

Novel Oyster Castle® Reefs Improve Salt Marsh Health, Coastal Resilience, and Response to Sea Level Rise - Jennifer Karberg

Innovative nature-based solutions provide key solutions to improve resilience. In 2021, the Nantucket Conservation Foundation, on Nantucket Island, MA installed the state's first intertidal oyster reef to reduce salt marsh erosion, provide protection for storm and wave impacts, and pilot novel a salt marsh expansion technique. Working through the MA In Lieu Fee Program and building partnerships with local shellfish associations, USACE, MA CZM, MA DEP and MA DFW, NCF obtained permitting within a year and a half with full reef installation completed over 3 days in November 2021. Extensive monitoring of this pilot resilience project captures reef impacts to intertidal water movement, storm surge impacts, salt marsh erosion, salt marsh health and harbor water quality as well as physical reef success. Two years of post-installation monitoring has documented an increase in sediment retention behind the reef, increase in biodiversity on the reef, stabilization of salt marsh soils, and viable health and growth of the oyster population. This project serves as an example of how to develop and implement innovative nature-based coastal resilience solutions as well as a provide a model for other salt marsh protection projects.

Combining monitoring data to understand saltmarsh sparrow breeding habitat availability - Samantha Apgar

The saltmarsh sparrow (*Ammospiza caudacuta*) is a rapidly declining tidal marsh endemic species. This species is reliant upon the high marsh zone that historically floods only on the highest spring tides of the month. Saltmarsh sparrows are declining due to increased nest flooding caused by sea level rise and its interaction with existing alterations to marshes. Saltmarsh sparrows are strongly linked to the high marsh vegetation species *Spartina patens*. *S. patens* existence alone, however, does not indicate suitable nesting habitat, because habitat change lags hydrological change. We have combined avian, hydrological, elevation, and vegetation data collected in 2023 to assess the availability of saltmarsh sparrow nesting habitat and potential for success at two north shore sites on Long Island, NY. Using monitoring guidance from the Atlantic Coast Joint Venture and Tidal Marsh Bird Rapid Assessment protocol from the Saltmarsh Habitat and Avian Research program, we show limited breeding at sites that likely once had a higher abundance of saltmarsh sparrows. Using the MarshRAM protocol (Kutcher et al. 2022) paired with RTK elevation and HOBO water level logger data collection, we show that *S. patens* dominated patches are extremely limited and those that exist are inundated more frequently than the minimum 23 flood-free days saltmarsh sparrows require to breed. As a result, saltmarsh sparrows are likely incapable of breeding successfully at these sites. We aim to use this information to guide restoration decisions and evaluate success after restoration is completed.

Approaching coastal resilience through collaborative conservation of tidal marsh birds - Aimee Weldon

The Atlantic Coast Joint Venture (ACJV) is one of 22 habitat joint ventures that work to conserve migratory birds across North American landscapes. The ACJV spans the Atlantic Flyway from Maine to Florida. Making a measurable impact to birds at that scale with limited staff and

budget is challenging. To address this challenge the ACJV management board and staff have adopted a coastal marsh focus through a suite of “flagship species” associated with tidal marsh habitat: Saltmarsh Sparrow, American Black Duck, and eastern Black Rail. The ACJV has 1) collaboratively written and published conservation plans for each species and coastal marsh as an ecosystem, 2) identified priority areas in which to work to benefit each species, 3) developed partnerships and focus groups to help address known bottlenecks to marsh conservation, 4) developed a database to track marsh project progress over time, and 5) recruited resources through grant application support and ghost-writing. We have accomplished these goals in partnership with local, state, federal governments, NGOs and universities by providing coordination capacity, science development/integration, and funding support focused on tidal marsh restoration efforts. We will share strategies in use for salt marsh restoration to support marsh birds, discuss lessons learned, and celebrate conservation successes as well as provide resources for learning more.

Engaging coastal communities in habitat restoration with the National Fish Habitat Partnership - Alex McOwen

The National Fish Habitat Partnership (NFHP) aims to restore and conserve fish habitat nationwide, leveraging federal, state, tribal, and private funding resources to achieve the greatest effect on fish populations. The network of 20 Fish Habitat Partnerships organized around key fish species, geographic areas, or important fish habitats have supported 1,300 projects benefiting fish habitat throughout all 50 states since 2006. As a key NFHP partner, NOAA Fisheries has funded coastal and estuarine Fish Habitat Partnerships to restore recreationally important fish habitats and engage recreational, subsistence, cultural, and non-commercial anglers. This opportunity has yielded a diversity of successful projects that improved degraded or declining fish habitat, increased community resilience, and enhanced local community engagement and stewardship. Whether installing plants and woody debris for salmon in Alaska, recovering and replanting coral fragments in Hawaii, or engaging elementary school students to restore oyster reefs in South Carolina, these projects have connected or reconnected communities with their coasts and estuaries to address local fish habitat and climate challenges. Additionally, this funding has prioritized projects that engage underserved and underrepresented communities in recent years and is maintaining this focus moving forward. This presentation will highlight the breadth of NOAA-funded projects, lessons learned, and how to get involved in future opportunities via the National Fish Habitat Partnership.

Carbon Sink? 29 Years of Habitat Enhancements - James McFarlane

Carbon sequestration is highly important, and the next most important part is protecting our existing marsh grasses and mangroves. Keeping the carbon sequestered in marsh grasses and mangroves means countering wave action, and sea level rise. Years of experience using Reef Balls™ for shoreline protections have shown some best practices to follow. Reef Ball are successful at sequestering carbon. Reef Balls™ research shows they add resiliency. Reef Balls™ stay put in the storm. Research shows successes in the accretion of sediment. Reef Balls™ provide protection of existing marsh grasses and submerged aquatic vegetation. Reef Balls™ provide successes growing and planting mangroves in areas of high wave energy. Reef Balls™

are excellent substrata for oyster growth that further protects the marsh grasses. Reef Balls™ are a complex module providing benefits of a diverse habitat, wave attenuation as a porous breakwater, and carbon sequestration.