North Pacific Fishery Management Council

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D2 ACLIM and GOA CLIM Updates

October 2021 Council Meeting

Action Memo

Council Staff:	Diana Evans
Other Presenters:	ACLIM – Dr. Kirstin Holsman, Dr. Alan Haynie, Dr. Anne Hollowed; GOA CLIM – Dr. Martin Dorn
Action Required:	1. Receive reports, provide feedback as appropriate.

BACKGROUND

(a) ACLIM Phase 2

Lead principal investigators for the ACLIM project will brief the Council on the second phase of the ACLIM project, which began late last year. The team is looking for Council input at this stage of the project in order to ensure that the results will be informative and relevant for future Council management discussions about climate change and management tradeoffs in the Bering Sea. The intent is to provide resource managers with alternative "climate-ready" management strategies to help them understand management objective tradeoffs, and how to adapt to changing conditions so North Pacific marine resources remain sustainable and fisheries and communities are as resilient as possible. At this meeting, the team is specifically seeking input from the Council and stakeholders on the management scenarios and harvest control rules that will be modeled under projected climate change scenarios.

ACLIM is a shorthand title for *"The Alaska Climate Integrated Modeling Project Phase 2: Building Pathways to Resilience Through Evaluation of Climate Impacts, Risk, and Adaptation Responses of Marine Ecosystems, Fisheries, and Coastal Communities in the Bering Sea, Alaska."* The primary objective of this project is to describe and project responses of the Bering Sea ecosystem – both the physical environment and human communities -- to varying climate conditions. It connects research on global climate and socioeconomic projections to regional circulation, climate enhanced biological models, and socio-economic and harvest scenarios. This effort informs managers of the risks of climate change on fish and fisheries and enables the evaluation of a range of adaptation strategies.

The project aims to address 4 main pressing issues related to climate change and the Bering Sea:

- Issue 1. Challenges to groundfish management arising from changes to species distributions and uncertainty about novel interactions in the NBS.
- Issue 2. Impacts of interacting changes in ocean conditions, circulation, and chemistry on shellfish and groundfish stocks.
- Issue 3. Novel challenges that may arise from shifting distributions (issue 1) and changes in productivity (issue 2) on protected species, subsistence resources, fishery interactions, and bycatch risk.
- Issue 4. Climate-driven changes in ecosystem structure and carrying capacity may require re-assessment of current management approaches and combined management and ecological responses may differentially impact stakeholders and coastal communities.

(b) GOA CLIM

Dr. Martin Dorn, a lead principal investigator for the GOA CLIM project, will brief the Council on a project complementary to ACLIM which is focused on the Gulf of Alaska. This project will examine how individuals, families, and communities may adapt to climate variability and associated changes in fisheries and marine ecosystems. It will also identify the factors underlying adaptation choices, and tradeoffs associated with those adaptations. Predicted fleet responses and adaptations will be coupled with regional economic models to understand potential economic impacts on fishing communities. In turn, fleet behavior will feed into biological models to understand changes in harvest patterns and species composition of catch. By providing near-term and long-term projections, scientists hope to help resource managers and local communities anticipate and better plan for environmental and ecological changes due to Climate Change in the Gulf of Alaska. One important management application of this research is to evaluate the Optimum Yield (OY) range (160,000–800,000 t) in the Groundfish Fishery Management Plan for the Gulf of Alaska in a changing climate.

Researchers developing this component of the project are looking for input from the Council and stakeholders.