

Incident Annex 3. Tsunami

Use this checklist, as applicable, in conjunction with other Tsunami plans on file with Coos County Emergency Management.

Coordinating Department/Agency: Coos County Emergency Management office; Coos County Road Department

Cooperating Departments/Agencies:

Tsunami Incident Checklist		
Phase of Activity	Action Items	Supplemental Information
PRE-INCIDENT	<input type="checkbox"/> Continue to maintain and revise applicable response plans pertaining to tsunami events, including the Coos County EOP and supporting procedures/plans such as other Tsunami plans.	
	<input type="checkbox"/> Monitor tsunami warning systems.	
	<input type="checkbox"/> Conduct pre-incident planning for evacuation.	
	– Prepare scripts covering evacuation. Provide evacuation routes. Include release instructions for media.	
	– Prepare radio messages for use by local radio stations during emergency broadcasts. Include release instructions.	
	<input type="checkbox"/> Have personnel participate in necessary training and exercises as determined by the Coos County EOP in coordination with applicable ESFs.	
	<input type="checkbox"/> Participate in county and local jurisdiction tsunami preparedness activities, seeking understanding of interactions with participating agencies in a tsunami scenario.	
	<input type="checkbox"/> Ensure emergency contact lists are updated and establish a pre-event duty roster allowing for 24/7 operational support for the county EOC.	
	<input type="checkbox"/> Ensure that Public Works and other response partners' physical and personnel resource lists are current. Test and maintain response and communications equipment and after-hours personnel contact information. Keep a stock of necessary response supplies.	
	<input type="checkbox"/> Inform Coos County Emergency Management personnel of any major developments that could adversely affect response operations (e.g., personnel shortages, loss of public works equipment, etc.).	

Phase of Activity	Action Items	Supplemental Information
	<ul style="list-style-type: none"> <input type="checkbox"/> Work with county agencies/departments for establishment of appropriate infrastructure protection measures in exposed and low-lying areas. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Provide public safety information and educational programs regarding emergency preparedness and response. 	
RESPONSE	<ul style="list-style-type: none"> <input type="checkbox"/> Activate the Coos County EOP when tsunamis impact or threaten the county. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Activate and staff the EOC (if approved) and establish Incident Command. Staffing levels will vary with the complexity and needs of the response. For larger events that cross multiple jurisdictions, establish a Unified Command with neighboring jurisdictions. At a minimum, the IC, Section Chiefs, Resource Coordinator, and management support positions will likely be needed. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Estimate emergency staffing levels and request personnel support. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure that action is taken to protect personnel and emergency equipment from possible damage by high water. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Develop work assignments for ICS positions (recurring). 	<i>ICS Form 203, Organization Assignment List</i>
	<ul style="list-style-type: none"> <input type="checkbox"/> Notify supporting agencies through applicable ESFs such as ESF 3, ESF 5, ESF 6, ESF 8, ESF 12, and ESF 13, as well as appropriate officials. 	
	<ul style="list-style-type: none"> - Identify local, regional, tribal, state, and federal agencies/entities that may be able to mobilize resources to support local response efforts and EOC staffing. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Determine the type, scope, and extent of the incident (recurring). Verify reports and obtain estimates of the area that may be affected. Obtain status of impacts within the county. 	<i>ICS Form 209, Incident Status Summary</i>
	<ul style="list-style-type: none"> - Notify command staff, support agencies, adjacent jurisdictions, ESF leads/coordinators, and liaisons of any situational changes. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Develop and initiate shift rotation plans, including briefing of replacements during shift changes. 	
	<ul style="list-style-type: none"> - Dedicate time during each shift to preparing for shift-change briefings. 	<i>ICS Form 201, Incident Briefing</i>
<ul style="list-style-type: none"> <input type="checkbox"/> Confirm or establish communications links between the county EOC and other jurisdictional EOCs including those at the county and state levels. Confirm operable telephone numbers and verify functionality of alternate communication systems. 	<i>ESF 2, Communications</i>	

Phase of Activity	Action Items	Supplemental Information
	<input type="checkbox"/> Ensure all required notifications have been made.	<i>Established emergency contact lists maintained at the EOC</i>
	<input type="checkbox"/> Manage and coordinate interagency functions. Assimilate into a Unified Command structure if the scope of the incident dictates.	
	<input type="checkbox"/> Implement plans and procedures to handle water inundation. Ensure that copies of all documents are available to response personnel. Implement agency-specific protocols and SOPs.	<i>Local, agency, and facility-specific SOPs</i>
	<input type="checkbox"/> Obtain reports from other jurisdictions that may be affected by tsunamis.	
	<input type="checkbox"/> Determine the need to conduct evacuation activities (recurring). Evacuation activities will be coordinated among multiple ESFs.	<i>ESF 5, ESF 6, ESF 13, and ESF 15</i>
	<input type="checkbox"/> Determine the need for additional resources and request as necessary through appropriate channels (recurring).	<i>ESF 7</i>
	<input type="checkbox"/> Submit a request for an emergency declaration, as applicable.	<i>Section 1 of Coos County EOP Basic Plan</i>
	<input type="checkbox"/> Consider activating mutual aid agreements as conditions dictate. Make initial contact with mutual aid agreement partners. Place backup personnel teams on standby and alert resource suppliers of potential and current needs.	
	<input type="checkbox"/> Coordinate resource access, deployment, and storage in the operational area including equipment, personnel, facilities, supplies, procedures, and communications. Track resources as they are dispatched and/or used.	<i>ICS Resource Tracking Forms</i> <i>ESF 7</i>
	<input type="checkbox"/> Develop plans and procedures for registering mutual aid and other first responders as they arrive on the scene and receive deployment orders.	
	<input type="checkbox"/> Establish a Joint Information Center (JIC) or coordinate with JIC(s) established by other jurisdictions. Staff JIC(s) with appropriate PIO(s) as required.	<i>ESF 15</i>
	<input type="checkbox"/> Formulate emergency public information messages and media responses using “one message, many voices” concepts (recurring). Message content may include expected magnitude of tsunami, expected duration, instructions for public protection, planned activities to address the emergency, and protection orders such as an advisory to boil water.	

Phase of Activity	Action Items	Supplemental Information
	<ul style="list-style-type: none"> - Public information will be reviewed by the IC designee. Information will be approved for release by the IC and Lead PIO before dissemination to the public. 	ESF 15
	<ul style="list-style-type: none"> <input type="checkbox"/> Record all EOC and individual personnel activities (recurring). All assignments, persons responsible, and actions taken should be documented in logbooks. 	<i>EOC Planning Section job action guide</i>
	<ul style="list-style-type: none"> <input type="checkbox"/> Record all incoming and outgoing messages (recurring). All messages and the person sending/receiving them should be documented as part of the EOC log. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Develop situation reports (recurring). At regular intervals, the EOC Director/Manager and staff will assemble a situation report. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Develop and update the IAP (recurring). The IAP is developed by the Planning Section and approved by the IC. The IAP should be discussed at regular intervals and modified as the situation changes. 	<i>ICS Form 202, Incident Objectives</i>
	<ul style="list-style-type: none"> <input type="checkbox"/> Implement objectives and tasks outlined in the IAP (recurring). 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Coordinate with private-sector partners as needed. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure that reports of injuries, deaths, and major equipment damage accrued during response activities are communicated to the IC and/or the Safety Officer. 	
RECOVERY/DEMOBILIZATION PHASE	<ul style="list-style-type: none"> <input type="checkbox"/> Ensure an orderly demobilization of emergency operations in accordance with current demobilization plans. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Once the threat to public safety is eliminated, conduct cleanup and recovery operations. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Activate if necessary the appropriate recovery strategies, continuity of operations plans, and/or continuity of government plans. 	<i>ESF 5 and ESF 14</i>
	<ul style="list-style-type: none"> <input type="checkbox"/> Release mutual aid resources as soon as possible. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Conduct a post-event debriefing to identify success stories, opportunities for improvement, and development of the After Action Report/Improvement Plan (IP). 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Deactivate/demobilize the EOC. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Correct response deficiencies reflected in the IP. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Revise any applicable emergency response plans based on the success stories and/or lessons learned during the response. 	
	<ul style="list-style-type: none"> <input type="checkbox"/> Submit valuable success stories and/or lessons learned to the Lessons Learned Information Sharing website (www.llis.gov). 	

IA 3. Tsunami Appendix

1. Introduction

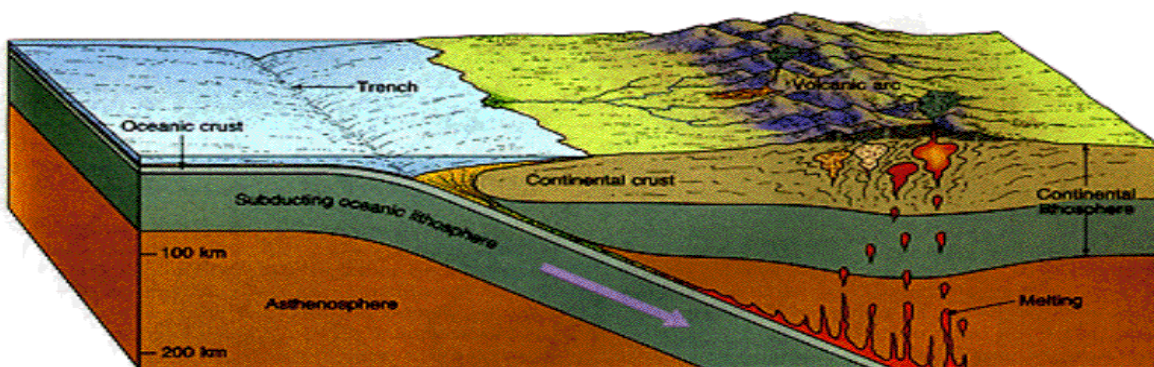
A tsunami is a series of traveling ocean waves generated by earthquakes or under sea landslides occurring below or on the floor of the sea. Spread out over the open sea, the waves are only a few feet high with up to a hundred miles distance between swells. As a tsunami enters shallow coastal water, the speed decreases from as much as six hundred miles per hour to around thirty miles per hour. At that point, the height of the waves increases dramatically. Previous crests of several feet in height rise to form a virtual wall of water sometimes fifty to one hundred feet in height as the tsunami contacts the beach front.



Tsunamis are a serious hazard for Coos County. Coos County coastline is described as a series of rugged, rocky sandstone cliffs with beach access all along the coastline. To the north of Coos Bay/North Bend lies the Oregon Dunes National Recreational Area. In addition to beaches and other recreational areas, there are a number of developed locations throughout the county, which might require evacuation during a tsunami emergency depending upon predicted wave height. Due to the closeness of our coast to the fault area, we may have from 5 minutes (Cape Blanco) to approximately 15 minutes in the Coos Bay area to respond by way of evacuation. There will be very little time to warn the population of the coastal cities of Coos County. With the distant waves caused by a distant event, the warning time increases to approximately four hours (Alaska) or more. The four major populated cities directly on the coast are Bandon, Coos Bay, North Bend, and Charleston.

Oceanic – continental convergence

The Pacific Northwest is the site of the Cascadia subduction zone, where an oceanic tectonic plate (the Juan de Fuca plate) is being pulled and driven (i.e., subducted) beneath a continental plate (the North American plate). Earthquakes (magnitude 9+) along the fault that is the contact between the two plates, termed the interplate thrust or megathrust, may generate significant local tsunamis in the Pacific Northwest.



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Juan de Fuca Ridge

The boundary between the Pacific and Juan de Fuca Plates is marked by a broad submarine mountain chain about 500 kilometers long (300 miles), known as the Juan de Fuca Ridge. Young volcanoes, lava flows, and hot springs were discovered in a broad valley less than 8 kilometers wide (5 miles) along the crest of the ridge in the 1970's. The ocean floor is spreading apart and forming new ocean crust along this valley or "rift" as hot magma from the Earth's interior is injected into the ridge and erupted at its top.

Picture – Oceanic-continental convergence



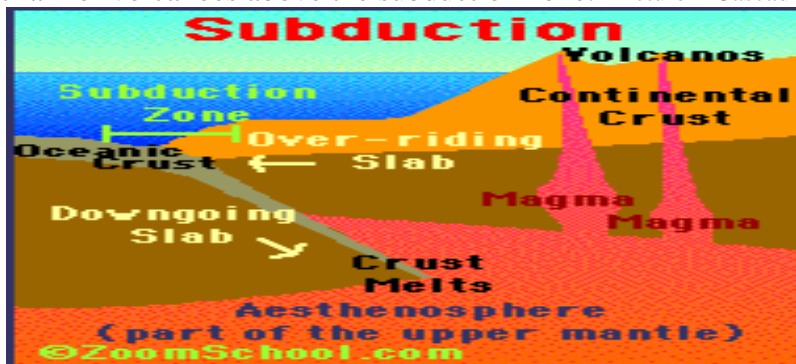
Location map of Juan de Fuca plates

(Modified from Washington Post)

Picture – Juan de Fuca Ridge – Cascade Range

Cascade Range

In the Pacific Northwest, the Juan de Fuca Plate plunges beneath the North American Plate. As the denser plate of oceanic crust is forced deep into the Earth's interior beneath the continental plate, a process known as "subduction", it encounters high temperatures and pressures that partially melt solid rock. Some of this newly formed magma rises toward the Earth's surface to erupt, forming a chain of volcanoes above the subduction zone. Picture – Cascadia Subduction Zone



Characteristics of Tsunamis

Tsunamis travel outward in all directions from the source area (Figure 2). The tsunami can strike coastal areas with devastating effect even in areas far removed from the source. Their speed depends on the depth of water. In the deep and open ocean waves can reach speeds of 800 kilometers per hour (approx. 480 mph or as fast a commercial jetliner). The waves slow down in shallow water and speed up in deep water. The height of the waves in deep water may range from 30 to 60 centimeters, producing only a gentle rise and fall of the sea surface, and are usually unnoticed in the open ocean.

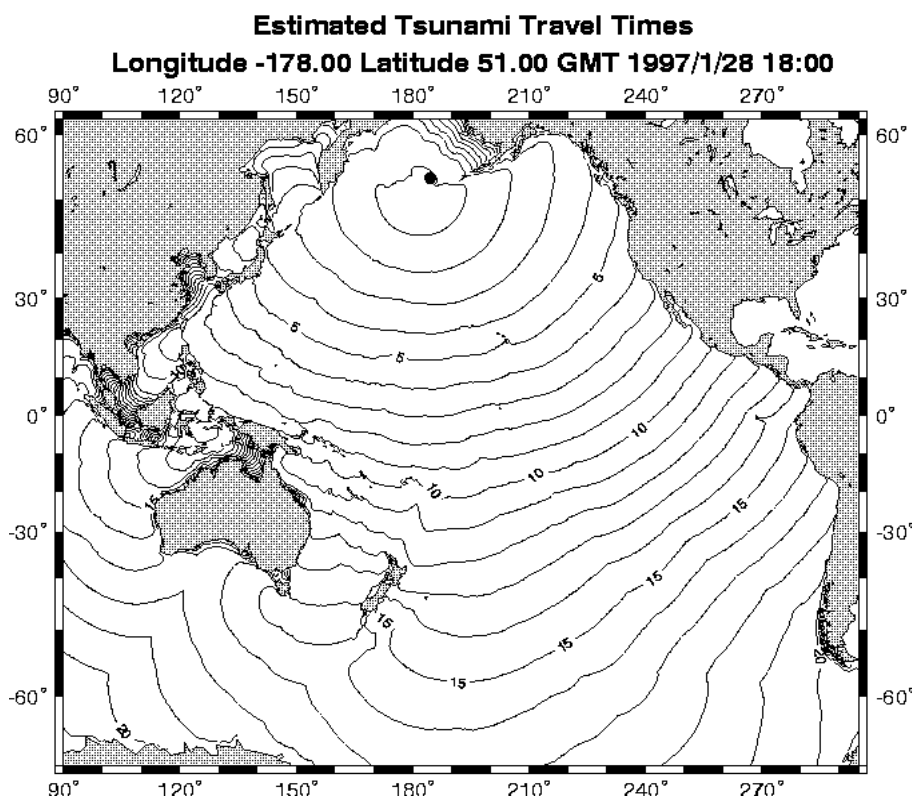
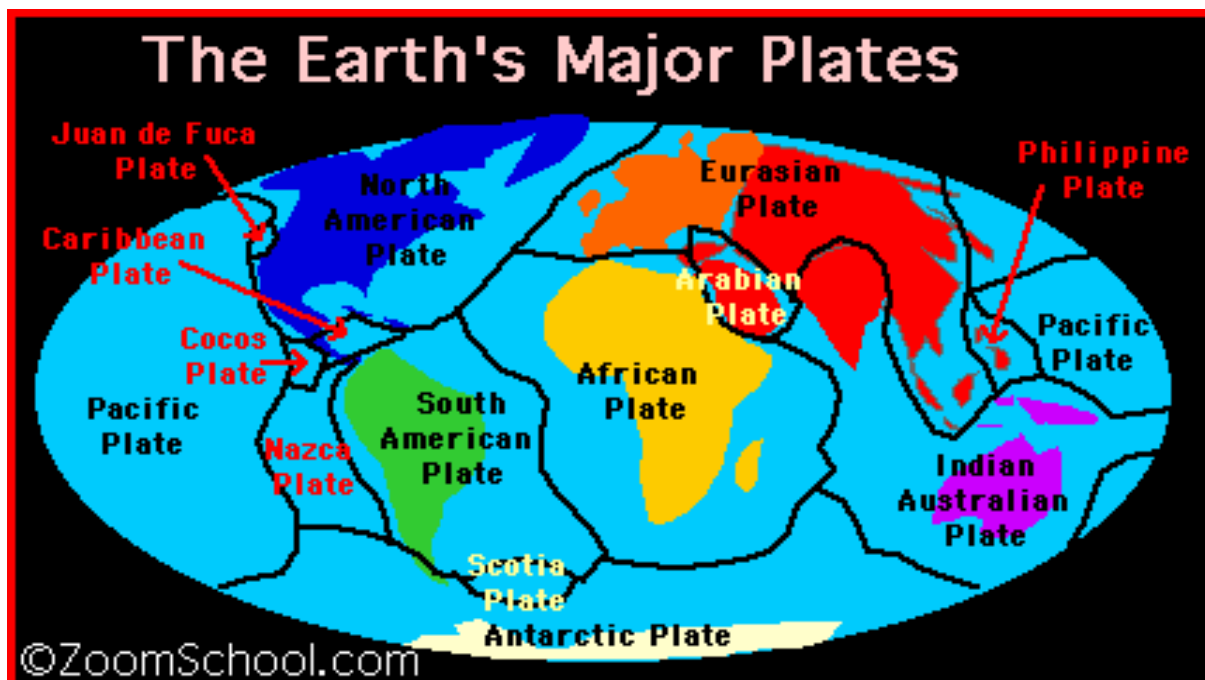


Figure 2: Tsunami arrival chronograph (Pacific Disaster Center) (contours in hours)

As a tsunami wave enters the shallow waters of a coastline, its speed decreases. This causes the front of the wave to slow down relative to the back, producing a greater height as the water piles up onto the coastline. The configuration of the coastline, shape of the ocean floor, and characteristics of the advancing waves play an important role in the destructiveness of the wave. A wave may be of negligible size at one point on a coast and of much larger size at other points. Narrow bays and inlets may cause funneling effects that magnify the initial and subsequent waves. Upon striking a coast, the wave reflects (bounces seaward) and then turns back toward the coast as a series of waves. Thus, every tsunami creates numerous waves, which may continue to arrive for hours after the first wave.



LOCAL EVENT – Subduction Zone Earthquake

- Earthquake **may be** felt on coastal area.
- Time to first impact of tsunami estimated at 5-15 minutes.
- Assumption that warning from official government sources would come too late.
- Activate Warning Notification List for tsunami based on the assumption that a tsunami would be generated. This level of activity would continue until the Alaska Tsunami Warning Center (ATWC) issued a bulletin as conditions warrant to continue, expand, restrict, or end the warning.
- Citizens would need to spontaneously evacuate, to high ground, those areas in the evacuation zone. As a minimum, evacuation zones would be the original inundation zone as mapped for Senate Bill 379 by Oregon Department of Geology and Mineral Industries (DOGAMI). As improved maps are completed throughout the county, evacuation zones may be revised according to new data and projections.
- Maps of evacuation zones and routes are included in the annex.

DISTANT EVENT

- ATWC issues a “TSUNAMI WARNING”: - Activate Warning Notification List for a tsunami warning. Evacuation recommended in those areas within the evacuation zone.
- ATWC issues a “TSUNAMI WATCH” – Activate Warning Notification List for Tsunami Watch.
- ATWC issues an “ADVISORY” regarding a tsunami – Emergency Services advised, No further action required.
- ATWC issues a “INFORMATION BULLETIN” regard a tsunami – No action is required.

**TSUNAMI HAZARD MAPS FOR COOS COUNTY COASTAL COMMUNITIES
LOCATED ON Section C (SEPARATE DOCUMENT)**

A Survey of Great Tsunamis

Throughout recorded history tsunamis have occurred that have significantly impacted coastal communities. The map below documents some of the more destructive recent tsunamis as listed:

- | | |
|--------------------------------------|---|
| ▪ 1929 Grand Banks, Canada | ▪ 2004 Sumarta 2006 11/15 Kuril Islands |
| ▪ 1946 Aleutian Islands, Alaska | ▪ 2007 01/13 Kuril Islands |
| ▪ 1952 Kamchatka Peninsula, Russia | ▪ 2007 04/01 Solomon Islands |
| ▪ 1957 Aleutian Islands, Alaska | ▪ 2007 08/15 Peru |
| ▪ 1960 Chile | ▪ 2007 12/26 Indian Ocean |
| ▪ 1964 Prince Williams Sound, Alaska | |
| ▪ 1975 Hawaii | (not indicated on the picture) |

picture – tsunami event list



2. Authority

The organizational and operational concepts set forth in this annex are promulgated under the following authorities:

2.1 State and Local authority for Emergency Management is established by Oregon Revised Statutes, Chapter 401.

2.2 Federal

2.2.1 Federal Civil Defense Act of 1950, PL81-950 as amended.

2.2.2 The Disaster Relief Act of 1974, PL 93-288 as amended.

2.2.3 Robert T. Stafford Disaster Relief and Emergency Assistance Act, PL 100-707.

3. Purpose

3.1 Provide emergency warning of a possible or actual, tsunami to coastal residents via a simultaneous broadcast warning on every radio or TV station on the Oregon Coast.

3.2 Establish responsibilities and operational requirements for County government during tsunami bulletins, advisories, watches and warnings (both natural such as a local earthquake, or from the Alaska Tsunami Warning Center).

3.3 Provide guidance for warning, response, and safest evacuation from coastal danger areas that are likely to be affected by a tsunami or earthquake/tsunami.

3.4 Minimize personal injury or property damage resulting from a tsunami by outlining the concept of emergency actions to be taken by County departments and the likely capabilities and activities for other public and private agencies and facilities. (note this annex can not mandate operations outside of the county government although efforts to ensure coordination are addressed through the basic section of the county emergency operation plan.

4. Situations and Assumptions

4.1 Situation

Coos County has approximately 47 miles of coastline with approximately 87 miles of coastline including the bays. With an additional hazard of 3 river mouths which feed directly into the Pacific Ocean. Due to this geography and our location in relationship to the Cascadia Subduction zone fault, Coos County is very susceptible to possible tsunamis. It should be noted that a tsunami is not just one wave, but a series of waves, which may build in size.

The tsunami threat to the coastal areas is based upon two possible events, both of which have occurred in the past. Either event could lead to damage and loss of life and economy, but they differ in the warning time available to emergency officials.

The type of tsunami with little warning time (5-15 minutes) would be generated by an earthquake associated with movement of the Cascadia Subduction zone fault, which lies approximately 200 miles off the coastline of Oregon it is and will be referred to as a “*Local Generated Tsunami*”. However, as the fault proceeds south and inward along the Oregon Coast

shoreline, for Coos County the distance decreases from Lakeside of about 50 miles to Bandon of 38 miles. A second tsunami event would be caused by fault movement off Cape Blanco causing little or no warning time. The other tsunami event would be caused by a distant undersea earthquake, for example in the Aleutian Chain, and will be referred to as a “*Distant Generated Tsunami*”.

4.2 Assumptions

Time for initial ground shaking to impact by the first generated tsunami will depend upon the distance from our shores. While a *Distant Generated Tsunami* would not be expected to carry the same amount of energy with the waves or arrive as soon, to avoid confusion with the public, it is preferable to have only one evacuation line designation. On one side of the line, people would be at higher risk than the other side. There is good evidence from the 1964 *Distant Generated Tsunami* on where water could be anticipated.

Time to impact from a *Local Generated Tsunami* will vary depending upon the nature and location of the fault movement, but the first wave is predicted to strike our coastline in 5-15 minutes, and before official warning could be given. Citizens will need to react spontaneously to evacuate to the safest available location within the time period given above.

Coos County Emergency Management has developed an EAS (Emergency Alert System) Annex and would be activated through the Warning Notification List as well as EAS for the warning announcement to be broadcast during or shortly after a locally felt earthquake. Refer to the EAS Annex and Warning Annex in the Coos County Emergency Management Plan for more information on notification to the public.

5. Concept of Operations

The responsibility for emergency response typically lies at the local level. Coordination and support of local emergency operations during times of disaster is a responsibility of the county, through the activation and operations of the Emergency Operations Center (EOC). Built upon the Incident Command System (ICS) and the National Incident Management System (NIMS) used by the local responders, the EOC can be a key in successfully managing a large devastating event such as a tsunami. Bringing together decision-makers allows for the most efficient and effective use of available resources. The county EOC also acts as the conduit for coordination with state and federal support activities. Development of coordinated incident management objectives and assignment and tracking of resources will help avoid duplication of rescue efforts.

The following Task Assignments are based upon existing capabilities and predicted emergency needs, however, local decision-makers may exercise discretion in carrying out different tasks based upon changing conditions at the time.

5.1 County Emergency Services

5.1.1 Activate the EOC, if necessary and being staffed as required by the incident as addressed in the County Emergency Operations Plan. The County Emergency Operations plan details who may request activation of the EOC, however, at a minimum a “partial activation” will occur for a

Distant Generated Tsunami and staffed by an Incident Commander, Safety, Public Information Officer and Liaison as Command staff.

5.1.2 Follow the procedures for authorization for evacuation:

Only three (3) bodies have the authority to order the evacuation of an area in Coos County –

- The Governor
- The Board of Commissioners or in absence of a quorum, the chairperson
- The Sheriff or his alternate has been given this authority in Coos County as the Emergency Program Manager (as stated in the general procedures for the evacuation annex)

5.1.3 In addition, the Planning Section will also be staffed including the Communications Unit. The EOC will be fully activated, when possible, for a Local Generated Tsunami. It should be emphasized that the earthquake that causes the Local Generated Tsunami will in itself pose challenges in opening the EOC.

5.1.4 Coordinate the flow of public information to ensure consistency and appropriateness.

5.1.5 In coordination with Sheriff's Office, SAR, Sheriff's Reserves, RACES, and Posse personnel for emergency duty status.

5.1.6 Coordinate with the PIO and Red Cross to establish a number to provide information to the public for concerned relatives and friends looking for missing parties.

5.1.7 Coordinate with Department of Environmental Quality to deal with livestock carcasses and other debris. Consult the appropriate section of the EOP for specific instructions.

5.1.8 Coordinate with City Departments of Emergency Management within Coos County for activation of tsunami sirens as applicable, notification to the public, evacuation notification, shelter establishment, damage assessment, and recovery activities such as "all clear" for return to the evacuated areas.

5.2 County Highway Department

5.2.1 Primarily responsible for closing and/or rerouting traffic on county roads to either assist movement of people out of evacuation zones, and/or keep people out of danger or impeding emergency response activities.

5.2.2 Responsible for "Level 1" bridge damage assessment in cooperation with ODOT and City Public Works personnel for bridges that are safe to approach.

5.2.3 Assist Oregon Department of Transportation (ODOT) on State Highways.

5.2.4 Provide damage assessment information to the EOC.

5.3 County Sheriff's Office

5.3.1 Assist in notifying areas needing to be evacuated, focusing on areas that are outside of local fire district boundary but inside the evacuation zone, providing task may be accomplished safely.

5.3.2 Assist the County Highway in closing county roads and/or rerouting traffic.

5.3.3 Assist ODOT and the Oregon State Police (OSP) in closing State Highways and/or rerouting traffic.

5.3.4 Provide damage assessment information to the EOC.

5.3.5 Initiate aerial damage assessment surveys through activation of local resources.

5.3.6 Assist State Park personnel in evacuation and traffic control of state park/wayside evacuation if needed.

5.4 Other County Departments

5.4.1 Provide support activities as outlined in the County Emergency Operations Plan.

5.5 Cities, Fire Districts, and other special entities

5.5.1 Administration

5.5.1.1 Provide damage assessment & situation reports to County EOC.

5.5.1.2 If desired, send resource and support requests to the County EOC as prescribed in the County Emergency Operations Plan.

5.5.2 Fire Department

5.5.2.1 If a county firefighter is unable to get to their home department they should report to the closest fire station and offer to be part of the manpower pool.

5.5.2.2 Assist in notification of areas within the evacuation zone and local fire district if task may be accomplished safely.

5.5.2.3 Coordinate activities through the County EOC.

5.5.3 Police Department

5.5.3.1 Assist in notification of areas within the evacuation zone if task may be accomplished safely.

5.5.3.2 Pass along information obtained from LEDS to other city departments.

5.5.3.3 Coordinate with City Public Works on long term rerouting of traffic.

5.5.4 Public Works

5.5.4.1 Establish short term evacuation routes to improve traffic flow away from danger.

5.5.4.2 Assist in primary bridge assessment post earthquake if necessary and task may be accomplished safely. Refer to Appendix A of this annex for **Guideline for Emergency Level I Bridge Inspections form**.

5.5.5 Other City Departments

5.5.5.1 Sanitary sewage systems could be affected by a tsunami depending on the height of the inundation: Bandon, Coos Bay, Charleston, North Bend, and Lakeside.

5.5.5.2 Water systems should be monitored for contamination. The Department of Environmental Quality, The Oregon State Health Division, and other state and federal agencies should be contacted through the Oregon Emergency Response System (OERS) at 1-800-452-0311.

5.5.6 Public Safety Answering Points (PSAPS)

5.5.6.1 To disseminate information per the warning notification list.

5.5.6.2 Routine and emergency communications.

5.5.6.3 Provide damage assessment and situation status reports to the County EOC.

5.6 Oregon Department of Transportation

5.6.1 Responsible to provide 'Level 1' or greater assessment of bridges, post earthquake on State Highways after a local generated tsunami.

5.6.2 ODOT Regions and Districts are responsible for preparing alternate route plans for all interstate and major state highways when it is necessary to reroute traffic from the interstate system or from other major state highways due to an incident or threat. Each Region should have an Alternate Route Coordinator. Regions and Districts will work with local jurisdictions in the establishment of alternate routes.

5.6.3 Provide damage assessment and situation status reports to EOC through the designee assigned.

5.7 Oregon State Parks

5.7.1 Notification, closure and evacuation of state parks/waysides in evacuation zones.

5.7.2 Provide damage assessment and situation status to EOC.

5.8 Oregon State Police

5.8.1 Responsible to provide traffic control along State Highways in coordination with county and city law enforcement.

5.8.2 Establish liaison with county EOC.

5.8.3 Provide damage assessment and situation status reports to county EOC.

5.9 U.S. Coast Guard

5.9.1 Dissemination of warning on all normal marine frequencies.

5.9.2 Response and rescue operations.

5.9.3 Provide damage assessment and situation status reports to EOC.

5.10 Medical/Ambulance Service

5.10.1 Dissemination of warning to all duty and standby personnel.

5.10.2 Triage requests for service and coordinated activities with EOC.

5.10.3 Provide damage assessment and situation status reports to EOC.

5.10.4 Develop medical re-supply and resource needs requests for EOC.

5.11 North Bend Municipal Airport

5.11.1 Dissemination of warning to all aviation frequencies.

5.11.2 Provide damage assessment and situation status reports to EOC.

5.11.3 Prepare to serve as site for air response and recovery assets.

5.12 Harbormaster – International Port of Coos Bay

5.12.1 Dissemination of warning to Port users and other.

5.12.2 Provide damage assessment and situation status reports to the County EOC.

5.13 Coquille Valley Hospital; Southern Coos General Hospital; and Bay Area Hospital.

5.13.1 Dissemination of warning to all on duty and callback personnel.

5.13.2 Evaluate safety of current site to resident population, implement appropriate actions.

5.13.3 Provide damage assessment and situation status reports to EOC.

5.13.4 Develop medical re-supply needs and requests and provide to County EOC.

5.14 Red Cross

5.14.1 To assist in Shelter and Feeding functions as outlined in the EOP.

6. Overview of the Tsunami Warning System

As part of an international cooperative effort to save lives and protect property, the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service operates two tsunami warning centers.

The Alaska Tsunami Warning Center ATWC in Palmer, Alaska, serves as the regional Tsunami Warning Center for Alaska, British Columbia, Washington, Oregon, and California.

The Pacific Tsunami Warning Center in Ewa Beach, Hawaii, serves as the regional Tsunami Warning Center for Hawaii and as a national/international warning center for tsunamis that pose a Pacific-wide threat. This international warning effort became a formal arrangement in 1965 when PTWC assumed the international warning responsibilities of the Pacific Tsunami Warning System (PTWS). The PTWS is composed of 26 international Member States that are organized as the International Coordination Group for the Tsunami Warning System in the Pacific.

Tsunami Advisory, Watch, and Warning Determination

The objective of the PTWS is to detect, locate, and determine the magnitude of potentially tsunami generated by earthquakes occurring in the Pacific Basin or its immediate margins. Earthquake information is provided by seismic stations operated by PTWC, ATWC, and the U.S. Geological Survey's National Earthquake Information Center and international sources. If the location and magnitude of an earthquake meet the known criteria for generation of a tsunami, a tsunami warning is issued to warn of an imminent tsunami hazard.

The advisory bulletin is issued to areas not currently in either warning or watch status when a tsunami warning has been issued for another region of the Pacific. An Advisory indicates that an area is either outside the current warning and watch regions or that the tsunami poses no danger to that area. The Center(s) issuing the Advisory will continue to monitor the event, issuing updates at least hourly. As conditions warrants, the Advisory will either be continued, upgraded to a watch or warning, or ended. A tsunami advisory indicates a tsunami which may produce strong currents and is dangerous to those in or very near the water is expected. Large inundations are not expected in areas under advisory status. Advisories are issued when the expected tsunami amplitude is in the range of 0.3 to 1 meter.

The warning includes predicted tsunami arrival times at selected coastal communities within the geographic area defined by the maximum distance the tsunami could travel in a few hours. A tsunami watch with additional predicted tsunami arrival times is issued for a geographic area defined by the distance the tsunami could travel in a subsequent time period.

If a significant tsunami is detected by sea-level monitoring instrumentation, the tsunami warning is extended to the entire Pacific Basin. Sea-level (or tidal) information is provided by NOAA's National Ocean Service, PTWC, ATWC, university monitoring networks and other participating nations of the PTWS. The International Tsunami Information Center, part of the Inter-governmental Oceanographic Commission, monitors and evaluates the performance and effectiveness of the Pacific Tsunami Warning System. This effort encourages the most effective data collection, data analysis, tsunami impact assessment and warning dissemination to all TWS participants.

Tsunami Warning Dissemination

Tsunami warning, watch, advisory, and information bulletins are disseminated to appropriate emergency officials and the general public by a variety of communication methods.

- Tsunami warning, watch, advisory, and information bulletins are issued by PTWC and ATWC are disseminated to local, state, national and international users as well as the media. These users, in turn, disseminate the tsunami information to the public, generally over commercial radio and television channels.
- The NOAA Weather Radio System, based on a large number of VHF transmitter sites, provides direct broadcast of tsunami information to the public.
- The US Coast Guard also broadcasts urgent marine warnings and related tsunami information to coastal users equipped with medium frequency (MF) and very high frequency (VHF) marine radios.
- Local authorities and emergency managers are responsible for formulating and executing evacuation plans for areas under a tsunami warning. The public should stay-tuned to the local media for evacuation orders should a tsunami warning be issued. And, **the public should NOT RETURN to low-lying areas until the tsunami threat has passed** and the “all clear” is announced by the local authorities.

How the System Works

The Oregon Tsunami Warning Network consists of NAWAS, NOAA Weather Wire/Radio, OERS, and EAS. The tsunami warning/watch from the West Coast/Alaska Tsunami Warning Center (WC/ATWC) is received over NAWAS. OERS sends out the warning/watch message over state NAWAS to the coastal PSAPs.

Activation Procedures for Officials

The warning/watch from the WC/ATWC is sent over LEDS to the coastal PSAPs via NOAA Weather Wire. The warning/watch from the WC/ATWC is also retransmitted by the NWS over NOAA weather radio along with a specific tone alert that triggers EAS. The WC/ATWC also sends out e-mail messages to those on their list (which includes emergency management and 911 personnel in Coos County).

Coos County has the capability to send out specific messages over EAS. Refer to the EAS Annex of this plan.

Designated Officials

Medford National Weather Service – Warning Coordination Meteorologist
Oregon Emergency Management – OERS, Communications Manager

Message Definitions

The WCATWC located in Palmer, Alaska, has the sole responsibility for issuing tsunami messages to coastal residents of California, Oregon, Washington, British Columbia, and Alaska. Tsunami warnings, watches, advisories, and information bulletins are issued based on earthquake location and magnitude. Bulletins issued by the WCATWC are defined below:

Tsunami Warning: Indicates that a tsunami is imminent and that coastal locations in the warned area should prepare for flooding. A bulletin, initially based only on seismic information without tsunami confirmation, issued as a means of providing the earliest possible alert to at-risk populations. Warnings initially place a restricted area in a condition that requires all coastal areas in the region to be prepared for imminent flooding. Subsequent bulletins are issued every 30 minutes or as conditions warrant to continue, expand, restrict, or end the warning. In the event a tsunami has been confirmed which could cause damage outside the source region, the warning will be extended as appropriate.

Tsunami Watch: An alert issued to areas outside the warned area. A bulletin, usually based only on seismic information without tsunami confirmation, issued as a means of alerting the population within 1 to 3 hours tsunami travel time beyond the tsunami warning area of an earthquake with the potential to have generated a tsunami that may affect the watch area. Subsequent bulletins are issued every 30 minutes or as conditions warrant to expand the watch area, upgrade it to a warning, or cancel the watch and warning. A Tsunami Watch is normally included in the text of the message that disseminates a Tsunami Warning.

Tsunami Advisory: A message issued when the Pacific Tsunami Warning Center has issued a warning for an event outside the WC/ATWC AOR which poses no imminent threat to the AOR. A bulletin issued to areas not currently in either warning or watch status when a tsunami warning has been issued for another region of an ocean. An Advisory indicates that an area is either outside the current warning and watch regions, or that the tsunami poses no danger to that area. The WC/ATWC will continue to monitor the event, issuing updates at least hourly. As conditions warrant, the Advisory will either be continued, upgraded to a watch or warning, or ended.

Tsunami Information Bulletin: Informational bulletins issued for earthquakes which are not likely to trigger a tsunami dangerous to the AOR. A bulletin issued to advise participants of the occurrence of an earthquake with the evaluation that a potentially destructive tsunami was not generated, or that an earthquake has occurred outside the TWCs AOR and could potentially generate a tsunami. If the evaluation indicates the possible generation of a destructive or nondestructive tsunami, an investigation will be initiated and additional tsunami information bulletins will be issued as warranted until the investigation is concluded.

Tsunami Information Message: Information messages issued when smaller earthquakes (less than the warning threshold) may be felt near coastal areas. These messages are issued to assure coastal residents and emergency managers that there is no tsunami danger.

Section A
GUIDELINE FOR EMERGENCY LEVEL I BRIDGE INSPECTIONS

PURPOSE

During a major earthquake event, there will not be enough bridge inspectors available to meet the immediate need for emergency bridge inspections. Many bridges may be on evacuation routes people are using, or need to use, and a rapid judgment call is necessary to keep them open or close them down. The purpose of this guideline is to establish a standardized process for all agencies to use to determine emergency-use bridge integrity.

GUIDELINE

- [] Ensure safety of own family.
- [] Assess the area for scene safety, i.e. downed power lines, fuel spills, landslides, aftershocks.
- [] Control traffic hazards while inspecting.
- [] Look for obvious freshly broken/hanging concrete or wood on ground near/under structure.
- [] Look for structural alignment, dips or bows by sighting down hand-railing.
- [] Look along the deck and points of support for misalignment, cracks, splits, pulled apart, or crushed.
- [] Check footings for sinking, avoid walking under the structure.
- [] After inspection and actions, mark bridge facing in a visible location, as below:

Red Color indicates closed, Green Color indicates open. If you do not have colored markers, use triage flagging (red or green) to clearly identify bridge status near your markings.

AGENCY	INITIALS
DATE	TIME

- [] Report your findings/actions to the county EOC.

Section B

USEFUL INFORMATION FOR PSA:

Continue listening to a NOAA Weather Radio, Coast Guard emergency frequency station, or other reliable source for emergency information. The tsunami may have damaged roads, bridges, or other places which may be unsafe.

Help injured or trapped persons. Give first aid where appropriate. Call for help. Do not move seriously injured persons unless they are in immediate danger of further injury.

Help a neighbor who may require special assistance --- infants, elderly people, and people with disabilities.

Use the telephone only for emergency calls. Telephone lines are frequently overwhelmed in disaster situations. They need to be clear for emergency calls and emergency personnel.

Stay out of buildings if waters remain around them. Tsunami waters, like floodwaters, can undermine foundations, causing buildings to sink, floors to crack, or walls to collapse.

When re-entering buildings or homes, use extreme caution. Tsunami-driven floodwaters may have damaged buildings where you least expect it. Carefully watch every step you take.

Wear sturdy shoes. The most common injury following a disaster is cut feet.

Look for fire hazards. There may be broken or leaking gas lines, flooded electrical circuits, submerged furnaces, or electrical appliances. Flammable materials may come from upstream.

Check for gas leaks. If you smell gas or hear a blowing or hissing noise, open a window and quickly leave the building. Turn off the gas using the outside main valve if you can, and call the gas company. If you turn off the gas for any reason, it must be turned back on by a professional.

Use battery-powered lanterns or flashlights when examining buildings. Battery-powered lighting is the safest and easiest, preventing fire hazards or gas explosions.

Examine foundations, walls, floors, doors, staircases, and windows to make sure that the building is not in danger of collapsing. Watch for loose plaster, drywall, and ceiling that could fall.

Look for electrical system damage. If you see sparks, broken or frayed wire, or if you smell burning insulation, turn off the electricity at the main fuse box or circuit breaker. If you have to step in water to get to the fuse box or circuit breaker, call an electrician first for advice.

Check for sewage and water line damage. You can obtain safe water from undamaged water heaters, or by melting ice cubes.

Use tap water if local health officials advise it is safe.

Watch out for animals. Use a stick to poke through debris. Tsunami flood waters flush snakes and animals out of their homes.

Take pictures of the damage, both of the building and its contents, for insurance claims.







LEGEND

RESOURCE CATEGORIES

POTENTIAL SHELTERS

- SCHOOL 
- OTHER 
- CHURCH CARE HOME
- MUSEUM DAY-CARE
- COMM. BLDG.




RESPONSE SERVICES

- 911 CTR. 
- FIRE 
- HOSPITAL 
- AMBULANCE 
- POLICE 
- COAST GUARD 

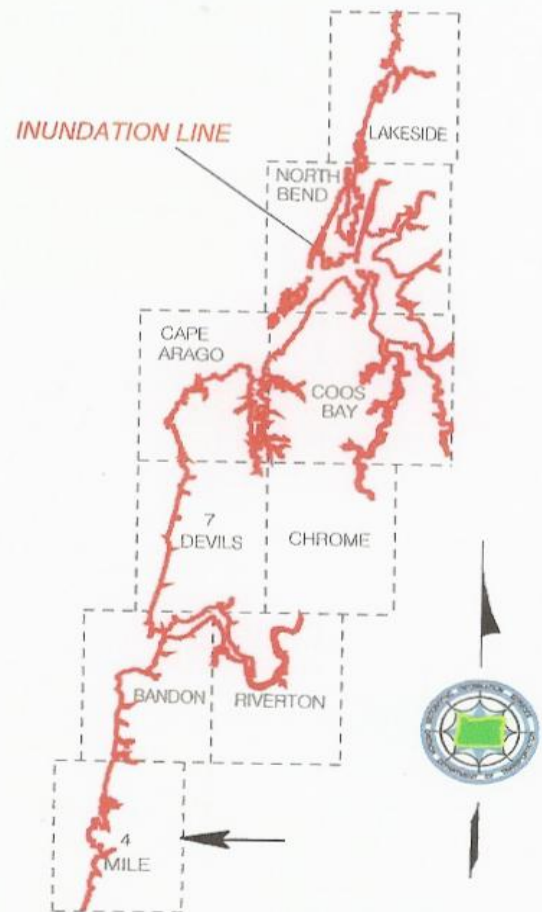
TRANSPORTATION

- BRIDGE 
- LAUNCH 
- PORT 
- AIRPORT 
- HELIPORT 
- NAVLIGHT 

MUNICIPAL FACILITIES

- HATCHERY 
- WASTEW 
- OTHER 
- = RESOURCE LOCATION
- = MILEPOINT LOCATION
- 45.63 = HWY. MILEPOINT

FOCUS AREAS



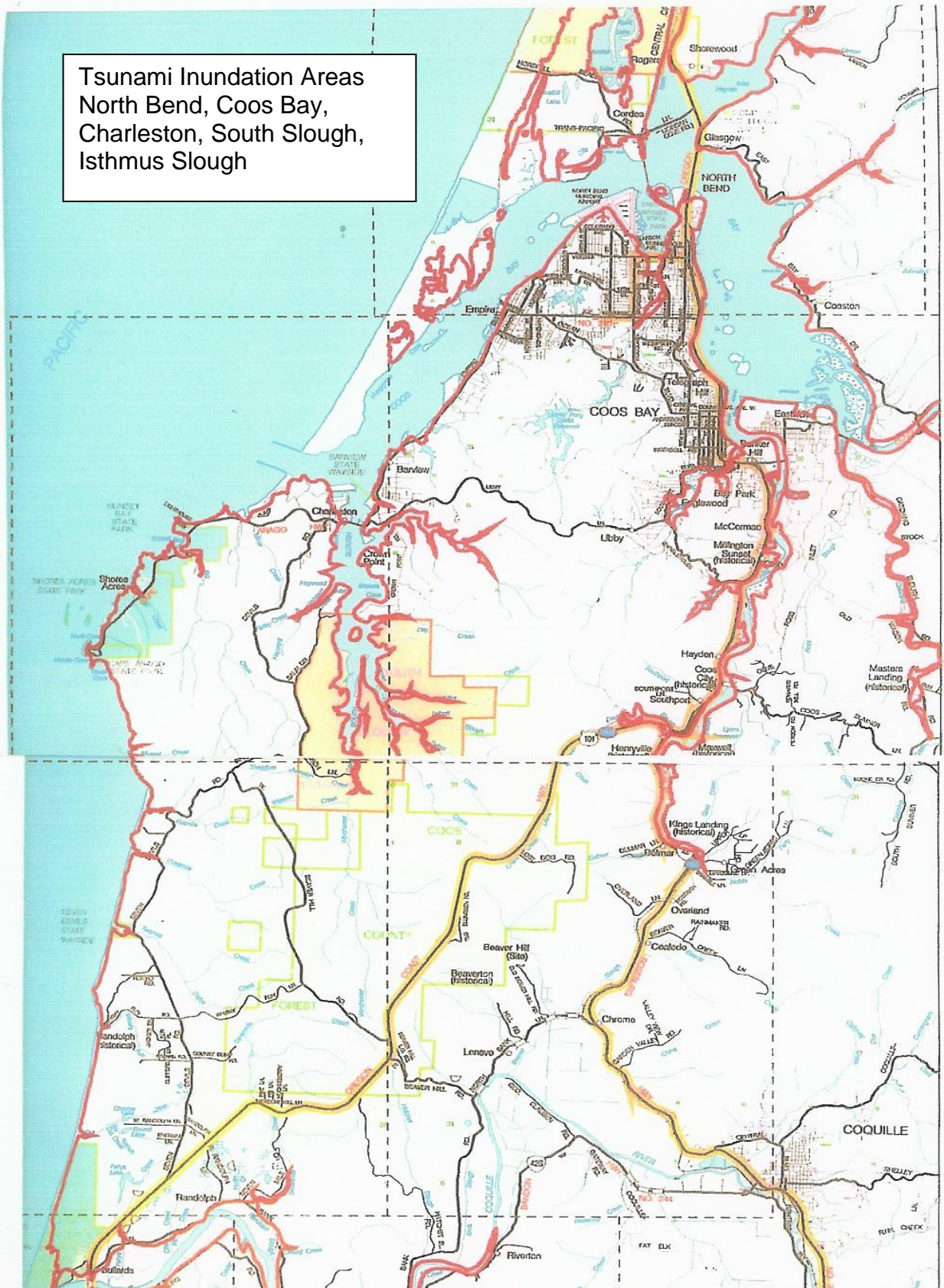
Tsunami Inundation,
Lakeside, Tenmile, and
National Recreation Area



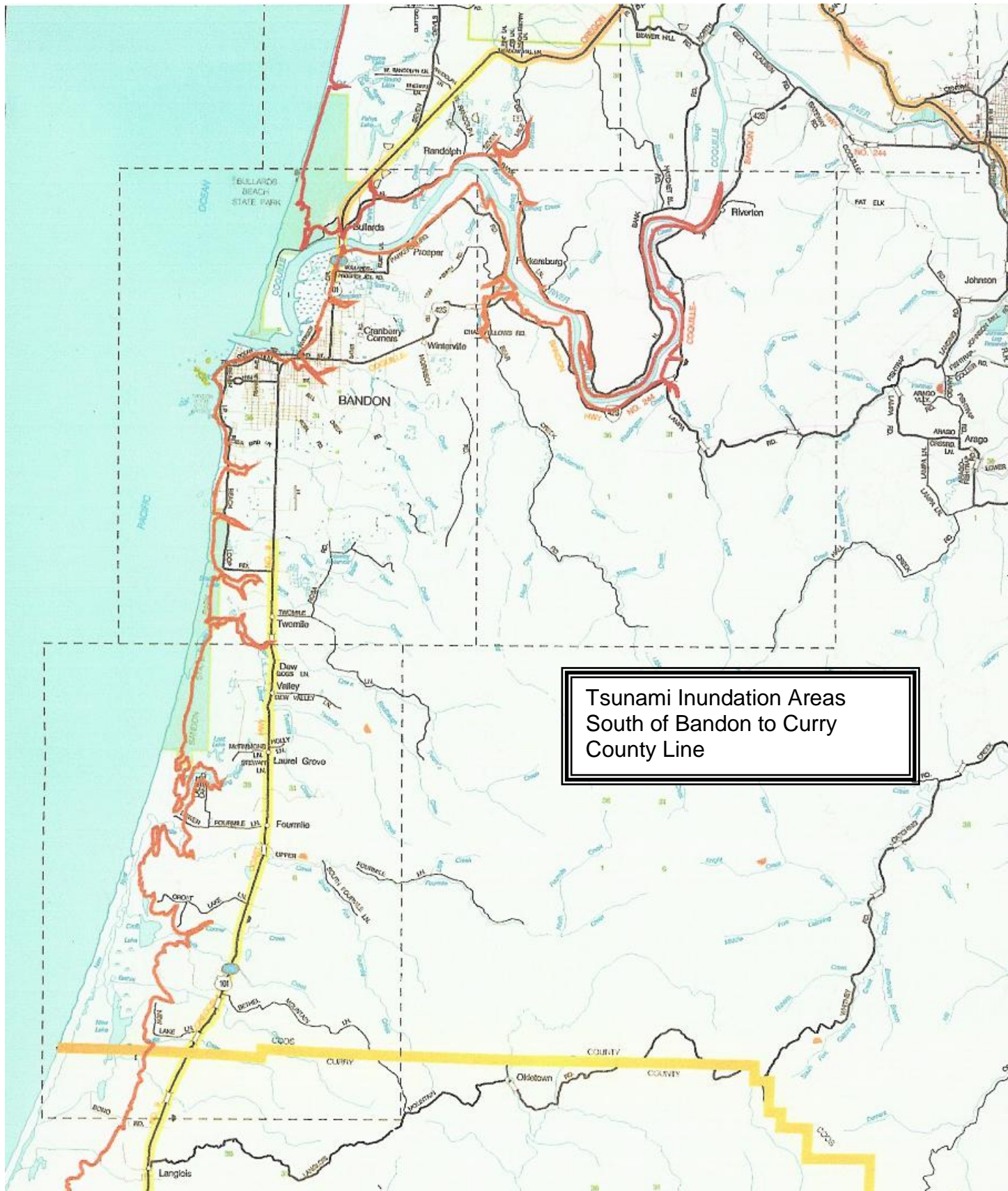
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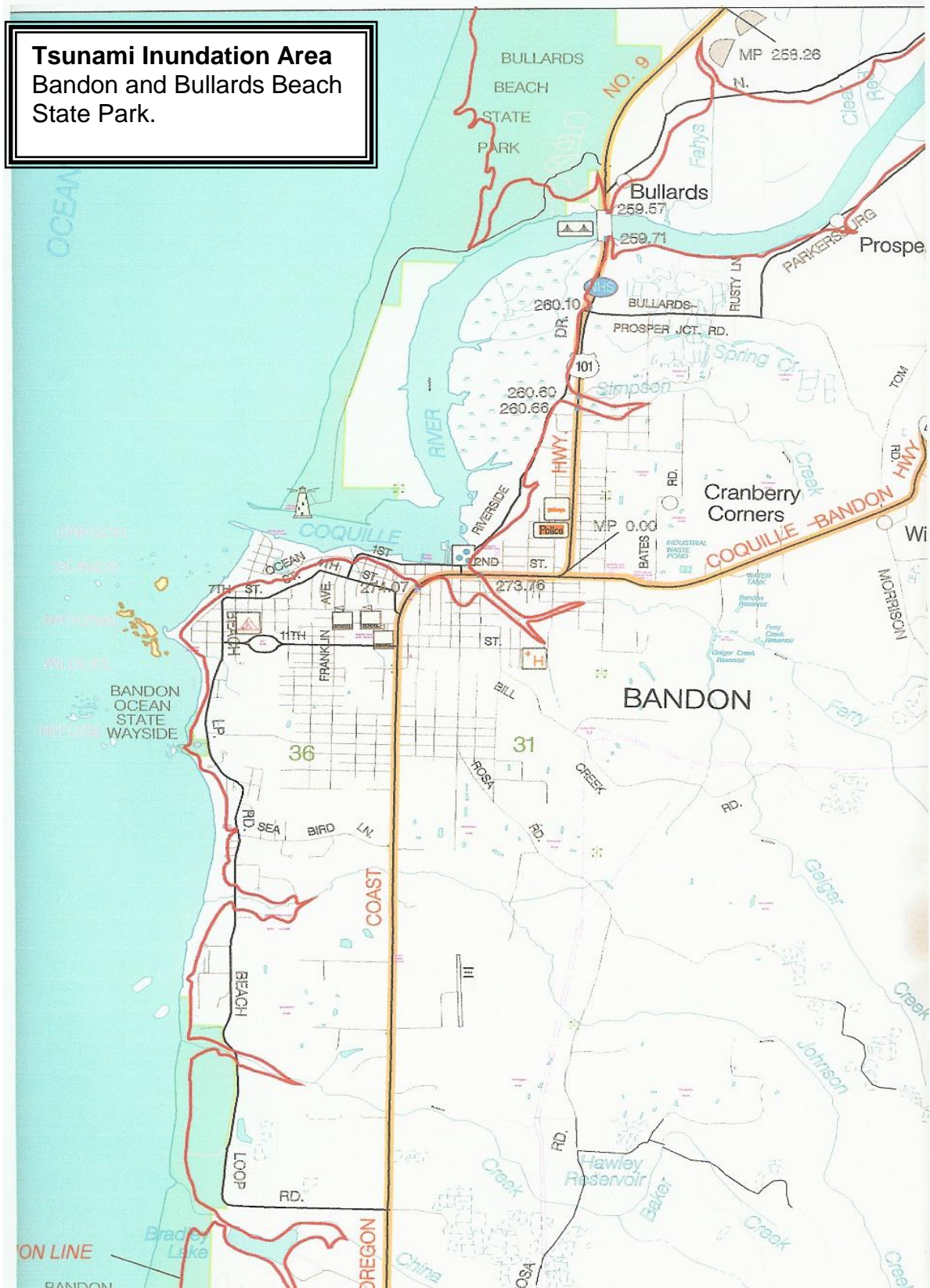
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IA 3 SECTION 3 - 3



IA 3 Section 3 - 6