Importance of spatial patterns in the persistence of new-settled mussel beds in the Wadden Sea.

Hélène de Paoli, Tjisse van der Heide, Johan van de Koppel

NIOZ, Waddensleutels project

Description of research:

In the western Wadden Sea, stable mussel beds have declined since 1989 and have now almost all disappeared from this area. This decline has a big influence on the entire ecosystem, as mussel beds are ecosystem engineers, providing refuge for many species, and filtering the water. To improve the prospects for restoration of mussel beds, we will try to understand the mechanisms determining to the establishment and persistence of a artificial mussel bed.

An important characteristic of establishing intertidal mussel beds is the presence of both small-scale patterns (clumps or strings separated with bare sediment) and large-scale patterns (hummocks), which are often observed in young mussel beds. An hypothesis is that these patterns (aggregation) are favorable for the restoration of mussel bed, by helping them to resist to hydrodynamic and predation stress.

To test this hypothesis, 20 artificial mussel beds were set up in the Wadden Sea (Schiermonnikoog), with different large-scale and small-scale aggregation treatments. The persistence of the bed over time will be surveyed by analyzing aerial pictures. The results show that the beds with a small-scale aggregation treatment are more persistent than the other beds. An aggregation treatment could then be favorable for the restoration of mussel beds in the Wadden Sea.