Enhancing Climate Resilience in Maryland: How Monitoring and Adaptive Management are Informing Nature-Based Shoreline Restoration - Rebecca Swerida

Rising waters, sinking land, and changing precipitation patterns have led to more common high tide and stormwater flooding that impacts day-to-day activities across Maryland. Nature based solutions can enhance the ability of communities to prepare for and recover from climate change impacts such as sea level rise, storm surge, erosion, high tide flooding and stormwater flooding. Recognizing the risk-reduction benefits of natural features, the Maryland Department of Natural Resources established a Resiliency through Restoration Initiative. This novel pilot program provides local governments and nonprofits with financial and technical support for design, construction and adaptive management of nature-based resiliency projects. From its inception, project monitoring was integrated as a vital component of the program. to inform site level adaptive management.

A partnership between the Chesapeake Bay National Estuarine Research Reserve-Maryland (CBNERR-MD) and Maryland's Coastal Zone Management Program is informing how these practices are designed and managed to address resilience goals over the long term. CBNERR-MD developed and launched a consistent, project-specific and adaptable monitoring framework to evaluate shoreline restoration strategies. CBNERR-MD implemented a Before-After Control-Impact (BACI) protocol to track marsh, shoreline and stone structure elevation, vegetation diversity and density, and changes in sediment characteristics at project and adjacent control sites. This presentation will discuss a selection of monitored natural and nature-based shoreline restoration projects located in Maryland's Coastal Zone. These monitoring efforts are informing site-level, and statewide adaptive management frameworks and restoration science to guide site management decisions and statewide guidance on the use of nature-based solutions.

Nature-Based Solutions in Urban Areas: an example from Miami-Dade County - Lynette Cardoch

Miami-Dade County and the United States Army Corps of Engineers (USACE) are currently engaged in a first of its kind process with the Miami-Dade Back Bay Coastal Storm Risk Management (CSRM) Feasibility Study. There is evolving policy on USACE CSRM frameworks, including federal guidance to prioritize nature-based solutions (NBS) and the introduction of Comprehensive Benefits. While there are many varied measures that can be implemented to reduce storm risk damages, this presentation will focus on the inclusion of nature-based elements and the integration of other landscape level projects. Other projects include the Comprehensive Everglades Restoration Plan, the Miami Beach CSRM, the Central and Southern Florida System Section 216 Flood Resiliency Study, and the new Key Biscayne CSRM. The County and USACE are currently seeking authorization for a NBS pilot program in Miami-Dade County that will allow better planning and implementation of NBS for coastal storm surge risk reduction. The program will also be geared toward large-scale implementation in urban areas and the appropriate quantification of ecological and social benefits.

Versatility of Nature-Based Solutions: Protections and Benefits from the Parcel to Community Scales - Emily Donahoe

This session will highlight the major takeaways from National Wildlife Federation's newest showcase report, titled "Versatility of Nature-Based Solutions: Protections and Benefits from the Parcel to Community Scales." The session will introduce the idea of natural infrastructure and nature-based solutions as approaches that not only provide hazard mitigation benefits, but also provide a plethora of co-benefits to support healthy and resilient communities and ecosystems.

Through a series of compelling showcase stories, this session will illustrate the remarkable adaptability and diversity of these nature-based solutions across a spectrum of scales, addressing a wide array of hazards while also providing invaluable co-benefits to the surrounding environment and community. These stories will serve as a testament to the efficacy of nature-based solutions in fostering resilience and promoting the health of our communities and ecosystems.

This presentation will provide participants with an enriched understanding of the versatility of nature-based solutions but also with actionable insights. These insights will empower attendees to champion the integration of natural infrastructure into their respective realms, ultimately contributing to the cultivation of healthier, more resilient communities.

Developing Nature-Based Solutions to Improve the Resilience of a Wellfleet Harbor Salt Marsh - Alex Patterson

Wellfleet Bay Wildlife Sanctuary (WBWS) on Cape Cod, Massachusetts is a 1,200-acre protected area consisting of an expansive salt marsh and barrier beach/dune system owned and managed by Mass Audubon. At WBWS, localized threats increase the vulnerability of salt marshes to the negative impacts of SLR. Primary among these are the impacts of purple marsh crab grazing and burrowing, which has denuded expansive areas of the marsh. Other factors include tidal restrictions and the presence of groins and a revetment along the barrier beach. Additionally, the local landform affords few areas adjacent to the marsh where meaningful marsh migration could occur. These factors contribute to an overall increase in the vulnerability of the system to SLR and degrade the ability of the system to support important community functions, including absorbing wave energy and attenuating nutrients. In partnership with the USACE Engineering with Nature Program, Mass Audubon, and other local stakeholders, EA is engaged in an effort to characterize existing threats to the marsh and surrounding community vulnerabilities and develop initial designs for recommended actions to improve the resilience of the system. Sediment augmentation is expected to be critical for supporting the ability of the marsh to persist in the future; however, this practice is prohibited by current state-level policies. This project is intended to serve as a test case to demonstrate the crucial need for additional management and restoration tools to sustain salt marshes in Massachusetts, including direct placement of sediment on the marsh surface.

Meeting the Moment on Nature-based Solutions in the San Francisco Bay - Heidi Nutters

The San Francisco Estuary faces complex challenges for communities and nature, including improving water quality while also protecting shoreline habitats, infrastructure, and frontline

communities from sea level rise and flooding. Policy drivers at the local, state, and federal level all push toward the use of nature-based approaches that incorporate green solutions at the shoreline at rapid pace to meet the urgent needs of our region. Meanwhile, centering community voices and building trust requires patient and purposeful relationship building. So how do we speed up the pace of adaptation while slowing down the intentional process of equity-centered community engagement?

The San Francisco Estuary Partnership's Climate Resilience Program is advancing on the ground nature-based shoreline adaptation projects and regional-scale technical assistance. This talk will highlight a suite of innovative NbS projects, including the Oro Loma Horizontal Levee, Palo Alto Horizontal Levee and First Mile Horizontal Levee. It will focus on the ways communities and Tribes are partnering with public entities to co-creating solutions. In addition, it will address barriers to implementation and coordinated efforts to overcome them, including design & engineering, permitting, governance and funding.