10-2014

Morphologic Changes of a Heavily Developed and Modified Back-Barrier System: Hampton-Seabrook Harbor, New Hampshire

Larry G. Ward
University of New Hampshire, lgward@ad.unh.edu

J. D. Irish

GSA 2014
19-22 October | Vancouver, BC, Canada
THE GEOLOGICAL SOCIETY OF AMERICA®

2014 GSA Annual Meeting in Vancouver, British Columbia (19–22 October 2014)

Paper No. 340-3
Presentation Time: 1:45 PM

MORPHOLOGIC CHANGES OF A HEAVILY DEVELOPED AND MODIFIED BACK-BARRIER SYSTEM: HAMPTON-SEABROOK HARBOR, NEW HAMPSHIRE

WARD, Larry, Center for Coastal and Ocean Mapping/Joint Hydrographic Center, School of Marine Science and Ocean Engineering, University of New Hampshire, Durham, NH 03824, larry.ward@unh.edu and IRISH, James, Ocean Engineering Program, School of Marine Science and Ocean Engineering, University of New Hampshire, Durham, NH 03824

Hampton-Seabrook Harbor, New Hampshire, is a heavily developed and highly modified back-barrier system characterized by unstable tidal channels, extensive sand shoals, and fully developed salt marshes with extensive high marsh platforms. The back-barrier system, along with the accompanying tidal inlet (Hampton Inlet) and barriers (Seabrook Beach and Hampton Beach) have been modified by jetties, seawalls, bulkheads, frequent dredging and periodic beach nourishment. Since 2002, several studies have been conducted by the University of New Hampshire with assistance from the USACE to assess the morphologic development of the back-barrier system and potential impacts of engineering structures. The semidiurnal tides in Hampton-Seabrook Harbor (2.5 m mean; 2.9 m spring) are controlled by eight tidal constituents (99% of the variance), with the M2 and N2 constituents accounting for 96% of the variance. Meteorological conditions cause aperiodic storm surges as demonstrated by water levels in the upper estuary being ~50 cm higher than predicted during a wind event. Typically, water level residuals (surges) result from weather forced sea-level changes in the western Gulf of Maine propagating into Hampton-Seabrook Harbor. The tidal forcing in Hampton-Seabrook Harbor results in strong tidal currents in the back-barrier channels with peak observed velocities on the order of 50 to 75 cm/s, with significant vertical and cross-channel flows (~10 to 20 cm/s). Orthorectified aerial imagery from 1943 to present reveal the evolution of the back-barrier system and how modifications of the inlet via jetty construction and extension have impacted the ebb tidal delta complex.

Session No. 340
T179. Back-Barrier Systems in Times of Change
Wednesday, 22 October 2014: 1:00 PM-5:00 PM

Vancouver Convention Centre-West 212
Geological Society of America *Abstracts with Programs.* Vol. 46, No. 6, p.818

See more of: Back-Barrier Systems in Times of Change
See more of: Topical Sessions

<< Previous Abstract | Next Abstract >>