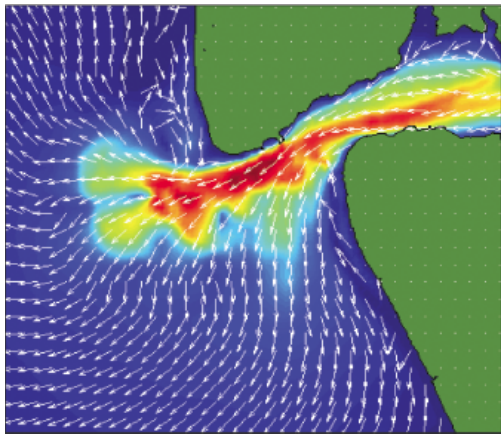
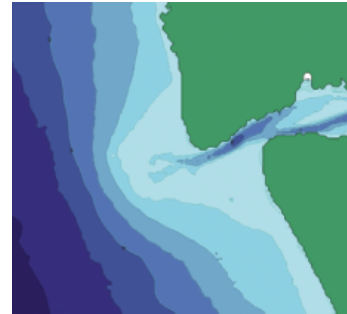


## Wave Climate Hindcasting on an Ebb-tidal Delta

The Manukau Heads is an energetic and dynamic harbour entrance. To understand the combined effect of waves and currents on the underkeel clearance for shipping, MetOcean Solutions undertook a 5-year wave and current hindcast of the harbour and ebb-tidal delta. Currents were simulated with POM and integrated into the SWAN wave model.

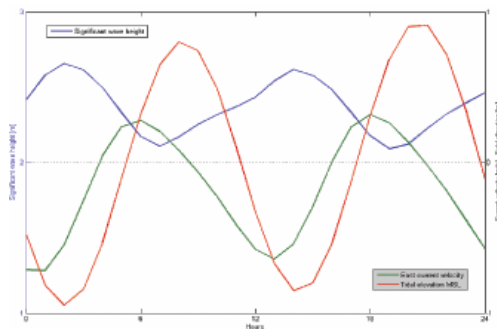


Ebb-tidal flows

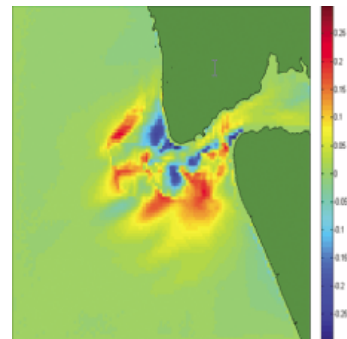


Model Bathymetry

The bathymetry and tidal currents strongly influence the wave heights along the shipping channel, particularly near the bar. The hindcast provided an hourly time-series at key 10 locations, and these data used for the underkeel clearance analysis. In future, the wave-current models will be run in forecast mode to ensure the safe passage of shipping in this region.



Effect of current on wave height



Wave height modulation over a tidal cycle