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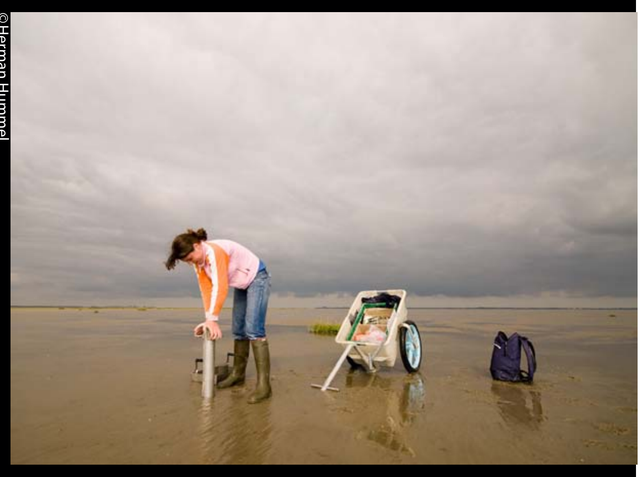
Dunes on the Wadden island of Terschelling provide protection from the sea as well as vital nesting grounds for various bird species. These dunes also act as dykes, protecting the brush and marshes further inland.

A scientist taking samples from the mudflats of the Wadden Sea.



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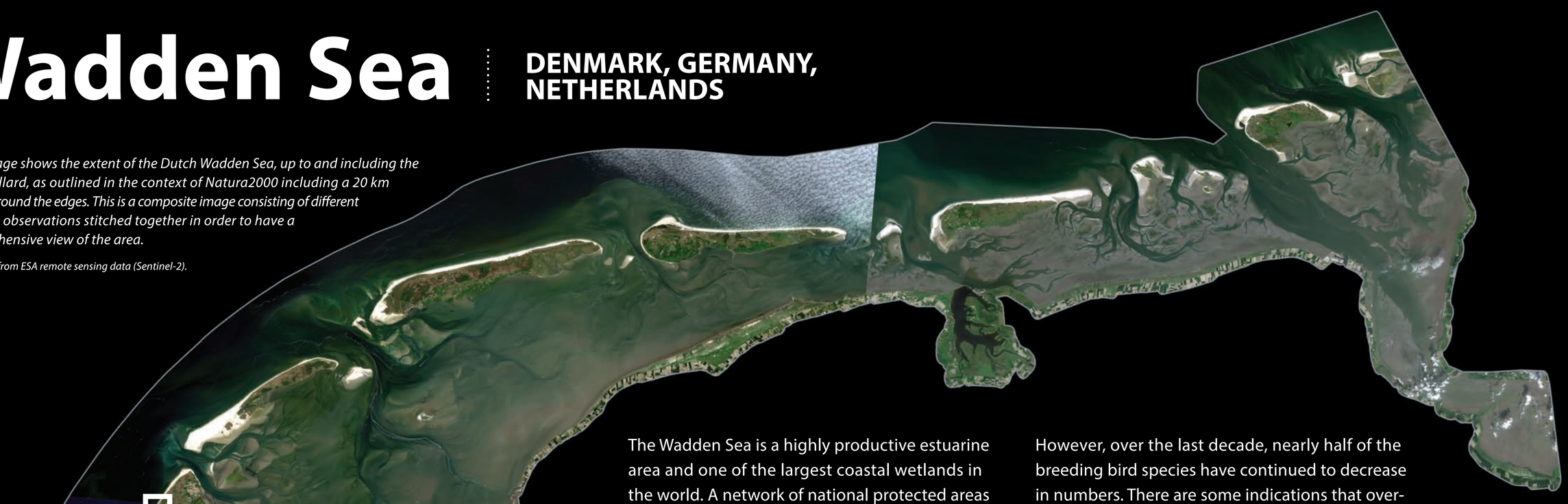
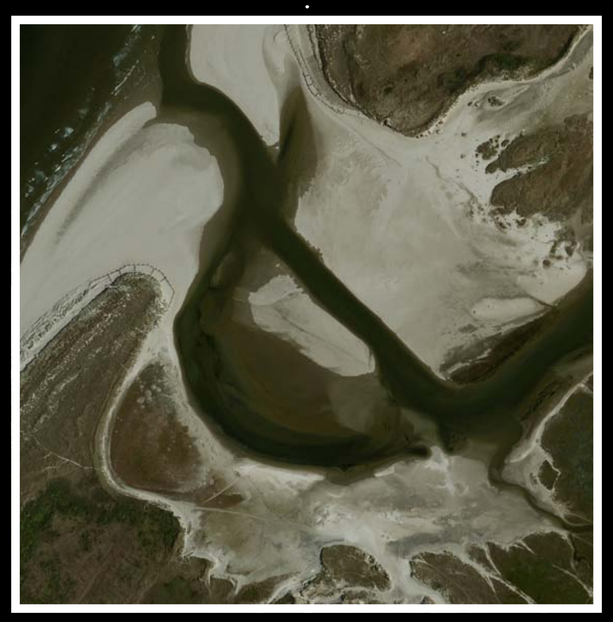
Wadden Sea

DENMARK, GERMANY, NETHERLANDS

This image shows the extent of the Dutch Wadden Sea, up to and including the Ems Dollard, as outlined in the context of Natura2000 including a 20 km buffer around the edges. This is a composite image consisting of different satellite observations stitched together in order to have a comprehensive view of the area.

Produced from ESA remote sensing data (Sentinel-2).





This image highlights a bird sanctuary delta located on the first Wadden Isle of Texel, which attracts droves of tourists annually. This area is a key site for bird watching and nature walks which abuts on a restricted area specifically designated as a breeding ground for local and migratory bird species.

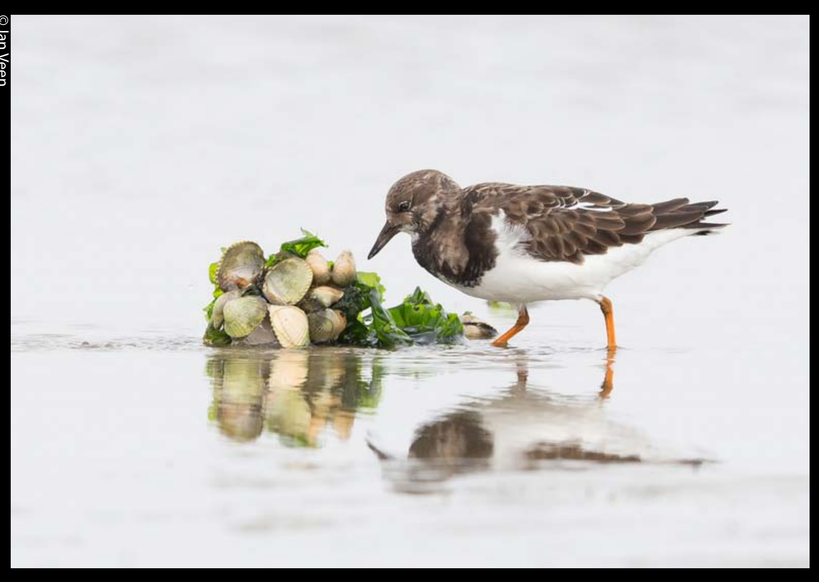
DigitalGlobe (images created with ShowMySite): [WorldView 1 Texel] © [2009] DigitalGlobe, Inc. Data provided in the framework of the ESA Earthnet TPM Programme, through the ESA EOhopS project managed by CloudEO.

The Wadden Sea is a highly productive estuarine area and one of the largest coastal wetlands in the world. A network of national protected areas spreading across the North Sea coastal areas of the Netherlands, Germany and Denmark exists to protect this remarkable area. Furthermore, the area as a whole constitutes a UNESCO World Heritage Site and is covered by the Natura 2000 network.

The Wadden Sea is a biodiversity hotspot due in part to its unique location as a meeting point of land, fresh, brackish water and marine habitats. Wind, waves, tidal action and riverine flow have created unique coastlines, ranging from extensive tidal mudflats and saltmarshes to deeper tidal channels. More than 10 million birds either live within or pass through the Wadden Sea, most on migratory routes between nesting grounds in the Arctic and wintering sites in Africa. They are attracted by the high levels of nutrients, brought by riverine systems emptying into the North Sea, which allow large colonies of cockles and mussels, as well as other food sources, to flourish.

However, over the last decade, nearly half of the breeding bird species have continued to decrease in numbers. There are some indications that over-fishing, as well as insufficient large roosting and moulting areas, could be behind these dwindling populations.

ECOPOTENTIAL is using 3D models to simulate how the birds' main food sources, including mussels and cockles, are faring in the Wadden Sea. Satellites can detect the larger mussel and cockle colonies and the algae that support these molluscs. Sand and mud bars, which provide habitats for the colonies, can also be detected. By enhancing these images and including them in the model, better predictions of how these creatures will spread and develop across the Wadden Sea can be made, giving scientists valuable information on whether these food sources are growing or dwindling, as well as where they are located. Policy and management strategies can also be incorporated into the model to determine how future food supply may be impacted by these strategies.



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A ruddy turnstone (Arenaria interpres) trolling the beachline at low tide in search of food.

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A group of birds follows a fishing vessel back to land hoping to obtain an easy meal from any resulting discards.

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