

SEASCAPES

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Flood, hail and more of the same?

The severe hailstorm which recently devastated parts of inner-city Sydney has been a sober reminder to the Australian community that it remains relatively vulnerable to the impact of severe hail. For those in the insurance industry this type of loss should come as no surprise since history has shown storms of similar hail producing capacity are relatively common events. The difference this time is that it happened where it could cause maximum damage.

While we cannot prevent the incidence of such storms we can plan appropriately for the likely damage they might cause and, for the future, we should aim to put in place mitigation plans to try to reduce the level of loss. Earlier Bureau

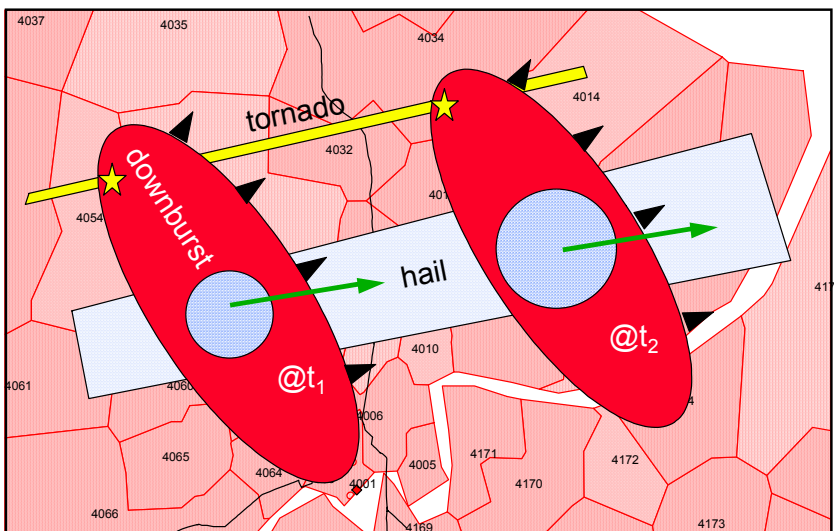
of Meteorology warnings may have reduced motor vehicle damage but would have had little effect on housing losses. Severe thunderstorms are very difficult to accurately forecast. Unlike tropical cyclones, which generally develop over several days, severe thunderstorms can change very significantly within just a few tens of minutes.

The SEA statistical severe storm model MIRAM is believed to be the only one of its type in the world. It has already been used very successfully in the Brisbane region to quantify the level of damage from such events, allowing estimates of average annual losses and also catastrophic losses to return periods in excess of 1,000 years. The model consid-

ers the joint impact of severe and damaging downburst winds, hail and also tornadoes using state-of-the-art physical representations. Its accuracy has been demonstrated against the \$350M+ Brisbane hailstorm of 1985 as well as the long term peak gust wind records at Brisbane Airport and regional hail statistics.

Because the model integrates its damage swath against the varying suburban topography it also predicts the most damaging approach paths for a given city geometry. MIRAM provides insurers with the type of statistical information essential for optimising retention and reinsurance options.

The MIRAM model's depiction of movement of a severe thunderstorm cell over suburban terrain creating swaths of wind and hail damage as the storm undergoes dynamic changes in structure.



**Will La Nina welcome in the new millennium?
see over for details ...**

Welcome to SEASCAPES

Welcome to another edition of SEASCAPES featuring the developing risk assessment capabilities of Systems Engineering Australia Pty Ltd (SEA). Our services include 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.

Visit us on the web:
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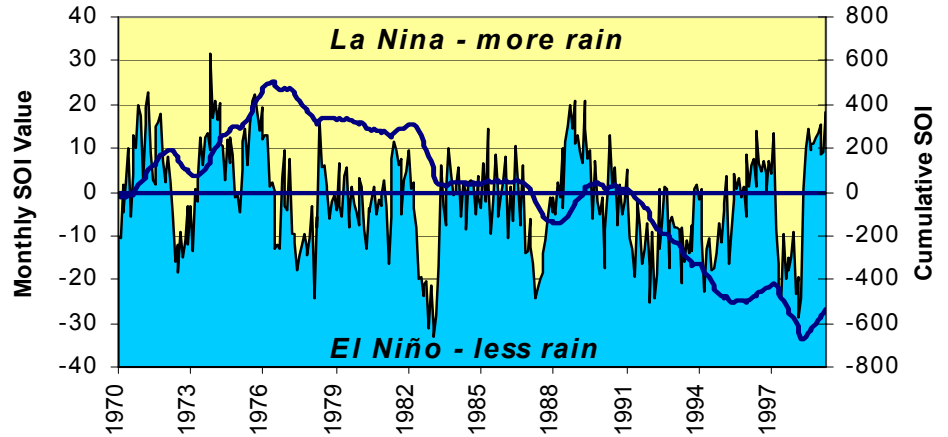


La Nina Set for an Encore Year !

Following the strengthening and persistent La Nina year during 1998, this year looks like continuing positive values of the SOI, taking us into the year 2000. Autumn is traditionally the time when El Niño shows his hand - a sharp drop in the SOI at this time would indicate a likely reversal back to the drought cycles which have affected the continent for much of the past 10 years. Last year's swing back to the La Nina heralded a return of the North Queensland wet, widespread rains across Queensland, flooding in SE Queensland and an increase in numbers of western Coral Sea tropical cyclones. None of this should come as too much of a surprise - numbers of tropical cyclones have been well below historical averages for at least 15

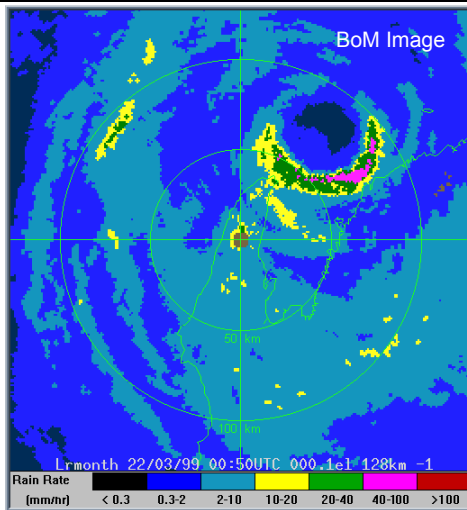
years on the Queensland coast. The SOI is a simple measure of the pressure difference across the South Pacific which is a strong indicator of the shift in weather patterns termed La Nina (girl child) and El Niño (boy child), after South American

legend. The graph below shows SOI values since 1970 with the last portion indicating the previous positive La Nina year. The superimposed line shows how the SOI has trended since 1970, perhaps indicating a bottoming-out at last and a return to more positive or near neutral conditions.



Did You Know?

Severe Tropical Cyclone *Vance*, which devastated the remote West Australian coastal town of Exmouth in March produced the most intense winds yet recorded on the Australian mainland - 267 km/hr. It was almost 10 years ago to the day since the next most intense cyclone in the Australian region - "awesome" *Orson*, another West Australian cyclone. In April 1989, *Orson* had a similar track to *Vance* but passed directly over the offshore production oil and gas platform North Rankin 'A' operated by Woodside Energy Limited located some 130 km off the coast near Dampier. The barometric pressure bottomed out at 905 hPa as the huge storm



passed over the structure and more than 100 personnel sweated it out during the long night. With winds up to 250 km/hr and waves up to 20 m high the massive steel structure danced and weaved while billiard balls in the mess room wandered about the table on their own. Luckily, *Orson* abated before it crossed the coast.

Some of the SEA Clients Since 1996

Tropical Cyclone Risks:

- RACQ-GIO Insurance
- Commercial Union Insurance
- SUNCORP General Insurance
- FAI Insurance
- Aon Group Australia Limited

Severe Thunderstorm Risks:

- SUNCORP General Insurance
- Natural Hazards Research Centre

Flood Risks:

- RACQ-GIO Insurance, Qld.

Coastal and Ocean Hazards:

- Woodside Offshore Petroleum, WA.
- Dept Natural Resources, Vic.
- EPA, Qld.

Research:

- The Risk Prediction Initiative, Bermuda.

Conference News:

American Meteorological Society

23rd Conference on Hurricanes and Tropical Meteorology
Jan 10-15th 1999, Dallas, Texas.

A joint paper was submitted by Dr Bruce Harper, Director of Systems Engineering Australia Pty Ltd, and Dr Greg Holland, Principal Research Scientist with the Bureau of Meteorology Research Centre in Melbourne. The paper was entitled "An Updated Parametric Model of the Tropical Cyclone" and summarised some outcomes and plans resulting from the WMO IWTC IV sessions in China last year and initiatives by the Risk Prediction Initiative in Bermuda. The paper was presented by Dr Holland. Copies are available upon request.



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