

COORDINATED, MULTIDISCIPLINARY ECOSYSTEM-LEVEL RESEARCH ON THE ALEUTIAN ISLANDS AS RESEARCH PRIORITY OF THE NPFMC

Recommendation of Aleutian islands as research priority

The Aleutian Islands shows some ongoing trends that would benefit from further research support:

- 1) Sustained temperatures above the long term mean throughout the water column
- 2) Changes in the structure of the ecosystem due to an increasing abundance of Pacific Ocean perch (mainly), a decrease of Atka mackerel.
- 3) Sustained lower fish condition for several species as well as changes in the diet of Pacific cod from predominantly fish to predominantly invertebrates
- 4) Potential effects of increased East Kamchatka pink salmon abundance
- 5) Continued decline of Steller sea lions and harbor seals in western Aleutians.

Research in the Aleutian Islands has been falling behind that in the eastern Bering Sea and Gulf of Alaska due to:

- i) Lack of regular oceanographic survey.
- ii) No integrated ecosystem research program or project
- iii) No reliable ROMS model for the area - the southern side of the ROMS-Bering Sea grid runs too close to the central Aleutian Islands, making a large portion of the output relevant for the Aleutians unreliable.

Summary of gaps in current research/ data/ modeling efforts relevant to the Aleutian islands

While some of the issues stated above (1 -5) can be considered within some of the current and proposed research priorities (see below), the fact that these topics are either directed to a particular species in the description (like for crab, sablefish, halibut, walleye pollock), decreases the relevance and priority of emphasis on the Aleutian Islands, differing commonly to related issues in the EBS, GOA. Likewise, some of the priorities are specifically targeted to a certain ecosystem, and only in a larger context can the Aleutian Islands be considered.

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.

Review of current research priorities relevant to Aleutian Islands

(based on Research priorities in existing Council database that are relevant to BS FEP team expertise)

While some of the current research priorities for the Council are relevant to the Aleutian Islands at an ecosystem level, these priorities are topic-specific and in general are not set-up to be considered in a more holistic manner, or developed with a multidisciplinary approach.

Relevant priorities that partially address issues 1 - 5 stated above:

733 - Climate change: Develop predictive tools to inform management options related to resilience and adaptation. The use of a larger grid (underway) would produce better output for the Aleutian Islands, but between finishing simulations with the new grid and validating output for the AI, this would be realistically 4-5 years away (assuming output is reliable).

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. Currently done primarily for the EBS followed by the GOA, but not done for AI (save occasionally for Unimak Pass).

158 - Research ecosystem indicators and their thresholds for inclusion in ecosystem-level management strategy evaluation.- not for AI.

159 - Evaluate interactions between fisheries and pinnipeds: partially ongoing

183 -Research the role of habitat in population dynamics and ecosystem processes

186: Collect and maintain zooplankton and meroplankton biomass and community composition time series - Considered critical ongoing monitoring, however not in the Aleutian Islands.

187- Continue to develop and improve the use of indicator-based ecosystem assessments throughout the range of the Council's managed resources. Ongoing for AI as part of Ecosystem Status Reports.

188- Develop indicator-based ecosystem assessments for AI (in progress), GOA, Arctic. - Ongoing for AI

192 - Collect, analyze, and monitor diet information. Ongoing, typically secondary to EBS and GOA. Several species need updated samples as they are not part of the core collection program (e.g. sablefish).

223 Develop and evaluate global climate change models (GCM) or down- scaled climate variability scenarios to assess impacts to recruitment, growth, spatial distributions, and benthic productivity.- Issues similar to 733.

224 - Climate and oceanographic information covering a wider range of seasons - Issues similar to 150 and 186

225. Develop projection models to evaluate management strategies under varying climate, ecological, and economic conditions and evaluate impacts to managed resources and coastal communities. Issues similar to 733, 223

241: Develop bottom and water column temperature database and indices -ongoing for CAI, EAI, but not for WAI.

242: Collect and maintain primary production time series - ongoing with satellite data only

244: Collect and maintain time-series data on the community composition, production and biomass of benthic invertebrate and vertebrate fauna - ongoing via summer bottom trawl biennial surveys in AI.

248 Measure and monitor large scale fish composition - ongoing via summer bottom trawl biennial surveys in AI.

249: Monitor the movement of Steller sea lions and northern fur seals

250: Conduct ecosystem structure studies - not for the AI

251: Modeling studies of ecosystem productivity in the different FMP areas - not for the AI

383: Determine quantitative indicators of spatial structure, particular for walleye pollock and Pacific cod - partially ongoing

536: Evaluate incorporation of climate change impacts into stock assessments - not for the AI

631: Maintain and update coupled biophysical projections for the North Pacific - issues similar to 733, 223, 225.

Review of proposed research priorities relevant to Aleutian Islands

[\(based on new submissions\)](#)

The new proposed priorities (56 total counting subtopics as unique) are largely geared to address issues related to crab, Pacific cod, salmon and the Arctic/ northern Bering Sea. The exception being NO35e:

Assessment of habitat and ecosystem impacts from fishing effort, including the cumulative impact of repeated effort over time. This should include benthic structures, habitat damage and disturbance, and "ecosystem component" fauna.