

Resiliency Plan: Recommendations
Addressing Climate Change

For

City of Port Angeles

By

Climate Action Planning Group

November 6, 2019

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Executive Summary

The Climate Action Planning Group met multiple times since January 2019 and have various recommendations and priorities for City Council.

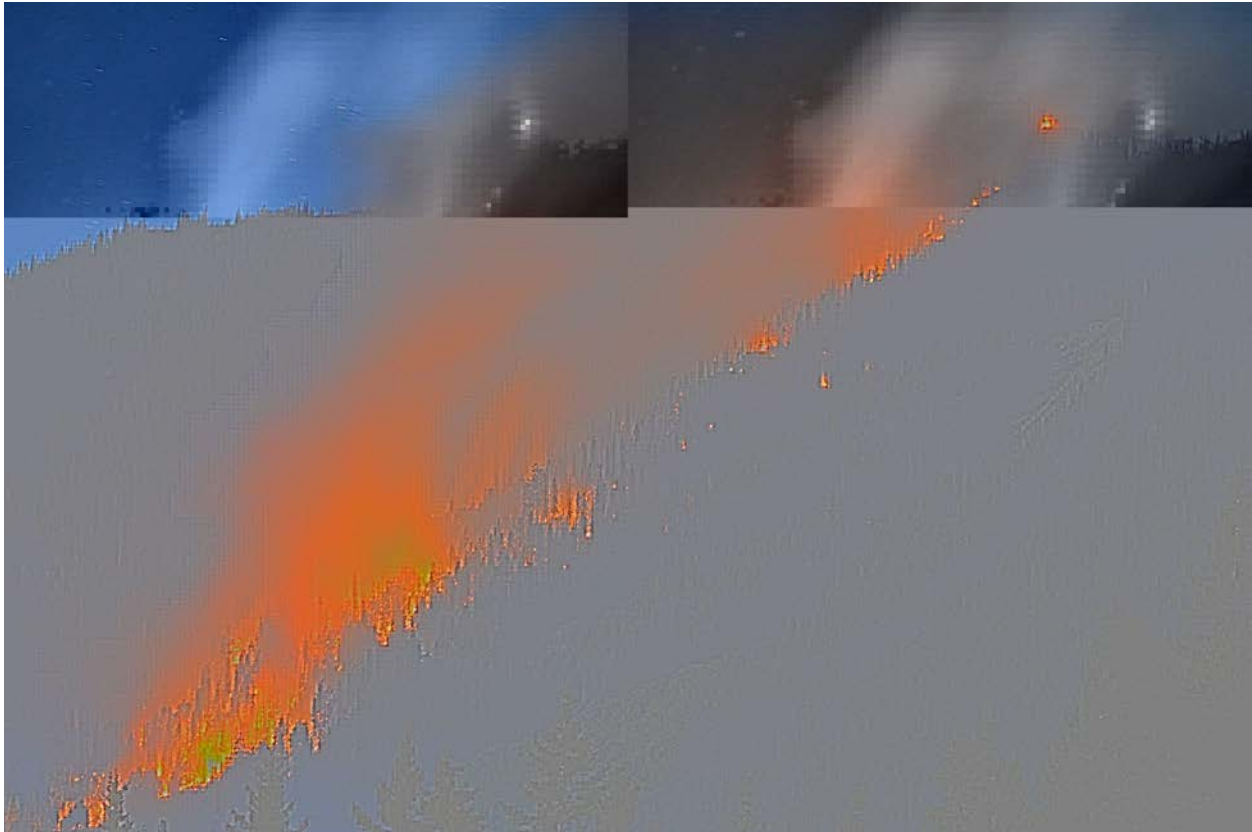
Climate Action Planning Group (CAPG) Summary of Recommendations:

1. The Planning Commission should create a sub-committee to address climate change planning and policy. This was believed to be the best place to hold open public hearings in a consistent manner and with staff backup. As recommendations are considered by the Planning Commission, actionable items would then be forwarded to City Council or other relevant advisory committees. We recommend that, initially, the Planning Commission spend at least 2 hours per month moving climate policy forward.
2. The CPAG conducted a preliminary prioritization process for a suite of policy, planning and implementation proposals. While we recommend that most of those be forwarded to the planning commission for further deliberation, this group recommends that city council immediately act on three of them:
 - a. Authorize a comprehensive Green House Gas emissions inventory to establish baselines for measuring progress in partnership with the Olympic Climate Action Committee, and should be complete by the end of 2020. This group finds that such an inventory is essential for evaluating the effectiveness of many of the actions proposed by this group for consideration by the Planning Commission
 - b. Integrate climate considerations more explicitly into the City's existing planning efforts. A variety of specific recommendations are offered for consideration by the Planning Commission
 - c. Continue to emphasize city-wide energy-use reduction, including:
 - i. increase use of public transportation and the use of electric vehicles,
 - ii. support development of infrastructure to increase biking and walking in the City,
 - iii. move towards 100% clean, renewable electrical energy source for the city by 2030 (including focus on increasing percentages of local, decentralized, non-hydropower renewable energy use),
 - iv. increase energy conservation and energy efficiency in our buildings, and
 - v. encourage use of local renewable energy.

Within the top 10 priorities there were 5 items focusing on energy, 2 items focused on emissions and carbon footprint, 2 items on policy (Planning Commission to vet climate policy and incorporating climate change in the Comprehensive plan and the Shoreline Master Plan) and one item addressing water storage.

3. All items in this report were added to the prioritization effort with the exception of Section 5g (page 9 - includes the items after prioritization), section titled "What can Community Members Do?", section titled "FEWSION for Community Resilience Network," and the last section (Current Documented Climate Changes).

4. The proclamation on page 17 was supported by the majority of the group.
5. The FEWSION for Community Resilience Network (F4R TM) is interested in having Port Angeles participate to improve local community supply chain emergency resilience, and also provides a formal process for collecting the last-mile supply chain data needed to effectively respond to local community supply chain disruptions. This was supported by the Climate Action Group. For more information, please see page 18.
6. Port Angeles is now a member of ICLEI that manages the database and software that has become a standard for GHG emissions. Clallam and Jefferson Counties both use the ICLEI GHG software to input their GHG data. It is recommended that we use this tool to help us in our efforts to measure GHG emissions.



Fire rages in Olympic National Park. Heavy smoke prompted closure of Obstruction Point Road. Those fires grew with the onset of hot, dry conditions. The Hayes Fire, 20 miles south of Port Angeles enlarged to 718 acres while the Godkin Fire, 25 miles south of Port Angeles, grew 181 acres. The Cox Valley Fire, north of Obstruction Point Road and 12 miles south of Port Angeles, stayed at 56 acres thanks to helicopter water dousings. Visitors parked at the Obstruction Point Road trailhead were escorted out of the road by park rangers and fire crews because of the smoke affecting visibility. 2016.

Recommendations Addressing Climate Change for the City of Port Angeles

City Council tasked staff to begin climate action planning, with a focus on emissions reduction and adaptation. Ken Debuc, Fire Chief, took on the task with the help of the Climate Action Planning Group (CAPG) to understand climate changes and their impacts to our city, document mitigation and adaptation recommendations, and create a plan to lead the city to address our changing climate in order to safeguard our community.

Experts and community members participated in a number of meetings, and below are the recommendations to City Council from this group.

1. Vet Climate Policy Through the Planning Commission

The Climate Action Planning Group (CAPG) recommends that Planning Commission address climate policy, as the meetings would provide an optimal venue for vetting policy decisions regarding climate change mitigation and adaptation.

A group of stakeholders will be asked to participate in a Subcommittee of the Planning Commission (SPC). This group may include, but is not limited to representatives from: Port Angeles City staff, City Council, County Commissioners, County Planning Dept., Hospital, Port of Port Angeles, Lower Elwha Klallam Tribe, Peninsula College, Port Angeles School District, Clallam Transit, Port Angeles Fire Department, Washington Sea Grant (Ian Miller), Land Trust, Olympic Climate group, Chamber of Commerce, Olympic National Park, and the Coast Guard. It is expected that collaboration will be regional in nature, but actions will be focused specifically in the City of Port Angeles, with expectations that the region can move forward together in addressing climate change.

2. Commit to Global Consensus on Green House Gas Emissions

CAPG recommends that The City of Port Angeles commit to meet science-based Green House Gas (GHG) emissions targets that are in compliance with the 1.5 degrees Celsius global consensus.

3. Inventory and Track Greenhouse Gas Emissions

Careful tracking and monitoring of emissions is critical for understanding progress and prioritizing actions. CAPG recommends:

- a. Complete a comprehensive GHG emissions inventory to establish baselines for measuring progress by the end of 2020, in partnership with the Olympic Climate Action Committee.
- b. Work with the Port Angeles High School on an annual update to GHG Inventory. SPC will collaborate with the high school to add curriculum module that will include an annual GHG inventory by students. Suggest the formation of “Students for Sustainability” similar to Port Townsend High School.
- c. Utilize low cost citizen science data gathering, monitoring and analysis to help measure GHG and monitor pollutants.

4. Reduce Greenhouse Gas Emissions

CAPG recommends an initial goal of reducing our GHG by 5% per year relative to 2018 emissions. Although we understand that this is not adequate to meet the emissions target stated above, we recognize that it is a start and we hope that once started, the effort will rapidly ramp up to meet our intended emissions target. This initial reduction could be achieved by:

- a. Limit GHG emissions from buildings: Work with the City to develop regulations and incentives that would result in all new and re-development projects to minimize GHG emissions by:
 - 1) Maximizing energy efficiency (weatherization programs, promotion of efficient appliances).
 - 2) Increasing renewable generation either on site or at a community renewable energy investment site.
 - 3) Incentivizing homeowners to switch heating sources from wood-burning stoves to high efficiency electrical heaters and other less carbon intensive sources, while disincentivizing the harvesting and burning of local timber.
- b. Ensure energy delivered to the City of Port Angeles is from renewable, resilient, lowest GHG emissions sources: The SPC will work with the City and UAC to review the Bonneville power franchise agreement and develop a plan to address renewal of the agreement. (currently our source has 9% from nuclear power), and understand the full impact of Bonneville's power source, environmental issues, transmission line vulnerability and financial health, as it relates to utility rates stability.
- c. Incentivize reduction in propane use: Work with the City and propane providers to develop strategies that reduce GHG emissions and improve air quality from generation, transportation and combustion of propane.
- d. Use the "City Green Team" model (Sustainability at Work: Green Team Guide): SPC would work with the City on sustainable purchasing and other activities to reduce the City's GHG footprint.
- e. Present findings from GHG consumption inventory: SPC will work with City staff to present findings from the GHG consumption inventory to the public.

Additionally, CAPG recommends additional long-term initiatives to reduce the City's overall emissions:

- f. Address climate finance and competitive advantage. Develop a City of Port Angeles internal carbon pricing program: City would incorporate a shadow price for carbon in evaluating all new capital and procurement decisions, and/or implement a carbon fee for operations. Revenues could be invested in energy efficiency and clean energy projects at city facilities. Each department is given a carbon budget (as well as a financial budget) for the year.

- g. Reduce energy use by moving towards 100% clean, renewable electrical energy source for the city by 2030, increase energy conservation and energy efficiency in our buildings, and encourage use of local renewable energy.
- h. Create community renewable energy project sites: Work with the City and others to develop both centralized and decentralized renewable energy projects in the City. Giving community members the opportunity to invest in and benefit from local generation (including financially through benefit from selling electrons into the grid) can increase local generation for those sited where it is not a functional option, and can protect the local tree canopy in those locations.
- i. Develop Local Micro-grids: Work with the City to evaluate the viability of harnessing local renewable energy production (e.g. Community Solar) into local microgrids to increase our resilience including increasing reliability.
- j. Monitor net-metering uses and issues for growth and policy changes.

Transportation is a major source of emissions. CAPG recommends:

- k. Continue to increase use of public transportation and the use of electric vehicles. Continue to support development of infrastructure to increase biking and walking in the City.
- l. Develop better understanding of park and rides: SPC and City staff would meet with Clallam Transit to improve the park and ride system in the City to potentially reduce GHG emissions. We need to better understand the current locations, how are they planned and the future park and rides plan.
- m. Support and incentivize electrification of transportation in the City: SPC would work with the City to create incentives to move our City transportation fleet toward electrification in order to reduce GHG emissions and improve local air quality (e.g., reduce local car tabs for electric vehicles and develop electrical charging stations around the City).
- n. Encourage School District/Park/etc. to move towards electric fleets: SPC would work to move towards electrification of their fleet and battery storage. Some examples can be found at <https://driveevfleets.org/> of ideas from other cities. Work with Park to add buses to Hurricane Ridge to reduce both gas emissions and vehicle use from downtown, and coordinate this effort with improvement of park-and-ride infrastructure and local energy production infrastructure.
- o. Explore options with Clallam Transit to move towards electrification of their fleet: City, SPC, and Transit committee would meet with Clallam Transit to learn of their plans for fleet electrification and how they could increase the use of electric buses.

- p. Develop strategies to encourage use of electric vehicles: City would develop strategies for increasing electric vehicle infrastructure and access for high density housing. SPC would evaluate how many electric cars are in the City and explore innovative ways to use cars during low production time.
- q. Explore the use of electric vehicles with UPS/FedEx/USPS: SPC would meet with the delivery companies to determine if they have pilot programs with electrification or if we could work with them to develop a pilot program. Also, we could prompt anti-idling programs with them (and other businesses like restaurant and bank drive-thru lanes, etc.) and with Olympic National Park to diminish idling of cars waiting at the park entry station (similar to anti-idling system used at I-5 at the U.S.-Canada border).
- r. SPC would work with all the groups to provide support on efforts to advance and improve non-motorized transportation and increase non-auto-centric transit paths.
- s. Introduce hierarchy of transit concept for adoption by council: SPC would work to develop strategies that promote transit equity and community safety by considering the most vulnerable, then design and implement transit to support pedestrians, bicycles, mass transit and individual cars, in that order.

Improving efficiency in the city's built environment can reduce overall energy consumption, and therefore emissions. We therefore recommend:

- t. Support the development of Green Building standards for all City-owned buildings: Work with city staff and others to develop a green building program. Install solar and wind on City properties and infrastructure where applicable.
- u. Support the development of green incentive programs for residential and commercial development: Work with the City to develop incentive programs that could include reducing plan check and building permit fees and expedited permit review for those projects that pursue some minimum green building standards (solar, etc.).
- v. Implement new rules of the International Building Code for construction, deconstruction and demolition: Work with the City's Building Department to develop code.

The use of lands within and adjacent to the City of Port Angeles may increase or decrease net emissions. CAPG recommends:

- w. Develop guidelines and strategies to reduce GHG emissions in development and work with local entities to develop strategies to preserve the existing stock of forest and to promote sustainable agriculture in the City.
- x. Create City-wide land use plan that reflects mitigation and adaptation goals: City would develop guidelines to encourage siting of projects to reduce GHG emissions: This could

include where to develop to decrease GHG emissions [(e.g., decrease miles driven), maintain open space services (e.g., water recharge, water filtration, air filtration, temperature amelioration), increase permeable surfaces (built and natural), manage for change, etc.].

- y. Update all tree policies to maximize a healthy and appropriate tree canopy and tree health.
- z. Designate and prioritize funding for land used for agriculture/ urban food forests.
- aa. Encourage and incentivize forestry practices promoting water retention within the watershed.

The management of waste in the City of Port Angeles need connection to emissions reduction. CAPG recommends:

- bb. Work on getting to zero waste, develop food waste diversion programs and evaluate our wastewater facility to reduce GHG emissions.
- cc. Eliminate many of the fast-acting, climate changing gases that are emitted when organics rot in landfills, and returning those as nutrients to the soil for raising more food locally (after first donating all edible food to people in need).
- dd. Begin use of greenwaste bins for household and commercial food waste: City would develop food waste diversion program for households and commercial businesses to greenwaste bins for compost or energy production to eliminate landfilling of food waste that cause methane emissions.

5. Climate Planning Recommendations

Simultaneous to our efforts to reduce emissions, CAPG recommends that The City of Port Angeles incorporate climate considerations into the various planning processes that the city uses to guide long-term development, with the goal of reducing future exposure to climate change impacts and eliminating future costs associated with adaptation. CAPG recommends a set of planning measures:

- a. Incorporate climate change more explicitly into the Comprehensive Plan and Shoreline Master Program (SMP). For specific Comprehensive Plan changes, see Section 7.
- b. Add climate impact overlays to existing “Critical Areas”. For example, create critical area flood mapping beyond FEMA’s historical flood data.
- c. Update municipal codes to account for enhanced fire risk at forest/residential interface where needed.

- d. Provide guidance on right “timeline” for erosion buffers period (50, 75, 150 years) and setback distances (50ft to 200ft) that account for changing climate conditions.
- e. Update Emergency management and response planning to include climate change where needed.
- f. Increase regional capacity for water storage [preferable with natural systems (underground aquifers) instead of man-made reservoirs], including incentivization and regulation of rainwater harvesting.
- g. Address these items that were suggested after prioritization took place.
 - a. Use hydrogen for larger buses (when feasible).
 - b. Car emissions are monitored yearly in other States. Should we begin to monitor car emissions?
 - c. Funding should be increased to monitor harmful alga blooms in the Port Angeles harbor.
 - d. Monitor and analyze climate change impact at salmon stream restoration sites and 6 creeks in the City.
 - e. Address wood stove GHG through public education and incentives.
 - f. Have high school students compile a yearly “Climate Action Report Card.”
 - g. Set energy requirements in existing buildings to reduce GHG.
 - h. City Lights Department should
 - i. consider implementing new EV charging stations as a new source of revenue and an incentive for the forest trade.
 - ii. inventory and rank all reasonable sites for solar power (i.e. City reservoir roofs, City buildings, airport structures and areas, etc.)
 - i. City should work with State legislators to fund asphalt recycling plant for rural area.
 - j. City should lobby timber interests to extend timber harvest rotation times, as longer aged trees will sequester more carbon.
 - k. City should establish a program other than the Planning Department and building permitting offices to evaluate development projects for climate change impacts.
 - l. The Planning Department should maintain a list of all opportunities to suggest sustainability concepts to developers even if not required by the building code.
 - m. An “Emerging Opportunities” list should be published listing the need and the implementation of sustainability principles in proposed projects – encourage small businesses to emerge, procurement partnering for savings, community members to learn, etc..
 - i. PA Waterfront Performing Arts Center – solar heat, recycling, EV charging stations
 - ii. PA William Shore Aquatic Center – solar heat, solar pre-heat water system, recycled water
 - iii. McKinley Mill – distant heat/energy

- iv. LEKT Hotel – EV charging station, solar heat, recycling
- v. PA City Light Operations building and corporate yard – ???
- vi. Proposed high rise residential on Front St. – ???
- n. Arrange to show the business case for investing in and installing solar systems.
- o. Promote housing infill.
- p. Holy Trinity would like to talk to the City about installing some charge points in the parking lot they share with the Library over the next few years. Making renewable fuels readily available in PA is a very cost-effective strategy for immediate reduction in carbon emissions.
- q. All diesel city vehicles should use B20 and we need E85 refueling facilities in Clallam County.
- r. Reduce vehicle use by ride sharing, encouraging bike riding and walking. Monitor the quantity of fuel sales in the City to monitor progress in reducing driving.
- s. Addressing building codes to allow secondary housing units (not just ADUs) on existing lots to increase density and address the shortage of affordable housing.
- t. Need programs to retrofit homes to be more energy efficient - including switching homes heated with LPG to electric heat pumps with priority to rental properties.
- u. incentives for purchasing the most energy efficient non-electric appliances (e.g. 95% efficient propane furnaces/boilers, etc.)

6. Climate Adaptation Recommendations

Simultaneous to our efforts to reduce emissions, CAPG recommends that The City of Port Angeles work to reduce our exposure to the impacts of climate change. These impacts will be referred to as climate change hazards in this report (e.g., fire, droughts, warming temperatures, changing precipitation patterns, changing vegetation, increased storm surges, sea level rise, etc.). To that end, we recommend a set of adaptation measures:

- a. SPC in collaboration with City staff would start with a sea level rise evaluation to evaluate the vulnerability of City assets including roads (motorized & non), other infrastructure (sewage treatment, water, buildings), and marine access. This first assessment will also provide a template for subsequent assessments. As needed, City staff will map additional climate change hazards.
- b. Review, modify and adopt tool for use in the evaluation of vulnerability of City assets, projects and activities: SPC would work with the City to identify, and eventually require, the use of a tool (e.g., “Climate Change Adaptation Certification Tool”) for use in evaluation of climate vulnerability of any activity or investment in the City. This would also include training for City staff, Council, and Committees in the use of the tool. The aforementioned climate change hazards maps may be used to inform these vulnerability assessments.
- c. Incorporate vulnerability evaluation tool into all City (departments, committees and council) workflow in order to identify vulnerability and risk reduction opportunities: City, Council and committees will develop processes by which all decisions, including

permits and expenditures, are evaluated for their vulnerability to climate change, and determinations can be made based on this assessment in order to ensure better long-term outcomes in the face of climate change hazards. SPC can advise in this process.

- d. Apply the tool in permitting, planning and budgetary decisions: Results from application of the vulnerability assessment tool are used by the City in decision-making to reduce risk and improve long-term benefits. This includes training of City staff, Council and committees in use of necessary tools.
- e. Community training on adopted risk reduction process: City would host community conversations with vulnerable sites and how to adapt to those changes.
- f. Encourage FEMA to incorporate climate change in rate maps and guidance.
- g. Update City development policies addressing finances for development in high risk areas (require long-term bonds, etc.).
- h. Enhance efforts to incentivize use of native plants landscaping in residential, commercial, industrial settings within the City. Partner with the County and Clallam Conservation District.
- i. Complete survey of sensitive submerged habitats and the species that utilize them and monitor them for change.
- j. Enhance efforts to restore and develop wildlife corridors (adaptation and mitigation of climate change).
- k. Decrease non-climate ecosystem stressors.
 - a. Continue efforts to reduce stressors to salmon stream habitats.
 - b. Support and enhance watershed and nearshore habitat restoration.
- l. Develop a funding program appropriate for acquisition of high-risk structures in coastal or riverine flood zones.
- m. Create funding mechanism for resilience projects in the City.
- n. Inventory and then prioritize shoreline and watershed areas appropriate for defense and retreat.
- o. Reduce local land-based pollutants that enhance acidification in marine waters.
- p. Utilize climate sensitive (adaptable) tree species in riparian buffers.

- q. Replace under-sized culverts to anticipate climate influenced run-off events.
- r. Enhance education on drought and water supplies issues for the city and the region.
- s. Adopt new regulations requiring water-efficient appliances (washers, dishwashers, toilets, etc.).
- t. Promote and incentivize smart irrigation technologies for golf course and parks.
- u. Identify monitoring needs and enhance water supply monitoring.
- v. Enhance efforts to educate home and business owners on the value of on-site water conservation, retention, and catchment.
- w. Continue to study ways to enhance water storage and groundwater aquifer recharge in the City. Work with partners that are currently doing this (e.g. Clallam Conservation District).
- x. Improve forecasting for future water supply and demand.
- y. Increase incentives for low-water use landscaping. Work with partners that are currently doing this (Clallam Conservation District).
- z. Adjust rate structure for water use to incentivize conservation where needed. For example, develop inverted block rate structure for water and sewer.
- aa. Develop code and infrastructure for a municipal reclaimed water system.
- bb. Enhance residential water conservation through incentives and outreach.
- cc. Encourage the state to lift restrictions or permit grey water reuse where appropriate to prevent soil and water pollution.
- dd. Create a smart grid water use system and share data with consumers to increase conservation.
- ee. Direct wastewater reuse between municipalities and industries.
- ff. Encourage soft defenses for Shoreline Infrastructure.
- gg. Improve on-site stormwater management practices.

- hh. Participate in FEMA’s Community Rating System (CRS).
- ii. Enhance stormwater retention in upstream areas where appropriate and feasible (ex. an old river meander, existing ponds, etc.).
- jj. Retrofit infrastructure for coastal flooding and sea level rise.
- kk. Consider hard shoreline protection in certain situations.
- ll. Encourage relocation of infrastructure outside of coastal flood zone.
- mm. Adopt new flood risk management standards and guidelines

7. Make Changes to existing Comprehensive Plan

CAPG recommends that City Council should forward the following changes to the Planning Commission for review and incorporation to the Comprehensive plan. All text in red should be added to the Comprehensive plan. These recommendations came from similar work done by the City of Bainbridge.

P-2A.01 In all its actions and to the extent consistent with the provisions of this comprehensive plan, the City will strive to implement the following goals of the State Growth Management Act:

- a) Urban growth. Encourage development in urban areas where adequate public facilities and services exist or can be provided in an efficient manner. **All development investment to be located outside of current and future hazard zones.**
- b) Reduce sprawl. Reduce the conversion of undeveloped land into sprawling, low-density development, **while encouraging location of development adjacent to mass and non-motorized transit corridors. Any allowed conversion of undeveloped land will maintain habitat connectivity such that species and ecosystem services are maintained under current and future conditions.**
- c) Transportation. Encourage efficient multimodal transportation systems that are based on regional priorities and coordinated with county and city comprehensive plans, **and site infrastructure outside of current and future hazard areas.**
- d) Housing. Encourage the availability of affordable housing to all economic segments of the population of this state **that respects affordability over time by developing energy efficient stock located outside of current and future hazard areas.** Promote a variety of residential densities and housing types, and preserve existing housing stock **if located outside of current and future hazard areas.**
- e) Economic development. Encourage economic development throughout the state that is consistent with adopted comprehensive plans, promote economic opportunity for all citizens of this state, especially for unemployed and for disadvantaged persons, promote the retention and expansion of existing businesses and recruitment of new businesses **with particular emphasis on investment in and encouragement of businesses and industries that utilize renewable sources of energy,** recognize regional differences impacting economic

development opportunities, and encourage growth in areas experiencing insufficient economic growth, all within the **current and future** capacities of the state's natural resources, public services, and public facilities.

- f) Property rights. Private property shall not be taken for public use without just compensation having been made. The property rights of landowners shall be protected from arbitrary and discriminatory actions. **Begin to consider that as climate changes, private lands will become vulnerable to hazards (e.g. sea level rise, erosion, shoreline change, ecosystem migration), which may affect property rights.**
- g) Permits. Applications for both state and local government permits should be processed in a timely and fair manner to ensure predictability. **Permitting will not be granted without full consideration of the implications of climate change over the life of the product of the permit.**
- h) Natural Resource Industries. Maintain and enhance natural resource-based industries **for both productivity and conservation of function under future climate scenarios**, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forestlands and productive agricultural lands, discourage incompatible uses, **and ensure that ecosystem function under future climate scenarios. Due consideration of future conditions and the effects on natural resource-based industries must be part of management.**
- i) Open Space and Recreation. Retain open space, enhance recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks and recreation facilities, **all considering current and future environmental conditions.**
- j) Environment. **Ensure the durability of our state's** environment and enhance our high quality of life, **through protection for** air and water quality, as well as water availability **even as temperature and precipitation patterns change.**
- k) Citizen Participation and Coordination. Encourage the involvement of citizens in the planning process and ensure coordination between communities and jurisdictions to reconcile conflicts. **Advance the understanding by citizens of the implications of climate so they are informed stakeholders and can plan for the future accordingly.**
- l) Public Facilities and Services. Ensure that public facilities and services necessary to support development shall be adequate to serve the development at the time the development is available for occupancy and use without decreasing current service levels below locally established minimum standards. **Also, ensure that any existing or newly permitted public facilities and services are designed to consider current and future climate scenarios when calculating level of service and are required to avoid present or future hazard areas.**
- m) Historic Preservation - Identify and encourage the preservation of lands, sites, and structures, that have historical or archaeological significance, **including planning for their vulnerability under future climatic conditions.**

Additional changes to the Comprehensive plan were suggested by the Olympic Climate Action Group to be recommended at a later date.

Land Use Element

Land Use Map Goals & Policies

G-3A. To guide land development in a manner that balances providing certainty about future land use and allowing flexibility necessary to adapt to future challenges and opportunities. **Add Policy:** Consider the projected climate change impacts and adaptation strategies contained in the Climate Preparedness Plan, in all land use decisions.

Commercial

G-3D: To create and maintain a healthy and diverse commercial sector for a balanced and stable local economy. **Add Policy:** Consider potential environmental consequences, such as GHG emissions and carbon footprints, when encouraging new commercial developments and businesses.

Industrial

G-3H: To provide opportunities for industrial development in a manner, which efficiently uses the community's natural resources and physical environment, has minimal impact on the natural environment, contributes to quality of life, and is compatible with the desired development patterns. **Add Policy:** Prohibit the expansion of infrastructure in support of fossil fuel transport in the Harbor.

Open Space

G-3J: To create open space within the urban landscape, retain natural landscapes, preserve fish and wildlife habitat, and to provide natural corridors connecting wildlife habitats. **Add Policy:** Consider storm surge adaptation strategies in open space policies, in order to minimize development in high-risk areas.

Utilities and Public Services

G-5D: To provide utility services in an efficient and cost-effective manner. **Add Policy:** Encourage the use of renewable energy in both the private and public sectors, providing all reasonable support and advocacy at the State level for regulations and incentives that encourage such installations.

Housing

G-6A: To improve the variety, quality, availability, and attainability of housing opportunities in the City of Port Angeles. **Add Measurable Actions:** (1) Eliminate barriers that prevent the use of low impact development techniques and BMPs, such as vegetated roofs, permeable pavement, and bioretention, while maintaining safety and aesthetic quality in the building process. (2) Work with financial institutions to lower barriers to non-traditional, green building practices.

Conservation Element

P-7B.13: Reference the most recently adopted Washington State Citations of Recommended Sources of Best Available Science for Designating and Protecting Critical Areas and other research identified as more locally appropriate and applicable when available as Best Available Science in the Critical Areas Ordinance. **Add Policy or Goal** Reference the Climate Preparedness Plan (as created by the Planning Commission) as Best Available Science.

Capital Facilities Element

G-8A: To provide and maintain safe and financially feasible urban services and capital facilities at or above stated levels of service to all City residents and the general public. **Add Policy:** In order to comply with RCW 70.235.070, which states that “when distributing capital funds through competitive programs for infrastructure and economic development projects, all state agencies must consider whether the entity receiving the funds has adopted policies to reduce GHG emissions,” the City shall prepare a climate action plan.

G-8C: To provide urban streets and utilities at minimum levels of service for all city residents and the general public. **Add Policy:** Consider projected climate change impacts and adaptation strategies contained in the best available scientific documents, such as the Climate Preparedness Plan, to consider whether adequate services can be provided into the future, prior to approving any development.

8. Community Engagement

The City of Port Angeles inspires action across the community and partners with local and regional organizations to take meaningful climate change mitigation and adaptation actions.

- a. Create Climate Change Week: Council proclamation to designate a week each year (in conjunction with Earth Month) for City and community evaluation of the progress made on meeting our community commitments and goals relating to reducing our contribution and vulnerability to climate change.
- b. Convene semi-annual City events: Collaborate with the City to convene at least semi-annual programs on issues relating to climate change and how the City is addressing this in their daily operations as well as future planning.
- c. Develop graphic tool to illustrate climate impacts.
- d. Provide new rules and more incentives, using Community Based Social Marketing, social media, innovative technologies and software, and harnessing creative talents in art, music, advertising and social change to reinforce and expand the change that has already occurred.
- e. Concentrate on helping residents and businesses to live and operate more efficiently and sustainably, creating jobs in the process and helping those in need to get quality food and goods donated or at very low prices.
- f. provide education how individuals and businesses can reduce their carbon footprint by their individual choices.
- g. Hold community discussions around vulnerable City sites: City would host community conversations addressing the climate change hazards and how to adapt to those changes.
- h. Support community events on climate change: Participate in ongoing information forums such as the Climate and Energy Forum and the Movies that Matter.

- i. Increase cooperation with other City advisory committees: Attend other relevant City Advisory Committees (e.g., Transit, UAC, and PA forward) at least twice a year.
- j. Work with local and regional partners in a collaborative approach to identify and implement mitigation and adaptation actions with buy-in, engagement, and leadership from all of these relevant entities.
- k. Make a recommendation to the City on regional collaborations that Port Angeles should participate in and the form that involvement should take. (For example, Puget Sound Climate Preparedness Collaborative; Clallam Public Transportation, and RTPO).
- l. Apply best practices in the re-writing of the municipal code and policy identified through the both the mitigation and adaptation work plan will need to be incorporated. This includes green building practices and planning tools that continue to identify the impacts of development on both mitigation and adaption to climate change.
- m. Engage partners. Adapting and mitigating for climate change will take time, resources and partners. This list is just the beginning and will need to grow as the plans get finalized:
 - o Olympic Climate Action (Policy research, Networking and coordination with other governments, nonprofits, and businesses, Public outreach and education, Data collection and collation – Green House Gas Data)
 - o Clallam County
 - o Port Townsend and Jefferson County
 - o Schools
 - o Peninsula College
 - o League of Women Voters
 - o Community Members
 - o Sierra Club
 - o NODC
 - o ICLIE
 - o Participate in the US Climate Alliance which Washington State has signed.
 - o Sea Grant
 - o Clallam Conservation District
 - o Olympic Medical Center

What Can Community Members Do?

1. Inform yourself of the regional context. Resources to get you started include:
 - Puget Sound regional climate change impacts reports (Mauger et al. 2015), available at cses.washington.edu/picea/mauger/ps-sok/PS-SoK_2015.pdf;
 - Washington Chapter of the American Planning Association’s website, including their “Ten Big Ideas,” the first of which is to address climate change: www.washingtonapa.org/address-climate-change;
 - Inform yourself using a local example. These resources will introduce you to the concepts and can be considered as framework to then insert their own community specific issues.
 - An interview with Dr. Lara Hansen, EcoAdapt, by Bainbridge Community Broadcasting, providing information on climate change and Bainbridge Island (bestofbcb.org/cafe-031ecoadapt-helps-cobi-comp-plan-to-adapt-to-climate-change/);
2. Help your community incorporate climate change into all activities:
 - Encourage the Planning Commission to add all climate-savvy recommendations into the next update of your Comprehensive Plan update.
 - Ensure that the Comprehensive Plan recommendations become part of local code and practice.
 - Be the voice that asks about climate change when decisions are being made.
3. Make your own climate-savvy decisions at home, school and work
 - Consider how you can make a personal contribution to mitigation and adaptation. There are goals, policies and actions that you can take in your business or home. Modify what you see here for your own needs. Make your personal ecosystem climate savvy and durable.

Take every opportunity you have to plan for climate change in building, maintenance and transportation choices, including: energy efficiency, landscape and lawn care choices, facilities siting and design

FEWSION for Community Resilience Network

The FEWSION for Community Resilience Network (F4R TM) is an initiative of Northern Arizona University’s FEWSION project. FEWSION is a U.S. national supply chain science project that is developing the first complete “mesoscale” (that is, city scale) datasets for the nation’s supply chains, and is exploiting leading-edge applications for resilience engineering, security, and emergency management.

Process: F4R TM combines the mesoscale FEWSION data capability with a participatory community process in which a community’s various leaders, stakeholders, students, and citizenry map and analyze their “last mile” supply chains, resulting in a synthetic understanding of how food, energy, water, and other supplies flow from suppliers through distribution and storage networks to reach neighborhood outlets. This process combines “last mile” with “mesoscale”

supply chain data to achieve a synthetic understanding of how a community's supplies function, all the way from the neighborhood to the world. A trained local facilitator leads a participatory curriculum that is published by Northern Arizona University; this curriculum is appropriate for adult volunteers, professionals, and college students.

Benefits: The F4R TM process creates an evidence-informed conversation among community leaders, stakeholders, citizens, and emergency responders to improve local community supply chain emergency resilience, and also provides a formal process for collecting the last-mile supply chain data needed to effectively respond to local community supply chain disruptions. The process makes visible connections that were formerly invisible, improving awareness and enhancing the ability to respond effectively to emergencies. The F4R TM process complements and augments existing FEMA, State, and local emergency response information and training programs, adding a new layer of strategic information.

For More Information: Visit the FEWSION website at <https://fewsion.us>, and check out the visualization system. A disclaimer is necessary for early-stage users: the FEWSION and F4R TM projects are still under development and this data and process must be considered preliminary until future validation and field trials are complete for emergency management applications.

Acknowledgements: FEWSION was seeded by a National Science Foundation grant (ACI-1639529) in 2016. FEWSION is Directed by Ben Ruddell (PhD, P.E.) of Northern Arizona University, with participation and collaboration from many academic institutions and national laboratories.

Current Documented Climate Changes

The Pacific Northwest is already experiencing drier summers, reductions in snowpack and glacial mass, higher spring and lower summer river flows, and a more acidic ocean. These are not isolated incidents, but part of a larger regional and global trend of changing climate conditions (U.S. Global Change Research Program, 2014).

The effects of climate change in the City of Port Angeles can be categorized in terms of six impact areas: temperature, precipitation/storminess, sea level rise, vegetation change, ocean acidification and slope stability (Petersen, 2015). The following information in this section comes from the 2015 Climate Change Preparedness Plan for the North Olympic Peninsula, unless otherwise cited.

1. Temperature

Between 1895 and 2011, we have seen an average temperature rise of 1.3 degrees in the Pacific Northwest.

Now, in the summer, we are currently experiencing an increase of 8 days with temperatures over 90-degrees. This leads to dryer summers and an increase in energy use from air-conditioning. In the winter, we have 35 fewer days below 32 degrees. This will help save on energy costs for heating, it will decrease our snow pack for our summer water, and it will likely increase the insect population. At Hurricane Ridge, January 2019 was 3.0 degrees F warmer than average, and average maximum temperatures were 3.5 degrees above average. The months of November and December were also well above average (Baccus).

2. Precipitation: Snow Pack, Runoff and Soil Water Storage

Overall rainfall patterns are changing. Our rainfall is increasing in severity, with much heavier rainfall being experienced. There is also a decrease in snow pack due to reduced precipitation. For the snow surveys for February 1, 2019, the snow pack resembled spring conditions more than late January, according to William Baccus from the Olympic National Park & North Coast

and Cascades Network. He states that snow level accumulations start around 4000 feet, meaning that in addition to having a lower than normal percentage of snow at our sites on Hurricane Ridge, it also indicates that less water is being stored at the low elevations. This is likely due to the warmer than average temperatures. For February, the snow pack was well below normal and the snow appeared quite spring like in terms of temperature and density. Shown is the SWE data for Cox Valley, to put this year in perspective.

Due to the increased severity of precipitation, we can expect increased runoff in the winter and decreased runoff in the summer. This decrease in precipitation during winter months, leading to

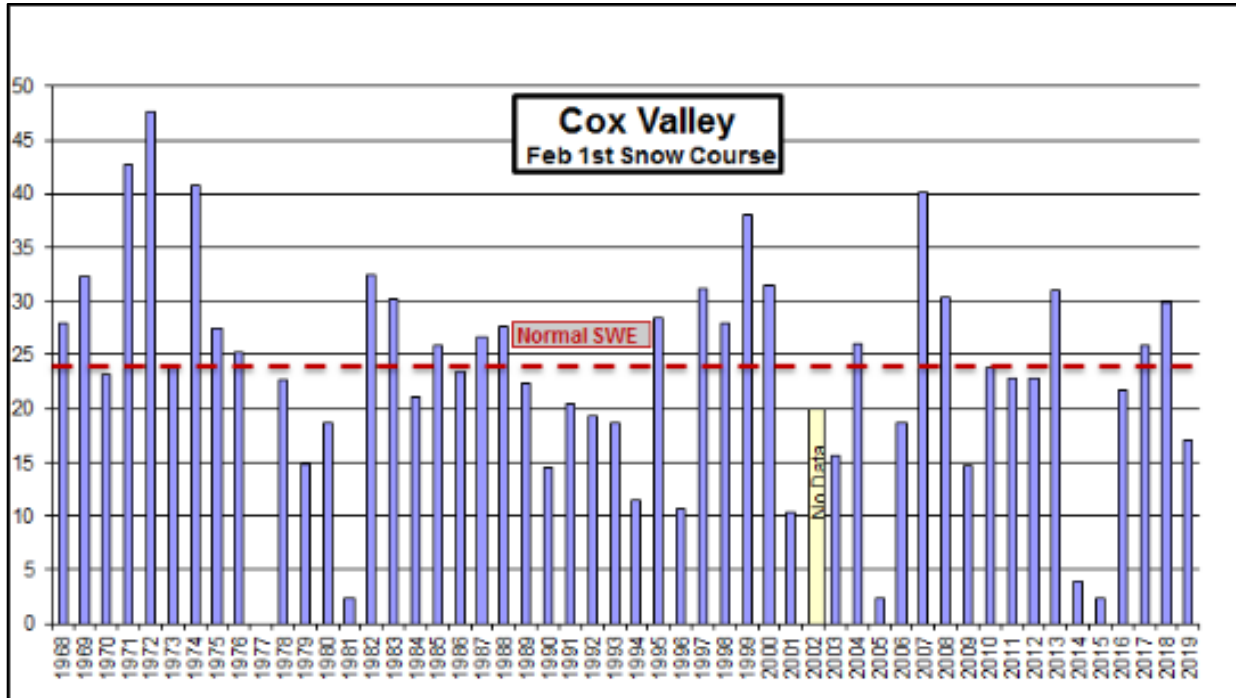


Figure 2: Cox Valley, Morse Creek SNOTEL Measurement - February 1st snow-water equivalent

reduced snow pack, results in lower water levels in the river. Drought conditions and water shortages need to be address both for city residents and for the salmon population.

Both reduced precipitation and increase severity of precipitation, lead to a reduction of storage of water in the soil. This affects crop yields and increases fire potential in the area.

The projected changes in precipitation patterns along with changes in temperatures for the region will likely have substantial impacts on:

- Hydrology and water resources (higher stream temperatures in the summer and lower summer stream flows);
- Forests (changes to forest complexes through shifting distribution of tree species and increased mortality due to more wildfire, insect outbreaks, and disease);
- Species and ecosystems (shifting composition of ecosystems as habitats and species adjust to temperatures and water availability);

- Agriculture (through too much or too little water and increasing heat stress on crops and livestock);
- Infrastructure (direct exposure to flooding and other impacts leading to service interruption and increased maintenance and operation costs); and
- Human health (through both direct exposure to flooding, extreme heat, and vector born disease and indirect impacts such as changes to diet and mental health) (NODC Report)

3. Sea Temperature, Acidification and Sea Level Rise

The change of 1 degree in sea temperature is significant and affects organisms. Here in Port Angeles, we have been measuring sea temperature since 1992 and have not seen any significant change. Acidification of our sea water is increasing causing shell fish issues.

In an interview on PBS “Acidifying Waters Corrode Northwest Shellfish” (PBS) experts explain that ocean acidification acts a lot like osteoporosis, the condition that causes bones to become brittle in humans. For oysters, scallops and other shellfish, lower pH means less carbonate, which they rely on to build their essential shells. As acidity increases, shells become thinner, growth slows down and death rates rise. For the young oyster, it eats away their shells before they can form. Over the last 200 years or so, we have released about two trillion tons of carbon dioxide into the atmosphere. And about a quarter of that, or 550 billion tons of carbon dioxide, have been absorbed by the oceans. All that CO₂ changes the chemistry of the water by making it more acidic, 30 percent more since the start of the Industrial Revolution. Because of natural tide and wave patterns, the Pacific Northwest Coast has been hit hardest, with corrosive water being brought up from the deep ocean to the surface, where shellfish live. That's why Washington's shellfish industry, worth \$270 million a year and responsible for thousands of jobs, is the first to feel the effects of this global phenomenon, says Bill Dewey of Taylor Shellfish, the largest producer of farmed shellfish in the country. In a single night, Taylor's growers will bring in about 50,000 oysters. Oyster seed production in the Northwest plummeted by as much as 80 percent between 2005 and 2009 (PBS).

Sea level rise for Port Angeles was well studied in the September 2015 Climate Change Preparedness Plan for the North Olympic Peninsula done by the North Olympic Development Council. The first map shows only the probabilistic projections of changes to the average daily high tide inundation areas due to sea level rise in 2050 for Port Angeles with no areas indicated.

The second map shows the combined probabilistic sea level rise projections and annual extreme coastal flooding probabilities where one can see areas of flooding, especially around the Coastguard station at the tip of Ediz Hook. These maps do show little impact to the City in regards to sea level rise but extreme flooding to the Coastguard Station in extreme storm events



Figure 3: Potential Annual Extreme Storm Flooded Areas in 2050 due to Sea Level Rise



Figure 4: Potential Sea Level Rise Inundation Area in 2050

in combination with sea level rise. Another effect of the extreme storm events is the accelerated

rates of erosion for the 10th street bluff houses.

The map below shows 2100 flooding to most of Ediz Hook, the McKinley mill area and the western portion of the coastal properties of the Port of Port Angeles. The old Rayonier property will also be affected by flooding.

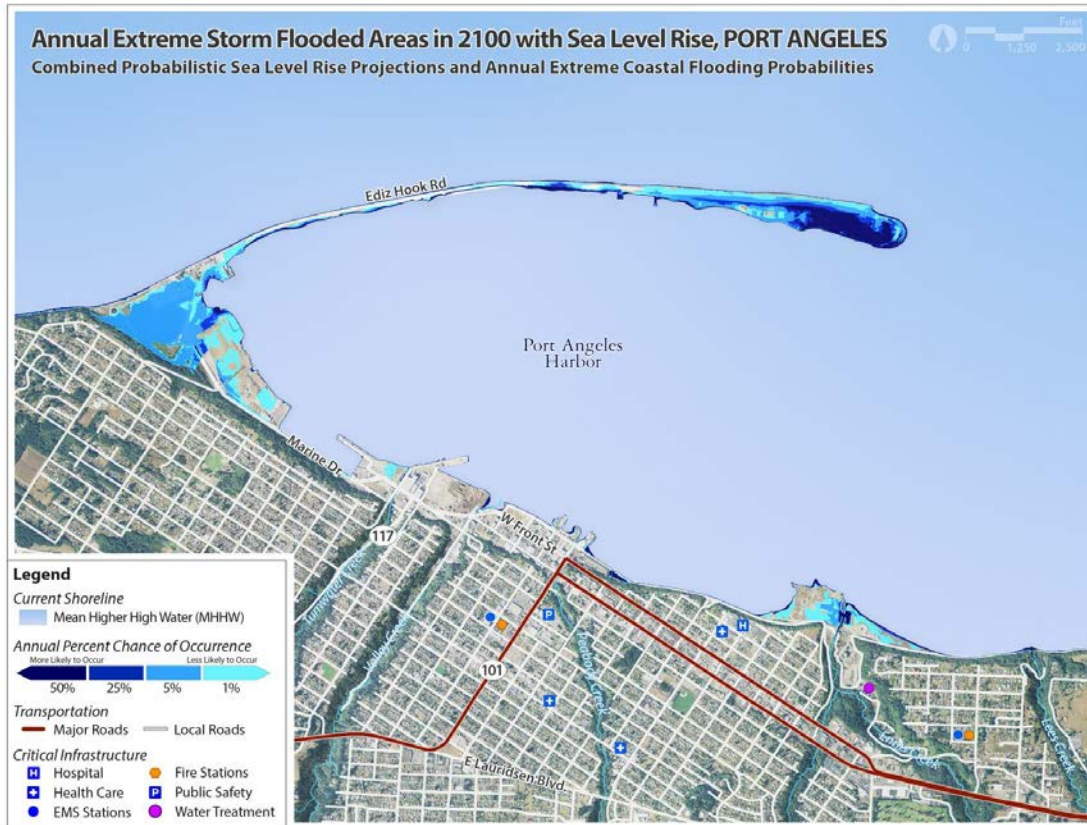


Figure 5: Potential Annual Extreme Storm Flooded Areas in 2100 due to Sea Level Rise

4. Human health and livelihoods

- Transportation corridor vulnerability – Moderated on 101 heading west. 8 bridges between Sequim and Port Angeles. One way in and one way out.
- Air pollution Concentration and distribution. Wind patterns in Port Angeles keep smoke and air pollutants from dissipating faster.
- Health – Heat-related illnesses and deaths
- Extreme weather – storm surges causing more destruction on Ediz Hook and other vulnerable areas.
- Population – Migration of other communities that are experiencing water shortages, flooding, or other climate change effects.

References

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Appendix A: Climate Resolution for the City of Port Angeles

WHEREAS, human activities have warmed the Earth to a point that threatens the stability of our climate and our modern way of life, and in 2018 The Fourth National Climate Assessment states that the Earth's climate is now changing faster than at any point in the history of modern civilization, primarily as a result of human activities and a failure to act expeditiously that will result in a loss of human life, ecological diversity, and economic growth; and

WHEREAS, climate change has already set into motion changes to the Earth's system including fresh water scarcity, risks to food security, the extinction of species, billions of climate refugees, the disappearance of island nations, acceleration of ice mass loss resulting in sea level rise, and the destruction of culturally sensitive areas along the Olympic Coast;

WHEREAS, unmitigated climate change will only exacerbate pre-existing political tensions and political instability in regions across the world as well as adversely affecting the most marginalized populations in Port Angeles, including but not limited to; those who are below the poverty line, those who are constantly plagued with financial instability, Tribal nations located on the Strait of Juan de Fuca, those living in flood plains, and those experiencing homelessness, and

WHEREAS, justice requires that those who are the largest contributors to the climate crisis carry a commensurate burden in reversing it to protect those most impacted, which includes the active consultation and protection of vulnerable and historically exploited populations in the development and implementation of these efforts; and

WHEREAS, climate change has already resulted in immediate danger to the residents of Port Angeles, from the lasting droughts that cause unnaturally hot and intense wildfires in our temperate rainforests, the plumes of wildfire smoke in the summer months resulting in air quality that has a detrimental effect on the health of all who live on the Olympic Peninsula, and rising king tides that have flooded areas of Clallam County, and;

WHEREAS, the City of Port Angeles has made commitments to adapt to the impacts of climate change, and now must take the same approach to mitigating their impact on the environment through greenhouse gas emission reduction, and the promotion of a carbon neutral economy that is equitable for all residents of Port Angeles.

NOW THEREFORE BE IT RESOLVED, that the City Council of Port Angeles declares that we will address climate change that threatens our city by reducing city wide greenhouse gas emissions to reach carbon neutrality by 2030, educating residents about climate change, and setting separate benchmarks for climate adaptation and mitigation efforts; and

BE IT FURTHER RESOLVED, that the City Council, in partnership with regional partners and stakeholders will work to invite and promote businesses in efforts to transitioning our local economy to carbon neutral by 2030 while ensuring that all efforts are centered in equity and respect for all community members; and








BE IT FURTHER RESOLVED, that the City of Port Angeles will reach out to elected officials at the county, state, national, and international level to assist with reaching adaptation and mitigation efforts whenever needed, whether it be through obtaining funds at the state and national levels, promoting climate change educational events, or working with our neighbors to the North to ensure our mitigation and adaptation efforts are in line with each other.

Appendix B: Actions for Reducing City Government Emissions City of Port Townsend Government Operations

Work sheet	Action	Lead	Cost Recovery (Years)	CO2e (metric tons)
1.14	Purchase Green Energy from the grid	City Manager	n/a	320
1.1	Build all new City buildings and develop sites to at least a LEED Silver criterion or some other third-party certification of energy water and waste conservation strategies (e.g. Architecture 2030)	City Council and Public Works	0.46	118
1.4	Conduct energy audits for each city or county owned buildings and infrastructure to develop and implement a plan to reduce energy consumption	RCM	4.81	112
1.9	Convert Streetlights to LED	Public Works	2.49	43
1.13	Set goals for government departments and encourage all local businesses to become certified by the Green Business program of Jefferson County Health	City Manager RCM & County Env. Health		40
1.6	Install photovoltaic panels on existing buildings and for stand-alone lighting on streets and in parks where appropriate and productive	RCM & Public Works	18.26	24
1.7	Establish a reduced idling policy for all government vehicles (heavy trucks)	Dept. Heads & Fleet Mgr & CAC	0.04	61
E-Cars	More efficient fleet and use of vehicles	Fleet Manager		40
1.5	Replace low-efficiency and high-emission vehicles with fuel-efficient & low-emission vehicles like plug-in hybrids as soon as possible	Fleet Managers & Dept. Heads	0.00	22
1.10	Create incentives for employees to reduce emissions in their daily commute	Dept. Heads	1.08	14
1.2	Implement vehicle trip reduction policy incorporating teleconferencing/ telecommuting and alternative work schedules where practical. Establish video and/or web conferencing CAPG abilities in all major City and County facilities	Dept. Heads	4.09	14

1.3	Use electric vehicles or bicycles whenever possible (e.g. for meter reading and building inspection)	CAC & Fleet Manager	5.09	11
E-Meters	Replace all the water meters with remote read meters. About 400 of the total 5000 are already remote read.	Public Works	1.44	9
1.7	Establish a reduced idling policy for all government vehicles (light vehicles)	Fleet Managers & Dept. Heads	0.03	4
Total Greenhouse Gas Emission Reduction (* above 2020 goal)				832

Appendix C: Climate Drivers

 <p>EXTREME HEAT/ HEATWAVES: Extreme temperatures are location specific. Heatwaves are prolonged periods of excessively hot weather. Likely increase in extreme air temperature and heatwaves in most areas.</p>	 <p>DRYING TREND/ DROUGHT: A prolonged dry period in a natural climate cycle which results in a shortage of water. Likely increase in drought conditions in some areas through a warming of air temperature and decrease in precipitation.</p>	 <p>EXTREME PRECIPITATION/ FLOODING: Extreme precipitation events are location specific and can cause flooding when downpours exceed the capacity of river or urban drainage systems. Uncertain climate projections, expected to intensify in some areas.</p>	 <p>STORM SURGE: The difference between the actual water level under the influence of a meteorological disturbance (storm tide) and the level which would have been attained in the absence of the meteorological disturbance (i.e. astronomical tide). Sea level rise exacerbate storm surge height.</p>	 <p>SEA LEVEL RISE: Anticipated sea level changes due to the greenhouse effect and associated global warming. Leads to changes in erosion and accretion, long term inundation, exacerbate storm surge and tsunami height.</p>	 <p>DAMAGING STORMS (WIND, LIGHTNING): Severe weather systems involving damaging winds and heavy rainfall downpour, including tornados, hailstorms, tropical cyclones and hurricanes. Uncertain climate projections.</p>	 <p>WILDFIRE: A massive and devastating fire which destroys forests, grasslands and crops, kills livestock and wild animals, damages or destroys settlements and puts lives of inhabitants at risk. Uncertain climate projections.</p>
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Appendix D: Climate Change Adaptation Certification Tool

Climate Change Adaptation Certification Tool: Moving communities from planning to implementation

IDENTIFY

EVALUATE

DETERMINE

EcoAdapt™
Meeting the challenges of climate change

FORESIGHT
PARTNERS CONSULTING

DECEMBER 2018

Climate Change Adaptation Certification Tool

Climate change has implications for both the effectiveness and hazard potential of many of the projects undertaken by local and regional governments today. Failing to properly evaluate the potential vulnerability of any project prior to approval can lead to missed opportunities to improve design, optimize siting or avoid risk.

The **Climate Change Adaptation Certification (CCAC) Tool** is for use during regulatory or procedural review processes being carried out as a matter of regular, ongoing community business. It is recommended that the CCAC become embedded as a regulatory requirement; alternatively, the CCAC could be a discretionary review tool used to evaluate an idea and inform all parties of expected impacts from a changing climate on a project during its lifecycle. Potential liabilities associated with a course of action could be identified prior to permitting or funding, which should enable decision makers to drive climate savvy and sustainable choices.

Using the CCAC will enable community services, infrastructure, ecosystems (and thereby local economies) to better anticipate and respond to climate change impacts by protecting public funds from climate risk or future community exposure to risk under altered conditions.

What "project" should apply the CCAC?

The CCAC should be applied to any decision that uses public funds, has a life cycle of greater than five years and can impact public good. This includes, but is not limited to:

- Fiscal Expenditures
- Capital Planning
- Permitting
- Infrastructure Design and Siting

The objective of applying the CCAC to these decisions is to:

- Explicitly evaluate the implication of future conditions on project function and longevity
- Understand the long-term sustainability of a project at the funding or permitting phase
- Reduce community risk from actions today that become a liability under future conditions

Who should apply the CCAC?

The CCAC can be used by local government, elected officials, businesses and individuals to enable climate savvy decision making. The CCAC informs any component of a publicly funded capital project, fiscal decision or privately-funded development of the climate change risks faced by the project, and to guide them toward reducing that risk.

The CCAC process includes the following:

STEP 1: Identification of Climate Change Risk Factors

Completing this step will identify if climate change impacts could affect a project over its lifetime. Step 1 provides a series of impact indicators that steer a proponent to think about how eight anticipated change factors have the potential to affect a project area. If any indicator is marked as present, then the change factors could be relevant to a project's long-term success. Therefore, it will have a "Yes" for that factor, requiring Step 2.

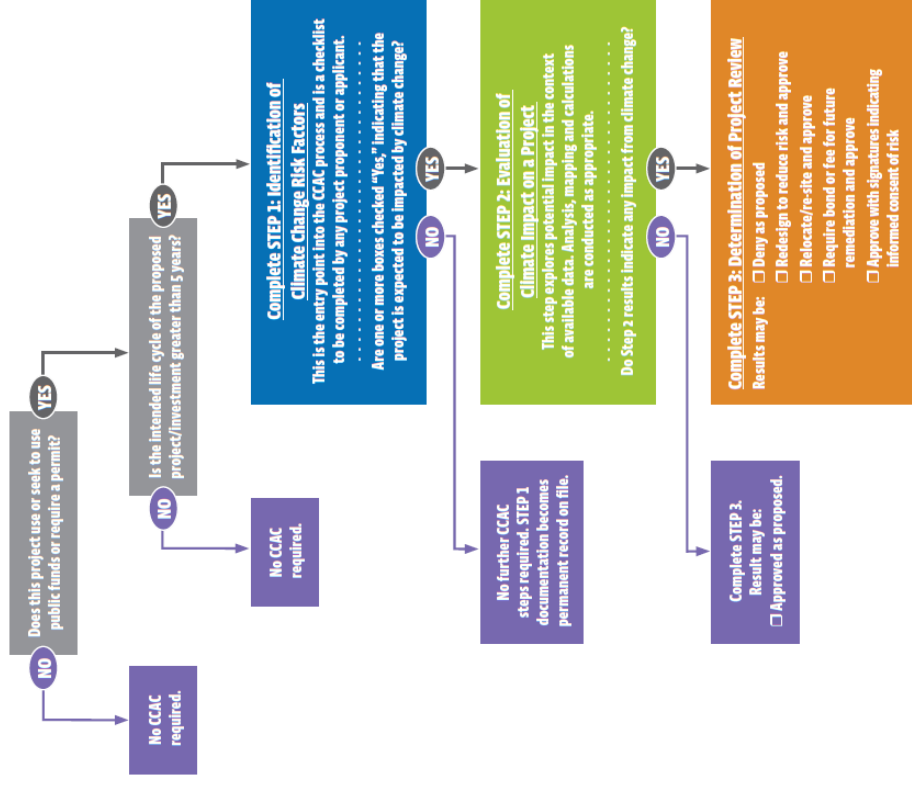
STEP 2: Evaluation of Climate Impact on a Project

If Step 1 detects likely impacts from climate change risks to a project area, then Step 2 asks a project proponent to dive deeper into existing climate data. Narratives, mapping and calculations will be sought to evaluate the project relative to future conditions and assess whether, as proposed, the project will involve (and should therefore avoid) future risk. Results of Step 2 are used by decision makers in Step 3 to inform a determination for the project.

STEP 3: Determination of Project Review

The CCAC review steps should allow a project to move forward only when it is expected to function sustainably over time; in other words, if it has avoided, minimized or mitigated future negative performance. A project should only proceed when awareness and accountability of risk is accepted. Thereby, a community will not be blindly on the hook for the costs to replace, retrofit, decommission or litigate responsibility for future damage, harm or poor project performance. Step 3 provides evidence that responsible parties are aware of climate change impacts and implication to the project they are either allowing or undertaking.

Climate Change Adaptation Certification (CCAC) Pathway to Climate Savvy Planning



STEP 1: Identification of Climate Change Risk Factors

STEP 1 will determine applicability of further CCAC review of a project. It should be completed by a project proponent with review by the appropriate project review authority.

Climate Change Risk Factors	- Identify if the following issues could affect the project over its lifetime. - Check all that apply. - If one or more of these boxes is checked, check YES in Column 3.	Climate Change Risk Identified For
PRECIPITATION Changing patterns will result in different and greater extremes, duration, and intensity.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> involves proper sizing of stormwater infrastructure to treat and accommodate run-off. <input type="checkbox"/> involves diversion or impoundment of surface water. <input type="checkbox"/> involves culverts, bridges, retaining walls or other structures within a riparian area to convey water or prevent flooding. <input type="checkbox"/> relies on a predictable and reliable water supply. <input type="checkbox"/> is within or near a mapped flood zone. <input type="checkbox"/> is affected by nuisance, localized or chronic flooding that is known generally to occur, though not mapped. <input type="checkbox"/> may be vulnerable to erosion or landslides. <input type="checkbox"/> relies on a predictable, reliable, and affordable power supply and other utilities. <input type="checkbox"/> is located within a Wildland-Urban Interface boundary or may be vulnerable to wildfire. <input type="checkbox"/> relies on sanitary sewers or community/private septic systems. <input type="checkbox"/> intersects with the multimodal transportation system. <input type="checkbox"/> other possible effects of precipitation changes (attach information and explanation). 	PRECIPITATION <input type="checkbox"/> YES <input type="checkbox"/> NO
TEMPERATURE Changes will include more extremes and prolonged highs or lows.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> relies on a predictable and reliable water supply. <input type="checkbox"/> may be vulnerable to wildfire. <input type="checkbox"/> uses energy generated by fossil fuel combustion (on site or from a power utility). <input type="checkbox"/> will have a maintenance budget for repairs and replacements. <input type="checkbox"/> relies on good air quality. <input type="checkbox"/> intersects with the multimodal transportation system. <input type="checkbox"/> involves habitat creation, restoration, or enhancement that relies on current temperature levels for successful implementation. <input type="checkbox"/> other possible effects of temperature changes (attach information and explanation). 	TEMPERATURE <input type="checkbox"/> YES <input type="checkbox"/> NO
SEA LEVEL RISE Relative sea level changes will result in intermittent or permanent inundation.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> is located within the coastal zone. <input type="checkbox"/> relies on a stable shoreline. <input type="checkbox"/> is within or adjacent to a mapped flood zone. <input type="checkbox"/> is within or may be affected by an area known to be vulnerable to flooding. <input type="checkbox"/> involves dock or harbor infrastructure. <input type="checkbox"/> relies on groundwater that may suffer from saltwater intrusion over time. <input type="checkbox"/> requires healthy and properly functioning tidal marsh, estuaries, or other tidal ecosystems. <input type="checkbox"/> relies on proper functioning of a sanitary sewer system regulated by the National Pollution Discharge Elimination System (NPDES). <input type="checkbox"/> relies on a septic system that is within or near the coastal zone. <input type="checkbox"/> intends to enhance tidal ecosystems. <input type="checkbox"/> other possible effects of sea level rise (attach information and explanation). 	SEA LEVEL RISE <input type="checkbox"/> YES <input type="checkbox"/> NO

Climate Change Risk Factors	- Identify if the following issues could affect the project over its lifetime. - Check all that apply. - If one or more of these boxes is checked, check YES in Column 3.	Climate Change Risk Identified For
VEGETATION CHANGES Long term temperature and precipitation changes will cause shifts in regional vegetation.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> could be affected by changes in vegetation. <input type="checkbox"/> could be affected by changes to transportation corridor buffers and impacts to roadways (brush fires, deadfall, water flow, etc). <input type="checkbox"/> could be affected by increased fuel load and wildfire risk (e.g., potential for dead-wood and detritus as die-off occurs increasing the fuel load and risk for wildfires). <input type="checkbox"/> has energy demands for heating and cooling that could increase if the percentage of tree-cover/canopy changes. <input type="checkbox"/> other possible effects of vegetation changes (attach information and explanation). 	VEGETATION CHANGES <input type="checkbox"/> YES <input type="checkbox"/> NO
SLOPE STABILITY Sea level and precipitation changes compromise once stable slopes.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> relies on the integrity of nearby slopes. <input type="checkbox"/> proposes development or investment on or near a slope. <input type="checkbox"/> other possible effects of slope instability (attach information and explanation). 	SLOPE STABILITY <input type="checkbox"/> YES <input type="checkbox"/> NO
OCEAN ACIDIFICATION Changes in ocean pH will have implications on permitted discharge and ocean health.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> relies on sanitary sewer that is subject to a NPDES permit. <input type="checkbox"/> relies on or affects shellfish within our local water. <input type="checkbox"/> other possible effects of ocean acidification (attach information and explanation). 	OCEAN ACIDIFICATION <input type="checkbox"/> YES <input type="checkbox"/> NO
POPULATION CHANGES Climate migration and regional population changes may have local/regional implications.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> relies on a stable population. <input type="checkbox"/> is designed and built to serve the current population. <input type="checkbox"/> could be adversely affected if population were to increase or decrease in our region. <input type="checkbox"/> could be affected by future climate migrants. <input type="checkbox"/> other possible effects of population changes (attach information and explanation). 	POPULATION CHANGES <input type="checkbox"/> YES <input type="checkbox"/> NO
GREENHOUSE GAS EMISSIONS Mitigation of future greenhouse gas emissions and fossil fuel dependence are driven in part by local/regional permitting decisions.	<p>My project or access to it:</p> <ul style="list-style-type: none"> <input type="checkbox"/> does not take cars off the road or decrease idling times. <input type="checkbox"/> neither improves nor increases access to non-motorized transportation options. <input type="checkbox"/> is dependent on fossil fuel and does not use renewable energy sources sufficient to cover demand. <input type="checkbox"/> other possible effects of greenhouse gas emissions (attach information and explanation). 	GREENHOUSE GAS EMISSIONS <input type="checkbox"/> YES <input type="checkbox"/> NO

CHECK ALL YOUR "YES" FACTORS
<input type="checkbox"/> PRECIPITATION <input type="checkbox"/> SEA LEVEL RISE <input type="checkbox"/> SLOPE STABILITY <input type="checkbox"/> POPULATION CHANGES <input type="checkbox"/> TEMPERATURE <input type="checkbox"/> VEGETATION CHANGES <input type="checkbox"/> OCEAN ACIDIFICATION <input type="checkbox"/> GREENHOUSE GAS EMISSIONS
<p>- For each Climate Change Risk Factor that indicated "YES" to climate risk, evaluation of the project is now required.</p> <p>- Proceed to STEP 2 and answer each Evaluation Question marked as required.</p> <p>- If you did not check any "YES" factors, no further CCAC steps are required. STEP 1 documentation becomes permanent record on file.</p>

STEP 2: Evaluation Questions

G Evaluate project connection to multimodal transportation.

Provide a narrative review explaining how motorized and non-motorized transit will be influenced by your project. Will non-motorized and/or public transit be increased or supported by this project (e.g., creation of bike lanes, sidewalks or non-motorized paths)? Will this project increase automotive miles driven or idle times?

RESULT:

- Project will facilitate multimodal transportation.
- Assessment indicates no accommodation of multimodal transit.
- Assessment indicates that multimodal transit could be accommodated by:

I Evaluate project connection to a healthy ocean environment.

Provide a narrative review explaining your project as it relates to:

- Marine discharge permits. Altered seawater pH may adversely affect compliance if discharge cannot be adjusted under these changing water chemistry conditions.
- Locally managed or harvested shellfish and whether the decline in shellfish populations affect your project or deem it unsustainable.
- Any other marine activities that affect or are affected by altered pH or related water chemistry changes.

RESULT:

- Project unaffected by changes in ocean chemistry.
- Assessment indicates climate change risk to project that cannot be avoided.
- Assessment indicates climate change risk to the project, but risk could be minimized by (explain here or in attachment):

H Evaluate project area susceptibility to wildfire.

1. Map your project's proximity to the Wildland Urban Interface and/or wildfire hazard areas. Overlay the following data layers on your project area:

- Regional or local GIS layers showing Wildfire Hazard Area or any available wildfire risk mapping

2. Provide a narrative review demonstrating your understanding of how long-term temperature and precipitation trend changes may cause shifts in vegetation and habitats affecting your project area's vulnerability to wildfire.

RESULT:

- Project unaffected by wildfire risk.
- Assessment indicates climate change risk to project that cannot be avoided.
- Assessment indicates climate change risk to the project, but risk could be minimized by (explain here or in attachment):

J Evaluate the connection between the project and local and regional population.

Provide a narrative review explaining how your project will function over time relative to population change. Will either increases or decreases (possibly due to climate migration) affect the long-term success of your project? Do your anticipated outcomes depend on certain local or regional population statistics?

RESULT:

- Project unaffected by population
- Assessment indicates climate change risk to project that cannot be avoided.
- Assessment indicates climate change risk to the project, but risk could be minimized by (explain here or in attachment):

STEP 3: Determination of Project Review

STEP 2 results indicate climate change risk to the project during its expected life cycle. Complete STEP 3 to decide conditions of approval.

1. **Proponents assessment** of the proposed project under future conditions:
2. **Staff assessment** of the proposed project under future conditions (include reference to any existing local, regional, and state natural hazard vulnerability assessments; climate vulnerability assessments, and/or climate action plans):

3. **CCAC Determination:**

- Project approved as proposed.** Low risk from future climate conditions.
- Project denied.** High risk that cannot be minimized or avoided with project alterations.
- Project redesigned to reduce risk and approved.**
 - Explain how risk was reduced due to the components of the redesign.

- Project relocated/sited in alternate location and approved.**
 - Explain how risk was reduced because of this move. Explanation should include a review of new site to ensure vulnerabilities do not exist at the new location.

- Project approved with conditions.** Applicant required to assume responsibility for anticipated future remediation necessitated due to permitting/funding/approving this now despite the known vulnerabilities.
 - Bond required in the amount of \$ _____
 - Fee required in the amount of \$ _____
 - Explain and document the expected remediation.

- Project approved with informed consent regarding the risk.**
 - Describe the risk.

Project Review Authority
Name: _____
Date: _____

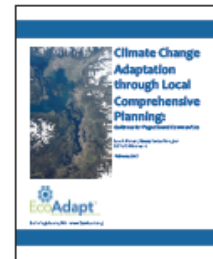
Project Proponent
Name: _____
Date: _____

Climate Change Adaptation Certification Resources and Acknowledgments

EcoAdapt and Foresight Partners Consulting developed the Climate Change Adaptation Certification project, process, and 3-Step Tool in order to advance nascent local conversations around climate change adaptation to tangible implementation actions. This work began in the Puget Sound region of Washington where they also developed guidance for anyone wanting to understand why and how to incorporate climate considerations into local Comprehensive Planning—addressing planning for both adaptation and mitigation. This guidance is also available:

Climate Change Adaptation through Local Comprehensive Planning: Guidance for Puget Sound Communities.
Hansen, L.J., S.J. Nordgren and E.E. Mielbrecht. 2017. EcoAdapt. Bainbridge Island, WA.

www.CAKEx.org/documents/climate-change-adaptation-through-local-comprehensive-planning-guidance-puget-sound-communities



The Climate Change Adaptation Certification Tool was developed to support communities beyond planning—helping them implement their updated Comprehensive Plan. Using this 3-Step CCAC Tool for rapid implementation of climate savvy planning goals and policies will enable community services, infrastructure, ecosystems, and economies to better anticipate and respond to the effects of climate change.

We would like to thank Jennifer Sutton (City of Bainbridge Island), James Rufo Hill (Seattle Public Utilities) and James B. Hansen (California Fish and Wildlife) for their time and insight as reviewers of this tool and its applicability to planning processes across a variety of circumstance.

In order to make this product useful and used, the authors surveyed community adaptation efforts and interviewed local, regional, and state employees around the Puget Sound to identify regulatory or discretionary processes already in place where one could integrate climate change adaptation into permitting—something beyond planning goals and policies. We would also like to thank (in alphabetical order) all those who took the time to inform us through interviews, including Mike Burnham (Thurston Regional Planning Council), Eileen Canola (Snohomish County), Christy Carr (City of Bainbridge Island), Ryan Dicks (Pierce County), Lisa Dulude (Snohomish County), Gary Idleburg (Washington State Department of Commerce), Jennifer Lee (Puget Sound Partnership), Kelly McGourty (Puget Sound Regional Council), Tracy Morgenstern (City of Seattle), Phillip North (Tulalip Tribes), Allison Osterberg (Thurston County), Joyce Phillips (City of Olympia), Jennifer Pouliotte (Puget Sound Partnership), Carol Lee Roalkvam (Washington State Department of Transportation), Dara Salmon (Snohomish County), Joseph Tovar (Tovar Planning), Lara Whately-Binder (King County), and Manuela Winter (Snohomish County).

Sample resource they shared included:

- Washington State Department of Transportation (WSDOT)—Guidance for Project-Level Climate Change Evaluations for NEPA and SEPA demonstrates how WSDOT should address climate change in its environmental documents/reviews
- King County—Sustainable Infrastructure ScoreCard used to meet the requirements of Seattle's Green Building and Sustainable Development Ordinance
- Seattle Public Utilities—Stage Gate process used internally by employees during project development
- Snohomish County's Puget Sound Initiative—Climate Change Decision Support Tool used by public works employees to consider climate change related impacts in their own project planning

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EcoAdapt provides support, training, and assistance to make planning and management less vulnerable and more Climate Savvy. EcoAdapt, founded by a team of some of the earliest adaptation thinkers and practitioners in the field, has one goal—creating a robust future in the face of climate change. We bring together diverse players to reshape planning and management in response to rapid climate change. www.EcoAdapt.org



Foresight Partners Consulting works to build societies' capacity to proactively address the effects of a changing climate. We work with practitioners to help them incorporate climate change considerations into programs, planning, and decision-making processes. We specialize in comprehensive community planning for climate change · hazard mitigation planning · philanthropic program strategy development and portfolio review. www.ForesightOnline.org