Crab Plan Team Harvest Control Rule update

Diana Stram, NPFMC
CPT November 2025

Brief overview of:

- CCTF and other (SCS8) consideration leading to Council December motion to develop a climate work plan
- SSC HCR workshop and resulting recommendations
- Groundfish Plan Team review in September and outcomes
- Questions in moving forward for the CPT to provide input and planning

Council’s Climate Work Plan

CCTF Timeline

CCTF Start

Climate On-ramps

CCTF work plan Adaptation & Resilience definitions

Climate Readiness Synthesis Report

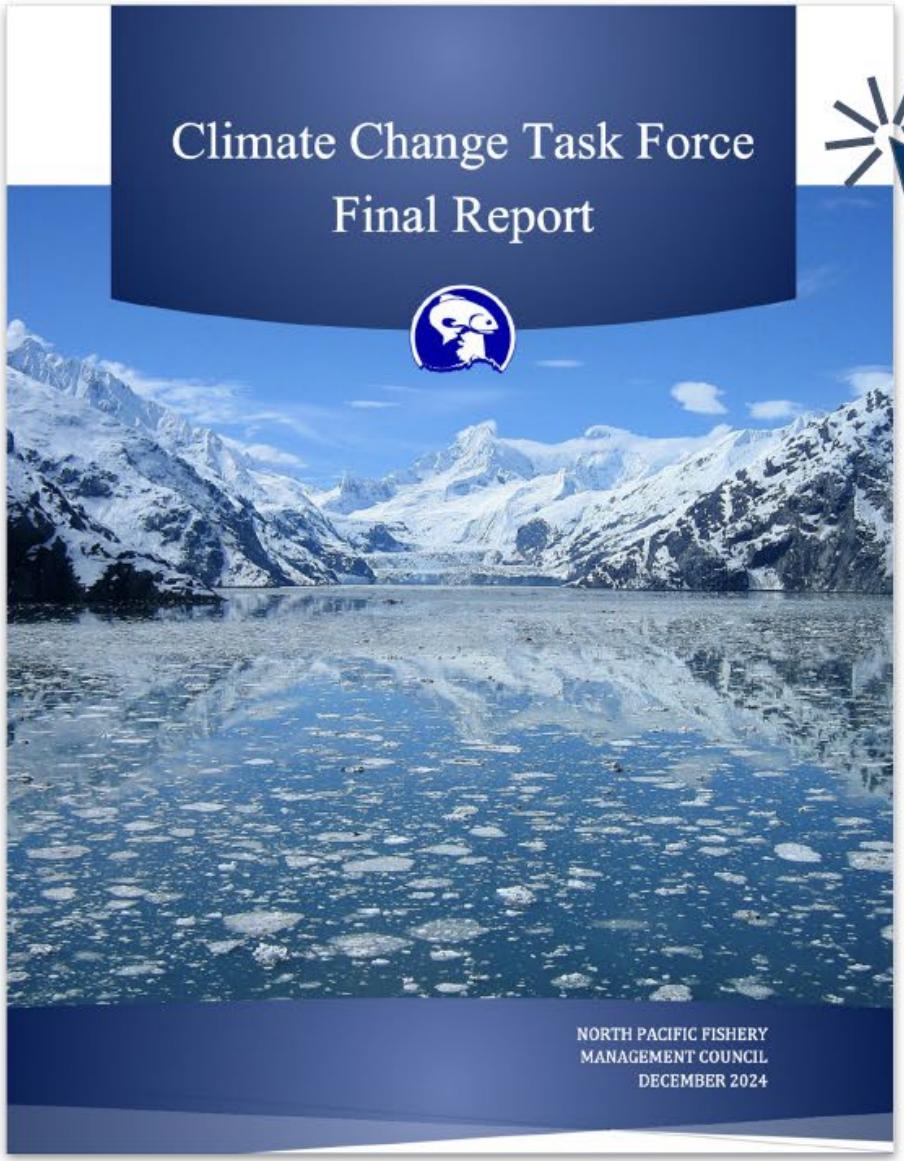
Climate Scenarios Workshop proposal Reviewed FEP goals and indicators & research priorities

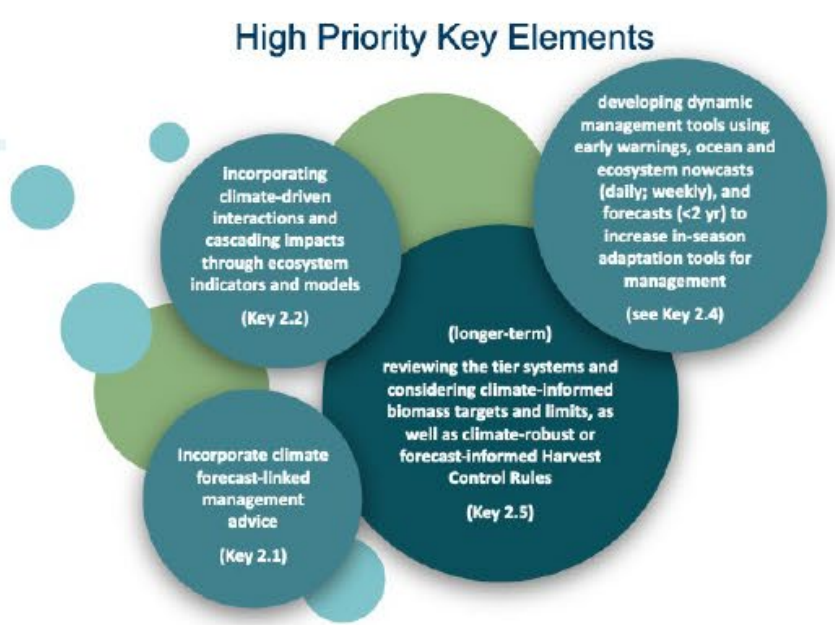
CCTF Final Report

2020 *2021* *2022* *2023* *2024*

Council Motion

NPFMC CCTF





Key Element 1

Expand existing & create new inclusive processes, collaborations, & partnerships that facilitate incorporation of multiple knowledge systems into climate planning & response

Key Element 2

Consider management tools & options focused on the inclusion of existing & emergent climate information

Key Element 3

Establish a dedicated review group charged with reviewing & packaging climate information entering Council processes

Climate Change Work Plan

To best advance the Council's goals related to climate readiness, the Climate Change Task Force recommends that a work plan be developed to advance resilience in the face of rapid change. The work plan should be crafted inclusively through engagement with the public using best practices identified by the CEC and LKTK Task Force.

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Council Motion

Initial items in Council's work plan*
Council December 2024 motion

- **Incorporate climate forecast linked management advice (2.1).** Use climate and ecosystem forecasts to improve management advice through assessments and supportive documents:
  a. Incorporate forecasts of climate and ecosystem conditions (+1-2 yrs) in the harvest projections and specifications processes, including through the assessment of maximum allowable catch, ABC and overfishing limit, OFL; as well as climate, ecosystem, and socioeconomic sections of Ecosystem Status Reports (ESRs), and Ecosystem and Species Profiles (ESPs) that are used in the Risk Tables (i.e., for ABC) and in the context of informing the TAC-setting process.
  b. Include climate forecast information and vulnerability assessments in management advice to inform Risk Tables and discussions around ABC or TAC. Climate information on risk could be communicated via updates and expanded climate risk sections of the Annual Community Engagement and Participation Overviews (ACEPOs), through an appendix to ESRs, or as a standalone report or assessment.
  c. Consider climate-forecast linked spatial management measures (e.g., via climate specific species distribution models) to inform apportionments.

- **Incorporate climate-driven interactions and cascading impacts through use of ecosystem indicators and models (2.2).** Develop and use ecological indicators and multi-species, multi-fleet, or ecosystem models that quantify uncertainty, interactions, and risk across multiple fisheries or species. As part of this effort risk table discussions can be aligned around climate buffers/risks.

- **Consider and incorporate dynamic management tools to increase in-season adaptation capacity (2.4).** Examples of these kinds of tools include:
  a. Using nowcasts (daily; weekly) and forecasts (<2 years) to inform spatial in-season and annual management actions
  b. Increase in-season flexibility and responsiveness in harvest measures through incorporation of real-time observations from a broader suite of observations and information

- **Review tier systems, consider climate-informed biomass targets and limits and climate-robust or forecast-informed harvest control rules (2.5)**

*additional longer-term items and priority actions may be considered in the future.

Initial items in Council's work plan

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Council Workplan

Council Motion

ID Climate work plan priorities including HCR workshop

SSC Alternative HCR Workshop

Draft work plan to SSC Feb (T), finalize June

Pending work plan, Council prioritization and staff availability

2025 2026 2027 2028 2029

HCR Workshop Schedule

June 4

Session 1:

2. Overview of workshop goals and objectives, current groundfish and crab Tiers, and harvest control rules and their potential flexibility under the Council's fishery management plans (FMPs) *(Diana Stram)*
3. Update on HCR considerations and simulations to date, based on ACLIM/GOACLIM work and related analyses *(Kirstin Holsman/Anne Hollowed)*
4. Questions and panel discussion on Session 1

Session 2:

5. Invited issue-specific 'lightning talks' (note titles may change)
    a. MOM6 projections for Bering Sea: *Kelly Kearney (AFSC)*
    b. ~~Application of HCRs under snow crab population decline: *Cody Szuwalski (AFSC)*~~
    c. Stock recruitment influence on HCRs: *Paul Spencer (AFSC)*
    d. Determining productivity related to EBS Pollock: *Jim Ianelli (AFSC)*
    e. Pacific Sardine HCR: *Chris Free (UCSB)*
6. Questions and panel discussion on Session 2

Session 3:

7. Cap discussion
    a. GOACLIM 2 modeling tools for exploring HCRs: *Carey McGilliard (AFSC)*
    b. Overview of analyzing OY cap in GOA: *Alberto Rovellini (UW)*
    c. Methodology on TAC modeling to explore cap alternatives: *Alberto Rovellini (UW) and Jim Ianelli (AFSC)*
8. Questions and panel discussion on Session 3

Public comment session

9. Public comment on all sessions

Next steps

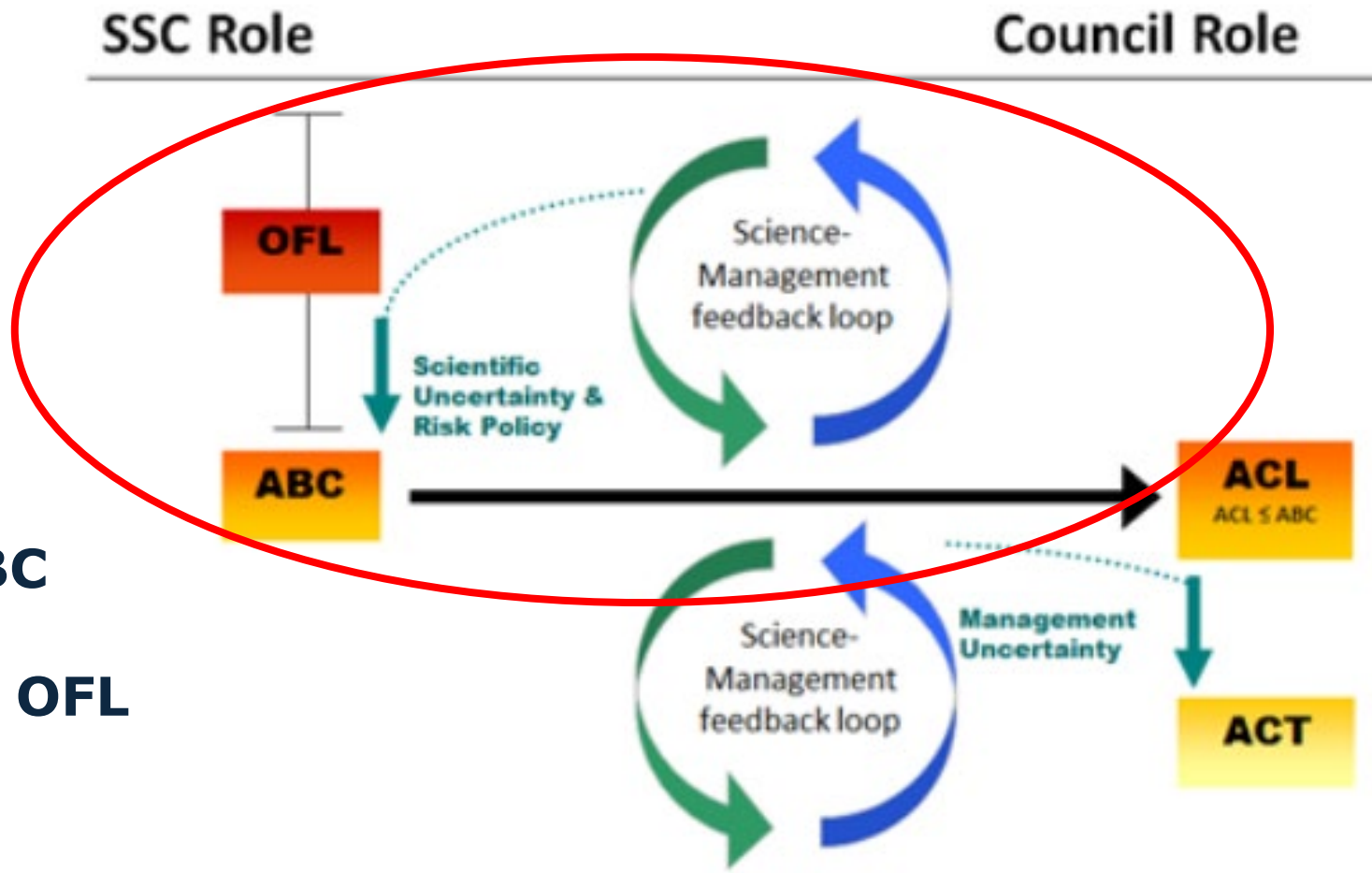
10. SSC-only discussion: recommendations on a workplan and terms of reference

Considerations on revising harvest control rules to be more climate resilient

- Identify available flexibility and/or lack thereof in current groundfish and crab tier systems [paper posted to June eAgenda]
- Identify recent issues by stock with the application of current system [periodic discussions by Plan Teams and SSC; April 2025 discussion on risk table application]
- Compile existing literature and ACLIM/GOACLIM results to help inform sensitivity of stocks to HCR shapes compared with biological reference points and/or fishing rate modifications
  - Council would need to weigh in on policy objectives (including risk tolerance) in modification of HCRs or reference levels

NPFMC ACL=ABC

For Crab ABC = OFL



Related roles of the regional fishery management councils and their Scientific and Statistical Committees in translating scientific information into recommendations for annual catch limits.

OFL – Overfishing limit
ABC – Acceptable biological catch

ACL – Annual catch limit
ACT – Annual catch target

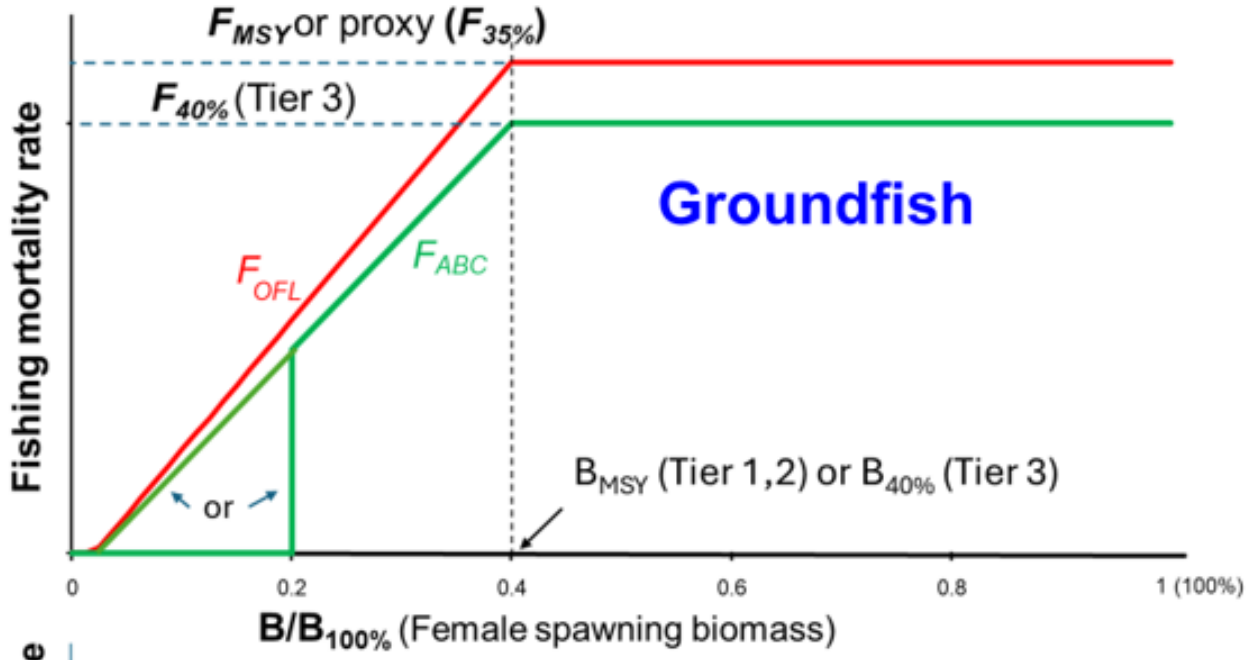
Risk Policy (ABC setting)

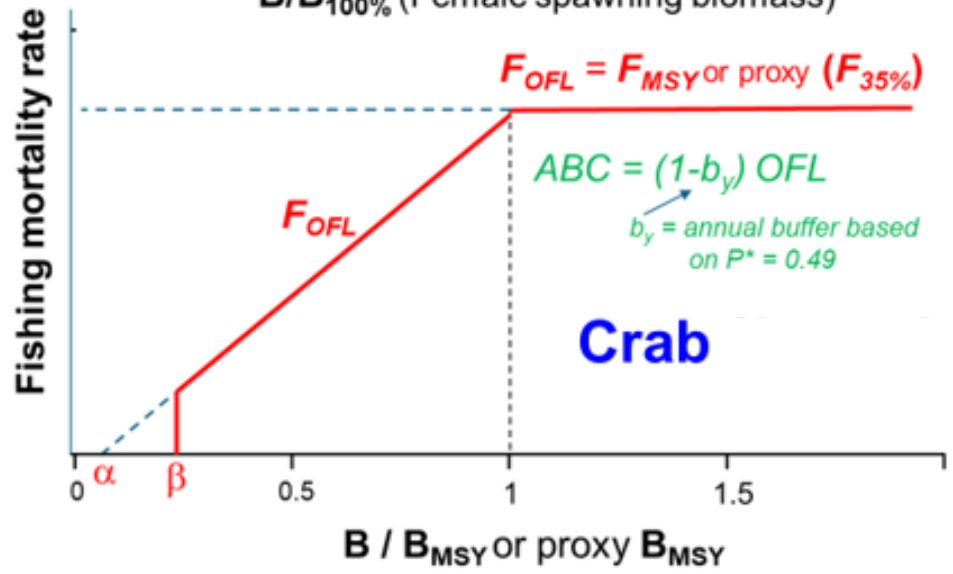
For Crab defined during Amd 36 for ABC control rule (P* =0.49)

- Risk policy that ABC = OFL.
  - But practically speaking never used → annually varying buffers
- Should risk policy be reconsidered in light of CPT discussion of buffers and annually varying ABCs?

For groundfish: risk tables and periodic ABC<maxABC

- Risk policy by Council in maxABC HCR superseded by periodic adjustments below maxABC
- Should we consider future revisions to HCRs to be more transparent in adjustments?



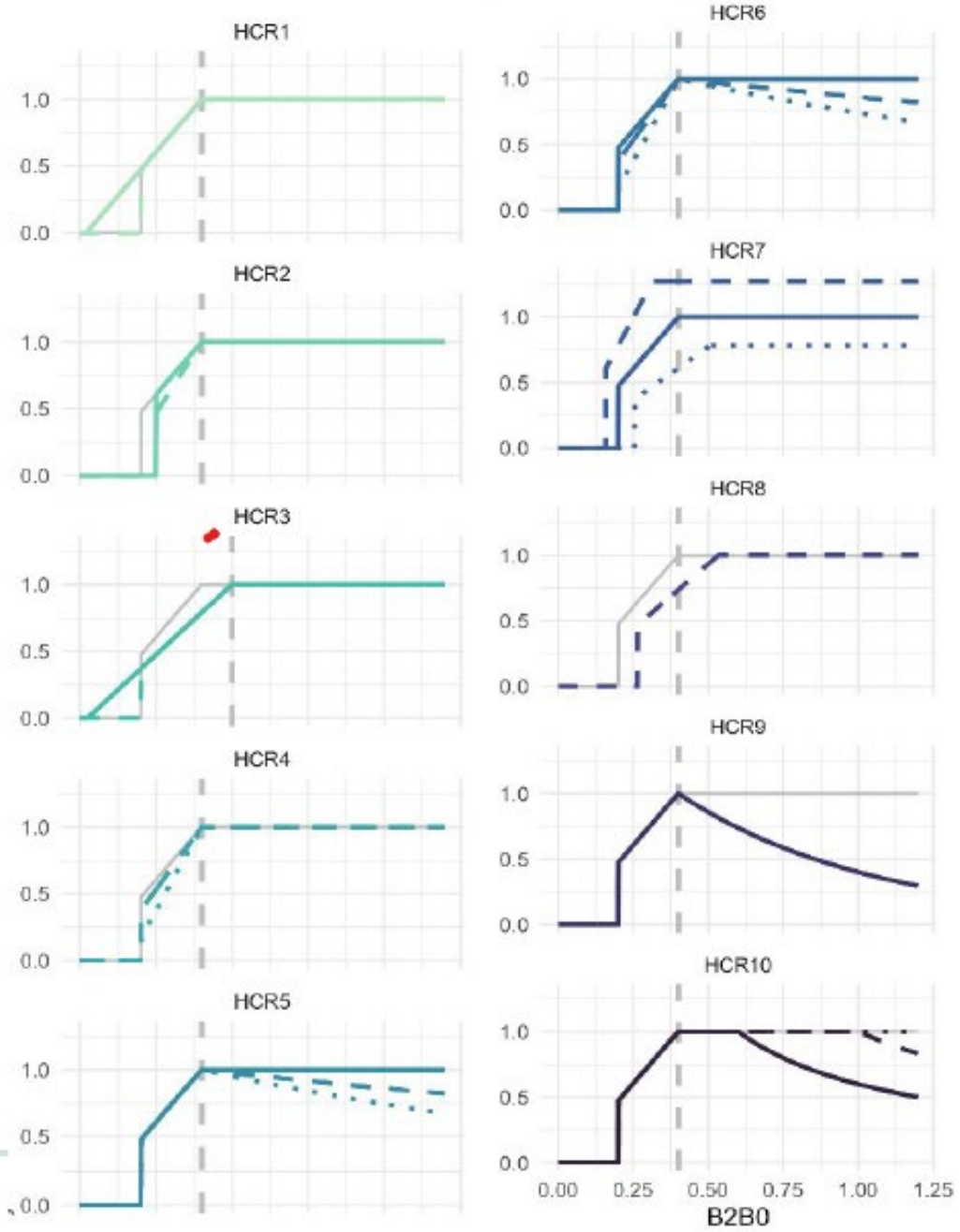


Inherent flexibility in setting ABC below maxABC Control rule.

Limited flexibility in OFL control rule

ACLIM2

HCR	Name
ABC+HCR 1	Status quo
ABC+HCR 2	Lagged recovery to estimate emergency relief financing needs
ABC+HCR 3	Long-term resilience (stronger reserve) B_target
ABC+HCR 4	Environmental index informed sloping rate, e.g., MHW category alpha
ABC+HCR 5	Maximize productivity/ increased reserve (buffer shocks)
ABC+HCR 6	Combination of MHW (HCR4) + Maximize productivity (HCR5)
ABC+HCR 7	Risk Table Bridging, R/S variability covariate adjusted HCR
ABC+HCR 8	Adjust effective spawning biomass (simulate adjusted B_target)
ABC+HCR 9	Forecast informed version of HCR 5
ABC+HCR 10	Maximize productivity/increased reserve (HCR5), linear version (1/ B_target) with offset



HCR Scenarios

ACLIM2

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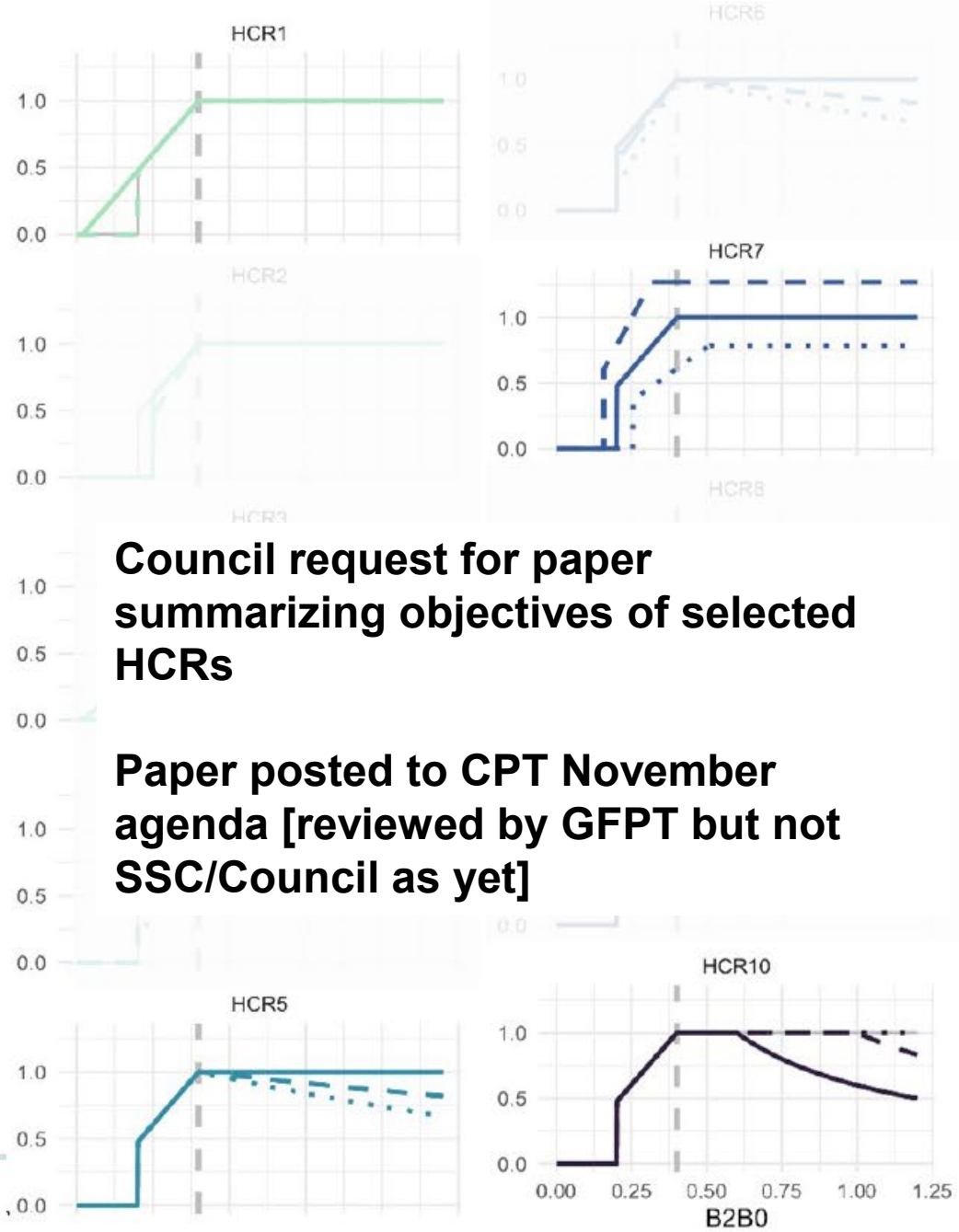

Council request for paper summarizing objectives of selected HCRs

Paper posted to CPT November agenda [reviewed by GFPT but not SSC/Council as yet]

Council motion on HCRs June 2025

Workplan goals/needs could answer questions such as:

- Which stocks are most sensitive?
- Which if any should use an alternative HCRs?
- What are options for alternative HCRs?

Feedback from Plan Teams

- What HCRs are of interest?
  - SSC/Council focus on 1, 5, 7, 10
- What species should we focus on first (e.g., highest productivity spp?)
  - SSC recommendation for BSAI/GOA P. cod and pollock, AK sablefish, snow crab and BBRKC
- What are some performance criteria to include in our evaluations?
- What to include in a work plan (priorities, capacity, evaluations)

Groundfish Plan Team feedback (September 2025)

- Workplan guidance:
  - Stocks or species to cover,
  - types performance indicators to use
- The Teams noted the need to focus on species that are most susceptible to environmental change
  - Agreed with SSC focus on Pacific cod, pollock, sablefish, snow crab, and Bristol Bay red king crab–**added Pacific Ocean perch**
- Development of a framework for implementing alternative HCRs
  - Umbrella actions based on evaluations of relevant indicators
  - Consideration of exceptional circumstances invoke meta-rules–a set of guardrails when a simulation-tested HCR appears to be straying from expectations
- Recommendations:
  - **The Teams recommended that a Joint Team meeting be conducted in early 2026 (January) to review and recommend alternative frameworks for when different HCRs could be triggered.**

- Should alternative HCRs be developed for Crab?
  - If so at the OFL or ABC level or both?
  - How does this interact with considerations for snow crab HCRs?
  - Timing for providing feedback prior to the February SSC meeting in preparation for the workplan development and review at the June Council mtg
- Feedback on GFPT plans for developing a framework for when/if alternative HCRs should be implemented?
  - Interest in similar approach for CPT?
  - Participation in workshop/GFPT meeting?
    - Issues and progress is different so it would be participation but not a joint GF/CPT meeting

Questions for the CPT to consider

Council Workplan

Council Motion

ID Climate work plan priorities including HCR workshop

SSC Alternative HCR Workshop

Draft work plan to SSC Feb (T), finalize June

Pending work plan, Council prioritization and staff availability

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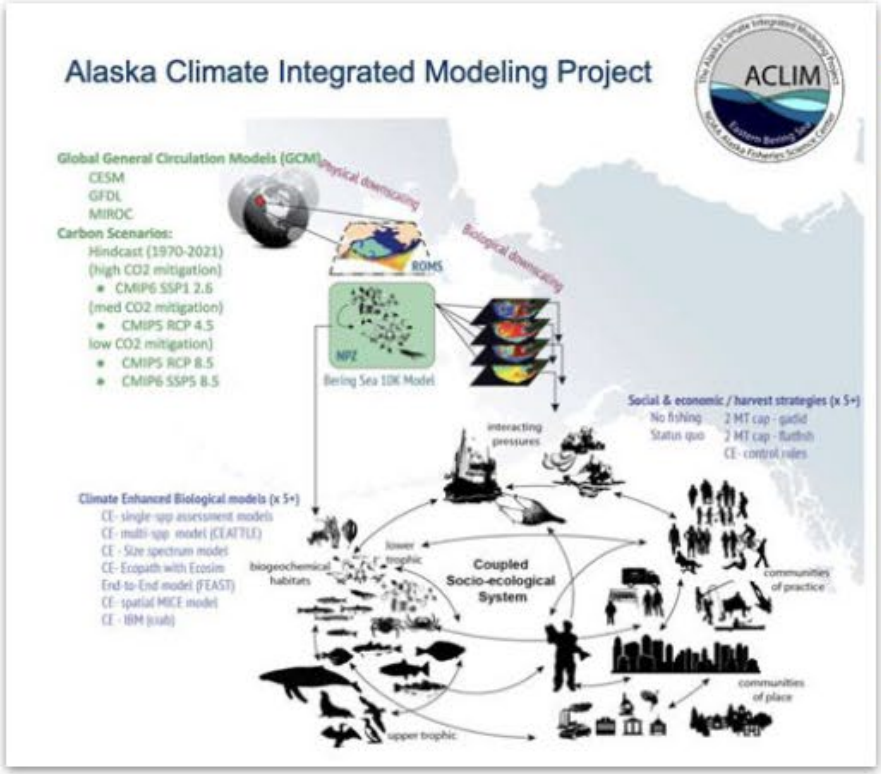
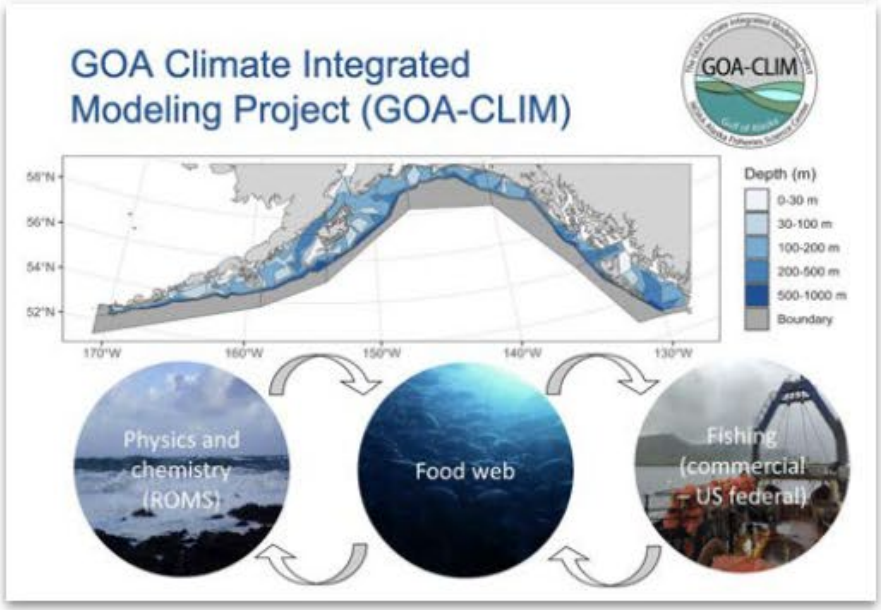
Thank You!

Extra slides





Goal: To address climate & ecosystem information needs with best available science & tools

What to expect?

- Project physical and ecological conditions under alternative levels of global carbon mitigation
- Characterize uncertainty

What can be done?

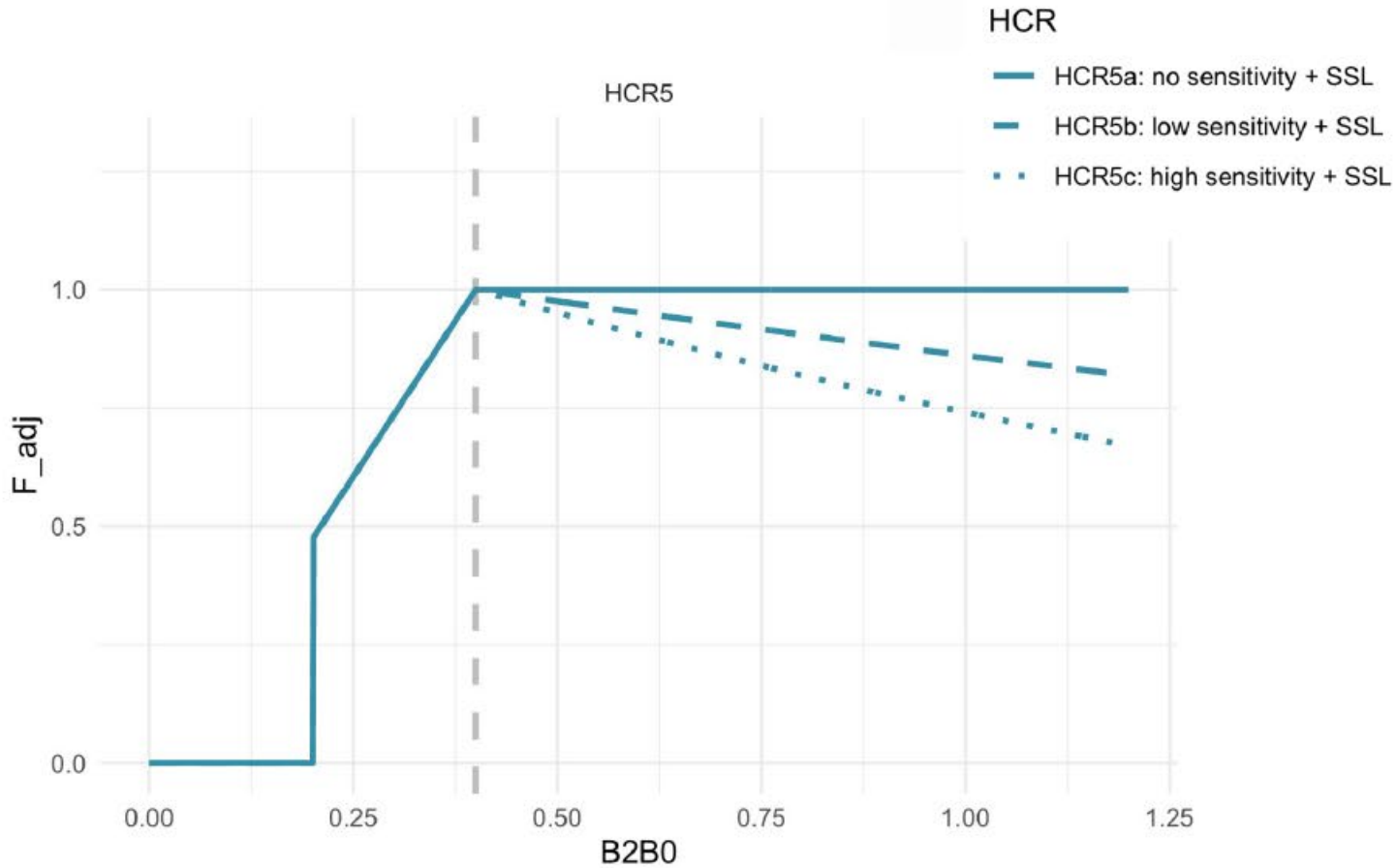
- Evaluate effectiveness of adaptation actions including those supported by fisheries management

Scenarios form the basis for comparative simulations & Management Strategy Evaluations

HCR 5 : Maximize productivity/ increased reserve (buffer shocks)

Simulation Goal:
HCR 5 is designed to **maximize ecosystem and spawning biomass productivity** by increasing reserves, creating a buffer against environmental shocks, and enhancing long-term sustainability

$$F_{ABC_{max}} = \begin{cases} F_{ABC}\, e^{(-\gamma(\frac{B_y}{B_{target}}-1))} & \frac{B_y}{B_{target}} > 1 \\ F_{ABC}((\frac{B_y}{B_{target}} - \alpha)/(1-\alpha)) & \frac{B_{lim}}{B_{target}} \leq \frac{B_y}{B_{target}} < 1 \\ 0 & \frac{B_y}{B_{target}} < \frac{B_{lim}}{B_{target}} \end{cases}$$

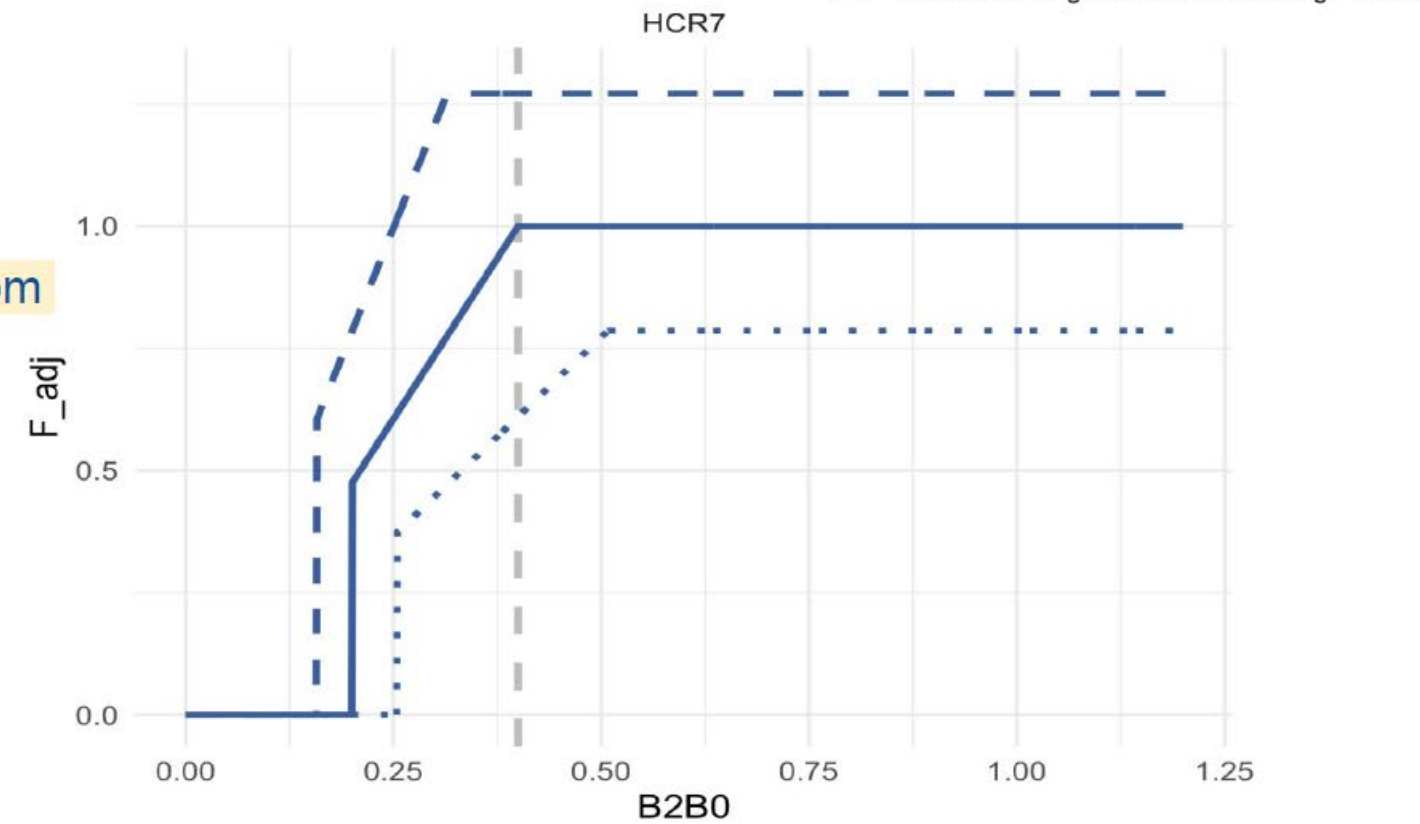


HCR 7: Risk TableBridging via R/S variability covariate adjusted HCR

Simulation Goal:
This HCR provides a way to transition from qualitative risk tables to a more explicit, analytical approach for species whose productivity is known to vary with environmental conditions.

$$F_{ABC_{max}} = \begin{cases} F_{ABC}\, e^{(\omega_1 * x_y)} & \frac{B_y}{\hat{B}_{target}} > 1 \\ F_{ABC}((\frac{B_y}{\hat{B}_{target}} - \alpha)/(1-\alpha))\, e^{(\omega_1 * x_y)} & \frac{B_y}{\hat{B}_{lim}} \leq \frac{B_y}{\hat{B}_{target}} < 1 \\ 0 & \frac{B_y}{\hat{B}_{target}} < \frac{\hat{B}_{lim}}{\hat{B}_{target}} \end{cases}$$

$$\hat{B}_{lim} = B_{lim} e^{(-\omega_3 * x_y)} \qquad \hat{B}_{target} = B_{target} e^{(-\omega_2 * x_y)}$$



HCR 10: Maximize productivity/increased reserve; linear version (1/ B_target) with offset

Simulation Goal:
This HCR builds on HCR 5 by applying a proportional reduction in fishing mortality based on biomass levels, further enhancing stock and environmental productivity through strengthening the buffer against environmental shocks.

$$F_{ABC_{max}} = \begin{cases} F_{ABC}/(\frac{B_y}{B_{target}}\frac{1}{(1+\gamma)}) & \frac{B_y}{B_{target}} > (1+\gamma) \\ F_{ABC} & 1 < \frac{B_y}{B_{target}} < (1+\gamma) \\ F_{ABC}((\frac{B_y}{B_{target}} - \alpha)/(1-\alpha)) & \frac{B_{lim}}{B_{target}} \leq \frac{B_y}{B_{target}} < 1 \\ 0 & \frac{B_y}{B_{target}} < \frac{B_{lim}}{B_{target}} \end{cases}$$