Bottom habitat mapping *in the EAF-Nansen Programme*

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Rationale

Benthic habitats are diverse and so are the biological communities inhabiting them and shaping them. The EAF-Nansen Programme Science Plan Theme 7 'Habitat mapping' facilitates collection of baseline data on a range of benthic habitats but focuses especially on vulnerable benthic habitats and communities, i.e. benthic habitats that may be significantly adversely impacted by fisheries but also other human activities, e.g. mining.Some of these habitats are biodiversity hotspots which recover very slowly from adverse impacts and therefore satisfy the definition of Vulnerable Marine Ecosystems (VMEs, *sensu* FAO, 2009), hence it is important to know their characteristics and distribution. Such knowledge is needed to provide science-based advice to management facilitating targeted and effective protective action.

Mapping of benthic habitats is often carried out by combining collected data sets from seabed bathymetry (multibeam echosounder), seabed observations (underwater video recordings), and sometimes also sampling of seabed sediments or organisms for ground-truthing and/or characterization of benthic communities.

Habitat mapping involves identification and characterizing of the benthic habitats present in a given area. This is done by identifying communities and their relation to environmental variables, preferably through statistical analysis. The combined set of variables and their values that is indicative of the occurrence of a specific community is the habitat/biotope of that community and are used in habitat suitability models that may suggest where certain habitats occur and guide further field efforts/ground-truthing. Different mapping methods are available depending on the environmental conditions, including depth, type of substrate (soft to hard) and the required resolution, i.e. from fine scale (cm-m) to broad-scale (> 100 km).

Habitat mapping, especially mapping of VMEs, can be demanding in terms of financial and human resources/capacity and these are often not available in developing nations where information on bottom habitats is usually scarce and predictions are often made based on modelling of variables that may not always be adapted to a given situation.

Theme 7 of the EAF-Nansen Programme science plan aims is to provide information on bottom habitats, and particularly on the presence of vulnerable habitats for which special care is required when planning activities that may affect them. Bottom habitat studies in the EAF-Nansen Programme is primarily dedicated to the deep sea of ABNJs, where knowledge on species and habitat diversity is still very poor. Studies within EEZs are also conducted in the context of oil and gas activities at sea, mainly to provide baseline knowledge where such activities are being planned.

Knowledge generated can be used for environmental impact assessment of oil/gas/mining activities.

The EAF-Nansen Programme has used various seafloor mapping techniques onboard its vessel, the *Dr Fridtjof Nansen*, in the southeastern Atlantic Ocean and the Indian Ocean. These include the use of video (Remotely Operated Vehicles, VAMS), grab samples, and for bathymetry multibeam echosounder.

The workshop will bring together EAF-Nansen Programme partners as well as global and regional experts on habitat mapping and related species distribution modelling.

Objectives

The main goal of the workshop is to explore the use and application of various bottom habitat mapping methods and techniques as well as modelling approaches in order to identify a suite of options for application in the EAF- Nansen Programme.

Main workshop objectives are to:

1. Provide an overview of habitat mapping in the context of the EAF-Nansen Programme
2. Reviewing and learning from past mapping experiences
3. Overviews of modelling approaches and tools; opportunities and limitations
4. Development of 'best practice guidelines' for exploratory habitat mapping and follow-up analyses in data-poor waters.

Expected outputs

- Workshop report including:
  - Overview of main methods for bottom habitat mapping
  - Recommendations on the approach to be taken by the EAF-Nansen Programme and "a best practice" guideline

Participation:

- Resource persons with relevant background and experience with bottom habitat mapping
- FAO
- IMR

Participants will be limited to around 20 invited experts. Specific contributions to the various agenda items will be requested from the confirmed participants.

Draft Agenda

Tuesday 4 December	
9:00 - 9:30	**Agenda item 1.** Opening of the workshop (Workshop background, scope and expected outputs)
9:30 - 10:30	**Agenda item 2.** Habitat Mapping in the EAF-Nansen Programme
10:30 – 11:00	Coffee/tea break
11:00 – 13:00	**Agenda item 3**. Overviews of modelling approaches and tools
13:00 - 14:00	Lunch
14:00 - 15:30	**Agenda item 3 continued**
15:30 - 16:00	Coffee/tea break
16:00 – 17:00	**Agenda item 4**. Use and application of various bottom habitat mapping methods and techniques**.**
Wednesday 5 December	
9:00 - 10:30	**Agenda item 4.** continued
10:30 – 11:00	Coffee/tea break
11:00 – 13: 00	**Agenda item 4.** continued
13:00 – 14:00	Lunch
14:00 – 15:30	**Agenda item 5**. Ongoing efforts in targeted regions Overview of possible methods for use in data-limited systems
15:30 – 16:00	Coffee/tea break
16:00 – 17:00	**Agenda item 5**. Continued
Thursday 6 December	
09:00 – 10:30	**Agenda item 6**. Development of 'best practice guidelines' for exploratory habitat mapping and follow-up analyses in data-poor waters.
10:30 – 11:00	Coffee/tea break
11:00 – 13:00	**Agenda item 6**. Continued
13:00 – 14:00	Lunch
14:00 – 15:30	**Agenda item 7**. Feeding into decision making
15:30 – 16:00	Coffee/tea break
16:00 – 17:00	**Agenda item 8:** Summary, conclusions and 'to-do'