Measuring the impact degree of different pressure types with the Benthic Ecosystem Quality Index (BEQI) H:25

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EU Framework Directives (marine environment)
- Water Framework Directive
- Marine Strategy Directive
- Habitat and Bird Directives
Healthy ecosystems where anthropogenic influences are well-managed

Evaluation of the environment
- Impact assessment
- Physical disturbance (fisheries, sand extraction, dredging)
- Pollution (chemicals, nutrients)
- Construction works (harbours, wind farms, coastal defense)
- Recovery assessment

Benthic Ecosystem Quality index (BEQI)
- Benthic indicator tool
- Scaled the deviation between control and impact data in 5 classes
- Sampling effort based
- Evaluate benthic parameters: density, biomass, number of species, similarity (species composition)

MEASURING IMPACT DEGREES: CASE STUDIES

Dumping of dredged material (BE)
- BEQI EQR scores versus dumping intensity
- Evaluation of the impact at 5 dredge disposal sites (2006-2008) in Belgian Coastal waters
- Benthic community impacted (EQR < 0.6) from a dumping intensity of 1 to 2 million tones dry matter per year
- Impact strongest on the parameter density
- Number of species less impacted
- Chronic dumping prevent the development of a healthy, stable benthic community

Organic enrichment (Lake Veere, NL)
- Ecological status in Lake Veere bad, mainly in the deepest habitat (< 8m) due to oxygen depletion as a consequence of eutrophication and stratification
- Management action: again water exchange through inlet in Oosterschelde dam
- Benthos recovery in deepest habitat
- Other habitats still affected, partly due to changed salinity patterns

Alien species (Ensis directus) (NL coast)
- Due to the dominance of Ensis directus in fine sandy sediments at Wadden Coast (2002-2004):
- Benthos species composition changed
  - Similarity EQR moderate
- Biomass quadrupled in last 10 years
  - Biomass EQR bad
- Number of species slightly decreased
  - Number of species EQR moderate

The need for adequate control/reference areas
- Sampling strategy spatially and temporally adapted to impact type

Impact assessment: Points of attention !!
- Biological assessment has to coincide with detailed knowledge on impact frequency and intensity
- Indicators summarize patterns, but they do not provide full explanations of observed patterns

CONCLUSION
- Indicators are evidence based tools which can be used for the evaluation of anthropogenic impacts in marine systems.
- The BEQI indicator tool is capable of measuring the impact degree of different pressure types. The different BEQI parameters combined in the tool, however, may react differently (the degree of impact) on exerted pressures.