

HIGHLY-RESOLVED COMPUTATIONS IN THE HUDSON RIVER ESTUARY

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Abstract: maximum is 180 words

We present highly-resolved computations and measurements of flow in a bend of the Hudson River Estuary around the Indian Point power plant, where thermal discharge may affect the ecosystem. ROMS modelling is performed in a domain between the USGS gauging stations at Poughkeepsie and Piermont. Higher-resolution Large Eddy Simulation (LES) is then done to resolve large-scale turbulent motions in the near-bank regions, applying the standard Smagorinsky model in the commercial software Fluent 6.3.26. In a shear layer at the edge of a shallow region, vortices are observed to roll up in the LES though not in $k-\epsilon$ URANS on the same grid. Proper Orthogonal Decomposition (POD; equivalent to Empirical Orthogonal Functions) is found to effectively identify these vortices. To check the computations, field measurements of discharge, and velocity and temperature profiles, around the ADCP station at West Point and the thermal plume from the power plant are performed.