



Northeast Fisheries Science Center



Science Spotlight

Contact: Shelley Dawicki
508.495.2378
Shelley.Dawicki@noaa.gov
NOAA/NMFS/NEFSC
166 Water St.
Woods Hole MA 02543

August 19, 2009
SS09.07A

NOAA Researchers Find Some Surprises on Mid-Atlantic Ridge Survey

Potential New Species and Distribution of Animals Among Highlights

Many unique specimens, some which may turn out to be new species, and animals thought to be living in certain depths but found living in others were among the highlights of a recently completed survey on the Mid-Atlantic Ridge.

An international team of scientists headed by NOAA's Mike Vecchione of the Northeast Fisheries Science Center (NEFSC) in Woods Hole, Mass. surveyed the Mid-Atlantic Ridge halfway between Iceland and the Azores to determine its biodiversity and perhaps find new species and clues to deep-sea food webs.

The research team spent five weeks in June and July aboard the 208-foot NOAA Ship *Henry B. Bigelow* working on the Mid-Atlantic Ridge Ecosystem Project, or MAR-ECO, part of a 16-nation effort to determine if the underwater mountain chain in the middle of the North Atlantic Ocean has its own distinct animal communities.

"We caught many unique specimens, including some that may prove to be new species after detailed follow-up studies ashore," said Vecchione, a specialist in deep-sea squids and octopods who also serves as director of the Fisheries Service's National Systematics Laboratory at the Smithsonian Institution. "We also caught representatives of species that were previously known, but only from very few specimens. Because we were using large gear, we were able to collect large specimens of species for which the later life-history stages were previously poorly known or unknown."

The MAR-ECO project is one of 14 field programs that are part of the Census of Marine Life, a 10-year global study of the abundance, distribution and diversity of marine life in the world's oceans.

"The mid-ocean ridge system is a huge and largely unexplored feature of the earth. We have built upon previous international MAR-ECO field work to begin to fill in

the gaps in our knowledge about the ridge and its associated oceanic areas," Vecchione said. "A major focus of this cruise was the bathypelagic fauna. The bathypelagic is the largest but least explored ecosystem on our planet. Although it comprises the majority of earth's living space, there have been very few studies of the animals that live there. MAR-ECO is the only Census of Marine Life project studying the bathypelagic nekton, the swimming animals like fishes, shrimps, and squids."

Much of the expedition focused on an area of the ridge around 52 degrees north latitude known as the Charlie Gibbs Fracture Zone, where water depths range from 1,600 to almost 15,000 feet and the terrain is very rugged.

"The *Henry Bigelow* is capable of sampling very deep with very large nets, which allowed us to catch things that could not effectively be sampled with standard, smaller gear in midwater or small trawls on the bottom," Vecchione said." In addition to adding to our knowledge of ecosystem structure, a major goal of this cruise was to support studies of ecosystem processes. We collected a lot of samples for studies of food-web relationships, age growth and maturity, and genetic relationships with similar fauna in other parts of the North Atlantic."

Rough weather at times hampered operations, but Vecchione said the cruise was a great success. "A preliminary impression from our midwater tows is that animals normally thought of as living very deep in the water column seem to be closer to the surface than expected above the ridge. Additionally, some species that were thought to live in the open water column seem to be associated with the bottom in the ridge area. Given the overall size of the global mid-ocean ridge system, if these patterns are correct they have important implications for general oceanic ecology."

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Related links:

June 30 Science Spotlight on MAR-Eco cruise:

http://www.nefsc.noaa.gov/press_release/2009/SciSpot/SS0907/index.html

Mar-ECO: <http://www.mar-eco.no/>

Background on the deep-sea squid *Promachoteuthis sloani*:

http://tolweb.org/Promachoteuthis_sloani/19529