



Workshop Summary

Addressing Sea Level Rise in Shoreline Master Programs

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Norm Dicks Government Center

Bremerton, WA

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ABOUT THE PUGET SOUND CLIMATE PREPAREDNESS COLLABORATIVE

The Puget Sound Climate Preparedness Collaborative is a network of local and tribal governments, regional agencies, and organizations in the central Puget Sound region working together to ensure that the economy, environment, and all residents are resilient to the impacts of climate change.

The Collaborative creates a forum for peer learning and exchange of information, ideas, and opportunities related to climate preparedness. This approach recognizes that strategic regional collaboration can:

- Leverage limited resources
- Reduce duplication of effort
- Facilitate institutional learning
- Increase the effectiveness of individual community and organization adaptation efforts

For more about the Collaborative, visit: <https://pugetsoundclimate.org/>

Cover photo: King County. <https://www.kingcounty.gov/services/environment/water-and-land/shorelines/about.aspx>

EXECUTIVE SUMMARY

Over the next two years, shoreline jurisdictions in the Puget Sound region will be completing a periodic review of their Shoreline Master Programs (SMPs). Local governments have expressed interest in using this opportunity to strengthen local-level responses to sea level rise.

To support local government efforts, the Puget Sound Climate Preparedness Collaborative, the Washington Department of Ecology, and the Shoreline & Coastal Planners Group hosted a workshop on August 2, 2018 to discuss the implications of sea level rise on shoreline management planning and approaches to addressing sea level rise in SMPs. More than 60 people from federal, state, and local agencies; sovereign tribal nations; non-governmental organizations; academia; and the private sector participated in the workshop.

The workshop provided a forum for learning about new sea level rise projections produced for 171 locations in Washington State as part of the Washington Coastal Resilience Project (WCRP) and local efforts to incorporate sea level rise into SMPs. Following a brief series of presentations on these topics, participants self-organized into groups to discuss the following topics:

- 1) Understanding the public interest in addressing sea level rise risks
- 2) Managing for a dynamic process
- 3) Outreach and education/risk communication
- 4) Mainstreaming and linking within—and beyond—the SMP
- 5) Brainstorming blitz (an open-ended discussion of ideas). An agenda for the workshop is included at the end of this summary.

Highlights from the presentations and table discussion are provided in the following sections. More broadly, the workshop pointed to the following key takeaways:

- **The response to the new Washington sea level rise scenarios was positive overall.** The probabilistic framing and the availability of scenarios at a finer spatial scale make the scenarios more relevant and useful compared to past projections. Additional guidance is still needed to help users interpret and apply the scenarios, however.
- **Local governments are making the transition from concept to action.** Local governments are moving from recognizing the issues associated with sea level rise to taking steps to address the impacts at multiple scales – small and incremental, to large and comprehensive efforts. The level of specific actions that have been adopted, and are currently being explored, span a range of programs that can work to address the impacts on the many uses along our shorelines.
- **Addressing sea level rise requires practical and creative thinking.** There is a recognition that there are steps we can take right now to better prepare communities, but there is also a need for more creative thinking and potentially fundamental shifts in programs needed to support more holistic strategies.
- **Getting support for action on sea level rise is a challenge** with the public, within local government, and with elected officials. While there is growing awareness of sea level rise impacts and the need to address sea level rise, concern about litigation and costs can make it difficult to move forward with adaptive actions. In some communities, the politics of climate change and sea level rise can also make it difficult to engage staff, the public, and elected officials on the topic.
- **More training and more localized communications for diverse audiences is needed.** Communication on the impacts of sea level rise needs to be developed specifically for local communities, staff, and elected officials. Different messages will resonate with each of those audiences. It is also important to train the consultants, engineers, and permittees on how to communicate to the public about sea level rise. Messaging related to changing coastal hazards may be more effective in areas where sea level rise is too political.
- **The balance between flexibility and predictability is difficult to define.** The flexibility for tailored approaches is ultimately a good thing to allow sea level rise strategies to fit the unique situations along

each stretch of shoreline, but can also be frustrating if you are working across jurisdictions as an applicant or developer because standards and requirements can be inconsistent.

- **Sea level rise accommodations have an additional cost.** There are still questions about who bears the cost, and what the cost benefits are to justify spending additional money. How do you justify decisions that may make some people upset now, but have a long-term benefit?
- **System interdependencies can limit action.** As projects begin to incorporate sea level rise, practitioners are finding that there are issues outside of their control that are not aligning with their effort. For example, while State Ferries wants to include sea level rise, all the resources they depend on for their facility (sewer, electric, etc.) are not able to adjust/accommodate easily.

As the workshop came to a close, progress was recognized by the many partners in the room. It was clear from the optimism and energy that the end of the day was just a pause in the ongoing efforts to find solutions to the complex problems that we face now and in the future.

PRESENTATION HIGHLIGHTS

A. Puget Sound Sea Level Rise: Projected Changes

Harriet Morgan, University of Washington Climate Impacts Group

Harriet Morgan of the UW Climate Impacts Group provided an introduction to the new Washington sea level rise projections produced by the [Washington Coastal Resilience Project](#) (WCRP). The projections, provided by decade through 2150 for a low (RCP 4.5) or high (RCP 8.5) greenhouse gas scenario, are available online for [171 locations](#) in Washington State.¹

The new projections are an improvement over past (2012) projections in several notable ways. First, the projections incorporate the latest science on global sea level rise, including the potential for rapid ice loss from Greenland and Antarctica. Second, the new projections take into account updated research on long-term trends in vertical land movement (i.e., subsidence and uplift) in Washington State. Differences in the rate and direction of vertical land movement along Washington's shoreline can cause notable differences in local sea level change, as illustrated in Table 1. This directly influences the water level that residents will experience along Washington's shorelines. Finally, the projections are presented in a probabilistic framework, which will help jurisdictions strategically plan for the impacts of sea level change.

Guidance on using the 2018 scenarios in decision making is being developed and will be available this fall on the WCRP website. A November 6 workshop on the guidance is also planned. The Collaborative will share information on that workshop when more details are available.

¹ See <http://www.wacoastalnetwork.com/wcrp-documents.html>

PROJECTED RELATIVE SEA LEVEL CHANGE FOR 2100 (feet, averaged over a 19-year time period)							
Location	Vertical Land Movement Estimate	Greenhouse Gas Scenario	Central Estimate (50%)	Likely Range (83-17%)	Higher magnitude, but lower likelihood possibilities		
					10% probability of exceedance	1% probability of exceedance	0.1% probability of exceedance
Tacoma (47.3N, 122.4W)	-0.5 ± 0.2	Low	2.1	1.5-2.7	3	4.6	7.9
		High	2.5	1.9-3.3	3.6	5.3	8.8
Neah Bay (48.4N, 124.6W)	1.1 ± 0.3	Low	0.5	-0.1 - 1.2	1.5	3.1	6.3
		High	1	0.3 - 1.7	2	3.8	7.4
Taholah (47.4N, 124.3W)	0.3 ± 0.5	Low	1.3	0.6-2.1	2.4	3.9	7.1
		High	1.7	1.0-2.6	2.9	4.6	8.1

Table 1: Relative sea level projections, in feet, for three of the 171 locations along Washington’s coastline (Tacoma, Neah Bay, and Taholah). Projections are expressed in terms of the “probability of exceedance” for 2100 (2090-2109) under a low (RCP 4.5) and high (RCP 8.5) greenhouse gas scenario. Projected changes are assessed relative to average sea level for the period 1991-2009. Table and caption from: [Miller et al. 2018](#).²

B. Where are We Now? Current State and Local Efforts to Address Sea Level Rise in SMPs

Sara Brostrom and Bobbak Talebi, WA Department of Ecology (Ecology)

Bobak Talebi and Sara Brostrom of the Washington Department of Ecology summarized key findings related to Ecology’s efforts to help communities incorporate sea level rise in Shoreline Master Programs.

Current Ecology guidance on addressing sea level rise in SMPs dates back to 2010, when guidance was added to Appendix A of the Shoreline Master Program Handbook. While this has been a useful tool, local governments have requested further refinement. This request prompted a number of past and ongoing activities intended to help shape and enhance Ecology’s support for local government sea level rise planning, including the following:

- Surveys (2009-2016): Ecology conducted an analysis of seven surveys administered by different organizations between 2009-2016. The analysis explored a range of topics related to sea level rise and climate change perceptions, preparation, and adaptation actions. The goal was to use existing data to help clarify needs of planners and coastal resource managers to help shape next steps for resources and updated guidance.
- Sea Level Rise Workshop (2016): Ecology held a day-long sea level rise workshop in 2016 with technical experts and local governments actively addressing sea level rise adaptation in their communities, and worked with a local government sound board to explore more specific opportunities for state support. Responses showed that approaches for addressing sea level rise are diverse and local governments are in the best position to determine how SMP amendments should be incorporated into their overall sea level rise response strategy. However, the state could play a helpful role in learning what local governments have done, and disseminating approaches and lessons learned across the state.

² Miller, I.M., Morgan, H., Mauger, G., Newton, T., Weldon, R., Schmidt, D., Welch, M., and Grossman, E. 2018. *Projected Sea Level Rise for Washington State – A 2018 Assessment*. A collaboration of Washington Sea Grant, University of Washington Climate Impacts Group, Oregon State University, University of Washington, and US Geological Survey. Prepared for the Washington Coastal Resilience Project.

- *SMP Review (2017)*: In 2017, [Ecology reviewed SMPs](#) for 56 jurisdictions with a marine shoreline. Twenty of these SMPs included a reference to climate change or sea level rise. This assessment established the first baseline collection of policy and regulatory language used in SMPs.
- *Interviews (2018)*: Ecology took the 2017 SMP review a step further by interviewing eight jurisdictions about their inclusion of sea level rise considerations in their SMPs. These interviews identified a variety of factors that influenced the development of the sea level rise language and implementation of that language.³
- *Focused Partnerships (ongoing)*: Ecology is partnering with a number of agencies, local governments, academic institutions, and nonprofit organizations to explore and expand resources for planners to help address sea level rise concerns, including: [Washington Coastal Resilience Project](#); [Coastal Training Program Climate Adaptation Series](#); and the [Washington Coastal Hazards Resilience Network](#).

Moving forward, Ecology expressed an interest in further investigating six themes that influence or directly relate to including sea level rise considerations in SMPs and other planning documents:

1. Understand the public interest in addressing sea level rise risks
2. Gain authority to work on this issue.
3. Manage a dynamic process
4. Outreach and education/risk communication
5. Mainstream and link within and beyond the SMP
6. Zoning and land use

The afternoon discussion session explored many of these themes.

C. Addressing SLR in the 2019 SMP Update: Moving Beyond Base Flood Elevation Requirements **Jim Simmonds, King County**

Jim Simmonds reviewed potential changes or additions related to sea level rise that King County is considering as part of its 2019 SMP update and other shoreline regulations.

King County is preparing a comprehensive sea level rise strategy as part of the county's 2015 Strategic Climate Action Plan. This strategy includes:

- 1) Understanding and incorporating the latest sea level rise projections (e.g., the WCRP project)
- 2) Addressing sea level rise impacts on King County owned assets
- 3) Updating King County policies and codes for shoreline development
- 4) Coordinating with regional partners on adaptation planning related to sea level rise

An interdepartmental team was assembled for the shoreline development component (#3). The team developed 27 potential recommendations for changes in policies and codes governing shoreline development. These potential recommendations include the following:

- Strengthen requirements for coastal 100-year floodplain, e.g., prohibiting new groundwater wells and on-site septic systems in the coastal 100-year floodplain;
- Create a new critical area called "Sea Level Rise Hazard Zone" and set requirements within this new zone, e.g., raising floor elevations, waterproofing on-site sewage systems, extending the height of well casings;
- Commit to updating maps and data, e.g., update coastal floodplain maps every 20 years or when sea level has risen one foot, whichever is earlier;
- Strengthen setback requirements on top of steep slopes;
- Strengthen bulkhead requirements for developed parcels, e.g., increase toe of bulkhead elevation requirement to three feet above the Mean Higher High Water elevation level when possible; and

³ The following jurisdictions were interviewed: Bellingham, Langley, Woodway, Bainbridge Island, Shoreline, King County, Gig Harbor, Mason County, and Olympia.

- Help shoreline residents adapt to sea level rise, e.g., provide financial assistance to help property owners elevate or move structures; educate property owners about sea level rise, legal requirements, and possible preparedness actions.

Jim noted that the county will probably not adopt all of the strategies; it will be up to department leadership in permitting, natural resources, and public health to make the final decision regarding which recommendations will be adopted.

TABLE DISCUSSION HIGHLIGHTS

Following the presentations, participants self-organized into table discussions related to the following topics:

- 1) Understanding the public interest in addressing sea level rise risks
- 2) Managing for a dynamic process
- 3) Outreach and education/risk communication
- 4) Mainstreaming and linking within—and beyond—the SMP
- 5) Brainstorming blitz (an open-ended discussion of ideas).

The goal was to identify and discuss a range of concepts and ideas; the feasibility or legality of ideas discussed at the workshop were not assessed.

Group 1: Understanding the Public Interest in Addressing Sea Level Rise Risks

Discussion questions:

- In addressing sea level rise through the SMP and other programs, where is the boundary between managing risk for the public interest and “let the buyer beware” (i.e., what is our interest/need)?
- What are the social, environmental, and economic impacts that motivate government action on sea level rise?

Discussion summary:

- The public interest in addressing sea level rise is motivated by three broad and often connected categories of impacts: social, economic, and environmental impacts.
 - *Social impacts:* can include public safety concerns; impacts on community structure and identity; equity and social justice concerns; loss of public access to beaches
 - *Economic impacts:* can include economic disruption when businesses or infrastructure are damaged; higher costs to taxpayers when public infrastructure is damaged more frequently by higher sea level and changing coastal hazards; loss of tax base from damaged or devalued shoreline properties
 - *Ecological impacts:* can include loss of habitat, loss of ecological functions.

For more detailed examples of each of social, economic, and ecological impacts, see the [City of Olympia community survey on sea level rise planning](#).

- The public interest issue also rests on the fact that local and state government is often required to step in and address public safety or environmental issues. For example:
 - Local and state government are directly involved in protecting the public from forest fires and helping communities recover from fires even though affected property is primarily private property.
 - In Lake Washington, 90% of the shoreline is private. However, if there is a spill, state and local government are responsible for the cleanup.
 - In North Cove, Pacific County (“Washaway Beach”), coastal erosion is causing damaged homes to fall into the ocean. This is creating an environmental hazard that the Dept. of Ecology, county, and local community is working to address.

Additional questions raised during discussion:

- Why does the SMA exempt bulkheads?
- What is the impact on bond rates?
- Is there a benefit to flood insurance rates?
- A lot of the shoreline enhancement buffers that we require now will at some point be underwater. What will be the buffer in the future?
- How do Tribal and treaty rights factor into these considerations?

Group 2: Managing a Dynamic Process

Discussion questions:

- How do we manage the dynamic nature of sea level rise while also providing a certain level of predictability for shoreline property owners and developers?
- How do we build in a process for integrating emerging science into the Shoreline Master Program (SMP) and other planning documents?

Discussion summary:

- Jurisdictions need to increase mapping support for hazard zones so that communities can develop a better idea of where to focus their planning efforts.
- There could be declarations or disclosures incorporated into the process of buying a property sited in a sea level rise hazard zone. Declarations or disclosures could be included in the title for the property and include considerations such as the “life of the structure” given sea level rise or include “sunsets” on certain uses. Port Townsend provides a possible example for identified sea level rise and tsunami hazards zones.
- There could be standards for regulations in “sea level rise zones,” such as a temporal element to permits (e.g. you may only have this until this happens), elevations, limited use policy that will avoid magnifying the problem.
- We could establish a “sunset” clause for a non-conforming use. Policies enacted for Tacoma billboards and aquaculture permits could serve as possible examples or models. It is important to consider that this type of action will likely lead to litigation and temporary uses do not exist in the SMA.
- Marine buffers could potentially be harnessed. This could be implemented by first requiring a site-by-site assessment at the time of development and permitting standards specific to the unique site consideration. If an applicant requests a reduction of standards (buffer, setbacks, etc.), then require sea level rise assessment.
- Local governments could integrate sea level rise into all plans when they are up for review, allowing for incrementally implementation of the sea level rise considerations. King County provides a great example of this.
- Risk assessment tools are not developed for coastal hazards, as is true in other fields of hazards management. However, wildfire protection plans could possibly provide a good model for future development of risk assessment tools.

Additional questions raised during discussion:

- Existing and non-conforming uses will continue to be the primary problem, how do we manage with these? Can we manage this issues without allowing armoring?
- Should we focus our planning efforts on port terminals and water-dependent uses first? Many are willing to do additional work to consider sea level rise but they need clear standards.

Group 3: Outreach and education/risk communication

Discussion questions:

- What is it that you want to communicate to your community, staff, and elected officials regarding sea level rise?
- What opportunities exist (or need to be created) for sharing this information with internal and external audiences?

Discussion notes:

- Communication on the impacts of sea level rise needs to be targeted to each of the following: community, staff, and elected officials
- Tsunami planning provides a possible opportunity to implement mitigation strategies that address tsunami impacts while also addressing sea level rise impacts. This type of messaging may be more fruitful.
- Jurisdictions could consider connecting with entities that the elected officials already listen to, such as the Farm Bureau and realtors. Often a third party/NGO is more effective at communicating or garners trust than “the government.” Another option is to connect with other organizations in the area that are already addressing this issue and develop similar messaging. For instance, Island County may consider connecting with state and federal parks, military, or ferry system.
- A social media campaign within a county or city could create heightened public attention, and as a result attention from elected officials to encourage action.
- Communities could develop a communication strategy with several stages in alignment with certain goals. For instance, during the first stage tsunami risk language with tsunami hazard zone maps could be leveraged. This stage could be used in the short term for the 2020 SMP update.
- It is important to train the consultants, engineers, and permittees on how to communicate with the public through:
 - Maps and graphics (best if images/outreach directly reference jurisdictions)
 - Options to act upon, contacts, and best practices
 - Websites and links
 - Resources dedicated to coastal communities addressing weather events
 - Communicate early through bulkheads updates and new construction (stormwater systems, waste water, and septic system)
 - Connections to superfund contamination sites
- Relators, engineers, planners, and others access professional associations and depend on regulations. We should ensure this information is reaching the professional realm via CE credits and other built-in incentives.
- There is a need for more examples. Public infrastructure adaptation projects could continue to be a source of examples. The lesson learned from these efforts need to be shared.
- Ideas for reaching landowners include messages that connect or address with the following issues: concern about maintaining community values and sense of place, concern over regulations, wise investments, experience with large storms, and a focus on hazards in relation to the projections. Near-term incentives need to be focused on transfer of development rights, community rating systems, and other adaptation actions.
- Many elected officials understand the risks associated with failing to plan for the impacts of sea level rise but they fear the political fallout from taking action. Climate change and sea level rise are terms that are difficult to use.
- There is hesitation around publishing maps that could possibly lead to litigation.

Group 4: Mainstreaming and Linking Within and Beyond the Shoreline Master Program

Discussion questions:

- As you think about the range of actions that could be taken to address sea level rise, what actions are best suited for the Shoreline Master Program (SMP) versus other regulatory frameworks?
- How do we maximize the benefits of our shoreline management programs when it comes to preparing and adapting to sea level rise?

Discussion notes:

- We need to step back and identify the aspects of our tool box that need to be developed for sea level issues and existing planning documents that can be leveraged. We should be thinking beyond the SMP because many of these impacts will be felt outside the 200 feet of the SMP's jurisdiction. These impacts will need to be considered by other planning regimes. Some examples to consider include: Hazard mitigation plans, FEEMA, vulnerability assessment, and critical areas.
- Cross-jurisdictional planning should be encouraging in order to avoid creating "islands of standards." For instance, Jefferson County is in collaboration with Port Townsend on their comprehensive code and preparedness plan.
- Kitsap County was considering discouraging or preventing additional septic systems on shoreline. However, Kitsap cannot run public sewer outside of urban areas and the county is mostly rural.
- Updates to coastal flood mapping, separate from FEMA, might be needed.
- Leverage the environment. Connect wetlands and estuaries to sea level rise; protect the migration of critical areas that will help mitigate impacts.
- Tribal governments have been progressive in resilience planning. Tulalip, Jamestown, Suquamish, and Quinalt are leaders. Increasing broader collaboration on information sharing and policy lessons learned could provide insight for other regional efforts.

Additional questions raised during discussion:

- If FEMA updates their own mapping, what happens to their liability if their requirements for building aren't keeping up? Would they be liable for home damage? Would a city create a new group of non-conforming uses within specific buffers or zones? Does that affect the value of the home? How will it be phased out in time?
- Could we allocate public funds to invest in entire neighborhoods instead of having individual home owners take action?
- SMP doesn't cover much area. What takes over outside of the SMP's jurisdiction? Regular land use code? If code isn't addressing that, does it matter? Maybe you could bypass the whole SMP and make it part of your code – does it need to be in both? If you go through the effort of updating code, does that trickle back into areas covered by the SMP?

Group 5: Brainstorming Blitz

Discussion question:

- What regulatory and non-regulatory approaches to shoreline management should we be considering in the near term and the longer term to reduce the impacts of sea level rise?

Discussion notes:

- Possible solutions driven by economics include:
 - Monetary incentives to get property owners to make better solutions
 - Transfer development rights
 - Create escrow accounts where a homeowner purchasing a property in an area at risk of sea level rise would need to transfer money in order to take care of the house when it is eventually impacted.

- Insurance pool could be developed that with at risk homes would pay into.
- Open Space incentives for sea level rise with tax deduction for a demonstrated benefit to the public. Like with other open space benefits, property owners would agree not to developed parts of their property threatened by sea level rise and receive a tax deduction in exchange. This type of system could include a penalty if a property owner withdraws from the program. For example, in the case of existing [Open Space](#) programs the property owner must pay back 7 years of back taxes.
- Other ideas:
 - Limit sub-divisions on coastal properties.
 - Non-floating structures transition to floating structures over time. No more floating structures are currently allowed. This strategy would require a legislative fix to allow people to have new floating structures.
 - An existing sea level rise risk zone and tsunami zone recently established in Jefferson County was discussed.

Additional questions raised during discussion:

- DNR is concerned about over water structures, particularly existing infrastructure. This is part of the SMP (marinas, ship yards, docks). How do we help marinas with existing leases get ready for the impacts? The Army Corp. maintenance does not help address this issue. How do you maintain and upgrade overtime?



Vashon Island shoreline, 2016. Source: Washington Dept. of Ecology [Shoreline Viewer](#)