

# The biological value procedure: a fast ecological assessment tool

**Gert Van Hoey<sup>1</sup>, Kris Hostens<sup>1</sup>**

<sup>1</sup>Institute for Agricultural and Fisheries Research, Aquatic environment and Quality, Ankerstraat 1, Oostende, Belgium

Phone: +32-(0)- 59 56 98 47

E-mail:

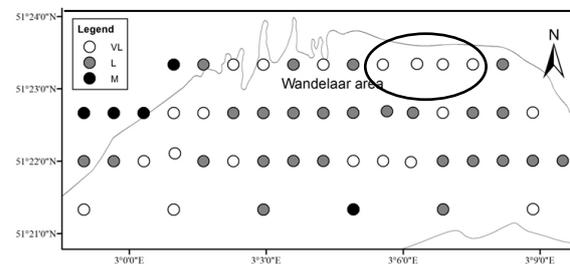
gert.vanhoey@ilvo.vlaanderen.be

**Introduction:** The development of a sustainable dredged material management implies the minimization of environmental conflicts. The presented study deals with the assessment of the biological value of the area west of the harbor of Zeebrugge (Wandelaar area) located in the Belgian Part of the North Sea as part of an environmental impact assessment (EIA). This area is currently being considered by the Belgian government as location for a new disposal site for dredged material (Figure 1). Prior to the final delimitation of the disposal site, the government has requested an evaluation of the biological value of the whole area. The biological value protocol presented here [1, 2] is an appropriate, fast and integrative tool that objectively summarizes the ecological value of an area. This assessment will then provide the scientific information necessary to minimize ecological conflicts or to predict possible impacts when the new site is put to use.

**Methods:** The biological value protocol consist of a set of possible assessment questions (in this case 10) related to different structures and processes of biodiversity, linked to the proposed valuation criteria. In this study, we designed the biological valuation protocol in such way that it is appropriate to judge on the diversity, productivity and functioning of the benthic ecosystem. The biological and sedimentological input information for the biological value protocol originated from two complementary techniques, i.e. a Van Veen grab and Sediment Profile Imaging [SPI].

**Results:** The sedimentology of the area was adequately described based on the information collected by both SPI and Van Veen grab, but only SPI revealed structural information on the physico-chemical habitat status (layering, a-RPD position). The dominant sediment types were soft mud/clay and coarse sandy sediments. The biological characteristics of the area were catalogued as poor, which means a low biodiversity, low densities and the dominance of opportunistic species. Within the Wandelaar area, there was a clear spatial pattern in sedimentology and biology, with the central area characterised by medium to coarse sediment and a very low diversity. The borders of the area were characterised by muddy sediments and a higher

diversity. The biological value of all samples was estimated to be low (1.8-2.6) to very low (<1.8), except for some stations in the northwest (moderate) (Figure 1).



**Fig. 1:** Map of the Wandelaar area (nearby the harbour of Zeebrugge) with indication of the biological value status. VL= very low; L= low; M= medium.

**Discussion:** The sedimentological and biological information, which was summarized in the biological valuation protocol, provided a clear view on the differences in biological value of the area and on the different sediment types. The installation of a new dredged material disposal site within the Wandelaar area, especially in the northeastern part, was not in direct conflict with the ecology. The area has a low biological value and the benthic system is adapted to changing conditions, which is signaled by the dominance of mobile, short living and opportunistic species.

The biological valuation protocol turned out to be a very suitable tool for the ecological evaluation of an area in the light of planning marine activities and of EIA processes.

**References:** [1] Derosus et al. (2007) *Oceanologia* **49**: 99-128; [2] Smith and Theberge (1986) *Environ. Manage.* **10**: 715-734.