

North Pacific
Fishery
Management
Council –

Science and Statistical Committee Workshop

February 7-8, 2023

Rapid change in the northern Bering and southern Chukchi Seas - Identifying ecosystem responses and effects on the management of Federal fisheries

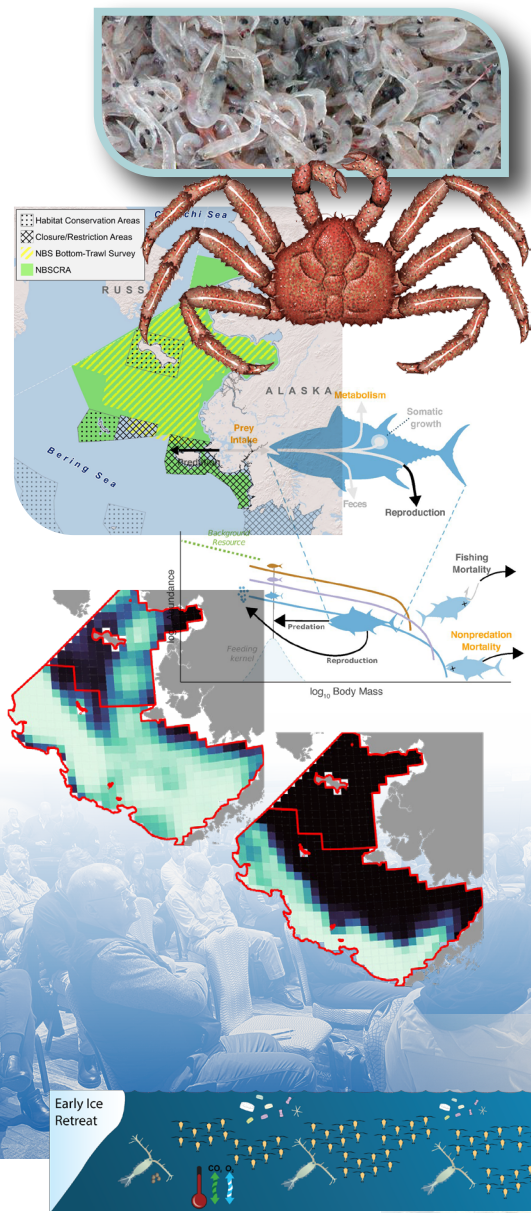
The Science and Statistical Committee held a workshop on *"Rapid change in the northern Bering and southern Chukchi seas - Identifying ecosystem responses and effects on the management of Federal fisheries."* The workshop was motivated by recent rapid changes in the Pacific Arctic and, in particular, in the northern Bering Sea and Bering Strait region. The results from the workshop are based on presentations, discussions, and public comments made during the workshop.

There have been significant changes in the physical environment; plankton and bottom-dwelling species such as crabs and clams; and seabirds, marine mammals, and groundfish in the northern Bering Sea and southern Chukchi Sea. Potential changes in carrying capacity or the maximum number of animals that these marine ecosystems can support will have important consequences for food security in a region that is heavily dependent on the marine environment. Addressing knowledge gaps in how this marine ecosystem functions will enable scientists to better monitor

marine species and better understand the connectivity among different regions in the Bering Sea and Chukchi. There are many opportunities for sharing information, co-producing knowledge, and co-management approaches, but these will require improved coordination among agencies and with local communities and Tribal governments.

Workshop participants emphasized the need for resources to support fish and ecosystem surveys, biological information, ecosystem considerations, and incorporate other sources of knowledge into science and management. New resources are necessary to improve data collection in the Chukchi Sea to be prepared for future changes. Partnerships and comprehensive/integrated fish and ecosystem surveys will be necessary to build capacity for data collection in the northern Bering Sea and Chukchi Sea. Priorities for data collection should focus on identifying the key factors that affect the number of fish, crabs, and marine mammals that survive to adulthood.



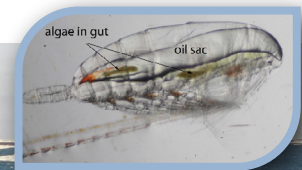


Considerations need to be given as to the effectiveness of current scientific and management approaches given climate challenges. Novel approaches (e.g. Alaska Climate Integrated Modeling Project, NOAA's Climate, Ecosystems, and Fisheries Initiative, NPFMC Climate Change Task Force and LKTK Task Force products, and future Programmatic EIS outcomes) may be needed to deal with a rapidly changing, and increasingly non-stationary or changing environment. Actionable advice and locally tailored solutions to improving predictive capacity will be needed.

Options for fishermen under current management methods are highly constrained and regulations may be too restrictive to allow for effective adaptation. However, workshop participants emphasized the importance of balancing the need for providing more flexibility with current policies that support industry and communities.

The use of more or less dynamic reference points will need to be informed by a better understanding of the associated risks with different management options. Increased dialogue with other regions as well as between the Science and Statistical Committee and Council will be necessary as the solutions reside at the science-policy interface.

To prepare for an adaptive fishery management system, improved communications with and opportunities for input from local communities and the fishing industry is necessary. Effective coordination of the relevant science across agencies, universities, tribes, and local communities will be necessary to meet Council objectives. This includes developing improved pathways for bringing community and local needs information into the management process to address both economic and food security challenges.



KEY TAKE-HOME MESSAGES

- The 2014-2022 heat wave event(s) and following oceanographic and ecosystem changes are on a similar level as the 1978 North Pacific regime shift
- Alaska marine ecosystems are undergoing changes that are affecting various fish, crab and marine mammal species' growth, development, mortality, and the number of fish that survive to maturity. Whether or not to manage to a 'new normal' is a policy call as much as a scientific decision.
- Preserving the existing ecosystem may no longer be an option and the reality of changing productivity, changing species' distributions, and an increased likelihood of future ecological change need to be clearly communicated to all stakeholders and should be accounted for in management.
- There are major gaps in our understanding of the changes occurring in the northern Bering Sea, capacity to support commercial species, and expectations for future ecosystem states.
- There are major gaps in our understanding of the relative importance of the southern Chukchi Sea as seasonal habitat for eastern Bering Sea fish stocks.
- New resources are needed to support the necessary fish and ecosystem surveys in the northern Bering Sea and Chukchi Sea without degrading data collections in other regions in Alaska that are also changing.
- Improved communication and coordination among agencies, industry sectors, local communities, tribal governments, academic partners, and international parties in the North Pacific are needed for sustainable management with future extreme events.

ACTIONS

Science	Management
<p>Local (northern Bering Sea & Chukchi)</p>	<ul style="list-style-type: none"> • Develop a monitoring program focused on understanding process changes in the northern Bering Sea that inform current understanding of carrying capacity or number of animals that these marine ecosystems can support and expectations for future commercial fisheries. • Develop recommendations and secure additional funding for a periodic assessment of the southern Chukchi Sea ecosystem. • Improve overall science coordination in the region.
<p>'Global'</p>	<ul style="list-style-type: none"> • Re-assess the time periods that are currently used to define the productivity of crab and groundfish stocks. • Consider alternatives to current harvest control rules based on available analyses. • Increase dialogue between the Science and Statistical Committee and Council on issues that straddle the science-policy interface. • Identify which stocks are likely to do better or worse in a changing environment to help fishermen and communities build the best fishing portfolio.

Management

Local (northern Bering Sea & Chukchi)

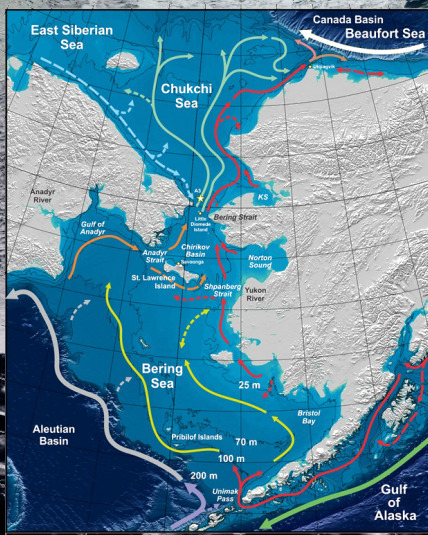
- Develop a monitoring program focused on understanding process changes in the northern Bering Sea that inform current understanding of carrying capacity or number of animals that these marine ecosystems can support and expectations for future commercial fisheries.
- Develop recommendations and secure additional funding for a periodic assessment of the southern Chukchi Sea ecosystem.
- Improve overall science coordination in the region.

- Improve engagement with Tribes and communities.
- Consider mechanisms for incorporating the full range of fish and crab stocks across state, national, and international jurisdictions into management.

'Global'

- Re-assess the time periods that are currently used to define the productivity of crab and groundfish stocks.
- Consider alternatives to current harvest control rules based on available analyses.
- Increase dialogue between the Science and Statistical Committee and Council on issues that straddle the science-policy interface.
- Identify which stocks are likely to do better or worse in a changing environment to help fishermen and communities build the best fishing portfolio.

- Increase dialogue between the Science and Statistical Committee and Council on issues that straddle the science-policy interface.
- Reassess time periods used to measure stock productivity in light of increased extreme climate events.
- Improve the use of approaches that explicitly consider risks





“The Council faces unprecedented challenges about how to balance protecting livelihoods and ways of life with sustainable harvests during a time of rapid change, as well as increased scrutiny and social conflict.”

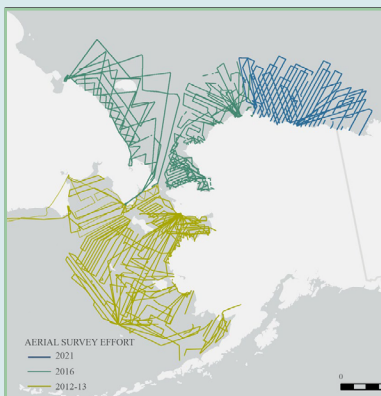
– Bill Tweit, North Pacific Fisheries Management Council Vice Chair

NEXT STEPS

Consider outcomes from this workshop as the Council identifies research priorities for 2023-24.

Incorporate these recommendations into the development of the planned Programmatic Environmental Impact Statement process to better address the impacts of climate change on the marine ecosystems and on the people dependent on those ecosystems.

Develop a roadmap that builds a bridge from assessment and climate science to adaptive management under climate change.



ACKNOWLEDGEMENT

Image collages were created with visuals used in presentations at the February SSC Workshop.



NORTH PACIFIC
FISHERY MANAGEMENT COUNCIL

Questions that emerged during this workshop

- What temporal and spatial scales of information are needed to track changing production, shifting boundaries, and changing species interactions?
- How can we better identify ecosystem factors influencing production of key commercial fish species so the limited resources are effectively focused.
- What baseline information is required ahead of future extreme events to be better positioned to manage fishery responses?
- Can overall as well as benthic vs. pelagic carrying capacity be reasonably assessed and tracked to inform optimum yields in an environment changing as quickly as the northern Bering Sea?

