

## WGIEANBS-CS – ICES/PICES Working Group on Integrated Ecosystem Assessment of the Northern Bering Sea-Chukchi Sea

**2019/FT/IEASG11** A ICES/PICES Working Group on Integrated Ecosystem Assessment of the Northern Bering Sea-Chukchi Sea (WGIEANBS-CS), chaired by Elizabeth Logerwell\*, USA, and Yury Zuenko\*, Russia, will work on ToRs and generate deliverables as listed in the Table below.

YEAR	MEETING DATES	VENUE	REPORTING DETAILS	COMMENTS (CHANGE IN CHAIR, ETC.)
2021	14 April	Online meeting	Interim e-evaluation	
	October	Qingdao, China		
2022	September (ICES ASC)	Copenhagen, Denmark	Interim e-evaluation	
	October (PICES AM)	TBD		
2023	September (ICES ASC)	TBD	Final e-evaluation and ICES Scientific Report by end of November	
	October (PICES AM)	TBD		
	September (Arctic community workshop)	TBD		

Other intersessional meetings and workshops will occur as the opportunities arise.

### ToR descriptors

ToR	Description	Background	<a href="#">Science plan codes</a>	Duration	Expected Deliverables
<b>a</b>	Determine approach and methodology for conducting an IEA in the Northern Bering – Chukchi Sea	Before starting data analysis, basic discussions on suitable methodological/analytical approaches are required. This can be started after initial datasets are assembled.	1.1, 1.3, 7.1	Year 1	Reports submitted to ICES and PICES
<b>b</b>	Compile an inventory of scientific metadata	The inventory will contain physical, chemical and biological (incl. higher trophic levels) oceanographic data.	1.1, 1.3	Year 1	Meta-database
<b>c</b>	Development of indigenous knowledge sharing with knowledge holders, to facilitate co-production of knowledge while protecting intellectual property as per the UN Declaration on the Rights of Indigenous Peoples (Articles 11.2, 31).	There are several indigenous Alaskan and Russian communities that can provide specialized Indigenous and Traditional Knowledge unavailable from other sources about characteristics and changes of the Northern Bering – Chukchi Sea	1.1, 1.3, 7.1	Year 1	Reports submitted to ICES and PICES

LME					
<b>d</b>	Compile an inventory of institutions and programs active in the region	There are several institutions and programs active in the NBS-CS that could contribute to the IEA	1.1, 1.3, 7.1	Year 1	Inventory. Reports submitted to ICES and PICES
<b>e</b>	Describe the key physical, biological and human elements of the ecosystem	Identification of key characteristics is needed to develop conceptual models of the ecosystem	1.1, 1.3, 7.1	Year 2	Reports submitted to ICES and PICES and/or paper submitted to peer-reviewed journal
<b>f</b>	Develop shared conceptual models including both Indigenous Knowledge and science; and review of hypotheses for ecosystem dynamics. Identify potential indicators. Describe goals and targets; and objectives and values	A dynamic description of the ecosystem can be achieved or supported through construction of conceptual models. This should encompass human activities along with the natural (non-human) components and processes of the system. Development of these conceptual models be done in close collaboration with Indigenous Peoples and relevant stakeholders, using Indigenous/Traditional and Local knowledge (TLK) along with knowledge from physical, biological and social sciences.	1.1, 1.3, 7.1	Year 2	Reports submitted to ICES and PICES and/or paper(s) submitted to peer-reviewed journal
<b>g</b>	Assess ecosystem status and trends. Identify potential impacts/risks at the LME-scale; and at the local scale with emphasis on human use and Indigenous Knowledge	This ToR will be based on activities and advancements of the above. It is a hope to produce scientific manuscript.	1.1, 1.3, 7.1	Year 3	Reports submitted to ICES and PICES and/or paper(s) submitted to peer-reviewed journal, possibly a special issue
<b>h</b>	Knowledge gap analysis	To further advance the IEA for the region, identification of knowledge and data gaps is inevitable, together with considering improvements in data collection.	1.1, 1.3, 7.1	Year 3	Reports submitted to ICES and PICES and/or paper(s) submitted to peer-reviewed journal, possibly a special issue

### Summary of the Work Plan

<b>Year 1</b>	During Year 1, the foundation will be created for conducting an IEA of the NBS-CS. Meetings will take place remotely via web/teleconferences. Cultural awareness training for WG members will be offered. The WG will determine the approach and methodology for the IEA and will compile information about existing datasets (as metadata), institutions and programs. The WG will also develop methods and approaches to facilitate co-production of knowledge.
<b>Year 2</b>	During Year 2, the key elements of the ecosystem will be described and shared conceptual models including both Indigenous Knowledge and science will be developed. Meetings will take place at

	ICES ASC and PICES ASM; and other venues as opportunities arise with preference to those in Arctic communities.
<b>Year 3</b>	Year 3 will see the culmination of the first two years of preparatory work. Meetings will take place at ICES ASC and PICES ASM; and in an Arctic community. An IEA of the NBS-CS will be published. This report (and collection of scientific papers) will assess the ecosystem status and trends; identify impacts/risks at the LME-scale and at the local scale with emphasis on human use and Indigenous Knowledge; and report on knowledge gaps.

## Supporting information

<b>Priority</b>	The Northern Bering Sea-Chukchi Sea (NBS-CS) region is experiencing unprecedented ocean warming and loss of sea ice as a result of climate change. Seasonal sea ice declines and warming temperatures have been more prominent in the northern Bering and Chukchi seas as almost all other portions of the Arctic. As an inflow shelf, the Chukchi Sea provides essential sources of nutrients, freshwater and heat to the Arctic Ocean, affecting processes in adjacent shelf systems as well as the deep basin. Chronic and sudden changes in climate conditions in this Arctic gateway are increasingly impacting marine species and food-webs and expanding opportunities for commercial activities (shipping, oil and gas development and fishing), with uncertain and potentially wide-spread cumulative impacts. There are strong concerns about the impacts of climate change and industrial activities, and these impacts may be particularly pronounced in Arctic indigenous communities dependent on the health and stability of the ecosystem. The combination of unprecedented, rapid change and increased interest in the Arctic in general and the NBS-CS specifically make this an opportune time for a synthesis of issues and knowledge. An Integrated Ecosystem Assessment (IEA) can accomplish this synthesis.
<b>Resource requirements</b>	No resource requirements from ICES
<b>Participants</b>	The group is expected to attract between 25 to 35 members and guests with broad coverage of ecosystems within ICES and PICES regions; and with representation from Indigenous/Traditional Knowledge as well as science.
<b>Secretariat facilities</b>	The group will request meeting rooms / times associated with the ICES ASC, for a half-day meeting. This will require some assistance from members of the secretariat organizing those events. Similar requests will be made of the PICES secretariat.
<b>Financial</b>	No financial requirements from ICES
<b>Linkages to ACOM and groups under ACOM</b>	There are no obvious direct linkages.
<b>Linkages to other committees or groups</b>	There is a very close working relationship with all the groups IEASG. It is also very relevant to the Working Groups on Ecosystem Assessment in other regions, such as WGEAWESS, WGIAB, WGIBAR, WGIEAGS and particularly WGICA.
<b>Linkages to other organizations</b>	<ul style="list-style-type: none"> <li>• Joint partnership between ICES and PICES: the proposal has been approved by PICES;</li> <li>• International Arctic Science Committee (IASC), interest in co-sponsorship has been expressed</li> <li>• Arctic Council Protection of the Arctic Marine Environment (PAME), interest in co-sponsorship has been expressed</li> <li>• NOAA Integrated Ecosystem Assessment Program, interest in co-sponsorship has been expressed</li> <li>• Bering Sea Elders Group</li> </ul>