

# EFFECT OF THE SHORELINE TOPOLOGY ON SEEPAGE PROPERTIES IN PORT JEFFERSON HARBOR, NY

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The fate of nitrogen entering Long Island Sound Embayments is dependent on both volume of submarine groundwater discharge (SGD) and geochemical transformations at the seawater interface. To understand the distribution of SGD and quantify the fluxes, a study combining resistivity surveys, pore water sampling and seepage measurements was conducted in Port Jefferson Harbor, on the north shore of Long Island, NY. Results from two sites on the eastern shore, approximately 400 m apart, reveal significant differences in salinity structure of the seawater interface. At the northern site, Belle Terre Beach, a small inland hydraulic gradient leads to the formation of an upper saline plume, and consequently fewer nitrates in manual seepage meter measurements due to important dilution. Conversely, the southern site exhibits freshwater seepage at the beach face, possibly due to a concave shoreline. It may focus groundwater discharge and prevents formation of an upper saline plume, resulting in higher nitrate concentrations, in seepage meter measurements. These contrasting scenarios provide new insights into how hydraulic gradient and beach topology are linked and can influence the magnitude of SGD in low-energy tidally dominated harbors.



Site map with the position of the two study locations: Belle Terre Beach and Centennial Beach in Port Jefferson Harbor, Long Island, NY.