

Reef Balls in the Baltic Sea

The private company MariLim created the first artificial reef in the Baltic Sea, consisting of Reef Balls on the 15th of June 2001. Reef Balls are half-round reef-modules having a central cavity with several openings. They were made out of marine friendly concrete with a pH-value similar to seawater. Hereby a rapid settlement of organisms is possible.

The balls were deployed in an area off the Holtenau bathing facility (Kiel).

Four groups of Reef Balls were manufactured, which differ in concrete mixture and surface texture to determine the most suitable mixture. All in all 12 Reef Balls were deployed. In a first step each of them was lifted into shallow water by crane. After that the structures were dragged by boat to the desired area. Subsequently, the deployment was done randomly. A diver was present all the time coordinating the work.

It is the aim of this study to monitor the speed of settlement and to determine the diversity of the algal and animal community living on or associated to the balls. On the 4th of July 2001 the first samples of the surface community were taken by a diver. From each ball an area of 10 by 10 cm was sucked off using an underwater suction device. The remaining residue was conserved for subsequent laboratory analysis. Additionally, samples for the determination of the benthic microorganisms were taken. This kind of sampling will be continued on a two weeks basis to get information about the succession of species. In order to incorporate larger species in this study scuba census is performed regularly on each ball.

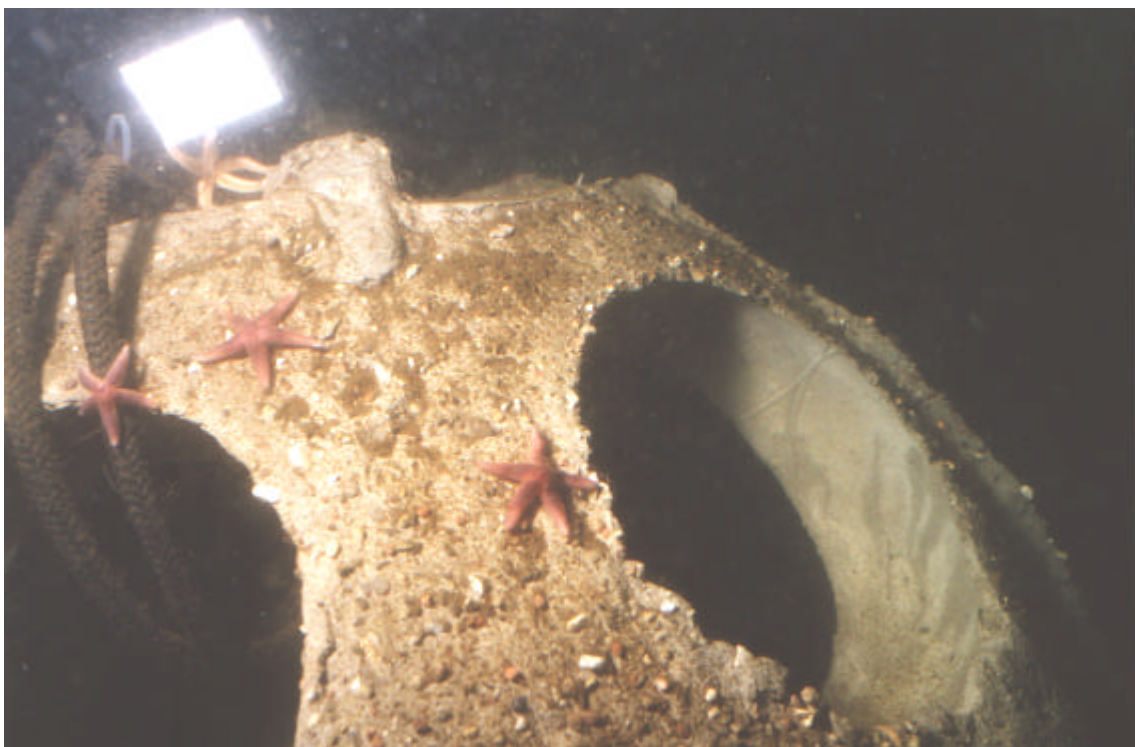


Figure 1: Only days after the deployment the settlement started.

The four different groups of Reef Balls will be tested statistically for differences in quality and quantity.

Only a week after the deployment a check dive revealed that settlement of the outer surface had already begun. A macrophytic green algae of the genus *Enteromorpha sp.* and a sessile polychaete worm (*Polydora sp.*) were found. The beach crab *carcinus maenas* was also very present in the inner cavities of the structures.

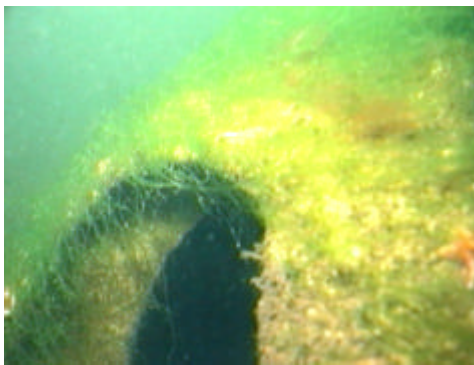


Figure 2: Strong occurrence of *Enteromorpha sp.* two weeks after deployment.

After three weeks the surface was colonised by a variety of invertebrate animals. Juvenile Black mussels (*Mytilus edulis*) and barnacles (*Balanus improvisus*) occupies wide areas. The carnivorous starfish *Asterias rubens* live in densities exceeding 100 individuals per ball.

The reef was also accepted by various fish species. The recorded species contain several species of the genus gobiidae. Frequently, individuals were observed feeding on the reef structures. Also “Sea scorpions” (*Myoxocephalus scorpius*) were found frequently in the central cavity of the balls. Being active mainly during the night, this species might use the reef as a resting area during the day.



Figure 3: Occupation of the whole surface area by a diverse algal and animal community four weeks after deployment.

The inner cavity of the balls is also occupied by sea squirts (*Ciona intestinalis*). These filter feeders may find suitable current conditions here.

In the near future a further increase of species number and diversity is very likely. The settlement of long living (perennial) algae also seems to be just a question of time.