



DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT

Guideline for preparing a coastal zone emergency action subplan



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1 Introduction

The *Coastal Management Act 2016* (CM Act) (section 15(1)(e)) outlines that a coastal zone emergency action subplan (CZEAS) must be included in a coastal management program (CMP) if the local council's local government area contains land within the coastal vulnerability area (CVA), and beach erosion, coastal inundation or cliff instability is occurring on that land. Mandatory requirements for a CMP, including the preparation of a CZEAS where required, are identified in Part A of the coastal management manual (OEH 2018).

The aim of this guideline is to provide additional guidance to councils to assist in preparing a CZEAS as part of a CMP.

The guideline describes the:

- statutory context and how a CZEAS fits within the coastal management framework and broader emergency management framework in New South Wales (Section 2)
- emergencies that are covered in a CZEAS (Section 3)
- purpose of a CZEAS (Section 4)
- steps to prepare a CZEAS (Section 5)
- content of a CZEAS (Section 6).

This document replaces 'Coastal zone management guide note: Emergency action subplans' (OEH 2011) and 'Guide to the statutory requirements for temporary coastal protection works' (OEH 2013), which supported the *Coastal Protection Act 1979*.

2 Statutory context

When preparing a CZEAS to be included in a CMP, councils must consider the relationship between the coastal management framework, established by the CM Act, and the broader NSW emergency management framework.

A CZEAS within a CMP must not include matters dealt with in any plan made under the *State Emergency and Rescue Management Act 1989*.

2.1 *State Emergency and Rescue Management Act 1989*

The overarching framework for emergency management in New South Wales is established by the *State Emergency and Rescue Management Act 1989* (SERM Act).

The SERM Act defines an emergency as follows:

(1) *In this Act:*

emergency means an emergency due to an actual or imminent occurrence (such as fire, flood, storm, earthquake, explosion, terrorist act, accident, epidemic or warlike action) which:

(a) endangers, or threatens to endanger, the safety or health of persons or animals in the State, or

(b) destroys or damages, or threatens to destroy or damage, property in the State, or

(c) causes a failure of, or a significant disruption to, an essential service or infrastructure,

being an emergency which requires a significant and coordinated response.

(2) For the purposes of the definition of **emergency**, property in the State includes any part of the environment of the State. Accordingly, a reference in this Act to:

(a) threats or danger to property includes a reference to threats or danger to the environment, and

(b) the protection of property includes a reference to the protection of the environment.

The SERM Act outlines roles and responsibilities for all emergency management in New South Wales. The Act specifies:

- that emergency management committees are established at the state, regional and local levels
- that emergency management plans (EMPLANs) are prepared and reviewed at the state, regional and local level
- arrangements for controlling emergency operations, and
- responsibilities of emergency operations controllers.

Arrangements established by the SERM Act are explained in [Emergency Management Arrangements for NSW](#) (NSW Government 2016a) and on the [NSW Emergency website](#).

The [NSW State Emergency Management Plan 2018 \(EMPLAN\)](#) (NSW Government 2018) describes the NSW approach to emergency management, the governance and coordination arrangements, and roles and responsibilities of agencies. The plan is supported by hazard specific subplans and functional area supporting plans.

Consistent with the SERM Act, the objectives of the EMPLAN are to:

- a. provide clarity as to command and control, roles and coordination of functions in emergency management across all levels
- b. emphasise risk management across the full spectrum of prevention, preparation, response and recovery
- c. emphasise community engagement in the development and exercise of plans as well as in their operational employment
- d. ensure that the capability and resourcing requirements of these responsibilities are understood.

The NSW State Emergency Service (NSW SES) is the designated combat agency for management of floods, tsunamis and storms, including severe storms which cause coastal erosion. The NSW SES prepares the State Storm Plan, State Flood Plan and State Tsunami Plan, which are subplans to the EMPLAN. The Emergency Operations Controller (EOCON) has responsibility for operations where no specific combat agency is nominated.

2.2 Coastal Management Act 2016

The CM Act identifies specific emergency management considerations associated with beach erosion, coastal inundation and cliff instability. Statutory provisions relevant to the CZEAS are detailed below.

Relevant statutory provisions from the CM Act

15 Matters to be dealt with in a coastal management program

(1) A coastal management program must:

(e) if the local council's local government area contains land within the coastal vulnerability area and beach erosion, coastal inundation or cliff instability is occurring on that land, include a coastal zone emergency action subplan.

(3) A **coastal zone emergency action subplan** is a plan that outlines the roles and responsibilities of all public authorities (including the local council) in response to emergencies immediately preceding or during periods of beach erosion, coastal inundation or cliff instability where the beach erosion, coastal inundation or cliff instability occurs through storm activity or an extreme or irregular event. For the purposes of this subsection, those roles and responsibilities include the carrying out of works for the protection of property affected or likely to be affected by beach erosion, coastal inundation or cliff instability.

(4) A coastal management program must not include the following:

(a) matters dealt with in any plan made under the State Emergency and Rescue Management Act 1989 in relation to the response to emergencies,

(b) proposed actions or activities to be carried out by any public authority or relating to any land or other assets owned or managed by a public authority, unless the public authority has agreed to the inclusion of those proposed actions or activities in the program.

16 Consultation

(1) Before adopting a coastal management program, a local council must consult on the draft program with:

(c) other public authorities if the coastal management program:

(ii) proposes specific emergency actions or activities to be carried out by a public authority under the CZEAS, or

(iii) relates to, affects or impacts on any land or assets owned or managed by that public authority.

Mandatory requirements from Part A of the coastal management manual

Local councils prepare their coastal management programs in accordance with the coastal management manual, pursuant to s. 14(1) of the CM Act. If the CM Act requires a coastal zone emergency action subplan to be prepared, it must identify any requirements for how emergency coastal protection works, within the meaning of the *State Environmental Planning Policy (Coastal Management) 2018* (CM SEPP), are to be carried out.

The management objectives for the coastal vulnerability area (CVA) are in s. 7 of the CM Act. Actions in the CZEAS must be compatible with, and assist in satisfying, these management objectives. The CZEAS should be consistent with plans prepared under the SERM Act including the state, regional and local EMPLANS, State Storm Plan and State Flood Plan. The relationship between the SERM Act and CM Act is detailed in **Figure 1**.

Note that the CZEAS is to identify emergency actions for cliff and bluff instability hazards and risks, which are not covered by a specific plan in the SERM framework.

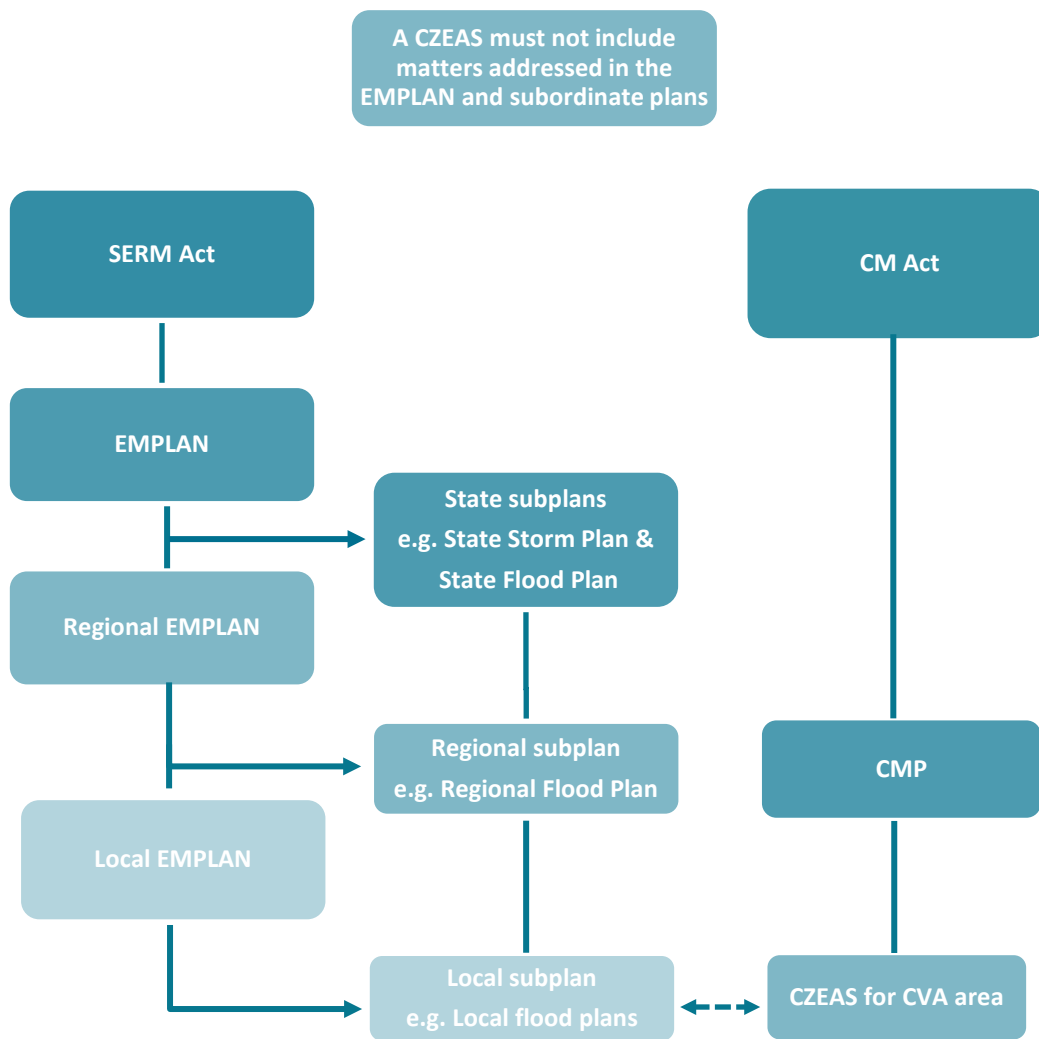


Figure 1 Simplified legislative framework for emergency management in NSW and its relationship with coastal management legislation and coastal management programs related to coastal hazards
Diagram based on Parmenter et al. (2013), updated to reflect commencement of the CM Act.

3 Emergencies covered in a CZEAS

The CM Act requires that a CZEAS be included in the CMP if the local council's local government area contains land within the coastal vulnerability area and beach erosion, coastal inundation or cliff instability is occurring on that land due to storm activity or an extreme or irregular event (see below for definitions of these hazards). Other coastal hazards identified in s. 4 of the CM Act (shoreline recession, coastal lake or watercourse entrance instability, tidal inundation and erosion and inundation of foreshores caused by tidal waters and the action of waves) are outside the scope of the CZEAS.

3.1 Coastal hazards to be addressed

Beach erosion occurs when wind, waves, currents or elevated ocean water levels are removing the sediment that comprises the beach and frontal dune system, landward of the fully accreted condition.

Storm driven beach erosion may result in:

- erosion on sandy beaches, including berms and frontal dunes, either directly because of undermining, or indirectly because the foundation capacity of the remaining dune adjacent to the eroded area has been reduced
- high, unstable, near-vertical back-beach erosion escarpments
- damage to poorly designed or maintained coastal protection works.

Beach erosion can create risks to public and private assets and present public safety risks. Not all beach erosion occurring during a storm event will trigger a coastal emergency.



Figure 2 Erosion at Wamberal beach caused property damage and a public safety risk, June 2016 (Photo: D Hanslow/DPIE)



Figure 3 Extensive damage to private property and utilities resulting from erosion at Collaroy Beach following a severe coastal storm (Photo: UNSW Water Resources Laboratory)

Coastal inundation occurs when a combination of marine and atmospheric processes raises water levels at the coast above normal elevations, causing land that is usually 'dry' to

be inundated by seawater. It is often associated with storms resulting in elevated still water levels (storm surge), wave set-up, wave runup and over-wash flows.

Overtopping and inundation can occur on:

- beaches and coastal dunes, causing erosion, slumping or movement of large objects
- seawalls, revetments and entrance training structures (breakwaters), causing structural instability and safety issues with the movement of large objects
- cliffs and bluffs (in extreme storm conditions).

Storm surge and powerful waves can also penetrate estuaries giving rise to strong currents or seiching. This may result in inundation of roads and low-lying land adjacent to estuaries and waves created by vehicle movement in these locations.



Figure 4 Coastal inundation at North Entrance (Photo: Wyong Shire Council)



Figure 5 Damage caused by coastal inundation (Photo: G Armstrong/Eurobodalla Shire Council)

Cliff instability refers to a variety of geotechnical processes on coastal cliffs and bluffs, including rock fall, slumps and landslides. It may be driven by coastal processes such as wave undercutting and overtopping, or by differential weathering of rock layers in cliffs and bluffs or by surface and groundwater flows. Instability may occur during or following a coastal storm event, but may also occur at other times. There may be very little warning that a cliff instability incident is imminent.

These hazards may endanger life and property at the site of the process (e.g. through collapse of a lookout platform or walking track, or undermining of dwellings), and at the toe of the cliff or bluff (rock platform or beach). They may result in risks to boaters and fishers in adjacent marine areas.



Figure 6 Rock fall from coastal cliff, Newcastle October 2002 (Photo: DPIE)



Figure 7 Rock fall at Turimetta Head, Warriewood (Photo: P Hardie/Northern Beaches Council)

4 Purpose of a CZEAS

The purpose of a CZEAS is to identify and facilitate the implementation of appropriate emergency responses for emergencies related to certain coastal hazards that will:

- protect human life and public safety
- minimise damage to property and assets
- minimise impacts on social, environmental and economic values
- not create additional hazards or risks.

Actions in the CZEAS aim to reduce risk:

- in areas where a council has chosen not to implement other coastal protection works to reduce coastal hazard risks, which have been evaluated as tolerable or acceptable
- where coastal hazard risks have not been reduced or eliminated because an agreed action in a CMP has not yet been implemented
- where coastal hazard risks remain after other actions have been implemented (residual risk)
- when rare and very large or unexpected events occur, outside the design criteria or capacity of agreed management actions in a certified CMP.

Effective coastal emergency responses will prioritise actions that support the continued functionality of essential infrastructure during and immediately after a coastal emergency.

The implementation of long-term risk mitigation strategies such as changes to land use, construction and maintenance of coastal protection measures or beach nourishment will reduce the risks and impacts associated with coastal storm events, and should, in turn, reduce the reliance on emergency response planning. Long lead times for the implementation of such large-scale integrated responses will necessitate emergency response planning in the interim.

The CZEAS should be prepared to facilitate effective emergency responses by:

- defining a coastal emergency and triggers for emergency response actions
- identifying the locations that may be affected by beach erosion, coastal inundation or cliff instability that would constitute a coastal emergency
- outlining the roles and responsibilities of all public authorities (including the local council) and coordinating their response to emergencies immediately preceding or during periods of beach erosion, coastal inundation and cliff instability
- identifying the locations and types of works that may be undertaken for the protection of property and assets
- outlining what actions are to be undertaken in the prevention, preparation, response and recovery phases of emergency management
- informing the public and potentially affected property owners about their responsibilities during a coastal emergency and what actions they are and are not permitted to undertake.

5 Preparing a CZEAS

5.1 Emergency management documents

In developing a CZEAS, it is recommended that councils read this guideline in conjunction with:

- [CM Act](#)
- [CM SEPP](#)
- [Emergency Management Arrangements for NSW](#)
- [Implementing Emergency Risk Management through the Integrated Planning and Reporting Framework: A Guideline for Local Government and Emergency Managers.](#)
- [Local Emergency Management Planning Guideline](#)
- [NSW Coastal Management Manual](#)
- [NSW Recovery Plan](#) and [Community Recovery Toolkit](#)
- [NSW State Emergency Management Plan \(EMPLAN\)](#) and relevant subplans
- [NSW State Storm Plan](#)

Other useful documents relating to emergency management are listed in Sections 7 and 8 below.

5.2 Aligning with the CM Act

A CZEAS must be consistent with the objects of the CM Act (s. 3) and the relevant management objectives for the coastal vulnerability area (s. 7 of the CM Act).

The management objectives for the coastal vulnerability area require CMPs to:

- prioritise actions that support the continued functionality of essential infrastructure during and immediately after a coastal hazard emergency
- improve the resilience of coastal development and communities by improving adaptive capacity and reducing reliance on emergency responses.

5.3 Aligning with the CMP

An effective CZEAS will align with the strategic direction of the CMP. This means that the CZEAS will be consistent with the way the CMP proposes to manage coastal hazard risks identified in the coastal vulnerability area. This may be through natural defences, structural coastal protection works or planning for change to the location or intensity of development and associated infrastructure.

5.4 CZEAS preparation tasks in each stage of the CMP

Where a CZEAS is required, it should be prepared as part of the CMP. The additional actions that councils may consider in developing the CZEAS are outlined in **Table 1** and are aligned with the relevant stage of CMP preparation.

Table 1 Tasks to develop a CZEAS as part of the CMP

CMP stage	Actions specific to the development of the CZEAS
<p>1 – Identify the scope of the CMP</p>	<p>Identify the scope of the CZEAS:</p> <ul style="list-style-type: none"> • identify and map land within the coastal vulnerability area which is, or may be, affected by beach erosion, coastal inundation or cliff instability • identify (using available information and a first-pass risk assessment) risks to property and public safety from: <ul style="list-style-type: none"> ○ beach erosion ○ coastal inundation ○ coastal cliff and slope instability • compile a register of: <ul style="list-style-type: none"> ○ built assets and utility service infrastructure (roads, water, sewerage, stormwater, electricity, gas and telecommunications) that may be affected in the immediate timeframe (within the next 10 to 20 years) ○ private assets and materials that may increase risk to beach users following an erosion event (i.e. private beach access, fences, building material, etc.) ○ public access points in areas subject to beach erosion ○ where feasible, existing coastal protection works and their condition (noting that some will be buried under sand, or may have been placed in an ad-hoc fashion) ○ the type of foundations of any buildings in the immediate coastal vulnerability area to assist in assessment during an emergency (where feasible) ○ land tenure in areas susceptible to emergency events • review the effectiveness of existing emergency responses to mitigate current, future and residual risk from coastal hazards • identify objectives for the CZEAS, consistent with management objectives of the CVA and the strategic direction in the CMP • identify relevant plans under the SERM Act (to ensure CZEAS does not duplicate actions) • determine the conditions that will trigger a coastal emergency (see Section 6.1 below) • ascertain community awareness about risks from coastal hazards • identify council staff that play a role in emergency management activities (e.g. Local Emergency Management Committee (LEMC) operations, communications, waste management, risk management and legal) • identify landholders, public authorities, businesses and community members who may be affected by coastal emergencies. This will include public and private infrastructure owners such as water and wastewater authorities other than the council, that have assets that may be affected in a coastal emergency • seek advice/clarification on the scope of the CZEAS from DPIE if necessary. <p>(See Section 1.5 in Part B, Stage 1 of the coastal management manual (OEH 2018b).)</p>
<p>2 – Detailed studies of risks, vulnerabilities and opportunities</p>	<ul style="list-style-type: none"> • Where necessary, complete additional studies to identify current and future hazards and risks which will require an emergency response. • Where necessary, complete additional studies to understand community sensitivity and vulnerability in coastal emergency conditions. This could include information about, age, health, language,

CMP stage	Actions specific to the development of the CZEAS
	<p>types of housing, presence and condition of existing coastal protection structures, and safe egress options.</p> <ul style="list-style-type: none"> • Determine community awareness of the risks and the necessity for and appropriateness of actions at the time of coastal emergency events. <p>(See Section 2.5.9 in Part B, Stage 2 of the coastal management manual (OEH 2018b).)</p>
<p>3 – Identify and evaluate options</p>	<ul style="list-style-type: none"> • Identify emergency response actions for the four phases of emergency management, consistent with the strategic direction identified in the CMP for the management of the coastal vulnerability area. • Consult with the SES and LEMCs about roles and responsibilities for coastal emergency management to ensure integration with the SERM framework and compatibility with sub-plans. • Consult with public and private infrastructure owners that may be affected by coastal emergencies (e.g. water and wastewater authorities other than the local council) about emergency management options to maintain functionality of essential infrastructure during a coastal emergency. • Consult with public authorities if the emergency actions are to be implemented by a public authority, or are affecting any land or asset that is owned or managed by a public authority. • Confirm responsibilities for implementation through further consultation with public authorities including the NSW SES. • Engage with the community about awareness of residual risks and emergency responses. • Consider the necessary approval pathways for emergency response actions. • Prepare a communication protocol to be used before, during and after a coastal emergency that outlines procedures to: <ul style="list-style-type: none"> ○ engage with landholders in the coastal vulnerability area to raise awareness of coastal emergency events and the dangers these conditions may present ○ inform landholders of actions council will take during an emergency, what actions a landholder may need to take and any assistance that may be available to them ○ issue safety advice to landowners and the community of the likelihood of an impending emergency that would initiate actions under the CZEAS ○ advise council staff of all emergency management procedures and ensure they have the capacity to respond. <p>(See Section 3.5.5 in Part B, Stage 3 of the coastal management manual (OEH 2018b).)</p>
<p>4 – Prepare, exhibit, finalise, certify and adopt the CMP</p>	<ul style="list-style-type: none"> • Prepare a draft CZEAS as part of the draft CMP. • Exhibit, finalise and certify the CMP which contains the CZEAS. • Obtain agreement from public authorities about any actions or activities to be carried out by the public authority, or on land or other assets owned or managed by the public authority.
<p>5 – Implement, monitor, evaluate and report</p>	<ul style="list-style-type: none"> • Obtain any necessary approvals or undertake relevant assessment of emergency actions. • Implement coastal emergency actions through council’s relevant emergency management plans, programs and policies and the Integrated Planning and Reporting framework where necessary. • Monitor and evaluate the implementation of the CZEAS after an emergency event and amend where necessary.

5.5 Identifying actions in each phase of emergency management

The CZEAS should include actions to be implemented in each of the four phases of emergency management (see **Figure 8**). Where actions, roles or responsibilities relating to coastal emergencies are covered by the SERM Act framework, the CZEAS should refer to the relevant plan or subplan, rather than duplicate those actions. Details of potential actions are show in **Table 2** below.

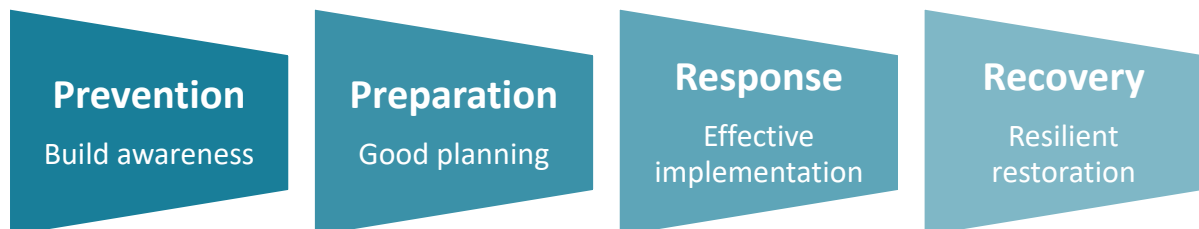


Figure 8 Emergency response in the coastal management context

Table 2 Emergency actions

Phase 1 – Prevention
<ul style="list-style-type: none"> • Assess threats to life and property arising from a coastal emergency. • Provide advice to the community, landholders and the NSW SES about the potential for a coastal emergency from beach erosion, coastal inundation or cliff instability, and the types of responses that are permitted and not permitted.
Phase 2 – Preparation
<p>Actions to be initiated to prepare a community for a coastal emergency may include:</p> <ul style="list-style-type: none"> • Identify type of emergency works, sources of materials and where they can be stored. This may include sand and sandbags, signage and fencing to control access. • Identify the types of coastal works that would be appropriate. • Identify locations where emergency coastal protection works may be placed. • Liaise with utility providers (water, sewerage, etc.) in areas where assets may be impacted during an emergency. • Identify the location of access ways where materials (sand and/or sandbags) could be moved onto the beach. • Detail any procedures or approvals required to make access ways available, e.g. keys for locked gates, or landowner's consent from NSW Department of Industry – Lands and Water. • Identify where signage would be erected and specific warnings, such as warning pedestrians of potential wave runup and overtopping on walkways, promenades and on cliffs or bluffs. • Identify when and how works will be removed. • Develop an operations procedure to guide council's response to emergency events (including resourcing, internal training, testing and periodic review). • Maintain up-to-date personal contact details for key council staff involved in coordinating actions under the CZEAS (include responsibilities of staff who prepare for, manage and coordinate recovery from an erosion emergency event) and individuals the council may need advice from, such as DPIE staff, or to integrate with personnel from other emergency sectors. • Ensure appropriate plant, equipment and experienced personnel are readily available, and assess any potential environmental impacts associated with the placement and removal of emergency coastal protection works and how those impacts will be managed. This should include consideration of how placement of these works may increase the risk to adjacent property along with any cultural heritage places and ecological values which may be affected by the proposed emergency works. • Identify those properties which may potentially require evacuation or the movement of readily movable household items during storm events.

Phase 3 – Response

Response actions may include:

- Implement the communication protocol in conjunction with the combat agency (NSW SES) to advise landholders, residents, public authorities and other organisations that a coastal emergency is likely or is occurring and that actions in the CZEAS are to be implemented.
- Alert land managers about access requirements.
- Increase surveillance of beach erosion and inundation hazards.
- Place appropriate equipment on stand-by.
- Install emergency coastal protection works to address beach erosion, coastal inundation or cliff instability, in compliance with the CM Act and CM SEPP. These works include the placement of sand or sandbags (which must be removed within 90 days) on a beach or sand dune adjacent to a beach:
 - i the council is the lead agency for this work, the SES may assist with coordination
 - ii works must only be implemented when it is safe to do so.
- Install emergency works for coastal emergencies that may arise without the presence of storm conditions, such as beach erosion and inundation associated with high water level anomalies that are not storm driven (extreme or irregular events).
- Install temporary fencing and/or signage on council managed land (e.g. foreshore reserves and beach access ways) affected by beach erosion, coastal inundation or cliff instability resulting from major storm activity or an extreme or irregular event, where this has resulted in unsafe conditions.
- Close council managed roads affected by beach erosion, coastal inundation or cliff instability hazards. Liaise with other agencies (e.g. Roads and Maritime Services, Crown land in New South Wales, National Parks and Wildlife Service) if debris from coastal hazards creates a safety hazard in adjoining areas (or liaise with road owners to enable closure).
- Close water and sewer infrastructure affected by beach erosion, coastal inundation or cliff instability hazards (or liaise with asset owners to enable shut down).

Phase 4 – Recovery

After a coastal emergency has ceased, the following recovery tasks may be required:

- Monitor the condition, performance and impact of any coastal protection works.
- Remove any threats to public safety, such as debris deposited or exposed on beaches.
- Remove any sandbags within 90 days.
- Restore access to beaches, headlands and estuary foreshores.
- Maintain temporary safety fencing and associated warning signage, as necessary.
- Issue clean-up orders under the *Local Government Act 1993*.
- Assess the structural integrity of unprotected assets affected by or damaged during the emergency event. Geotechnical, structural and/or coastal engineering investigations may be required to understand residual risk following an emergency event.
- Liaise with property owners to ensure any private and/or public structures do not pose a risk to the public.
- Undertake works to re-establish or enhance the natural protective features of the coast, such as dune shaping and revegetation.
- Advise the community of any ongoing dangers, such as high, unstable or near-vertical erosion escarpments drying out and/or geotechnical hazards collapsing without notice (in high-use public areas the council may consider collapsing these escarpments with machinery).
- Issue orders under the *Local Government Act* and/or the *Environmental Planning and Assessment Act 1979* when properties are deemed structurally unsafe or pose a risk to the public.
- Replenish any emergency materials and supplies for future emergency events.
- Critically review the CZEAP (coastal zone emergency action plan), communications plan and operational procedures to ensure they achieved their performance objectives.

6 Content of a CZEAS

As a minimum, a CZEAS should identify any requirements for how emergency coastal protection works, within the meaning of the CM SEPP, are to be carried out.

Clause 19(4) of the CM SEPP defines emergency coastal protection works as ‘works comprising the placement of sand, or the placing of sandbags for a period of not more than 90 days, on a beach, or a sand dune adjacent to a beach, to mitigate the effects of coastal hazards on land’.

The CZEAS must outline:

- the roles and responsibilities of all public authorities (including the local council) in response to emergencies immediately preceding or during periods of beach erosion, coastal inundation or cliff instability, where the beach erosion, coastal inundation or cliff instability occurs through storm activity or an extreme or irregular event
- consultation that has taken place with other public authorities in preparing the CZEAS
- any works for the protection of property affected or likely to be affected by beach erosion, coastal inundation or cliff instability triggers for emergency response actions.

It is also recommended that the CZEAS include:

- the objectives and scope of the CZEAS, consistent with the objects of the CM Act, management objectives of the CVA and the strategic direction of the CMP
- a definition of coastal emergencies
- criteria/thresholds/triggers for when a coastal emergency is occurring
- a map and/or register of land and assets that are, or may be, affected by beach erosion, coastal inundation or cliff instability
- coastal emergency actions for the four phases of emergency management: prevention, preparation, response and recovery
- a protocol for communication and engagement before, during and after an emergency event.

6.1 Defining when emergency action will be initiated

The CZEAS must specify the criteria and thresholds for when emergency action will be initiated in relation to coastal hazards.

When considering whether a storm could give rise to a coastal emergency, councils should consider:

- predicted wave conditions (height, direction, period, duration and set-up)
- predicted tidal range and tidal anomaly generated by storm surge (Gordon et al. 2016)
- condition of the beach
- condition of dune vegetation
- presence and influence of adjacent headlands and coastal protection structures.

The Bureau of Meteorology (BoM) provides weather information including warnings, forecasts and briefings to the NSW SES and State Emergency Management Committee (SEMC). The BoM specifies the following thresholds for issuing warnings for ‘severe storms’:

- rainfall of sufficient intensity to cause flash flooding (generally equal to or exceeding the one in 10-year average recurrence interval)
- waves equal to or exceeding five metres height in the surf zone
- storm surge (see Section 2.2.8 of the 2018 State Storm Plan).

In addition to the 'severe storm' warning, councils may wish to consider specific triggers for when **beach erosion** requires an emergency response. These may include storm bite being within a set distance of:

- essential infrastructure – such as sewage pump stations or roads
- other public assets such as a surf club building
- privately owned built assets such as homes

Another consideration may be where storm bite erosion is damaging and making beach access ways and access structures unsafe.

Consideration may also be given to specific triggers for **coastal inundation** including:

- wave runup at low tide is a set distance from essential infrastructure such as sewage pump stations or roads
- wave runup is affecting safe access to public land, such as council reserves at the back of the beach and beach access ways
- wave runup is likely to impact on public assets such as surf clubs or schools
- wave runup and overtopping affects the safety of egress for vulnerable people
- wave runup at low tide is a set distance of any residence.

In considering geotechnical risks associated with **cliff and bluff instability** triggers may include:

- open cracks, or steps, along contours
- groundwater seepage, or springs
- bulging in the lower part of the slope
- trees leaning down slope, or with exposed roots
- debris/fallen rocks at the foot of a cliff
- tilted power poles or fences
- cracked or distorted structures.

Information on approval pathways for emergency coastal protection works are set out in the *Coastal protection works* fact sheet (Department of Planning and Environment 2018).

7 Reference documents

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8 Additional resources

The NSW State Emergency Service (SES) has developed a series of information guides and smartphone apps to assist councils to inform communities of risks from floods, storms and tsunamis. These include local and targeted FloodSafe Guides, a Stormsafe Guide and TsunamiSafe Guides. Refer to the SES [Flood Storm and Tsunami Guides](#) webpage.