

# SEASCAPES

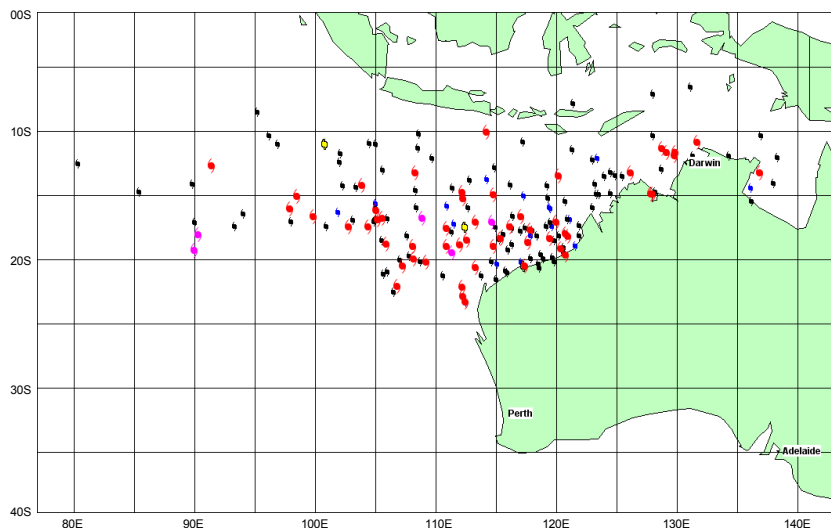
Volume 11, Issue 1

Autumn 2008

## The Critical Need for Reliable Risk Data

A scientific paper soon to be published in the Australian Meteorological Magazine highlights the critical need for reliable data when estimating tropical cyclone risks, not just in the Australian region, but also worldwide. The paper discusses a review of historical tropical cyclone datasets in the North-West Australian region that was conducted in 2002 by Systems Engineering Australia Pty Ltd on behalf of Woodside Energy Ltd in Perth. It addressed growing concerns about the quality of the Australian tropical cyclone dataset in terms of the changes in intensity estimation practices and improvements in satellite technology since the 1970s. The review was made public in 2006 to counter a number of

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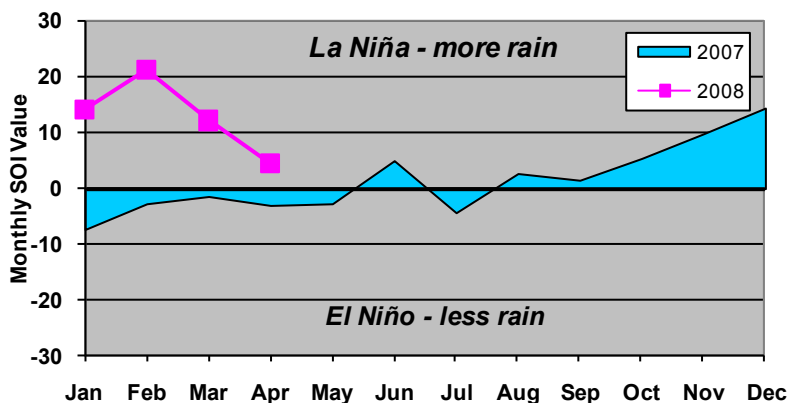


**FIGURE:** Results of the Woodside Energy sponsored historical cyclone review:

Map shows the location of tropical cyclones when at their greatest intensity in the Woodside Energy Ltd reviewed dataset for seasons 1968/69 to 2000/01 and for storms entering the region 5°S to 27°S and 105°E to 140°E. Colour coding compares relative change in cyclone intensity category between the original Bureau of Meteorology and the reviewed Woodside datasets; black is unchanged, red is increased by 1 category and purple increased by 2; blue is decreased by 1 category and yellow is decreased by 2.

## La Niña has come ... and gone ...

An early season spring prediction of a “neutral” summer season rapidly turned into a full yet brief La Niña episode. Parts of North Queensland experienced record monsoonal impacts yet conditions remained generally unfavourable for genesis of tropical cyclones due to other atmospheric factors. The SOI, which is simply ten times the ratio of the mean surface pressure between Darwin and Tahiti, reached a high of 21.3 in February—the highest level since Nov 2000 and a record for February. If the SOI maintains a generally neutral outlook then, based on historical averages, there will likely be more cyclones than average next season. *[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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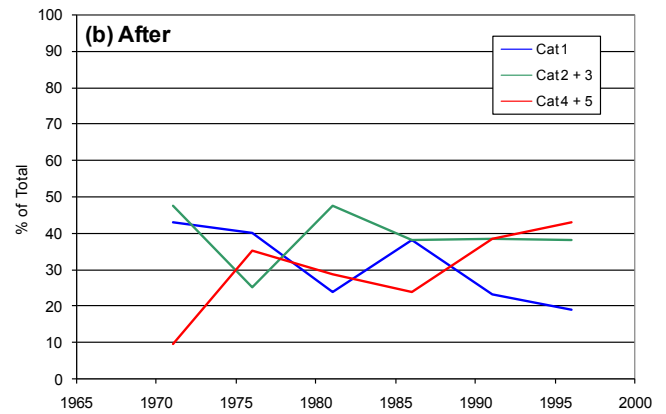
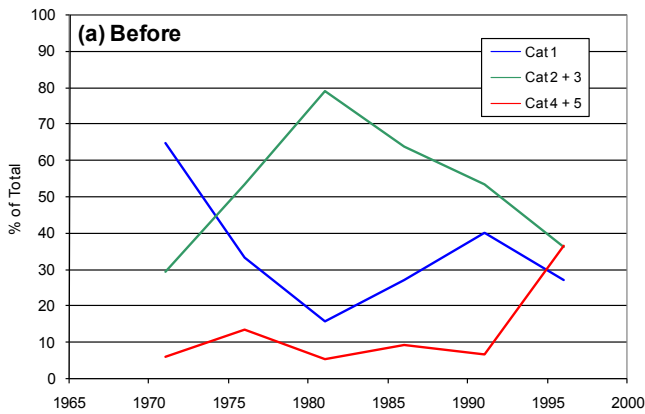


FIGURE: Results of the review of North-West Australian data, showing the changes in the relative proportions of Category 1, Category 2 and 3 and Category 4 and 5 grouped tropical cyclones over a 30 year period.

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claims that the historical datasets were already indicating significant increases in tropical cyclone intensities that were likely due to the effects of anthropogenic climate change. The Woodside-sponsored review involved a team of experienced meteorologists re-examining the historical dataset and applying a more consistent approach than had been possible over the past 30 years as technology and methodologies were slowly changing and improving.

The review showed that it was possible to significantly alter the perceived changes in the proportions of tropical cyclones of a given estimated intensity over the past 30 years by applying a consistent analysis technique. Extrapolating this result worldwide implied that similar global assessments were likely significantly affected by the non-homogeneity of the historical datasets, thus making claims of climate-related trends difficult to justify. Importantly, there are also many reasons why it might be expected that better technology has allowed detection of more intense tropical cyclones over time. This principally relates to the increased spatial resolution of satellites, their greater number and hence their increased rate of sampling of the worlds' oceans. The review also showed that some of the earliest data in the 1970s was not able to be fully reviewed with confidence due to the limited satellite coverage during that period.

It is concluded that a bias towards lower intensities likely exists in earlier (pre-1980) tropical cyclone intensity estimates of the order of at least 10 to 20 hPa, later reducing to 5 hPa in this region. Implications for detecting potential climate change trends are discussed and recommendations are made for a detailed review of the tropical cyclone dataset for the entire Australian region as well as a call for improvements in the analysis and direct sensing of tropical cyclone intensity.

## Conferences and Workshops:

SEA's Dr Bruce Harper continued his active local and international participation in several scientific meetings and workshops over the past 6 months:

- American Meteorological Society, 28th Conference on Hurricanes and Tropical Meteorology, Orlando, Florida, April 2008; "Wind Speed Time Averaging Conversions for Tropical Cyclone Conditions".
- AMOS/AWES National Conference, Geelong, Jan, 2008; Convenor of the Cyclone Tracy Symposium; "Modelling the Tracy Storm Surge – Implications for Storm Structure and Intensity Estimation " and "Wind Speed Time Averaging Conversions for Tropical Cyclone Conditions".
- 1st International Conference on Asian Catastrophe Insurance, Kyoto, Dec, 2007; In association with the Willis Research Network.

### Some of the SEA Clients:

#### Coastal and Ocean Hazards:

- Woodside Energy Ltd, WA
- EPA, QLD
- Dept Env and Climate Change, NSW
- Alcan
- 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
- Powerlink Queensland
- Geoscience Australia
- CSIRO Atmospheric Research
- Risk Management Solutions

#### Severe Thunderstorm Risks:

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

#### Research:

- Risk Prediction Initiative, Bermuda.
- James Cook University CTS
- Willis Research Network

#### Guidelines:

- World Meteorological Organisation
- Engineers Australia

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 making tools for your business.**