

SEASCAPES

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NT Storm Tide Prediction System

Systems Engineering Australia Pty Ltd (SEA) has been awarded a contract to develop and implement a real-time storm tide warning system for the Bureau of Meteorology in the Northern Territory. The work is being funded by contributions from Emergency Management Australia (EMA), the Bureau of Meteorology and the NT Department of Emergency Services (NTES).

The project is designed to provide a real-time tropical cyclone storm tide prediction system for the coastline of the Northern Territory and the northern Kimberley (WA) that will:

- utilise forecast or observed parameters of cyclone intensity, size,

speed and track;

- enable forecasters to make allowance for variability in the forecast parameters;

- estimate the potential magnitude, location and duration of the storm surge;
- combine the storm surge with the predicted astronomical tide;

- estimate the simultaneous effect of breaking wave setup;

- produce a prediction of the total water level (storm tide) comprising the storm surge, tide and wave set-up;

- provide guidance to Emergency Services in the NT and WA on the possible range of the predicted storm tide as a function of the forecast variability, including the maximum potential level;



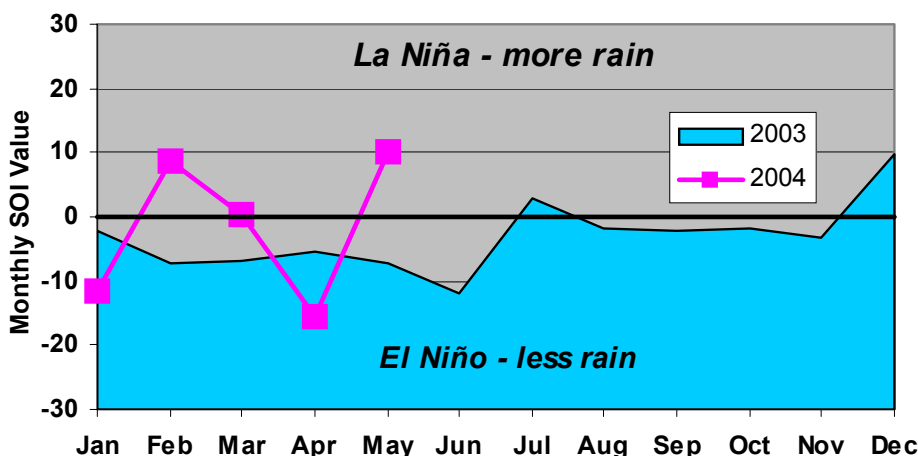
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- produce broad storm surge information to inform community and disaster response planning decisions for coastal community.

The methodology follows recommendations from the Queensland Climate Change and Community Vulnerability Study undertaken in 2001. The work is being done in conjunction with the Marine Modelling Unit at James Cook University, who are currently also completing extensive storm tide studies for the Queensland coast under the extended Queensland Climate Change and Community Vulnerability Study.

Erratic but Likely Neutral Season

The 2004 Southern Oscillation Index (SOI) has been especially erratic and seen to oscillate markedly within the near-neutral ($-10 < SOI < 10$) zone since the start of the year, likely linked to a strong Madden Julian Oscillation. Ocean temperatures across the equatorial Pacific are slightly warmer than normal. Most numerical climate models predict continuing neutral conditions for the coming Southern Hemisphere summer period but models at this time of year have a low predictive skill. [Data and comments based on Bureau of Meteorol-



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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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WMO Review of Wind Speed Averaging

Following the International Workshop on Tropical Cyclones (IWTC-V) held at Cairns in Dec 2003, Dr Bruce Harper of SEA was commissioned by a specialist subcommittee of the UN World Meteorological Organisation (WMO) to prepare a set of guidelines for adjusting tropical cyclone wind speeds for different wind-averaging standards.

Although the WMO standard for wind averaging is 10 minutes, many nations also employ local standards for forecasting and warnings based around other periods such as 3, 2 and 1 minute. The guidelines present a review of the existing science of wind speed variability in tropical cyclones and provide a practical method for adjusting wind speeds between the various national standards. For example, the guidelines will allow consistent conversion across short period wind gusts (2 or 3 second), 1 minute winds and 10 minute winds for a variety of exposures. Standardisation has important implications for warning systems and public education as well as ensuring the scientific record is consistent and recoverable. The technical review has been completed and the recommendations are currently under review by the specialist international WMO



International Conference on Storms: Storms Science to Disaster Mitigation - Brisbane, July 2004.

Dr Bruce Harper of SEA is the Topic Chairman for Tropical Cyclones at the forthcoming AMOS (*Australian Meteorological and Oceanographic Society*) International Conference on Storms. The venue will be the Mercure Hotel, 85-87 North Quay, and will be held over 5th to 9th July. Co-sponsors of the conference are the World Meteorological Organization, the Bureau of Meteorology, Emergency Management Australia, Queensland Emergency Services - Counter Disaster and Rescue Services, the American Meteorological Society and the Meteorological Society of New Zealand.

The conference covers a wide range of scientific matters and has an impressive lineup of local and international keynote presenters on all aspects of severe storms (tropical cyclones, thunderstorms, tornadoes, waves at sea and flooding). A special focus on mitigation and public policy is planned for the Friday 9th July session, which permits day registration. Details can be found online at:

26th AMS Conference on Hurricanes and Tropical Meteorology

Dr Bruce Harper of SEA was recently invited to participate in a special commemorative session at the American Meteorological Society's 26th Hurricane Conference in Miami Beach in May. The special session entitled "30 yrs of the Dvorak Technique" highlighted the enormous contribution made to the forecasting of the intensity of tropical cyclones by Vernon Dvorak, a NOAA scientist who developed a satellite-based pattern recognition system in 1972. Dr Harper summarised Australia's reliance on the Dvorak technique and outlined some possible future enhancements to the method based on work supported by Woodside Energy Ltd in the past few years.



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- Dept Natural Resources, VIC
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- Dept Infrastructure Planning and Natural Resources, NSW
- Commonwealth Dept of Transport and Regional Services
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- Bureau of Meteorology
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Multi-Hazard Studies:

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

Research:

- RPI, Bermuda.
- James Cook University CTS

Guidelines:

- World Meteorological Organisation

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