Large-Scale Coastal Restoration in the Pacific Northwest - Heida Diefenderfer

The Pacific Northwest (PNW) region of the U.S.A. and Canada is often overlooked in estuarine research, yet the region is important and it may be indicative of other global temperate areas. Here we focus on two estuarine habitat restoration programs—the lower Columbia River estuary and the Whidbey Basin of the Salish Sea—to examine potential blue carbon, flux, and other related ecosystem services of reconnecting tidal wetlands and watersheds. For the PNW, we have shown that tidal swamps are comparable to, or greater than, mangroves in terms of carbon stocks. Fisheries resources continue to be a primary beneficiary of planned restoration and protection of aquatic resources in this region. Data gaps remain for tidal scrub-shrub ecosystems and for coastal wetland restoration trajectories, which have spatial and temporal gaps in research to date. These are high priorities for future research required to support large-scale spatial planning for coastal restoration to enhance coastal community resilience.

Monitoring for management: A modular, ecosystem function-based assessment framework to assess estuarine condition - Jan Walker

Building an estuarine assessment program around a modular, function-based framework addresses several key challenges to large scale monitoring, such as comparability across heterogeneous environments and differing management needs. A function-based approach provides a way to accommodate different estuary types and assimilate data from diverse monitoring programs. The modular nature of the approach provides flexibility for implementing agencies to address both local and regional needs concurrently, thereby encouraging broad adoption. Here, we present such an approach developed to assess the effectiveness of California's Estuarine Marine Protected Area Program (EMPA). The multi-level program leverages existing regional monitoring organizations, universities, NGOs, and indigenous communities. A key aspect of this program is a focus on ecological functions versus a single type of flora or fauna. We present examples of standard protocols to assess key estuarine features, coupled with standard data templates and guidance on analysis, synthesis, and reporting to illustrate four guiding principles of the program: flexibility, comparability, interpretability, and practicality. Currently, our team is testing the monitoring framework across three geographic regions and fifteen estuaries. This framework provides an opportunity to assess general condition and trends of coastal wetlands that can be used as baselines for regional assessments, proposed restoration projects, and the development of bioassessment tools, as well as help the state assess its large investment in coastal wetland protection, enhancement, and restoration.

Building Momentum for Coastal Watershed Restoration and Climate Resilience in the Context of Natural Resource Management: WA DNR's Snohomish Watershed Resilience Action Plan - Rachel Benbrook

The Washington Department of Natural Resources manages 6 million acres of state-owned aquatic lands and uplands, including over 175,000 acres in the Snohomish Watershed in Puget Sound. In 2022 the agency launched the Watershed Resilience Action Plan, or WRAP, a “trees to seas” plan to accelerate salmon recovery and watershed health over the next decade in the Snohomish River Basin. Like other state natural resource agencies, DNR has historically focused on managing state lands to maximize revenue on behalf of its trust beneficiaries. The WRAP represents and important opportunity to diversify the work of the agency to include large scale watershed restoration and resilience projects that promote a collaborative approach to achieving ecosystem objectives in one of the largest watersheds in the Puget Sound estuary. This presentation will provide an overview of WRAP goals, outcomes, and actions and share lessons learned from the first two years of implementation. We will discuss the importance of early and often tribal consultation, the challenges around launching a cross-programmatic and interdisciplinary program in the context of state government, and how we are building momentum and capacity for this work at DNR. Our hope is that through WRAP, we can develop a framework for integrating landscape-scale restoration goals related to salmon recovery, climate resilience, and watershed health into land management decisions at the local and regional level.

The Role of the Geology in the Evolution and Disintegration of the Texas Coastal Marshes: How Hydric Soils Can Help Us to Understand Restoration Concepts - Juan Moya

Coastal tidal marshes are essential habitats and are receiving significant amounts of funding to restore them across the Texas coast. These marshes were developed after the last sea level rise event slowed and intertidal flows allowed for marsh communities to establish. Restoration efforts have been conducted through numerous organizations to restore, protect, and enhance marsh habitats. These actions have included protection measures including wave attenuation devices, dredging and beneficial use of dredged material, hydrological re-connectivity, and other activities depending on the site conditions. Recent studies on the evolution of the Holocene landscapes before, during, and after sea level rise inundations have shown that marshes were not distributed randomly across the bays and estuaries. After the stratigraphic definition of the Holocene depositions on the Texas coast, it has been confirmed that the large areas of the continental marshes were developed mainly on top of the Mermentau Alloformation, which consist of channel-fill deposits. An analysis of the presence of the Mermentau Alloformation across the Texas upper coast shows that the modern marshes and wetlands are connected to specific paleo-geomorphological conditions and have specific hydric soils. Some of the restoration techniques being used to restore marshes DO NOT MATCH the original hydric soils conditions that created and are sustaining the marshes. Soil data on the original substrate is discussed.

Public / Private Partnership for Programmatic BUDM Implementation in Texas - Stephen McDowell

Since 2006, a public/private partnership has restored over 2,900 acres of coastal marsh using about 8.2 million cubic yards (mcy) of dredge material at the J.D. Murphree Wildlife Management Area (JDWMA), owned by Texas Parks and Wildlife Department (TPWD). TPWD partnered with local industry along the Sabine Neches waterway to obtain large quantities of dredge material. In 2006, 244 acres were restored using 1.2 mcy of new work material. In 2010 a second project restored 1,500 acres using 3.2 mcy of material, and in 2013 an additional 419 acres were restored with about 1.5 mcy. The most recent project (2019) restored 790 acres with 2.3 mcy. Each project offered a cost benefit to both partners and restored healthy marsh vegetation. In 2024 a new partnership will restore an additional 1,280 acres. Additionally, the Texas General Land Office funded a 1,867 acre engineering and design project on the JDMWMA that will use 7.26 mcy of dredged sediment. These plans have been submitted for a permit by TPWD for future implementation. The JDMWMA BUDM projects may represent one of the most continuous landscape scale attempts to programmatically implement BUDM and provides a case study example to dredging practitioners of public/private partnerships that can provide for large-scale coastal restoration in an economical manner. Lessons learned will be discussed including target elevations, use of settlement plates, on-site logistics, use of temporary containment, and the need for project planning to stay in front of the dredge and provide for future BUDM opportunities.