



Tools for Sustainable Fisheries: EcoCast and Dynamic Ocean Management

Overview

Traditional approaches to sustainable fisheries management can put ecological goals in conflict with economic needs. How can fishers continue to catch the same amount of fish while decreasing the amount of protected or threatened species they catch? This conflict eases when fisheries managers use a new tool that integrates multiple sources of data—collected by satellites, remote sensors and people—to improve fishing operations. Called “EcoCast,” this **ecosystem forecast** tool was developed by researchers with NOAA, Stanford and other research institutions. It allows fisheries managers to predict daily relative catch and bycatch probabilities in near real-time.

Key Points for Policymakers

- ▶ **Dynamic ocean management tools like EcoCast allow fisheries managers to meet the dual objectives of ecological and economic sustainability.** This tool helps fishers choose ideal fishing locations by tracking ocean conditions, collecting on-site fisheries data and incorporating species tracking data.
- ▶ **Tools like EcoCast can help increase productivity by improving efficiency (reducing bycatch).** The use of approaches like EcoCast can help safeguard protected and endangered species, such as loggerhead and leatherback turtles, small dolphins, beaked whales and California sea lions, each of which frequently becomes bycatch along the California coast.

- ▶ **These types of ocean management tools can be used to reduce the frequency of fisheries closures (fishing bans).** By implementing dynamic management approaches, the area of existing closures could be reduced by 2 to 10 times while maintaining conservation goals.

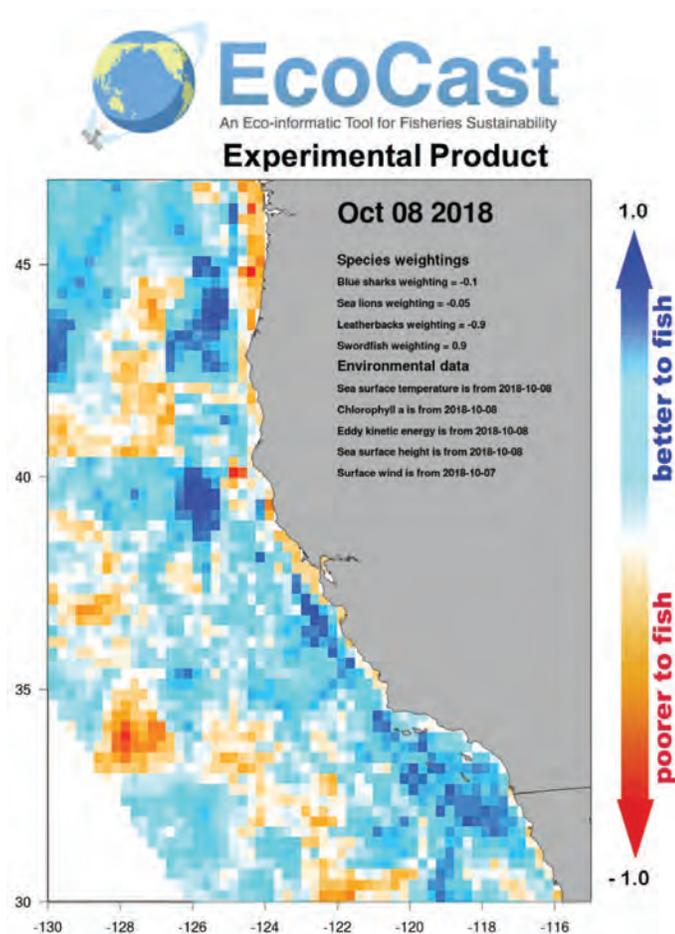
Background

Preventing overfishing is integral to achieving the UN Sustainable Development Goals of zero hunger (*SDG2*) and protecting life below water (*SDG14*). Maintaining global fish populations is also critical in order to feed the 3 billion people worldwide for whom seafood is



Fishing vessel off the coast of southern California.

an essential source of protein. Fishing efficiently and sustainably will only become increasingly difficult as the ocean reacts to the changing climate and other human impacts. For example, fish populations will shift as temperature and chemical changes in the ocean alter habitat conditions.



The above map uses environmental data to predict where species are likely to be each day, minimizing bycatch and maximizing target catch for fishers.

While U.S. fisheries have made significant progress in balancing conservation with fishing industry needs—primarily due to the historic *Magnuson-Stevens Fishery Conservation and Management Act of 1976*—transitioning from static, single species management approaches to dynamic, multispecies approaches can help sustainably manage fisheries and reduce bycatch in the future.

With the advent of tools like EcoCast and sufficient available data, bycatch can be dramatically reduced. This will help protect endangered species, keep our fisheries sustainable and support fishing communities. While EcoCast was designed for a specific fishery that had ample accessible data, evidence suggests that in the future, dynamic methods—with real-time monitoring tools that allow fisheries managers to rapidly adapt to changing conditions—will improve our ability to fish sustainably.

About the Authors

Elliott L. Hazen is a research ecologist with the National Oceanic and Atmospheric Administration Southwest Fisheries Science Center and a visiting scholar at the Stanford Woods Institute for the Environment.

Larry Crowder is the Edward Ricketts Provostial Professor of Marine Ecology and Conservation at Stanford's Hopkins Marine Station, a senior fellow at the Stanford Woods Institute for the Environment and codirector of Stanford's Osa & Golfito Initiative.

Sarah Mesnick is an ecologist and the lead for Communications at the Southwest Fisheries Science Center, NOAA Fisheries, and adjunct professor at Scripps Institution of Oceanography, UC San Diego.

This brief is based on the paper "*A dynamic ocean management tool to reduce bycatch and support sustainable fisheries.*"