

Project information

Project title

Ocean Health in Transition (OHiT)

Year

2018

Project leader

Per Fauchald, NINA

Geographical localization of the research project in decimal degrees (max 5 per project, ex. 70,662°N and 23,707°E)

From 65°N, 12°E along the coast to 71°N, 31°E

Participants

Lead:

- Per Fauchald (per.fauchald@nina.no), Norwegian Institute for Nature Research (NINA)

Administrative responsible:

- Cathrine Henaug (cathrine.henaug@nina.no).

Partners:

- NINA:
 - o Sigrid Engen
- Institute for Marine Research:
 - o Erik Olsen
 - o Lis Lindal Jørgensen
 - o Gro van der Meer
 - o Per Arneberg
- NIVA:
 - o Hege Gundersen
 - o Trine Bekkby
 - o Hartvig Christie
- SALT:
 - o Jannike Falk-Andersson
- NOFIMA
 - o Eirik Mikkelsen
- UiT-Arctic University of Norway:
 - o Vera Helene Hausner
 - o Ann Eileen Lennert
- International partners:
 - o Benjamin Halpern, NCEAS, University of California Santa Barbara (USA)
 - o Stefan Gelcich, Catholic University of Chile (Chile)
 - o Greg Brown, California Polytechnic University San Luis Obispo (USA)

In 2018, OHiT was integrated in a larger project co-funded by the Fram Centre Incentive project "Sustainable Blue Growth –a Coastal Barometer for Northern Norway" and the NRC project "BlueTrans".

Summary of Results

Summary:

The growth in the blue economy is changing coastal ecosystems and communities. To guide ecosystem-based management, there is a need for developing measures of ocean health and analyze how industrial development is affecting sustainability goals.

In 2018, we received a grant for a four years NRC project (BlueTrans, 2018-2022) that builds directly on the work accomplished in OHiT (Fram Centre -MIKON) and the Coastal Barometer (Fram Centre -Incentive Funds). Two PostDocs have been hired on the project. The new project has made it possible for us to improve the ocean health indicators we have developed so far by including more relevant data series and carry out more extensive user involvement. Furthermore, the funding will enable us to improve the communication of the coastal barometer and conduct more thorough analyses of how the development in the dominant blue industries (i.e.; fisheries, aquaculture and tourism) impact the sustainability goals.

Our main task in 2018 has therefore been to improve and finish the development of the nine ocean health indicators for the Coastal Barometer covering 81 coastal municipalities in Northern Norway. The nine indicators are based on the Ocean Health Index and includes: Food provisioning; Small-scale fisheries; Natural Products; Carbon Storage; Sense of Place; Livelihood and Economies; Tourism and Recreation; Clean Waters and Biodiversity. We have carried out two workshops and several meetings among the project scientists to further develop and quality assure the different indicators and include new data series.

A coastal survey of stakeholder workshops has been planned and will be carried out in five municipalities in Northern Norway (Vardø, Hammerfest, Skjevøy, Vågan and Vega) in early 2019. In these workshops, we will gather local stakeholders and use nominal group technique to investigate how local stakeholders prioritize different sustainability goals and evaluate and further improve the ocean health indicators. We have also worked with how to best communicate the indicators, and the first version of the indicator set will be published on the coastal barometer web page in early 2019. To further engage local people and improve the indicators, we have, based on a pilot study conducted by OHiT, planned a comprehensive web-based PPGIS survey, covering all coastal municipalities in Northern Norway. In this survey, local people can express their place values and their concerns related to sustainable use and development of the coast. The survey will be initiated in 2019.

In 2018, we have analyzed national spatio-temporal fisheries data in relation to data on biodiversity and socio-economic data. During the last 40 years, management actions have made Norwegian fisheries more economic sustainable while at the same time the harvest pressure has stabilized on sustainable levels. We use comprehensive datasets to investigate how this development has impacted social sustainability and how the fisheries impact environmental sustainability. Several publications are expected on this topic the coming year. Similarly with respect to the growth and development in Norwegian aquaculture, we have collated comprehensive datasets on biodiversity and socio-economy, and analyzed the different aspects of sustainability related to the growth in this industry. Several publications are expected on this topic the coming years.

Highlights:

1. OHiT is developing a Norwegian version of the Ocean Health Index. The set of indicators has been named *Kystbarometeret*
2. *Kystbarometeret* consists of indicators for nine sustainability goals, specifically formulated for a Norwegian context
3. The indicators are calculated for 81 coastal municipalities in Northern Norway using comprehensive datasets encompassing biodiversity, socio-economy, environment, fishery and aquaculture statistics, public participatory mapping, social media and news outlets.
4. To involve local people in *Kystbarometeret*, a comprehensive Public Participatory GIS (PPGIS) study will be carried out in 2019.
5. A stakeholder survey with workshops in five municipalities has been planned and will be conducted in early 2019.
 6. Using the extensive datasets compiled in the project, we have conducted in-depth analyses of how the development of fisheries and aquaculture have impacted economic, environmental and social sustainability along the coast.

Master and PhD-students involved in the project

None

For the Management

- *Kystbarometeret* measures indicators for nine sustainability goals in 81 coastal municipalities in Northern Norway.
- *Kystbarometeret* utilizes extensive datasets on biodiversity, socio-economy, environment, fishery and aquaculture statistics, public participatory mapping, social media and news outlets.
- *Kystbarometeret* specifically addresses public participation in defining sustainability issues through internet mapping.
- *Kystbarometeret* might guide Marine Spatial Planning on the municipality, county and national levels.
- Quantitative analyses of the indicators will provide new knowledge on how the development of marine industries in Northern Norway influence sustainable coastal development.
- The analyses will also provide new knowledge on the cumulative environmental impact of the marine industries in Northern Norway.

Published Results/Planned Publications

A number of scientific publications are planned and are under work. These include (but are not restricted to):

- Transitions of Norwegian fisheries; economic, social and environmental sustainability
- The growth and sustainability of Norwegian aquaculture
- Sustainability of coastal communities under blue growth
- Coastal biodiversity impacts from human drivers
- Measuring sense of place: What are the most important place-values for youth?
- Changes in the perception and biological status of iconic species
- Understanding socio-ecological transitions using the ocean health index

These, and other future publications that are products of the MIKON project, will be reported as soon as they are published.

Communicated Results

The Coastal Barometer will be highly relevant for environmental and economic policies, marine spatial planning, marine industries, management authorities, coastal municipalities and local people. The communication of results to a large variety of end-users is therefore vital for the project's impact and success. The Coastal Barometer web site will be the main hub for communication and dissemination. The site will host several tools for visualization of indicators as well as tools for user participation (e.g., PPGIS). It will also include a thorough presentation of the data and methods applied.

The impact of *Kystbarometeret* depends on legitimacy, transparency and scientific rigor. We have therefore adopted a prudent communication strategy awaiting quality assurance of our indicators through the review process of scientific publications and stakeholder involvement. *Kystbarometeret* has been presented on internal seminars at IMR and NINA.

OHIT has been presented on:

Fauchald P (2018) Hvordan måle bærekraft? -Kystbarometeret for Nord Norge. FjordNord konferanse, Framsenteret 18.04.2018.

Interdisciplinary Cooperation

The research questions addressed by OHIT demands a broad interdisciplinary approach. All members of the

research team have experience from interdisciplinary research and represent a broad suite of competence in marine ecosystem-based management, resource economy, sustainability science, and marine and coastal ecology.

Budget in accordance to results

From the grants from the Fram centre we have built an interdisciplinary research team, compiled an extensive database, formulated indices of ocean health, developed a web-site for communication, conducted a pilot PPGIS study, and developed a successful research proposal for the Norwegian Research Council. The funding from NRC has made it possible for us to expand and improve all aspects of the project, including improved communication, more comprehensive analyses and stronger user-involvement.

Could results from the project be subject for any commercial utilization

No

Conclusions

OHiT has been successful in initiating a larger research project. In the extension of OHiT, we develop new interdisciplinary methods for analyzing sustainable transitions of social-ecological systems. The extended project will allow for a more comprehensive involvement of stakeholders as well as including local peoples' values and preferences in the definition of ocean health. The project will provide new interdisciplinary knowledge on how the growth in the blue economy affects ocean health.