

# Puget Sound Nutrient Forum

A collaborative effort to discuss, learn, and provide input on reducing human sources of nutrients entering Puget Sound

Kick-off meeting

April 25, 2018







# Welcome, Icebreaker, & Background

Heather Bartlett, WQ Program Manager

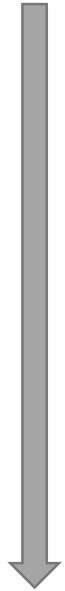
# Why are we asking you to be here?

## Converging interests

- EPA's national priority for States to deal with nutrients
- Ten-year investment in science and computer modeling
- Puget Sound Action Agenda and recovery strategies
- Marine water quality intersection with Salmon Recovery
- Continual regional planning for growth

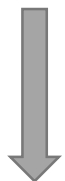
# Background of Puget Sound DO Work

Model  
Development



- **2003-2006**
  - Deschutes River/Budd Inlet TMDL led to recognition that Dissolved Oxygen and human nutrient sources is a regional issue
- **2006-2014**
  - South Sound DO Model developed
  - Salish Sea Model (SSM) preliminary development
- **2014-2017**
  - Sediment Diagenesis Module added to SSM
  - Ocean Acidification Module added to SSM
- **2017**
  - Project Scoping and Stakeholder Outreach
  - Puget Sound Nutrient Dialogue
- **2018-2022**
  - *Develop a nutrient reduction plan*

Model  
Application

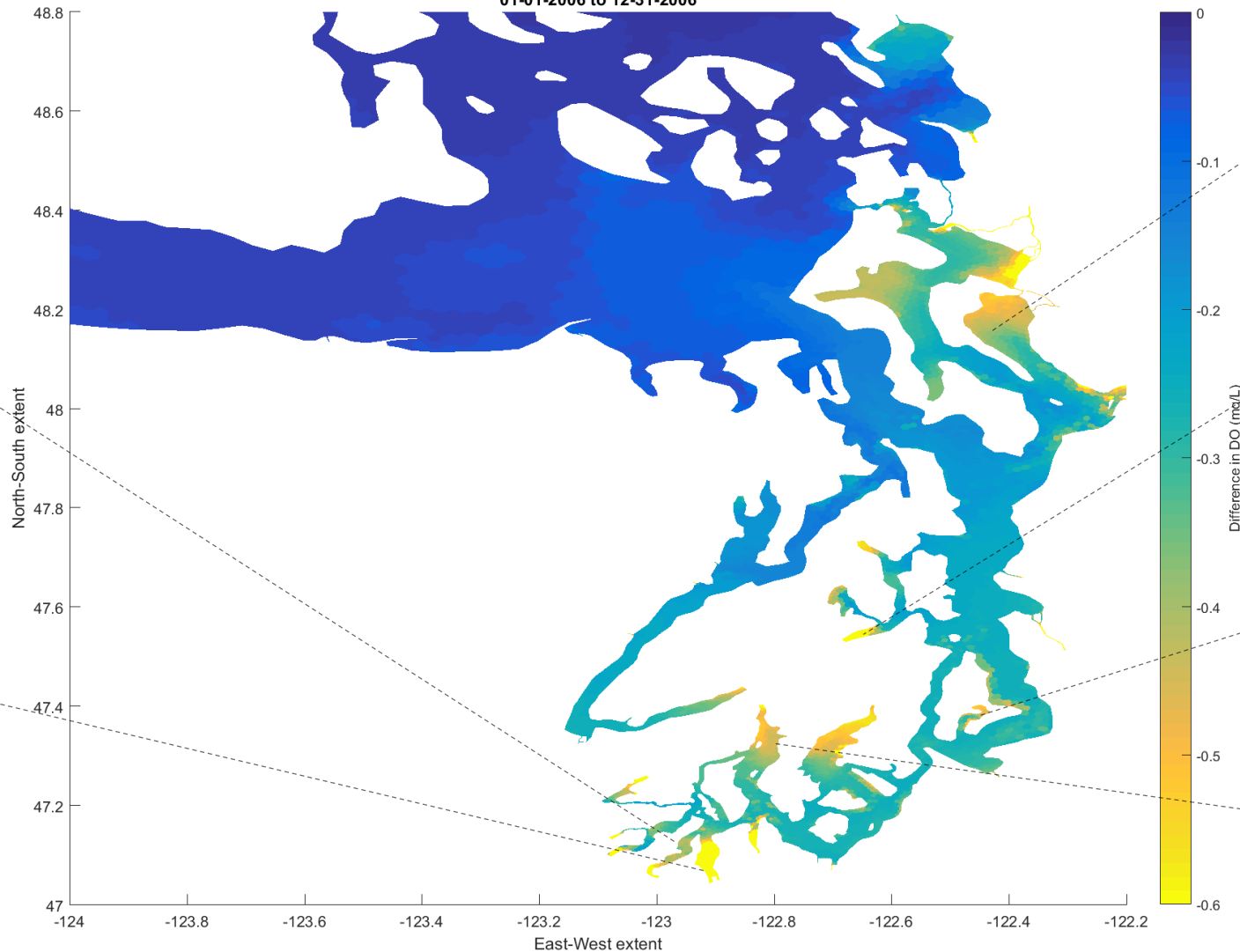




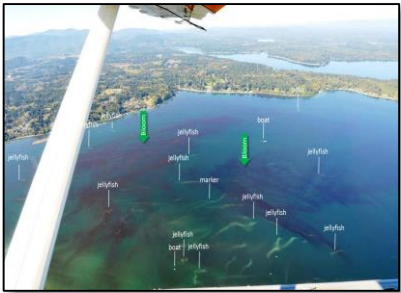
# Model and monitoring results agree

## Human sources of nutrients are having an impact on Puget Sound

Maximum depletion of DO by regional anthropogenic sources  
01-01-2006 to 12-31-2006



### Eutrophication Indicators



# Nitrogen in Puget Sound Story Map

Type [Bit.ly/nitrogenstorymap](https://bit.ly/nitrogenstorymap) into any web browser

## Nitrogen in Puget Sound

A story map of nitrogen in Puget Sound, created by the Washington State Department of Ecology [f](#) [t](#) [e](#)



Overview

Excess Nitrogen

Nitrogen Sources & Pathways

Monitoring Nitrogen

River Trends

Marine Trends

Acknowledgements & References

### Excess nitrogen

Nitrogen is a nutrient that is present in the natural environment and is needed by marine plants and animals to grow. Nitrogen from various sources (both human and natural) enters Puget Sound via different pathways. People increase the amount of nitrogen entering the Sound above natural levels. For example, nitrogen is present in human wastewater and in plant fertilizers.

Excess nitrogen can fuel algae blooms that eventually decompose and sink through the water column. This organic matter decomposition process decreases dissolved oxygen levels, typically near the bottom of Puget Sound waters.

Fish and other marine organisms depend on oxygen to survive and thrive. Oxygen levels in many parts of Puget Sound are below levels that are needed for these organisms to thrive successfully.

PHOTO: red-brown algal bloom in Ostrich Bay, Dyes Inlet (taken August 28, 2017).







We need to figure out how to reduce Nitrogen and Carbon impacts as the region continues to grow in order to...

# **PROTECT THIS**





# Puget Sound Nutrient Source Reduction Project

## *Project Vision:*

***Develop and implement a Puget Sound nutrient source reduction plan to guide regional investments in point and nonpoint source nutrient controls so that Puget Sound will meet DO water quality criteria and protect aquatic life designated uses by 2040.***



# Nutrient Forum Objectives

Inform the development of a nutrient reduction plan and find the best solutions for nutrient reductions that are:

- Effective
- Implementable
- Efficient

We will achieve that objective by:

- Sharing information
- Engaging others
- Listening

Hold approximately 10 meetings over the course of the next year





**Questions for Heather?**

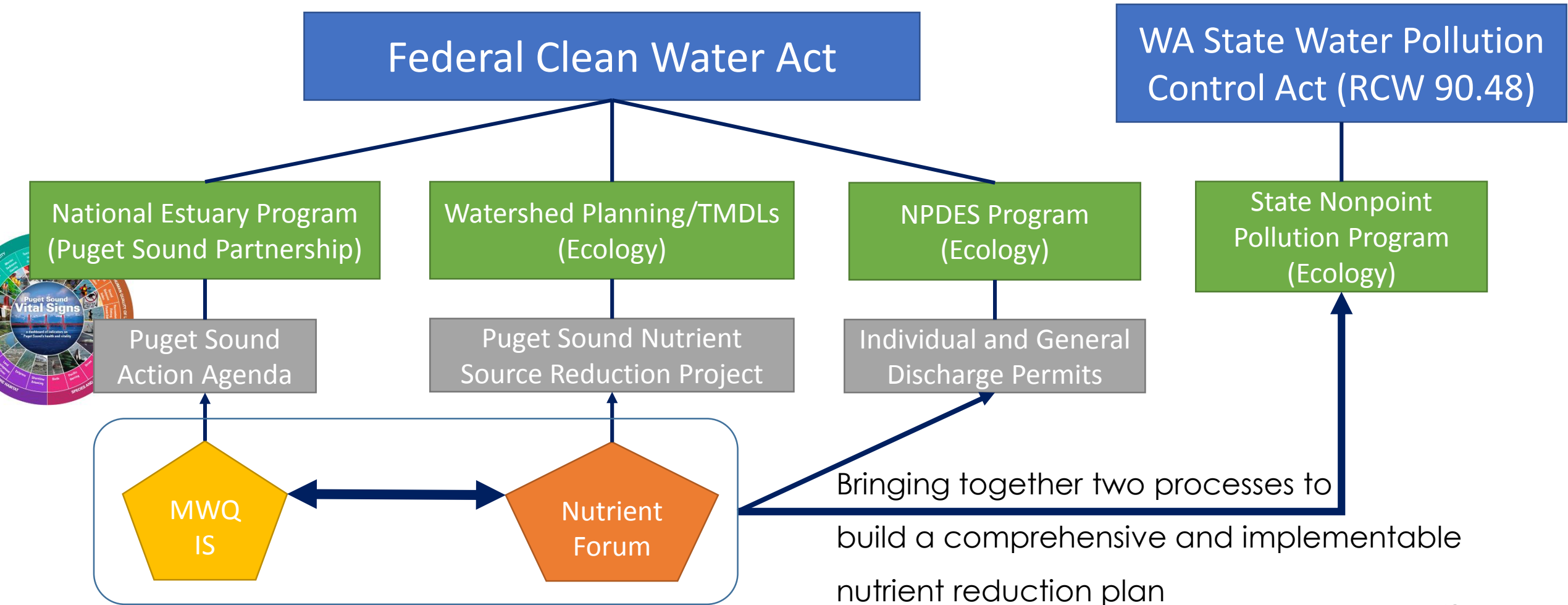




# Connecting the Nutrient Forum with Puget Sound Partnership Efforts

**Dustin Bilhimer, Ecology Water Quality Program**

# Regulatory Connections





# Marine WQ IS Objectives

- Identify priority pressures affecting the Marine WQ Vital Sign and key barriers to recovery
- Assess and combine elements of local and regional recovery efforts and ongoing programs
- Identify adaptive management elements, processes, and responsibilities
- Identify approaches to achieve recovery target including:
  - Regional strategies
  - Implementation actions
  - Programs and policies

# Integrating Two Processes

## Puget Sound Action Agenda Process

### Marine Water Quality Implementation Strategy

- Interdisciplinary group
- Broader Puget Sound restoration focus and connection with National Estuary Program (NEP)
- Develop “BIG picture” implementation strategy that is part of Action Agenda

## Ecology’s Public Advisory Committee Process

### Puget Sound Nutrient Forum

- Broad representation of stakeholders and tribes
- Discuss regulatory aspects of point source approaches
- Identify ways to implement point and nonpoint source reductions

Inform and Collaborate

- Cross-membership
- Both have input on work products
- Both will inform modeling of potential solutions

### Salish Sea Model

- Run scenarios for different source reduction strategies
- Quantify benefits and ensure water quality criteria and Puget Sound recovery goals are met



# What will implementation look like?

- ✓ Point and Nonpoint source nutrient reduction activities
- ✓ Nutrient load allocations that meet Puget Sound water quality objectives
- ✓ Solutions will drive how implementation happens

Objective: Implement the **right actions**, in the **right sequence**, to get started on water quality improvement **as soon as possible**.



**Questions for Dustin?**





# **Feedback on Future Nutrient Forum Topics**

**Susan Braley and Dustin Bilhimer**

# High-Level Issues

- The extent of the science and what it tells us, and application of water quality standards
- Nutrient sources and options to address those sources
- Nutrient reduction strategies being used in other parts of the country
- What approaches could work for Puget Sound to manage nutrient reductions from both point and nonpoint sources
- Opportunities and challenges for addressing Puget sound nutrient loads



# Issue Details

## **The extent of the science and what it tells us, and application of water quality standards**

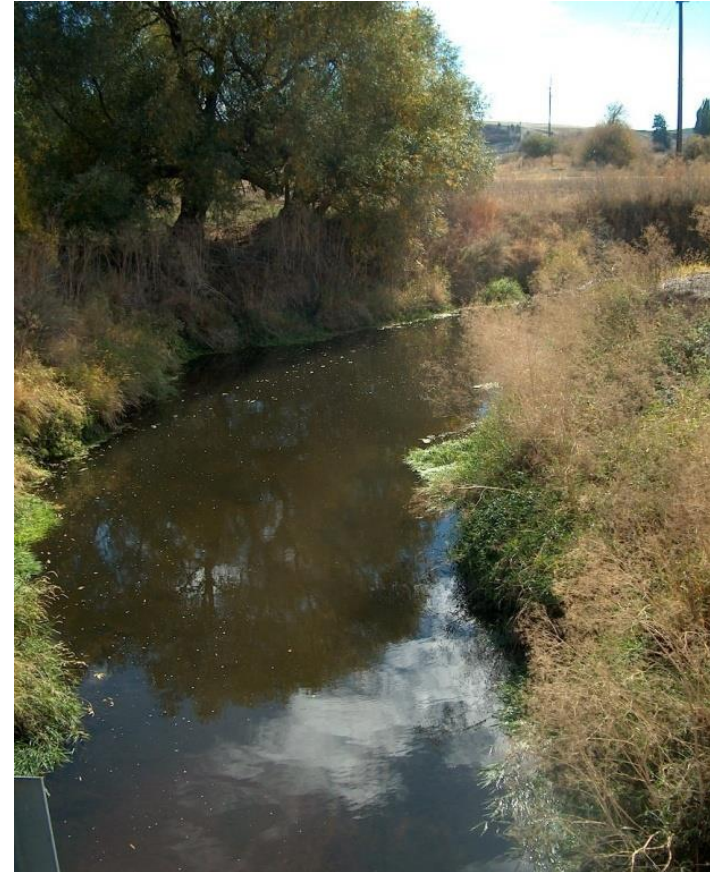
- Monitoring and Modeling indicates a growing problem for marine water quality
- Salish Sea modeling efforts
- Dissolved Oxygen criteria and protection of aquatic life
- Eutrophication indicator responses to nutrients



# Issue Details

## Nutrient sources and options to address those sources

- Marine vs. Watershed sources
- Data gaps
- Seasonal and inter-annual variation





# Issue Details



## **Nutrient reduction strategies being used in other parts of the country**

- Examples could include: Chesapeake Bay, Tampa Bay, San Francisco Bay, etc.
- Pros/Cons of different approaches
- What can we learn and apply from these examples?

# Issue Details

## **What approaches could work for Puget Sound to manage nutrient reductions from both point and nonpoint sources**

- Potential requirements, incentives, and partnerships
- Providing certainty and feasible expectations for the regulated community
- Creative approaches for meaningful nonpoint nutrient solutions
- Timing



# Issue Details

## Opportunities and challenges for addressing Puget sound nutrient loads

- Improve/focus existing programs to reduce nutrient loading
- Opportunities for new nutrient reduction/control programs
- Funding mechanisms



# High-Level Issues

## Discussion

- The extent of the science and what it tells us, and application of water quality standards
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- Nutrient reduction strategies being used in other parts of the country
- What approaches could work for Puget Sound to manage nutrient reductions from both point and nonpoint sources
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# Next Steps

- Suggestions for future Forum meetings.
- Homework:
  - Feedback to Ecology using the questionnaire.
  - Review Ecology's Marine dissolved oxygen standards paper.
- Put a hold on your calendar for May 30<sup>th</sup> to discuss DO criteria and how to determine compliance.



# Primary Project Contact



Contact:

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