NOAA Climate, Ecosystems, and Fisheries Initiative

The NOAA Climate, Ecosystems, and Fisheries Initiative (CEFI) will build the end-to-end, operational ocean modeling and decision support system needed to safeguard the nation's marine resources and resource-dependent communities in a changing climate.

More information at: https://www.fisheries.noaa.gov/topic/climate

US Fisheries Economic Impact

1.8 million jobs

$372 Billion

FEUS 2019

The Challenge

Climate change is significantly impacting the nation's oceans and marine resources, putting the many people, businesses, communities and economies that depend on them at high risk. Warming oceans, rising seas, increasing acidification and extreme events (e.g., marine heat waves) are transforming the structure and function of marine ecosystems and threatening NOAA's ability to fulfill its mandiates for sustainable fisheries management, protected resources conservation, coastal community resilience and a climate-ready nation.

Government, industry and community decision makers urgently need robust information on future ocean conditions, how to prepare and what actions to take to reduce risks and adapt. There is no operational system to provide decision makers with the information and tools they need to prepare and respond to rapidly changing oceans.

NOAA's Response

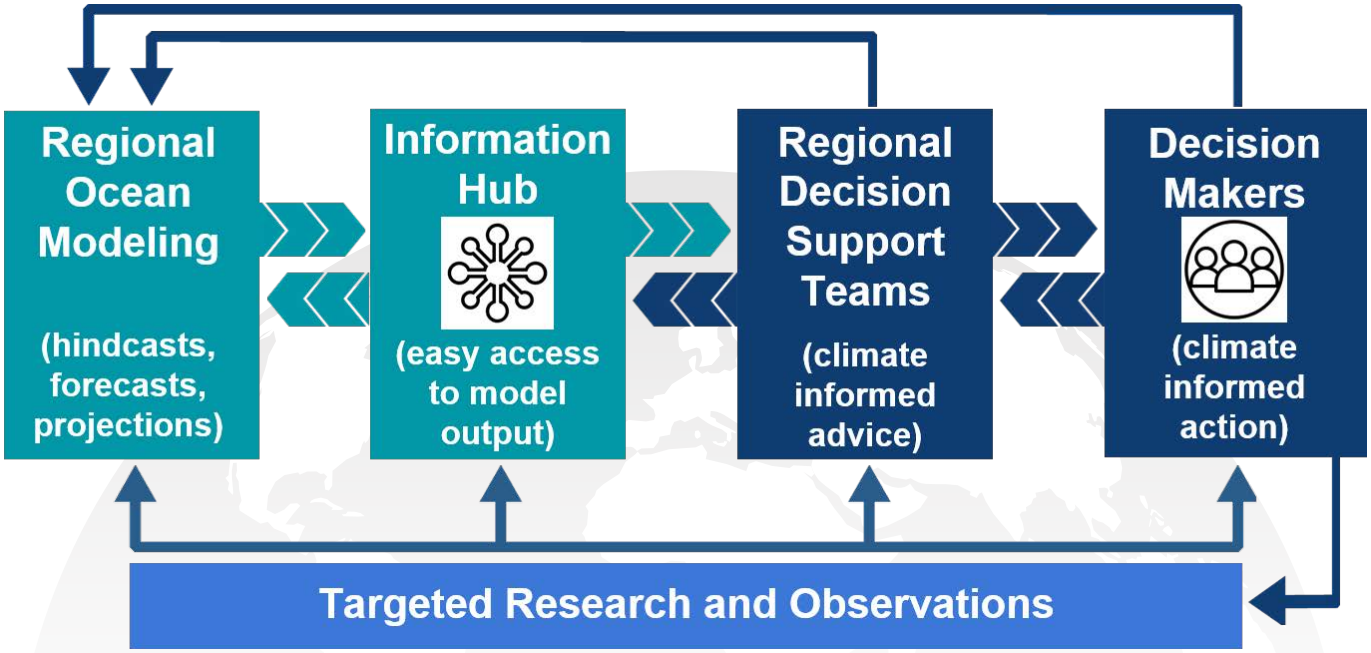
The Climate, Ecosystems, and Fisheries Initiative (CEFI) is a cross-NOAA effort to build the nation-wide, operational ocean modeling and decision support system (System) needed to reduce impacts, increase resilience and help marine resources and resource users adapt to changing ocean conditions. The end-to-end System will provide decision makers with the actionable information and capacity they need to prepare for and respond to changing conditions today, next year and for decades to come. The CEFI System addresses four core requirements for climate-ready decision-making for marine resources:

1. Robust forecasts and projections of ocean and Great Lakes conditions for use in developing climate-informed advice;
2. Operational capability to assess risks, evaluate options and provide robust advice on adapting to changing conditions;
3. Decision-maker capability to use climate-informed advice to reduce risks and increase the resilience of resources and the people that depend on them; and
4. Continuous validation and innovation through observations and research.

The CEFI is a timely, efficient, and effective way to address the nation's requirements for climate ready resource management and community adaptation. By combining existing capabilities and new investments, the CEFI will build the modeling and decision support system needed in each region to provide decision makers with the climate-informed advice they need to reduce risks, accelerate adaptation and increase resilience of the nation's valuable living marine resources and resource-dependent communities.

The CEFI is an essential part of the U.S. Ocean Climate Action Plan and NOAA's Climate Ready Nation Strategy.

CEFI Integrated Modeling and Decision Support System



Regional Ocean Modeling (hindcasts, forecasts, projections)

This component builds on existing NOAA modeling systems to deliver robust near-term forecasts (e.g., daily to monthly) and longer-term projections (seasonal to multi-decadal) of ocean conditions in all six US ocean regions. This nation-wide ocean modeling system is the essential foundation for early warnings, socio-ecological projections, risk assessments and climate-informed advice (e.g., best fishery management & community adaptation strategies) that decision makers need to reduce impacts and adapt. The system delivers customized products for specific users in each region.

Information Hub

The Information Hub is a data management system and portal to manage, store and provide access to the information produced by the ocean modeling component. This component is critical to handle the large amounts of model output (forecasts, projections) that need to be curated for easy access by experts across a range of fields, from fisheries to coastal communities and other ocean uses (e.g., wind energy, aquaculture). This effort will also serve relevant data sets including reanalyses and provide web-based systems for analyzing and visualizing the data.

Regional Decision Support Teams

Regional Decision Support Teams provide the operational capacity to produce the climate-related information and advice needed by decision makers for effective resource management (fisheries, protected species, protected areas), industry planning and community adaptation. The Teams work with the existing science enterprise in each region to provide early warnings and projections of future ecosystem conditions (e.g., future species distributions and abundance), risk assessments, and actionable advice for climate ready fisheries management, protected species conservation, protected area management and community adaptation.

Decision Maker Capacity

This component will increase the capacity of resource managers (e.g., regional fisheries management councils, state agencies, protected area managers), fishing communities and other decision makers to use climate-related information and advice to take action to reduce impacts and adapt to changing ocean conditions.

Targeted Research and Observations

Targeted research and observations are critical to ensure the CEFI System can continuously validate its products and improve its operation. This effort builds on NOAA's expertise and strong partnerships with academia and industry.

The Takeaway

NOAA's Climate, Ecosystems, and Fisheries Initiative Decision Support System will provide decision makers with the information and capacity needed to assess risks, identify adaptation strategies and take action to safeguard the nation's valuable marine resources and the many people, communities and economies that depend on them.