

## **The Science Track for Fisheries Science in the Central Arctic Ocean: Possible Steps Forwards**

Terms of Reference for a scientific meeting to develop a Joint Program for Research and Monitoring in the central Arctic Ocean (CAO)

### **Background**

The issue of the international management of fisheries in the central Arctic Ocean (CAO) was addressed at a meeting of governments (including Canada, Norway, Greenland/Denmark, the Russian Federation and the United States) held in Oslo, Norway in June 2010. A key question raised in that meeting was “*what is the status of science?*” This led to an initial scientific meeting held in Anchorage, AK in June 2011. There the general conclusion was that there was no urgency, but that given the limited scientific knowledge of the CAO there was a need to establish baseline data.

The five governments next met in Washington D.C. during April-May 2013. A key question raised there was what were the prospects for commercial fisheries in areas of the CAO beyond national jurisdiction? Again this meeting of policy makers was followed by a 2<sup>nd</sup> scientific meeting held in Tromsø, Norway October 2013. The general conclusion of scientists in attendance was that there was no near term prospects for commercial concentrations of fish but that there remained a need to know more about fish stocks with the potential to be harvested in the CAO.

The next meeting of the five governments was held in Nuuk, Greenland in February 2014. The governments reached elements of agreement on CAO fisheries but also issued a call for Joint Program of Scientific Research. Terms of reference were developed at this meet for the 3<sup>rd</sup> scientific meeting, which was held in Seattle, WA, USA in April 2015. Participants there developed a developed a status & gaps report, a partial inventory of research & monitoring, and a draft framework for a Joint Program of Scientific Research & Monitoring. Participants at the workshop identified several next steps including the need for:

- A thorough synthesis and integration of analysis of “where we are now” is needed
- Large-scale and coordinated monitoring as possible to capture temporal and spatial variability
- Continued development of an international Joint Program of Scientific Research and Monitoring

Most recently the five governments met with representatives from the governments of China, European Union, Iceland, Japan, and Korea in Washington, DC in December 2015 to further discuss management of potential CAO fisheries. These participants agreed upon the need for the development of a Joint Program of Research and Monitoring to address four questions (which represent a refinement of questions raised in the 3<sup>rd</sup> scientific workshop):

- What are the distributions and abundances of species with a potential for future commercial harvests in the central Arctic Ocean?
- What other information is needed to provide advice necessary for future sustainable harvests of commercial fish stocks and maintenance of dependent ecosystem components?
- What are the likely key ecological linkages between potentially harvestable fish stocks of the central Arctic Ocean and adjacent shelf ecosystems?
- Over the next 10-30 years, what changes in fish populations, dependent species, and the supporting ecosystems may occur in the central Arctic Ocean and the adjacent shelf ecosystems?

### **Terms of Reference for the next Scientific Meeting**

Representatives from the 10 governments agreed to three Terms of Reference (ToR) for the next scientific meeting.

**ToR 1: Complete the synthesis of knowledge** – Prior to the meeting there will be a call for existing data and analyses of the CAO from science organizations of the parties. This will be used to complete the synthesis and integration of analysis of “where we are now”, and identify the priorities for research and monitoring gaps. Most of this synthesis should be done prior to the workshop

**ToR 2: Develop a Joint Scientific Research and Monitoring Plan to address the four questions** – The primary objective of the meeting shall be to develop a joint Research and Monitoring Plan. This plan shall build upon the outcomes of the three scientific meetings, take the questions from the Joint Program of Scientific Research as the point of departure, and consider the need for additional modeling of ecosystem relationships for areas of the CAO with physical and biological data relating to commercial fish species. Participants at the meeting shall develop a science Plan for the next five years showing staged development of research and monitoring that addresses gaps in abundance, distribution and other information required to provide advice about the potential for sustainable harvest of commercial species.

The plan shall include:

- Spatial and temporal scope, objectives and rationale
- Use, to the extent possible, existing research and monitoring programs
- Incorporation of indigenous and traditional knowledge (ITK), where relevant
- Methodology & scientific approach including the need for new research cruises in the CAO
- Appropriate ecosystem (physical, biological, social) indicators
- Analysis and modeling strategy
- Data and Information sharing strategies

**ToR 3: Provide a Framework for the Implementation Plan** – Participants at the meeting shall use the Research and Monitoring Plan discussion to develop the list of

considerations for implementation of the Plan. This Framework shall develop broad options for implementation addressing

- Data needs and how they are to be acquired
- Additional surveys needed to supplement existing surveys
- Assessment/synthesis
- Modeling
- Hosting of data
- Organization of work/Governance

**Research Framework** – Participants at the December 2015 meeting asked that a schedule for execution of each of the ToRs be provided. Provisional timing is as follows:

- ToR 1 will be completed between before the scientific meeting (before Fall 2016)
- ToR 2 will start at the scientific meeting held in Fall 2016
- ToR 3 will frame the implementation plan as guidance to a scientific meeting to be held in 2017
- Implementation will begin in 2018

**Logistical Considerations** – The Scientific Meeting Workshop will be hosted by Norway during Fall 2016. Invitations will be issued to all 10 governments requesting 2-3 scientific delegates familiar with Arctic science, surveys and modeling, and the science necessary to support management and conservation of marine living resources. Arctic indigenous groups shall be included as part of the 10 delegations, where relevant. Invitations will also be made to other interested bodies including the Arctic Council (PAME/CAFF), PICES/ICES, NEAFC, and other subject matter experts.