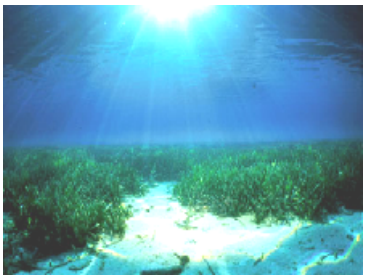
Inverse effects of autogenic and allogenic ecosystem engineers on diversity in coastal sediments

Nils Volkenborn*, Christian Buschbaum*, Karsten Reise*
and the RMP 4.2. working group
*Alfred Wegener Institute for Polar and Marine Research, Wadden Sea Station Sylt, Germany


Seagrass meadow (*Posidonia oceanica*)

At sedimentary coasts ecosystem engineering above and below the sediment surface plays a key role in coastal diversity.

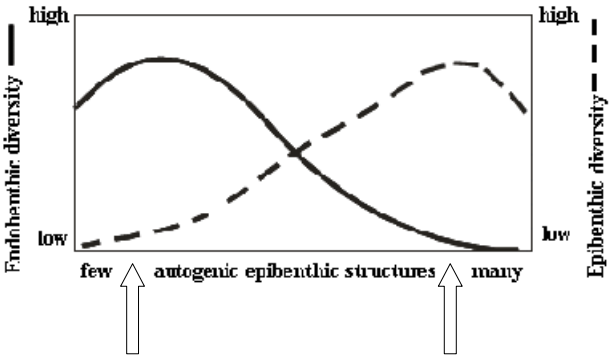
Autogenic ecosystem engineers modify the habitat via their own physical structures and are primarily epibenthic.

Allogenic ecosystem engineers modify the sedimentary habitat via their activities, and are primarily endobenthic.

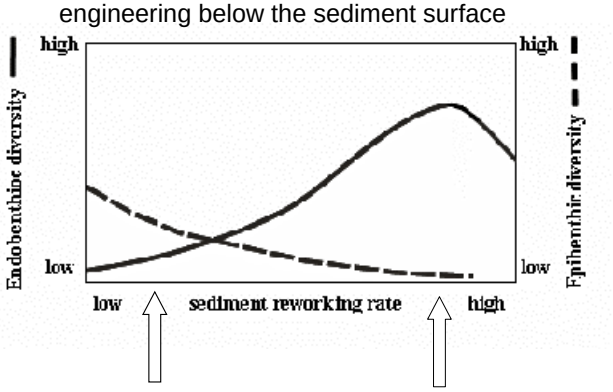

Intertidal flat bioturbated by thallasinidean shrimps

We hypothesize that autogenic ecosystem engineers facilitate epibenthic diversity at the expense of endobenthic diversity, while allogenic ecosystem engineers facilitate endobenthic diversity at the expense of epibenthic diversity.

Hypothesized effects of autogenic ecosystem engineering above the sediment surface



Hypothesized effects of allogenic ecosystem engineering below the sediment surface



The working group of the MarBEF RMP 4.2 "*The role of native and/or invasive ecosystem engineers in explaining biodiversity"* plan experiments to test the hypothesis. The expertise on different engineering species (Table 1) will be used for joint publication(s) and may trigger ideas for future collaboration. The goal is to derive a general concept on inverse effects of autogenic and allogenic ecosystem engineers on epibenthic and endobenthic diversity in coastal systems.

Table 1. Target species within the MarBEF RMP 4.2 and involved scientists and institutes

Engineering species	Habitat	Scientists	Institute
*Arenicola marina (*lugworm)	Wadden Sea	Nils Volkenborn	Wadden Sea Station Sylt, AWI, Germany
Caulerpa taxifolia and (*seaweed)*	Mediterranean Sea	Salud Deudero	University Illes Baleares, Spain
*Crassostrea edulis (*Pacific oyster)	Wadden Sea	Karsten Reise	Wadden Sea Station Sylt, AWI, Germany
Dreissena polymorpha (Zebra mussel)	Curonian lagoon, Baltic Sea	Sergei Olenin, Anastasjia Zaiko	CORPI, Klaipeda University, Lithuania
Furcellaria lumbricalis (seaweed)	Curonian lagoon, Baltic Sea	Martynas Bucas	CORPI, Klaipeda University, Lithuania
Marenzelleria viridis (spionide)	Curonian lagoon, Baltic Sea	Andrius Siaulys	CORPI, Klaipeda University, Lithuania
Mytilus edulis (Blue mussel)	Wadden Sea	Tom Ysebaert et al.	NIOZ, Yerseke, The Netherlands
		Christian Buschbaum	Wadden Sea Station Sylt, AWI, Germany
Posidonia oceanica (seagrass)	Mediterranean Sea	Iris Hendriks	IMEDEA, Spain
Sargassum muticum (seaweed)	Wadden Sea	Christian Buschbaum	Wadden Sea Station Sylt, AWI, Germany
Thallasinidean shrimps	Tropical tidal flats	Erik Kristensen et al.	University of Southern Denmark
Zostera noltii (seagrass)	Wadden Sea	Anja Schanz	Wadden Sea Station Sylt, AWI, Germany
		Tjeerd Bouma, Peter Hermann	NIOZ, Yerseke, The Netherlands