Lessons Learned While Restoring Oysters To New York Harbor And Applied To Brooklyn Bridge Park - Jennifer Zhu

Billion Oyster Project (BOP) aims to restore oyster reefs to New York Harbor through public education initiatives and engage one million New Yorkers in the process. Native to New York, the Eastern oyster (Crassostrea viginica) provides crucial ecosystem services, yet its population has suffered depletion due to overharvesting, pollution, and habitat loss. This presentation explores insights from BOP's research and hands-on experience in oyster restoration with the direct participation of local school students and members of the community, focusing on practical applications at the Brooklyn Bridge Park site.

In 2020, BOP installed SEAPA cages with live spat (juvenile oysters) suspended off a floating dock to serve as a nursery. Data show consistent oyster growth, low mortality rates, and recurring wild recruitment during successive monitoring seasons. Diverse restoration techniques, including cabinet reefs and subtidal gabions installed in 2021, showcased parallel trends in oyster growth and wild recruitment. Cabinet reef oysters had higher mortality rates, potentially due to predation and frequent human interaction. Ongoing monitoring is essential to comprehensively assess oyster performance and health across different structures and techniques. BOP continues to explore suitable techniques for the restoration of estuarine habitats and the engagement of New Yorkers in long-term restoration efforts.

Community-based oyster restoration to help defend a low-lying coastal town - Bowdoin Lusk

The Town of Wachapreague, one of the last fishing communities left on the Eastern Shore of Virginia, is protected by a system of barrier islands and marshes, where marshes are the last natural defense against storms and rising seas. As a result of increased storm frequency, protective saltmarshes are disappearing, and flooding events are becoming more frequent. Through meetings and listening sessions with the people of Wachapreague, The Nature Conservancy (TNC) identified the erosion of a nearby marsh island as a direct threat to the resilience of the town's working waterfront. With funding from the National Fish and Wildlife Foundation, TNC called on community volunteers to assist in constructing oyster reefs adjacent to the marsh island with the goal of keeping the island in place so that it will continue to buffer Wachapreague from open water wave energy during high-tide storm events. Volunteers played a crucial role in manufacturing and installing two different alternative oyster substrates, Oyster Castles and Oyster CatcherTM, along 610 meters of shoreline. Now after nearly four years of work construction is complete, and oysters are continuing to recruit and grow on these substrates to enhance the resilience of this vulnerable coastal community.

Designing restored oyster reefs to maximize coastal protection benefits - Libby Bieri

As sea level rises and storms become more intense, many coastal communities that rely on the natural buffering capacity of marshes from winds and waves are becoming more exposed and vulnerable. This study evaluated restored oyster reefs as a nature-based solution for attenuating waves, stabilizing marsh edges and providing habitat in coastal Virginia. Two types of artificial substrates, oyster castles developed by Allied Concrete and Oyster Catcher, a novel

biodegradable hardscape created by Sandbar Oyster Company©, were placed adjacent to a marsh island. Direct field measurements were collected before and after reef construction to quantify changes to the wave and morphologic environments related to reef presence. Oyster growth was also quantified for each substrate. Oyster reefs successfully dissipated wind-wave energy, but only when water depths were near or below reef crest heights. In-situ measurements of reef-lined and un-lined marshes showed reefs at this location significantly reduced rates of marsh edge erosion, but only for gently sloping portions of the shoreline. Oyster Catcher substrate fostered greater oyster growth than oyster castles. This study demonstrates that it is a combination of marsh morphology and the presence of fringing oyster reefs that determines the degree to which wave energy reaching marsh edges is reduced. To maximize coastal protection and ecological benefits, marsh edge morphology, reef elevation and substrate type should be considered when designing an oyster reef restoration project.

Hope on the Half Shell: Harnessing oysters to build ecological and community resilience - Allison Colden

The Chesapeake Bay's shoreline stretches over 11,600 miles through Maryland and Virginia. Home to nearly nine million people, this area is critically important to the social, economic, and ecological fabric of the region. Yet it is increasingly at risk. Centuries of degradation have diminished one of the Bay's most important natural protections—its oyster reefs. The loss of oysters and their reefs has resulted in diminished ecosystem services, species diversity, and economic opportunities.

The success of recent large-scale oyster restoration efforts in the Chesapeake Bay, which are among the largest in the world, show that concentrated and coordinated work can bring back oysters and restore ecological and economic benefits. The Bay partnership is moving into the next chapter of oyster restoration as Maryland and Virginia are ramping up efforts to tackle climate change. Through redoubling efforts to bring back the many co-benefits of oysters, managers can achieve multiple goals – improved water quality, equitable economic opportunities, climate change mitigation, coastal resilience, and improved fisheries management. Setting ambitious restoration goals, which consider oyster restoration in a broader social, ecological, and economic context will only improve upon previous successes.

Now is the time to ensure oyster restoration can realize its full potential to support the ecological, economic, and social resilience of our estuary and vibrant communities where people and nature can thrive together.

Status and trends in oyster habitat along the Northern Gulf Coast: Bridging the great divide between Texas and Louisiana habitat mapping and monitoring techniques - Kelsey Calvez

What is a habitat? How do we define it, measure it, and map it? This environmental characterization of the natural world is at the heart of the scientific method and a key metric for evaluating the health of ecosystem productivity. For the states of Texas and Louisiana, their approach to mapping and monitoring oyster habitat, for example, is quite different. Although similarly situated in ecology and geography, the state agencies responsible for tracking and

managing these important habitats vary greatly in process and design, setting up a fundamental question for gulf-wide assessments: How does the scientific community bridge the data and workflow gap in monitoring protocols to create a standardized assessment of oyster habitat health from a geographically wholistic point of view? This presentation will showcase a project funded by the Gulf of Mexico Alliance to find the common ground of oyster habitat mapping and monitoring across the Northern Gulf of Mexico. The objectives of the study are to focus on Texas and Louisiana datasets to establish the historical extent of oyster habitat, identify data gaps, provide spatial data for oyster habitats, and document oyster habitat trends from 1985 to present. The results presented are being used to identify local and regional threats to oyster habitat and to develop recommendations for a region-wide oyster status and trends assessment. Lessons learned and audience feedback is encouraged as the research team seeks to understand how managers and agencies monitor, map, and track oyster habitat and health across large geographic regions.