



Natural Hazards in Australia: storms, wind and hail
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Climatic Change

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What phenomena produces extreme wind & hail?

- Tropical cyclones
- Extra-tropical cyclones
- Severe thunderstorms
- East Coast Lows
- Mountain wave activity



Sydney 2015

Observed trends in wind and hail

Wind

- Inconclusive results based directly on wind data (McVicar et al 2008; Troccoli et al 2012)
- Decreasing TCs (Callaghan & Power 2011; Dowdy 2014; Haig et al 2014)
- No change in ECLs (Pepler et al 2014)
- Change in severe thunderstorms?

Hail

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Projections of Wind and Hail

Wind

- Decrease in TCs numbers (Knutson et al 2015)
- Increase in (summer) extreme ECLs (decrease over all) (Pepler et al 2015)
- Increase in strong extra-tropical cyclones over SE Australia (Grieger et al 2014)
- Increase in severe thunderstorms (Allen et al 2014)

Hail

- few studies
- Increase in frequency in SE Australia (Braganza et al 2013)

Recommendations

- Improvements in climate model simulations of TCs & ECLs – better resolution, improved physics
- High temporal resolution wind observations (1 minute?) may provide more information than just maximum gust
- known about the past/present/future for hail – new satellite and radar observations may provide some insight
- Diagnosis of storm-related quantities from satellite data requires more research
- Perhaps citizen science apps so the public can make hail reports could help?