

Coastal Resilience, Long Island, USA

Coastal Resilience Project:

The purpose of the Coastal Resilience project is to provide communities with easy access to information to assist in coastal planning, zoning, acquisition, and other management decisions regarding resources at risk from sea level rise and coastal hazards. One of the principal products of the project is a spatially explicit tool that provides forecasts of inundation on the south shore of Long Island under different sea level rise scenarios. The aim of this web mapping tool is to provide communities with easy access to information for their planning, zoning, acquisition and permitting decisions.

Category: Ecological

General Description:

The population protection potential calculation is an index of marsh size and proximity to adjacent human communities. This index provides a general estimation of a marsh's potential ability to protect adjacent human communities. Marshes perform myriad ecological services such as protecting against wave energy and cleaning local water supplies; thus, abating shoreline erosion and potentially acting as a buffer against storm surge.

Source:

1. 1974 wetland inventory dataset with 1995 update for Shinnecock Bay area: NY DEC
2. 2009 Population Distribution dataset: TNC (see separate methods document for *Population Distribution* methodology)

Caveats and limitations:

This index provides a general estimation of a marsh's potential ability to protect adjacent human communities based on the number of people within 1 kilometer of a marsh and the size of the marsh. This index assumes that the larger the marsh, the more protective capacity it has against negative impacts (i.e. shoreline erosion), and that the more people within a 1 kilometer radius of the marsh, the more critical the marsh's ecological services are to the adjacent human communities. This is a general estimation and in no way indicates which human communities are safest or most threatened based on a marsh's size and adjacency. Furthermore, to most accurately capture the ecological services provided by tidal marshes, a marsh-specific, "on the ground" analysis would need to be employed. This type of analysis was beyond the scope of this project.

This dataset is dated (1974 with minimal updates in 1995), but remains the primary spatial dataset upon which regulatory decisions are made within Suffolk County. Due to the historical nature of this dataset, this dataset likely contains inaccuracies as the spatial distribution of marshes in Suffolk County has undoubtedly changed over the past 30 years. The Coastal Resilience web application will serve updated tidal marsh data as it becomes available.

Process:

1. Marsh size
 - Calculated marsh area based on NYDEC marsh datasets
 - Classified **marsh size** into 5 classes using a Jenks Natural Breaks classification technique
2. Adjacent population
 - Used parcel data to dasymetrically map US census block-scale population data using housing density values per parcel and non-developed parcels (and water) as exclusionary ‘mask’ layers. (see *Population Distribution* methodology in separate methods document)
 - Summed number of people per 10m² cell within 1 kilometer of marshes
 - Classified **adjacent population** into 5 classes using a Natural Breaks (Jenks) classification technique
3. Added classified **marsh size** and **adjacent population** layers
4. Scaled summed layer’s data range from 0 to 20 to 1 to 10 for total **Population Protection Potential** calculation.
5. The 1 to 10 classification is shown in 5 classes within the Coastal Resilience web mapping tool, ranging from “Less” to “More”. The raw values are as follows (from “less” to “more”): 2, 3-4, 5, 6-7, and 8-10.

The Nature Conservancy
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