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Littoral Zone Forecasting:

Predicting temporal and spatial variability in nearshore waves and currents on a barred beach with diurnal forcing.

Centre for Australian Weather and Climate Research

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Australian Government
Bureau of Meteorology

BLUE link
Ocean Forecasting Australia

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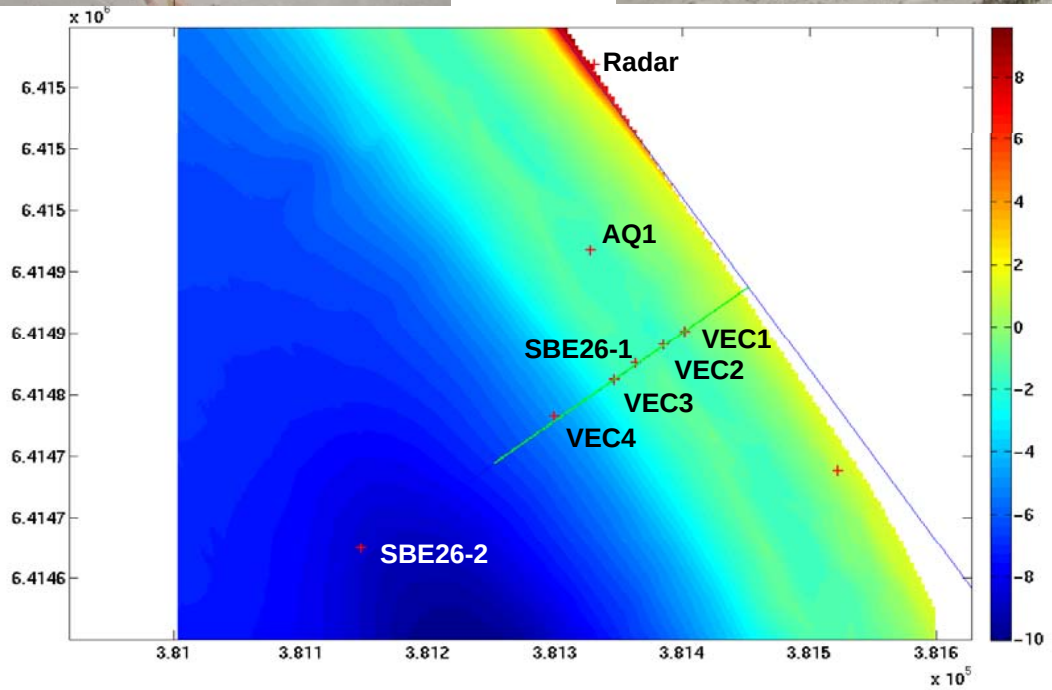
BLUElink Model Hierarchy

Scale	Numerical Models	Prediction systems
Global	**OFAM** (MOM4 - NOAA GFDL) Ocean Forecasting Australia Model Resolution 10km	**OceanMAPS** (Forecast) Ocean Model Analysis and Prediction System **BRAN** (Hindcast) Bluelink ReANalysis
Regional O(100) km	**SHOC** (CSIRO) Sparse Hydrodynamic Ocean Code Resolution >2km **RAMS** (Colorado State U) Regional Atmospheric Modelling System **SWAN** (Deltares) Simulating WAves Nearshore	**ROAM** (Hindcast and forecast) Relocatable Ocean-Atmosphere Model

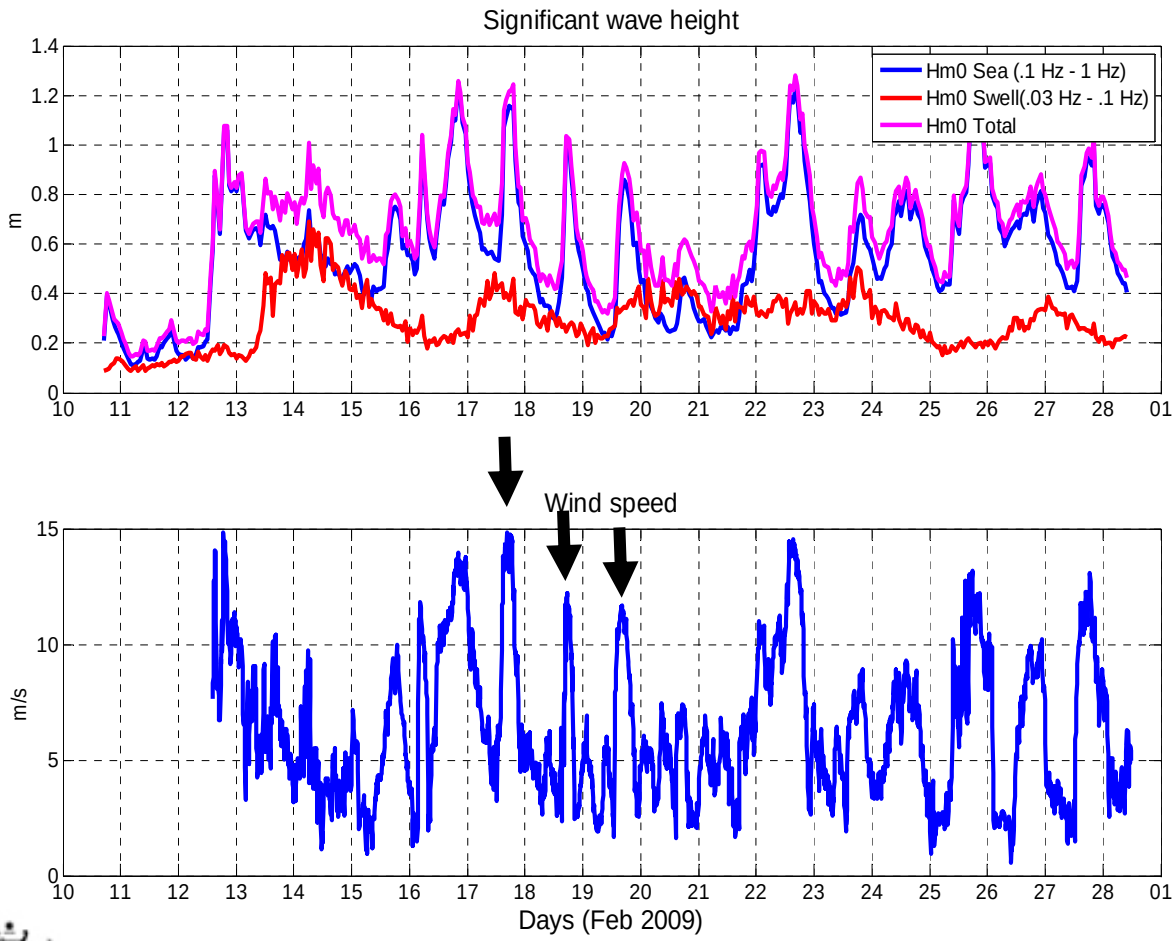
LOMS Objectives

- To develop laptop-based software system to provide several-day wave and current forecasts for use in Royal Australian Navy amphibious and other littoral zone exercises - LOMS.
- To develop, for the Bureau of Meteorology, an operational surface-wave prediction system, to provide forecasts for the Australian coastal region – WW3.
- To implement, test, compare and develop models for predicting surface waves and wave-driven currents in the littoral zone.
- To validate the model against in situ observations.

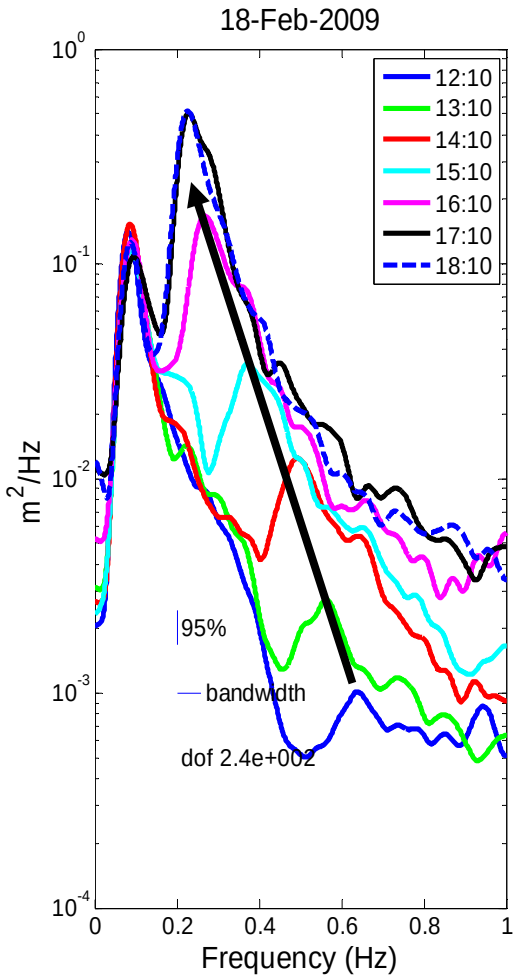
Secret Harbour, Feb 9-28, 2009



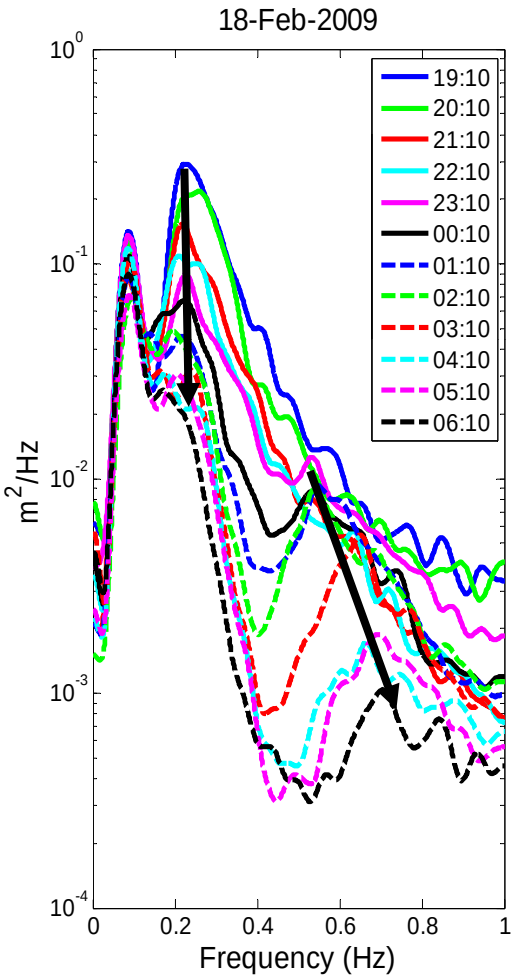
Wind and waves



Wave spectra (AWAC)

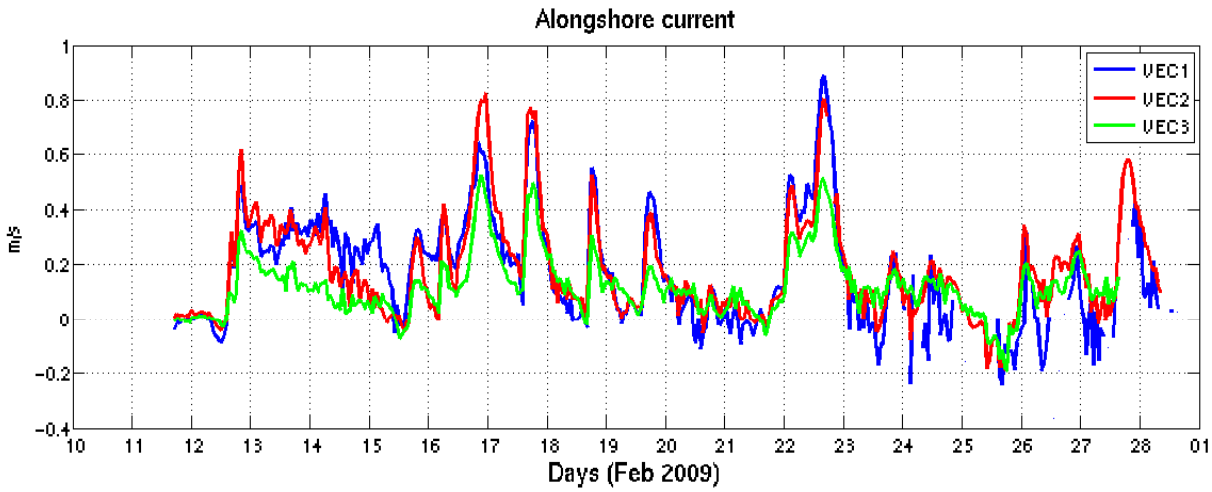


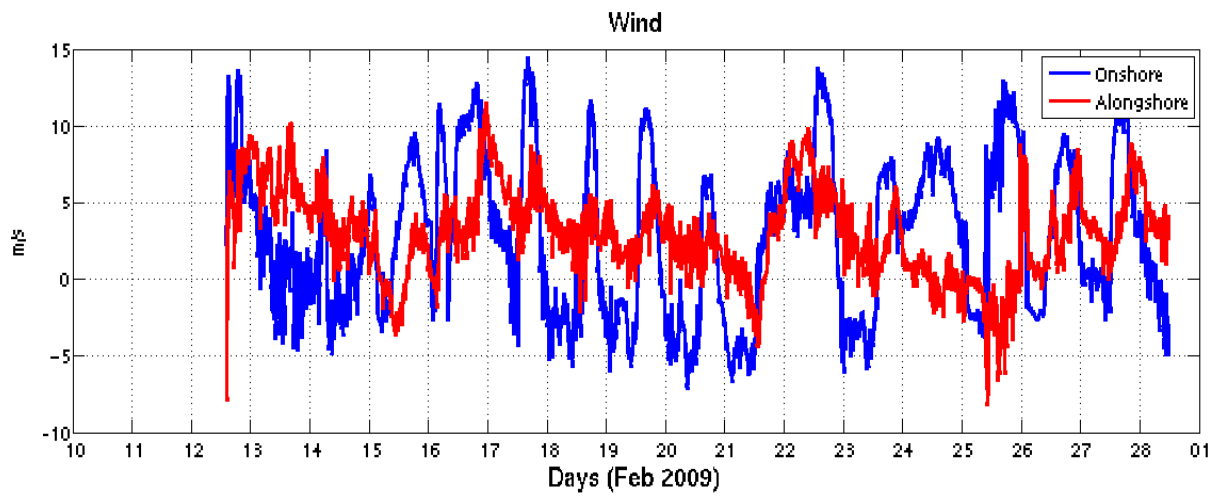
Increasing wind



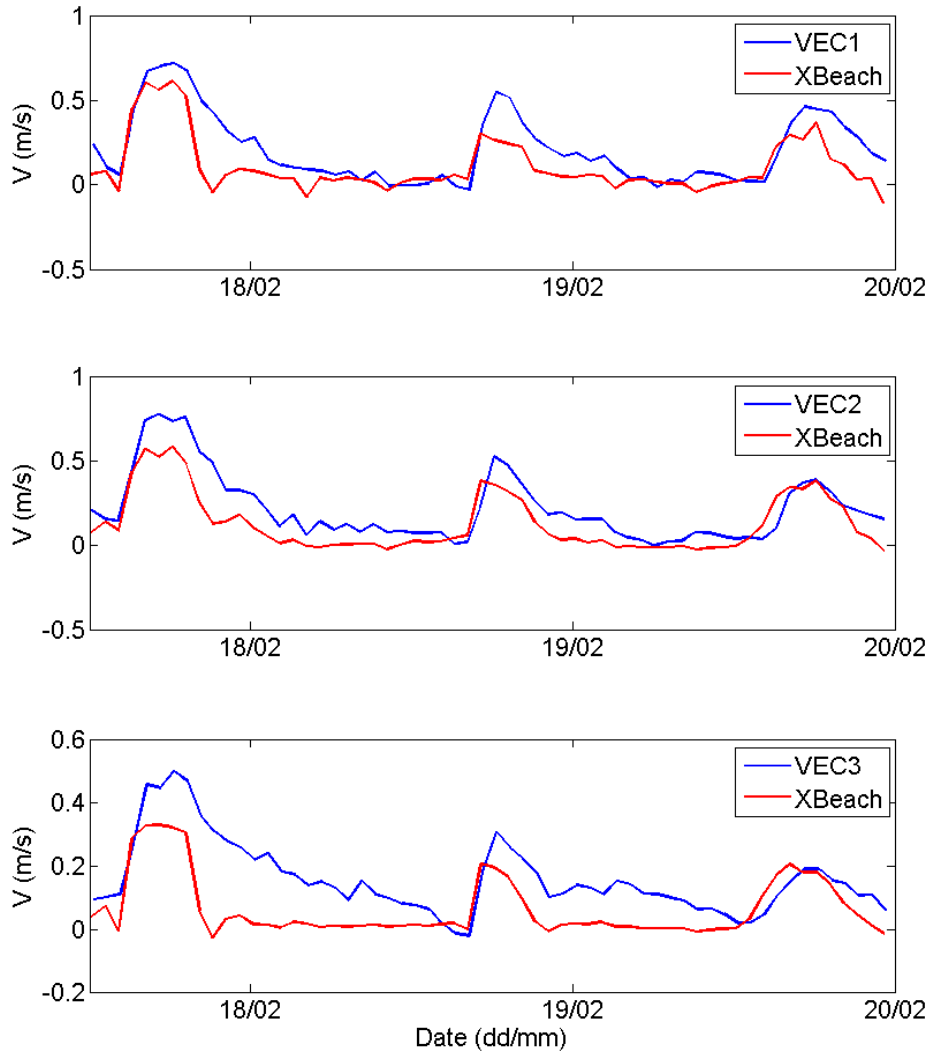
Decreasing wind

Alongshore currents

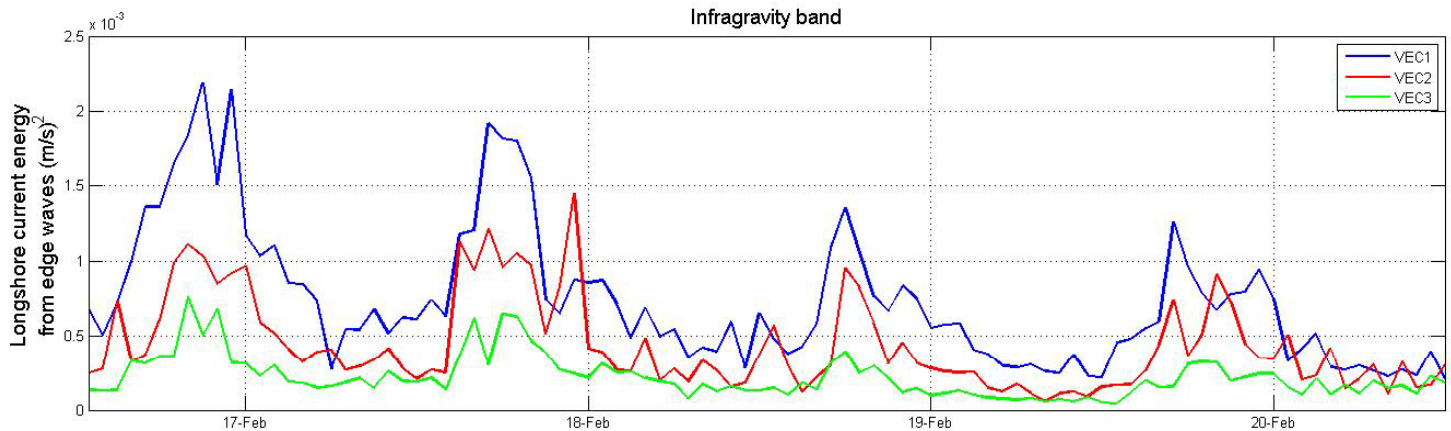


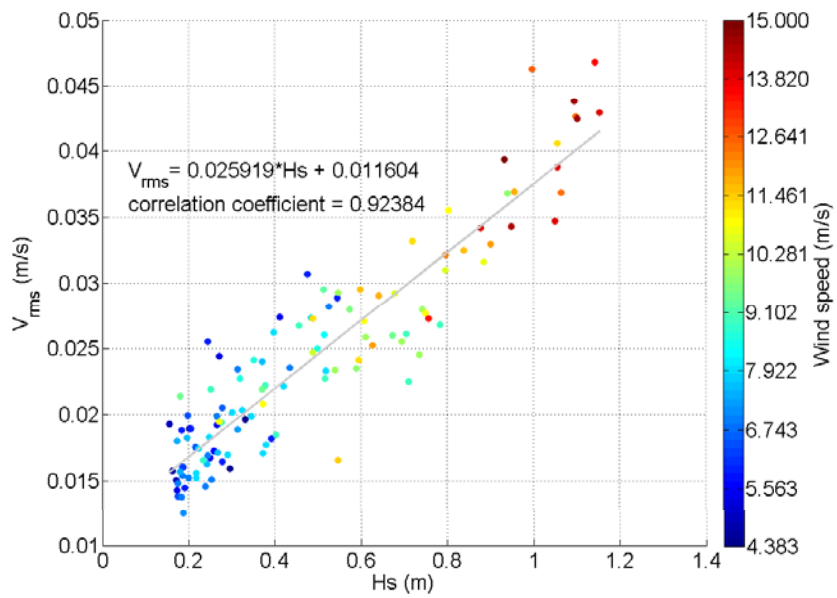


XBeach vs observed alongshore currents

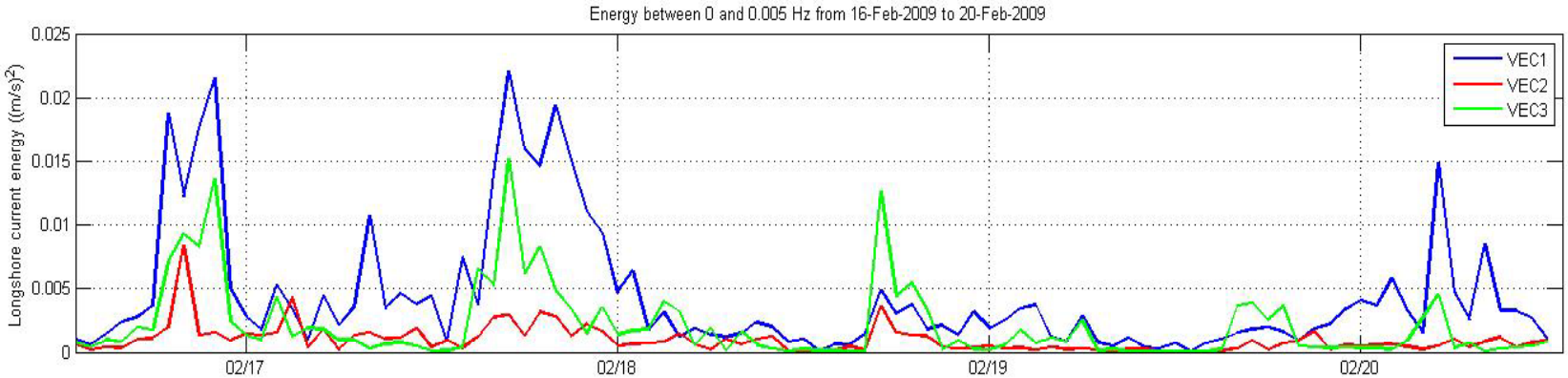


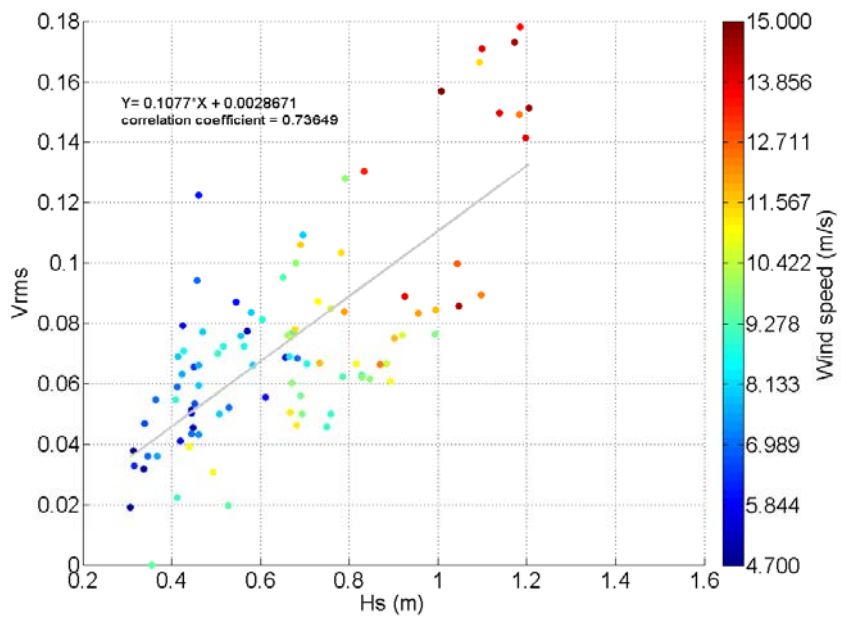
Infragravity band (.01 - .05Hz)





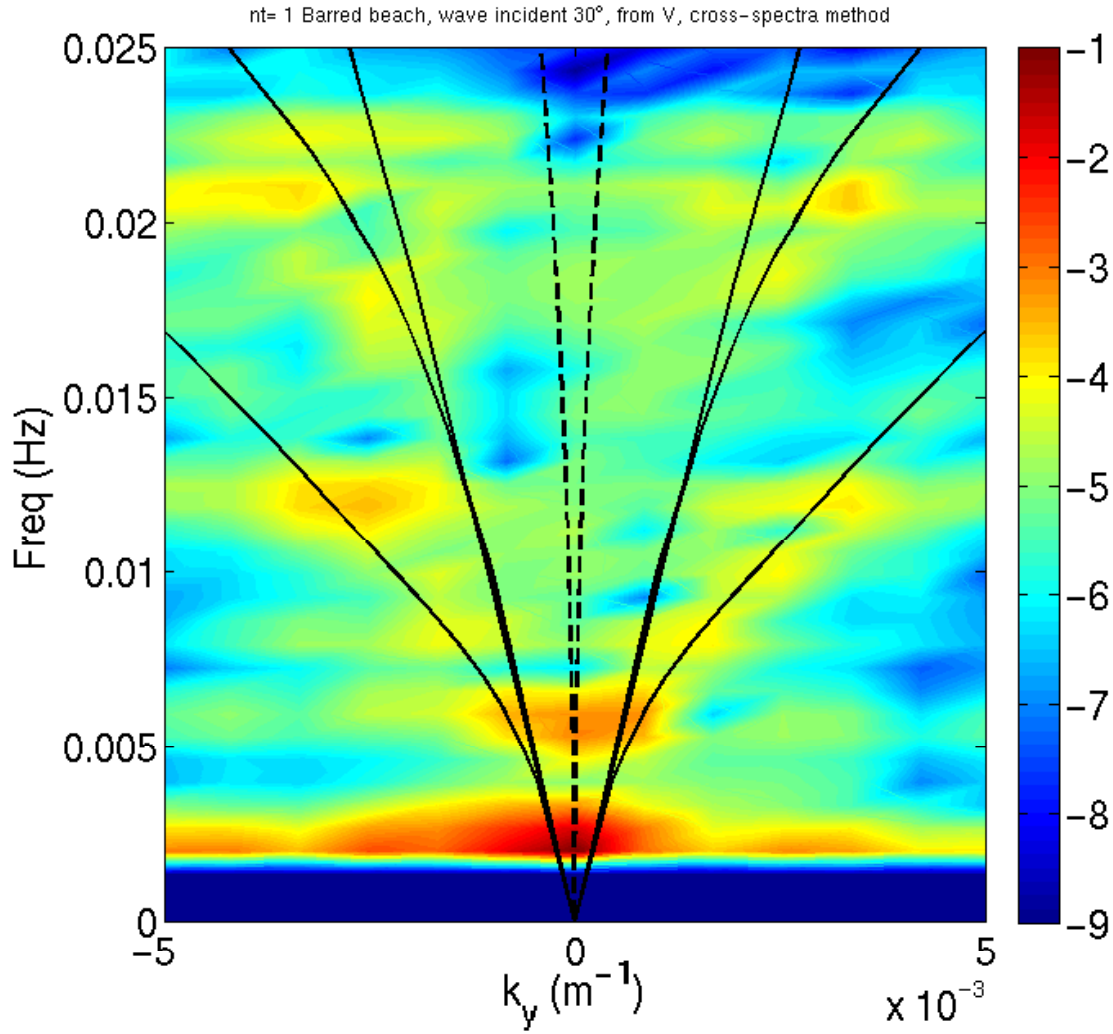
Far Infragravity band (0-0.005 Hz)





XBeach
Frequency-wavenumber spectrum

Alongshore uniform, barred beach



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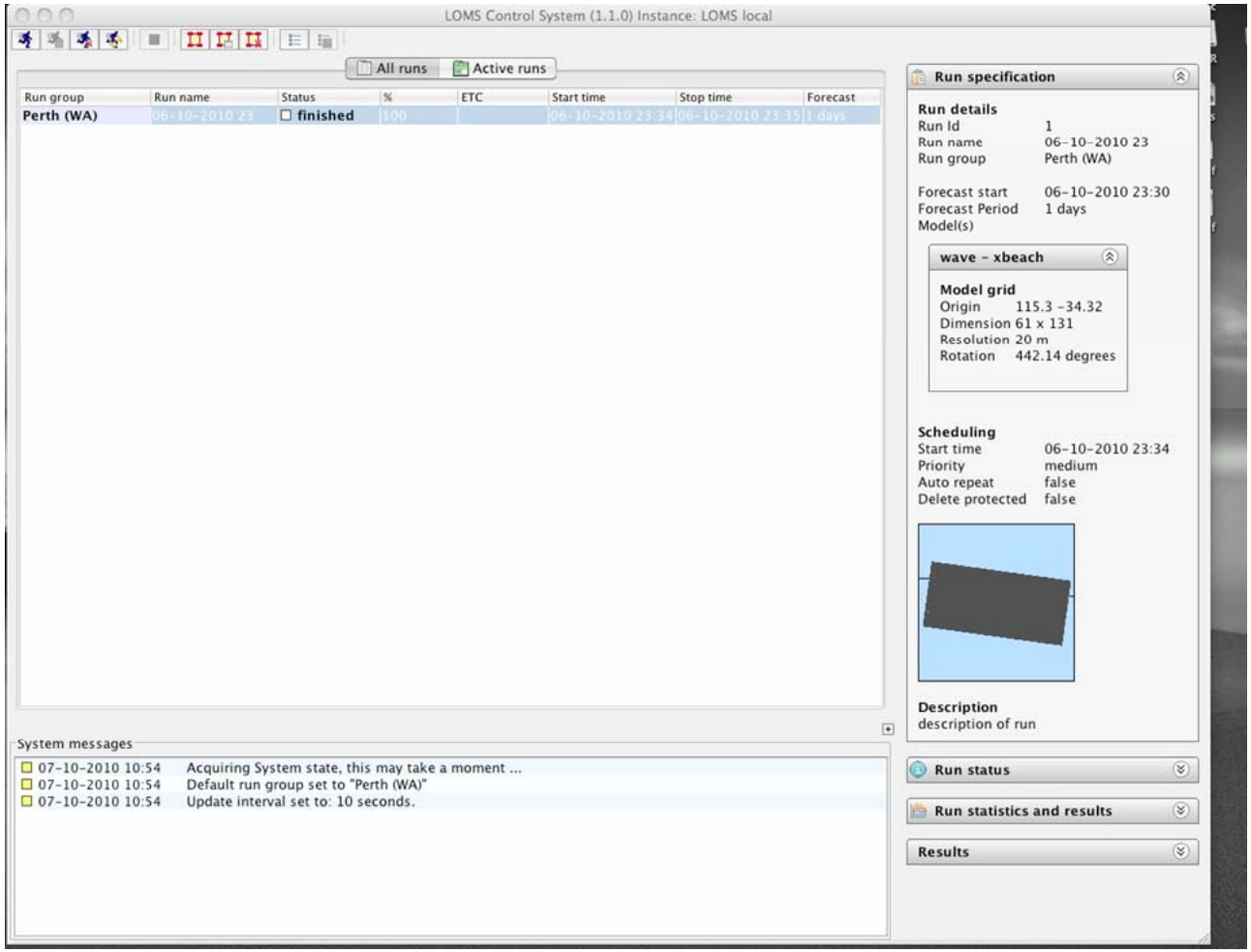
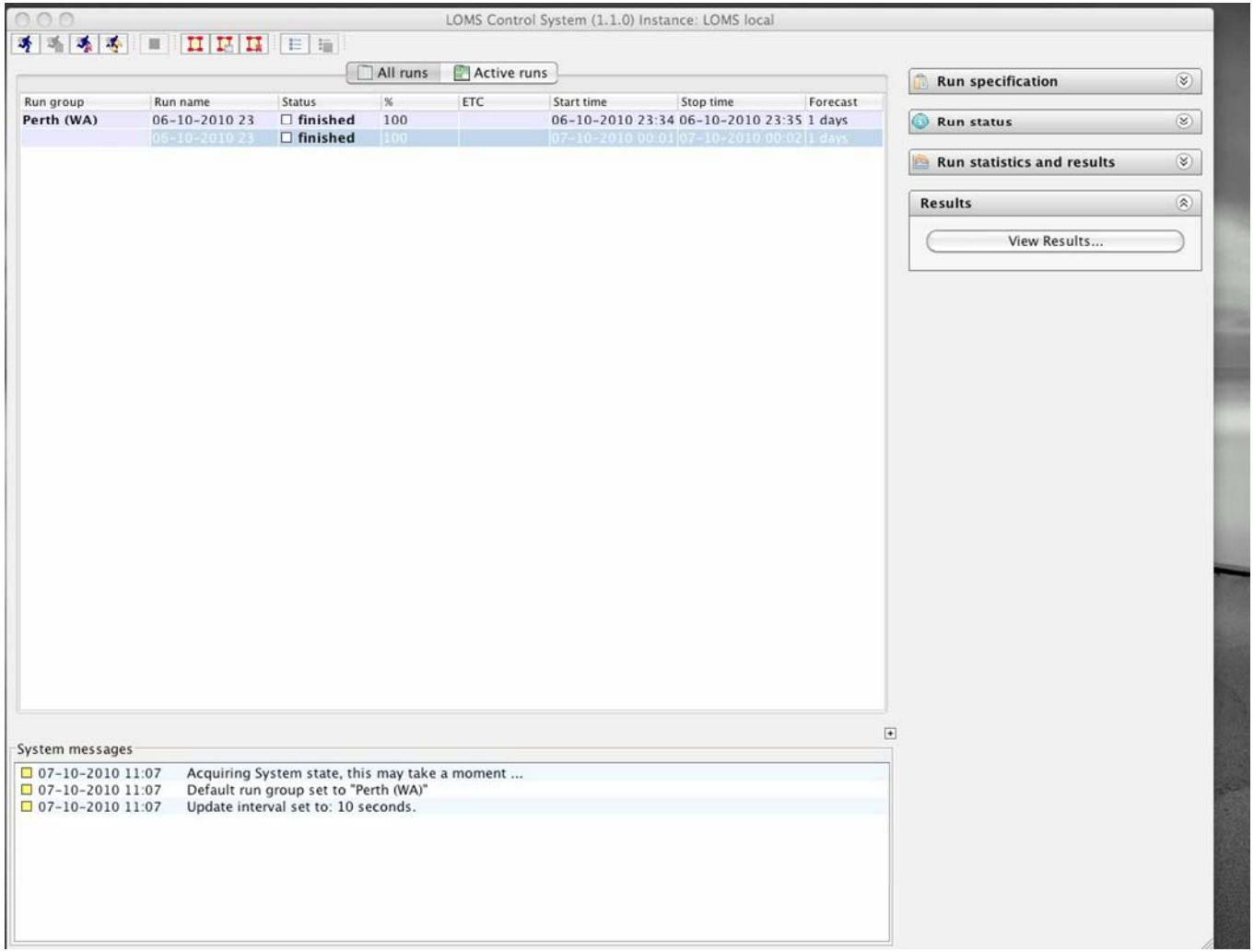
LOMS – Create run



LOMS - Results



Bluelink Nearshore Forecasting
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Research: Graham Symonds, Jim Gunson, Nick Mortimer, Stephanie Contardo
Software Engineers: Uwe Rosebrock, Gary Carroll

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Thank you

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A partnership between CSIRO and the Bureau of Meteorology

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