

EMERGENCY MANAGEMENT OTAGO

Coastal Tsunami Plan

2022




Emergency
Management Otago
Te Rākau Whakamarumarū Ōtākou

Otago CDEM Group Coastal Tsunami Plan

Contents

Introduction	3
Scope of Plan.....	3
Description of vulnerable area.....	4
Definition of the risk	4
National warning system description	7
NEMA Response indicators.....	7
Initial Threat Assessment.....	8
Public tsunami notifications using Emergency Mobile Alert (EMA)	10
Roles and Responsibilities.....	11
Risk Reduction measures	12
Readiness actions.....	12
Response planning – Territorial authorities	13
Response Planning – Group Emergency Coordination Centre	13
Response planning – Emergency Services	15
Response planning – Community	15
Critical contacts in response	15
Recovery issues	15
Testing, monitoring and evaluation.....	16
Appendix 1: Pre-determined Emergency Mobile Alert messages	17

 Emergency Management Otago Te Rākau Whakamarumaru Ōtākou	Document Name: Otago CDEM Group Coastal Tsunami Plan
	Document Owner: Otago Civil Defence Emergency Management Group Office
	Authorised By: Chair of the Otago Civil Defence Emergency Management Group
	Implementation Date: March 2022
	Review Period: 5 yearly, following an exercise, or use.
	Last Reviewed: N/A
	Next Review: March 2027

Introduction

Although a tsunami cannot be prevented, the impact of a tsunami can be mitigated through community awareness, preparedness, timely warnings and effective response.

It is therefore important that the Otago CDEM Group plans for the provision of coordinated public and community information, timely consistent warnings and effective response for a tsunami event on the Otago coast.

This plan is to detail the preparedness, warning processes and systems, risk evaluation, activation, evacuation and other response arrangements in the event of a tsunami threat on the Otago coast. An inland tsunami risk is recognised as a hazard to lakeside communities in Queenstown Lakes and Central Otago districts but are out of scope for this plan.

Scope of Plan

- Identify at risk coastal areas and communities.
- Describe the risk of tsunami on Otago Coast.
- Warning and notification arrangements procedures, including links with national warning systems and public alerting processes.
- Media arrangements. - Incorporating pre-scripted messages in the Public Information plan.
- Testing and exercising of warning systems as part of the overall exercise programme.
- Provision of education to support Community based plans.

Tsunami continues to be a hazard which covers multiple districts in Otago and requires regional coordination.

Standard Operating Procedures (SOPs) are in place in each of the coastal districts and planned for the Group Coordination Centre. This plan documents the thinking behind SOPs, response plans and will assist in guiding future revisions.

This plan was approved by the Otago Civil Defence Emergency Management Group Joint Committee at it's meeting 31 March 2022.



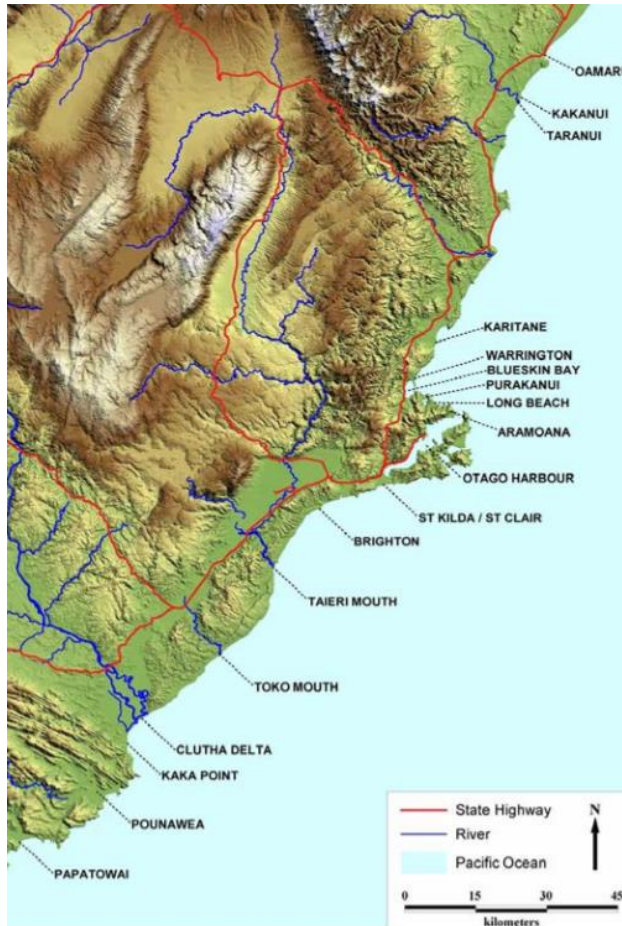
AARON HAWKINS

Chairman, Otago Civil Defence Emergency Management Group

Description of vulnerable area

In Otago the coastal districts of Waitaki, Dunedin and Clutha consist of 480 kilometres of coastline¹.

Significant communities at risk from a coastal tsunami (north to south) are¹:



- Oamaru
- Kakanui
- Taranui
- Waikouaiti
- Karitane
- Warrington
- Blueskin Bay
- Purakanui
- Long Beach
- Aramoana
- Otago Harbour (Harwood / Harington Point)
- St Kilda / St Clair / Ocean Grove
- Ocean View / Brighton
- Taieri Mouth
- Toko Mouth
- Clutha delta
- Jacks Bay
- New Haven
- Kaka Point
- Pounaweia
- Papatowai

Figure 1 Coastal communities included in ORC report - Community vulnerability to elevated sea level and coastal tsunami events in Otago. (2012)

Other areas at risk may include river mouths during recreational fishing seasons, or coastal areas during significant events such as regattas, ship movements etc.

Definition of the risk

The New Zealand tsunami hazard is outlined in the National Hazardscape Report².

The Otago coastline could be affected by tsunami of varying amplitudes and originating from many sources. NIWA³ investigated all credible sources of tsunami that could impact on the Otago coast. The sources include a distant (far-field) source from around the perimeter of the Pacific Ocean (often referred to as the 'Pacific Ring-of-Fire'), and local source (near-field) tsunami, sourced from local

¹ Community vulnerability to elevated sea levels and coastal tsunami events in Otago (ORC, 2012)

² NZGovt. (2007). *National Hazardscape Report*.

³ NIWA. (2007). *Otago Region hazards management investigation: tsunami modelling study*.

offshore faults and nearby subduction zones, such as the Puysegur trench to the south of New Zealand's South Island.

NIWA concluded that both near and far-field earthquakes can generate tsunami that could affect the Otago coast. The northern stretch of the Otago coastline (north of the Otago Peninsula) generally has a greater level of exposure to tsunami generated from South America, while the southern stretch of coastline (south of the Otago Peninsula) generally has a greater level of exposure from near-field subduction zone events in the Puysegur Trench. This difference is mainly due to the local geography and aspect of these two sections of coast. The coastline north of the Otago Peninsula has a more easterly aspect and is therefore more exposed to tsunami waves approaching from South America. The Otago Peninsula may also have a moderating effect during a Puysegur Trench tsunami, with refraction of waves occurring along the coastline to the north of this feature. Communities to the south of the Otago Peninsula are also closer to the Puysegur Trench.

NIWA identified that the largest tsunami faced by the Otago region is likely to be associated with a large subduction zone earthquake on the Puysegur Fault. This is due to the proximity of this potential tsunami source and its potential to generate large earthquakes. The impact of a tsunami generated from the Puysegur Trench is likely to be considerable for the southern part of the coast.

Other sources of tsunami include offshore local faults, such as the Castle Hill, Akatore, Takapu and Waihemo fault systems and the continental shelf submarine landslides. NIWA concluded that the effects of tsunami generated by offshore local faults are likely to create 'small' tsunami with water-surface displacement of up to two metres.

Whilst not well researched or reported on, the threat of an inland lake tsunami exists from the same triggers – i.e. large earthquake or landslip into the lake. Research work on this is planned for inclusion in the 2021-2031 10-year plan for the Otago Regional Council.

Reports offering more detail of the tsunami threat for Otago include:

- GNS national report *Review of Tsunami Hazard in New Zealand (2013 Update)*
- ORC report *Community vulnerability to elevated sea level and coastal tsunami events in Otago.* (2012)
- NIWA reports: *Otago Region hazards management investigation: tsunami modelling study.* (2007); *Modelling tsunami inundation of Aramoana and Harrington Point Dunedin A 1:500 year 50th percentile scenario.* (2015)

The GNS report "Review of Tsunami Hazard in New Zealand⁴ (2013 Update)" contains a probabilistic tsunami hazard model covering the entire NZ coastline. The coastline was divided into 268 sections each approximately 20km long. The model produces a hazard curve that illustrates the expected maximum tsunami height as a function of return period.

⁴ Report downloadable from civildefence.govt.nz

The GNS Report⁵ has divided the Otago Coast into 13 sections each approximately 20km long. The maximum wave amplitudes the modelling provided for 1:500(50%) and 1:2500(84%) return period tsunami scenarios are shown in the following table.

Sect No.	District/City	Section Location	1:500(50%)	1:2500(84%)
			Amplitude height (metres)	
165	Waitaki	Oamaru	4.6	8.5
166	Waitaki	Kakanui	4.4	8.3
167	Waitaki	Hampden	4.3	8.0
168	Waitaki	Shag Point / Matakaea	3.5	6.7
169	Dunedin	Waikouaiti	5.0	9.4
170	Dunedin	Dunedin City	4.8	9.2
171	Dunedin	St Clair	3.6	6.9
172	Dunedin	Brighton	5.3	10.3
173	Clutha	Chrystalls Beach	5.1	9.8
174	Clutha	Clutha River	5.1	10.0
175	Clutha	Catlins River	4.8	9.3
176	Clutha	Tahakopa Bay	4.5	10.3
177	Clutha	Makati (Chaslands Mistake)	4.8	9.1

Evacuation zone boundaries are best estimates based on forecast maximum wave heights at the coast and do not necessarily reflect the area that will be inundated by a tsunami wave. Some properties/dwellings etc. will not necessarily be inundated but have been included within the evacuation zone because access may be affected, and they would be isolated.

Evacuations of zones on the Otago coast have been aligned with the National Emergency Management Agency (NEMA) threat levels as follows.

NEMA Threat Level		Threat Definition	Zones Evacuated along Otago coast		
0.3 – 1 m	Land & Marine Threat	Strong and unusual currents activity (incl. harbours, estuaries & small boats)	Red Zone		
1 – 3 m			Red and all Orange Zones		
3 -5 m			Red, all Orange, and all Yellow Zones		
5 – 8 m			Red, all Orange, and all Yellow Zones		
> 8 m			Red, all Orange, and all Yellow Zones		

More detailed information on the determination of the evacuation zones is in the “2017 Tsunami Evacuation Zone Project Background” prepared by Emergency Management Otago for the zone mapping project.

⁵ GNS national report Review of Tsunami Hazard in New Zealand (2013 Update)

National warning system description

The revised national Tsunami Advisory and Warning Plan [SP 01/20] outlines the national procedures for National Emergency Management Agency to advise local authorities, national agencies and the media of possible tsunami that could affect coastal areas of New Zealand. It deals with the arrangements to receive and assess tsunami information at the national level, and the dissemination of national official notifications via the National Warning System (NWS) and the Emergency Mobile Alert (EMA) system.

NEMA Response indicators⁶

Region	Location	Thresholds	Possible notification issued via the National Warning System
1	New Zealand (0-1 hour to nearest coast Local source)	$M \geq 6.5$ and <100km depth	<p>Natural, felt signs are the primary warning for local source tsunami (Region 1).</p> <p>If possible and as appropriate, NEMA will issue one or a sequence of the following Advisories and Warnings:</p> <ul style="list-style-type: none"> • <i>National Advisory: Earthquake Being Assessed</i> • <i>National Advisory: Tsunami Activity – Strong Unusual Currents</i> • <i>National Warning: Tsunami Threat</i> • <i>Emergency Mobile Alert (to areas where land inundation is forecast)</i> • <i>National Advisory: No Tsunami Threat</i> • <i>National Advisory: Earthquake - No Tsunami Threat</i>
	Southern Kermadec (<1 hour to nearest coast Local source)	$M \geq 7.9$ and <150km depth	<p>Natural, felt signs are the primary warning for local source tsunami (Region 1), however Southern Kermadec earthquakes located between 25°S and 33°S may not be widely felt in New Zealand.</p> <p>If possible and as appropriate, NEMA will issue one or a sequence of the following Advisories and Warnings:</p> <ul style="list-style-type: none"> • <i>National Advisory: Earthquake Being Assessed (local/regional boundary holding message)</i> • <i>National Advisory: Tsunami Activity – Strong Unusual Currents</i> • <i>National Warning: Tsunami Threat</i> • <i>Emergency Mobile Alert (to areas where land inundation is forecast)</i> • <i>National Advisory: No Tsunami Threat</i>
2	South-West Pacific (1-3 hours Regional-source)	$M \geq 7.5$ and <100km depth	<p>Initial message:</p> <ul style="list-style-type: none"> • <i>National Advisory – Large Pacific Earthquake Being Assessed holding message</i> <p>Followed by (as appropriate, once confirmed data and advice received from GNS Science):</p> <ul style="list-style-type: none"> • <i>National Advisory: Tsunami Activity – Strong Unusual Currents</i> • <i>National Warning: Tsunami Threat</i> • <i>National Advisory – No Tsunami Threat to New Zealand</i> • <i>Emergency Mobile Alert (to areas where land inundation is forecast)</i>
3	Wider Pacific (>3 hours Distant-source)	$M \geq 8.0$ and <100km depth	<ul style="list-style-type: none"> • <i>National Advisory: Tsunami Activity – Strong Unusual Currents</i> • <i>National Warning: Tsunami Threat</i> • <i>National Advisory – No Tsunami Threat to New Zealand</i> • <i>Emergency Mobile Alert (to areas where land inundation is forecast)</i>

NEMA and GeoNet receive tsunami notifications directly from the Pacific Tsunami Warning Centre (PTWC), and NEMA receives earthquake (or other potential tsunami sources e.g. offshore volcano) reports from GeoNet.

When the first National Warning is issued by NEMA, information about the expected threat may be provided if available in the form of estimated wave arrival times and/or a threat map (or table) that shows coastal regions at risk. Often this data is not available at the time of the initial warning.

⁶ MCDEM (NEMA) Tsunami Advisory and Warning Plan [SP 01/20]

Subsequent National Warnings will include any new information as it becomes available, including new or revised wave arrival times, amplitudes, and threat maps (see figure 2).

All CDEM Groups and CDEM Group members receive official national tsunami advisories and warnings via the NWS. When time and expertise is available, CDEM Groups are responsible for further local threat assessment and deciding on appropriate local public alerting and response for regional and distant-source tsunamis. For example, designating which evacuation zones are relevant to evacuate, dependent on the threat.

Initial Threat Assessment

NEMA receives tsunami notifications directly from the PTWC, as well as earthquake notifications (for local earthquakes) from GeoNet. The initial PTWC message will include:

- Preliminary earthquake parameters – magnitude, time (UTC), coordinates of epicentre, depth and description of location (e.g. southeast of Loyalty Islands).
- An initial evaluation e.g. “* BASED ON THE PRELIMINARY EARTHQUAKE PARAMETERS... WIDESPREAD HAZARDOUS TSUNAMI WAVES ARE POSSIBLE.”
- A tsunami threat forecast e.g. “* HAZARDOUS TSUNAMI WAVES FROM THIS EARTHQUAKE ARE POSSIBLE WITHIN THE NEXT THREE HOURS ALONG SOME COASTS OF (countries listed)
- Recommended actions for government agencies (NEMA) and public.
- Estimated times of arrival for potentially affected localities – noting actual arrival times may differ and the initial wave may not be the largest. E.g.
“NORTH CAPE NEW ZEALAND 34.4S 173.3E 1520 02/10”
“AUCKLAND WEST NEW ZEALAND 37.1S 174.2E 1624 02/10”

Emergency Management Advisors also receive tsunami notifications directly from the PTWC (this is a publicly subscribed service) and will make an initial risk assessment of the to-be-expected first wave arrival time. This allows for an indication of the urgency for response actions to be taken ahead of the first alert through the NWS.

A group meeting via teleconferencing is undertaken to ascertain the appropriate initial response requirements to ensure we are ready to act in response to the National Emergency Management Agency advice.

Any decisions made need to take into account that the PTWC messages are received by media and members of the general public at the same time Civil Defence Emergency Management. Expectations by the public for authoritative messaging and action will be high.

Depending on the assessment of the information received for an earthquake, NEMA may issue one or more of the following official notifications:

National Advisories:

- *National Advisory – Earthquake Being Assessed*
- *National Advisory – Large Pacific Earthquake Being Assessed*
- *National Advisory – No Tsunami Threat to New Zealand*
- *National Advisory – Earthquake – No Tsunami Threat to New Zealand*
- *National Advisory – Tsunami Activity – Strong Unusual Currents*

National Warnings:

- *National Warning – Tsunami Threat*

Tsunami cancellation messages:

- National Advisory – *Tsunami Activity CANCELLED*
- National Warning – *Tsunami Threat CANCELLED*

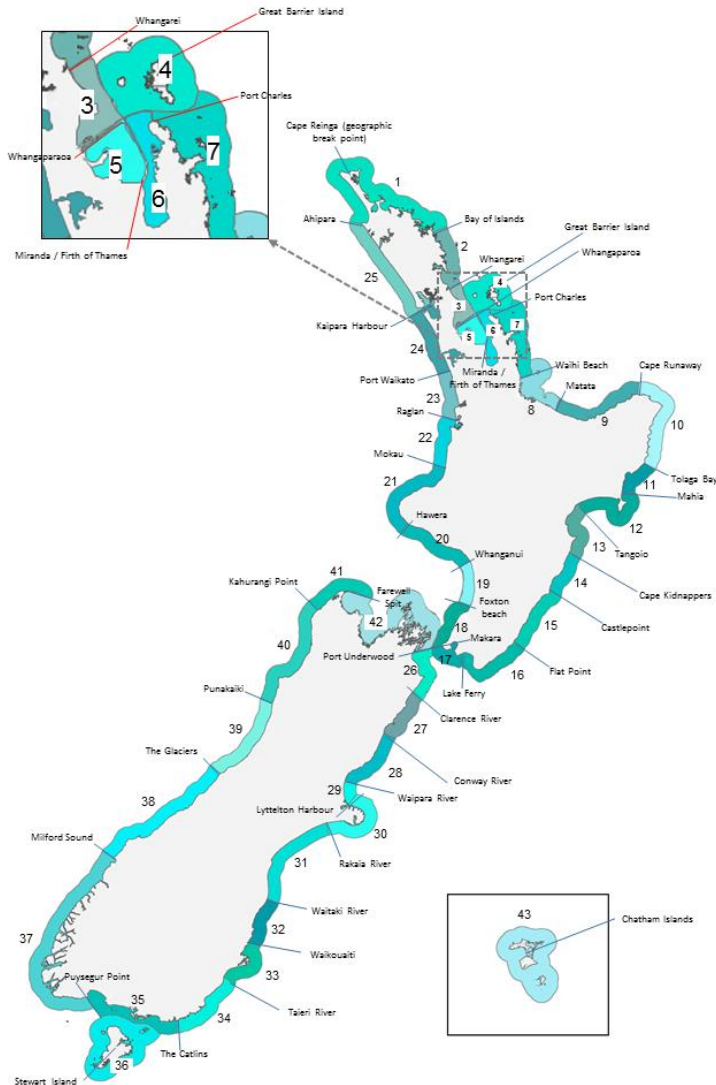


Figure 2 Coastal regions for wave height estimations issued in National Warnings (NEMA)

The different colours only reflect the different regions. Maps produced during an event will be colour-coded to indicate potential wave heights for each region.

In Otago the national warning system is received by Emergency Management Otago staff, who will then activate their Incident Management Teams as appropriate to the level of advisory / warning. See *Response Planning*, pages 13-15 for more information.

Public tsunami notifications using Emergency Mobile Alert (EMA)

The Emergency Mobile Alert (EMA) system delivers alerts directly to people's mobile phones in targeted areas, without subscription required. NEMA and the CDEM Groups have agreed the optimum arrangements to alert people via EMA once a credible tsunami threat has been established.

Use of EMA during a tsunami

	Upon receipt of Threat Forecast Map or Rapid Threat Evacuation Map from GNS Science/GeoNet that includes at least one coastal region with land inundation.	Upon receipt of a further Threat Forecast Map or Rapid Threat Evacuation Map from GNS Science/GeoNet that increases or decreases the number of coastal regions with land inundation.	Upon advice from GNS Science/GeoNet that immediate threat has passed.	
Local / Regional-source tsunami threat				
NEMA	Issue EMA to those coastal regions that are subject to a land threat telling people to evacuate from coastal areas.	Issue EMA with updated locations to the new and old coastal regions telling people to evacuate from coastal areas.	Teleconference between NEMA and CDEM Groups to agree further EMA messaging and responsibility for issuing, including cancellations.	
Distant-source tsunami threat				
NEMA	Issue EMA to those coastal regions that are subject to a land threat advising people to be prepared to move and check with local authorities for further information.	Issue EMA with updated locations to the new and old coastal regions advising people to be prepared to move and to continue to check and listen to local authorities for next steps.		
CDEM Groups	If at least one coastal region with land inundation in their Group, issue EMA to those coastal regions with the locally appropriate evacuation messages, after the EMA issued by NEMA, supporting that national message.	If at least one coastal region with land inundation in their Group, issue EMA to new and old coastal regions with the locally appropriate evacuation messages, after the EMA issued by NEMA, supporting that national message.		

The Otago Group Stakeholder Engagement Advisor is responsible for ensuring there are sufficiently trained staff in each local authority in Otago to operate the emergency mobile alerting system. These staff are typically the Emergency Management Officers and public information teams for each Emergency Operations Centre.

Roles and Responsibilities

National Emergency Management Agency / GNS

- Research and updating hazard knowledge relating to tsunami
- Maintaining capability to activate a national warning system and public emergency mobile alert system
- Update Civil Defence Emergency Management Groups and partner agencies on tsunami impact risks during an event

Otago Regional Council

- Maintaining currency in hazard knowledge relating to tsunami – both coastal and inland (lake tsunami)
- Considering current knowledge of the tsunami hazard in planning and consent decisions
- Maintaining capability to establish and operate the Group Emergency Coordination Centre in response

Territorial Authorities in Otago

- Maintaining capability to establish and operate the local Emergency Operations Centre in response
- Considering current knowledge of the tsunami hazard in planning and consent decisions
- Maintaining the ability to send an emergency mobile alert and initiate other public information processes to warn / advise / inform impacted communities
- Educate communities on the hazards and response actions

Emergency Management Otago

- Maintaining currency with, and evaluating standard operating procedures for all Civil Defence Emergency Management co-ordination centres
- Maintaining capability of coordination centres through training and exercises
- Maintaining the ability to send an emergency mobile alert and initiate other public information processes to warn / advise / inform impacted communities.
- Maintain engagement and collaboration with key sector partners.

Fire and Emergency New Zealand

- Utilise all available fire resources to assist in the response
- Assist with evacuation where appropriate
- Undertake rapid post-impact assessments

New Zealand Police

- Utilise all available police resources to assist in the response
- Assist with evacuation where appropriate, including cordon management
- Plan for and undertake Disaster Victim Identification as required

District Health Board

- Identify any health facilities at risk and plan for effective response
- Plan for post-impact health response

- Coordination of the health sector to assist in response, this can include being the conduit to community health providers enabling the identification of vulnerable populations in the community

Critical Infrastructure

- Considering current knowledge of the tsunami hazard in asset planning and identify appropriate mitigation measures where necessary.
- Critical infrastructure network operators will consider tsunami response actions in their plans

Coastal communities

- Community response groups will consider tsunami response actions in their plans
- Community response groups will promote tsunami awareness within their communities

Risk Reduction measures

District plans have included consideration of natural hazards in the next generation plans. Coastal inundation zones form a layer in plan maps and will influence the decision for future development of these at-risk areas.

The significant risk area of South Dunedin has mitigation in place through the St. Clair Seawall and the managed dune system from St. Clair to Lawyers Head.

Readiness actions

The Otago Civil Defence Emergency Management website provides public access to the tsunami evacuation zone map prepared in 2017. The evacuation zones are included in coastal community emergency response guides distributed in each community and available on the Otago Civil Defence Emergency Management website. In 2017-2018 community flyer mail-outs were done for all the at-risk coastal communities. The zones are also mapped on community response plans for these communities.

Awareness campaigns through social media remind communities of how to find out what the tsunami risk is for them. Inland lake tsunami awareness is also being undertaken in this manner.

There is currently no tsunami signage in these communities, however a budget for the 2021-2031 long term plan is set for considering signage in accordance with technical standard TS-01/08. A pilot programme is being developed to create on-ground visibility of tsunami evacuation zones using coloured markers on power poles.

The three coastal territorial authorities have tsunami specific response plans primarily focussed on the warning and evacuation of at-risk communities. Briefings for emergency services and community response group are periodically undertaken to keep responders informed.

There are several warning mechanisms for the Otago communities, primarily using the emergency mobile alerting system, with supplementary arrangements for local community warning through phone contacts with community response groups or the use of portable sirens in accordance with the technical standard TS-03/14, or emergency services alerting residents in communities. NEMA has an MOU with all national broadcasters, ensuring that tsunami alerts will be broadcast on radio and television as priority messages, 24/7.

Response planning – Territorial authorities

The local Emergency Operations Centres are responsible for all activity required to warn at risk communities, assist in any necessary evacuations, provide emergency welfare assistance and local public information to evacuees and undertake post-impact assessments, planning and response for their communities.

The response plans in each of the coastal authorities includes:

- Identifying the at-risk communities, creating manageable sectors for evacuation and assessment.
- Warning arrangements – particularly for communities where cellular coverage is poor and EMA alerts may not be received. This will include locally specific instructions on established assembly areas for evacuees.
- Identification and activation procedures for evacuee assistance centres, principally supported by and managed through community contacts and response groups.
- Cordon arrangements including information on areas protected through the cordons and resources required to affect these.
- Intelligence gathering procedures to ascertain information on the efficacy of evacuation efforts, initial severity of tsunami impacts on the shoreline and activity at evacuee assistance centres.
- Reporting arrangements from field resources to the Emergency Operations Centre and also between the Emergency Operations Centre and Group Emergency Coordination Centre.
- Post-impact assessment procedures to facilitate an early understanding of the impact and workload on the Emergency Operations Centre and rapid repatriation of evacuees whose homes remain habitable.

These plans are templated in the D4H operational platform in each Emergency Operations Centre.

The inland authorities should plan for activating to assist coastal areas after tsunami inundation.

Response Planning – Group Emergency Coordination Centre

The Group Emergency Coordination Centre is responsible for providing regionally consistent warning messaging, liaison with the emergency services and providing logistical support to Emergency Operations Centres that have a high post-impact workload.

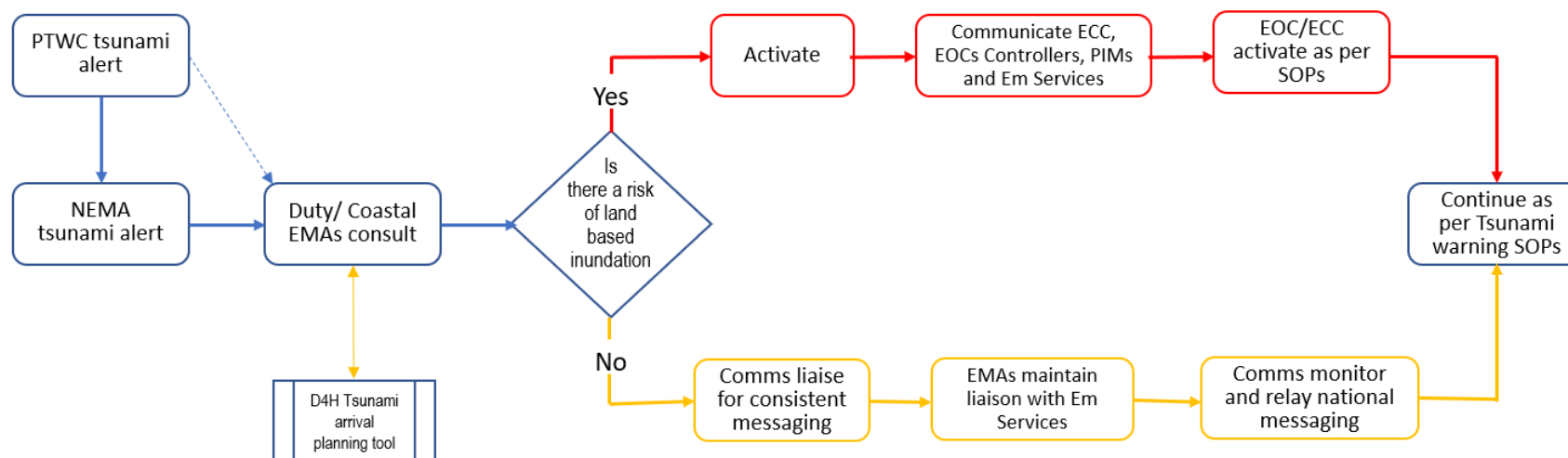
Initial emergency services coordination is expected to take place at the EOC level for any event where the first wave arrival time is less than 3 hours from time of the first tsunami warning issued by NEMA.

The response plan for the Group Emergency Coordination Centre includes:

- Duty Officer responsibilities (Emergency Management Officer with 0800 phone)
- Warning receipt / notification (SAR/Coastguard, harbour master, ports)
- Alerting / warning, Declaration protocol
- Initial actions
- EOC coordination
- NCMC communication
- Public Information

This plan is templated in the D4H operational platform for the Emergency Coordination Centre.

EM Otago Activation Process



Disclaimer: This process is subject to many factors. This is a process that would be followed if there was a 'textbook' activation. There are many contributing factors and this process is designed to give the user the initial concept of operations.

Response planning – Emergency Services

The following response plans are also in place for tsunami response:

- Te Kei Tsunami Plan – Local Procedure (Fire Emergency New Zealand)⁷
- District Emergency Management Plan (New Zealand Police) – tsunami specific tactical plans are to be developed
- Tsunami Tactical Plan (St John) - a specific tactical plan being developed.

In the event CDEM is activating in response to a tsunami warning for Otago, both Police and Fire would activate their regional coordination centres to coordinate their response.

Response planning – Community

Community response plans for communities at risk of tsunami include details on how the community itself will respond when it becomes aware of a tsunami threat. These plans will include:

- Phone contact lists
- Pre-determined assembly areas
- May include identified vulnerable members of the community

In the communities of Moeraki, Karitane and the lower Otago Peninsula, local marae are actively involved in these local plans and will act as a focal point for the evacuation.

Critical contacts in response

Each local authority's Emergency Operations Centre and the Group Emergency Coordination Centre D4H platform have key contacts including:

- Community contacts, marae
- Port / harbour authorities, emergency services
- Subject matter experts – GNS, Otago Regional Council Hazards team

Recovery issues

A state of emergency is likely to remain in place for the period after tsunami impact until immediate welfare needs are addressed, and rapid building assessments have been completed to inform the transition to recovery report. Each impacted district will be required to appoint a Recovery Manager, with the Group Recovery Manager providing regional coordination and support to recovery.

Any tsunami with significant land impact is going to require recovery planning across the four environment sectors of Social, Economic, Natural and Built. Recovery structures should be established in line with the Director's Guideline on Recovery Preparedness and Management [DGL 24/20].

⁷ Available from Fire Emergency New Zealand, Te Kei Region - Planning and Performance

Testing, monitoring and evaluation

This plan should be reviewed at least 5-yearly (i.e. in 2025) or after an actual tsunami warning event affecting Otago and requiring activation.

The Otago Civil Defence Emergency Management Group should hold a tier 2 exercise for a tsunami scenario within 5 years. This requirement would be superseded if the Group activates for an actual event.

Local Standard Operating Procedures will be reviewed at least every three years.

Any exercise or activation in response to a tsunami warning should have a full debrief, identifying a corrective action plan and this Group Tsunami Plan should be carefully reviewed as part of this process.

Appendix 1: Pre-determined Emergency Mobile Alert messages

OTCDEM-TS01-Tsunami Activity

CIVIL DEFENCE TSUNAMI ADVISORY: Strong and unusual currents and unpredictable surges at the shore are expected following a M@@Magnitude@@ earthquake near @@Location@@. Strong currents and surges can injure and drown people. There is a danger to swimmers, surfers, people fishing, small boats, marinas and anyone in or near the water close to shore.

PEOPLE IN COASTAL AREAS DO NOT NEED TO EVACUATE, but should:

1. Stay out of the water (sea, rivers, and estuaries)
2. Stay off beaches and shore areas and away from marinas
3. Do not go sightseeing
4. Listen to local Civil Defence and radio/TV for updates
5. Share this information with family, neighbours and friends

This advisory is for @@LOCATIONS@@. For more information go to @@www.URL.govt.nz@@

Issued at @@Time@@ @@DayDateMonth@@.

OTCDEM TS02-Evacuate Immediately

CIVIL DEFENCE TSUNAMI WARNING: A M@@Magnitude@@ earthquake near @@Location@@ has caused a large tsunami that will impact New Zealand. A tsunami is a LIFE-THREATENING surge of sea water flooding coastal land, carrying debris.

People in coastal areas MUST LEAVE IMMEDIATELY out of all evacuation zones and move to high ground or as far inland as possible. DO NOT STAY AT HOME. Walk, run or cycle if you can.⁸ Take only essential items (and pets) with you and share this information if it doesn't delay you. DO NOT RETURN until Civil Defence gives the all-clear message. Stay out of the sea, rivers and off beaches. Dangerous waves will continue for many hours.

This warning is for those in areas near the coast between @@LOCATION to LOCATION@@, including @@LOCATIONS@@.

OTCDEM-TS03 -Change in Evacuation

CIVIL DEFENCE TSUNAMI UPDATE: A life-threatening tsunami has been caused by today's @@Name@@ earthquake. Impacts have occurred from this tsunami. Dangerous waves will continue for many hours. STAY OUT of coastal areas.

Evacuation now ONLY applies to the following areas - LEAVE NOW, walk, run or cycle: The @@Direction@@ of the South Island from @@LOCATION to LOCATION@@, including @@LOCATIONS@@. DO NOT RETURN until an all-clear message is given by Civil Defence.

All NZ coastal waters may have unusual strong currents lasting for several more hours. Stay out of the water, rivers, & off beaches.

⁸ National Emergency Management Agency's consistent-messages-part-B-tsunami-revised-Oct-2017 recommends "Walk or bike quickly if possible, drive only if essential. If driving, keep going once you are well outside of all evacuation zones, to allow room for others behind you." Given the relatively low population centres on the Otago coastline, it may be appropriate to remove the current statement all together. – For consideration.

OTCDEM-TS04- Stay Out

CIVIL DEFENCE TSUNAMI UPDATE: The tsunami from @@Location@@ is still flooding land along New Zealand's coasts. This tsunami (surge of sea water) is LIFE-THREATENING and is causing MAJOR IMPACTS. This is a serious event.

DO NOT RETURN to coastal areas until an official all-clear message is given by Civil Defence. STAY WELL AWAY FROM THE WATER, including beaches, rivers, inlets, and shore areas. Dangerous waves will keep coming for many more hours. The first waves are usually not the largest.

People in areas near the coast between @@LOCATION to LOCATION@@, including @@LOCATIONS@@. should have left for high ground, or be as far inland as possible. If you haven't already done so, LEAVE NOW.

OTCDEM -TS05-Don't return Home

CIVIL DEFENCE TSUNAMI UPDATE: Following the @@Name@@ earthquake and tsunami this @@morning/afternoon/evening@@, the situation has changed. Unfortunately, due to damage from the tsunami, it remains unsafe to go back into coastal areas, including @@LOCATIONS@@. People from those areas need to stay with friends or family, or go to a Civil Defence Centre once they are setup. Help others if you can. New Zealand's coastal waters may still get unusual, strong currents and surges lasting for several more hours. Stay out of the water, off beaches, rivers and shore areas until further notice.

@@www.URL.govt.nz@@. Issued: @@Time@@ @@DayDateMonth@@.

OTCDEM -TS06- Return Home

CIVIL DEFENCE TSUNAMI UPDATE: Following the @@Name@@ earthquake and tsunami this @@morning/afternoon/evening@@, the situation has changed. There will be no more flooding of coastal areas in New Zealand from the tsunami. You no longer need to evacuate. New Zealand's coastal waters may still get unusual, strong currents and surges lasting for several more hours. Stay out of the water, off beaches, rivers and shore areas until further notice.

If you are returning to, or travelling through an area that has been impacted by the tsunami or earthquake, TAKE EXTREME CARE. You may have experienced or come across damage. Look for, and report, broken utility lines to appropriate authorities. The flood water will be unsafe and contaminated. Take notes and photos of damage, and contact your insurance company. Help others if you can.

Issued @@Time@@ @@DayDateMon@@.