816 Second Ave
Suite 200
Seattle, WA 98104

future wise

(206) 343-0681 Ext. 118
tim@futureise.org
futurewise.org

September 26, 2016

The Honorable Steve Rogers
The Honorable Frank Wolfe
The Honorable Lisa Ayers
Board of Commissioners for Pacific County
300 Memorial Drive
South Bend, Washington WA 98586

Dear Commissioners Rogers, Wolfe, and Ayers:

Subject: Comments for the Board of County Commissioners Hearing on the Draft Shoreline Master Program Update (September 2016).

Sent via email to: srogers@co.pacific.wa.us; fwolfe@co.pacific.wa.us; layers@co.pacific.wa.us; mguernsey@co.pacific.wa.us

Thank you for the opportunity to comment on the Shoreline Master Program Update. In short, we strongly support the Shoreline Master Program Update. We believe that the update is well written and contains many helpful protections for water quality, people, and property. While we could identify many good provisions, we do want to particularly identify the following provisions as excellent:

- Designating Coastal Ocean and Coastal Ocean High Intensity environments and Willapa Bay Conservancy and Willapa Bay Estuary environments. Having these paired aquatic environments allows the County to identify the most important resources in water resources to protect in the bay, estuary, and ocean and areas where more intense uses can be allowed with less risk to economic and ecological resources.
- The Historic/Cultural/Scientific/Educational regulation in Section 4.1B. These regulations will help protect the county's many cultural sites.
- The Primary Dune Buffer in Section 5.10B2. As the shoreline master program recognizes, protecting the primary dune is important to protecting properties from storm surges, tsunamis, flooding, and sea level rise.
- The ocean use policies and regulations in 6 Coastal Ocean Uses and Modifications. These policies will help maintain and enhance the beneficial and sustainable uses of the ocean.

We do have some recommendations to protect these important resources and people and property explained below.

Futurewise is working throughout Washington State to create livable communities, protect our working farmlands, forests, and waterways, and ensure a better quality of life for present and future generations. We work with communities to implement effective land use planning and policies that prevent waste and stop sprawl, provide efficient transportation choices, create affordable housing and strong local businesses, and ensure healthy natural systems. We are creating a better quality of life in Washington State together. Futurewise has members across Washington State, including Pacific County.

Clarify of the definition of "Adverse Impact" in Section 2 on page 4 to provide for no net loss of shoreline ecological functions

The Shoreline Master Program Guidelines, in WAC 173-26-201(2)(e)(ii), provides in relevant part:

> Consistent with WAC 173-26-186(5) and (8), master programs shall also provide direction with regard to mitigation for the impact of the development so that:
>
> (A) Application of the mitigation sequence achieves no net loss of ecological functions for each new development and does not result in required mitigation in excess of that necessary to assure that development will result in no net loss of shoreline ecological functions and not have a significant adverse impact on other shoreline functions fostered by the policy of the act.[1]

However, the definition of adverse impact on page 4 allows much greater impact to shoreline functions than no net loss, it allows harm up to "moderate or greater harm." This will not achieve the Shoreline Master Program Guidelines' no net loss requirement. We recommend that the definition of adverse impact be modified to include the no let loss standard. Our recommended additions are double underlined and our recommended deletions are double struck through.

ADVERSE IMPACT - An impact that can be measured or is tangible and has a reasonable likelihood of causing a net loss of ~~moderate or greater harm to~~ ecological functions or processes or moderate or greater harm to~~,~~ economic activities or normal uses, or other elements of the shoreline environment.

This change is consistent with the definition of "no net loss" on page 18 of the Shoreline Master Program Update which requires "no resulting adverse impacts on ecological functions or processes."

We recommend that ordinary high water mark determinations should not be valid for five years, see Section 3.4(D) on page 44

We share the Washington State Department of Ecology's concerns that five years is too long for an ordinary high water mark determination to be valid. The ordinary high water mark can change quickly, on some streams and rivers it can change in year. Further, one of the reasons

[1] Even through the Shoreline Master Program (SMP) Guidelines are called "guidelines," they are actually binding state agency rules and shoreline master program updates must comply with them. RCW 90.58.030(3)(b) & (c); RCW 90.58.080(1) & (7). The SMP Guidelines cited in this letter were accessed on September 22, 2016 at: http://apps.leg.wa.gov/wac/default.aspx?cite=173-26&full=true

that wetland deletions are typically valid for five years is the cost of doing a wetland delineation. However, ordinary high water mark delineations are much quicker and cheaper to do. So we recommend that the ordinary high water mark delineation should only be valid for a year.

Please improve Public Access Requirements in 4.3B on pages 50 to 51

One of the policies of Washington's Shoreline Management Act is to increase public access to publicly owned rivers, streams, and lakes.[2] As our population increases, we need more public access. The development needed to accommodate this growth can also interfere with the traditional public accesses that people have used for years to access publically owned waters for boating, swimming, fishing, and other uses. Ecology's Shoreline Master Program Guidelines implement the Shoreline Management Act policies by including more specific requirements for public access. These provisions include WAC 173-26-221(4)(d) which requires in part that:

> (iii) Provide standards for the dedication and improvement of public access in developments for water-enjoyment, water-related, and nonwater-dependent uses and for the subdivision of land into more than four parcels. In these cases, public access should be required except:
>
> (A) Where the local government provides more effective public access through a public access planning process described in WAC 173-26-221(4)(c).
>
> (B) Where it is demonstrated to be infeasible due to reasons of incompatible uses, safety, security, or impact to the shoreline environment or due to constitutional or other legal limitations that may be applicable.
>
> In determining the infeasibility, undesirability, or incompatibility of public access in a given situation, local governments shall consider alternate methods of providing public access, such as off-site improvements, viewing platforms, separation of uses through site planning and design, and restricting hours of public access.
>
> (C) For individual single-family residences not part of a development planned for more than four parcels.

Generally, the proposed public access requirements meet these standards. However, proposed 4.3B1d, on pages 50 and 51, allows subdivisions of greater than four parcels but less than ten parcels to meet their public access requirements by providing community access to the shoreline for the non-commercial recreational use of the property owners and guests. This is inconsistent with WAC 173-26-221(4)(d) and this provision should be deleted. Public access should be required for these developments as WAC 173-26-221(4)(d) requires.

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[2] RCW 90.58.020.

Proposed 4.3B2, on page 51, could be interpreted as only requiring public access on rights of way and easements that exist now, not rights of way or easements created in the future to meet the public access requirements in proposed 4.3. We do not believe that is the county's intent and it is not consistent with the SMA and the Shoreline Master Program Guidelines quoted above. So we recommend that that proposed 4.3B2 be modified to read as follows with our additions double underlined and our deletions double struck through.

2. For the purposes of this SMP, the right to public access shall not be construed to include the right to enter or cross private property, except through the use of a~~n existing~~ dedicated public right-of-way or through an ~~existing~~ easement or similar legal mechanism that allows public access.

Please improve Table 5-1, Permitted Uses and Modifications by Environment Designation, on pp. 61 – 67 for certain uses.

Table 5-1 allows some uses in certain environments that are inconsistent with the Shoreline Master Program (SMP) Guidelines and would lead to further ecological damage. Allowing commercial and industrial development is inconsistent with the SMP Guidelines for the "Rural Conservancy" environment and similar environments.[3] Commercial and industrial development should not be allowed in the "Rural Conservancy," "Coastal Conservancy," "Willapa Bay Conservancy" and any urban conservancy environment in the County unless they are low intensity, water-oriented uses allowed "in the limited instances where those uses have located in the past or at unique sites in rural communities that possess shoreline conditions and services to support the use."[4] If these uses are to allowed in these environments, these qualifications must be added as footnotes.

Flood control structures are also inconsistent with the Rural Conservancy environment.[5] So we recommend flood control structures only be allowed as part of a restoration project or to maintain an existing structure.[6]

WAC 173-26-211(5)(c)(ii)(A) provides that new over-water structures are allowed only for water-dependent uses. In addition, WAC 173-26-231(3)(c) provides that:

> Fills waterward of the ordinary high-water mark shall be allowed only when necessary to support: Water-dependent use, public access, cleanup and disposal of contaminated sediments as part of an interagency environmental clean-up plan, disposal of dredged material considered suitable under, and conducted in accordance with the dredged material management program of the department of natural resources, expansion or alteration of transportation

[3] WAC 173-26-211(5)(b).
[4] WAC 173-26-211(5)(b).
[5] WAC 173-26-211(5)(b).
[6] WAC 173-26-211(5)(b).

> facilities of statewide significance currently located on the shoreline and then only upon a demonstration that alternatives to fill are not feasible, mitigation action, environmental restoration, beach nourishment or enhancement project.

So the five aquatic environments (the "Freshwater Aquatic," "Coastal Ocean," "Coastal Ocean High Intensity," "Willapa Bay Estuary," and "Columbia River Estuary") can only allow water-dependent commercial development and water-dependent recreational development waterward of the ordinary high water mark. Other commercial and recreational development cannot be allowed except on existing uplands.

Fills below the ordinary water mark are inconsistent with the SMP Guidelines for the Natural environment and should be prohibited except for restoration.[7] Structural shoreline stabilization is also inconsistent with the Natural environment and should not be allowed.[8]

We support prohibiting shellpiles in the Willapa Bay Estuary and the Columbia River Estuary environments. We also agree that footnote 2 should prohibit shellpiles from spilling over into areas below the ordinary high water mark.

The buffers on Table 5-2, Dimensional Standards, on page 69 should be wider

The Shoreline Master Program Guidelines, in WAC 173-26-241(3)(j), provide in part that:

> Master programs shall include policies and regulations that assure no net loss of shoreline ecological functions will result from residential development. Such provisions should include specific regulations for setbacks and buffer areas, density, shoreline armoring, vegetation conservation requirements, and, where applicable, on-site sewage system standards for all residential development and uses and applicable to divisions of land in shoreline jurisdiction.

The Rural Conservancy, Shoreline Residential, Willapa Bay Conservancy, and Coastal Conservancy buffers are not adequate to protect the water quality of the Willapa Bay estuary from residential or commercial development.[9] While we appreciate deleting the Rural Conservancy and Shoreline Residential environment's 25-foot buffer for man-made canals and lakes, the remaining buffers are too narrow to protect water quality.[10] A buffer width of 262 feet is needed to protect water quality in estuaries from typical residential and commercial

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[7] WAC 173-26-211(5)(a).
[8] WAC 173-26-211(5)(a).
[9] Jonathan D. Phillips, *Evaluation of North Carolina's estuarine shoreline area of environmental concern from a water quality perspective* 17 COASTAL MANAGEMENT 103, p. 103 (1989) (a buffer width of 80 meters, 262 feet, is needed to protect water quality in estuaries from typical residential and commercial development).
[10] *Id.*; K. L. Knutson and V. L. Naef, *Management Recommendations for Washington's Priority Habitats: Riparian* pp. 164 – 65 (Wash. Dept. Fish and Wildl., Olympia: 1997) accessed on Sept. 26, 2016 at: http://wdfw.wa.gov/publications/00029/

development.[11] Sediment and nutrient removal requires buffers from 100 feet wide to 200 feet wide and wider.[12] Protecting other functions, such as shoreline habitats, typically requires buffers of 150 feet or wider buffers.[13] To address these impacts, we recommend that the buffers for the Rural Conservancy, Shoreline Residential, Willapa Bay Conservancy, and Coastal Conservancy environments be increased to 150 feet.

Allowing a buffer narrower than 150 feet will result in significant removal of native vegetation along Willapa Bay and its tributaries. Allowing the removal of this vegetation to construct new homes will adversely impact the water quality of Willapa Bay and will not maintain the existing ecological functions of the bay.[14]

Standards for mining in flood plans, floodways, and channel migration zones should be included. Please see Section 5.16 Mining pp. 96 – 98.

Gravel mining in flood plain, floodways, and channel migration zones has the potential to adversely impact rivers and streams. As the Washington State Department of Natural Resources geology staff have written:

> Seeking the lowest cost material, gravel miners commonly choose to excavate large, deep ponds adjacent to active river channels … Wherever a channel shifts into a gravel pit or multiple pits that are large relative to the scale of the flood plain and the river's sediment transport regime, natural recovery of original flood plain environment and similar channel morphology could take millennia (Collins, 1997). The time for recovery is highly dependent on the availability of sediment, particle size, gradient, and the size of excavations to be filled. Regardless of the best planning and intentions, impacts of flood-plain mining may simply be delayed until the river is captured by the gravel pit. While capture may not occur in the next 100-year flood event, it is likely to occur in the future as development and consequent flood magnitude increase. In the long term, stream capture by gravel pits is a near certainty. Because the gravel pits have a lower base elevation, there is risk of rapid channel change

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[11] Jonathan D. Phillips, Evaluation of North Carolina's estuarine shoreline area of environmental concern from a water quality perspective 17 COASTAL MANAGEMENT 103, p. 103 (1989).
[12] K. L. Knutson and V. L. Naef, *Management Recommendations for Washington's Priority Habitats: Riparian* pp. 164 – 65 (Wash. Dept. Fish and Wildl., Olympia: 1997).
[13] K. L. Knutson and V. L. Naef, *Management Recommendations for Washington's Priority Habitats: Riparian* pp. 157 – 63 (Wash. Dept. Fish and Wildl., Olympia: 1997); EnviroVision, Herrera Environmental, and Aquatic Habitat Guidelines Program, *Protecting Nearshore Habitat and Functions in Puget Sound* pp. III-37 – III-39 (October 2007, Revised June 2010) accessed on Sept. 26, 2016 at: http://wdfw.wa.gov/publications/pub.php?id=00047
[14] Jennifer L. Bowen and Ivan Valiela, *The ecological effects of urbanization of coastal watersheds: historical increases in nitrogen loads and eutrophication of Waquoit Bay estuaries* 58 CAN. J. FISH. AQUAT. SCI. 1489 p. 1489 (2001) accessed on Sept. 26, 2016 at: http://portal.nceas.ucsb.edu/working_group/valuation-of-coastal-habitats/meta-analysis/papers-for-meta-analysis-database/seagrass-articles-chris/newseagrass/bowen2001cjfas.pdf and enclosed in a separate email. The Canadian Journal of Fisheries and Aquatic Sciences is a peer-reviewed scientific journal. See the "Instructions for Authors" webpage p. 4 of 11 accessed on Sept. 26, 2016 at: http://www.nrcresearchpress.com/page/cjfas/authors and enclosed in a separate email.

into the pits during high flows, a process termed avulsion. The flooded pits "capture" the stream. The effects of avulsion are similar to those of in-stream mining discussed in Evoy and Holland (1989), Collins and Dunne (1990), Netsch and others (1981), Kondolf and Graham Matthews (1993), Kondolf (1993, 1994), and Williamson and others (1995a,b). They may include:

- lowering the river bed upstream and downstream of mining operations, causing river bed erosion and (or) channel incision and bank erosion and collapse,
- eroding of footings for bridges or utility rights-of-way,
- changing aquatic habitat,
- unnaturally simplifying the complex natural stream system,
- increasing suspended sediment, and
- abandoning reaches of spawning gravels or damaging these gravels by channel erosion or deposition of silts in spawning and rearing reaches.[15]

Unfortunately, Section 5.16, Mining, does not contain any standards to prevent these adverse impacts on the environment and nearby property owners. If mining is going to be allowed in flood plains, floodways, and channel migration zones, which the SMP Update allows, then standards are needed.[16] We recommend the following regulations.

First, mines should be located outside the channel migration zone so that they do not increase the rate of channel migration. Second, mines should be no deeper than the bottom of the nearby streams and rivers so when the river moves into the mine, which is a certainty, the impacts will be reduced. Third the mine reclamation plan should have a design so that when the river or stream is captured by the river or stream the mine it is not so wide that the captured sediments destabilize the river or stream or increase erosion risks on upstream properties.

Please improve Public Access Requirements in 5.19B.7 on page 102

One of the policies of Washington's Shoreline Management Act is to increase public access to publicly owned rivers, streams, and lakes.[17] As our population increases, we need more public access. The development needed to accommodate this growth can also interfere with the traditional public accesses that people have used for years to access publically owned waters for boating, swimming, fishing, and other uses. Ecology's Shoreline Master Program Guidelines implement the Shoreline Management Act policies by including more specific requirements for public access. These provisions include WAC 173-26-221(4)(d) which requires in part that:

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[15] David K. Norman, C. Jeff Cederholm, and William S. Lingley, Jr, "Flood Plains, Salmon Habitat, and Sand and Gravel Mining" *Washington Geology*, vol. 26, no. 2/3, pp. 4 – 13 (Sept. 1998) accessed on April 26, 2016 at: http://file.dnr.wa.gov/publications/ger_washington_geology_1998_v26_no2-3.pdf

[16] *Pacific County Shoreline Master Program Planning Commission Draft (March 2016)* Table 5-1. Permitted Uses and Modifications by Environment Designation footnote 14 p. 66.

[17] RCW 90.58.020.

> (iii) Provide standards for the dedication and improvement of public access in developments for water-enjoyment, water-related, and nonwater-dependent uses and for the subdivision of land into more than four parcels. In these cases, public access should be required except:
>
> (A) Where the local government provides more effective public access through a public access planning process described in WAC 173-26-221(4)(c).
>
> (B) Where it is demonstrated to be infeasible due to reasons of incompatible uses, safety, security, or impact to the shoreline environment or due to constitutional or other legal limitations that may be applicable.
>
> In determining the infeasibility, undesirability, or incompatibility of public access in a given situation, local governments shall consider alternate methods of providing public access, such as off-site improvements, viewing platforms, separation of uses through site planning and design, and restricting hours of public access.
>
> (C) For individual single-family residences not part of a development planned for more than four parcels.

Generally, the proposed public access requirements meet these standards. However, proposed 5.19B.7 on page 107 allows subdivisions of greater than four parcels but less than ten parcels to meet their public access requirements by providing community access to the shoreline for the non-commercial recreational use of the property owners and guests. This is inconsistent with WAC 173-26-221(4)(d) and this provision should be deleted. Public access should be required for these developments as WAC 173-26-221(4)(d) requires.

Include regulations to address sea level rise

We strongly support proposed regulation 4.4B.4.j on page 54 which provides that when determining if a use is appropriate in a flood plain, the county should consider the "expected heights, velocity, duration, rate of rise and sediment transport of the floodwaters expected at the site, including those associated with climate change and sea level rise." We also support policy 5.19A.8, on page 101, that directs the County to "[l]imit residential development within … areas vulnerable to inundation under projected sea level rise in the foreseeable future." Proposed policy 5.22A.3, on page 103, directs "[n]ew transportation facilities should be located outside of the floodplain and areas vulnerable to inundation as a result of sea level rise." We support this policy too. While these policies are helpful, additional regulations would make it easier to implement the policies.

Sea level rise is a very real problem that is happening now. Sea level is rising and floods and erosion are increasing. In 2012 the National Research Council concluded that global sea level had risen by about seven inches in the 20th Century and would likely rise by 24 inches on the

Washington coast by 2100.[18] The general extent of the two feet of sea level rise currently projected for coast can be seen on the NOAA Office for Coastal Management DigitalCoast Sea Level Rise Viewer available at: https://coast.noaa.gov/digitalcoast/tools/slr

Ecology writes that "[s]ea level rise and storm surge[s] will increase the frequency and severity of flooding, erosion, and seawater intrusion—thus increasing risks to vulnerable communities, infrastructure, and coastal ecosystems."[19] Not only our marine shorelines will be impacted, as Ecology writes "[m]ore frequent extreme storms are likely to cause river and coastal flooding, leading to increased injuries and loss of life."[20]

A recent peer reviewed scientific study ranked Washington State 14th in terms of the number of people living on land less than one meter above local Mean High Water compared to the 23 contiguous coastal states and the District of Columbia.[21] This amounted to an estimated 18,269 people in 2010.[22] One meter, 3.28 feet, is within the projected sea level rise estimates of three to four feet or more for the end of this century.[23] Zillow recently estimated that 31,235 homes in Washington State may be underwater by 2100, 1.32 percent of the state's total housing stock. The value of the submerged homes is an estimated $13.7 billon.[24] Zillow wrote:

> It's important to note that 2100 is a long way off, and it's certainly possible that communities take steps to mitigate these risks. Then again, given the enduring popularity of living near the sea despite its many dangers and drawbacks, it may be that even more homes will be located closer to the water in a century's time, and these estimates could turn out to be very conservative. Either way, left unchecked, it is clear the threats posed by climate change and rising sea levels have the potential to destroy housing values on an enormous scale.[25]

Sea level rise will have an impact beyond rising seas, floods, and storm surges. The National Research Council wrote that:

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[18] National Research Council, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* p. 23, p. 156, p. 96, p. 102 (2012) accessed on Sept. 26, 2016 at: http://www.nap.edu/catalog.php?record_id=13389

[19] State of Washington Department of Ecology, *Preparing for a Changing Climate Washington State's Integrated Climate Response Strategy* p. 90 (Publication No. 12-01-004: April 2012) accessed on Sept. 26, 2016 at: http://www.ecy.wa.gov/climatechange/ipa_responsestrategy.htm

[20] *Id.* at p. 17.

[21] Benjamin H Strauss, Remik Ziemlinski, Jeremy L Weiss, and Jonathan T Overpeck, *Tidally adjusted estimates of topographic vulnerability to sea level rise and flooding for the contiguous United States* 7 ENVIRON. RES. LETT. 014033, 4 (2012). Accessed on Sept. 26, 2016 at: http://iopscience.iop.org/1748-9326/7/1/014033/article This journal is peer reviewed. Environmental Research Letters "Submission requirements" webpage accessed on Sept. 26, 2016 at: http://iopscience.iop.org/1748-9326/page/Submission%20requirements

[22] *Id.*

[23] Washington State Department of Ecology, *Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy* p. 82 (Publication No. 12-01-004: April 2012).

[24] Krishna Rao, *Climate Change and Housing: Will a Rising Tide Sink all Homes?* ZILLOW webpage (8/2/2016) accessed on Sept. 26, 2016 at: http://www.zillow.com/research/climate-change-underwater-homes-12890/

[25] *Id.*

> Rising sea levels and increasing wave heights will exacerbate coastal erosion and shoreline retreat in all geomorphic environments along the west coast. Projections of future cliff and bluff retreat are limited by sparse data in Oregon and Washington and by a high degree of geomorphic variability along the coast. Projections using only historic rates of cliff erosion predict 10–30 meters [33 to 98 feet] or more of retreat along the west coast by 2100. An increase in the rate of sea-level rise combined with larger waves could significantly increase these rates. Future retreat of beaches will depend on the rate of sea-level rise and, to a lesser extent, the amount of sediment input and loss.[26]

A recent paper estimated that "[a]nalysis with a simple bluff erosion model suggests that predicted rates of sea-level rise have the potential to increase bluff erosion rates by up to 0.1 m/yr [meter a year] by the year 2050."[27] This translates to four additional inches of bluff erosion a year.

Homes built today are likely to be in use 2100. And new lots created today will be in use in 2100. This is why the Washington State Department of Ecology recommends "[l]imiting new development in highly vulnerable areas."[28]

Unless wetlands and shoreline vegetation are able to migrate landward, their area and ecological functions will decline.[29] If SMPs are not updated to address the need for vegetation to migrate landward in feasible locations, wetlands and shoreline vegetation will decline. This loss of shoreline vegetation will harm the environment. It will also deprive marine shorelines of the vegetation that protects property from erosion and storm damage by modifying soils and accreting sediment.[30] Failing to address this impact violates the policy of the Shoreline Management Act to protect shoreline vegetation.[31]

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[26] National Research Council, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* p. 135 (2012).

[27] George M. Kaminsky, Heather M. Baron, Amanda Hacking, Diana McCandless, David S. Parks, *Mapping and Monitoring Bluff Erosion with Boat-based LIDAR and the Development of a Sediment Budget and Erosion Model for the Elwha and Dungeness Littoral Cells, Clallam County, Washington* p. 3 accessed on Sept. 26, 2016 at: http://www.coastalwatershedinstitute.org/Final%20Report_Clallam%20County%20Bluffs%202014_Final%20revised.pdf.

[28] State of Washington Department of Ecology, *Preparing for a Changing Climate Washington State's Integrated Climate Response Strategy* p. 90 (Publication No. 12-01-004: April 2012).

[29] Christopher Craft, Jonathan Clough, Jeff Ehman, Samantha Joye, Richard Park, Steve Pennings, Hongyu Guo, and Megan Machmuller, *Forecasting the effects of accelerated sea-level rise on tidal marsh ecosystem services* FRONT ECOL ENVIRON 2009; 7, doi:10.1890/070219 p. *6 accessed on Sept. 26, 2016 at: http://nsmn1.uh.edu/steve/CV/Publications/Craft%20et%20al%202009.pdf

[30] R. A. Feagin, S. M. Lozada-Bernard, T. M. Ravens, I. Möller, K. M. Yeagei, A. H. Baird and David H. Thomas, *Does Vegetation Prevent Wave Erosion of Salt Marsh Edges?* 106 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA pp. 10110-10111 (Jun. 23, 2009) accessed on Sept. 26, 2016 at: http://www.pnas.org/content/106/25/10109.full

[31] RCW 90.58.020.

So we recommend that new lots and new buildings be located outside the area of likely sea level rise. So we recommend the following new regulations be added to Section 5.19B, on page 102, or a section on geological hazards.

11. New lots shall be designed and located so that the buildable area is outside the area likely to be inundated by sea level rise in 2100 and outside of the area in which wetlands will likely migrate during that time.

12. Where lots are large enough, new structures and buildings shall be located so that they are outside the area likely to be inundated by sea level rise in 2100 and outside of the area in which wetlands and aquatic vegetation will likely migrate during that time.

Please correct the minor typos in Section 8.4E on page 126

Section 8.4E uses the term "Shoreline Hearings Board" twice. We recommend that both references be corrected to "Shorelines Hearings Board," the Board's actual name.

Thank you for considering our comments. If you require additional information, please contact me at telephone 206-343-0681 or email tim@futurewise.org

Very Truly Yours,

Tim Trohimovich, AICP
Director of Planning & Law

cc: Mr. Tim Crose, Director via email tcrose@co.pacific.wa.us w/enclosures

Enclosures