

**SOME COMPARISONS BETWEEN OBSERVED AND MODELLED OCEANOGRAPHIC
RESPONSE TO TROPICAL CYCLONE WINIFRED**

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Between January 5 and April 3, 1986, an array of oceanographic instruments was deployed at four locations in a cross-shelf line from Hinchinbrook Island to Britomart Reef. This array was designed to measure current profiles, coastal water elevation, water salinity and temperature. The centre of the eye of cyclone Winifred crossed the coast roughly 80 km to the north of the array. The currents were primarily northward and barotropic before the storm landed. Thereafter, the currents reversed rapidly, and the vertical shear became considerable in coastal waters. A pool of fresh water was found offshore, probably generated by rainfall, followed several days later by freshwater plumes inshore.

A two-dimensional numerical hydrodynamic model of the shelf water response to the passage of cyclone Winifred has been constructed. This uses available meteorological data on the storm (central pressure, speed and direction of its track, radius of maximum winds) and known astronomical tidal elevations as its forcing, to allow a combined storm/tidal simulation to be performed. Results from the model are the fields of sea surface elevation and depth-averaged currents, with subtraction of the tidal fields producing the net storm-induced response. The time series obtained from the model are compared with the observations at the four instrumented locations.