

## Sea Level Rise and Coastal Hazards: Case Study—New York City

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20th century global mean sea level (1.5-1.6 mm/yr) doubled to  $\geq 3$  mm/yr since 1993. Ice sheets track the high end of IPCC projections since 2000; glaciers and ice sheets now constitute the main source of sea level rise. NYC's mean 20th century sea level rise (SLR) of 2.8 mm/yr exceeds the global mean trend due to ice-mass losses, thermosteric, and geophysical causes. Several low-elevation NYC neighborhoods, especially surrounding and within Jamaica Bay, Queens already experience more frequent storm flood events and monthly high tides resulting from SLR. In 2015, the New York Panel City on Climate Change (NPCC) projected a SLR of 1.91 m (90th percentile) by 2100, relative to 2000-2004, raising the likelihood of today's 100-year storm surge (1% chance/yr) to 12.7%/yr by the 2080s. In 2019, the NPCC (2019) developed a low probability, upper-bound scenario (ARIM) for NYC, which projects 2.06 m SLR by the 2080s and 2.9 m by 2100. Several neighborhoods would undergo daily flooding, possibly even localized permanent inundation. While NYC implements adaptation and resiliency measures based on the latest climate research, its comprehensive waterfront plans only covers the next several decades, but not the much higher anticipated late 21st century sea levels. Additional adaptation investments, greater public awareness of future flood risks, studies on adaptation costs relative to benefits are needed. The ability to overcome these and similar issues will determine the adaptive capacity of vulnerable neighborhoods in NYC and other cities facing SLR, requiring cost-prohibitive future protections and unavoidably disruptive relocation.

### Biography

Vivien Gornitz received her Ph.D. from Columbia University in geology and subsequently become involved in climate change studies. Her current research focus is on impacts of sea level rise on urban coastal flooding. She has been a contributing author to the IPCC, NPCC, and UCCRN. She has also edited the Encyclopedia of Paleoclimatology and Ancient Environments, written *Vanishing Ice: Glaciers, Ice Sheets and Rising Seas*; *Rising Seas: Past, Present and Future*, in addition to numerous scientific papers.