

Fisheries data powerhouse EMerges in the Gulf

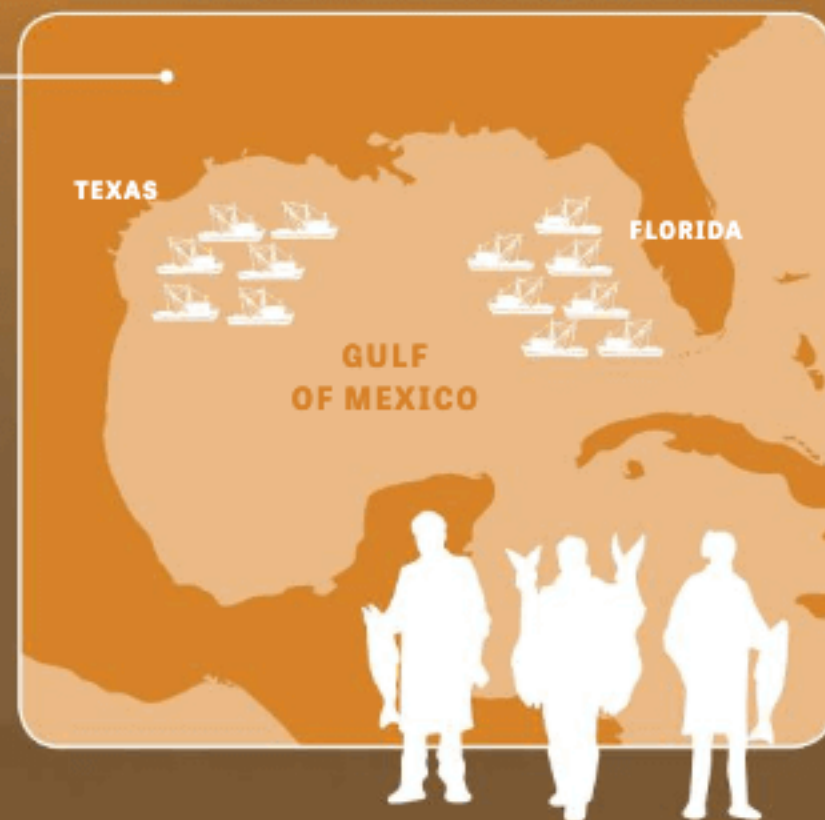
Check out how the Center for Fisheries Electronic Monitoring at Mote (CFEMM) has grown with the goal of filling data gaps on the snapper-grouper fishery and its bycatch.

Fishers carry EM science farther

Bottom longline and vertical line fishers originally carried Mote's EM gear to the West Florida Continental Shelf, and in the past two years, they've expanded CFEMM's reach into the northern and western Gulf of Mexico.

Seven Florida vessels and six Texas vessels of the commercial snapper-grouper fishery carried EM gear for CFEMM this year, nearly doubling 2018 participation.

"Captains here in Texas were so happy to participate that there weren't enough cameras for everyone at the time," said Capt. Buddy Guindon, Founding Member & Executive Director of the Gulf of Mexico Reef Fish Shareholders' Alliance, who helped connect Mote with the Texas fishers.



Tools that rule

NOAA Fisheries observers measure fish length aboard commercial vessels at sea—an indicator of fish maturity and determinant of legal size. To expand upon those data, Mote's CFEMM is testing a digital "ruler" from Saltwater, Inc., with the goal of documenting fish length from videos.



Shark bycatch concerns grow

Based on CFEMM data from bottom longline vessels, incidental shark bycatch increased from about 4% in 2017 to 6.2% of the total catch by early 2019, a concern for both industry and shark conservation. Some shark species are prohibited from harvest to protect vulnerable populations; others can be caught with appropriate permits but can damage catch and bottom longline gear.

Apparent increases in incidental shark encounters "are frustrating for fishers working to make a living," said Max Lee, a NOAA Fisheries Observer who recently joined Mote's CFEMM as staff biologist and advanced its protocols for accurately identifying sharks in EM videos.



UCAM aims to deepen bycatch data

Current, above-water EM cameras can't see all shark bycatch. "For sharks too large to bring aboard to remove the hook, the line is cut as the shark nears the side of the vessel," Lee said. "At times we just see the flash of a fin or a shadow underwater"—not enough to identify species. To identify sharks more accurately, Mote citizen-scientist volunteers headed by Joe Gill, and industry partners, are testing an underwater camera system, nicknamed UCAM. The

team ran six tests of a prototype UCAM on private and commercial charter-for-hire vessels—investigating how to mount UCAM unobtrusively, camera angle, field of view, depth of field and how water clarity affects video. By October, they were ready to test a new mounting system designed by Brad Kapper and Chuck Casagrande of SeaSucker, LLC, to attach UCAM to a commercial fishing vessel with a "dummy" camera for its maiden voyage. UCAM represents a big step forward: a novel integration of an underwater camera with EM software to improve fisheries bycatch documentation.

CFEMM: A data goldmine

After a fishing trip, Mote's EM team confidentially reviews the collected video, identifying fish species caught and discarded with 99% accuracy and using software from Saltwater, Inc., to consistently document when fish are alive or dead, intact or damaged—for instance, by sharks or marine mammals. New quality control processes coded by Mote scientist Dr. Ryan Schloesser help catch errors automatically.

CFEMM has amassed 70,000 records of caught and discarded species—just from sampling 25% of their recorded fishing events!

CFEMM partner Daniel Roberts of Waterinterface, LLC, is working to statistically model how fishing practices and environmental conditions influence species of interest. For example, if CFEMM can provide data on the most cost-effective fishing locations, and areas to avoid high shark bycatch, industry will benefit.

From data to decisions

Mote's CFEMM scientists are working with NOAA research partners on specific opportunities for EM to address management goals, particularly for data-limited species. Mote is providing CFEMM collected data and investigating methods for applying new EM technologies—i.e., to automate fish measurements and facial recognition of species as they come aboard.

EM could help address other management questions as well. For example, reviewing EM imagery of which species are discarded and caught together is useful for quantifying predation—i.e., if fishers are losing catch because it is being preyed upon by sharks or porpoises.

