Appendix A: Workshop Documentation

Recommendations for Westport's Comprehensive Plan Update

Prepared for the City of Westport, WA, by the University of Washington Urban Design & Planning Studio "Community Engagement for Coastal Resilience," URBDP 508B, Autumn 2018

UNIVERSITY of WASHINGTON

A Report based on Community Responses to Tsunami and Sea Level Rise Scenarios for purposes of Integrating the Grays Harbor County Multi-Jurisdiction Hazard Mitigation Plan with the City of Westport Comprehensive Plan

November 21, 2019

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1. Coastal Resilience Workshop Summary

1.1. Document Overview

This document includes a summary and documentation of two workshops held in Westport on Friday and Saturday, November 16-17, 2018. It constitutes an appendix to the University of Washington (UW) Urban Design & Planning 508B Studio report of Recommendations for the City of Westport's Comprehensive Plan Update (Recommendations Report). UW faculty and students and members of the Westport Steering Committee or the project (Steering Committee) co-designed the workshops to engage partners and community members in hazard resiliency planning and gather input to inform the recommendations made in the Recommendations Report. This Appendix includes a summary of the workshop outcomes, as well as documentation from the discussions that took place both days. The workshops served as the primary opportunity for the UW team to gather input from a diverse representation of partners and community members, building on information gathered during previous meetings, site visits, and interviews.

1.2. Summary of Workshop Approach and Outcomes

This section provides a brief summary of the approach used during the two workshops and overarching themes that emerged from discussions. The two workshops consisted of (1) an invitation-only "Partners Workshop" for local leaders in planning and emergency management on Friday, Nov. 16, and (2) a "Community Workshop" widely advertised and open to the general public on Saturday, Nov. 17. More detail on the approach and outcomes for each day is provided below. Both workshops focused on the theme of making hazard mitigation more meaningful to the community and actionable in Westport and the larger South Beach area. Workshop goals included:

- Build on the community's already-significant accomplishments in preparing for a large earthquake and tsunami, including its construction of North America's first tsunami vertical evacuation structure;
- Help the City update its Comprehensive Plan Update, to include hazard mitigation in a way that reflects Westport/South Beach values and needs;
- Raise public awareness of households' needs and means to be prepared for emergencies, and encourage a culture of community self-reliance and mutual help;
- Discover everyday value in preparing for rare and uncertain future events, based on the use of complex and evolving scientific knowledge about multiple locally relevant hazards.

Though there were some minor differences between the two days, the workshops drew from the same general approach and organization of activities and discussion sessions, outlined in Figure 1 below.

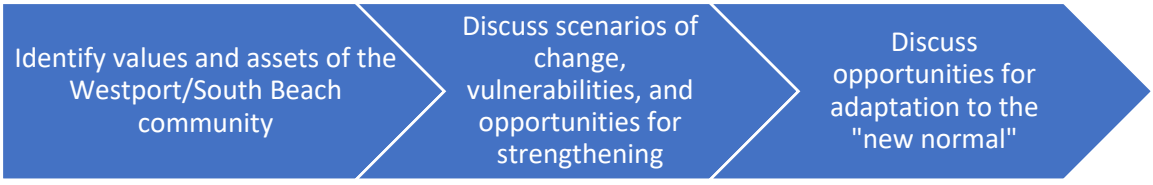

Figure 1. Overview of Workshop Approach and Structure

1.2.1.Values and Assets

In both workshops, participants first considered Westport/South Beach community values and then identified and located assets that support those values. This "appreciative inquiry" approach, rather than beginning with a focus on hazards and vulnerabilities, encourages participants to think about changes as opportunities rather than threats and helps them develop a holistic set of criteria to use in identifying hazard mitigation strategies.[1] Values were defined as: "what makes Westport/South Beach a great place to live, work and play?" Participants were encouraged to think of values as more general qualities, such as "I like how everyone knows each other" or "the fishing and hunting are really good around here; I can earn a living doing these things and feed my family!" They might be even more basic such as "good healthcare". Assets, on the other hand, were intended to consist of specific places, groups or activities that support these values and can be identified on a map or associated with particular amenities, facilities, institutions, businesses, people or events.

While the identified assets and values varied among days and discussion groups, many participants identified common themes. Table 1 below includes a summary of values and assets highlighted by workshop participants.

Table 1. Westport/South Beach Community Values and Supporting Assets

Values	Description and Supporting Assets
People are resilient	The people are hardworking, self-sufficient, innovative, resourceful and outdoor survivalists. The know how to fix boats, car, house, equipment, hunt, fish, and live outdoors.
Social bonds	People meet each other on the docks, at school events, at church gatherings or in the neighborhood. They help each other out and people have strong sense of belonging, community, and cultural identity here.
Education	The Westport Timberland Library and Ocosta School District are valued for providing education and communal space for children and families.
Naturally available foods	The ocean and forests surrounding Westport provide an abundant amount of fresh seafood, elk, deer, berries, and mushrooms for the community to fish, hunt, and collect freely with the right permits and equipment.
Natural resources for economic vitality	The scenic ocean views, local fisheries and aquaculture, and cranberry bogs are the heart of the economy in this area. Scenic ocean views drives tourism along the beaches and in the marina district. The local fisheries provide jobs for fishermen, and the seafood is processed in plants in the marina district. The fisheries also provide charter companies with tourists who want to do deep-ocean fishing. The cool climate and farmlands provide a place for cranberry bogs and a robust cranberry industry to thrive. Surrounded by the ocean, the city is an ideal place for a boating development industry.
Natural features for recreation	State and local parks and beaches provide excellent recreational space for hiking, running, walking, and site seeing. The ocean provides a place for swimming and surfing. These natural features enhance community health and well-being.

[1] An earlier version of the approach is discussed in Freitag, R. C., Abramson, D. B., Chalana, M., & Dixon, M. (2014). Whole Community Resilience: An Asset-Based Approach to Enhancing Adaptive Capacity before a Disruption. *Journal of the American Planning Association, 80*(4), 324-335.

Values	Description and Supporting Assets
Rural, seaside, and small-town local character	The area's rural character provides clean water and air which allow the natural features to thrive and enable people to enjoy the outdoors. The city feels quiet and relatively safe, there is minimal traffic, and the area is not densely populated. The downtown area has mostly local, non-franchised businesses and maintains a seaside character. People appreciate the quality of life here.
Public services	Local and regional public agencies support and enhance community safety and security.
Affordability and employment opportunities	Affordable housing and high-quality food in the area make it an attract place to live while enhancing quality of life. The natural resources (e.g., fishing, oyster, seafood processing, cranberry farming) and downtown businesses provide employment opportunities for residents of the region.
Historical features	The people of Westport are proud of their heritage and history. The Grays Harbor lighthouse and Westport Maritime Museum encapsulate these values.

Figure 2 shows community members and UW facilitators building a list of values and assets during the Saturday, November 17, workshop.

Figure 2. Values and Assets Brainstorming and Mapping Discussion

1.2.2. Hazards Scenarios

Following discussions of values and assets, the UW team shared information about different potential hazard scenarios that Westport/South Beach could face. The workshops focused on flooding and coastline change associated with sea level rise (SLR), as well as tsunamis and land subsidence associated with two possible scenarios of Cascadia Subduction Zone (CSZ) earthquake. In each workshop, one or

two table groups discussed the same set of SLR information, while two other table groups each discussed a different earthquake and tsunami scenario.[2]

The SLR information included projections for 2060, 2080, and 2100. Table 2 shows the SLR projections with different probabilities of coastal flooding for each time horizon.

Table 2. SLR Predictions and Associated Probabilities

Amount of SLR	2060	2080	2100
1 foot	11% probability	51% probability	77% probability
2 feet	0% probability	5% probability	27% probability
3 feet	0% probability	1% probability	5% probability

Source: table generated on 07/18/18 for the Washington Coastal Resilience Project, www.coastalnetwork.com/wcrp-documents.html

Both workshops also explored two near-source tsunami scenarios: one generated by a "medium" and "most shallow" Magnitude 8.9, or "M1", Cascadia subduction zone (CSZ) earthquake, which most resembles the last time a CSZ earthquake and tsunami occurred in 1700; and another generated by a "large" and "most shallow" Magnitude 9.0, or "L1", CSZ earthquake. Figure 3 shows how the M1 and L1 earthquake scenarios compare to other possible CSZ earthquake sources of tsunamis, in terms of: their magnitude (Mw); their depth below the ocean floor (most shallow, shallow, or deep); their likelihood of occurrence (i.e. if a CSZ earthquake occurs at all, what is the chance it will take one or another of these forms); and their associated amount (in meters) of uplift (red) or subsidence (blue) of the ocean bottom and land. Note that uplift and subsidence varies considerably at different distances from the fault offshore towards the land. (Contour intervals for uplift/subsidence are 3 meters, with reference to the tide level at Mean High Water.) These details of earthquake behavior are all very difficult to predict, not to mention the position along the 620-mile-long CSZ at which the next rupture might occur, and because they determine tsunami behavior at any one point on the coast, it is also difficult to predict *that* behavior, including the tsunami's time of arrival on the coast after the earthquake happens, the number and duration of waves, the depth and extent of flooding, the direction and speed of currents, etc.

Definitions and Acronyms

SLR = Sea level rise

MHW = Mean high water

CSZ = Cascadia Subduction Zone

L1 = Large and shallow magnitude 9.0 CSZ earthquake

M1 = Medium and shallow magnitude 8.9 CSZ earthquake

[2] Initially it was intended to have table groups rotate, "World Café"-style, at the end of the workshop so that most participants would have a chance to discuss more than one scenario, but there was not enough time in the schedule to allow that. However, each table reported out to the room, and this appendix and the Comprehensive Plan Update recommendations themselves represent a synthesis of the workshop discussions.

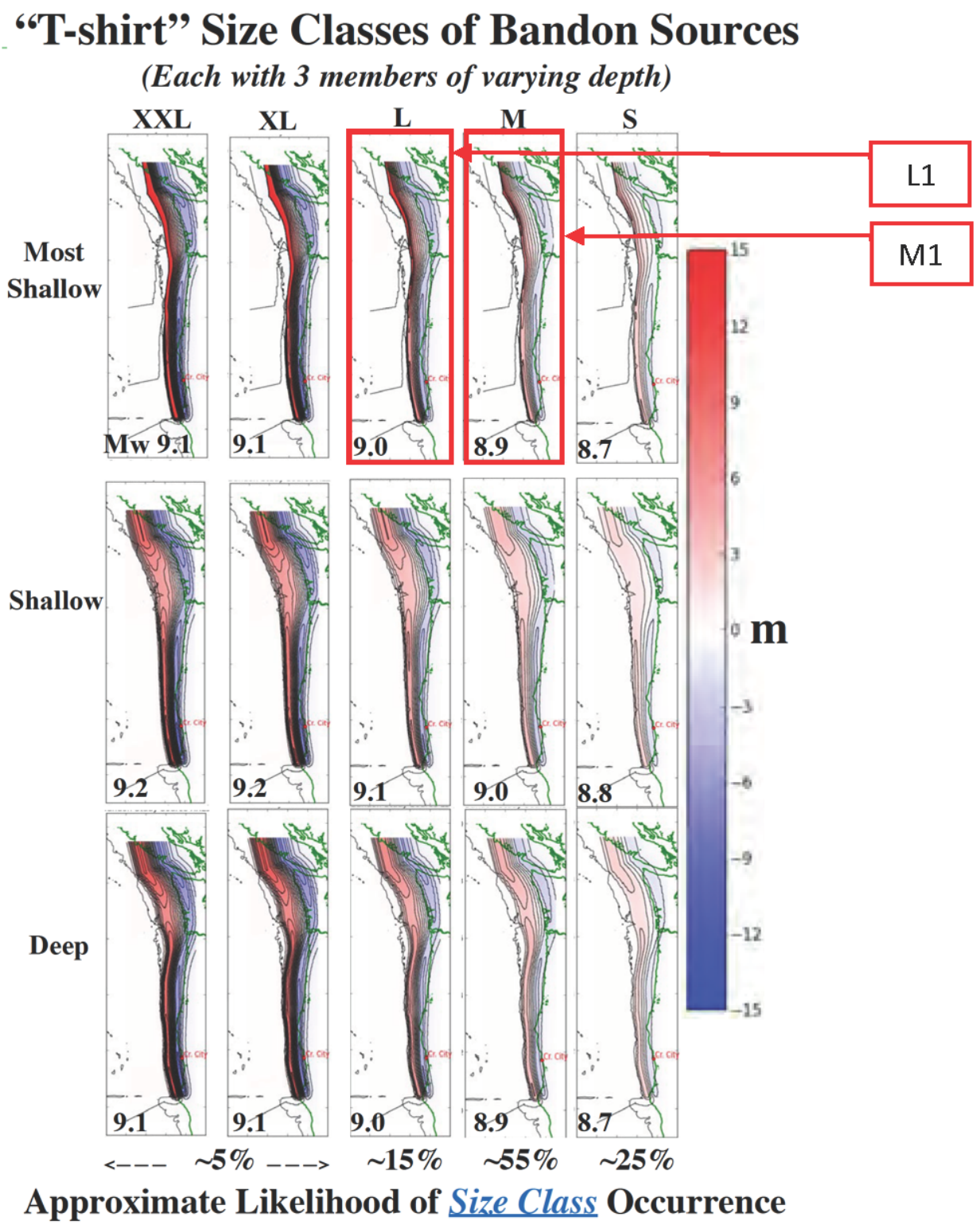

Figure 3. Suite of 15 Possible Cascadia Subduction Zone Fault Earthquakes. Source: Frank Gonzalez, based on a hazard assessment study for Bandon, Oregon. See Witter, Robert C, Yinglong Zhang, Kelin Wang, George R Priest, Chris Goldfinger, Laura L Stimely, John T English, and Paul A Ferro (2011): Simulating Tsunami Inundation at Bandon, Coos County, Oregon, Using Hypothetical Cascadia and Alaska Earthquake Scenarios. DOGAMI Special Paper 43 (July 11): 1–63.

Presentation of these scenarios in the workshops emphasized that both earthquake and climate impacts modeling is probabilistic and uncertain, but it is based on an increasing amount of available historic data and sophistication of methods to analyze it. Not all possible CSZ earthquake scenarios were considered, nor were any distant-source earthquake-tsunami scenarios (such as the very large Alaska 1964 event). Still, working simultaneously with SLR and two near-source earthquake-tsunami scenarios enabled the participants to address both on-going, cumulative, and relatively more predictable if less severe changes (SLR) as well rarer, sudden, and less predictable but possibly more severe changes (earthquakes and tsunamis). Considering multiple scenarios has several benefits for the planning process, including:

- Helping to account for the uncertainty of future outcomes
- Encouraging forward-looking thinking beyond disaster response and survival, to mitigation, recovery and betterment
- Creating robust long-term strategies for land use and development, infrastructure and service investments, and environmental protection – i.e. strategies that work under multiple possible future scenarios of change
- Informing future decisions about prioritizing and implementing strategies

To inform discussion, the UW team developed several maps depicting flooding hazards and coastline change associated with the scenarios for both the Partners Workshop and the Community Workshop.[3] For each map, the UW team developed a version showing the full peninsula, and a version showing Westport. There was one SLR map depicting the 1-, 2- and 3-foot rise in sea level shown in Table 2 (Figures 4 and 5; same map showing Westport and the peninsula).[4]

Maps showing earthquake and tsunami hazards referred to both the "T-shirt sizes" of M1 and L1 earthquake scenarios depicted in Figure 3, but also referred to them in less specialized language, respectively: M1 = "Like the last time", i.e. what occurred in 1700; and L1 = "Maximum Considered" for official State emergency planning purposes.

For each of these earthquake scenarios, the UW team prepared two types of maps: one type showing the inundation areas and maximum flooding depths over land during the first four hours following an M1 earthquake (Figures 6 and 7) and an L1 earthquake (Figures 8 and 9); and one type showing loss of coastal land due to earthquake subsidence following M1 (Figures 10 and 11) and L1 events (Figures 12 and 13). The flooding depth maps were used only in the Partners Workshop, which addressed both immediate tsunami response as well as long-term mitigation, recovery, and adaptation to possible "new normal. The Community Workshop used only the subsidence maps as it focused primarily on anticipating these "new normals".

[3] The maps were based on fine resolution Digital Elevation Models (DEMs) developed by the National Oceanic and Atmospheric Administration (NOAA) specifically for tsunami modeling on the Washington coast, and calculate elevations from Mean High Water (MHW). Available at https://catalog.data.gov/dataset/astoria-oregon-1-3-arc-second-mhw-coastal-digital-elevation-model

[4] Note that the SLR maps shown in the workshop contained an error, by depicting what is actually a 5-foot rise in sea level as a 3-foot rise. See the Erratum at the end of this Appendix that shows the correct areas flooded at 1-, 2-, 3- and 5-foot rise in sea level (Figure 36). Given that the two time-horizons for which workshop participants chose to discuss SLR effects – 2060 and 2080 – involved only 0% and 1% probabilities of 3-foot sea level rise respectively, the impact of this error on discussion was probably negligible.

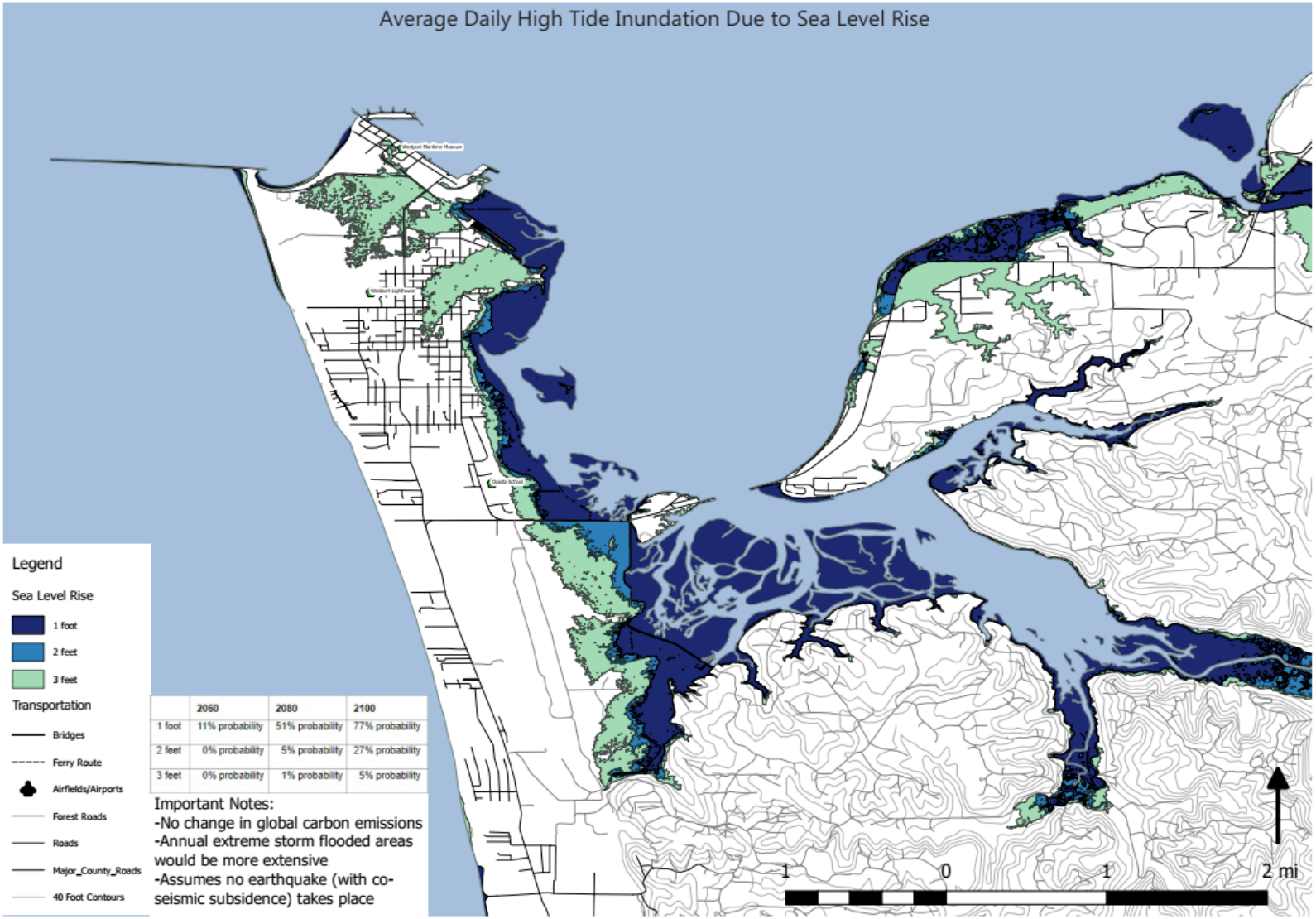

Figure 4. Regional Map of Average Daily High Tide Inundation under Different SLR Scenarios (1-3 feet)

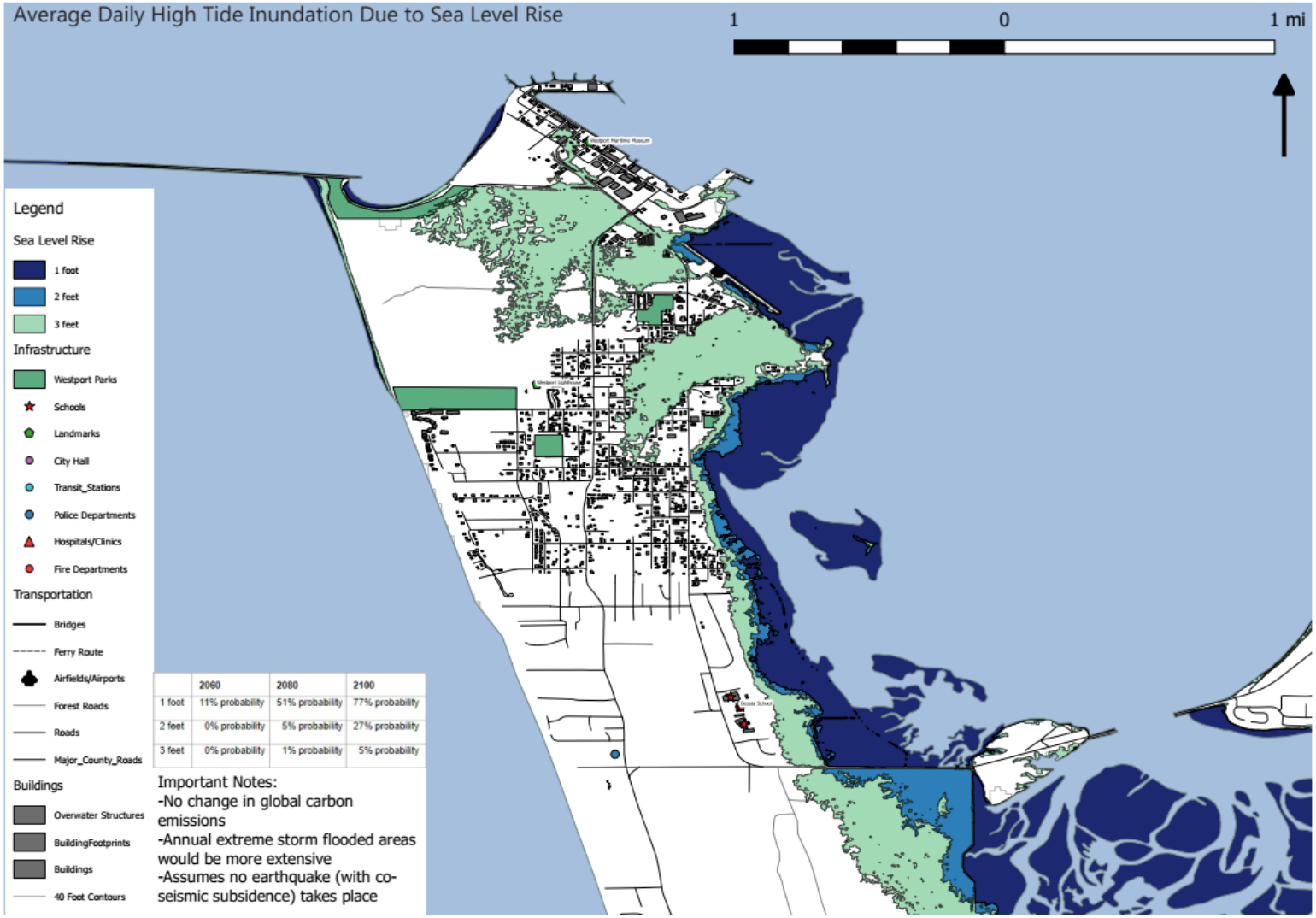

Figure 5. Westport Map of Average Daily High Tide Inundation under Different SLR Scenarios (1-3 feet)

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M1 Land Above and Below Average Daily High Tide

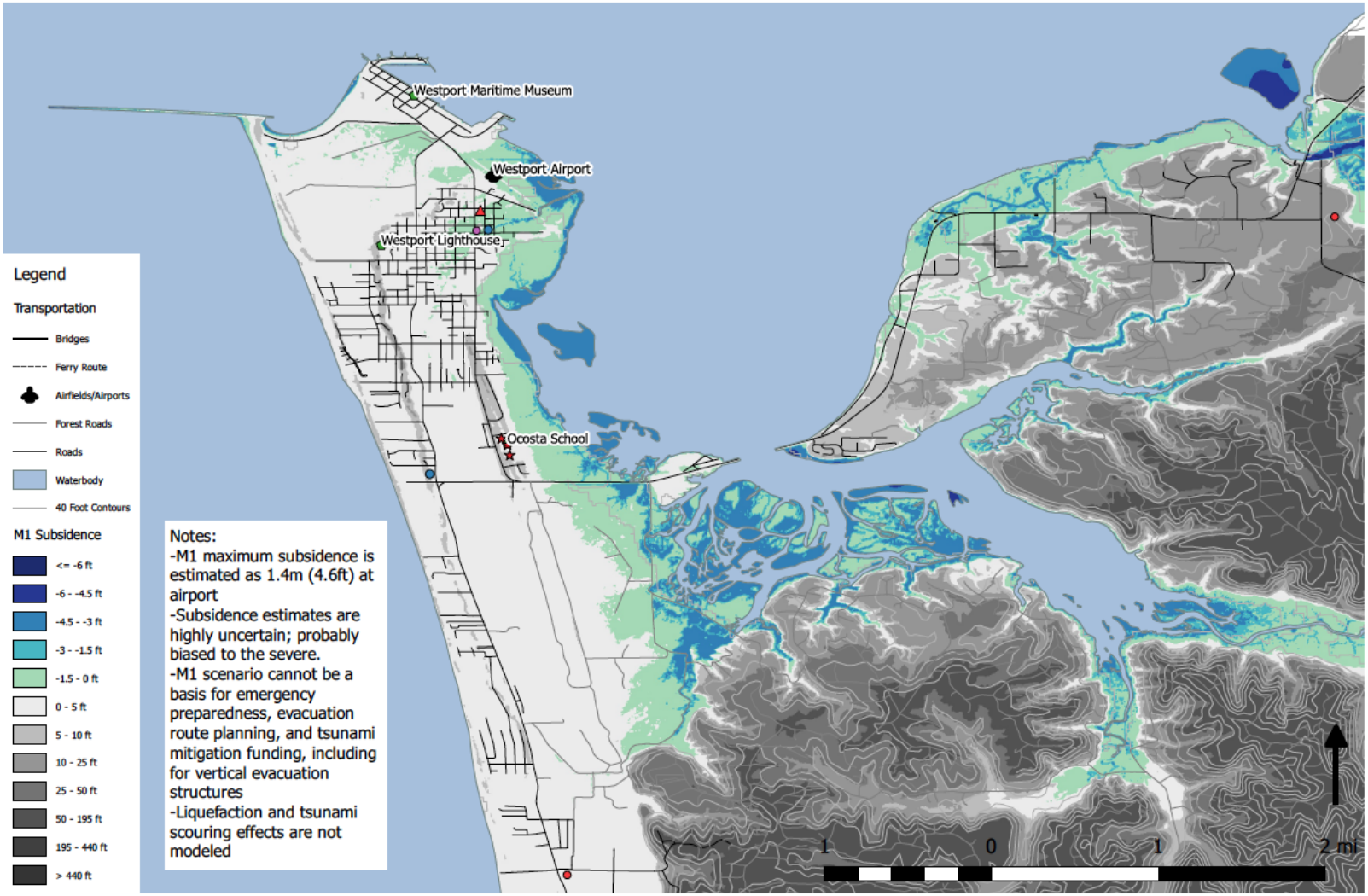

Figure 6. Regional Map Depicting Land Subsidence after an M1 Event

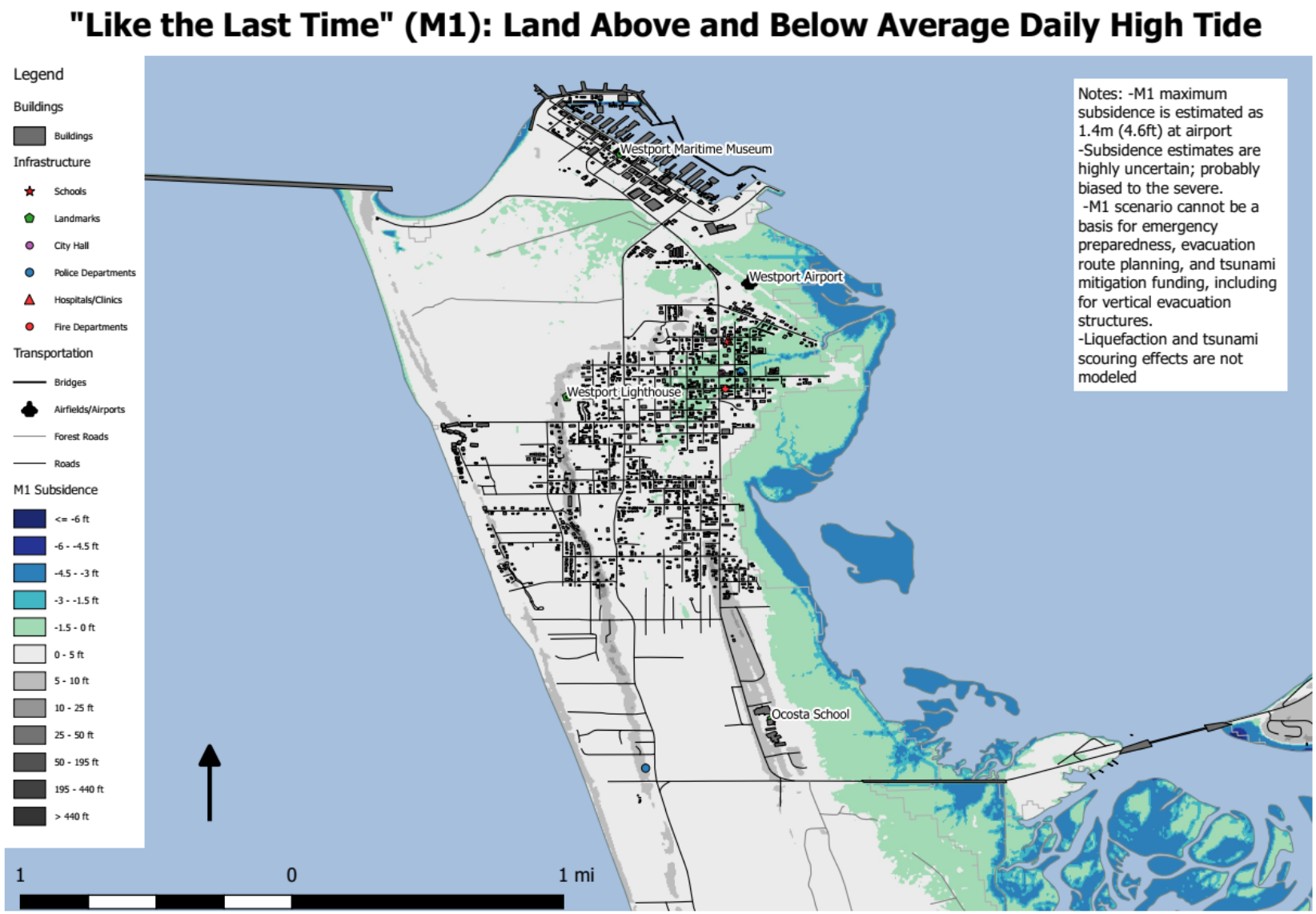

Figure 7. Westport Map Depicting Land Subsidence After an M1 Event

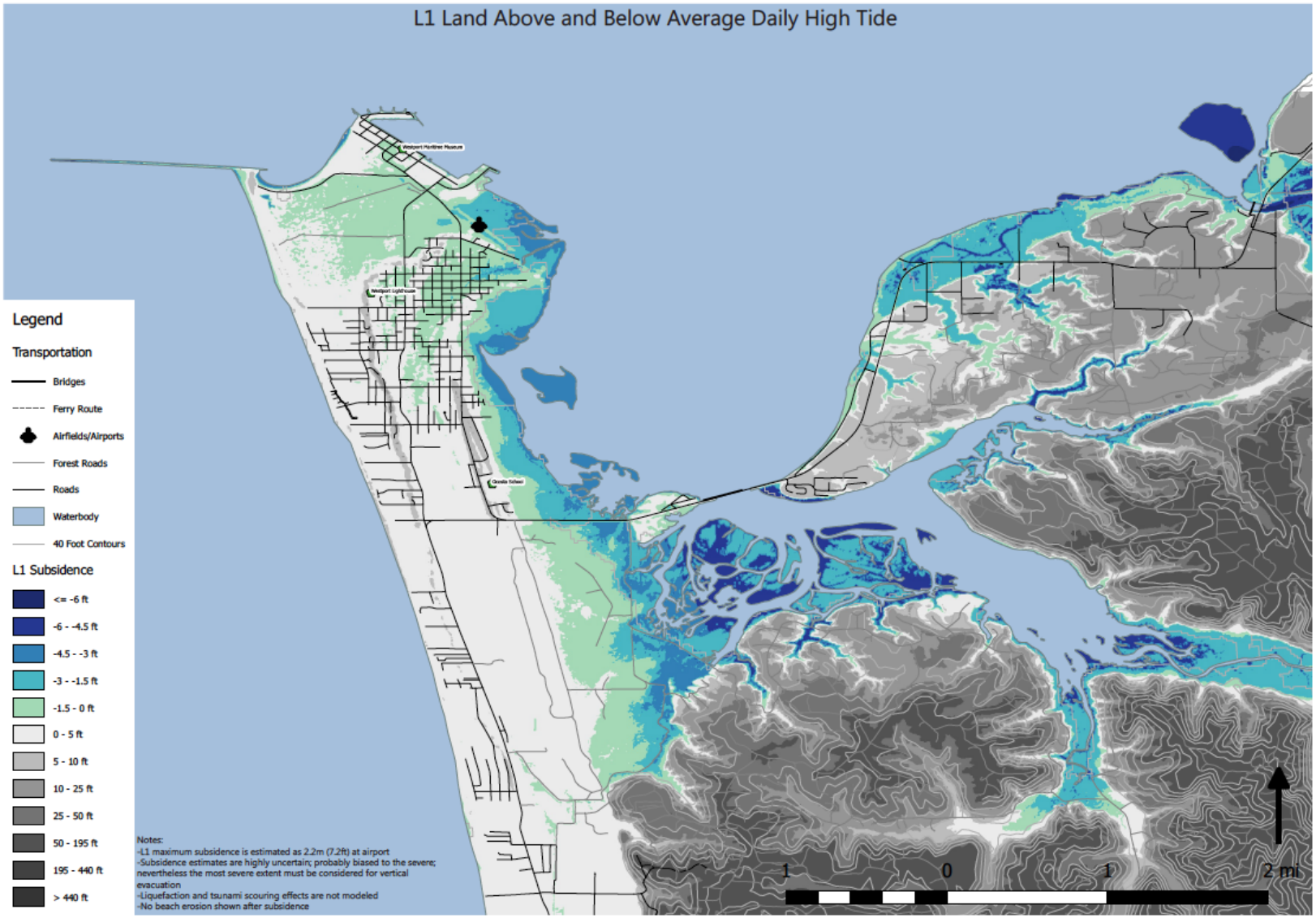

Figure 8. Regional Map Depicting Land Subsidence After an L1 Event

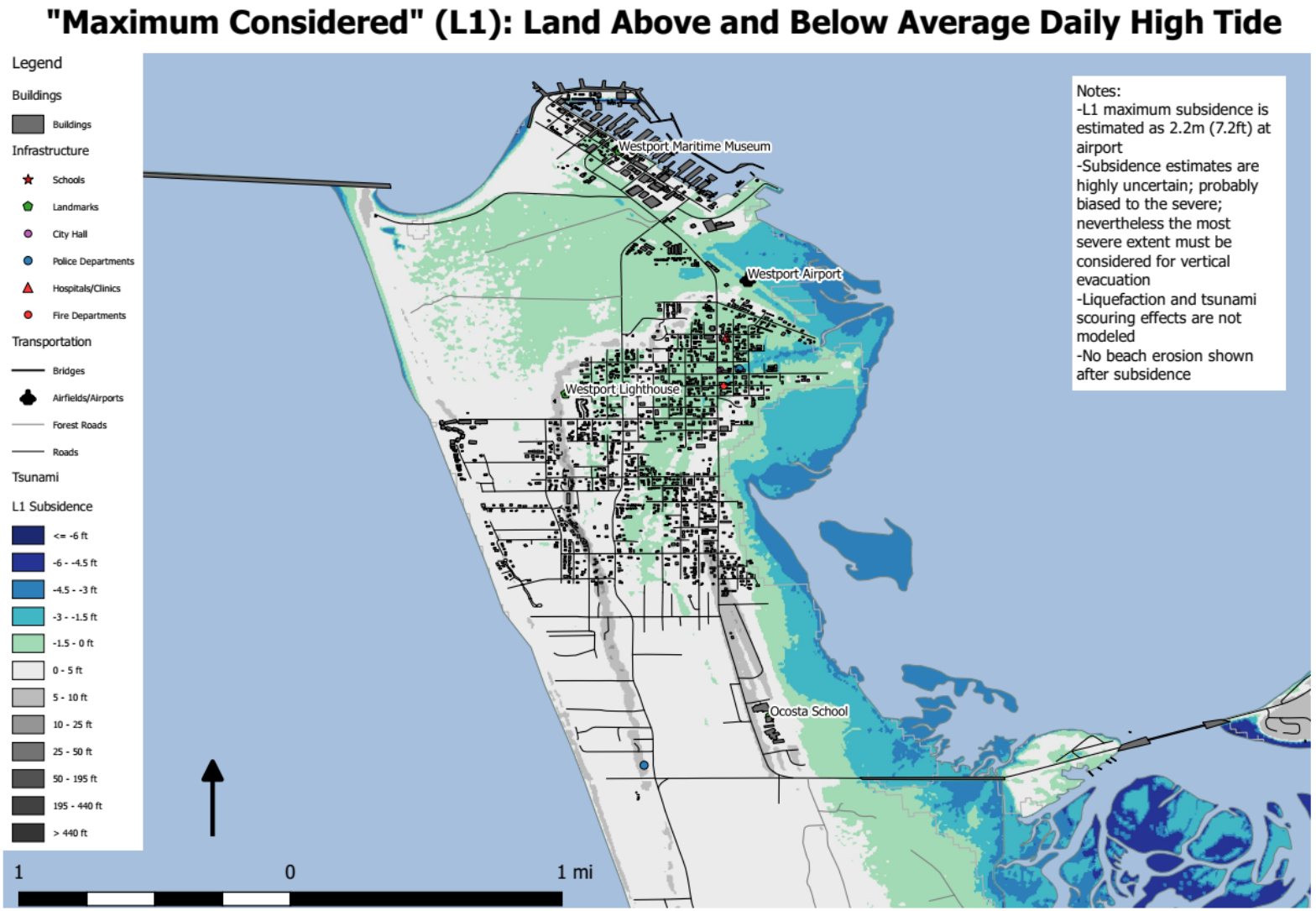

Figure 9. Westport Map Depicting Land Subsidence After an L1 Event

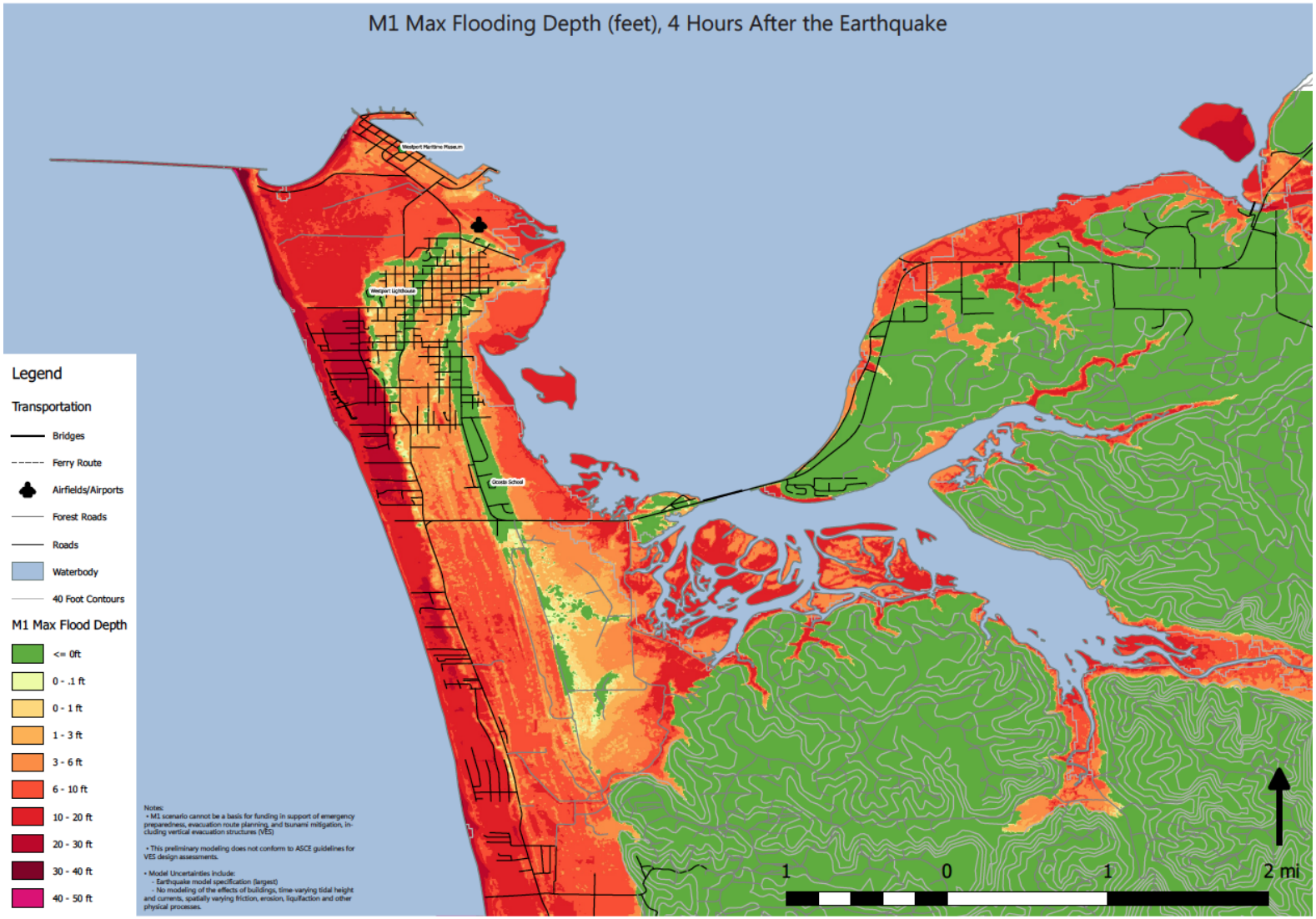

Figure 10. Regional Map Depicting Max Flooding Depth of M1 Event

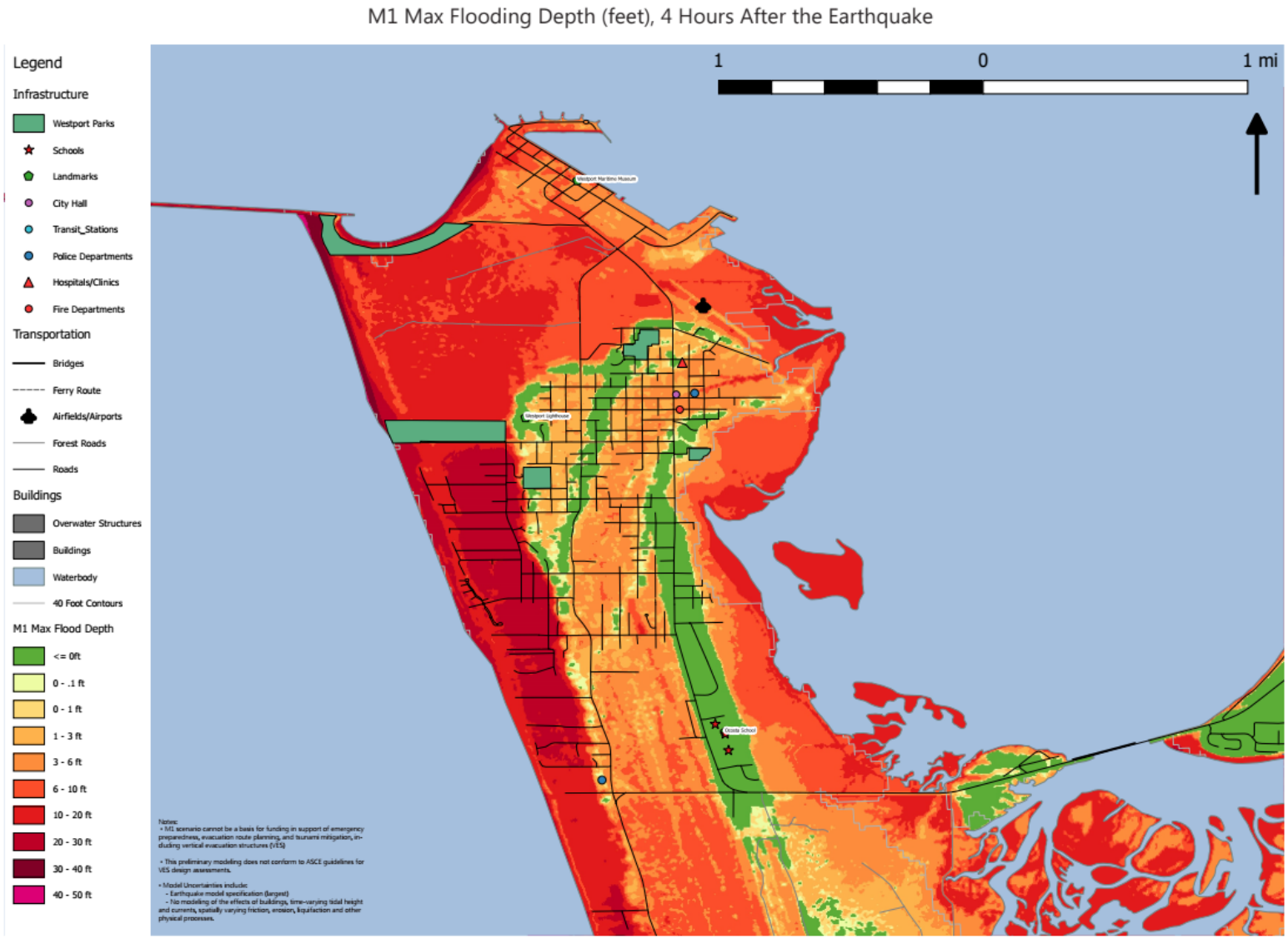

Figure 11. Westport Map Depicting Max Flooding Depth of an M1 Event

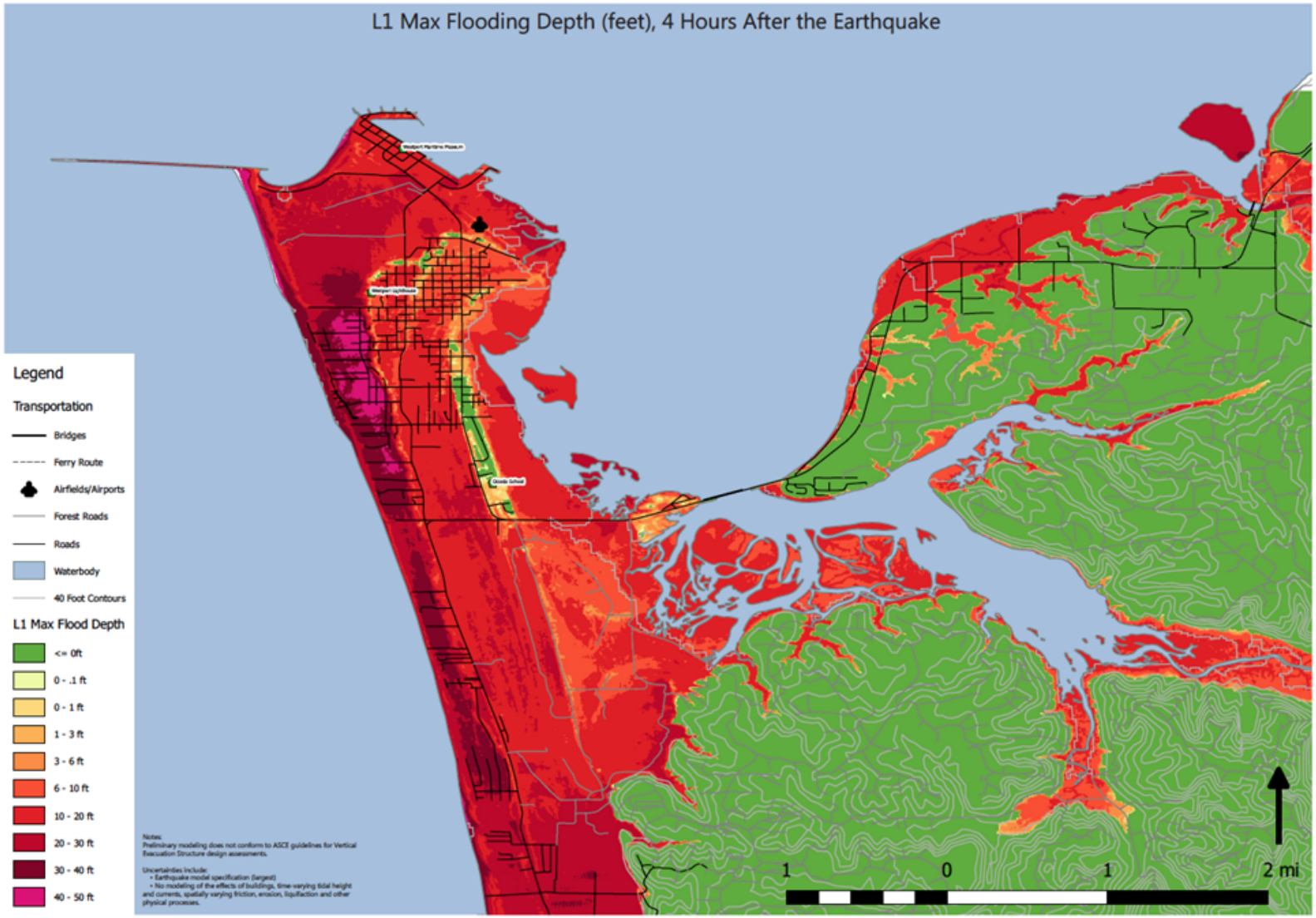

Figure 12. Regional Map Depicting Max Flooding Depth of an L1 Event

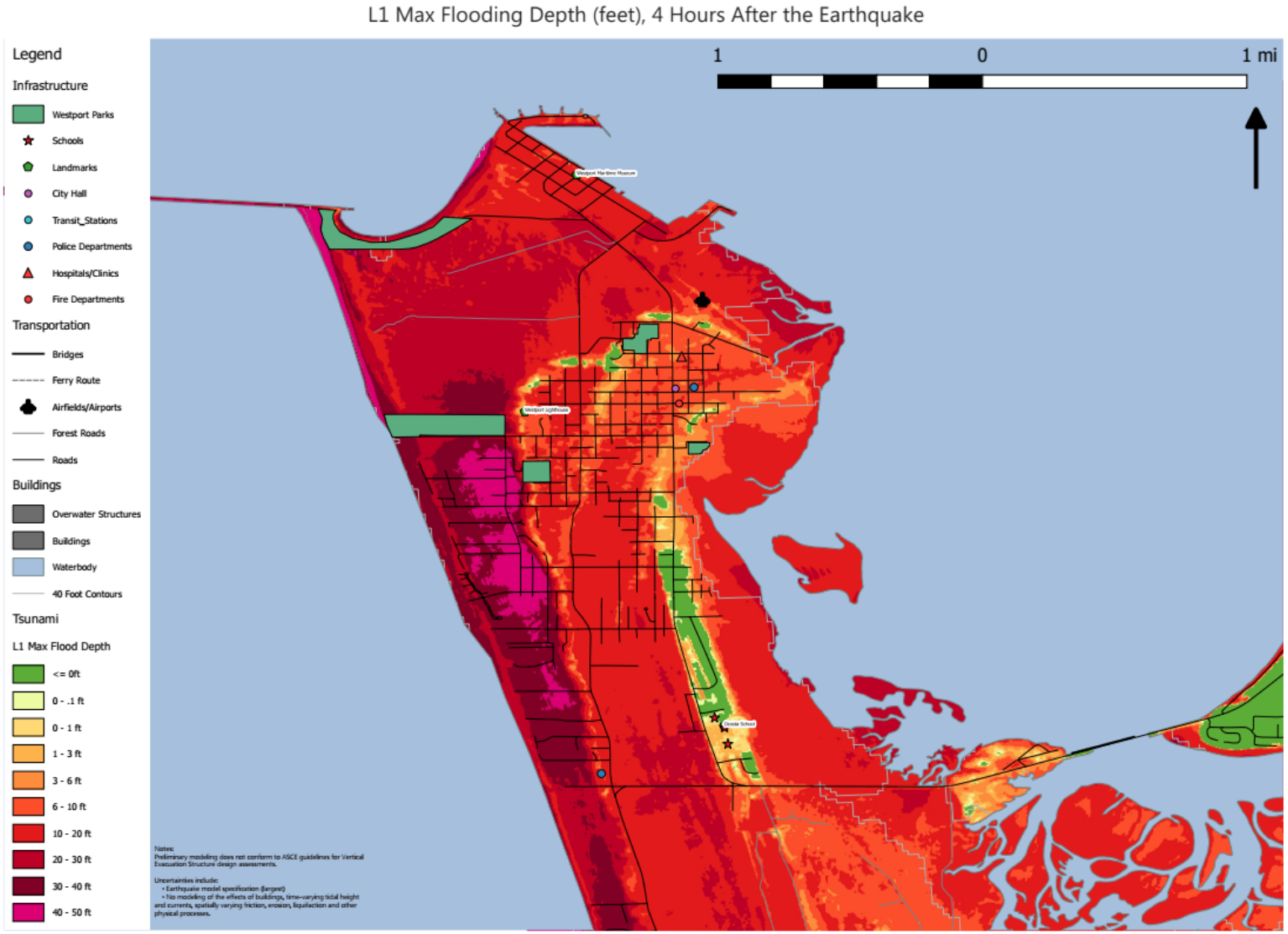

Figure 13. Westport Map Depicting Max Flooding Depth of an L1 Event

To further prompt participants to think positively and creatively for the long term, the UW team also first presented some imagery of historic coastline change on the Westport peninsula, due to sediment deposit and erosion, dredging and filling, and construction of the Westhaven jetty (Figures 14-16), and asked participants to recall any memories they had of previous earthquakes and tsunamis. Participants were encouraged to consider how much change the community had already experienced over 150 years, how it had responded to that change as well as created much of it itself, and therefore how future changes could pro-actively achieve co-benefits of mitigation, as opposed to being just reactive to conditions outside of the community's control.

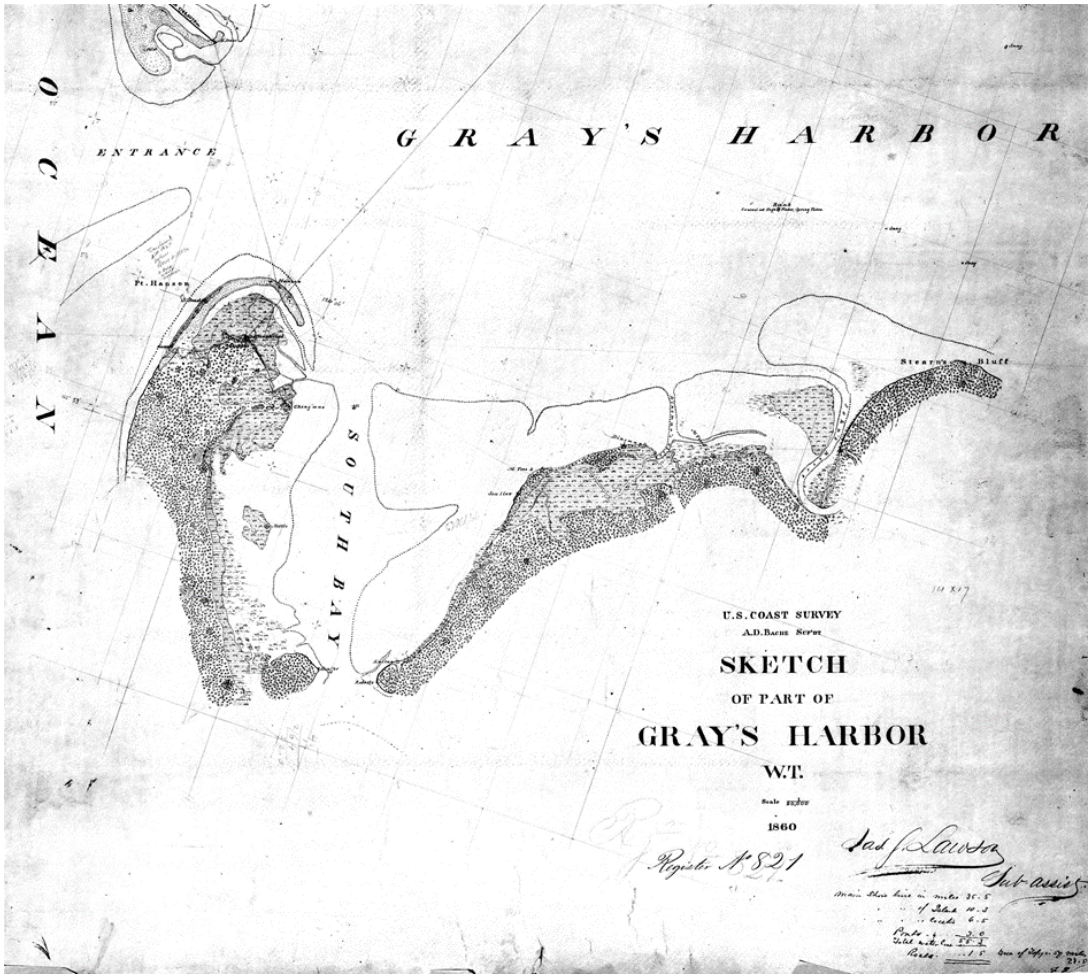

Figure 14. Imagery of Historic Coastline: 1860 Map of the Westport Peninsula and Grays Harbor. Map Source: NOAA Non-georeferenced NOAA Shoreline Survey Scans, https://nosimagery.noaa.gov/images/shoreline_surveys/survey_scans/T-821.jpg

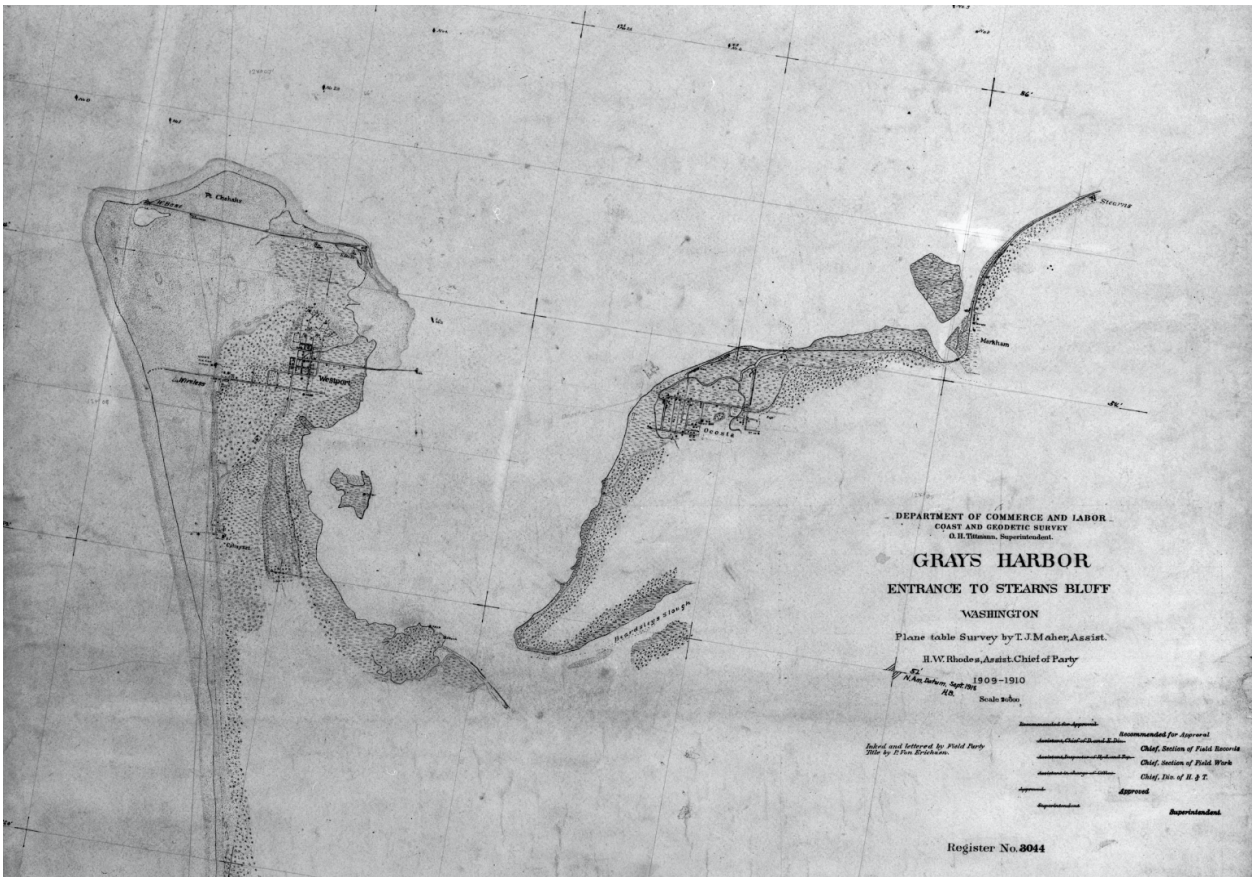

Figure 15. Imagery of Historic Coastline: 1910 Map of the Westport Peninsula and Grays Harbor. Map Source: NOAA Non-georeferenced NOAA Shoreline Survey Scans, https://nosimagery.noaa.gov/images/shoreline_surveys/survey_scans/T-3044.jpg

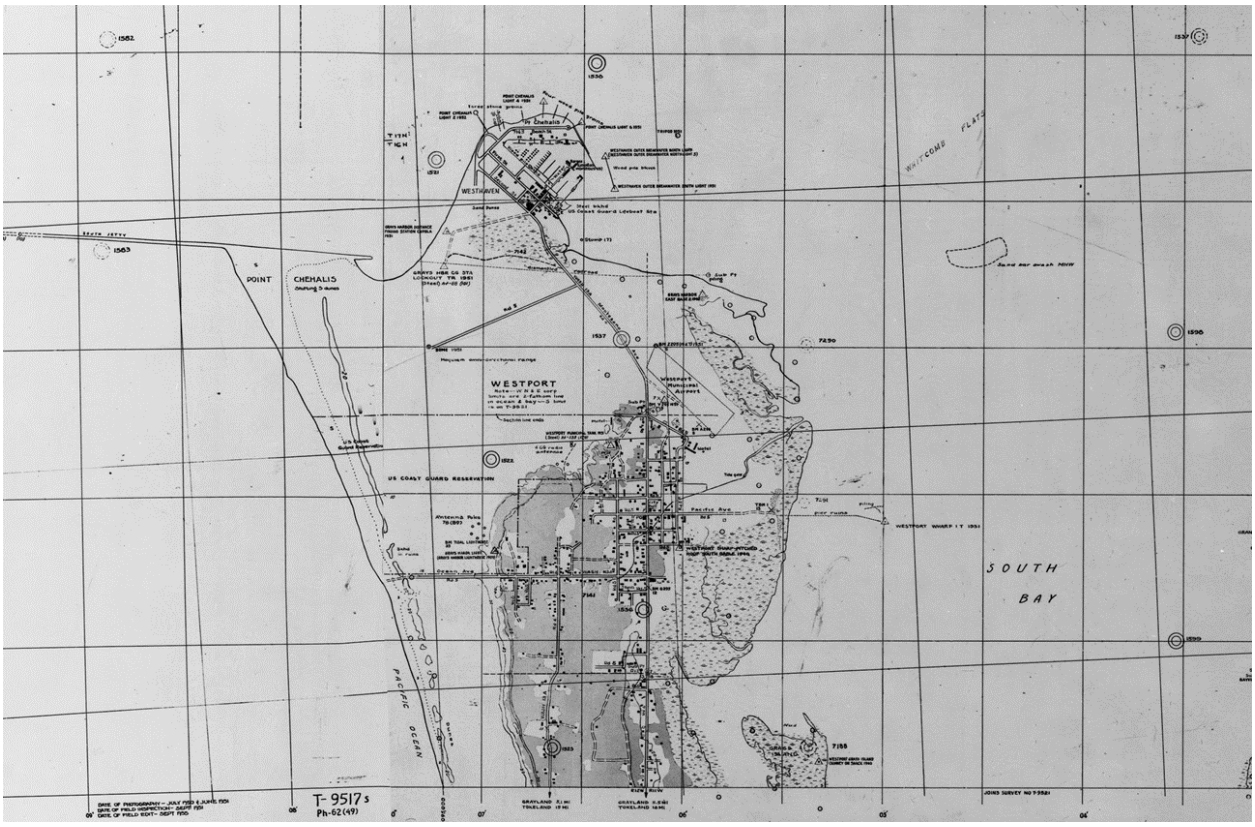

Figure 16. Imagery of Historic Coastline: 1950 Map of the Westport Peninsula and Grays Harbor. Map source: : NOAA Non-georeferenced NOAA Shoreline Survey Scans

Some examples of common themes that emerged from discussions are described below; see *Sections 2 and 3* for more detail on discussions.

- **Transportation Infrastructure Improvements:** Participants frequently discussed their perception that Westport's key transportation infrastructure (e.g., highways, roads, bridges) may be vulnerable to hazards, there is a risk of "being cut off" in an event, and resilience needs to include infrastructure improvements, both for mobility and communication. Such improvements could bring the co-benefits of participation in rural broadband development and attraction of employment opportunities.
- **Increasing Preparedness:** Participants discussed the need to make sure other residents are aware of hazards and that all residents have a plan in place to respond to an event. They discussed increasing preparedness through outreach, as well as practical approaches like gathering supplies and establishing more evacuation/meeting sites where residents can go during/after an event. Co-benefits to such preparedness would be increased sociability among residents and greater "situational awareness" at an individual level.
- **Uncertain Response to Large/Rare Events:** Participants had difficulty envisioning adaptation to the "new normal" following a large (M1 or L1) type event, and what the city could do now to be resilience to the possibility of such an event. Some of the ideas in response to SLR, such as improvements to key bridges and highways leading to the peninsula, or restrictions on building in flood-prone areas, were noted as being useful also for mitigating impacts of an earthquake, tsunami, and land loss due to subsidence. A significant area of possible action included exploring

the relocation of critical facilities and services facilities out of harm's way, to higher ground within the peninsula, and even outside Westport's city limits, which might bring opportunities for new investment and improved facilities. However, participants worried whether "Westport would still be Westport" if large parts of the community had to abandon the peninsula, either in anticipation of a major disaster, or in recovery from one.

2. Westport/South Beach Partners Coastal Resilience Workshop Documentation

This section documents the Friday, November 16, 2018 Partners Workshop, including an overview of the workshop and documentation of discussion sessions.

2.1. Partners Workshop Goal and Agenda

The Partners Workshop focused on the theme of making hazard mitigation more meaningful to the community and actionable in Westport. Overall workshop goals are described in the summary section above. The Partners workshop, however, as a gathering of local leaders and other experts in hazards mitigation and emergency planning, including members of the Westport/South Beach Tsunami Safety Committee who are currently leading the community's efforts to build more tsunami vertical evacuation structures, addressed information about tsunami inundation and flood depths that was not used in the Community Workshop.

The Partners Workshop included a combination of presentations, facilitated discussion/brainstorming exercises, and participatory mapping. Mapping exercises during the Partners Workshop were conducted using WeTable, a participatory geographic information system (GIS) platform that uses open-source QGIS software and a projector, allowing participants to digitize geographic information in real time using a calibrated pen and a tabletop map projection (Figure 17 17).

Figure 17. Participants in the Partners Workshop use WeTable to Map Values and Assets

Participants sat at tables set up to discuss one of the three hazard scenarios (SLR, M1, L1, see Figure 18 18). The room was set up to allow some experts and observers to "float" but in fact nearly all participants joined one or another of the tables.

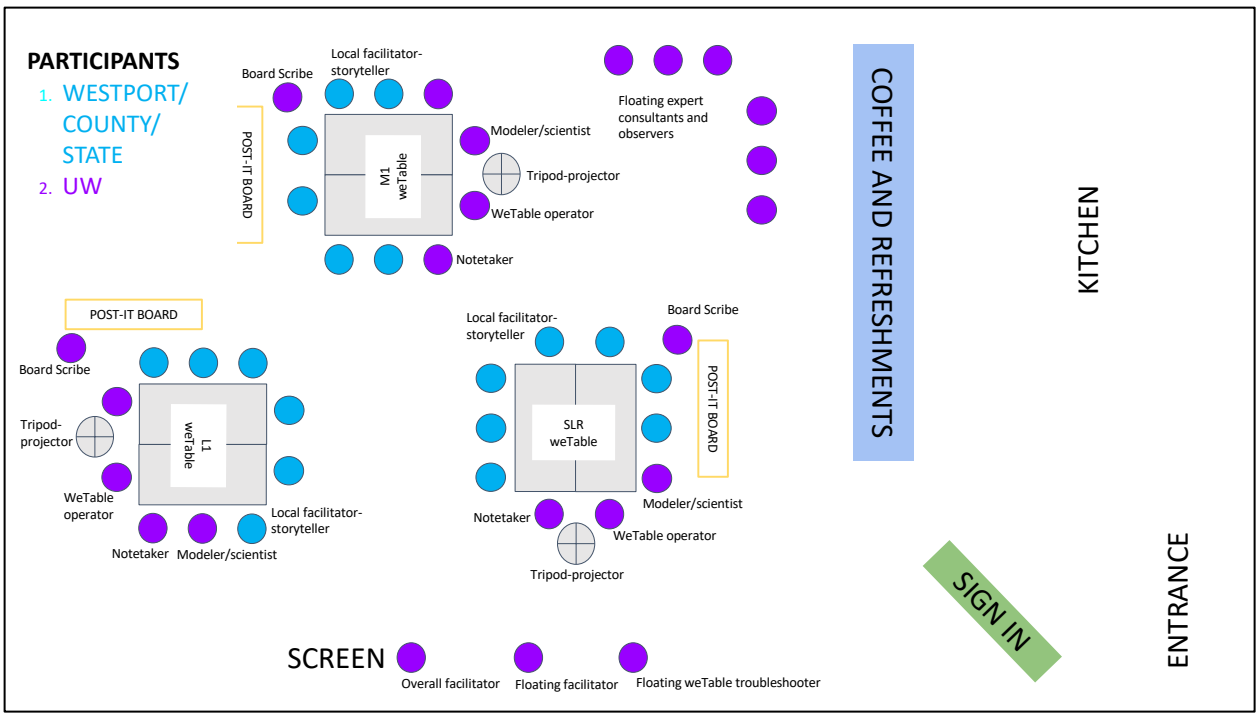

Figure 18. Partners Workshop Room Setup

Table 3 below includes the workshop agenda and approximate timing of the meeting. Sub-sections in this appendix are organized by scenario and roughly follow the agenda below.

Table 3. Partners Workshop Agenda

Approximate Timing	Agenda Item
2:30-3:00pm	Coffee and refreshments
3:00-3:10pm	Welcome and introductions
3:10-3:15pm	Overview of workshop goals and activities
3:15-3:45pm	Discussion Round 1: Values and asset mapping
3:45-4:25pm	Discussion Round 2: Scenarios of change and survival
4:25-4:45pm	Discussion Round 3: Strategies of adaptation to possible "new normals"
4:45-4:55pm	Report out: Storytelling
4:55-5:00pm	Next steps

2.2. Partners Workshop Participants

The Partners Workshop convened 24 individuals representing the city, county, and state agencies with expert knowledge regarding Westport and/or hazard mitigation planning in the region, as well as UW team members. Participants included representatives of the following organizations listed in Table 4 below.

Table 4. Participating Organizations

Organization Type	Represented Organizations
City of Westport/South Beach area	Department of Public Works, Police, Chamber of Commerce, South Beach Regional Fire Authority, Ocosta School, Tsunami

Organization Type	Represented Organizations
	Safety Committee, Westport Property Development, Timberland Library, Westport-by-the-Sea condominiums
County Agencies	Grays Harbor County Department of Emergency Management,
State Agencies	Washington State Parks, Washington State Emergency Management Division
Other local stakeholders	Shoalwater Bay Tribe
UW Faculty and Students	Department of Urban Design & Planning, Dept. of Applied Mathematics, Dept. of Civil & Environmental Engineering, Dept. of Earth & Space Sciences, School of Forestry and Environmental Sciences, Pacific Northwest Seismic Network, US Geological Survey

2.3. Partners Workshop Discussion Documentation

As described in the *Summary of Workshop Approaches and Outcomes* section above, meeting participants first discussed values of Westport/South Beach. UW Facilitators prompted this discussion with the question: "What makes Westport/South Beach a great place to live, work and play?" In addition, facilitators provided lists universal quality-of-life values excerpted from the United Nations Millenium Ecosystem Assessment (e.g., shelter, food, etc.). Following the value-brainstorming exercise, facilitators asked participants to list community- and place-specific assets that support each value. Note-takers recorded the list of values and assets on poster paper. Figure 19 shows an example of the values-assets brainstorm. In addition to listing assets, participants marked the location of each asset on a projected map of the Westport peninsula; the geographic location of each asset was recorded using WeTable and saved to a map for each scenario group. The SLR, M1, and L1 subsections below include information from the values discussion and asset mapping exercise for each scenario.

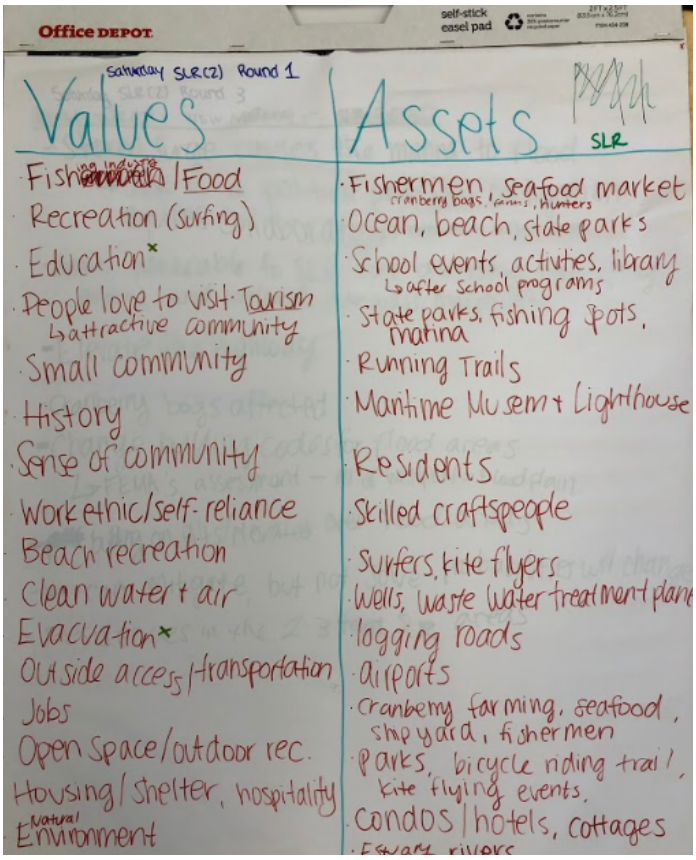

Figure 19. Example Values and Assets Brainstorm

After discussing values and assets, the UW team presented stories of coastal change, illustrating potential changes that Westport could face by presenting historical shoreline maps (Figures 14-16), maps of flooding depth and subsidence in an M1 earthquake and tsunami scenario, and maps of flooding depth and subsidence in an L1 earthquake and tsunami scenario. The UW team also presented information about earthquake

modeling uncertainty, liquefaction, and tsunami inundation areas and evacuation.

In addition to information on each scenario, the UW team asked respondents for memories of the 1964 Alaska Earthquake and tsunami. Participants recalled hearing news reports of the event, being afraid of a tsunami, and the evacuation process. They described how the whole Westport peninsula was evacuated to high ground where the school is now.

Following the presentation of the hazard scenarios, facilitators asked participants to identify assets that would be lost in an event and think about existing assets that could support community values in the place of lost assets. Finally, facilitators asked participants to imagine how the community could adapt to, prepare for, or take advantage of the "new normal" suggested by their scenarios, including brainstorming strategies that would help Westport/South Beach continue to support its values. The SLR, M1, and L1 subsections below also include information from these discussions.

2.3.1. Sea Level Rise (SLR) Scenario

The SLR discussion group identified and discussed the following values and assets included in Table 5. Figures 20 and 21 below show the assets that the SLR group mapped.

Table 5. Partners Workshop SLR Group Discussion of Values and Assets

Values	Assets
Outdoor recreational opportunities	Parks and beaches; ocean; Westport lighthouse; state parks, including the Grayland beach state park
Independence	None indicated
Education	School
Close-knit community	School
Strong family and friends ties	School
Vision and innovation	School
Access to fresh seafood	Ocean; Brady's Oysters, Westport Marina
Quality of life	Downtown, marina area, cranberry bogs
Natural beauty and history	lighthouse
Low crime rate	None indicated
Scientific opportunities	local clues to regional earthquakes/tsunamis (on the harbor/ shores/ intertidal zones); John's River
Tourism	None indicated
Health	None indicated
Good social relations	None indicated
Security	None indicated
Freedom of choice	None indicated
Other	Airport, highways, marina, police, fire department, homes

Figure 20. Community Assets Identified by Friday SLR Group - Westport

Figure 21. Community Assets Identified by Friday SLR Group - Regional

In addition to the values and assets listed above, the group discussed the following:

- Westport is an attractive destination for tourists; a lot of tourists visit the area and the outdoor recreation opportunities are a draw
- The area is rich in natural beauty and people statewide benefit from scientific evidence of past hazard events found in the Westport area
- Westport is a safe place without gangs or violence
- Downtown Westport is a business hub, most businesses are located there
- The cranberry bogs and related industry support values and family ties

After discussing values and assets and hearing the presentation about potential hazards, the group discussed vulnerabilities. Discussion focused on the themes listed below.

- **Transportation and public service infrastructure:** Participants identified the airport, highways (including to Aberdeen), police, and fire department as vulnerable to SLR. Participants discussed that access to the town will be compromised, including the highway to the south east, noting that even a bad El Nino year could cut off road access. They also noted that the airport and associated assets will be lost to SLR. The clinic is not vulnerable to SLR.
- **Marina/commercial district and businesses:** Participants observed that with 1 foot of SLR, the marina is not affected, but parts of the commercial district are. They noted that Brady's has high ground next to it.

- **Residential areas:** Homes may be lost to SLR, but possibly not at only one foot of rise.
- **Other topics:** Participants expressed concern over replacing lost assets.

For the discussion of "new normal" and strategies to help support Westport's values, participants focused on the 2060 SLR scenario (1 foot; 11% probability). Discussion included the themes listed below.

- **Relocation:** Possible to buy out properties and move homes, though Taholah has been working on that for 20 years without much progress; need to move the airport
- **Infrastructure investments:** Need to address risk to the marina through a possible retrofit; can make periodic infrastructure investments with federal support; concern about safety of the bridge and need to plan a new bridge; bridge is outdated so there may be the possibility to gain political support for replacement; road could be rerouted through Ocosta; need for climate resilient building codes; need to reroute and elevate roads, including a possible levy system.
- **Political context:** Potential lack of political will to build something for 40 years from now; SLR in Westport may not be a top priority. City government is a strong asset for advocating for a new bridge or better road, because some decision-makers still deny SLR.
- **Other topics:** Assets overlap between sea level rise and subsidence, so strategies are relevant to both scenarios; Brady's oysters may be affected by SLR, but oyster beds could move further in. School will remain.

2.3.2. M1 "Like the Last Time (1700)" Earthquake and Tsunami Scenario

The M1 discussion group identified and discussed the following values and assets included in Table 6. Figures 22 and 23 below include the assets mapped by the M1 group.

Table 6. Partners Workshop M1 Group Discussion of Values and Assets

Values	Assets
Fishing industry; including a strong sense of belonging to the fishing industry	Ocean companies, including WA crab, ocean cold, Ocean Gold, Harn's, the docks and marina, the Tokeland marina, oyster processing facilities, the Westport shipyard, and the fishing fleet
Tourism industry, in the context of the tourism value being rooted in Westport being a unique place that people want to visit	Chamber of Commerce, small businesses
Education and school system are valued in this area, including successful athletic programs	Ocosta School, library, high school
Culture of community support and strong sense of community; one participant noted: *"Being not from the area, it's clear how much coastal communities have a strong sense of community. People stick together, fall and rise together, have strong bonds between neighbors."*	The community group called We Fish (a group of families that have helped to build community); Maritime museum, Marina, and port office; churches though they are sometimes not well attended; Stores and restaurants including the grocery store, the Hungry Whale and the Midtown Deli; community centers including the Westport Y, VFW and the Senior Center, the Grange Hall, the Rec Hall, and the Grayland Community Center; attractions like the observation tower

Values	Assets
Access to parks, beaches, and nature	State Parks including Westhaven, Twin Harbor, Bottle Beach, Westport Light, and Grayland Beach; the Long Beach peninsula
Cranberry industry	None indicated
Self-reliance of residents	Access to hunting and fishing
Necessary material	Water infrastructure, including the north water tower and wastewater treatment plant, the south water tower; gas stations and stores; airports and rural runways
Health	One in-town doctor's office called the Beach Clinic that houses one doctor, one PA, one nurse practitioner; the main hospital is 30 minutes away in Aberdeen
Social relations	City Hall
Security	Fire department, some stations down south in Grayland; coast guard station; police department

Figure 22. Community Assets Identified by Friday M1 Group - Westport

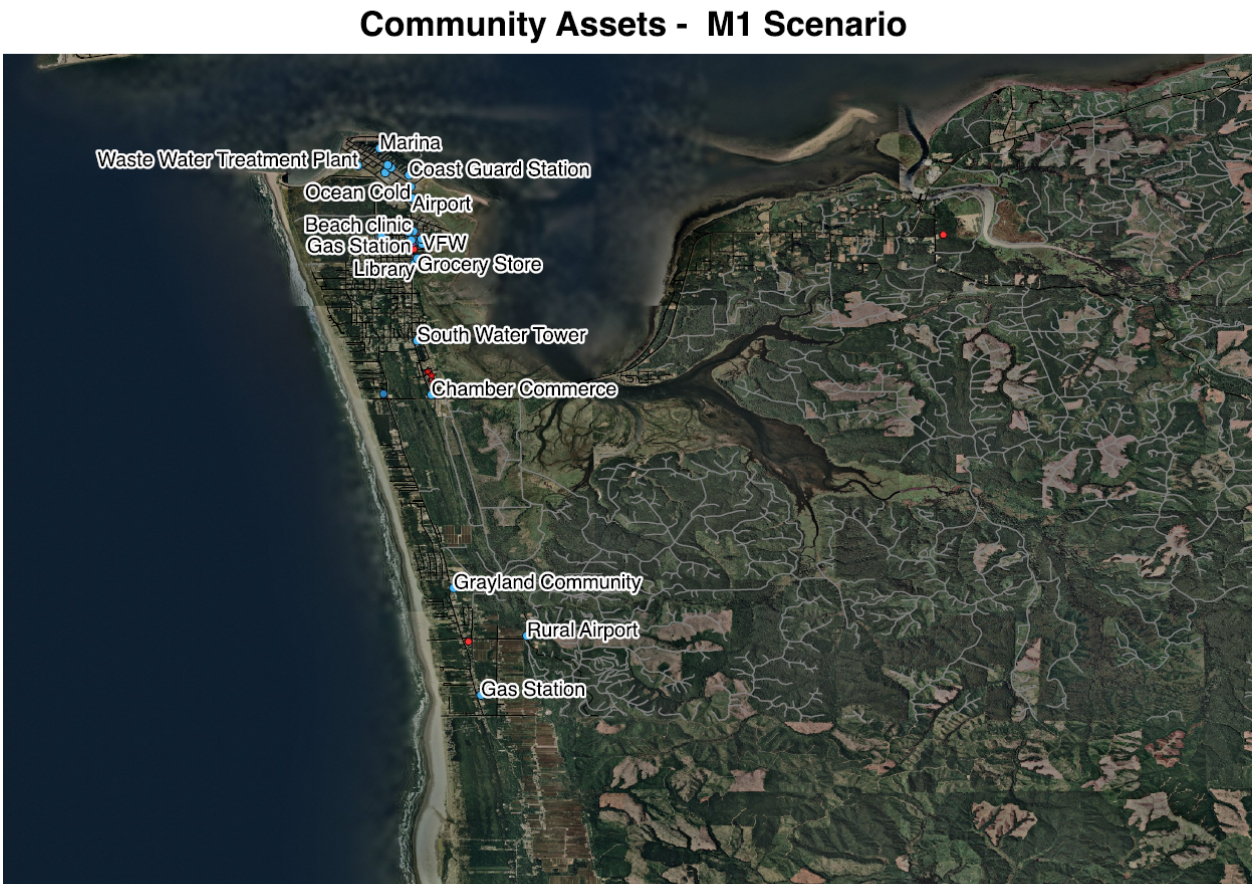

Figure 23. Community Assets Identified by Friday M1 Group - Regional

The M1 group discussed assets that are **vulnerable** to an M1 tsunami scenario, including:

- Assets that support the fishing industry, including seafood processing plants, docks and the marina, and the shipyard, boats
- The library could be affected, and the high school would be unlikely to survive; the old part of the elementary school would also be affected
- Assets that support Westport's sense of community would be affected, including the maritime museum and marina area, as well as grocery stores, restaurants, and community centers
- Assets that provide necessary resources, including gas, transportation infrastructure (e.g., roads and bridges), and water infrastructure (e.g., wastewater treatment)
- Routes to the vertical evacuation structure

The M1 group also discussed **adapting existing assets**, including:

- Chamber of commerce can be used to store and provide supplies
- Tsunami vertical evacuation structure at Ocosta School is a key asset for hazard response and is stocked with food, water, and some emergency supplies, but may need more.
- Preparing residents to have their own evacuation kits
- Using the water tower as another location for supplies
- Identify areas on high ground where the city can store supplies
- Areas that can provide opportunities to evacuate by air

Discussion of adaptation to a "new normal" focused on the following:

- **Preparing and recovering from hazards:** need to develop evacuation routes, provide more vertical evacuation in accessible places, and gather more supplies (e.g., food, water, radios, and generators) to store in evacuation areas; need to work with state and county to ensure there is a plan for Westport in the event of a disaster
- **Improving transportation and infrastructure:** bridges may be destroyed by earthquakes; will need to re-establish the jetty after the event; need to identify logging roads that could be used for accessing Westport after an event; need to mitigate risks of tree fall and landslides on access roads; need more signage demarcating tsunami zones and evacuation routes
- **Education:** need to educate residents about risks; need to educate tourists who visit Marina district in the summer, other areas have brochures and outreach to hotels; need to make presentations to hotel and motel owners and do outreach to campers in the state park (county is working on these projects currently); need to provide information about how to respond to an earthquake and tsunami
- **Funding:** Need to identify sources of funding (e.g., FEMA) to help with preparedness
- **Multi-use evacuation structures:** could create vertical evacuation structures to be a tourist attraction, providing vertical evacuation and education; could also incorporate event center and multi-purpose area

2.3.3. L1 "Maximum Considered" Earthquake and Tsunami Scenario

The L1 discussion group identified and discussed the following values and assets included in Table 7. Figure 24 below show the assets mapped by the L1 group.

Table 7. Partners Workshop L1 Discussion Group of Values and Assets

Values	Assets
Going fishing (as a chance to meet people) and crabbing	beaches, ships, docks, jetty
Having a sense of community and strong social bonds	Residential areas and neighbors, State Parks and beaches, fishery, boats, marina; one participant noted: *"A lot of people know each other and when people do need help, everybody helps."*
Obtaining benefits from the local resources (natural and economic)	Fishery, oyster farms, beach, tourism industry, ship/boats industries, marina, businesses, restaurants, ship yards, fish processing; one participant noted: "*We do have everything here in Westport"*
Having unique waterfront businesses and rural character	Beaches, ships, fishery, marina and dock area, tourism (infrastructure), safe neighborhoods,
Having unique culture and strong cultural identity	Library is cultural, social, and educational asset; the school, along with its evacuation center is an important part of the community; include Tokeland and Shoalwater Bay Tribe as parts of the community; the 105 bridge; neighbors and community; marina and jetty; beaches and nature
Obtaining support from public service providers	Fire department; Chamber of Commerce because it provides us with natural, cultural, business/economic resources and policy; Police station for public safety; drugs store/pharmacy and clinic

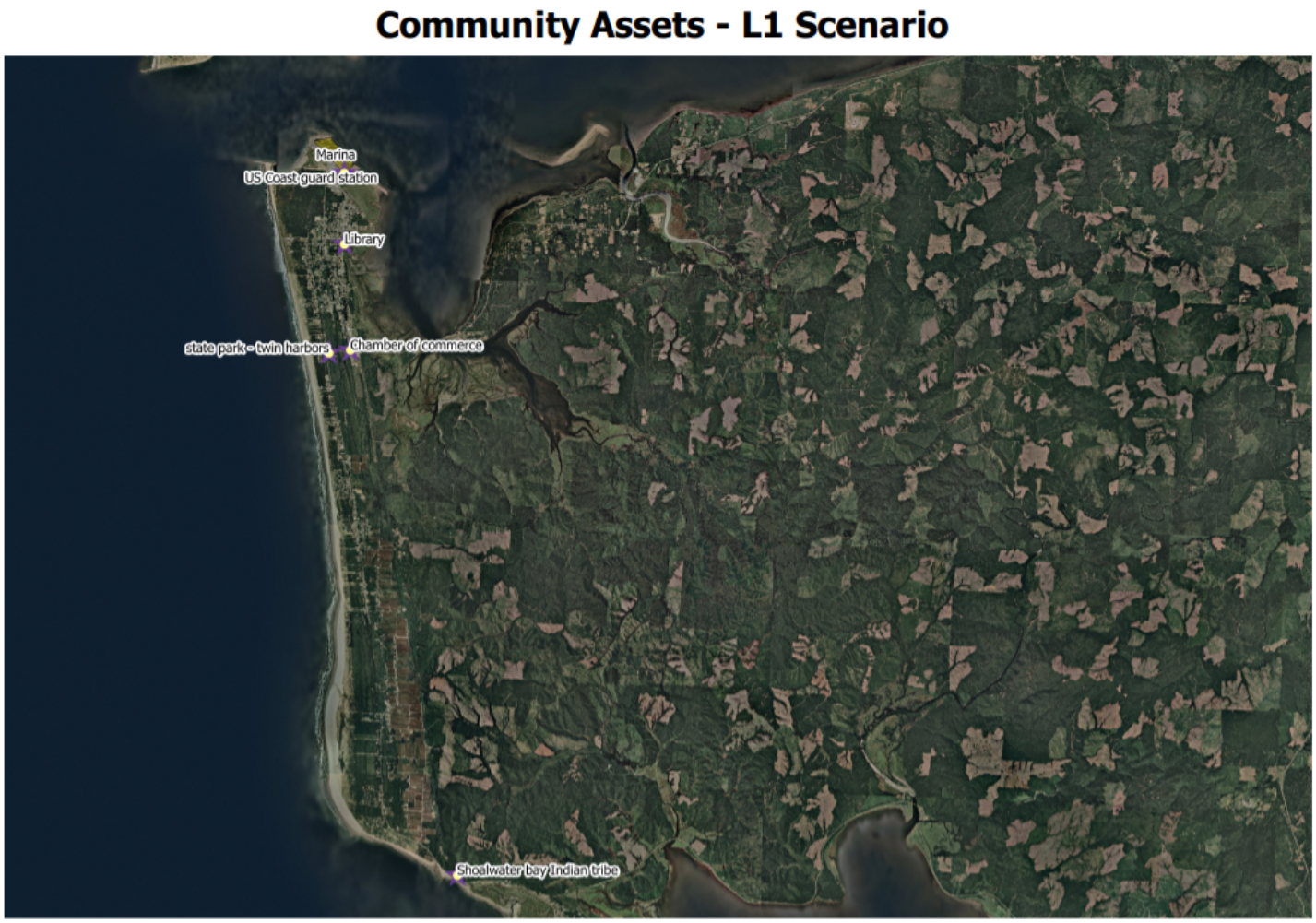

Figure 24. Community Assets Identified by L1 Group - Regional

Following presentation of the hazard scenarios, L1 group members discussed values and assets that are **vulnerable** to the L1 tsunami, including the themes described below.

- **Sense of community and social bonds:** residential areas will be affected, need to think about the structures that will exist after event
- **Cultural identity:** need to add life safety information to important cultural centers
- **Other values and assets:** key public services like the police department will be gone, school will be inundated; economy is strong but L1 will destroy many assets

The L1 group also discussed **adapting existing assets**, including:

- Planning for the worst, including that dunes and boats may not offer protection
- Strengthening access, including the need for access to relocate/move from the city and considering how and where to relocate if infrastructure is destroyed – could require "starting over"
- Need to ensure that people have insurance to help with rebuilding

Finally, the L1 group discussed proactive strategies for adapting to a potential "new normal" post tsunami event, including the following themes.

- **Buying new land:** Participants noted that there might be a need to buy new land. Concerns included funding to purchase land after a devastating disaster, zoning considerations, potential lack of support from relying on the government, adjacent areas also being vulnerable, and possible FEMA funding
- **Moving infrastructure:** Participants brought up the possibility of moving the city's infrastructure to Tokeland, nothing that the Marina will be destroyed.
- **Relocating/moving to safer areas:** Participants noted needs for access to the south, need for a new bridge if destroyed, and need to somehow create cohesion if people need to be relocated; concern that without economy and resources, people will leave and not return; need for access to Aberdeen through timber lands.
- **Regaining the collective memory of recovery experiences**: need to draw from memory of rebuilding and survival after tsunami in 1964 for long-term planning and education

2.3.4. Workshop Summary: Telling the Story of Westport/South Beach

After the final group discussions of strategies for adapting to a "new normal," representatives from each group shared from their group discussions, using a storytelling format. This section includes the "stories" from each discussion group.

L1: *"When we first started this project, I was very negative about L1, because what is left? But we've had good discussion about what can you do. Regarding long-term planning over the next 40-50 years, do you buy land and redevelop inland? This could be a good strategy. We will have a bit of land where we sit here, but the infrastructure will be gone. When we looked at values – sense of community, economy, shipbuilding, fishing, tourism, how community comes together and helps, rural character of Westport – why people chose to live here, because it's awesome to live here. In L1, everything goes away. How do we plan to keep these things in place? We talked about many things, but focused on how to make it over the bridge. The wastewater treatment and water tower are gone… do I go to city and ask for them to build a new one that won't be affected by L1? Can the city look for property outside the area and encourage people to move? But if we move out there then we lose these values that are tied to where Westport is and what it is. Long-term planning for L1 Cascadia scenario is very difficult. For example, if you don't have a school, people will not stay here… are we going to start building another school as a long-term strategy? Will be hard to convince community to do this, but would be a good idea because it will sustain our values. Do we move all the good stuff out of Westport? I don't know. Do we annex land for 15 miles? This is only the L1, there are bigger things that can happen. We encourage everyone to get flood insurance."*

Comment: *"There's another insurance product – parametric insurance, where the event itself triggers payout, not claims and damage assessment. If you are trying to get funding to rebuild quickly, parametric insurance is an option that could work. Flood insurance will cover individuals; but it is claims based. Parametric insurance can move more quickly. But it could be an insurance rabbit hole and you would need to consider if it's a good source of funds, but it can be mobilized more quickly. Say we have money to rebuild, are people going to choose to rebuild here? Is there going to be anywhere to rebuild here?"*

M1: *"We have a sliver of land, the elementary school, chamber, water tower, street of flags left after this event. We discussed how much storage and supplies we can cram into this area. How can we get more*

storage and supplies at the chamber and water tower? How can we prepare the rest of Westport that will be underwater? Vertical evacuation, evacuation routes… there are tourists who may just be here for the day and not know anything about tsunamis. Incorporating signage into tourist hot spots, campsites, hotels, observation tower, and preparing these locations. We talked about how to get out of here without a bridge, talked about logging roads, how we can get supplies and get people out of here."

***SLR**: "Ours was pretty easy, ours assumes SLR of 1 ft. by 2060. As of now only 98% of world's scientists say this… we would lose virtually no homes, but would lose bridge, highway into Aberdeen, roads, marshlands. We would still have the school and housing. If we do have political will – our bridge is outdated, not built to current standards, no bike lane or pedestrian access. With political will, we could get the bridge redone. We have already had an instance where we had to reroute a road down south. Wouldn't be a hard sell to reroute through the Ocosta subdivision, which is high ground. We aren't worried [about our scenario]."*

3. Westport/South Beach Community Coastal Resilience Workshop Documentation

This section provides documentation of the Saturday, November 17, 2018 Community Workshop, including an overview of the workshop and documentation of discussion sessions.

3.1. Community Workshop Goal and Agenda

Building on the Partners Workshop held the previous day, the Community Workshop sought to more broadly engage community members from Westport and the wider South Beach area in Westport's hazard mitigation and long-term planning process. The workshop was designed to learn about community values, priorities, and gather creative suggestions at the intersection of hazard mitigation and long-term planning. The overarching Community Workshop goal was the same as the Partners Workshop: to make hazard mitigation more meaningful to the community and actionable in Westport.

Like the Partners Workshop, the Community Workshop included a combination of presentations, facilitated discussion/brainstorming exercises, and participatory mapping. Mapping exercises were conducted by asking attendees to mark values and assets on large paper maps of the Westport area depicting land subsidence and inundation for each scenario, rather than using WeTable. Participants sat at tables corresponding with each hazard scenario (SLR, M1, L1, Figure 25). To accommodate the larger and more diverse group of participants, four tables were set up, with two of them discussing SLR, and one of these staffed with local interpreters for Spanish speakers.

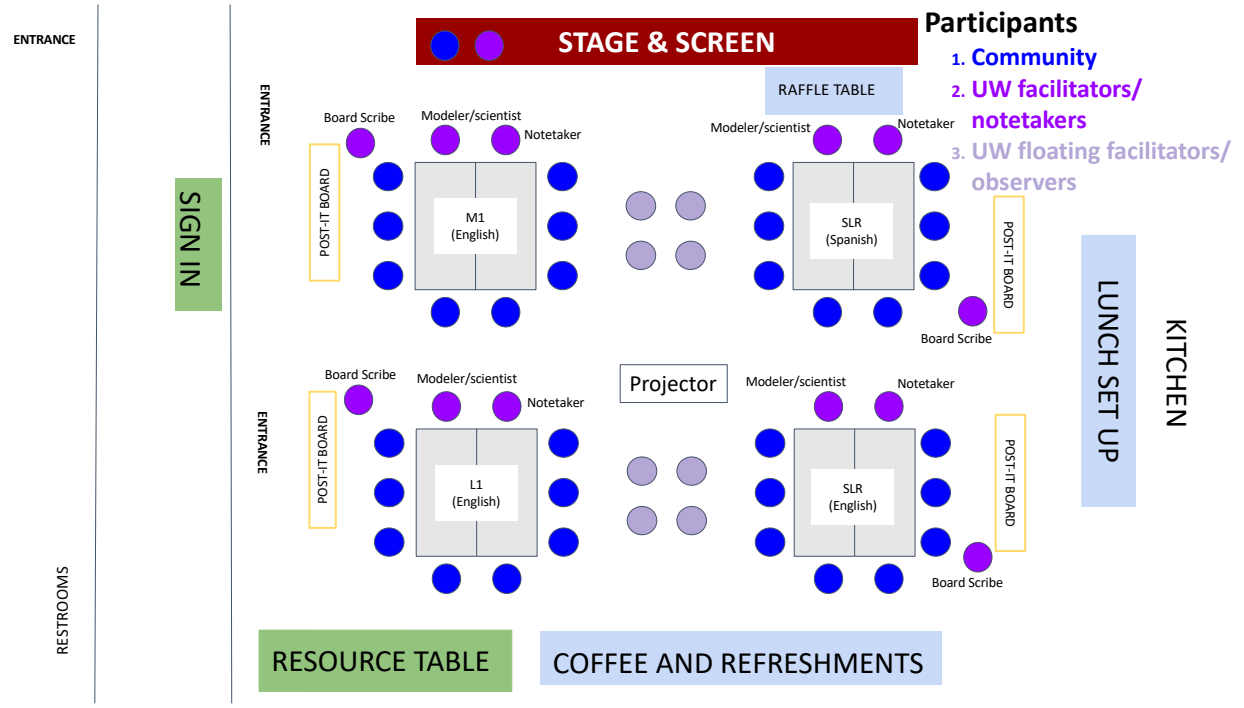

Figure 25. Community Workshop Room Setup

Error! Not a valid bookmark self-reference. includes the workshop agenda and approximate timing of the meeting; sub-sections in this appendix are organized by scenario and following the agenda below.

Table 8. Community Workshop Agenda

Approximate Timing	Agenda Item
9:30-10:00am	Coffee and refreshments
10:00-10:05am	Welcome and introductions
10:05-10:10am	Emergency safety protocols and raffles
10:10-10:20am	Purpose of the workshop and agenda
10:20-11:45am	Round 1: Values and asset mapping
11:45am-12:15pm	Social capital video, lunch break, and raffle
12:15-12:45pm	Round 2: Supporting values and strengthening assets
12:45-1:05pm	Stories of coastal change and survival
1:05-1:30pm	Round 3: Planning for a "New Normal"
1:30-1:50pm	Storytelling
1:50-2:00pm	Next steps
2:00-2:30pm	Vertical evacuation site tour

3.2. Community Workshop Participants

The community workshop was open to all residents and community members of Westport/South Beach. 30 Participants attended the workshop representing Westport, South Beach, Ocean Shores, and the surrounding area. Some participants attended both the Friday and Saturday workshops, including staff

from City of Westport Public Works, Chamber of Commerce, Tsunami Safety Committee, Westport Property Development, Ocosta School District, Grays Harbor County Commission and Emergency Management, WA State Emergency Management Division, and residents of more distant communities in the County, such as Montesano and Ocean Shores. Four UW tsunami scientists attended both workshops, as did all the UW urban design and planning faculty and student facilitators and notetakers.

3.3. Community Workshop Discussion Documentation

The Community Workshop was structured similarly to the Partners Workshop, with some differences in the discussion themes and approaches. In general, there was a greater focus on identifying values and assets, and on adapting to "new normals," rather than on vulnerability to the impacts of tsunami inundation immediately following an earthquake. With the more diverse, and less technically expert group of participants, the Community Workshop replaced discussion of those vulnerabilities with a Round Two discussion on everyday quality of life needs ("Supporting Values and Strengthening Assets"). There was also more of an emphasis on education about preparedness and reminders of the work the community had already done to plan for tsunami vertical evacuation.

As in the Partners Workshop, participants started with a Round One discussion to brainstorm values and assets with someone else at their table and recording ideas on a post-it note, responding to the prompt regarding what they appreciate about Westport. After the post-it notes brainstorm activity, each table collectively built a list of values and assets on poster paper. Participants then used pens and large paper base maps of Westport and the surrounding area to locate assets (Figures 26 and 27), though in some cases, the . Finally, the Round ended with a "storytelling" report-out to the whole room, defining Westport in terms of its values and assets, related in Section 3.3.4 below.

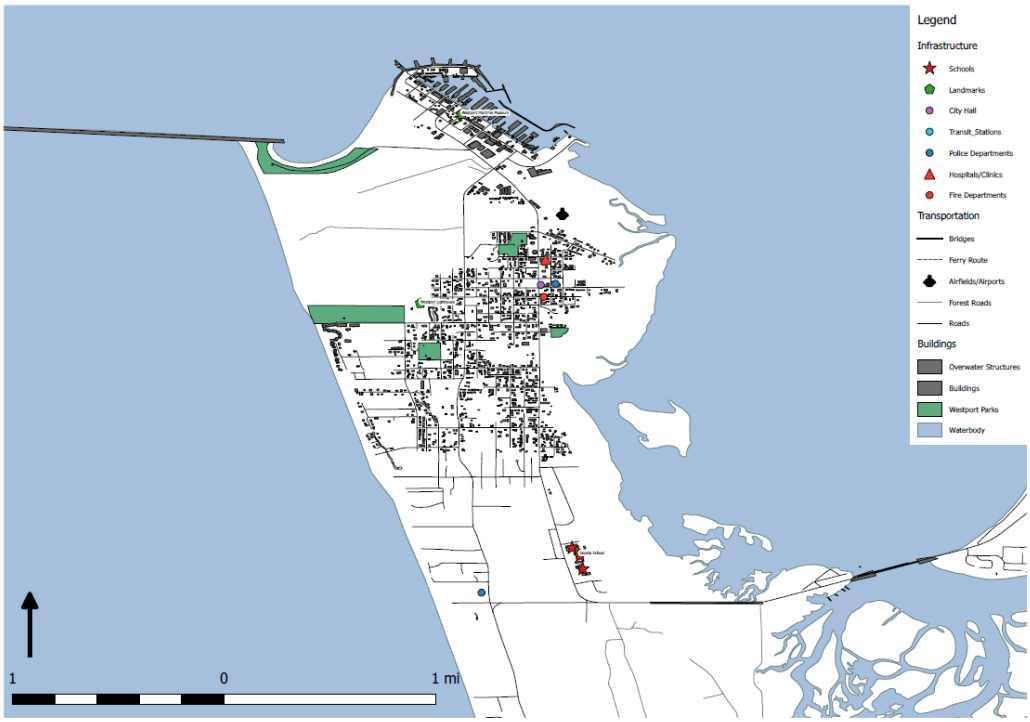

Figure 26. Base Map of Westport Prepared for the Workshop

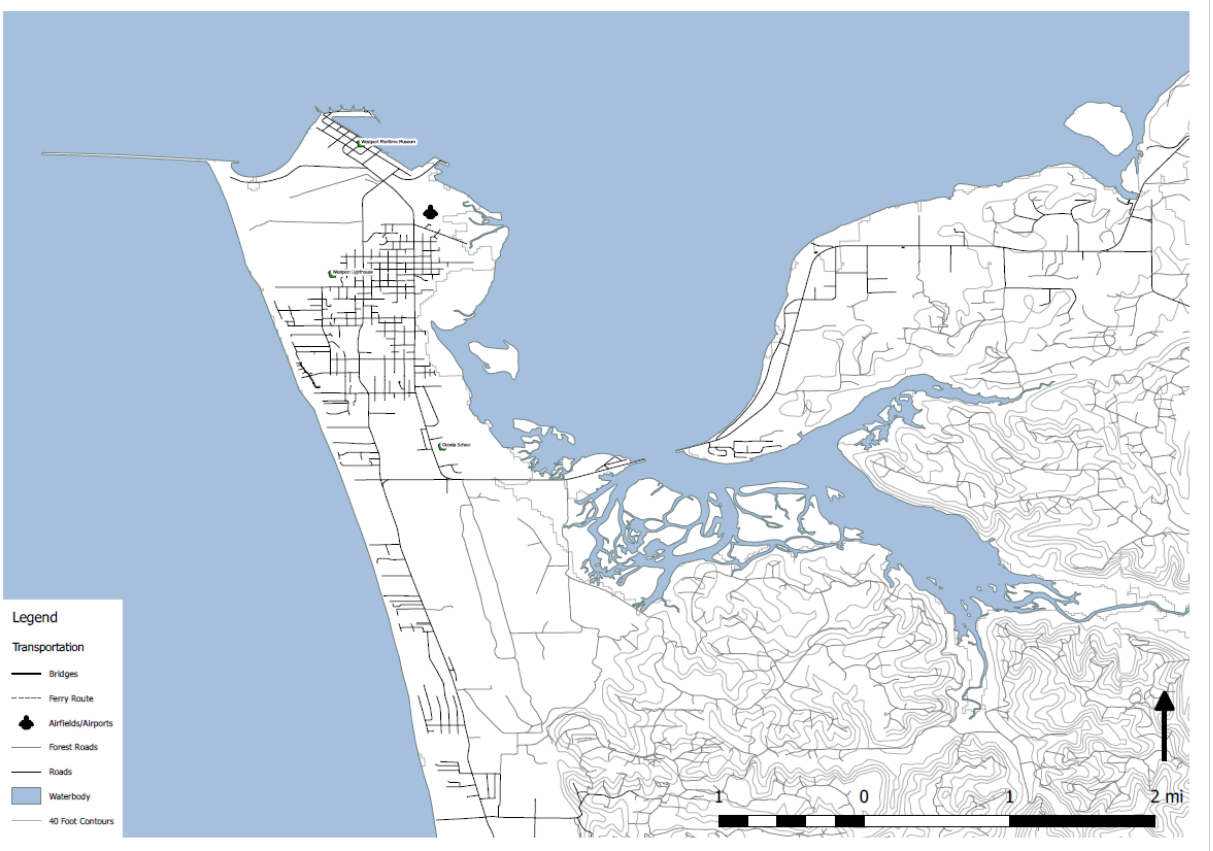

Figure 27. Base Map of the Peninsula Prepared for the Workshop

After the values and assets brainstorm, facilitators shared a video about social capital[5] and a brief presentation on emergency preparedness.[6] The Round Two discussion asked participants to review their list of values and assets, identify any values that are not adequately supported by existing assets, and brainstorm ways to strengthen assets to better support values.

The UW team then presented information about hazards, as "Stories of Coastal Change and Survival." This session included some very basic science on SLR, M1, and L1 hazards. Rather than show the simulations of M1 and L1 tsunami flooding depth used in the Partners Workshop, this session of the Community Workshop reviewed the State Department of Natural Resources' latest tsunami inundation maps (based on an L1 scenario) and reviewed Westport's prior work beginning with Project Safe Haven up through the construction of the new Ocosta Elementary School evacuation structure, and the role of this facility in hazard mitigation and life safety.[7]

[5] Social capital video can be found here: https://www.fema.gov/preptalks/aldrich.
[6] Emergency preparedness presentation included the following FEMA videos on first aid response: Why You Need to Stop Bleeding Right Away, https://www.youtube.com/watch?v=z331Zcmropc; How you stop bleeding, https://www.youtube.com/watch?v=e1nR5stSZn0; You are part of the team, https://www.youtube.com/watch?v=i8Wc5VwksPU
[7] *Project Safe Haven: Tsunami Vertical Evacuation on the Washington Coast; Grays Harbor County*, 2011, report available at https://mil.wa.gov/uploads/pdf/emergency-management/haz_safehavenreport_graysharbor.pdf. Paula Ackerlund, who as Superintendent of Schools at the time led the effort to rebuild the school, gave a brief presentation of the school's features.

As in the Partners Workshop, this session of the Community Workshop also presented images of historic coastal change, shown in Figures 14-16, and the UW team asked respondents for memories of the 1964 Alaska Earthquake and tsunami. Participants recalled their memories of the ground shaking and being afraid, including being woken up from sleep by the shaking. One participant reflected on how that experience made her more aware of the forces beyond our control, and that she is grateful for the opportunity to discuss preparedness.

For the final Round Three discussion, facilitators asked participants to imagine how the community could adapt to, prepare for, or take advantage of the "new normal" suggested by each scenario, including brainstorming strategies that would help Westport/South Beach continue to support its values, and even address some of the everyday needs identified in Round Two. The SLR, M1, and L1 subsections below include details from these discussions.

3.3.1. Sea Level Rise Scenario

The two SLR discussion groups identified and discussed the following values and assets included in Table 9. Figures 28 to 31 below show the assets that the SLR group mapped.

Table 9. Community Workshop SLR Discussion of Values and Assets

Values	Assets
Access to fresh food	Fishermen, seafood market, hunters, clam digging is a draw for visitors
Recreation opportunities and access to nature and open space	Surfing, ocean, beach access, roads/trails suitable for running, biking trail, city park
Quality educational opportunities	School, including events and activities, library, Ocosta School building
Desirable location that people enjoy visiting	Tourism opportunities, including state park and fishing opportunities
Small, quiet town	Small population
Rich maritime history	Museum, lighthouse
Sense of community and community values	Residents, strong work ethic, self-reliance, skilled craftspeople
Clean air and water	Wastewater treatment plan, wells
Access to the wider area	Airport, logging roads that could be used for evacuation
Employment opportunities	Cranberry bogs/industry, jobs provided by the shipyard, seafood industry
Availability of goods and services in Westport	Hospitality and accommodations, pharmacy (which sells some groceries), grocery store, good restaurants that draw visitors from the wider area (but may be closed during the week)

Figure 28. Community Assets Identified by Saturday SLR Group 1 - Region

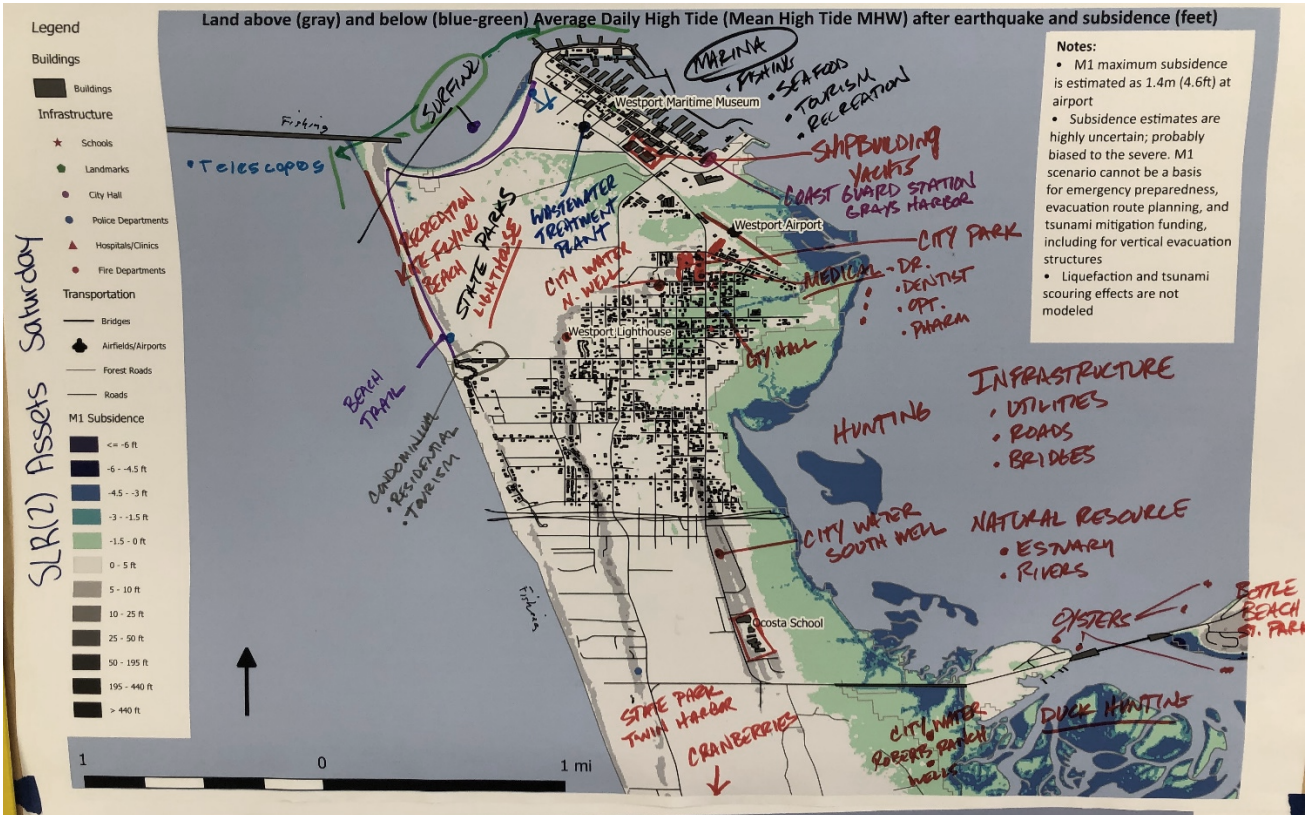

Figure 29. Community Assets Identified by Saturday SLR Group 1 - Westport

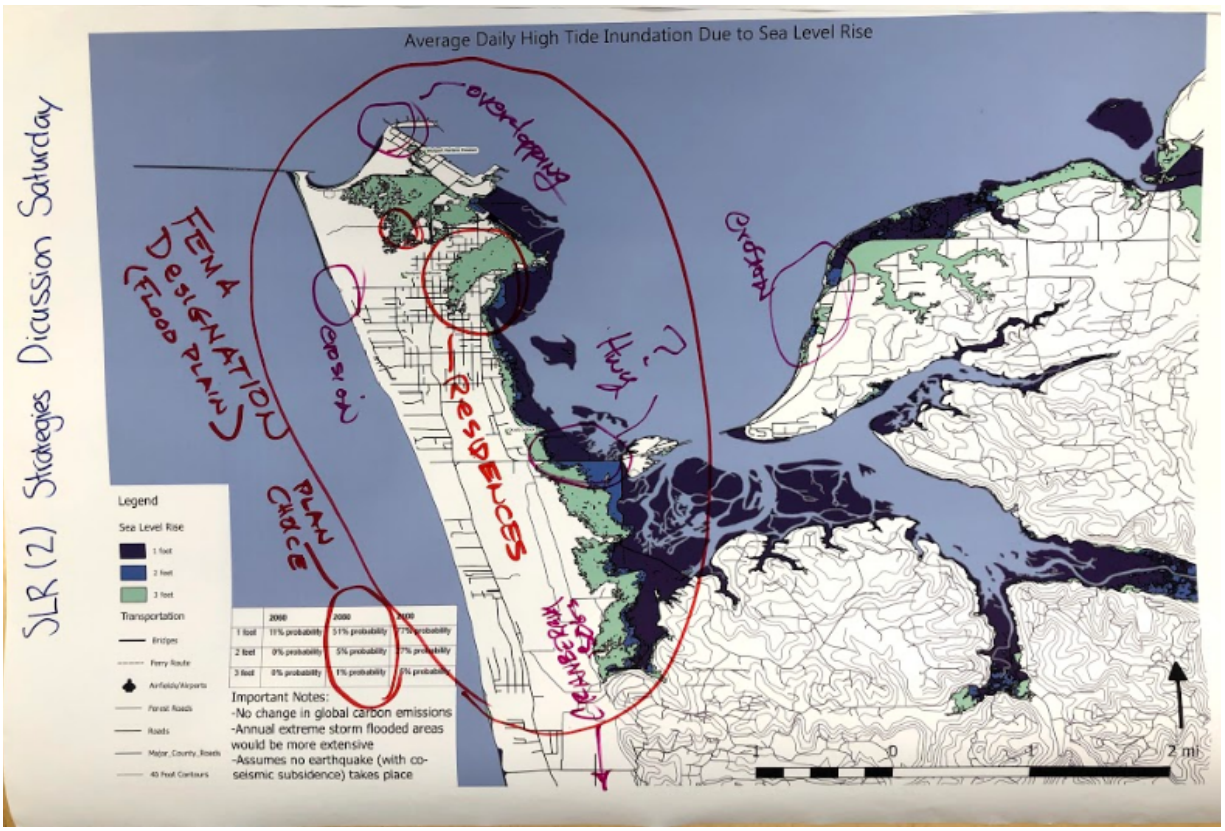

Figure 30. Community Assets Identified by Saturday SLR Group 2 – Region

Figure 31. Community Assets Identified by Saturday SLR Group 2 - Westport

In addition to the values and assets listed in Table 10, participants discussed the following during the values and assets brainstorming session:

- Westport is a place that has many assets – but it can be challenging year-round when restaurants and shops are closed in the winter
- The community has an "underdog spirit" that helps people band together; there is a sense of needing to face challenges and be able to be self-reliant (e.g., repair boats, cars, houses)
- While there are employment opportunities and industries that are valued, many people do not work
- There may be new recreation assets – such as potential campgrounds that the state park is developing

After discussing values and assets and hearing the presentation about social resilience, the group reviewed their list of values and assets, identified those that are not adequately supported, and brainstormed ways to better support these elements. Table 10 includes values and assets that participants identified as vulnerable, and opportunities for supporting these values and assets.

Table 10. Community Workshop SLR Discussion of Vulnerable Values and Opportunities for Strengthening

Vulnerable Values and Assets	Vulnerabilities and Opportunities for Strengthening
Education and preparedness	• Many tourists will not know what to do in an earthquake or tsunami, need signage and meetings related to hazard preparedness, potentially through hotels and restaurants. • There may be a mentality that if people can make it to a facility that has supplies after an event, they will be taken care of. Need to promote individual preparedness so that people have supplies and are more self-sufficient.
Community involvement	Neighbor groups can enhance/provide community support; breaking down the community into smaller groups can help
Housing and lodging	Shortage of affordable housing needs to be addressed
Infrastructure	• Retrofitting bridges is needed now as a preparedness step, other improvements needed though infrastructure is generally pretty good. • Currently building a new water facility on higher ground that could hopefully withstand an M1 event
Access to wider region	Have logging roads that can be used for access if bridges are compromised, but there may be gates; need to work on gaining access, such as through conversations with forestry logging industry
Health/medical facilities	Have medical facilities in town, but could consider moving facilities and/or supplies to high ground
Services and amenities	Grocery stores close very early, could need to be addressed

Other topics discussed included:

- Response and planning are limited to within the City of Westport; people who live to the south will need to rely on the county; could consider someday annexing southern area where school is located
- It will be important to work with the county on expanding vertical evacuation; city needs more than one vertical evacuation location
- Need to coordinate with the county on mitigation

After the presentations of potential hazard scenarios and information about Westport's vertical evacuation structure, participants discussed how the community could adapt to, prepare for, or take advantage of the "new normal." The Saturday SLR group focused on the 2080 SLR scenario that has a 55% probability of occurring. Discussion included the following:

- Beach erosion needs to be incorporated into planning; SLR and erosion become more critical with storms, and storm surge will flood areas in the marina. Dealing with erosion can be a political issue – there may be a need to add more sand, but this is not permitted by the Department of Ecology.
- 100 years can go by pretty fast, meaning that SLR scenarios may be reality sooner that it seems. However, there is difficulty addressing SLR because of bureaucracy issues with the Army Corps of Engineers and general political environment where some politicians don't believe in global warming. There is a need to start planning today to address future SLR risk, but projections may change in the future.

- Given that flooding will be significant, there may be a need to pass laws restricting new development in wetland areas, but there could be pushback and blaming of the city if restrictive new laws are passed. However, there is a need for new codes for flood-prone areas; some cities adopt international building codes, because usually FEMA decides the codes. Most of Westport is not in floodplain based on FEMA assessments, which could lead to political problems addressing flood risk. Flood-related regulations may mean that it will cost more to build homes and/or obtain insurance, which will have opposition.
- High priority risks include potential flooding of the highway, which would need to be moved, and the fact that saltwater will kill valuable cranberry bogs.

3.3.2. M1 "Like the Last Time (1700)" Earthquake and Tsunami Scenario

The M1 discussion group identified and discussed the following values and assets included in Table 11. Figures 32 and 33 below shows the assets that the group mapped.

Table 11. Community Workshop M1 Discussion of Values and Assets

Values	Assets
Local industries and employment opportunities (e.g., maritime industry, cranberry industry, etc.)	• Marina and seafood processing plants drive local revenue. The Westport shipyard, Washington Crab Producers, and Ocean Gold provide a ton of jobs and support the seafood industry • Ocean spray provides jobs and is located further south. The Markham factory is where they make craisins. The berries for juice and fresh are shipped to Henderson Nevada.
Supportive community and strong networks	Community organizations and support networks, including: • Christian outreach group, which provides free food, monetary resources to support those in need; is a cooperative of all the churches in the area. Located at the corner of Veterans Forest in the Living Hope Church building. • The Giving Freely Westport Facebook Group gives surplus stuff to neighbors, is a group of about 25 people, is also a way for neighbors to meet • Catholic Church • Food banks, where people donate and cook Thanksgiving for people in need
Supportive community and neighbors	Elementary school and high schoolers help each other, neighbors know each other
Access to fresh food and seafood	Community garden, clamming along the beach south of the jetty
Good services and security, government institutions	• Westport has the Coast guard, City Hall, fire department and ambulance and an engaged police department who actually checks in on people and businesses; people like the Police Chief are an asset • Citizen academy, crime watch • Emergency services/EMS
Historical character and livability of a small town	• Small town is comfortable and livable • Lighthouse, museum, etc.

Values	Assets
Good access to nature and ocean	Beaches, lighthouse trail, walkable for the community, big state park
Mom n' pop character of local businesses	Local restaurants and stores
Clean water	Water treatment plant
Access to wildlife and shellfish	Clamming along the beach south of the justice
Access to the outdoors, nature, ocean and healthy lifestyles	• Campgrounds, twin harbors state park, national forest, lighthouse hiking trail that used to be a boardwalk • Open spaces, nature, some of the best air in the entire state • Temperate weather • Beaches
Sense of opportunity and affordability	• Affordable real estate and the sense that people can open businesses if they want to
Places that are attractive to tourists	Beaches, State Parks, etc.
Access to good education	Small schools

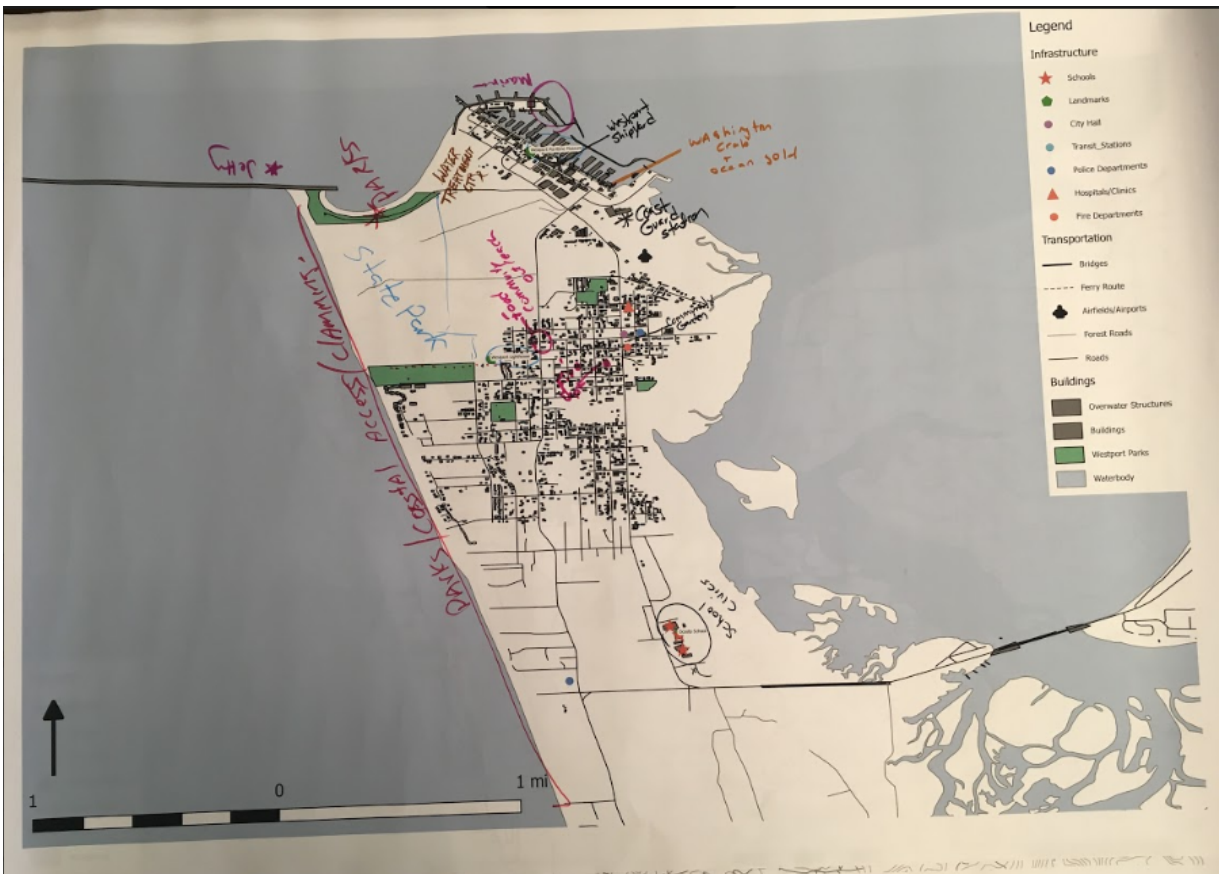

Figure 32. Community Assets Identified by Saturday M1 Group – Westport

Figure 33. Community Assets Identified by Saturday M1 Group – Region

Table 12 includes values and assets that participants in the M1 discussion identified as vulnerable, and opportunities for strengthening values/assets.

Table 12. Community Workshop M1 Discussion of Vulnerable Values and Opportunities for Strengthening

Vulnerable Values/Assets	Vulnerabilities and Opportunities for Strengthening
Access to the outdoors; clean beaches	Need beach cleanups; beach is often a mess after the tourists come here
Fishing industry	• Marina is vulnerable to SLR and tsunami, would need to be reinforced • Vulnerable to regulatory impacts; people say that the town used to be twice as big as it is now, but have been hit hard by fishing regulations
Benefits from tourism economy	Need education for tourists and visitors about hazards
Supportive community organizations	• Need emergency supplies at the senior center and schools (ex: bottled water, blankets, cots) • Need food delivery for seniors because food is costly here • Need senior and accessibility transit
Infrastructure provisioning	• Water infrastructure needs strengthening • Need to improve drainage on the peninsula (e.g., state park has ponds that fill)

	• Need to improve accessibility throughout the community. Currently, it's hard for seniors and disabled people to get around. Need bike lanes and crosswalks with lights.
Employment opportunities	• Need more connectivity to the wider region (e.g., Ocean Shores); Ferry to Ocean Shores is in progress; would need a supporting bus that runs on the weekends to make this effective • Need more housing and employment synergy to wider region, need more access to Ocean Shores for activities, particularly for young people
Historic buildings	Need earthquake triggered access doors to the lighthouse
Character of having local mom n' pop businesses	There are many for-sale signs, which gives the impression that there the town is dying; need to work on keeping businesses here.
Strong community	Need a place for young people to gather, like a skating rink to keep the kids busy
Emergency services and preparedness	• Need a response plan and triage approach • AEDs & medical supplies needed across locations • Need first aid and medical training, especially for seniors

Participants next discussed options for adapting to and preparing for the new normal, focusing on new strategies to support community values and assets and mitigation needs. Discussion included the following:

- **Transportation:** There is a need to address vulnerability of the bridge and options for getting in and out of the peninsula; this would be a first priority in recovering from an M1 event. There is discussion of adding a ferry system. The airport is critical for getting supplies in and out and could be moved to the other side of the peninsula to mitigate flood risk; if not possible, Westport could access the private airport.
- **Relocation:** If the M1 event were to occur, Westport could rebuild in a new location on high ground. Participants suggested rebuilding up on the hill in Grayland, and then where they would safe in the event of an M1 event happening again – the town could be "Grayport" or "Westland." Hills and high ground could provide a long-term option after a tsunami. However, participants expressed concern about abandoning Westport following an M1, because based on the subsidence map, they think the city could recover to some extent in its current location.
- **Hazard recovery assets:** The safe haven structure would probably still be standing, and the Coast Guard and military would help respond to an M1. There is a need to determine how these entities would access Westport (e.g., via a logging road because there would be no bridge).
- **Risk of isolation:** Westport is vulnerable to isolation; creative solutions like logging roads, a ferry system where the coast guard could land ships and access people at a dock, seaplanes/a water airport could all mitigate this risk.
- **Engineering solutions:** Participants discussed the possibility of raising sections of Westport using dredged material to elevate lowlands before an event creates a need to rebuild or requiring that new construction is built higher than the present level. Lessons could be learned from Alaska towns with regards to this solution. Other ideas included building levees to protect the marina and bringing in fill to pre-empt flooding hazards. Participants liked the idea of reinforcing the bridge and other areas as appropriate now to pre-empt an event. Some cited examples that the Army Corps is working on protecting other areas of the coast. However, some participants noted that these solutions can cause adverse impacts (e.g., dredging can cause loss of the dunes as is

happening in Washaway Beach) and could be damaged by a tsunami wave. Furthermore, land gets built back up naturally after a tsunami event.

- **Rebuilding:** Participants noted that rebuilding could be difficult for the elderly and the rebuilding process might require that Westport change its appearance. Participants suggested that the city might need more high-rise buildings because there will be less land available for housing; older prefab homes will be gone, and the city will need housing to be rebuilt.
- **Local economy:** Some aspects will remain unchanged after an event. For example, Westport will still be primarily a fishing town, and will still need business and industries to support the fishing industry, which will recover. Participants discussed recovering Westport's economy after a tsunami, including that the city is unique now because of local businesses and a lack of franchising. Some participants emphasized that they would want to preserve local character; however, some noted that they may need to court franchises and investment to generate rebuilding efforts. They noted that Washington is growing and there could be pressure for expansion here. They agreed that the oyster growing business wouldn't be affected long-term, though the oyster beds would have to be re-established and/or re-zoned. The cranberry industry would be vulnerable because cranberries grow in peat bogs and don't like salt. Commercial fishing would still be available, but there may be a need to replace the Marina.

3.3.3. L1 "Maximum Considered" Earthquake and Tsunami Scenario

The L1 discussion group identified and discussed the following values and assets included in Table 13 below. Figures 34 and 35 below shows the assets that the group mapped. The discussions of values and assets in the L1 group were influenced by the magnitude of the event. Some participants had difficulty identifying values and assets in a pre-disaster context, and others focused on the magnitude of the potential wave and emergency response (e.g., fire department, coast guard, etc.).

Table 13. Community Workshop L1 Discussion of Values and Assets

Values	Assets
Strong community bond	Schools
Having skilled, hardworking, and open-minded residents	Human resources/people in the city: mechanics, seafood processing workers, fishermen; independent and resourceful individuals with skills
Having access to fresh foods	Forests, oyster farms, elks hunters, Marina docks
Having natural resources for recreations: hiking, walking on the beach and surfing	Camping grounds, blue sky, long beach walks, playgrounds, two surfing spots in the city, surf shops and surfing community, beach trails
Economy opportunity	Vacant lots in the business center, possibility of farming, possible new employment opportunities at the State Park, logging, fishing industry, cranberry industry
Safety and security provided by the city	Airport, Coast Guard, water towers (public and private owned), no traffic
Resiliency provided by the city	fire department, communication system, broadband technology

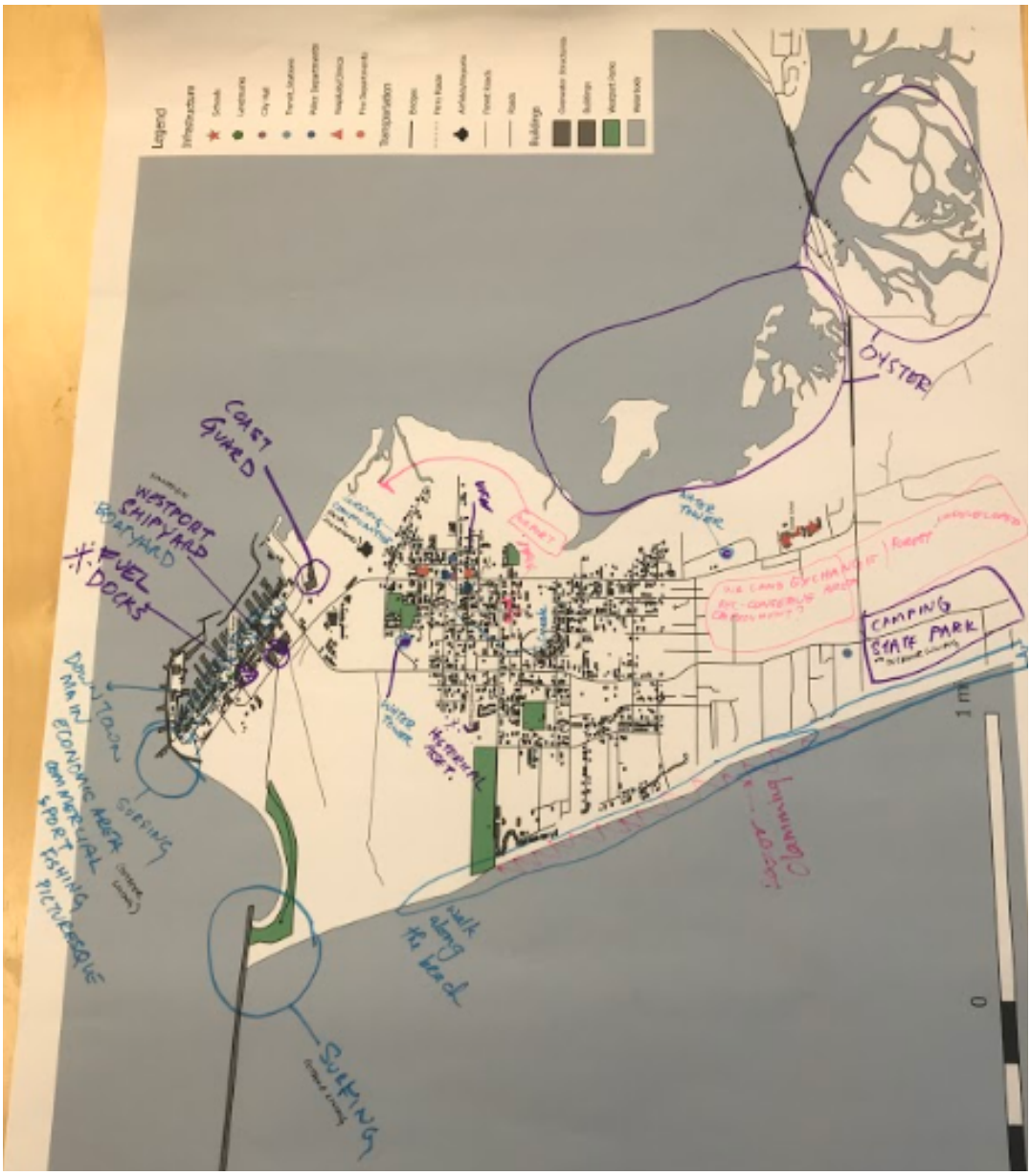

Figure 34. Community Assets Identified by Saturday L1 Group – Westport

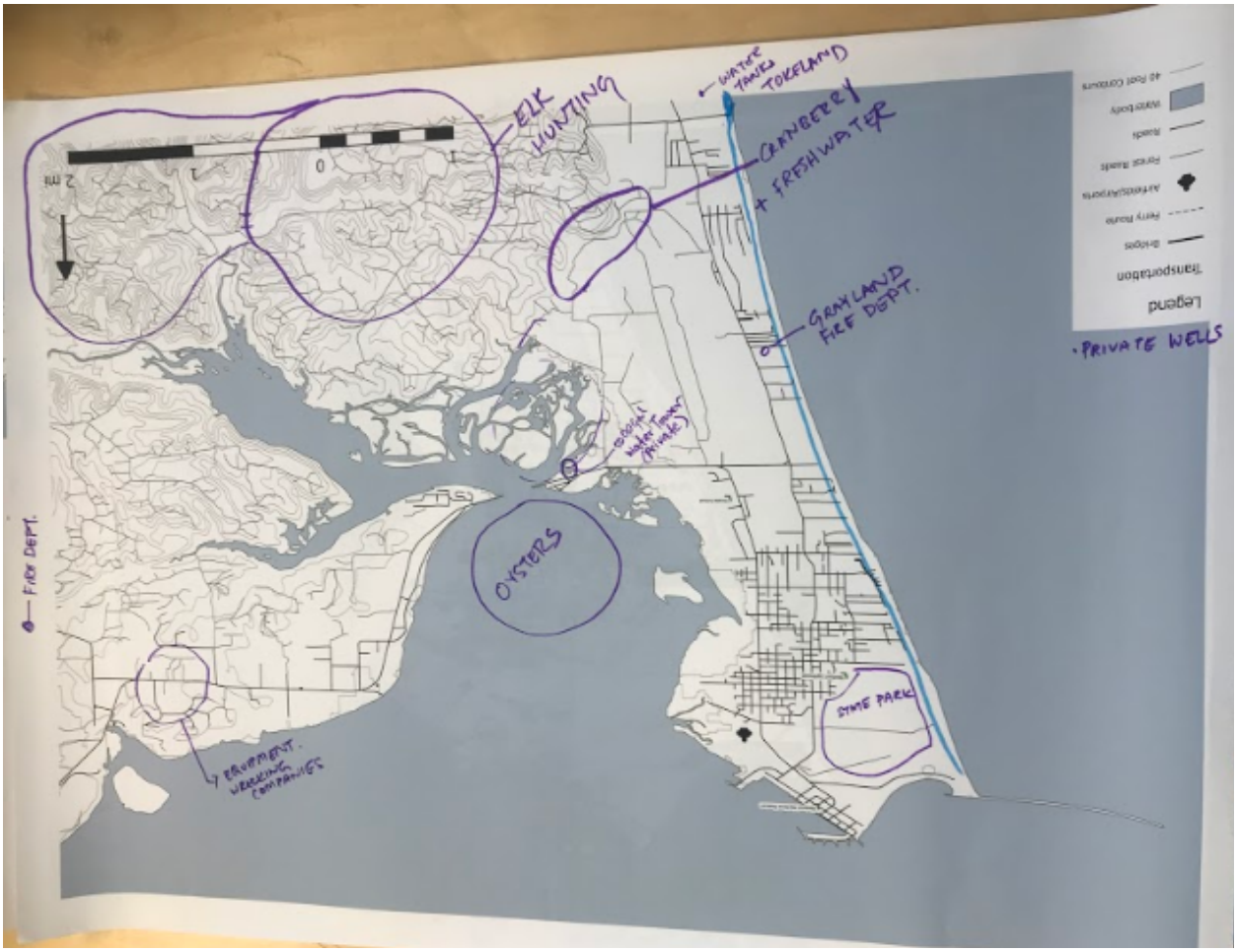

Figure 35. Community Assets Identified by Saturday L1 Group - Region

The L1 group then discussed values and assets that are vulnerable to hazards, identifying the following vulnerabilities:

- Communications systems, including internet access
- Economic diversity
- Vital facilities/services, including fire department and EMS, radios, powerlines, generators, port systems, signage, water resources, transportation system
- Tourism industry and visitors

With regards to adaptation to a "new normal," the L1 group focused on ideas including relocating the community to a safe areas and/or increasing the height/level of the road systems and bridge.

3.3.4. Values and Assets Storytelling

The Community Workshop had two opportunities for report-back and storytelling to the whole room. The first story-telling opportunity followed the values and assets discussions held at the individual tables in Round One. Values and assets stories shared by representatives from each group are included below.

Group 1: *"Once upon a time, along the coastal shores of Washington, there was an idyllic community called Westport. This place had blue skies, fresh water, razor clamming, and long beach walks. It became*

not just a place for us to live, work, and play, but also became a playground for people from Portland and Seattle to come; these people appreciated that they could drive here on uncrowded roads and experience a quality of life that was not hectic. Here, we value our resiliency, independence, and helping and supporting one another. This community was worried because they found that they were subject to natural disasters, and due to the remoteness of the community and the distance from urban areas, the community would have to rely on itself. But the community had lots of assets and resourceful people who like to meet together and work on issues these. So, they met and discussed what they could do and prioritized strategies. This community had so much resilience and such a can-do attitude, and so much awareness, they built the first vertical evacuation structure in North America."

Group 2: *"Once upon a time in Westport, we valued our small community, the feeling of closeness that you can only have in a small down. We valued our fishing industry and the jobs that it provides, diverse cultures and people coming together, the cranberry industry, our schools, and our community gardens. We liked that we have lots of beaches where you can even see bald eagles; you wouldn't find that back home in Indiana. The weather here is so nice that the tourists come visit us – there's only 30 degrees variation during the year, and no snow. We liked that it's not heavily industrialized or commercialized, not tore up or denuded; it's still beautiful and untouched. There's green everywhere. You can see deer, see elk; you can go crabbing for dinner. Anyone here can go get a fresh seafood meal and it doesn't cost a fortune. You just have to take the time and go sit on dock with the other who are out there trying to catch their dinner. Everyone here is coming together to make things better, for us all to grow and prosper. And we value our traditions."*

Group 3: *"Once upon a time there was a sleepy fishing village with more salmon than they knew what to do with. As the resources dwindled, people didn't stop coming, so the town diversified. It added services, recreation opportunities, so that full time residency could be more convenient here in Westport. We value that we are a small town that has a can-do attitude and a working-class mentality. Westport has banded together not only for recreation services, but also health services, food services, and an operational marina which is pretty unique – not many communities have a big marina like that."*

Group 4: *"Once upon…. The traffic and stress of [the city] drove him out here, dragging his wife with him. They moved to a small community on the coast of Washington. He fell in love with the place that had one stoplight that was shut off after Labor Day and not turned back on until Memorial Day. They liked the beach, clean air, and schools – this was a surprise because they were coming from [a place with big schools and they weren't sure how it would compare]. They liked that everyone knew everyone; and people were independent – the fishermen were independent business people. They liked that there was a community value of hard work. Westport kids got up early worked harder than any other kids they had seen. There were seven and eight-year-old kids cleaning fish on the docks in the mornings, and the children of business people worked for the family business. This led to independence. They liked the general quality of life, it's probably the most giving community they had ever witnessed. When people need something, people rally around and get it to them. They didn't like that the community was resistant to change. Over the past 40 years, this has changed; this community now wants to move forward in every way possible. When you come down I-5 and turn the corner, your stress just drops… and by the time you get to the beach, it's gone."*

3.3.5. Adaptation Storytelling

Later during the meeting, participants had another opportunity to use storytelling to share the discussions from their table groups. The second storytelling session focused on adaptation and resilience to hazards.

Group 1: ***"****A long time ago in a galaxy far away… there were lots of diverse opinions. In our group, we were looking at pre-planning and post-reality. Pre-planning, we were thinking about how we can prevent destruction. Maybe geotubes, levees, dykes, and vertical evacuation structures that have double and triple uses and roles. How do we minimize loss of life and community viability? We need to protect the economy, commerce, viable transportation, and utility corridors for power and transportation. Thinking about the post – scenario, how much destruction do you have to deal with and what are the realities?"*

Group 2: ***"****Once upon a time in Westport, with strength and determination, the town was able to regrow from a tsunami. They devised a water airport for supplies while the bridges were being rebuilt. Some people moved up on the bluffs to escape the congestion. They built high rises to house people. Our biggest asset is fishing industry and it was not affected. The oyster beds moved inland as the land receded, the docks are still there, much of our tourism is based on deep sea fishing and we would still have that. We would just need to move and shift a bit and I believe we would be fine. This town is strong, we are survivors, it's a close-knit community, and we would be strong in the face of adversity."*

Group 3: ***"****We are dealing with sea level rise in the year 2080. The challenges are both physical and political. The physical changes that would need to take place would need to be taken care of in a political manner. Flood plain inundation would be residential and commercial – the docks and marina would be affected. We would have to go through the political wrangle of why you would require stricter and more costly regulations, that would be more prohibitive of what you can and can't do with your property. Inundation would affect municipal and commercial infrastructure and would have effects on the residential areas and transportation corridor. We are in for another political wrangle."*

Group 4: ***"****We chose to focus on 11% chance of 1 foot of sea level rise by 2060. Recognizing the assumptions that these predictions are made based on current information of climate change, and projections could be different. Under this scenario, we would lose access to Aberdeen. The road would be under water in the Ocosta curve. Up by O'Leary Creek would also be under water and the bridge would be inadequate. We would lose the airstrip. The bridge would be a difficult situation. This is an opportunity because there are other reasons to replace the bridge and straighten the curve other than safety under SLR. In South Beach we have a history of successfully moving roadways because of encroachment."*

4. Workshop Feedback Survey Results

Below are the results of a survey that the UW team circulated to workshop participants following the workshops to solicit their feedback and input.

Coastal Resilience Project – Westport Workshop Survey Results 11.16.2018

Instructions: Please answer the questions below using a 1 to 7 scale (1 = not at all to 7 = extremely).	
Questions	**Response average**
1. In general, would you say that people try to be helpful?	5.8
2. In general, would you say that people are looking out for themselves?	5.2
3. How concerned are you about sea level rise?	5.4
4. How concerned are you about a Cascadia Subduction Zone (CSZ) earthquake and tsunami?	5.9
5. After participating in this workshop, do you feel you have a greater understanding than before of the possible impacts of sea level rise or a CSZ earthquake and tsunami on your community?	6.3
6. How confident do you feel that your community will thrive even as sea level rises?	4.9
7. How confident do you feel that your community will recover from a CSZ earthquake and tsunami?	4.1
Two weeks after a Cascadia Subduction Zone earthquake and tsunami, who are you expecting to rely on for help? (Circle one for each)	
a. People in my home	6.0
b. People in my neighborhood	5.2
c. People from my church or faith-based group	3.6
d. Non-profit organizations	4.2
e. Fire, police, emergency services personnel	5.2

9. Describe what you expect the City government of Westport to do after a disaster.
Take care of its people first!
Emphasis on rebuilding and re-instate means to sustain life for the collective good. Be open to improvements! Thanks so much for this workshop!
Volunteer guidance and assistance. Begin finding/assisting survivors and assisting evacuation accessibility for all who need it.
Not much.
Not much if anyone survives than (illegible)
As much as their resources allow.
Abandon (illegible)
Provide shelter, other services. Locate survivors. Arrange for rescue.
Help as best as they can with all that they have available.
Communicate, request state/federal resources. Organize relief/recovery efforts.
Provide fuel, tools, and equipment for locals to clear their areas.
Implement a working disaster plan.
Panic and be overwhelmed. Rescue operations (evac, medical). Infrastructure removal and repair.
Set up emergency medical stations. Help with accessibility of finding people.
Door to door/enlist Coast Guard.
The best they can.
Keep people calm and looting down. Implement measures agreed upon. Coast Guard and National Guard.
Do their best to help EVERYONE in need.
Keep up the plan on recovering already set by preparedness.
Whatever possible for less able/disadvantaged.

5. Erratum: Corrected Map of Sea Level Rise Projections

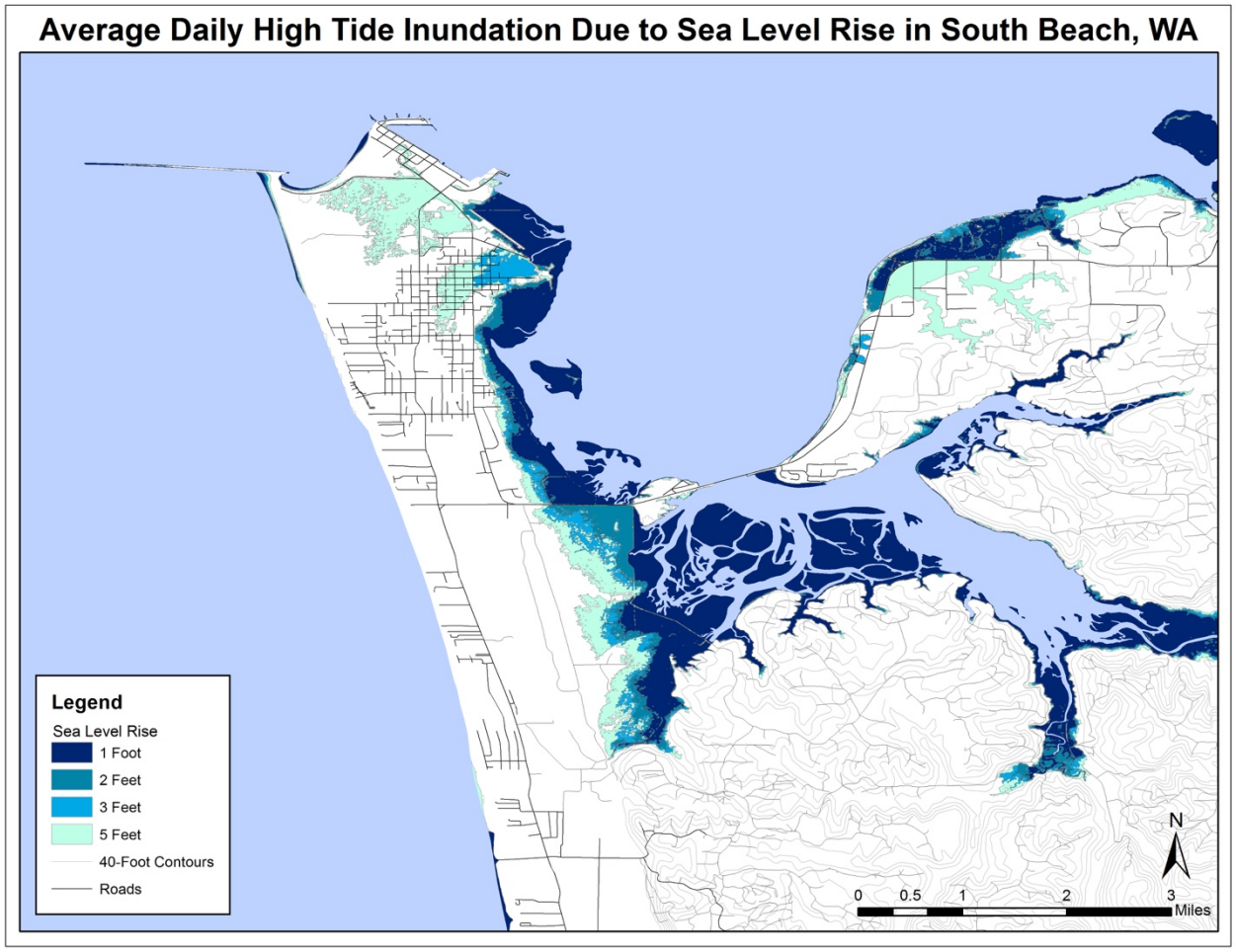

Figure 36. Sea Level Rise for Westport and South Beach, WA, corrected March 2019, post-workshop.