

Baseline benthic biodiversity of the Belgian part of the North Sea: lessons learned and the way forward with ecological restoration goals

J.-S. Houziaux, J. Haelters, F. Kerckhof, S. Degraer, and T. Jacques

The determination of “baselines” is a necessary step in the implementation of ecological “restoration”. A baseline can be defined as the ecosystem state under levels of anthropogenic pressure that do not negatively affect its functioning. Historical situations providing us with information on marine ecosystem structure and functioning prior to anthropogenic impacts are thus invaluable to determine the extent of human-induced environmental change and to set targets for the future. The ecology of the Belgian Part of the North Sea, now subject to intensive human-induced disturbance, has been intensively studied since the 1970s. Earlier, in the first decade of the twentieth century, ecological surveys were also conducted by Gustave Gilson, an early contributor to ICES science. The resulting unpublished archive (specimens and written records), kept at the Royal Belgian Institute of Natural Sciences, was researched between 2003 and 2009, and was supplemented with an analysis of the pre-1900 literature. The data were compared with the recent situation, targeting subtidal sediments and their benthos. Historical “baselines” were drawn for benthic habitats located offshore (*Ostrea edulis* beds; gravels) and nearshore (coastal sediments) and were placed in their context of anthropogenic pressure. Observed long-term (>100 years) biodiversity shifts are consistent with the expected impact of human activities during the twentieth century. How such detailed historical data alter our perception of “ecosystem health”, thus far mainly based on post-1970 knowledge, is discussed and has implications for the definition of meaningful and achievable marine ecological restoration goals (e.g. under the EC “Habitat” and “Marine Strategy” framework directives).

Keywords: baselines, benthos, ecological restoration, environmental management, long-term changes, seabed integrity.

Contact author: J.-S. Houziaux, Royal Belgian Institute of Natural Sciences (RBINS), Management Unit of the North Sea Mathematical Models (MUMM), Gulledele 100, 1200 Brussels, Belgium [e-mail: js.houziaux@mumm.ac.be].