NOAA Climate and Fisheries Initiative

The NOAA Climate and Fisheries Initiative (CFI) 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

The Challenge

Climate change is significantly impacting the nation's valuable marine and Great Lakes ecosystems, fisheries and the many people, communities, and economies that depend upon them. Warming oceans, rising seas, melting sea ice and increasing acidification are affecting ecosystem structure and the distribution and abundance of marine species in many regions.

These changes affect many parts of NOAA's mission, from fisheries management and aquaculture to conservation of protected resources and habitats. The impacts are expected to increase and there is much at risk. In the U.S., for example, marine ecosystems annually contribute over $210 billion and 1.7 million jobs from fisheries and provide a range of other vital services including recreation and protection from coastal storms and erosion.

To safeguard fisheries and other resources in the face of rapidly changing oceans, resource managers and stakeholders urgently need better information on what's changing, who's at risk and how to increase resilience. NOAA currently must develop the ocean modeling and decision-support system needed to produce, deliver and use information to sustain marine resources and resource-dependent communities in a changing climate.

NOAA's Response

The Climate and Fisheries Initiative (CFI) 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 CFI System addresses four core requirements for climate-ready decision-making for marine resources:

1. Delivery of state-of-the-art ocean and Great Lakes forecasts and projections for use in developingclimate-informed management advice;
2. Operational capability to use ocean and Great Lakes forecasts and projections to assess risks, evaluate management strategies and provide robust management advice for changing conditions;
3. Continuous validation and innovation through observations and research; and
4. Capability to use climate-informed advice to reduce risks and increase the resilience of resources and the people that depend on them.

The CFI is a timely, efficient, and effective way to address NOAA's requirements for climate-informed marine resource management. The CFI System will leverage existing capabilities and make critical new investments in the following three System elements. Each of the three System elements include components essential for the System to be fully functional as illustrated in the next figure:

- Advancing Climate, Ocean, and Ecosystem Understanding
- Operational Decision Support Systems
- Climate Ready Decision Making

CFI Integrated Ocean Modeling and Decision Support System

Advancing Climate, Ocean, and Ecosystem Understanding

Operational Decision Support Systems

Climate Ready Decision Making

National Community of Practice

Convene a nationwide community of practice to harness broad community expertise to guide development of the CFI ocean modeling and decision support system at regional and national scales.

Enhanced Observations

Targeted ocean- and marine-life observing systems to continuously improve early warnings, ecosystem projections and management advice for climate-informed decision making.

Targeted Research that Fuels Innovation

Support collaborative research and modeling to fuel innovations, improve ocean forecasts and projections and increase understanding of changing oceans, impacts on marine resources, and best approaches for resilience and adaptation.

Enhanced Ocean Modeling Capabilities

Enhance ocean and earth system models and High-Performance Computing (HPC) capacity building on a strong, sustainable national foundation for CFI regional and global modeling efforts.

Regional Ocean Modeling and Prediction

Regional Ocean Modeling Teams use the national ocean modeling framework to produce and deliver regional ocean hindcasts, forecasts, and projections for use by the FACSS and others in developing climate-informed management advice.

CFI Information Hub

The CFI InformationHub will provide easy access to regional ocean model outputs (high spatial resolution reanalysis, hindcasts, predictions, and projections), ecosystem projections and other information needed for climate-informed resource management.

Fisheries and Climate Decision Support System (FACSS)

Working with many partners, the expert FACSS teams at NMFS Science Centers will accelerate production of the climate-informed assessments and actionable advice decision-makers need to sustain fisheries, protected resources, habitats and the communities that depend on them.

Ecosystem Predictions

The FACSS—in concert with NOAA and external experts—will provide actionable information including projections of future ecosystem conditions for use in climate-informed decision-making.

Increasing Capacity for Climate Ready Decisions

New investments will increase the capacity of decision makers to use climate-related information to help sustain marine resources and resource-dependent communities.

Rapid Response

Provide early warnings to improve planning and response to extreme events such as marine heat waves and toxic algal blooms.

Climate Ready DecisionSupport Tools

Provide climate-enhanced risk assessments, stock assessments, management strategy evaluations, adaptation frameworks and other tools for climate-informed decision making.

Improve Surveys and Research

Improve the efficiency and effectiveness of fisheries surveys and research using ocean forecasts to adjust to changing ocean conditions and shifting species distributions.

Coordinated Science and Advice

Increase coordinated delivery of climate-related management advice for living marine resources at regional, national and international levels.

The Takeaway

NOAA's Climate and Fisheries Initiative will provide the climate, ocean and ecosystem information and capacity needed to assess risks, identify adaptation strategies and safeguard both marine and Great Lakes resources and the communities that depend on them.