

Work in two ICES Working Groups for Integrated Ecosystem Assessment – WGIBAR for the Barents Sea and WGINOR for the Norwegian Sea Large Marine Ecosystems

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Abstract

The International Council for Exploration of the Sea (ICES) puts emphasis on *ecosystems* in their current Strategic Plan and has established a number of regional working groups for doing Integrated Ecosystem Assessment (IEA). Two of these groups are WGINOR and WGIBAR that were established in 2013 and 2014 for the Norwegian Sea and Barents Sea ecosystems respectively. Both groups have met three times and produced reports that are available at the ICES webpage (<http://www.ices.dk/explore-us/who-we-are/Pages/Expert-Groups.aspx>).

WGINOR and WGIBAR have taken similar approach and scope to doing IEA for the two Large Marine Ecosystems (LMEs). The scope has been to focus on the influence of climate variability and change on the (mostly) pelagic part of the ecosystems and on interactions with fisheries. The approach has been to assemble time series of oceanography, plankton and fish stocks and provide a multivariate description and analysis of the variability and changes in the two ecosystems. Information on seabirds, marine mammals, benthos, fishing activities and catches has also been included in some of the work. Much of the data comes from joint surveys in the Barents and Norwegian Seas and is presented both with spatial information (e.g. distribution maps from the surveys) as well as spatially aggregated (e.g. fish stocks, mean zooplankton biomass) as annual time series for the ecosystems. Integrated trend plots of all the time series variables (represented as anomalies) are used to visually show temporal patterns of change, which are further explored by multivariate analyses (MVA), notably Principle Component Analysis (PCA). The purpose is to understand the current situation in the ecosystem with focus on the most recent year, e.g. 2015 in the two most recent reports by WGINOR and WGIBAR. Use of time series and MVA help us see where we are coming from in interannual and decadal perspectives, which again may help us to better understand the current situation and likely short-term developments in the ecosystems.