

**SYMBIOSES: a practical risk management tool to integrate fisheries and hydrocarbon activities in the Lofotens and Barents Sea, Norway**

Daniel Howell [1], JoLynn Carroll [2], Frode Vikebø [1]

[1] Institute of Marine Research, Norway

[2] Akvaplan-niva, University in Tromsø

**Contact author:** Daniel Howell, IMR Norway, daniel.howell@imr.no

The Lofotens in Norway are the spawning grounds for several key commercial species in the Barents Sea, including Northeast Arctic cod, currently the world's largest cod stock. At the same time, this area is believed to be rich in oil and gas deposits, and an area of interest to the hydrocarbon industry. There is consequently a need for a multisectoral risk analysis tool, to analyse the potential impacts of oil spills in the region on the fish stocks of the Barents Sea. This presentation outlines such a tool, "SYMBIOSES", recently developed to combine high resolution oceanography, ecotoxicology, zooplankton, and larval modeling to evaluate the likely impacts of hypothetical oil spills on cod larvae in the region around the spawning grounds. This is then coupled to a multispecies model of the Barents Sea in order to estimate likely impacts on the fish stock and commercial fishery. By combining fisheries and toxicology in this way, we can assess the relative risks of different potential drill sites, evaluate how the state of the stock interacts with the oil spill, and examine the extent to which managers could mitigate the impacts of an oil spill by reducing fishing pressure. The tool does not model all risks, for example risks to the local ecosystem or tourist industry are not included. It does however represent a significant step forward in combined analysis of different human pressures on the major commercial fish resources of the Barents Sea.