Conferences and Meetings

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ECSA – Workshop on the Role of Intertidal Seagrass Beds – Organisms and Fluxes on Ecosystem Level

The workshop had the aim to demonstrate the necessity of a multidisciplinary approach considering different scales of the seagrass bed community for the understanding of the role and the ecological value this threatened community has for the intertidal ecosystem. 30 scientists from 5 countries attended the workshop which was held at the Wadden Sea Station Sylt in List on the island of Sylt (Germany) from 7th - 13th August 1998. The proceedings of the workshop will be published in the series "Helgoland Marine Research" (former "Helgoländer Meeresuntersuchungen") in 1999.

In the first part of the workshop, novel field methods for measuring structure and function of seagrass beds were demonstrated. For this issue, a new flume construction, developed at the Wadden Sea Station (by A. Schanz, H. Asmus and R. Asmus), could be shown in the field to measure biological parameters in seagrass beds under different current regimes. Methods for structural analysis (sampling of endo- and epibenthic organisms for abundance and biomass determination by pop net and by drop trap catches) and functional analyses of processes (benthic chamber experiments, community metabolism and sedimenation) were also presented. During field trips, the ecological highlights of the island of Sylt, the tidal flats, the different forms of seagrass beds, the dunes and salt marshes could be shown.

The second part of the workshop dealt with the exchange of scientific experience lectures and discussions. Over the past few decades, a dramatic seagrass decline with catastrophic losses of thousands of hectares has occurred and still continues all over the world. During the workshop, the causes and consequences of seagrass decline were outlined. Especially the role of eutrophication and the consequences for seagrass, other primary producers, as well as for benthic invertebrates were shown. The effect of pesticides on seagrass plants was also found to be an important cause of decline, especially in Southern England and the German estuaries. Long- term changes in seagrass beds and seagrass modeling indicated the problems and difficulties of the predictability of the development of seagrass beds, especially in the North Sea region.

It is well known that seagrass beds, with their high productivity and biodiversity, have significant ecological and economic value. The role of interactions of seagrass with the hydrodynamic environment was demonstrated in detail. On the ecosystem level, seagrass beds play an important role for the material exchange and food web. However, it depends on the ambient environment on the density of seagrass beds whether they act as particle traps, as could be shown for the Wadden Sea, or if they have only an insignificant influence on sedimentation like in Mediterranean *Posidonia* beds. Negative and positive factors as, well as key factors in seagrass systems, were outlined (compare Tab. 1).

Coastal managers and nature protection agencies urgently need an effective management tool

Aspects	Negative	Positive	Key Factor
Physical factors			
Climate:			
Storms (currents +/ waves ++)	+		+
Severe winters		?	?
Severe summers	+		?
Hydrodynamics:			
Strong currents and waves	+		+
Shelter		+	+
Sediment factors:			
„pool effect“		+	+
Sediment stability		+	+
Chemical factors			
Salinity	+		?
Biological Factors			
Natural factors:			
Plants			
Dense green algal mats*	+		+
Epiphytes*	+		+
Dense phytoplankton blooms*	+		+
Animals			
Arenicola (bioturbation)	+		?
Nereis (damage)	+	?	+
Hydrobia (cleaning)		+	?
Littorina (cleaning)		+	?
Mytilus edulis	+		
Brent geese and widgeons (grazing)		?	
Anthropogenic factors:			
Fishing activities	+		
Eutrophication	+		+
Herbicides	+		?
Land reclamation works	+		

*** These are natural factors, which can be enhanced by man-made eutrophication**

Table 1
Negative and positive influences of physical, chemical and biological processes on intertidal seagrass beds, and rating of these factors as key factors (Summarized by the Seagrass-Workshop in List on the island of Sylt, 1998)

to quantify the impact and consequences of the various environmental changes on seagrass beds. Assessing the ecological role of seagrass beds is still in progress and is subject to many difficulties because of major gaps in knowledge. But the ecological value of this special community to the ambient coastal ecosystem is high where it still occurs. The loss of seagrass bed communities has led to fundamental changes in species diversity, productivity and sediment balance of the coastal area. Therefore, activities to reintroduce seagrass are developing all over the world. During the workshop, the scientific context of reintroduction experiments in the Dutch Wadden Sea, as well as the political background and the consequences, were presented.

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