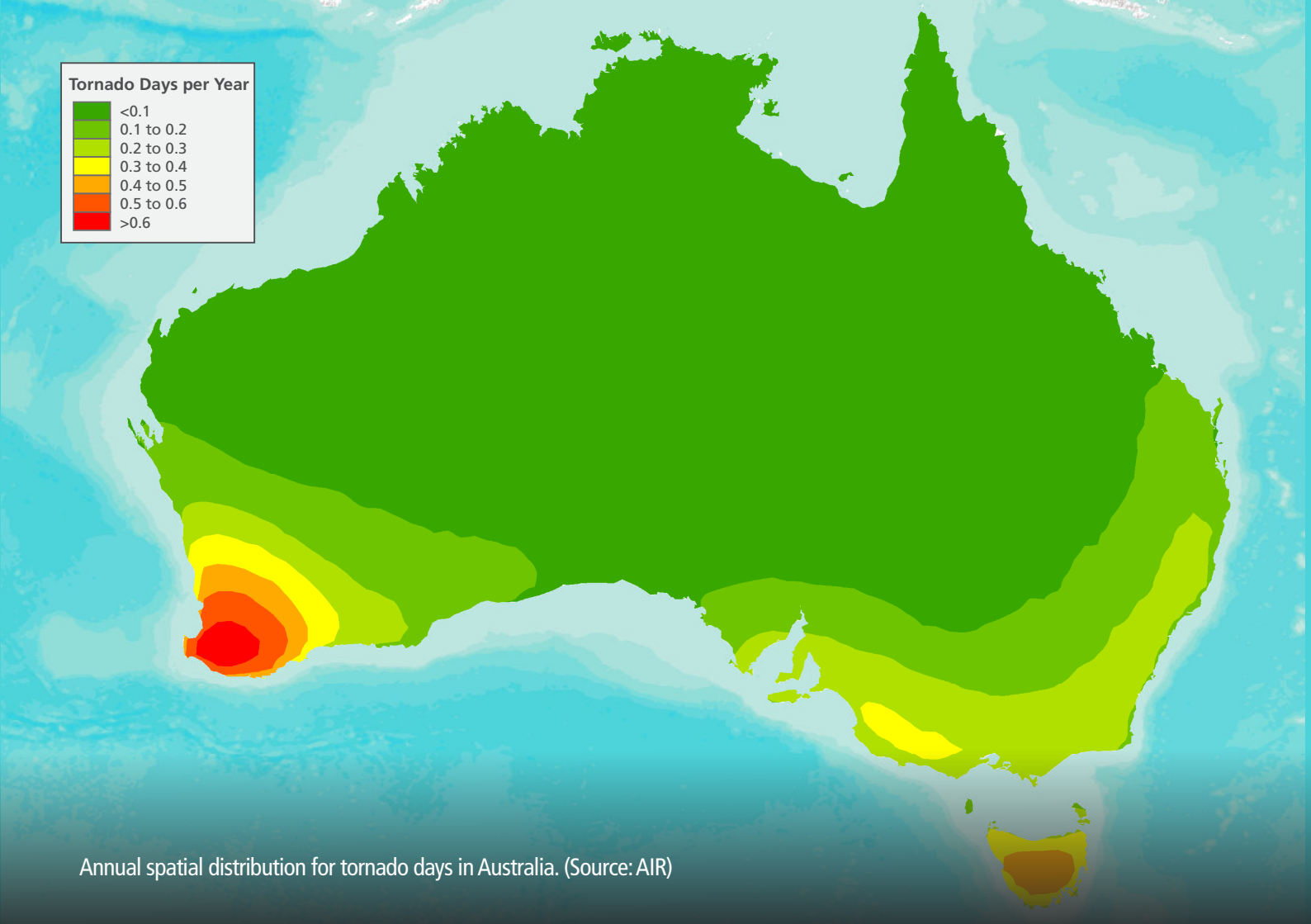
THE AIR SEVERE THUNDERSTORM MODEL FOR AUSTRALIA

In Australia, severe thunderstorms occur more frequently and cost more annually than any other atmospheric peril. The industry's first comprehensive severe thunderstorm model for the country, the AIR Severe Thunderstorm Model for Australia explicitly models all three sub-perils—hail, tornado, and straight-line wind—to help companies manage the risk.

HAIL

Hailstorm outbreaks can last for several days and affect multiple states and territories, but individual swaths may last for just minutes and devastate highly localized areas. AIR uses advanced algorithms to create realistic groupings of hail microevents that are close together in space and time. The resulting stochastic event footprints are based on observation data rather than artificially imposed grid sizes, providing users with far more realistic views of loss probabilities.



Annual spatial distribution for tornado days in Australia. (Source: AIR)

TORNADO

Because of the scarcity of historical records for tornadoes and biases in reporting, AIR employs a "smart-smoothing" technique to augment observation data with information about atmospheric conditions conducive to a severe thunderstorm outbreak, including instability, wind shear, temperature, and moisture.

Smart-smoothing allows for simulation of plausible events where none appear in the historical record, giving companies a more accurate view of their tornado risk.

A shelf cloud front rolling over Sydney Harbour.

STRAIGHT-LINE WIND

The most frequent yet often overlooked sub-peril is straight-line wind, which can cause significant losses. Damage from straight-line wind is often mistakenly attributed to weak tornadoes, even without the presence of cyclonic wind motion or a central vortex.

As seasons change and temperatures shift from warm to cool, straight-line wind events shift regionally. The AIR Severe Thunderstorm Model for Australia applies different severity indexes to capture this seasonal variability throughout the region to provide more robust loss estimations.

Severe property damage from straight-line winds.

VULNERABILITY

The vulnerability module of the AIR Severe Thunderstorm Model for Australia features separate damage functions for hail, tornado, and straight-line wind to capture their unique impacts on buildings, contents, automobiles, and complex industrial facilities, as well as business interruption losses.

Damage functions are formulated using data from published literature and incorporate the regional and temporal variations in Australian building codes. They are then validated using claims, historical loss data, and results from damage surveys.

A panoramic view of Sydney, Australia, and the landmark Sydney Opera House.

EXPOSURE

The greatest concentrations of exposure are the densely populated cities of Adelaide, Brisbane, Canberra, Melbourne, Perth, and Sydney. The number of insurable exposures continues to grow as development expands into previously unpopulated areas, and loss potential is increasing as property replacement values rise.

The AIR Severe Thunderstorm Model for Australia incorporates a highly detailed (1-km grid resolution) industry exposure database that contains information on risk counts, replacement values, occupancies, and construction types of insurable properties, including industrial facilities.

SIGNIFICANT HISTORICAL SEVERE THUNDERST

Year	1973	1985	1990	1999
Event	Brisbane Tornado	Brisbane Storm	Sydney Storm	Sydney Hails
Damage Type	Tornado	Hail/Straight-Line Wind	Hail/Straight-Line Wind	Hail
Insured Losses (AUD Millions*)	105	2,201	1,384	4,582

*Losses are trended to 2015 dollars. (Data Source: Insurance Council of Australia)

ORM EVENTS

	2008	2010	2010	2014
torm	Brisbane Storm	Melbourne Storm	Perth Storm	Brisbane Storm
	Hail/Straight-Line Wind	Hail/Straight-Line Wind	Hail/Straight-Line Wind	Hail/Straight-Line Wind
	379	1,237	1,087	1,379

WHAT'S YOUR RISK?

Where are your exposure concentrations relative to areas of high hazard risk? Based on detailed modeling of your portfolio, how likely are different levels of loss?

To help you answer these questions and truly own your risk, AIR is releasing a severe thunderstorm model for Australia in 2017.

This model will provide the insurance industry with the most advanced view of hail, tornado, and straight-line wind risk in Australia. Combined with AIR's Touchstone® catastrophe risk management platform, the AIR Severe Thunderstorm Model for Australia is the most advanced tool for assessing severe thunderstorm risk in the Australian insurance market.

ABOUT AIR WORLDWIDE

AIR Worldwide (AIR) provides catastrophe risk modeling solutions that make individuals, businesses, and society more resilient. AIR founded the catastrophe modeling industry in 1987 and today models the risk from natural catastrophes and terrorism globally. Insurance, reinsurance, financial, corporate, and government clients rely on AIR's advanced science, software, and consulting services for catastrophe risk management, insurance-linked securities, site-specific engineering analyses, and agricultural risk management. AIR Worldwide, a Verisk Analytics (Nasdaq:VRSK) business, is headquartered in Boston with additional offices in North America, Europe, and Asia. For more information, please visit www.air-worldwide.com.

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