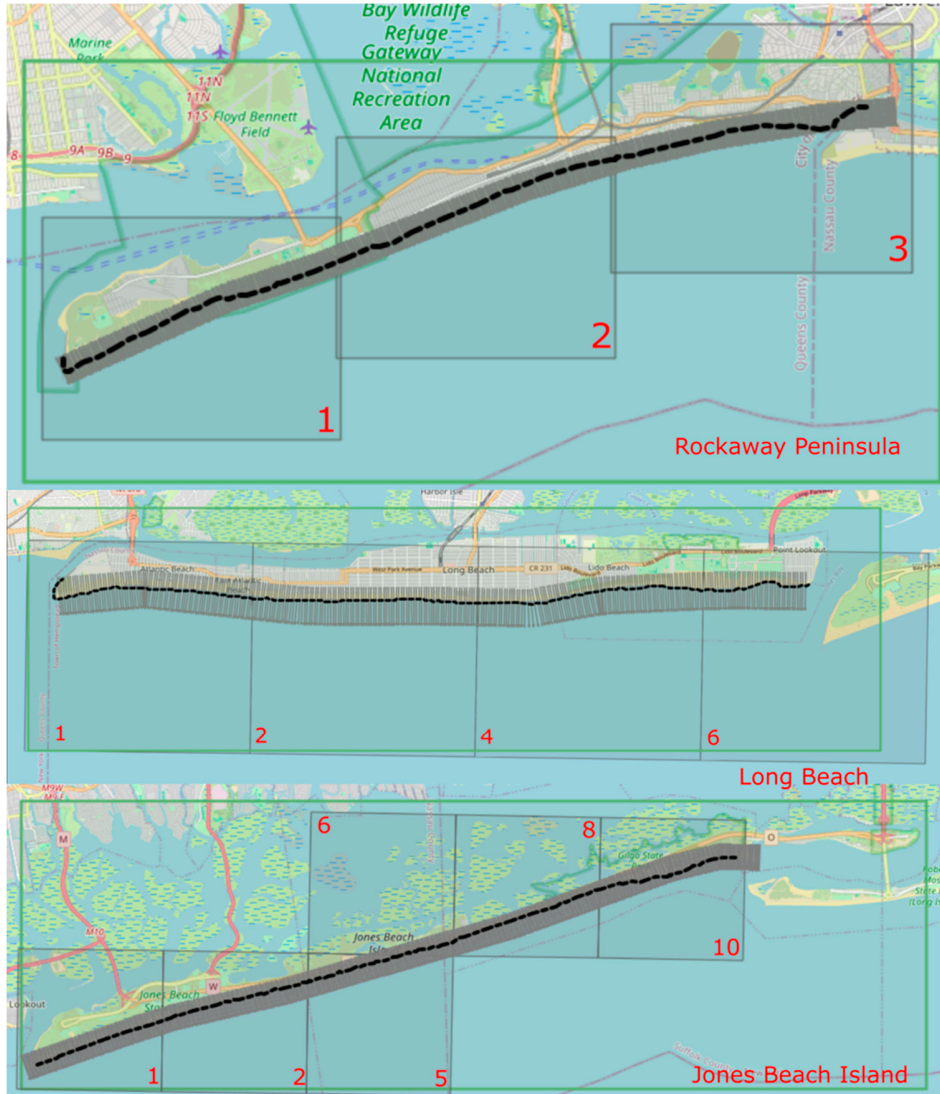**Supplemental Materials**

Figure S1. Orientation and numbering of each site location directly from CoastSeg. Rockaway Peninsula (top) contains 3 ROIs, 1, 2, 3. Long Beach (middle) contains 4 ROIs, 1, 2, 4, 6. Jones Beach Island (bottom) contains 6 ROIs, 1, 2, 5, 6, 8, 10. ROI numbering is from west to east.

Figure S2. Locations of more specific beach nourishment projects. (a) shows the location of Rockaway Beach (red) on Rockaway Peninsula and the location of Point Lookout (cyan) on Long Beach. (b) shows the location of Gilgo Beach (purple) on Jones Beach Island. (a) and (b) have the same scale. Imagery from Google Earth from December 14, 2015, to January 1, 2021.
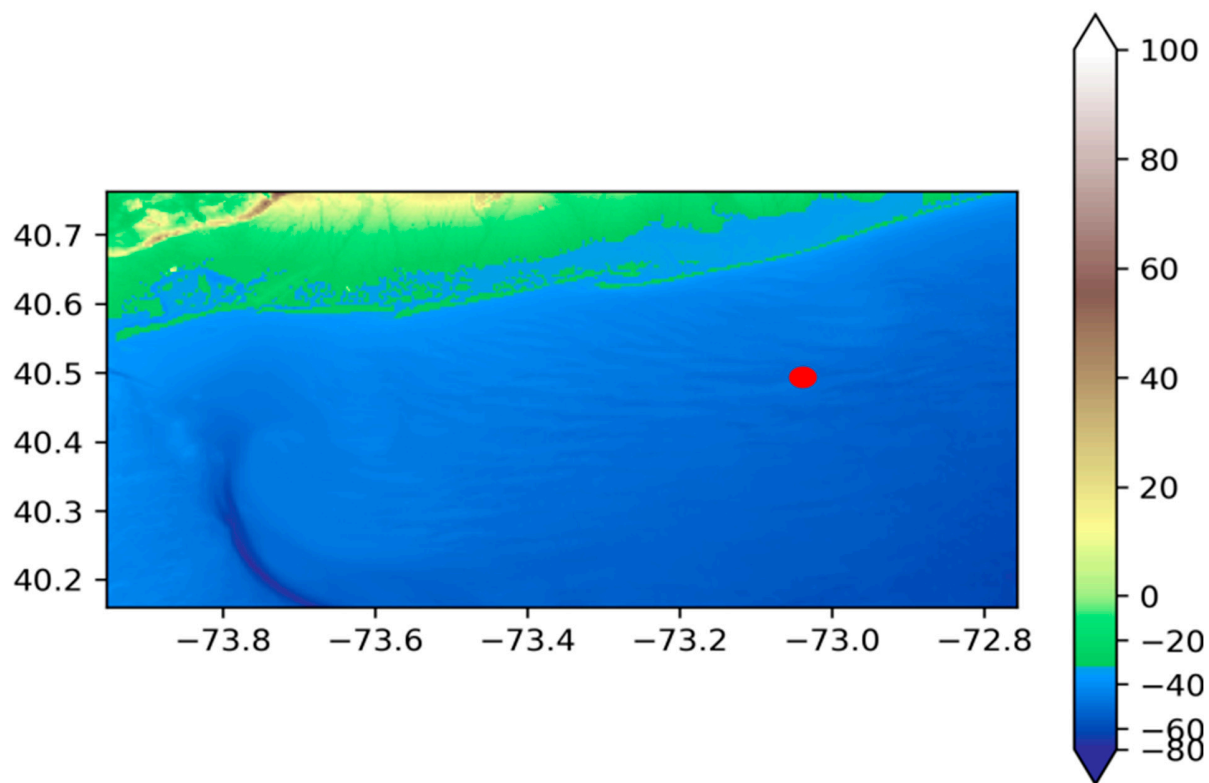
Figure S3. Exact location of ERA5 wave data downloads at 40.47 latitude, -73.07 longitude, water depth ~55 m. Figure created using data from ERA5. Data taken from January 1, 1984, to December 31, 2022.
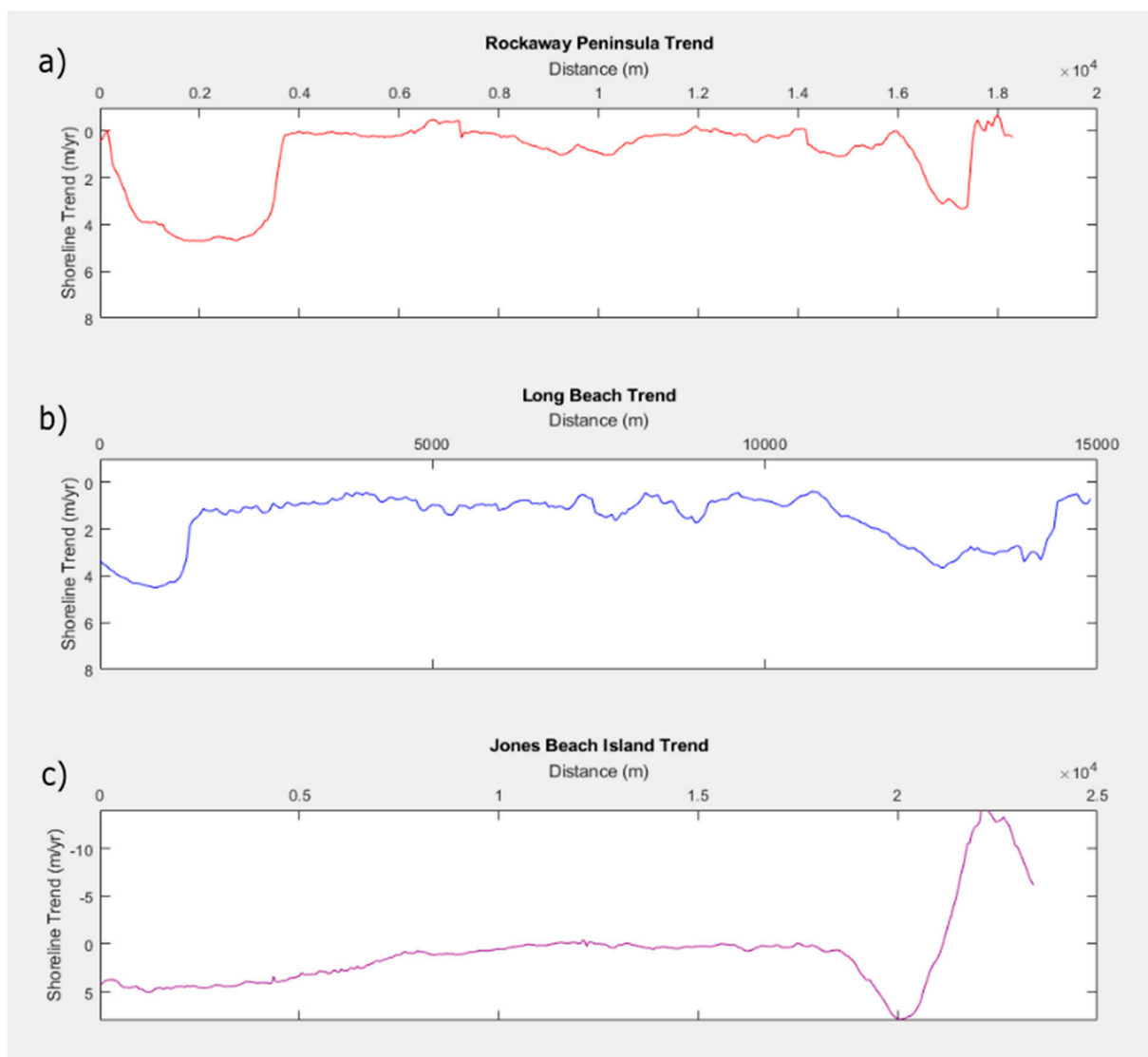
Figure S4. Trends in the shoreline positions for the three study area beaches computed from linear regression of the LOESS-filtered monthly shoreline data. (a) Rockaway Peninsula, (b) Long Beach, (c) Jones Beach Island. Shown without the use of the break-axis function.
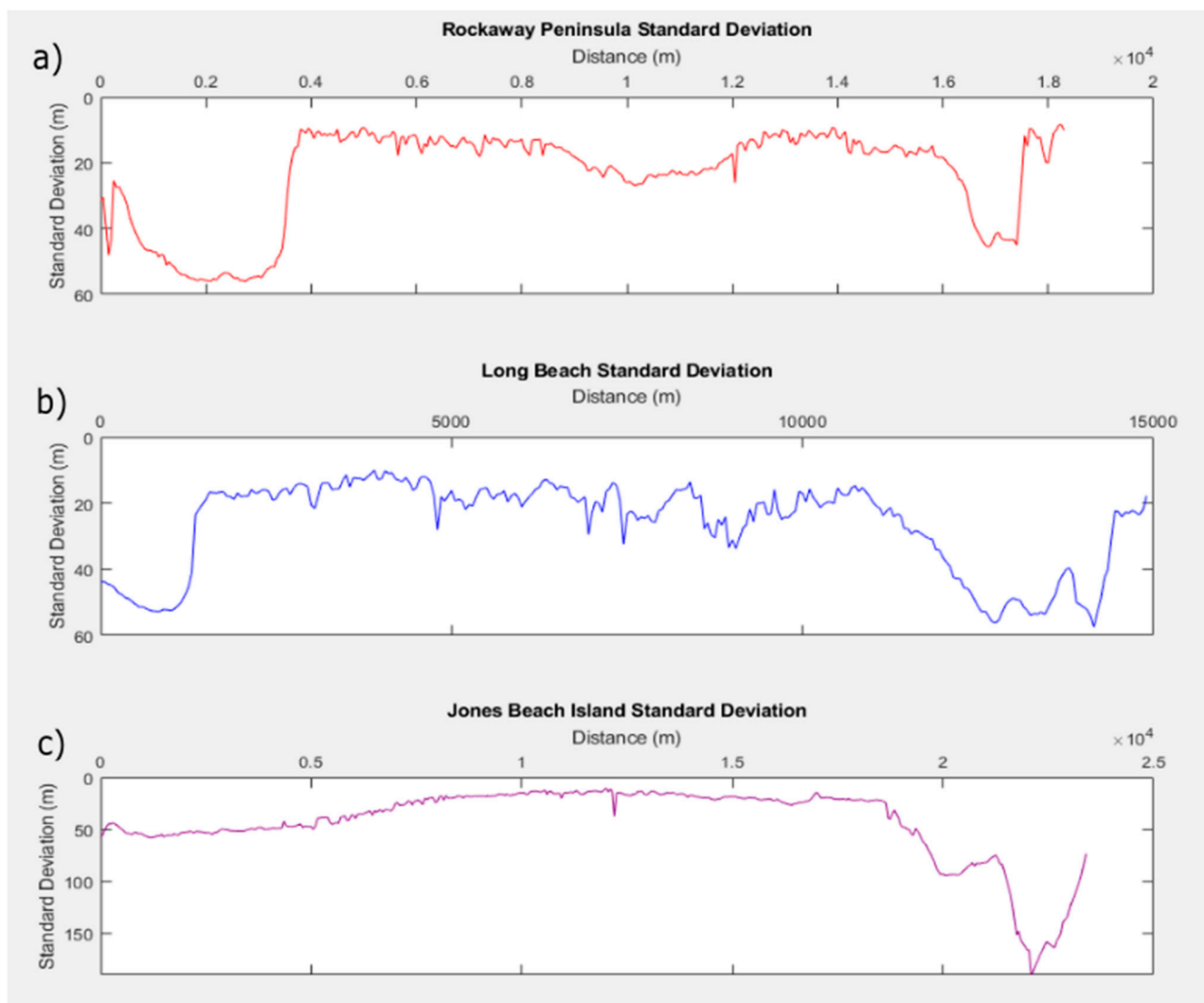
Figure S5. Standard deviation of each site: (a) Rockaway Peninsula, (b) Long Beach, (c) Jones Beach Island. Standard deviation in meters and distance in meters. Shown without the use of the break-axis function.