Challenges and opportunities for informing coastal resilience project implementation with advanced coastal science - Rebecca Atkins

With unprecedented federal investments in coastal community and ecosystem resilience, federal, state, tribal, and local entities are tasked with determining their vulnerability, identifying activities towards mitigating current and future risk, and prioritizing which actions to propose for financial and leadership-level support. Those funding the work are tasked with evaluating and selecting from proposals that may lack innovation or offer a limited understanding of how different possible actions will perform in combination.

NOAA's Effects of Sea Level Rise (ESLR) Program has spent the past eight years incentivizing the collaboration of interdisciplinary teams across the country to advance the science and products needed to inform coastal managers of local coastal vulnerability and solutions to mitigate food risk, while also holistically considering the built and natural infrastructure. However, there is a need to integrate these efforts with other funding opportunities that support the implementation of on-the-ground resilience projects. Ultimately, this will help to ensure that the advanced science capable of evaluating climate, flood, and management scenarios is being used to maximize federal investments.

This talk will highlight NOAA's Effects of Sea Level Rise (ESLR) Program to discuss a range of program-level considerations, from identifying science gaps to facilitating science advancement and application at local and regional scales. We will present several case studies representing successful collaboration, as well as strategies and lessons learned for connecting cutting-edge science to coastal communities seeking technical assistance.

Deriving and communicating fish and invertebrate density and production enhancement from U.S. coastal nursery habitats - Philine zu Ermgassen

Structured coastal habitats are well recognized nursery grounds for fish and invertebrates. Yet quantification of the production enhancement by these habitats is challenging. Here we present updates to an established method for quantifying the production enhancement arising from the nursery function of three U.S. coastal habitats and its current application in coastal management. The method uses young of year density data in paired structured and unstructured habitats to identify which species are recruitment enhanced, then applies growth and mortality models to derive estimates of production value and the associated uncertainty. The results of applying this model are communicated to restoration practitioners and policy makers via a well-developed online tool. Recent efforts to expand the application of these models have resulted in production estimates now being available for seagrass habitats on the Atlantic coast and a select region of the southern Pacific coast of the US, in addition to the initially presented values for oyster reef, salt marsh and seagrass habitats in the Gulf of Mexico. In this presentation, we will briefly introduce the method and the tool, and provide examples of how the tool has been utilized to inform conservation and restoration decisions. We will then focus largely on the new developments and results from the Atlantic and Pacific coasts. In

addition, we will outline regions of the U.S. where the approach has not yet been applied and examine what has limited the approach in those regions.

Developing Comprehensive Restoration Strategies for the Mattapoisett Neck Salt Marsh through Remote-sensing, Hydrodynamic Modeling, and Habitat Assessments - Adam Finkle

Mattapoisett Neck Marsh is a 200-acre salt marsh system in the Town of Mattapoisett, Massachusetts. The northern basin is connected to Mattapoisett Harbor through three parallel culverts underneath a roadway crossing and the southern basin is directly connected to Buzzards Bay. The culverts are undersized and this tidal restriction has led to ongoing degradation of the saltmarsh. The roadway crossing also serves as the only means of access for the residents of Mattapoisett Neck and is vulnerable to storms and climate change. To develop a long-term restoration plan for the Mattapoisett Neck Marsh system, Woods Hole Group partnered with a group of stakeholders including the Town of Mattapoisett, Buzzards Bay Coalition, Mattapoisett Land Trust, MA Coastal Zone Management, and the Massachusetts Department of Ecological Restoration to identify key stressors impacting the saltmarsh and develop evaluate restoration actions to mitigate against further degradation while maintain access for residents. The first phase of this study included a field data collection effort with RTK GPS survey, aerial drone mapping, resource delineations, and tides and salinity measurements. The second phase used the collected data within a 2D hydrodynamic model to understand the dynamics of the system and identify stressors. The third phase evaluated restoration alternatives by testing replacement structures using the 2D model (to improve hydraulic efficiency) and then developing management recommendations and restoration actions that could advance the goals of the project partners.

Using Cellular Trail Cameras for Coastal Restoration - Zack Royle

Advances in trail camera technology now allow for the remote streaming of video via cellular networks, facilitating real-time video monitoring of coastal restoration sites such as salt marshes and oyster reefs. Because video feeds can be accessed from anywhere and on-demand, this technology opens the door for new monitoring and surveillance opportunities that can not only lead to better monitoring and project outcomes but may also facilitate the implementation of new projects that were previously restricted over safety concerns. In this presentation, I will discuss the benefits, shortfalls, and other considerations regarding this technology by reviewing their use at an American Littoral Society oyster reef project in Forked River, NJ.