

THE WORKING WATERFRONT



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Column

Science Potpourri for the Holidays

by Dr. Heather Deese and Catherine Schmitt

We started Fathoming in an attempt to go deeper into the science behind the news about our coast and the Gulf of Maine. Over the past two years, we have written about everything from offshore wind's impacts on marine fauna to ocean acidification, oyster disease, whales and the persistent abundance of lobsters. We've talked with lots of scientists. But there are many more stories that we did not get to. Here, then, we take a look back at a few science stories of 2011 that we did not cover in previous columns.

Turns out lobsters talk

Maybe no surprise to lobstermen who handle thousands of lobsters every week, researchers documented for the first time this year that lobsters make sound—part groan, part buzz—by vibrating the carapace, the largest part of the shell. A research team working in Dr. Win Watson's laboratory at the University of New Hampshire conducted a series of experiments to study lobster noise-making habits.

They held lobsters in separate tanks—either alone, with other lobsters, or with fish, including cod and striped bass. The lobsters held alone made only one or two sounds in each 30-minute period, while those in the tanks with striped bass made 15 sounds, and those with cod made a raucous 50 sounds in the half hour. The research team conducted a series of experiments with the sounds, and documented that 75 percent occurred when fish approached within a foot or two of the lobster, and often resulted in the fish moving away, leading to the conclusion that lobsters may be sounding off in order to discourage fish predation.

Carbon snowstorms in the sea

Mary Jane Perry's research group from the University of Maine spent most of the 2008 spring on large research vessels, using a novel approach to study the annual spring phytoplankton bloom in the North Atlantic. Perry's group teamed with scientists from other institutions to deploy robotic floats, autonomous instrument platforms that float passively at a specified depth within the water column. They also made a series of measurements from the research vessels, via instruments lowered thousands of feet from the side of the ships.

Their observations, published in 2010 and 2011, provided rare real-world data of phytoplankton drifting from the surface to deeper waters. They were able to document major phytoplankton "sinking events" when phytoplankton clumped together and fell more than 300 feet through the water column, a phenomenon scientists call "marine snow" and a critical part of the global carbon cycle known as the biological pump. Some percentage of the carbon in the atmosphere (including the carbon pollution we cause by burning fossil fuels for electricity, heat, and transportation), is taken out of the air by land plants and phytoplankton, and eventually the carbon is "pumped" into soil or the seafloor as plants or phytoplankton die and become buried.

Carbon sequestration in the deep sea, thanks to sinking phytoplankton, is a key process that researchers around the world are incorporating into global climate models. Perry's group not only tracked the

progression of the spring phytoplankton bloom clumping and sinking in specific patches of ocean water, but also used the data to test and adjust computer models that will eventually be used to refine global climate projections.

Tiny owls and abundant falcons visit on Maine's offshore islands

The BioDiversity Research Institute (BRI) is based in Gorham, Maine, but is known internationally for its studies of mercury contamination in wildlife. In recent years, it has expanded its focus including new investigations into coastal bird migrations.

BRI researchers made headlines again last year when they unexpectedly captured 253 northern saw-whet owls on Isle au Haut, a finding that inspired an investigative effort that spanned the coast of Maine in October 2010. They documented that these tiny owls, weighing barely as much as a pencil, fly over open water and use islands as stopover sites during their migration. In addition to helping protect vulnerable species, this kind of data can inform future siting decisions for wind power facilities and other development.

BRI's island-based studies of raptors, particularly hawks and falcons, uses methods that include visual observations, banding and tagging with satellite transmitters. The two female peregrine falcons that Chris Desorbo's team was able to fit with satellite tags travelled between Monhegan Island in Maine and the northern shores of South America over a two-month period in fall 2010.

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Heather Deese holds a doctorate in oceanography and is the Island Institute's vice-president of programs. Catherine Schmitt is communications coordinator for Maine Sea Grant.

What scientific insights will be gained in 2012? What stories need to be revisited? Please contact us with your ideas by emailing editor@workingwaterfront.com