Enabling Sustainable Tidal Energy Development in the Bay of Fundy: Fishing for Solutions

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The Bay of Fundy is renown for its immense tidal energy resource, with the world's highest tidal range (up to 16 meters) and current speeds exceeding 5 m/s. A key outcome of the Task Force on Sustainable Tidal Energy Development in the Bay of Fundy was identifying the need for industry enabling research to more accurately quantify the risks of fish-turbine encounters. Acadia is leading a multi-year, collaborative research project (2025-2028), funded by NRCan and with in-kind support from Fisheries and Oceans Canada. With research partners, Fundy Ocean Research Centre for Energy (FORCE) and the Ocean Tracking Network, this project focuses on collecting sufficient fish detection data to better understand movements of migratory fishes through the Minas Passage, including fish-turbine encounter rate probabilities for six key species of interest. The work involves acoustically tagging fish (>500) with Innovasea’s HR tag technology and detecting tagged fish moving past receivers moored year-round in Minas Passage. Acadia will also analyse relevant detection datasets collected by The Confederacy of Mainland Mi'kmaq to further boost knowledge outcomes on fish movements in Minas Passage. Additionally, the project will deliver newly designed receiver platforms for use in detecting fish avoidance of installed turbines. Understanding the risk to fish of tidal energy developments at FORCE requires use of ADCP data, FVCOM simulations, drifter datasets, and CFD models of the FORCE tidal site. A Computing Cluster (Kelvin) has been developed and installed at Acadia to support CFD modelling activities for this and other MRE projects. The team is working with existing ADCP datasets collected by FORCE for validation of the CFD simulations of tidal flow through the FORCE site. Collaboration with Orbital Marine Power is the next step toward modelling tidal turbines in situ to predict the forces acting on fish passing proximate to installed turbines.