# Olympia Sea Level Rise Response Update

## Olympia Land Use and Environment Committee
## November 2, 2023

LOTT Clean Water Alliance

Olympia

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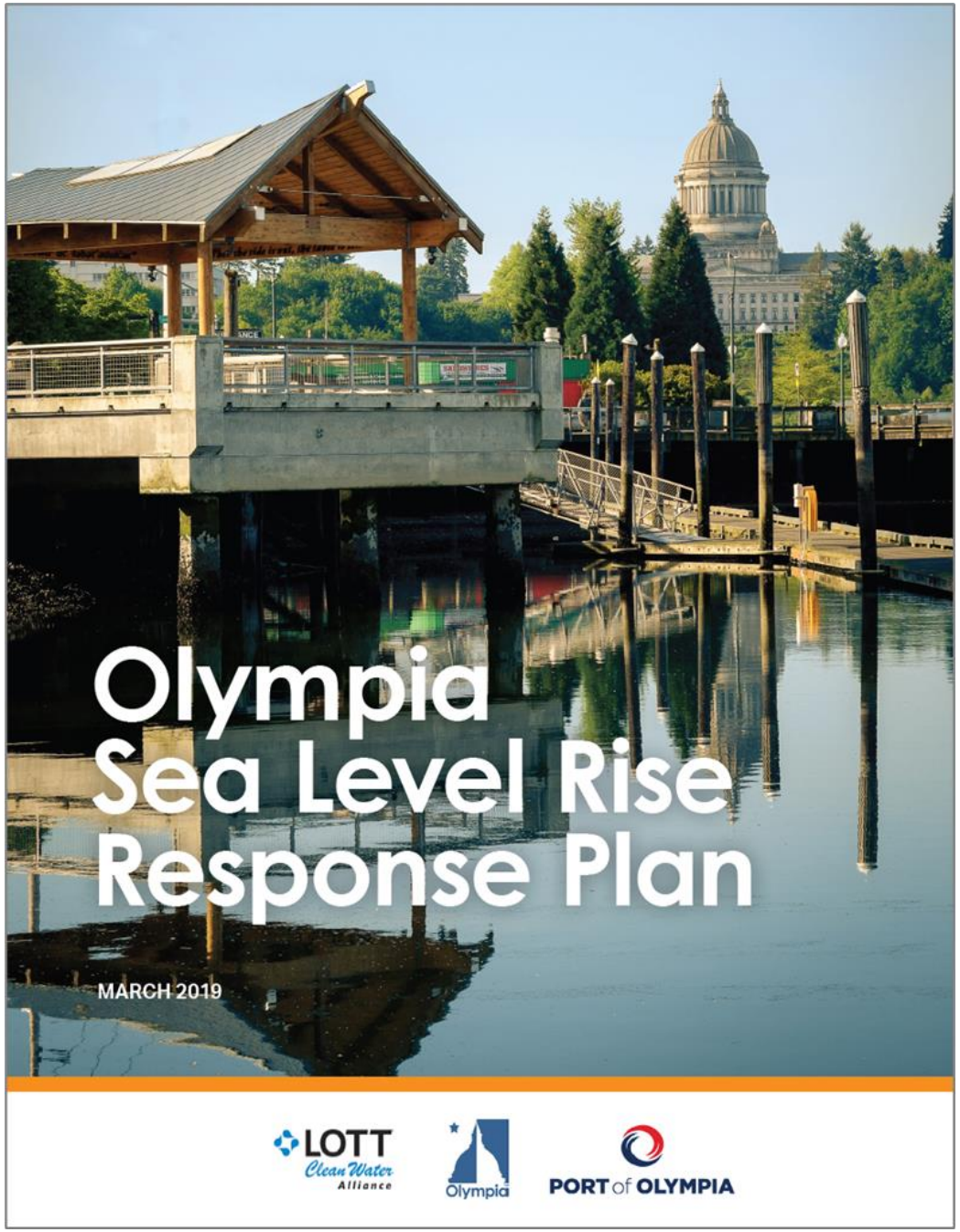
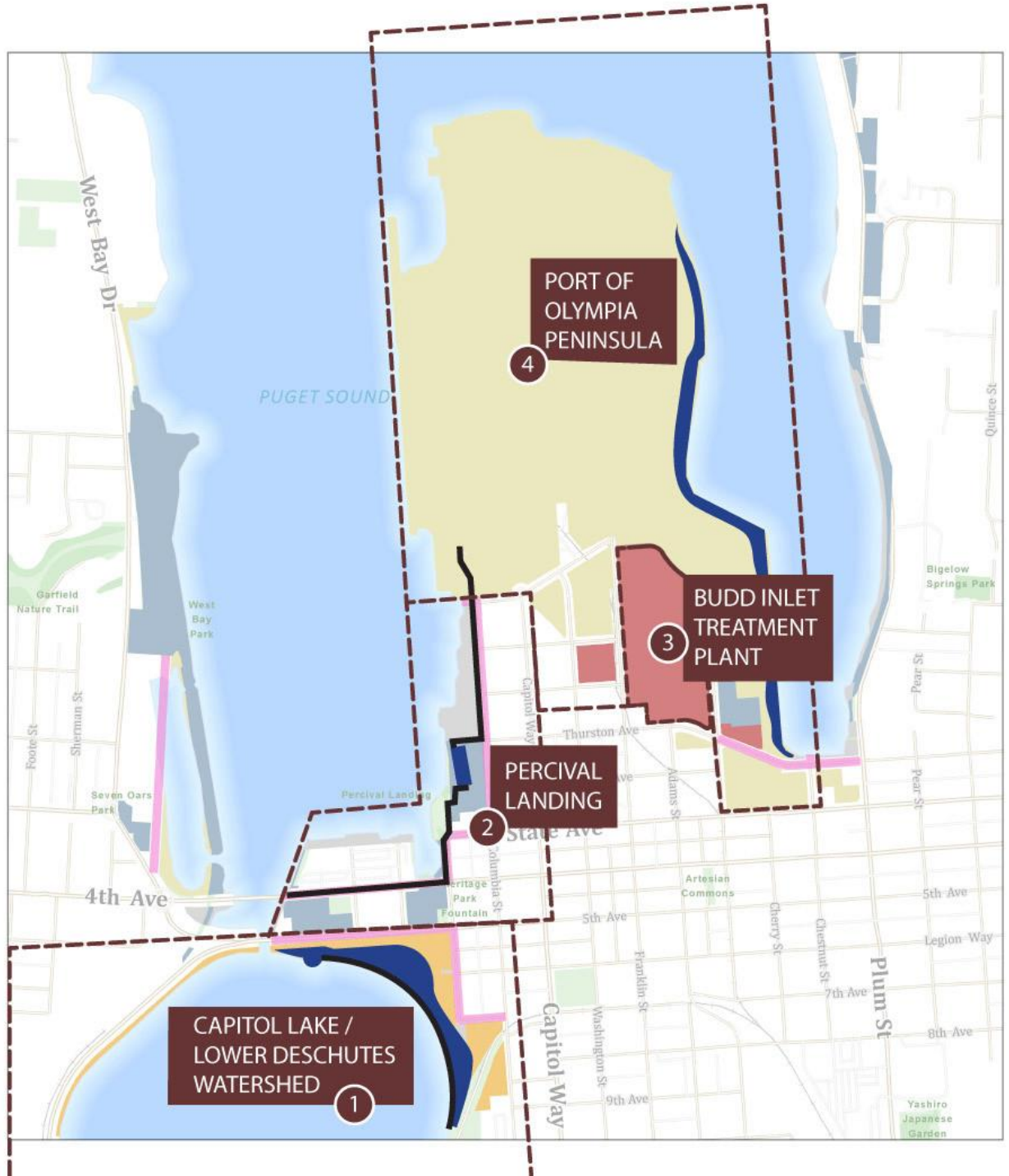
# Planning Goal

Develop a formal community plan that prioritizes strategies and investments for best responding to sea rise, while protecting downtown's economic, social and environmental values.



# Planning Context

The project area encompasses the downtown peninsula from the eastern shoreline of the 4th Avenue Bridge in West Bay to the intersection of East Bay Drive and Olympia Avenue in East Bay, including Capitol Lake, the Port, and the Budd Inlet Treatment Plant.



# Planning Approach

The plan identifies:

- SLR Science and Projections
- Vulnerability and Risks
- Adaptation Strategies
- Needed Actions and Next Steps
- Estimated Costs and Resources
- Implementation Schedules

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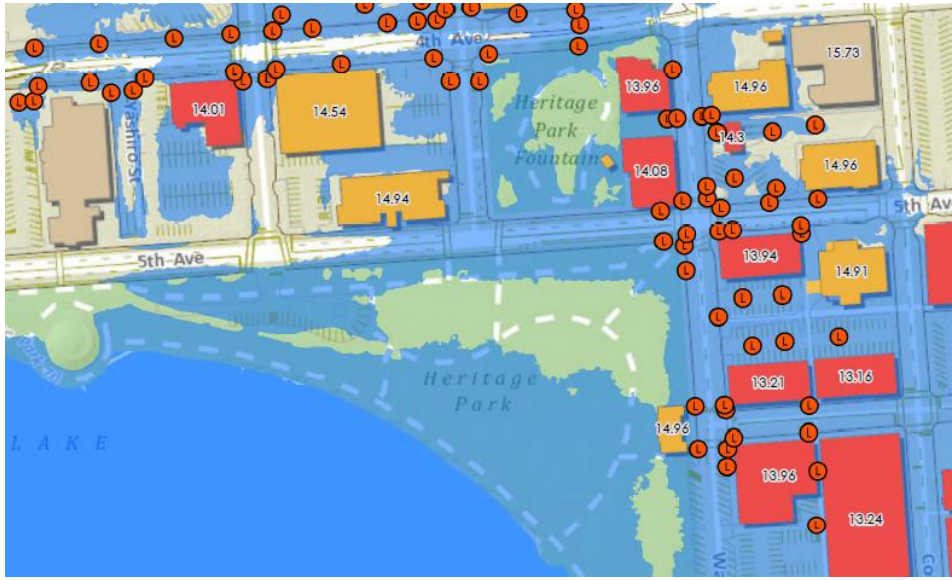
# Physical Strategies

Tailored to focus areas:

- Capitol Lake / Lower Deschutes Watershed
- Percival Landing and Isthmus
- Port of Olympia Peninsula
- Budd Inlet Treatment Plant and Combined Sewer System

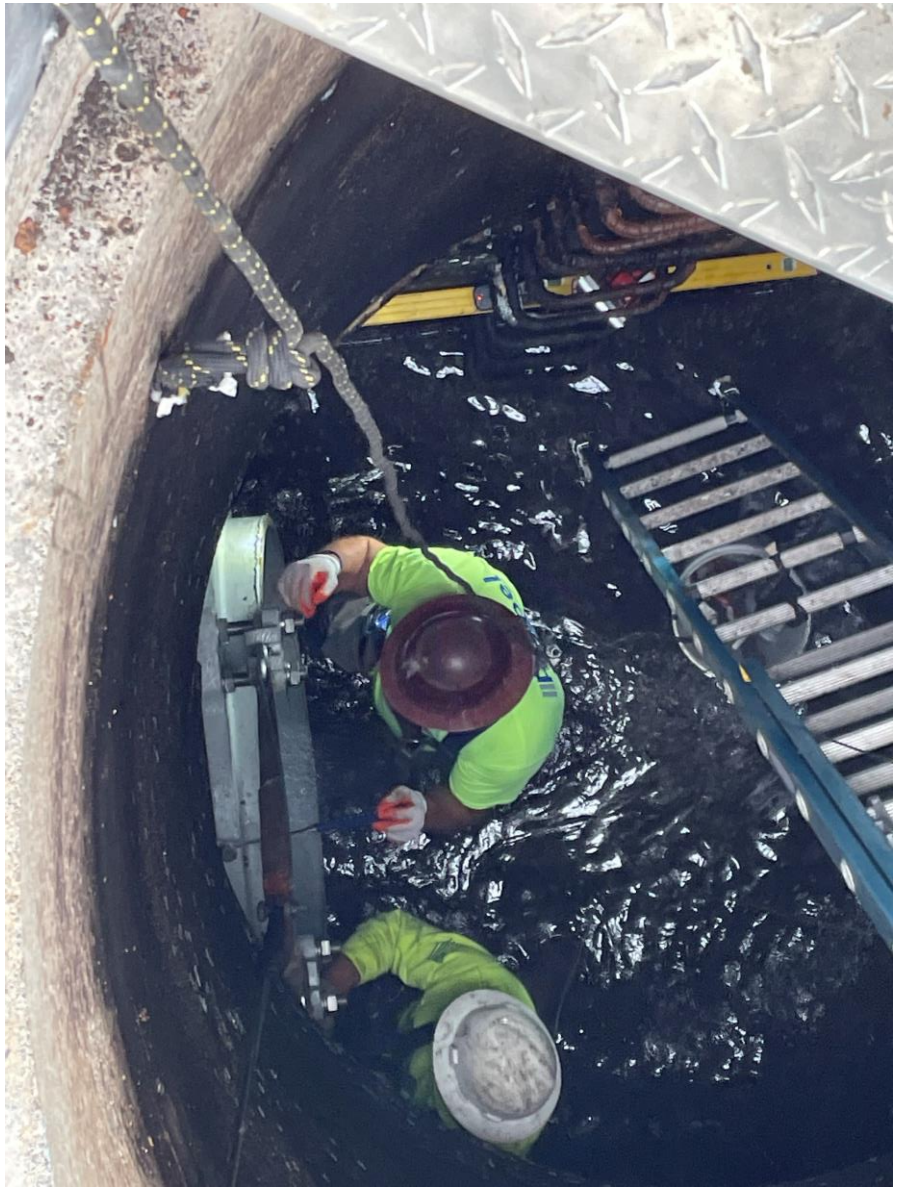
# Operational Strategies

- Operations and maintenance
- Coordinated emergency response
- Information sharing



# Tide Gates

- Tide gates allow water to flow in only one direction – out of the stormwater pipe.
- Olympia's Stormwater Utility completed installation of 22 tide gates in 2021.



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# Informational Strategies

- Refine sea level rise and flood monitoring – local tide gage
- Monitor land subsidence
- Initiate groundwater study
- Understand future precipitation projections
- Model flow rates for stormwater outfalls and combined sewer system

# Governance Strategies

- **Collaboration** - Develop governance structure
- **Policy** – Update planning documents, flood ordinance and development codes
- **Finance** - Investigate and implement long-term public financing mechanisms
- **Education and outreach –** Community and regional strategies

# SLR Collaborative
# 2023 Workplan and Budget

| Work Item | Total Cost | Olympia (50%) | LOTT (25%) | Port (25%) |
|---|---|---|---|---|
| Land Subsidence Survey | $50,000 | $25,000 | $12,500 | $12,500 |
| Groundwater Study | $100,000 | $50,000 | $25,000 | $25,000 |
| Public Financing and Governance | $50,000 | $25,000 | $12,500 | $12,500 |
| Tide Gauge Installation | $10,000 | $10,000 | - | - |
| **Total** | **$210,000** | **$110,000** | **$50,000** | **$50,000** |

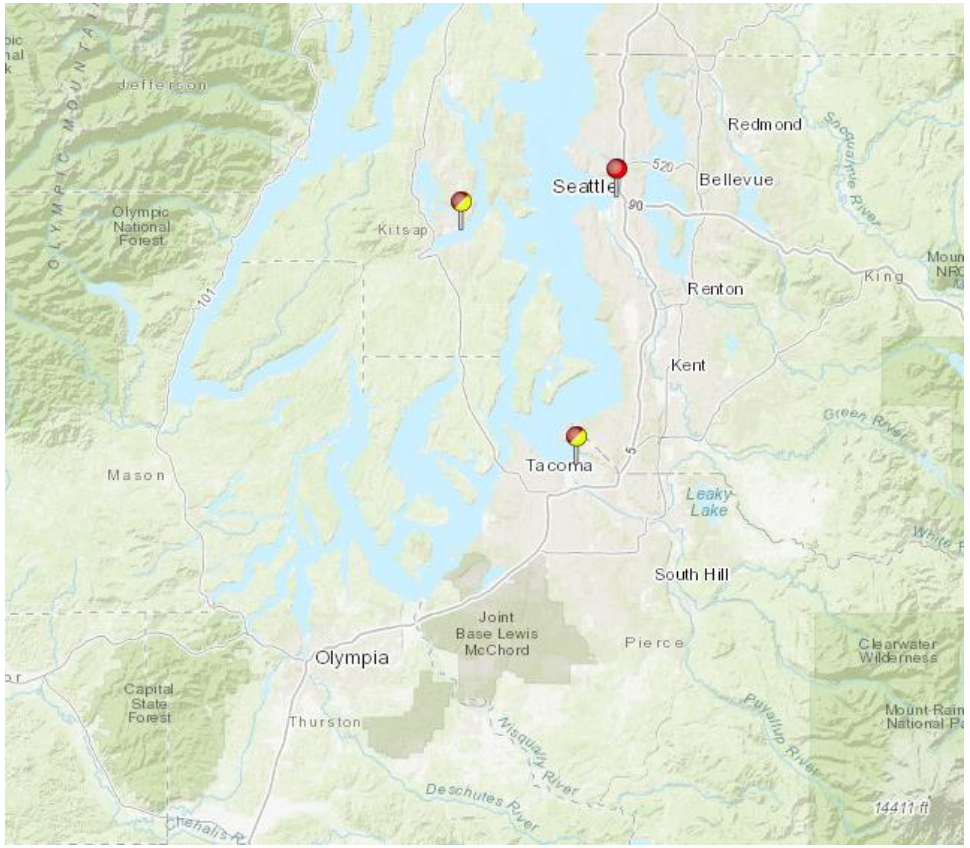
# Tide Gauge Installation

**Project Lead**: City of Olympia

**Budget**: $10,000

## Project Description

Install a tide gauge at the Port Marine Terminal to improve monitoring of local water level conditions.




NOAA Water Level Stations
https://tidesandcurrents.noaa.gov/map/

# Land Subsidence Survey

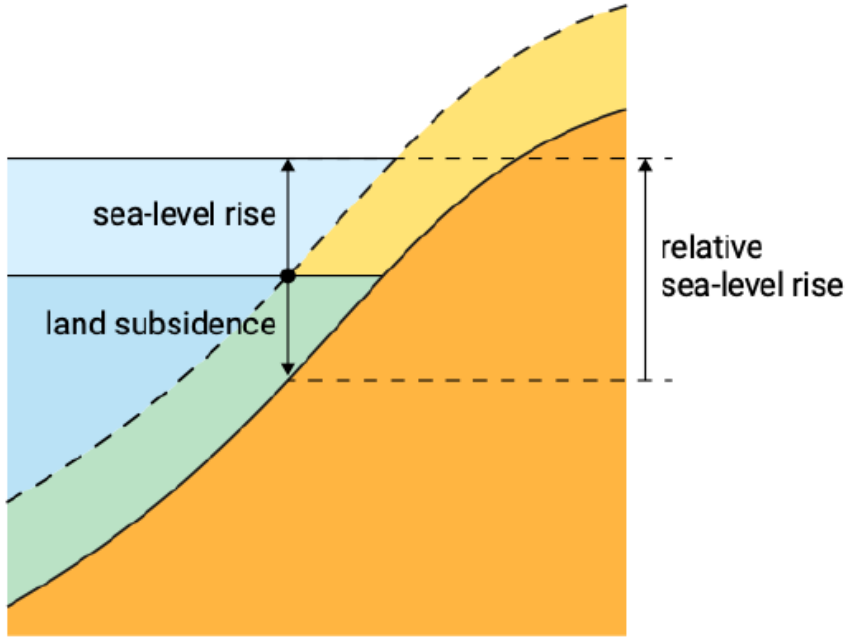
**Project Lead**: Port of Olympia

**Budget**: $50,000

## Project Description

Hire a consultant to conduct a satellite land subsidence survey:

- Interferometric Synthetic Aperture Radar (InSAR)
- Requires 3 years of continued monitoring is needed for reliable results.



# Groundwater Study

**Project Lead**: LOTT Clean Water Alliance

**Budget**: $100,000

## Project Description

Conduct a hydrogeological investigation to evaluate tidal influence on groundwater. Assessment the potential impact of SLR on:

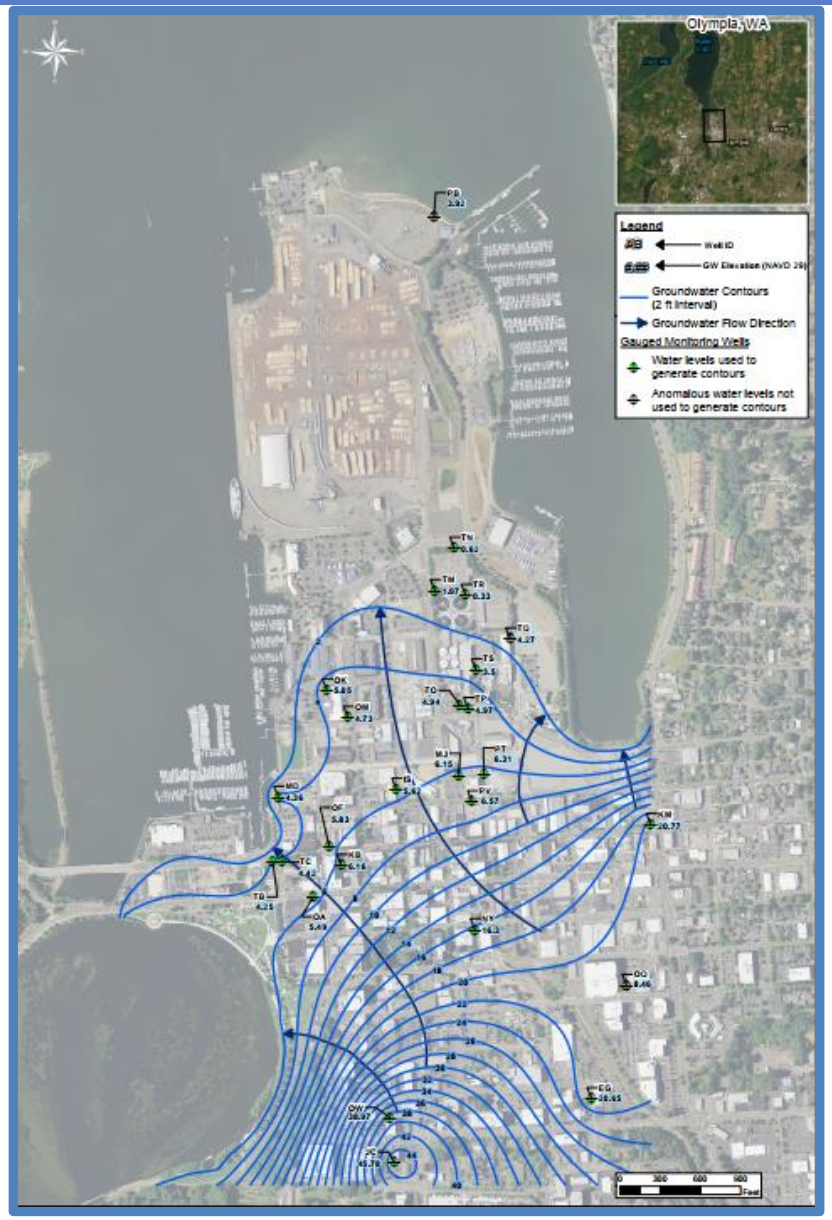
- Groundwater elevations
- Proposed adaptation measures
- Buried storm and sewer lines
- Surface water ponding due to daylighting groundwater

# Groundwater Evaluation Overview: Three Phases

- Phase 1: Evaluation of existing groundwater information sources and identifying data gaps – Complete
  - $55,884
- Phase 2: Filling data gaps – Evaluated/ Not needed
  - $0
- Phase 3: SLR groundwater evaluation – Spring- Fall 2024
  - Estimated $50,000

# Phase 1

- Developed GIS database of shallow groundwater well locations
- Surveyed and measured wells for elevation, depth to groundwater, and salinity
- Gauged shoreline wells during low and high tide to gather initial tidal influence data
- Generated groundwater contour and groundwater salinity maps



# Phase 3

- Conduct additional groundwater measurement event at end of the wet season
- Develop groundwater model for SLR evaluation using BITP model as base
- Evaluate groundwater rise due to SLR by increasing the sea level in the model
- Generate report of findings

# Public Financing Mechanisms

**Project Lead**: City of Olympia

**Budget**: $50,000

## Project Description

Hire a financial consultant to:

- Investigate funding opportunities (federal, state and private grants) for design and construction of Plan strategies.
- Identify potential needed legislative actions by the State to support sea level rise planning and strategy implementation.
- Evaluate how costs are to be shared amongst Collaborative Members and the community.

# SLR Collaborative
# 2024 Workplan and Budget

| Work Item | Total Cost | Olympia (50%) | LOTT (25%) | Port (25%) |
|---|---|---|---|---|
| Land Subsidence Survey (Year 2) | $50,000 | $25,000 | $12,500 | $12,500 |
| Groundwater Study (Phase 3) | $50,000 | $25,000 | $12,500 | $12,500 |
| Public Financing and Governance (Phase 2) | $50,000 | $25,000 | $12,500 | $12,500 |
| Administrative Support | $30,000 | $15,000* | $7,500 | $7,500 |
| **Total** | **$180,000** | **$90,000** | **$45,000** | **$45,000** |

* In-kind contribution for staff time administer and facilitate the Collaborative

# 2024 Workplan and Budget

The proposed 2024 workplan includes several Phase 2 and Phase 3 work items to continue implementation of projects started in 2023.

- **Land Subsidence Survey** - Continue satellite land subsidence survey to monitor land subsidence. Three years of continued monitoring is needed for reliable results.
- **Groundwater Study** - Conduct a groundwater gauging event at the end of the wet season and generate a groundwater model to evaluate sea level rise impacts on groundwater levels.
- **Public Financing Committee** - Facilitate ad-hoc financial committee to evaluate potential financing mechanisms identified during Phase 1.

# Adaptation Strategies Status Update

Review and provide a status update on the potential adaptation strategies outlined in Table 11 of the SLR Plan.

| Strategy Type / ID | Strategy | Lead Agency | Resources | Time-frame |
|---|---|---|---|---|
| **Physical Strategies** | | | | |
| **Capitol Lake / Lower Deschutes Watershed** | | | | |
| ***Near-Term Strategies (up to 6 inches of sea level rise)*** | | | | |
| CL-1 | Install backflow prevention on stormwater outfalls and other key pipes | City of Olympia Public Works | Existing Staff $50K | 2019-2024 |
| CL-2 | Minor landscaping at key locations to raise ground elevations | DES | $250K | 2019-2024 |
| ***Mid-Term Strategies (up to 24 inches of sea level rise)*** | | | | |
| CL-3a | Construct new wall: Construct a new flood-wall at elevation 17 feet and elevate Capitol Lake path along the shoreline | DES | $4M - $6M | 2025-2050 |
| CL-3b | Construct new berm: Construct a berm at elevation 17 feet within Heritage Park and relocate Capitol Lake path inland to a higher elevation | DES | $3M - $5M | 2025-2050 |
| CL-4 | Install flood gate across railroad and Pow-erhouse Road (required with wall and berm options) | City of Olympia Public Works | $200K - $300K | 2025-2050 |
| ***Long-Term Strategies (up to 68 inches of sea level rise)*** | | | | |
| CL-5a | Raise floodwall: Raise floodwall and path along shoreline to 21 feet | DES | $2M - $2.5M | 2050-2075 |
| CL-5b | Raise berm: Raise berm and path in Heri-tage Park to 21 feet | DES | $8M - $10M | 2050-2075 |
| CL-5c | Raise floodwall and berm: Hybrid strategy that would raise floodwall and landscaping within Heritage Park | DES | $14M - $17M | 2050-2075 |
| CL-6 | Replace flood gate across railroad and Powerhouse Road | City of Olympia Public Works | $300K - $400K | 2050-2075 |
| CL-7 | Raise 5th Ave and Columbia Street (optional) | City of Olympia Public Works | $80M - $100M | 2050-2075 |
| CL-8 | Consolidate stormwater outfalls | City of Olympia Public Works | TBD | 2050-2075 |
| CL-9 | Construct stormwater discharge pump station | City of Olympia Public Works | $300K - $400K | 2050-2075 |
| CL-10 | Protect Percival Drinking Water Pump Station | City of Olympia Public Works | $0.5M - $1M | 2050-2075 |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