



NEW SOUTH WALES STATE TSUNAMI PLAN

A Sub Plan of the State Emergency Management Plan (EMPLAN)

Endorsed by the State Emergency Management Committee

13 September 2018

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Proposals for amendment to this plan are to be forwarded to:
Manager, Emergency Risk Management Branch, NSW State Emergency Service, PO Box 6126,
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1. OUTLINE AND SCOPE

1.1 PURPOSE

- 1.1.1 The purpose of this plan is to set out the state wide multi-agency arrangements for the emergency management of tsunamis in New South Wales including Lord Howe Island.

1.2 AUTHORITY

- 1.2.1 This plan is written and issued under the authority of the *State Emergency and Rescue Management Act 1989* (NSW) ('SERM Act'), the *State Emergency Service Act 1989* (NSW) ('SES Act') and the NSW State Emergency Management Plan (EMPLAN).
- 1.2.2 This plan is a Sub Plan to the NSW State Emergency Management Plan (EMPLAN) and is endorsed by the NSW State Emergency Management Committee (SEMC).
- 1.2.3 The NSW SES is the designated Combat Agency for tsunamis and for coordinating the evacuation of affected communities.

1.3 ACTIVATION

- 1.3.1 This plan does not require activation. The arrangements set out in this plan are always active.
- 1.3.2 The NSW State EMPLAN is active at all times in anticipation of the need to coordinate support and resources requested by combat agencies, including the NSW State Emergency Service (NSW SES).

1.4 SCOPE

- 1.4.1 This plan sets out the state wide emergency management arrangements for prevention, preparation, response and initial recovery arrangements for tsunami activity at the strategic level. The plan accounts for all tsunami magnitudes and generation mechanisms.
- 1.4.2 In this plan, a 'tsunami' is defined as a series of ocean waves generated by a sudden displacement of large volumes of water of sufficient severity to threaten lives and cause damage to property, vehicles, infrastructure, vegetation and the coastal environment.
- 1.4.3 This plan recognises that agencies have responsibilities during emergencies allocated under the NSW State EMPLAN or other Sub or supporting plans to the NSW State EMPLAN. This plan does not duplicate those responsibilities or roles but does refer to them.

1.5 GOALS

1.5.1 The primary goals for tsunami emergency management in NSW are:

- a. Protection and preservation of life (including the lives of responders and the community);
- b. Issuing of community information and community warnings;
- c. Coordination of evacuation and welfare of affected communities; and
- d. Initiation of recovery.

1.5.2 Due to the potential for very short warning times and large scale impacts of a tsunami, the following secondary goals are identified as being achievable only when time and resources permit:

- a. Management of waterways and marine infrastructure;
- b. Protection of critical infrastructure and community assets essential to community survival during an emergency event;
- c. Protection of property;
- d. Protection of assets and infrastructure that support individual and community financial sustainability and aid assisting a community to recover from an incident; and
- e. Protection of the environment and conservation values considering the cultural, biodiversity and social values of the environment.

1.6 ROLES AND RESPONSIBILITIES

1.6.1 General responsibilities of emergency service organisations and functional areas are set out in the NSW State EMPLAN.

1.6.2 Specific roles and responsibilities for agencies, functional areas and organisations in relation to tsunamis are detailed in this plan and Appendix A.

1.6.3 Any agency with agreed responsibilities in this plan that are temporarily unable, or no longer able to fulfil their responsibilities must as soon as possible notify the:

- a. NSW SES State Controller or NSW SES State Duty Operations Controller (for state level responsibilities);
- b. NSW SES Incident Controller (for local level responsibilities during response operations); and
- c. NSW SES Local Controller (for local level responsibilities outside of response operations).

1.7 PLAN MAINTENANCE AND REVIEW

1.7.1 The NSW SES Commissioner will maintain the currency of this plan by:

- a. Ensuring that all supporting emergency services and functional areas, organisations and officers named in this plan are made aware of their roles and responsibilities;

- b. Conducting exercises to test arrangements;
- c. Reviewing the contents of the plan;
 - After tsunami operations;
 - After changes in the knowledge of tsunami risk affecting NSW;
 - When changes to land use strategic plans and policies increase the population at risk;
 - When there are changes which alter agreed plan arrangements; and
 - As determined by the NSW SES Commissioner.
- d. The plan is to be reviewed no less frequently than every five years.

1.8 SUPPLEMENTARY DOCUMENTS

1.8.1 Supplementary material published in previous versions of the State Tsunami Plan is now available on the NSW SES website at: <https://www.ses.nsw.gov.au/about-us/flood-storm-and-tsunami-plans/>. Supplementary documents include:

- a. The Tsunami Hazard and Risk in NSW
- b. Tsunami Warning Arrangements

1.8.2 Further information on tsunami hazard and warning is located on the following websites:

- a. Australian Institute for Disaster Relief (AIDR)
<https://knowledge.aidr.org.au/resources/tsunami-planning-handbook/>
- b. Joint Australian Tsunami Warning Centre (JATWC)
<http://www.bom.gov.au/tsunami/>
- c. NSW SES <https://www.ses.nsw.gov.au/disaster-tabs-header/tsunami/>

2. OVERVIEW OF NSW TSUNAMI HAZARD AND RISK

2.1 THE TSUNAMI THREAT

2.1.1 The NSW 2017 State Level Emergency Risk Assessment (SLERA) classifies a tsunami as a priority hazard that poses a significant risk to the State.

2.1.2 A tsunami could impact the entire NSW coast or only some parts of it. A large tsunami impacting the entire NSW coast would directly threaten between 250,000 and 1.5 million people, depending on tsunami magnitude, time of day and season. Tsunami warnings are categorised into two threat levels:

- a. **Marine and immediate foreshore threat:** Warning of potentially dangerous rips, waves and strong ocean currents in the marine environment and the possibility of only some localised overflow onto the immediate foreshore.
- b. **Land inundation threat:** Warning for low-lying coastal areas of major land inundation, flooding, dangerous rips, waves and strong ocean currents.

2.2 TSUNAMI GENERATION

2.2.1 Tsunamis may be caused by any one or combination of the following:

- a. Vertical movement of the sea floor as a result of a large earthquake,
- b. Sub-marine or coastal volcanic eruptions,
- c. Meteor impacts,
- d. Coastal landslides and slumps, either land-based or sub-marine;
- e. Rapid changes in barometric pressure such as moving storm fronts; these are known as meteotsunamis.

2.2.2 Tsunamis can be classified as either, local, regional or distant:

- a. **Local tsunamis** are generated close to the coast. Time between generation and arrival can be around 20 minutes for submarine landslides, or as little as five minutes for coastal landslides. In Australia, no local tsunamis have been observed since European settlement. Evidence of previous submarine landslides has been found on the continental shelf off NSW.
- b. **Regional tsunamis** are generated within the south west Pacific. Potential sources are located in subduction zones along the Indian-Australian and Pacific tectonic plate boundary. Travel time to the NSW coast is in the order of 2 hours to several hours.
- c. **Distant tsunamis** are generated by subduction zone boundaries as far away as North America, South America and Asia or divergent boundaries located between Australia and Antarctica. Travel time to the NSW coast is in the order of several hours to days.

2.2.3 The Australian coastline has experienced over 50 recorded tsunamis since European settlement (1), although many have been too small to produce noticeable effects. The maximum run-up in NSW for a historical tsunami was 1.71m at Eden which was generated from the Chilean earthquake in 1960 (2). Damage was limited primarily to vessels and moorings, although the oyster industry did suffer some losses.

2.2.4 The following table lists tsunami travel times for 5 modelled sites in NSW, comparing a possible event (200 Average Recurrence Interval, ARI) with a very rare event (10000 ARI).

Table 1. Tsunami travel times for 5 modelled sites in NSW (3)

Average Recurrence Interval (ARI)	Tsunami Source	Tsunami Travel Time (hours:mins)				
		Site				
		Lake Macquarie	Manly	Botany Bay	Wollongong	Merimbula
200 (possible)	New Hebrides	03:50	03:54	03:56	04:14	04:18
200	Puysegur	02:40	02:38	02:34	02:31	02:27
200	South Chile	14:04	14:02	14:00	13:57	13:41
10000 (very rare)	New Hebrides	03:40	03:43	03:46	03:52	04:09
10000	Puysegur	02:28	02:26	02:26	02:25	02:17

2.3 CONSEQUENCES OF A TSUNAMI

2.3.1 Destruction from a tsunami is the direct result of: inundation, currents, waves, erosion and debris impact on coastal structures. Flotation and drag forces can move buildings and over-turn vehicles. Tsunami associated wave forces can demolish buildings. Considerable damage is also caused by debris, including boats, up-rooted vegetation, structural materials, and vehicles that are swept along by the force of the water. Even a small tsunami can generate currents strong enough to cause damage to boats and associated facilities. Destructive waves may continue for several hours and several days may pass before the sea returns to its normal state.

2.3.2 The consequences of a tsunami can include:

- a. Loss of life, particularly drowning;
- b. Property damage or destruction (including vessels, buildings and vehicles);
- c. Infrastructure damage, particularly marinas, moorings, ports and coastal infrastructure such as beach access, but also land-based infrastructure such as airports, roads, bridges, downed power and telephone lines, water and sewerage;
- d. Isolation of properties or vehicles due to road closures;
- e. Economic losses (for example impacts to maritime industries, local businesses, infrastructure loss, tourism and agricultural damages);
- f. Destruction of the natural environment, particularly in the coastal zone and the marine environment;
- g. Generation of large volumes of waste and potentially hazardous materials; long term issues around the disposal of waste and debris; and
- h. Indirect effects such as disruption to community activities and ongoing psychological issues. The broader community can be affected by infrastructure damage, disruption of essential services and disruption to transport and shipping routes.

2.3.3 Further information on the tsunami threat in NSW can be found in the State Tsunami Plan Supplementary Documentation (see Section 1.8).

3. PREVENTION

- 3.1.1 Prevention and mitigation strategies for tsunamis, such as land and marine use planning, building codes and sea-wall and coastal infrastructure construction, are not currently adopted in NSW.
- 3.1.2 The NSW SES works with all agencies and the community to assist them in building their own resilience with the aim of risk avoidance in respect of tsunamis.

4. PREPARATION

4.1 INTRODUCTION

- 4.1.1 Preparation includes arrangements or plans to deal with an emergency or the effects of an emergency.
- 4.1.2 Preparation is undertaken by:
 - a. Agencies and organisations that have responsibilities before, during and/or in the recovery from a tsunami; and
 - b. Communities, businesses and households that are likely to be impacted by the effects of a tsunami.

4.2 EMERGENCY PLANNING

- 4.2.1 **Strategy:** NSW SES develops, reviews and maintains tsunami Sub Plans.
- 4.2.2 **Actions:**
 - a. Develop and review the State Tsunami plan.
 - b. Develop and review Regional and Local Tsunami Plans as required:
 - If roles and responsibilities change at these levels.
 - If the tsunami hazard is deemed to be location specific, for example, at Lord Howe Island.
 - c. Review Sub Plans as per section 1.7.
 - d. Develop and maintain complementary and local level arrangements within NSW SES, for specific tsunami risk areas, as required.
- 4.2.3 Further tsunami research will inform future tsunami Sub Plans.

4.3 TSUNAMI INTELLIGENCE DEVELOPMENT

- 4.3.1 The NSW SES maintains tsunami intelligence with a view to establishing a Tsunami Intelligence System complimentary to the existing Flood Intelligence System.
- 4.3.2 **Strategy:** NSW SES develops and maintains a tsunami intelligence system to identify tsunami impact on the community and required response actions.

4.3.3 Actions:

- a. Gather and assess tsunami information for the full range of tsunami types and severities;
- b. Collect, collate and assess information on the characteristics of communities at risk;
- c. Collect, collate and assess information about the potential effects of tsunamis on communities at risk;
- d. Share tsunami intelligence information with supporting agencies;
- e. Invest and/or support research and development of information, technology and systems which may improve the tsunami intelligence system and data gathering; and
- f. Be the primary point of contact in NSW for emergency risk management related tsunami research, modelling and planning.

4.4 DEVELOPMENT OF WARNING SYSTEMS

4.4.1 The official tsunami warning centre for Australia is the Joint Australian Tsunami Warning Centre (JATWC) operated by the Bureau of Meteorology and Geoscience Australia. The JATWC forms part of the Australian Tsunami Warning System (ATWS) which is a national collaboration between the Australian Bureau of Meteorology, Geoscience Australia, Department of Home Affairs and relevant State and Territory Emergency Service Agencies.

4.4.2 The Australian Tsunami Advisory Group (ATAG) is a reference group of the Australian-New Zealand Emergency Management Committee, which deals with national tsunami issues, including the implementation of the ATWS, and coordination of programs relating to tsunami capability development, promoting research, information knowledge management and education in Australia.

4.4.3 **Strategy:** Develop, maintain and prepare systems for the provision of tsunami warnings and associated warning services.

4.4.4 Actions:

- a. The Bureau will provide warning services in line with the Intergovernmental Agreement on the Provision of Bureau of Meteorology Hazard Services to the States and Territories;
- b. All levels of government work in partnership to develop and maintain tsunami warning infrastructure; and
- c. NSW SES will develop and maintain warning and tsunami information products, in consultation with the Bureau and JATWC, by:
 - Utilising tsunami intelligence data;
 - Developing pre-written warning and tsunami information products;
 - Continuously reviewing warning and tsunami information products; and
 - Consulting with affected communities, key stakeholders and ATAG.

4.5 BRIEFING, TRAINING AND EXERCISING

4.5.1 **Strategy:** Ensure NSW SES, supporting agencies, functional areas and the community are familiar with the strategies and arrangements within the Tsunami Sub Plan and supporting documents.

4.5.2 **Actions:**

- a. NSW SES will consult stakeholders through the development and review of plans;
- b. NSW SES will inform stakeholders of content changes after revisions;
- c. NSW SES will train members, supporting agency and functional area personnel, where relevant, for their expected tsunami operation roles;
- d. NSW SES will regularly brief and exercise the arrangements contained in the Tsunami Sub Plan with stakeholders;
- e. NSW SES will brief and exercise the arrangements contained in Regional and Local Tsunami Plans, where they exist, in conjunction with support agencies and functional areas.
- f. NSW SES will conduct after action reviews following exercises to identify what was done well, areas for improvement and gaps. These will be utilised to review and amend existing arrangements, systems and plans.
- g. NSW SES will maintain and review this plan supporting documents 'Tsunami Hazard and Risk in NSW' and 'Tsunami Warning Arrangements' with supporting agencies and functional areas in line with the review schedule and requirements of this plan.
- h. NSW SES will conduct activities to engage and educate the community about the arrangements within the Tsunami Sub Plan; and
- i. Supporting agencies will ensure all personnel are appropriately trained for tsunami operational roles they are required to undertake as outlined in Appendix A.

4.6 COMMUNITY RESILIENCE TO TSUNAMIS

4.6.1 The community needs to be as prepared as emergency agencies for the impact of all hazards, including tsunamis.

4.6.2 **Strategy:** NSW SES works with individuals, communities, businesses and government agencies to build tsunami resilience.

4.6.3 **Actions:**

- a. NSW SES works with communities to understand and manage the risks associated with tsunamis, including flooding caused by tsunami events, such as providing business continuity guidance (Emergency Business Continuity Plan), family preparedness (Home Emergency Plan) and other engagement strategies;
- b. NSW SES collates, assesses and disseminates tsunami information to the community;

- c. NSW SES collaborate with individuals, businesses, government agencies and communities when developing tsunami intelligence, preparedness and response information; and
 - d. NSW SES plan for tsunamis collaboratively with communities through community and stakeholder participation and engagement.
- 4.6.4 **Strategy:** NSW SES provides and maintains a flexible volunteer workforce to support community resilience.
- 4.6.5 **Actions:**
- a. NSW SES ensures ongoing recruitment and training of a diverse range of volunteers; and
 - b. NSW SES ensures pre-planning to facilitate the management of spontaneous volunteers and community members during a tsunami.

5. RESPONSE

5.1 INTRODUCTION

5.1.1 Tsunami response operations will begin:

- a. On receipt of a Tsunami Watch or Warning from the JATWC indicating a threat to NSW; or
- b. On receipt of a Pacific Tsunami Bulletin that refers to Australia; via the Bureau from the Pacific Tsunami Warning Centre; or
- c. After reports of a large earthquake on or near the NSW coast; or
- d. After the impact of a locally generated tsunami; or
- e. When unusual ocean behaviour indicative of an imminent tsunami is observed; or
- f. When any other evidence leads to the possibility that a tsunami may impact on the NSW coast.

5.2 PHASES OF RESPONSE OPERATIONS

5.2.1 Key factors which will determine the extent of any tsunami response operation are tsunami magnitude, time of day, season, warning time and areas likely to be affected.

5.2.2 The response operation consists of the following phases:

- a. **Pre-impact Phase** - This phase begins when a *Tsunami Watch* or *Tsunami Warning* is issued. Depending on the distance of the tsunami source, there may be no time or up to a day for response operations such as warnings, evacuation, and protection of essential infrastructure.
- b. **Impact Phase** - This phase is characterised by the impact of a series of separate waves and likely to last several hours. Operations during this phase maybe limited due to safety considerations of emergency services.

- c. **Immediate Post-Impact** - This phase will commence upon the issue of a *Tsunami Warning Cancellation* indicating that the destructive potential of the tsunami has ceased.

5.2.3 The following response strategies and actions, for Sections 5.3 – 5.16, generally follow this sequence of phases but there may be some overlap of actions between phases.

5.3 INCIDENT MANAGEMENT ARRANGEMENTS

5.3.1 **Strategy:** NSW SES will maintain effective control of tsunami operations across NSW.

5.3.2 **Actions:**

- a. NSW SES use the Australasian Inter-service Incident Management System (AIIMS) to manage the tsunami response;
- b. Control of tsunami response will be at the lowest effective level and will be scaled to suit the incident;
- c. The NSW SES State Controller will appoint Incident Controllers and establish Incident Control Centres;
- d. The NSW State Controller (or representative) will determine one or more Areas of Operations;
- e. The Incident Controller, in consultation with participating supporting emergency services and Functional Areas when required, will determine appropriate breakdown of an Incident Area into Division and/or Sector in accordance with the principles of AIIMS; and
- f. NSW SES may request response units from other emergency services to accept responsibility for particular types of tasks, areas or sectors, operating under overall NSW SES control, as well as accept tasking direct from the NSW SES Incident Controller or operate under control of the NSW SES for tasking purposes.

5.3.3 **Strategy:** Maintain a single State Operations Centre.

5.3.4 **Actions:**

- a. NSW SES will operate a 24/7 State Operations Centre to enable the public to contact the NSW SES on 132 500; and
- b. The NSW SES State Operations Centre will:
 - Coordinate and oversee single or multiple areas of operation as appropriate to ensure internal and external information flow;
 - Undertake state wide resource management; and
 - Provide operational oversight and support to Strategic Command and Incident Management Team(s).

5.3.5 **Strategy:** Establish and maintain Incident Control Centres using endorsed control arrangements to effectively manage operational response.

5.3.6 **Actions:**

- a. NSW SES will operate Incident Control Centre(s) as required;
- b. The NSW SES Incident Control Centre(s) will:
 - Control resources from NSW SES and coordinate resources of supporting emergency services and functional areas;
 - Manage Request for Assistance (RFA) tasking and ensure they are actioned in a timely manner;
 - Undertake response planning and determine future resourcing requirements; and
 - Coordinate information flow, including warnings, public information and social media.

5.3.7 **Strategy:** Provide effective liaison between NSW SES and supporting agencies or functional areas in accordance with the NSW State EMPLAN.

5.3.8 **Actions:**

- a. Supporting emergency services and Functional Areas will provide Liaison Officers to NSW SES Incident Control Centres, NSW SES State Operations Centre and/or Emergency Operation Centres as required;
- b. NSW SES will provide a Liaison Officer to Emergency Operations Centres as required; and
- c. The NSW SES State Duty Operations Controller (SDOC) will ensure consultation with the State Emergency Operations Controller (SEOCN) and State Emergency Operations Centre (SEOC) is ongoing throughout response operations.
- d. The NSW SES will be prepared to support the State Crisis Centre, in the event that it is activated for a major and significant tsunami crisis.

5.3.9 **Strategy:** Supporting agencies support Tsunami Operations as required.

5.3.10 **Actions:**

- a. Emergency Operations Centres will be activated as per the Emergency Operations Centre Policy;
- b. Emergency Services, Functional Areas and supporting organisations provide support as per arrangements in the following plans:
 - Agriculture and Animal Services Functional Area Supporting Plan;
 - Ambulance Services Supporting Plan (AMPLAN);
 - Asbestos Emergency Sub Plan;
 - Energy and Utilities Services Functional Area Supporting Plan (EUSPLAN);
 - Engineering Service Functional Area Supporting Plan (EngPLAN);
 - Environmental Services Functional Area Supporting Plan (ENVIROPLAN);
 - Gas Supply Disruption Plan;
 - Hazardous Materials (HAZMAT) / CBRN Emergency Sub Plan;

- Health Services Functional Area Supporting Plan (HEALTHPLAN);
- Major Structure Collapse Sub Plan;
- Public Information Services Functional Area Supporting Plan;
- Telecommunications Services Functional Area Supporting Plan;
- Transport Services Functional Area Supporting Plan;
- Welfare Services Functional Area Supporting Plan;
- NSW State Flood Sub Plan;
- NSW State Storm Sub Plan.

5.3.11 **Strategy:** Coordinate resources and logistics support to ensure operational effectiveness.

5.3.12 **Actions:**

- a. NSW SES may request resources and logistics support directly from a supporting emergency service or functional area. If it is likely that State resources will be exhausted or are insufficient for particular tasks, liaison with the SEOCON will occur to determine the need for access to Interstate or Commonwealth assistance;
- b. Wherever possible, supporting organisations are to provide their own logistics support in consultation with NSW SES where appropriate;
- c. If local NSW SES and other local resources are insufficient or likely to be exhausted within the area of operation, additional NSW SES resources may be deployed. NSW SES Out-of-area teams and other emergency services will normally be placed under the operational control of local NSW SES units for tasking purposes;
- d. In the post-impact phase, NSW SES will provide consumable operational stores such as tarpaulins, rope and plastic; and
- e. In the post-impact phase, NSW SES will coordinate the acquisition and utilisation of major plant and equipment such as cranes, cherry pickers and front-end loaders unless specifically authorised separately.

5.3.13 **Strategy:** Coordinate specialist logistics support.

5.3.14 **Actions:**

- a. NSW SES may engage professional arboriculture services to assist with damage response tasks in accordance with NSW SES procedures; and
- b. Engineering Services Functional Area may assist with the supply of goods and services as requested by the NSW SES, and where required, in consultation with the Transport Services Functional Area.

5.4 USE OF INFORMATION AND COLLECTION OF INTELLIGENCE

5.4.1 **Strategy:** Ensure tsunami information is effectively collected and communicated to the combat agency, supporting agencies and Functional Areas during a tsunami in a timely manner.

5.4.2 Actions:

- a. Information relating to response team tasking must be entered into the NSW SES Operational Management System (OMS) – Beacon;
- b. Information relating to the consequences and impacts of tsunami, response strategies, situational awareness and operational updates will be distributed by NSW SES to supporting agencies, emergency services and Functional Areas listed under this plan;
- c. Geospatial information to support response strategies and situational awareness may be provided by Spatial Services Emergency Information Coordination Unit (Department of Finance);
- d. All supporting emergency services and Functional Areas will accurately record and report information relevant to their activities and any real time tsunami information to the NSW SES State Duty Operations Controller (for state level activities) or the NSW SES Incident Controller (for regional and local level activities), this may be in the form of a combined EOC report, or direct from agencies where an EOC has not been established;
- e. Functional areas and supporting agencies who have the capability, utilise ICEMS /OMS to provide real time reports to NSW SES.
- f. NSW SES may establish and operate a Joint Intelligence Unit (incorporating situation and analysis, modelling and predictions, technical advice and mapping) to coordinate the collection, collation, interpretation, mapping, actioning and dissemination of information;
- g. Emergency Services, Functional Areas and supporting organisations will provide trained staff for the Joint Intelligence Unit as required.
- h. Reconnaissance, mapping, damage assessments, intelligence validation and post tsunami evaluation will be coordinated by NSW SES. This will occur post impact and continue into the recovery phase.

5.5 PROVISION OF INFORMATION AND WARNINGS TO THE COMMUNITY

5.5.1 The JATWC issues public warning products through the Bureau in consultation with NSW SES, before and during an earthquake / tsunami event, which may include:

- **National No Threat Bulletin** – to advise the earthquake has been assessed and no tsunami threat exists.
- **National or State / Territory Watch** – to advise that a tsunami threat may exist.
- **State / Territory Warning** – to advise that a tsunami threat does exist, what the level of threat is and the recommended action.
- **National Warning Summary** – to provide a summary of the status of tsunami warnings nationally.
- **Event Summary** – to provide summary information that can be used in post-event analysis.

5.5.2 State / Territory warnings are further categorised into two threat levels:

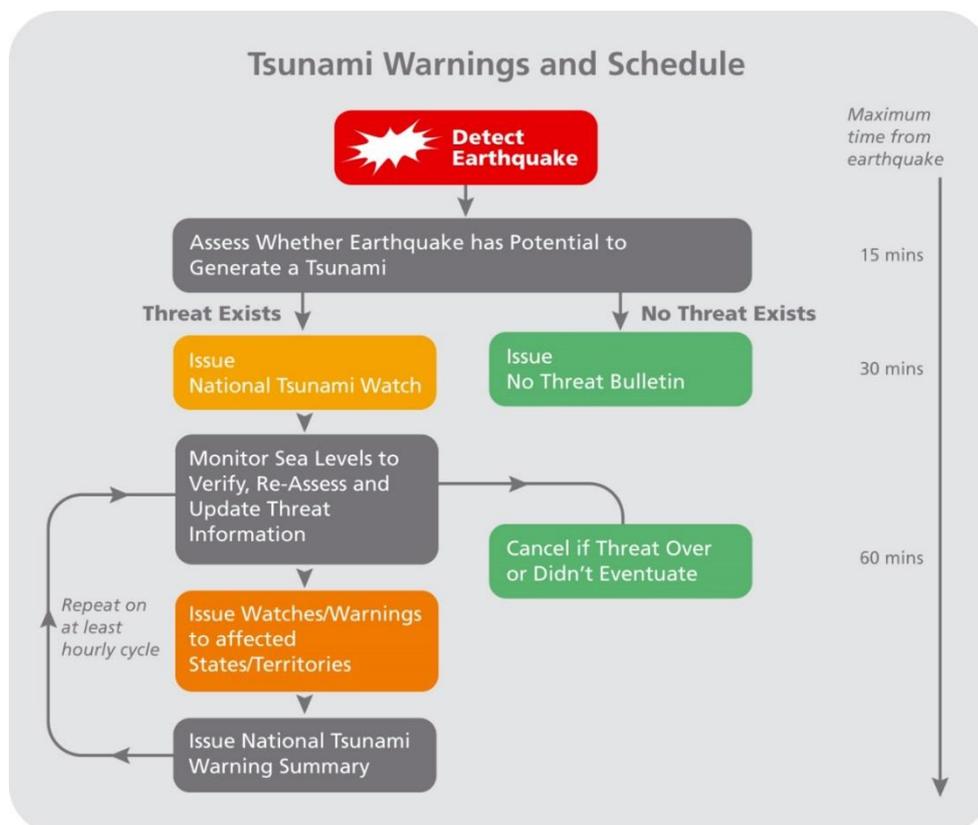
- Marine and immediate foreshore threat
- Land inundation threat

5.5.3 A *Warning Cancellation* message will be issued by the JATWC after confirmation that the main threat has passed or if a tsunami didn't eventuate, and the coastal area is safe for emergency services to enter the impact area.

5.5.4 **Strategy:** Timely and effective warnings are distributed to the community.

5.5.5 **Actions:**

- a. The Bureau issues JATWC Watches, Warnings and Bulletins for earthquake / tsunami events according to the following schedule:



Graphic: JATWC

- b. No tsunami warnings are provided for tsunamis generated by volcanic eruptions, meteor strikes and landslides, or meteotsunamis.
- c. The Bureau disseminates all JATWC Watches, Warnings and Bulletins directly to the media and all emergency services. These products are available at www.bom.gov.au/tsunami.
- d. The Pacific Tsunami Warning Centre (PTWC) also issue advice regarding potential Regional and Distant tsunamis in the Pacific Ocean. This advice can be found at <http://ptwc.weather.gov>. The JATWC Tsunami warning products are however regarded as the authoritative source of tsunami information for NSW.
- e. Tsunami Warnings for NSW disseminated by the Bureau are intended to cover the entire NSW coast and will include only general instructions and safety advice (provided by NSW SES) in a pre-agreed format. Separate warnings are also issued for Lord Howe Island.
- f. NSW SES Incident Controllers may issue NSW SES information products incorporating warnings from JATWC products, expected consequences,

including possible local effects, actions required and community response advice as follows:

Marine and Immediate Foreshore Threat:

- Get out of the water and move away from the immediate water's edge of harbours, coastal estuaries, rock platforms, and beaches.
- Boats in harbours, estuaries and in shallow coastal water should return to shore. Secure your boat and move away from the waterfront.
- Vessels already at sea should stay offshore in deep water until further advised.
- Do not go to the coast to watch the tsunami, as there is the possibility of dangerous, localised land inundation of the immediate foreshore.
- Check that your neighbours have received this advice.

Land Inundation Threat (in addition to advice above):

- People are strongly advised to go to higher ground, at least ten metres above sea level, or if possible move at least one kilometre away from all beaches and the water's edge of marinas, harbours and coastal estuaries.
- Take only essential items that you can carry including important papers, family photographs and medical needs.
- It may be in your own interests to walk to safety if possible to avoid traffic jams.
- If you cannot leave the area take shelter in the upper storey of a sturdy brick or concrete multi-storey building.

g. NSW SES will provide alerts and deliver tsunami information to affected communities using a combination of some of the following methods where resources are available:

- Mobile and fixed public address systems;
- Low flying aircraft equipped with public address systems, dependent on weather, availability, and suitable risk assessment;
- Marine Rescue Vessel public address systems;
- Surf Life Saving NSW Coastal Radio Network;
- Public marine radio channels (i.e. VHF);
- Marine Satellite phone;
- Emergency Alert (SMS and voice message alerting system);
- Telephony (including Auto dial systems);
- Standard Emergency Warning Signal;
- Doorknocking, if warning time permits;
- Variable message signs;
- Community notices in identified hubs;

- Distribution through established community liaison networks, partnerships and relationships;
 - NSW SES social media and website; and
 - Standard Media outlets including the emergency broadcaster – ABC radio;
- h. NSW SES may request supporting agencies redistribute NSW SES warnings, alerts and information;
 - i. Marine Rescue NSW broadcasts Bureau and NSW SES warnings to boaters in the NSW marine radio network (public marine radio channels i.e. VHF with remote link to bases outside impact areas);
 - j. The Australian Maritime Safety Authority (AMSA) will disseminate official warnings and related information to commercial shipping in Australian and international waters; and
 - k. A Joint Media Information Centre may be formed and coordinated by the NSW SES.

5.6 MANAGEMENT OF WATERWAYS

5.6.1 **Strategy:** On receipt of a Tsunami Warning (Marine or Land Threat), relocate or secure vessels to minimise the potential for tsunami damage.

5.6.2 **Actions:**

- a. Port Authority NSW or AMSA will advise vessels within their jurisdictions, which are in or close to deep water, to remain in or move to deep water until advised that it is safe to enter ports and harbours.
- b. When sufficient warning time is available, Port Authority NSW will coordinate the movement of ocean capable vessels from port limits to deep water offshore. Such vessels will be prioritised by risk posed to the nearby port facilities and population and their potential to provide assistance during rescue and recovery phases.
- c. If vessels in shallow water are unable to move to deep water, Port Authority NSW will instruct commercial vessels under their jurisdiction to secure their vessels;
- d. Marine Rescue NSW will provide advice to recreational vessels which is in line with the community response advice provided in JATWC warnings.
- e. Access to moored vessels to secure them may be allowed up until evacuation orders come into force.
- f. When insufficient warning time is available, access will not be allowed to waterways to remove trailerable boats.

5.7 EVACUATION MANAGEMENT AND WELFARE

- 5.7.1 Evacuation is the NSW SES's primary response strategy for managing the population at risk of tsunamis.
- 5.7.2 NSW SES has released mapping showing modelled evacuation areas in the event of a land-threat tsunami. This can be found on the NSW SES website at <https://www.ses.nsw.gov.au/resources-folder/tsunami-evacuation-map/>
- 5.7.3 Evacuation management plans may be available for high risk locations, for example the [Sydney and North Sydney CBD Evacuation Management Sub Plan](#).
- 5.7.4 It is not currently possible to predict the extent of flood impacts which would be caused by any predicted tsunami. Therefore evacuation must be applied to broad areas if land inundation is anticipated. Attenuation rules based on research and modelling, as well as conservative yet viable community messaging, means that an area 1 kilometre from the coast and below 10 metres above mean sea level will require evacuation. Evacuation would also include areas up to 10 kilometres upstream in coastal estuaries and rivers. Evacuation centres should be located outside these areas, on high ground away from the coast.
- 5.7.5 Most homes and small buildings are not designed to withstand tsunami impact and therefore should not be used as a refuge. However, if evacuation is no longer safe or possible, the upper floors of rigid multi-story buildings may provide refuge. This should not be relied upon as a response strategy.
- 5.7.6 In some circumstances, warning and evacuation may need to be initiated immediately at the local level using local arrangements and Consequence Management Guides referenced within the Local EMPLAN:
- a. If a strong earthquake is felt in a coastal area i.e. ground shaking lasting 20 seconds or longer, or unusual ocean behaviour indicative of tsunami is observed, such as a noticeable rise or retreat of coastal waters.
 - b. Local tsunamis can also be produced by submarine or coastal landslides for which there will be no warning time for communities immediately adjacent to the landslide. Some warning time (around 20 minutes) may be available for communities north and south of the initial point of impact.
- 5.7.7 Evacuation by foot may be the only means possible for the following reasons:
- a. A large earthquake has occurred locally, causing damage to roads and bridges.
 - b. Roads are congested due to evacuation traffic demand exceeding road capacity.
- 5.7.8 Consideration must be given to persons with mobility difficulties and the distance required to reach safety. This could include instructing able evacuees to leave on foot, leaving roadways for ambulances and mass transport options. Consideration must also be given to potentially large numbers of tourists with limited local knowledge, some of whom will be attempting to leave with vehicles or mobile homes.

5.7.9 **Strategy:** NSW SES evacuate people pre-emptively from dangerous or potentially dangerous places created by a tsunami to safe locations away from the hazard.

5.7.10 **Actions:**

- a. On receipt of a Tsunami Warning (Marine or Land Threat), NSW SES will coordinate the evacuation and closure of beaches, estuaries, rock platforms, direct waterfront areas of harbours and port facilities, within specified coastal waters areas, in consultation with local government councils, Surf Life Saving NSW, Roads and Maritime Service, NSW Police Force and Port Authority NSW;
- b. On receipt of a Tsunami Warning (Land Threat), in addition to item a, NSW SES will coordinate the evacuation of low-lying coastal land and tidal river areas within specified coastal waters areas;

People will be instructed to move to high ground at least 10 metres above sea level and 1 kilometre away from the water's edge. If no high ground is available nearby, people will be instructed to move as far away from the coast and tidal river areas as possible and to stay there until advised that it is safe to return.

- c. Evacuations will also take place when there is a risk to public safety due to flooding or damage, as described in the State Flood Plan and State Storm Plan.
- d. All evacuation decisions will be made as per the NSW SES Communication and Dissemination of Evacuation Decisions Standard Operating Procedure;
- e. Evacuations operations need to be consistent with the NSW Evacuation Management Guidelines;
- f. Support to evacuation operations may be requested from other emergency services and supporting agencies using arrangements in the NSW State EMPLAN and supporting plans;
- g. Where warning time permits, NSW SES will issue advice to emergency service and supporting agencies to leave impact areas 30 minutes before predicted tsunami impact; and
- h. Disaster Victim Registration will be managed by the NSW Police Force.

5.7.11 **Strategy:** Restrict access to the coastal zone when a NSW Tsunami Warning is current.

5.7.12 **Actions:**

- a. The NSW Police Force will assist the NSW SES in restricting access to areas at-risk during a tsunami event, to authorised personnel only. Priority will be given to restricting access to waterfront locations in urban areas;
- b. The NSW Police Force will coordinate the security of supply lines and evacuated and damaged areas.

5.7.13 **Strategy:** Maintain the welfare of communities and individuals affected by the impact of a tsunami.

5.7.14 **Actions:**

- a. NSW SES will provide immediate welfare for evacuees where required but will hand the responsibility over to the Welfare Services Functional Area as soon as possible. In these cases the NSW SES will brief the Welfare Services Functional Area at the earliest opportunity regarding the assistance required;
- b. The NSW Department of Education will manage the safety of students directly affected by tsunamis and the management of school premises, and will work with the NSW SES and Welfare Services in the management of school evacuees;
- c. Welfare Services Functional Area will manage evacuation centres for affected residents and travellers in accordance with the Welfare Services Functional Area Supporting Plan;
- d. Field Teams who encounter residents whose dwellings are uninhabitable or who otherwise are likely to need assistance will notify the Incident Management Team, via their line of control, as soon as possible so that assistance can be provided to them by the Welfare Services Functional Area;
- e. NSW SES will provide details of all residents assisted in evacuations to the Welfare Services Functional Area as early as possible;
- f. Where the expected number of evacuees and the duration of evacuation is assessed to be beyond the capability and capacity of the established evacuation centre arrangements the SEOCON may establish Major Evacuation Centres or Mass Care Facilities; and
- g. The decision to establish Major Evacuation Centres or Mass Care Facilities will be made by the SEOCON in consultation with the NSW SES, and relevant members of the State Emergency Management Committee.

5.7.15 **Strategy:** Coordinate available and accessible health services for tsunami affected communities.

5.7.16 **Action:** The provision of environmental health advice, assessment of public health risks and coordination of immediate mental health support will be provided by Health Services Functional Area.

5.8 PROTECTION AND PRE-DEPLOYMENT OF ESSENTIAL RESOURCES

5.8.1 **Strategy:** Where sufficient warning time is available, without additional risk to life, coordinate the protection or pre-deployment of essential resources required to respond to the impacts of tsunamis, such as rescue equipment, critical communications equipment, boats, aircraft, fuel, food and earth-moving equipment for debris removal.

5.8.2 **Actions:**

- a. Pre-deploy available land resources from outside potential impact areas to staging areas, closer to impact areas. Consideration should be given to the possibility that the path of water egress after tsunami inundation may not be the same as the path of water ingress during tsunami inundation.

So impacts such as road closures may occur in different areas as water recedes;

- b. Relocate land resources from within the immediate potential impact area to outside the impact area, if sufficient time is available;
- c. Secure marine resources in the immediate area, or if trailerable, relocate outside the potential impact area, if sufficient time is available; and
- d. NSW SES will coordinate the timing of protection and pre-deployment activities, to avoid potential conflict created by the removal of resources essential for warning and evacuation.

5.9 PROTECTION OF LIFE AND PROPERTY

5.9.1 **Strategy:** Coordinate the protection of life and property in the immediate post impact period to minimise further damage and potential injury. This activity will only be undertaken when it does not conflict with rescue and recovery priorities, and appropriate training has been provided.

5.9.2 **Actions:**

- a. NSW SES, supporting agencies and community volunteers will undertake tsunami damage tasks including:
 - Limiting access to hazardous areas by the general public until they are deemed safe;
 - Structural and damage assessment to identify extent and significance of damage;
 - Unblocking stormwater drains;
 - Pumping water out of premises;
 - Shoring-up damaged buildings against collapse (excluding properties damaged by coastal erosion);
 - Clearing debris, that directly interferes with operation response, or poses a direct threat to the public;
 - Identifying potential asbestos and other contamination; and.
 - Identifying public health risks.

5.9.3 NSW SES will work with the relevant authorities to ensure response operations detailed within this plan do not unnecessarily impact on the immediate and surrounding non-impacted natural environment.

5.10 PROTECTION OF ENERGY, TELECOMMUNICATION AND UTILITY

SERVICES INFRASTRUCTURE

5.10.1 **Strategy:** Minimise disruption to the community by ensuring protection of infrastructure and supply of essential energy, telecommunication and utility services (including water supply and wastewater management).

5.10.2 Actions:

- a. The Energy and Utilities Services Functional Area is to facilitate the coordination of the assessment and restoration of essential energy and utility services (not including telecommunications);
- b. The Engineering Services Functional Area is to coordinate the assessment and restoration of water and wastewater utilities outside Sydney and Newcastle;
- c. The Telecommunications Services Functional Area is to coordinate the assessment and restoration of telecommunications and the Government Radio Network; and
- d. The Engineering Services Functional Area is to coordinate the assessment and restoration of critical public buildings, for example hospitals.

5.11 SEARCH AND RESCUE

5.11.1 **Strategy:** Control and coordinate search and rescue of people from collapsed structures, waterways and the ocean during and after tsunami impact.

5.11.2 Actions:

- a. NSW Police Force will control and coordinate search and rescue;
- b. In the case of major structural collapse, FRNSW will control and coordinate urban search and rescue operations as per the State EMPLAN;
- c. NSW Police Force will keep the NSW SES State Duty Operations Controller and NSW SES Incident Controller informed of the progress of search and rescue operations and the requirements for rescue operations;
- d. NSW Marine Rescue will assist with search and rescue operations from the ocean/coastal waterways;
- e. Local Government Councils through their Lifeguard services and Surf Life Saving NSW will assist with the rescue of people from the surf zone following the impact of a tsunami;
- f. NSW SES will respond with appropriate resources to support the rescue of victims relating to tsunami damage; and
- g. The SEOCON will activate the Major Structural Collapse Sub Plan if required.

5.11.3 **Strategy:** Control and coordinate flood rescue of people and domestic animals arising from flooding.

5.11.4 **Action:** NSW SES and accredited rescue agencies will perform flood rescue, including flooding from tsunami inundation, as per arrangements in the State Flood Plan.

5.12 ESTABLISHMENT OF ACCESS

5.12.1 **Strategy:** Re-establish access to impact areas, properties and dwellings, initially to assist search and rescue operations, and subsequently to minimise disruption to the community.

5.12.2 Actions:

- a. NSW SES will coordinate the re-establishment of access, for example by removing fallen trees blocking roads, and may utilise emergency services or supporting agencies with the shortest lead time based on operational priorities;
- b. Where directly notified of a hazard or requested by NSW SES:
 - The Transport Management Centre (TMC) in coordination with Roads and Maritime Service (RMS) and its maintenance contractors will coordinate the assessment of any damage and the subsequent clearance of debris from the state road network; and
 - Local Government Councils will coordinate the assessment of any damage and the subsequent clearance of debris from Council managed road network and public land including beaches, where appropriate.
- c. Engineering Services Functional Area may provide assistance with the coordination of road access if requested by NSW SES;
- d. The NSW Police Force and the Transport Management Centre coordinate traffic control activities on state roads, with assistance from NSW SES.
- e. Fire and Rescue NSW coordinate the re-establishment of access for HAZMAT affected areas, once deemed safe;
- f. Environmental Services Functional Area can assist with re-establishing access by providing technical advice, guidance and support to assess impacted areas; and
- g. For larger impacts areas in which people have been evacuated NSW SES will assess, in consultation with the relevant EOCON and SERCON, the level of access to be granted. Access may be initially limited to:
 - Emergency services and response agencies, or
 - Residents and/or business operators.

5.13 RESUPPLY

5.13.1 **Strategy:** Coordinate resupply to towns and villages isolated by tsunami to minimise disruption to the community.

5.13.2 **Action:** NSW SES to coordinate the resupply of isolated communities and/or properties, in consultation with Transport Services Functional Area where required.

5.14 SAFE TO RETURN

5.14.1 **Strategy:** Coordinate the safe return of communities to tsunami affected areas when the immediate danger to life and property has passed.

5.14.2 Actions:

- a. JATWC will issue a *Warning Cancellation* if it determines that the destructive impacts of a warned tsunami will not eventuate and it is safe to return to evacuated areas;
- b. Following the impact of a destructive tsunami, NSW SES will determine when it is safe to progressively return to impacted areas, in consultation with the relevant EOCON and State Emergency Recovery Controller (SERCON), Functional Areas and supporting agencies considering damage assessments and the impact on the following:
 - Potential for mass casualties;
 - Access and egress;
 - Communications;
 - Power supply;
 - Gas supply;
 - Water and sewerage supply;
 - Infrastructure damage;
 - Hazardous materials; and
 - Public health risks.
- c. NSW SES will specify the level of access to affected communities as the following:
 - Not suitable for access;
 - Limited access by emergency services and response agencies;
 - Limited access by residents and/or business operators; or
 - Full access;
- d. The NSW SES Incident Controller will issue a *Safe to Return* message when the immediate danger to life and property has passed for areas assessed as safe; and
- e. The NSW SES will facilitate the return of evacuees to their homes.

5.15 END OF RESPONSE OPERATIONS

5.15.1 **Strategy:** Conclude response operations.

5.15.2 **Actions:** Response operations will conclude when all of the following conditions have been met:

- a. The physical impact of the tsunami has ceased;
- b. All requests for assistance related to the tsunami have been completed;
- c. The need for warning and evacuation no longer exists;
- d. There is no further prospect of rescuing people;

- e. Resupply is no longer required (resupply operations may occur concurrently with the recovery phase);
- f. Response to fire and hazardous materials incidents have concluded (not including subsequent clean-up of contaminated sites); and
- g. All affected areas have had a 'Safe to Return' issued.

5.16 POST IMPACT ACTIONS

5.16.1 **Strategy:** Learnings from the event are used to inform recovery and future events.

5.16.2 **Actions:**

- a. NSW SES will continue to engage with communities following a significant tsunami through convening one or more community forums, workshops or other opportunities to provide communities a chance to provide feedback, address any concerns and provide input into the recovery process. These will typically include other agencies such as Geoscience Australia, the Bureau of Meteorology, Welfare Services and Local Council representatives;
- b. NSW SES will ensure that damage assessment information is provided to the SEOCON or relevant Emergency Operations Controller to inform the recovery impact assessment within agreed upon timeframes;
- c. NSW SES will conduct After Action Reviews, wherever possible, within three weeks of the end of response operations, which will involve all stakeholders. Findings will be shared and incorporated into improved disaster resilience planning;
- d. NSW SES will provide a response summary report to the SEOCON to inform the response to recovery handover from the SEOCON to the SERCON. The response summary should outline:
 - The emergency action plan in place at the conclusion of the response emphasising any continuing activities including community meetings/engagement activities;
 - Resources allocated to the emergency response and associated exit strategies;
 - Details of any areas or situations with potential to re-escalate the emergency;
 - A recommendation for the end of response operations and handover to recovery operations; and
 - Any actions that are incomplete or outstanding.
- e. NSW SES will undertake/coordinate a comprehensive review of plans following significant tsunami events.

6. RECOVERY OPERATIONS

6.1 INTRODUCTION

- 6.1.1 Recovery is the process of returning an affected community to its proper level of functioning after an emergency. It will generally commence simultaneously with the Response phase.
- 6.1.2 Recovery operations will be initiated and conducted as outlined in the NSW State EMPLAN and as further detailed in the NSW Recovery Supporting Plan.

6.2 NSW SES RECOVERY ROLE

- 6.2.1 **Strategy:** NSW SES will support recovery operations and established Recovery Committees.
- 6.2.2 **Actions:**
 - a. NSW SES will provide representation to Recovery Committees as required and may have an ongoing role in the Recovery phase through its community engagement personnel and other relevant NSW SES members;
 - b. NSW SES roles on Recovery committees may include providing information about any continuing response, guidance on mitigation strategies and general advice and assistance to the committee as a subject matter specialist;
 - c. NSW SES will provide information to the Office of Emergency Management to support applications to Treasury for Natural Disaster Relief and Recovery Arrangements;
 - d. NSW SES will assist with clean-up operations after a tsunami where possible;
 - e. NSW SES, in conjunction with a Recovery Committee, will provide a service to support the information needs of a community immediately following a tsunami; and
 - f. Where the maintenance of tarpaulins will be required over a protracted period, NSW SES may request the Engineering Services Functional Area to undertake this work in accordance with procedures established by NSW Disaster Assistance Guideline A5- Maintenance of Tarpaulins.

7. ABBREVIATIONS

AIDR	Australian Institute for Disaster Relief
AIIMS	Australasian Inter-service Incident Management System
ATAG	Australian Tsunami Advisory Group
ATWS	Australian Tsunami Warning System
Bureau	Australian Government Bureau of Meteorology
CBRN	Chemical, Biological, Radiological, Nuclear
EMPLAN	Emergency Management Plan
EOCON	Emergency Operations Controller
FRNSW	Fire and Rescue New South Wales
HAZMAT	Hazardous Materials
JATWC	Joint Australian Tsunami Warning Centre
IGA	Intergovernmental Agreement on the Provision of Bureau of Meteorology Hazard Services to the States and Territories
MRNSW	Marine Rescue NSW
NSW SES	New South Wales State Emergency Service
RFA	Request for Assistance
RMS	Roads and Maritime Services
SDOC	State Duty Operations Controller
SEMC	State Emergency Management Committee
SEOC	State Emergency Operations Centre
SEOCON	State Emergency Operations Controller
SERCON	State Emergency Recovery Controller
SLERA	State Level Emergency Risk Assessment
SLSNSW	Surf Life Saving NSW
TMC	Transport Management Centre

8. GLOSSARY

Community Resilience. Communities and individuals harnessing local resources and expertise to help themselves in an emergency, in a way that complements the response of the emergency services. Resilient communities are better able to withstand a crisis event and have an enhanced ability to recover from residual impacts.

Damage Assessment. Collection and collation of specific impact information to inform the impact assessment. The information assists with the transition to recovery.

Evacuation. A risk management strategy that may be used to mitigate the effects of an emergency on a community. It involves the movement of people to a safe location and their return. For an evacuation to be effective, it must be appropriately planned and implemented

Incident Controller. The individual responsible for the management of all incident control activities across a whole incident.

NSW SES State Controller. The NSW SES Commissioner, in connection with the exercise of his or her functions under the SES Act, may use the title NSW SES State Controller and the NSW SES Deputy Commissioner may use the title NSW SES Deputy State Controller

NSW SES State Duty Operation Controller (SDOC). A position delegated by the State Controller, that provides strategic control, command and coordination for NSW SES controlled event and other emergencies for which the State Controller is accountable. The SDOC must ensure compliance with policy and directions as set by the Commissioner/State Controller as well as provide support and guidance to Operations Controller and/or Incident Controllers as required.

Spontaneous Volunteers. Emergent volunteers during times of crisis who volunteer their time to help their local communities but do not wish to have an ongoing commitment to an organisation.

Telecommunications. In this plan means resources and services provided by members of the functional area which are telecommunications carriers as well as the NSW Government Radio Network.

Tidal Wave. A common term for tsunami used in older literature, historical descriptions and popular accounts. Tides, caused by the gravitational attractions of the sun and moon, may increase or decrease the impact of a tsunami, but have nothing to do with their generation or propagation. However, most tsunamis (initially) give the appearance of a fast rising or fast-ebbing tide as they approach shore, and only rarely appear as a near vertical wall of water.

Travel Time. Time that it takes the tsunami to travel from its source to a particular location that it floods.

Tsunami. A series of ocean waves with very long wavelengths (typically hundreds of kilometres) caused by disturbances of the ocean such as earthquakes, landslide, volcanic eruptions, explosions or meteorites. The word 'tsunami' is Japanese for 'harbour wave'.

Warning Products:

- **National No Threat Bulletin** - Notification that there is no tsunami threat to the Australian mainland or islands after an undersea earthquake has occurred.
- **National or State / Territory Watch** - If there is a potential tsunami threat, the first product the Bureau would issue a National Tsunami Watch. Assessment would continue and either a cancellation or a Warning will be issued.
- **State / Territory Warning – Marine and Immediate Foreshore threat or Land Inundation threat** - A Tsunami Warning may be issued once there is high degree of confidence that a tsunami threat exists, based upon detection that a tsunami has been generated; or if there is a potential threat (unconfirmed) to NSW within the next 90 minutes.
- **National Warning Summary** - Provides a national summary of all Tsunami Warnings, Tsunami Watches and cancellations issued by the Bureau of Meteorology.

More information about tsunami warning products can be found on the [Bureau tsunami website](#).

Utilities. In this plan, utilities are those businesses that own, operate and provide utility services, namely electricity, water, sewerage, gas and liquid fuels, but excluding telecommunication and engineering services.

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AGENCY	RESPONSIBILITIES
A1. NSW STATE EMERGENCY SERVICE	<p>The NSW SES is the designated Combat Agency for storms, floods and tsunamis, and controls response operations.</p> <p>NSW SES roles and responsibilities in relation to tsunamis are detailed within the NSW State Tsunami Plan above, and where relevant the NSW State Flood and Storm Plans.</p>
A2. AGRICULTURE AND ANIMAL SERVICES FUNCTIONAL AREA	<p>The roles and responsibilities for Agriculture and Animal Services are outlined in the <u>Agriculture and Animal Services Supporting Plan</u>.</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> • Disseminate briefing information to participating agriculture and aquaculture operators, commercial fishers and animal services and related stakeholders; and • Coordinate support to primary producers, animal holding establishments, evacuees and the community in emergencies, including rescue, evacuation and emergency care of animals in accordance with other relevant NSW State Plans.
A3. DEPARTMENT OF HOME AFFAIRS	<ul style="list-style-type: none"> • Work with the NSW SES, Geoscience Australia and the Bureau in the development of tsunami warning systems for NSW.
A4. AUSTRALIAN BUREAU OF METEOROLOGY (THE BUREAU)	<ul style="list-style-type: none"> • Operate, with Geoscience Australia, the Joint Australian Tsunami Warning Centre; <p>Preparedness</p> <ul style="list-style-type: none"> • Work with the NSW SES and Geoscience Australia in the development of tsunami warning systems; • Develop and maintain the NSW Regional Forecasting Centre (RFC) Tsunami Standard Operating Procedures; • Assist the NSW SES with the development of scenarios for use in the exercising of this plan. Undertake community engagement activities and contribute to similar community engagement and capacity building programs undertaken by the NSW SES; <p>Response</p> <ul style="list-style-type: none"> • Provide the NSW SES State Headquarters with all tsunami advice received indicating a possible impact on the NSW coast; and • Issue JATWC Bulletins and official warnings, in consultation with NSW SES and including NSW SES safety messages within warnings.
A5. AUSTRALIAN MARITIME SAFETY AUTHORITY (AMSA)	<ul style="list-style-type: none"> • Meet the agreed arrangements described in the NSW SES / NSW AMSA Memorandum of Understanding; • Assist the NSW SES with community engagement and capacity building programs;

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> • Respond to marine oil and chemical spill incidents in State waters, as detailed in the NSW Marine Oil and Chemical Spill Contingency Plan; and • Disseminate official warnings and related information to commercial shipping in Australian and international waters.
A6. EMERGENCY INFORMATION COORDINATION UNIT	<ul style="list-style-type: none"> • Assist the NSW SES with the distribution of intelligence to agencies listed within this plan and State EMPLAN; • Assist the NSW SES by providing GIS trained staff and equipment to assist with establishment of a Joint Intelligence Unit if requested.
A7. ENERGY AND UTILITIES SERVICES FUNCTIONAL AREA (EUSFA)	<p>The roles and responsibilities for Energy and Utilities Services are outlined in the <u>Energy and Utility Services Supporting Plan (EUSPLAN)</u>.</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> • Assist NSW SES with identification of infrastructure at risk from tsunami inundation, within available resources; • When warning time permits assist with the dissemination of official warnings and related information to coastal infrastructure of EUSFA participating organisations; • Liaise with the NSW SES State Duty Operations Controller or Incident Controller to develop priorities of response; and • Provide input into resupply management planning during a State-coordinated response.
A8. ENGINEERING SERVICES FUNCTIONAL AREA	<p>The roles and responsibilities for Engineering Services are outlined in the <u>Engineering Services Supporting Plan</u>.</p>
A9. ENVIRONMENTAL SERVICES FUNCTIONAL AREA	<p>The roles and responsibilities for Environmental Services are outlined in the <u>Environmental Services (ENVIROPLAN) Supporting Plan</u>.</p> <p>Additional roles and responsibilities specific to this Sub Plan include:</p> <p>Preparedness</p> <ul style="list-style-type: none"> • Assist with the assessment of identified hazards, including chemical storage and waste facilities, and the post-impact implications on public health and the environment; • Undertake exercises in conjunction with NSW SES, functional areas and supporting agencies; <p>Response</p> <ul style="list-style-type: none"> • Supply trained staff, resources and information to assist the Joint Intelligence Unit; • Provide Incident Management personnel and Liaison Officers to the NSW SES, if required;

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> • Assist with the coordination of post-impact assessment, debris and waste management; and <p>Recovery</p> <ul style="list-style-type: none"> • Advise and support activities for management of debris and waste collection, storage and disposal. <p>Additionally, the Environmental Services Functional Area has roles and responsibilities that are outlined in the <u>Hazardous Materials/ Chemical, Biological, Radiological and Nuclear Sub Plan</u>, and the <u>NSW Marine Oil and Chemical spill Contingency Plan</u>.</p>
<p>A10. FIRE AND RESCUE NSW</p>	<p>Preparedness</p> <ul style="list-style-type: none"> • Identify and notify the NSW SES of any locations at risk from fire (within Fire Districts) or hazardous materials that pose a significant threat to surrounding populations due to the impact of a tsunami for incorporation into NSW SES tsunami intelligence and planning; <p>Response</p> <ul style="list-style-type: none"> • Meet the agreed arrangements described in the NSW SES and Fire and Rescue NSW Mutual Aid Agreement; • Provide Incident Management personnel and Liaison Officers to the NSW SES when required; • Notify the SES of tsunami related jobs received via the Triple Zero system; • When requested, assist the NSW SES with the warning and/or evacuation of at risk communities; • Assist the NSW SES with the warning and monitoring of coastal facilities at-risk of fire or hazardous materials due to tsunami impact; • Conduct Hazmat operations including asbestos risks, resulting from tsunami emergencies in coordination with the SES Incident Controller; • Provide damage response teams to assist the NSW SES with property protection tasks; • Provide Land Based and In Water Flood Rescue Operators as required; • Provide appropriately trained personnel to perform Down the Wire (DTW) functions as required; • Provide trained staff to support a Joint Intelligence Unit, if established by NSW SES, including Remotely Piloted Aircraft System (RPAS) pilots to assist with field observations; • Assist the NSW SES in monitoring/reconnaissance of areas potentially damaged by a tsunami; and • Assist the NSW SES to undertake damage assessment including structural collapse risks, and recommend activation of the Major Structural Collapse Sub Plan if required. Recommend activation of the

AGENCY	RESPONSIBILITIES
	Hazmat/CBRN Emergency Sub Plan and/or the NSW Asbestos Emergency Sub Plan if required.
A11. GEOSCIENCE AUSTRALIA	<ul style="list-style-type: none"> • Work with the Bureau and the NSW SES in the development of tsunami warning systems for NSW; • Provide specialist scientific advice to assist the NSW SES, other State Government Agencies and Local Government Councils on tsunami-related matters; • Provide national seismic detection capabilities; • Operate, with the Bureau of Meteorology, the Joint Australian Tsunami Warning Centre; • Contribute to tsunami community engagement and capacity building initiatives; and • Assist the NSW SES with the development of scenarios for use in the exercising of this plan.
A12. FORESTRY CORPORATION NSW	<p>Preparedness</p> <ul style="list-style-type: none"> • Assist the NSW SES with identification of road infrastructure in State Forests at risk from tsunamis; <p>Response</p> <ul style="list-style-type: none"> • Assist the NSW SES with the communication of official warnings and information within coastal State Forests; • Close and evacuate at-risk camping grounds within State Forests in coastal areas when requested by NSW SES; • Close and reopen Forestry roads when affected by a tsunami and advise the NSW SES of their status; and • Facilitate the safe reliable access by emergency resources on Forestry managed roads.
A13. HEALTH SERVICES FUNCTIONAL AREA	The roles and responsibilities for Health Services Functional Area are outlined in the <u>Health Services (HEALTHPLAN) Supporting Plan</u> .
A14. HOUSING NSW	<p>Response</p> <ul style="list-style-type: none"> • Assist the NSW SES with the response to damaged public housing.
A15. LOCAL GOVERNMENT COUNCILS IN NSW COASTAL AREAS	<p>Local Government Councils are responsible for the care, control and management of beaches through the Local Government Act and the Crown Lands Act.</p> <p>Preparedness</p> <ul style="list-style-type: none"> • Contribute to community engagement activities;

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> • Assist the NSW SES in planning for tsunamis within their respective local government boundaries; <p>Response</p> <ul style="list-style-type: none"> • Assist the NSW SES with the dissemination of official warnings; • Notify the NSW SES when unusual ocean behaviour indicative of a tsunami is observed, or a tsunami has occurred for which there has been no prior warning; • Close and evacuate patrolled beaches on receipt of a NSW Tsunami Warning or upon observation of unusual ocean behaviour indicative of a tsunami, in consultation with NSW SES and Surf Life Saving NSW. • Council’s Lifeguard staff assist with the rescue of people from the surf zone following the impact of a tsunami; • Subject to the availability of council resources, assist the NSW SES with tsunami damage operations including: <ul style="list-style-type: none"> – The conduct of reconnaissance to identify tsunami damage; – Traffic management on council managed roads; – Provide assistance to the local NSW SES unit (plant, equipment and personnel, including headquarters staff where able and as requested); – Remove tree and other debris from council managed roads and council managed public land during tsunami damage clean-up operations in consultation with the NSW SES; and – Close and reopen Council roads (and other roads nominated by agreement with RMS) and advise the NSW SES, the NSW Police Force and people who contact the council for road information.
<p>A16. LORD HOWE ISLAND PORT OPERATIONS OFFICER</p>	<ul style="list-style-type: none"> • Assist the NSW SES with the evacuation of people from port facilities if required; • Encourage all commercial vessels to undertake appropriate measures to secure themselves before the arrival of a tsunami; and • Disseminate official warnings and related information to shipping in or near port, anchorage and in the Lord Howe Island area.
<p>A17. MANLY HYDRAULICS LABORATORY</p>	<ul style="list-style-type: none"> • Provide data from NSW tide gauges and wave height buoys, on behalf of NSW Office of Environment and Heritage.
<p>A18. NSW AMBULANCE</p>	<p>The roles and responsibilities for NSW Ambulance are outlined in the Health Services (HEALTHPLAN) Supporting Plan.</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> • Provide Land Based and In Water Flood Rescue Operators as required; • Provide specialist damage response teams as requested to assist the NSW SES; and

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> Meet the agreed arrangements described in the NSW SES / NSW Ambulance Memorandum of Understanding.
<p>A19. NSW DEPARTMENT OF EDUCATION</p>	<p>NSW Department of Education is listed as a supporting agency under this plan.</p> <p>Preparedness</p> <ul style="list-style-type: none"> Ensure each school and education workplace liable to tsunami impacts has an emergency management plan (that is accessible locally and from a central incident management team), that includes local response procedure for tsunami events, and information for parents and carers; Conduct exercises to test schools' emergency management plans; Identify schools and known school bus routes within tsunami impact zones; <p>Response</p> <ul style="list-style-type: none"> Disseminate official warnings and related information to all at-risk schools across the NSW Education sector; Coordinate the early notification to all at-risk schools across the NSW Education sector where schools, staff and students are likely to be impacted by tsunami events; Assist with the coordination of the evacuations of schools within the tsunami impact zone, and the immediate welfare of students until returned to the appropriate carer, noting that school student bus transport may not be immediately available; Liaise with the NSW SES and, if appropriate, arrange for the early release or relocation of students whose travel arrangements are likely to be disrupted by a tsunami and/or road closures and transport disruptions; Consider and act on the advice of the NSW SES with regard to temporary ceasing operations of schools across the NSW Education sector; Provide a Liaison Officer to the SEOC if required; Coordinate local situation reports from all schools during a tsunami related incident through to the SEOC; <p>Recovery</p> <ul style="list-style-type: none"> Support schools to return to normal operations as soon as practicable; Support the continued education of students of schools destroyed or damaged in a tsunami event; and Participate in After Action Reviews as required.
<p>A20. MARINE RESCUE NSW</p>	<p>Preparedness</p> <ul style="list-style-type: none"> Assist the NSW SES with community engagement and capacity building programs;

AGENCY	RESPONSIBILITIES
	<p>Response</p> <ul style="list-style-type: none"> • Notify the NSW SES when unusual ocean behaviour indicative of a tsunami is observed, or a tsunami has occurred for which there has been no prior warning; • Maintain and monitor the NSW marine radio network for boaters and coastal on-water users on a 24x7 basis; • Disseminate official warnings and related information to boaters through the NSW marine radio network (public marine radio channels i.e. VHF with remote link to bases outside impact areas) in accordance with arrangements of NSW Police Force; • Include NSW SES safety messages within warnings if appropriate; • Assist NSW SES with the closure and / or evacuation of marinas, boat-ramps and waterways when required; • Consider and act on the advice of NSW SES with regard to the warning and evacuation of exposed MRNSW facilities and assets; • Assist the NSW SES with the warning and/or evacuation of at-risk coastal communities and areas; • Assist the NSW SES and NSW Police Force with the provision of trained members to support public information units; • Support NSW Police Force by providing suitable MRNSW facilities as Search and Rescue Coordination Centres and/or operations centres; • Under the coordination of the NSW Police Force, assist with search and rescue operations from the ocean/coastal waterways; • At the direction of the NSW Police Force assist in the identification and recovery of vessels; • Assist NSW SES in conducting reconnaissance and/or impact assessment; and • Assist NSW SES with the resupply of isolated coastal communities.
<p>A21. NSW NATIONAL PARKS AND WILDLIFE SERVICE</p>	<p>Preparedness</p> <ul style="list-style-type: none"> • Assist the NSW SES with identification of infrastructure in National Parks at risk from tsunamis; <p>Response</p> <ul style="list-style-type: none"> • Assist the NSW SES with the communication of official warnings and information within coastal National Parks; • Close and evacuate at-risk camping grounds, visitor areas and recreational nodes within National Parks in coastal areas when requested by NSW SES;

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> • Close and reopen National Parks and Wildlife Service roads when affected by a tsunami and advise the NSW SES of their status; • Facilitate the safe reliable access by emergency resources on National Parks and Wildlife Service managed roads; • Provide a Liaison Officer to the NSW SES Incident Control Centre or Emergency Operations Centre as required; and <p>Recovery</p> <ul style="list-style-type: none"> • Participate in After Action Reviews of major tsunami events.
<p>A22. NSW OFFICE OF EMERGENCY MANAGEMENT</p>	<p>Preparedness</p> <ul style="list-style-type: none"> • Administer the <i>State Emergency and Rescue Management Act 1989</i> (NSW) and the State Emergency Management Plan (EMPLAN); • Contribute to NSW SES reviews into plans, policies and procedures as required; <p>Response</p> <ul style="list-style-type: none"> • Display, wherever practicable, the Bureau tsunami warnings without change on the Emergency NSW website; • Support the State Emergency Operations Centre; <p>Recovery</p> <ul style="list-style-type: none"> • When required, undertake recovery operations under direction of the SERCON; • When requested, establish evacuation and recovery centres; • Administer Disaster Relief Account; and • Participate in After Action Reviews as required.
<p>A23. NSW OFFICE OF ENVIRONMENT AND HERITAGE</p>	<p>Preparedness</p> <ul style="list-style-type: none"> • Provide the NSW SES, other State Government Agencies and Local Government Councils with scientific and technical advice to identify the nature of the tsunami threat, during the planning process; and <p>Response</p> <ul style="list-style-type: none"> • Provide damage response teams to assist the NSW SES and National Parks and Wildlife Service.
<p>A24. NSW POLICE FORCE</p>	<p>Response</p> <ul style="list-style-type: none"> • Notify the NSW SES State Headquarters of any information indicating that a tsunami has impacted the NSW coast (or adjacent areas of the Queensland or Victorian coasts); • Provide a Liaison Officer to the NSW SES Operation Centre if required;

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> • When requested by NSW SES in tsunami operations: <ul style="list-style-type: none"> – Restrict access to areas affected by a tsunami; – Assist with dissemination of official warnings and related information, including to commercial and recreational vessels; – Assist with warning and/or evacuation of at-risk communities; and – Assist with monitoring and reconnaissance of areas potentially damaged by a tsunami; • Control and coordinate search and rescue operations; • Provide available rescue resources as required; • Conduct road and traffic control operations in conjunction with NSW SES, council and/or RMS; • Coordinate security for supply lines, evacuated and damaged areas; • Manage Disaster Victim Registration and Disaster Victim Identification; and • Operate the Public Information and Inquiry Centre, if requested or otherwise needed during tsunami events.
<p>A25. NSW RURAL FIRE SERVICE</p>	<p>Preparedness</p> <ul style="list-style-type: none"> • Identify and notify the NSW SES of land based facilities at-risk of fire within prescribed Rural Fire Districts that pose a significant threat to surrounding populations during tsunami events, for incorporation into NSW SES tsunami intelligence and planning; <p>Response</p> <ul style="list-style-type: none"> • Meet the agreed arrangements described in the NSW SES / NSW RFS Memorandum of Understanding; • Provide a Liaison Officer to the NSW SES Operations Centre or Emergency Operations Centre as required; • Provide Incident Management personnel when requested; • Provide trained staff to support a joint intelligence unit, if established by NSW SES; • Advise NSW SES of tsunami related jobs received by the NSW RFS; • Provide Strike Teams during tsunami operations when requested by NSW SES. This may include assistance with: <ul style="list-style-type: none"> – Warning and/or evacuation of at-risk communities; – Assist NSW SES with the warning and monitoring of coastal facilities at risk of fire due to tsunami impacts; – Monitoring/reconnaissance of areas potentially damaged by a tsunami; – Property protection tasks;

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> – Back-up radio communications; – The resupply of isolated communities and/ or properties; and – Providing access to areas/ properties isolated by tsunami damage. <ul style="list-style-type: none"> • Assist the NSW SES with the provision and management of aircraft through the State Air Desk; • Provide speciality aircraft and appropriately trained personnel to perform Down the Wire (DTW) functions as required; and • Assist NSW SES with impact and damage assessments.
A26. NSW VOLUNTEER RESCUE ASSOCIATION	Response <ul style="list-style-type: none"> • Meet the agreed arrangements described in any NSW SES/ NSW VRA Memorandum of Understanding; • Assist NSW SES with the dissemination of official warnings and related information; • Assist the NSW SES with the evacuation of at-risk communities; • Assist the NSW SES in monitoring / reconnaissance of areas potentially damaged by a tsunami; • Assist with search and rescue operations; and • Provide damage response teams to assist the NSW SES.
A27. PORT AUTHORITY OF NSW	Preparedness <ul style="list-style-type: none"> • Identify and notify the NSW SES of port facilities which are at-risk of fire or hazardous materials and pose a significant threat to surrounding populations during tsunami events, for incorporation into NSW SES tsunami intelligence and planning; • Provide information on at-risk port infrastructure, anchorages and moorings within port boundaries, for NSW SES tsunami intelligence and planning; Response <ul style="list-style-type: none"> • Disseminate official warnings and related information to commercial shipping in or near port, or at anchor; • Assist the NSW SES with the evacuation of people from port facilities if required; • Encourage all commercial vessels to undertake appropriate measures to secure their vessels before the arrival of a tsunami; • Coordinate the movement of high risk vessels from within port boundaries (Ports and Maritime Administration Regulation 2012, NSW) to deep water if sufficient warning time is available; and • Respond to marine oil and chemical spill incidents in State waters, as detailed in the NSW Marine Oil and Chemical Spill Contingency Plan, in conjunction with Roads and Maritime Services.

AGENCY	RESPONSIBILITIES
A28. PUBLIC INFORMATION SERVICES FUNCTIONAL AREA	The roles and responsibilities for Public Information Services are outlined in the <u>Public Information Services Supporting Plan</u> .
A29. ROADS AND MARITIME SERVICES (RMS) TRANSPORT MANAGEMENT CENTRE (TMC)	<p>Response</p> <ul style="list-style-type: none"> • The Transport Management Centre (TMC) will assist the NSW SES with the communication of tsunami warnings and information provision to the public through variable message signs (VMS) according to the VMS protocols and procedures; • Assist the NSW SES with the evacuation of at-risk communities by maintaining state road access and egress routes; • Coordinates the assessment of damage to roads and bridges, and the clearing and removal of trees and debris from state roadways prior to opening, in consultation with NSW SES; • Where possible, assists NSW SES in monitoring / reconnaissance of areas potentially damaged by a tsunami; • leads information dissemination on state road and public transport conditions ; • RMS Maritime will coordinate harbour clearing services to remove obstacles causing obstruction to Sydney waterways; • RMS Maritime, following the direction of the NSW Police Force will assist in the identification and recovery of vessels; and • RMS Maritime respond to marine oil and chemical spill incidents in State waters as detailed in the NSW Marine Oil and Chemical Spill Contingency Plan.
A30. SEOC	<p>Response</p> <ul style="list-style-type: none"> • The SEOC will: <ul style="list-style-type: none"> a. Notify NSW SES State Headquarters when advised by Emergency Management Australia of an earthquake in a coastal or offshore area; b. Notify State Emergency Management Committee Members of a potential tsunami and the existence of tsunami warnings, or NSW SES warning products; and c. Distribute NSW SES operational updates to the SEOCON, State Emergency Management Committee members and Australian Government.
A31. SEOCON	<p>Response</p> <ul style="list-style-type: none"> • Monitor tsunami operations; • Open SEOC as necessary; • Consider requests for State or Commonwealth assistance;

AGENCY	RESPONSIBILITIES
	<ul style="list-style-type: none"> • Coordinate the establishment of a Major Evacuation Centre in accordance with Major Evacuation Centre Guidelines if required; • Facilitate requests for the Public Inquiry and Information Centre to be stood up; and • If requested, coordinate support to the NSW SES and/or other agencies.
A32. SERCON	<ul style="list-style-type: none"> • Coordinate recovery operations.
A33. SURF LIFE SAVING NSW	<ul style="list-style-type: none"> • Where local arrangements allow, provide support to NSW SES as per agreed arrangements; <p>Preparedness</p> <ul style="list-style-type: none"> • Assist NSW SES with community engagement and capacity building programs; <p>Response</p> <ul style="list-style-type: none"> • Assist the NSW SES with the dissemination of official warnings and related information; • Notify the NSW SES when unusual ocean behaviour indicative of a tsunami is observed, or a tsunami has occurred for which there has been no prior warning; • Assist with beach closures on receipt of a NSW Tsunami Warning or upon observation of unusual ocean behaviour indicative of a tsunami, in consultation with Local Government Councils, and advise NSW SES; and • Assist with the rescue of people from the surf zone following the impact of a tsunami.
A34. TELECOMMUNICATION SERVICES FUNCTIONAL AREA	<p>The roles and responsibilities for Telecommunications Services are outlined in the <u>Telecommunications Services (TELCOPLAN) Supporting Plan</u>.</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> • Assist the NSW SES to identify telecommunications infrastructure at risk of tsunami damage for incorporation into planning and intelligence.
A35. TRANSPORT SERVICES FUNCTIONAL AREA	<p>The roles and responsibilities for Transport Services are outlined in the <u>Transport Services Supporting Plan</u>.</p> <p>Roles and responsibilities in addition to the Supporting Plan are:</p> <ul style="list-style-type: none"> • Assist the NSW SES with the resupply of isolated communities and/or properties.
A36. WELFARE SERVICES FUNCTIONAL AREA	<p>The roles and responsibilities for Welfare Services are outlined in the <u>Welfare Services Functional Area Supporting Plan</u>.</p>

10. REFERENCES

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3. **Cardno Pty Ltd.** *NSW Tsunami Inundation Modelling and Risk Assessment.* 2013.