
Introduction

In recent years, it has been acknowledged that Norwegian waters host large cold-water coral reefs at depths ranging from 40 to 600 m. These ecosystems are complex three-dimensional structures that provide suitable habitats for many sessile and free-swimming organisms, resulting in a rich and diverse associated fauna. Cold-water coral reefs may be particularly vulnerable to environmental pressures because the growth and habitat formation is a slow process, and they also need protection and management as they represent a unique heritage from the past. One of the key reef-building species is the scleratinian coral *Lophelia pertusa*. A priority for both industries and national management bodies is to understand the cold-water coral ecosystem sensitivity to anthropogenic activities related to O&G industries.

The Norwegian Oil Industry Association (OLF) has decided to organize the 1st Norwegian workshop on cold-water corals which will be hosted by the International Research Institute of Stavanger (IRIS-Biomiljo), Stavanger, Norway. The workshop will bring together scientists, industries, governmental and non-governmental agencies actively involved in cold-water coral research and management. Together, they will share their knowledge on cold-water coral vulnerability to natural or anthropogenic disturbances and build a common understanding on ecosystem sensitivity. The workshop will thus provide attendees with an excellent opportunity to share results obtained from national and international research projects and national experiences and practices. Possible knowledge gaps and challenges will be identified. This workshop will contribute to establish the basis for a future management strategy needed to obtain a "zero harm" policy to cold-water coral habitats and ecosystems.

Topics addressed during the workshop:

- State-of-knowledge of the basic biology and key features of *Lophelia pertusa*

What is the basic biology knowledge? Where do we lack information? What do we need to understand better?

Aspects of *Lophelia pertusa* biology that are related to behaviour, feeding, defence mechanisms, metabolic tolerance, reproduction, larval development and growth should be covered.

- Coral ecosystems, ecology and specific associations

Lophelia pertusa is the main species forming the cold-water coral reefs. However, a high diversity of other soft and hard corals, sponges and associated invertebrates use these reefs as habitat. Also a specific microbial fauna appears to exist in connection to corals. What do we know about these species and their function to the well-being of coral reefs? What are the relationships between the different species associations?

- Current state-of-knowledge of impacts on corals from natural and O&G activities

We are beginning to understand how corals function, but there are still large gaps on what factors determine their well-being under natural conditions. Recent studies have addressed more specifically the impact from O&G activities. What are these studies revealing? Is this knowledge sufficient, and what are we lacking?

- Current sampling methods, mapping and monitoring strategies from laboratory and field experience with cold-water corals (CWC)

Cold-water corals are found in deep-water and the use of different technologies adapted to their observations in the field is necessary. Observations based on video recordings obtained from ROVs, in situ measurement of growth, monitoring of currents and spreading of particles from drilling activities and the use of acoustic for mapping coral distribution are prevalent. In the laboratory, several techniques can be used to measure other subtle and vital changes to corals. Do these measurements give useful information that can be used as indicators of coral health during and after drilling operations? Are the methods sufficient to apply for management purposes?

- Lessons learned from experiences and management of corals

We need to limit the impact from several anthropogenic activities to cold-water corals. Are the current mitigating practices by O&G industries sufficient to document effects from their activities, and separate it from other activities, or is there a need for better documentation? Can some experiences with tropical corals and management strategies applied to tropical coral reefs be transferred to cold-water corals?

- The way forward: identify current challenges, limitations and potential needs.

What do we need to know better, where should we put the efforts and which research areas do we need to highlight to provide the necessary information suitable for a coral management strategy.