American Lobster Settlement Index

Update 2009

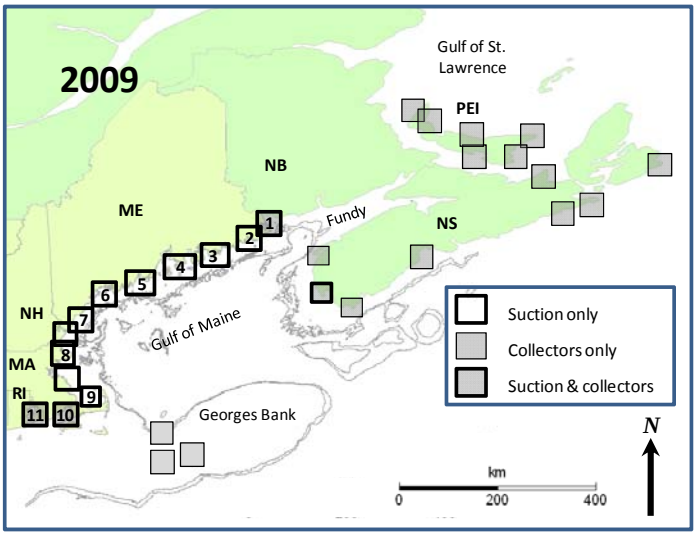
Compiled by: Richard Wahle (University of Maine, Darling Marine Center, richard.wahle@maine.edu)

Participants: ME DMR (C. Wilson), MA DMF (R. Glenn), RI DFW (M. Gibson), DFO Canada (M. Comeau, P. Lawton, G. Sharp, J. Tremblay), UNB (R. Rochette), Guysborough Co. Inshore Fishermen's Assoc., NS (E. O'Leary), Fisherman & Scientist Research Soc. (P. King)

In June of 2009 the settlement index celebrated its 20th anniversary. It was an eventful year, featuring an anniversary workshop, exploratory deployments of passive collectors into new US offshore and Canadian territory, and as we enter 2010, deliberations are under way to give the index reference point status in future US Stock Assessments. This year's *Update* gives the results of the 2009 settlement survey, as well as a brief overview of these new developments.

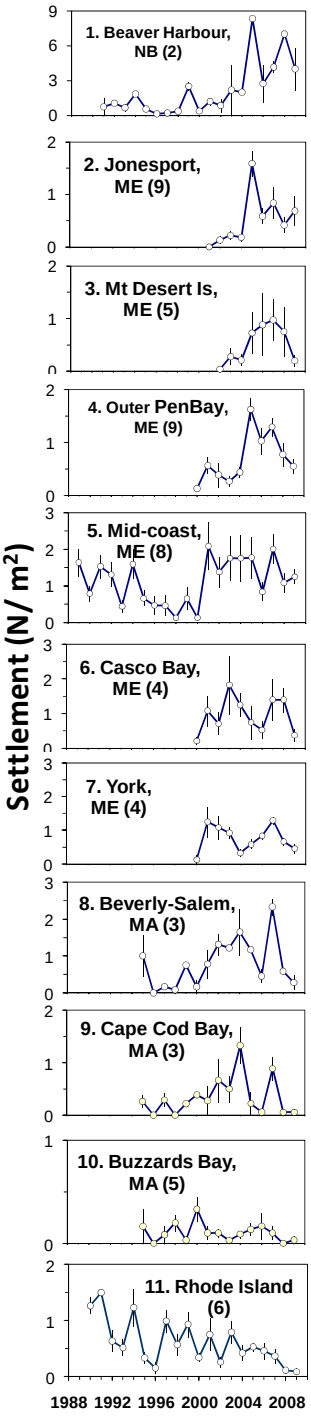
20th Anniversary Workshop: The workshop was held as a two-day retreat on Burnt Island in Boothbay Harbor, Maine. Sponsored by Bigelow Laboratory, Maine DMR, and Maine Sea Grant, it convened some 40 participants from New England and Atlantic Canada, some of whom were the early inspirations behind the program. The aim: to look back at our accomplishments and look ahead to set priorities for the future of the program. The first day involved a recap of the geographic expansion of settlement monitoring over two decades, and spot-lighted research that has emerged from it over the years, from larval transport modeling to forecasting fishery recruitment. During the second day, priorities were set by participants under three major headings, survey methodology, assessment, and understanding ecological processes. For a more detailed workshop summary, go to the Wahle lab website: http://www.umaine.edu/marine/people/sites/rwahle/LobsterSettlementIndex.htm.

Settlement Pattern in 2009: Diver-based suction sampling has provided the standard index of settlement over the years, but collectors have been used more widely in places where diving is unsafe or impractical (Fig. 1). In what we hope is a more informative presentation of the time series than in past updates, Fig. 2 gives the time trends for 11 regions that have more than 5 years of suction sampling data. Settlement in 2009 continued a wide-spread downturn that started in many areas in 2008. While the overall trend in southern New England has been in a rather dismal decline over the past several years, eastern Maine and the lower Bay of Fundy continue to be on an upward trajectory. Much uncertainty and concern surrounds the cause of southern New England's declines; speculation includes the impact of warming sea temperatures, shell disease, and heightened losses of larvae and postlarvae. The upward trend in eastern Gulf of Maine and Fundy, in contrast, remains equally unexplained, but may bode well for the region's future landings.



← **Figure 1.** Lobster settlement data were collected in 2009 either by suction sampling, passive collectors, or both. Boxes with numbers surround suction sampling sites used for regional averages in Fig. 2 at right.

→ **Figure 2.** Complete time series of settlement, expressed as mean densities of Young-of-year lobsters at 11 regions with five or more years of suction sampling data. Number in parentheses is number of sites sampled.



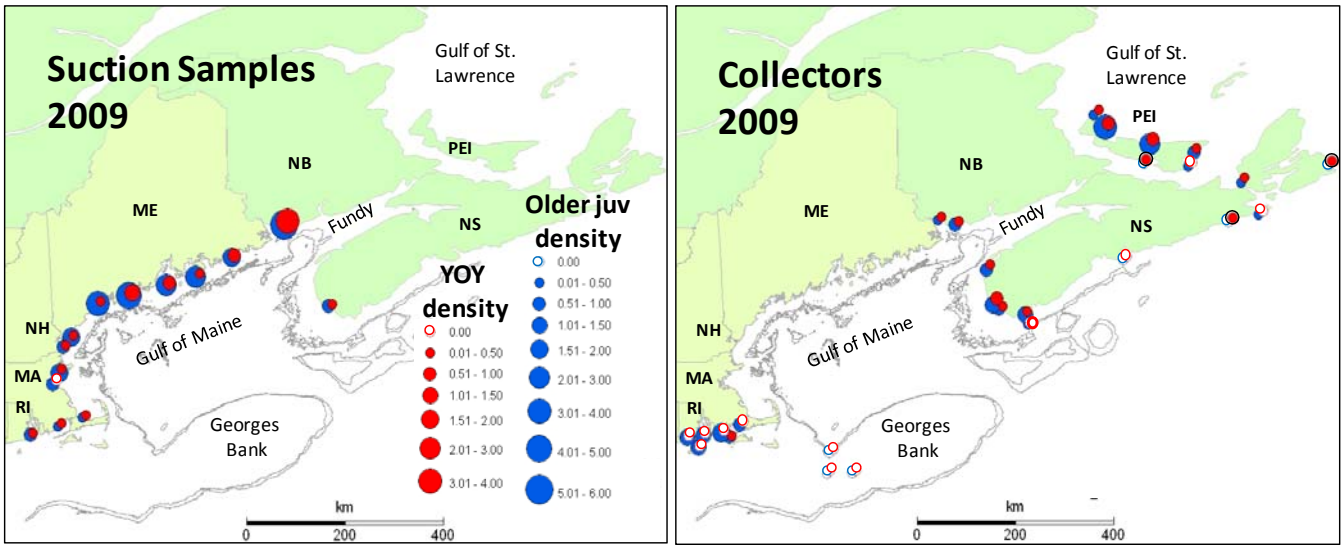


Figure 3. Spatial patterns by suction sampling and collector. Average densities of young-of-year (**red**) and older juvenile lobsters (**blue**) found in suction samples (**left**), and collectors (**right**) deployed in 2009. Symbols represent regional multi-site averages.

Collectors in New Territory: The use of cobble-filled, passive postlarval collectors deployed from fishing boats continued to expand into new territory in 2009. The collectors sample both young-of-year lobsters settling from the plankton, as well as older juveniles that walk in from the surrounding seabed. In separate fisherman-scientist collaborations, all told, some 1341 collectors were set between Rhode Island and the southern Gulf of St. Lawrence (Fig. 1). Canadian groups led by John Tremblay (DFO) in Southwest Nova Scotia, Michel Comeau (DFO) in the southern Gulf of St. Lawrence, Gene O'Leary of the Guysborough County Fishermen's Cooperative in eastern Nova Scotia, and Remy Rochette of U. New Brunswick, intensified deployments in their regions. Meanwhile on the US side, Bob Glenn (MA DMF) led a southern New England Cooperative Research project to renew and expand sampling off coastal Rhode Island and Buzzards Bay, while Rick Wahle and collaborating harvester, Bob Colbert, finished off a Northeast Consortium project with the first exploratory collector deployments on the southwest corner of Georges Bank. Collector based sampling revealed relatively high densities of recent settlers and older juveniles in southwest Nova Scotia and Prince Edward Island. Young-of-year or older juveniles were found in virtually all coastal locations, but disappointingly, no lobsters of any size were found on Georges Bank. It is surely too soon to draw conclusions about settlement on offshore banks given the huge area and the limited sampling coverage to date.

A New Reference Point: The settlement index has also just achieved new status in the stock assessment world. The Atlantic States Marine Fisheries Commission is charged with conducting the US Stock Assessment for lobsters, and has for a number of years used the settlement index as one of the indicators of the health of the resource. The ASMFC Lobster Management Board is now considering reference points that represent thresholds for management actions. One new reference point about to be implemented states that if stock abundance, as determined by trawl surveys, is running 25 to 50% below its long-term average, *and* the settlement index has fallen below 25% of its own long-term average for three of the past five years, a conservation measure will be triggered to rebuild the fishery. Details on the new reference points and stock status by assessment area will be available on the ASMFC website http://www.asmfc.org/ under *Breaking News* by 21 May.

Looking Ahead: As we enter the summer of 2010, the lobster settlement collaborative is making progress on several fronts. At a February meeting hosted by the Fisherman and Scientist Research Society, the collaborative agreed to make efforts to streamline and automate data management and sharing. Canadian workers are committing to continued monitoring with collectors for at least the next few years, and are considering deployments on Brown Bank off southwest Nova Scotia in 2010. Additionally, refined size-definitions for young-of-year and 1-year-old lobsters will be forthcoming. ϴ