

NCCOS ADVANCING CLIMATE-INFORMED DECISIONS IN NOAA'S CLIMATE, ECOSYSTEMS, AND FISHERIES INITIATIVE

Nationally Integrated Operational Climate, Ocean, and Ecosystem Decision Support Systems

▶ Advancing Climate, Ocean, and Ecosystem Understanding

▶ Operational Climate, Ocean, and Ecosystem Decision Support Systems

▶ Climate Ready Decision Making



Enhanced Observations

NCCOS will streamline its ocean model post-processing workflows (hindcast, re-analysis, forecast, and projection) and integrate outputs with its living marine resource (LMR) observation holdings to generate datasets required for ecological modeling, ecosystem assessments, and science-based decision making. Furthermore, NCCOS will conduct field surveys designed to generate observations required to develop short-term forecasts and long-term projections of ecosystem change alongside local and partner engagement to enhance the utility and relevance of these data at multiple scales.

Targeted Research that Fuels Innovation

NCCOS will expand its existing ecological modeling techniques and frameworks to produce climate-forced projections of LMR (e.g., corals, marine birds, habitats), and test model results to evaluate and refine model confidence.

Ecosystem and Climate Decision Support Services

NCCOS will operationalize its support to NOS and external management authorities (ONMS, OCM/NERR, BOEM) to provide climate-informed ecological assessments for sanctuary designation, condition reporting, vulnerability assessments, and spatial resource management. These support services will parallel and collaborate with the efforts of the regional FACSS.

Ecosystem Prediction

NCCOS will standardize a modeling framework to regularly project future ecosystem conditions in support of sanctuary designation and condition reporting. In addition, NCCOS will test this framework in coastal areas where NOAA Operational Forecast Systems and coincident LMR observations are available (e.g., National Estuarine Research Reserves)

Increasing Capacity for Climate Ready Decisions

NCCOS will assemble a team to assist development, deployment, and distribution of CEFI climate-informed products and services to support federal, state, and local stakeholders to evaluate management options and assess associated risks.

Climate Smart Decision Support Tools

NCCOS will provide climate-informed spatial management advice and tools, including model code-base, web-based map services, and attending data delivery through NOAA's National Centers for Environmental Information (NCEI) and other available data discovery and distribution platforms.

Beyond the NCCOS CEFI decision support work outlined above, funded under the IRA, NCCOS will leverage other existing NOS coastal modeling infrastructure and prediction services that are relevant to, but not yet supported under the initiative. These efforts align with the NOS modeling vision to “enhance prediction-based ecosystem management, understand the effects of climate change on living marine resources, and identify risk reduction strategies that optimize adaptation and resilience.”



NEAR-TERM ACTIVITIES

NCCOS will enhance its ecological modeling and assessment enterprise to support climate-informed, living marine resource management in coastal ecosystems with a focus in NOAA "Special Places" (e.g., National Marine Sanctuaries and National Estuarine Research Reserves). Work performed under the NCCOS CEFI portfolio will accelerate routine delivery of current and projected ecosystem condition scenarios, risk assessments, and management options that take into account the changing climate. Specific activities for the first two years of NCCOS CEFI include:

1. Develop a framework for providing climate-informed ecological assessments to assist NOAA's Office of National Marine Sanctuaries (ONMS) ongoing sanctuary designation processes, beginning with Hudson Canyon and proximal Mid-Atlantic shelf and slope ecosystems. These assessments would address known management requirements and include projections of critical indicators, living marine resources, and habitats under climate driven impacts to support sanctuary management and pending designations and expansion efforts across the sanctuary system.
2. Develop ocean model hindcast, particle trajectory and climate risk assessment tools for coastal Alaska marine resource management with the NOS Cook Inlet Operational Forecast System, and advance support of NOAA stewardship missions under the [NOS coastal modeling vision](#). NCCOS will work with other NOS offices, the Alaska Ocean Observing System, other regional partners and private industry to evaluate and improve model performance for resource management applications, support coastal community and habitat vulnerability assessments, provide tools for oil spill response planning, predict climate-related changes in species distributions, and conduct science to support shellfish restoration and coastal resiliency. These tools will help inform management and coastal planning efforts of the Kachemak Bay National Estuarine Research Reserve (NERR), BOEM Alaska Region, Alaska Department of Fish and Game, Alaska Native tribal organizations, and Kachemak Bay mariculture industry, and provide a testbed for applications that can be transferred to other Alaska regions.
3. Operationalize NCCOS support to ONMS in developing [sanctuary condition reports](#) and attending [climate vulnerability assessments](#); thereby providing a standardized summary of resources in NOAA sanctuaries, driving forces and pressures on those resources, and current conditions and projections for resources and ecosystem services. This will streamline historical NCCOS support to ONMS in developing management responses to pressures that threaten the integrity of the marine environment and expand historical support through our existing ecological modeling enterprise.
4. Hire 2 permanent federal staff to lead and coordinate NCCOS CEFI activities across NOAA and partners.

