

# **North Pacific Fishery Management Council Ecosystem Research Workshop**

## **Workshop Summary**

**Presented by Katie Latanich, Fisheries Leadership & Sustainability Forum  
February 12, 2018**

# Summary organization

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## Three sections:

### I. Workshop overview

- Goals, objectives, and framing
- Topics and content

### II. Workshop discussions

- Gulf of Alaska Pacific Cod: Learning from experience
- “Spotlight” issues

### III. Final reflections and cross-cutting themes

# Summary organization

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## How does this summary reflect workshop discussions?

- Summarizes cross cutting themes (not chronological or by perspective to avoid repetition)
- Integrates key points and questions identified by speakers, Council leadership, and session facilitators and rapporteurs
- Includes examples but is not comprehensive
- Captures the range of ideas discussed but does not imply recommendations or consensus.
- All information is stated in terms of participants' perceptions and not as fact

# Part I: Workshop overview

- Goals, objectives, and framing
- Topics and content

# Goals, objectives, and framing

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**The short version...** (Also refer to workshop agenda)

Context: Growing body of knowledge regarding climate change impacts to Alaska ecosystems, NPFMC-managed fisheries and stakeholders, and robustness of the management framework.

Goal: Engage the Council community in a discussion about how ecosystem knowledge can be incorporated into Council processes

# Goals, objectives, and framing

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## The short version...

### Objectives:

1. Provide baseline understanding of impacts and efforts to understand, anticipate, and respond
2. Update on efforts by NMFS-AFSC to provide information and tools; opportunities for input
3. Explore management challenges associated with changing resources
4. Identify potential **next steps and opportunities** for the Council community to stay informed, provide input, and incorporate knowledge into Council processes

# Goals, objectives, and framing

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## Discussion questions

- What's working well? What makes the Council process well equipped to integrate ecosystem knowledge and respond to changing conditions?
- What can the Council community be doing more effectively to stay informed of ecosystem research, provide input, and integrate this knowledge into Council processes? What are the opportunities and challenges that should focus this group's discussion?

# Goals, objectives, and framing

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## Defining “next steps”

- Things the Council community can do to stay informed, provide input, and integrate ecosystem knowledge
- Could include...
  - Specific, actionable ideas
  - Questions and conversations to continue
  - Coordination, planning, or communication needs
  - ...what else?



# Content and topics

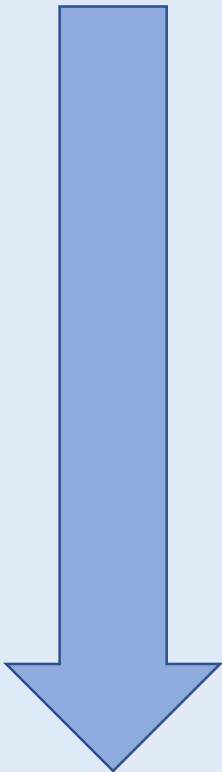
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# Content and topics

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## Agenda outline


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- Introductory remarks
  - Context and purpose
  - Climate science and frameworks
  - Management challenges
    - Presentations
    - Breakout discussion (mixed groups)
  - Opportunities and next steps (breakouts by role
    - Council, SSC, AP, EC)
  - Wrap-up and closing remarks

# Context and purpose


## 1. Context and tools for EBFM in Alaska

*Kerim Aydin, NMFS/AFSC*

NOAA FISHERIES SERVICE




**PLACE-BASED**  
FOUR Large Marine Ecosystems -  
FOUR Integrated Ecosystem Assessment Programs



Eastern Bering Sea (EBS)      High Arctic

Aleutian Islands (AI)      Gulf of Alaska (GOA)

NOAA FISHERIES SERVICE



**C: Products**

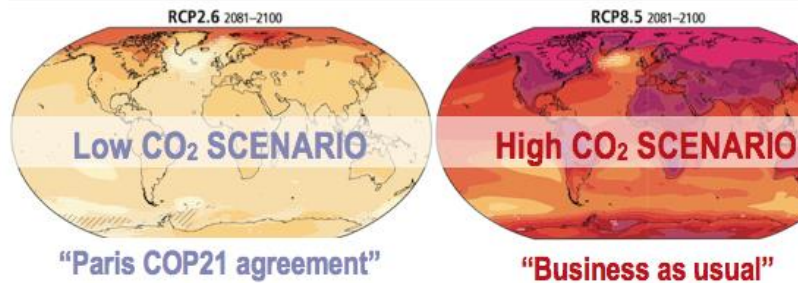
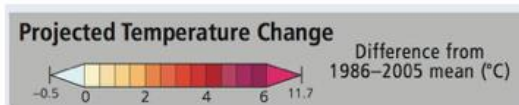
- Fisheries Ecosystem Plans (FEPs)
- Conceptual Models
- Ecosystem Models
- Ecosystem Indicators
- Ecosystem Assessment
- Risk Assessments
- Management Strategy Evaluations

# Context and purpose

## 2. Overview of integrated climate impact modeling – Evaluating strategies under different climate futures

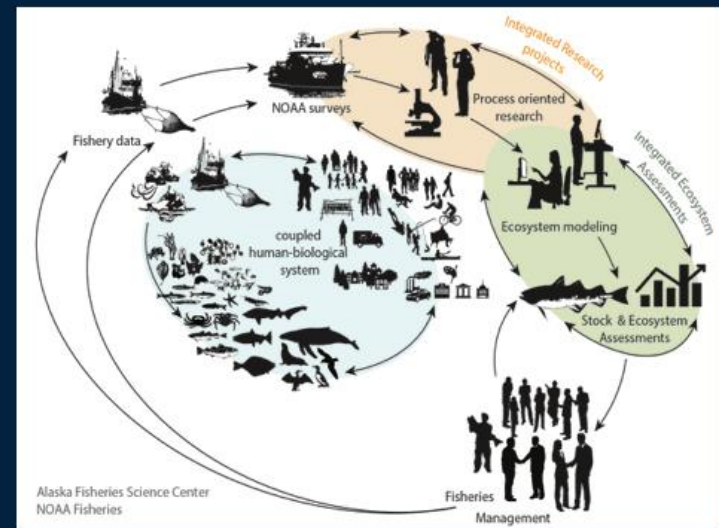
*Anne Hollowed, NMFS/AFSC*

Intergovernmental Panel on Climate Change (IPCC)  
5<sup>th</sup> Assessment Report (2013, 2014)



<https://www.ipcc.ch/report/ar5/>

## Fish and Fisheries Integrated Approach



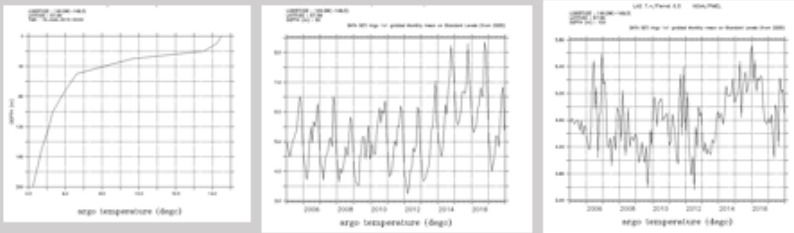
# Context and purpose

## 3. The value of simple mechanistic models and how to use their squishy data

*George Hunt, University of Washington, NPFMC SSC*

### Temperature in a Context

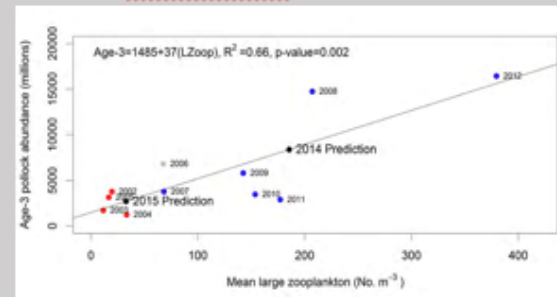
- Gulf of Alaska Blob in 2015-2017 (Courtesy Nick Bond)



- Temperature responses of Pacific cod
  - Chung, Kim & Kang (2013): most cod caught 0°C - 8°C; top temp. 12.8°C
  - Hanna et al. (2008): 4 - 11°C; metabolic rate 28% higher at 11°C
- Ecosystem Context
  - Prey status important

### Food Availability II

- Eisner and Yasumiichi 2017:



- Simple model, considerable explanatory and predictive value
- Possible to add effect of bottom temperature (Coyle & Gibson, 2017), spawner biomass

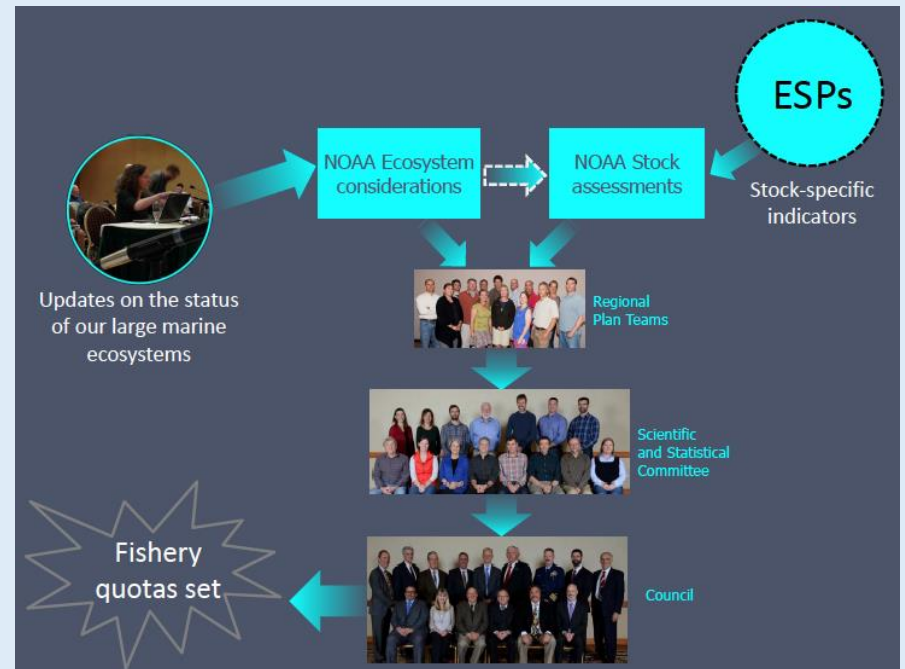
# Climate science and frameworks

## 4. Using ecosystem indicators to inform fisheries management

*Stephani Zador, NMFS/AFSC*

		Stock Assessment information	
		Not okay	Okay
Ecosystem Status Report information	Not Okay	2006 EBS pollock 2017 GOA cod	2016 EBS Pollock
	Okay	"No red flags were indicated."	EBS Yellowfin sole

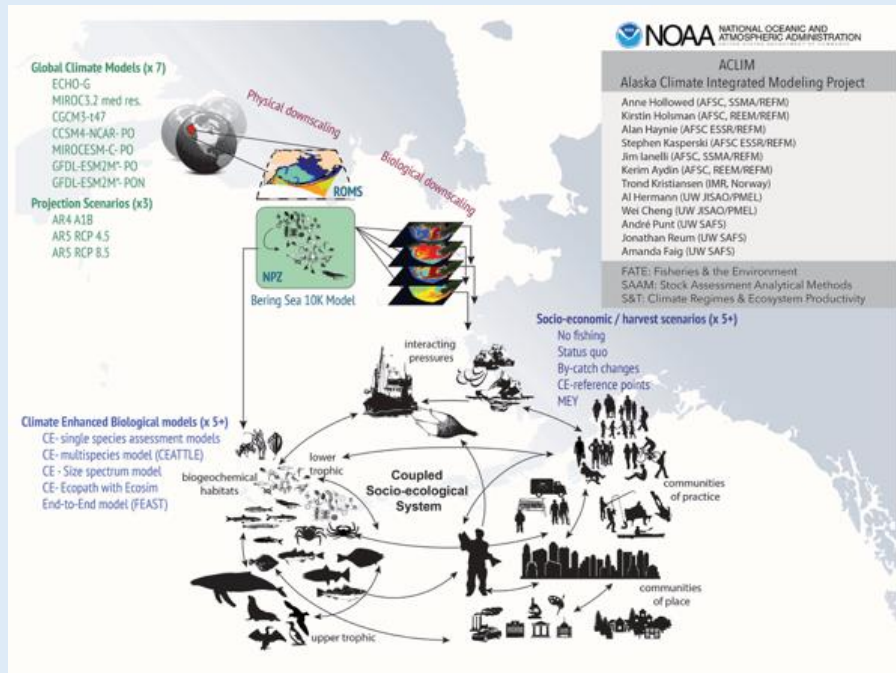
Zador and Harvey, in prep.



# Climate science and frameworks

## 4. The Alaska Climate Integrated Modeling Project

*Kirstin Holsman and Steve Kasperski, NMFS/AFSC*



### Our questions for you:

- What are we missing?
- What are the biggest challenges to management and fishery adaptation?
- How can we best share results with the Council & other stakeholders?

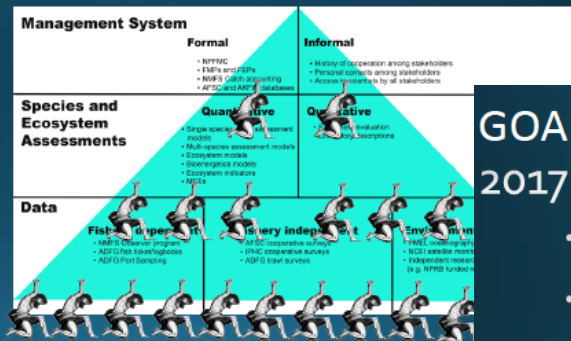
# Management challenges

## 5. Implementing an ecosystem approach to fisheries management: Gulf of Alaska Pacific cod

Steve Barbeaux, NMFS/AFSC

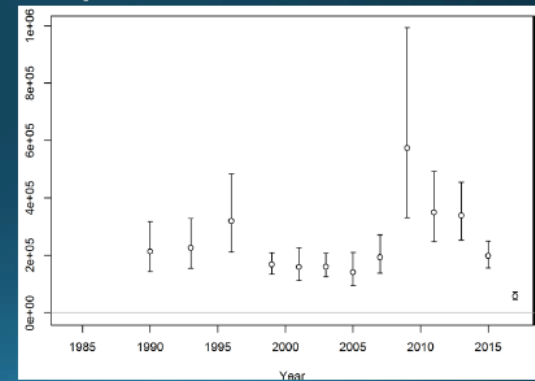
GOA Pacific cod  
Bringing it all together for GOA Pacific cod in 2017  
What's different in the North Pacific?

- Perception of a shared responsibility among stakeholders
- Diverse expertise
- Communication
- Trust



## GOA Pacific cod 2017 Bottom trawl survey

- Lowest estimate ever  $1.96 \times 10^8$  fish and 107,324 t
- Precise estimate (0.117 CV)
- 71% decline in abundance since 2015 (83% since 2013)
- 58% decline in biomass since 2015 (78% since 2013)





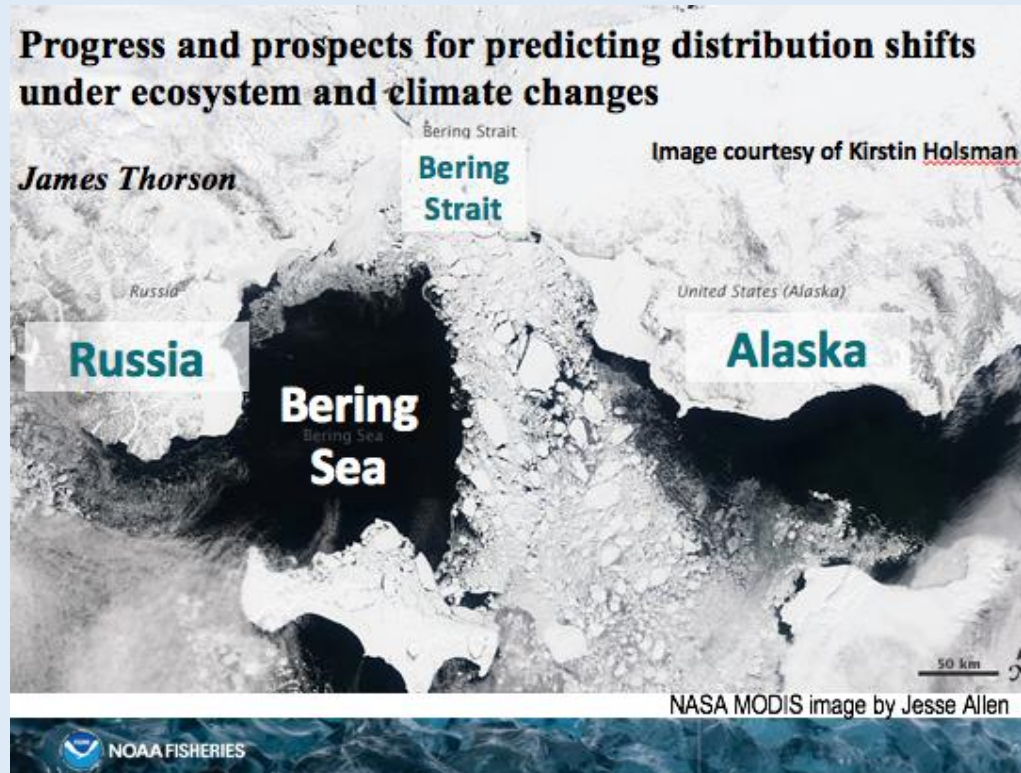


# Management challenges

## 7. Overview of shifting distributions

*Franz Mueter, University of Alaska, NPFMC SSC*

*(filling in for Jim Thorson, NMFS/AFSC – presentation online)*



# Content and topics

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Photo: Mark Holsman

## **Part II: Workshop discussions**

- Gulf of Alaska Pacific Cod
- Spotlight issues

# Summary organization

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**How does this summary reflect workshop discussions?**

Reminder! The information presented in Sections II and III is an effort to capture and synthesize participants' ideas, questions, and perspectives and is not stated as fact or recommendation.

Consider every sentence as beginning with “Participants felt that...”

# Gulf of Alaska Pacific cod

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## Four themes of discussion

1. What makes this a learning experience?
2. What worked well?
3. What are challenges and opportunities for improvement?
4. What are the potential management consequences/intersections?

# Gulf of Alaska Pacific cod

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## 1. What makes this a learning experience?

- Preview or “test case” – how well can we identify and respond to changes?
- Cohesive story and trajectory
- Mixed perspectives; strengths/successes and weaknesses/opportunities for improvement
- Situation still unfolding

# Gulf of Alaska Pacific cod

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## 2. What worked well?

First: “What worked well” and “challenges and opportunities for improvement” are related

- A strength can be lost if not maintained or if conditions change
- A weakness can be an opportunity to strengthen



# Gulf of Alaska Pacific cod

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## 2. What worked well?

- Attributes of the system and management process (good starting point, robust harvest strategy, system working as designed)
- Attributes of people and relationships (successful teamwork and collaboration among scientists, effective “storytelling,” communication, and outreach; trust, transparency, and acceptance of science)
- Attributes of the scenario (alignment with on-the-water observations and experience)

# Gulf of Alaska Pacific cod

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## 3. What are challenges and opportunities for improvement?

- Warning signs could have been identified sooner
- Outcomes and impacts are still to be determined
- Future changes and disruptions may play out differently (e.g., similar conditions but different outcomes, data-poor scenarios, lack of alignment with on-the-water observations)
- Data foundations including surveys and stock assessments are essential (funding, frequency challenges)
- Other circumstances can change

# Gulf of Alaska Pacific cod

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## 4. What are the potential management intersections and spillover effects?

- General examples (not necessarily specific to Pcod): Season openings and closings, levels of observer coverage, bycatch constraints and limitations, deliveries and processor openings, effort spillover
- Different perspectives on timely anticipation and response (by industry, Council, NOAA Fisheries)

# Spotlight issues

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## **Four linked themes of discussion**

*(“Spotlight” = prominent cross-cutting theme; not implied here as recommendations or priorities)*

1. Early warnings and red flags
2. Squishy, new, and non-traditional data sources
3. Ongoing two-way communication
4. Management flexibility

# Spotlight issues

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## 1. Early warnings and red flags

Early warnings could take multiple forms.

- Scientific inputs (surveys, ecosystem indicators, etc.)
- Observations and experience
  - Changes in fishing (e.g. participation, catch rates)
  - Changes in the environment (e.g. dead seabirds, marine mammals)

# Spotlight issues

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## 1. Early warnings and red flags

Early warnings could be used in multiple ways.

- To trigger a closer look, discussion, or some other follow-up action
- To generate hypotheses to test in stock assessments

# Spotlight issues

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## 1. Early warnings and red flags

Early warnings should be used appropriately. Considerations:

- Is there a (defensible, actionable, scientifically rigorous) relationship and basis for response?
- What are the risks of “getting it wrong?”

# Spotlight issues

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## 1. Early warnings and red flags

The use of ecosystem indicators could be strengthened or formalized. Why?

- Trigger a closer look
- Identify, formalize what worked well for GOA Pcod
- Share the responsibility
- Improve timeliness/earlier scrutiny (“yellow flags,” partial looks)



# Spotlight issues

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## 1. Early warnings and red flags

Questions and considerations:

- Which indicators? How strong are they as predictors?
- Who formalizes and what is the process?
- How to track success?
- Are there opportunities to test without operationalizing?

# Spotlight issues

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## 2. Squishy, new, and non-traditional data sources

- Includes several sources of information that participants perceived as underutilized and valuable for enhancing ecosystem knowledge (more information from more perspectives).
- Distinct and different (important to define)
- Can be collected and used in different ways

# Spotlight issues

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## 2. Squishy, new, and non-traditional data sources

Several distinct types of information; important to define:

- Traditional ecological knowledge (TEK)
- Local ecological knowledge (LEK)
- Citizen science and observation
- Historical and archaeological information
- Cooperative research
- “Squishy” data (as described earlier)
- ...others?

# Spotlight issues

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## 2. Squishy, new, and non-traditional data sources

Why is it valuable?

- Enhancing ecosystem understanding
- Providing early warnings
- Providing diversity of perspectives and information inputs
- Understanding and ground-truthing behavior (“getting fishing right”)
- Supplementing or backstopping other information sources

# Spotlight issues

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## 2. Squishy, new, and non-traditional data sources

Questions and considerations related to collecting/utilizing:

- What is our comfort level/tolerance for “squishiness”?
- What specific gaps and needs can these information sources help fill? On what scale (space, time?)
- How can it be collected and organized?
- How can it be used appropriately, meaningfully, and respectfully? (As context, modeling inputs, etc.)
- At what point in the process is it most informative?
- How to ensure information is used?

# Spotlight issues

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## 3. Two-way and ongoing communication

- Strengthening communication between and among scientists, managers, and stakeholders is critical for identifying, understanding, and responding to change.
- Closely related to the themes of early warnings (issue 1) and utilization of new information sources (issue 2), with an emphasis on two-way

# Spotlight issues

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## 3. Two-way and ongoing communication

Why else is two-way communication important?

- Mutual interests and benefits to sharing ecosystem information and knowledge (Council, stakeholders, communities)
- Helps promote good relationships, trust, transparency
- Supports timely information sharing and response
- Helps ensure that what works well continues to work well (Pcod example)
- Ensure that useful information is available and accessible

# Spotlight issues

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## 3. Two-way and ongoing communication

### Questions and considerations

- What are the existing conduits for two-way information sharing? Are they formal or informal? (E.g. communications, “open door” policies”, outreach to scientists)
- What other conduits could be considered?
- Who is responsible for taking the initiative?



# Spotlight issues

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## 4. Management flexibility

- Management strategies for managing effort and participation (“fences”, “little boxes”) that work well under stable conditions can create rigidity and may limit flexibility in a changing environment.
- Less directly linked than previous 3 issues
- Recognized as “big questions” (important but difficult to gain traction)

# Spotlight issues

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## 4. Management flexibility

### Questions and considerations

- What are the major constraints and barriers to adaptation? What are the tipping points (e.g. fixed infrastructure)
- What are the big challenges to confront? (Allocation, displacement, distributional impacts?)
- What are the opportunities to support resilience and diversification?
- What mechanisms to managers and industry each have for facilitating flexibility? Who is responsible?

# Spotlight issues

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## 4. Management flexibility

Questions and considerations (continued)

- What features do we consider “fixed” (part of the Council’s fundamental conservation and management strategies)?
- What features could be examined through modeling capabilities (ACLIM)? (e.g., OY cap, harvest control rules, forage management policies)

# **Part III: Final reflections and cross-cutting themes**

# Final reflections and themes

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## Cross-cutting themes

- Important to recognize what is working well: Good starting point, healthy fisheries, intact ecosystems, nothing is “broken,” inclusive and transparent process, trust, good fundamentals and information inputs, effective communication, sophisticated modeling capabilities...and more!

# Final reflections and themes

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## Cross-cutting themes

- Time frames: What are we planning for, what are potential blind spots?
- Guidance and metrics: What are our goals and objectives? What do we want to achieve and avoid? What are our metrics for evaluation?
- Risk: Do we share the same tolerance for risk?

# Final reflections and themes

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## Cross-cutting questions (continued)

- Resources: How do we prioritize and make tradeoffs to make the best use of limited resources (time, funds, information inputs, etc.)?
- EBFM: How can EBFM inform a broader range of decisions in addition to precautionary ABCs?

# Final reflections and themes

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## Cross-cutting themes

Other shared reflections: What makes managing under changing conditions difficult?

- Progress is not always evolutionary; it can also mean revisiting past decisions.
- Necessary to maintain dialogue and address tough discussions (management flexibility topics)
- Recognize there is no “perfect” system for dealing with the unexpected; there may be opportunities for new ideas and improvements but also room for caution in making adjustments in response to change



# Final reflections and themes

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## Final reflections (Bill Tweit)

- Identify manageable pieces and steps
- Make use of and provide input into the tools that have been developed for the region (indicators, ACLIM)
- Support communication and exchange of information
- Broaden thoughts about where data comes from
- Continue the conversation

# Final reflections and themes

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## Final reflections

*“We need to begin to learn to use the powerful tools the science community has built for us...They are built from significant time on the water and significant research funds; we as a Council family can use those to make wise decisions about future changes and future challenges.” (Bill Tweit)*

*“More than ever we need each other and different ways of understanding the ecosystem and to exchange that information and make use of it in our own ways.” (Bill Tweit)*

*“The final report from this will not close the loop, but will highlight a lot of different potential pathways. The challenge for the Council is to determine which things are most efficient and how to improve communications and process.” (Dan Hull)*

# Final reflections and themes

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**Our next steps:** Workshop summary available late spring

**Acknowledgements:** A productive workshop depends on having all the right ingredients! Thank you:

- Participants (Council, SSC, AP, EC)
- Speakers
- Session facilitators and rapporteurs
- Council staff
- Public and stakeholders