Restoration and Sea Level Rise: Local Context

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Island County MRC
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Clean Water Facility Project
DANGER
OVERHEAD
POWER LINES
SIDEWALK
CLOSED

Who Needs the Info?

- WRIA 6 Lead Entity for Salmon Recovery: Recovery Plan Update
- Island Local Integrating Organization: 5-year Ecosystem Recovery Plan
- Restoration projects
- Near Term Actions
- Shore Friendly messaging

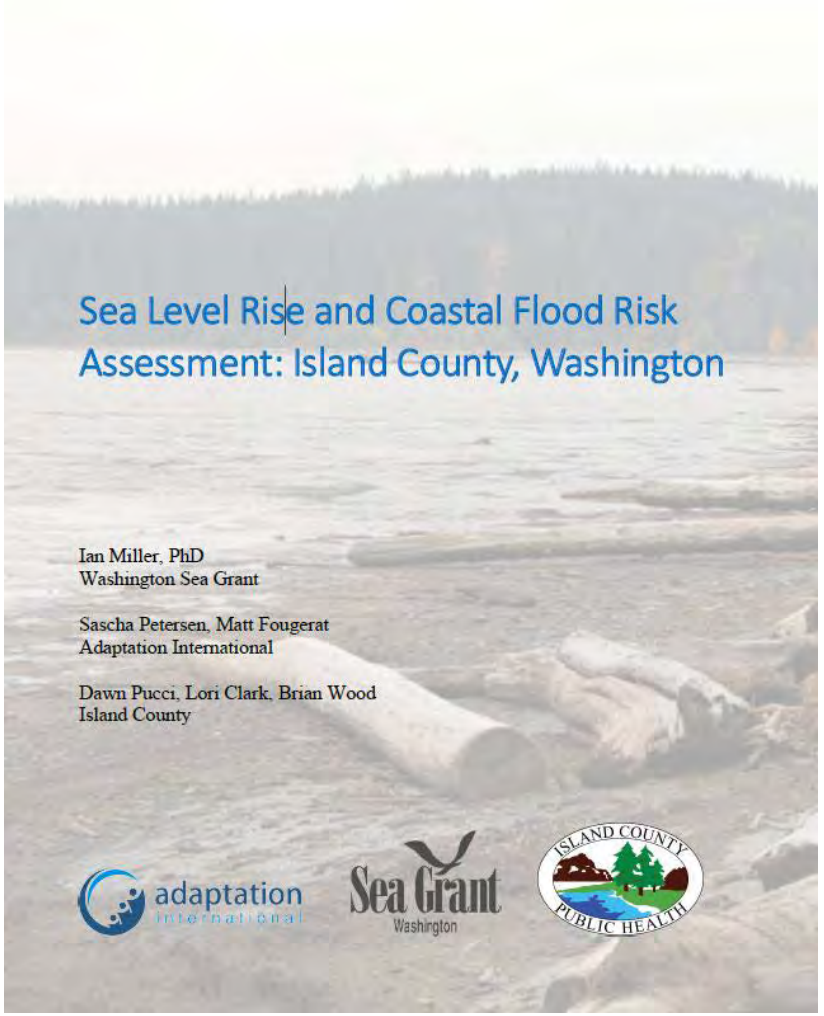
Why is this meaningful for Island County DNR?

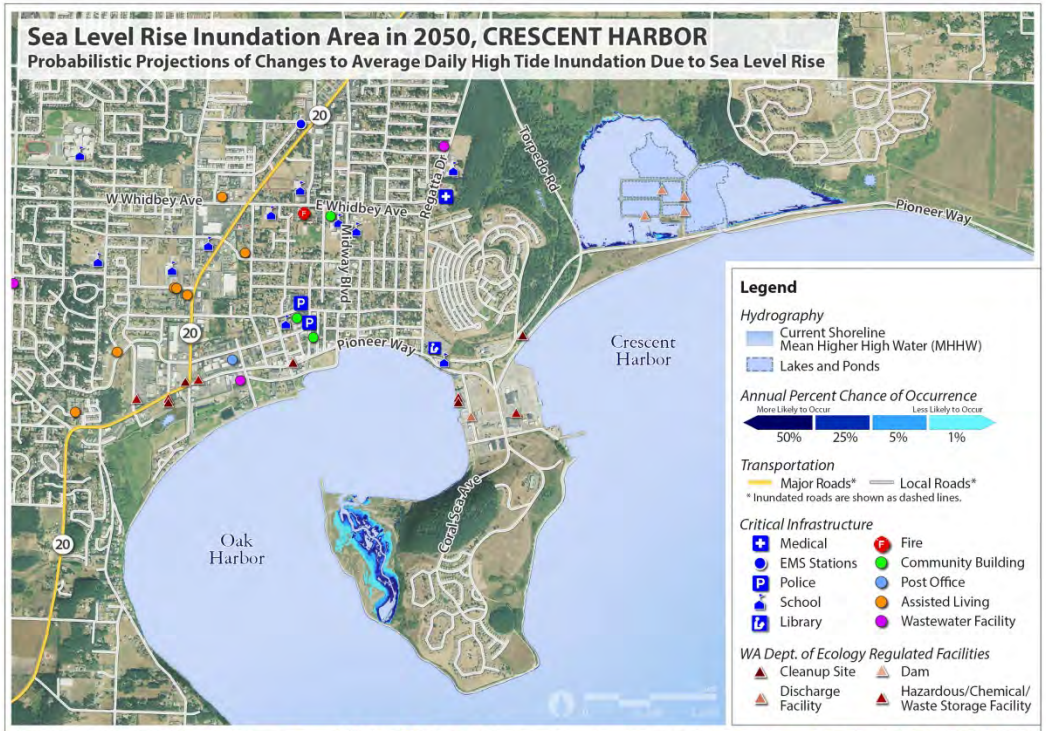
- 200+ miles of shoreline
- Most restoration projects are in the nearshore
- Large amount of private infrastructure in nearshore

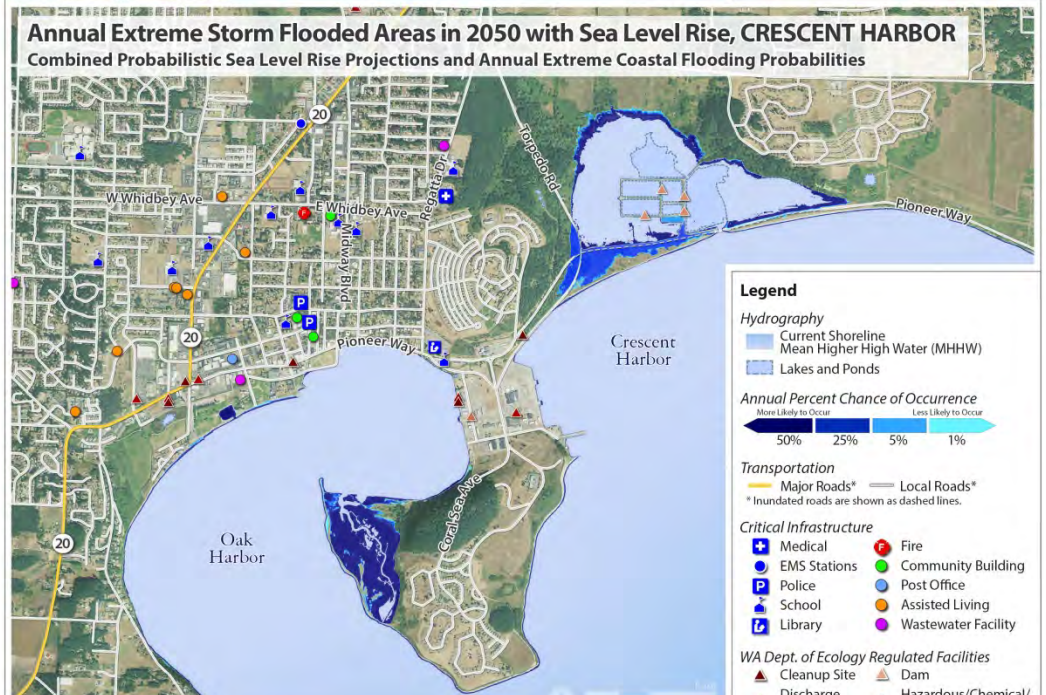
- Restoration planning
- Communication tool
- Use restoration as a tool to achieve resiliency

What we've done in Island County

- Sea Level Rise and Coastal Flood Risk Assessment
- Probabilistic framework
- Levels of risk and certainty
- Incorporates vertical land movement
- Local focus
- Sea Level Rise
- Storm Surge
- Maps and Tables




Sea Level Rise Inundation Area in 2050, CRESCENT HARBOR
Probabilistic Projections of Changes to Average Daily High Tide Inundation Due to Sea Level Rise
W Whidbey Ave
E Whidbey Ave
Midway Blvd
Regatta Dr
Torpedo Rd
Pioneer Way
Crescent Harbor
Oak Harbor
Coral Sea Ave
20
Legend
Hydrography
Current Shoreline Mean Higher High Water (MHHW)
Lakes and Ponds
Annual Percent Chance of Occurrence
More Likely to Occur
Less Likely to Occur
50%
25%
5%
1%
Transportation
Major Roads*
Local Roads*
* Inundated roads are shown as dashed lines.
Critical Infrastructure
Medical
Fire
EMS Stations
Community Building
Police
Post Office
School
Assisted Living
Library
Wastewater Facility
WA Dept. of Ecology Regulated Facilities
Cleanup Site
Dam
Discharge Facility
Hazardous/Chemical/ Waste Storage Facility


Annual Extreme Storm Flooded Areas in 2050 with Sea Level Rise, CRESCENT HARBOR
Combined Probabilistic Sea Level Rise Projections and Annual Extreme Coastal Flooding Probabilities
W Whidbey Ave
E Whidbey Ave
Midway Blvd
Regatta Dr
Torpedo Rd
Pioneer Way
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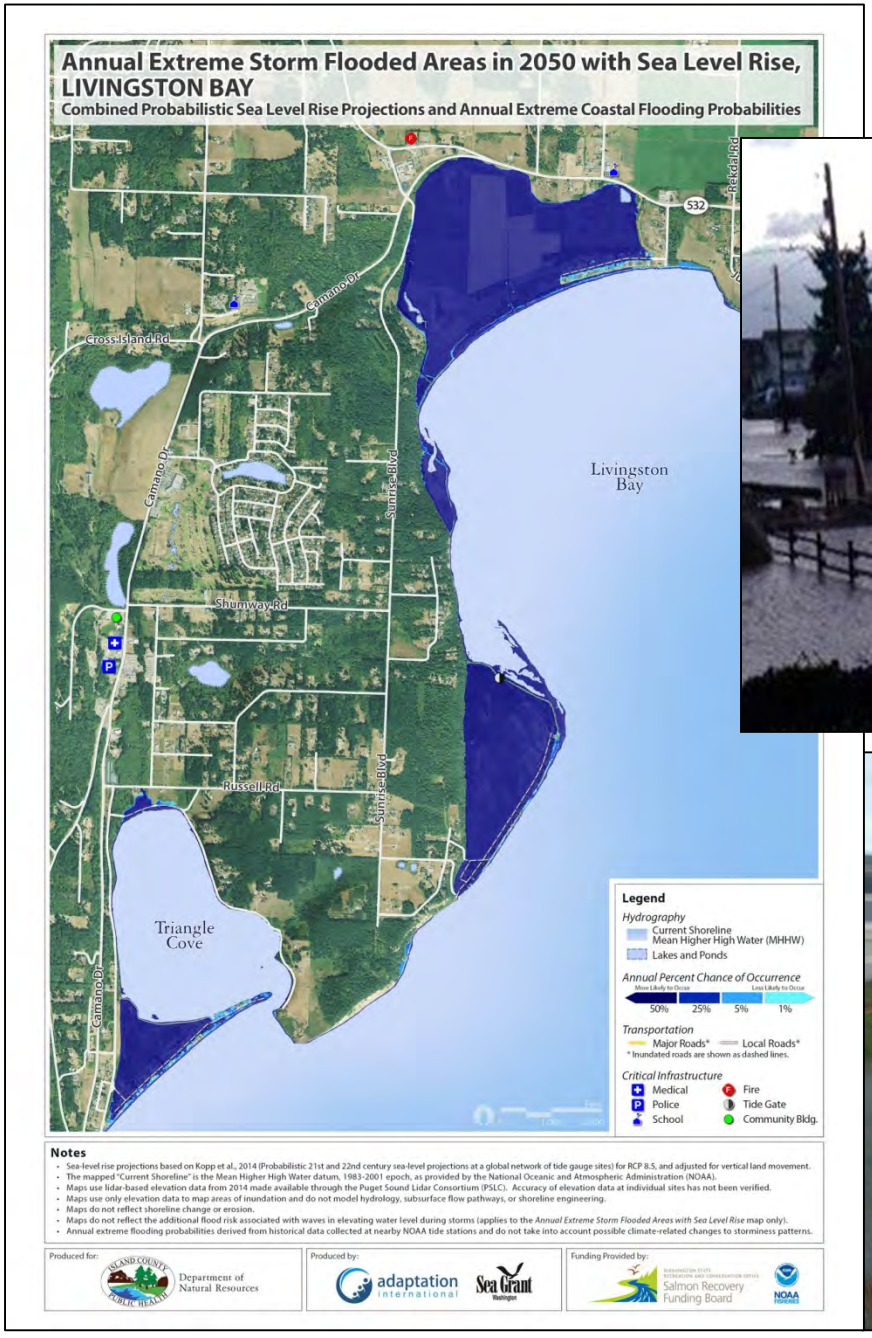
Cleanup Site
Dam


Annual Extreme Storm Flooded Areas in 2050 with Sea Level Rise, LIVINGSTON BAY
Combined Probabilistic Sea Level Rise Projections and Annual Extreme Coastal Flooding Probabilities
Livingston Bay
Triangle Cove
Cross Island Rd
Camano Dr
Shumway Rd
Russell Rd
Sunrise Blvd
532
Legend
Hydrography
Current Shoreline
Mean Higher High Water (MHHW)
Lakes and Ponds
Annual Percent Chance of Occurrence
50%
25%
5%
1%
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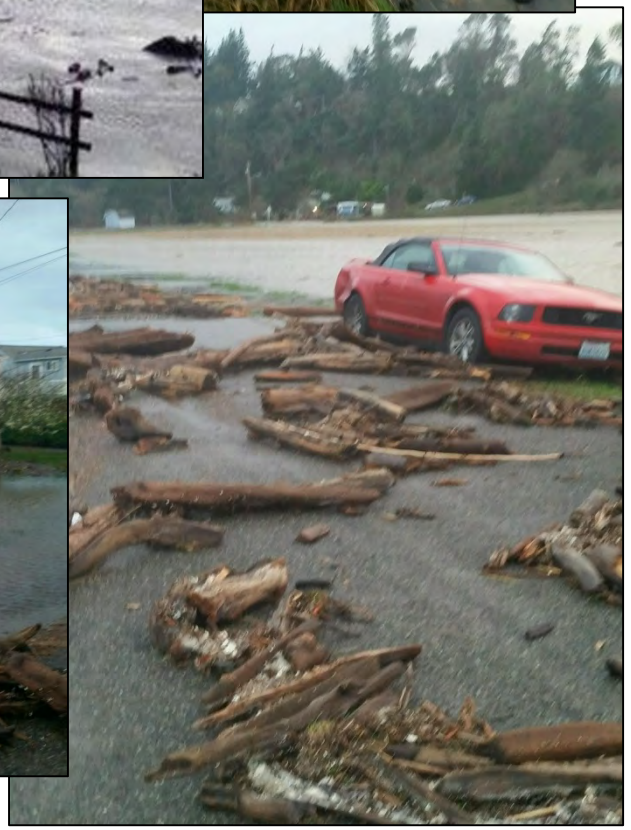
Local Roads*
*Inundated roads are shown as dashed lines.
Critical Infrastructure
Medical
Police
School
Fire
Tide Gate
Community Bldg.
Notes
Sea-level rise projections based on Kopp et al., 2014 (Probabilistic 21st and 22nd century sea-level projections at a global network of tide gauge sites) for RCP 8.5, and adjusted for vertical land movement.
The mapped "Current Shoreline" is the Mean Higher High Water datum, 1983-2001 epoch, as provided by the National Oceanic and Atmospheric Administration (NOAA).
Maps use lidar-based elevation data from 2014 made available through the Puget Sound Lidar Consortium (PSLC). Accuracy of elevation data at individual sites has not been verified.
Maps use only elevation data to map areas of inundation and do not model hydrology, subsurface flow pathways, or shoreline engineering.
Maps do not reflect shoreline change or erosion.
Maps do not reflect the additional flood risk associated with waves in elevating water level during storms (applies to the Annual Extreme Storm Flooded Areas with Sea Level Rise map only).
Annual extreme flooding probabilities derived from historical data collected at nearby NOAA tide stations and do not take into account possible climate-related changes to storminess patterns.
Produced for:
Island County Public Health
Department of Natural Resources
Produced by:
adaptation international
Sea Grant Washington
Funding Provided by:
Salmon Recovery Funding Board
NOAA


March 10, 2016
waves



By the year _2050_, there is a _95_% likelihood of an annual flood exceeding _2.2_ ft above current MHHW.

	Probability of Exceedance (RCP8.5)									
YEAR	99.9	99	95	75	50	25	5	1	0.2	0.1
Current	0.9	1.2	1.5	1.9	2.2	2.6	3.0	3.2	3.4	3.4
2010	1.0	1.3	1.6	2.0	2.3	2.6	3.1	3.3	3.5	3.5
2020	1.1	1.4	1.7	2.1	2.4	2.8	3.2	3.5	3.6	3.7
2030	1.2	1.5	1.8	2.3	2.6	2.9	3.4	3.6	3.8	3.8
2040	1.3	1.7	2.0	2.4	2.8	3.1	3.6	3.8	4.0	4.1
2050	1.5	1.8	2.2	2.6	3.0	3.3	3.8	4.2	4.5	4.7
2060	1.7	2.0	2.4	2.9	3.2	3.6	4.1	4.5	5.0	5.3
2070	1.8	2.2	2.6	3.1	3.5	3.9	4.5	5.0	5.8	6.4
2080	2.0	2.4	2.8	3.4	3.8	4.2	4.9	5.7	6.9	7.7
2090	2.1	2.5	3.0	3.6	4.1	4.6	5.4	6.4	8.0	9.2
2100	2.2	2.7	3.2	3.9	4.4	5.0	6.0	7.3	9.3	10.9
2110	2.4	2.9	3.3	4.1	4.6	5.2	6.3	7.9	10.6	12.0
2120	2.6	3.1	3.6	4.3	4.9	5.6	7.0	9.0	12.1	14.3
2130	2.7	3.2	3.7	4.6	5.2	6.0	7.6	10.0	14.0	15.9
2140	2.6	3.3	3.9	4.8	5.6	6.4	8.4	11.1	15.8	18.0
2150	2.7	3.3	4.0	5.1	5.9	6.9	9.1	12.4	17.8	20.5

Effective Communication

- Trusted source
- For decision-makers: 1-on-1 meetings
- What the maps do and don’t say
- Goal of project: what are we trying to restore?
- Timeline for planning
- Phasing options

Shoreline Properties

- Retreat
- Raising house
- Where feasible, natural and soft shore allow for coastal resilience
- Simple steps
  - Moving memorabilia
  - Raising electrical

What's Next?
Washington Coastal Resilience Project

Objectives

1: Fill critical information gaps (probabilistic SLR projections)

2: Increase capacity in Washington State to support coastal resilience

3: Enhance the resilience of at least three Washington coastal communities through pilot projects (**Island, Tacoma, ESRP Restoration**)

4: Employ targeted and strategic outreach to Washington's coastal communities