

Beaches Conference 2019

Understanding Beach Change

(36 attendees)

Larry Ward, Assessing the Stability of NH Beaches: a study involving UNH, NH State Agencies, and Citizen Scientists

- Vol BP in NH 3 years ago.
- Why are we doing this?
 - Need scientific input to aid management decisions and planning
 - No long-term study has been done for NH
- What do we do with dredged sediment?
 - Need more input on where dredge materials go in future – other than Seabrook
- Volunteer Beach Profile Program in NH
 - 6 major NH beaches
 - 5 year plan
 - Expanded number of stations
 - Next step: linking with NH Geological Survey for Web
- Wallace Sands
 - 39 profiles taken from Dec 2016 – May 2019
 - Long term and significant events impacts
 - Building of man-made berm in July 2018 – eroded back
- How to deal with all the data in a meaningful way
 - Too soon for LT trends
 - Assess events
 - Convert to volumetric comparisons
- WS 2
 - Erosion of dune system from Riley
 - But deposited off shore and slowly returning to rebuild beach
 - Less impact in winter 2019
- Jenness Beach
 - Also major impact from Riley plus change in beach sediment to pebble from sand; upper beach accretion and berm formation, lower beach erosion
 - Less impact in winter 2019
- North Hampton
 - Part year sandy, part rocky
 - Post Riley major transport of boulders at seawall into road from storm and surge – major damage caused
 - Lost lots of volume
- North Beach
 - Also huge Riley impact with major change in beach shape and huge volume sand lost
 - Major erosion of lower profile, sand pushed to upper beach

- Some recovery but exposure of peat for first time
- Mid Hampton Beach
 - Also huge Riley impact with erosion of foreshore, retreat of berm and vertical accretion of backshore from overwash,
 - some recovery but also beach manicuring
- Seabrook
 - Steep narrow beach with lots of change. Large Riley impact with erosion of upper beach and deposition on lower beach.
 - Recovery and now doing well. But erosion at Salisbury – other end of same beach
- Summary
 - Volunteer beach profiling = cost effective approach
 - Database being developed to help guide future management (Which beaches most vulnerable? Where to place dredge material? Where should we nourish?)
 - Database is growing fast – how best to analyze, archive and present results?
 - Next steps:
 - Complete analysis of present DB
 - Link with NHSG for web
 - Nourishment at Seabrook this winter
 - Thank you beach profile volunteers!

Peter Slovinsky, State of Maine's Beaches in 2019

- State of the Beaches in 2019 – Report available at <https://www.maine.gov/dacf/mgs/explore/marine/beaches19/contents.htm>
 - Analysis calls on 2 data sets from
 - Beach profile monitoring
 - Began in 1999 –
 - Conducted by volunteer teams on 14 beaches in 8 communities
 - Qualitative data set – accurate to 1 -2 feet
 - Data for this report from 2007 – winter 2019
 - ME Beach Mapping Program
 - 33 beaches in 15 communities
 - Creates a composite picture with BP
 - Data for this report from 2007 – summer 2018
 - Real Time GPS system – accurate to 1 – 2 inches
 - Key metrics
 - Beach Profiling:
 - Max Vertical Position (MVP)
 - Upper Beach Width (UBW)
 - Highest Astronomical Tide (HAT)
 - Mean High Water (MHW)
 - Beach Mapping
 - Dune change

- Beach change
 - Dry beach width
 - Dry beach width change
- Analysis since 2007 Patriots Day Storm
 - Prior to 2007 – lower than mean; since it is higher : Beach es growing
 - Shoreline change rate – overall erosion since 2007
 - Mapping Program data
 - State averages for all beaches
 - Dune change average -0.1 feet/year
 - Beach change average -2.3 feet/year
 - Dry beach width
 - Natural beaches = 85 feet
 - Beaches with sea walls = 52 feet
 - Average = 76 feet
 - Dry beach width change
 - Natural = +4 feet
 - Sea walls = -5 feet
 - Average = +4 feet
- Wells Beach
 - Loss in area near jetty, 2 other areas with increases
 - Low points in winter 2010 and 2018
 - Casino Pt – no high tide beach
 - Line 4 – major change, heavy losses
 - Highest level over report period = summer/fall 2016, and has fallen since
 - Generally, stable beach over time
- Goose Rocks
 - Losses near rivers
 - Line 2 has average elevation ~2.8 m
 - Stable 2007 – 2010, then growth, less in 2013, then steady growth at ~4 cm/year
 - Line 3 has average elevation 3.4 m
 - Very stable over time, much less impact from storms that line 2
- Saco Beaches
 - Ferry
 - Average 5.4 m
 - Some dune change due to storms – starting point for monitoring has been moved back several times due to dune loss.
 - Dune crest elevation has been relatively stable

- Kinney Shores
 - Average 1.5 m
 - Relatively stable dune crest
 - Some dune growth in 2007, 2009 – 2010, possibly sea level rise due to dune overwash
- Beach profiling overall trends
 - Max vertical Position
 - Increasing
 - Ogunquit, Wells, Goose Rocks, Kinney shores, East Grand
 - Stable
 - Long Sands, Goochs, Ferry (Saco), West Grand, Scarborough, Willard
 - Decreasing
 - Laudholm, Fortunes Rocks
 - Upper beach width
 - Increasing
 - Fortunes Rocks, Higgins
 - Stable
 - Wells, Kinney Shores, Scarborough, Willard
 - Decreasing
 - Drakes Island, Laudhom, Ferry

John Lillibridge and John Zarrella, 3 (or 4) Ways to Improve Your Beach Profiles

- Note time when you reach the water
 - less important when start
 - profile + tide height = constant = easy to ID outliers /bad data points (does not improve the actual profile data)
- Don't profile if can't see the horizon
 - siting error = angle error at every data point, increasing with every data point = major error by end of profile line
- Keep sticks level
 - angle error; use bubble levels
- Be careful
 - Record data accurately – especially with - + indications
 - Especially at starting stake

Questions

For John Lillibridge

- Need clarify the “how” of point 1
 - Willard team can't view horizon – alternatives used may be introducing long term error
- Need for 3rd person to catch point 2 in the field

- Time of finishing line needs to be emphasized on field data sheet versus start time

How is Beach Profiling data used?

- MGS does advise beach management inc dredge and nourishment – data helps in ID off shore storage to inform management
- NWS program uses BP data to improve predictive capacity for modeling impacts of storms based on storm conditions
 - BP data allows capturing that storm impact data to enable seeing how quickly or slowly beach recovers.
 - 20 years of data is just beginning to illustrate these long-term trends – but have good grasp of seasonal trends

Are surf breaks identified as a resource in towns? Are towns considering this in beach management – nourishment will impact these breaks.

- NRPA has ref to recreational impacts
- Need for all stakeholders engaged in discuss of management – “I’m not a scientist – I just spend 300 days a year in the ocean” as a surfer.

Is nearshore dredge disposal a viable option?

- Will MGS study be able to ID which approach most beneficial (on shore or nearshore).