

# Sea Level Rise and Flood Risk

## Sea Level Rise

Sea level rise (SLR) will alter shorelines and the low-lying areas near them around the world. New York City is no exception. Besides the average diurnal tidal fluctuation of 5.19 feet (Horn's Hook), rising ocean water levels represent a long-term trend that has accelerated in the 20th century. Scientists disagree on the rate at which this is happening, and various climate models have been used to project future water levels. The New York City Panel on Climate Change (NPCC) published projections in 2013 that have been adopted by the City for planning purposes. These projections reveal a middle range of sea level rise of between 11 to 24 inches in 2050, from 2000 baseline elevations, with a high-end projection of 31 inches (NPCC, Climate Risk Information, 2013). Even in a high-end scenario, the surface of the Esplanade will be above water level at normal high tide in 2050. However, during storm surge events, there is a greater chance that the Esplanade and the neighboring community will be flooded. These kinds of storm events are predicted to occur with greater frequency and intensity in the future.

New York City is in process of adopting revised Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) that will dictate base flood elevation and hazard zones throughout the city. Large areas of East Harlem and smaller portions of the Upper East Side currently lie within Zone AE, meaning that these areas are subject to inundation by the 1-percent-annual-chance flood event formerly referred to as the 100-year storm. Open space areas like the Esplanade can be designed to accommodate more regular flooding or they can be used to protect adjacent development.

## Flood Risk

Low-lying areas along rivers are subject to flooding as part of the natural process associated with intense rainfall and coastal storms. In highly urbanized areas, such as along the East River Esplanade, this flooding has the potential to destructively impact development. Preliminary flood maps from FEMA indicate a high possibility for flooding along the Esplanade between 60th and 90th Streets, however, the possibility that this flooding will greatly affect inland buildings, infrastructure, and businesses is limited.

North of 90th Street, the possibility for flooding to have a larger impact dramatically increases. As noted earlier, this area has a historically low elevation where a network of streams previously drained into the river. While the creeks and streams have been filled in, the overall topography of this area of East Harlem is unchanged and at risk for flooding.

East Harlem is one of the largest contiguous areas in Manhattan under threat of inundation in a storm and has significant land mass located in Flood Zone AE. There are other areas in the city with similar possible flooding projections, such as the Financial District and food distribution center in the South Bronx. These areas are clearly critical to the City's economic operation and food supply, and have received attention for these reasons. However, the areas of East Harlem under discussion are middle to high-density underserved residential neighborhoods and are also in need of consideration for future flood mitigation planning. Much of this area includes residences administered by the New York City Housing Authority (NYCHA). While these residents may not be outspoken about the risks posed to their homes and community, the potential risks necessitate that planning for such events be elevated to the forefront of city planning efforts if the affordable housing units in this community are expected to remain viable.

Fig. 3.22 Sandy + SLR

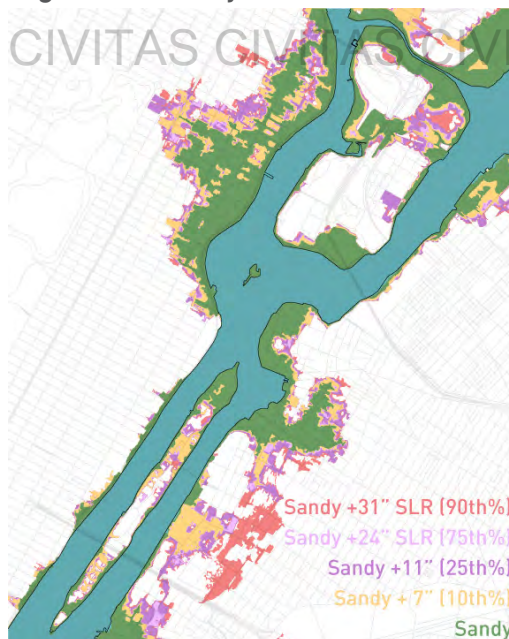
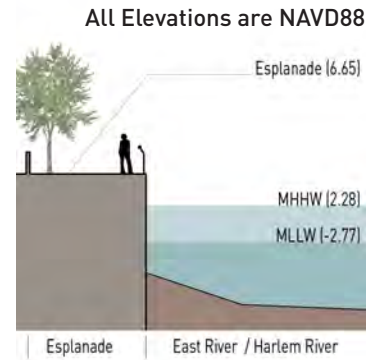
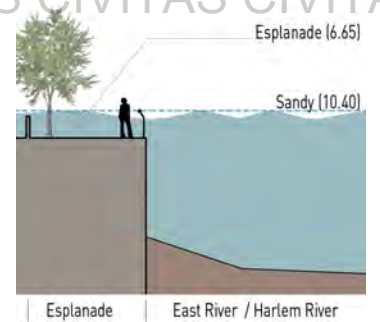


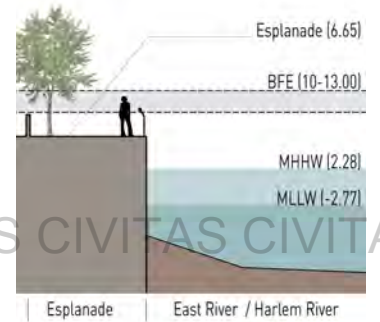
Fig. 3.21 SLR Section



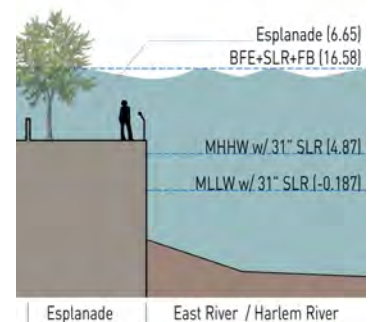
Average Tidal Fluctuation



Hurricane Sandy



Preliminary FIRM BFE



Storm Condition / SLR (2050)



Fig. 3.23 Buildings in 100-Year Floodplain (East River Esplanade)

