**Good bets for tidal flat hiking**

**Safety:** Hiking in the tidal flats is advisable only under the guidance of experienced and qualified guides – this is for your own safety and to avoid disturbing the wildlife unwittingly. Experts know the permitted routes well, and on a guided tour, you learn many interesting facts about the flora and fauna of the Wadden Sea.

**Legal restrictions:** For the benefit of all participants, tidal flat hiking guides are responsible for making sure that safety regulations are respected. Each guide can take a maximum of 50 people per tour; for island crossings the maximum is 30. Children under the age of eight are not permitted to take part in hikes of more than 90 minutes – the difficulty of hiking in the tidal flats should not be underestimated!

**Clothing:** Bring warm clothing and something to cover your head. Even in summer it can feel cold when you are out on the exposed tidal flats where the harsh rays of the sun are reflected by the remaining fine water layers.

**Footwear:** Ask your guide if it is best to hike in rubber boots, old trainers or barefoot. Boots are only appropriate for walking on solid sandflats or in the winter months. Trainers will stay on your feet even in soft mud and on the mixed flats, and protect you from sharp-edged shell pieces. Going barefoot will of course give you the best "feet-on" experience of the landscape, but please tread carefully to avoid getting hurt.

## Experience the tidal flats

Further information about the national park and about guided hikes over the tidal flats is available from the national park visitor centres.
**www.nationalpark-wattenmeer.de/infozentren**

Since 2001, hiking guides in Lower Saxony can qualify to become certified National Park Guides. They are officially trained to give tours in this specific area, and are recognizable by the national park logo.
**www.nationalpark-wattenmeer.de/veranstaltungen/nds**

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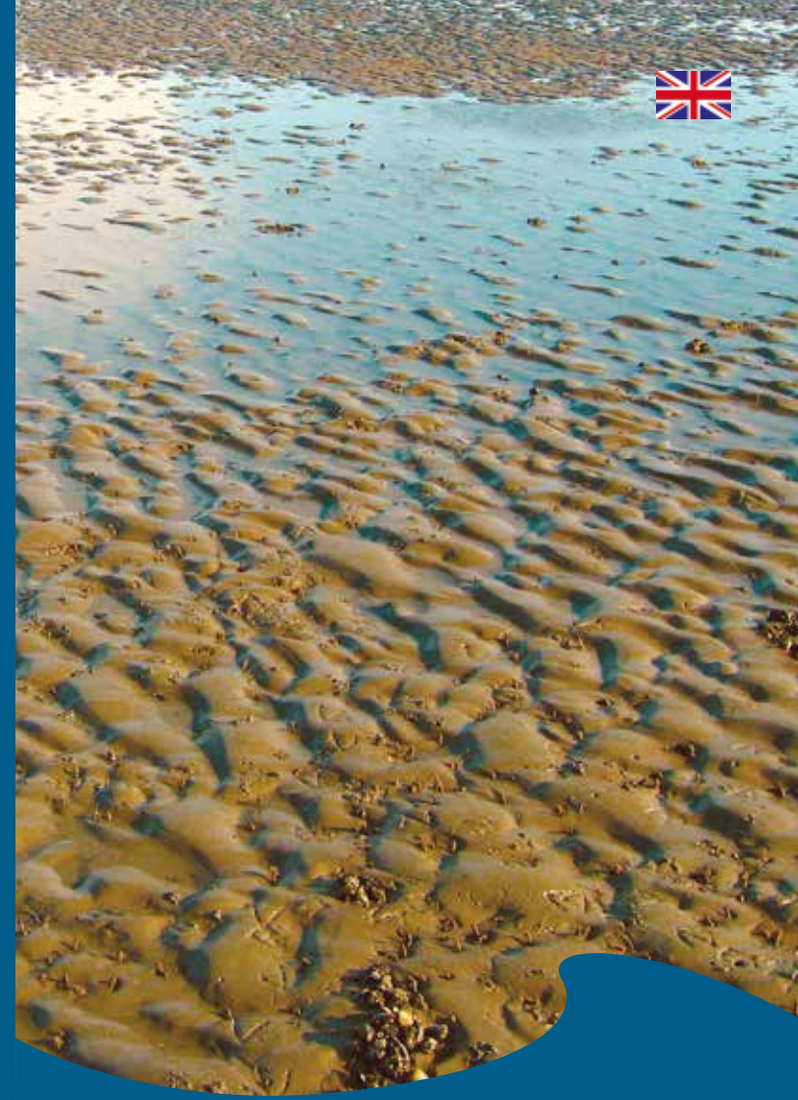


# Life on the tidal flats

WADDEN SEA WORLD HERITAGE

**Nationalpark Wattenmeer**
NIEDERSACHSEN

# Discover the tidal flats

The Wadden Sea consists of several different types of habitat: these include the “Watt” (German for tidal flats) as well as saltmarshes and sand dunes. The tidal flats are the areas that are covered by the sea at high tide and left exposed at low tide. Tidal flats make up two thirds of the entire Wadden Sea. The huge expanse of grey and brown that is exposed at low tide is by no means just a muddy desert. This guide to your walk through the tidal flats will reveal how much there really is to discover here.

**The only thing that stays the same on the tidal flats is change!**

The term “Watt” comes from the Old Frisian word “wad”, meaning shallow; it is also used for areas that a person can wade in. “Watt” or tidal flat areas develop in places where the force of the waves and currents is slowed by offshore islands, sand banks and a seabed that deepens at a very shallow gradient. Thus, sand and mud particles carried by the sea and rivers sink to the sea floor. Heavier particles settle even in water that is not at all still: this creates the so-called “Sandwatt” or sand flats. Closer to the coast, the ground is flatter and the water is calmer: this is the so-called “Mischwatt” or mixed flats, composed of sand, clay and organic particles. Last but not least, adjacent to the dike on land, are the smooth tidal flats, characterised by a high proportion of organic material.

Sand gaper

Baltic clam (left side) und Whelk

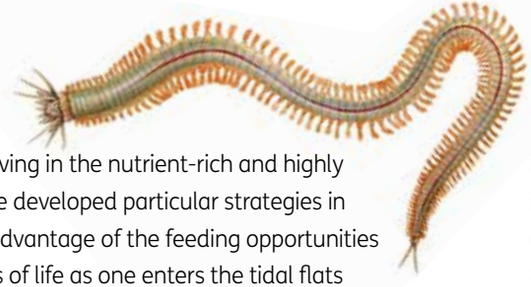
Lug worm

**Tidal flats alive!**

The animals and plants living in the nutrient-rich and highly productive tidal flats have developed particular strategies in order to be able to take advantage of the feeding opportunities in the area. The first signs of life as one enters the tidal flats can be felt underfoot: slippery brownish microalgae are spread across the sea floor. These one-celled plants feed on minerals, and produce tiny bubbles of oxygen in the water. When the tide comes in and they are covered, they can retreat beneath the surface of the tidal flats and survive for short periods. Without the algae the tidal flats would not be as muddy as they are: the slime that they produce causes the sediment to stick together. Algae create the “feeding ground” for the organisms on the next level within the food chain. Traces in the form of lines across the surface of the mud give us a clue as to what these creatures are. The wider trails are left by sea snails, and the narrow ones by tiny laver spire snails, both of which “graze” on the algae using a toothed “tongue” called a radula. The calm waters of the mixed flats provide a home for mussels of various shapes and sizes, including baltic clams and the peppery furrow shell. Buried in the sand and mud, they extend a tube-like organ (called a siphon) up towards the surface of the sea floor and suck down particles of algae to feed on.

Still further down, at a depth of approx. 30 cm below the surface, we find the lug worms living in U-shaped burrows. They take in sand from one end of the burrow, digest the nutrients within, and then excrete the leftover sand at the other end. On the surface of the sand we can see both the funnel-shaped opening and the spaghetti-like coil of sand produced at the exit. The sand mason worm creates a distinctive cocoon by sticking sand kernels and fragments of shell together. The part

Mussels



Ragworm

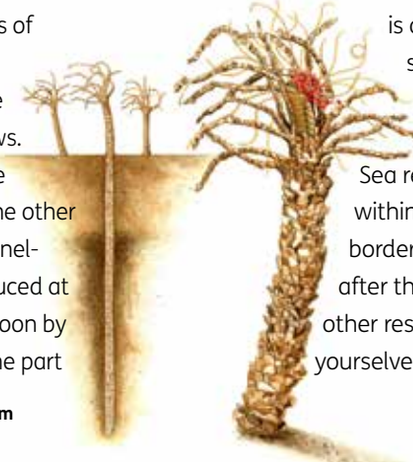
that we can see above the surface is the “crown” of the tube-like structure, through which the worm extends his tentacles in order to catch food. Cockles, soft-shell clams and blue mussels are filter feeding molluscs that live in large colonies. Cockles use their muscular feet to bury themselves deep into the sand. Blue mussels settle on the surface of the tidal flats and use their tough protein threads to protect themselves from displacement by the current: these threads attach the mussels to rocks, poles or the shells of other molluscs, thus forming large mussel banks. A “new arrival” in the Wadden Sea area is the Pacific oyster, originally found in Japan.

Bar-tailed godwit

**International visitors on the tidal flats**

The ripple marks on the tidal flats are further patterned by delicate footprints and long trails. These are left by the most eye-catching of the creatures that take advantage of the abundance of food in the tidal flats: wading birds and water birds. They stop here to rest and to restore their energy reserves during the long migratory flight from breeding areas in the far North to wintering grounds in the South. Each species of bird has a beak of a particular length and shape that makes it perfect for accessing the bird’s preferred type of food. This specialisation depends on how far beneath the surface the desired delicacy is buried, and whether the bird is after something soft (e.g. a worm, or something with a hard shell to crack open first.

A second glance at the Wadden Sea reveals its great significance – not just within Germany but far beyond the country’s borders. It really is worth going a step further after this short introduction and discovering the other residents and visitors of the tidal flats for yourselves.



Sand mason worm