

Sea Level Rise – Report on the Olympia Experience

Point Hudson, Port Townsend, June 3, 2016

Perspectives of an (ex) elected official...

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Slide deck for posting – some slides from original presentation have been consolidated.

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Experience and Background

Elected Official (Mayor and Council Member City of Olympia) January 2010 through December 2015

Updated Shoreline Master Plan, Comprehensive Plan and major initiative for re-development of downtown Olympia.

Over 30 years in Community Development, including managing state's CDBG Program, Capital Programs and Housing Trust Fund.

State CD coordinator for federal and Presidentially declared disasters (floods, windstorms and landslides).

Work Related to Climate Change:

Founding member of Safe Energy Leadership Alliance

Enrolled Olympia in Compact of Mayors – committing to green house gas inventory and reductions

Attended COP21 and Local Leaders Summit in Paris

Currently teach part-time at the Evergreen State College

Context: Primary Issue is Climate Change

Impact on Municipal Governments of all sizes is direct and severe:

- ✓ Changes in hydrology [water sourcing, storm water management, slope stability]
- ✓ Increased fire danger along the interface of open lands and the built environment; and
- ✓ Sea Leve Rise

All of these issues will [and are] causing fiscal distress.

Climate change is irreversible – **IRREVERSABLE**
in terms of any *meaningful human time frame*.

Best available science tells us that no change in policy or practice will prevent us from small and large scale disruptive impacts.

Generally speaking
we seem to be under
the influence of the
“lemming effect” of
global development...

If we're going to run
with the lemmings
let's at least be
smart about it...

Sea Level Rise in Olympia – we've been at this since 1990...

PRELIMINARY ASSESSMENT OF
SEA LEVEL RISE IN
OLYMPIA, WASHINGTON:
TECHNICAL AND POLICY IMPLICATIONS

June, 1993

City of Olympia
Public Works Department
Policy and Program Development Division
Olympia, Washington

Olympia's Response to
The Challenge of Climate Change



Background Report and
Preliminary Recommendations



September 200

CITY OF OLYMPIA
ENGINEERED RESPONSE TO SEA LEVEL RISE



Underlying question:

How fast?

How high?

Ultimately – need to make choices that reflect highest value to the public.

The “two door” policy framework:

Damned if you do;
damned if you
don't...

Jefferson/Thurston:

Both *Commission* forms of government.

Rural/urban population distribution.

Population (2015 rounded) –

Jefferson: **30,700**

Thurston: **270,000**

Port Townsend/Olympia:

Both council/manager forms of government.

Both county seats.

Population (2015 rounded):

Port Townsend: **9,360**

Olympia: **52,000**

Similarities:

- Progressive politics
- Historic districts
- Water and recreation oriented
- Destination aspects to our downtowns
- Regional and state cultural centers
- Maritime waterfront heritage

Serious challenges related to SLR.

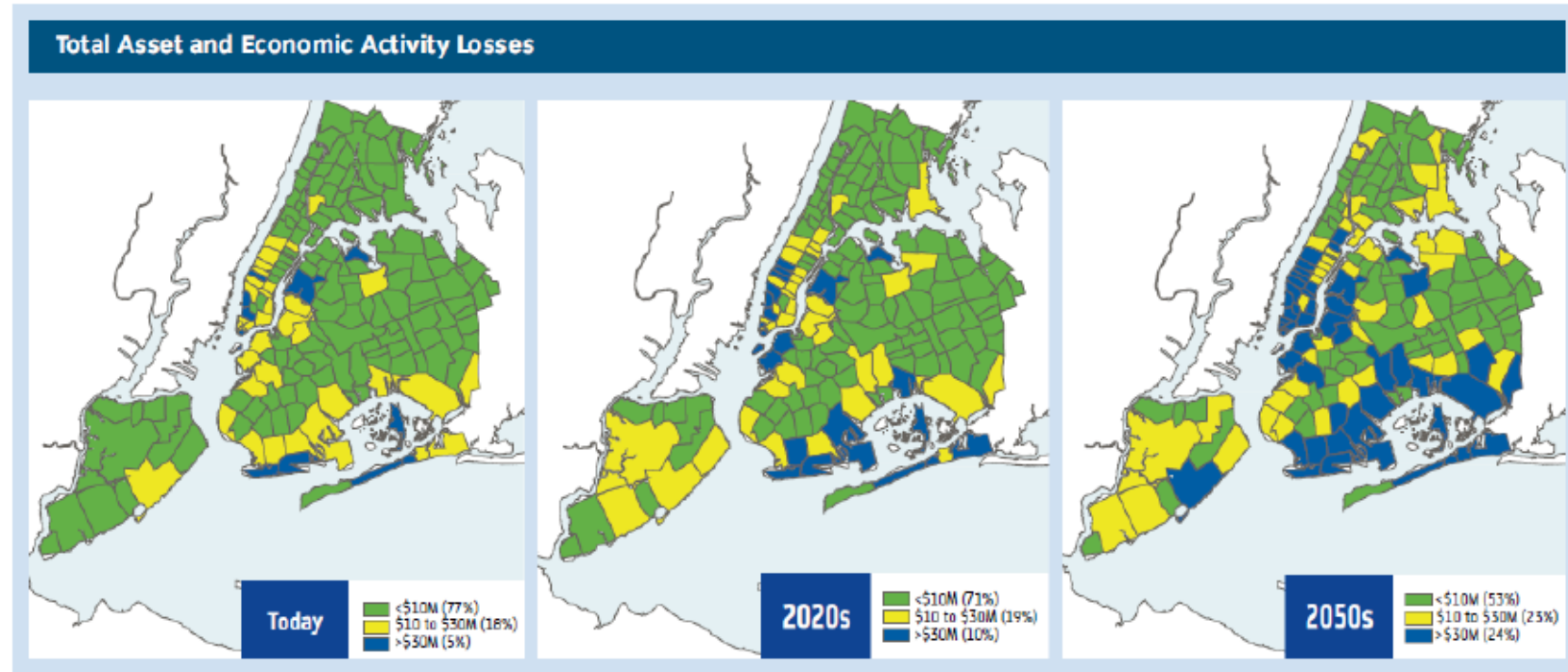
However – neither of us are New York...

Results

Annual Expected Loss by ZIP code

*A Stronger
More Resilient
New York* (page
35):

**Their modeling
predicted
expected
annual losses
of \$1.7 billion
today will grow
to \$4.4 billion
in current US
dollars by the
1950s.**



Source: A Stronger, More Resilient New York

- Current drivers of loss: east and south shores of Staten Island, southern Brooklyn and Queens, Brooklyn and Queens waterfront and southern Manhattan.
- Under future scenarios: Same geographic regions, plus northern Queens and the Bronx
- Under 2050s scenario: 400% increase in ZIP codes which have an AEL of USD 30 million

Open ended questions:

At city level:

How far will the public be willing to off-set an individual's or small area's cost of sea level rise?

At state and national level:

How far will the public be willing to spread the cost of an individual city's sea level rise challenge – a test of our federal system.

Small and moderate size cities need to work together in order to leverage influence for:

- Federal and State assistance
- Leverage financing
- Share best practices and exchange information

What I will cover very quickly:

History and current configuration of Olympia's downtown waterfront.

Our Sea Level Rise challenge – short and long term

Our assets and liabilities – and some options for managing them



Olympia's
Waterfront is a big
part of our identity
as a city.



**Olympia
1885
Painting by
Elisabeth
Kimbal**

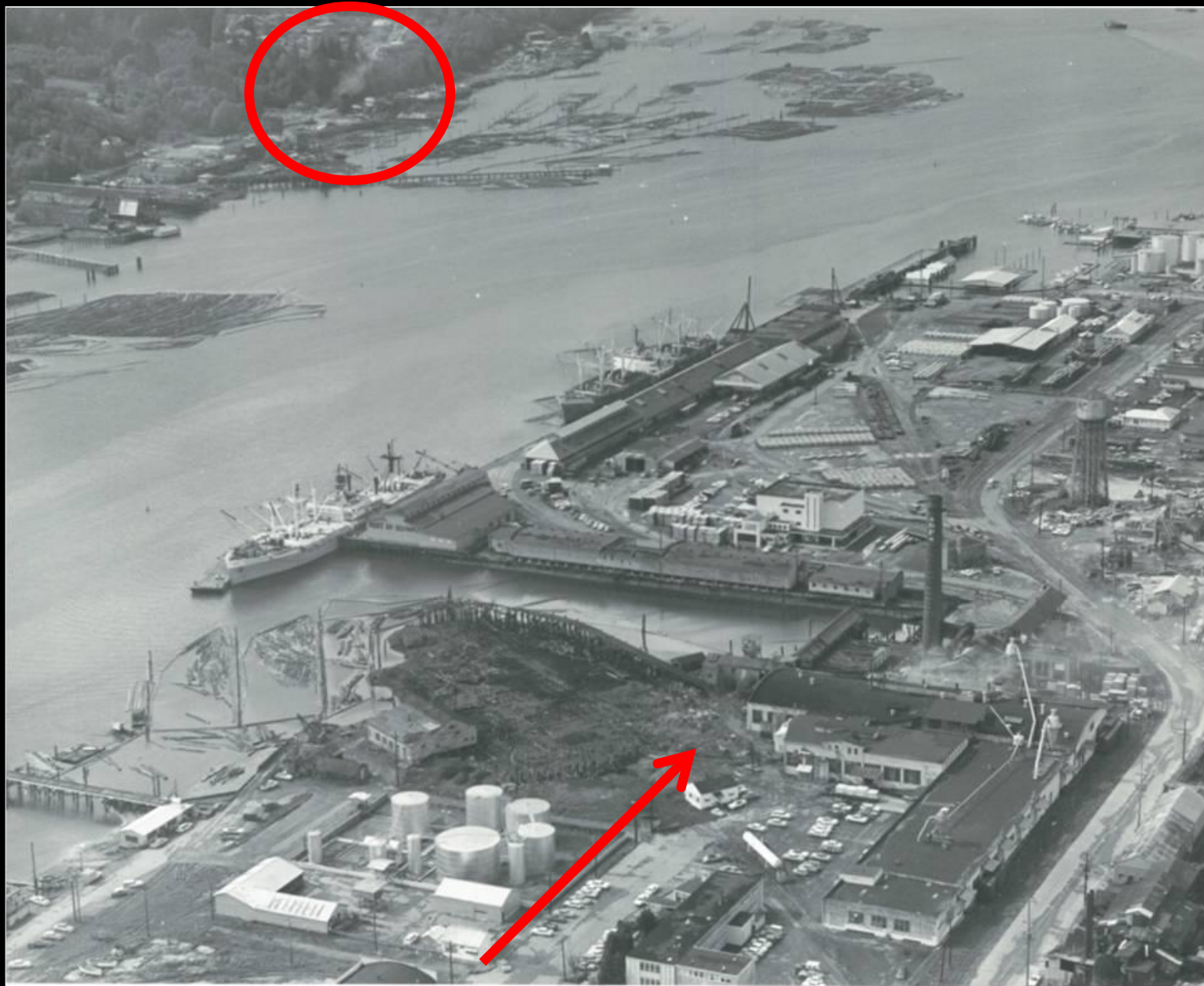
View Directly North



Courtesy Washington
State Historical Society



**60
Years
Later...
Olympia
- 1945**



Courtesy Olympia
Historical Society

**Olympia
- 2007**

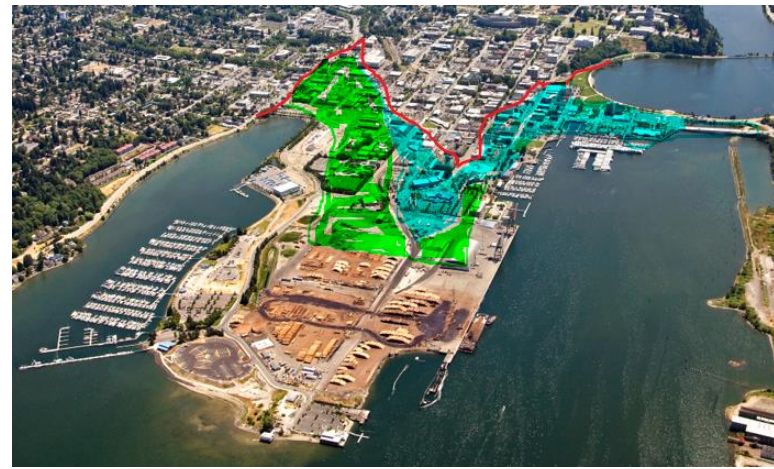


Courtesy
Port of
Olympia





1856
Original
shoreline



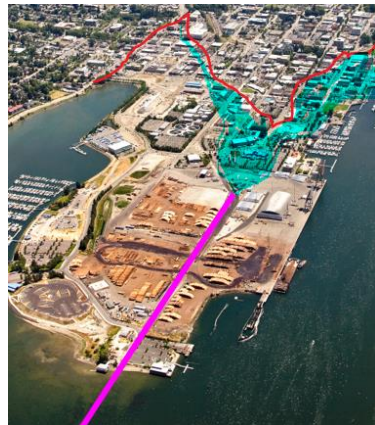
1910
Port
dredge and
expansion



1878
First
major fill
project



1935
Port
Expansion



1885
Addition
4,798'
Wharf

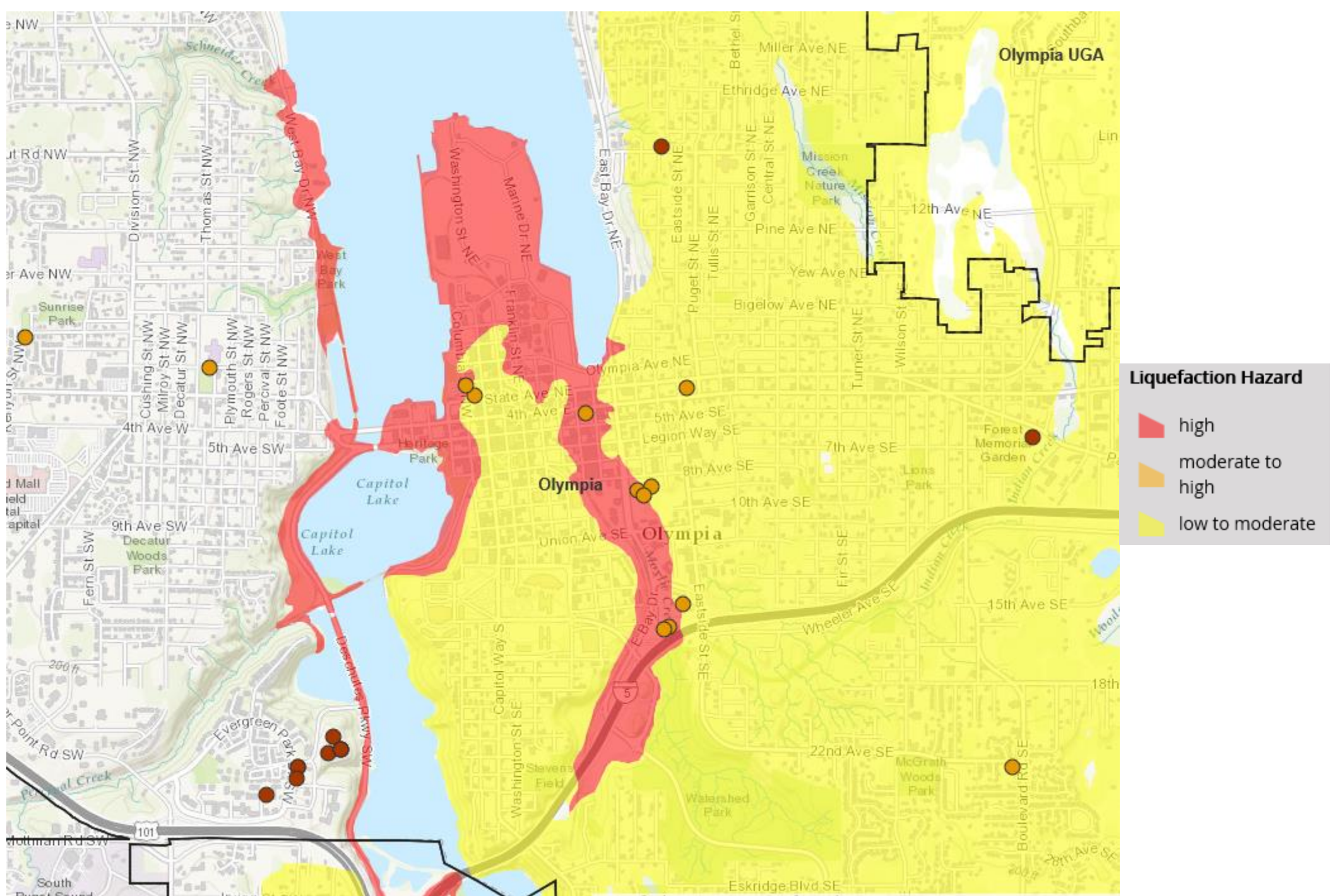


Port Today
Including
Swantown
Marina
Expansion

Seismic Event Hazard Areas

Liquefaction

Source:
Thurston Regional Planning Council



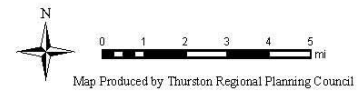


DISCLAIMER:
 This map is for general planning purposes only. Thurston Regional Planning Council makes no representation as to the accuracy or timeliness of the information for a particular purpose.

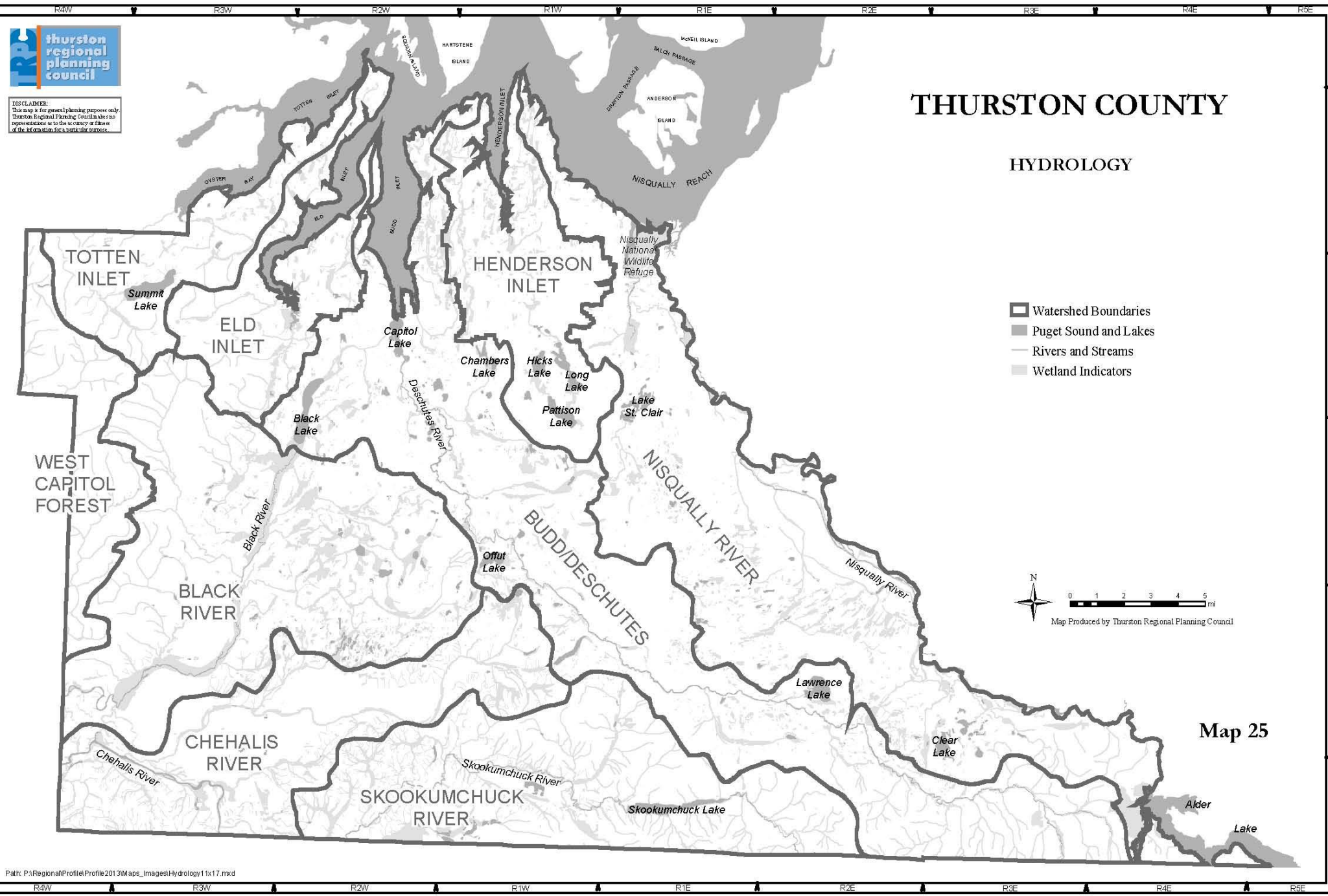
THURSTON COUNTY

HYDROLOGY

- Watershed Boundaries
- Puget Sound and Lakes
- Rivers and Streams
- Wetland Indicators



Map 25





Inundation of Budd Inlet and Capitol Lake Shorelines



Capitol Lake

Inundation of Budd Inlet and Capitol Lake Shorelines



Oyster House - December 17, 2012... 17.6 Foot Tide

Importance of Weather

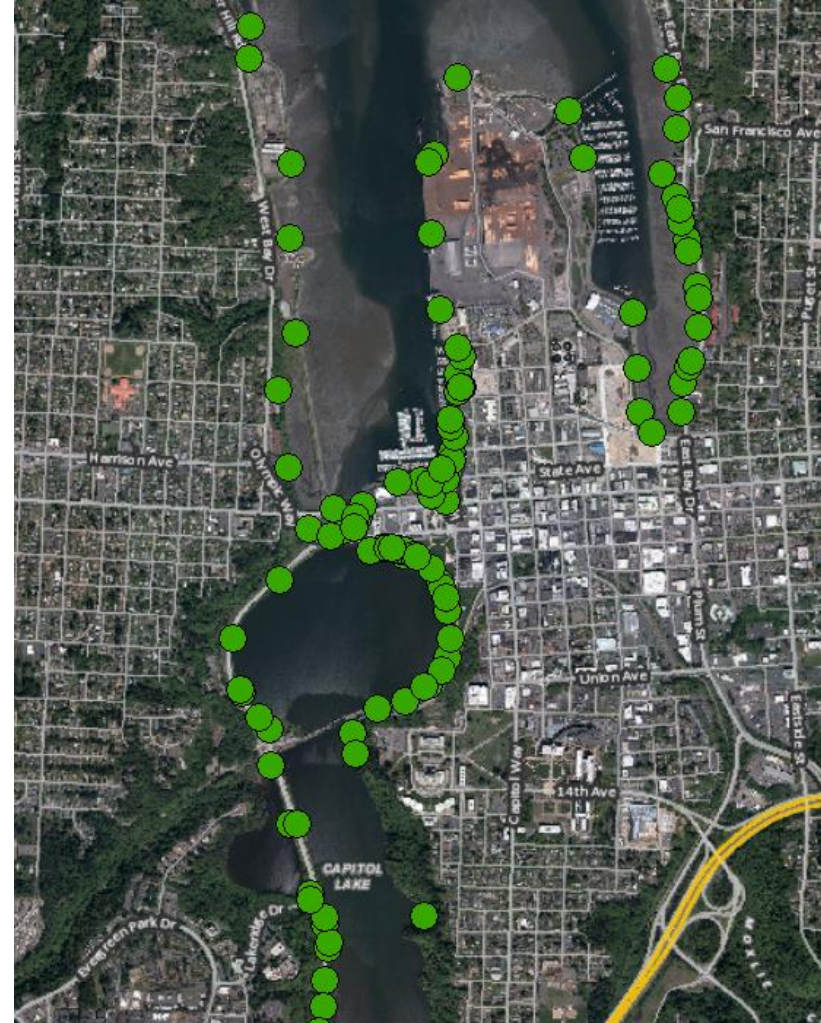
The tidal event on December 17th, 2012 was a good example of the impact of weather on water levels. On that day, due to the low atmospheric pressure, the actual tide was about a foot higher than the predicted tide. A decrease in atmospheric pressure of 1-inch mercury causes 13.6 inches of rise in tidal elevation.



Fiddlehead Marine - December 17, 2012

Pipe Backflow Flooding

- 112 known outfalls to Capitol Lake and Budd Inlet within the city limits



Backflow Prevention Devices



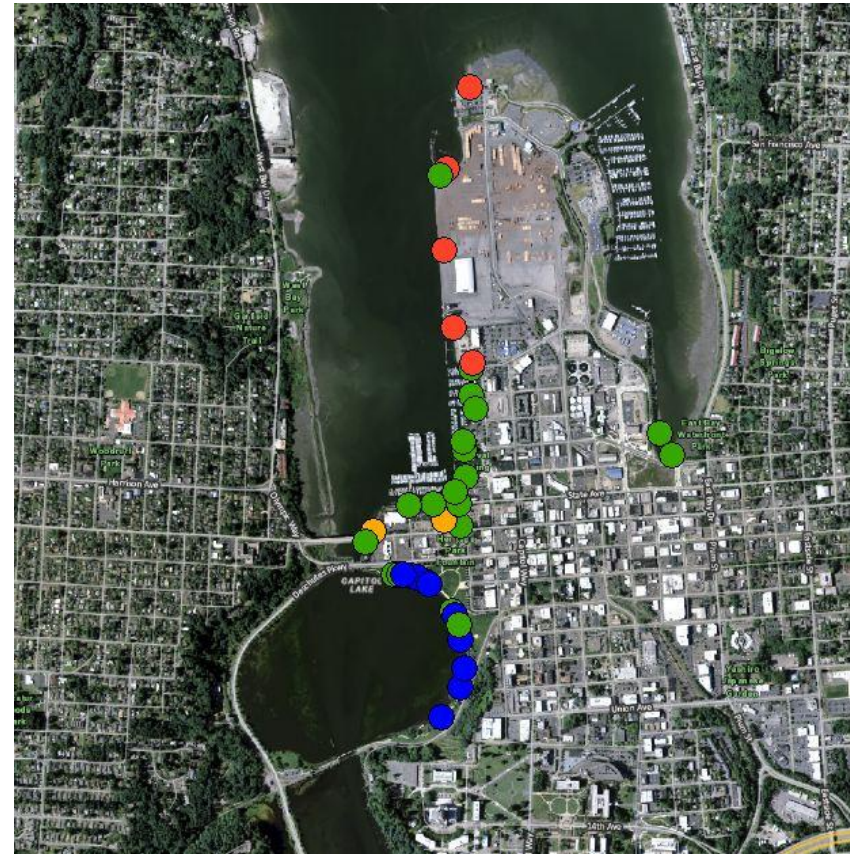
Flap tide gates & Gate valve



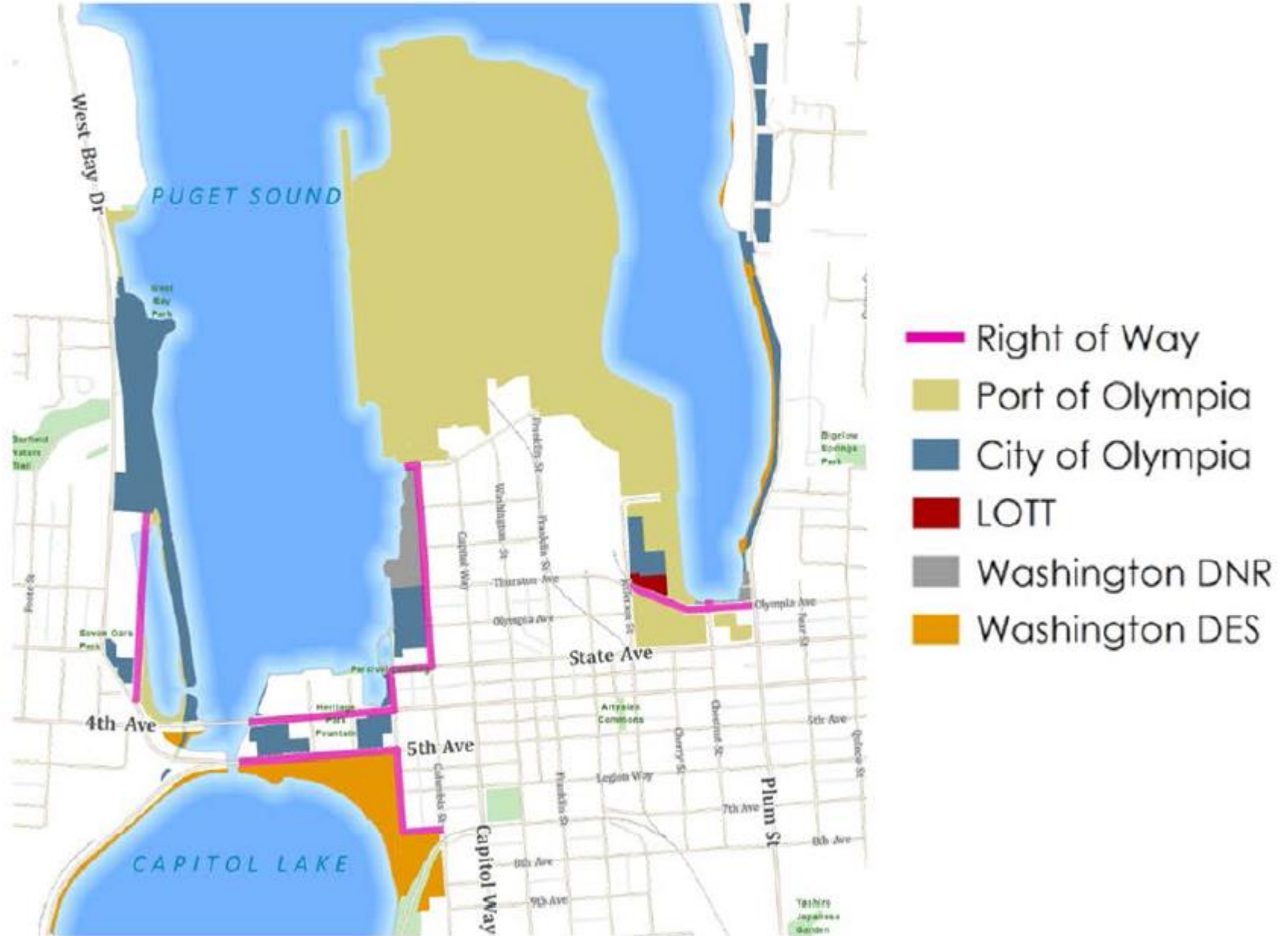
Pinch valve "duck bill"

Pipe Backflow Flooding

- Of those piped outfalls, 36 are susceptible to backflow flooding
- 20 **City**-owned
- 9 **State**-owned
- 5 **Port**-owned
- 2 **Privately**-owned

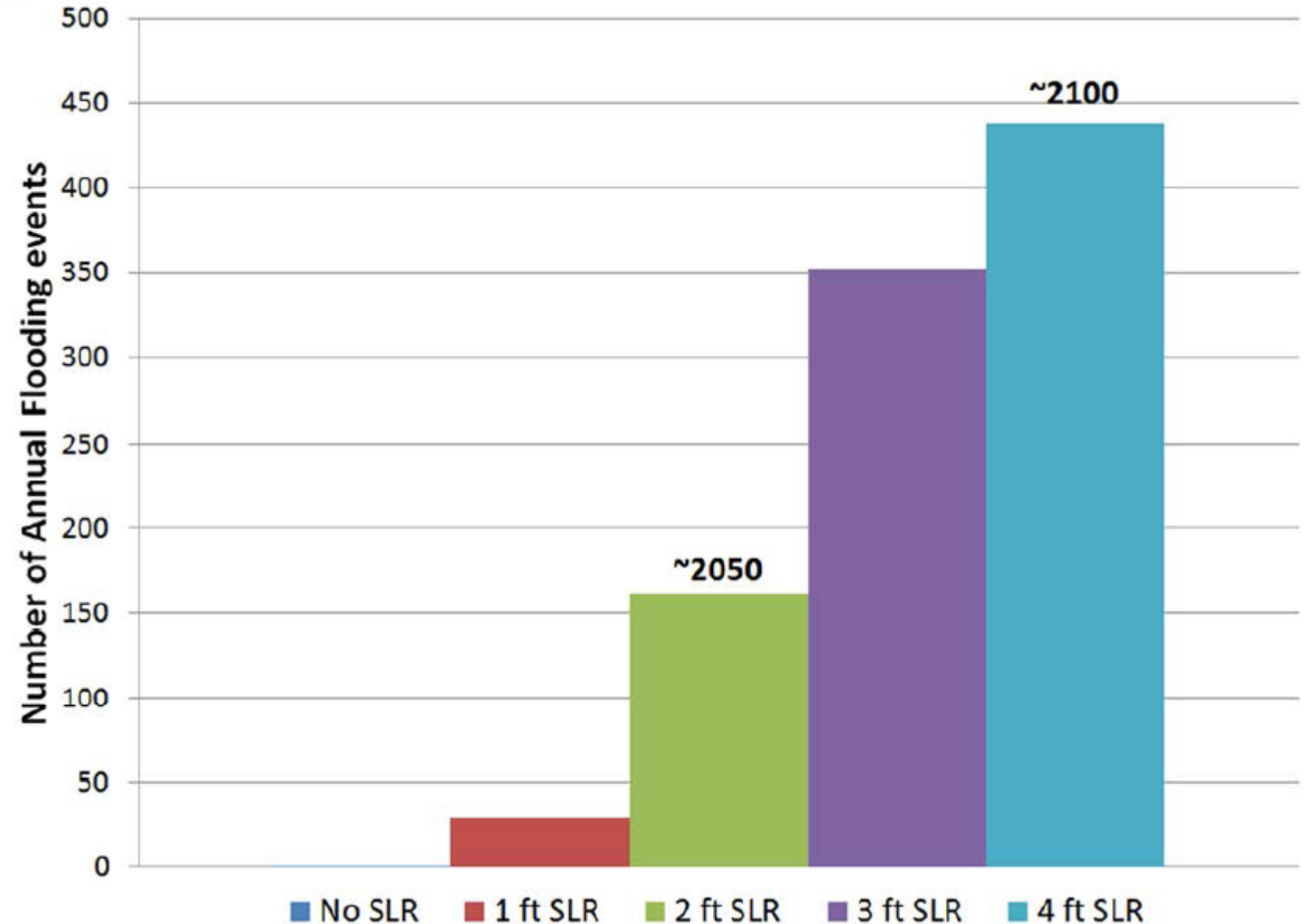


Downtown Olympia Shoreline Ownership



Annual Nuisance Flooding – City of Olympia

Currently, we only see nuisance flooding once or twice a year. As sea levels rise, so will the frequency of flooding.



City Council Policy Direction in 2010:

Protect downtown.

Understand the implications of 50 inches of sea level rise.

Use opportunities for new public and private investments to prepare for sea rise.

Seek opportunities to maintain control of valuable shoreline.

Changing **Conditions** (today we get new information almost weekly)

Persistent question is not “if” but how FAST and how HIGH.

Recent developments suggest sea level rise is moving much faster than current commonly used standards.

New attention is being given to the impact of thermal expansion of ocean water and decline of the Greenland and Antarctic ice sheets – the leading conclusions being that both have been underestimated.

Subsidence – or a sinking/lowering of Olympia’s elevation due to local geological factors is also exacerbating sea level rise for the city.

Frequency of Storm *Events*

The severity of storm events are determined by how factors align and influence each other.

Conditions are influencing severity and frequency of events – leading to increased frequency and severity (El Nino and La Nina effects).

Given *current* conditions, it's possible for Olympia's downtown to be inundated due to a low pressure system this year – it's just a matter of aligning low pressure, storm surge and a high tide.

The “intercom directive”: you are always on mic... Elected officials are often hyper-aware of what they say.

- Important to not overreact.
- Test assumptions.
- Take your time with messaging.
- Can't afford to lose citizen confidence, investor confidence.

The “intercom directive”
is often exacerbated by
the “rowing in circles”
phenomena:

- Uncoordinated and conflicting data.
- No clear goal.
- Competing visions of success.

Margaret Davidson, NOAA's senior advisor for coastal inundation and resilience science and services, and Michael Angelina, executive director of the Academy of Risk Management and Insurance, offered their take on climate change data in a conference session titled "Environmental Intelligence: Quantifying the Risks of Climate Change."



Davidson said recent data that has been collected but has yet to be made official indicates sea levels could rise by roughly 3 meters or 9 feet by 2050-2060, far higher and quicker than current projections. Until now most projections have warned of sea

level rise of up to 4 feet by 2100.

These new findings will likely be released in the latest sets of reports on climate change due out in the next few years.

Source: Insurance Journal

RIMS 2016: Sea Level Rise Will Be Worse and Come Sooner By Don Jergler | April 12, 2016

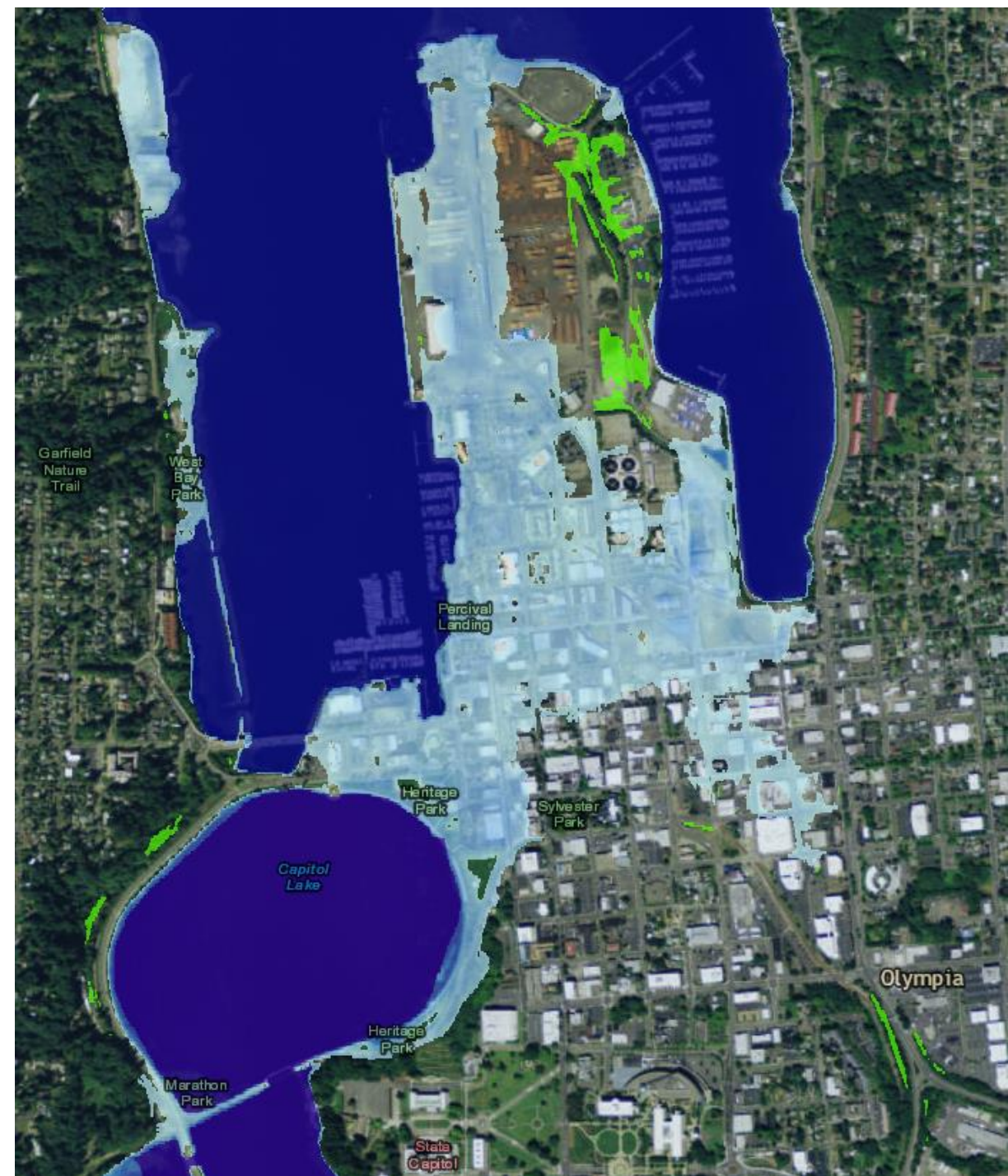
6' SLR

Source:

<https://coast.noaa.gov/slr/>

3' lower than then what was shared as a likely height by 2050 – 2060.

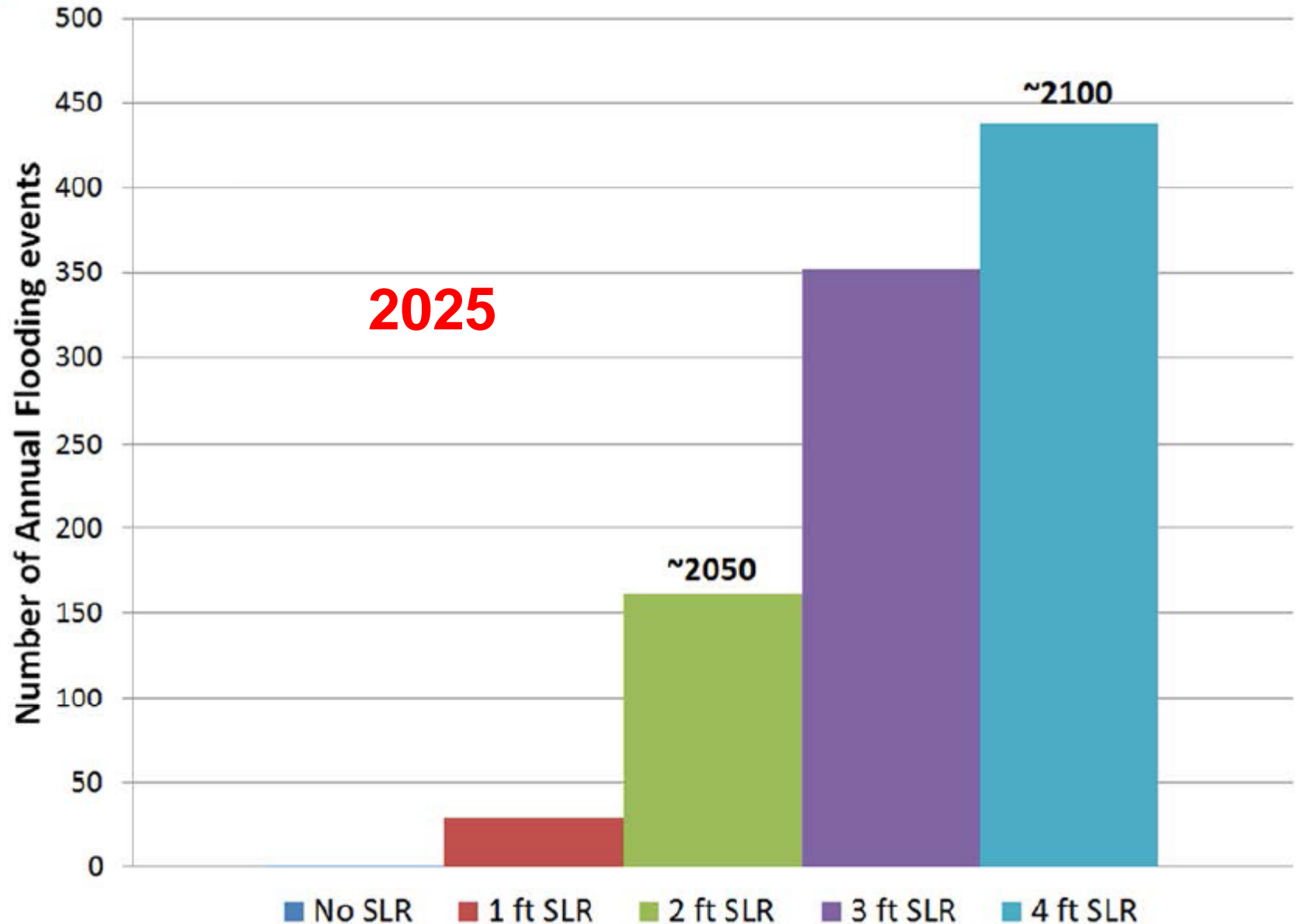
Let's all do the math on that... Regular inundation events could start in the next decade.



Annual Nuisance Flooding – City of Olympia

2040

If recent statements from NOAA and the Academy of Risk Management are correct, current estimates for flooding will have to be revised.

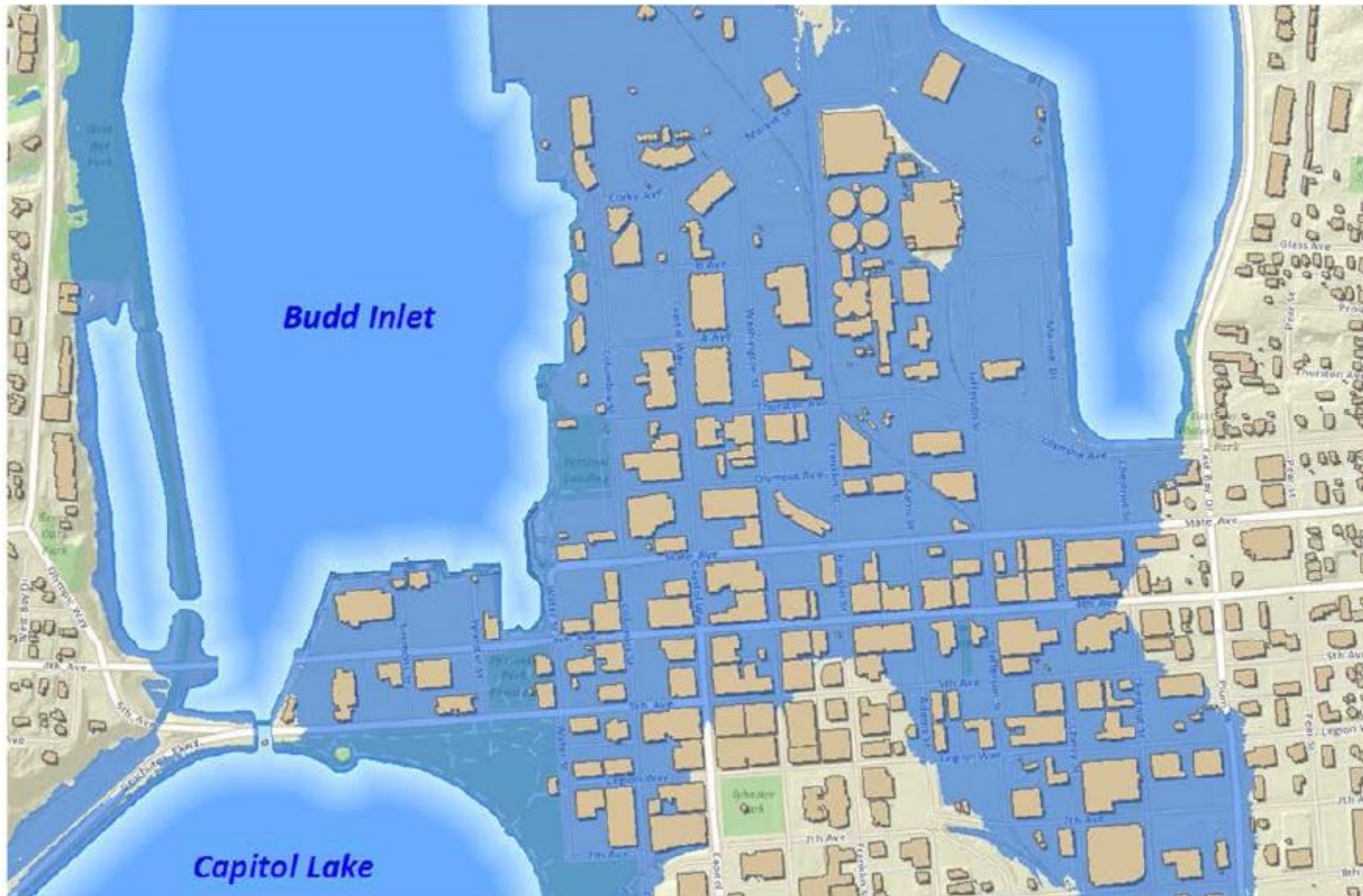


Ten Years is a realistic time frame for a major public works project - from the point when a policy goal is set to completion.

Present data and analysis practices are not giving us the time we need to initiate appropriate action.

Critical to set clear goals that are achievable and forward thinking – most important it's critical to ***start – even in the absences of complete agreement on data.***

4' SLR 100 Year Flood Extents (Using City of Olympia data)



Assets (and liabilities):

Public asset inventory is a critical part of determining strategic visions for how to meet climate change challenges.

We need strong partnerships to meet the challenge of climate change – knowing who and what is at risk is part of building partnerships.

Need to look at all the different ways to quantify public value of an area threatened by flooding.

4' SLR 100 Year FEMA Flood Extents

Regional waste-water treatment Replacement value estimated at \$1.5 billion or more.

Senior housing.

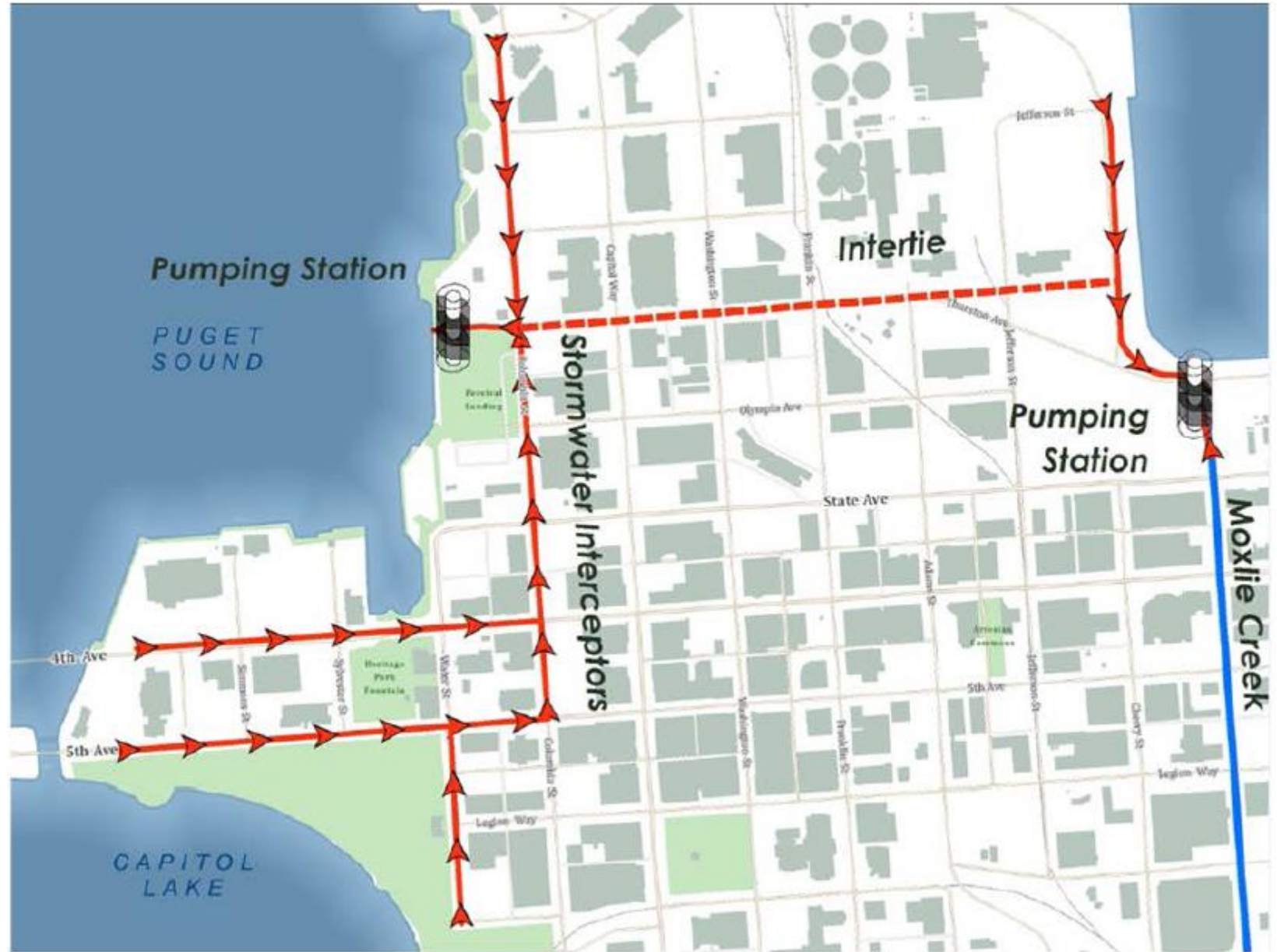
Olympia Center

East/West transportation connection.

City Hall



Initial critical investments by the City of Olympia are likely in the \$60 million range.

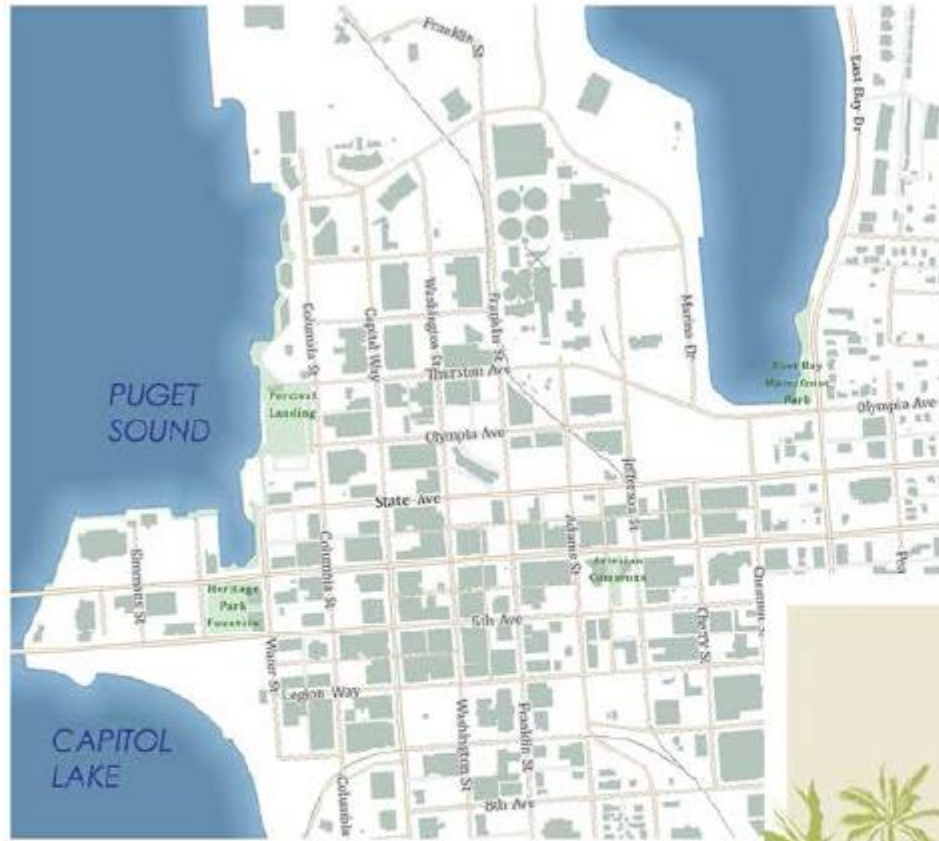


Heritage Park Elevated Landscape

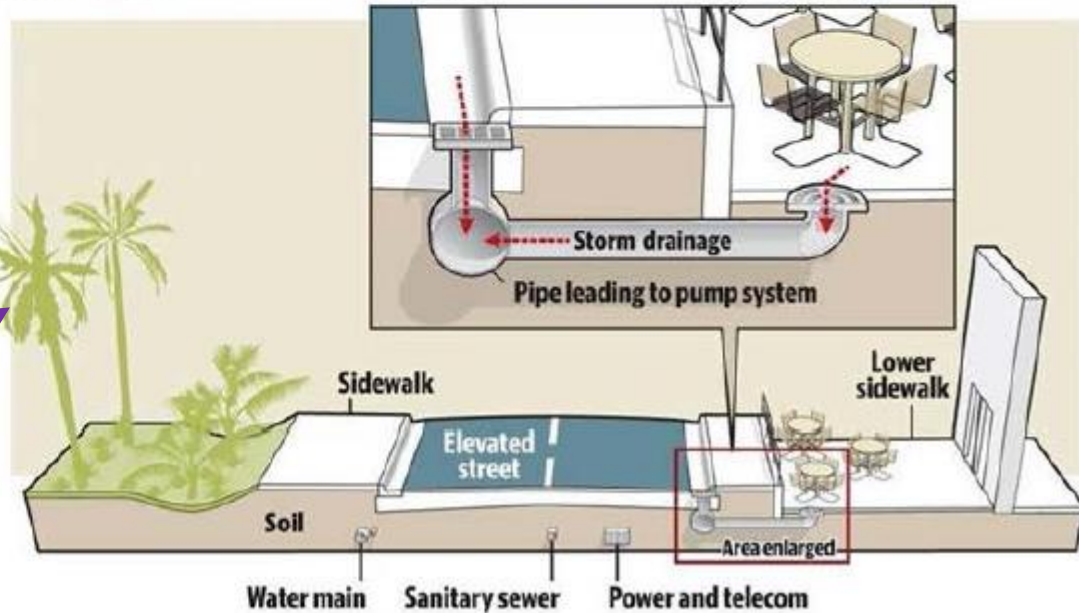
Partnerships with the state are likely critical in order to successfully protect downtown waterfront assets.



Elevated Roadways



Olympia Date Palms
[new varietal]



Olympia's Near Term Plans:

- Perform public outreach in concert with Downtown Strategy
- Revise code to establish minimum floor elevations for downtown structures – staff recommend at least 2 feet above current flood elevations.
- Engage Utility Advisory Committee to scope Sea Level Rise Program Plan.
- Actively develop inter-agency partnerships.
- Work to identify financial needs and funding sources.
- Need to better understand financial needs and identify funding sources for a Sea Level Rise Program.
- Funding will need to be substantial and should be equitable.
- At this time staff estimates the cost of measures to protect downtown from 50” of sea level rise to be in excess of \$60 million.

Reward creativity...

revisit old assumptions of city planning
– work with the water – include it in city
landforms.

Sea-Level Rise:
Re-imagining the Urban Edge

A preliminary investigation of the effect of
future sea-level rise on the design of our
built environment.

Olympia, Washington

by

Brenda Lorene Snyder

This thesis is submitted in partial satisfaction of the
requirements for the degree of Master of Urban Design,
Graduate Division of the University of California, Berkeley.

Committee in Charge:
Peter Bosselmann, Chair
Louise Mozingo
Rob Thayer

Fall 2010

Figure 7.7 Proposed storm surge inundation



Source: Brenda Lorene Snyder, Thesis

Figure 7.9 Master plan



Zone 2 and 3: The Uplands

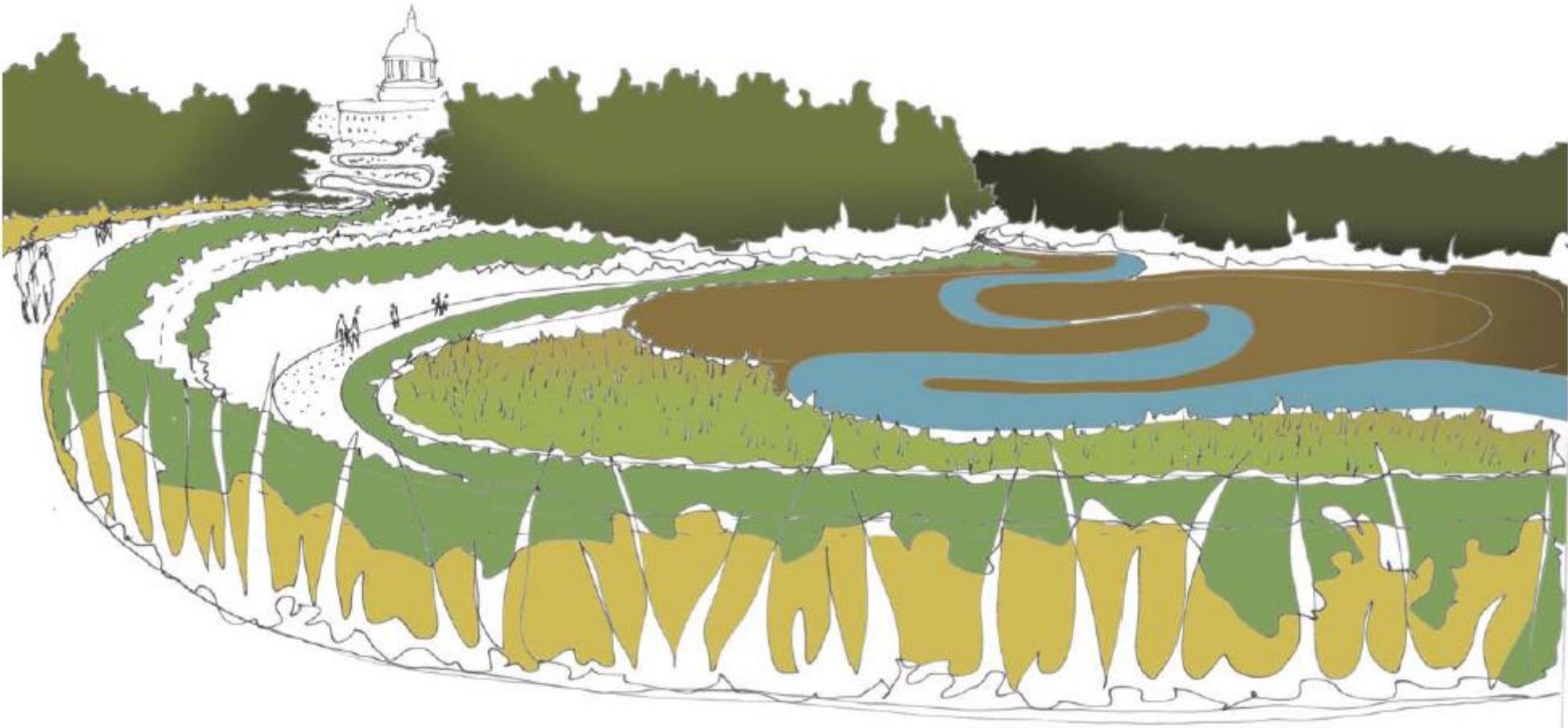


Figure 7.28 View south along Capitol Crest Promenade, Capitol Lake Park

Zone 5: The Heart



Figure 7.37 Aqua Block alleyway stormwater channel

Source: Brenda Lorene Snyder, Thesis

Figure 7.39 Zone 5 plan in detail



Be adaptive – expect to be challenged... Always look for the opportunities.

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