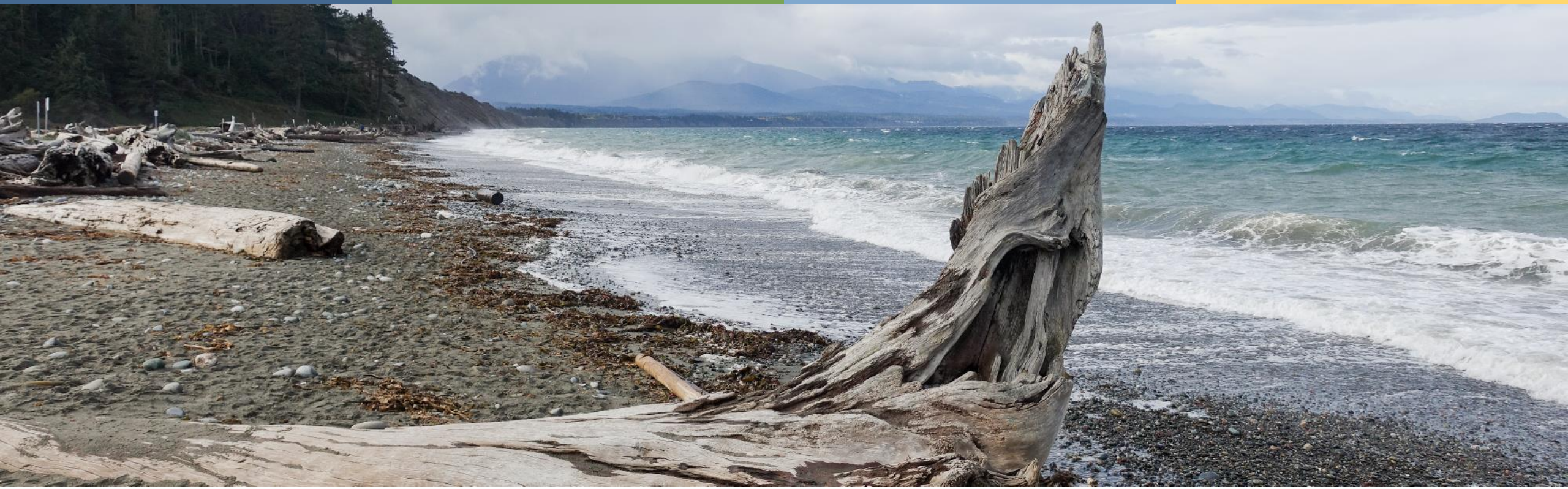


Puget Sound Nutrient Forum

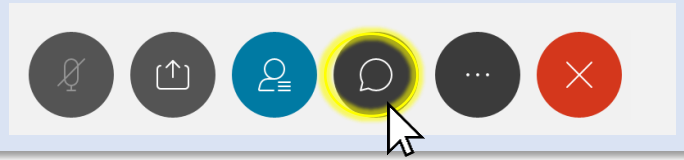
Clean Water Act, regulatory models, and using the Salish Sea model to manage nutrients

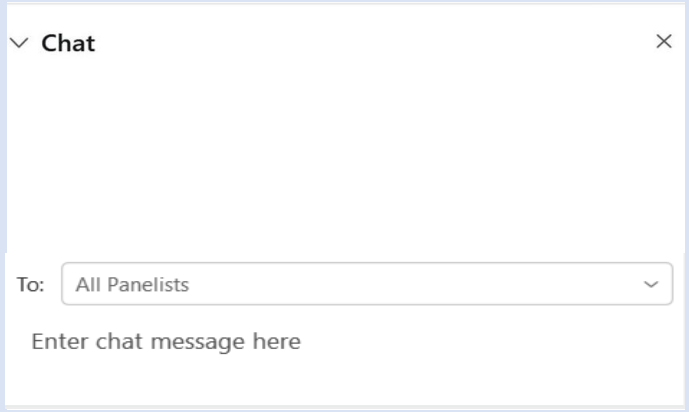
March 9, 2021

DEPARTMENT OF ECOLOGY
State of Washington

How to Participate

You can ask questions via the chat function

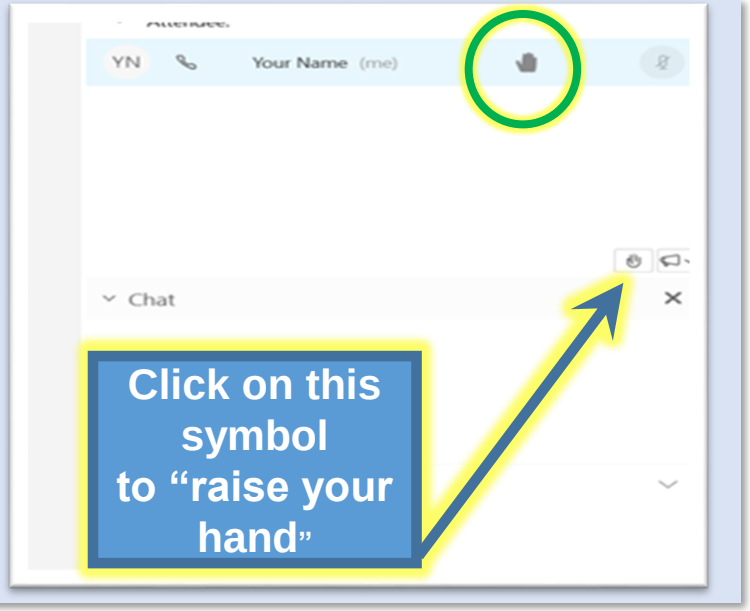




You can also ask questions by raising your hand so we can unmute you to participate

We ask that you:

1. **State your name** first before speaking.
2. **Mute your audio** unless speaking.
3. **Lower your hand** when you are done speaking



Today's Objective

Refresher courses on how we use models in a regulatory process

Answer your questions

Discuss next steps for Puget Sound Nutrient Reduction Project

Today's Agenda

1. Introduction
2. Clean Water Act & Regulatory Models
3. Salish Sea Model
4. Questions & Answers
5. Using the SSM to calculate meeting standards
6. What's coming down the pipeline

PSNRP: Litigation update

December 31, 2020: Lawsuit filed on behalf of City of Tacoma, Birch Bay Water and Sewer District, Kitsap County, Southwest Suburban Sewer District, and Alderwood Water & Wastewater District

Puget Sound Nutrient Reduction Project

Goal:

- Meet dissolved oxygen (DO) water quality standards
- Restore and protect healthy and robust aquatic species and communities

How:

- Reduce both human point and nonpoint sources of excess nutrients
  - Puget Sound Nutrient Reduction Plan
  - Puget Sound Nutrient General Permit
  - Future Watershed Nutrient Reduction Plans

Nutrient Forums

2018
- 5 Forums

2019
- 7 Forums

2020
- 4 Forums

2021

Salish Sea Model

Policy & Planning

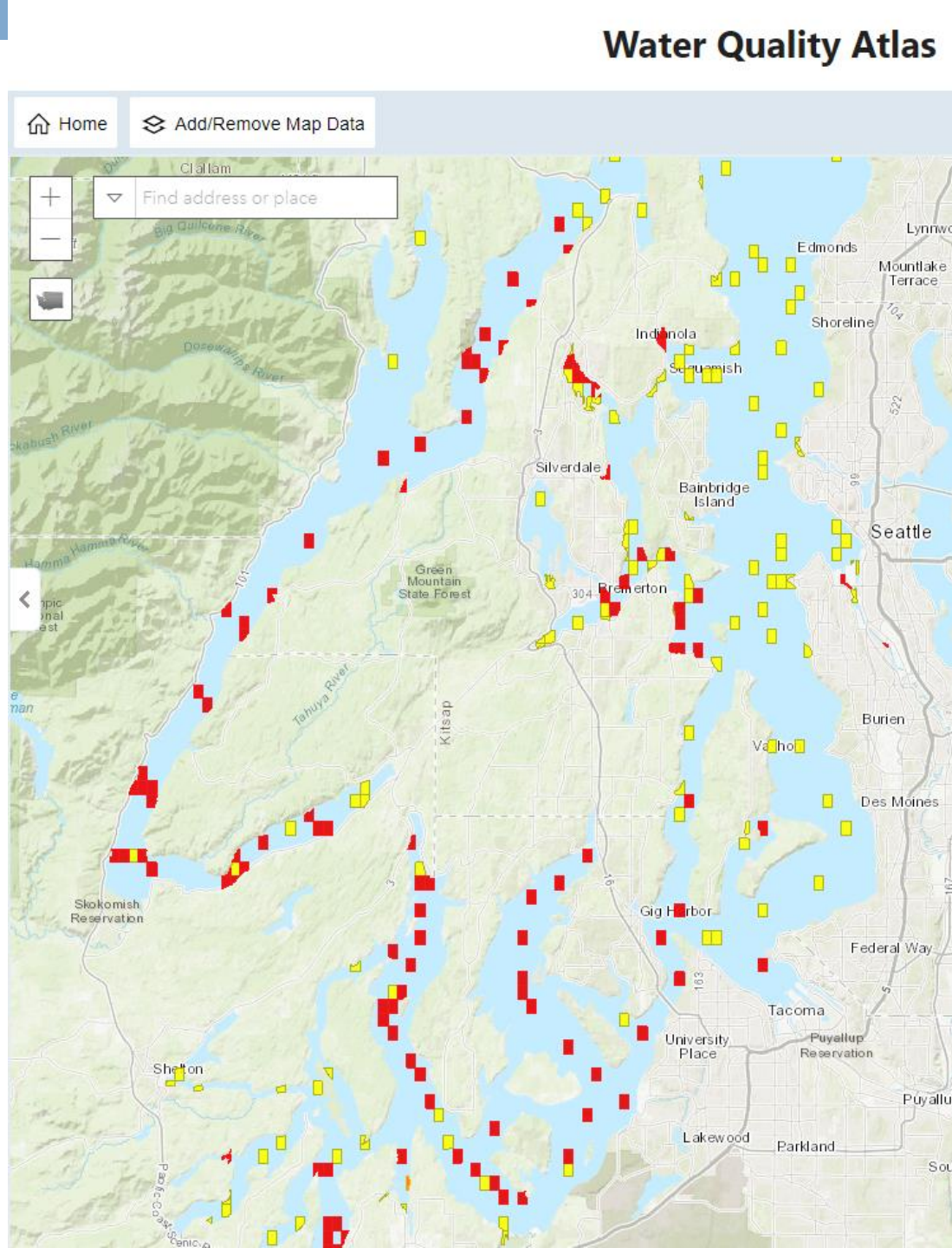
Nutrient Science

Implementation

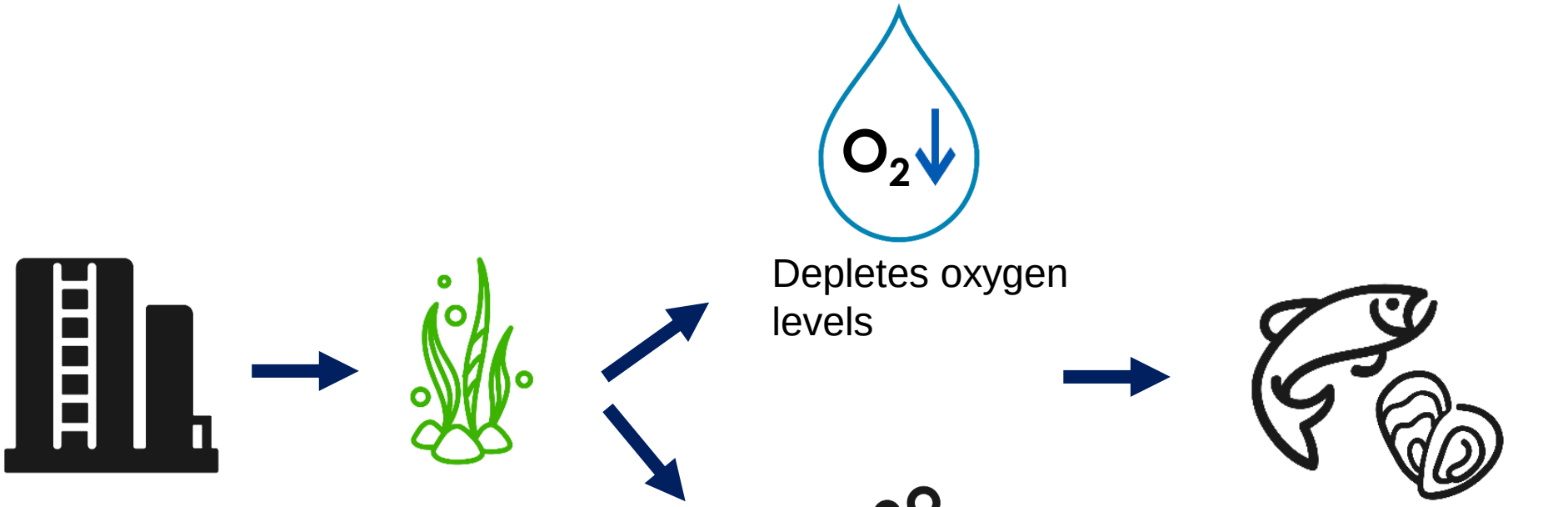
All past presentations & meeting materials:
https://www.ezview.wa.gov/DesktopDefault.aspx?alias=1962&pageid=37106

Marine Dissolved Oxygen Standards and 303(d) Listings

- Set to protect healthy, robust aquatic communities, including the most sensitive species
- Monitoring shows DO standards are not met
- 136 impaired waterbody listings on the 303(d) list



Nutrient imbalance impacts Puget Sound ecology



Excess nutrients throw off balance in Puget Sound

Excessive algal growth, then decomposition

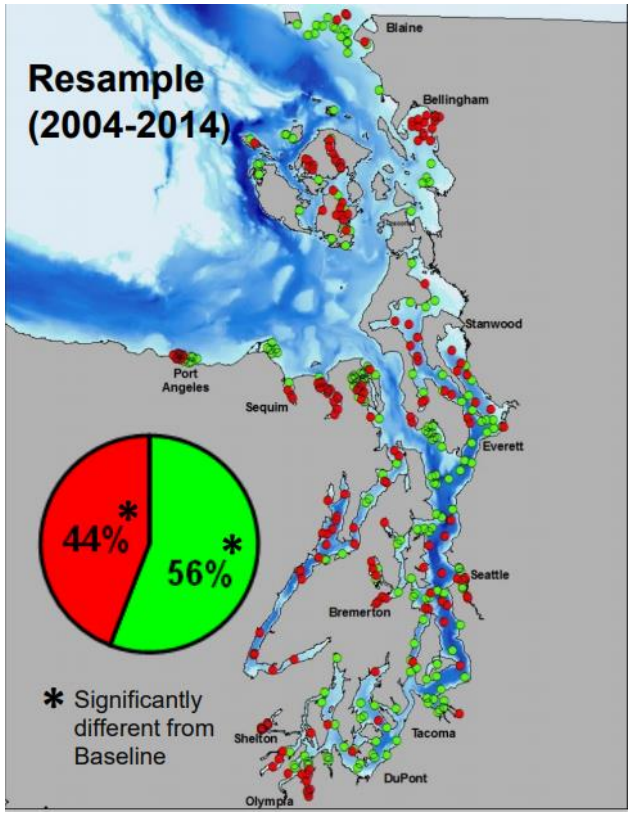
Depletes oxygen levels

Increased CO_2 and acidification

Environmental stress on Puget Sound ecosystem

Observed eutrophication impacts

Overabundance of jellyfish



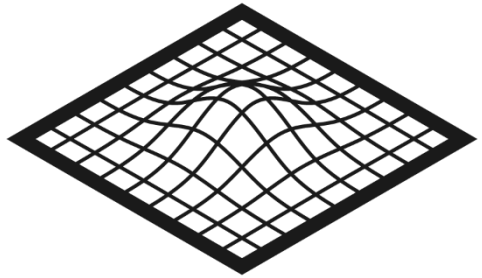
Declining benthic index

Algal blooms

Ecology's regulatory question

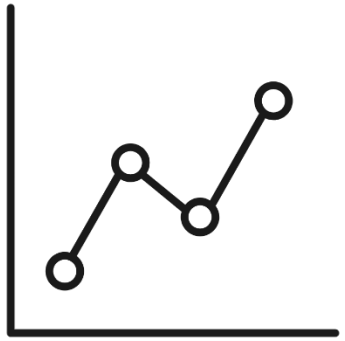
Are human nutrient sources contributing to not meeting marine DO standards, and by how much?

Both modeling and monitoring are needed



Mechanistic model: Salish Sea Model

- Isolate and evaluate specific impact of human nutrient loads
- Separate signal of human impacts from natural environmental variability



Continued water quality monitoring

- WQ trends over time
- Model corroboration

Salish Sea Model helps us understand how much human sources contribute to lowering DO

2019 Bounding Scenarios Report

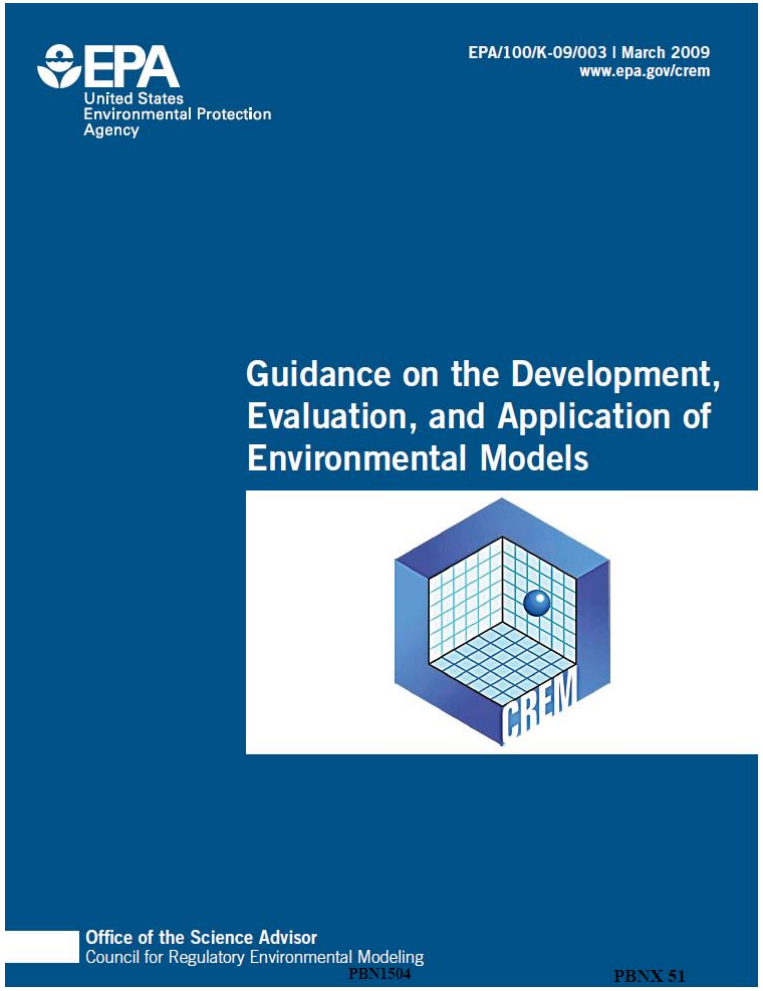
- Human sources contribute to not meeting DO standards
- “Reasonable potential” led to nutrient permit decision

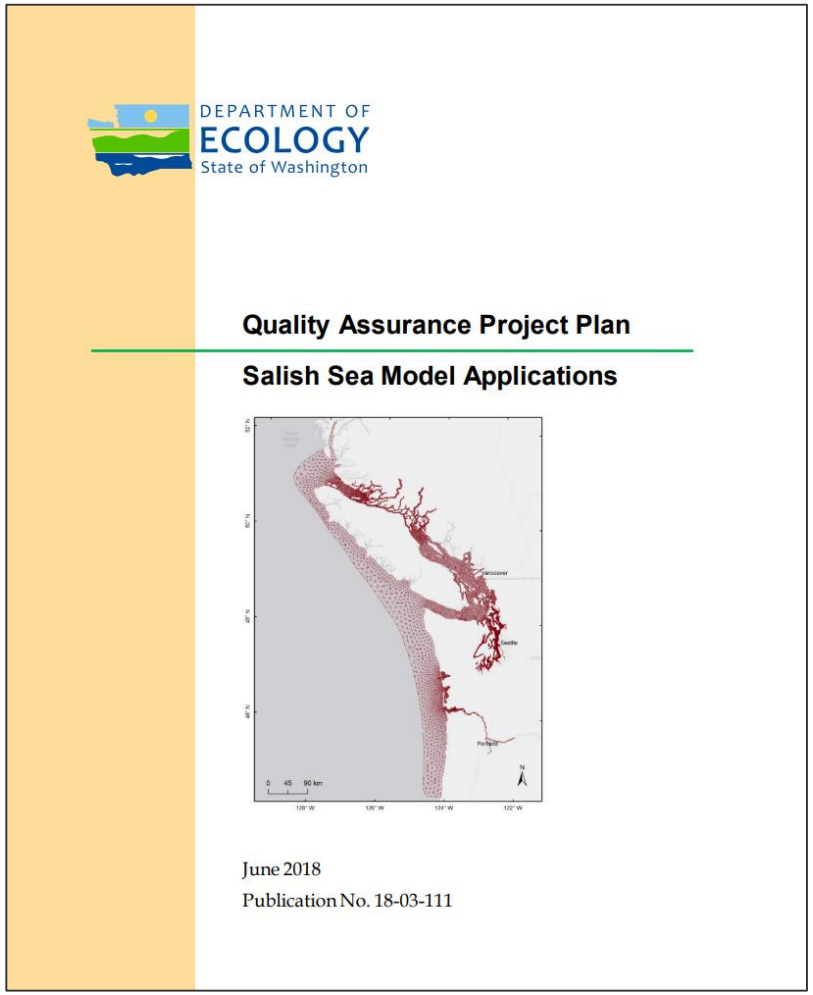
Year 1 Optimization Scenario results this spring

- Watershed Contributions
- Future Loads
- Combination of marine source and watershed inflow reductions to meet DO standards

Next round of modeling to start this summer

Ecology's use of the SSM





https://ecology.wa.gov/Research-Data/Data-resources/Models-spreadsheets/Modeling-the-environment/Salish-Sea-modeling

Why we're here today

Refresher courses:

- Using the Salish Sea model to make Clean Water Act decisions
- Salish Sea Model performance

Answer your questions

Comparing Model Results to DO Standards

Prepare for upcoming Forums on modeling