



PLEASANT BAY
ALLIANCE

New Study Reveals Unexpected Information about Pleasant Bay Tidal Patterns

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The formation of a second inlet in the Nauset Barrier Beach in 2007 resulted in bigger tides in Pleasant Bay. However, a new study by the Provincetown Center for Coastal Studies (PCCS) finds that over the past two years that trend has reversed.

Following the second inlet in the Nauset Barrier Beach in 2007, higher high tides and lower low tides were observed throughout Pleasant Bay. Consequently, the measured difference between high and low tides, known as tidal range, was expanding. Tidal range is a key indicator of changes in the volume of water flowing in and out with the tides. If tidal range is expanding, there's a good chance that the volume of water exchanged with the tides also is growing.

A new study of tide data conducted by PCCS for the Pleasant Bay Alliance reveals that the volume of water flowing in and out of Pleasant Bay in 2012 is about the same as it was right after the second inlet formed in 2007. This is due to the fact that the increase in tidal range experienced after the 2007 inlet reached a peak in March of 2010, and has experienced a slight but steady decrease in the two years since. Tidal range is now less than at any time since soon after the formation of the second inlet in 2007, and mean high water is lower than it has been since 2009.

"A confluence of local and regional factors is contributing to these trends," according to Graham Giese, author of the study. "Localized shoaling is restricting out-flowing water during low tides, keeping low tides higher. On the other end of the tidal cycle, a downward trend in regional mean sea level is having a downward influence on high tides in Pleasant Bay and elsewhere," Giese said. "We don't know how these trends will evolve, but the data gathered over the past seven years is conclusive," Giese said.

The report examines data collected from tide gages installed at Meetinghouse Pond in Orleans, the Fish Pier in Chatham, and Boston Harbor. The Meetinghouse Pond gage is owned and monitored by the Cape Cod National Seashore, and the Boston and Chatham gages are owned and monitored by the National Oceanographic and Atmospheric Administration (NOAA).

“Many people ask us what is going on with tide levels in the Bay, and rather than rely on observations or impressions we wanted to understand what the data indicate are the trends,” said Carole Ridley, Alliance Coordinator. She added that the report would be valuable to local and regional resource managers, and provide further information to help assess options for addressing nutrient loading throughout the system, and for evaluating proposals for coastal structures. “The findings demonstrate that Pleasant Bay is a complex and dynamic system, and that we cannot rely on tidal flushing to ensure healthy water quality,” Ridley said.

The study may be downloaded from the Alliance website at www.pleasantbay.org, from the home page, the reports and documents page or the coastal processes program page.

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The Pleasant Bay Alliance is the organization of Chatham, Brewster, Orleans and Harwich formed to implement the resource management plan for the Pleasant Bay Area of Critical Environmental Concern and watershed. The Alliance’s programs and activities encompass technical research, policy development, and public education.