

Coastal Climate Change Adaptation and Engineering Alternatives

East Boston, Massachusetts

Project Characteristics:

- *Sea Level Rise Assessment and Predictions*
- *Return-Period Storm Surge Evaluation*
- *Sustainable Coastal Engineering Alternative Analysis*
- *Costs Estimations for Engineering Alternatives*
- *Recommended Engineering Adaptations for Sea Level Rise*

Woods Hole Group worked with Battelle Ocean Sciences on assessing the impacts of Climate Change on the coastal community of East Boston, Massachusetts. The evaluation included the impacts of sea level rise and storm events on potential flooding. A select number of representative areas were selected for site-specific evaluation and a range of engineering adaptation alternatives were considered. The alternatives ranged from management approaches (e.g., evacuation, flood-proofing of structures, etc.), to soft-engineering options (e.g., beach nourishment, creation of wetlands, etc.), to more significant hard engineering structures (e.g., modular seawalls, revetments, etc.). For each location, conceptual designs and associated cost estimates were developed and compared to the potential cost incurred by flooding and storm damages to the location without protective measures over a given time horizon.



Engineering adaptations and costs estimates were provided for high and low rates of projected sea level rise, coupled with various return period storm events (10-, 20-, 50-, and 100-year). Engineering, construction, and maintenance cost estimates were provided for adaptations levels that would be required in 2030 and 2100. These costs were then compared to potential damage and management costs associated for flooding projections corresponding to those same scenarios.