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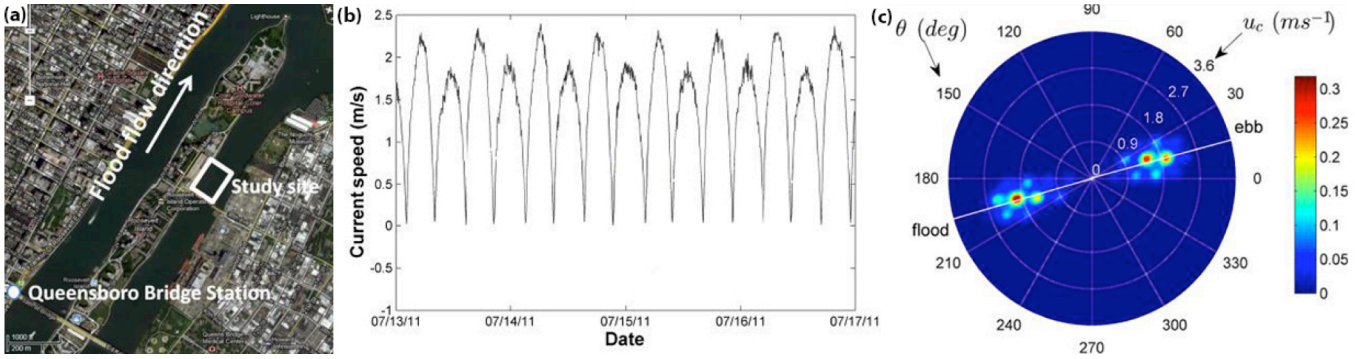
Tidal Energy Resource Assessment in the East River Tidal Strait, New York

Sandia recently worked together with Verdant Power, Inc., and ORNL to conduct two-months of high-resolution velocity and turbulence measurements using acoustic Doppler velocimeters (ADVs) at the Roosevelt Island Tidal Energy (RITE) site. Verdant Power was recently given permission by FERC to deploy up to 30 axial-flow turbines at this site. This study's main goal was to examine the temporal variation of current speeds, current directions, turbulence intensities, and power densities.



(a) *The RITE study site,* (b) *current speed time series, and* (c) *the joint probability distribution of the current speeds and the current directions.*

Due to its relatively straight and uniform channel geometry, the tidal current at the site is highly regular, which is desirable because it allows accurate electricity supply forecasting. The mean ebb and mean flood flow directions are nearly bidirectional. The turbulence level and unsteady loads at the site are shown to increase with the mean current speed. The study also found that insufficient temporal resolution measurements can cause low pass filtering, leading to underestimations of the tidal energy resource and the device loads.

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