

NPFMC Fisheries Ecosystem Plan Climate Change Task Force

Progress and recommendations

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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



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.
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Climate Change Task Force Steps



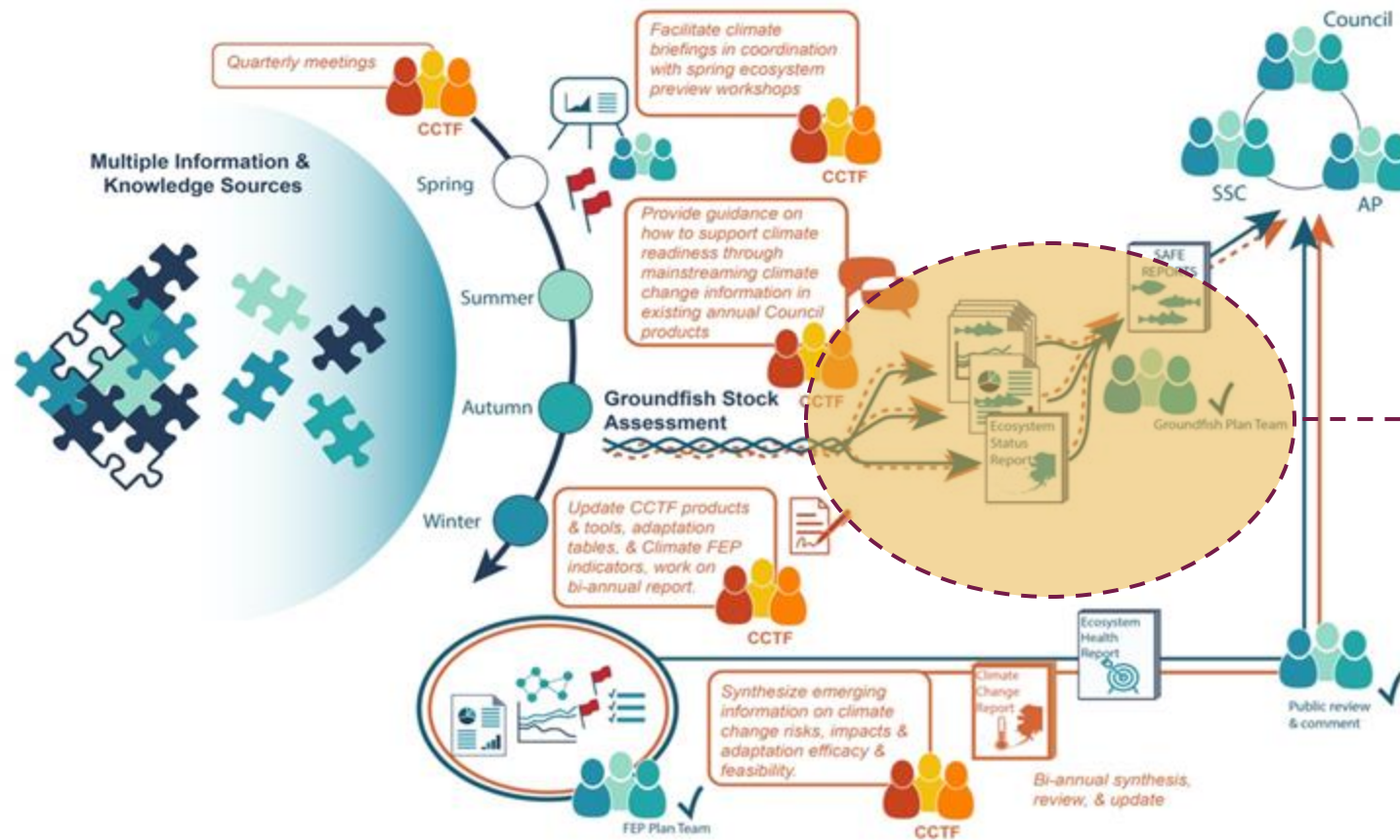
CLIMATE CHANGE TASK FORCE

2020- now



- (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

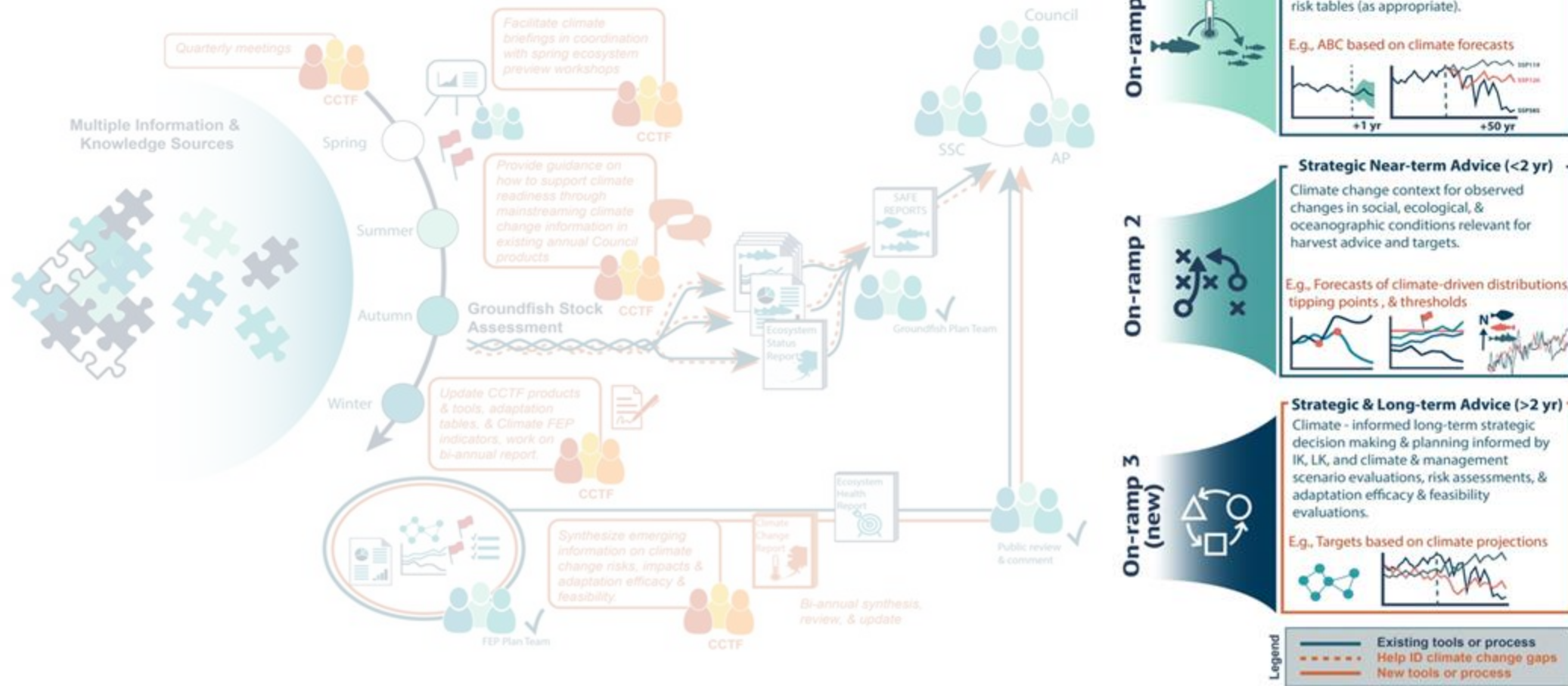
Climate-informed fisheries management: Proposed “on-ramps” and existing coordination



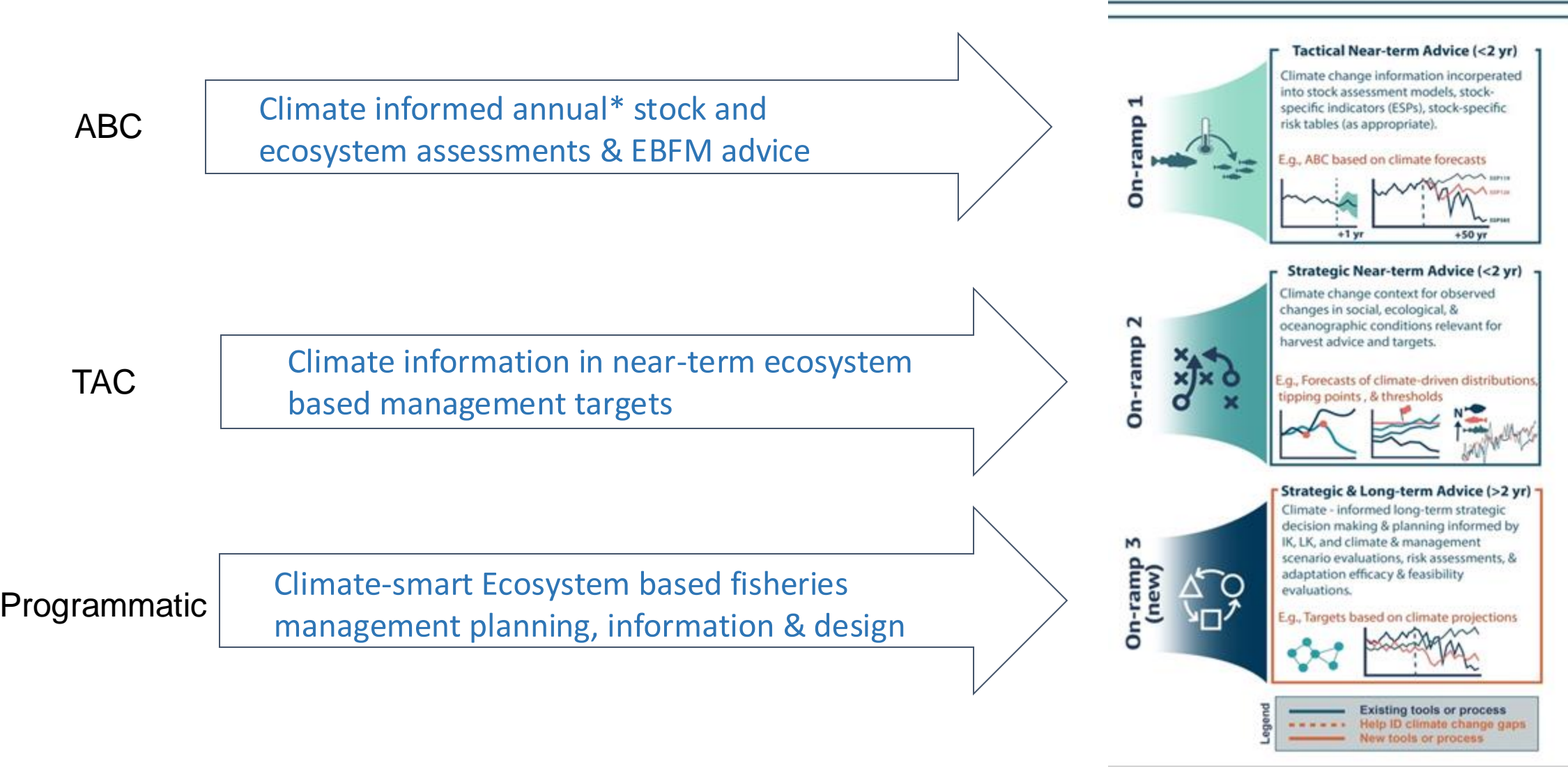
Existing climate information on-ramps:

Ecosystem reports, ESPs, and ecosystem sections of stock assessments

Climate-informed fisheries management: Proposed “on-ramps” and existing coordination



Climate information on ramps for fisheries management



Workplan products & activities review



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 ○ → Is annual the right freq?
- **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**

Products of the CCTF annual process:

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

- **When:** Annually as part of the annual stock assessment cycle ○ → Is annual the right freq?
- **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**

- **Via the NOAA CEFI / Alaska Climate Team: climate briefs, ESPs, decadal predictions, risk assessments etc. 2024-2026**

Products of the CCTF annual process:

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 CEFI/ ACT product?**
 - Conceptual model of climate-social-ecological linkages (including direct and indirect connections) ☐ **Conceptual model 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**

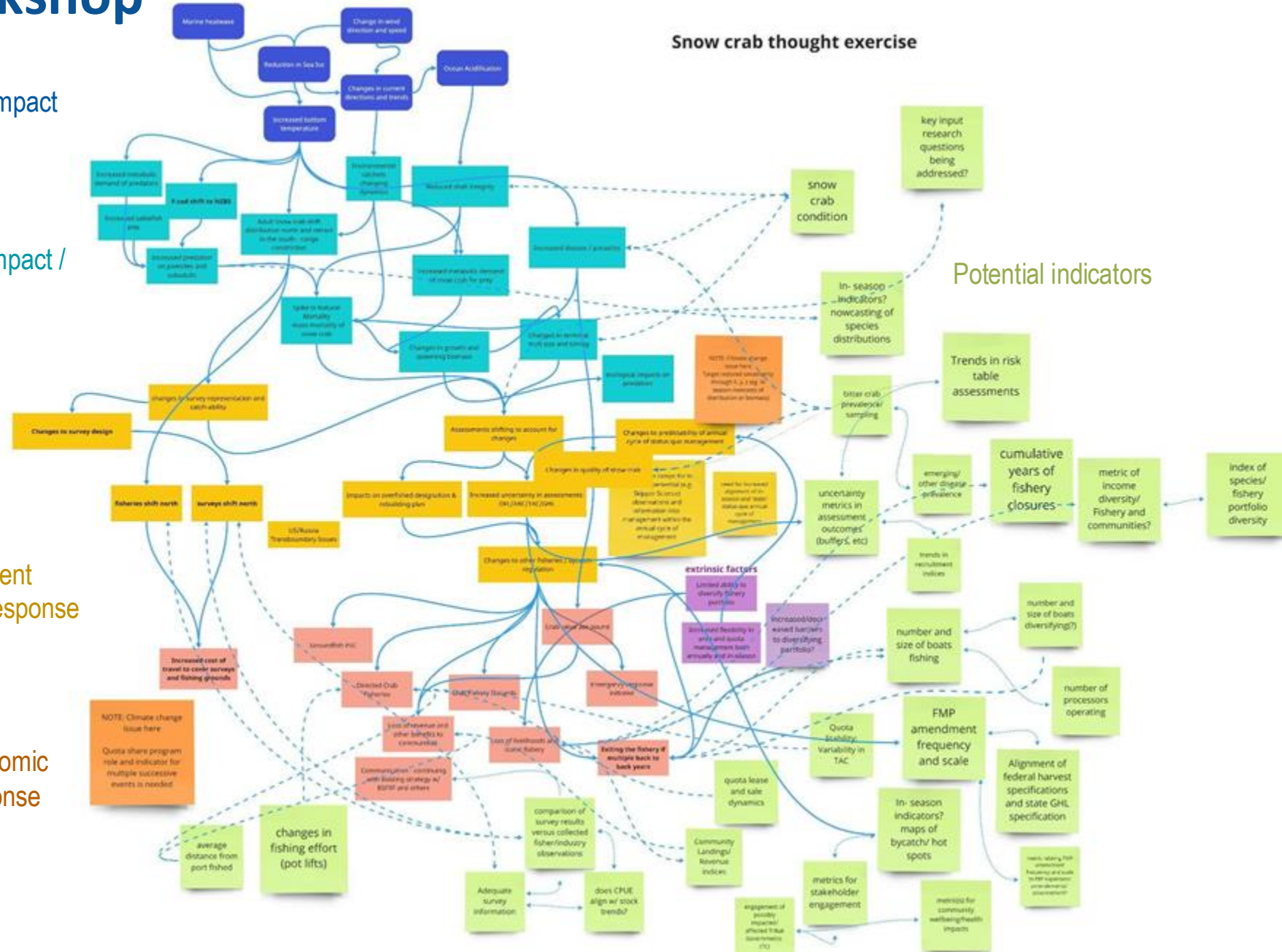
True impacts and responses are interconnected

... as are adaptive solutions

Ecological impact / response

Harvest & management
impact / response

Social & economic impact / response



CCTF Indicators workshop

Climate impact

Harvest & management impact / response

Social & economic
impact / response

KEY: Develop a process to collectively re-evaluate impacts and solutions

Snow crab thought exercise



Products of the CCTF annual process:

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 need to continue to keep it up to date and inclusive
 - Climate Briefing Form and Process (used for Adaptation and Climate Testimonial workshops)
 - Table of climate change drivers, impacts, potential policy/management responses, targets, and gaps/needs
Adaptation and Climate Testimonial workshop summaries
 - 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).
 - 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.
-

Living (evolving) definition of Resilience & Adaptation



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

“adaptation to support climate resilient social-ecological systems includes **ecosystem-based management policies** that embrace uncertainty, adjust at a rate that is consistent with observed changes (e.g., allows communities and fisheries to **adapt in a proactive** rather than a solely reactive manner), **are inclusive of diverse knowledge sources** and information that may change and **evolve over time**”

Seattle, WA, USA

³ Sandhill Culture Craft, Girdwood, AK, USA

⁴ Aleut Community of Saint Paul Island, St. Paul, AK, USA

⁵ Ocean Conservancy, Juneau, AK, USA

⁶ Natural Resources Consultants, Inc., Seattle, WA, USA

⁷ AFSC Marine Mammal Lab, Seattle, WA, USA

⁸ NMFS Regional Office, Juneau, AK, USA

⁹ SeaState, Seattle, WA, USA

¹⁰ Ocean Peace, Inc.

Resilience

Community resilience has numerous interconnected aspects, including the epistemic (e.g. access to information, rich involvement in scientific-management-policy activities, etc.), individual well-being (e.g. mental and physical health), economic vitality, and sociocultural prosperity (e.g. social cohesion, self-determination, integration of community with natural resources, thriving intergenerational relationships, community sustainability and vibrancy, food security, economic diversity, adaptability to change, etc.). The ecological/ biological resilience of marine resources likewise spans a wide array of considerations including biological and genetic diversity, healthy habitats and populations, adequate resources, sustained recruitment, and a balanced trophic structure. Resilience must be considered at the nexus of these two domains, i.e., coupled social-ecological systems. This includes, for example: sustained strong connections between harvest species and humans and communities that rely on them; management that is capable of being adaptive, flexible and stable in order to sustaining ecosystems and livelihoods; strengthened

co-management, community engagement, and co-management, and policy to challenges of variability in making that includes diverse knowledge and just assessment of risks, impacts and tradeoffs.

ent to actual or expected climate change and its fisheries, adaptation to support climate resilient management policies that embrace uncertainty, adjust allows communities and fisheries to adapt in a sive of diverse knowledge sources and consider both direct and indirect impacts and and the environment. The latter relies on change as well as the social, cultural, and rically coupled social-ecological Bering Sea understanding changes as well as identifying,

understanding, and promoting pathways of adaptation in both fisheries and fishing communities. Some social and ecological changes could help promote adaptation, but others might intensify negative impacts of climate-driven change.

Adaptation can include reactive responses as well as proactive, anticipatory planning and prevention. Adaptation is separate from, but can be synergistic with (i.e., have co-benefits for), “carbon mitigation” measures, which are actions at global or regional scales that aim to reduce or recapture atmospheric CO₂. Climate adaptation planning is a multi-step and iterative process that includes evaluation of key risks and needs, assessment of available potential tools and approaches, understanding of institutional capacity and feasibility for adaptation planning and implementation (and evolving limits and constraints to adaptation), and interactive inclusive discussions regarding realized costs, tradeoffs, and benefits of adaptation measures (Meredith et al. 2019). This evolving definition will serve as the basis for ongoing climate-biological-social-economic evaluations of management actions that address climate-driven impacts, utilize novel opportunities, and identify and promote equitable adaptive pathways.

Products of the CCTF annual process:

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 need to continue to keep it up to date and inclusive CCTF Final report :
 - Climate Briefing Form and Process (used for Adaptation and Climate Testimonial workshops) additional ideas to
 - Table of climate change drivers, impacts, potential policy/management responses, targets, and gaps/needs consider

Adaptation and Climate Testimonial workshop summaries □ CCTF Final report
- 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 just the start, more/broader approach 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 complete

LKTKS on-ramps

Onramps for Local Knowledge, Traditional Knowledge, and Subsistence Information in the North Pacific Fishery Management Council's Process

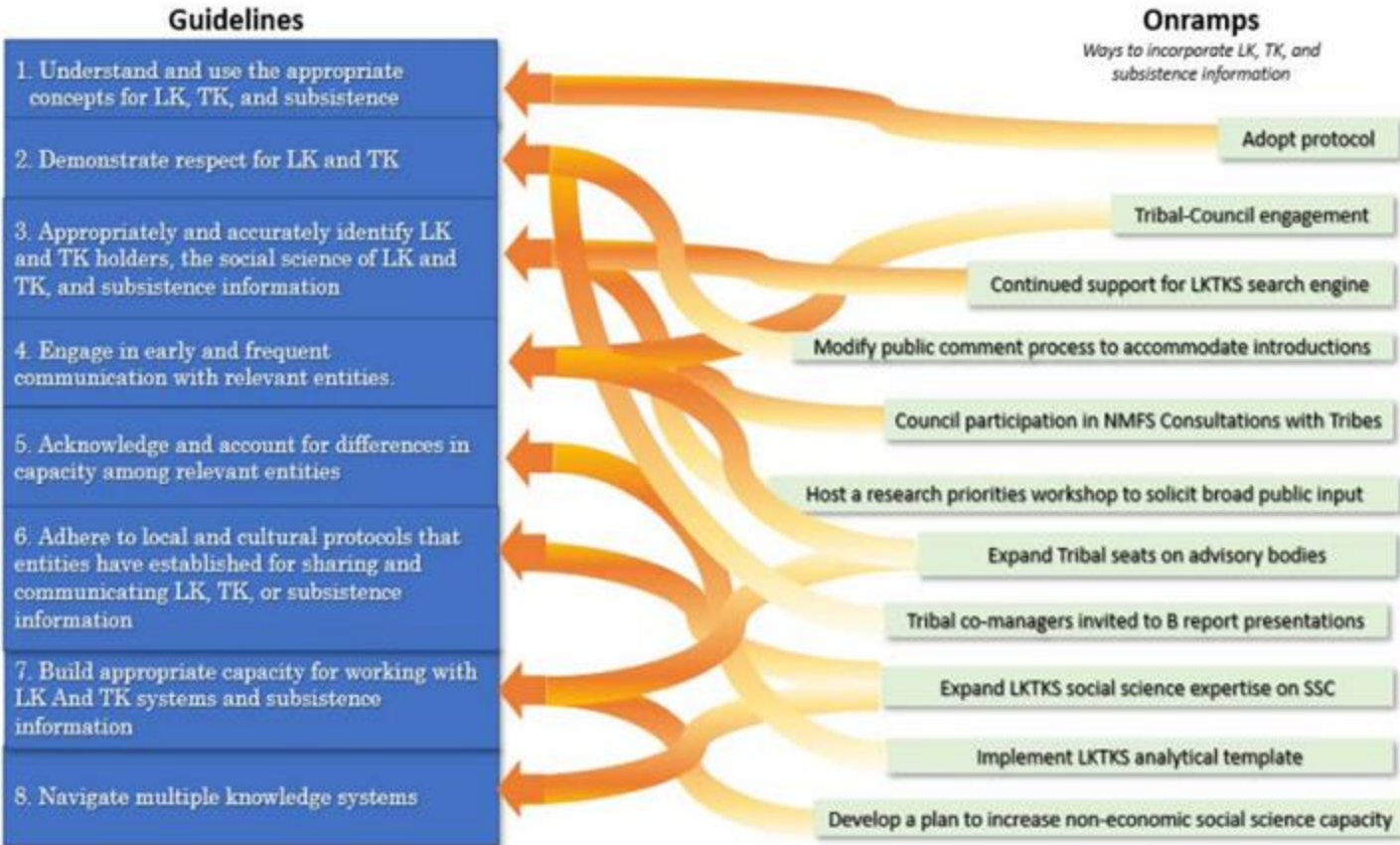
March 2023

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

Abstract:

The Council's motion from January 2020 directs the Local Knowledge, Traditional Knowledge, and Subsistence Taskforce to identify potential onramps (or points of entry) for incorporating Local Knowledge, Traditional Knowledge, the social science of Local Knowledge and Traditional Knowledge, and subsistence information into its decision-making process. This document contains eleven onramp recommendations for the Council to consider. These recommendations are for changes to the Council's current decision-making process to better incorporate these knowledge systems. The onramp recommendations are presented individually to provide the Council a highly flexible approach to determining whether to take action and initiate future work on any individual onramp(s). The onramp recommendations are directly related to the eight guidelines housed in the *Local Knowledge, Traditional Knowledge, and Subsistence Protocol*. Together, the protocol and onramp recommendations provide the full suite of information for the Council to consider how it could achieve its goals of better identifying, analyzing, and incorporating LK, TK, and subsistence information into its decision-making process.

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CCTF Final Report:

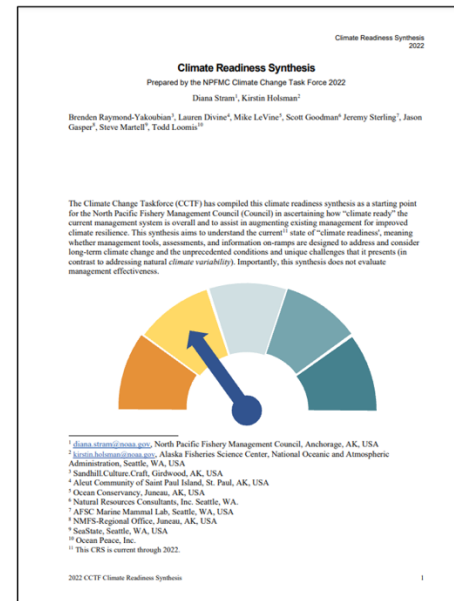
Pens Down by Nov 11th,
Post by Nov 15 th

REPORT Components

- CCTF recommendations
- Toolbox / CSW Table X tools
- Adaptation definition
- Resilience definition
- Mental modeling (final figure needed)
- Climate briefings recommendation
- CRS
- Review of progress towards workplan

Draft CCTF Guidelines?

Climate Readiness Synthesis 2022



KEY: Systematically increase climate information in EBM process & reports

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

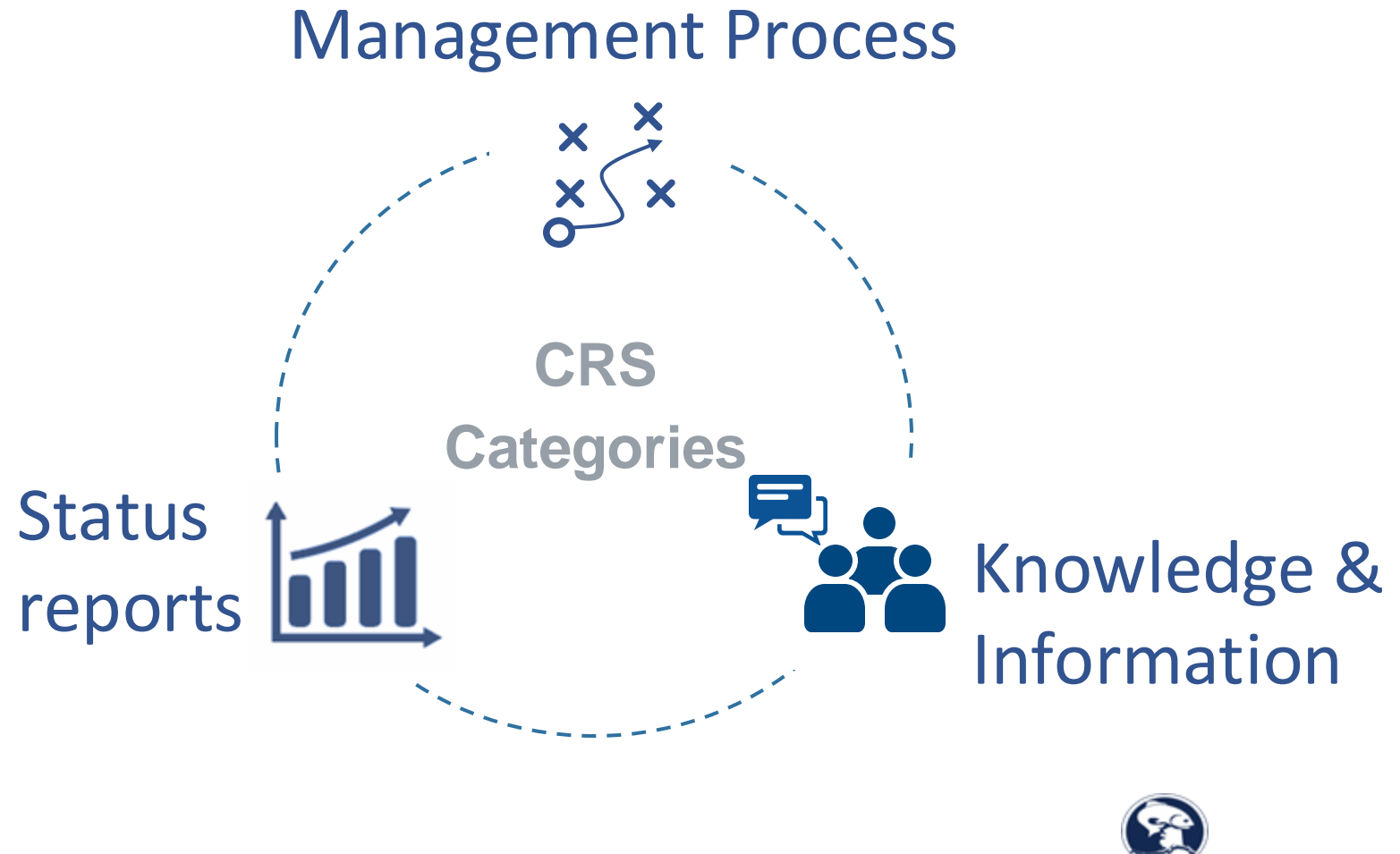
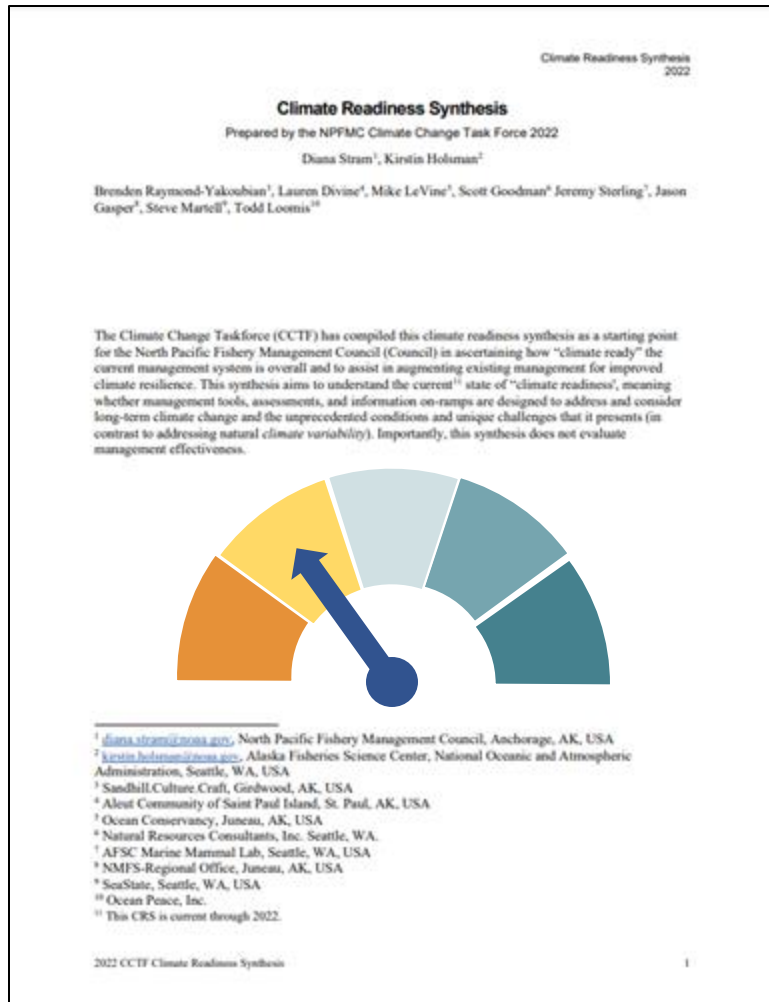
KEY: Expand (or create) processes, collaborations, & partnerships that facilitate inclusion of understanding from multiple knowledge systems in climate planning

Build off the Climate Ready Synthesis & the Climate Scenarios Workshop report

CCTF Final Report: Framing & themes



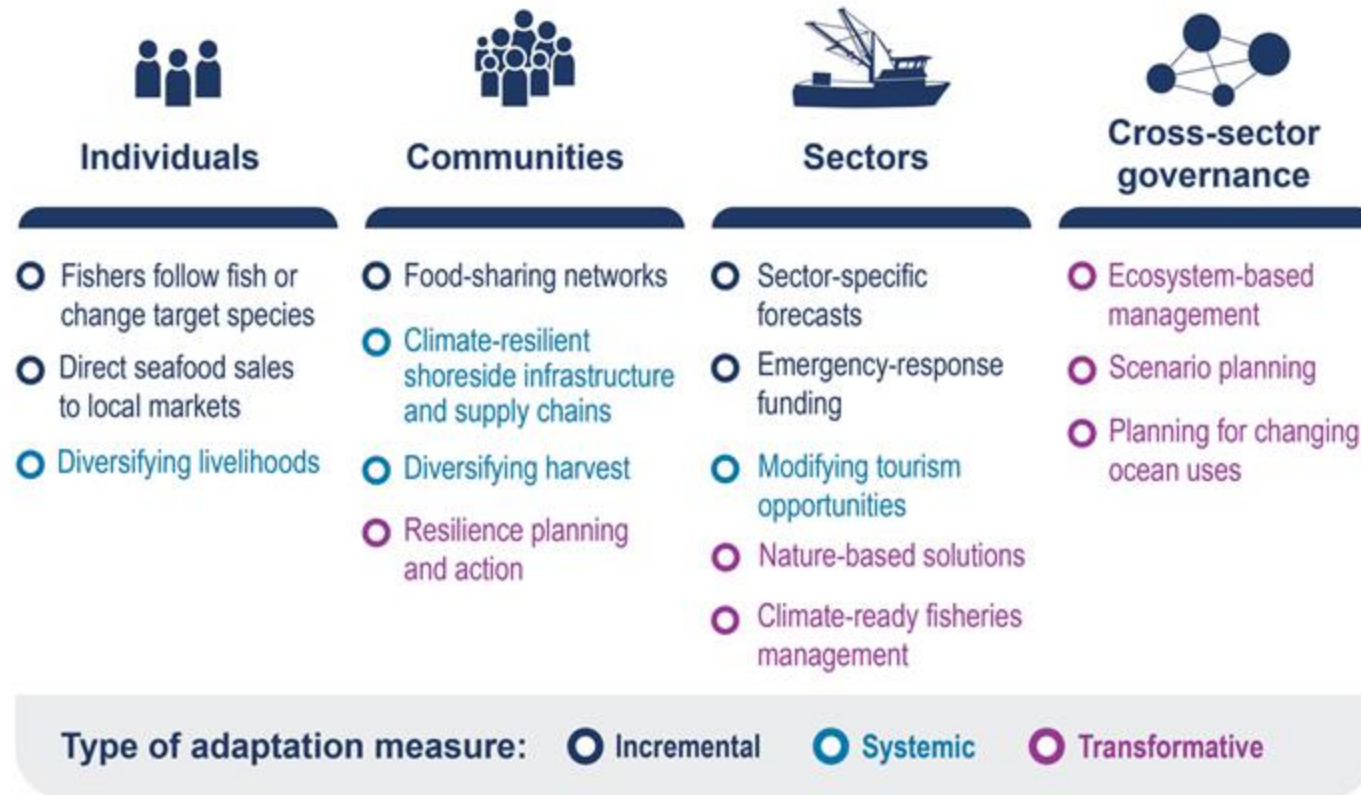
Climate Readiness Synthesis 2022



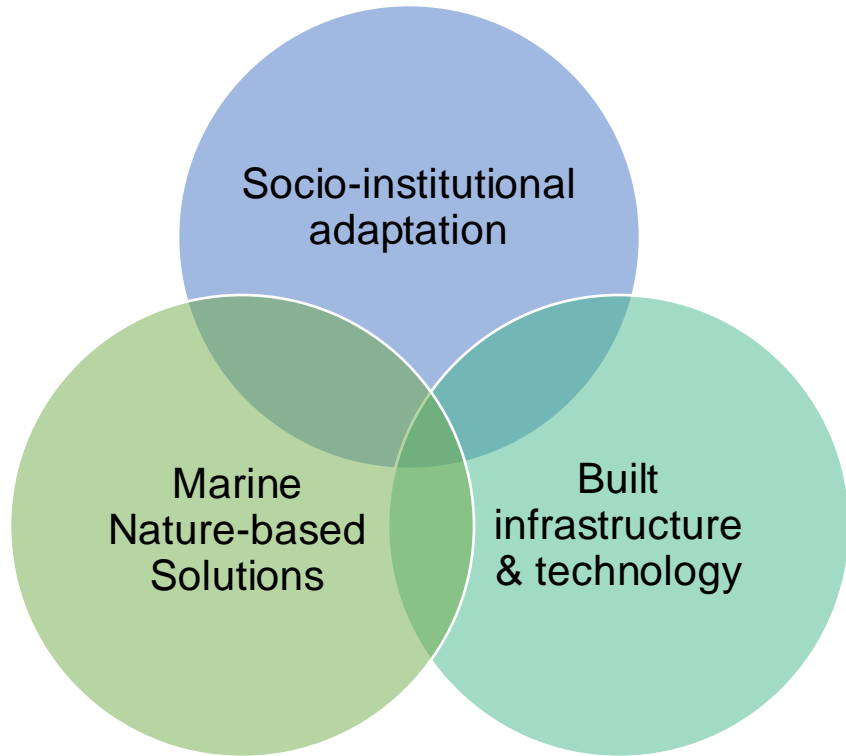
5th National Climate Assessment 2023

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

Ocean-Related Climate Adaptation Strategies



Adaptation (IPCC WGII)



Categories

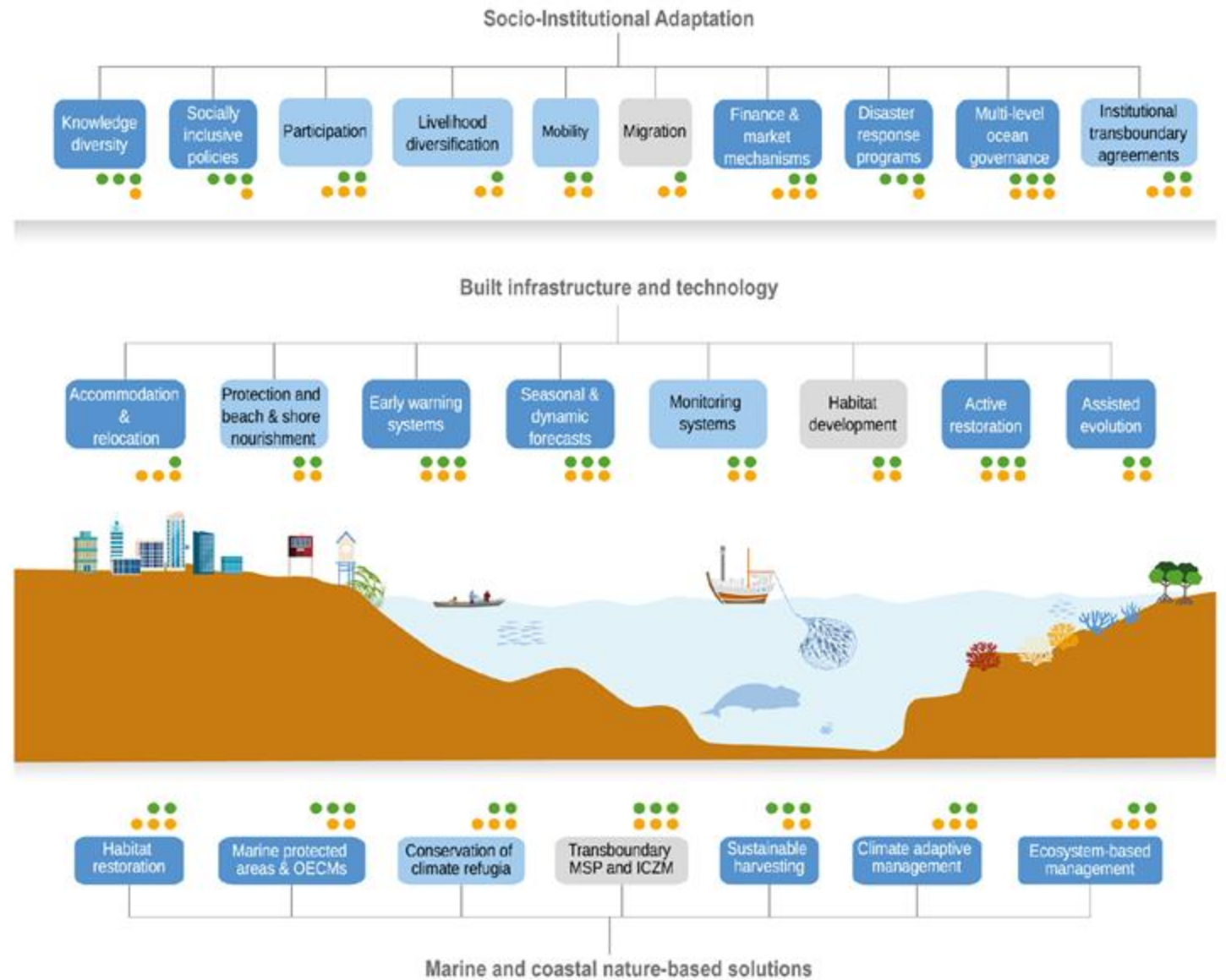
- Feasibility (green square)
- Effectiveness (orange square)

Confidence in solution

- High (dark blue square)
- Medium (light blue square)
- Low (grey square)

Level

- High (three dots)
- Medium (two dots)
- Low (one dot)



Climate-ready fisheries: best practices for linking knowledge and action

Putting the puzzle together



Mason et al. 2023. Linking knowledge and action for climate-ready fisheries: Emerging best practices across the US

<https://doi.org/10.1016/j.marpol.2023.105758>

Supporting knowledge diversity

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Ellam Yua, J. Raymond-Yakoubian, R. Alisaq Daniel, and C. Behe. 2022. A framework for co-production of knowledge in the context of Arctic research. Ecology and Society 27(1):34. <https://doi.org/10.5751/ES-12960-270134>

Insight

A framework for co-production of knowledge in the context of Arctic research

Negeqlikacaarni kangingnaulriani ayuqenrilinguut piyaraitgun kangingnauryararkat

Ellam Yua, Julie Raymond-Yakoubian¹, Ratschelle Alisaq Daniel² and Carolina Behe³

ABSTRACT. The Arctic has been home to Indigenous Peoples from time immemorial. Distinct Indigenous worldviews and complex knowledge systems have been passed on from generation to generation, evolving over time in a living process that continues to this day. Indigenous Peoples' knowledge systems hold methodologies and assessment processes that provide pathways for knowing and understanding the Arctic, which address all aspects of life, including the spiritual, cultural, and ecological, all in interlinked and supporting ways. For too long, Indigenous Peoples of the Arctic and their knowledges have not been equitably included in many research activities. We argue for systematic change in how research-related activities are conducted in the Arctic. Bringing together multiple knowledge systems, specifically Indigenous Peoples' knowledge systems and science, can lead to more equitable, inclusive, and useful outcomes. The co-production of knowledge framework that we forward is designed to assist researchers, decision makers, and communities in moving toward those goals. Given increased interest in the Arctic by the research community, the complex, rapid, and ongoing change in Arctic systems, and amidst renewed and urgent calls for equity globally and across all spheres of life, adoption of a co-production of knowledge framework for the conduct of Arctic research is timely as well as a moral and intellectual imperative. Further, solutions to challenges facing the Arctic and global community are enhanced by the combined understanding of Indigenous Peoples' knowledges and science.

Imukenineq Negeqlikacagaat [makuni igani "Arctic"] nutem tamakumiunek ciulialget nunaketuit. Ukanirpak nutem tamakumiunek ciulialget ukveruciteng ellameng-llu tunginun elitelteng kinguallrukait piinanermeqni man'a engelkarluku cimirturluteng. Nutem Negeqlikacaarmiunek ciulialget elitellermegteggun munameng tungiitnun nallunritlerkameqgnun yuvrillerkameqgnun-llu piyararluteng kangingnauryarluteng-llu, yuucimeqni tamalkuita cat yuita, piciryameng, ellam-llu tunginun atunem ilakluki. Ukanirpak nutem Negeqlikacaarmiunek ciulialget elitellrit tapeqluki ilanginrilkurtesiyaglukui kangingnautut. Negeqlikacaarni Kass'at kangingnauryaraita piciryarait cimiosumaaput. Ayuqenrilinguut elitellritgun, arcaqerlukui nutem Negeqlikacaarmiunek ciulialget Kass'at-llu kangingnauryarait tapeqluki, atunem pitalligutekluki kinkunon cangallrunrilingurnek, ilakuralrianek, atunruarkaulrianek-llu kingungqerrarkauluteng. Yuullgutkenrilinguut Negeqlikacaarmiunek ciulialget Kass'at-llu elitellritgun atunem caliyyaraq, makut igaqeput tamatum tungiitnun ikayutngauarkauluteng. Kangingnaurtet caungengatki Negeqlikacagaat, tamakumiun-llu ayuqenrilingurteggun cokamek cimirturalrit, cali-llu ellam tamiini yuut tamalkuita pitallikelluki pisqerigatki, ayuqenrilinguut elitellritgun atunem caliyyaraq Negeqlikacaarni pinariluni, elluarluni, elitnaulrianun-llu nancunaunani. Cali-llu Negeqlikacagaat ellam-llu tamiini arenqiallugutaita kitugutkait, atunem nutem Negeqlikacaarmiunek ciulialget Kass'at-llu kangingnauryarateng aturluki elluanruut. Cali-llu Negeqlikacagaat ellam-llu tamiini arenqiallugutaita kitugutkait, atunem nutem Negeqlikacaarmiunek ciulialget Kass'at-llu kangingnauryarateng aturluki elluanruut.

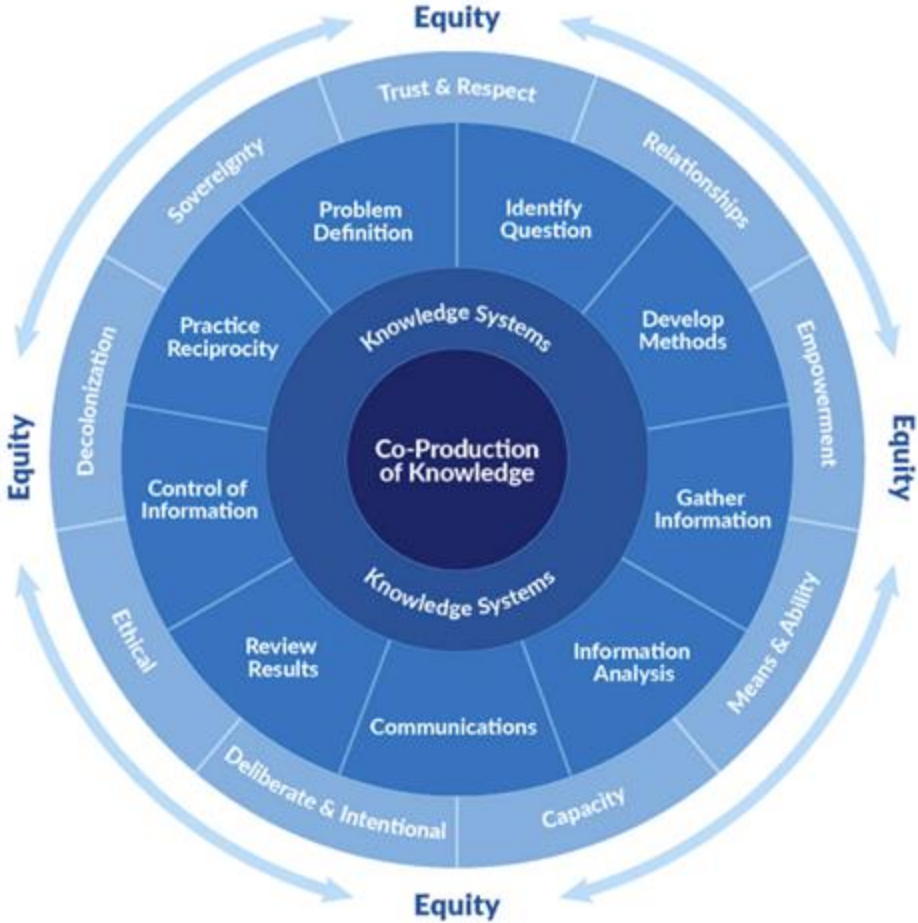
Key Words: Arctic; collaboration; co-production of knowledge; ellam yua; equity; Indigenous; Indigenous Peoples' knowledge; partnerships; research

INTRODUCTION

We define co-production of knowledge (CPK) as a process that brings together Indigenous Peoples' knowledge systems and science to generate new knowledge and understandings of the world that would likely not be achieved through the application of only one knowledge system. Co-production of knowledge emphasizes the importance of attaining equity in research relationships. The value of a CPK approach, if done appropriately and respectfully, is that it allows people engaged in research to bring different ways of knowing, experiencing, and looking at the world together to gain a broader, deeper, and new understanding of topics and to generate new knowledge. A true CPK approach is urgently needed in the Arctic to enhance understanding and to inform adaptive and holistic decision making in research, resource management, and policy. The work we present forward builds upon the experiences of the co-authors, all that they have learned from Indigenous communities, the work of the many colleagues working within these and similar topics, and the decades of effort and work conducted by Indigenous Peoples, communities, and organizations. The co-production of knowledge framework presented includes tools and concepts designed to assist researchers, decision makers, and communities to move toward the goal of equitable research.

The Arctic is the homeland of over 1 million Indigenous Peoples across 40 different Indigenous cultural groups (Karvinen and Rantakallio 2019; Fig. 1). For thousands of years, Indigenous Peoples have maintained strong cultural ties to northern lands and waters. Over generations, they have systematically amassed knowledges with extraordinary and distinct information about

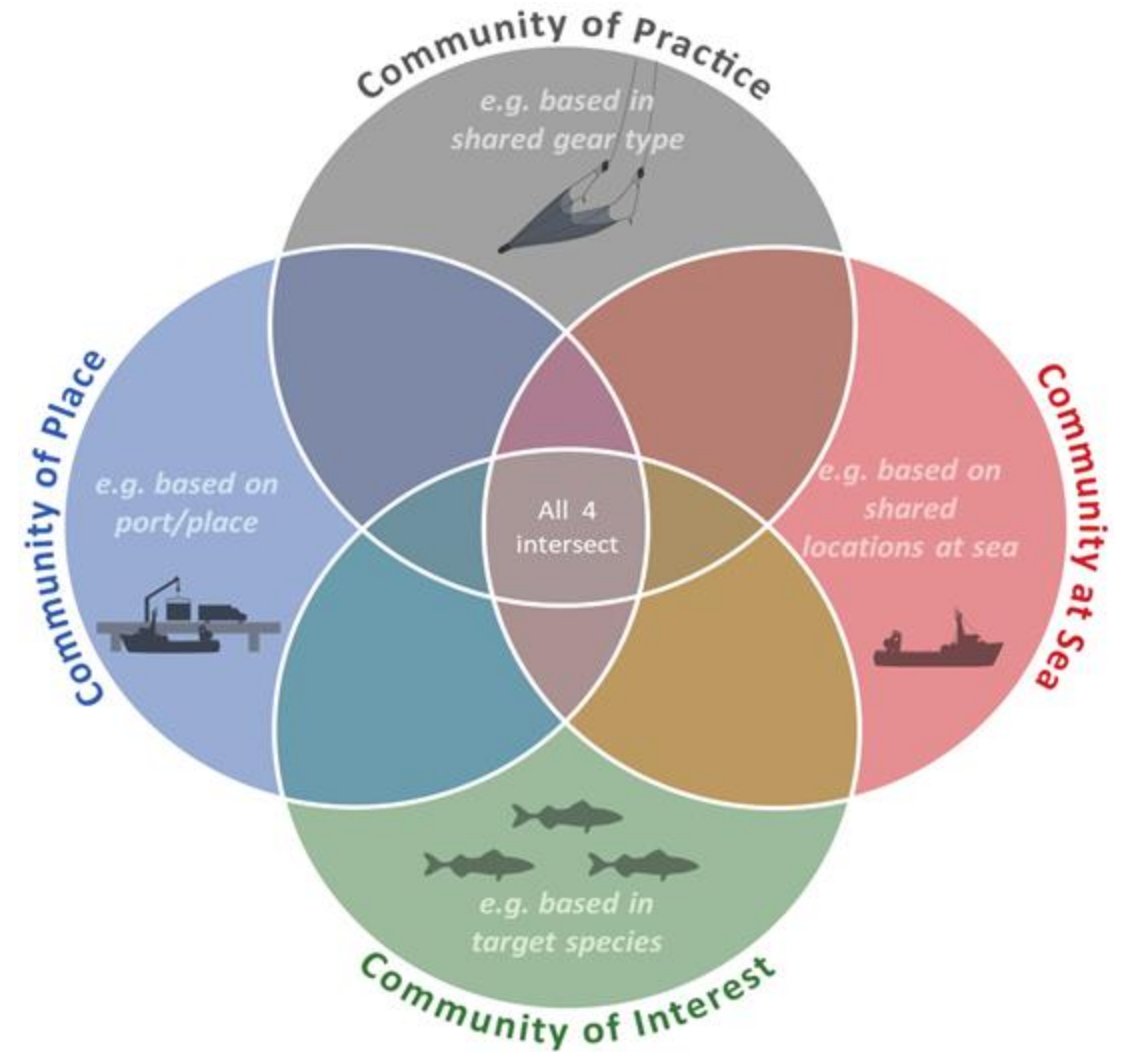
Fig. 2. Figure 2: A framework for co-production of knowledge.



Yua et al. 2022. <https://doi.org/10.5751/ES-12960-270134>

Collaborative approach to climate solutions

- ❑ Scenario planning, workshops, and collaborations to identify regionally, locally, and culturally tailored solutions & tools
- ❑ Providing meaningful and actionable advice requires an multidisciplinary approach & sustained support
- ❑ Holistic and shared solutions can emerge from collaborative discussions within teams with diverse expertise & knowledge

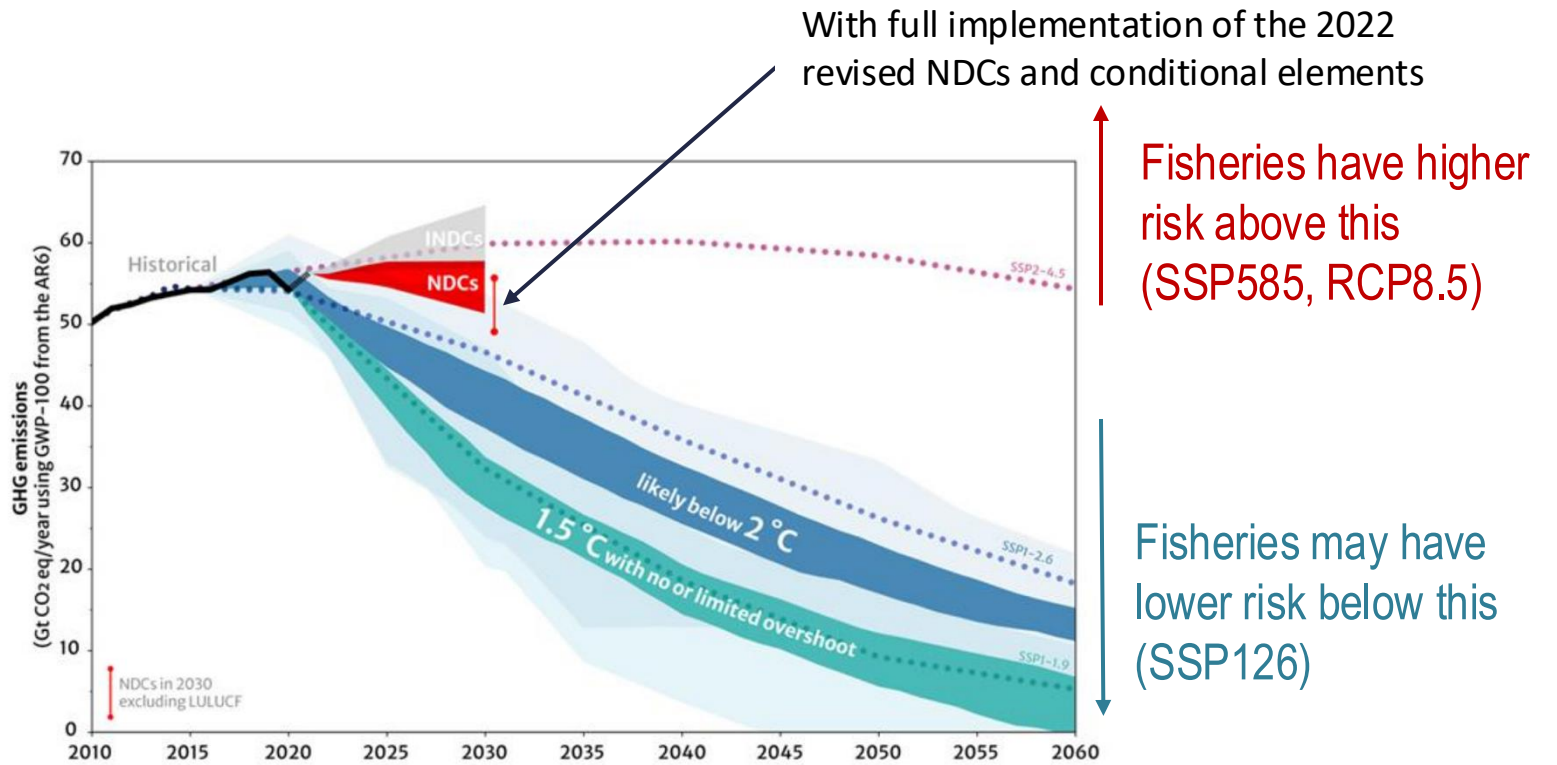


UNFCCC 2022 Nationally Determined Contributions Synthesis report

PARIS CLIMATE AGREEMENT



- Nationally determined contributions (NDCs) are at the heart of the Paris Agreement and the achievement of its long-term goals.
- NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change.
- The [Paris Agreement](#) (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve.
- Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.



<https://unfccc.int/ndc-synthesis-report-2022>



- 1) Carbon mitigation is critical for productive fisheries & effective adaptation
- 2) Adaptation planning is needed to support equitable climate response & resilience
- 3) Ecosystem Based Management is a framework to support inclusive, dynamic, & equitable climate planning

Needed : Sustained support for coordinated climate change adaptation planning and climate-integrated tools & advice for fisheries management

**CCTF Final Report: Future directions
AFSC ACT + Council (as an example)**





**Climate, Ecosystems,
& Fisheries Initiative**

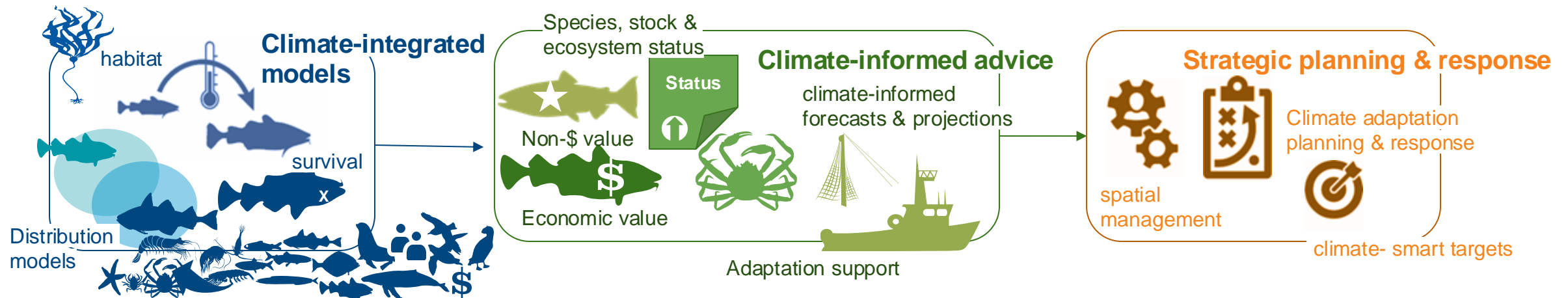
The Alaska Climate/CEFI Team (ACT)

Kirstin Holsman
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NOAA AFSC
2024



Climate, Ecosystems, & Fisheries Initiative

Alaska's Climate Ecosystem and Fisheries Initiative

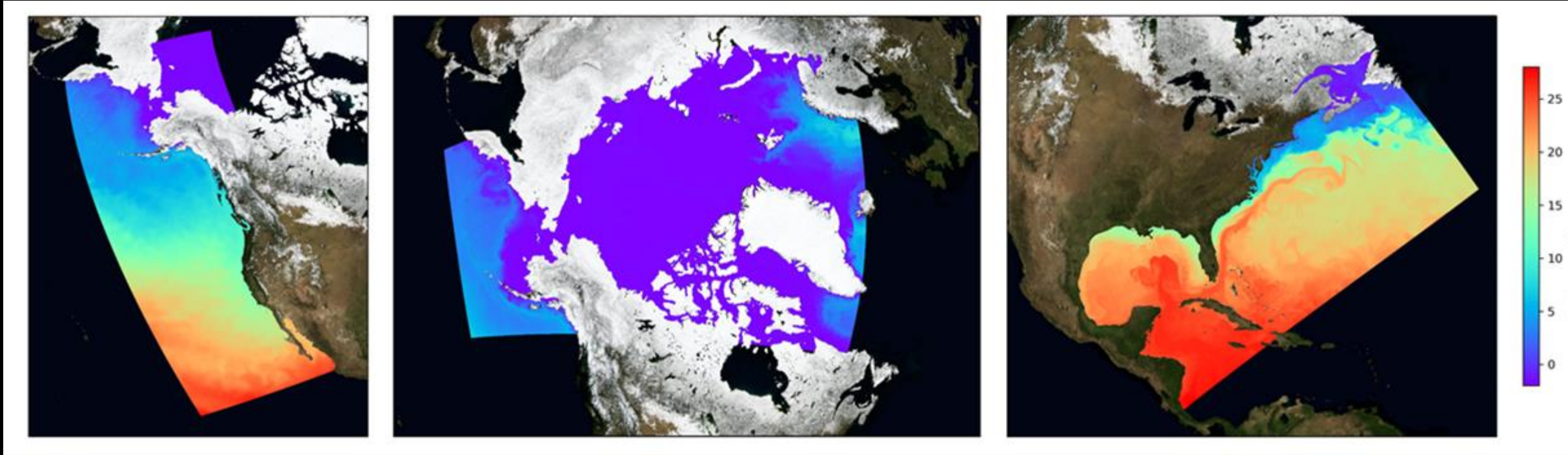


CEFI High resolution oceanographic model (MOM6) grids

Pacific

Arctic

Atlantic



CEFI-OAR High resolution models (operational delivery)

hindcasts

seasonal forecasts

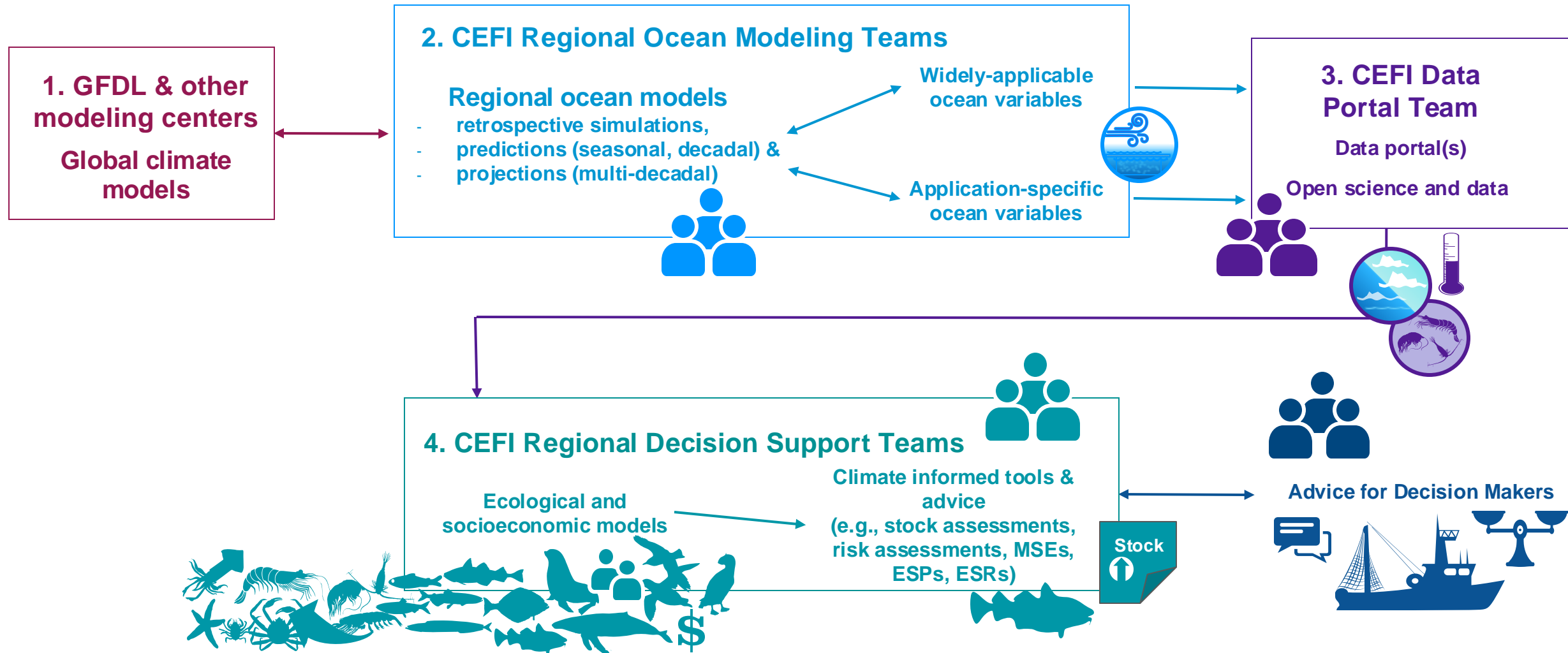
decadal predictions

multidecadal climate change projections

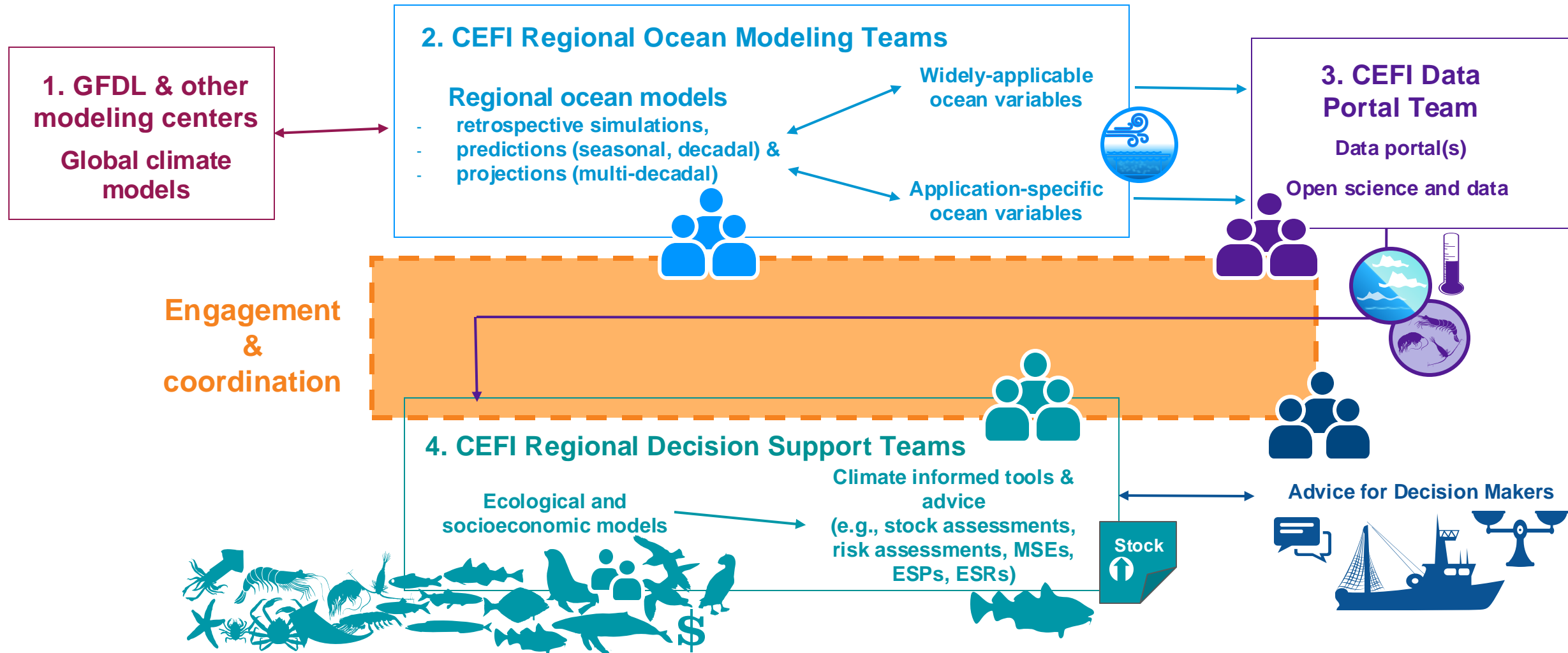
(e.g., sea ice, water temp, pH, winds, currents, zooplankton)

NOAA's Climate Ecosystem and Fisheries Initiative (CEFI)

National CEFI Component Workflow

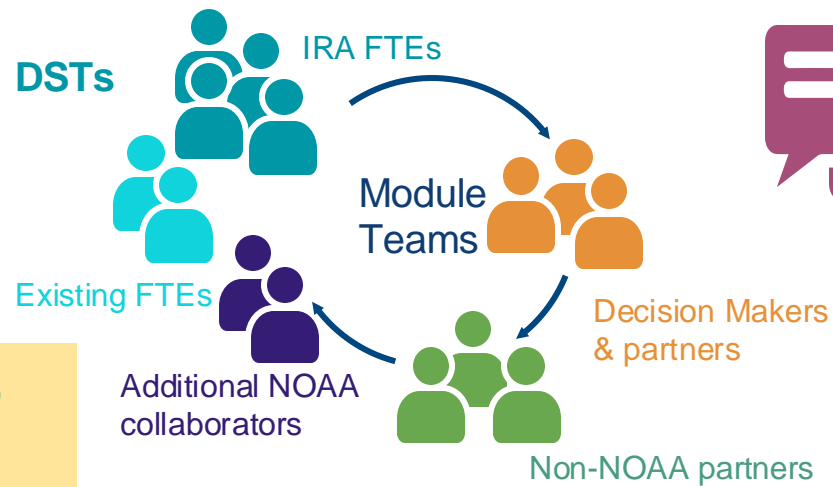


National CEFI Component Workflow



What are Decision Support Teams?

Transdisciplinary nested teams that will help deliver climate informed products and advice, specifically tailored to decision maker needs.



- 1) Understand current capacity for inclusion of climate informed advice
- 2) Identify near-term needs for CI-advice
- 3) Identify long-term needs for development
- 4) Link CEFI, IEA, Stock Assessment, and Other NOAA products to meet needs

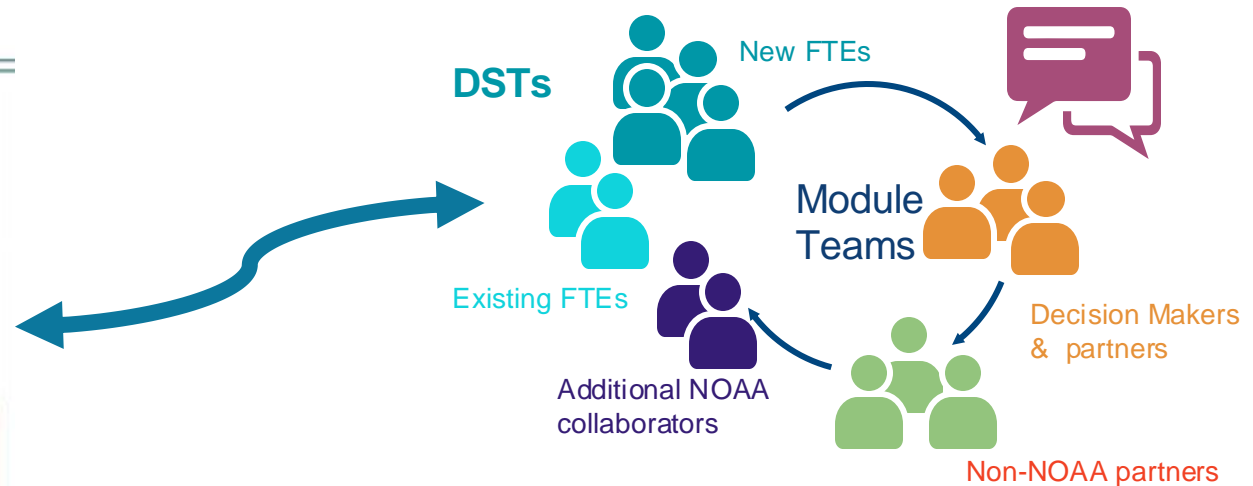
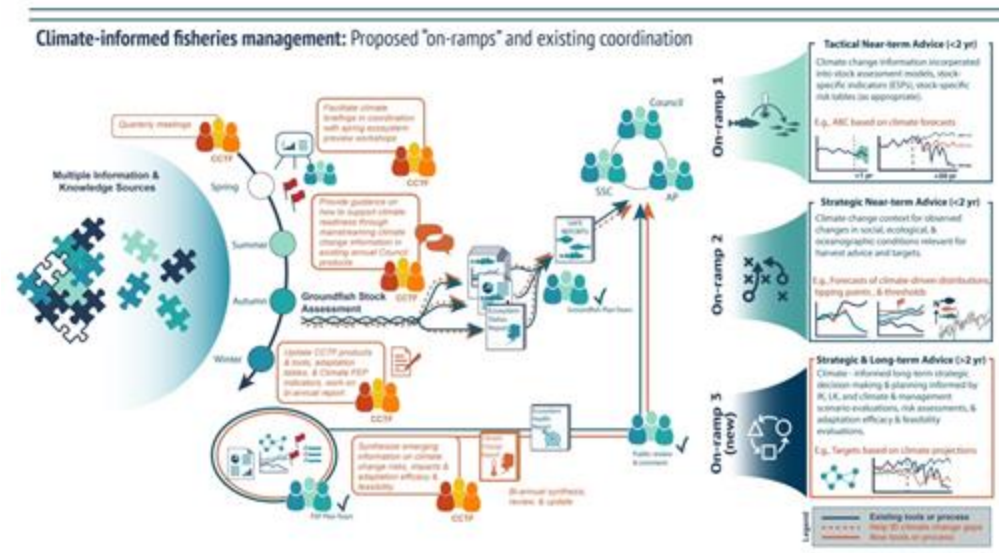
Support and co-leverage

not repeat or re-invent

NOAA Climate, Ecosystems, & Fisheries Initiative

ACT

The AFSC Decision Support Team is called the “ACT”, for the Alaska CEFI/Climate Team (being formed Fall/winter2024)



Co-generate regionally,
locally, and community
tailored tools & advice

Decision Support Delivery Steps

2024 Step 1: Engagement & Partnership Building

Identify key partners and collaborators and begin or advance discussions around climate change planning and needs

2024 Step 2: Co-identify on-ramps

In coordination and collaboration with partners and decision makers, identify existing and needed climate specific decision support needs

2025 Step 3: Co-identify needs & prioritize

Co-identify needs and prioritize decision support information, needs, and products

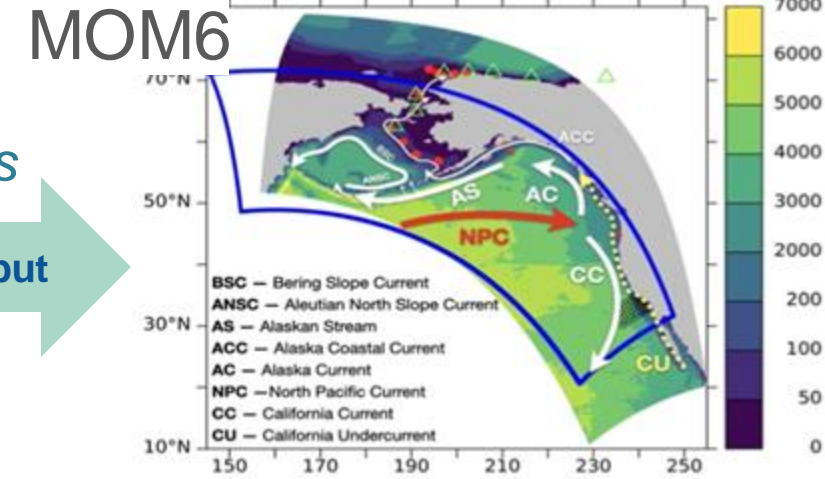
2025 Step 4: Design, build & TEST

Match resources and tools to needs and test skill relative to co-identified metrics of performance

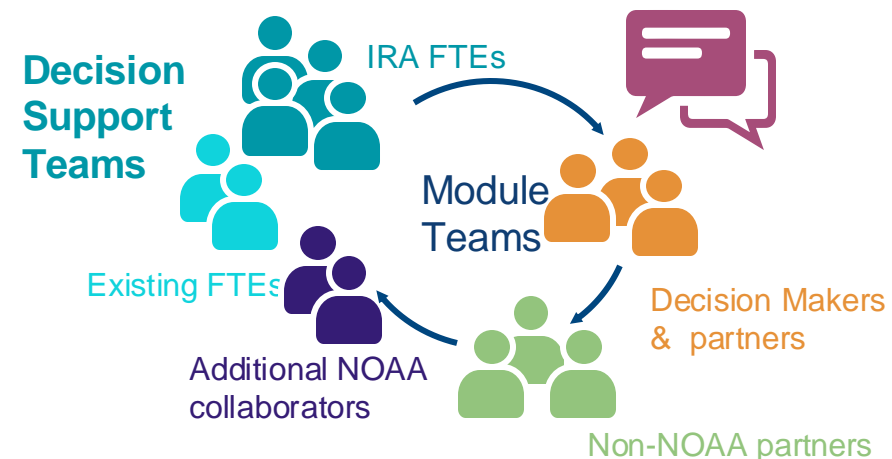
2027 Step 5: Deliver & refine

Deliver decision support tools and advice; iterate and refine products with feedback and engagement

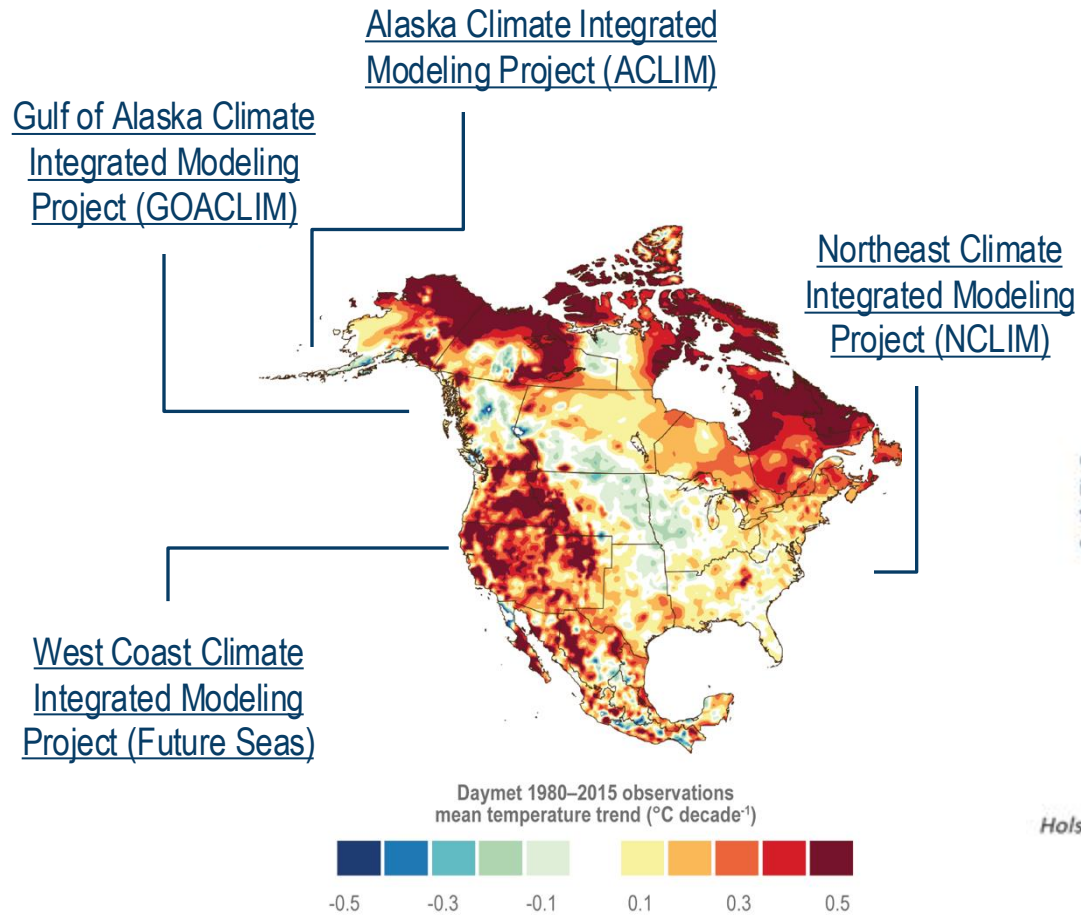
Parallel process
Test ocean model output



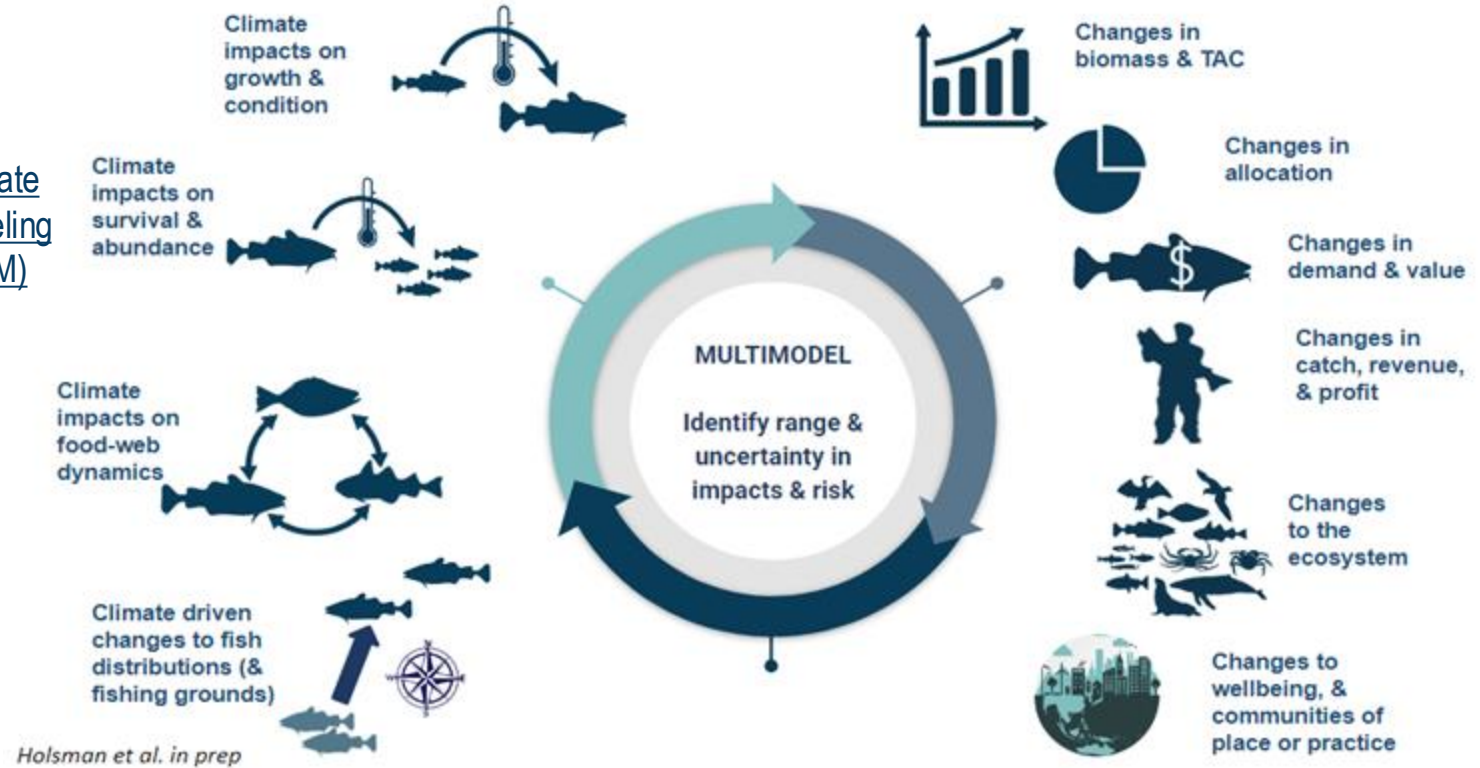
- Is there an existing tool/product that meets the need?
- Do the scales match advice?
- Does the output skillfully meet needs?



US Integrated Modeling projects




Modeling the adaptation cycle to help inform effective response

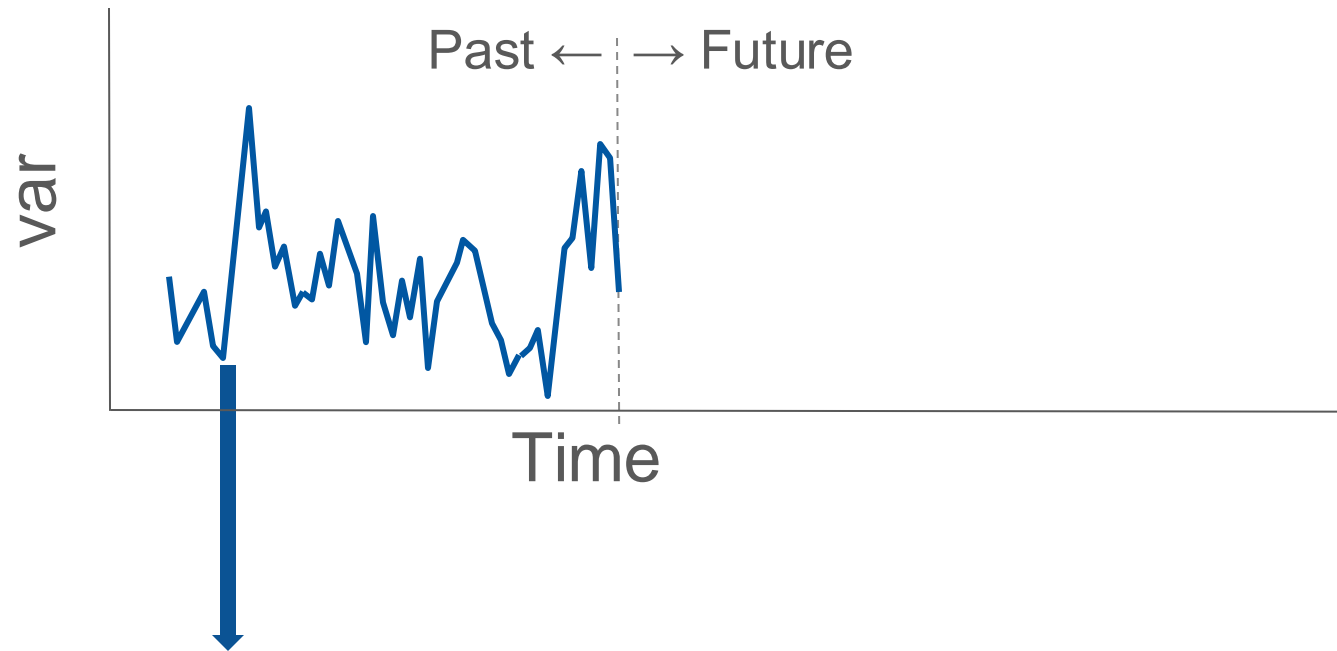


Updated oct 2024

An ambitious timeline for deliverables

Year	East Coast	West Coast and Arctic	Great Lakes, Pacific Islands
FY23	Initial hindcast ✓	Initial Configuration ✓	
FY24	Hindcast update, retrospective seasonal predictions ✓	Initial hindcast ✓	Initial configuration ✓
FY25	Hindcast update, retrospective decadal predictions , initial climate change projections	Hindcast update, retrospective seasonal predictions , initial climate change projections	Initial hindcast
FY26	Hindcast update, expanded projections , seasonal outlooks reliably delivered	Hindcast update, retrospective decadal predictions , initial climate change projections	Hindcast update, retrospective seasonal predictions , initial climate change projections
FY27	All products reliably delivered	Hindcast update, expanded projections , seasonal outlooks reliably delivered	Hindcast update, retrospective decadal predictions , initial climate change projections
FY28	All products reliably delivered	All products reliably delivered	Hindcast update, expanded projections , seasonal outlooks reliably delivered
 FY29	All products reliably delivered	All products reliably delivered	All products reliably delivered

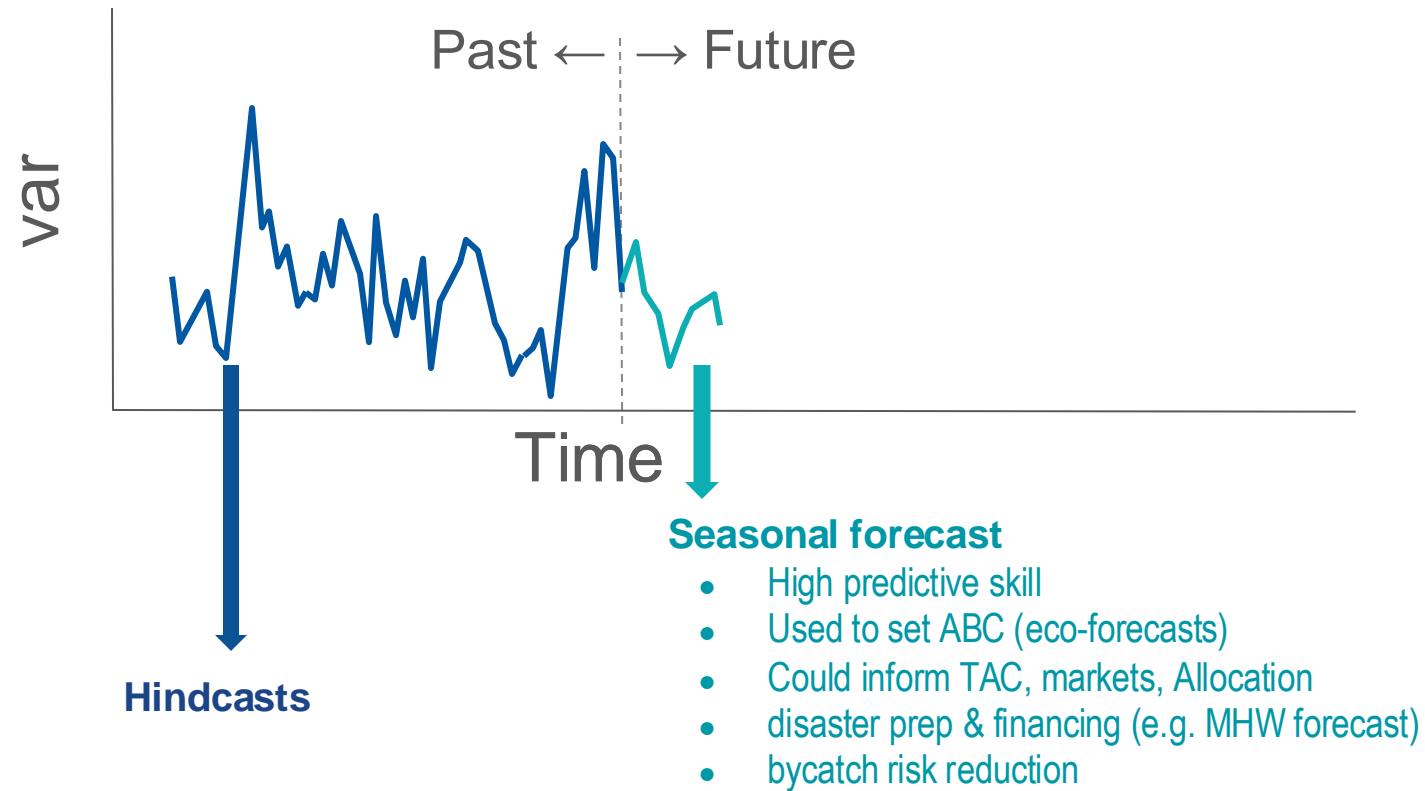
Matching scales to tools & advice



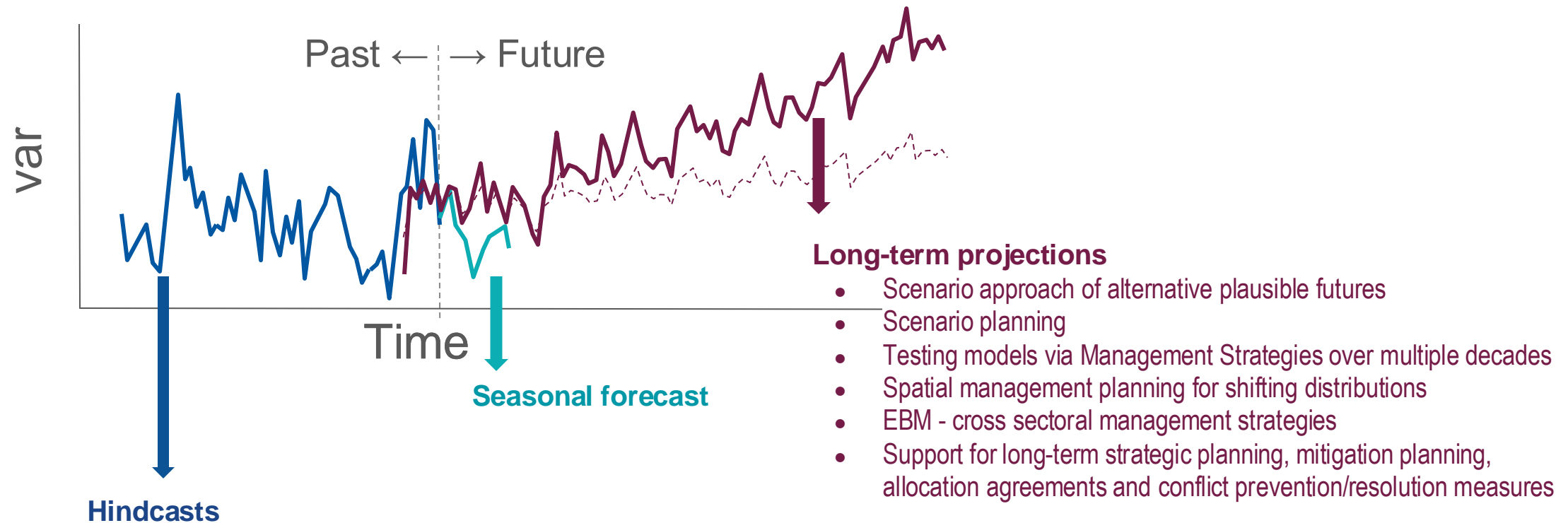
Hindcasts

- High retrospective skill
- Used to “train” or conditionally fit models (rec, assessments, etc)
- Can be used to set ABC and TAC (with persistence forecasts)
- Strategic advice on EBM/EBFM (e.g., changes to ecosystem)
- Used to help supplement or extend survey data

Matching scales to tools & advice



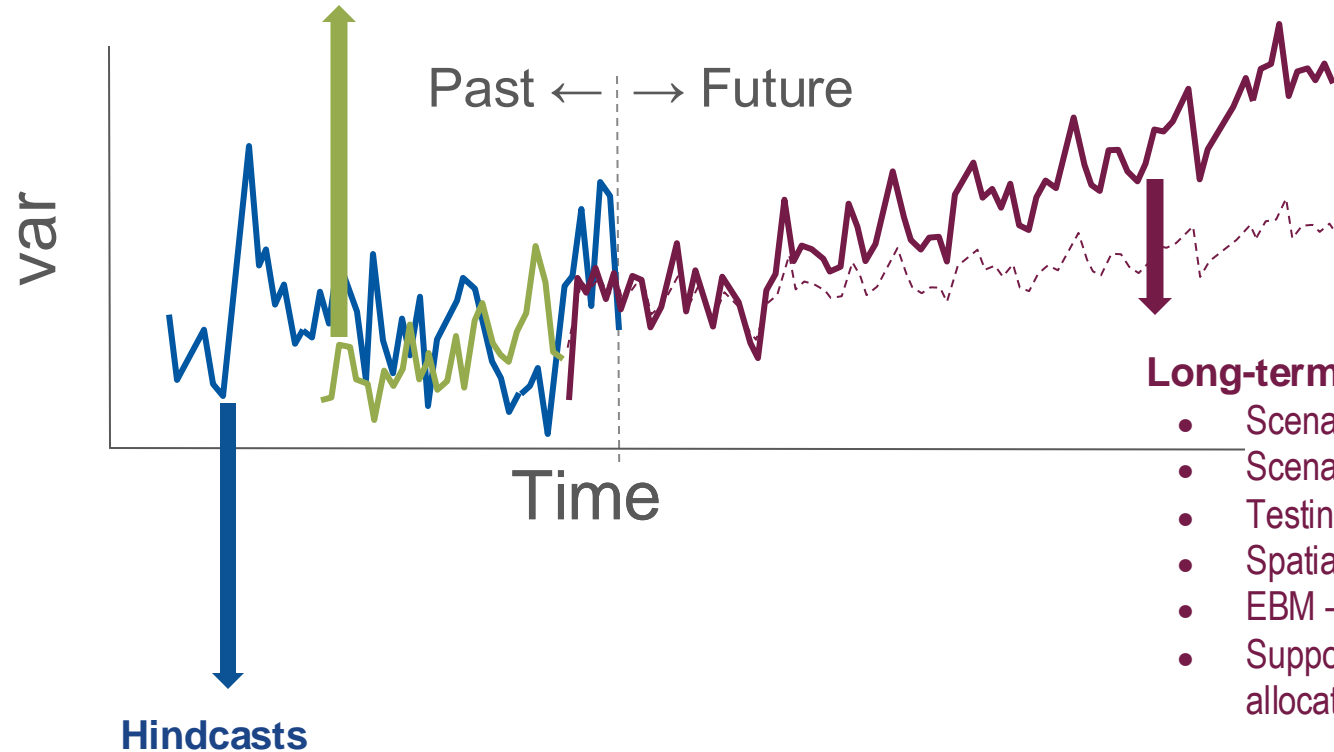
Matching scales to tools & advice



Matching scales to tools & advice

Historical runs

- Used to bias correct projections (in some cases)
- Used for climate change attribution (e.g., Natural historical runs)



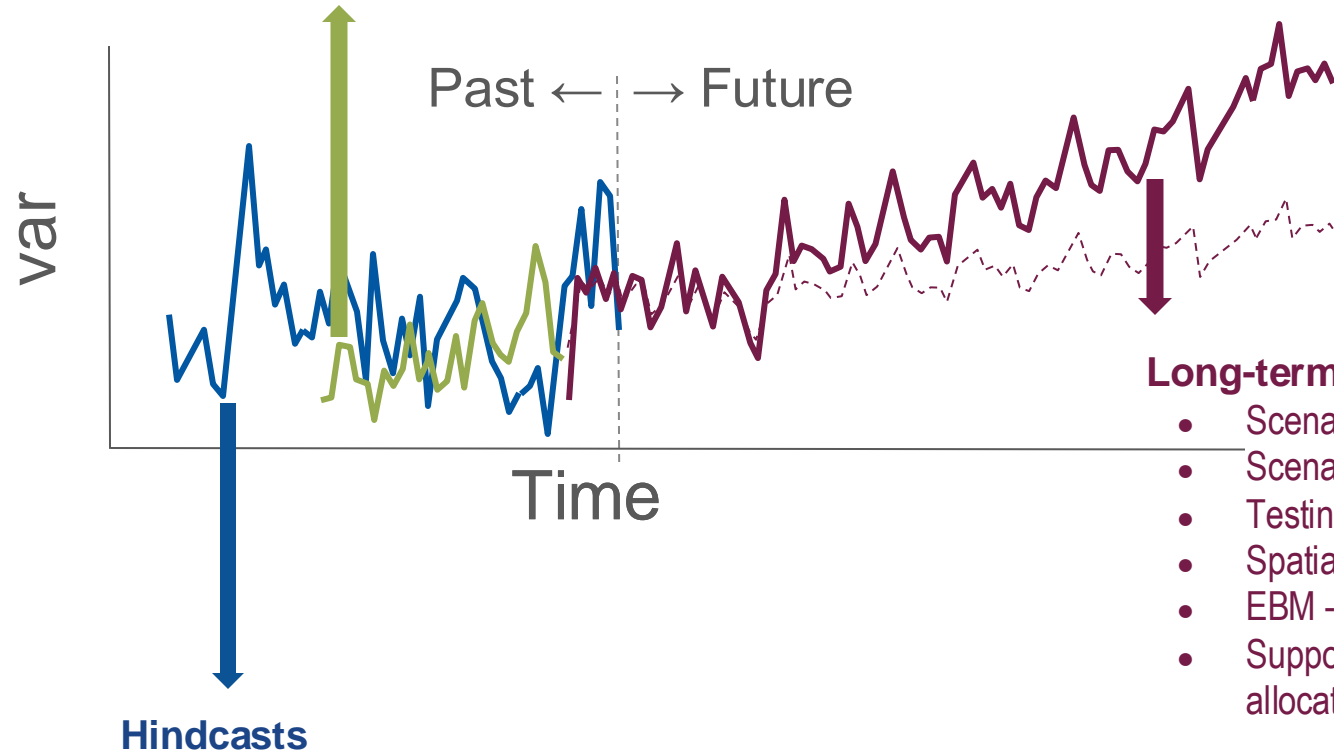
Long-term projections

- Scenario approach of alternative plausible futures
- Scenario planning
- Testing models via Management Strategies over multiple decades
- Spatial management planning for shifting distributions
- EBM - cross sectoral management strategies
- Support for long-term strategic planning, mitigation planning, allocation agreements and conflict prevention/resolution measures

Matching scales to tools & advice

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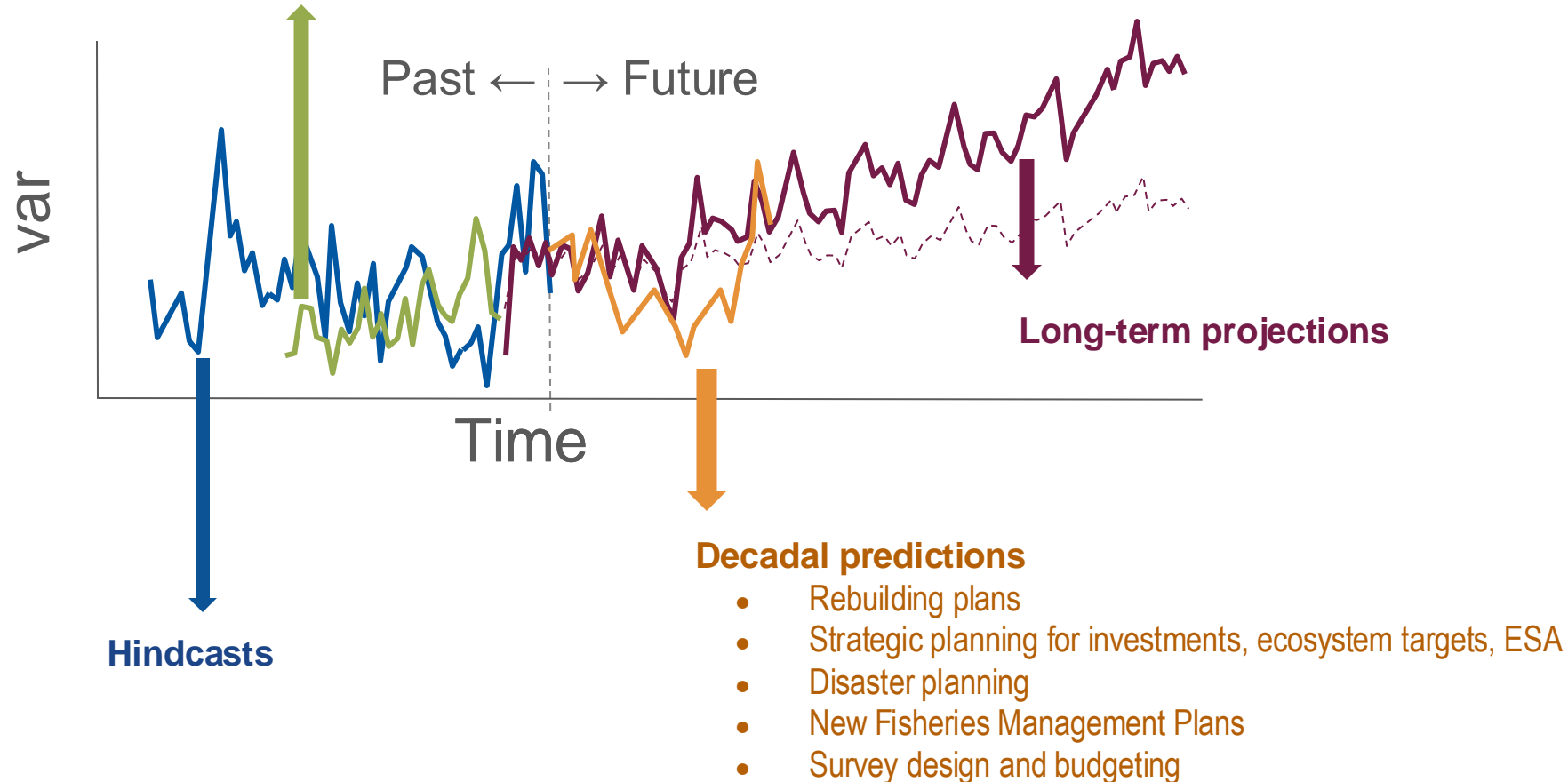
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Matching scales to tools & advice

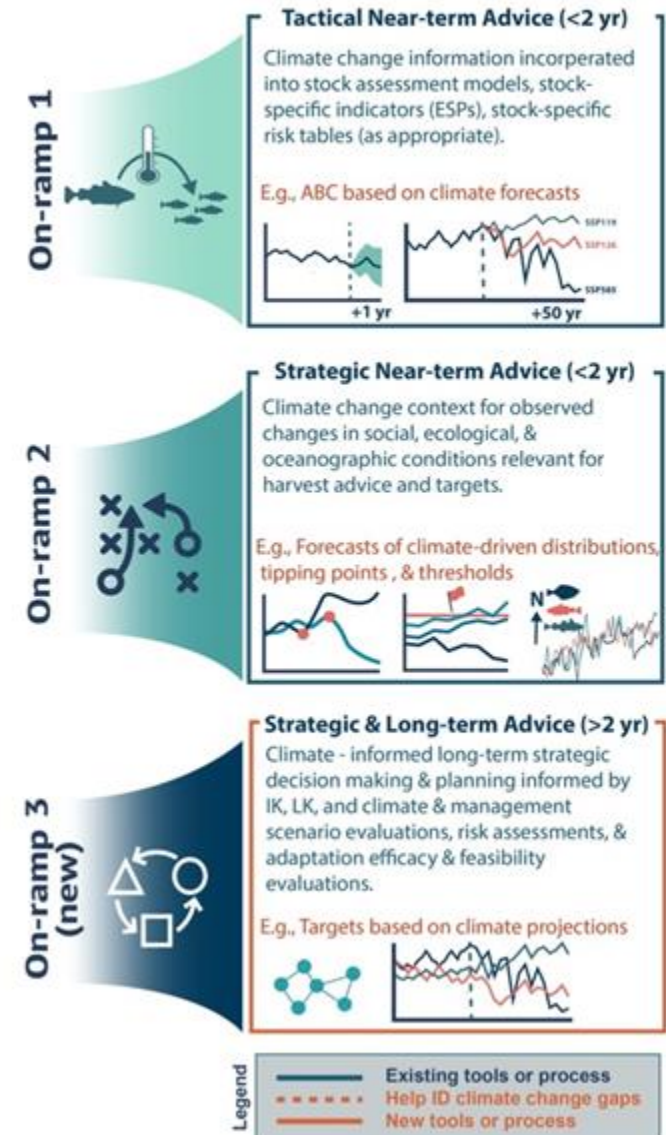
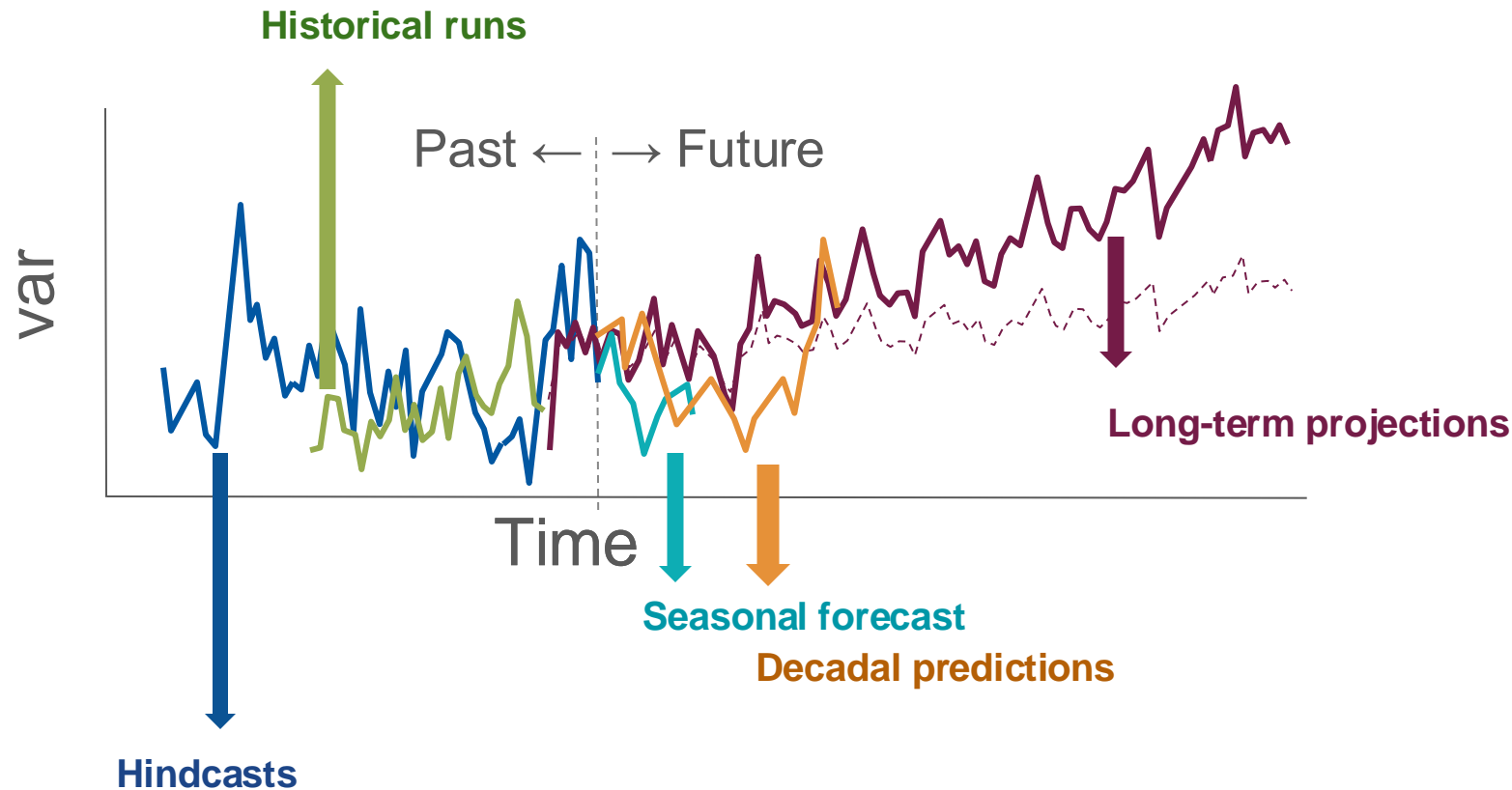
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Matching scales to tools & advice

Advice “on-ramps”

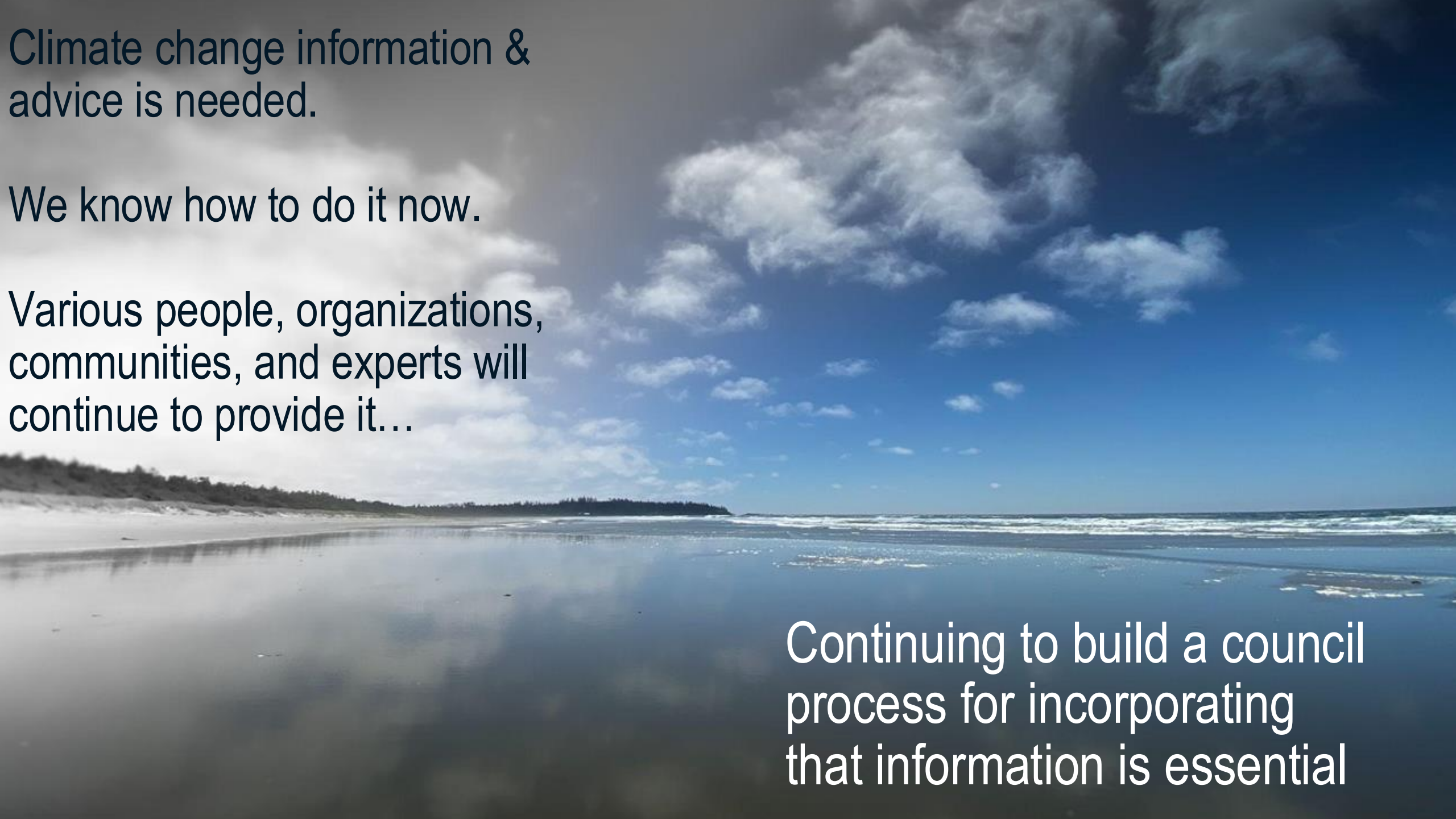


Climate change information &
advice is needed.

We know how to do it now.

Various people, organizations,
communities, and experts will
continue to provide it...

Continuing to build a council
process for incorporating
that information is essential



Cross walk to CSW table

NPFMC Potential Climate Resilience Focus Areas **DRAFT for Climate Change Task Force Discussion**

This is a planning draft intended to support discussions at the final Climate Change Task Force meeting, November 6-7, 2024. This document is for planning purposes only and is not intended as an updated IRA work plan. An updated version of this document may be provided for the December 2024 Council meeting.

Reference links

2022 CCTF [Climate Readiness Synthesis](#) | 2023 SSC [workshop report](#) | Feb 2024 IRA [work plan](#) | Climate Scenarios Workshop [report](#)

Introduction

The purpose of this document is to summarize across the Council's climate-related initiatives to identify potential focus areas for ongoing work that could be implemented through IRA funding, initiatives in progress including the Programmatic Evaluation, and other topics the Council could identify as near- or longer-term priorities for building climate resilience. The table below is populated with ideas generated at the Climate Scenarios Workshop (CSW), the 2023 SSC workshop, and the Climate Readiness Synthesis (CRS) prepared by the Climate Change Task Force (CCTF), but **does not yet incorporate ideas from the upcoming CCTF meeting and final report (November 2024)**. It focuses on ideas that are at least partially implementable through Council actions, Council processes and procedures, other initiatives (such as workshops) and analytical practices.

The table also incorporates suggestions from October 2024 Council, SSC, and AP discussions and motions, including actionable steps as well as the following suggestions:

- Identify the underlying climate resilience needs, challenges, and issues that workshop ideas are intended to address.
- Focus on actionable elements.
- Continue clarifying timelines, resourcing, and tasking considerations, contributors and information inputs, and dependencies.

Information not included in table

