Alaska Fisheries Science Center
- updates on surveys and climate research

Robert Foy (+NMFS/AFSC/Partner PIs)  
AFSC Research and Science Director

Presentation to North Pacific Fisheries Management Council  
May, 2021
Alaska Fisheries Science Center

- 2021 Survey Update
- Execution of 2021 Executive Orders
  - AFSC climate informed science for management
  - AFSC and environmental justice in research
# Gulf of Alaska fish/eco surveys

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- Limited coverage of GOA deep (>700 m) stations in favor of NBS
- no saildrone backup
- charter backup
### Bering Sea fish/eco surveys

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- **Bottom trawl surveys**
- **Long line surveys**

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- **NOAA Fisheries: charter backup**
2021 Executive Orders associated with climate change

EO 14008 (2021): Tackling the Climate Crisis at Home and Abroad

Section 203. National Climate Task Force
Section 207: Renewable Energy (DOI led …double offshore wind by 2030)
Section 208. Oil and Natural Gas (DOI led)
Section 215. Civilian Climate Corp (DOI led)
Section 216. Conserving Lands and Waters
   Section 216(a) [conserve 30% by 2030].
   Section 216(c).

Directs DOC/NOAA to …”to collect input”…”on how to make fisheries and protected resources more resilient to climate change, including changes in management and conservation measures, and improvements in science, monitoring, and cooperative research.”

Climate considerations shall be an essential element of U.S. foreign policy and national security. The U.S. will move quickly to build resilience, both at home and abroad, against the impacts of climate change that are already manifest and will continue to intensify according to current trajectories.
Food security is a local, regional, national, and global issue
NMFS Ecosystem Based Fishery Management

LEGAL AUTHORITIES AND MANDATES: MSA, MMPA, ESA, NEPA


EBFM Policy → EBFM Road Map (Plan, Advance, Prioritize, Explore trade-offs, Ecosystem management, Resilience/Community well being)
AFSC Ecosystem Based Fishery Management

AK Integrated Ecosystem Assessment (IEA) program

- Support development of early warning systems and ecological forecasts
- Support the Preview of Ecological and Economic Conditions (PEEC)
- Participatory science to support conceptual models and scenario planning (e.g. for use in FEPs and support Climate Change Task Force)...onramps to short and long term management advice...ADAPTIVE and climate ready?
- Leveraged support for Ecosystem Status Reports (ESR) development
- Maintain operational readiness of ecosystem models and risk frameworks
- Support ROMSNPZ virtual ocean predictions and forecasts
  - Data access, model webpage, R tools

AK IEA Steering Committee:
Kirstin Holsman, Kerim Aydin, Jamal Moss, Stephen Kasperski, Libby Loggerwell, and Phyllis Stabeno

https://www.fisheries.noaa.gov/topic/ecosystems
AFSC Ecosystem Based Fishery Management

Ecosystem Status Reports (~20 years)
- Indicator-based assessments by region
- Tailored to the North Pacific Fisheries Management Council
- Linked with annual stock assessment cycle
- Provide context for Ecosystem-Based Fisheries Management

Ecosystem Socioeconomic Profiles

Category 1: Informs stock assessment model
Category 2: Used to inform the Allowable Biological Catches
Category 3: Indicators inform other Ecosystem Based Management Processes
Category 4: Exploratory
NMFS climate informed science for management

- Science Capacity
- Climate-Ready Management
- Resilience and Adaptation
"U.S. National Marine Fisheries Service has called for increasing the production, delivery, and use of climate and environmental information to fulfil its living marine resource stewardship mandates."


“Traditional methods and assumptions used in the fishery management process need to be adapted to ensure effective stewardship of living marine resources under changing conditions.”
AFSC climate informed science for management

EBS & GOA Regional Action Plans (2015-today)

✓ Climate-informed reference points
✓ Advance robust management strategies (e.g. FEP, ACCLIM, multi-spp.)
✓ Advance adaptive management processes (Ecosystem socio-economic Profile-ESP, risk tables)
✓ Project Future Conditions (physical forecasts, projections, IBM)
✓ Mechanisms (lab, movement, heatwaves, place-based IEA, LKTK)
✓ Track and provide early warnings (Ecosystem Status Report-ESR)
✓ Build and maintain adequate science infrastructure (surveys, research [trophodynamics, aging], stock assessments)

EBS & GOA 2.0 and Arctic 1.0 -> October 2021

➢ Process Studies
➢ Monitoring
➢ Management Oriented Synthesis
➢ Socio-economic
➢ Marine Mammals
Source: NOAA Fisheries.

Characterize and project climate-driven changes to the eastern Bering Sea (EBS) ecosystem, from physics to fishing communities.

EBFM can forestall climate declines and provide critical time to adapt.


NOAA Climate and Fisheries Initiative

**end-to-end operational ocean modeling & decision support system**

- Habitat and distribution maps
- Spp. forecasts and projections
- Ecosystem-wide forecasts and projections
- Tipping points and thresholds
2021 Executive Orders associated with environmental justice (and climate)

EO 14008 (2021): Tackling the Climate Crisis at Home and Abroad
Section 219-223. SECURING ENVIRONMENTAL JUSTICE AND SPURRING ECONOMIC OPPORTUNITY

EO 13990: Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis
Section 1. Policy
• “….listen to the science;……to bolster resilience to the impacts of climate change; to restore and expand our national treasures and monuments;….”
Section 3. Restoring National Monuments (DOI led)
Section 4 (b). Arctic Refuge
• Reinstates EO 13754 (December 9, 2016) Northern Bering Sea Climate Resilience - to maintain existing prohibitions on commercial non-pelagic trawl gear in Bering Sea and Aleutian Islands FMP and Arctic FMP

EO 13985: Advancing Racial Equity and Support for Underserved Communities Through the Federal Government
NOAA: “Advancing Equity for All Roadmap”
NMFS: Equity and Environmental Justice Working group

Presidential Memorandum: Tribal Consultation and Strengthening Nation-to-Nation Relationships (2021)
Executive Order 13175 (2000): Consultation and Coordination With Indian Tribal Governments
AFSC and environmental justice in research

“Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

Environmental Justice in Alaska includes Food Security

- Policy (subsistence, co-management, IWC, MSA-NPFMC)
- Data and knowledge collection/analysis
- Cooperation
- Collaboration
- Communication
- Co-development

AFSC and **environmental justice** in research

**Engagement Indices** - *A relative score* (compared to all other AK communities in that fishery)
- Commercial Processing
- Commercial Harvesting

**Regional Quotient** – *A relative share* (% of landings relative to all other AK communities in that fishery)
- Commercial Processing
- Commercial Harvesting

**Community Sketches**
- **Community Vitality (by proxy)**
  - Deep dive into Highly Engaged communities
  - School enrollment – direct metric
  - Average pounds delivered and % of revenue landed
  - Fish taxes

**Community Sketches**
- Demographics
- Area Description
- Social Indicators
- Infrastructure & Transportation
- School Enrollment
- Current Economy
- Fish Taxes
- Fishing History & Regulatory Background

Sarah Wise, Kim Sparks, and Jean Lee
AFSC and environmental justice in research

AFSC and environmental justice in research

Changing sea ice affecting ice seal biology

AFSC and environmental justice in research

Co-develop best practices for building relationships and partnerships with communities

- Communication and engagement (sharing information)
- Framework for identifying, prioritizing, and implementing research Cooperation
  - Data production: providing information.
  - Research project or data gathering that is a priority
  - Co-production of knowledge: development to implementation and communication of results.

Survey and research communication plan

- Provide clear and accessible information about AFSC scientific surveys and research activities and how they support science-based management
- Improve and increase dialogue and feedback mechanisms in target areas
- Facilitate cross-cultural learning opportunities for Alaska Native K-12 and college students
AFSC and **environmental justice** in research

Co-develop (in progress) white paper - 2022

Building relationships: co-development of knowledge through a dialogue between ocean hunters and western science researchers

**Goal and Vision**
To develop a framework to build relationships between and among Alaskan Indigenous communities and marine mammal researchers to improve **communication, coordination, collaboration**, and to create a framework for the co-development of knowledge through a dialogue between marine hunters and western science researchers.

**Committing staff**
- Interagency Arctic Research Policy Committee (IARPC) Indigenous Engagement and Communications Specialist
- AFSC Tribal research coordinator
Challenges for research informing management

**Climate change**
- Non-stationarity; is the change in productivity due to climate or fishing pressure? When do we change reference points? Will tipping points (thresholds) change?
- Limited resources
- Acceptable levels of uncertainty, risk
- Balance of management informed indicators and mechanisms
- How do we provide bookends and expect decisions?
- What don’t we know?

**Environmental justice**
- Identifying community specific research needs and services within NOAA Fisheries mission scope
- Identifying and prioritizing co-developed research questions (threatened communities, sectors)
- Applying resources within the entire Alaska EEZ
- Assessing inequality in effects of environmental change (communities, fishing sectors)
Thank You!

“We must listen to science — and act.”
[EO 14008 (2021)]

“Agencies shall make achieving environmental justice part of their missions by developing programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts.”
[EO 14008 (2021)]