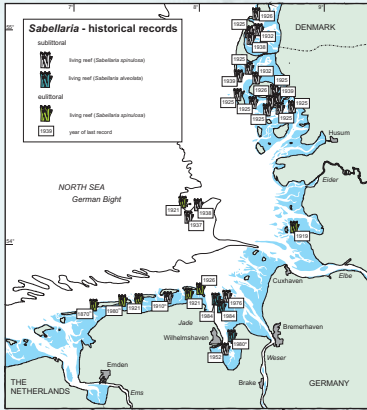


# On the decrease of *Sabellaria* reefs in the North Sea - the role of anthropogenic impacts -

## THE PROBLEM



In historic times extensive reefs mainly of the tube-building polychaete *Sabellaria spinulosa* occurred frequently in the sublittoral of the German Wadden Sea.

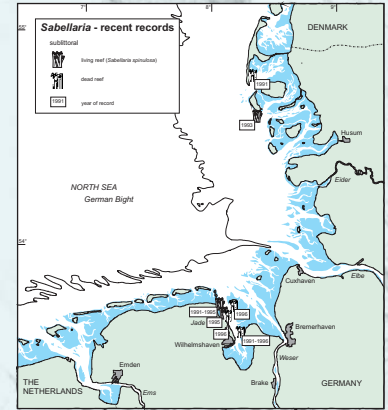
The natural succession in sabellarian reefs is characterized by phases of (1) rapid growth after origin and (2) by stagnation followed by (3) destruction.

Middle of the 1920<sup>th</sup> a netto decrease of sabellarian reefs at the German North Sea coast started, but the reasons were unknown.

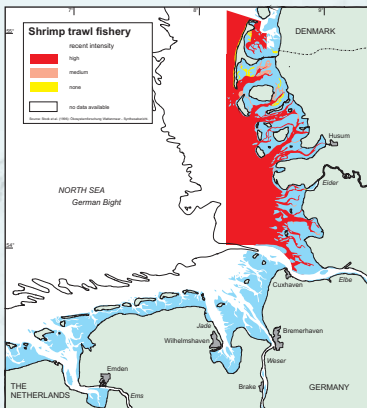


Among the occurrence of dead reefs (lumps of empty tubes) recently only three living reefs have remained, two in the Jade, the third southerly from the island Sylt.

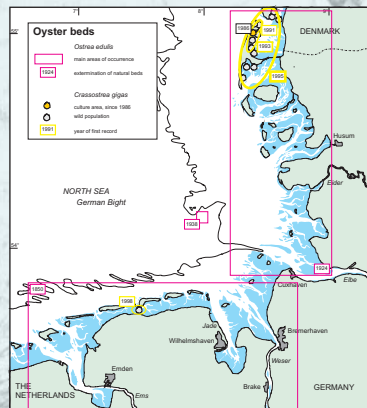
The poster summarises information on the effects of anthropogenic impacts on sabellarian reefs. Finally a first action plan is presented to activate reef development.



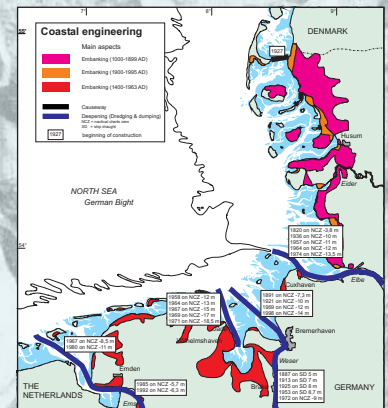
## ANTHROPOGENIC IMPACTS



- The main operation area of the shrimp fishery in the Wadden Sea is alongside the slopes of the tidal channels.
- Total landings of the shrimp fishery have fluctuated but have not increased since the 1920<sup>th</sup>.
- The size of the fleet has declined but on the other side fishing gear has become larger and more efficient.



- In former times the native oyster *Ostrea edulis* was of widespread occurrence in the Wadden Sea alongside the tidal channels from low tide level down to about -6 m.
- Overexploitation exterminated these populations.
- The sites of former oyster beds are now occupied mainly by blue mussel beds.
- Regular culturing of the Pacific oyster *Crassostrea gigas* began in 1986 at the island Sylt.
- Since 1991 wild population of *Crassostrea gigas* were observed in the Wadden Sea with increasing abundances.



- The most serious and permanent destruction of habitats/biotope in the Wadden Sea is caused by measures of coastal protection including land reclamation.
- However most areas along the German North Sea coast have been embanked before 1900.
- In the 20<sup>th</sup> century several causeways were constructed which have significant influences on the hydrological system in the surrounding Wadden Sea.
- During the last 100 years the estuaries were repeatedly deepened. This caused a permanent dredging and dumping of sediments in the estuaries up to now.

## CONCLUSION

Many biotic and abiotic factors act simultaneously in an unpredictable way on sabellarian reefs interfered with anthropogenic effects. An intensive analysis showed that the decrease of sublittoral sabellarian reefs in the German Wadden Sea is ultimately caused by human interference:

- Shrimp trawl fishery:** Shrimp fisheries with bottom trawls are carried out in the main distribution area of sabellarian reefs. It is to suggest that mechanically destruction of reefs by gears as well as extinction of reefs by net catch were a main cause of the decline. It is to assume that recently shrimp fisheries prevented reef development.
- Oyster fishery:** Oyster beds, in some areas an important natural hard substrate for *Sabellaria*, declined by overexploitation. It is to suggest that the extinction of oysters has negative consequences on the number of reefs, but complete disappearance of reefs is unlikely. However it is take notice that since several years the pacific oyster spread into the WaddenSea as well as the european oyster has by first individuals reappeared.
- Coastal engineering:** Building of dikes and dams as well as deepening have caused changes in hydrological conditions. It is to suggest that these activities have effects on single reefs, but complete disappearance of reefs is unlikely.

### First action plan

- To activate sabellarian reef development the establishment of undisturbed sublittoral areas along the slopes of selected tidal channels will be a first suitable action.
- A monitoring should be done primarily in areas where sabellarian reefs recently occur to get more information about population dynamics of *Sabellaria* in the Wadden Sea.

### Main Data Sources

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