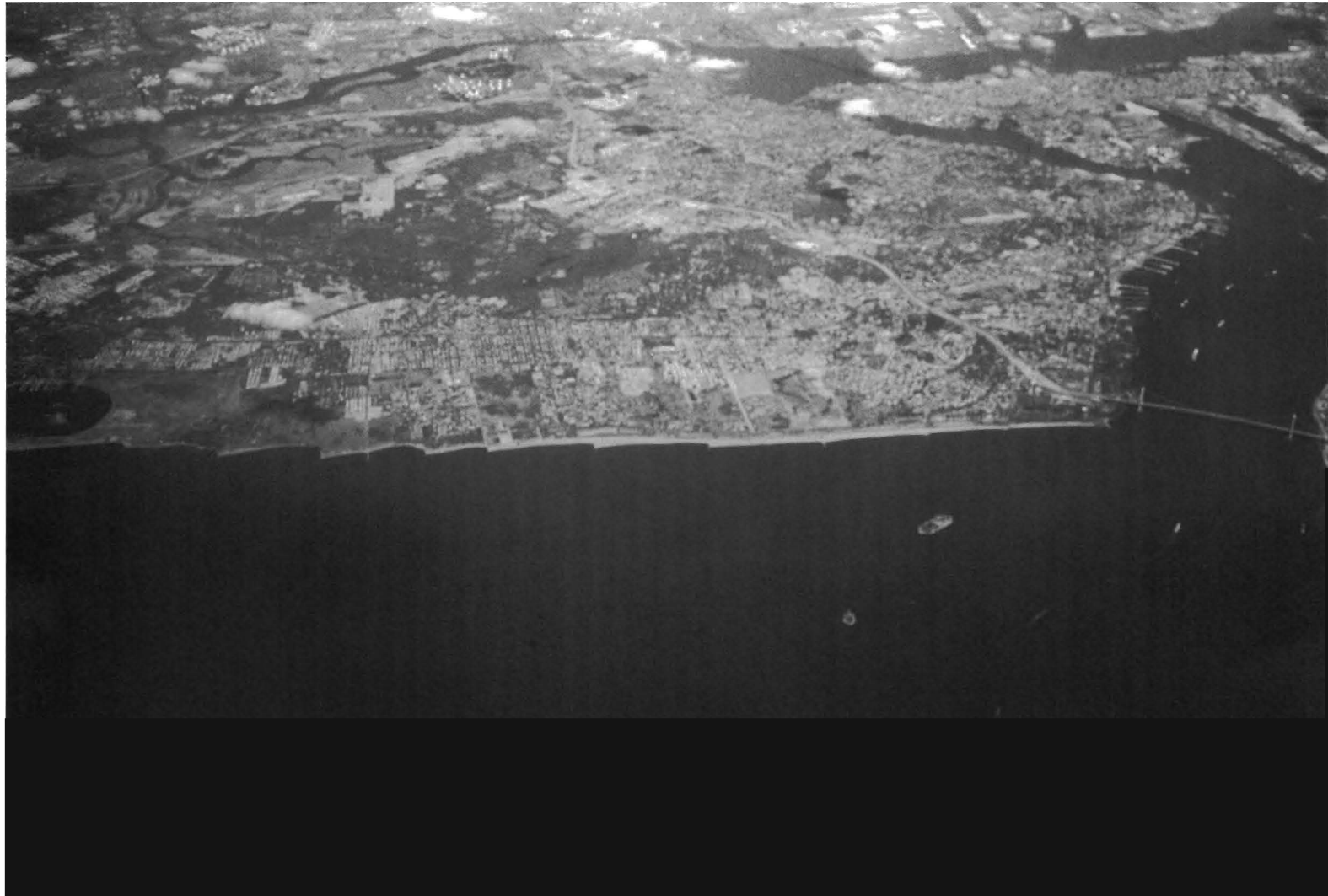


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COASTAL PHOTO BY CYRIL GALVIN

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A stable beach at a zone of diverging longshore transport, Staten Island, New York. The Raritan Bay shoreline of Staten Island, New York (Borough of Richmond, New York City) extends in a SW (left) to NE (right) direction. Along right edge of photo: Verrazano Narrows Bridge, Upper New York Bay, and Bayonne, New Jersey. Along top edge of photo: Newark Bay and Kill van Kull on right, and Arthur Kill on left. Branching tributary from Staten Island to Arthur Kill is Fresh Kills (upper left). Elliptical water on left edge of photo is Great Kills. The two islands in Raritan Bay off the beach are Hoffman Island (larger) and Swinburn Island (smaller).

Beaches along the Raritan bay shore are crossed by stormwater outfalls that act as groins. These groins interrupt the longshore transport in ways that show a zone of diverging longshore transport to exist opposite Hoffman Island: to the left of Hoffman Island, transport is clearly to left (to SW); to the right of Hoffman Island, transport is clearly to right (to NE). This situation has existed for over a century. Cyril Galvin took this photo on 6 May 1973, but the beaches in the photo resemble those mapped around 9100 and those existing in 2000. This diverging zone of *longshore* transport at a relatively stable shore requires wave-induced *onshore* transport from the vicinity of the islands.

Within the past 12 years, Cyril Galvin has made coastal processes studies for siting two recreational piers and a private development on the Raritan Bay shore of Staten Island. In 1993, he made an extensive study for FEMA of storm damage along the entire Raritan Bay shore and in the barge facility at Fresh Kills, following the great northeast storm of December 1992.