

# SLR Project Kick Off





**Assessing the Risk of Future Loss of Floodplain Habitats  
to Sea Level Rise**

**June 26, 2018**

**Science Work Group**





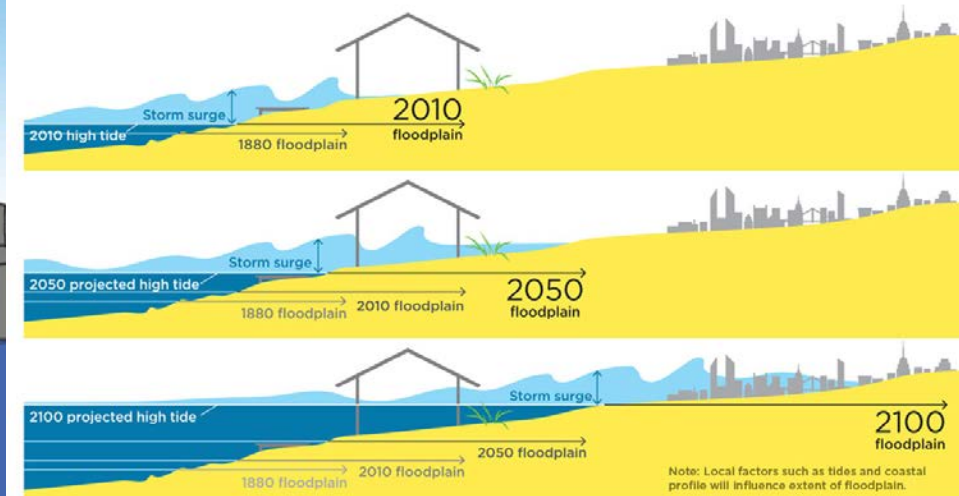
# Sea level rise (with more frequent and intense storms, increased wave energy, increased erosion and flooding) (National Climate Assessment 2014, 2017)

- **Ecosystem shift** – predictions of saltwater intrusion up to Cathlamet
  - OHSU's Mojgan Rostaminia Dissertation
- **Further loss of floodplain habitats** - increased flooding, conversion, submersion and erosion of floodplain habitats; *coastal squeeze* in locations where habitats cannot migrate inland (e.g., impervious surface, high elevation gradient)
- Increased intrusion of **ocean acidification and hypoxia (OAH)** into estuary – changes in food web, fish behavior

NASA : SEA LEVEL RISE LIKELY TO GET MUCH WORSE ...



FIGURE 3. Storm Surge and High Tides Magnify the Risks of Local Sea Level Rise



Sea level sets a baseline for storm surge—the potentially destructive rise in sea height that occurs during a coastal storm. As local sea level rises, so does that baseline, allowing coastal storm surges to penetrate farther inland. With higher global sea levels in 2050 and 2100, areas much farther inland would be at risk of being flooded. The extent of local flooding also depends on factors like tides, natural and artificial barriers, and the contours of coastal land.

# Generalized Predictions of Sea Level Rise Exist:



## ➤ NWF 2007 - Modeled SLR for Puget Sound to Tillamook Bay

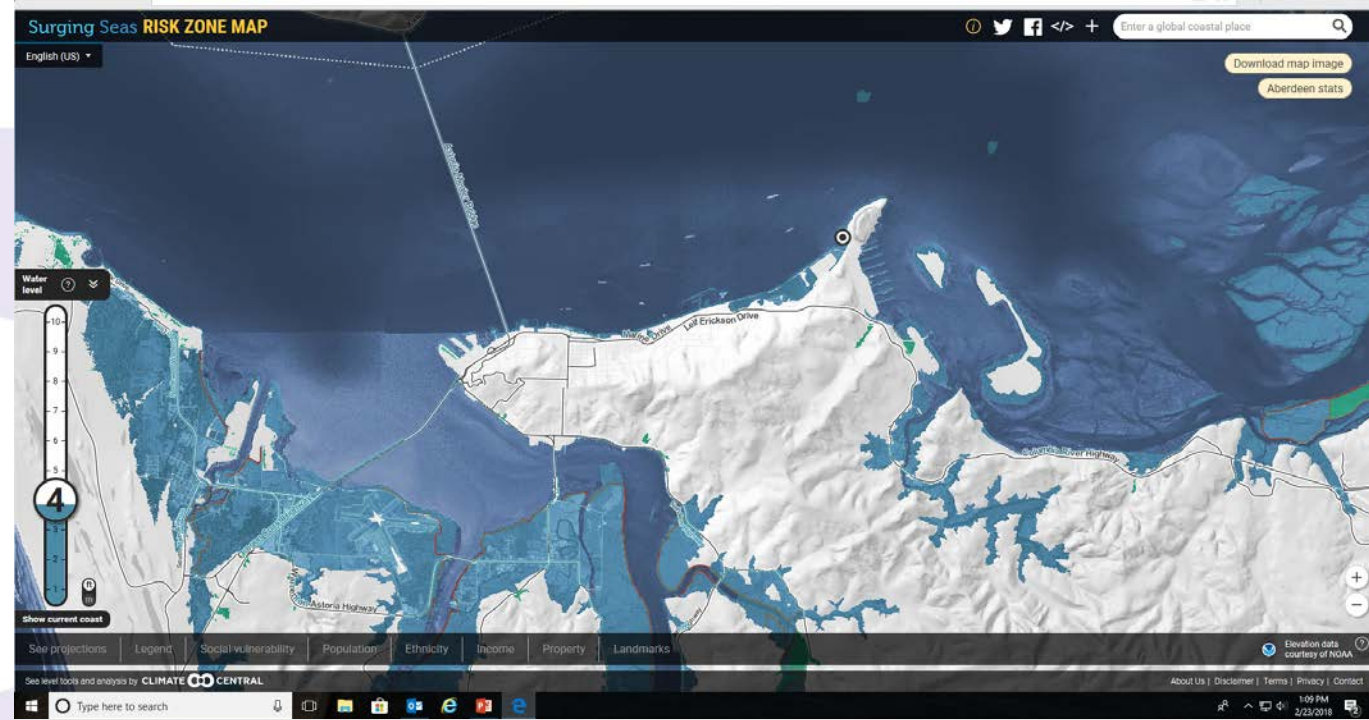
- Demonstrates likelihood of significant loss of floodplain habitats
  - Inundation, conversion and erosion
- Good first step BUT need more site specific, detailed information
  - SLAM model
  - Lower Columbia composited with Willapa down to Tillamook Bay (1.4 million acres)
  - Covered only up to Cathlamet
  - Repeated by Ducks Unlimited (*unpublished*)

## ➤ Surging Seas Risk Finder & NOAA Sea Level Rise Viewer

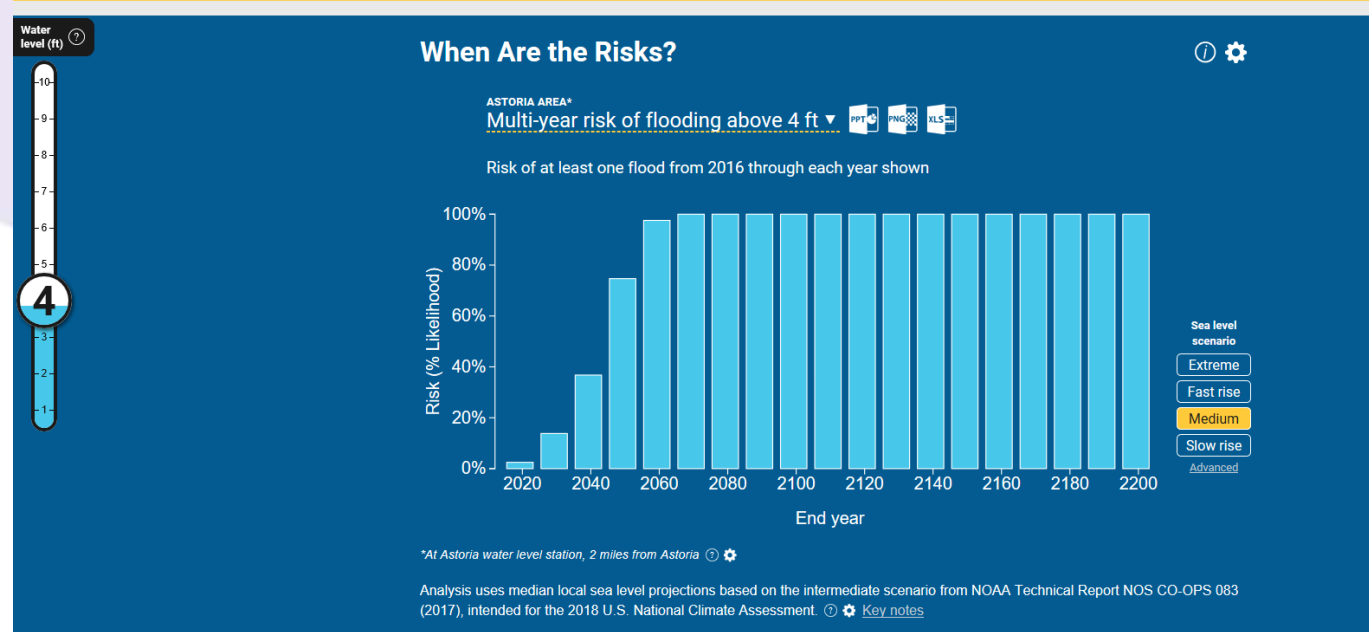
- Really cool citizen-friendly graphics and risk projections
- Not sufficient for local planning

# Generalized Predictions of Sea Level Rise:

- **Surging Seas Risk Finder**



**Surging Seas RISK FINDER** | Astoria, Oregon, USA



<https://riskfinder.climatecentral.org/>



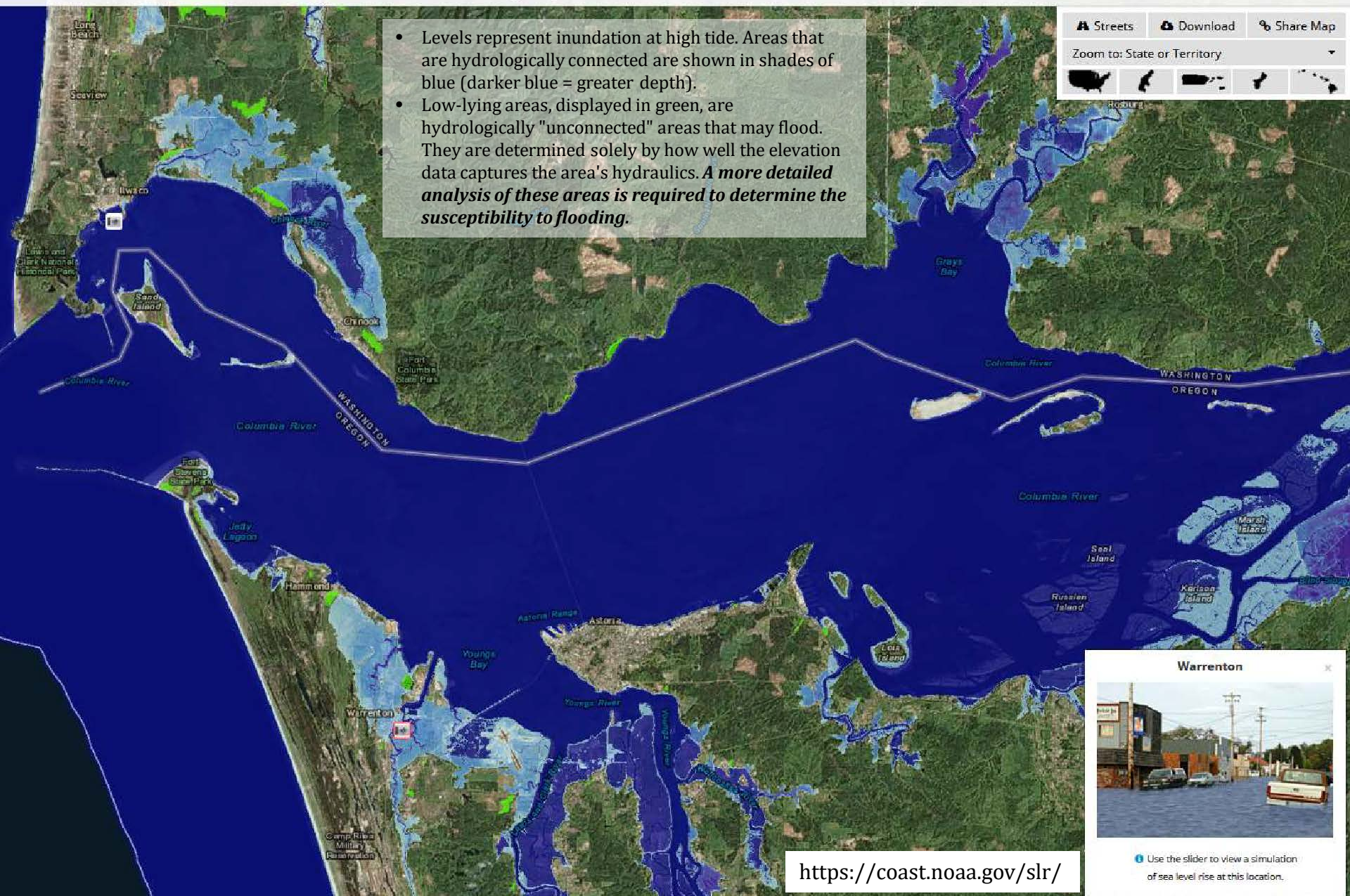
# 3ft Sea Level Rise

## Sea Level Rise and Coastal Flooding Impacts

- Levels represent inundation at high tide. Areas that are hydrologically connected are shown in shades of blue (darker blue = greater depth).
- Low-lying areas, displayed in green, are hydrologically "unconnected" areas that may flood. They are determined solely by how well the elevation data captures the area's hydraulics. *A more detailed analysis of these areas is required to determine the susceptibility to flooding.*

Streets Download Share Map

Zoom to: State or Territory



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

Use the slider to view a simulation of sea level rise at this location.



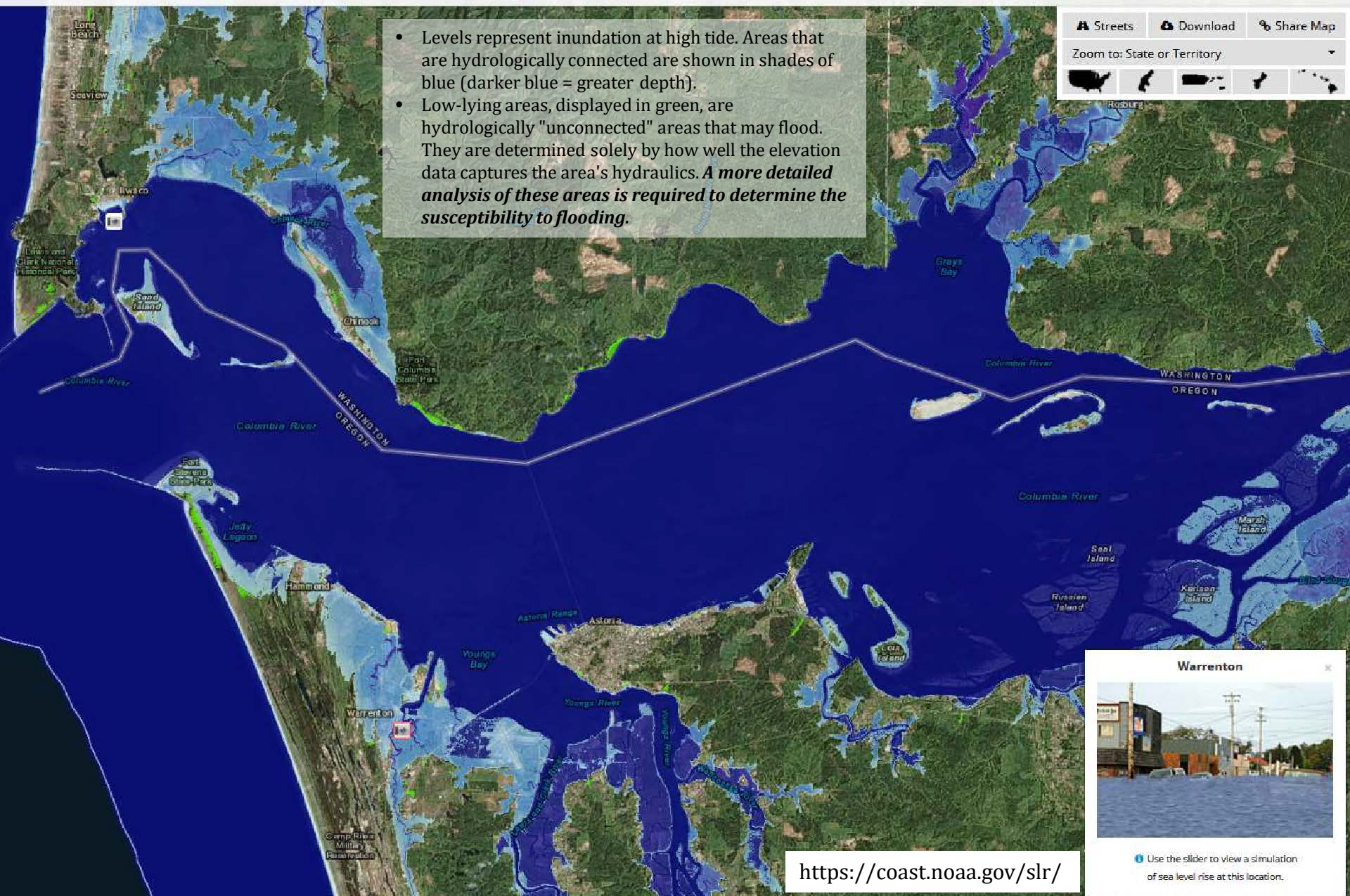
# 6ft Sea Level Rise

## Sea Level Rise and Coastal Flooding Impacts

- Levels represent inundation at high tide. Areas that are hydrologically connected are shown in shades of blue (darker blue = greater depth).
- Low-lying areas, displayed in green, are hydrologically "unconnected" areas that may flood. They are determined solely by how well the elevation data captures the area's hydraulics. *A more detailed analysis of these areas is required to determine the susceptibility to flooding.*

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Zoom to: State or Territory



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



Use the slider to view a simulation of sea level rise at this location.

# This Assessment:

## ➤ Use published projections of SLR:

- 0.5, 1.0, and 1.5 meters bc USACE generated corresponding water surface elevations throughout lower Columbia

1. **Develop wetland elevation model** –establish predicted wetland elevation ranges for five ‘zones’ in Borde et al. (2012) to create GIS representations of wetland elevation zones
2. **Analyze impacts of three SLR scenarios to current wetland habitats**
3. **Evaluate wetlands ability to migrate based on flow barriers**
4. **Evaluate wetlands ability to migrate based on 2010 land cover**
5. **Evaluate constraints to meeting habitat coverage targets**
6. **Disseminate results**

## ➤ *Niko Peha lead investigator*



# Questions

- Other SLR scenarios should we use rather than 0.5, 1.0 and 1.5 meters?
  - 0.4, 0.8, 2.5, 4.7, 7.3, 9.2 ft of SLR (Mojoy's dissertation using NOAA 2017)
- Other questions of interest?
- Anyone interested in reviewing early results, providing input, participating in any field data collection for wetland model?

