Modelling of Australia’s southern coastal region in support of the Albany Wave Energy Project

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The Western Australian Department of Primary Industries and Regional Development has awarded $3.75M to the University of Western Australia to establish a Wave Energy Research Centre (WERC) based in Albany. WERC is delivering research relevant to marine renewable energy generally, but also has a specific role in supporting the Albany Wave Energy Project that will involve the deployment of a 1.5MW wave energy converter by Carnegie Clean Energy off Albany in 2020. A primary task of WERC has been to conduct a detailed assessment of the wave resource and extremes, as well as deliver real-time observations and predictions of waves and currents at the development site. A detailed understanding of the wave climate and real-time conditions are critical for maximising power extraction, preventing damage during extreme conditions, and determining safe operating conditions. Details of the wave resource assessment, conducted using a 36 year hindcast, and real-time observational and modelling system will be presented. Wave observations are provided by two directional wave buoys, one deployed at the device site (30 m depth) and a second in 350 m depth (~50 km offshore) with the observations from the offshore buoy used to drive a SWAN wave model. Observations from the buoy at the device site will be used for model calibration/validation and to provide a redundant data source. The wave model will also be coupled with a regional ROMS circulation model. All observations and model predictions will be freely available via a website that is presently being developed.