

2:30-4:00 Concurrent Session II

Lighting Round

Coastal Erosion Mitigation in Southern Maine, Sue Schaller, Bar Mills Ecological

- Ferry Beach, Saco – private cottage property
 - 10-13' dune loss in 3 winter storms early 2013
 - Seawall abutters accrue additional damage due to their neighbor's structure – wave energy deflected to the abutters
 - Maine's pocket beaches are geologically formed and maintained by river sediments; in Saco, erosion is exacerbated by Camp Ellis Jetties – blocks sediments coming in from Saco River
 - Nor'easter storms create beach scouring – wave energy striking jetty deflects shoreward and accumulates
 - Saco has lost 38 properties
 - Direction of a storm can accelerate dune loss
 - Damage to homes and businesses → community stress
 - Municipal infrastructure – roads, water, sewer, services
 - Long-term impacts to city tax base, budgets, tourism
 - Loss of wildlife habitat
 - 'Soft solutions' = no hardscape, duration uncertain
 - Construction of a sloped dune via beach-scraping
 - Slope dissipates wave energy via wave run-up
 - Dune grass holds slope, dissipates energy, catches sand
 - Seaweed feeds soil, plant growth hormones, native mulch
 - Considerations for beach projects:
 - State DEP and city permitting (MDIFW – 4-6 weeks, DEP PBR – 2 weeks, city/local – 4-6 weeks)
 - Timing – season, tides, weather, subcontractors
 - Components: access ways, temp road, equipment, seaweed, plant materials
 - 2013 – 19 properties
 - Mixed results – storms took 50% over 2013-14 winter, spring repairs; ongoing challenge
 - Sisters of Mercy site – optimal outcome – sand retained and accreted
- Town of Old Orchard Beach – ongoing work with DPW
 - Dune constructed in 1996; 72 private access ways – foot traffic → cumulative dune loss = lost protection
 - Openings funnel stormwater and debris into streets and homes; openings widen with each additional season
 - Street drains fill with sand = added maintenance costs and street flooding
- Additional tools = elevated walkovers
- Soft solutions can be only option against damage (under current regulations) – buy time, but nothing lasts forever; vegetation and seaweed are valuable components; fencing usually mandatory for project success

Are we ready for rising seas? Pete Hanranhan, E.J. Prescott

- Supplier of erosion control/stormwater management products
- People moving closer to sea; sea moving closer to people
 - 3M people in the US live within 3' of MHW
 - Nuisance flooding up 300% to 925% since 1960s

- 100M people live in coastal counties (1/3 of our population)
- Required reading: *High Tide on Main Street*, John Englander; *Design with Nature*, Ian McHarg
- Need to study the Dutch
- Need to get away from riprap
- Revetment at the base, beach nourishment (temporary, but economic realities – dependence on beaches), soft solutions (buy you time, sometimes it's the only thing you can do)
 - MA, CT, RI – can't use riprap; work with a lot of coir, sand, beach grasses
- Artificial reefs = most exciting technology – forma habitat, slow water down, contribute to sand deposition/accretion; Caribbean, Florida, up to Delaware so far
- Cam: Eventually we'll have to retreat from some areas
 - Pete: Good point; economic realities of certain places – they'll find ways to keep it open, they're not willing to consider retreat yet
- Intelligent adaptation

Let's talk wetland benefits, Jane Ballard, NOAA Digital Coast Fellow with NERRA

- These services aren't always accounted for in decisions → work to quantify these benefits so they can be included in decisions
- Example: stormwater decision or buffer decision; constraints: funding, time, different interests at the table, challenge of getting people to understand impacts to wetlands and what it means to them
- Values link different interests to coastal wetlands – economy, community character, water quality, stormwater and flooding → changes to coastal wetlands link back out to those different interests
 - Engage diverse stakeholders
 - Provide support for funding
 - Offer transparency or support for decisions
- When you protect coastal wetlands, you also protect... fishing, air and climate, shoreline, beaches and health, hazard adaptation, and property and infrastructure
 - Make comparisons to personal/community identities (e.g., "NH way of life), connect to more tangible things people already understand
- Spatial analysis – Digital Coast, OpenNSPECT tool (nonpoint source pollution and erosion comparison tool) → identified wetland parcels that provide flood abatement benefits, water quality benefits, or both → guide restoration priorities, funding decisions
- The Nature Conservancy project – identified areas likely to provide multiple benefits (pollution attention, flood storage, public water supply) – available on NH GRANIT Coastal Viewer → prioritize strategies and offer support/justification for funding
- Role of coastal wetland values: awareness → analysis (weighing tradeoffs) → action (better-informed decisions)
- <http://coast.noaa.gov/digitalcoast>
- Sue A.: Ted talks – Jonathan Haidt – moral roots of liberals and conservatives; Robb Willer how to have a better political conversation

Local and regional trends in salt marsh integrity, Susan Adamowicz, Rachel Carson NWR

- Nekton in salt marshes – animals that we can capture with the nekton traps
- Salt marsh integrity program – US FWS, evaluate salt marsh holdings from ME to VA, 2012-2016
 - Why = no prior assessment on FWS salt marshes, BIDEH policy
 - How = with help of USGS we developed a 'rapid' assessment process that includes surveys of birds, vegetation, nekton as well as physical and landscape parameters
 - Sampled marsh pools, ditches, creeks

- Water quality analysis – salinity (18 ppt threshold – Phragmites → ID areas that might be challenged with invasives)
- Nekton density, most common species, shrimp to fish ratio (more shrimp indicates degradation)
- What’s different – only two systems were distinctly different from one another – mummichog causes most of the difference
- Coded for tidal restriction status – open, semi-restricted, restricted → restricted sites different from both; no difference between open and semi restricted
 - More mummichogs in restricted vs. open areas; less green crabs
- Next steps:
 - Continue with data analysis to compare refuges
 - Identify marshes with poor nekton habitat
 - With other SMI results identify SMI units with lower quality:
 - Develop a list of potential mgmt. actions to increase SMI score
 - Run an optimization analysis to determine best combination of actions
 - Begin implementing restoration/resiliency actions
 - Monitor, evaluate, manage, retreat
- Mummichogs are known to go to the head of the stream – might be an artifact of the fact that most of the restricted areas are further upstream

Artistic mapping for community engagement with shorelines: the pragmatism of artistic mapping, Molly Holmberg Brown, Molly Maps

- Visually communicating climate change in map – people resonate with messages that are local, positive, emotionally resonating
- Communication – art plays a big role
- Started with custom maps for organizations
 - GBNERR Discovery Center floor map → kids can interact
 - Bangor Land Trust → birds eye view of open spaces in Bangor
- Love of place → commonalities across political boundaries
- We don’t have enough geographic visuals around us to help us see the bigger picture – hard to find
 - Amazing tool for connection of place, remind people why they care, support fundraising and membership
- Making custom art more affordable for the public and organizations/nonprofits → woodcut prints
- Convey that watershed is huge, powerful, important → art can tell that story in a more powerful way than a traditional map
- “Mapette” workshops – for kids and adults – get people to slow down and remember the places that are most meaningful for them
- Want to see more artists talking to scientists and vice versa
- Based in Portland; offer free consultations to organizations trying to figure out what types of visualizations/maps they may need
- Kristen G.: Maps can help bridge the gap between science and art – most people can connect with maps, not all feel like they connect as much with art
- Climate change
 - UCS infographic – ME moving down southward – playing with people’s sense of identity
 - Think a lot about shorelines – flexible boundary
- www.mollymaps.com

The myth of dry feet: What can we learn from how the Dutch engage in flood defense? Kristen Grant, Maine Sea Grant and UMaine Extension

- Dutch have been managing water for 800+ years; about half the country was resurrected from the sea, would be underwater
 - Windmills – main purpose is to pump water out of wetlands and into canals, create dry land
- The story of the Great Flood of 1953 – prologue to the Dutch myth of dry feet
 - Referred to as Katrina + Sandy put together in terms of the impact – turning point in Dutch history; 1800 died, 5,000 acres of land flooded, thousands forced to leave their homes
 - Delta Commission established to develop the Delta Plan → drain regularly flooded areas and protect them through a series of dikes, storm surge barriers, flood gates (“Delta Works”)
 - Threat to their culture
- Since 1953 flood, serious flooding in Netherlands wasn’t considered realistic – keeping the water out; reducing flood risk to 1/10,000 (orders of magnitude different from the risk we look at here)
- “The Netherlands Lives with Water” public awareness campaign, 2003 – raise awareness about the need for local and individual responsibility for flood defense
 - No one believed it; the ‘myth of dry feet’ – possibility of flooding wasn’t considered realistic
- Research – How were the Dutch going to confront this myth? Are similar methods used here in New England? Looking at stakeholder engagement. 19 interviews (14 in Netherlands, 5 in New England)
- Themes re: stakeholder engagement in flood defense
 - Where – context, relevance, specific, scale (Netherlands is about half the size of Maine); population of Maine is 1.3M vs. Netherlands 17M (>13x the population)
 - Stakeholders are more effectively engaged when planning happens at a scale and specific context that are relevant to them
 - Who – people who live and work locally in the impacted areas, help those individuals share their individual interests; professionals are also key, but we need the involvement of those who have the authority to make decisions
 - Why – Stakeholders are most effectively involved when the planning directly affects their interests, needs, and values in the long-term
 - How (most prevalent theme) – Stakeholders are most effectively engaged if the process involves valuing the diverse types of knowledge that all of the stakeholders can bring to the table (not elevating any one type of knowledge above another); providing opportunities for folks to listen to, learn from, build trust in each other
- Cam: Heard they’re beginning to give land back to the sea – must have been a difficult decision
 - Kristen: “Room for the river” campaign – working directly with the people who live in those areas, extremely volatile issue, ‘poldering’ process – hundreds of years old, practice of bringing in impacted stakeholders in those areas where they were going to be changing the hydrology in those areas; not a simple process – they’ve been promised dry feet