



NOP RC&D

NORTH OLYMPIC PENINSULA
RESOURCE CONSERVATION
& DEVELOPMENT



Department of Commerce
Innovation is in our nature.

Planning for Climate Change Across a Rural, Two-County Geography

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AGENDA

- Project Overview
- Process and Engagement
- Vulnerabilities and Strategies
- Lessons Learned
- Next Steps

PROJECT OVERVIEW: Assumptions

- ✧ **CLIMATE CHANGE IS HAPPENING**
- ✧ Not going to **argue about WHY** or science
- ✧ Focus on **Adaptation**, not Mitigation
- ✧ **Land use** planning perspective
- ✧ Planning is a **responsibility** of governments, neighborhoods, businesses, communities...
- ✧ Earth is **adaptable**, people are **innovative**

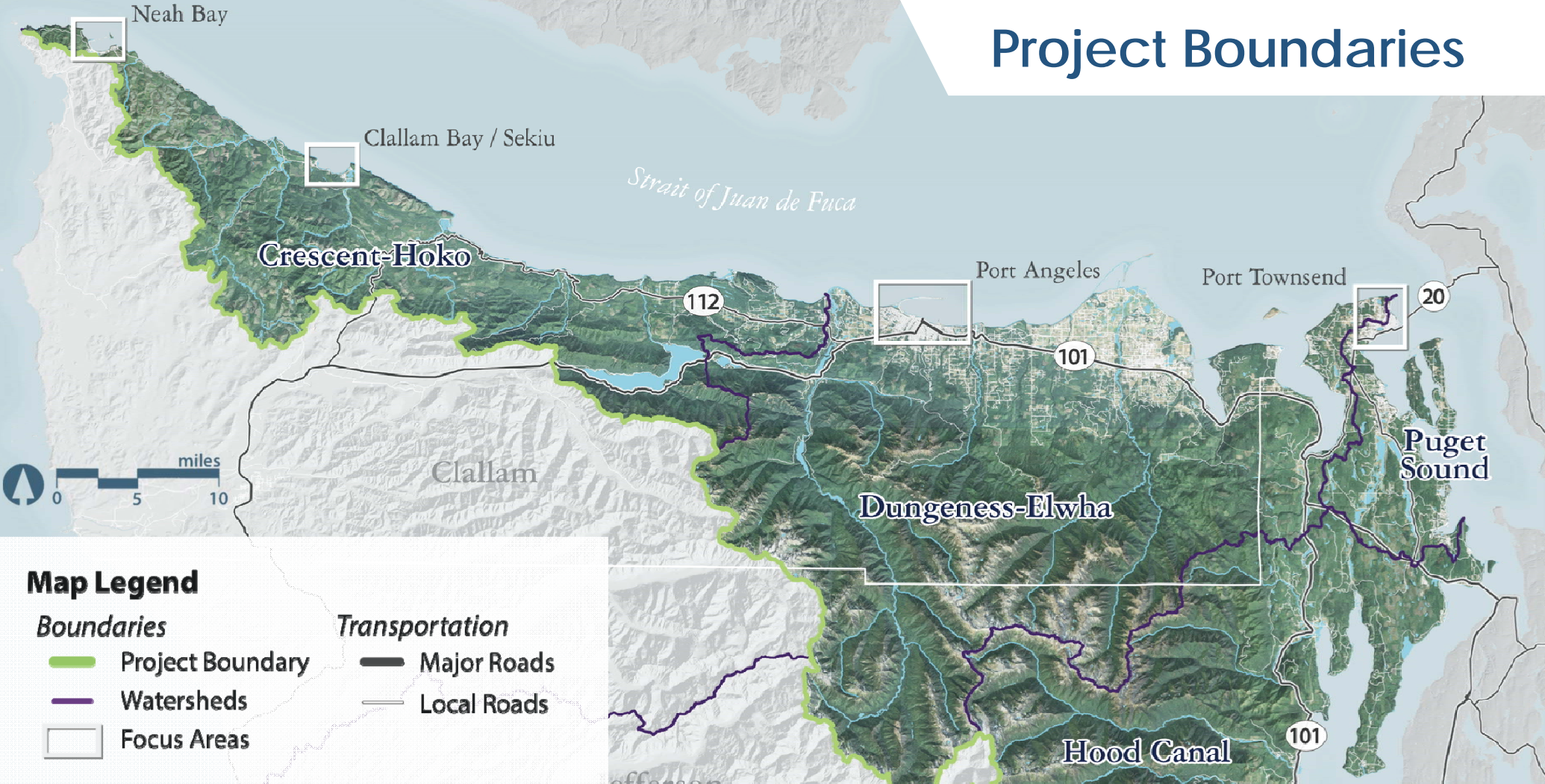


NW Hikers: 2014



NW Hikers: 2015

Project Boundaries



Map Legend

Boundaries

- Project Boundary
- Watersheds
- Focus Areas

Transportation

- Major Roads
- Local Roads



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PROJECT OVERVIEW

- *Create a Climate Change Preparation Plan for the North Olympic Peninsula that will inform the comprehensive and strategic planning processes of the area.*
- **Funded by:** Washington Department of Commerce
- **Recipient:** NOP Resource Conservation & Development Council
- **Consultants:**
 - Adaptation International
 - Washington Seagrant
 - **Timeframe:** June 2014 – October 2015



Project Process and Timeline

Step 1:

Conduct high level climate assessment (August 2014)

Step 2:

Workshops Identify Vulnerabilities and Priorities
(November 2014)

Step 3:

Workshops to Develop Adaptation Strategies
(April 2015)

Final Deliverables:

Report, Presentation of Results,
Sea Level Rise Maps,
Planning Language Examples,
Monitoring Plan (Oct 2015)



PROCESS: ORGANIZATIONAL STRUCTURE

NOP RC&D:

2 Counties, 3 Cities, 3 Tribes, 2 Ports, 2 PUDs, 2 EDCs, 2 Higher Ed, Federal Legislative Staff

STAFF:

1 Project Manager, 3 consultants/ climate scientists

CORE TEAM:

2 City and 1 County Council Members, 1 City Planner, 3 Tribal Reps, 4 Environmental Orgs, 1 Timber Industry Rep

PARTNER TEAM:

175 Reps from environmental groups, city and county departments, state and federal agencies, fisheries, forestry...

PROCESS: Vulnerability Assessment Workshops:

ECOSYSTEMS, WATER SUPPLIES, CRITICAL INFRASTRUCTURE & COMMUNITY VITALITY

Vulnerability Ranking

Table 3. Natural and Managed Ecosystems Vulnerability Ranking Table

		Sensitivity: Low → High				
		S0	S1	S2	S3	S4
Adaptive Capacity: Low ↓ High	AC0					*Wild Salmon *Nearshore environment-natural context
	AC1		*Wetlands		*Waterfowl *Clallam Low elevation forests - natural *Chimacum Agriculture	*Wild/commercial shellfish stocks *Nearshore environment-urban context *Food chain base (fish, insects, plankton) *Amphibians *Sea and shorebirds
	AC2				*Marine mammals *Southeast Jefferson Co. Forests *High elevation forests *Shellfish hatchery *Raptors *Songbirds	*Nearshore environment-estuary context *Marine and Freshwater Fish
	AC3			*Dungeness Agriculture *Quilcene Agriculture *Salmon aquaculture *Large land mammals	*Salmon hatchery *Small land mammals	
	AC4				*Clallam low elevation forests-managed *High elev forests-managed	

Action-Planning Criteria

- Resources available
- Project capacity and data gaps
- Relevance to both counties
- Informing decision-making
- Timing and magnitude of impacts



PROCESS: Adaptation Workshops

Climate Preparedness Strategy Evaluation Criteria							
Timeframe for Implementation: The ideal timeframe for initiating implementation of the proposed action in order to be most effective. <i>(4 = Immediate, 3 = near-term (0-3 years), 2 = short term (3-10 years), 1 = long-term (10+ years))</i>	Adaptive/Flexible: The proposed strategy allows for responding to uncertain outcomes or timing of climate change impacts <i>(4 = Very flexible, 2 = somewhat flexible, 0 = not flexible)</i>	Cost of the Action: Direct financial cost or economic costs of the project. <i>(4 = >\$1M, 3= 1M – \$250,000, 2= 100,000 – 250,000, 1 = <\$50,000, NA, Unknown)</i>	Avoided Cost: Perceived cost of inaction (financial or economic) ranked on same scaling as "Cost of Action". <i>(4 = >\$1M, 3= 1M – \$250,000, 2= 100,000 – 250,000, 1 = <\$50,000, NA, Unknown)</i>	Technical Feasibility: Current technology can be used and physically implemented to solve the problem it is meant to address <i>(4 = High, 2 = Medium, 0 = Low).</i>	Political & Social Feasibility: Action has political and social community support or, at a minimum, does not have political or community opposition. This also considers the "fundability" of an action. <i>(4 = High, 2 = Medium, 0 = Low).</i>	Alignment with Other Community Goals: The action has benefits for other community goals, plans, or actions, leads to increase in social resilience, if relevant; action is socially equitable. <i>(4 = High, 2 = Medium, 0 = High)</i>	Environmentally Sound: Action increases resilience of natural environment in the face of a range of climate change impacts; action decreases the emission of GHGs (has Mitigation Co-benefits); action complies with environmental regulations; there will be no immediate or cumulative negative environmental consequences from the action. <i>(4 = Yes, 2 = Somewhat, 0 = No)</i>



Critical Infrastructure



Port Townsend Marine Science Center



TOP 10 Strategies for Critical Infrastructure



STRATEGY	SCORE	TYPE	LEAD GROUP(S)	CO-BENEFITS
Update Emergency management and response planning to include climate change where needed	20	PLANNING	Emergency Manager	
Reduce inflow and infiltration to wastewater systems	19.5	POLICY	Operations and Maintenance Dept.	
Update planning documents to incorporate sea level rise and flooding where needed	19	PLANNING	Multi-Stakeholder	
Do outreach and education on climate adaptation to build community support	19	AWARENESS	Multi-Stakeholder	
Develop and utilize decision making tools related to climate change risks	18	PLANNING	Local Governments	
Create critical area flood mapping beyond FEMA's historical flood data	17	PLANNING	Multi-Stakeholder	
Encourage soft defenses for shoreline infrastructure	16	POLICY	Local Government & Private Sector	
Improve on-site stormwater management practices	16	POLICY	Multi-Stakeholder	
Participate in FEMA's Community Rating System (CRS)	16	PLANNING	Multi-Stakeholder	
Enhance stormwater retention in upstream areas	16	POLICY	Multi-Stakeholder	



Critical Infrastructure Adaptation Strategies - Detail

CI-3: Update planning documents for sea level rise and flooding where needed					
Score	Type of Strategy	Timeframe for Implementation*	Lead Group(s)	Opportunities or Concerns	Focus Area Co-benefits
19	Planning	Near Term	Multi-Stakeholder	<i>Medium and long-term issue where planning now can help reduce future costs</i>	<i>Ecosystems</i>

*Near-term (0-3 years), Medium-term (3-10 years), Long-term (>10 years)

Key Action Steps:

- Create a sea level risk district for inclusion in Comprehensive Plan and promulgate new codes and code changes associated with managing for sea level risk.
- Incorporate climate change and coastal hazard considerations into building codes by increasing freeboard requirements to two feet (three feet for critical projects) above the current 100-yr flood plain as buildings are redeveloped, developed, or renovated.
- See **Supplementary Information C** for more details.



Ecosystems



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Port Townsend Marine Science Center



TOP 10 Strategies for Ecosystems



STRATEGY	SCORE	TYPE	LEAD GROUP(S)	CO-BENEFITS
Enhance efforts to encourage breeding and planting of drought tolerant, resilient plant species	20	AWARENESS	Agriculture/Forestry & Edu. Orgs	
Incorporate climate change more explicitly into comprehensive plans and Shoreline Master Programs (SMP)	19	PLANNING	Local Governments	
Enhance promotion of agricultural best management practices to include future climate conditions	19	AWARENESS	Agriculture Sector and Edu. Orgs	
Update municipal codes to account for enhanced fire risk at forest/residential interface where needed	19	POLICY	Local Governments	
Increase regional capacity for water storage <i>(preferable with natural systems)</i>	18	PLANNING	Multi-Stakeholder	
Encourage FEMA to incorporate climate change in rate maps and guidance	18	PLANNING	State and County Government	
Develop graphic tool to illustrate climate impacts	17.5	PLANNING	Multi-Stakeholder	 
Update financing policies for development in high risk areas	17	POLICY	Multi-Stakeholder	
Enhance efforts to incentive use of native plants landscaping in residential, commercial, industrial settings	17	AWARENESS	Local Gov't and Private Sector	
Utilize low cost citizen science monitoring and analysis approaches and technologies	17	AWARENESS	Research Institutions and Citizens	

Ecosystem Adaptation Strategies - Detail

E-2: Incorporate climate change more explicitly into comprehensive plans and Shoreline Master Programs (SMP)					
Score	Type of Strategy	Timeframe for Implementation*	Lead Group (s)	Opportunities or Concerns	Focus Area Co-benefits
19	Planning	Near-term	County and City Governments	N/A	Critical Infrastructure

*Near-term (0-3 years), Medium-term (3-10 years), Long-term (>10 years)

Key Action Steps:

- Research sample language from other regional and national efforts. One example is the San Juan Islands- http://www.sanjuans.org/documents/Loring_2014_sea_level_rise_regulatory_review.pdf.
- Use best available climate change projections and share relevant information with County and City governments in region.
- See “Planning Language Examples for Climate Resiliency” document in section **Supplementary Information: C** for more details.
- Other relevant and critical plans that would benefit from climate change planning include: functional plans, strategic plans (especially those of Ports, PUDs, and non-profits), and comprehensive schemes.



Ecosystem Adaptation Strategies - Detail

E-10: Utilize low cost citizen science monitoring and analysis approaches and technologies					
Score	Type of Strategy	Timeframe for Implementation*	Lead Group (s)	Opportunities or Concerns	Focus Area Co-benefits
17	Awareness	Near-term	Research Institutions, Non-profit Education Centers, Citizen Scientists	<i>Highly adaptive, feasible, and in line with political and social goals.</i>	

*Near-term (0-3 years), Medium-term (3-10 years), Long-term (>10 years)

Key Action Steps:

- Develop a citizen science program.
- Host trainings for interested individuals. Including detail about monitoring and analysis specific to emerging climate change impacts on the peninsula, such as: the presence of invasive/migrating fish species, monitored through trace DNA molecular analysis of seawater collected by citizen scientists.

Ecosystem Adaptation Strategies - Detail

E-12: Complete survey of sensitive submerged habitats and the species that utilize them

Score	Type of Strategy	Timeframe for Implementation*	Lead Group (s)	Opportunities or Concerns	Focus Area Co-benefits
16.5	Awareness	Medium-term	Research Institutions, Citizen Scientists	<i>Low social/political feasibility, would address the ecosystem wide impacts</i>	

*Near-term (0-3 years), Medium-term (3-10 years), Long-term (>10 years)

Key Action Steps:

- Inventory and monitor submerged habitats that may be affected by rising sea levels and ocean acidification.
- Promote preservation and restoration of submerged native aquatic vegetation for management of nutrient loading.
- Identify potential future habitats and protect species using or reliant on the habitat.



Water Supplies



Jeff Taylor



Barney Burke



TOP 10 Strategies for Water Supplies



STRATEGY	SCORE	TYPE	LEAD GROUP(S)	CO-BENEFITS
Enhance education on drought & water supplies issues for the peninsula	20	AWARENESS	Multi-Stakeholder	
Adopt new regulations requiring water-efficient appliances	20	POLICY	State Government	
Promote and incentivize smart irrigation technologies for agriculture	20	AWARENESS	Agricultural Sector	
Identify monitoring needs and enhance water supply monitoring	19	AWARENESS	Multi-Stakeholder	
Enhance efforts to educate home and business owners on the value of on-site water conservation, retention, and catchment	18	AWARENESS	Multi-Stakeholder	
Continue to study ways to enhance water storage and groundwater recharge	18	PLANNING	Water Utility & Local Governments	
Encourage forestry practices promoting water retention within the watershed	18	AWARENESS	Forestry Sector	
Research or develop model to assess sea level rise and saltwater intrusion to groundwater	18	PLANNING	Local Governments	
Improve forecasting for future water supply and demand	18	PLANNING	Water Utility Managers	
Map water retention values for ecosystems	18	PLANNING	Multi-Stakeholder	

Water Supplies Adaptation Strategies - Detail

WS-21: Explore opportunities for artificial recharge of groundwater aquifers					
Score	Type of Strategy	Timeframe for Implementation*	Lead Group (s)	Opportunities or Concerns	Focus Area Co-benefits
11	Planning	Long-term	Multi-stakeholder	<i>Minimally adaptable, high cost, facing technical and political barriers</i>	

*Near-term (0-3 years), Medium-term (3-10 years), Long-term (>10 years)

Key Action Steps:

- Research options, including infiltration basins, injection wells, and artificial lakes/ponds.
- Assess water sources (reclaimed water, stormwater, peak river flows).
- Collaborate with WA Department of Ecology on their reclaimed water rules (accepting comments on new rule promoting reclaimed water in fall 2015).



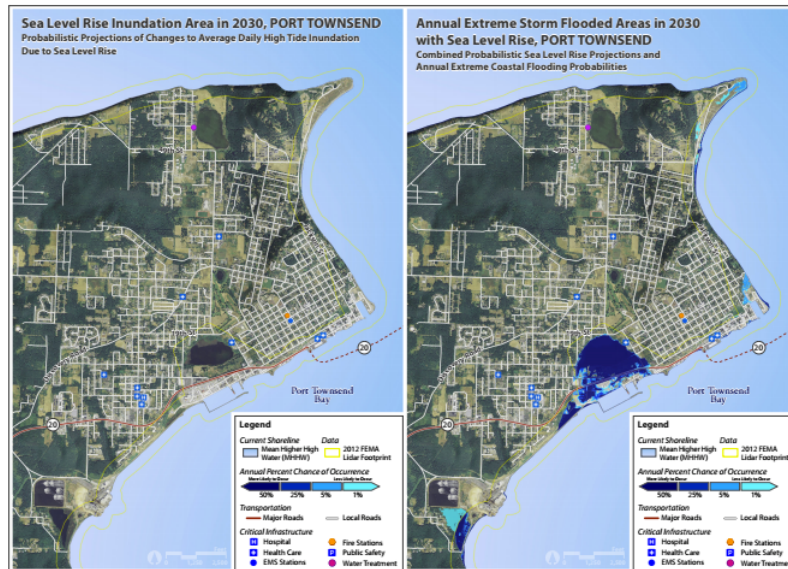
LESSONS LEARNED

- Use champions to get people to the table
- Give participants something to do
- 1 + 1 = 3 eg: water managers
- “Preparedness” is palatable
- Framing vs. openness
- Publish



LESSONS LEARNED: Create Useful Tools

- SLR probabilistic modeling
- Interface with NOAA Sea Level Rise Viewer
- Spreadsheet of sortable adaptation strategies
- Database of sources/ data
- Sample planning language



Next Steps

- Presenting to jurisdictions, others
- Input on Comp Plans
- NTA status
- Monitoring Plan





Thank You!

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For full report, see www.nopr.cd.org

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