



Bering Sea Fishery Ecosystem Plan Team

REPORT

January 9, 2024, [Webconference](#)

Plan Team Members in attendance¹:

Керим Aydin, co-Chair (AFSC REEM)
Diana Evans, co-Chair (NPFMC)
Davin Holen (Alaska Sea Grant)
Danielle Dickson (NPRB)
Heather Renner (USFWS)

Phyllis Stabeno (NOAA PMEL)
Ian Stewart (IPHC)
Stephani Zador (AFSC REFM)
Jared Weems (ADFG)

Others in attendance included: Connie Melovidov, Ivonne Ortiz, Chris Tran, Sarah Webster

The co-Chairs opened the meeting with a review of the agenda, which was primarily to identify research priorities for the Council's triennial review. The Team also had a brief discussion of next steps.

Research Priorities Recommendations

Nicole Watson provided an overview of the process that the SSC and Council are using for this triennial review of research priorities. Diana Evans clarified that although the Team is Bering Sea focused, for this activity, the SSC would appreciate recommendations that are not necessarily geographically limited to the Bering Sea, as no comparable Teams exist for other Council areas.

Prior to the meeting, Team members had an opportunity to review relevant research priorities from the existing Council database, as well as submissions from the public with new ideas or in support of existing prioritization. Team members also had the opportunity to complete a brief poll with their initial priorities and any new ideas from members. The results of the member poll provided the structure for discussing potential value of different research needs, from which a voting list was curated in order to arrive at the top 3-5 priorities requested by the SSC. The Team voted using the same ranked choice voting software as other Plan Teams have used this cycle. After the vote, the Team discussed the results and expressed some misgivings as members' preferences did not tend to converge on any priority in particular. As a result, **the Team emphasizes that while the list below reflects the highest priorities that emerged from ranked choice voting, there were no clear "winners" among the various recommendations, and all of the research projects should be considered important.**

Top 5 recommendations from BS FEP Team

The FEP Team's top recommendations are all adapted from existing priorities in the database. Some of the Team's recommendations combine several related entries, or update the wording to include elements from public comment or team member discussion. There was discussion about the relative values of lumping vs splitting research priorities, and the Team leaned towards the former, as broader priorities provide more opportunity for research to adapt to specific concerns that might arise in the future.

¹ ADFG – Alaska Department of Fish and Game, AFSC – NMFS Alaska Fisheries Science Center, IPHC – International Pacific Halibut Commission, NPRB – North Pacific Research Board, PMEL – Pacific Marine Environmental Laboratory, REEM – Resource Ecology and Ecosystem Modeling Program, REFM – Resource Ecology and Fisheries Management Division, USFWS – U.S. Fish and Wildlife Service

TOP 5 RESEARCH RECOMMENDATIONS				
ResID	Title	Description	Related to?	BSFEP Team Notes
BSFEP 008	Develop projection models and predictive tools to evaluate down-scaled climate variability scenarios and inform management options related to resilience and adaptation, and their effects on managed resources and coastal communities.	Climate change impacts are becoming an important consideration for long term planning. Quantify the effects of historical climate variability and climate change on recruitment, growth, spatial distribution, and benthic productivity, and evaluate the robustness and resilience of different management strategies under varying climate, ecological, and economic conditions. Projection models should forecast seasonal and climate related shifts in the spatial distribution and abundance of commercial fish and shellfish, and impacts to communities. Incorporation of climate-based parameters into fish stock assessments will allow for exploration of harvest scenarios in the context of evolving climate conditions.	Combines several priorities that relate to CEFI work: #223, #225, #536, #733	Leverage the important work of the Climate Ecosystems Fisheries Initiative (CEFI) and use it to update ecosystem indicators relevant to stock assessment and apply it to management strategy evaluations. Resilience & adaptation can provide new opportunities to think outside the box with new tools (e.g. risk tables, MSEs) and metrics of community health. Broad-scale strategic thinking/ methodologies. Although CEFI is funded through 2026, important to maintain this priority as high profile given its importance.
BSFEP 006	Biological and fisheries research on commercially important crab stocks	Investigations are needed to address the impacts of global climate change on spatial patterns of benthic productivity. This research should include both life history (e.g., aging methods, natural mortality estimation, movement among areas, growth) and the effects of fishing through landings, discards and unobserved mortality. This is important for fisheries that target benthic species such as crab for which management may be structured on an assumption of stable stock distribution. Comprehensive research is needed to better understand the current and future population dynamics of commercially important crab stocks that are struggling in the Bering Sea.	Adapted from #147	Refocused for broader scope (all crab species), and on life history and fishing effects for all commercially important crab stocks. Important to address as research priority to understand why many crab species are in decline.
BSFEP 007	Characterize expected changes in benthic production due to climate change, including collecting time-series data and understanding the impact of fisheries.	Collect and maintain time-series data on the community composition, production and biomass of benthic invertebrate and vertebrate fauna. Conduct studies to assess the impact of bottom trawl fisheries on invertebrate abundance and species composition in benthic habitats. This is especially relevant to direct impacts on commercially important crab species, for which management may be structured on an assumption of stable stock distribution, as well as indirect impacts to the foraging ecology of walrus, bearded seals, and gray whales.	Combines several benthic community/ ecosystem-focused priorities: #217, #244, #671	Important because benthic productivity is decreasing - potentially due to loss of sea ice & associated productivity with sea ice. Also species shifting to NBS which is a benthic dominated system - don't want to carry over expectations from the pelagic dominated EBS.

TOP 5 RESEARCH RECOMMENDATIONS				
ResID	Title	Description	Related to?	BSFEP Team Notes
BSFEP 009	Evaluate the role of fisheries in the Bering Sea in providing economic opportunities and food security in coastal communities.	This priority would include an assessment based on locally derived indicators of success and the region's shared cultural and social values. The assessment would be driven by a community well-being framework that includes traditional methods of assessment, including vulnerability indices and economic data, but would also focus on input on measures of successful livelihoods through gathering data from local residents, elders, and other cultural bearers. Information derived from this research priority could be used in annual reports (such as ESRs), specific fishery management actions, or future development of conceptual models.	Combines #732 & a new submission	Local observations of change through the collection of TK and LK are used to develop science questions that can drive data collection. Integrate the observations from both knowledge systems to better inform the management of the region that integrates the aspects of fisheries important for commercial fisheries and the subsistence way of life.
BSFEP 010	Research into actionable ecosystem indicators relevant to management strategy evaluations, stock assessments, and ecosystem assessments.	Initiate/continue research on the synthesis of ecosystem indicators, and developing and evaluating implementable ecosystem indicators, for use in ecosystem-level MSE, ESRs, and ESPs. Efforts to understand relationships among ecosystem components, and which can be combined/simplified into more useful indicators, would be helpful for management decisions.	Combines several ecosystem indicator priorities: #158, #187, #188, and a new submission	Analyses to quantify relationships *among* ecosystem indicators / simplify them. We have such a high volume of ecosystem information available, it becomes overwhelming to interpret them and decide what is important.

Other recommendations from BS FEP Team

Two additional priorities were elevated to include in the voting list: a **new research priority focused on Aleutian Islands research (#BSFEP002)**, and an existing priority for monitoring **changes in herring distribution (#556)** and the effect on Council bycatch management.

OTHER RECOMMENDATIONS			
ResID	Title	Description	BSFEP Team Notes
BSFEP 002	Coordination/synthesis of Aleutian Islands research/fishery issues (description).	The last comprehensive study for the Aleutian Islands was in 2005, followed by the AIFEP in 2007. There has been no update to the AIFEP as a whole, or specifically to the risk matrix, nor have action modules (similar to those part of the BSFEP) been identified. The research priority on coordinated, multidisciplinary ecosystem-level research for the Aleutian Islands would focus a coordinated approach of independently funded efforts as well as single ecosystem-integrated projects. Focusing on coordinated multidisciplinary approaches leverages funding efforts via grants and internal NMFS programs by strengthening cross-collaboration between groundfish, marine mammal and oceanographic research, and addresses some of the gaps on current research priorities that are not set up with a holistic approach.	Including this priority highlights the importance of the Aleutian Islands and of monitoring changes in this unique region. The AI play a critical role in heat fluxes, and can be an indicator of the Bering Sea. Compared to other Alaska regions, AI is data poor, and there is a need to identify what basic data are required to answer questions related to this region. Also CEFI project is active in BS and GOA, but very limited in high Arctic and no resources in the AI, so this would help provide data.

OTHER RECOMMENDATIONS			
ResID	Title	Description	BSFEP Team Notes
556	Re-evaluate the location and temporal structure of Herring Savings Areas	Re-evaluate whether the current locations of the Herring Savings Areas are likely to be effective at protecting herring populations (i.e. overlap with current distribution of herring during the specified dates) and whether seasonally-fixed or moving closures would be the most effective. Re-evaluation is particularly necessary due to recent changes in herring distributions. The research would ensure that groundfish fisheries are not pushed into areas with higher salmon PSC and squid bycatch without meeting the goal of protecting herring.	Recognizes importance of herring to coastal communities GOA, PWS, Togiak, BS, and as keystone species. Important early commercial fishery in BS. Interested in spatio-temporal changes over time, esp because so important to coastal communities. Also important given less ADFG survey work.

Critical ongoing monitoring recommendation

The BS FEP Team recommends that an **amended research priority #150** continue to be included in the Council’s list of critical ongoing monitoring. The existing language (see title and description below) should be modified (as listed in notes) to explicitly include the mooring M-8, in the northern Bering Sea. Additionally, the Team highlighted the importance of **amended priority #192**, adjusted to clarify that data collection is needed in addition to that which comes from surveys, and emphasizing also a study of the nutritional quality of the prey base. Changes are indicated in purple.

CRITICAL ONGOING MONITORING			
ResID	Title	Description	BSFEP Team Notes
150	Maintain the core biological and oceanographic data (e.g., biophysical moorings, diet data, zooplankton, age 0 surveys, benthic production) necessary to support integrated ecosystem assessment.	Maintain the core data and process studies needed to support integrated ecosystem assessments. Core data include inputs for single- or multi-species management strategy evaluations, food web, and coupled biophysical end-to-end ecosystem models (e.g. biophysical moorings, stomach data, zooplankton, age 0 surveys (i.e. BASIS surveys), benthic production). Develop and maintain indices of sea ice formation, sea ice retreat, and timing/extent of the spring bloom for the EBS. For this, maintenance of moorings, especially M-2 and M-8, is essential. If recent changes in ice cover and temperatures in the Bering Sea persist, these may have profound effects on marine communities.	M8 (in the northern Bering, >20 yr timeseries) should be explicitly included also. Higher bottom temperatures impacting commercially valuable species; in time of non-stationarity, direct observations are critical. CEFI utilizes these ecosystem measurements and observations.
192	Collect, analyze, and monitor diet information in seasons in addition to summer.	Collect, analyze, and monitor diet information (species, biomass, energetics, nutritional quality of the prey base), from seasons in addition to summer, to assess spatial and temporal changes in predator-prey interactions, including marine mammals and seabirds. The diet information should be collected on the appropriate spatial scales for key predators and prey to determine how food webs may be changing in response to shifts in the range of crab and groundfish.	Diets inclusive of predators and prey. With recent changes e.g. in crab and cod, increased interest in the connections in ecosystems and how they are changing. Collect in summer surveys but not in winter.

Next Steps for BS FEP Team

The FEP Team also had a brief discussion about next steps for the Team. Diana Evans reported on progress with the two FEP action modules, one of which has concluded and the other of which is nearing its culmination in the Council Climate Scenarios Workshop planned for June 2024. The Council has also embarked on a series of actions to improve climate resiliency in fisheries management planning and implementation, with funding from the Inflation Reduction Act. The Council intends to focus on developing a climate-resilient management policy through the vehicle of a programmatic evaluation of its fisheries, as well as other work on developing harvest specifications tools that are adaptive to environmental risk.

Given the Council's workload over the next couple of years, Diana suggested consulting with the Council about what direction is best for the BS FEP Team over the next couple of years. If the Council is interested, the Team could consider and present ideas for other Bering Sea FEP action modules that the Council could initiate, or continue work on the Bering Sea Health Report that has been discussed previously. Alternatively, the Council may wish to focus its immediate efforts on the programmatic evaluation and other IRA-funded activities, and pause work on the Bering Sea FEP for the moment. The Ecosystem Committee and Council have previously done some exploratory staff work on the idea of developing a GOA FEP; the SSC has also previously suggested the value of transitioning the Bering Sea FEP team to a more generalized FEP team for all Alaska regions. It is possible that work on the programmatic may focus the Council's specific ideas for the FEPs and the Team. **The Team will look to the Council for direction before scheduling future work.**