Elliot River Monitoring for Pacific Reef Fisheries

Objectives:

Monitoring of the Elliot River took three forms. Firstly, the tide heights were to be monitored for at least 28 days, to establish a datum and tidal planes in the area. Currents were measured on two days, where there was a large tidal range, to give JCU Modellers, an indication of currents at the gauge site. Thirdly, offshore bathymetry was to be obtained in an area around the proposed pipeline outfalls and surrounding area to give Modellers a representation of the seabed.

Tidal Information:

A water level sensor was established on April 7 2002, at the mouth of the creek that flows into the Elliot river, approximately 500 metres west of the River mouth. A datum was levelled from PSM 136648, RL 2.79m AHD, obtained from SKM. The tide gauge bench mark was a star picket driven to within 50 mm of the ground level and next to a stump of and old tree some 4 metres from the creek bank. The sensor was deployed and water levels measured to define the gauge zero. Water level heights were taken every ten minutes for the next 38 days.

Readings showed that the River is indeed bar bound, with low waters seldom falling below –0.3m AHD,i.e 1.35m LAT.

Tides were downloaded and transferred to an Excel spreadsheet where the offset was applied to bring the levels on to the Australian Height Datum. See attached sketch for tide gauge details.

Current Information:

Currents were measured on two consecutive days. The method involved tracking three drogues with differential GPS as they drifted up current. The drogues were weighted as such that they did not have interference from the wind. As the currents were tracked in the creek mouth there were only two directions in which they flowed, to the north west on the flooding tide and to the south east on the ebb. Results indicate that on the larger tidal ranges, ebb and flood currents can reach 0.7 m/s.

Current measurements are included on the tidal spreadsheet, to provide correlation with the tidal ranges.

Bathymetry:

Soundings were taken offshore from the Elliot River and just to the north west of the mouth. A four kilometre grid was sounded with lines one kilometre apart, to give an indication of the seabed terrain. Line spacing was closed to 250 metres within two kilometres of the shoreline and three profiles each were taken at the proposed pipeline routes. These profiles were run on the centreline and fifty metres either side of each proposed pipeline.

After sounding, the data was corrected for swell and reduced to the AHD via the gauge readings at the Elliot River mouth. Enhanced predictions from Abbott Point were used to check for any gross errors, and to determine at what point the Elliot River gauge became bar bound.

There is good correlation of results and good coverage of the area, with soundings taken in seas to about 0.4 metres and winds in the vicinity of 8 knots. Soundings corresponded with high water to obtain as much beach profile as possible.

Data is on the AMG AGD84 and soundings reduced to the AHD.