# Frequently Used Acronyms and Terms

This document includes a selection of acronyms and terms that appear in the Climate Scenarios Workshop agenda and scenarios. More information is available in other workshop documents including "About the Climate Scenarios Workshop" and "Themes and Ideas for Climate Readiness Planning." Both are available through the Climate Scenarios Workshop eAgenda.

## 1. Acronyms for Council and NMFS initiatives

**Alaska Climate Integrated Modeling Project (ACLIM):** ACLIM is a comprehensive effort by NMFS and partners to describe and project responses of the Bering Sea ecosystem, including both the physical environment and human communities, to varying climate conditions.

- More information

**Climate Change Task Force (CCTF):** The CCTF is a Council advisory body that was convened to develop and execute a work plan for a Climate Action Module under the Bering Sea Fishery Ecosystem Plan. The goal of the Climate Action Module is to facilitate the Council's work toward climate-ready fisheries management that helps ensure both short-term and long-term resilience for the interconnected ecological and human communities of the Bering Sea. The CCTF developed the Climate Readiness Synthesis (CRS, see below) and helped plan the Climate Scenarios Workshop.

**Climate, Ecosystem, and Fisheries Initiative (CEFI):** The Climate, Ecosystems, and Fisheries Initiative is a cross-NOAA effort to build the nationwide, operational ocean modeling and decision support system needed to reduce impacts, increase resilience, and help adapt to changing ocean conditions.

- More information

**Climate Readiness Synthesis (CRS)**: The CRS is a report that was developed by the CCTF to help the Council assess the climate readiness of the management system. The report is organized into three sections evaluating the climate readiness of 1) the management system, 2) Stock Assessment and Fishery Evaluation (SAFE) reports and products including Ecosystem Status Reports; and 3) knowledge bases that support climate readiness and adaptation, focusing on indigenous community, industry, and NMFS and Council knowledge bases.

- 2022 Climate Readiness Synthesis

**Gulf of Alaska Climate Integrated Modeling Project (GOACLIM):** GOACLIM is a multidisciplinary modeling effort by NMFS and partners that complements the ACLIM approach and focuses on the Gulf of Alaska region.

- More information

**Inflation Reduction Act (IRA):** The IRA is a large investment of one-time funding to support climate readiness, including $20 million dedicated to supporting the regional fishery management councils to support climate resilience and responsiveness to climate change impacts. NPFMC submitted a proposal for $2.5 million in IRA funding, which it will use to build upon existing work by 1) developing a climate-resilient management policy, 2) continuing work to incorporate local and traditional knowledge, and 3) strengthening the consideration of uncertainty and risk in harvest specifications and other aspects of Council management.

- ➢ More information

**Local Knowledge, Traditional Knowledge, and Subsistence (LKTKS) Protocol:** The LKTKS Protocol defines these knowledge systems and includes guidance to inform the Council's decision-making process for how to appropriately identify, analyze, and incorporate Local Knowledge, Traditional Knowledge, and subsistence information into the Council's decision-making process. The Taskforce also identified onramp recommendations for the Council's consideration at final action that identified potential changes to the Council's process to better incorporate these knowledge systems. While the work of the LKTKS task force is not specifically focused on climate change, diverse knowledge systems are a vital component of climate readiness and adaptation.

- ➢ LKTKS Protocol

**Programmatic Evaluation**
The Programmatic Evaluation initiated by the Council in June 2023 will revisit the management policies, goals, and objectives for all of the Council's federally managed fisheries in the Bering Sea, Aleutian Islands, and Gulf of Alaska. Through this process, the Council will consider whether its management approach should be updated and revised in consideration of current environmental variability and the ability of the management framework to respond to change.

## 2. Levels of ecosystem management

The future scenarios that will be discussed at the Climate Scenarios Workshop refer to different levels of ecosystem management that could be practiced by the Council, ranging from stock-specific management to cross-sector ecosystem-based management. Council policies recognize the importance of ecosystem management principles, and the Council is already taking steps to incorporate ecosystem information and considerations into decision-making. The purpose for including varying levels of ecosystem management in the workshop scenarios is to consider how these approaches might help or constrain the Council's ability to support climate readiness.

Ecosystem management is more like a spectrum of approaches for incorporating ecosystem information and tradeoffs into science and management, rather than a set of clearly defined

levels. However, it's helpful to understand the key terms[1,2] used to describe ecosystem management approaches, and the information that is used in each of these approaches to conduct stock assessments, provide scientific advice and set biological or system reference points, and inform management decisions.

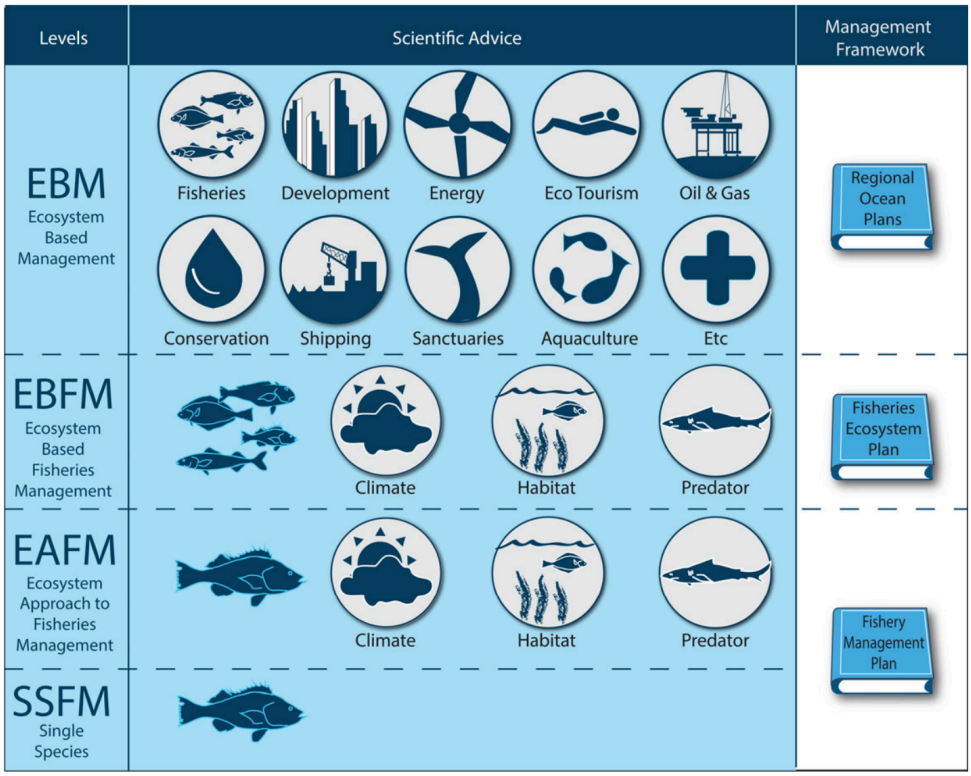


*Figure: Levels of ecosystem management (from Dolan et al 2015)*

**Single-species management (SSM)** only considers the biology of fish stocks and how they interact with a fishery.

Under an **ecosystem approach to fisheries management (EAFM),** stock assessments and biological reference points account for additional ecosystem and environmental information. Management advice and decisions are still made on a stock-specific basis. Most stocks assessed by the NMFS Alaska Fisheries Science Center and managed by the Council are considered an ecosystem approach to fisheries management.

**Ecosystem-based fisheries management (EBFM),** like EAFM, considers ecosystem and environmental information. EBFM also accounts for interactions and tradeoffs between fisheries

[1] Definitions in this section are adapted from Tara E. Dolan, Wesley S. Patrick, Jason S. Link, Delineating the continuum of marine ecosystem-based management: a US fisheries reference point perspective, ICES Journal of Marine Science, Volume 73, Issue 4, March/April 2016, Pages 1042–1050, https://doi.org/10.1093/icesjms/fsv242; and

[2] NMFS Ecosystem-Based Fisheries Roadmap

in an ecosystem and utilizes system-level reference points that can account for biological reference points as well as other ecosystem-level goals.

**Ecosystem-based management (EBM)** is a coordinated, whole-ecosystem approach that considers tradeoffs and supports coordination between ocean use sectors that impact and are impacted by the fishing sector, such as shipping, aquaculture, and energy development.

Two of the scenarios that will be discussed at the Climate Scenarios Workshop describe a future in which the Council is able to engage in EBM. The purpose is to explore how EBM might help support climate readiness, for example through better spatial management and coordination across sectors to minimize risks.

## 3. Glossary of Terms

This glossary includes a selection of terms that appear in the workshop agenda and scenarios. Unless otherwise noted, definitions are adapted from the Glossary of Terms from the Fifth National Climate Assessment.[3] These terms and definitions are provided to help support workshop discussions, while also recognizing that workshop participants may use or interpret these terms differently based on their individual experiences, worldview, and perspectives.

**Adaptation** - The process of adjustment to actual or expected climate and its effects to moderate harm or exploit beneficial opportunities.

The Climate Readiness Synthesis provides a more detailed discussion and definition of climate adaptation in the context of Bering Sea Fisheries.[4]

**Adaptive capacity** - The ability of systems, institutions, humans, and other organisms to adjust to potential damage, to take advantage of opportunities, or to respond to consequences.

**Climate change** - Changes in average weather conditions that persist over multiple decades or longer. Climate change encompasses both increases and decreases in temperature, as well as shifts in precipitation, changes in frequency and location of severe weather events, and changes to other features of the climate system

**Climate readiness**[5] - The Climate Readiness Synthesis defines climate readiness as “whether management tools, assessments, and information on-ramps are designed to address and consider long-term climate change and the unprecedented conditions and unique challenges that it presents.” Workshop discussions will also explore participants’ perspectives on the meaning of climate readiness.

---

[3] Grade, A.M., A.R. Crimmins, S. Basile, M.R. Essig, L. Goldsmith, A.R. Lustig, T.K. Maycock, A. McCarrick, and A. Scheetz, 2023: Appendix 5. Glossary. In: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023.A5

[4] Climate Readiness Synthesis. Prepared by the NPFMC Climate Change Task Force 2022. p.6

[5] Climate Readiness Synthesis, p. 1

**Climate projection** - The simulated response of the climate system to a scenario of future emissions or concentrations of greenhouse gasses and aerosols, generally derived using climate models. Climate projections depend on the emissions, concentration, or radiative forcing scenario used, which, in turn, is based on assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized.

**Community** - The workshop scenarios and discussions use the term "community" in an inclusive way to accommodate the many ways people experience and understand community. Community can rest in a place, may include social networks on which people interact and rely, and can overlap. For this workshop, community refers to a group that feels connected to one another in specific ways. The term can refer to any of the following:

- Community of place - a group of people that are connected to a geographic place through where they live, work, or spend meaningful time. (Examples could include: fish camp, or a city or town).
- Community of practice - a group of people that share a common practice, vocation, or occupation. (Examples could include: fishing, teaching, or dancing).
- Communities of interest - a group of people that share a common social or economic interest or concern or activity. (Examples could include: students for reasonable homework, teachers for equitable pay, citizens for clean water).

**Cold pool -** In the Bering Sea, an area of cold, salty water that forms near the seafloor following the melting of the winter sea ice. The cold pool's annual extent affects many aspects of the life of fish, crabs, and other bottom-dwelling species. The cold pool can act as a boundary separating Arctic species from subarctic species.[6]

**Dynamic management**[7] - Dynamic management strategies are able to adjust quickly in response to changes in the environment through the integration of near real-time biological, oceanographic, social and/or economic data. In some of the workshop scenarios managers are able to practice dynamic management, while in others management continues to use fixed management measures such as area and seasonal closures.

**Marine heatwave** - A period during which water temperature is abnormally warm for the time of the year relative to historical temperatures, with that extreme warmth persisting for days to months.

**Non-stationarity**[8] - refers to the condition in which ecosystem and biological processes such as mortality, recruitment, and growth are changing over time, either directionally or periodically as regime shifts. Accounting for non-stationarity is important to making assumptions about the future productivity of stocks, setting appropriate biological reference points and developing harvest specifications.

---

[6] Adapted from feature article Temperature Anomalies and Cold Pool Estimates from Bering Sea Bottom Trawl Surveys 2023. NMFS Alaska Fisheries Science Center 2023.
[7] Adapted from Maxwell, Sara M. et al. (2015). Dynamic ocean management: Defining and conceptualizing real-time management of the ocean. 58. https://doi.org/10.1016/j.marpol.2015.03.014
[8] Adapted from Final SSC February 2023 Workshop Report, B13, April 2023, p. 8-9

**Predictive capabilities** - In the workshop scenarios, this refers to the ability of scientists, technology, and tools to provide information about the potential future conditions of ecosystems, climate, markets, and other attributes of social-ecological systems.

**Resilience -** The ability to prepare for threats and hazards, adapt to changing conditions, and withstand and recover rapidly from adverse conditions and disruptions.

The Climate Readiness Synthesis includes a more detailed discussion of resilience including community resilience, biological and ecological resilience, and the importance of considering the nexus between these two components.[9]

**Risk -** Threats to life, health, and safety, the environment, economic well-being, and other things of value. Risks are evaluated in terms of how likely they are to occur (probability) and the damages that would result if they did happen (consequences).

**Tipping point** - The point at which a change in the climate triggers a significant environmental event, which may be permanent.

[9] Climate Readiness Synthesis, p. 6