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Analysis of water table responses to Hurricane Sandy on Long Island, New York

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Coastal zones have come under increased investigation in recent years for two main reasons: first, because of the sizeable populations that reside there (over half of the population of the United States is found in coastal zones), and second, because of the sensitivity of these regions to the effects of global climate change. Hurricane Sandy (October 28-29, 2012), the largest Atlantic hurricane on record, brought a significant and unique ocean surge to the densely populated coastline of Long Island, New York (among other places) that caused widespread flooding, over a mile inland in many places. Previously installed USGS monitoring stations along Long Island's coast and within Long Island's unconfined Upper Glacial aquifer allow us the unique opportunity to witness the real-time response of this hydrologic system to a storm of literally historic proportions. An investigation into groundwater response to storm events such as Hurricane Sandy is imperative, especially to Long Island, whose 3 million people rely entirely on groundwater from Long Island aquifers and thus should be highly concerned with groundwater quality following a storm event. This report uses the real-time data mentioned above in collaboration with limited eyewitness testimony to determine that this tidal-driven ocean surge did not significantly infiltrate into the ground, but rather, it forced a Boussinesq-type pressure pulse through the island that temporarily increased the water table level within the Upper Glacial aquifer.

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