

SEASCAPES

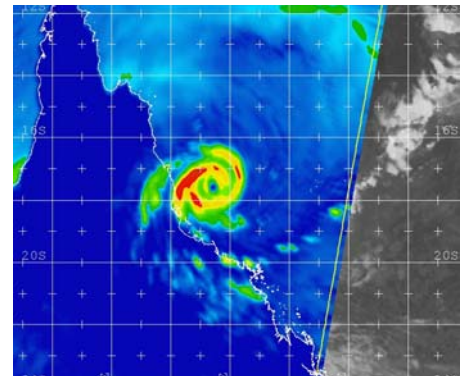
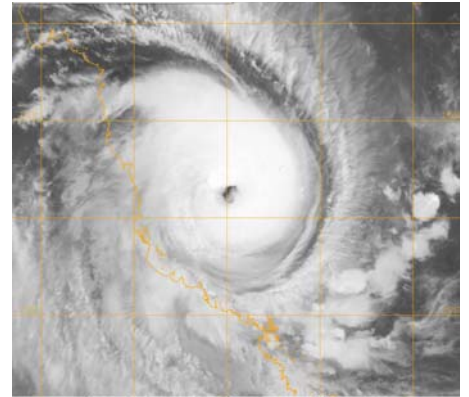
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Cyclone *Larry* - Was it a Category 3, 4 or a 5?

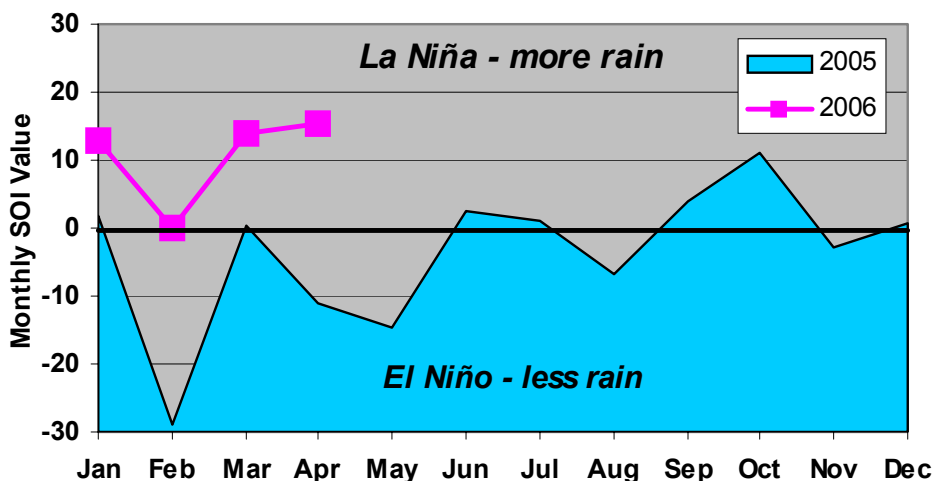
When Tropical Cyclone *Larry* approached the Queensland coast on 20th March it bore all the trademarks of a very severe cyclone and the Bureau of Meteorology had estimated its strength as Category 4 over the preceding day. Just prior to landfall in the early hours of the morning, the satellite images also indicated signs of intensification, leading to a final upgrading to Category 5 just prior to landfall - making it the first such coast-crossing storm in over a century. The storm tore through the coastal region from Mission Beach north to Babinda and passed directly over the regional centre of Innisfail, causing extensive damage to residential and commercial property (refer story overleaf) as well as decimating the rainforest environment. However, when the wind and pressure data was retrieved from the South Johnston automatic weather station and comparisons were made with barometric pressures at Innisfail and Babinda, it became clear that *Larry* had lost his punch and the available evidence pointed to it possibly only being a Category 3 storm, similar to *Winifred* that affected the same area in 1986. Why the storm seemingly lost its power is still being investigated but it may be

(continued) Two views of TC *Larry*; Top: An infrared image showing cloud banding; Bottom: A microwave image showing the inner core structure. [US Navy Research Labs images]



SOI is in a Positive Phase for 2006

As forecast in the Spring 2005 newsletter, the rising SOI may well have contributed to an increase in tropical cyclone activity this season. *Larry* and *Monica* were not only intense but critically moved west and made landfall. Since June 2005 the monthly SOI (Southern Oscillation Index) has been steadily rising, passing through the "neutral" range (± 10 ; within one standard deviation of the long term mean) in January. The SOI, which is simply ten times the ratio of the mean surface pressure between Darwin and Tahiti, has been shown to be a reasonable indicator of the El Niño Southern Oscillation (ENSO) - a tendency for the Pacific Ocean sea surface temperatures (SSTs) to fluctuate from "warm" to "cool" over a number of months or years. If the SOI maintains a generally positive outlook there will be a greater likelihood of more tropical cyclones than average in the coming seasons. Much of the Queensland coast has experienced below-average cyclone activity for the past 20 years. [Data and comments based on Bureau of Meteorology sources.]



SEASCAPES

SEASCAPES features the developing risk assessment capabilities of Systems Engineering Australia Pty Ltd (SEA).

Our services include coastal, ocean and offshore engineering, statistical analysis of tropical cyclone data, quantitative estimation of insurance losses, cyclone wind, wave and storm surge modelling, flood risk assessment and severe thunderstorm downbursts, hail and tornadoes. We do investigations, analysis, consulting, peer review and research.

Visit us on the web:
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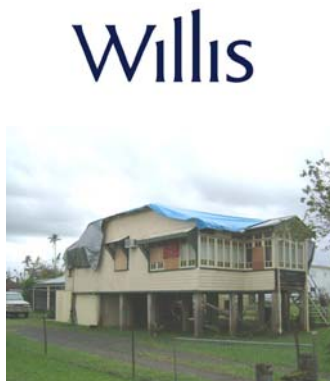


Damage Assessments from TC Larry

With the support of **Willis Re Australia**, Dr Bruce Harper was amongst the first post-disaster assessment teams into the region and was able to report directly on the extent and severity of property loss across all affected regions on the coastal strip, including areas where the roads had not yet been cleared. Initial impressions categorised the damage as somewhat similar to that experienced in Townsville from cyclone *Althea* in 1971 but with potentially more severe damage in some specific areas, mainly houses on steep hillsides.

Importantly, homes built since 1980 generally performed well but older homes and older commercial premises were significantly damaged. An emerging issue is the cost to reinstate older houses to the new post-1980 design standards, which will likely add significantly to insurer's costs. Also, underinsurance in the area is very significant, and a severe shortage of skilled labour and materials could mean that the final insurance bill for *Larry* may well exceed current estimates. The costs could also prove inconsistent with previously modelled losses for events of similar intensity that have not allowed for these special circumstances.

Willis and SEA have undertaken further detailed damage assessments in association with major insurers to help develop more sophisticated models that might better anticipate such situations. The results of this work will represent a significant modelling advance, with many lessons to be learnt before the next cyclone season - which is already shaping up as a potentially active period.



Top: An older house with typical loss of roofing; Bottom: A newer house destroyed by a flying roof, removed from an older house, that had passed over several other low set homes.

Happy 10th Birthday to SEA!

SEA recently passed its 10th anniversary of providing quality specialist risk assessment services in the areas of coastal, ocean, wind and insurance losses. We're proud of our record and pleased to assist our various clients in helping address their many business planning challenges.

Some of the SEA Clients:

Coastal and Ocean Hazards:

- Woodside Energy Ltd, WA
- Dept Natural Resources, VIC
- Dept Natural Res. and Mines, QLD
- EPA, QLD
- Dept Infrastructure Planning and Natural Resources, NSW
- Commonwealth Dept of Transport and Regional Services
- GHD Pty Ltd
- Bureau of Meteorology
- Kvaerner E&C Australia
- McConnell Dowell

Multi-Hazard Studies:

- Dept Emergency Services, QLD
- Bureau of Meteorology / GA

Tropical Cyclone Risks:

- Willis Re
- RACQ Insurance
- CGU Insurance
- Suncorp Metway Insurance
- IAG
- Powerlink Queensland
- Geoscience Australia
- CSIRO Atmospheric Research
- Risk Management Solutions

Severe Thunderstorm Risks:

- Suncorp Metway Insurance
- Macquarie University, NHRC
- Powerlink Queensland

Flood Risks:

- RACQ Insurance, QLD

Research:

- Risk Prediction Initiative, Bermuda.
- James Cook University CTS

Guidelines:

- World Meteorological Organisation
- Engineers Australia

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associated with its unusually fast movement (25 to 30 kph) and its interaction with the mountainous terrain. *Larry's* peak 2.3m storm surge proved non-threatening when combined with the neap tides, but was well captured by the EPA's network of storm tide gauges and this will greatly assist in estimating the overall storm intensity. Combined with the damage assessments, SEA believes that it is likely that *Larry* will emerge officially as a Category 4 storm at landfall.

The Tropical Cyclone Climate Change Debate - It's Heating Up!

SEA's Dr Bruce Harper recently attended the US 27th Hurricanes and Tropical Meteorology Conference held in Monterey, California. His paper on the urgent need to revise and correct the historical tropical cyclone databases was based on work undertaken for **Woodside Energy** over the past few years. Without correction, the historical data can severely bias statistical studies of cyclone risk and Dr Harper asserts that recent "climate change trends" identified by some US academic researchers are deeply flawed. His paper drew attention to the data quality issues and helped add substance to the ongoing heated debate that has divided much of the tropical cyclone research community in a series of articles published in *Science*, *Nature* and the *Wall Street Journal*. Dr Harper has joined several prominent international researchers in providing more sober assessments of climate trends based on the need for more careful data analysis.

Real risk management decision - making tools for your business.

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