

3. Vorträge vom 27.09.1993

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am 27.9.93

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BD Dr. Kunz, Forschungsstelle Küste/Norderney
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Coastal protection in the past Integrated Coastal Zone Management in the future

by Dr. Kunz

The mainland along the German North Sea coast is low lying land; parts are sheltered by islands. History of coastal protection started about one thousand years ago; in the 13th century the embanking of the whole coast was largely completed; in the second half of the 19th century all exposed dikes were fixed. Eroding parts of the islands have been stabilized by solid constructions since the middle of the last century. After the severe storm floods of 1953 and 1962 the coastal protection line has been intensely strengthened. The basis for the actual coastal protection works are legal plans. They promise security against flooding by a coastal defence line according to fixed design criteria. Coastal protection, stabilization of islands, and land reclamation created static boundary conditions and limited substantially the ability of the Wadden Sea to react dynamically and develop naturally. Throughout the last millenium the coastal community agreed on the absolute necessity of land reclamation and coastal defence. Since some decades the targets of nature conservation have become increasingly relevant. They interfere with the established coastal protection strategy: the latter favours the existing defence line, while nature conservation promotes substantial retreat. However, sidespecific compromises can be achieved, especially since land reclamation is no goal any longer.

Since some years global warming has become a topic. Although we can't detect by the analysis of tide gauge-data any changes that significantly relate to global climate change, we have to face an accelerated rise of MSL and higher tidal ranges as a realistic expectation. If we relate to the IPCC - best estimate scenario, the security amount implemented in the German design criteria would be worn out in 20 to 40 years. The technique is available to deal with this rate of SLR and even more by adapting the defence line without substantial retreat. Nevertheless, the concepts for the future protection of the German coast must be adjusted, if society really wants to meet the goals of nature conservation, especially in the Wadden Sea National Parks.

The morphological reaction of the tidal flats on SLR, on higher tidal range and on changes of wind climate will be of crucial importance, as well for the unprotected parts of the saltmarshes as for the islands. If society wants to preserve those areas in a natural stage, we have to review the actual coastal defence line strategy. Numerous demands need to be taken into account besides environmental aspects. This leads to concepts of Coastal Zone Management. But on a long term basis they can only be effectively applied, when the coastal community agrees on the necessity to provide parts of the mainland and of islands for natural development processes, which means losses by erosion. With respect to history and to the established infrastructures and uses it is not likely that a decision on substantial retreat will come up within the next decade. Hence, according to the legal plans, the coastal defence system needs to be completed at first. Since environmental aspects are more appreciated nowadays they will have an important influence on the design of the completion. This allows to implement compromises towards more nature conservation, even if it would require more expensive solutions. An intermediate next step could be "coastline management plan" providing more flexible responses. If we want to meet the multi-functional demands stated by society in an appropriate way, we need to promote further towards "coastal zone management plans".