INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (of UNESCO)

Fourteenth Session of the Intergovernmental Coordination Group
for the Indian Ocean Tsunami Warning and Mitigation System
(ICG/IOTWMS-XIV)

Jakarta, Indonesia, 17-19 November 2024

National Report of Australia

Page 1: Overview

Q1

Consent: I have read the above information and wish to proceed.

Confirm by clicking the checkbox

Q2

Please select your country from the list below:

Australia

Page 2: PART I: Basic Information

Q3

TNC Name:

Piero Chessa

Q4

Position:

Group Executive, Community Services

Q5

Organisation:

Bureau of Meteorology

Q6

Telephone Number:

Respondent skipped this question

Q7

E-mail Address:

piero.chessa@bom.gov.au

Q8 **Respondent skipped this question**

Fax Number:

Q9

Postal Address:

GPO Box 1289, Melbourne, VIC 3001, AUSTRALIA

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Q10

NTWC Agency Name:

Joint Australian Tsunami Warning Centre (JATWC)

Q11

NTWC URL (web link) for tsunami warnings:

http://www.bom.gov.au/tsunami

Q12

NTWC Agency Contact or Officer in Charge (person):

Yuelong Miao

Q13

Position:

Team Lead, Tsunami Marine & Coastal Hazards; Co-Director Joint Australian Tsunami Warning Centre

Q14

Telephone Number:

Q15

E-mail Address:

yuelong.miao@bom.gov.au

Q16

Postal Address:

GPO Box 1289, Melbourne, VIC 3001, AUSTRALIA

Q17

3a) Is your Tsunami Warning Focal Point (TWFP) the same as your National Tsunami Warning Centre (NTWC) agency?The TWFP is the 24 x 7 point of contact (office, operational unit or position, not a person) officially designated by the NTWC or the government to receive and disseminate tsunami information from an ICG Tsunami Service Provider according to established national Standard Operating Procedures. The TWFP may or not be the NTWC.

Yes

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Q18

TWFP Agency Name (if different from the NTWC Agency):

Respondent skipped this question

Q19

Name:

Respondent skipped this question

Q20

Position:

Respondent skipped this question

Q21

Telephone Number:

Respondent skipped this question

Q22

E-mail Address:

Respondent skipped this question

Q23

Postal Address:

Respondent skipped this question

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Q24

TWFP 24x7 point of contact (office, operational unit or position, not a person):

Respondent skipped this question

Q25

E-mail Address:

Respondent skipped this question

Q26 **Respondent skipped this question**

Telephone Number:

Q27 **Respondent skipped this question**

Cellular Telephone Number:

Q28 **Respondent skipped this question**

Fax:

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Q29 **No**

3d) Has your country appointed a Tsunami Ready Focal Point (TRFP)?The TRFP is a person from the Disaster Management (DMO) or similar institution that:- Acts as a national advocate for national implementation of the Tsunami Ready Recognition Programme (TRRP) or a recognised similar initiative to help make at-risk communities prepared and resilient to any tsunami threat within their Member State.- Actively contributes to the national implementation of TRRP or a recognised similar initiative.- Routinely update UNESCO-IOC ICG/IOTWMS on the status of the national implementation of the TRRP or a recognised similar initiative. - Informs relevant national authorities and orgaisations involved in the implementation of TRRP or a recongised similar initiative on any information and/or updates provided by UNESCO-IOC on activities related to making at risk communities Tsunami Ready.

Q30 **Respondent skipped this question**

If yes, please provide their details below:Name of the TRFP:

Q31 **Respondent skipped this question**

Position:

Q32 **Respondent skipped this question**

Agency:

Q33 **Respondent skipped this question**

Telephone Number:

Q34 **Respondent skipped this question**

E-mail Address:

Q35

Postal Address:

Respondent skipped this question

Page 7: PART II: Hazard Assessment

Q36

4a) Has your country undertaken a hazard assessment?

Yes

Page 8: PART II: Hazard Assessment

Q37

4b) What type of hazard assessment has been carried out?

Multi-hazard assessment including tsunami

Page 9: PART II: Hazard Assessment

Q38

4c) What type of multi-hazard assessment has been carried out? (select all that apply)

Tsunami,

Earthquakes,

Flooding,

Cyclone

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Q39

4d) Who did the tsunami hazard assessment in your country? (select all that apply)

National Agency,

National / Local University,

National / International Consultant

Q40

4e) At what level was the tsunami hazard assessment carried out? (select all that apply)

National Level,

Regional Level,

City Level,

Other (please specify):

National and local (GA), state & local (QLD Dept of Environment and Science [DES]), local (NSW State Emergency Services [NSW SES], Cardno, Mineral Resources Tasmania [MRT], University of Newcastle, Macquarie University, University of New South Wales [UNSW]

Q41

4f) Which coastal areas have been mapped for tsunami hazard? Please include the names of the Region / City and an approximation of the percentage mapped.

Western Australia (WA) 2008-2009 maps at city level: Broome; Port Hedland; Karratha/Dampier; Onslow; Exmouth; Carnarvon; Perth; Mandura; Busselton; Bunbury.
Western Australia (WA) 2021-2024: continuous inundation map coverage from Geraldton to Dunsborough, including the Greater Perth area.
Queensland (QLD) 2013-2024 maps at regional level: Sunshine Coast; Moreton Bay; Gold Coast; Gladstone (in-progress).
New South Wales (NSW) 2009-2014: Swansea/Lake Macquarie; Manly; Botany Bay/Cronulla/Kurnell; Wollongong/Port Kembla; Merimbula; Sydney.
New South Wales (NSW) 2023-2025: Statewide inundation mapping (100% coverage including Lord Howe Island, in progress).
Northern Territory (NT): Darwin.
South Australia (SA): Victor Harbour.
Victoria (VIC): Lakes Entrance; Port Fairy.
Tasmania (TAS): Hobart.

Q42

4g) For each of the data types listed below (in rows), answer the two questions (in columns). Select Yes / No / Don't know from the drop-down menu.

	Was this data used for tsunami hazard assessment?	Is this data publicly available?
Bathymetry	**Yes**	**Yes**
Seismo-tectonic model	**Yes**	**Yes**
Topography	**Yes**	**Yes**
Land Cover	**Yes**	**Yes**
Infrastructure details	**Yes**	**Yes**

Other data used (please specify):
Re availability of Infrastructure details, some studies have used GA's NEXIS which has publicly available data but at an aggregated level due to licence constraints. Also, landcover has been used for a subset of the studies above, only.

Q43

4h) What products do you have from the tsunami hazard assessment? (select all that apply)

Probabilistic Tsunami Hazard Assessment (PTHA),

Field Studies on Tsunami Impacts,

Hazard map,

Inundation map,

Guidelines (please specify below),

Other (please specify):

The bulk of this mapping used the 2008 PTHA which has now been updated/replaced by the 2018 PTHA. Relevant governments will assess their need to update their respective mapping products given the significant changes to the PTHA. In WA, evacuation maps are being developed from the Midwest (Geraldton) to the South West (Dunsborough), including the Greater Perth area.

Page 11: PART II: Hazard Assessment

Q44

4i) On a scale of 1 (Very poor) to 5 (Very good), please rate your country's capability to undertake tsunami hazard assessment

Capacity to undertake tsunami hazard assessment	**Good**

Q45

4j) On a scale of 1 (Not a priority) to 5 (Essential), what is the priority level in your country to improve capacity in the following areas of tsunami hazard assessment?

Probabilistic Tsunami Hazard Assessment (PTHA)	**Medium priority**
Deterministic Tsunami Hazard Analysis	**Medium priority**
Field Studies on Tsunami Impacts	**Low priority**
Hazard map	**Medium priority**
Inundation map	**Low priority**
Evacuation map	**Medium priority**
What other areas of capacity in tsunami hazard assessment require improvement?	**Communication between all parties (from modelllers to emergency management) to ensure that the scientific results are translated into emergency management response in a good way (considering not just the modelling and scientific uncertainties, but also practical issues that will affect the response).**

Q46

4k) On a scale of 1 (No capacity) to 5 (Very good), what capacity does your country have to give training and/or consultancy on tsunami hazard assessment to other countries?

Probabilistic Tsunami Hazard Assessment (PTHA)	**Good**
Deterministic Tsunami Hazard Analysis	**Good**
Field Studies on Tsunami Impacts	**Moderate**
Hazard map	**Good**
Inundation map	**Good**
Evacuation map	**Good**
Please provide the name(s) and contact detail(s) of any individuals / institutions in your country that could provide this training / consultancy	**Geoscience Australia has previously provided training on offshore and onshore hazard modelling (i.e. PTHA and inundation modelling) through the overseas aid program delivered by the Australian Government's Department of Foreign Affairs and Trade (DFAT). Previous PTHA training required access to proprietary software. With the update of the Australian PTHA, Geoscience Australia has developed open-source software for PTHA assessments. A number of open-source inundation tools are now available. Other state/territory agencies such as NSW SES can also assist with many of these aspects, too. In contrast, we have limited experience in field studies of tsunami impacts.**

Page 12: PART II: Risk Assessment

Q47

5a) Has your country undertaken a tsunami risk assessment?

Yes

Page 13: PART II: Risk Assessment

Q48

5b) What type of risk assessment?

Multi-hazard risk assessment including tsunami

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Q49

5c) What hazards have been considered in your multi-hazard risk assessment? (select all that apply)

Epidemics,

Tsunami,

Earthquakes,

Flooding,

Landslide,

Cyclone

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Q50

5d) Who did the tsunami risk assessment in your country? (select all that apply)

National Agency,

Other (please specify below),

Please specify the name(s) of the agency(ies):

Every Australian state government is required to maintain a state-wide risk assessment as part of the National Partnership Arrangement with the Commonwealth. A tsunami risk assessment was undertaken as reported in the 2017 WA Natural Hazards Risk Profile.

Q51

5e) At what level was the tsunami risk assessment carried out? (select all that apply)

Regional Level,

Other (please specify):

For Australia, regional refers to State/Territory.

Q52

5f) Which coastal areas have been tsunami risk mapped? Please include the names of the Region / City and an approximation of the overall national percentage of risk prone areas mapped.

In Western Australia (WA), detailed hazard modelling based on the Probabilistic Tsunami Hazard Assessment 2018 has been undertaken from the Midwest (Geraldton) to the South West (Dunsborough), including the Greater Perth area, since July 2021

Older (about 10 to 15 years ago), less detailed hazard modelling has been undertaken in Broome, Port Hedland, Karratha/Dampier, Onslow, Exmouth, and Carnarvon.

(See also response to 4f))

Q53

5g) How many Cities / Municipalities / Regencies are at risk from tsunami?

Australia is an island nation meaning that all coastal communities have potential tsunami risk. The PTHA shows how the offshore hazard varies around the country which could be potentially used to prioritise further work, however, there is not necessarily a direct relationship between high offshore hazard and high onshore hazard due to the nature of the nearshore environment and the source of the event itself.

Q54

5h) What products do you have from the tsunami risk assessment? (select all that apply)

Risk map,

Evacuation map,

Guidelines (please specify below),

Other (please specify):

DMOs can refer to the National Emergency Risk Assessment Guidelines (NERAG) at https://knowledge.aidr.org.au/resources/handbook-10-national-emergency-risk-assessment-guidelines/ as well as the IOTWMS Risk Assessment Guidelines.

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Q55

5i) On a scale of 1 (Very poor) to 5 (Very good), please rate your country's capability to undertake tsunami risk assessment

Capability to undertake tsunami risk assessment	**Good**

Q56

5j) On a scale of 1 (Not a priority) to 5 (Essential), what is the priority level of your country to improve capacity in the following areas of tsunami risk assessment?

Tsunami risk assessment at national level	**Low priority**
Tsunami risk assessment at regional level	**Medium priority**
Tsunami risk assessment at city level	**Medium priority**
Tsunami risk assessment at village level	**Low priority**
Tsunami risk assessment at community / neighbourhood level	**Low priority**

Q57

5k) On a scale of 1 (No capacity) to 5 (Very good) what capacity does your country have to give training and/or consultancy on tsunami risk assessment to other countries?

Tsunami risk assessment at national level	**Good**
Tsunami risk assessment at regional level	**Moderate**
Tsunami risk assessment at city level	**Moderate**
Tsunami risk assessment at village level	**Moderate**
Tsunami risk assessment at community / neighbourhood level	**Moderate**
Other (specify below)	**No capacity**

Page 17: PART II: Policies

Q58

6a) Does your country have a national tsunami policy? For each of the four disaster management phases listed below, select standalone policy / multi hazard policy / policy not available. Use the comments box to detail the specific name of the policy (if available).

	In what form is the policy?
Prevention and mitigation	**Standalone tsunami only**
Preparedness	**Standalone tsunami only**
Emergency response	**Standalone tsunami only**
Rehabilitation and reconstruction	**Policy is not available**

What is the name of policy? (if available):
National Strategy for Disaster Resilience (Feb 2011); National Disaster Risk Reduction Framework; Australian Emergency Management Arrangements Handbook at https://knowledge.aidr.org.au/resources/handbook-9-australian-emergency-management-arrangements/; Tsunami Emergency Planning in Australia Handbook at https://knowledge.aidr.org.au/resources/tsunami-planning-handbook/ Australian Evacuation Planning Handbook at https://knowledge.aidr.org.au/media/5617/aidr-evacuation-planning-handbook.pdf

Q59

6b) Does your country have local tsunami policies? For each of the disaster management phases listed below, select standalone policy / multi hazard policy / policy not available. Use the comments box to detail the specific name(s) of the policy (if available).

	In what form is the policy?
Prevention and mitigation	**Standalone tsunami only**
Preparedness	**Standalone tsunami only**
Emergency response	**Standalone tsunami only**
Rehabilitation and reconstruction	**Standalone tsunami only**

What is the name of policy? (if available):
Each state/territory has a tsunami emergency response plan which also covers relevant policy.

Page 18: PART II: Plans

Q60

7a) Does your country have national, local and community level tsunami disaster risk reduction plans? For each of the four disaster management phases listed below, select standalone plan / multi hazard plan / plan not available. Use the comments box to detail the specific name(s) of the plan(s) (if available). Please use the scroll bar to view the entire table.

	National level	Local level	Community level
Prevention and mitigation	**Multi hazard including tsunami**	**Standalone tsunami only**	**Multi hazard including tsunami**
Preparedness	**Multi hazard including tsunami**	**Standalone tsunami only**	**Multi hazard including tsunami**
Emergency response	**Multi hazard including tsunami**	**Standalone tsunami only**	**Multi hazard including tsunami**
Rehabilitation and reconstruction	**National plan is not available**	**Multi hazard including tsunami**	**Multi hazard including tsunami**

What is the name of the plan(s) (if available):
COMDISPLAN stipulates when and how to seek Federal Government assistance in a major disaster; Tsunami subplan in each State/Territory Emergency Service; Multi-hazard plan in each State/Territory and local government area Local WA: State Hazard Plan – Tsunami Queensland Strategy for Disaster Resilience Queensland Strategy for Disaster Resilience | Queensland Reconstruction Authority (qra.qld.gov.au)

Q61

7b) Are your country's tsunami disaster risk reduction plans based on hazards and risk assessments?

Yes

Page 19: PART II: Guidelines

Q62

8a) Does your country have national tsunami DRR guidelines? For each of the four lifecycle phases, select standalone guidelines / multi hazard guidelines / guidelines not available. Use the comments box to detail the specific name of the guidelines (if available).

	In what form are the guidelines?
Prevention and mitigation	**Standalone tsunami guidelines**
Preparedness	**Standalone tsunami guidelines**
Emergency response	**Standalone tsunami guidelines**
Rehabilitation and reconstruction	**Guidelines not available**

What is the name of guidelines? (if available):
Tsunami Emergency Planning in Australian Handbook and its companion documents at https://knowledge.aidr.org.au/resources/tsunami-planning-handbook/

Q63

8b) Does your country have local tsunami DRR guidelines? For each of the four lifecycle phases, select standalone guidelines / multi-hazard guidelines / guidelines not available. Use the comments box to detail the specific name of the guidelines (if available).

	In what form are the guidelines?
Prevention and mitigation	**Standalone tsunami guidelines**
Preparedness	**Standalone tsunami guidelines**
Emergency response	**Standalone tsunami guidelines**
Rehabilitation and reconstruction	**Standalone tsunami guidelines**

What is the name of guidelines? (if available):

Each state/territory has tsunami sub-plan which also includes guidelines.

Page 20: PART III: Detection and Warning

Q64

Yes

9a) Does your country have a national capability to assess and/or receive potential tsunami threat information and advise/warn its coastal communities?

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Q65

Use own threat assessments

9b) Does your country utilise the data provided by the IOTWMS Tsunami Service Providers (TSPs) for the Coastal Forecast Zones (CFZ) of your country's coastline to determine national threats or does it undertake its own threat assessments? (select all that apply)

Q66

9c) Which organisation in your country has the responsibility for assessing and/or receiving potential tsunami threat information?Please provide the name and contact details.

Joint Australian Tsunami Warning Centre (JATWC), Bureau of Meteorology (the Bureau)

while Geoscience Australia as an integral partner in the JATWC provides the 24/7 seismic detection and analysis.

Q67

Yes

9d) Does the organisation responsible for assessing and/or receiving potential tsunami threat information operate 24x7?

Q68

9e) What / which infrastructure is available to enable 24x7 operations? (select all that apply)

Computers,

Internet,

Landline Phone,

Mobile Phone or Cell Phone,

Satellite Phone,

Fax,

GTS (WMO Global Telecommunication System),

UPS (Uninterruptable Power Supply),

Please specify any other infrastructure:

24x7 staffed sea-level monitoring and auto-station-fault-alerting application at Bureau of Meteorology (JATWC-BOM); 24x7 business continuity sites and second data centres; redundant infrastructure and communications services; direct GA-Bureau video conferencing facility; and media room allowing JATWC spokesperson to provide live TV interviews to any TV station remotely.

Q69

9f) Which level of tsunami threat forecast information is produced by the responsible organisation? (select all that apply)

Ocean-wide,

National,

Local

Q70

9g) Does the organisation have access to national and/or international seismic networks? (please select one from the following options)

Yes, national and international

Page 22

Q71

9h) Is national seismic data shared in real time?

All national seismic data is shared in real time,

Please specify which seismic data is shared in real time:

All data from the Australian National Seismograph Network, (network code = AU), operated by Geoscience Australia.

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Q72

9i) Does your organisation have access to GNSS data?

No

Q73

9j) Is the list of broadband seismometers operated by your country listed accurately in the IOTWMS seismic database http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20796)?

Yes

Q74

9k) When compared to the IOTWMS seismic database (http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20796), have you decommissioned or added broadband seismometers operated by your country (Check all that apply and include details in the comments section below)

Some stations have been decommissioned,

Some stations have been added,

Please indicate which stations have been decommissioned or added, including the Station Name/Location, email Contact of the Station Operator (IOTWMS Secretariat will contact for more information).:

Changes to the Australian National Seismograph Network (ANSN, https://dx.doi.org/10.26186/144675) including upgrades, decommissioning/re-siting, and additions have occurred in the period since the referenced document was created (2017). Current information, at any point in time, is available from the Seismological Facility for the Advancement of Geoscience (SAGE), operated by the EarthScope Consortium. Metadata for all AU stations can be sourced from SAGE at https://ds.iris.edu/mda/AU/.

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Q75

9l) Does the organisation have access to national and/or international sea level networks? (please select one answer from the following options)

Yes, national and international,

If yes, please list/describe sources of information (e.g. national data through national communication infrastructure, WMO Global Telecommunications System (GTS), IOC Sea Level Facility):

Near real-time data from Australian operated 43 coastal sea level stations and 6 deep-ocean tsunami detection stations (DART) are transmitted to JATWC through both land-based and satellite communication channels, and freely provided internationally via GTS.

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Q76

9m) Is national sea level data shared in real time?

All national sea level data is shared in real time,

Please specify which sea level data is shared in real time:

Near real-time data from Australian operated 43 coastal sea level stations and 6 deep-ocean tsunami detection stations (DART) are transmitted to JATWC through both land-based and satellite communication channels, and freely provided internationally via GTS.

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Q77

9n) Is the list of sea level stations operated by your country listed accurately in the IOTWMS sea level database (http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20833)?

Yes

Q78

9o) When compared to the IOTWMS sea level database (http://www.ioc-tsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=20833), have you decommissioned or added sea level stations operated by your country (Check all that apply and include details in the comments section below)

There are no changes

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Q79

9p) What other observing networks are operated by your country and used for tsunami early warning?

GNSS/GPS (please specify below),

Please provide the type of observing network, the station name/location, email contact of any other observing network operator (IOTWMS Secretariat will contact for more information).:

Name, network name, stream operator, stream format, constellation(s), latency statistics, and current status is available at http://auscors.ga.gov.au/status/. Detailed information about each GNSS station, including location, instrumentation and agency point-of-contact is available at ftp://ftp.ga.gov.au/geodesy-outgoing/gnss/logs/.

Q80

9q) Does the organisation have the capability of analysing real-time seismic and sea-level data for potential tsunami threat?

YesPlease specify the software tools used:
SeisCOMP3

Q81

9r) Does the organisation have capability for tsunami modelling to support generation of threat forecasts?

YesPlease specify the modelling tools and data used:
MOST Model is used to develop a pre-computed database of over 2000 scenarios with travel time and amplitude prediction in the open ocean deeper than 20 metres. TTT model runs real-time and provides prediction of travel time without amplitude information.

Q82

9s) Does the organisation responsible for identifying a potential tsunami threat also issue national tsunami no threat, watches, advisories, alerts and/or warnings?

Yes

Q83

9t) What are the threshold or criteria (for example sea levels, magnitude) for declaring a potential national tsunami emergency, watch, alert, advisory or warning?

The model output has been calibrated against known impacts in Australia
from a number of real tsunami events since 1960.

The resulting threshold is based on the 95 percentile deep water value for three threat levels.
No Threat < 20 cm (< 10cm for offshore islands), equivalent to <40cm near shore
Marine Threat 20 - 55 cm (10 - 50 cm for offshore islands), equivalent to 40cm - 1m near shore
Land Threat > 55cm (> 50cm for offhsore islands), equivalent to > 1m near shore

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Q84

9u) What actions were taken by your country's National Tsunami Warning Centre (NTWC) and/or Tsunami Warning Focal Point (TWFP) in response to earthquake events and messages issued by the IOTWMS TSPs during the inter-sessional period?

For information only. JATWC provides own independent national tsunami assessment.

Q85

9v) Did your country's NTWC and/or TWFP participate in the 6-monthly communications tests conducted by the IOTWMS TSPs?

Yes (please name the organisation(s) that participated in the additional comments)

,
Additional comments:
Bureau of Meteorology.

Q86

9w) Did your country's NTWC and/or TWFP participate in national and/or international Tsunami Exercises (eg. IOWave) conducted in the inter-sessional period between ICG meetings?

Yes (please name the exercise(s) and organisation(s) that participated in the additional comments)

,
Additional comments:
IOWave23. Agencies participated include Geoscience Australia Bureau of Meteorology National Emergency Management Agency Australian Antarctic Division Australian Navy AirServices Australia Indian Ocean Territory and Administration Department of Fire and Emergency Services, Western Australia South Australia State Emergency Service Victoria State Emergency Service Tasmania State Emergency Service New South Wales State Emergency Service Woodside Energy

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Q87

9x) After the December 26 2004 tsunami and until now, was your country impacted by any damaging tsunami? If Yes, what was your national response to each event (please comment if warnings were issued by your NTWC in a timely manner to enable communities to respond, if public were evacuated, etc.)

Yes (please indicate your national response to each event):
HTHH Volcanic eruption of 15 January 2022. Marine Warning issued for Norfolk Island, three hours after the eruption, later upgraded to Land Warning, Marine Warning also issued for Lord Howe Island and later upgraded to Land Warning with local emergency service ordered evacuation which took place overnight. Marine Warning was also issued for most of the Australian east coast. These warnings were verified well against many sea level observations. M7.9 Kermadec Islands of 05 March 2021. Timely Marine Warning issued for Norfolk Island and verified well by observations. Below threat waves also observed along east coast of Australia. M7.6 Loyalty Islands of 11 February 2021. Timely Marine Warning issued for Lord Howe Island and verified well with observations. No evacuation required but communities self evacuated on the island. Below threat waves also observed along east coast of Australia. 11 Mar 2011 Japan event. JATWC issued a National No Threat Bulletin to Australia for this event. A few tide gauges in Australia recorded tsunami waves up to 55cm. Unusual currents and waves were noted at Port Kembla and Sydney Harbour. Several swimmers were washed into a lagoon at Merimbula NSW although inconclusive whether due to tsunami. Overall the impact to Australia is minor. 17 Jul 2006 Java event generated a very localised impact to Steep Point of Western Australia (WA) where a camp site was destroyed and evidence of inundation to 200m inland. No tsunami warning was issued with the JATWC still being built. A field impact assessment survey was subsequently conducted. Tide gauge observations along the WA coasts provided little clue to this very localised impact.

Q88

9y) Since 2018, have there been any enhancements in your national warning SOPs and alerting?

Yes (please specify the enhancements):
Regular update of SOPs took place in Australia. From the Bureau of Meteorology, the entire tsunami warning services from policy setting to detection and warnings to customer decision support were ISOL 9001 certified in 2020 by SAI Global as a quality managed system. The certification was renewed in 2023 for another three years.

Page 28: PART III: Dissemination

Q89

10a) How is the tsunami information (warning, public safety action, etc) disseminated within country? (select all that apply)

Email,

SMS,

Telephone,

Fax,

Webpage,

Radio,

WhatsApp / Facebook / Other social media,

Door-to-door,

Sirens,

Television,

Warning towers,

Megaphone,

Police/military,

Public alert system,

VHF radio,

VPN,

Other:

Emergency Alert; Phone trees; 1300 TSUNAMI telephone services

Q90

10b) For each emergency response organisation listed below, which communication methods for emergency response are available? (select all that apply)

National DMOs	**Telephone, Fax, Email, SMS, Other (please specify below)**
Local DMOs	**Telephone, Fax, Email, SMS, Siren, Other (please specify below)**
General Public	**Telephone, Fax, Email, SMS, Siren, Other (please specify below)**
Coastal Communities	**Telephone, Fax, Email, SMS, Siren, Other (please specify below)**
Media	**Telephone, Fax, SMS, Other (please specify below)**

Q91

10c) How is the warning situation terminated?

JATWC will issue a warning cancellation when it assesses that either no tsunami has eventuated, or the tsunami threat has passed. In the latter case, the observed wave amplitudes must be below the Marine Threat threshold for at least two hours, although abnormal sea level changes and currents may persist for many hours.

The All Clear advice on when it's safe to return to coastal areas is not issued by the JATWC, but by the State/Territory emergency management authorities who have jurisdictional responsibility for public safety and response to any tsunami impacts.

Q92

10d) What website is used for display of national threat status during events? Please provide the URL.

The JATWC website www.bom.gov.au/tsunami

DMOs have own agency websites to display threat status in their area.

Q93

10e) Does your country's national tsunami warning system utilise the Common Alert Protocol (CAP) for the dissemination of warnings? If yes, please describe how the CAP is integrated into your warning dissemination processes, including any platforms or communication channels that are specifically utilised to broadcast CAP-formatted alerts to the public and relevant stakeholders.

Yes (please describe how CAP is integrated):
Currently CAP-XML products are used on the Bureau mobile application for warning content rendering and for deciding who should be notified based on the specified geospatial areas in CAP. The WMS and WFS products are also produced from the CAP products. They are provided to interested emergency partner agencies to render on their GIS common-operating-picture platforms for situation awareness of all current hazards.

Q94

10f) Who is primarily responsible for the direct dissemination of tsunami alerts to the public in your country, and what is the timeframe for these alerts to achieve effective last-mile responses? Please provide details.

JATWC is primarily responsible with its timely issued warnings containing nationally agreed action statements by all emergency services. In addition, each affected emergency services will issue added on public safety advice through mass-broadcasting channels known as Emergency Alert.

Page 29: PART IV: Standard Operating Procedures

Q95

11a) For each of the (upstream) emergency response issues listed below (in rows), consider the four questions (in columns). Select a yes/no response using the drop-down menus.

	Does your SOP address this aspect of tsunami emergency response?	Is support required to develop/improve this aspect of tsunami emergency response in your SOP?	Is support required to develop Human Resources in this aspect of tsunami emergency response?	Is support required to develop infrastructure for this aspect of tsunami emergency response?
24/7 Emergency Operation Centre (EOC)	**Yes**	**No**	**No**	**No**
Receiving information from the NTWC	**Yes**	**No**	**No**	**No**
Response Criteria / decision making	**Yes**	**No**	**No**	**No**

Q96

11b) For each of the (downstream) emergency response issues listed below (in rows), consider the four questions (in columns). Select a yes/no response using the drop-down menus.

	Does your SOP address this aspect of tsunami emergency response?	Is support required to develop/improve this aspect of tsunami emergency response in your SOP?	Is support required to develop Human Resources in this aspect of tsunami emergency response?	Is support required to develop infrastructure for this aspect of tsunami emergency response?
Warning dissemination	**Yes**	**Yes**	**Yes**	**No**
Evacuation call procedures	**Yes**	**Yes**	**Yes**	**No**
Community evacuation procedures	**Yes**	**Yes**	**Yes**	**Yes**
Communication with NTWC	**Yes**	**Yes**	**Yes**	**No**
Communication with Local Government	**Yes**	**Yes**	**Yes**	**No**
Media arrangements	**Yes**	**Yes**	**Yes**	**No**
Communication with other stakeholder i.e. Red Cross, Fire Brigade, Search and Rescue, Police, Army, Navy etc.	**Yes**	**Yes**	**Yes**	**No**

Q97

11c) Would your country be willing to share your SOPs with the IOTIC and other countries?

Yes

Page 30: PART IV: Evacuation Infrastructure

Q98

12a) Does your country have the following evacuation infrastructure? (select all that apply and detail specific areas). Please use the scroll bar below to view the entire table.

Evacuation shelter	**No**
Comment:	There are shelters but not specifically designed for tsunami
Vertical evacuation structure	**No**
Comment:	There are shelters but not specifically designed for tsunami
Natural or artificial hill for vertical evacuation	**Yes**
Comment:	Yes but no definitive percentage. Places like Cocos Islands do not have hill for vertical evacuation.
Evacuation signage	**Yes**
Comment:	Limited to very few coastal cities such as Manly Beach
Other (please specify)	**No**

Q99

12b) Is your evacuation infrastructure integrated in the evacuation plan?

No

Page 31: PART IV: Tsunami Exercises

Q100

12c) Are tsunami exercises incorporated within national policies and guidelines? (select all that apply)

National policy,

National guidelines

Q101

12d) At what levels were the exercises conducted during the inter-sessional (between ICG meetings) period? (select all that apply)

National level,

Regional level

Q102

12e) What kind of tsunami exercise activities have been undertaken in your country and how many times during the inter-sessional (between ICG Meetings) period?

Organisation table top exercise	**Yes**
Comment:	ad hoc
Inter-organisation table top exercise	**Yes**
Comment:	ad hoc. Bombora in Aug 2022 was the last such national scale table-top exercise
National tsunami drill/exercise	**Yes**
Comment:	once a year
Indian Ocean Wave exercise	**Yes**
Comment:	once every two years
Local tsunami drill/exercise	**Yes**
Comment:	ad hoc
Other (please specify)	**No**

Page 32: PART IV: Public Awareness

Q103

13a) Who is responsible for tsunami public awareness programmes in your country?

Other (please specify):
All players of the end-to-end tsunami warning chain. They form the Australian Tsunami Advisory Group that coordinates the national efforts towards raising tsunami public awareness.

Q104

13b) What tsunami related education and awareness materials do you have? (select all that apply)

Leaflets or flyers,

Posters,

Booklets,

Information boards,

Tsunami Signage,

Video, or other visual or oral media,

Teaching kits on tsunamis,

School curricula,

Public Evacuation Map,

Other (please specify):

A tailored-to-Australia online tsunami education resource called "Tsunami: The Ultimate Guide" at https://knowledge.aidr.org.au/resources/the-ultimate-guide-tsunami/#/ Get Ready Queensland https://www.getready.qld.gov.au/getting-ready/understand-your-risk/types-disasters/tsunami Tsunami Guide for Queensland (current version 2019, with 2024 version due for release by end of June 2024) - www.disaster.qld.gov.au

Q105

13c) Would your country be willing to share these education and awareness materials with the Indian Ocean Tsunami Information Centre (IOTIC) and other countries?

Yes

Q106

13d) Do you undertake the following tsunami awareness activities?

World Tsunami Awareness Day	**Yes**
Comment:	Annually
Global Disaster Risk Reduction day	**Yes**
Comment:	Anually
Public tsunami preparedness outreach	**Yes**
Comment:	ad hoc
School and/or children awareness	**Yes**
Exhibitions	**No**
Competitions or other ways of highlighting tsunami safety	**No**
Tsunami Exercise	**Yes**
Comment:	>10 times which included the monthly Bureau-GA JATWC exercises
Other (Please specify)	**No**

Q107

13e) Use the boxes below to indicate any areas in which you require support from the IOTIC to develop or enhance public awareness in your country. If you do not require support, please leave blank.

Customisation of general materials to country or community

,

Development of tsunami awareness programmes, activities or campaigns

,

Participation/support by international agencies or experts to your country's activities

,

Provision of general tsunami awareness materials,

Other (please specify):

Keen to work with IOTIC to enhance tsunami preparedness

Q108

13f) Can your country offer support to other Member States to develop or enhance public awareness in their country?

Yes (please specify what type of support):
Keen to work with IOTIC and all MSs to enhance tsunami preparedness

Page 33: PART V: UNESCO-IOC Tsunami Ready Recognition Programme (TRRP)

Q109

14a) Does your country have an interest to participate in the UNESCO-IOC TRRP?

No, and there are no plans to do so in the near future (please elaborate in the additional comments)

,

Additional comments:

Still in the educational phase to weigh up the benefits and efforts required to run such a TRRP program in Australia.

Q110

14b) Aside from UNESCO-IOC TRRP, is your country currently implementing any other tsunami resilience and preparedness related initiatives or programmes?

No

Q111

14c) What number of villages, cities/districts and provinces/state levels in your country are at risk to tsunami?

Respondent skipped this question

Q112

14d) Does your country have a National Tsunami Ready Board (NTRB)The National Tsunami Ready Board (NTRB) is responsible for guiding the community on the steps for Tsunami Ready recognition and for the review and approval of the community's Tsunami Ready application. It consists of designated representatives of the National Emergency Management Agency or Disaster Mangement Office, NTWC, TNC, the scientific community, and other invited guests.

No (if no, is there another existing coordination mechanism that can fulfil this role of NTRB? please specify below)

,

Please specify any existing coordination mechanisms that can fulfil this role of NTRB:

Advisory Group or ATAG which consists of key players in the Australian Tsunami Warning System, from warning centre organizations, to national emergency management agency (NEMA), to state/territory emergency services.

Q113

14e) Which institution(s) should be involved in the implementation of TRRP or similar national initiative? (please use a comma between the name of the institutions)

JATWC, NEMA, state/territory emergency services, surf life saving Australia, coastal councils.

Q114

14f) Are any communities (for example, villages, cities, districts, provinces or states) in your country currently working towards implementing or interested in implementing the UNESCO-IOC TRRP or similar national initiative?

Yes (please list the names of the communities below),

Names of the communities working towards or interested in working towards TRRP:

Christmas and Cocos Islands were interested but key staff turnover may have contributed to a pause in this redirection.

Q115

14g) Have any communities in your country achieved recognition through UNESCO-IOC TRRP or similar national initiative?

No

Page 34: PART V: UNESCO-IOC Tsunami Ready Recognition Programme (TRRP)

Q116

15a) Is there national capacity to develop tsunami hazard maps?

Yes, it can be easily done through mobilising national experts and funding

Q117

15b) Is there national capacity to train the community on identifying and estimating the number of people that live in the tsunami hazard zone?

No, there is a strong need for technical support organised through IOTIC and/or ICG/IOTWMS activities

Q118

15c) Is there national capacity to train the community on the inventory of available economic, instrastructural, political, and social resources to reduce tsunami risk at the community level?

No, there is a strong need for technical support organised through IOTIC and/or ICG/IOTWMS activities

Q119

15d) Is there national capacity to work with the community to develop tsunami evacuation maps, plans and procedures at the community level?

Respondent skipped this question

Q120

15e) Is there national capacity to work with the community to develop a public display of tsunami information?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Q121

15f) Is there national capacity to work with the community to develop local context outreach and public education materials?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Q122

15g) Is there national capacity to train and build capacity of community to be able to organise and implement outreach and education activity?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Q123

15h) Is there national capacity to train and build capacity of community to be able to organise and implement tsunami exercises?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Q124

15i) Is there national capacity to train and build capacity of communities to be able to develop their community Emergency Operation Plan?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Q125

15j) Is there national capacity to train and build capacity of communities to manage 24/7 tsunami emergency response operation?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Q126

15k) Is there national capacity to train and work with the communities to develop mechanisms (means and procedures) to receive 24/7 warning?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Q127

15l) Is there national capacity to train and work with the communities to develop mechanisms (means and procedures) to disseminate 24/7 warning to the community?

Yes, it can be partially done through mobilising national experts and funding, but also needs some international technical expertise

Page 35: PART V: UNESCO-IOC Tsunami Ready Recognition Programme (TRRP)

Q128

15m) Which of the following challenges inhibit the implementation of TRRP or similar national initiatives in your country? (select all that apply)

Tsunami is not a high priority hazard in country,

Limited resources (for example, champions, leadership, scientific support, social support)

,

Limited support of government (for example, policy, financial)

,

Limited awareness,

Limited activity,

Lack of community interest

Page 36: PART VI: Narrative

Q129

16) Please briefly describe any innovations or modifications to national tsunami warning and mitigation procedures or operations since the last reassessment. For example, this might include tsunami related research projects, implementation of new seismic and/or sea level monitoring technologies, tsunami mitigation activities and best practices (especially in preparedness and emergency management), as well as public education programmes or other measures taken to heighten awareness of the tsunami hazard and risk.

[WA RESPONSE]
From July 2021, the Department of Fire and Emergency Services, WA, together with Geoscience Australia, are working on the WA Tsunami Inundation Modelling Project. This project is developing regional-scale tsunami evacuation maps informed by high-resolution tsunami inundation modelling. The study area is from the Midwest WA (Geraldton) to the South West WA (Dunsborough), including the Greater Perth area. The project deliverables are:
- Completion of tsunami inundation modelling
- Compile historical tsunami information, impacts and experiences
- Develop spatial tools to identify exposure and vulnerability for the selected areas
- Develop recommendations to update and amend state tsunami plans and procedures
- Develop the WA State Tsunami Awareness Guide
- Develop a communications strategy for tsunami awareness promotion

[QLD Response]
- University of Newcastle completed a study into the potential for submarine landslide inundation off the Queensland Coast (inundation modelling from Noosa to Gold Coast)
- QLD Department of Environment, Science and Innovation has conducted detailed inundation modelling for a subset of scenarios from the PTHA at the Sunshine Coast, Moreton Bay, Hervey Bay and Gold Coast.
- QLD released the state-wide evacuation area mapping in 2020/21 https://www.qfes.qld.gov.au/prepare/tsunami/evacuation-areas
- QLD released the Tsunami Guide for Queensland in 2019 and updated version in 2024 (www.disaster.qld.gov.au)
- QLD included tsunami in the 2023 State Disaster Risk Report (URL same as above)
- Queensland and New South Wales hosted the national exercise, Exercise Bombora in August 2022.

Q130

17) Please provide a brief summary of plans for future tsunami warning and mitigation system improvements

[QLD Response]
- Queensland received national funding through the Coastal and Estuarine Risk Mitigation Program for a tsunami risk assessment for Gladstone (to be delivered by Oct 2025)
- Planned tsunami inundation modelling project in the Cairns region in Queensland (led by DESI)
- A decision support system for storm surge impact is being developed for Queensland (led by Griffith University, by Mar 2025)
- Research into the potential tsunami hazard from volcanic sources in the Australian region
- Research into First Nations tsunami stories

[Bureau of Meteorology]
- TOAST will be implemented at the Bureau to perform tsunami monitoring, assessment and product generation for both the national service and the Indian Ocean TSP service.
- A new Bureau's website www.bom.gov.au will be launched, with tsunami warning an integral part of. However, the launch will be staged and both the current and test websites will co-exist for sometime.

Q131

Respondent skipped this question

18) Please list areas where your country would like support for targeted capacity development.

Q132 **Respondent skipped this question**

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