Beaches Conference 2019

Understanding Beach Change
(36 attendees)

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

- Vol BP in NH 3 years ago.
- Why are we doing this?
    - Nee 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

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

Peter Slovinsky, State of Maine's Beaches in 2019
- State of the Beaches 2019
  - o 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

  - o 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 20013 – 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

- o Average 1.5 m
- o Relatively stable dune crest
- o Some dune growth in 2007, 2009 – 2010, possibly sea level rise due to dune overwash

- Beach profiling overall trends
  - o 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
  - o 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
  - o less important when start
  - o 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
  - o siting error = angle error at every data point, increasing with every data point = major error by end of profile line
- Keep sticks level
  - o angle error; use bubble levels
- Be careful
  - o Record data accurately – especially with - + indications
    - Especially at starting stake

Questions

For John Lillibridge
- Need clarify the "how" of point 1
  - o 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 discus 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).