

Tsunami Plan

The District of Kitimat Tsunami Plan establishes the framework that ensures the District is prepared to deal with a tsunami. It is the methodology through which the District will mobilize its resources in the event of a tsunami, thereby restoring the municipality to a state of normalcy. It is designed to ensure that all agencies which may become involved in an emergency are aware of their respective roles and responsibilities during the tsunami and participate in the Emergency Management Program.

Additionally, the Tsunami Plan makes provisions for the earliest possible coordinated response to an emergency, an understanding of the personnel and resources available to the District, and recognition that additional expertise and resources can be called upon if required.

The Tsunami Plan in itself cannot guarantee an efficient, effective response to a tsunami. It must be utilized as a tool to assist emergency and municipal services and officials in their emergency response activities.

The aim of the District of Kitimat Tsunami Plan is to provide the framework within which extraordinary arrangements and measures can be taken to protect the health, safety, and welfare of the inhabitants of the District of Kitimat when faced with a tsunami.

The plan unifies the efforts of District organizations for a comprehensive and effective approach for responding to and reducing the impacts of a tsunami. It is intended to increase the emergency response capability of the District of Kitimat by establishing a plan of action to efficiently and effectively deploy emergency services.

The District of Kitimat Evacuation Plan will be used in conjunction with the Municipal Emergency Management Plan, department emergency plans, and the emergency plans of external stakeholders. The scope of the evacuation plan must be defined in the terms of its interaction with these plans.

Municipal Emergency Management Plan: The all-hazard Municipal Emergency Plan describes how the District will find out about potential emergencies, evaluate these emergencies, and activate emergency operations centres to coordinate the response. This can occur centrally, via the District of Kitimat Emergency Management Program, or on-site, via first responders on the scene of an emergency. The plan also assigns department/service responsibilities for specific emergency functions, all of which are respected by the Evacuation Plan.

The Evacuation Plan describes who will coordinate an evacuation or shelter-in-place initiative and how; how the decision to evacuate, shelter-in-place, or maintain the status quo is made; how the area to be evacuated is determined; and how the following functions will be coordinated:

- ✓ perimeter and access control,
- ✓ evacuation routes and traffic control
- ✓ on-site notification
- ✓ liaison with Corporate Communications and mass notification
- ✓ liaison with Emergency Support Services (ESS)
- ✓ mass transportation
- ✓ medical transportation

- ✓ assistance to self-evacuating citizens
- ✓ liaison with requiring stakeholders
- ✓ zone clearance
- ✓ zone hazard mitigation
- ✓ re-entry planning
- ✓ scribe duties
- ✓ zone security

The Evacuation Plan will discuss, but not describe in detail:

- plans for opening and managing Emergency Support Services Reception Center (this is contained in the Emergency Support Services (ESS) emergency plan)
- plans for sheltering outside of the District of Kitimat

Assumptions:

- A tsunami is defined as a large, often destructive, sea wave or inundation of water produced by an earthquake, submarine landslide, or a volcanic eruption.
- Some tsunamis do not appear on shore as massive breaking waves but instead resemble a quickly surging tide that inundates coastal areas.
- A tsunami event will likely strain the District's capabilities and require a broad range of assistance that may require regional and/or provincial assistance.
- A tsunami may occur with little or no warning, and may escalate more rapidly than response organizations can manage.
- A tsunami may cause injury, possible fatalities, property loss, and disruption of normal support systems. A large number of casualties, heavy damage to building and basic infrastructure, and disruption of essential public services may stress the capabilities of the District to meet the needs of the situation.
- When the District resources are strained, additional resources may be requested through mutual assistance agreements with neighbouring municipalities and/or through requests to the Provincial/Federal governments.

Overall Responsibility

The Pacific Tsunami Warning Center (PTWC), located in Hawaii, serves as the operational warning headquarters for the Pacific Tsunami Warning and Mitigation Systems (PTWS). PTWC works closely with other international, sub-regional and national centres in monitoring seismic and sea level stations around the Pacific Ocean for large earthquakes and tsunami waves. The PTWS makes use of a worldwide network of seismic stations to locate potentially tsunami generating earthquakes, as well as deep-ocean sensors and coastal sea level stations to verify the generation and evaluate the severity of a tsunami. The system disseminates tsunami

information and warning messages to designated national authorities in more than 100 locations throughout the Pacific.






The U.S. National Tsunami Warning Center operated by the Alaska Region of NOAA's National Weather Service, in Palmer, Alaska, has the responsibility for issuing Tsunami Warnings, Advisories, Watches, Cancellations, and Information Statements and interpretive information to civilian emergency and military officials in Alaska, Washington, Oregon, California, and British Columbia (EMCR and the Canadian Armed Forces Joint Task Force Pacific).

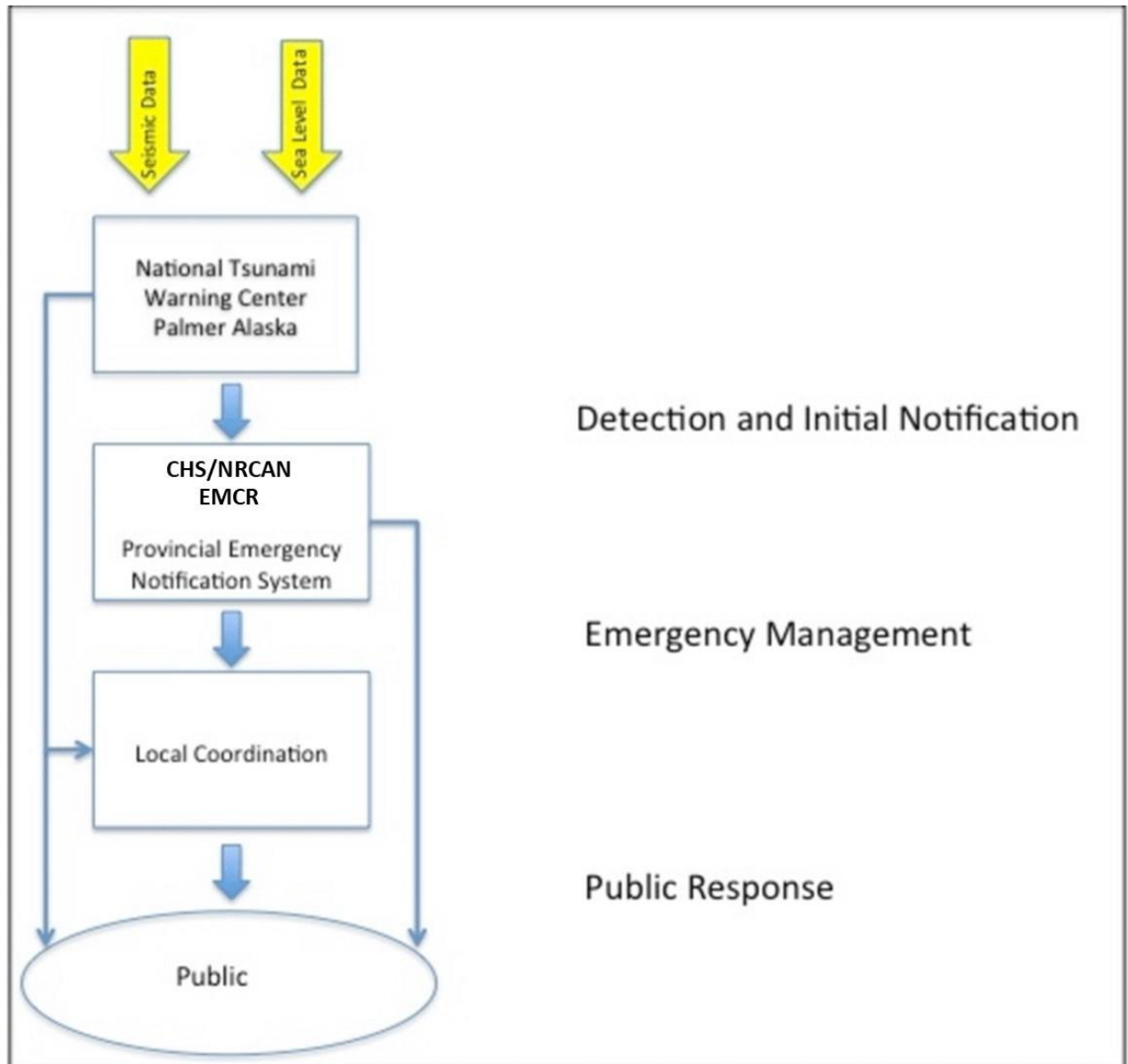
EMCR finalize the composition of messages and bulletins. EMCRC will initiate internal procedures to activate the Provincial Emergency Response Management Structure and prepare the initial BC Tsunami Advisory Bulletin for distribution to various agencies and communities at risk. This is done through various means of communication tools including, email and telephone calls to the Emergency Program Coordinator (EPC) for the at-risk community as well as through a wireless public alerting system (Alert Ready). This system sends alerts out to the general public by means of radio and TV, cable/satellite and compatible wireless devices connected to LTE networks.

All watch and warning messages are transmitted through the Operations Centre of the Maritime Commander of the Pacific (MARPAAC) in Esquimalt. EMCRC will not usually issue a BC Tsunami Advisory Bulletin when messages indicate that a tsunami has not been generated.

Tsunami messages issued by NTCWC and EMCRC use the same alert levels. From the highest to the lowest threat, the alert levels are: Warning, Advisory, Watch, Information Statement and Cancellation.

Types of Tsunami Alerts

Alert Level	Threat	Action
 WARNING	Flood wave possible	Full evacuation suggested
 ADVISORY	Strong currents likely	Stay away from the shore
 WATCH	Danger level not yet known	Stay alert for more information
 INFORMATION STATEMENT	Minor waves at most	No action suggested
 CANCELLATION	Tidal gauges show no wave activity	Confirm safety of local areas



Communication

Tsunami Inundation Risk Zones

NWTC Warning, Watch and Advisory regions are based on distance from the earthquake epicentre, tsunami travel time, or pre-computed threat estimates. British Columbia is divided into five tsunami inundation risk zones A, B, C, D, and E. These were developed taking into account wave height, run-up, subsidence, and adding a safety margin, and to ensure timeliness in notification.

The District of Kitimat is located in Zone B.

ZONE	WAVE HEIGHT (m)	RUN-UP (x2.0) (m)	SAFETY (X1.5) (m)	SUBSID-ENCE (m)	PLANNING LEVEL (m)
Zone A (North Coast and Haida Gwaii)	2.0	4.0	6.0		6
Zone B (Central Coast)	2.0	4.0	6.0		6
Zone C (W. Vancouver Island)	3.0	6.0	9.0	1.0	10
Zone D (Juan De Fuca Strait)	1.3	2.7	4.1		4
Zone E (Strait of Georgia)	0.5	1.0	1.5		2

Those on or close to tidal waters should be notified of the Warning or Advisory as soon as possible. Consideration should be given to the Kitimat River as it is anticipated that the river levels will rise in the event of a tsunami. This includes industry and any boats/ships anchored within the harbour and/or Douglas Channel.

Public notification should be sent out as early as possible to inform the public of the Tsunami Alert or Warning. This should be done by means of the District of Kitimat Public Alert Messaging System and District approved social media accounts. Those at-risk should be notified first and then the general public should be notified of the event.

Evacuation

Evacuation of persons and moveable property in a hazard area may be necessary depending on the forecasted intensity of the tsunami. Evacuation orders can be issued through Voyent Alert, District approved social media sites, the media and by means of door-to-door notification and/or loudspeakers.

Issuing the Tsunami warning may or may not lead to evacuation. Some people may respond to a warning by moving themselves outside the hazard area, possibly moving valuables and moveable property. Others may do nothing.

Evacuees should be moved in an orderly fashion starting with those most at risk. Evacuation routes should be clearly marked by use of signage and/or clearly identifiable persons and barricades. Direction should be executed in a clear and understandable communication method.

Secondary Impacts

Flooding

Tide heights and river flows should be considered when evaluating the evacuation of the at-risk area. Both can have an influence on the potential of flooding in areas that may typically not be at risk by the tsunami itself.

Harbour Activity

In addition to the inundation of large amount water, very strong currents can have devastating effects on ships/vessels, docks/wharfs, and other critical infrastructure either on or near the water. Those vessels moored or anchored should be notified as soon as possible. Persons occupying the wharfs, docks, and/or waterfront areas should be evacuated. Industry should be notified and involved with the notification of vessels that occupy their property or are in the harbour for their purpose.

Kitimat River Activity

Due to the potential of “back up” conditions involving the Kitimat River, consideration should be given to those areas along the Kitimat River that are frequented by both local and visitors. The potential of the inundation of water to the river has high potential of causing flood like conditions to take place.

Long-term Effects

Significant secondary effects should be expected from a tsunami primarily from hazardous materials spillage (fuels/oils), contamination of water supplies, floating debris abandoned or boats adrift and sunken boats or vessels.

The tertiary or indirect effects of a tsunami would be substantial with damage to waterfront industrial activities. The potential impact of industrial operations may have serious and long-term effects on the economy.

Other in-direct effects could be social and financial impact on residents within the inundation elevation or in close proximity. Emergency or temporary housing costs could be significant.

Relief programs must be maintained in a constant state of readiness. Plans for temporary housing, food, and clothing for approximately 500 people should be planned. Medical care should receive a high priority, including transportation to other hospitals in Terrace and beyond if the Kitimat Hospital becomes overloaded.