

Historic Levees and Cultural Resource Management in South Jersey

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In fall 2011, a team of nine graduate students at the University of Pennsylvania included an unusual component in a historic preservation study: floodplain management. As part of Penn's Graduate Program in Historic Preservation, the team was charged with developing a Cultural Landscape Report for Greenwich Township in Cumberland County, New Jersey, located where the Cohansey River enters the Delaware Bay. The township experiences severe flooding during intense storms, and municipal and county agencies are struggling to identify appropriate long-term solutions for it and similar communities in the area. Team members completed archival research, surveyed local architecture, collected residents' oral histories, and conducted interviews with tourists. To fully understand the landscape and protect cultural resources, a broader view of the historical, environmental, and regulatory factors driving change in the township was needed .

Greenwich relies on a series of earthen levees for flood control. Originally built by Dutch and English immigrants in the 17th and 18th centuries to reclaim fertile agricultural land from tidal marsh, the levees today protect high-value residences, as well as public roads, evacuation routes, and historically significant architectural heritage. The township's freshwater supply for agricultural irrigation, public and private wells, and wildlife habitat also depends on the levees, which themselves are important evidence of early American settlement.

Unfortunately, lack of funds and neglect have created serious maintenance problems in these earthen structures and may cause further deterioration. The USDA and the New Jersey Office of Coastal Management commissioned two recent reports on the region's levee inventory and Greenwich's resilience and vulnerabilities to coastal hazards, which correlate levee instability and the vulnerability of the township to flood events. Meanwhile, local residents are pushing for the replacement of the earthen levees with larger, higher structures that could meet FEMA's

requirements for certification in the National Flood Insurance Program and lower flood insurance premiums.

In this complex situation, the Penn team responded with a multi-part analysis that included quantitative research and qualitative stakeholder feedback. In the case of the levees, a GIS platform was used to overlay village land-use patterns, elevation data, cultural resource maps, available land parcels, current and future preserved farmland, protected wetlands, and properties listed on the National Register of Historic Places with flood-prone area data and estimated sea-level rise figures. The resulting maps were used to evaluate “Rebuild, Retreat, or Raise” alternatives in hypothetical disaster situations. Alternatives were rated by severity and frequency of threat, magnitude of intervention necessary to reduce vulnerability, implementation period, and agencies involved in implementation.

The team’s final Cultural Landscape Report seeks to ensure the long-term integrity of the township, both as a heritage place and a contemporary home for residents and businesspeople who steward that heritage. It responds to the landscape and the needs of village residents and local farmers while referencing a local history with national significance. Sustainable land-use decisions made with interdepartmental and intra-agency collaboration are a key part of this. Estuary advocates, agricultural interests, recreation enthusiasts, and county floodplain managers can all benefit from the Report’s holistic consideration of place and use of diverse resources, tools, and quantitative scientific information.