NCCOS NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

NOAA'S NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE FY25 EFFECTS OF SEA LEVEL RISE (ESLR) PROGRAM AWARDS

Developing Arctic Coastal Protection Solutions with Alaska Native Communities

Institutions: George Mason University, University of Alaska, Fairbanks, University of Alaska, Anchorage, Alaska Division of Geological and Geophysical Surveys
Project Period: June 2025 - May 2029
Location: Alaska
First Year Funding: $544,335
Total Anticipated Funding: $2,000,000

Project Summary: A considerable gap still exists in the use of natural infrastructure for protecting communities in dynamic Arctic coastal regions. The coastal zone in Alaska is unique due to the lack of materials for coastal protection, the remoteness of coastal sites, and their extreme environmental conditions. This project will work with Alaska Native communities in the Yukon-Kuskokwim Delta to support the co-production of natural infrastructure for coastal protection, drawing on traditional knowledge and local solutions, and building on existing community projects. Scenario-based numerical modeling will be used to evaluate and explore coastal adaptation strategies under sea level rise, accounting for changes in sea ice, permafrost degradation, changing conditions, and extreme events. This work will enable informed planning and management actions that reduce the impacts of coastal hazards by considering natural infrastructure and other adaptation strategies that are co-produced with the communities, and can be considered by more western Alaskan communities moving forward. Learn more.

Evaluating Longevity and Benefits of Natural Infrastructure that Reduces Coastal Flooding Impacts

Institutions: Greater Farallones Association, Greater Farallones National Marine Sanctuary, U.S. Geological Survey, Environmental Protection Agency
Project Period: June 2025 - May 2029
Location: California
First Year Funding: $397,884
Total Anticipated Funding: $1,568,754

Project Summary: Coastal decision-makers and engineers lack capable modeling tools and data to evaluate potential benefits and trade-offs of natural infrastructure for mitigating coastal flooding and sea level rise impacts, especially when considering how natural infrastructure might evolve and degrade over time with rising seas and storms. The benefits of natural infrastructure are typically quantified in terms of avoided flood damages to local coastal properties, which can inadvertently prioritize protection for higher income areas. This project will model the co-evolution of the beach, natural and managed dunes, and flooding under different proposed management and inundation scenarios to evaluate the long-term protective, social, and ecological merits of beaches and dunes in North-central California. A measure of non-local recreation benefits provided by the natural beach area (e.g., number of visitors from other counties), will be quantified, allowing for a better understanding of specific locations on beaches that support higher recreational use compared to others. Visitation metrics will be combined with the modeled estimates of protective benefits to identify sites where adaptation investments might have the most cumulative benefits, and where there might be trade-offs between local vs. non-local benefits. This work will be made publicly available for coastal managers and professional engineers as an off-the-shelf model to run scenario-based evaluations of natural infrastructure anywhere on the west coast. Overall, this work will allow for rapid evaluation of a wide range of design alternatives that will enable local coastal managers to more accurately weigh the co-benefits of multiple natural infrastructure projects within a region, helping them determine where to focus adaptation efforts. Learn more.