

Severe wind risk modelling

Severe wind modelling team

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Project summary

Geoscience Australia's Risk and Impact Analysis Group, in collaboration with both government and industry stakeholders, is undertaking research to analyse the instrumental historic and prehistoric record of all severe wind events in Australia.



Image left: *Housing estate destroyed by Cyclone Tracy in 1974 (Geoscience Australia).*

The Bureau of Meteorology has valuable information describing the patterns and regularity of severe winds experienced by Australian capital cities, major country towns and other sites over the past 100 years. However, severe winds from small-scale events such as thunderstorms and tornadoes have not always been captured in the observed record. Additional information within a longer record, properly interpreted, can extend our understanding of wind patterns and regional-scale extreme events back many thousands of years. Using statistical analysis, sophisticated computer models and our understanding of climate change, it will be possible to estimate the likelihood of severe winds occurring in every part of the continent during the 21st century and beyond.

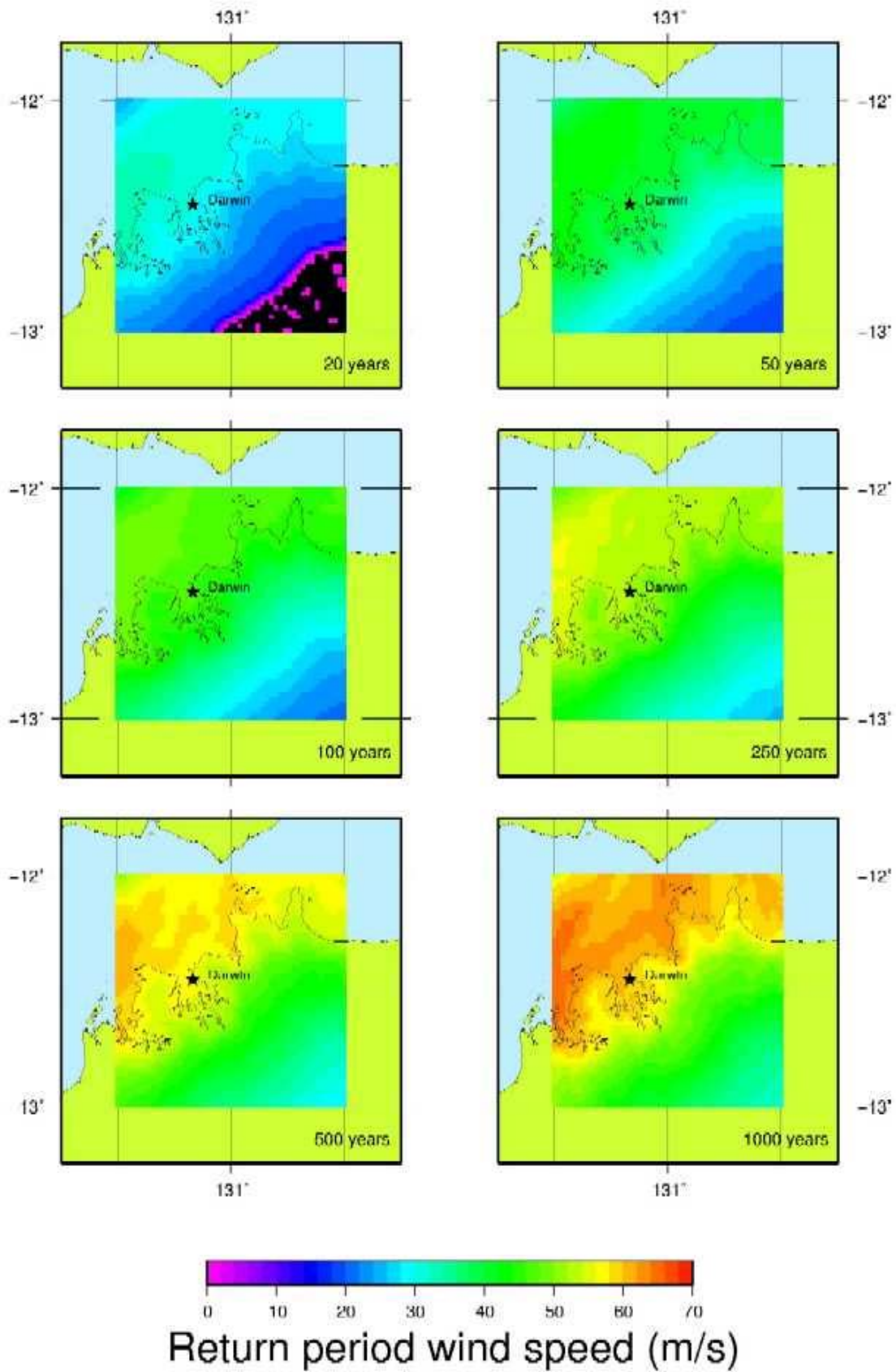


Image: Return-period winds estimated for Darwin using a synthetic cyclone catalogue (image Geoscience Australia, modelling software courtesy of Aon Re).

This information will be used by Risk and Impact Analysis Group engineers to estimate the damage such winds are likely to cause to commercial and residential buildings and the impact on critical infrastructure. Consequently, likely patterns of damage and financial losses can be estimated for regions, cities and towns across the nation. These informed estimates can be used by economists to assess longer term direct and indirect economic impacts of severe wind events, and by social scientists to develop strategies to support communities recovering from them.

This will build preparedness, help to mitigate future impacts, make communities more resilient, and enable swifter disaster recovery:

- Emergency managers will be able to improve response planning by utilising the predicted consequences and assessed likelihoods of scenario events.
- Capability gaps can then be more clearly identified and plans developed to improve the effectiveness of post-event emergency and recovery operations.
- Planners and engineers will be able to more accurately identify factors contributing to the risk of damage to infrastructure and develop strategies to improve resilience through measures such as improved building codes and community awareness.
- Insurance companies will be better able to estimate their portfolio risk and thus develop the most appropriate insurance premium schedules and incentives for property holders in high risk areas and the broader community.
- Community members will be better informed about their relative level of risk and thus more likely to take up appropriate insurance cover.

The research will allow us to better understand cyclone, thunderstorm, tornado and winter storm hazards, anticipate their impacts and, with appropriate planning, mitigate their impacts.

Papers

Cechet, B., A. Hitchman and M. Edwards (2006), "[Beating the big blows: new research assesses severe wind risk](#)", *AusGEO News*, 81