

Solar Shenanigans: Space Weather Preparedness and Practice in Aotearoa New Zealand

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The Membership of the Aotearoa NZ Space Weather Science Advisory Panel
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Where we have come from

Aotearoa New Zealand had taken proactive steps to address space weather risk prior to the 2024 Gannon Storm, led by the electricity industry and its planning in the 2000s. The Ministry for Business, Innovation and Employment (MBIE) funded Solar Tsunamis Programme began in 2020 and bolstered this planning through close research to operations partnership with a focus on modelling Geomagnetic Induced Currents (GIC). The NZ government, led by the National Emergency Management Agency (NEMA) and MBIE, is actively working on space weather, and it is an identified national risk with ongoing risk management and inter-agency collaborative work.



2001
Electricity grid asset destroyed by space weather



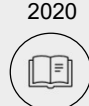
2000s
Electricity Industry space weather plan developed



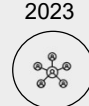
2015
Gov't funds Research & Electricity Industry partnership to test and refine plans



2016
New Zealand's National Risk Register developed – space weather included



2020
Government investment in Solar Tsunamis Research Programme



2023
Electricity industry working group established



2023
Prioritised national risk work undertaken on space weather

The 2024 Gannon Storm energized the NZ system to build on that research and industry momentum to improve national space weather readiness and awareness. NEMA has established a Space Weather Programme to drive readiness and national collaboration across government, critical infrastructure providers, science agencies, universities, and the private sector.

Recent steps forward include the Aotearoa New Zealand Space Weather Science Advisory Panel (and its operational Response Subgroup) and the National Space Weather Response Plan. The Response Plan is supported by a range of sector-specific response plans, such as for the electricity industry, health, aviation, emergency services, and foreign affairs.

Where we are now



Aotearoa New Zealand Space Weather Science Advisory Panel

- To steward and develop NZ's capability & capacity
- To advocate and coordinate monitoring, data collection and strategies.
- To be a focal point for international liaisons.
- Includes sectors likely to be impacted: aviation, electricity, positioning and timing



Operational Response Subgroup

- To provide timely, well-communicated science advice to NEMA and Transpower.
 - Recently activated in November 2025 & January 2026.
- Membership include: NEMA, University of Otago, Transpower.



National Space Weather Response Plan

- Provides a framework for how Aotearoa New Zealand will respond to a severe space weather event – drawing content from the overarching Catastrophic Event Handbook.
- 7 levels: proceeding from Operational Readiness, Pre-impact and Impact, through to Recovery phases
- Multi-sector and multi-agency, with well defined roles and responsibilities
- Supported by individual agency response plans



Exercise Tahu-nui-a-Rangi

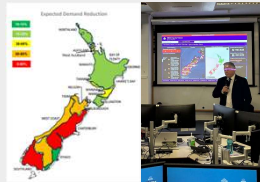


November 2025, NEMA brought partners together to test the Response Plan and exercise our science panels over 2 days.

Increased public awareness of space weather (picked up by major NZ news sources) and improved participant operational resilience.

Lessons from panel perspective:

- Easy to use science advice templates
- Trusted relationship between scientific advice and civil defence decision making
- Conveying uncertainty is key
- International consistency is vital



Left: Example of impacts forecast during exercise. Right: NEMA Minister Mitchell addresses the bunker.



140 participants across gov't, science advice, civil defence and impacted sectors, played through an R5 solar flare, S5 radiation storm and G5+ CME.

Where we are headed



Continue to refine roles across government



Continue to build and formalise international partnerships



Iteratively update the Response Plan as the international knowledgebase grows



Continue exercising and other readiness activities (inc. 2026 electricity industry exercise)



Explore risk reduction measures, such as capacitor blockers



MBIE funded Solar Tsunamis – Next Generation, including ionospheric monitoring to address wider impacts

