

Climate Readiness Synthesis: Overview

NPFMC Climate Change Task Force

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Climate Change Task Force:

Diana Stram

Lauren Divine

Scott Goodman

Jason Gasper

Mike LeVine

Steve Martell

Brenden

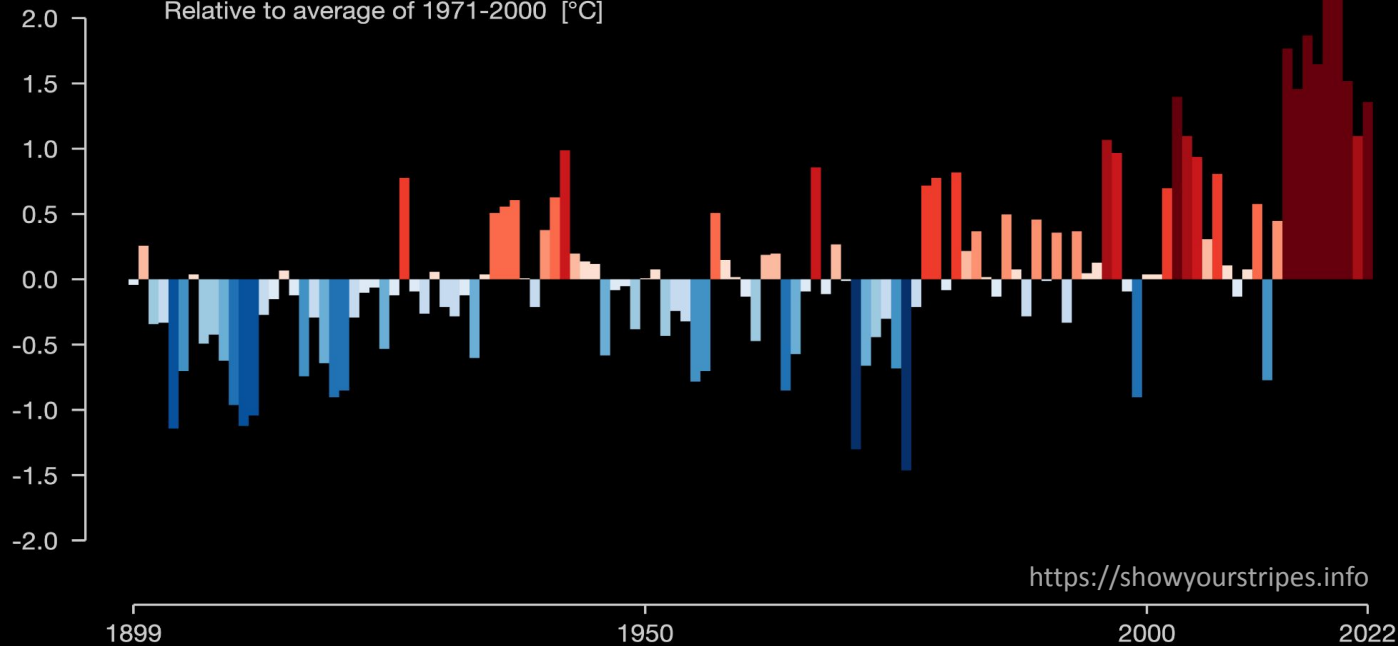
Raymond-Yakoubian

Jeremy Sterling

Todd Loomis

Temperature change in Bering Sea

Relative to average of 1971-2000 [°C]



<https://showyourstripes.info>



[supporting effective adaptation]
“to climate change depends on
society’s ability & willingness to anticipate the change,
recognise its effects,
plan to accommodate its consequences,
& implement a coordinated portfolio of informed solutions”

-- IPCCWGII Chp.3



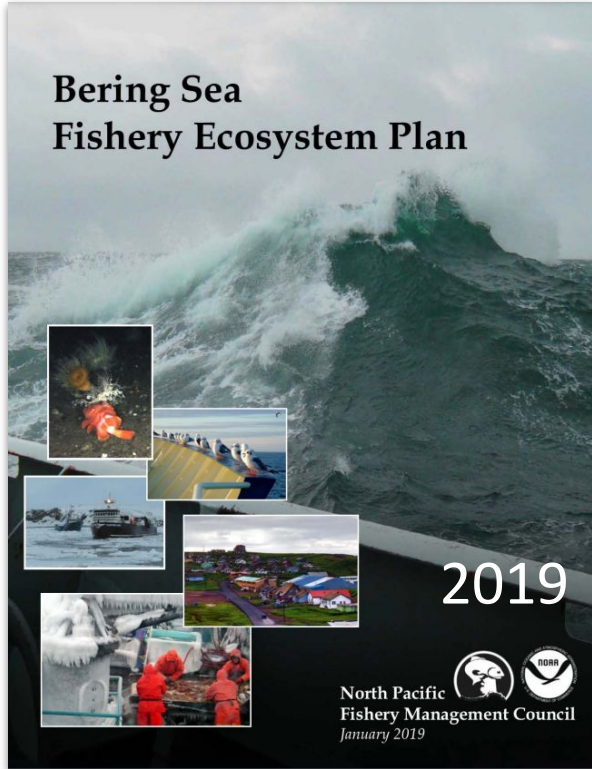
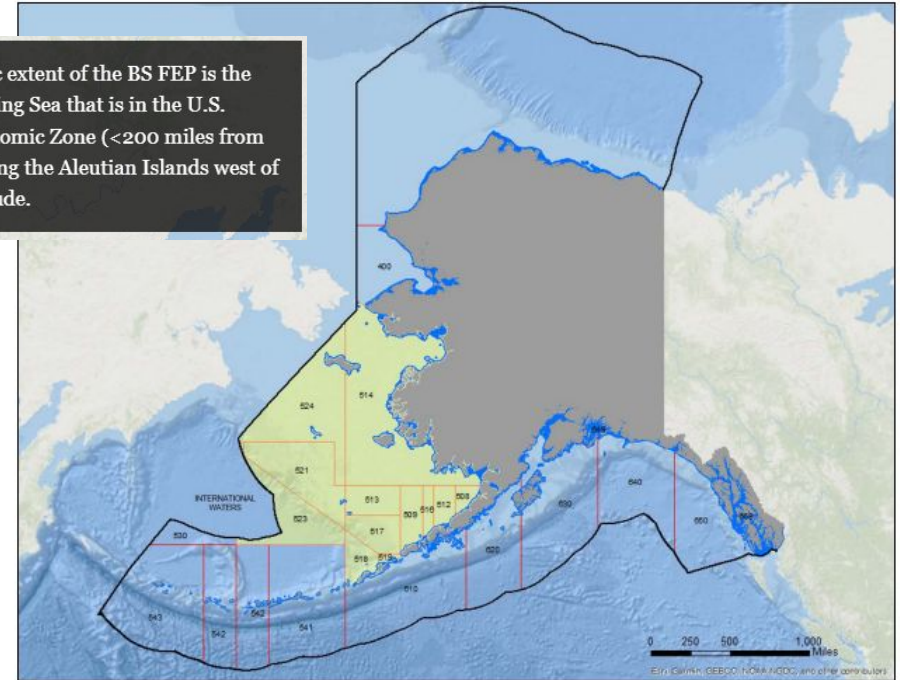


Figure 6-2 Map of Federal groundfish management areas in the Bering Sea ecosystem

Note, areas in blue denote State waters that are outside of Federal jurisdiction. Yellow is BS FEP area.

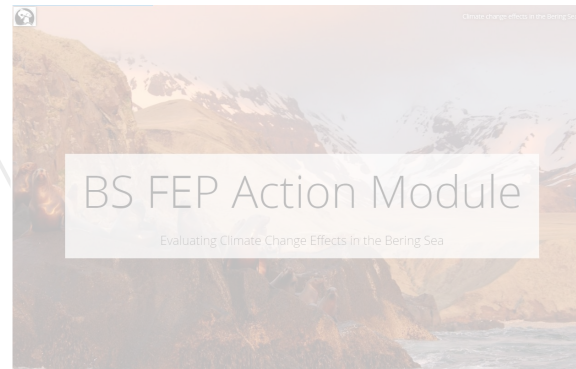
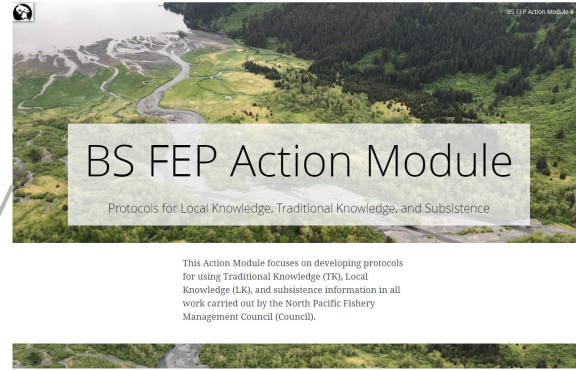
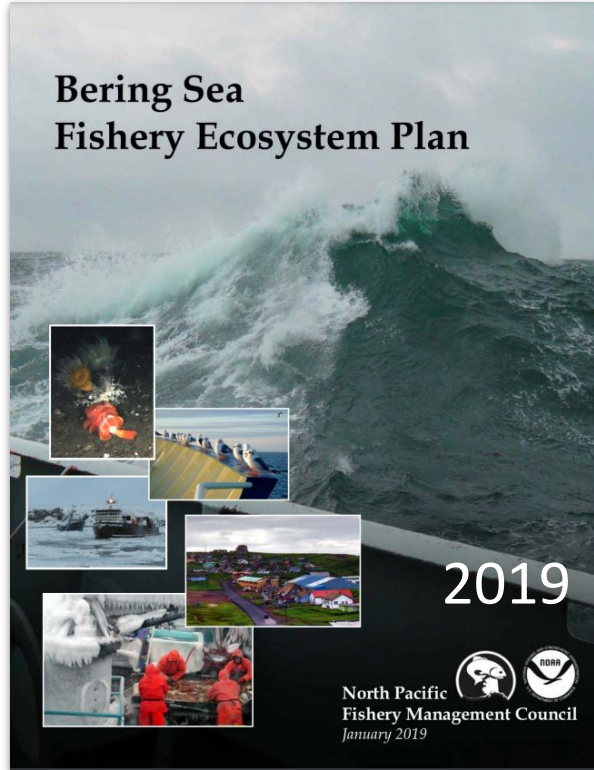
The geographic extent of the BS FEP is the area of the Bering Sea that is in the U.S. Exclusive Economic Zone (<200 miles from shore), excluding the Aleutian Islands west of 169° W. longitude.



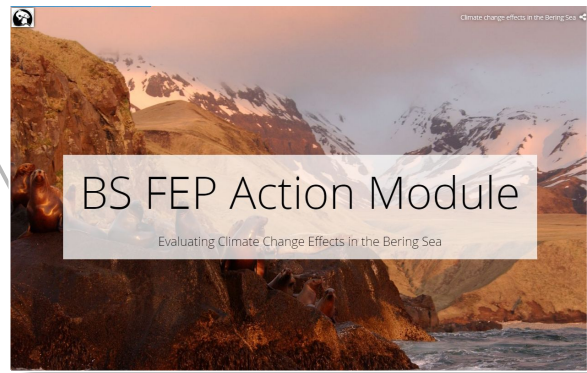
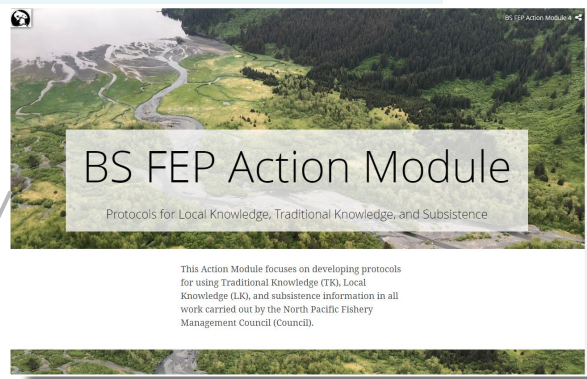
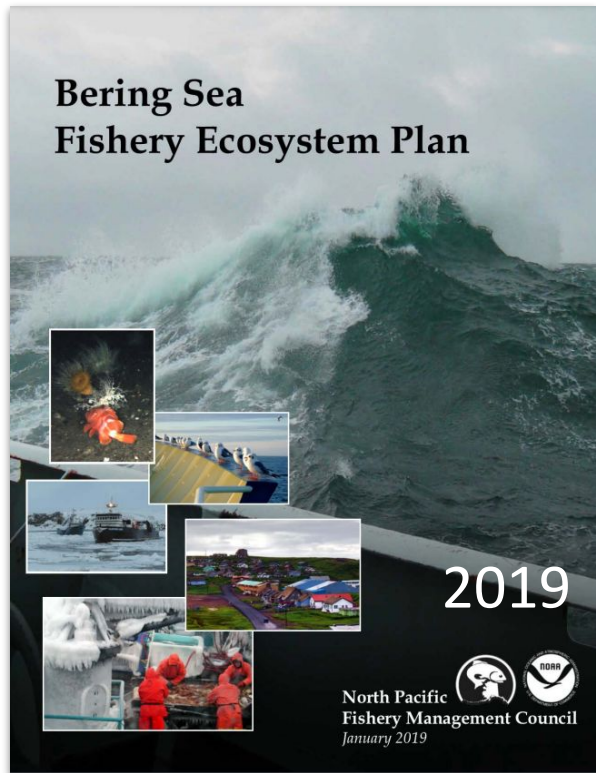
2020

Local Knowledge,
Traditional Knowledge &
Subsistence Information
Task Force

Climate Change
Task Force



2020



Climate Change
Task Force

CLIMATE CHANGE TASK FORCE



NORTH PACIFIC
FISHERY MANAGEMENT COUNCIL

CCTF Members:

Diana Stram (NPMFC)

Kirstin Holsman (NMFS- AFSC)

Lauren Divine (Aleut Community of Saint Paul Island)

Scott Goodman (Natural Resources Consultants/BS Fisheries Res. Foundation)

Jason Gasper (NMFS-Regional Office)

Mike LeVine (Ocean Conservancy)

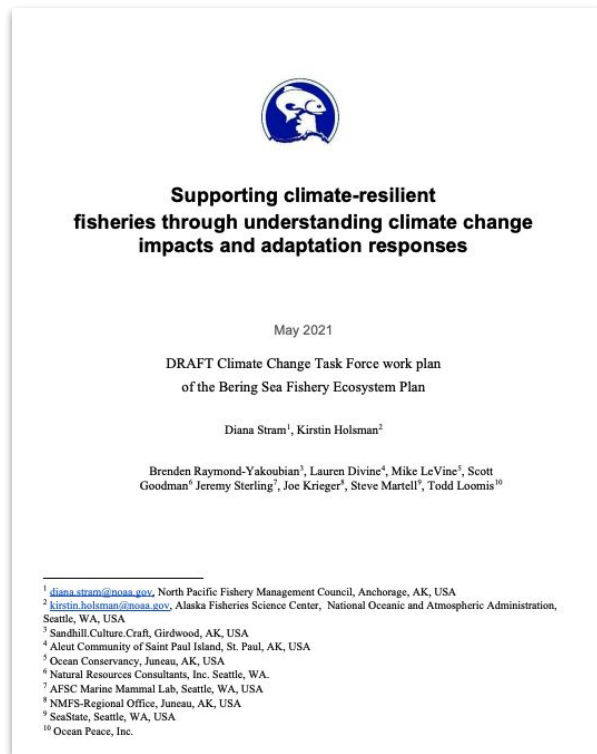
Steve Martell (SeaState)

Brenden Raymond-Yakoubian (Sandhill Culture Craft)

Jeremy Sterling (AFSC Marine Mammal Lab)

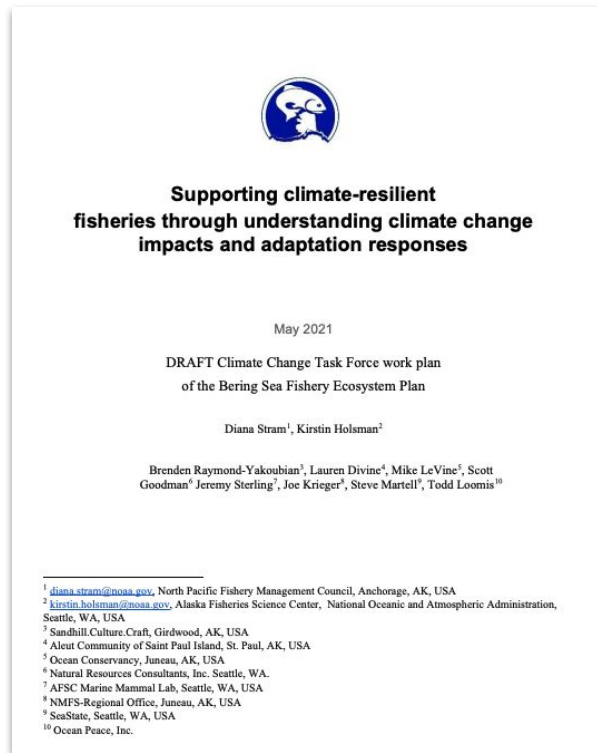
Todd Loomis (Ocean Peace, Inc.)

Climate Change Task Force Steps



- (1) Map existing management process & identify climate information on-ramps
- (2) Develop living definitions of resilience and adaptation
- (3) Use case studies to explore climate impacts, responses, and indicators
- (4) Review existing climate readiness
- (5) Provide framework for climate-informed decision making

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Climate Change Task Force Steps



Supporting climate-resilient fisheries through understanding climate change impacts and adaptation responses

May 2021

DRAFT Climate Change Task Force work plan
of the Bering Sea Fishery Ecosystem Plan

Diana Stram¹, Kirstin Holsman²

Brenden Raymond-Yakoubian³, Lauren Divine⁴, Mike LeVine⁵, Scott Goodman⁶, Jeremy Sterling⁷, Joe Krieger⁸, Steve Martell⁹, Todd Loomis¹⁰

¹ diana.stram@noaa.gov, North Pacific Fishery Management Council, Anchorage, AK, USA

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⁷ AFSC Marine Mammal Lab, Seattle, WA, USA

⁸ NMFS-Regional Office, Juneau, AK, USA

⁹ SeaState, Seattle, WA, USA

¹⁰ Ocean Peace, Inc.

- (1) Map existing management process & identify climate information on-ramps



Climate information “on ramps” for EBFM

Climate informed annual* stock and ecosystem assessments & EBFM advice

Climate information in near-term ecosystem based management targets

Climate-ready Ecosystem Based Fisheries Management planning, information & design

KEY: Matching climate information & projections to scale of decision making & advice

On-ramp 1



Tactical Near-term Advice (<2 yr)

Climate change information incorporated into stock assessment models, stock-specific indicators (ESPs), stock-specific risk tables (as appropriate).

E.g., ABC based on climate forecasts



On-ramp 2



Strategic Near-term Advice (<2 yr)

Climate change context for observed changes in social, ecological, & oceanographic conditions relevant for harvest advice and targets.

E.g., Forecasts of climate-driven distributions, tipping points, & thresholds



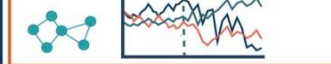
On-ramp 3 (new)



Strategic & Long-term Advice (>2 yr)

Climate - informed long-term strategic decision making & planning informed by IK, LK, and climate & management scenario evaluations, risk assessments, & adaptation efficacy & feasibility evaluations.

E.g., Targets based on climate projections



Legend

- Existing tools or process
- - - - - Help ID climate change gaps
- New tools or process

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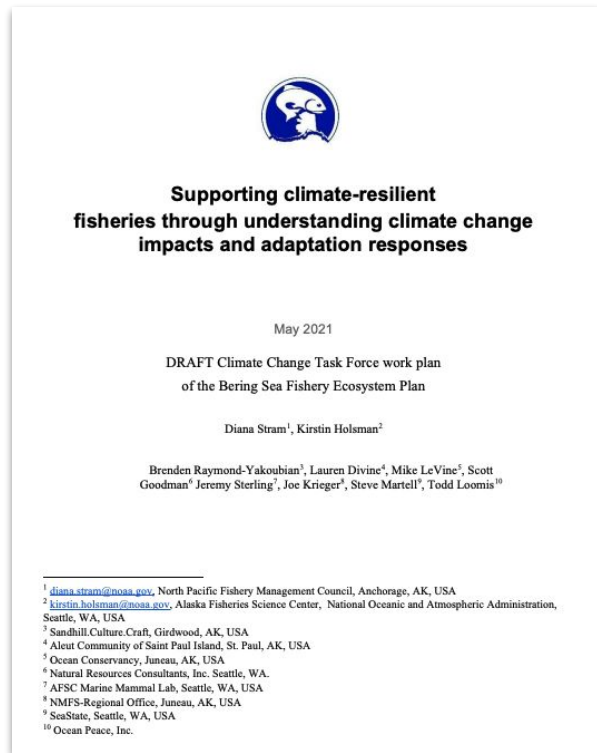
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CCTF Indicators workshop

Climate impact

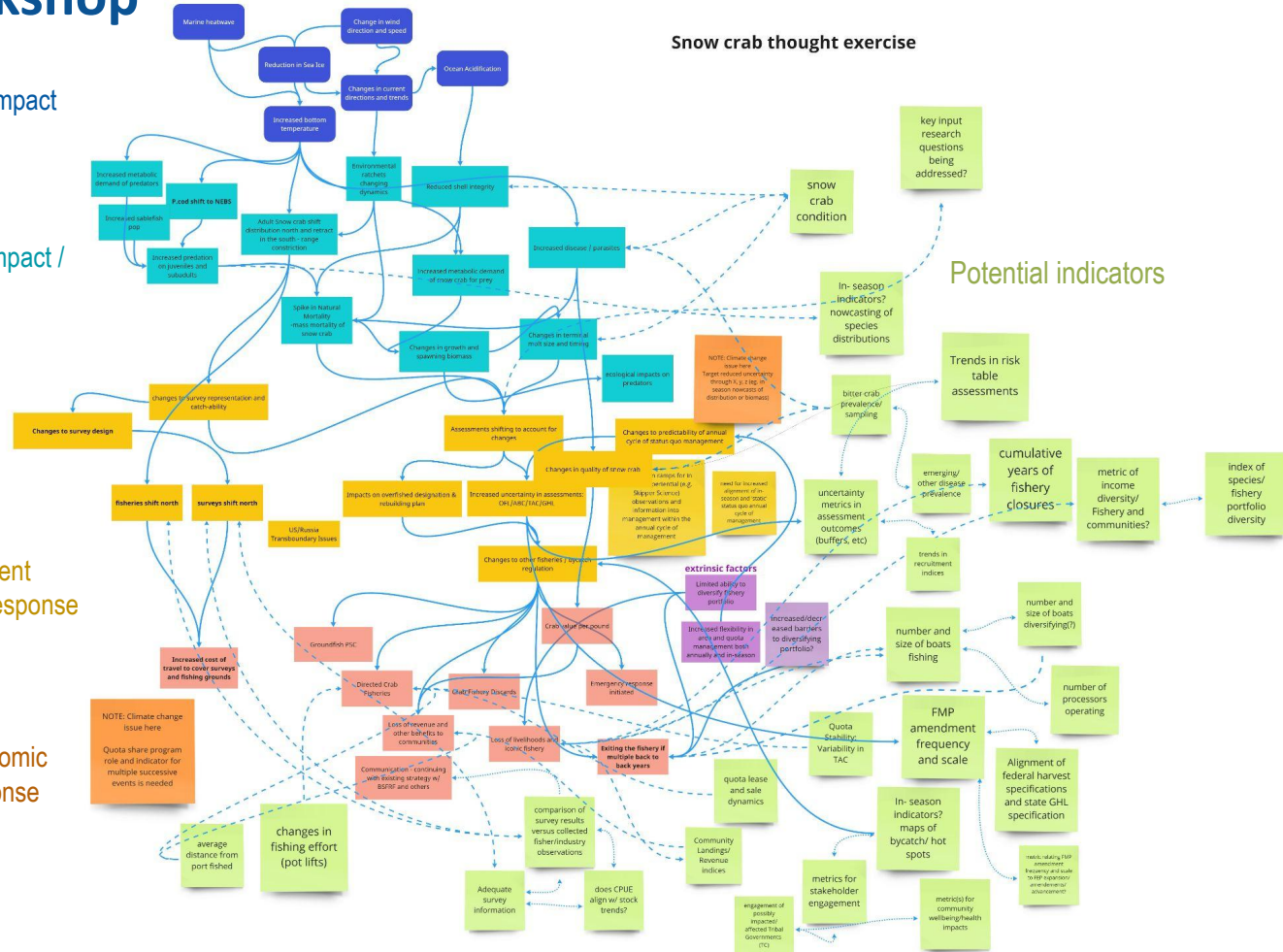
Ecological impact / response

Harvest & management impact / response

Social & economic impact / response

Impacts and responses are interconnected ... as are adaptive solutions

Snow crab thought exercise



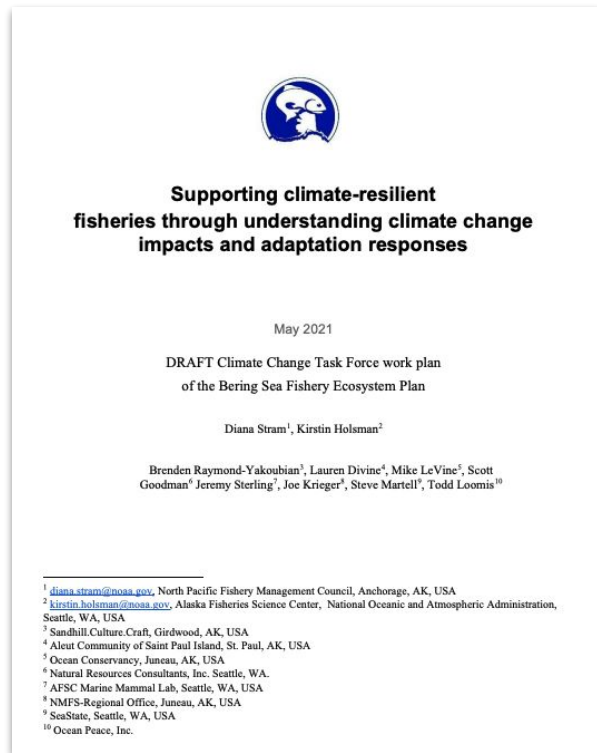
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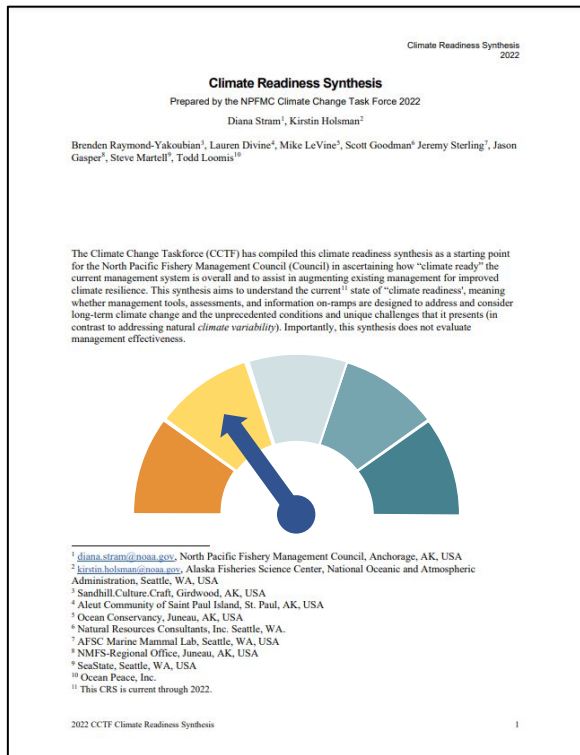
KEY: Develop a process to co-develop a shared understanding of the system, define resilience & adaptation and re-evaluate interconnected impacts & solutions

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Climate Readiness Synthesis 2022

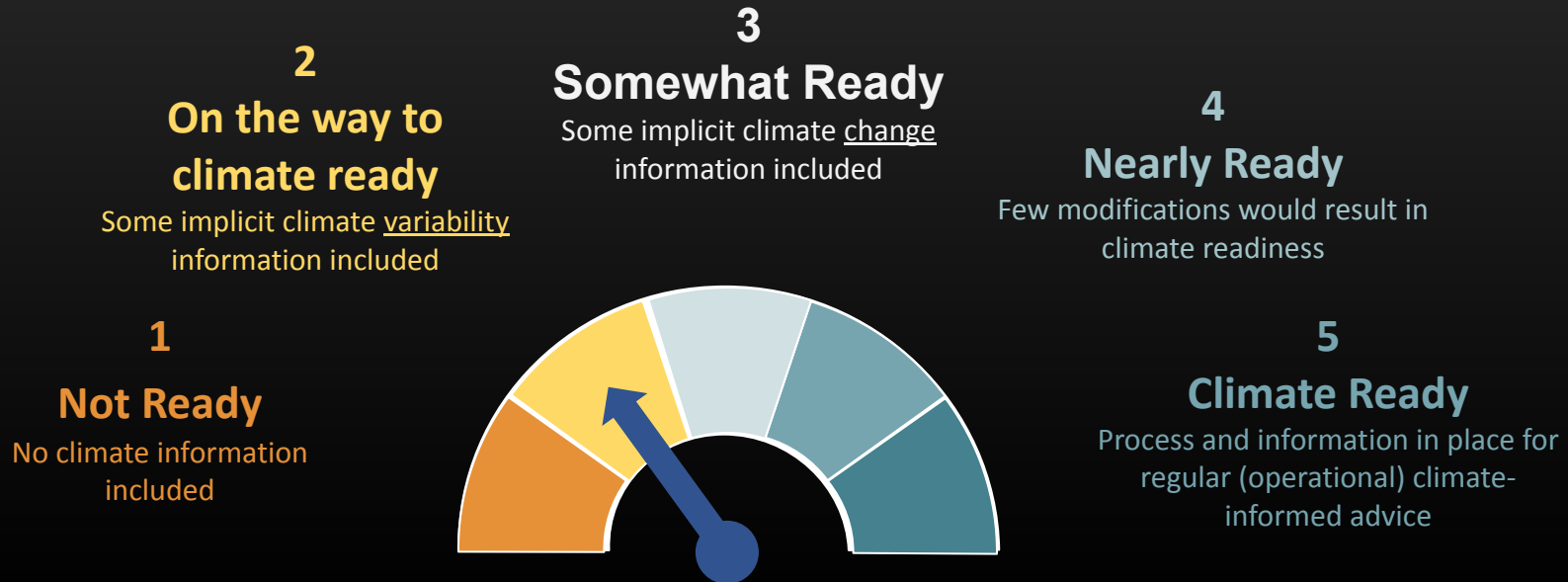


Management Process



Defined scoring rubric individually for each component helped articulate individual component targets for climate integration

2022 NPFMC Climate Readiness Synthesis



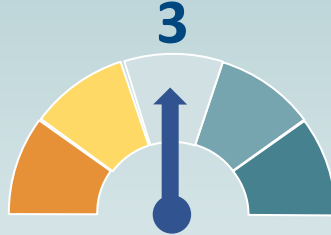
2022 NPFMC Climate Readiness Synthesis

Management Process



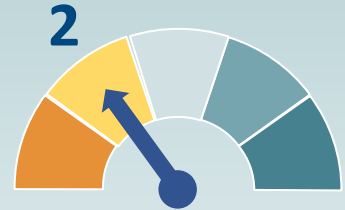
- Implicit climate variability information associated with some management measures
- Conceptually climate information informs management measure but is not directly implemented

Status reports



- Some implicit climate information included via EBFM processes & reports
- Climate and ecological information is increasingly included in a few assessments, but for most climate change information is absent or implicit in assessment models & text

Knowledge & Information



- Management measures include some/limited information from various knowledge bases and not others
- Integration into the NPFMC & NMFS system of information from the knowledge base of Indigenous communities is extremely limited
- Integration into the system from industry, agency, and other knowledge bases is a bit higher in general

2022 NPFMC Climate Readiness Synthesis

Management Process



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Status



Knowledge &



KEY: Some EBM measures (e.g., closure areas) can provide climate resilience in the near term but may lose effectiveness with higher warming

KEY: Build a process to iteratively re-consider potential strengths, weaknesses, & opportunities for improvement across management tools

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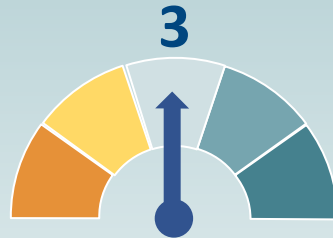
2022 NPFMC Climate Readiness Synthesis

Management Process

KEY: Systematically increase climate information in EBM process & reports

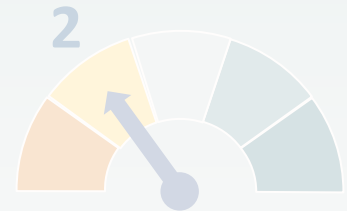
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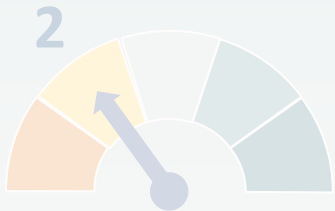


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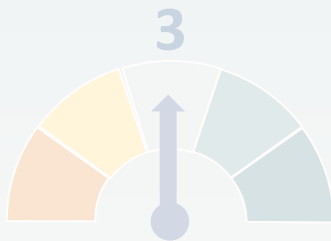
Management

Process 



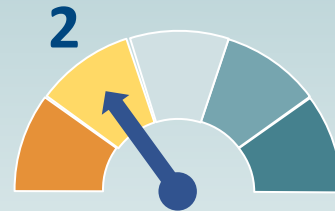
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Knowledge & Information Inclusion in decision making process



Table 3-2 Climate readiness ranking for subsections of Section 3

Sub-Section	Ranking	Details
Indigenous Community Knowledge Integration	1	Community knowledge is expansive and contains detailed information about changes and impacts. There is not a meaningful system of on-ramps for this knowledge to systematically enter into NPFMC/NMFS management and decision-making processes, and lack of sufficient collaborative engagement from research and management to bring together other information with community information.
Industry Knowledge Integration	2-3	Fishery dependent information is included in stock assessments and industry representatives participate in the Plan Team and Council processes to offer their insights and fishery observations. While much of this is qualitative it is explicitly incorporated into the management process.
Agency (Council, NMFS) Knowledge Integration	2-3	See rankings in Sections 1 & 2, as well as discussion of unique climate-relevant functions of various Council bodies below in Section 3.5. With regard to the latter, most higher-ranking activities most likely occur within the Ecosystem Committee, while an overall assessment of other activities would be lower ranking.
Other Knowledge Bases Integration	1-2	There are no distinct on-ramps currently available for the diversity of “other” knowledge bases described here other than through invited presentations, stakeholder testimony, or being indirectly brought into the process via other mechanisms (e.g., analyses). See Section 3.6 Gaps and Next Steps for recommendations regarding assessing the level of how these knowledge bases are incorporated into the process.

2022 NPFMC Climate Readiness Synthesis

Management
Process 

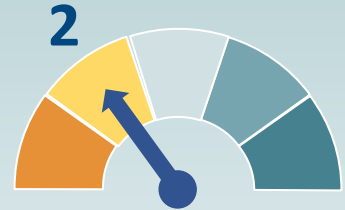
Status
reports 

Knowledge &
Information 

KEY: Expand (or create) processes, collaborations, & partnerships that facilitate inclusion of understanding from multiple knowledge systems in climate planning

- Implicit climate variability information associated with some management measures
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Local Knowledge, Traditional Knowledge, and Subsistence Task Force

D2 LKTKS Protocol
APRIL 2023

Protocol for Identifying, Analyzing, and Incorporating Local Knowledge, Traditional Knowledge, and Subsistence Information into the North Pacific Fishery Management Council's Decision-making Process

March 17, 2023

For further information contact: Kate Haapala, North Pacific Fishery Management Council
1007 W. 3rd Ave, Suite 400, Anchorage, AK 99501
(907) 271-2809

Abstract:

This Protocol provides guidance for identifying, analyzing, and incorporating Local Knowledge, Traditional Knowledge, and subsistence information into the Council's decision-making process.^{1, 2} The Protocol is the result of a collaborative, multi-year effort from the Council's Local Knowledge, Traditional Knowledge, and Subsistence Taskforce, which is a nominated body formed under Action Module 2 in the Bering Sea Fishery Ecosystem Plan. This Protocol is specific to the Bering Sea region, though it could be used more widely as the information within is relevant to Council and agency staff, Council advisory bodies, and the public. The full Protocol provides the Council foundational information for working with Local Knowledge, Traditional Knowledge, and subsistence information. However, the primary content for how to best identify, analyze, and incorporate Local Knowledge, Traditional Knowledge, the social science of Local Knowledge and Traditional Knowledge, and subsistence information within the context of the Council's decision-making process is housed in the eight guidelines in Section 4 of the Protocol which provide the reader with best practices for engaging and working with these knowledge systems and expertise. Each guideline is followed by some ideas illustrating different ways to move forward related work to help the Council consider what it might look like to put the guidelines into practice.

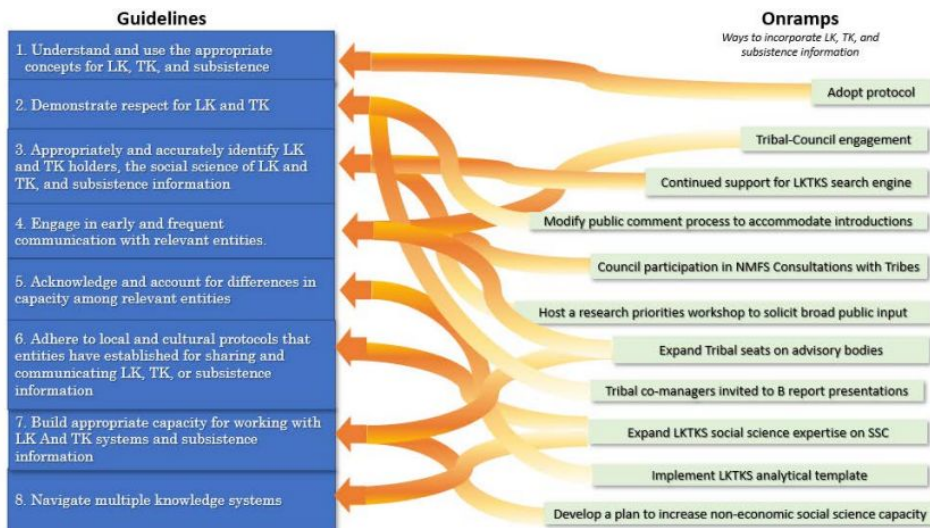
¹ The Taskforce chose to work with the term 'Traditional Knowledge' because it resonates with knowledge holders and existing work on Indigenous knowledge systems in the Bering Sea region.

² The Council's motion adopting the goals and objectives for this Taskforce can be found here:

<https://meetings.npfmc.org/CommentReview/DownloadFile?p=cc213a15-6672-4d0b-9fad-6b071938804.pdf&fileName=D3%20MOTION%20.pdf>

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Potential council pathways for inclusion of multiple knowledge sources



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Lessons learned

- EBM supports potential on-ramps for climate-informed decision making
- Necessary to match the scale of climate information to the scale of social-ecological system dynamics and management decisions
- Evolving landscape of impacts & responses requires a dynamic inclusive planning process that supports diverse perspectives
- Collaborative approach can help identify interconnected challenges & shared solutions for climate adaptation
- Climate planning is an opportunity to advance EBM (e.g., EBFM→EBM)
- Start immediately, plan for and provide time, investment & resources to build teams and bridge understanding (start specific, build out)



