

Enabling Delta Life



Profile



Deltares

Deltares is a leading, independent, Dutch-based research institute and specialist consultancy in matters relating to water, soil and the subsurface. We apply our advanced expertise worldwide to help people live safely and sustainably in delta areas, coastal zones and river basins.

To achieve this, we constantly extend our knowledge base via government research programmes and contract research, forming consortia with universities and other research institutes, encouraging innovation and accelerating the practical implementation of new theoretical advances. At the same time, we continuously develop our own innovative products and services, integrate them with the advances achieved by other bodies and make the results publicly available around the world. We advise both the public and private sector, often as early as the initial phase of a project, using our state-of-the-art expertise to make sound independent assessments of the physical condition of delta areas, coastal zones and river basins.

Delta technology

All over the world, habitable space in deltas and river basins is under increasing pressure from economic expansion, growing populations, subsidence and the impacts of climate change. Deltares has the knowledge and resources to tackle water and subsurface issues worldwide in a new, integrated way we call 'delta technology'. This means we never focus exclusively on technological issues. Our approach invariably takes account of ecological factors and administrative constraints like spatial planning, with all the associated policy agendas, competing interests, and legal and economic processes. The integrated application of our areas of sophisticated know-how produces solutions that are more sustainable, better for local people and often, more economical.

We aim towards the sustainable enhancement of the living environment, with high-grade technological solutions that have the support of society as a whole, putting into practice our strategic principle: 'Enabling Delta Life'.

'Committed to sustaining the environment'



Coast and Sea

[Living behind coastal defences]

Today's coastlines are under threat from climate change, rising sea levels and coastal erosion. To secure them and avert the threat of coastal flooding, it is vital to understand how coasts and seas function as systems. Deltares has this understanding of natural processes and applies it to the engineering and management of coasts. We work hand in hand with nature, pursuing a philosophy of sustainable coastal engineering that involves encouraging the development of natural features and using natural dynamics to maintain coastlines and improve flood protection.

Climate change causes more extreme weather conditions. Deltares studies how this impacts on the environment, water defences, coastal engineering projects, energy supplies and transport. Based on integrated coastal management, Deltares supports policies and management for the coastal zone, targeting the impact of climate change, but also examining the effects of interventions on water and soil quality. We have integrated what we know about ecosystems into models and monitoring systems that can be used to implement European initiatives, such as the Water and Marine Strategy Framework Directives. We help government authorities to tackle pollution and disaster management more effectively. We develop early warning systems for the timely identification of threats.

We search for solutions that draw on the potential of the coastal system, that enhance safety in densely-populated coastal zones and that minimise the ecological impact. Deltares acts as a specialist consultant during the realisation of projects for coastal engineering, coastal safety, recreation, energy supply and transport.



[Living on the edge]



[Maeslant Barrier Rotterdam]



Policy and Planning

Around the world, spatial planning now takes increasing account of water and the subsurface. Deltares supplies the requisite specialist know-how to enable public authorities to prepare their area development, innovation management and flood safety policies and plans with these factors in mind. We analyse existing policy and conduct strategic reviews, scenario studies and integrated studies for the development of new plans and the elaboration of innovations.

Deltares looks far ahead to recognise the challenges we will face as a society and to identify the expertise needed to respond to them. Our knowledge and experience are invaluable in the initial phase of studies and projects, when problems are being defined and potential solutions examined.

Together with our clients and other research institutes, we work today to confront the major challenges of tomorrow: the design and management of sustainable and climate-robust deltas, coastal areas and river basins.



[Spatial Planning Rotterdam]



Soil and Subsurface

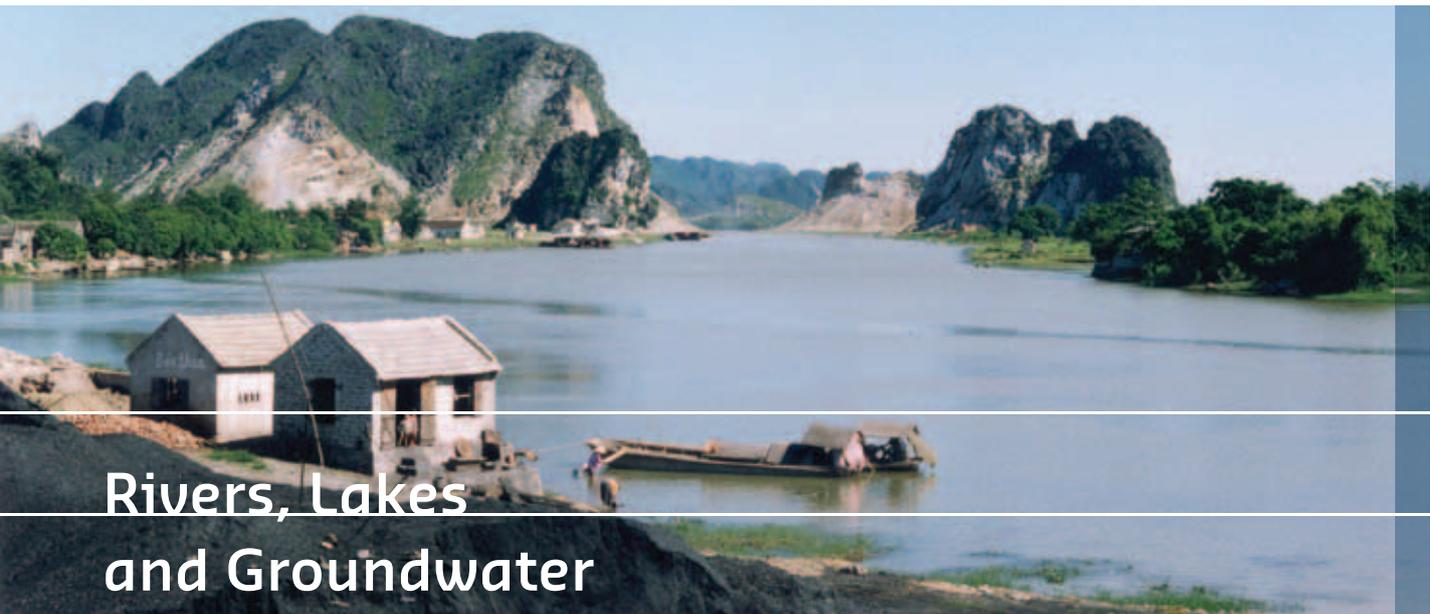
The ground beneath our feet is valuable in many different ways. It contains commodities like sand, gravel and clay. It serves as a firm foundation for infrastructure and provides extra space for additional functions. And it contains groundwater, which connects with the surface water in lakes, rivers, ditches and streams.

Deltares brings together expertise in all these areas to arrive at innovative solutions. For example, we apply our knowledge of geological structures to expertise in dredging and sand production, or we apply our understanding of urban groundwater on the one hand and of soil on the other to the creation of infrastructure. After all, an expert knowledge of geotechnology and foundations is essential to reduce the risks inherent in construction on and in soft subsurfaces (like those in The Netherlands).

Furthermore, we also map soil quality risks and advise on remediation in many places around the world where past industrial activity has resulted in pollution of the subsurface.



[Water Supply India]



Rivers, Lakes and Groundwater

Deltares' consultancy work and simulation models are rooted in a clear understanding of how water systems work. Our models help public authorities make vital predictions concerning matters like river levels or the flow patterns and quality of groundwater and surface water. Since the quality and quantity of groundwater and surface water are inextricably linked, we produce linked models in this area and use integrated water management techniques to support policy-making and management in the area of fresh water reserves. We also apply our understanding of the interaction between groundwater and surface water to areas that may seem at first glance completely unrelated, such as energy from seasonal thermal storage in the subsurface.

Local populations need to be protected from river flooding but river water is also essential to their economic and social well-being. Deltares advises on flood safety measures, water transport, and the use of groundwater and surface water for drinking, irrigation and cooling, as well as for nature

conservation. Our consultancy services are founded on an advanced knowledge of hydrology, geology, morphology, riverine hydraulic engineering, ecology and economics. We work hand in hand with public authorities and water boards to ensure that river valleys are safe, pleasant places in which to live and work.

*'Enabling
Delta Life'*



[Diminishing Water Levels]



[Aquatic Ecology]

Software

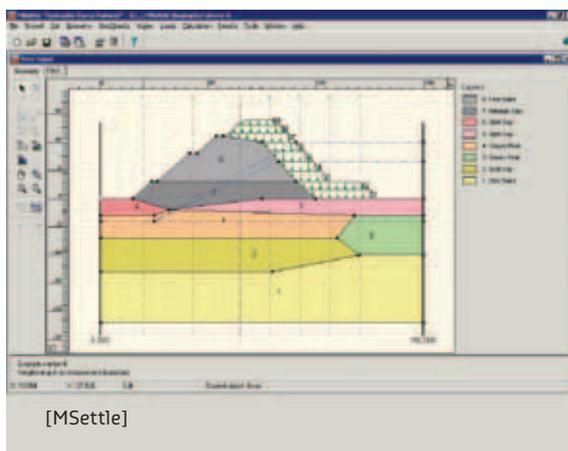
[Modelling Coastal Sand Mining]

Deltares software gives users rapid access to the latest advances in the area of water and the sub-surface. Out in the field, it generates new research issues and produces new insights. Together with users and research partners, we engage in a constant cycle of application and development that results in ever wider use of our knowledge through the medium of our software.

The integration of data, software and expert knowledge enhances the range of applications available to users. For example, Deltares supports decision-making during flood alerts by producing software that helps authorities predict high water levels, patterns of flooding following dike failures, and the consequences of measures like evacuations. Likewise, we produce linked models for groundwater and surface water and in a major new move, we are working with public authorities and research

institutes to develop a set of National Models for The Netherlands.

Our aim is to provide open architecture software, fully compatible with third-party programmes. Under the name Deltares Systems, our software is currently used worldwide in more than 60 countries. It covers our whole sphere of expertise including coastal waters and estuaries (Delft3D), rivers and urban water management (SOBEK), the design of diaphragm wall structures (MSheet) and the stability of flood defences (MStab), as well as an operational forecasting system (FEWS).





Research facilities

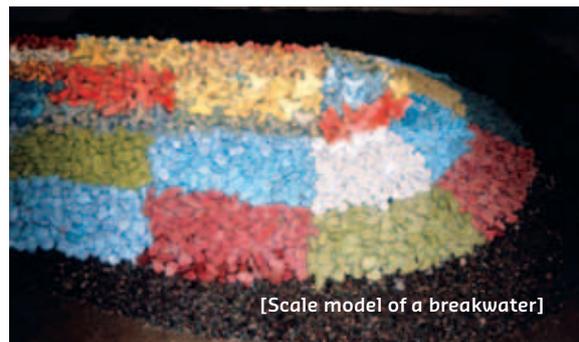
[Delta Flume]

Deltares has its own in-house physical laboratory facilities (including an environmental laboratory, a Delta Flume and a GeoCentrifuge). These are used not only to conduct water and subsurface research for the validation of new models and software, but also to test designs and scale models for hydraulic and geo-engineering structures or for the biochemical strengthening of the subsurface. They are also made available to external researchers from around Europe.



[GeoCentrifuge]

The wide range of in-house facilities allows us to study all the facets of ground and water behaviour. We conduct research not only on the water quality and morphology of rivers, lakes and coasts, but also on ground and subsurface strength, the effects of wave loads and currents on structures, and the stability of these structures. Experiments are often designed to examine multiple physical processes simultaneously (for example, both the wave load on a dike and the strength of the dike in terms of soil mechanics). The extent of our facilities allows us to progress in a carefully considered way, via a combination of small and large-scale experiments, towards the practical implementation of our knowledge - building flood defences, constructing foundations or using bacteria to modify the properties of soils.



[Scale model of a breakwater]

Deltares
Enabling Delta Life 

Deltares

PO Box 177
2600 MH Delft
The Netherlands
T +31 (0) 88-335 82 73
info@deltares.nl
www.deltares.nl

Version May 2010



Photography: Ewout Staartjes, Pure Budget, Melchert Meijer zu Schlochtern, Aeroview Rotterdam, Deltares • **Design:** Sirene Ontwerpers, Rotterdam • **Print:** 3L Drukkerij, Rotterdam