Biogas emissions at the Estuarine Turbidity Maximum in the Hudson River

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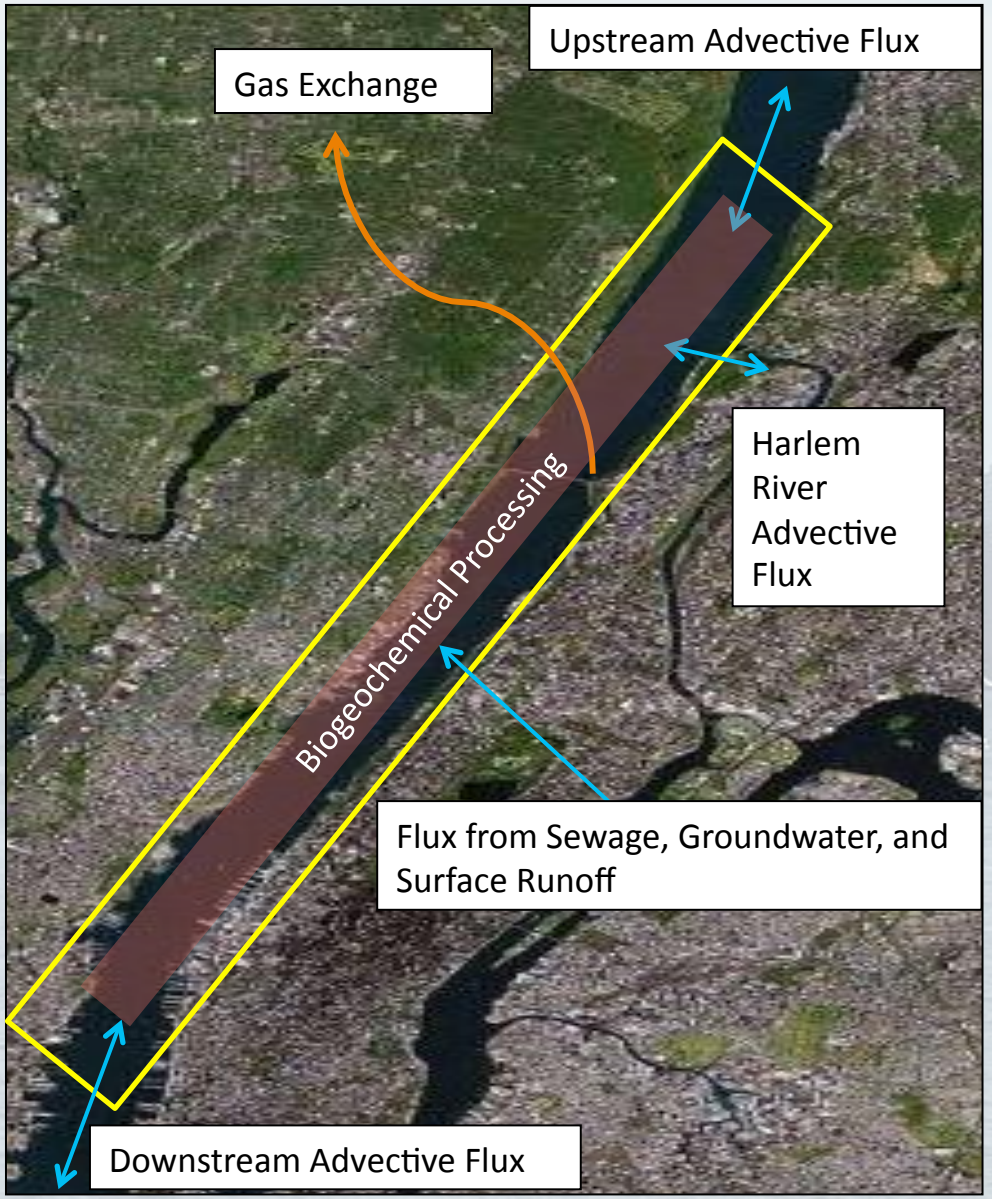
Significance

More than 12 million people live near the Hudson River Estuary and depend on its ecological health to sustain their quality of life.

Background

Microbial respiration can cause the Hudson River Estuary ecosystem to collapse if it increases to unsustainable levels. The supply of organic carbon to feed microbial communities is one of the main limits on their expansion. Nitrogen enrichment of the estuary can lead to higher levels of primary production and provide the organic carbon necessary for microbial growth.



Research

The impact of biogeochemical processing on the fate of carbon and nitrogen inputs to the Hudson River Estuary was quantified through construction of a box model over the Estuarine Turbidity Maximum, where microbial activity is most intense, for all of the relevant transport fluxes and gas exchanges in the system. Measurements of the biogases: N_2, N_2O, CH_4, and CO_2 inside the box were used with data from the New York City Harbor Survey on dissolved constituents in the system to assess the accumulation and conversion of carbon and nitrogen. The results were analyzed for their impact on dissolved oxygen dynamics and the estuary's overall ecological health.