



TSUNAMI AND STORM SURGE

Please note that the foundation messages are included in the previous section: Key messages for all-hazards household and family disaster planning. Separate messages are also available for other specific hazards.

A tsunami is a sea wave of local or distant origin that results from large-scale seafloor displacements associated with strong earthquakes, major submarine slides, or exploding volcanic islands.

A tsunami can strike any coast at any time and we cannot predict exactly when or where they will occur. Undersea earthquakes most often cause tsunamis but submarine landslides or volcanic eruptions can also cause them. A tsunami can move as fast as a jet plane across the Open Ocean and can hit land with waves as high as 20 metres or more. The water may wash inland for several kilometres in flat lying areas, and can move up streams and rivers, destroying everything in its path. Waves may continue to strike the shoreline for many hours, and dangerous currents can continue for days following the event.

Since the devastating Sumatra earthquake and Indian Ocean tsunami of December 2004, it has been recognized that there is risk of tsunami along all coastlines. Due to its devastating impacts, exemplifying the tremendous fatalities and losses, tsunamis are now part of many risk reduction programmes. With more than 220,000 fatalities, the Indian Ocean tsunami was one of the deadliest disasters triggered by a natural hazard.

Although a tsunami cannot be prevented, its impact can be lessened when communities understand the risks, receive timely warnings and know how to respond.



Assess and plan

Key messages	Context-specific details
Learn about local risks of tsunami, storm surge, and king tides	<ul style="list-style-type: none"> Find out if your home, workplace, school or visited locations are at risk from tsunami and coastal inundation. Learn about the history of tsunami, coastal inundation and king tides, and about the impacts of climate change related to these risks in your area.
Make your tsunami evacuation plans	<ul style="list-style-type: none"> Identify higher ground (if possible 30 meters, i.e. 100 feet above sea level or 3 kilometres, i.e. 2 meters inland) and the routes to get there. Identify tsunami-safe shelters or structures in your community. Know the tsunami evacuation zone and routes for your area. Display maps wherever helpful. Post and observe evacuation route signs. Plan to evacuate on foot, bicycle and vehicle where possible. (If you live in a community with lots of people and vehicles, consider evacuating on foot immediately after the strong shaking stops.) Plan to evacuate pets and livestock.
If you feel a long or strong earthquake or see a rapid rise or fall of coastal waters move inland or to higher ground, immediately – these are warning signs	<ul style="list-style-type: none"> Natural warning signs are: <ul style="list-style-type: none"> Strong earthquake shaking for 30 seconds or more means immediate, high tsunami risk from near-field earthquake (no time for official warning). Move to higher ground immediately. Long moderate or weak earthquake shaking that lasts for 40 seconds or more means high local tsunami risk from mid-field earthquake (official warning time may be very short). Move to higher ground immediately. Rapid rise or fall in coastal waters Coastal water making unusual noise (like approaching train, plane or whistling)
Learn and be ready to act on official tsunami advisory and alert system	<ul style="list-style-type: none"> Official tsunami advisory and alert system includes: <ul style="list-style-type: none"> international tsunami warning regional tsunami warning local tsunami warning <i>all clear</i> means danger has passed, you may return home

Work with schools in tsunami risk areas to plan evacuation routes	<ul style="list-style-type: none"> • If school is in an identified tsunami risk area, ensure and learn the schools' evacuation routes, and practice evacuation drills. • Be sure that schools plan for automatic evacuation in response to natural warning signs. • Make plans for <i>safe family reunification</i> after the <i>all clear</i> is given.
Know when it is safe to return	<ul style="list-style-type: none"> • If there has been an official warning, there will be an official <i>all clear</i> message by radio or SMS issued by the authorities or an official agency. • If there has been no official warning, you may return after two hours, if there has been no impact.
Consider and plan for evacuation needs of all household members	<ul style="list-style-type: none"> • Plan for evacuation needs of small children, elderly people, those with disabilities and pets.



Mitigate risks: physical or environmental

Key messages	Context-specific details
Seek expert advice before construction	<ul style="list-style-type: none"> • If you are building in a coastal area, ask local authorities about the likelihood of tsunami and coastal inundation (including the effects of climate change). • If you build in a coastal zone, follow construction practices to make structures less vulnerable to strong surges. Clearly post evacuation instructions and plan and keep evacuation routes clear.
Protect your home, farm and livestock	<ul style="list-style-type: none"> • Follow and promote proper land-use planning. • Seek information from local authorities to mitigate potential coastal inundation damage. • If long-range warning time permits, secure unanchored objects.
Prepare evacuation routes and <i>safe havens</i>	<ul style="list-style-type: none"> • Identify <i>safe havens</i> and prepare safe routes for yourself and your family, pets and service animals and livestock. • Practice evacuation at least once a year.



Prepare to respond: develop skills and store provisions

Key messages	Context-specific details
Respond to natural warning signs and do not wait for alert: In case of a very strong or very long earthquake, move quickly to higher ground or as far inland as possible	<ul style="list-style-type: none"> During strong, moderate, and weak earthquakes follow <i>drop, cover and hold on</i> and count the number of seconds of shaking (e.g. say '1–1,000, 2–1,000, 3–1,000' to count each second passing). If it difficult to stand up due to the strong shaking of the ground that lasts for 20 seconds, or if moderate or weak shaking lasts for 40 seconds or more, evacuate immediately. Evacuate to higher ground 30 meters above sea level or 3 kilometres inland. Follow posted evacuation routes, where present. If there are any official tsunami evacuation structures nearby, proceed there immediately. If you cannot evacuate to higher ground, move to the third floor or above, go to the roof, climb up a tree, or grab a floating object. Do not stop to collect animals unless they are easy to get to and will not delay you or inhibit your own safety. Do not try to reunite until you reach the <i>safe haven</i>, or after until after the <i>all clear</i> is issued. Avoid hazards caused by earthquake damage.
Follow instructions for tsunami advisory or alert	<ul style="list-style-type: none"> In case of an international tsunami warning, listen to the radio, television and heed to local warnings and prepare to evacuate. In case of a regional tsunami warning, help vulnerable members of household to evacuate as quickly as possible. Share warnings in your community and follow instructions for evacuation. If time permits secure unanchored objects outside.
Practice tsunami evacuation drills	<ul style="list-style-type: none"> Practice community-wide tsunami evacuation drills from work, school and home, following evacuation routes to <i>safe haven</i>, and waiting for the <i>all clear</i> signal. Include animals and livestock in drills, where possible.
Protect livestock and pets	<ul style="list-style-type: none"> Consider precautionary evacuation of your animals to higher ground.

Stay away from the coast, tidal estuaries, rivers and streams	<ul style="list-style-type: none"> • In the event that you can see the wave coming, you are too close to outrun it. • Tsunamis can travel quickly up rivers, streams and estuaries.
If you are at sea, stay there	<ul style="list-style-type: none"> • Boats are generally safer in water deeper than 20 meters. • Ships are safest on high seas in water deeper than 100 meters. • A combination of loose mooring and loose anchorage reduces risk of boats drifting onto land. • Do not return to land or port until an <i>all clear</i> has been issued.
Stay out of danger until an official <i>all clear</i> message is received	<ul style="list-style-type: none"> • Follow family reunification plans after the <i>all clear</i> message is received. • Return home only after official message is received.
Be aware of and minimize secondary hazards	<ul style="list-style-type: none"> • Beware of secondary hazards such as contaminated water, damaged roads, landslides and mudflows among others. • Check your water supply since it may have been contaminated. Avoid use of contaminated water. • Avoid tsunami impacted areas and debris in the water. • To minimize risk of fire, electrical and hazardous materials release: <ul style="list-style-type: none"> • turn off gas in case of leaks • turn off electricity in case of inundation or damage. • Stay out of buildings that have water around it since these may sink or collapse. • Strong aftershocks or secondary earthquakes can trigger another tsunami. If the ground shakes again for more than 20 seconds, follow the same evacuation procedures. • Watch out for wild animals, especially poisonous snakes in water. Use a stick to poke through debris ahead of you.