



Developing a Time of Emergence Approach to Sea-Level Rise Adaptation

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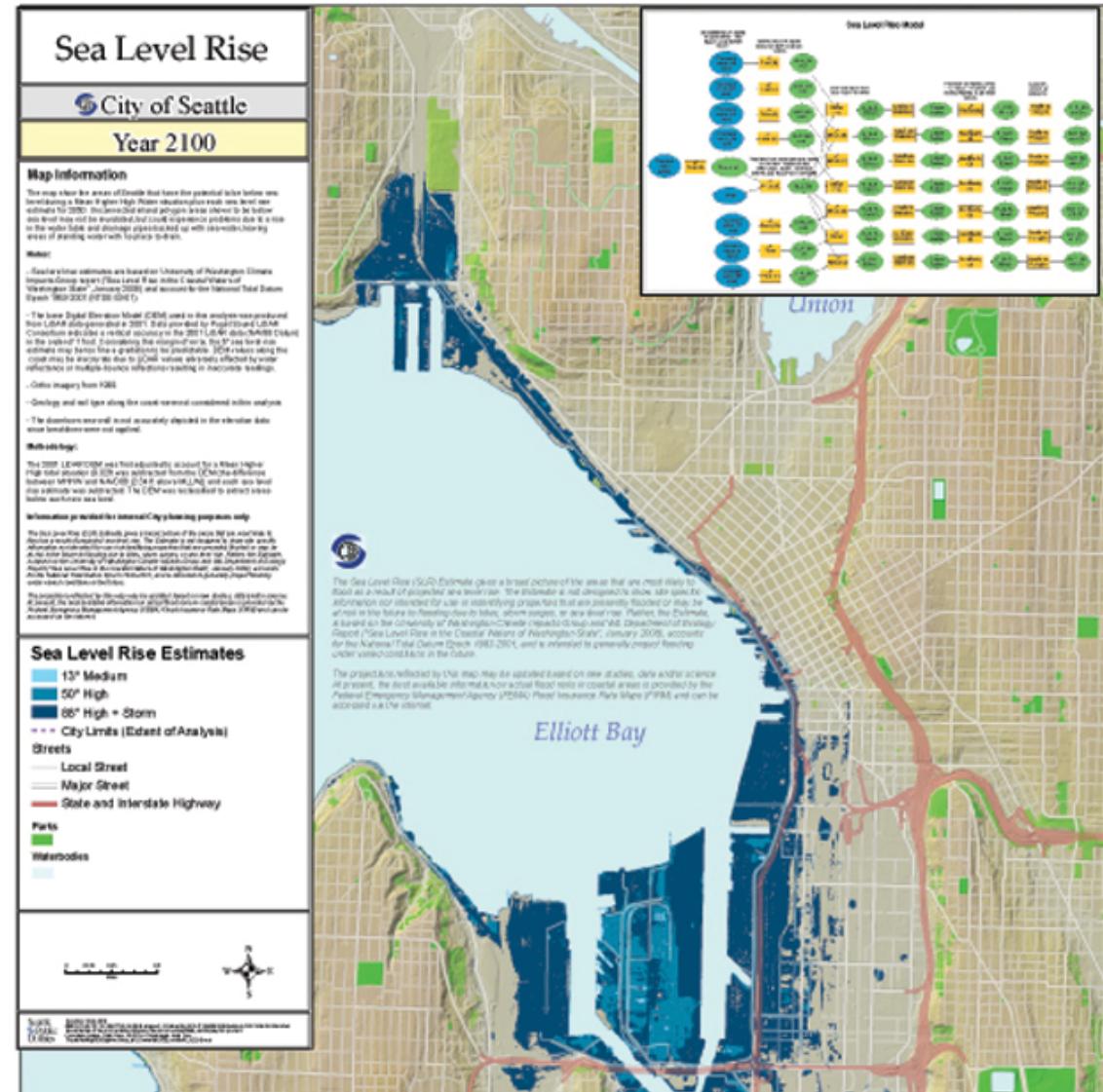
Sea Level Rise in the Coastal Waters of Washington State

A report by
the University of Washington Climate Impacts Group
and the Washington Department of Ecology

Prepared by Philip Mote, Alexander Petersen, Spencer Reeder, Hugh Shipman, and Lara Whitely Binder



January 2008

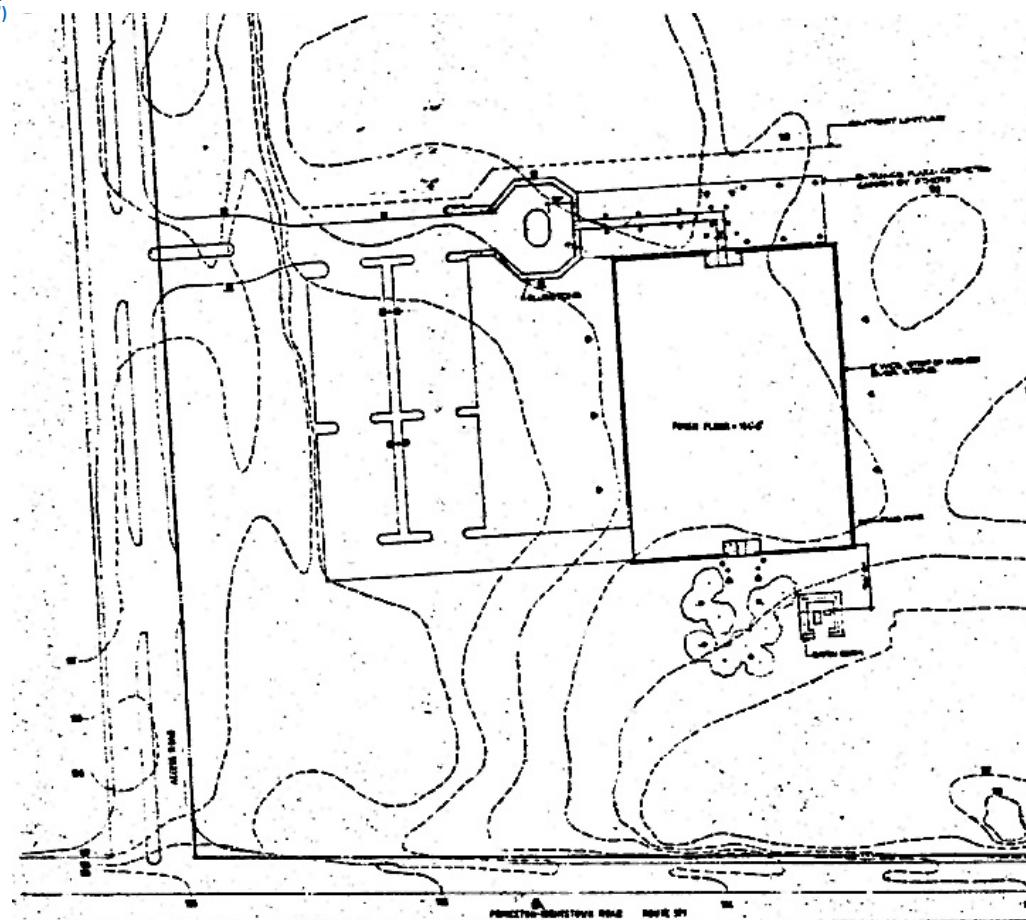
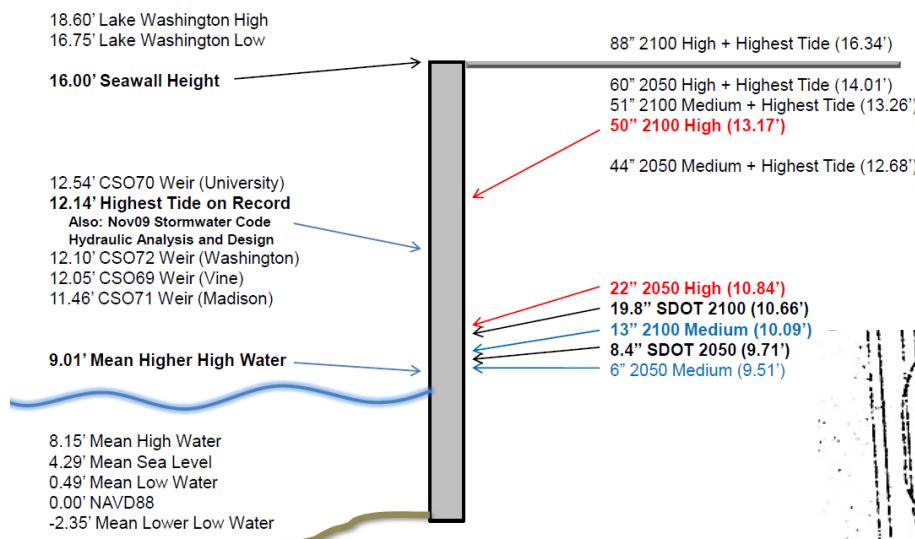






Elevations and Data

NAVD88: Approved City of Seattle Vertical Datum







SEATTLE PUBLIC UTILITIES

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Ray Hoffman, Director

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Projected Changes

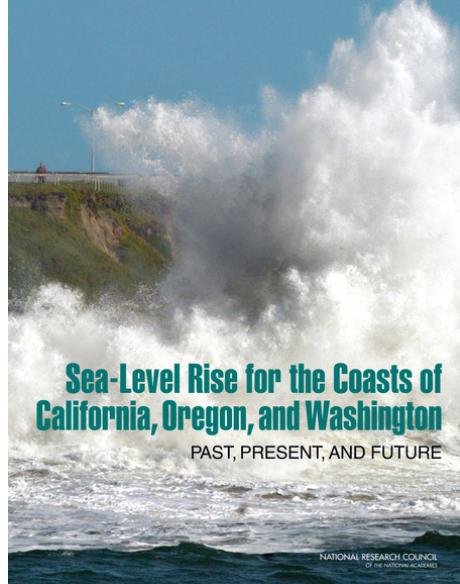
» Sea-Level Rise Map

Migration

Research

Collaboration

Blog



Sea-Level Rise for the Coasts of California, Oregon, and Washington

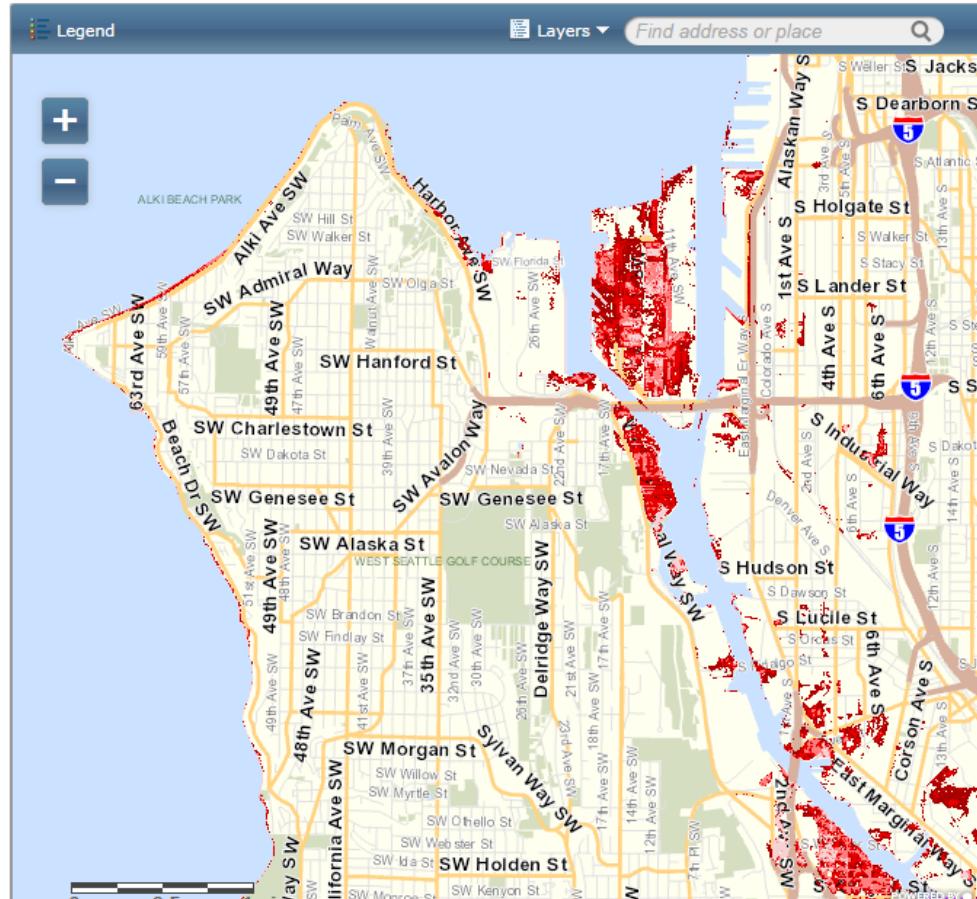
PAST, PRESENT, AND FUTURE

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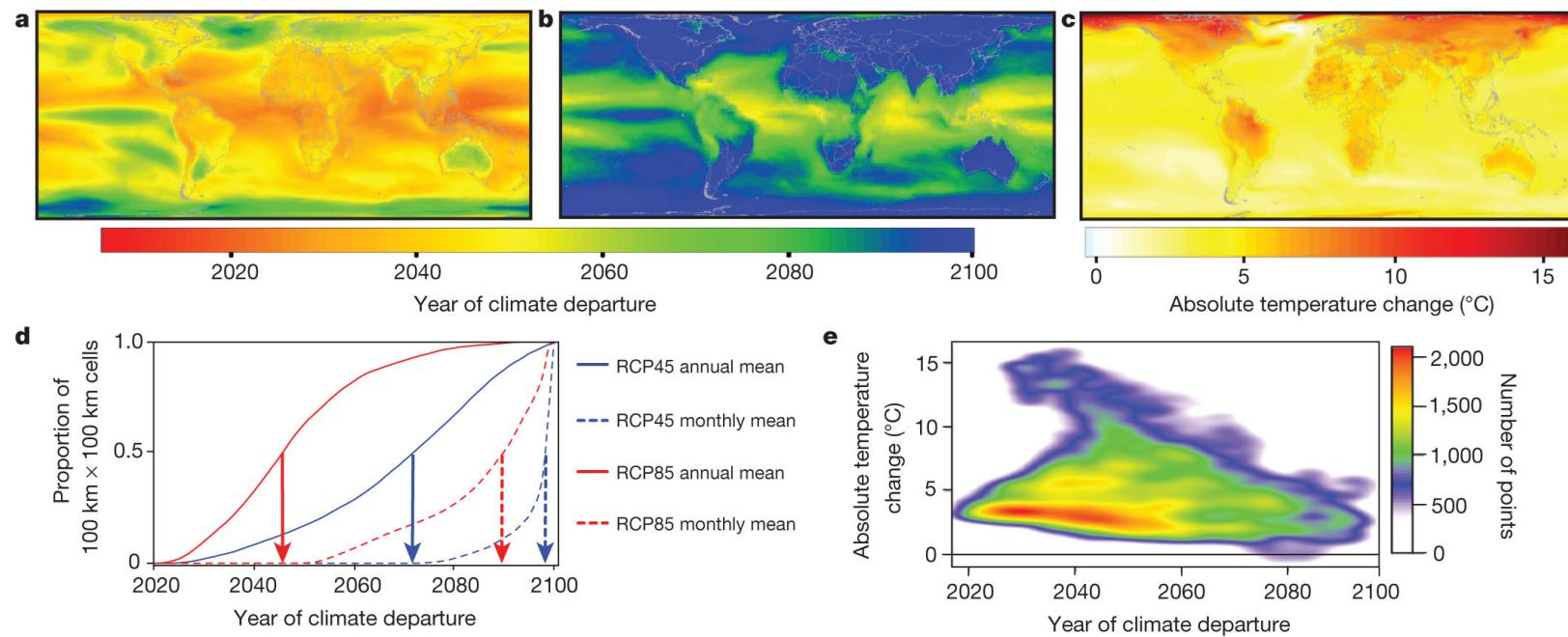
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Sea-Level Rise Map

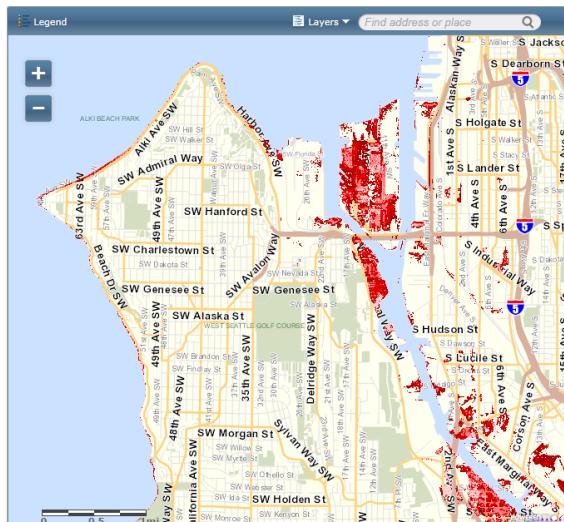
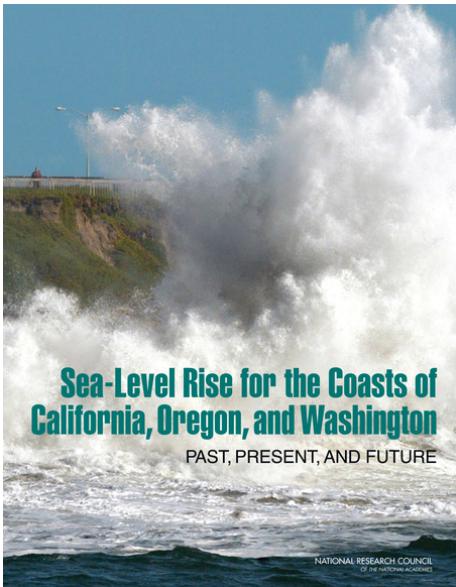


The projected timing of climate departure from recent variability.



C Mora et al. *Nature* **502**, 183-187 (2013) doi:10.1038/nature12540

nature

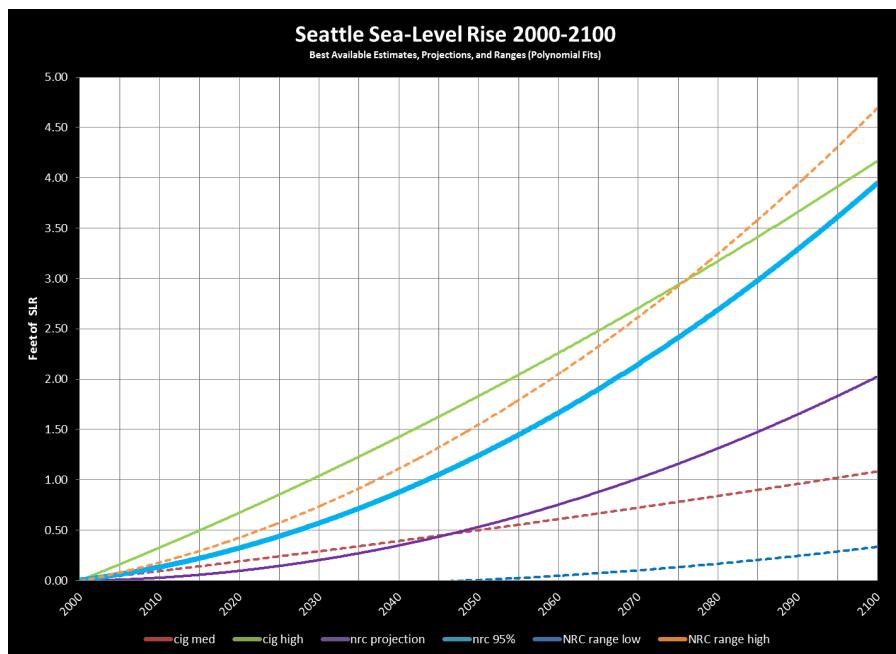


11' NAVD88

- 2' SLR above MHHW
- King Tide today
- monthly tide 2033 - 2064
- daily tide 2058 - 2099

12' NAVD88

- 3' SLR above MHHW
- King Tide 2033 - 2063
- monthly tide 2056 - 2095
- daily tide 2076 - 2122



13' NAVD88

- 4' SLR above MHHW
- King Tide 2056 - 2095
- monthly tide 2074 - 2119
- daily tide 2091 - 2142

14' NAVD88

- 5' SLR above MHHW
- King Tide 2073 - 2119
- monthly tide 2089 - 2139
- daily tide 2104 - 2159

Tidal Impacts on Wastewater Pump stations and CSO Facilities

Seattle University Dept. of Civil and Environmental Engineering

June 2014

Tidal Impacts on Wastewater Pump Stations and CSO Facilities

CEE 14.1

 **Table 6:** Wastewater pump stations (WWPS) and Combined Sewer Overflow (CSO) facilities at risk of seawater inflow.

Facility Name	Facility Type	NPDES #	Overflow Weir Elev. (ft.) ↓	2014					2030					2050					2100								
				MHHW		1	10	50	100	MHHW		1	10	50	100	MHHW		1	10	50	100	MHHW		1	10	50	100
				9.15	11.55	11.92	12.21	12.35	9.37	11.77	12.14	12.43	12.57	9.69	12.09	12.46	12.75	12.89	11.18	13.58	13.95	14.14					
-	CSO	111D	10.3	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
WWPS72	WWPS	-	10.44	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
-	CSO	107	10.66	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
WWPS39	WWPS	88	10.78	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
WWPS36	WWPS	80	10.81	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
WWPS70	WWPS	94	10.94	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
WWPS73	WWPS	-	11.05	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
WWPS38	WWPS	83	11.54	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
WWPS71	WWPS	-	11.74	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
WWPS42	WWPS	91	11.78	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
WWPS75	WWPS	85	11.82	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
WWPS43	WWPS	59	11.83	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
-	CSO	70	11.94	○	○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●	●	●	
-	CSO	71A	11.96	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	
-	CSO	61	12.03	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	
WWPS77	WWPS	69	12.05	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	
-	CSO	64	12.07	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	
WWPS37	WWPS	72	12.1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	
WWPS30	WWPS	78	12.23	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	
-	CSO	-	15.89	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●	●	●	●	
WWPS22	WWPS	68A	16.72																								
-	CSO	60	16.9																								
WWPS1	WWPS	99	20.57																								
-	CSO	-	24.91																								
-	CSO	68B	30.27																								
-	CSO	95	32.66																								
-	CSO	62	37.18																								
		111H	169.14																								

● = severe inflow event (inflow lasting longer than one hour).

○ = moderate inflow event (inflow lasting < one hour).

MHHW=Mean Higher High Water.

NAVD88 = North American Vertical Datum of 1988.



Climate Resilience: Land Use

a mapping inventory of sea level rise

Prepared for Seattle Office of Sustainability & Environment by:

GGLO
architecture | interior design | landscape architecture | planning & urban design



Thank You

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Seattle Public Utilities
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