

OrcaFlex and OrcaWave: simulation tools for marine renewable energy

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Abstract ID: 111

Submitted: May 8, 2026

Call.: MRC 2026 Research & Technical Track – Call for Abstracts

What Theme Are You Submitting for?: Data, Modeling, and Simulation

Presenter Name: Paul Jacob

Focus Area: Offshore Wind

Keywords: OrcaFlex, OrcaWave, analysis, cables, diffraction, dynamic, floating, hydrodynamic, modelling, mooring, offshore, renewables, waves, wind

Canada's marine renewables sector – spanning offshore wind, wave, and tidal energy – is growing rapidly, and with it the need for robust engineering tools capable of supporting project development and full life cycle from early concept through detailed design, installation, operation and eventual decommissioning, removal and disposal.

OrcaFlex, developed by Orcina, is a dynamic analysis tool trusted across the offshore energy industry for the design and engineering of floating systems, including their mooring, inter-array, and dynamic power cables. Developments in recent years extend this capability to fully coupled analysis of floating offshore wind turbines (FOWTs), integrating hydrodynamic body modelling with an aerodynamic turbine model to simulate the combined response to wind, wave, and current loading. OrcaFlex is also used for evaluation of cable on bottom stability. OrcaWave, Orcina's complementary diffraction analysis tool, computes the hydrodynamic data required to characterise the wave-induced motion of large floating structures.

In this presentation we demonstrate how OrcaFlex and OrcaWave can support the engineering workflows relevant to Canada's emerging marine renewables market.