

Topics at the nexus of climate change, fisheries, and blue foods

A webinar series highlighting the impact of climate change on fisheries, aquaculture, and the communities who depend on them

February 2026: Modeling the impacts of climate change on oceanic processes and fisheries

Date and time: February 19, 2026 at 11:00am US Eastern Time (UTC-5)

Presentation 1: Climate change risks for regional marine ecosystems and fisheries

Climate change is affecting ocean temperature, acidity, currents, and primary production, causing shifts in species distributions, marine ecosystems, and ultimately fisheries. Earth system models simulate climate change impacts on physical and biogeochemical properties of future oceans under varying emissions scenarios. Coupling these simulations with an ensemble of global marine ecosystem models has indicated broad decreases of fish biomass with warming. However, regional details of these impacts remain much more uncertain. Here, we employ CMIP5 and CMIP6 climate change impact projections using two Earth system models coupled with four regional and nine global marine ecosystem models in ten ocean regions to evaluate model agreement at regional scales. We find that models developed at different scales can lead to stark differences in biomass projections. On average, global models projected greater biomass declines by the end of the 21st century than regional models. For both global and regional models, greater biomass declines were projected using CMIP6 than CMIP5 simulations. Global models projected biomass declines in 86% of CMIP5 simulations for ocean regions compared to 50% for regional models in the same ocean regions. In CMIP6 simulations, all global model simulations projected biomass declines in ocean regions by 2100, while regional models projected biomass declines in 67% of the ocean region simulations. Our analysis suggests that improved understanding of the causes of differences between global and regional marine ecosystem model climate change projections is needed, alongside observational evaluation of modelled responses.

Webinar Presenter: **Tyler Eddy** is a Research Scientist at the Fisheries & Marine Institute, Memorial University, Canada. He is interested in past, present, and future human interactions with, and ecology of, marine ecosystems. Tyler is a Founding Coordinator of the Fisheries and Marine Ecosystem Model Intercomparison Project (FishMIP), a Steering Committee member of the Biodiversity and Ecosystem Services Scenario-based Inter-Model Comparison (BES-SIM), a Founding Section Editor of PLOS Ecosystems, and a Visiting Scientist at the Charles Darwin Research Station, Galápagos Islands, Ecuador.

Presentation 2: Upwelling systems as natural laboratories for understanding climate change impacts on marine ecosystems and fisheries

Eastern Boundary Upwelling Systems (EBUS) are highly productive and highly variable ocean systems. Forage fish in EBUS represent some of the world's most important fisheries resources, while playing a key role in the food-web as prey for other fish, seabirds and marine mammals. Understanding how the climate-driven variations and shifts in temperature, planktonic productivity, and oxygen conditions affect ecosystem functioning, fisheries yield, and fishing-dependent communities in EBUS can therefore help us to better understand the resilience of marine fisheries systems to climate change. This presentation will discuss process-based ecological models for the California Current (CaCu) and the Northern Humboldt Current (Peruvian) systems, which link fish population and food-web dynamics fitted to observations, to

climate forcing from regional ocean-biogeochemical models and fisheries impacts. An age-structured Model of Intermediate Complexity (MICE) for the CaCu explicitly represents environmental driving of processes such as recruitment, food availability, migration, and reproduction, using an ensemble approach to quantify ecological uncertainty. A spatial food-web model (Ecosim-Ecospace) for the Peruvian upwelling system captures environment-driven dynamics in fisheries resources, trophic interactions and regionally detailed socio-economic scenarios. Using future projections under regionally downscaled Earth system models, we assess climate-driven shifts in fish productivity, food-web interactions, spatial distributions, and fisheries over the 21st century. The presented models support ecosystem-based fisheries governance and the co-development of adaptation strategies to sustain blue food production under global change.

Webinar Presenter: **Stefan Koenigstein** studies marine ecosystems and fisheries, combining concepts and methods from ecology, ecophysiology, and the climate and sustainability sciences to investigate how marine living resources are shaped by environmental and ecosystem conditions, and impacted by fisheries and other anthropogenic pressures. Dr. Koenigstein uses ecological models as integrative tools to better understand system responses, feedbacks and possible future trajectories, incorporating observational and experimental data, regional ocean and earth system model output, and stakeholder input. A primary focus of the modeling is on increasing incorporation of biological processes and advancing quantification of uncertainty. Dr. Koenigstein aims to improve the potential of models for extrapolation into the future under multiple global change drivers, and support the co-development of scientific advice for ecosystem-based governance and adaptation.

Since 2025, Dr. Koenigstein has led the newly established Working Group Ecosystems and Resource Sustainability at Leibniz Centre for Tropical Marine Research in Bremen, Germany. Previously, Dr. Koenigstein was a Project Scientist at University of California Santa Cruz and NOAA Southwest Fisheries Science Center, working on multi-species population dynamic models for forage fish species in the California Current. He has worked in interdisciplinary research projects in Peru, Portugal and Norway, linking marine ecology to fisheries, with an additional focus on incorporating local stakeholder input. He has also led the development of an educational table-top/role-playing game for high schools and environmental education groups, teaching an understanding of ocean systems and their users (www.ocean-limited.com).



This webinar series is jointly hosted by the UN Ocean Decade Programs [Blue Food Futures](#), [Fisheries Strategies for Changing Oceans and Resilient Ecosystems \(FishSCORE\)](#), [Sustainability, Predictability, and Resilience of Marine Ecosystems \(SUPREME\)](#), [Sustainability of Marine Ecosystems through Global Knowledge Networks \(SmartNet\)](#), and [Fisheries and Marine Ecosystem Model Intercomparison Project \(FishMIP\)](#) and endorsed project [Basin Scale Events to Coastal Impacts \(BECI\)](#). This webinar series highlights current efforts and challenges at the climate-fisheries nexus. Presentations and discussions will range from data-driven efforts to better understand oceanographic and biological changes affecting fisheries, to how the results can be used to inform fisheries management, aquaculture, and sustainable food decisions, to the many ways people and broader communities are being impacted by and adapting to changes in marine ecosystems and marine resource use.