

# TSP Australia Report

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# TSP Australia Structure

TSP Australia is operated by the JATWC (Joint Australian Tsunami Warning Centre), consisting of:

**Geoscience Australia (GA), Canberra:** Earthquake Monitoring and Alerting

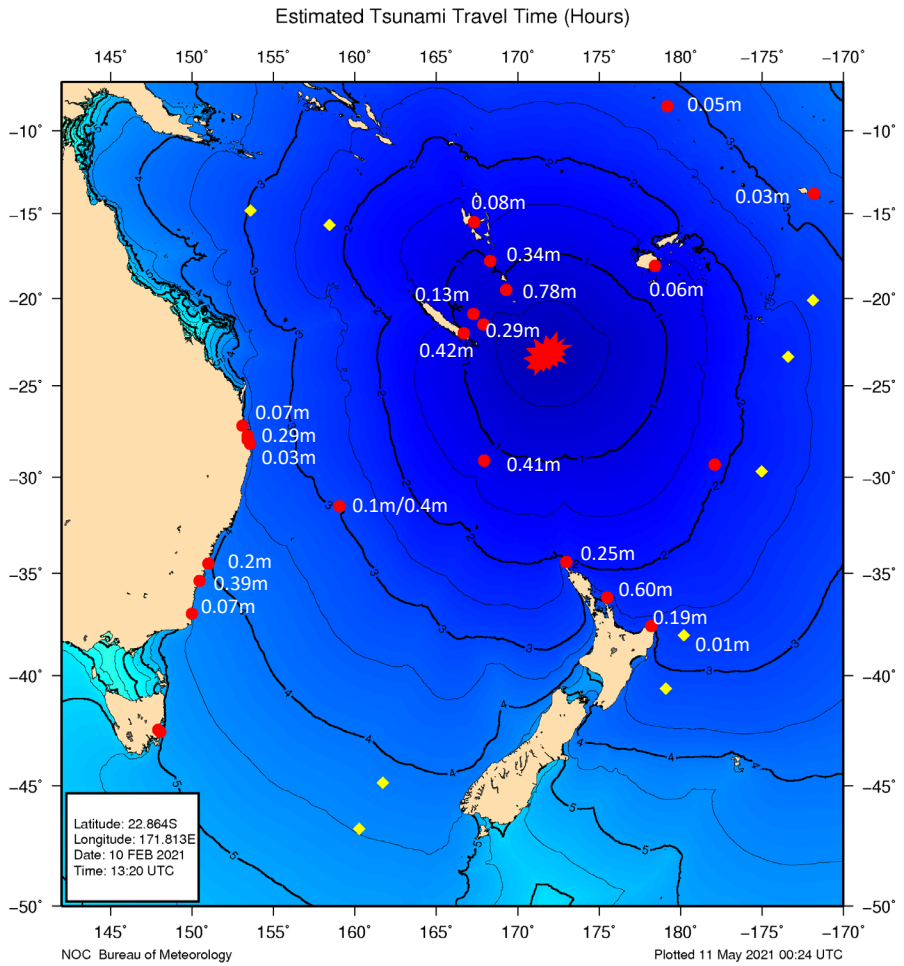
**Bureau of Meteorology (BOM), Melbourne & Brisbane:** Sea Level Monitoring and Tsunami Warning



*JATWC staff located at Geoscience Australia (left) and Bureau of Meteorology (right)*

# Loyalty Islands Event

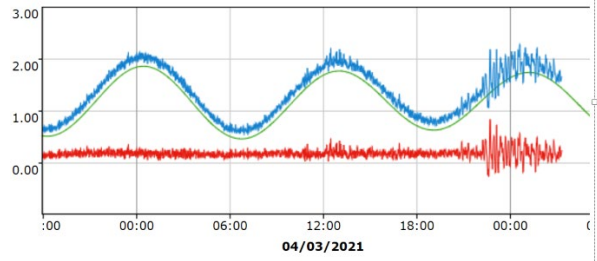
Time (UTC)	Elapsed Time (hh:mm)	Key Event 10 Feb 2021
13:20:00	0	Earthquake occurs Southeast of the Loyalty Islands, New Caledonia.
13:30:00	10 min	Geoscience Australia issues Manual Solution (Mag 7.5).
13:36:41	16 min	IOTWMS assessment generated (Mag 7.5) – EQ Bulletin issued.
13:37:52	17 min	IOTWMS No Threat Bulletin issued but shouldn't be.
13:38:03	18 min	ATWS assessment generated (Mag 7.5).
13:41:59	21 min	ATWS National No Threat Bulletin issued.
13:46:00	26 min	Geoscience Australia issues Manual Solution (Mag 7.5).
13:55:00	34 min	Geoscience Australia issues Manual Solution (Mag 7.6).
13:58:20	38 min	ATWS assessment generated (Mag 7.6).
14:18:31	58 min	ATWS National Watch Bulletin 1 issued.
14:44:06	01:24	ATWS Lord Howe Island Marine Warning 1 issued.
14:44:26	01:24	ATWS National Warning Summary 1 issued.
15:02:49	01:42	ATWS Lord Howe Island Marine Warning 2 issued.
15:03:29	01:43	ATWS National Warning Summary 2 issued.
15:11:08	01:51	Norfolk Island - Observed Wave Amplitude: 0.11 m.
15:11:17	01:51	Suva Viti Levu, Fiji – Observed Wave Amplitude: 0.04 m.
15:23:49	02:03	Norfolk Island – Observed Wave Amplitude: 0.38 m.
15:28:56	02:08	Port Villa, Vanuatu – Observed Wave Amplitude: 0.35 m.
16:01:48	02:41	ATWS Lord Howe Island Marine Warning 3 issued.
16:02:52	02:42	ATWS National Warning Summary 3 issued.
17:02:02	03:42	ATWS Lord Howe Island Marine Warning 4 issued.
17:04:08	03:44	ATWS National Warning Summary 4 issued.
17:10:20	03:50	Lord Howe Island – Bureau observer reported tsunami waves
17:25:43	04:05	Gold Coast – Observed Wave Amplitude: 0.15 m.
18:03:21	04:43	ATWS Lord Howe Island Marine Warning 5 issued.
18:03:43	04:43	ATWS National Warning Summary 5 issued.
18:52:03	05:32	Port Kembla – Observed Wave Amplitude: 0.15 m.
19:00:48	05:40	ATWS Lord Howe Island Marine Warning 6 issued.
19:01:17	05:41	ATWS National Warning Summary 6 issued.
19:42:32	06:22	Gisborne, New Zealand – Observed Wave Amplitude: 0.05 m.
19:58:27	06:38	ATWS Lord Howe Island Warning Cancellation issued.
20:06:13	06:46	ATWS National Warning Summary 7 issued.
20:07:18	06:47	ATWS National Event Summary 8 issued.
20:08:00	06:48	The JATWC is stood down.



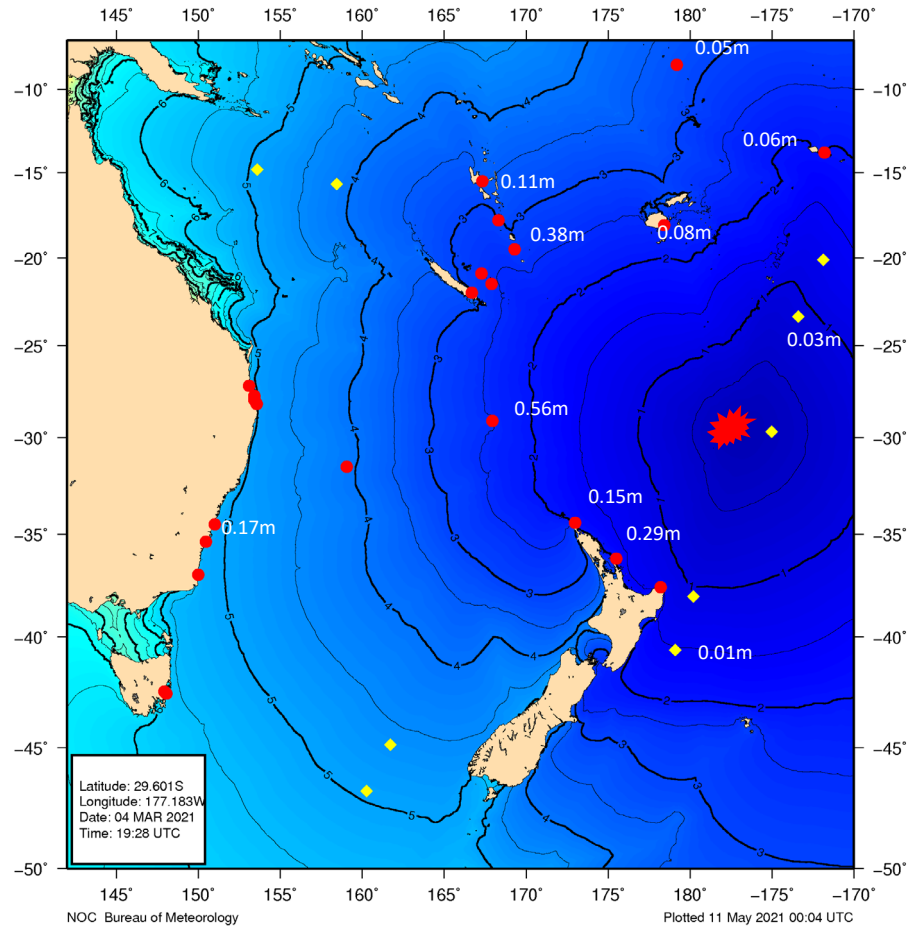
# Kermadec Islands Event

Time (UTC)	Elapsed Time (hh:mm)	Key Event
		4 March 2021
13:27:00		M7.3 Earthquake occurred near the North Island, New Zealand. National No Threat Bulletin issued.
18:09:00		M7.3 Earthquake near the Kermadec Islands, New Zealand. National No Threat Bulletin issued.
19:28:00	0	M7.9 Earthquake occurred near Kermadec Islands, New Zealand.
19:37:00	9 min	Geoscience Australia assessed as M7.3
19:42:00	14 min	Geoscience Australia upgraded to M8.1.
19:46:00	18 min	ATWS National Watch Bulletin 1 issued
19:53:00	25 min	Geoscience Australia downgraded to M8.0.
20:02:00	34 min	Geoscience Australia downgraded to M7.9.
20:10:00	42 min	ATWS Norfolk Island Marine Warning 1 issued, predicted impact in 1 hour 49 minutes.
21:33:00	02:05	Tsunami confirmed with observed waves of 6cm at Nuku'Alofa, Tonga.
22:45:00	03:17	Norfolk Island tide gauge recorded 64cm tsunami waves.
23:13:00	03:45	M6.6 Earthquake occurred in the same location. JATWC considered it as aftershock, not as a new event to avoid conflicting threat advice.
01:20:00	05:52	ATWS Cancellation of warning. JATWC stood down.

Norfolk Australia



Estimated Tsunami Travel Time (Hours)



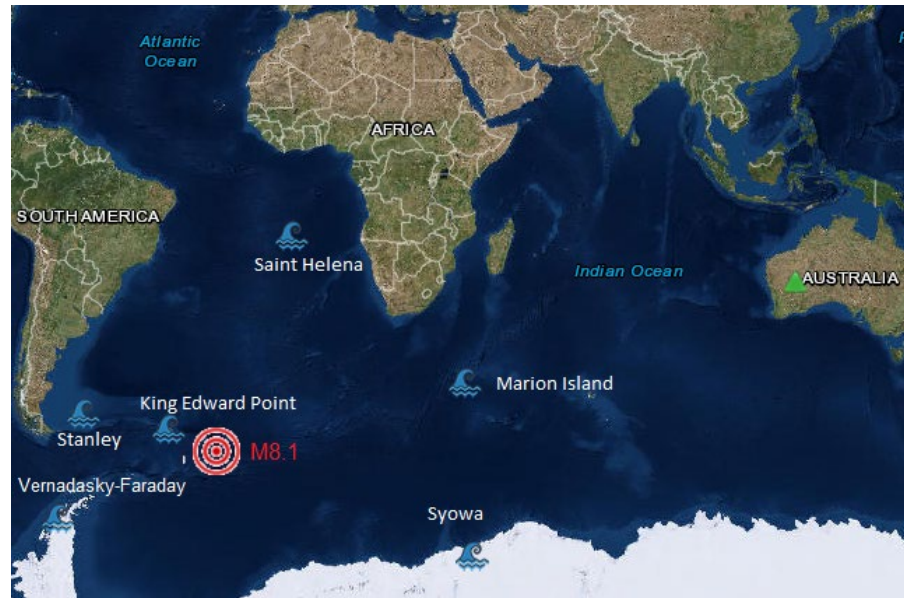
# TSP Australia – Events 2021 (Jan-Oct)

Date	Time	Location	Mag	
21-Jan-21	12:23	Talau Islands, Indonesia	7.0	
23-Jan-21	23:36	South Shetland Islands	6.9	
10-Feb-21	13:20	Southeast of Loyalty Islands	7.5	
10-Feb-21	21:24	Southeast of Loyalty Islands	6.5	
04-Mar-21	13:27	Off E. Coast of N. Island, N.Z	7.3	
04-Mar-21	17:41	Kermadec Islands, New Zealand	7.3	
04-Mar-21	19:28	Kermadec Islands, New Zealand	8.0	← No Threat
04-Mar-21	23:13	Kermadec Islands Region	6.6	
06-Mar-21	00:15	Off E. Coast of N. Island, N.Z	6.5	
16-Mar-21	18:38	Off East Coast of Kamchatka	6.6	
20-Mar-21	09:09	Near East Coast of Honshu, Japan	7.0	
01-Apr-21	09:56	Kermadec Islands, New Zealand	6.3	
03-Apr-21	01:16	East of South Sandwich Islands	6.6	
24-Apr-21	00:23	Fiji Islands Region	6.6	
25-Apr-21	22:28	Fiji Islands Region	6.6	
01-May-21	01:27	Near East Coast of Honshu, Japan	6.8	
12-May-21	14:05	Mauritius/Reunion Region	6.6	← Potential Threat
14-May-21	06:33	Off West Coast of Northern Sumatra	6.7	← No Threat
19-May-21	00:42	Southern East Pacific Rise	6.7	
21-May-21	22:13	Fiji Islands Region	6.5	
20-Jun-21	17:05	Kermadec Islands, New Zealand	6.5	
21-Jul-21	21:15	South of Panama	6.9	
23-Jul-21	20:49	Mindoro, Philippines	6.7	
29-Jul-21	06:15	Alaska Peninsula	8.0	← No Threat
03-Aug-21	03:42	Nicobar Islands, India Region	6.5	← No Threat
11-Aug-21	17:46	Mindanao, Philippines	7.0	
12-Aug-21	18:32	South Sandwich Islands Region	8.0	← Confirmed Threat
14-Aug-21	11:57	Alaska Peninsula	6.7	
16-Aug-21	11:10	South Sandwich Islands Region	6.9	
18-Aug-21	10:10	Vanuatu Islands	7.0	
22-Aug-21	00:45	South Sandwich Islands Region	6.7	
22-Aug-21	21:33	South Sandwich Islands Region	7.1	
08-Sep-21	01:47	Guerrero, Mexico	7.1	
22-Sep-21	09:57	Near Coast of Nicaragua	6.6	
02-Oct-21	06:29	Vanuatu Islands Region	7.2	
09-Oct-21	10:58	Vanuatu Islands Region	6.9	
11-Oct-21	09:10	Alaska Peninsula	6.9	

# South Sandwich Islands Event

Time (UTC)	Elapsed Time (hh:mm)	Key Event
18:32:00 12/08	00:00	Earthquake at South Sandwich Islands Region
18:47:00 12/08	00:15	Geoscience Australia Manual Solution issued (Mag 7.1)
18:55:17 12/08	00:23	IOTWMS assessment generated (Mag 7.1) – EQ bulletin issued
18:56:19 12/08	00:24	IOTWMS No Threat Bulletin 2 issued
18:56:27 12/08	00:24	ATWS assessment generated (Mag 7.1)
18:57:10 12/08	00:25	ATWS National No Threat Bulletin issued
19:12:02 12/08	00:40	ATWS assessment generated (Mag 7.6 - Source Mag 7.1)
19:33:00 12/08	01:00	Geoscience Australia Manual Solution issued (Mag 7.8)
19:35:47 12/08	01:03	ATWS assessment generated (Mag 7.8)
19:36:40 12/08	01:04	IOTWMS assessment generated (Mag 7.8)
19:40:54 12/08	01:08	IOTWMS assessment generated (Mag 7.8) – EQ bulletin issued
19:41:54 12/08	01:09	ATWS National No Threat Bulletin issued
02:29:00 13/08	07:56	Geoscience Australia Manual Solution issued (Mag 8.0)
02:40:06 13/08	08:08	King Edward Point, UK – Observed Wave Amplitude: 0.65 m
02:41:39 13/08	08:09	IOTWMS Threat Bulletin 4 issued
02:42:59 13/08	08:10	Stanley, FALKLAND ISLANDS – Observed Wave Amplitude: 0.21 m
02:49:08 13/08	08:17	Marion Island, SOUTH AFRICA – Observed Wave Amplitude: 0.46 m
02:52:10 13/08	08:20	Syowa, ANTARCTICA – Observed Wave Amplitude: 0.30 m
03:01:19 13/08	08:29	Vernadsky Faraday, ANTARCTICA – Observed Wave Amplitude: 0.05 m
03:47:53 13/08	09:15	IOTWMS Threat Bulletin 5 issued
04:52:51 13/08	10:20	IOTWMS Threat Bulletin 6 issued
06:03:16 13/08	11:31	IOTWMS Final Threat Bulletin 7 issued

Location	Observed Amplitude (m)	Predicted (m)
Marion Island (Funk Seamount)	0.49	0.15
Pointe des Galets (Saint-Denis)	0.21	0.10
Rodrigues (La Ferme)	0.32	0.11
Port Louis (Grande Reviere Sud Est-West)	0.24	0.00
Kerguelen (Ile Kerguelen)	0.10	0.05
Toamasina (Toamasina Airport)	0.06	0.00
Cocos Islands (Cocos Island)	0.08	0.00
Hillarys Harbour (Perth Coast)	0.10	0.00



# TSP Australia Recent Developments

- COVID-19 has had minimal impact on TSP Australia's continued operations and no impact on service delivery.
- JATWC commenced regular joint (GA-Bureau) operations exercises in January 2021.
- Geoscience Australia commenced development of the training and accreditation system for GA-JATWC front-line staff in July 2021.
- The Bureau upgraded their tsunami Decision Support Tool (DST) in August 2021:
  - Automated issuing of IOTWMS EQ Bulletin from GA issued earthquake solutions.
  - Update the TSP Australia Public page to facilitate separate bulletins for multiple events
  - Extend the technique for generating products for atypical (non-seismic) events to IOTWMS products
  - Added new IOTWMS products for international maritime agencies.
- The Bureau's Tsunami Warning Services, part of the JATWC, maintained its accreditation as an ISO 9001 compliant quality managed system after a successful audit in July 2021.
- Changed operating model with deeper tsunami science expertise available on call during events

# TSP Australia Future Developments

- TSP Australia services will be upgraded to match version 4 (2019) of the IOTWMS TSP Service Definition Document (new Final Bulletin message, new Cancellation message).
- The Bureau is reviewing its tsunami applications with a view to replace for security and resilience.
- GA-JATWC will upgrade to SeisComP4 (early 2022)
- GA-JATWC will integrate, test and operationalise seismic array processing as input to rapid earthquake detection and characterisation.
- GA-JATWC will commence work towards ISO 9001:2015 accreditation for GA-JATWC systems (as input to BOM-JATWC accredited system).



# TSP Australia Ongoing Commitments

- Continue to contribute strongly to IOTWMS activities in the next intersessional period, including:
  - The planning, conduct and reporting of biennial IOWave exercises
  - The planning, conduct and reporting of 6-monthly Communication Tests
  - Regular NTWC/DMO/Media SOP Training Workshops
  - ICG/IOTWMS Working Groups and Task Teams
  - The Bureau of Meteorology's funding of the IOC staff of the IOTWMS Secretariat Office located at the Bureau's Perth office and their support with infrastructure and other logistics

# Thank you

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