DEPARTMENT OF ECOLOGY
State of Washington

Puget Sound Nutrient Reduction Plan

Jeremy Reiman

June 24, 2025 – Nutrient Forum

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Puget Sound Nutrient Reduction Plan

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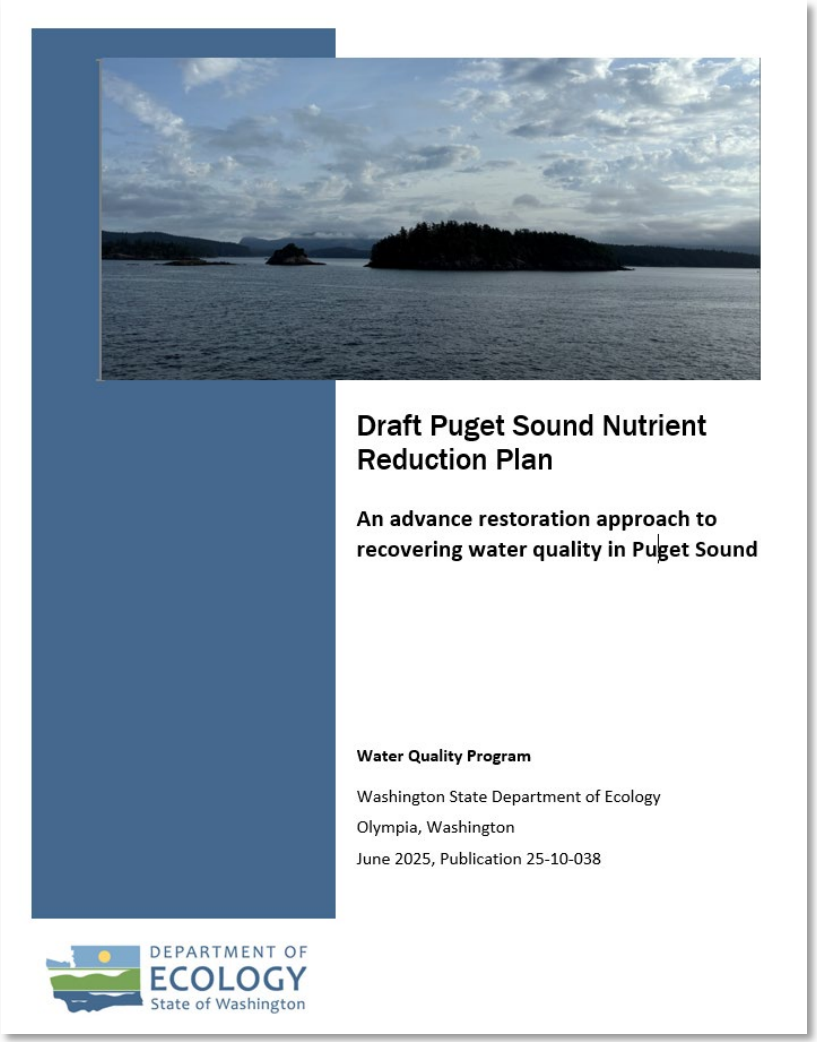
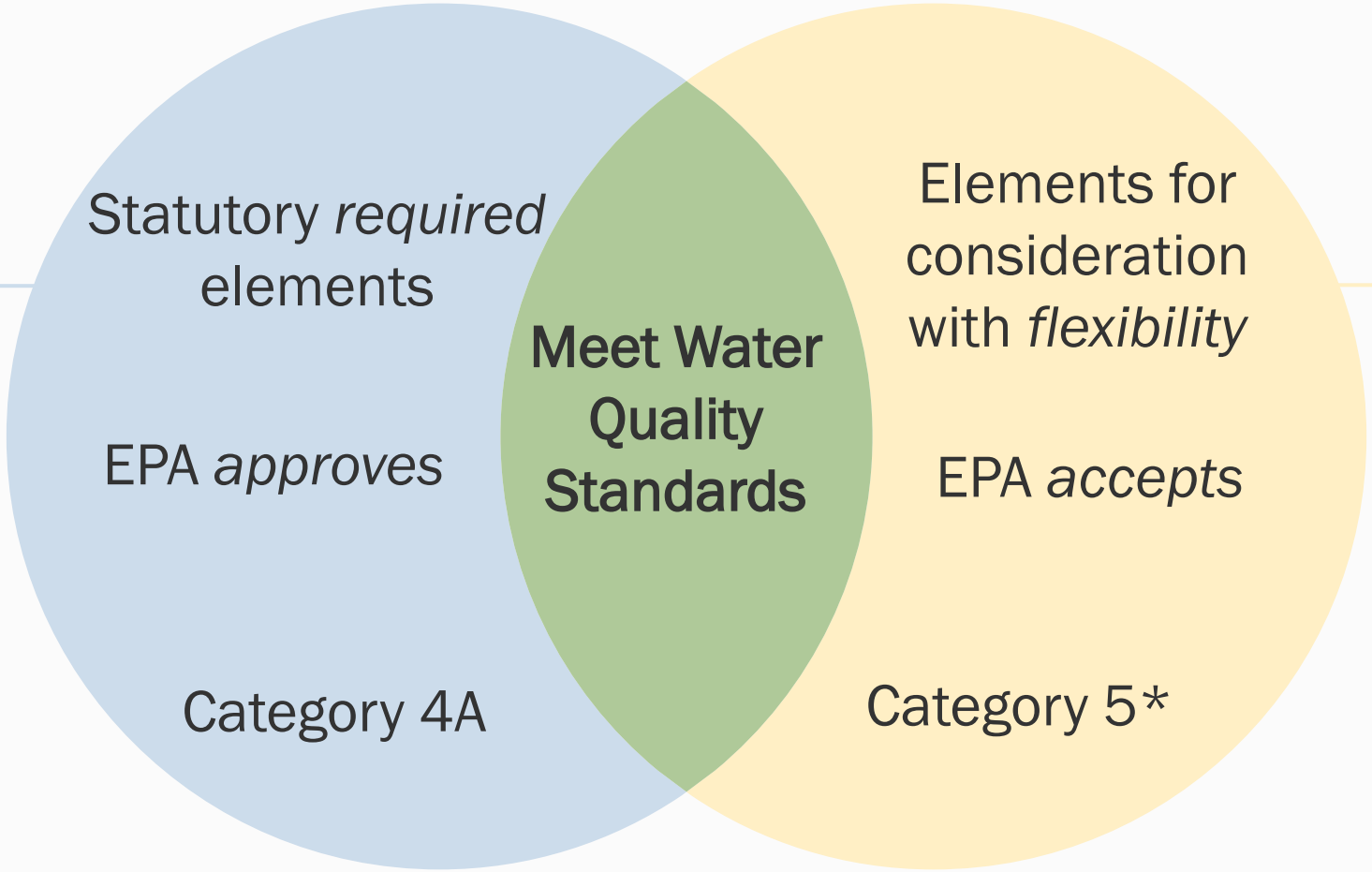


TMDL vs. ARP Comparison

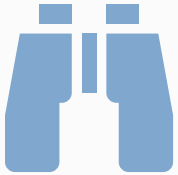
Total Maximum Daily Load (TMDL)



Advance Restoration Plan (ARP)

What's in the plan?

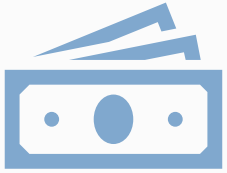
Background



Scope

Nitrogen Targets

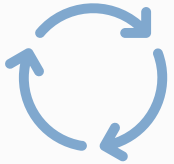
Implementation



Financial Assistance

Schedule & Milestones

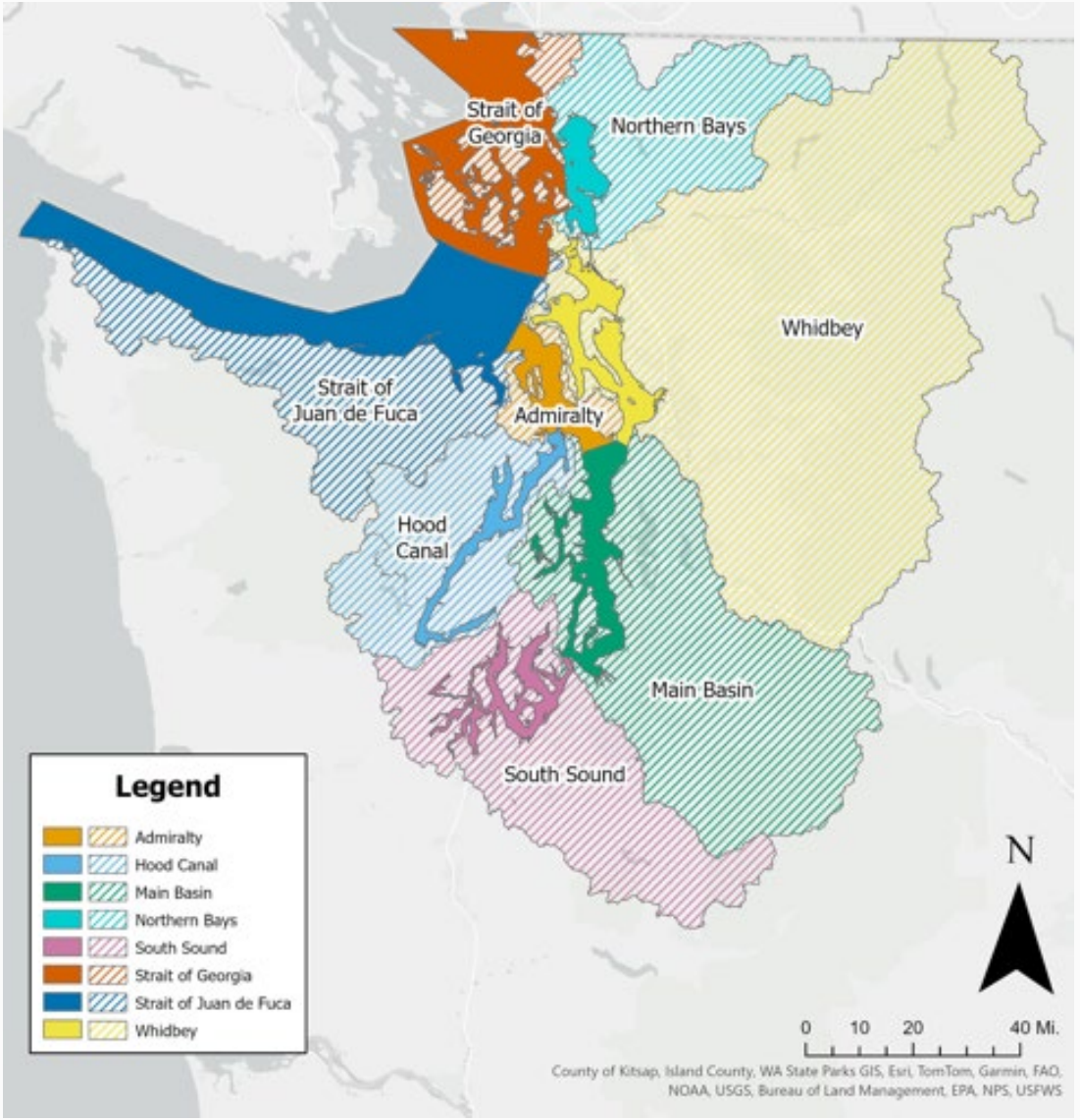
Monitoring



Adaptive Management

Scope of Plan

- Addresses all DO 303(d) (Cat 5) impairments in Puget Sound
- 8 basins
- Sets nutrient targets for:
  - Marine Point Sources
  - Watersheds
- No targets assigned to Canadian or open ocean sources



Puget Sound basins

Two groups of targets

Marine Point Sources

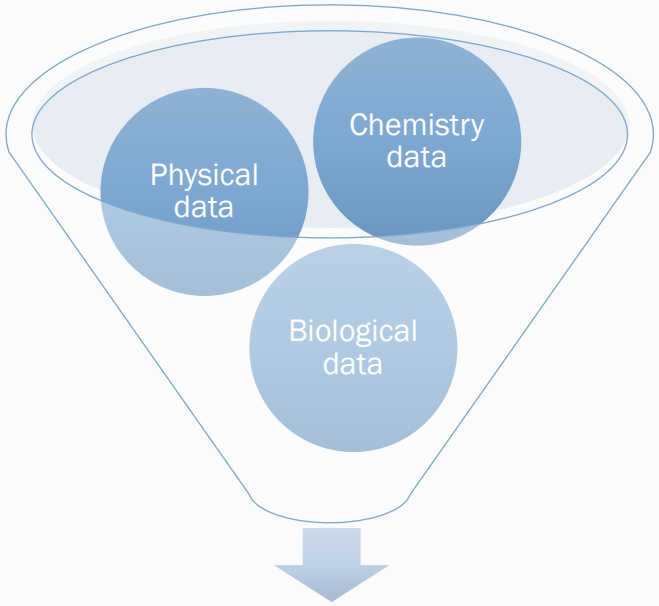
- Municipal, Private, Federal, Tribal WWTPs
- Industrial Facilities

Watersheds

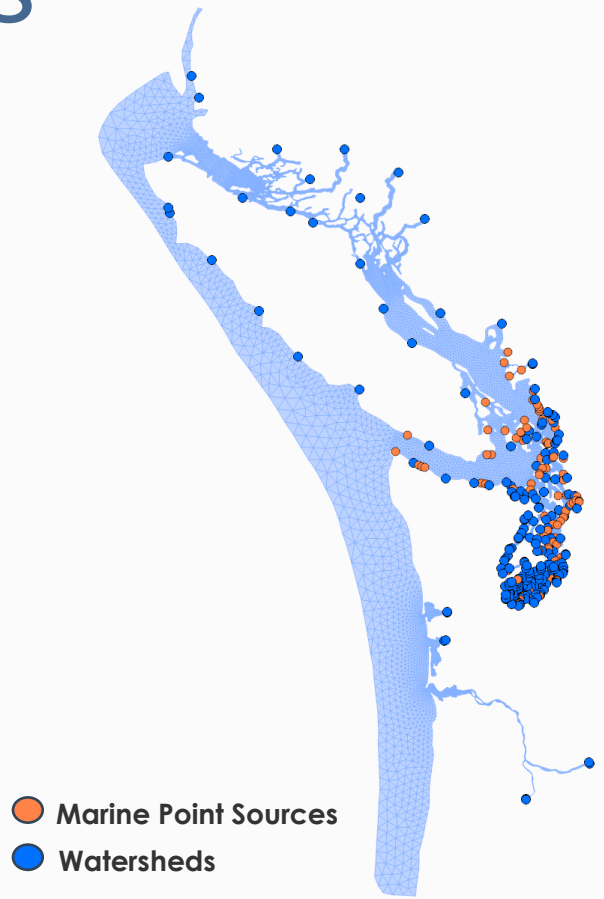
- Rivers/streams
  - Point and nonpoint sources
  - Shoreline stormwater point sources
  - Diffuse shoreline pollution (example: septic systems)

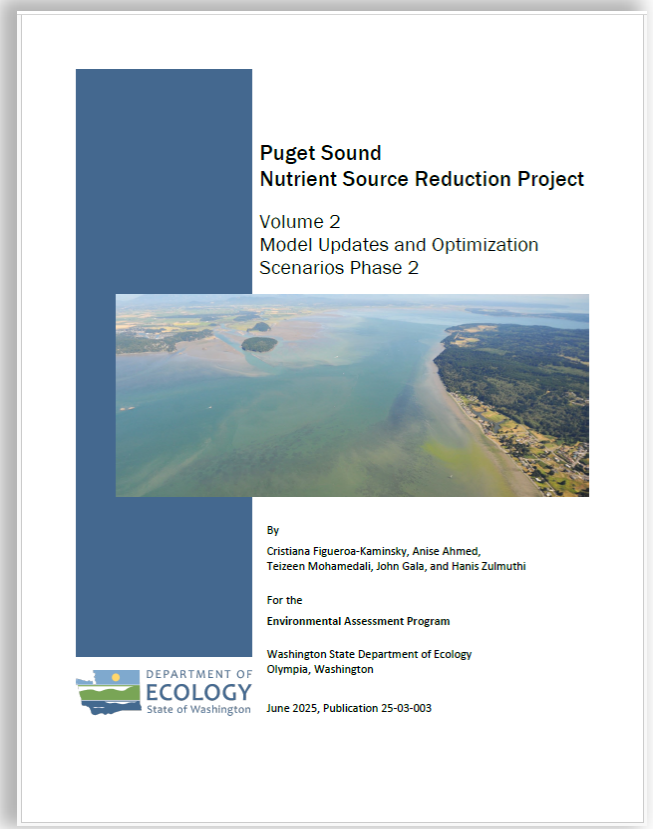
Model Scenario as Basis for Targets

- Selected scenario: Opt2_8
  - Model Year: 2014



Dissolved Oxygen Levels





Marine Point Source Framework

2014 Loads

Industrial Facilities

Very Small WWTPs

Admiralty, Hood Canal, SJF, SOG WWTPs

3 mg/L DIN Year Round

WWTPs discharging near Sinclair Inlet

Opt2_8 Marine Point Sources

8 mg/L DIN - Cool

3 mg/L DIN - Warm & Hot

Main Basin Dominant* WWTPs not treating combined influent

8 mg/L DIN - Cool

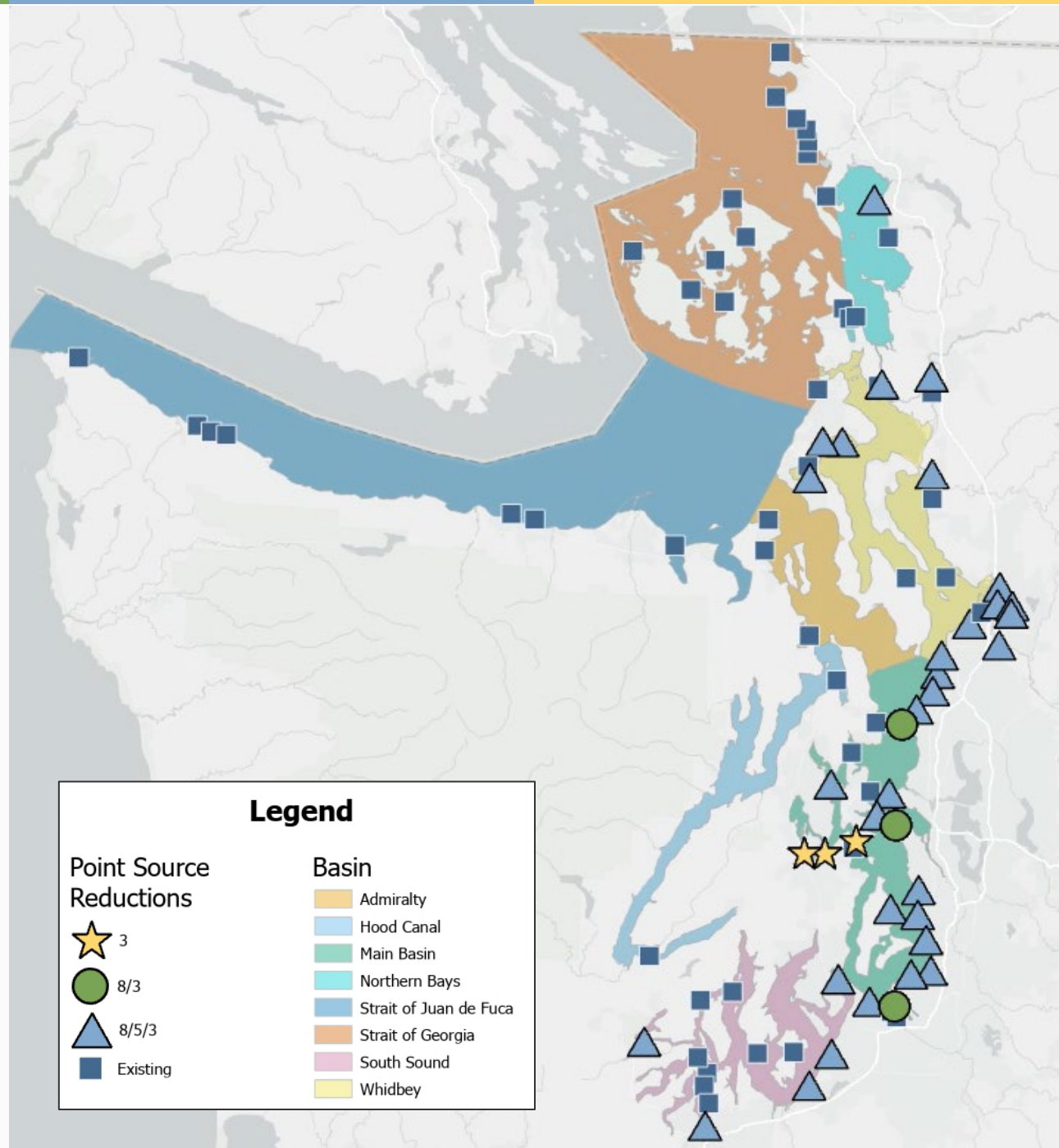
5 mg/L DIN - Warm

3 mg/L DIN - Hot

Remaining WWTPs in Northern Bays, Whidbey, Main, and South Sound Basins

All DIN reductions also included organic carbon reductions applied as **8 mg/L CBOD**

Cool = Nov–Mar | **Warm** = Apr – Jun, Oct | **Hot** = Jul – Sep

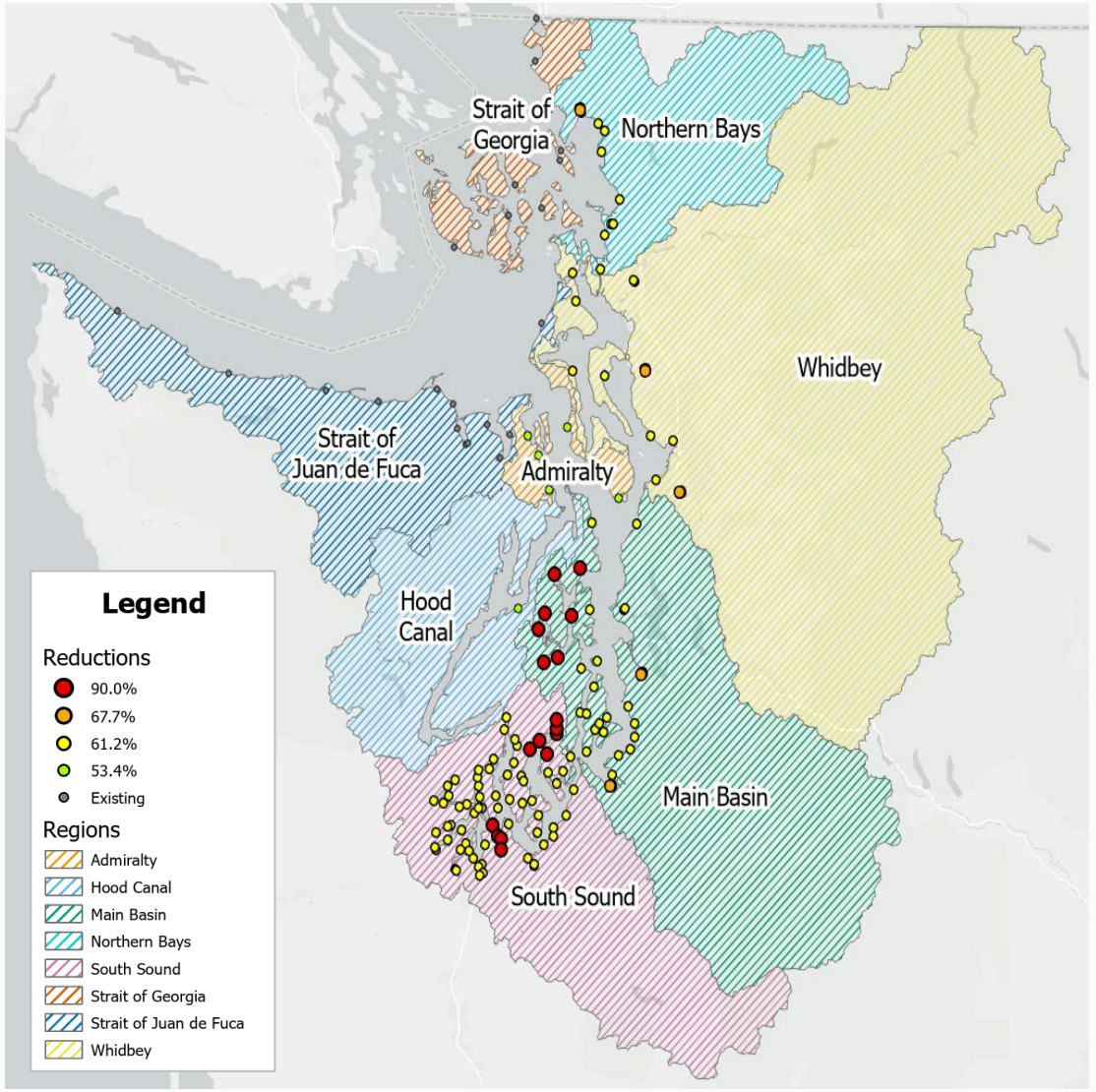


Watershed Framework

- Applied to total nitrogen (TN) and total organic carbon (TOC)
- Anthropogenic loads

Basin(s)	Reduction in Anthropogenic TN and TOC Loads
Northern Bays & Whidbey	67.7% in large watersheds* 61.2% in all other watersheds
Main Basin	90% in watersheds draining to Sinclair & Dyes Inlet and Liberty Bay 67.7% in large watersheds* 61.2% in all other watersheds
South Sound	90% in watersheds draining to Carr, Case, and Henderson Inlets 67.7% in large watersheds* 61.2% in all other
Hood Canal	90% in watersheds draining to Lynch Cove 53.4% in all other watersheds
Admiralty	53.4% in all watersheds
Strait of Juan de Fuca & Strait of Georgia	No reductions

*Large watershed: >1000 kg TN/day



TN Targets (pg. 30)

Opt 2_8 model inputs → Targets

Total Nitrogen - Basin level - Annual

Marine Point Source Targets (lbs. TN/yr) (*Table 5*)

Basin	Total Annual Target	Reduction Anthro TN*
Northern Bays	449,000	58%
Whidbey	1,130,000	63%
Main	6,300,000	72%
South Sound	898,000	66%
Hood Canal	823	0%
Admiralty	54,400	0%
Strait of Juan de Fuca	233,000	0%
Strait of Georgia	563,000	0%

*Relative to 2014 loads

Watershed Targets (lbs. TN/yr) (*Table 6*)

Basin	Total Annual Target	Reduction Anthro TN*
Northern Bays	3,390,000	66%
Whidbey	11,900,000	67%
Main	4,330,000	68%
South Sound	2,940,000	63%
Hood Canal	1,030,000	66%
Admiralty	50,100	53%
Strait of Juan de Fuca	929,000	0%
Strait of Georgia	1,070,000	0%

*Relative to 2014 loads

Targets: Additional Details

- Assumption: achieving TN targets = achieving OC model inputs
- Marine targets include 3 facilities no longer discharging
- Watershed targets do not address upstream freshwater DO impairments
- Targets consistent with Budd Inlet TMDL bubble allocation

Implementation (pg. 40)

How will we achieve our targets?

Implementation Strategy Overview

Marine Point Sources

Establish numeric Water Quality Based Effluent Limits (WQBELs)

- Tools for achieving permit limits
  - Compliance schedules
  - Nutrient credit trading
  - Reclaimed water

Watersheds

Develop, and implement watershed prioritization strategies

- **Water clean-up plans (TMDLs/STIs/ARPs)**
- Addressing watershed point sources
- Nonpoint pollution control

Implementation – Marine Point Sources

- Targets will be used to inform numeric WQBELs
  - WWTPs and Industrial facilities
  - See Appendix H
- Technical Advisory Committee to support WQBEL development
  - William Weaver, William.weaver@ecy.wa.gov
- No new WWTP or industrial discharge into Puget Sound will be permitted unless targets can be met

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Compliance schedules

- "shortest reasonable amount of time necessary to achieve compliance"*
- Interim limits
- Step-wise progress

*WAC 173-220-140, WAC 173-226-180 and 40 CFR 122.47

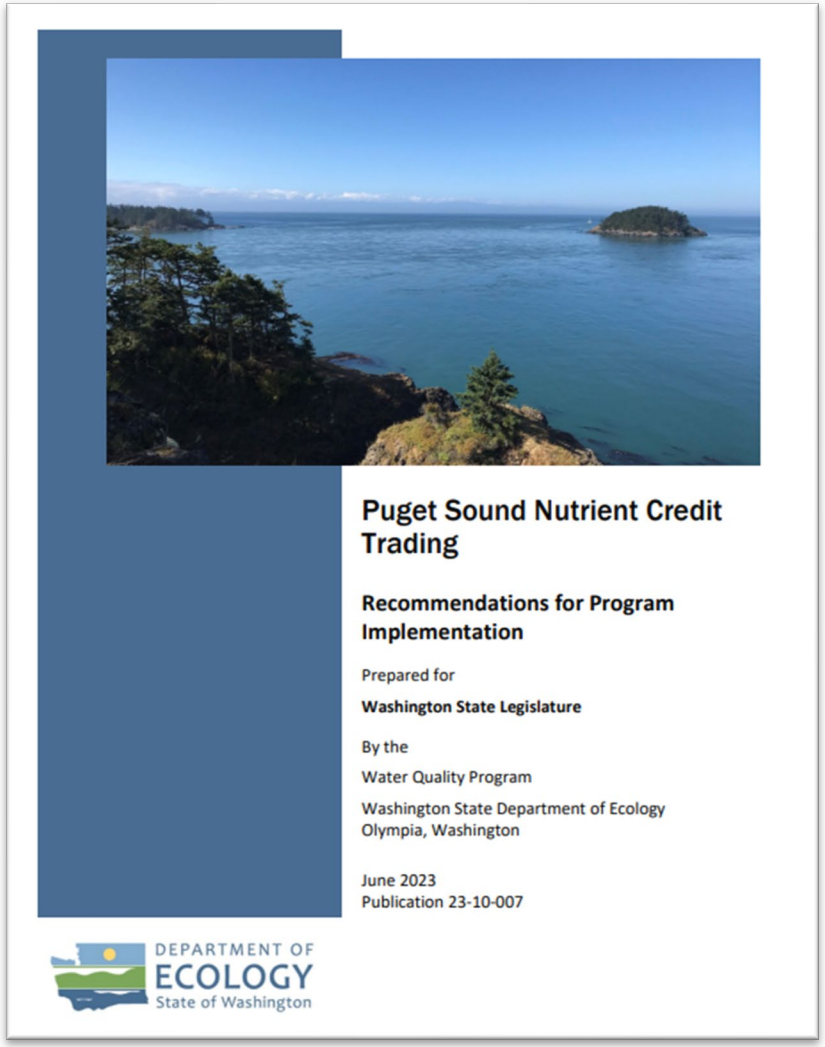
Nutrient Credit Trading (Water Quality Trading)

- A market-based approach to meeting **water quality goals**
- Assigns **pollution reduction** activities a "credit", which can be traded on a local market
- **Goal:** cost-effective alternative to meeting **water quality goals**
- **Objective:** facilitate exchanges of credits which can more quickly **reduce pollution and clean-up waters**

2023 Nutrient Credit Trading Legislative Report

Recommendations

- Program Structure
- Statutory and Regulatory
- Tribal and external party engagement
- Funding



https://apps.ecology.wa.gov/publications/documents/2310007.pdf

2023 Legislative Report Next Steps

Request legislature funding

- Market feasibility analysis
- Develop formal outreach plans
- Technical research

Establish numeric nitrogen effluent limits in PSNGP

Develop and initiate outreach plans for interested parties and Tribes

Reclaimed Water

- Wastewater treated for safe re-use
  - Examples: Irrigation, industry
- Regulated by Ecology and WA Dept. of Health
- Reduce direct nitrogen loading
  - Effluent reduction (volume)
  - Nitrogen concentration reductions

Watershed Implementation

- Ecology regional offices will be drafting **watershed prioritization strategies**
  - Identify and prioritize **water clean-up plans** – target dates
  - Roadmap to achieve necessary **permitted point source** reductions
  - **Nonpoint pollution control** priority watersheds
- Adaptively managed ~ 25 years

Watershed Targets (lbs. TN/yr) (*Table 6*)

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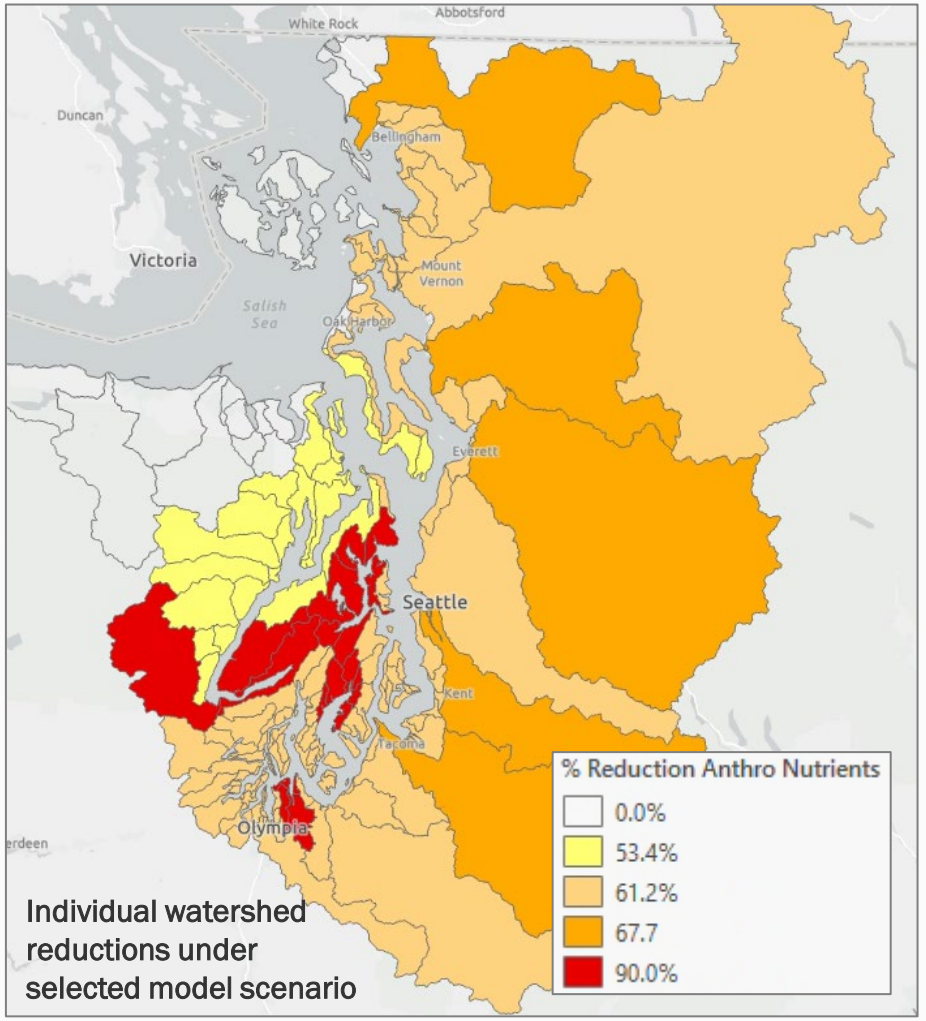
Water clean-up plans for watersheds

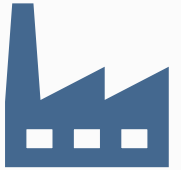
- Primary approach for achieving watershed targets
  - TMDL, ARP, Straight to Implementation (STI)
- Consistency with targets = meeting marine DO standards
- Regional offices prioritize clean-up plans annually
  - Policy 1-11
- Additional nutrient controls?



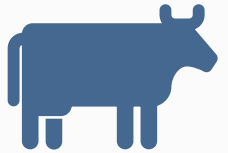
Permits in the Watersheds

- Future watershed clean-up plans will address permitted sources in watersheds
  - Nutrient allocations/targets → Permit limits (WQBELs)
  - Additional best management practices (BMPs)
- Additional monitoring may be necessary
- Permit action does not preclude clean-up plan development

WWTP



Industrial



CAFO GP

Stormwater GP:
Municipal
Industrial
Construction

Sand & Gravel GP

Upland Fin Fish GP

Nonpoint Pollution Control

- "The Nonpoint Plan"
- Voluntary Clean Water Guidance for Agriculture
  - Managing Nutrients
  - Transport and Treatment
- Future watershed prioritization strategies will describe nonpoint prioritization efforts

Financial Assistance (pg. 53)

- Grants and loans available to marine point source and watershed implementation
  - Wastewater planning, optimization, and upgrades
  - Nonpoint best management plan (BMP) implementation
  - Restoration
  - Conservation

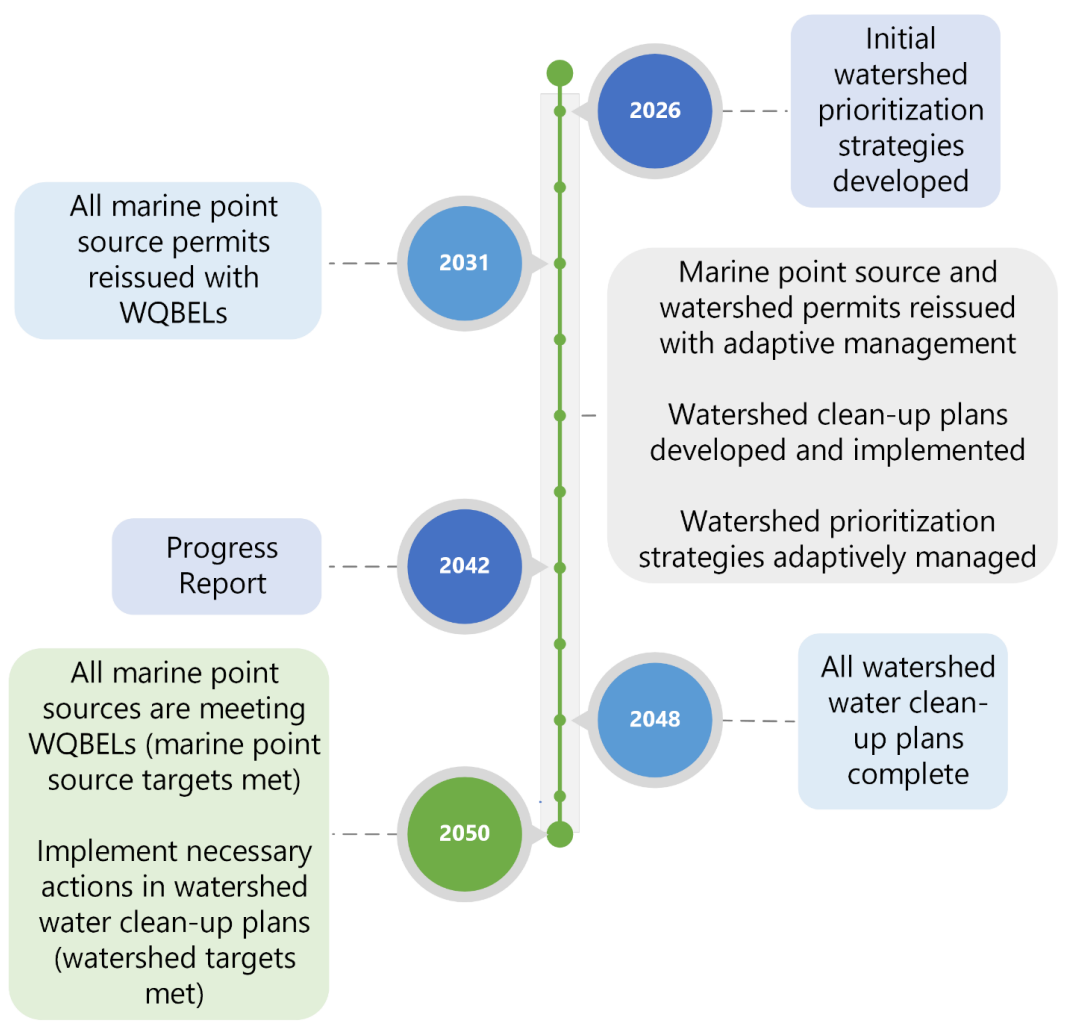
Ecology's Puget Sound Nutrient Reduction Grants Program

- Project scope: Planning, monitoring, and operational efficiencies to meet requirements of Puget Sound Nutrient General Permit
- Eligible entities: PSNGP permittees
- $10 million for SFY 2025-2027

Ecology's Water Quality Combined Funding Program

- Grants and loan funding from 7 state/federal sources
- Project types: wastewater, stormwater, nonpoint BMPs, restoration, protection, monitoring, onsite sewage systems
- Eligible entities: local governments, Tribes, sewer districts
- Ranges from $100-200 million

Schedule & Milestones (pg. 57)

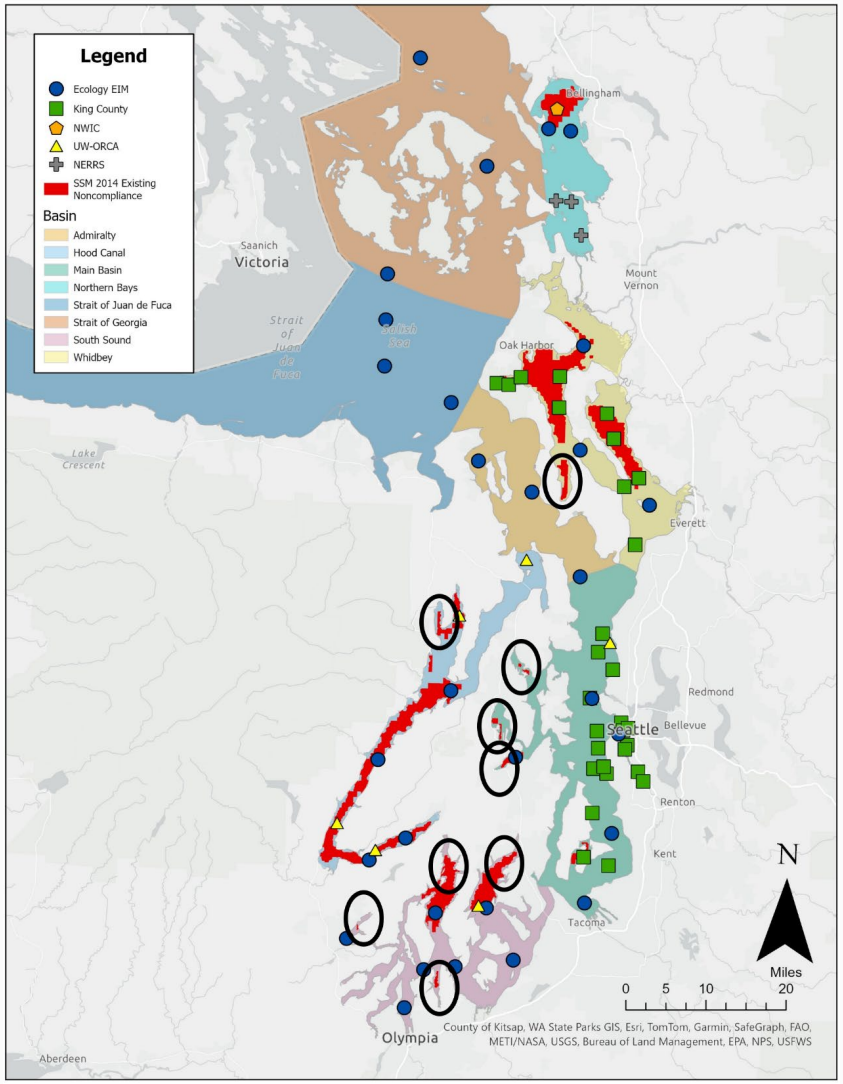


- Measurable Milestones (Table 9)
  - Permits
  - Water clean-up plans
  - Progress reports – 2042 & 2055
- Reoccurring Milestones (Table 10)
  - Permit coordination, review, updates
  - Nonpoint field staff work
  - Adaptive management

Effectiveness Monitoring (pg. 63)

- Evaluates existing efforts
- Recommendations for future efforts
- How we will use these data

- Primary types of monitoring
  - Marine point source nitrogen loads
  - Watershed nitrogen loads
  - Puget Sound dissolved oxygen
    - Inputs to Salish Sea Model
  - Implementation tracking



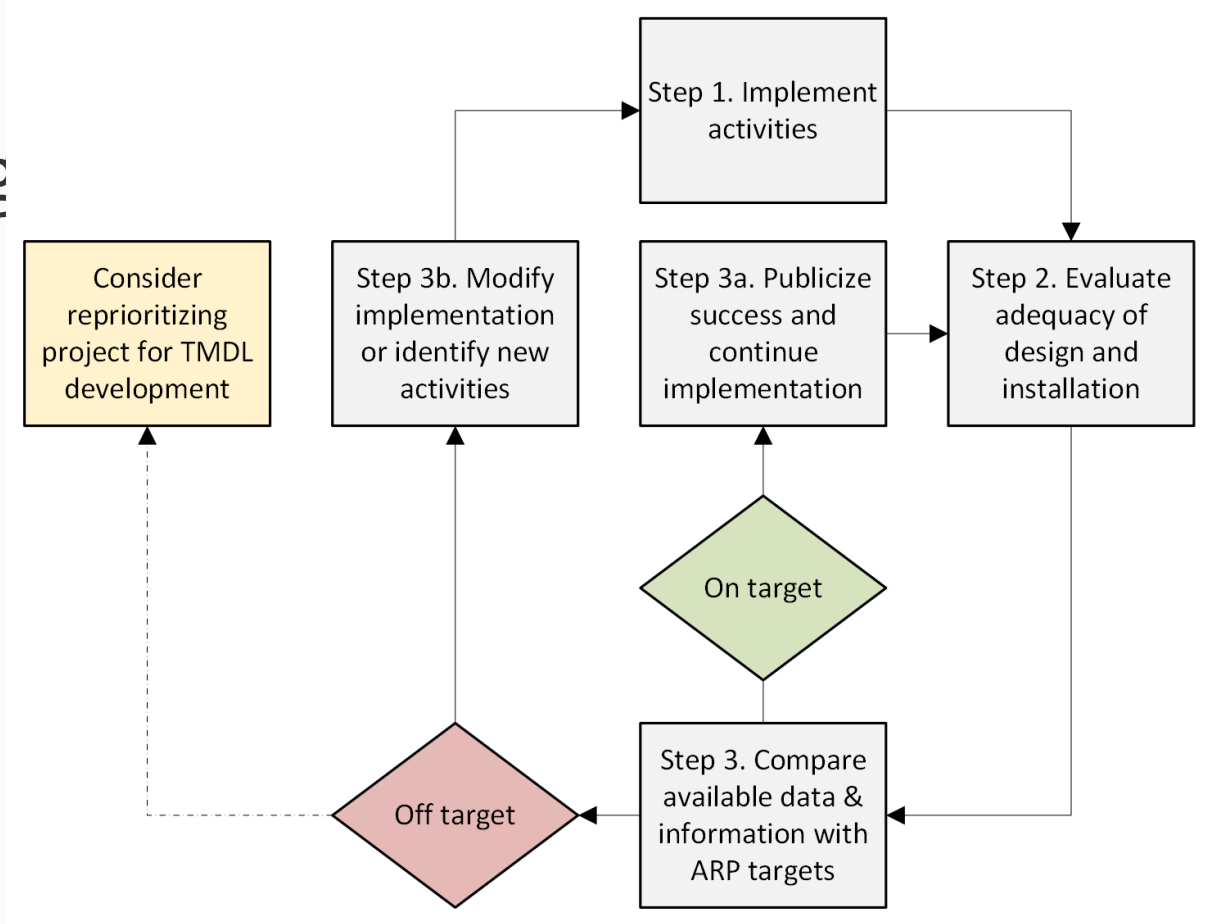
Examples of potential DO monitoring gaps in Puget Sound (Figure 12)

Other Monitoring Considerations

- Additional monitoring needed in some watersheds
- Collecting implementation data, before additional monitoring efforts
- Future Salish Sea Model runs to evaluate DO will need a variety of data
  - Progress reports in 2042 and 2055
- Other types of data helpful for understanding broader recovery
  - Algae blooms, sediment, benthic macroinvertebrates, biological

Adaptive Management (pg. 72)

- *Strategic* "trial and error"
- Is our implementation working
  - If not, what will we do about it?



How to comment

Comments are due by 11:59 p.m. August 27, 2025

Comment online or by mail

- Comment online at: https://wq.ecology.commentinput.com/?id=9ruD7M5ie
- Send comments by mail to:

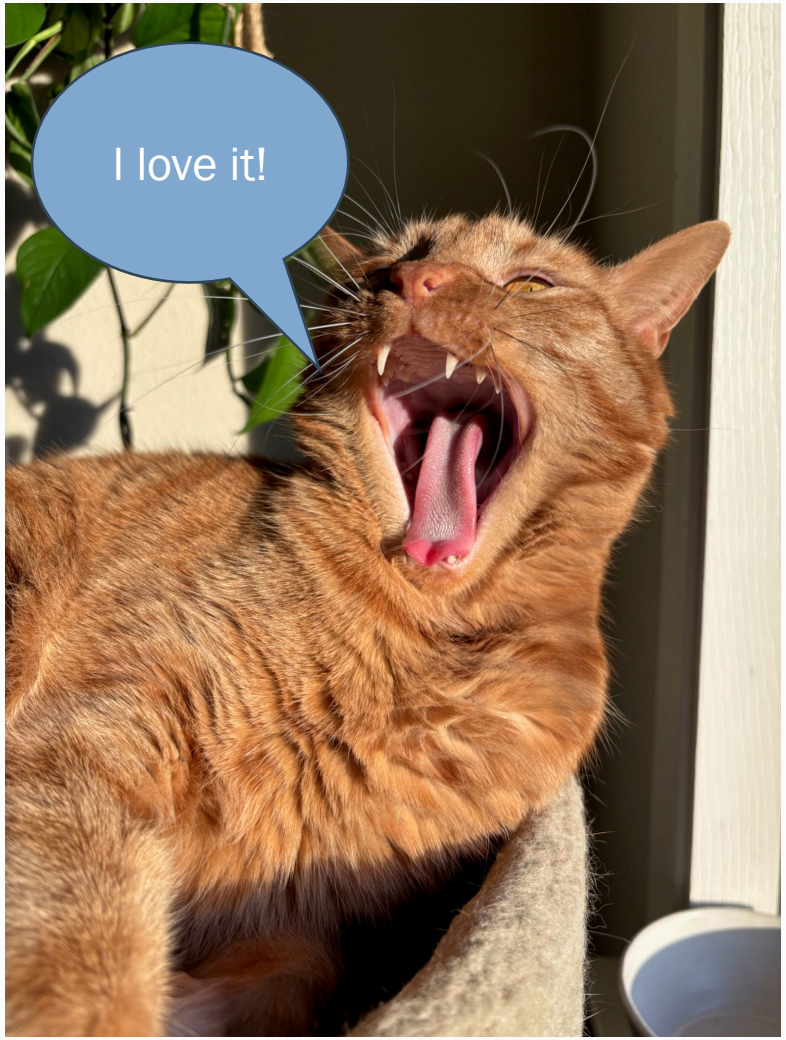
  Jeremy Reiman
  Department of Ecology
  Water Quality Program
  PO Box 47600
  Olympia, WA 98504-7600

- Due: August 27th, 2025

Scan me!

Helpful feedback

- Clear & specific
- Are there other reduction scenarios that may meet state water quality goals?
- Do you have ideas for setting WQBELs? (Appendix H)
- Are there other creative implementation tools we should consider?
- Are refined or additional milestones needed?



Next Steps

July 2025

In-person Nutrient Forums

August 27, 2025

End of plan comment period

Fall 2025

Review comments and update plan

December 2025* *anticipated*

Transmit plan to EPA and publish response to comments

Next 25 years

Continue implementation of the plan!

Next Steps

Working with partners, interested parties, and Tribes

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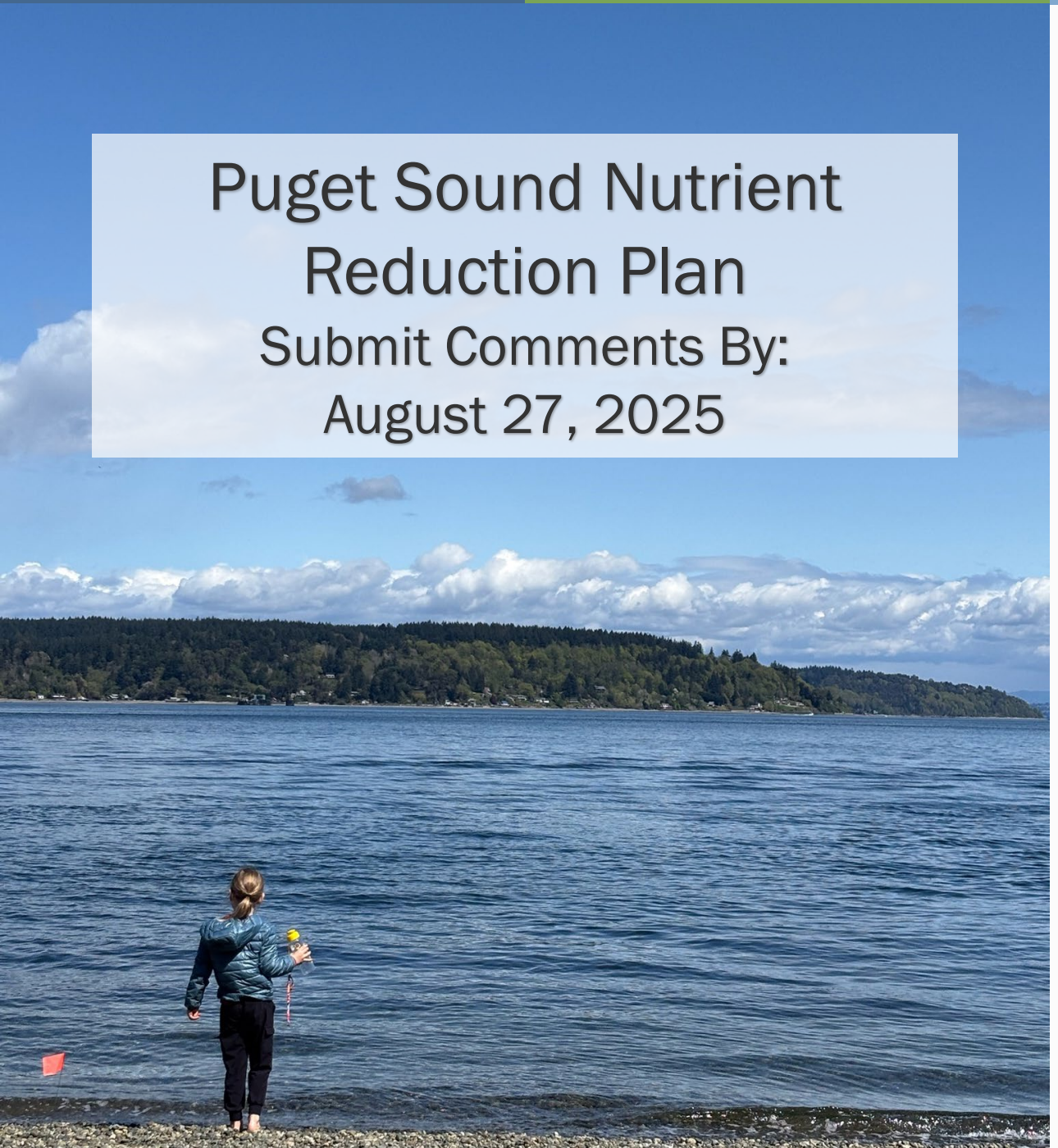
Next 25 years

Continue



Thank you

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Reducing Nutrients webpage