

NPFMC Climate Change Task Force

Final Report

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Executive summary (1 pager of recommendations)

[ADD brief 1 page version of recommendations with clear figure like LKTKTF flow chart]

Introduction

P1[General short introduction]

P2 [brief overview of the current management approach][Acknowledge where we are – some good things and leadership, and new tools/techniques are needed to continue to manage sustainably]

P3 [Challenges are expected to increase]

There is considerable evidence that climate change already has and will continue to exacerbate inequalities and challenges in the Council’s management system. To address this, an approach is needed that includes stock and ecosystem (including human) sustainability, well-being, equity, resilience, and management metrics and targets in the context of climate change impacts and risks. It is important to acknowledge that if diverse perspectives are not systematically included in the process of designing policies, collecting information, and synthesizing that information for advice, we risk outcomes of Council's decisions will favor particular interests to the detriment of other interests?, and therefore disproportionately impact resilience across communities of place and practice. Therefore it is important to promote climate-integrated processes that provide input and analyses that help illustrate and communicate the potential tradeoffs across fisheries, fleets, communities, and associated vulnerabilities relative to climate-related Ecosystem-Based Management (EBM) issues.

P 4 [Going forward... key considerations]

P5 [CCTF now and what we’ve done]

P6[from this, here are our key recommendations] Over the past five years the CCTF has documented, evaluated, and discussed the needs, processes, and information sources critical to achieving climate

resilient fisheries and vibrant Alaska communities. As a final work product, we have synthesized our work into a final set of recommendations. We envision that these recommendations inform the development of an NPFMC Climate Work Plan which could be crafted in an engaged manner with the public using best practices (e.g., using insights from the Community Engagement Committee (CEC), LKTKS Taskforce, etc.). *The CCTF recommends the Council implement a climate change work plan that outlines a process for bringing climate-related information to the Council, addresses the shifting challenges of climate change, and provides a regular process for public input and discourse (e.g., roundtables).*

Key [better word here: Climate Ready/Climate Resilient] Recommendations:

[intro text—big picture recommendation is to create a work plan that incorporates the following three overarching elements]

Recommendation 1: Expand existing (and create new, where appropriate) inclusive processes, collaborations, and partnerships that facilitate inclusion of multiple knowledge systems in climate planning.

1. Build on existing successes and expand inclusive approaches to provide rapid climate change information, observations, and responses across Council processes, documents, and information sharing approaches and materials.
2. Continue to provide regular opportunities for public-facing brainstorming and two-way information sharing (e.g., like the breakout sessions at the CSW), which may take the form of (no options are mutually exclusive; Annual round table discussion(s) on various climate topics; Dedicated evening session(s) at Council meeting(s); Climate testimonial(s))
3. Advance measures that promote inclusive decision-making and formalize (as needed) and implement on-ramps that incorporate information and perspectives from diverse knowledge sources into decision-making processes [Crosswalk these on-ramps to LKTKS on-ramps]
4. Support and resources for collaborative and cooperative structures and processes which are inclusive of Tribes (e.g. promoting co-production of knowledge, promoting and integrating results of timely and meaningful Tribal Consultation, supporting and exploring collaborative and cooperative management and policy structures and processes, promoting co-stewardship, promoting co-presentation on Council issues by Tribal entities, etc.)
5. Reduce barriers to diverse participation and to increase information exchange (economic, time/season, location, internet access, safety of the environment - harassment, inappropriate verbal attacks, intimidation, etc.)
6. Provide Council support and resources for mentorship programs (e.g., Marine Resource Education Program (MREP), UAF Tamamta Program) to build capacity for Council involvement and contributions

7. Promote open access to information (as appropriate and using FAIR, CARE, LKTKS Taskforce, and other existing protocols for information sharing). Improve access to documents ahead of Council meetings that promote equitable participation.

Recommendation 3: Establish a dedicated review group charged with reviewing climate information entering Council processes

In addition to recommendations 1 and 2, identify a review group to receive, review, and recommend explicit management measures (new or modifications to existing) to improve climate response and robustness and to iteratively and regularly re-consider potential strengths, weaknesses, & opportunities for improvement across management tools. The CCTF discussed potential alternative structures for this approach which included three alternatives

- (1) the Council forms a new CCTF- like group (if choosing to discontinue the CCTF) with a directive to provide advice through existing pathways (AP, SSC, Plan Teams, Committees and other existing working bodies, GPT and CPT, Council);
- (2) the Council uses a review group approach to compose a small team of Council body reps (no more than 2 representatives from each: AP, SSC, Council, Staff) that would convene, as appropriate, tactical sub- teams of experts and public roundtable discussions, to guide analysis and reporting on recommendations of management measures to the Council;
- (3) Existing Council structures expanded to include climate; similar to (2) but re-assignment of the following tasks to existing Council bodies and committees; or
- (4) staff only and no public process (this option not favored by CCTF as this is less feasible for implementation).

The CCTF recommends that in establishing this group, that the Council:

1. Provides synthesis and assessment of various climate-related processes and initiatives as they relate to Council activities.
2. Establish a longer time frame for the group, with membership rotation policy/protocol in place.
3. Provide tasking that allocates time and resources to complete recommendations or actions.
4. [add set agenda item; identify process for input to that agenda item]

The CCTF recommends this group conduct the following activities:

5. Review of emerging, and coordinate as necessary, climate-specific resilience metrics for measuring progress towards climate readiness. Provide periodic review and evaluation of the Council actions and performance of actions previously taken over time and under various conditions. Re-evaluate risks and climate readiness on a regular basis and periodically reconsider metrics used to monitor climate readiness (e.g.,). Review low-hanging fruit identified in CRS Section 3 (knowledge base section) for the potential to pursue some of those actions and products
6. Recommend initiating and identifying subteams to conduct analyses or evaluations to be approved by the Council and report back on 1 -2 years later on outcomes of the analyses (e.g., Table X item 3.7). Consider how these needs align with the Council's research priorities.

7. Identify robust and equitable climate resilience-oriented strategies and tools (including identification of roadblocks to development and implementation of strategies and tools)

Recommendation 2: Systematically include existing and emergent climate information in Council process & reports across scales of management advice

The CCTF discussed that much of the recently compiled climate advice and tools [see Table X] fall within various scales of management from near-term decision making to long-term policy planning. There is overlap across these scales. We have summarized recommendations related to these measures below, with bold measures as those that might be implemented in the next 2-4 years with current resources. Some of these were previously identified in the CRS and the CSW (held June 2024):

[FILTER THESE THROUGH THE CRS TABLE 1.2 (TAC, allocation, quota etc) → here is an example, we suggest the council use this table [add] to filter through these recommendations as part of climate workplan.

We feel these measures are doable in the next 1-3 years, are incremental, and would be our recommended initial actions (1,3, 4, 6) but as new measures it is important to monitor their performance and establish an approach for skill testing.

Annual assessment process (ABC, OFL, TAC setting); using +1-2 yr forecasts

ABC & OFL

1. Improve ecosystem forecasts and interpretation of impact on species and fisheries including changes in survey indices, changes in availability, catchability, uncertainty and changes in population dynamics central to assessment and harvest recommendations (e.g., 3 to 12+ month marine heat wave (MHW) forecasts linked to increases or decreases in survival, growth, or corraling or dispersion of fish distributions, or changes of access and processing by harvesters; pH or low oxygen events linked to fish mortality; harmful algal blooms (HABs) linked to food safety of subsistence resources).
2. Develop climate and ecological indices that feed into multi-species, multi-fleet, or ecosystem models that quantify uncertainty, interactions, and risk across multiple fisheries or species. Align risk table discussions around climate buffers/ risks.
3. Consider climate or forecast-informed Harvest Control Rules (HCR) and biomass targets
4. Include climate information in stock assessments (e.g., as appendix to ESRs, similar to the California Current Integrated Ecosystem Assessment (IEA), or as a standalone report/ assessment). Consider climate connections through Ecosystem and Species Profiles (ESPs).
5. Build on collaborative data collection methods and explore statistical approaches to bring fishery-dependent data (especially around climate and species and fishing effort redistribution) into stock assessments and management actions

TAC setting

6. Update and expand climate risk sections of the Annual Community Engagement and Participation Overviews (ACEPOs)
7. Consider spatial management overlap and allocation
 - ACEPO → Community specific implications

■ ESPs → TAC OFL allocation

We feel the following measures are critically important but might take more time to implement but have high potential to increase flexibility and resilience under climate change (7, 8, 9).

In season management and early warnings (<1 yr forecasts)

These are tools intended to be available pre-season and within season as adjustments [would need to create a system to allow managers to be able to open and close as needed, not currently done / hasn't been done yet. Need feedback loop for how to implement it] To implement these might require a combination of regulatory and innovation to develop or refine opportunities that facilitate and incentivize industry based solutions that allow for and monitor [can start now though because the pieces are in place but they might take longer to implement]

8. Develop dynamic and within-season climate-linked management options, e.g., climate or ecologically-informed dynamic pre-defined spatial or seasonal measures.
9. Increase in-season flexibility on harvest measures (e.g. State of Alaska coho salmon management triggers) considering TK IK / LK / Citizen science in-season triggers and actions
10. Include climate information in stock assessments (e.g., as appendix to ESRs, similar to the California Current Integrated Ecosystem Assessment (IEA), or as a standalone report/ assessment)
11. Develop climate risk sections of the Annual Community Engagement and Participation Overviews (ACEPOs)

Harvest specification process (ABC, OFL, TAC setting) based on hindcasts &< 5 yr forecasts

12. Review the current Tier systems and consider climate robust biomass targets and lower limits (e.g., B50 or ecosystem MSY).
13. Consider climate linked spatial management measures (e.g., via climate specific species distribution models) to improve by-catch avoidance, climate refugia, and habitat protection

Policy advice based on longer term predictions (10yr) and projections (>10 yr projections)

14. Consider climate linked protected resources measures and conservation areas
15. Consider climate - specific recovery and rebuilding plans
16. Include fishery, ecological, and social management tradeoffs / knock on effects under the lens of alternative climate scenarios
17. Consider mandates beyond Magnuson Stevens Act for EBM e.g., MSY for ecosystem not just single species
18. Consider market dynamics and low carbon domestic market development in allocations
19. Cross-sector coordination

- Ensure broad and equitable representation within the Council process
- Ensure Council membership has cross-sector representation
- Consider Council members who also participate/serve on other sector Councils

3. Implementation of recommendations

P1 [Key resources of implementation] Tasking, people, communication, etc.

- Importance of transparency of the process of rapid communication [@jeremy]

P2 [Key considerations for implementation] Kir's slides, how to do it that is most likely to succeed

P3 [Examples/ Suggested approaches that have worked elsewhere?]

P4 [Final wrap up - climate change is a challenge but a dedicated approach can help lessen impacts]

[ADD follow on paragraphs about why these three recommendations]

4. Figures

Fig 1: NCA5 adaptation figure

“Adaptation can occur at many organizational scales—from individuals to governance systems.” Chp 10

Ocean-Related Climate Adaptation Strategies

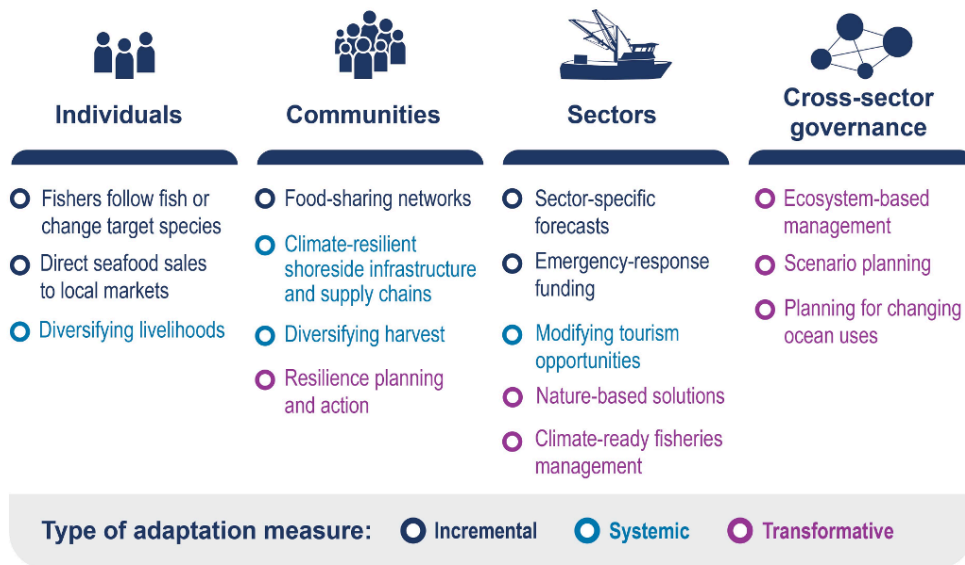


Fig 1: NCA5 adaptation figure

<https://nca2023.globalchange.gov/chapter/10/#fig-10-4>

Fig 2: Infographic of various streams of climate advice and on-ramps (existing or new)

Fig 2: Update to our concept figure?

Fig 3: Figure of different management options and recommendations with the council cycle

5. Appendices

- 1. Table Recommendations: map to Table 3.1 and within season climate-linked management options (e.g.,...)**
- 2. Toolbox / CSW Table X tools**
- 3. Adaptation definition**
- 4. Resilience definition**
- 5. Mental modeling (final figure needed)**
- 6. Climate briefings recommendation**
- 7. CRS**
8. Review of progress towards work plan / Recap of goals of the CCTF and progress towards original goal
9. What the CCTF did and didn't do (according to directive, scope, plan, etc)
10. Meeting summaries
11. Products (e.g. Climate Ready Synthesis (CRS), working draft definitions, etc.)
 - a. Related Council activity/product: Climate Scenario Workshop (CSW) and its report
12. Recommendations for development of a Climate Work Plan [see below]
13. Other recommendations
14. ANYTHING ELSE?

Appendix A: Retrospective review of goals and progress of original CCTF Work Plan

Main threads from the workplan

- Objective 1: Coordinate the review of existing and emergent climate information on impacts, adaptation, and residual risk.
- Objective 2: Assess key climate change impacts, adaptation actions, and residual risk
- Objective 3: Summarize and communicate potential risks and adaptation actions

Original CCTF Goals:

The CCTF aims to operationalize the delivery of climate change information to the Council including climate change information, tools, and recommendations that can help the Council further its ecosystem vision statement through equitable climate change adaptation pathways, transparent communication, utilization of diverse knowledge sources, and broad engagement.

This module will support the Council's capacity to:

1. More effectively incorporate climate change information from diverse knowledge holders into the fishery management process through transparent, effective and dynamic communication and engagement with communities, fishers, managers, scientists and other Council stakeholders with the Council and Council staff; and,
2. Evaluate and implement management measures that can: help preserve livelihoods, economies, health and well-being across fisheries and dependent coastal communities; support near- and long-term adaptation to climate change; and ensure the continued productivity and sustainability of the coupled social-ecological Bering Sea system.

Products of the CCTF annual process:

On-ramp 1: Climate-informed near-term tactical advice (<2yr)

- When: Annually as part of the annual stock assessment cycle
- Who: CCTF will summarize existing climate information and identify additional information that may be useful for tactical decision making (e.g., ABC harvest recommendation, gear specification, size-based release, area/season closures; Gavaris 2009) based on review of contributions provided during the Climate Adaptation meetings, as well as synthetic analysis of diverse sources of climate information.
- What: List of potential issues, red flags, and stock-specific indicators and emergent issues for possible consideration in climate-enhanced stock assessments (e.g., OA indices, temperature indices, changes in habitat area). CCTF will review existing climate-information included in stock assessments and will help summarize additional climate knowledge from various sources to

help increase the speed of uptake of climate information into tactical decision making (as is deemed appropriate). **Climate Ready Synthesis Report**

On-ramp 2: Climate-informed near-term strategic advice (<2yr)

- When: Annually as part of the annual stock assessment cycle
- Who: CCTF will produce this summary based on contributions provided during the Climate Adaptation meetings (and shared with permission from knowledge holders and with clear attribution of authorship, following and consistent with the co-production of knowledge approach), and synthetic analysis of diverse sources of climate information.
- What: An annual review of the previous year reports (including Stock assessments, Ecosystem Status Reports, and Socio-economic reports) in order to provide a long-term multidecadal context of climate conditions and changes in the Bering Sea to inform near-term strategic management decisions (e.g., climate-informed MSY proxies like 40% of B₀, by-catch limits, ecological tipping points thresholds) **Climate Ready Synthesis Report**

On-ramp 3: Long-term strategic advice based on synthesis of climate change impacts, risks, and adaptation

- When: The report will be bi-annual and in coordination with the Ecosystem Health Report (FEP report)
- Who: CCTF will produce this report with input from contributing authors and review from the FEP team, stakeholders and the public and will provide it to the Council.
- What: EBS Climate Change and fisheries report
 - Synthesis of diverse knowledge about climate change effects, evaluation of the scope of impacts from such change, suggestions about tools to aid in decision-making, and on-ramps for climate information into the Council process) (Objective 1 and associated Activities) **CSWorkshop & CSWreport and SCS7 and SCS8 report**
 - Evaluation and summary of key risks and short-, medium-, and long-term adaptation measures across a range of climate scenarios (updates to Table 1) (Objective 2 and associated Activities) **→ Could be an ACT product?**
 - Conceptual model of climate-social-ecological linkages (including direct and indirect connections) **Conceptual model results - post link/figure; needs revisiting**
 - Recommendations for short-, medium-, and long-term actions that could be considered and initiated through the Council process (Objective 3 and associated Activities) **CCTF Final report**
 - Review of additional ways in which climate information can be on-ramped and operationalized within the Council process (especially in association with Objective 1 and its associated Activities, as well as through coordination with LK/TK/Subsistence Taskforce) **CCTF Final report**

CCTF additional products:

- These key products will be included by reference or appended to the above-noted Synthesis Report and Framework, and will be developed iteratively throughout the CCTF's work:
 - **Adaptation Briefing Note (collaboratively and iteratively developed with stakeholders)**
 - **Resilience Briefing Note (collaboratively and iteratively developed with stakeholders)**

- Climate Briefing Form and Process (used for Adaptation and Climate Testimonial workshops) CCTF Final report : additional ideas to consider
- Table of climate change drivers, impacts, potential policy/management responses, targets, and gaps/needs CRS and CCTF Final report
- Adaptation and Climate Testimonial workshop summaries CCTF Final report : additional ideas to consider
- Coordination with LK/TK/Subsistence Taskforce and the BS FEP Team to communicate issues/topics of joint relevance, minimize duplicative efforts/products, and coordinate related to pertinent Activities noted above to follow best practices (e.g. regarding use of LK/TK/Subsistence information). [CCTF process; more needed]
- Periodic updates with SSC, Plan Teams, and Ecosystem Committee to provide interim synthetic climate information of value to ongoing work by those bodies e.g. assisting in the period update of recommendations for the Council's climate-specific research priorities. [CCTF process; done]

Parking lot

Action models

Cross walk CSW matrix

Council direction

Recommendations:

Updates going forward:

- Repeat the CRS for each region bi-annually (in brief; update), redo = cross check
- Revisit definitions of adaptation and resilience periodically
- Hold/support future workshops to discuss climate impacts and key adaptation needs /successes

Who going forward

- AFSC - ACT meets monthly and delivers summarize and briefs to the Council
 - Who on the Council is tasked with reviewing/ uptake the climate information
 - SSC→ ABC relevant information
 - AP?Council → TAC and policy/programmatic relevant info
 - Every year the ACT will provide an overview to the Council (tech group providing the council with feedback)
- Council Process
 - Opt 1: Ecosystem committee would receive the briefing - ACT would provide the technical info to the EcoComm, as well as the Council
 - Task to make sure that the info is being taken up to the council
 - Opt 2: maybe 2 members from each SSC, AP, Eco-subcommittee
- Map the above into a potential workplan format (for 2-5 yr workplan scope)

Tools

- Council process tie in for
 - ABC - when who where how
 - TAC - when who where how
- Tools organized by CSW headings/google sheet with tools rows and rest columns
 - Tools under each heading
 - Status
 - Utility for what
 - Example application
 - Tactical vs strategic
 - Long vs near term
 - CEFI linkage?