Enabling Research in the Tidal Energy Sector Report

Highlighting the research, technical innovation, and sector discussions from the 2025 Marine Renewables Canada Conference & Exhibition

FERN
FUNDY ENERGY RESEARCH NETWORK

May, 2026

A Snapshot of Research and Technical Developments in the Tidal Energy Sector, as Presented at the 2025 MRC Conference

Research presented at the 2025 Marine Renewables Canada Conference & Exhibition in Halifax, Nova Scotia, spanned a wide range of topics. They included ongoing efforts in the Bay of Fundy to reduce uncertainty in environmental effects of operational tidal stream devices. Presentations highlighted ongoing and planned applications of various sensors (multibeam imaging sonars, echosounders, optical cameras, etc.), detection of acoustic tags implanted in migratory fishes, and use of the FVCOM hydrodynamic model and drifter track data to better understand fish trajectories through a tidal energy development site. Research underway with an installed Orbital Marine Energy device (O2), located at a European Marine Energy Centre (EMEC) site in Scotland, involves evaluating sensor performance and automated data-processing methods to improve the detection and monitoring of marine animals.

One of the presentations demonstrated how computational tools, hydrodynamic models, and CFD modeling are being used to inform both environmental effects prediction and turbine design optimization. Another focused on evaluating hub retrofit concepts for horizontal-axis tidal turbines, finding that while 3D simulations showed no net power gain, a new 2D CFD-based optimization approach improved lift-to-drag performance.

From platform concepts to turbine designs, technical innovation in the tidal sector is continuously evolving. Arup introduced their Marine Ensemble Tension Stationkeeping (METS) system, which is a mooring approach for floating offshore wind and wave structures. This design helps to reduce dynamic loads, limit platform drift, and minimize seabed impact. Wave Water Watt Inc. developed SeaVortex, an ocean energy platform designed to harvest energy from waves, currents, and tides, with evaluations under the IEA-OES framework. Tidewind Inc. presented a patented unidirectional rotation rotor turbine intended for both tidal and wind environments.

The integration of environmental data, advanced modelling, and engineering innovation help support the future of the tidal energy sector. To learn more about the various tidal energy topics presented at the 2025 MRC Conference, please visit **HERE.**

Indigenous Participation

The 2025 Marine Renewables Canada Conference & Exhibition presented a unique opportunity for selected members to develop workshops for fellow members based on a topic of their choosing.

Notably, the Fundy Ocean Research Centre for Energy (FORCE) organized a workshop – *Stronger Relationships: Netukulimk, Etuaptmumk and the Future of Ocean Energy* – to discuss

opportunities to integrate Mi'kmaw knowledge, leadership, values, and practices into marine renewable energy development.

This workshop drew on lived experiences and collaborative initiatives, including a delegation of Mi'kmaw Chiefs to Scotland to observe an operating turbine and visit the European Marine Energy Centre. Discussion included the importance of acknowledging the Mi'kmaq as Rights Holders and Knowledge Holders rather than stakeholders and shaping research and monitoring through Mi'kmaw perspectives. Additionally, panelists discussed how developing ocean energy collaboratively can align with Indigenous laws, values, and environmental ethics and respect the priorities of the community.