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BENTHOS ECOLOGY WORKING GROUP

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Palægade 2–4 DK–1261 Copenhagen K Denmark

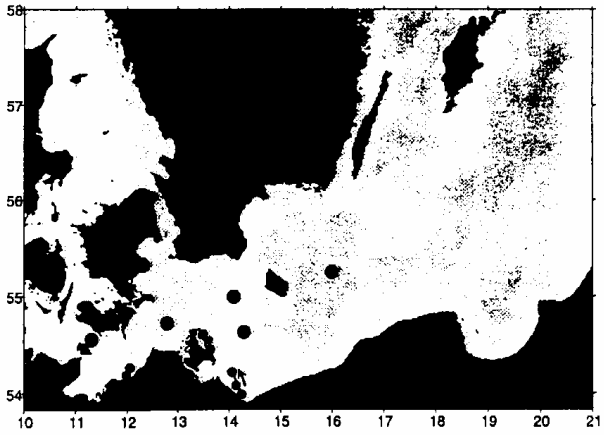
ANNEX 5: UNDERWATER VIDEO-TECHNIQUE AS A TOOL FOR THE BENTHIC MONITORING IN THE GERMAN PART OF THE BALTIC SEA

Michael L. Zettler and Doris Schiedek
Baltic Sea Research Institute Warnemünde, Seestrasse 15, D-18119 Rostock, Germany

In 1997 a project was started, aiming at the development of an underwater video-system for routine use within our national benthos monitoring programme. The programme was supported by the Federal Ministries for the Environment (BMU) and for Education and Research (BMBF). In the first part of the project a specific underwater video-system was constructed using expertise proposed in the literature (Holme and Barrett, 1977; Bluhm, 1994; Rumohr, 1995; Carleton and Done, 1995; Jacoby, 1998) and the results of several discussions with Heye Rumohr. After solving some technical problems, the underwater video-system, consisting of a sledge (ViMoS 2) and a video camera (Hitachi VK-C78ES, CCTV power zoom camera) was tested in the field. On these cruises various areal investigations were performed at different stations within the southern and western part of the Baltic Sea. During the video monitoring, the sledge was towed across the bottom by a drifting vessel at lowest possible speed. The camera was installed on a pan and tilt head. Scaling was accomplished by two parallel laser beams projected into the picture.

Finally, about 17 stations were visited during summer and autumn 1998, reaching from the Fehmarn belt to the Bornholm Sea (Figure 1). In total, 20 transacts have been recorded in water depths between 10 and 90 metres.

Figure 1. Stations in the southern and western Baltic, where the underwater video-technique was employed during the cruises in 1998.

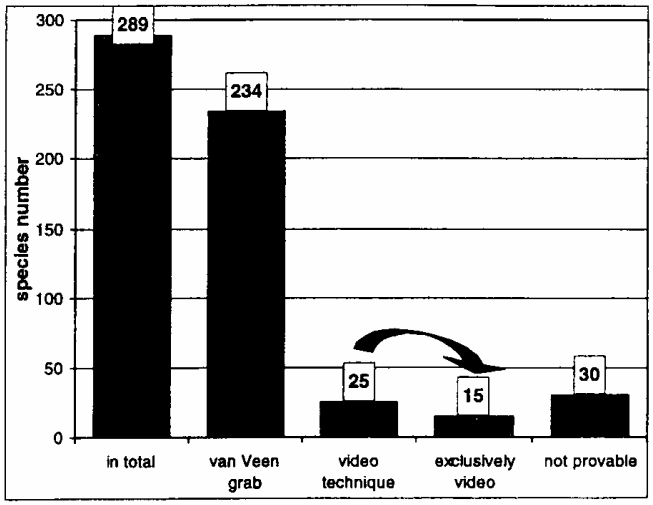


For the later calibration of the video pictures, bottom samples were taken using van Veen grabs (0.98 and 0. 106 m^2) and dredges. All samples were treated according to the 'Guidelines for the Baltic Monitoring Programme for the third stage' (HELCOM, 1988). The recorded video material was analysed not only qualitatively but also quantitatively to some extent.

Using long-term benthic monitoring data (Baltic species list) as a reference 289 macrozoobenthic species are assumed present in total in the southern and western Baltic (Figure 2). The results obtained in the project, however, indicate that only 80 % of theses species (234) were found in the samples when only using the van Veen grab. A further 25 species are likely recognisable after analysing the video films. Some of the species already identified from the video pictures are representatives of epibenthos, such as the sea star *Asterias rubens* or the brittle star *Ophiura albida*. Others belong to the endobenthos, e.g., the soft-shell clam *Arenomya arenaria* or the boring Pholadidae *Barnea candida*. They were identified due to their typical tracks on the sediment surface.

Probably 15 of the video-analysed species are more or less exclusively recognisable by means of the video technique. They are usually only sporadically collected with the van Veen grab, although they are prominent members of the various benthic communities (e.g., the shore crab *Carcinus maenas*, the isopod *Saduria entomon* or the lugworm *Arenicola marina*).

Figure 2. Comparison of van Veen grab and underwater video-technique regarding the amount of species verifiable with the different methods.



Considering the already mentioned Baltic species list (compiled within the Bund-Länder-Mess-Programme) about 30 species remained which were yet not verifiable either with the van Veen grab or the underwater-video-technique. Several crustaceans belong to this group, e.g., the amphipods *Gammarus* ssp. or *Hyperia galba*, the isopods *Idotea* ssp. and *Sphaeroma* ssp. or decapods such as *Palaemon* ssp. Some mysiids or opisthobranch molluscs (e.g., *Elysia viridis*, *Limapontia nigra*) were also not detectable with either of the techniques. In order to include all these species, a dredge was employed. However, this method only allows determination of relative abundance.

The importance of the video pictures is demonstrated very well for the lugworm *Arenicola marina*. This polychaete worm is known to be dominant within the sandy community of the eastern Baltic up to the Darss Zingst Sill. On the video pictures an abundance of about 100 individuals per m^2 has been estimated. When using the van Veen grab non of these worms were found except juveniles. A similar situation exists in the case of *Arenomya arenaria*. Some specimens were always found in the grab samples, but never older age groups. Since older *Arenomya* are known to live in the deeper parts of the sediments they were not caught with the van Veen grab, whereas on the video pictures they were recognisable due to their sipho-funnels.

In order to further specify the video analysis some additional cruises are planned for 1999. Moreover, the quantitative analysis shall be improved with regard to species composition and abundance.

References

Bluhm, H. 1994. Monitoring megabenthic communities in abyssal manganese nodule sites of the East Pacific Ocean in association with commercial deep-sea mining. Aqu. Conserv.: Mar. Freshw. Ecosyst., 4: 187–201.

Carleton, J.H., and Done, T.J. 1995. Quantitative video sampling of coral reef benthos: large-scale application. Coral Reefs, 14: 35–46.

HELCOM. 1988. Guidelines for the Baltic Monitoring Programme for the Third Stage. Baltic Sea Environment Proceedings, 27D. 161 pp.

Holme, N.A., and Barrett, R.L. 1977. A sledge with television and photographic cameras for quantitative investigationof the epifauna on the continental shelf. J. Mar. Biol. Assoc. U.K., 57: 391–403.

Jacoby, C. 1998. Use of video to sample benthic habitats: Examples from Jervis Bay. Internet: http):/Ikaos.erin.gov.au/marine/natmis/standards/biology/jacobv.htnil: 1 pp.

Rumohr, H. 1995. Monitoring the marine environment with imaging methods. Sci. Mar., 59 (Supl. 1): 129–138.