It was pointed out that the change in sensitivity of a single species according to a salinity gradient has been demonstrated and that it is difficult to disentangle natural stress from anthropogenic stress.

4.1.4 Assessing the ecological status within European transitional waters (northeast Atlantic): intercalibrating different benthic indices

G. Van Hoey reported on work done by A. Borja, G. Van Hoey, G.Phillips, M. Blomqvist, N. Desroy, K. Heyer, J.-C. Marques, I. Muxika, J. Neto, A. Puente, J. Germán Rodríguez, J. Speybroeck, M. Dulce Subida, H. Teixeira, W. van Loon, J. Witt

The Water Framework Directive (WFD) has developed several methods to assess the benthic status of European marine waters. The WFD implementation requires the intercalibration of such methods, in order to ensure that the status classification is consistent and comparable across countries and waterbody types. A working group of 9 countries (Portugal, Spain, France, Belgium, Netherlands, Germany, Sweden, Ireland and the UK) has been established to intercalibrate methods in transitional (estuaries) waters, within the northeast Atlantic ecoregion. The following steps for intercalibration were agreed upon by this group:

(i) to establish common waterbody types across Europe, based on salinity, tidal range, mixing conditions, intertidal area and estuary size (6 common types were identified);
(ii) to compile a common dataset (9337 samples collated, from 59 estuaries and 8 countries, covering 5 out of the 6 types, and most of the ecotopes);
(iii) to harmonise the taxonomy of the dataset (using ERMS, WoRMS and Fauna Europaea);
(iv) to collate human pressures from each estuary;
(v) to set reference conditions for each type;
(vi) to calculate Ecological Quality Ratios for each of the 10 methods proposed for intercalibration (BAT, M-AMBI, BOPA, BO2A, QSB, MISS, BEQI, AETV, BQI, IQI);
(vii) to interpret the response of these methods to different anthropogenic pressures;
(viii) to determine boundaries for each of the 5 quality class (from bad to high status), using the 10 methods; and
(ix) final agreement in the assessment and intercalibration.

This contribution presents the steps already taken and the way forward in this intercalibration exercise.

4.1.5 The use of benthic indicators to assess anthropogenic impacts: some cases from Belgium

G. Van Hoey reported

Environmental monitoring and the use of indicators for assessing anthropogenic impacts and the status of the marine environment are topics that get a lot of attention in current scientific research. The basis for this lays in the (recent) implementation of different European Directives, like the Habitat- and Bird Directive, the Water Framework Directive and the Marine Strategy Framework Directive. Policy makers and managers need objective tools to evaluate the impact on the marine ecosystem and to assess the recovery after enforcement of the measures. Three main groups of anthropogenic pressure types are here considered: (1) pollution (e.g. eutrophication, chemi-

cal); (2) physical disturbance (e.g. bottom trawl fishery, sand extraction, dredging) and (3) constructions works (harbours, land reclamation).

Currently, a wide variety of indicators are developed, including univariate, multimetric and multivariate approaches, the latter combining different parameters with different sensitivity levels. The aim of those indicators is to detect deterioration or improvement of the benthic habitat or community conditions as a result of a change in an anthropogenic pressure type. Because no benthic indicator is sensitive to all pressure types, it is worthwhile to test different benthic indicator types against the different pressure types.

The Bio-environmental research group of ILVO is currently performing environmental assessments using benthic indicators, on the effects of different anthropogenic activities on the benthos. The monitoring strategy is characterised by a control-impact design, an appropriate number of samples for a confident assessment, and lab analyses that adhere to international standards. The behaviour of two benthic indicators (BEQI [www.beqi.eu], m-AMBI) in relation to different anthropogenic activities (land reclamation in estuaries, dredge disposal, sand extraction, wind farm) is presented.

- Case 1: *Benthic habitat surface area changes in the Westerscheldt estuary due to land reclamation activities.* In the Westerscheldt estuary, the benthic habitat conditions were rather good, whereas their areal distribution is seriously declined in the last century. A lot of ecological important benthic habitats disappeared (e.g. mussel beds) or seriously declined (e.g. intertidal area) because of the deepening of the estuary and the construction of its embankments.
- Case 2: *Impact assessment of dredge disposal.* The relation between the indicator value and the dumping quantity per year at the different disposal sites over the period 2004–2008 was tested. The BEQI parameters decline with increasing dumped amounts, but this is not reflected in the m-AMBI.
- Case 3: *Impact assessment of sand and gravel extraction.* Despite the serious physical disturbance in one extraction area in the last years, neither indicator shows a negative impact. This is partly due to the increase in diversity (new colonizers) in this extraction area.
- Case 4: *Impact assessment of construction activities (e.g. wind farms).* Both indicators and specially their diversity component show a negative effect on the benthos in the period of the construction of the wind mills. This effect already all but disappeared a year later.

The results show that indicators react sometimes different, depending on the pressure type. Therefore, several indicators with complementary properties may be needed to provide a strong and effective support for management decision-making.

4.2 Broaden the geographic scope of the BEWG work on benthic indicators to North American waters

4.2.1 Regional Assessments of the Benthos and Overlying Waters throughout US Coastal Ocean Waters

J. Hyland reported on work done by J. Hyland and W. Nelson

Since 2003 NOAA, US EPA, and various coastal states have conducted studies to assess the status of ecological condition and potential stressor impacts throughout coastal-ocean waters of the US Protocols are similar to those used in EPA's Environmental Monitoring and Assessment Program (EMAP) and National Coastal Assess-