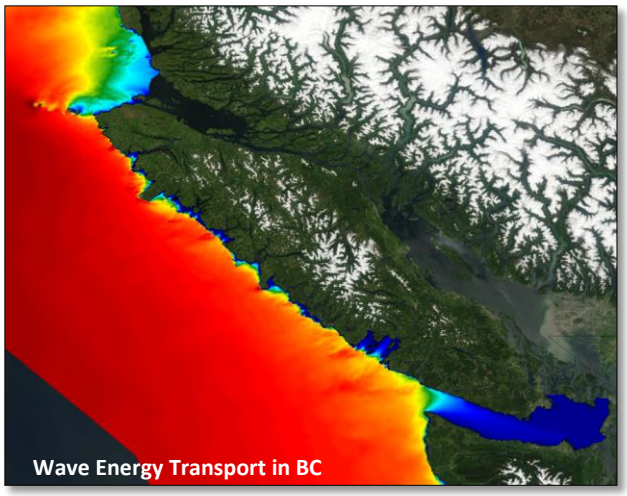
University of Victoria | Institute for Integrated Energy Systems

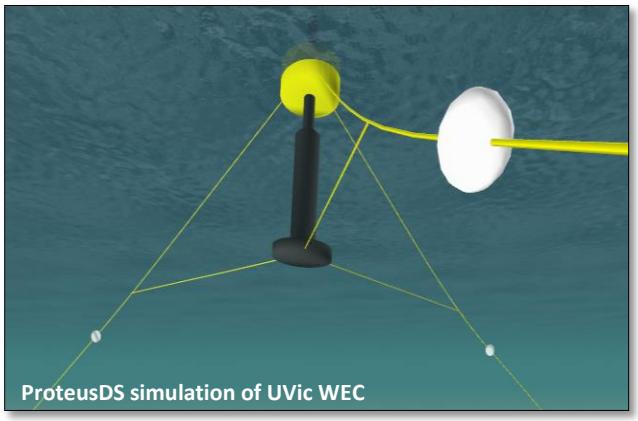
West Coast Wave Initiative (WCWI)
University of Victoria, PO Box 1700 STN CSC, Victoria, BC Canada V8W 2Y2

*The West Coast Wave Initiative (**WCWI**), within the Institute for Integrated Energy Systems at the University of Victoria, is a collaborative group of researchers, international Wave Energy Converter (**WEC**) developers and Canadian service providers. The WCWI is mandated to develop highly detailed wave propagation models to estimate the gross wave energy resource off Vancouver Island, to use high fidelity computer simulations to model WEC's and their expected electricity production, and to investigate the integration of wave energy electricity production into the BC and Western Canada's electrical grids.*

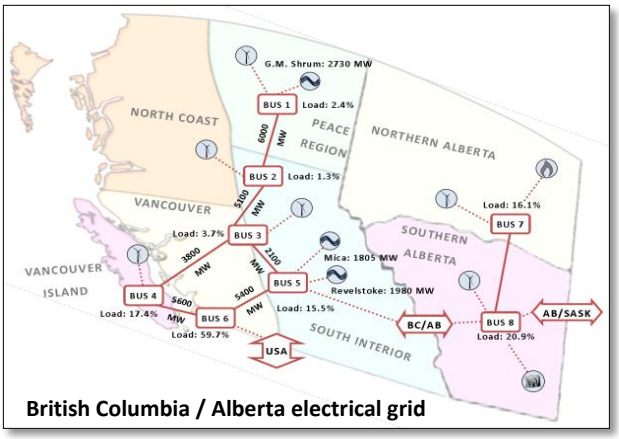
The combination of WCWI's network of AXYS Technologies wave measurement buoys along the west coast of British Columbia and a detailed numerical wave model, which WCWI and Cascadia Coast Research developed, provides detailed fully directional wave data for an area of ~410 000 km^2 - at industry leading resolution and detail. This enables WCWI to quantify all seastate characteristics, and energy contained therein, over the past decade. The model provides an unprecedented understanding of the environmental conditions and will ensure that future WEC designs can be created for the true operational environment, reducing risk to WEC developers, deployment communities and the environment.


Wave Energy Transport in BC

*WCWI has teamed up with Dynamic Systems Analysis (**DSA**) to create dynamic models of WECs using their ProteusDS finite element analysis software. WCWI creates simulations of its four partners' WEC technologies; Ocean Energy Limited's (**OEL**) floating oscillating water column, Resolute Marine Energy's (**RME**) seafloor mounted surging flap, Seawood Designs' floating pontoon and the University of Victoria (**UVic**) Mechanical Engineering Departments two body point absorber.Each participating WEC system utilizes different methods of power capture, is affected differently by mooring dynamics and requires different control strategies. By including these affects in the simulation environment, better estimates of the available electric power will be computed and allow WCWI to iteratively test design and control concepts in simulation – something that isn't possible to economically do on physical prototypes.*


ProteusDS simulation of UVic WEC

The final mandate is to determine the effect that WEC electricity production will have on the electrical grid at the community (kW), Vancouver Island (MW) and provincial (GW) scales. This will allow WCWI to be a "truth broker" for the wave energy industry in British Columbia. Would wave power make a positive contribution to British Columbia's power needs? Is it cost effective with other alternate power systems? Is it reliable? Building on renewable energy grid integration work completed at UVic, WCWI aims to thoroughly investigate the opportunities and hurdles for penetration of wave powered electricity within Canada.



British Columbia / Alberta electrical grid