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Changes in North Atlantic right whale distribution

North Atlantic right whales (NARWs; *Eubalaena glacialis*) are one of the least abundant baleen whales, with recent evidence suggesting a further decrease in their population. Understanding NARW distribution and movement patterns is critical for management and conservation efforts, particularly noting recent observations of NARWs in unexpected locations. Davis et al. used a decade (2004-2014) of passive acoustic monitoring data collected by 19 organizations throughout the western North Atlantic to assess changes in the distribution of NARWs along the eastern coast of North America. Their findings suggest that NARWs are broadly distributed across the eastern shore of North America from the Western Scotian Shelf to the coast of Jacksonville, FL, and that their habitat use has changed over time. However, data also suggested that the entire population does not consistently migrate on an annual basis and those individuals that do not migrate may have a broader distribution throughout the year.
Photo courtesy of NEFSC

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Management efforts reduce sea turtle bycatch

Sea turtle bycatch in longline fisheries has been associated with population declines for leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*) sea turtles, and led to the implementation of regulations on longline vessels fishing

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swordfish and tuna in the Pacific and parts of the Atlantic. Swimmer et al. examined 20 years of fisheries observer data and found that with the implementation of regulations, sea turtle bycatch declined in the Atlantic by 40% for leatherback and 61% for loggerhead turtles. For the Pacific shallow set fishery, bycatch declined by 84% for leatherback and 95% for loggerhead turtles. Swimmer et al. also used generalized additive mixed models (GAMMs) to assess the probability of expected sea turtle interactions with consideration given to fishing location, hook type, bait type, sea surface temperature, and use of light sticks. GAMMs results suggested that circle hooks reduced capture probability in general and that fish bait rather than squid reduced capture probabilities for loggerheads in both the Atlantic and Pacific, and for leatherbacks in the Atlantic only. This work highlights the value of maintaining a long term data set of observed target and non-target species caught in U.S. longline fisheries, and shows that the regulations were effective in significantly reducing sea turtle bycatch in U.S. longline fisheries.

Photo courtesy of TAMAR

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Varied controls on endangered Hawaiian monk seal populations

Understanding how ecosystem processes can impact population trends is critical to the recovery and stability of endangered species such as the Hawaiian monk seal *(Neomonachus schauinslandi*). In order to better understand the decrease in monk seal biomass at French Frigate Shoals (FFS) and more stable biomass and Laysan Island and the underlying ecosystem dynamics, Weijerman et al. used trophic models to compare ecosystem structure and energy flows and simulated perturbations (altered predator abundance, altered monk seal prey abundance, and altered primary productivity). Modeling efforts suggested that both populations are influenced by changes in productivity and that predator and prey abundance influenced energy flow and community structure. Reductions in prey fish biomass (through fishing) resulted in decreases in monk seal biomass but a change in predator abundance was less influential in Laysan compared to FFS. Trophic dynamics alone were not enough to explain declines in monk seal biomass and there are likely other factors (e.g., shark predation on pups at FFS) influencing mortality especially in FFS. For more info, see the Pacific Islands Fisheries Science Center news release.

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Sea turtle brevetoxin exposure in Texas

After two *Karenia brevis* blooms (red tide) in October 2015 and September-October 2016 off the southern coast of Texas, 5 green (*Chelonia mydas*) and 11 Kemp's ridley (*Lepidochelys kempii*) turtles were either found dead or died soon after stranding. The turtles were tested for brevetoxin exposure by ELISA analysis of liver and kidney tissues, and stomach and intestinal contents. Brevetoxins were found in one or more tissues of all 16 turtles, and necropsy and brevetoxin analysis suggested that 10 of the Kemp's ridley and 2 of the green turtles died due to brevetoxicosis via ingestion. This is the first documentation of sea turtle death associated with brevetoxicosis in Texas.

Photo courtesy of NOAA Fisheries

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The **Protected Species Science Branch (PSSB)** within the NOAA Fisheries Office of Science and Technology supports and provides the science necessary to inform management decisions. We do this by coordinating closely with the six Fisheries Science Centers, the Office of Protected Resources, and other NOAA Headquarters Offices.

This newsletter is intended to summarize the latest research on protected species from scientific publications that include one or more NOAA Fisheries authors. It will be distributed quarterly with alternate issues highlighting research from the East and West Coasts centers and offices.

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