



mareano
samlar kunnskap om havet

Hovedkonklusjoner ICES og veien videre

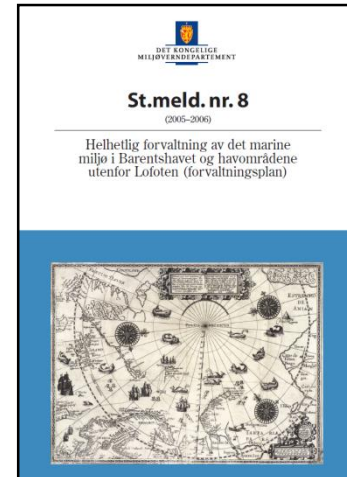
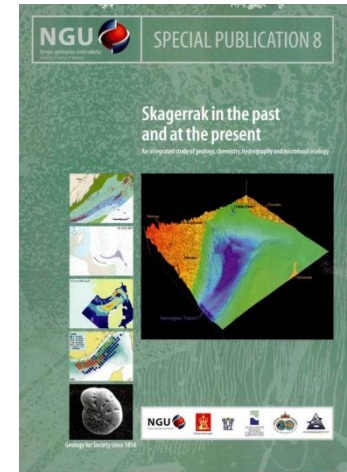
Terje Thorsnes, Norges geologiske undersøkelse

Oversikt

- MAREANO – fra oppstart til i dag
- Hva er ICES, og hva skulle de evaluere
- Hovedtrekk fra evalueringsrapporten
- Veien videre

MAREANO - fra oppstart til i dag

- 1990-1996 – Skagerrak-prosjektet (NGU, SK, HI, UiB, SFT, OD, NP)
- 1998 – 2005 – pre-MAREANO, utvikling av forvaltningsplan (FP) Lofoten- Barentshavet, SUSHIMAP (NFR-prosjekt)
- 2005 – 5,1 mill rev. statsbudsjett juni, 23.4 mill. statsbudsjett oktober
- 2006 - FP Lofoten-Barentshavet 31.3 2006
- 2011 – ekstra midler Barentshavet øst, 2017 – 106.6 mill



Hva er ICES?

The International Council for the Exploration of the Sea (ICES) is a global organization that develops science and advice to support the sustainable use of the oceans.

ICES is a network of more than 5,000 scientists from over 690 marine institutes in 20 member countries and beyond.

ICES is committed to building a foundation of science around one key challenge: [integrated ecosystem understanding](#) of marine ecosystems.

ICES advances this through the coordination of oceanic and coastal monitoring and research, and advises international commissions and governments on marine policy and management issues.

Our goal is to provide the best available science for decision-makers to make informed choices on the sustainable use of the marine environment and ecosystems.



Hvem har gjort evalueringen?

P. Degnbol (chair) – Adjunct professor, Aalborg University, DK

J. Rasmussen – Data manager, data management, Marine Scotland, UK

J. Jensen, Head of department, geology, GEUS, DK

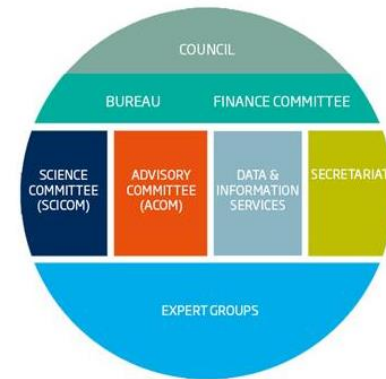
M. Viitasalo, Research professor, habitat mapping and benthic ecology, Finnish environmental inst., FI

R. Rosenberg, Professor, benthic ecology, Univ. Gothenburg, Sweden

S. Olafsdottir, Researcher, benthic ecology and mapping, Marine Research Inst., Iceland

T. Furey, Programme manager INFOMAR, bathymetry and geology, Marine Institute, Ireland

C. Robinson, Senior toxicologist, Marine Scotland – input regarding geochemistry



Hva skulle de evaluere?

- 1. **Is the programme effective:** Has the programme delivered to the aims and objectives?*
- 2. **Is the programme scientifically sound:** Are the employed methods and approaches employed, i.e. from selecting sampling strategy and sites through collection, analysis and until dissemination of data, scientifically sound and in line with recognized best practices/standards?*
- 3. **Has the programme implementation been efficient:** Is the use of physical resources such as ship time and manpower, quality and speed of data collection/mapping properly balanced, when compared to recognized best practices in the field of seabed mapping? If not, identify imbalances, and associated causes, as well as suggesting measures to improve any imbalances.*

Spesifikke problemstillinger

*Are the objectives and the associated scientific-quality standards of MAREANO clearly outlined?
Do all programme partners have a clear and common understanding of the programme objectives and scientific-quality standards?*

Has the programme delivered to these objectives and standards?

Have appropriate methodology and equipment standards been used in the seabed mapping?

Given the objectives of MAREANO, is the sample coverage in data sets fit-for-purpose, are appropriate QA/QC data flows in place to link raw data to their use as described in the objectives, and is appropriate dissemination of project results and data in place?

Can MAREANO data/products be used as a basis for future monitoring and assessment? If so, what type of monitoring and assessment?

In terms of ensuring that best standards are employed and scientific integrity: Have the appropriate institutes and scientists been involved in MAREANO to ensure work that is fit for purpose can be delivered? Do the institutes within MAREANO have capacity and expertise to implement the project? Are the skills of staff involved in MAREANO fit-for-purpose? Should other institutes also be involved?

What are the modifications, if any, which are required in the future to ensure that the scientific implementation of the programme fulfils the requirements as set out in the objectives of the project in a scientifically sound and efficient manner?

Is the programme effective?

ICES concludes that overall the programme has and is delivering data products, maps, and dissemination material which meet the needs of the assumed objectives of the programme.

The main objective for the programme, in practice, has been to inform public policy-making. The needs of policy-makers are defined by the management plans for the three Norwegian Sea areas. The needs of third party user groups (e.g. private/commercial/academic) do not appear to be influential in the programme. ICES understands that an evaluation of the actual use and utility for all users will be the subject of a separate future review.

ICES recommends that the Steering Group, to avoid ambiguity, defines, weights, and publishes the short- and the long-term criteria for prioritization of geographic areas.

ICES advises that if the overall vision of MAREANO is to be met for these areas, existing data will need to be examined for their usefulness and standards put in place for future data collection, ensuring future compatibility and effectiveness.

Is the programme effective? - 2

The outputs of MAREANO are required for a variety of public policy needs. For example, the main current usage of the biological mapping appears to be to define areas that hold vulnerable marine ecosystems (VMEs). Societal inputs have not yet been a part of the MAREANO programme in setting thresholds for the abundance of indicator species that define VMEs. In this and other cases, ICES advises that decisions are made in a dialogue process between science and policy.

Is the program scientifically sound?

ICES advises that overall, for the programme and the disciplines/activities involved:

-the methods employed are generally in accordance with sound scientific standards and best practices;

-the results are communicated well, both in terms of products and target groups by making reports, publications, and map products available to policy-makers, the general public, and to the scientific community;

- the data produced by the programme are made available to potential users and the future quality and availability of these data is largely secured.

Is the program scientifically sound? - 2

Some examples of possible improvements to the programme include:

- better cross-partner collaboration in data processing to enhance further the outputs/products;
- using biological samples to improve and verify current biotope maps;
- sub-bottom profiling data collection should be a mandatory part of tenders for bathymetry in order to maximize the use of costly offshore survey time;
- increasing the storage of biological samples in ethanol so that DNA analysis can occur more frequently;
- mapping of statistical confidence to help in future decision-making;
- continued harmonization of biological modelling between different map products to improve comparability and transparency;
- implementing and further developing the existing efforts to optimize sampling strategies in order to maximize the benefits of the programme.

Has the programme implementation been efficient?

ICES advises that existing data are used in the planning of new sampling and in fulfilling the overall vision of MAREANO.

Although some further work may be needed to incorporate such data, use of these data would improve programme efficiency. Some of the data collected by MAREANO are not being used fully and the balance between data collection and analysis should be improved.

Has the programme implementation been efficient? - 2

Specific issues that could be addressed by MAREANO to improve the cost-effectiveness and balance of the programme are:

Many data collected outside the MAREANO programme (e.g. by oil companies, academic institutes, monitoring programmes) would supplement MAREANO data, for example data collected

- by echosounders on board non-bathymetric vessels (e.g. OLEX data),
- in preparation of oil exploration and other environmental impact assessments,
- by ecosystem monitoring projects and programmes,
- through academic projects from within the Norwegian Geological Survey (NGU) and the Institute of Marine Research (Havforskningsinstituttet, HI) and by other organizations.

Veien videre

- Bevilgning på 1 mill til innsamling, systematisering og tilgjengeliggjøring av metadata og data fra eksterne kilder i 2017. Forslag om samme sum i 2018.
- Metodeprosjekter som inkluderer konfidens gjennomføres i 2017.
- Forslag om metodeprosjekt som videreutvikler kart over sårbare biotoper – adresserer råd om tettere kontakt mellom forskning og forvaltning.
- Forslag om videreutvikling av strategi for innsamling av video og fysiske prøver som gjennomføres i 2018-2019. Konfidens er et sentralt aspekt.
- Forslag om å evaluere valg av optimale plattformer og sensorer for visuelle data.
- Forslag om å dokumentere kvalitetskontroll og metodikk for uorganisk og organisk kjemi.
- MAREANO vil også ta stilling til resten av anbefalingene – ca. 100 stykker

Oppsummering

Overall MAREANO is a well-conducted programme.

Several other countries are also embarking on full EEZ-scale bathymetric, geological, and biological mapping, but MAREANO is globally unique in its approach, particularly in relation to the extent of the biological investigations that are central to the programme.

The amount of effort and the duration invested in this programme is such that for some aspects there is no comparable programme internationally and the MAREANO standard is *de facto the best available*.