



## Development and validation of a maritime forecasting system for the New Zealand region

R.M. Gorman, E.M. Lane, P.A. Gillibrand, and M.J. Uddstrom

National Institute of Water and Atmospheric Research, New Zealand (r.gorman@niwa.co.nz)

A new maritime forecasting system for the New Zealand region has been developed including global and regional wave models and regional tide and storm surge models. These form part of an integrated “all – hazards” forecasting capability, which also includes an accurate, data assimilating high resolution weather forecasting system and a national-scale flood forecasting system.

For wave predictions, Wavewatch III is run on nested global and regional grids. A 144-hour forecast is run daily on the global domain, providing boundary conditions for twice-daily 48-hour forecasts on a New Zealand regional domain at a resolution of approximately 12 km. The regional wave forecasts have been validated against data from six wave buoy deployments. For global forecasts, these are supplemented with data from NDBC buoys in the North Pacific.

Predicted variations in sea surface height and depth-average velocity due to tides and storm surge are provided in twice-daily 48-hour regional forecasts. At present tide and storm surge components are computed separately. Storm surge is predicted for the New Zealand region using the RiCOM model on an unstructured grid, in depth-averaged mode using semi-implicit integration in time. The amplitude and phase of the tidal constituents have been pre-calculated using Tide2D, a companion model to RiCOM which works in frequency space on an unstructured spatial grid. These models are validated against data from 16 sea level gauges located around the New Zealand coast.