

Norwegian component of the Ecosystem Studies of Subarctic and Arctic Regions

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Project summary

The main goal of NESSAR is to quantify the impact of climate variability on the structure and function of marine ecosystems in the Nordic and Barents seas. This interdisciplinary program will mount intensive field studies of the physical and biological processes at the Arctic Front in the Barents Sea and at the boundary of the Norwegian/Iceland seas. It seeks improved quantitative knowledge of: the physical processes of biological importance, especially those related to phytoplankton production such as mixing and/or convergence, sea ice and the influence of light spectra; variability in frontal position and their mechanisms; the detailed linkages between zooplankton and phytoplankton as a function of size; biomass accumulation as a function of prey and predators; and how fish use the front for feeding and growth, especially their relationship with zooplankton. Instruments and techniques not previously used or attempted in Norway, such as moored fluorometers and autonomous gliders (with both physical and biological sensors) that can sample for extended periods and penetrate close to the ice will be used along with more traditional methods. To maximize the information on trophic linkages, careful consideration is being made to match the appropriate sampling scales. Model and retrospective studies will support interpretation of the observations. Comparative analyses will be carried out, first between the Barents and Nordic seas and then with subarctic seas of the Northwest Atlantic and North Pacific as well as Arctic regions, especially with other members of the ESSAR consortium. These comparisons should provide insights into what are the fundamental processes in arctic and subarctic marine ecosystems and what are regionally unique. Successful completion of NESSAR will improve quantitative predictions of climate and food chain linkages that can be used in the ecosystem approach to fisheries and to predict the ecosystem response to possible future climate change.