The international Council for the Exploration of the Sea (ICES)
An Intergovernmental Marine Science Organization

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ICES is an intergovernmental organization whose main objective is to increase the scientific knowledge of the marine environment and its living resources and to use this knowledge to provide unbiased, non-political advice. ICES supports its Member Countries and international governmental institutions like the EU Commission, NEAFC, NASCO, NAFO, NAMMCO,OSPAR and HELCOM by providing scientific information and knowledge and advice on ecosystem, fisheries, and aquaculture issues.

1. Arctic Research Policy and Goals

   The Arctic marine environment is currently undergoing major changes due to climate change and human activities. ICES has prioritized arctic research to help improve understanding of ecological processes and human impact.
   A number of ICES expert groups focus on subarctic fish stocks in the Barents Sea, Iceland and East Greenland, as well as widely distributed and straddling stocks.

   ICES has a network of Integrated Ecosystem Assessment (IEA) Groups, providing opportunity to share methods and guidance between ecoregions.

   Of specific Arctic relevance are three IEA groups:

   - Working Group on the Integrated Assessments of the Norwegian Sea (WGINOR)
   - Working Group on the Integrated Assessments of the Barents Sea (WGIBAR)

   Both of these groups can provide knowledge about the state of ecosystems, overviews of available data, monitoring strategies, and adaptive management. In addition

   - the Working Group on Integrated Ecosystem Assessment for the Central Arctic Ocean (WGICA; joint group with the North Pacific Marine Science Organization (PICES) and the Arctic Council Working Group Protection of the Arctic Marine Environment (PAME)) works on IEA for the Central Arctic Ocean, with a specific focus on prospects for future fisheries and sensitivity and vulnerability in relation to shipping activities

   A joint ICES and PAME workshop *Ecosystem Approach guidelines and Integrated Ecosystem Assessment in the Arctic* dealt with the inclusion of indigenous knowledge in IEAs in the changing Arctic region. This is crucial not only to avoid risks to human life and to secure resources important for indigenous peoples and their cultures, but also to support the scientific basis for management in rapidly changing Arctic ecosystems.

   Our IEA Groups have compiled Ecosystem overviews for the Barents Sea, Icelandic waters, and Norwegian Sea, providing a description of the ecosystems, identifying the main human pressures, and explaining how these affect key ecosystem components.

   We provide the evidence base for marine assessments in the ICES area; for example, the Contaminants and Biological Effects dataset is related to the work of AMAP. This includes potential further cooperation on a hazardous substances assessment tool, generating an on demand dataset product from the ICES databases.

   For more than a decade ICES has produced an annual report of the North Atlantic and Nordic seas describing the state and trends in ocean climate. The report is available as an operational data tool; http://www.ices.dk/news-and-events/newsarchive/news/Pages/Climate-report-enters-the-digital-age.aspx

   Biannually, ICES publishes Zooplankton, Phytoplankton, and Microbial Plantion Reports covering subarctic waters

ICES works collaboratively with several international groups active in Arctic science, such as working groups of the Arctic Council, International Arctic Science Committee (IASC), Third International Conference on Arctic Research Planning ICARP (III), and Association of Polar Early Career Scientists (APECS).

Meetings of Scientific Experts on Fish Stocks in the Central Arctic Ocean (FiSCAO), supporting the December 2017 concluded Agreement to prevent unregulated high seas fisheries in the central Arctic Ocean

The FiSCAO meetings have focused on potential fisheries resources in the Central Arctic Ocean, including the design of a 1-3 year long mapping program for fisheries resources and a potential monitoring program, as well as the identification of resources needed for mapping and monitoring, and the development of data collection, sharing, and hosting protocols.

The recent meeting of FiSCAO concluded that the development of a data sharing protocol will require negotiation and legal review among the parties, and recommended that a data management/sharing pilot study be undertaken. USA, ICES, and PICES in cooperation offered to undertake the pilot study.

Examples of events, scientific symposia, and themes sessions with Arctic focus

- 2016 Workshop on impacts and consequences of ocean acidification for commercial species and end-users
- 2017 ICES Scientific advice on distributional changes in fish stocks linked to environmental conditions (mostly through sea temperature) and fishing
- Joint ICES/PICES working group on climate change and biologically driven ocean carbon sequestration
- 2017 Symposium: Ecosystem Studies of Subarctic and Arctic Seas Program International Open Science Meeting
- 2017 Workshop on global ecological and economic connections in Arctic and sub-Arctic crab fisheries
- 2017 Joint ICES/PICES strategic inititative on climate change impacts on marine ecosystem, covering among other issues vulnerability assessments on fish and shellfish and on the human communities depending on them
- 2018 joint ICES/PICES Workshop on Political, Economic, Social, Technological, Legal and Environmental scenarios to be used in climate projection
- 2018 symposium: Fourth International ICES/PICES/IOC/FAO Symposium, The effects of climate change on the world's oceans, Washington D.C., USA – addressing both consequences and impacts of climate change in the world oceans, gaps and insufficiencies in the evidence-base as the basis for proposals for priorities for future research, as well as to derive appropriate climate-ready policies that can help society adapt and protect the marine environment and living resources in the future
- ICES Annual Science Conference, 24-27 September 2018, Theme Session: The Nordic seas and the Arctic – climatic variability and its impact on marine ecosystems, fisheries and policymaking