SEASCAPES

Volume 9, Issue 2 Spring 2006

Cyclone *Larry* - Officially now a Cat 4

Willis

As foreshadowed in the Autumn edition of SEASCAPES, Tropical Cyclone *Larry* has now been officially re-classed by the Queensland Regional Office of the Bureau of Meteorology as a Category 4 storm at landfall. The announcement was made at the conclusion of the Tropical Cyclone Coastal Impacts Program (TCCIP) technical meeting at Cairns on Oct 17th, where the latest survey and analysis information was assembled and discussed.

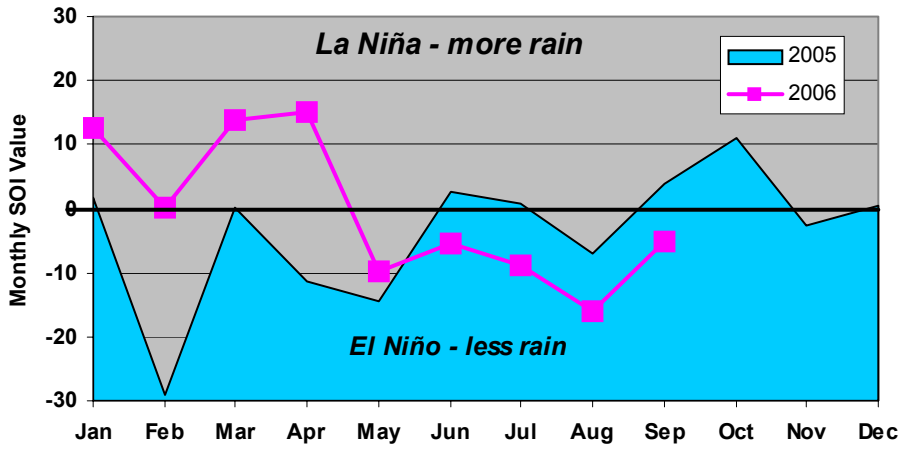
The re-classing is based on the combined evidence from a number of post-storm damage investigations, combined with the Bureau's own expert re-assesment. The analyses undertaken by SEA, in conjunction with Willis Re, and the associated surveys by the James Cook Cyclone Testing Station (JCU CTS) were among those available to the Bureau (refer http://www.bom.gov.au/weather/qld/cyclone/tc_larry/LARRYMeetingTownsvilleReport.pdf).

Notwithstanding the devastating effects of the cyclone in the Innisfail region and the personal hardship that it caused, it is important that the community and Government organisations appreciate that the damage would have been much more significant if *Larry* had indeed delivered the Category 5 winds that were forecast at the time. Government and organisational planning, procedures and systems still need to be improved and expanded to better cope with the possibility of a true Category 5 event impacting a major Queensland population centre.

Above: JCU Cyclone Testing Station Senior Research Engineer Campbell Leitch discusses the roof damage to an Innisfail house with the owner. On behalf of Willis Re, SEA and the JCU-CTS undertook a detailed inspection of damaged homes in early May, correlating the damage with assessed insurance losses.

SOI heading negative for 2007

After April this year the monthly SOI (Southern Oscillation Index) shifted from the positive range, that possibly enhanced the previous tropical cyclone season, dropping to around -10 (one standard deviation below the mean). 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 negative outlook there will likely be fewer cyclones than average in the coming season. Much of the Queensland coast has experienced below-average cyclone activity for the past 20yr. These recently observed conditions are consistent with the developing stage of a potential El Niño event, although model results vary on whether a significant event is likely. *[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:
http://www.uq.net.au/seng
seng@uq.net.au

SEA

Workshops:

Dr Bruce Harper was invited to present on the subject of tropical cyclone winds at the recent James Cook University Cyclone Testing Station's *International Wind Loading Workshop* held in August at Townsville. Attendees were drawn from a geographically wide area to enhance their knowledge in the application of the AS/NZS 1170.2 Wind Actions Code. Dr Harper is also a member of the Standards Australia committee that met in Townsville in conjunction with the workshop.

In August, Dr Harper also presented at a Workshop jointly convened by the ARC Network for Earth System Science and the Bureau of Meteorology in Melbourne. The topic of the meeting was "On the reanalysis of the Australian tropical cyclone record" and consisted of invitees from all interested stakeholder groups and organisations. Dr Kevin Walsh from the University of Melbourne was the principal organiser and the workshop will be providing recommendations for future work in this critical area of analysis that affects the accuracy of climate change predictions. Dr Harper has long advocated the need to revise the Australian tropical cyclone archives and has developed a proprietary database over the past 20 years as a means of improving the accuracy of the data. The workshop showed that many stakeholder's needs would benefit from a revision and updating of the existing datasets.

Publishing News:

SEA's Dr Bruce Harper teamed with noted commentator on climate change issues Dr Chris Landsea (NOAA, National Hurricane Center) and other international researchers in a recent article published in the July issue of the prestigious journal *Science* (10.1126/science.1128448). The article highlights the considerable uncertainties in the existing historical databases of tropical cyclones that effectively limits the ability to extract potential climate change signals at this time. The article was widely supported by practising meteorologists familiar with the deficiencies in the historical data, which has been steadily improving since the introduction of satellite observations and the availability of new analysis techniques. These views are counter to recent claims by some US academics of alarming trends in tropical cyclone intensities over the past 30 years. The increasing realisation of critical data deficiencies is leading to more innovative approaches to trend analyses for hurricanes.

Dr Harper was also a principal contributor to a special tribute paper to honour Vernon Dvorak (ex NOAA Satellite Analysis Branch), who invented the technique of estimating tropical cyclone intensity soley on the basis of satellite images of the cloud structure. Developed in 1972 but enhanced variously until 1984, the method remains as the only systematic means of estimating and forecasting intensity without insitu measurement of winds and pressure. The tribute paper, headed by Dr Chris Velden from the University of Wisconsin, was published in the September edition of the *Bulletin of the American Meteorological Society* (BAMS). Other distinguised authors included Mr Max Mayfield, the retiring Director of the National Hurricane Center in Miami. The Dvorak method is the principal method of intensity analysis available in the Australian region and, because of Australia's sparse recording network, is unfortunately rarely able to be validated.

Conferences:

SEA's Dr Bruce Harper was invited to present at the Insurance Council of Australia (ICA) 11th Annual Conference in Brisbane in May and also the recent 24th Annual National Insurance Brokers Association (NIBA) Convention at the Gold Coast. The topic in each case was the consideration of a Hurricane Katrina-like tropical cyclone impacting the Gold Coast region. The presentations highlighted the considerable physical differences between the New Orleans and Gold Coast areas but demonstrated that an event of similar intensity was possible, even under existing climate conditions. Principal differences would be that the 10m+ storm surge at the Mississippi coast would be significantly reduced on the Gold Coast, although wave setup would be a significant factor.

Dr Harper has also been invited to attend the Sixth International Workshop on Tropical Cyclones (IWTC-VI) to be held in San Jose, Costa Rica in November. The IWTC is convened by the UN World Meteorological Organisation (WMO) and held every four years. It is the principal world forum for researchers, forecasters and associated analysts focusing on the science and understanding of tropical cyclones. This will be the third IWTC that Dr Harper has participated in, the previous being in Haikou (China) and in Cairns. For 2006, Dr Harper is contributing to the statements on forecasting and observation of windfield structure and also storm surge. He has also been invited to attend a special technical meeting on the economic and social impacts of tropical cyclones.

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***

Real risk management decision - making tools for your business.

For more information please contact:
Dr Bruce Harper
Systems Engineering Australia Pty Ltd
ABN 065 073 544 439
7 Mercury Court
Bridgeman Downs, Qld 4035, Australia

Tel/Fax:
(07) 3353-0288

Email:
seng@uq.net.au