# Garibaldi, Oregon Local Natural Hazards Mitigation Plan

An annex to the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan

Update 2011

Prepared By:

Sabrina Pearson And The City of Garibaldi

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Chapter 2: Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan

# **Executive Summary**

The City of Garibaldi reviewed its October 23, 2006, Local Natural Hazard Mitigation Plan, an appendix to the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan and decided to create this 2011 Update as annex document that addresses the twenty items of the FEMA crosswalk. Since the writing of the plan approved by FEMA on October 23, 2006, Garibaldi has significantly increased participating in the planning process, studied and enhanced knowledge of the natural hazards facing the jurisdiction, undertaken mitigation action items, and incorporated mitigation into the development ordinance, all while encouraging public involvement. This local plan annex describes how Garibaldi has addressed each of the Natural Hazard Mitigation Plan requirements.

# Section 1: The Process of Natural Hazard Mitigation

FEMA 1: Resolution of Adoption by the Local Governing Body		
The City Council of the City of Garibaldi adopted the Garibaldi Local Hazard Mitigation Plan 2011 Update at a City Council meeting on by Resolution # The City utilized the model resolution included in the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan Administration Documents.		
FEMA 2: Resolution of Multi-Jurisdiction Plan Adoption		
The City Council of the City of Garibaldi adopted the Garibaldi Local Hazard Mitigation Plan 2011 Update as an annex to the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan at a City Council meeting on by Resolution # The City utilized the model resolution included in the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan Administration Documents.		
FFMA 3: Description of the Multi-Jurisdiction Planning Process		

The City of Garibaldi sent representatives to each steering committee meeting for the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan. Documentation of these meetings is provided in the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan.

#### FEMA 4: Description of the Local Hazard Mitigation Planning Process

Local hazard mitigation in Garibaldi is carried out by the City Manager, the City Fire Chief and the City Public Works Superintendent with the approval of the City Council who seek to implement the goals of the Local Hazard Mitigation Plan. The Planning Commission ensures that hazard mitigation is analyzed with each land use application for which they must issue a decision. The Planning Commission and City Council ensure that each amendment passed does

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not increase the potential for hazards, consistent with their Comprehensive Plan goals and policies that implement Oregon Statewide Planning Goal 7 Hazards. Public input about ways to reduce the potential for hazards is welcomed at the Planning Commission and the City Council meetings. Meetings of the Planning Commission and City Council are posted and noticed to the public.

#### Section 2: Risk Assessment

#### FEMA 5: Identifying Hazards

Garibaldi has a risk of natural hazards from Climate Change, Coastal Erosion, El Nino, Flooding, Landslide, Debris Flow, La Nina, Drought, Earthquake, Wildland Urban Interface Fire, Windstorms, and Winter Storms. Garibaldi has a risk of catastrophic earthquake and tsunami. The last significant distant Tsunami event was recorded on January 26, 1700. The most recent distant Tsunami event was March 11, 2011. Flooding, El Nino, Landslide, Debris Flow, La Nina, Windstorms, and Winter Storms have historically occurred frequently.

#### Local Risk Analysis

Because a portion of Garibaldi is in a tsunami inundation zone, residents make themselves familiar with evacuation routes for the city. A local Tsunami can come onshore within 15 to 20 minutes after an earthquake, before there is time for an official warning from the national warning system. Ground shaking may be the only warning so evacuate quickly and have a plan. A distant Tsunami will take 4 or more hours to come ashore and residents will feel no earthquake. The tsunami will generally be smaller than that from a local earthquake and typically there is time for an official warning and evacuation to safety. Evacuation warnings for a distant tsunami will generally be indicated by a steady three minute siren blast and announcement over NOAA radio that the local area has been put on an official tsunami warning. In isolated areas along beaches and bays, there may not be a warning siren. If residents or visitors hear the three minute blast or see a sudden change in sea level, first evacuate away from shoreline areas, then turn on broadcast media or NOAA weather radio for further information. If you feel an earthquake, protect yourself until the earthquake is over, drop and hold, move immediately inland to high ground and move away from low lying coastal areas. In Garibaldi, move up the hill away from the water and U.S. Highway 101. Go on foot if possible, do not wait for an official warning, do not pack or delay, do not return to the beach or waterfront. Wait for an "all clear" from local emergency officials before returning to low-lying areas. A tsunami may come in a few minutes and large waves may continue to come onshore for several hours. Residents and visitors should be prepared and should assemble emergency kits with a 3-5 day supply for each family member.

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#### FEMA 6: Profiling Hazards

During the planning period 2006 – 2011, Garibaldi experienced five disaster declarations and hazards from flooding, landslide, debris flow, windstorms, and winter storms. Flooding, debris flow, landslide, and winter storms prevented access out of Tillamook County by blocking U.S. Highway 101, Oregon Highway 6 and Oregon Highway 26. These presidential disaster declarations are identified in the Multi-Jurisdiction Plan. The city appreciated the financial assistance provided by FEMA in response to and in recovery from these natural disasters.

FEMA – DR 1956	Severe Winter Storm, Flooding, Mudslides, Landslides, and Debris Flow Declared Date: 2/17/2011 for period 1/13/2011 – 1/21/2011 Total Public Assistance to all affected counties: \$2,768,029
FEMA – DR 1824	Severe Winter Storm, Record and Near Record Snow, Landslides, and Mudslides; Declared Date: 3/2/2009 for period 12/13/2008 – 12/26/2008 Total Public Assistance to all affected counties: \$10,925,460
FEMA – DR 1733	Severe Storms, Flooding, Landslides, and Mudslides Declared Date: 12/8/2007 for period 12/1/2007 – 12/17/2007 Total Public Assistance to all affected counties: \$56,117,225 Total Individual Assistance to all affected counties: \$6,402,583 for 1059 applications
FEMA – DR 1683	Severe Winter Storm and Flooding Declared Date: 2/22/2007 for period 12/14/2006 – 12/15/2006 Total Public Assistance to all affected counties: \$5,095,726
FEMA – DR 1672	Severe Storms, Flooding, Mudslides Declared Date: 12/29/2006 for period 11/5/2006 – 11/8/2006 Total Public Assistance to all affected counties: \$5,095,726

#### FEMA 7: Assessing vulnerability: An Overview

The following risk analysis discusses how hazards affect Garibaldi when compared to Tillamook County.

The impact of <u>climate change</u> on Garibaldi is anticipated to potentially increase the impacts of all other hazards; therefore, climate change analysis is an ongoing action item.

Although the impact of <u>coastal erosion</u> on Garibaldi has not been analyzed, observation of geographic, geologic and topographic features indicate that sedimentation from the Miami River combined with existing natural and manmade rock formations, sea walls, wake disbursement

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infrastructure and other forms of water-based infrastructure maintain stabilization of existing shorelands.

Infrequent episodes of <u>drought</u> in Garibaldi are addressed with water rationing. Garibaldi encourages water conservation through its own water rate structures and with the cooperation of Tillamook County Community Development's Building Department, which encourages water efficient plumbing in new building construction and reconstruction. Garibaldi also actively seeks to reduce water loss by locating and repairing leaks within the public water system, as well as by prohibiting the wasting of water by system users in the City's municipal code. Freezing conditions and extreme heat are atypical weather conditions to which Garibaldi especially vulnerable.

<u>La Nina</u> weather patterns cause an increase in wet and windy weather. Wet weather increases landslide, flooding and debris flow hazards. High winds are more common and represent a more likely hazard, if perhaps better prepared for. A primary hazard of winter storms in Garibaldi is the potential for tree falls.

In the past five years, tree fall and flooding has closed access routes out of Tillamook County.

<u>El Nino</u> weather patterns cause dry weather that prevents adequate snow pack and can affect water supply.

Earthquakes pose a potential hazard to all existing and new structures in Garibaldi. Garibaldi is currently retrofitting its City Hall/Fire Department building for seismic stability with financial assistance from the Oregon Department of Emergency Management. Other critical facilities include a United States Coast Guard base, an ambulance station, a commercial marina and a grade school. Garibaldi has a relic smoke stack built around the late 1930's that may be a significant hazard if it collapses. Preliminary engineering assessments indicate that it is losing structural integrity and may become dangerous without some form of structural rehabilitation. Earthquakes also pose a contamination hazard to Garibaldi's ground and surface water sources. Garibaldi uses a ground water source with no impurities for municipal use, and therefore has no facility for decontaminating water. Any contamination of ground water sources as a result of seismic activity is likely to inhibit or prevent Garibaldi from producing potable water after an earthquake.

<u>Tsunamis</u> pose a significant hazard to property located adjacent to Tillamook Bay. Garibaldi is currently waiting to evaluate new mapping by DOGAMI in order to refine hazard potential associated a tsunami event. Garibaldi has an observably high risk of isolation as a result of earthquake and tsunami events based on apparent vulnerability of transportation infrastructure. General vehicular access to Garibaldi is facilitated by Hwy 101, which runs north and south along the Oregon Coast. Garibaldi can also be accessed through a series of forest land utility roads that interconnect throughout the coast range. However, use of these roads requires access to private property and no agreements are in place at this time for use of these roads in either an emergency or for emergency preparation.

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Hwy 101 through Tillamook County relies on a series of bridges and culverts for structural functionality; all of which may be rendered unsafe or possibly destroyed in the event of either a <u>tsunami</u> or <u>earthquake</u>.

Marina infrastructure is especially susceptible <u>tsunami</u> hazards, and potential damage to docks and mooring facilities may hinder or prevent transportation in and out of Garibaldi by use of watercraft. It is unclear as to the effect of a <u>tsunami</u> or <u>earthquake</u> on jetty infrastructure located at the entrance of Tillamook Bay; however, it is reasonable to conclude that a significant hazard exists to this infrastructure in such events. The effect of such an event could prevent fishing operations, transportation of goods and people, and may compound flooding issues throughout the county's watersheds by inhibiting proper drainage of Tillamook Bay.

Additional hazards posed by <u>tsunamis</u> include flooding and structural damage as a result of high velocity water movement.

Earthquakes and high volumes of rain associated with <u>winter storms</u> combined with steep slopes prevalent throughout Garibaldi pose potential <u>landslide</u> hazards as well as <u>flooding</u>.

Garibaldi utilizes land-use zoning to mitigate the impact of structural building on slope stability, as well as to ensure structures meet the requirements of the NFIP.

Garibaldi interfaces with a commercially operated forest resource, which poses the potential for wildfire and wildland urban interface fire hazards, as well as debris flow associated with landslides.

Municipal water infrastructure is susceptible to <u>earthquake</u> and <u>landslide</u> hazards. Garibaldi's existing reservoirs are not equipped with seismic-activated shut off valves. Additionally, more than two miles of existing water mainline infrastructure is composed of asbestos/concrete pipe, which does not possess either the material flexibility or strength to endure significant ground shifting.

Potential hazards from <u>volcanic</u> activity have not been assessed; however, potential ash fall and impacts to weather patterns could pose hazards to storm water, wastewater and transportation infrastructure, as well as jeopardize ground and surface water sources for Garibaldi.

#### FEMA 8: Assessing Vulnerability: Repetitive Loss Properties

To prevent adverse impacts of flooding, culverts and drainage ways are carefully managed At the time of building permit or site development review, the city reviews plans to ensure that anticipated storm water is accommodated within the appropriate drainage basin.

FEMA National Floodplain Insurance Program records provided by FEMA Region X Coordinator Kristen Meyers identify:

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#### CITY OF GARIBALDI

Regular Entry: 04/17/1978

Policies in Force: 20

Insurance in Force: \$4,750,600.00

No. of Paid Losses: 1

Total Losses Paid: \$9,085.82

Sub. Damage Claims Since 1978: 0

CAV Date: 04/20/2000

Rep Loss: 0

#### FEMA 9: Assessing Vulnerability: Identifying structures, infrastructure, & critical facilities

The Garibaldi City Hall is located in the anticipated Tsunami Inundation Zone. City Hall includes a community meeting facility. In the event of a catastrophic disaster event such as a magnitude 8.5 - 9.5 Cascadia subduction zone earthquake event and possible Tsunami, the City expects that the City Hall.

Analysis of each building permit and land use application, infrastructure improvement is done to determine if the structure or infrastructure will be located in an area subject to natural hazard. Hazard mitigation is required prior to application approval. The precise and complete inventory of structures vulnerable to each hazard is an action item.

#### FEMA 10: Assessing Vulnerability: Estimating Potential Losses

Garibaldi contracts with the City County Insurance Services to insure city critical facilities and infrastructure. Each facility is assessed for the real market value replacement cost. The Tillamook County Tax Assessor's office estimates the assessed and real market value of all structures in Garibaldi. It is possible to use Garibaldi Hazard Analysis maps, CCIS data and Assessor Maps to estimate the valuation of the potential losses for each hazard event.

#### FEMA 11: Assessing Vulnerability: Analyzing Development Trends

The 2010 census data has not been broken out for Garibaldi and it is an action item to update this information. Garibaldi complies with the statewide planning goals with an adopted and acknowledged Comprehensive Plan and implementing ordinances that require mitigation of hazards prior to development. Garibaldi contracts for building services with Tillamook County and requires compliance with Oregon Building Code and the Oregon Fire Code. Garibaldi has its own sewer system and has its own water system.

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#### FEMA 12: Multi-Jurisdiction Risk Assessment

The 2009 Oregon Natural Hazards Mitigation Plan Oregon Coast Regional Profile and the 2009 Tillamook County Hazards Analysis, included in the Tillamook County Multi-Jurisdiction Natural Hazard Mitigation Plan, describe the risk of natural hazards in Tillamook County. Each jurisdiction has completed a risk analysis where the hazards differ from those anticipated.

# Section 3: Mitigation Goals and Action Items

#### FEMA 13: Local Hazard Mitigation Goals

The following goals and objectives are adopted by the City of Garibaldi to apply comprehensively to each hazard.

GOAL 1: Develop and implement mitigation initiatives to reduce hazards to life, businesses, property, and environmental systems.

- 1. Evaluate applicable city ordinances and capital improvement plans to ensure that they guide development that reduces potential for hazard
- 2. Promote insurance coverage to provide economic recovery after a disaster
- 3. Preserve environmental systems to serve natural hazard mitigation functions
- 4. Continuously develop and update natural hazard related data

Status: Ongoing. The city accomplished mitigation action items toward Policy 1, 2, 3, and 4. The City evaluated hazard ordinances and grading ordinances and adopted amendments to ensure that development reduces the potential for hazard, continues to promote insurance coverage to provide economic recovery after a disaster, administers ordinances and standards designed to preserve environmental systems to serve natural hazard mitigation functions, and commissioned a hazard analysis and GIS map project to update natural hazard related data.

#### GOAL 2: Implement effective mitigation projects and activities

- 1. Evaluate mitigation projects and activities for benefit/cost analysis and cost effective analysis
- 2. Educate the public about hazard risks and mitigation project implementation
- 3. Consistently seek diverse funding and resource partnerships for mitigation project and activity implementation

<u>Status</u>: Ongoing. The city accomplished mitigation action items toward Policy 1, 2, and 3. The City evaluated mitigation projects and activities for benefit / cost analysis and is working toward the accomplishment of goals described in FEMA Item #17. The city continues to seek diverse funding and resource partnerships for mitigation project and activity implementation.

# GOAL 3: Enhance Emergency Services and the capabilities of Local First Responders

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- 1. Enhance community self-sustainability
- 2. Prepare first responders with training and equipment
- 3. Strengthen emergency operations through improvements to communication and coordination
- 4. Coordinate hazard mitigation with emergency operations plans and procedures

<u>Status</u>: Ongoing. The city accomplished mitigation action items toward Policy 1, 2, 3, and 4. The City purchased generators for critical infrastructure, the fire department and City Hall. The fire department trains first responders and offers training to the local citizens. The city purchased communication equipment. The City coordinated hazard mitigation with emergency operations plans and procedures and plans to prepare an updated emergency operation this planning period.

#### GOAL 4: Improve regional coordination and communication

- 1. Participate in the Regional Hazard Mitigation Steering Committee
- 2. Maintain an active Emergency Preparedness Committee
- 3. Survey the community and develop response plans for each potential hazard

<u>Status</u>: Ongoing. The city accomplished mitigation action items toward Policy 1, 2, and 3. The City participated in the Regional Hazard Mitigation Steering Committee, maintains an active Emergency Preparedness Committee, and continues to survey the community and develop response plans for each potential hazard.

#### FEMA 14: Identification and Analysis of Mitigation Actions

Garibaldi has adopted hazard mitigation action items that address each natural hazard. These are provided in Volume 1, FEMA Item #14 of the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan 2011 Update. Mitigation action items currently in process or identified to be undertaken within the five year planning period are identified in this local hazard mitigation plan in FEMA Item #17.

# FEMA 15: Identification and Analysis of Mitigation Actions: NFIP Compliance

Garibaldi participates in the National Floodplain Insurance Program (NFIP). The FIRM is adopted and available as a digital document. FEMA is working with Garibaldi to update the FIRM with a final product anticipated to be adopted in 2013. Garibaldi adopted a flood hazard prevention ordinance that provides requirements consistent with the FEMA NFIP. At the time that development is proposed within an identified flood zone, an elevation certificate is required to document the elevation of the site before site development and the elevation of the structure after site development. Building permit applications in identified flood zones are reviewed by the Building Official, a certified floodplain manager. In a flood zone, the City flood ordinance and

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grading ordinance requires an elevation certificate and mitigation of hazards to ensure that there is no adverse effect the site and surrounding property.

#### FEMA 16: Implementation of Mitigation Actions

During the writing of the previous hazard mitigation plan Garibaldi established a local hazard mitigation planning committee that has continued to meet on a regularly scheduled basis to evaluate hazard mitigation and prioritize mitigation actions according to a cost benefit ratio of the proposed project benefits and to the project costs. When action items are undertaken for implementation as described in FEMA Item #17, a written cost benefit analysis is obtained from a qualified consultant and coordinated with Oregon Emergency Management and FEMA. Hazard mitigation action items address each potential natural hazard and are prioritized with timeframes to actively pursues completion: short (one to two years), medium (two to five years); or long term (more than five years). In March and September of each year, these action items are identified as "completed, deleted, or deferred" as a benchmark for progress and an update written for the local hazard mitigation plan. Where activities for prioritized projects remain unchanged, the plan describes why no change occurred.

#### FEMA 17: Multi-Jurisdiction Mitigation Action Items

This is a list of action items in process or that have been completed.

Action Item: Miami-Foley Transmission Waterline Relocation identified in the 2005 HMP. Hazards: Earthquake, tsunami, volcano eruption, flooding, landslide, debris flow, El Nino

Time frame: Completed through OEM funding by the City.

Action Item: Retrofit Garibaldi City Hall/Fire Department building for seismic stability with

financial assistance from the Oregon Department of Emergency Management.

Hazards: Earthquake, tsunami

Time frame: In process

Action Item: Dismantle 100' tall relic smoke stack.

Description: Garibaldi has a relic smoke stack built around the late 1930's that may be a

significant hazard if it collapses. Preliminary engineering assessments indicate that it is losing structural integrity and may become dangerous without some form

of structural rehabilitation.

Hazards: Earthquake, tsunami, volcano eruption

Timeframe: 2-4+ years

Action Item: Develop action plan for analyzing and decontaminating water in the event of an

earthquake.

Description: Earthquakes also pose a contamination hazard to Garibaldi's ground and surface

water sources. Garibaldi uses a ground water source with no impurities for municipal use, and therefore has no facility for decontaminating water. Any

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contamination of ground water sources as a result of seismic activity is likely to inhibit or prevent Garibaldi from producing potable water after an earthquake.

Hazards: Earthquake, tsunami, volcano eruption

Time frame: 2-4+ years

Action Item: Refine hazard analysis with scientific data: DOGAMI Risk Map

Description: Garibaldi is currently waiting to evaluate new mapping by DOGAMI in order to

refine hazard potential associated a tsunami event.

Hazards: Earthquake, tsunami, flooding, landslide, debris flow, El Niño

Timeframe: 1-2 years.

Action Item: Agreement to use forest roads in an emergency or disaster response

Description: Garibaldi has an observably high risk of isolation as a result of earthquake and

tsunami events based on apparent vulnerability of transportation infrastructure. General vehicular access to Garibaldi is facilitated by Hwy 101, which runs north and south along the Oregon Coast. Garibaldi can also be accessed through a series of forest land utility roads that interconnect throughout the coast range. However, use of these roads requires access to private property and no agreements are in place at this time for use of these roads in either an emergency or for emergency

preparation.

Hazards: Earthquake, tsunami, flooding, landslide, debris flow, La Nina

Time frame: 1-2 years

Action Item: Seismic retrofits to bridges and culverts on U.S. Highway 101 to prevent collapse

in an earthquake.

Hazards: Earthquake, tsunami

Time frame: 2-4+ years

Action Item: Analysis of Jetty infrastructure and port to determine if action could better assure

usability for fishing the transport of goods to the area in the event of a disaster.

Hazards: Tsunami, earthquake

Time frame: 2-4+ years

Action Item: Equip reservoirs with seismic-activated shut-off valves

Hazards: Earthquake, landslide

Time frame: 2-4+ years

Action Item: Replace two miles of asbestos / concrete pipe

Description: more than two miles of existing water mainline infrastructure is composed of

asbestos/concrete pipe, which does not possess either the material flexibility or

strength to endure significant ground shifting.

Hazards: Earthquake, landslide

Time frame: 2-4+ years

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# Section 4: Plan Implementation and Maintenance

#### FEMA 18: Monitoring, Evaluating, and Updating the Plan

Garibaldi will continue to review the Hazard Mitigation Plan at not fewer than two public meetings per year anticipated to be held in March and September of each year. The Hazard Mitigation Plan Committee shall include a staff member or qualified consultant identified as the lead Hazard Mitigation Planner responsible for ensuring that data from each biannual meeting is incorporated into the local hazard mitigation plan. In addition, each participating jurisdiction shall continue to send steering committee members to Tillamook Multi-Jurisdiction Natural Hazard Planning Committee meetings held not less than twice per year. Local and multi-Jurisdiction meetings are currently scheduled to be held in March and September of each year. Meetings shall be noticed to the public consistent with Public Meetings Laws. Minutes shall be taken of each meeting and made available to the public upon request. A copy of the minutes for each Multi-Jurisdiction Meeting shall be sent to each participating jurisdiction and incorporated by the local hazard mitigation planner into the local Hazard Mitigation Plan.

At the September Multi-Jurisdiction Hazard Mitigation Plan meeting, the City shall submit to the Tillamook County Multi-Jurisdiction Hazard Mitigation Planning Committee an update to the Local Natural Hazard Mitigation Plan to be reviewed, revised if appropriate, and resubmitted to the State Hazard Mitigation Officer for approval within five years of the date that the Multi-Jurisdiction Plan is approved in order to continue to be eligible for HMGP project grant funding. The State will then send the plan to the appropriate FEMA Regional Office for formal review and approval. When the Tillamook County Multi-Jurisdiction Hazard Mitigation Planning Committee is notified that their plan is approved, Garibaldi shall adopt the plan by resolution.

# FEMA 19: Implementation through Existing Planning Mechanisms

Garibaldi will continue to seek and incorporate the latest scientific reports, map and studies that analyze the risk of natural hazards in Garibaldi into planning mechanisms. In the next five year planning period, Garibaldi continues to evaluate action items for implementation and to review the development ordinance and comprehensive plan to make certain that these documents align with mitigation goals.

#### FEMA 20: Continued Public Involvement

The City of Garibaldi has been an active participant in the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan Steering Committee. During the next five years, Garibaldi will continue efforts to obtain public involvement to meet mitigation goals, prepare, respond to and recover from natural hazards. Garibaldi will continue to work with the Tillamook County Multi-Jurisdiction Natural Hazards Mitigation Plan Steering Committee to ensure that they participate in the regional effort to prepare for, respond to and recover from natural hazards.

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