

With thanks to Ian Hunter, Principal Researcher of the South African Weather Service, and a member of the Durban Branch, for the following article about the storm system which wreaked havoc to beach areas in Kwa-Zulu Natal.

### **The Cut-off Low of 17-21 March 2007 off the East Coast of South Africa**

As far as the author is aware the only significant event *at sea*, relating to the above storm, was a relatively minor collision between two Greek-owned, Panamanian-flagged bulkers off Richards Bay on Sunday 18<sup>th</sup> March. WSW'y winds averaged over 40 knots throughout Sunday, with gusts to over 60 knots. By early Monday morning the wind was slowly easing, but significant wave height peaked at over 8 metres along the coast, the highest since February 1984 (Tropical Cyclone 'Imboa').

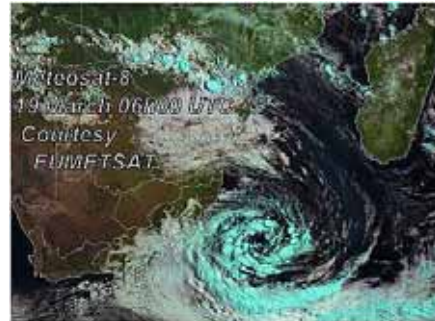


Fig 1. Meteosat 8 visible image – 0600 UTC, 19 March 2007

At East London the port had to be closed for the first time since August 2002 (also the result of a cut-off low remaining semi-stationary offshore). However, on this occasion, the low started off overland and then moved seaward. The March 2007 system remained over the ocean throughout its lifetime.

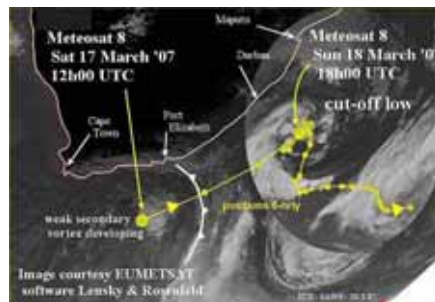


Fig 2. Track of cut-off low with Meteosat 8 images superimposed

Cut-off lows are one of the most important synoptic-scale weather systems when it comes to the generation of heavy seas off the South African east coast. Fig.1 clearly shows the vortex, approximately 300 n.m. south-east of Durban. The double satellite image (Fig.2) shows the track of the low. Note how little movement there is between Sunday 18h00 UTC and Tuesday 18.00 UTC. Winds on the south-western and western side of the low were averaging over 60 knots (Fig.3).

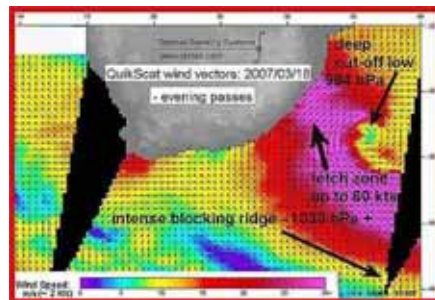


Fig 3. Sea surface wind field - evening passes 18 March 2007

With the broad and intense fetch area remaining essentially stationary for 48 hours, wave generation was considerably enhanced, as can be seen in the wave height analysis (Fig.4). Apart from extensive damage to coastal infrastructure (amounting to over \$100m), the maritime industry also incurred significant losses. The port of Richards Bay suffered damage due to the heavy swell and unusually high water levels (equinoctial spring tide + wind set-up + wave set-up + wave run-up). But there was also a considerable loss of revenue as a result of the closure of all three ports – East London, Durban and Richards bay – for 2 days. 'Ports and Ships Maritime News' reported that there were 14 container ships waiting outside Durban by the time it was re-opened on 22 March.

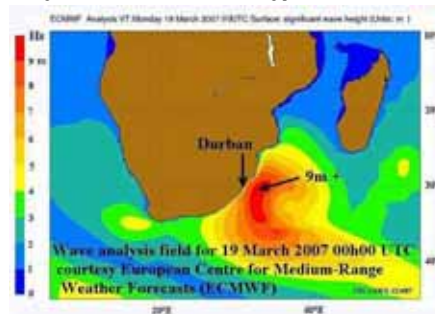


Fig.4 Wave analysis from the ECMWF global wave model

Finally, this seems a good opportunity to thank all mariners that provide Voluntary Observing Ship reports (VOS).

**M.V. Serenata**, bound for South America, provided regular observations as she tracked close to the centre of the vortex. Their barometric pressures were very useful for the sea level pressure analysis of the cut-off low and their wind observations helped to verify the satellite-derived sea surface winds from QuikSCAT. The Master was even kind enough to comply with a request to send some photos of sea conditions!

**Ian T. Hunter, Principal Researcher, South African Weather Service.**