



Puget Sound Nutrient Forum

Looking Forward to 2020

December 19, 2019

Next Puget Sound Nutrient Forum:
January 30, 2020
This will be an in-person meeting.

Today's Goals

- Revisit science behind nutrients in Puget Sound
- Provide clarification around nutrient permitting
- Share what we heard in the public comment process
- Explain next steps for nutrient permitting and the Nutrient Forum
- Answer questions

Our goal for nutrient reduction

Reduce the regional burden of human nutrients that enters Puget Sound so that we protect the resiliency to the increasing stresses from population growth and climate change.

Achieve human source nutrient load reductions to:

- **Meet Marine WQ Standards for Dissolved Oxygen (DO)**
- Protect for natural conditions in Puget Sound
- Support a nutritious marine food web that supports healthy and robust populations of salmonids and orca whales
- Support healthy nearshore eelgrass and kelp habitats

WQ Dissolved Oxygen Standards in Puget Sound

- Numeric Criteria:
 - 7.0 mg/L - most of Puget Sound and the Straits
 - 6.0 mg/L – Bellingham Bay, Samish Bay, Skagit Bay, around Whidbey, other inlets/bays
 - 5.0 mg/L - Commencement Bay, Budd Inlet, and portions of some inlets
 - 4.0 mg/L – very tiny finger of Commencement Bay
- Protection of natural condition
 - 0.2mg/L “Human DO Depletion Allowance”

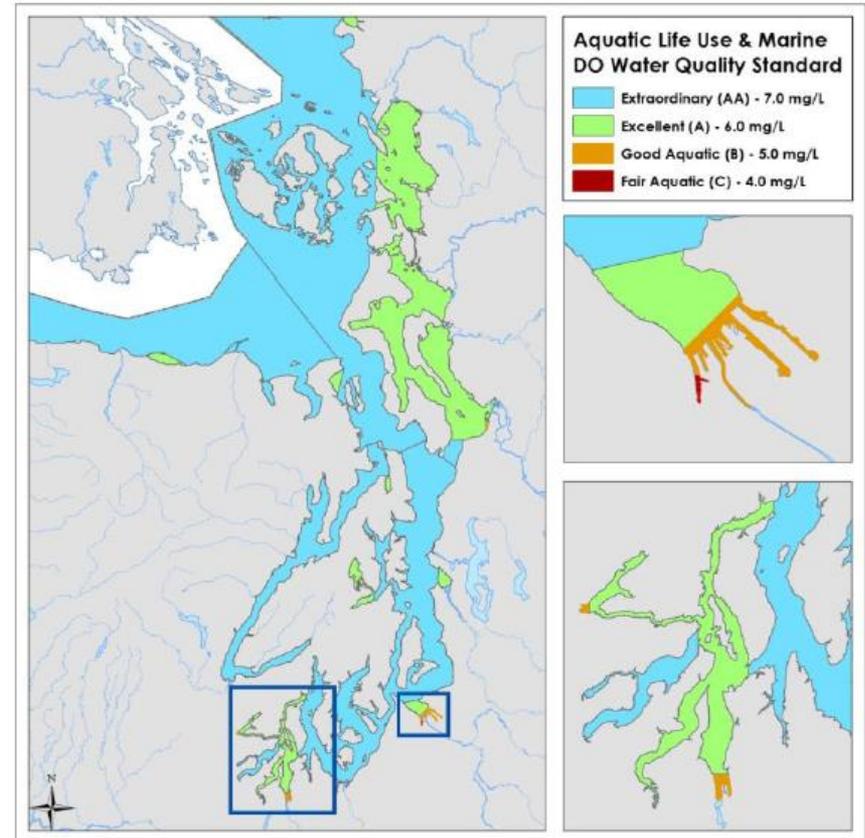




Photo credit: WA Dept. of Ecology

Overabundance of jellyfish



Photo credit: WA Dept. of Ecology

Nuisance macroalgae



Algal blooms

Human nutrient loads contribute to eutrophication indicators



Parvilucina tenuisculpta

Photo credit: WA Dept. of Ecology

Benthic Community Shifts



Stress on nearshore habitats



Low Oxygen

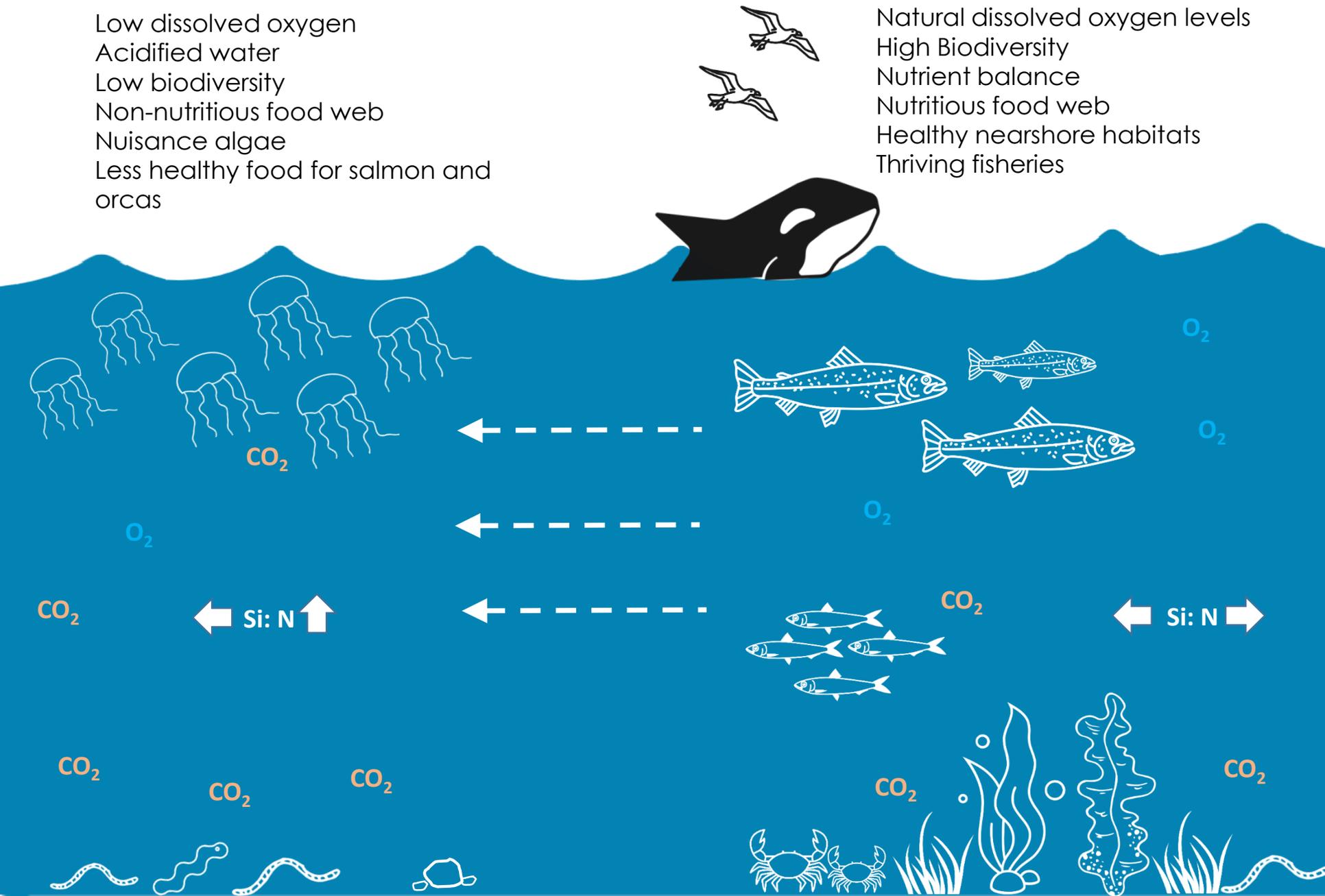
Photo Credit: KOMO news

Unhealthy Puget Sound

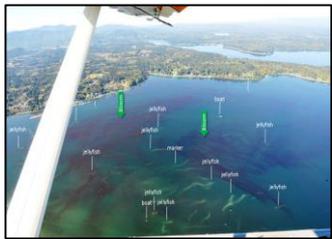
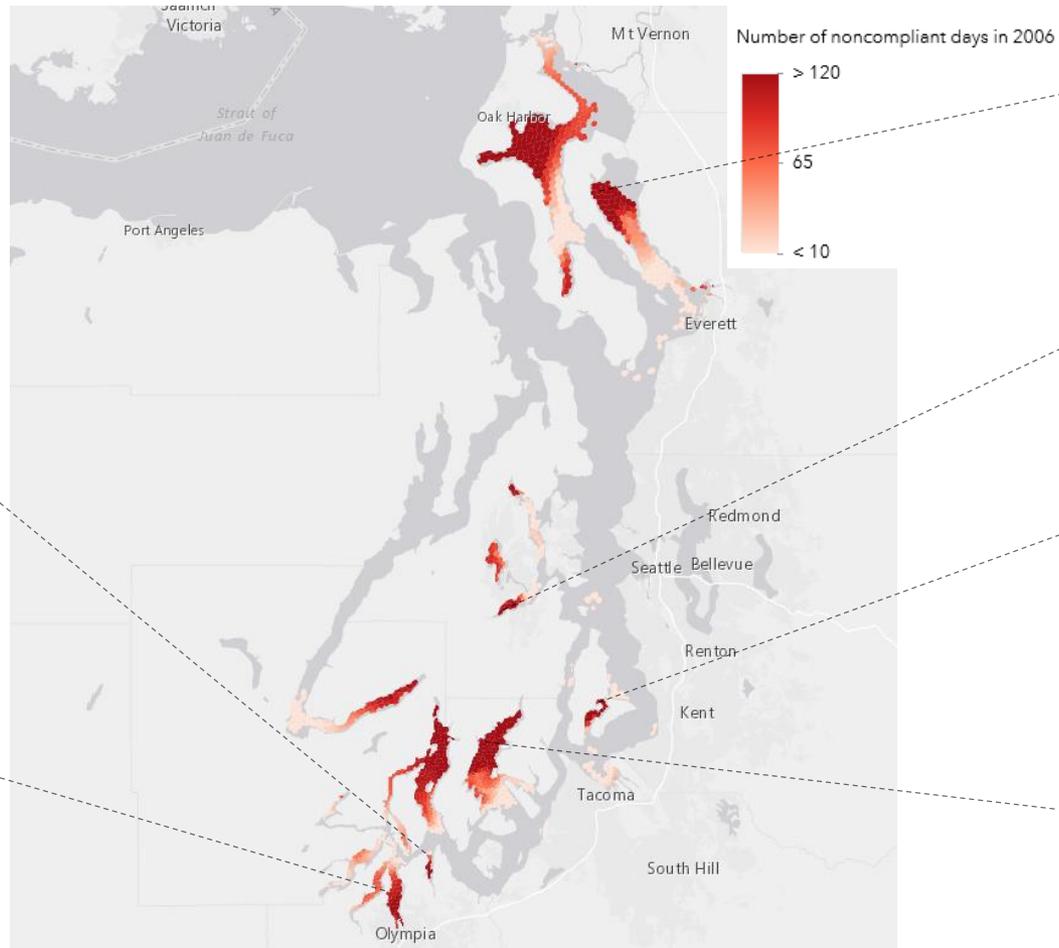
Low dissolved oxygen
Acidified water
Low biodiversity
Non-nutritious food web
Nuisance algae
Less healthy food for salmon and orcas

Healthy Puget Sound

Natural dissolved oxygen levels
High Biodiversity
Nutrient balance
Nutritious food web
Healthy nearshore habitats
Thriving fisheries



Monitoring and observations complement Salish Sea Model findings



Photos from Ecology's Eyes Over Puget Sound Program

Major processes involving DO dynamics

- Reaeration (wind and concentration induced)
- Photosynthesis (sunlight, O₂, nutrients, algal growth)
- Nitrification - Denitrification
- Respiration and die-off (CO₂, organic matter)
- Organic matter decomposition (decay rates, BOD)
- Sediment oxygen demand (sediment diagenesis)
- Estuarine circulation, stratification, residence times
- Water Temperature
- **Freshwater (watershed and WWTP) and oceanic inputs**



Assessed Waterbodies for
Dissolved Oxygen:

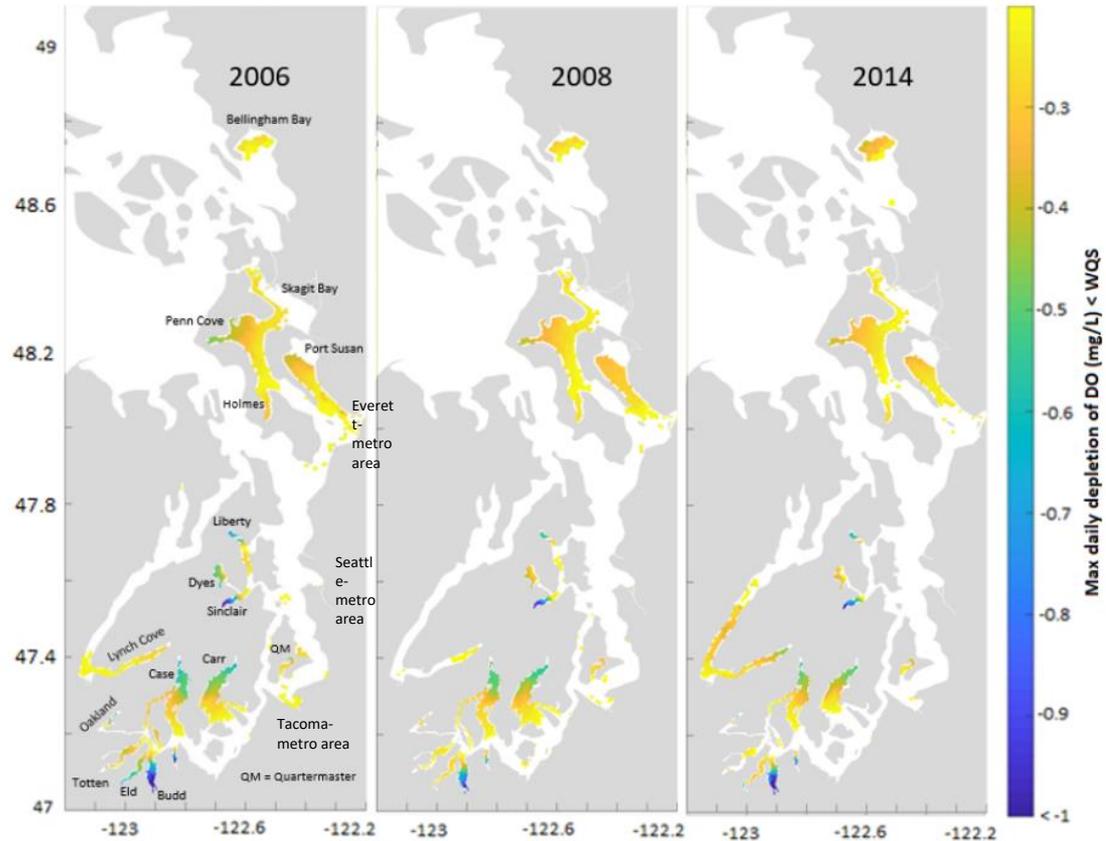
RED = 303(d) listed

ORANGE = Waters of
Concern

Understanding total human impacts on marine DO

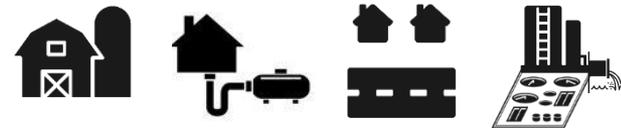
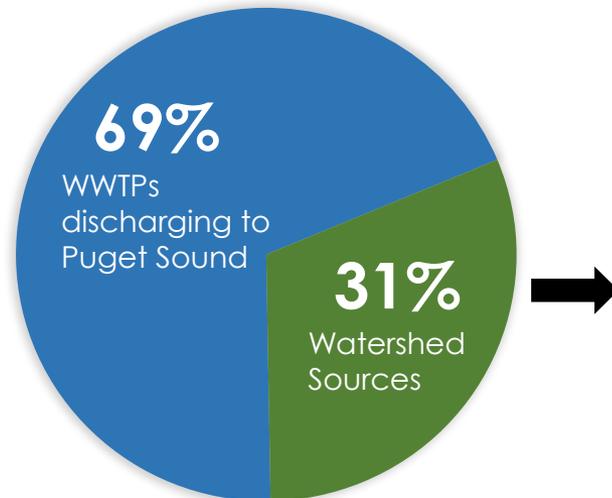
Discharges of nutrients from total human sources in the Puget Sound region are contributing to lower DO levels in Puget Sound

Human sources are causing a problem during a hot/dry year as well as during average condition years.



**Figure 26 from Volume 1: Model Updates and Bounding Scenarios, Pub. #19-03-001*

Human Sources of Nutrients to Puget Sound



Watershed WWTPs, Agricultural runoff, onsite septic systems, unmanaged stormwater

Puget Sound WWTP nutrient controls:

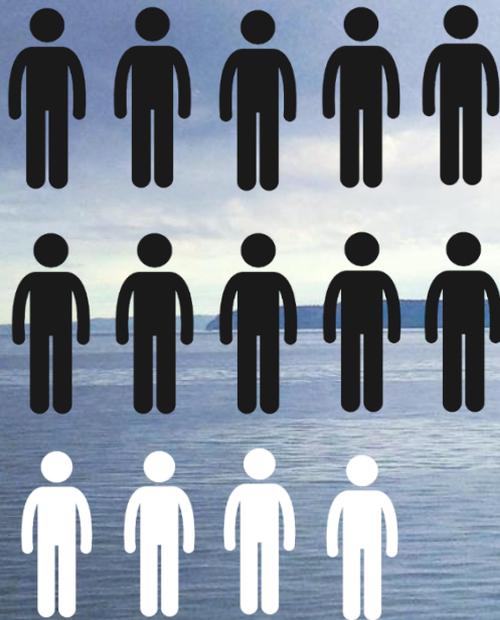
- NPDES permits
- Infrastructure investments
 - Optimize existing treatment
 - Advanced treatment
 - Reclaimed water



Reducing watershed sources:

- NPDES permits (WWTP and Stormwater)
- Nonpoint Source Actions
 - BMPs for landowners
 - Local Partnerships
 - Centennial Clean Water Grant Program
 - Clean Water State Revolving Fund Loans

We Need to Invest in Our Infrastructure



The current population of Puget Sound is over **4.5 million** and current loads are causing marine water quality problems.

1.8 million more people will move to Puget Sound region by **2050**

40% increase over current loads

In Summary

- Total human nutrient loads combined are creating dissolved oxygen problems in Puget Sound and parts of Bellingham, Padilla, and Samish Bays.
- Excess nutrients can have wider ecological and water quality effects than DO alone.
- We need to do something **now** before increasing human and other physical stresses further degrade the integrity of Puget Sound water quality.

Expanding what we know



Investigating tools to understand human nutrient contributions in watersheds

- [McCarthy, Sheelagh. 2019. Puget Sound Nutrient Synthesis Report, Part 2: Comparison of Watershed Nutrient Load Estimates. Washington Department of Ecology, Publication #19-03-019.](#)

Nutrient Forum: Year in Review

February

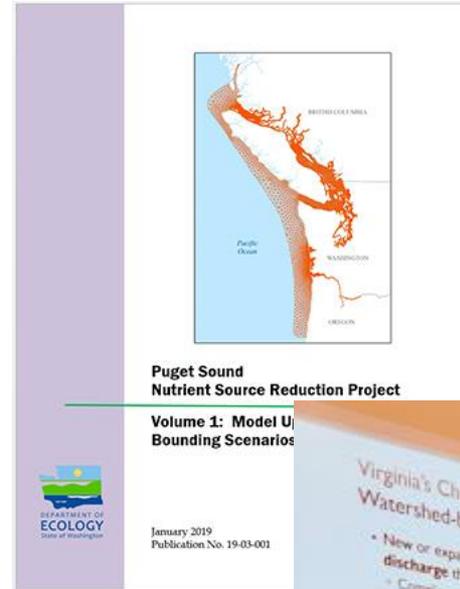
Bounding Scenarios
Results & AKART decision

March

Nutrient Management in
other states

April

Optimization Scenarios



Nutrient Forum: Year in Review

June

Puget Sound
Implementation Examples

July

Finalization of Optimization
Scenarios

August

Costs & Creative Solutions,
Preliminary Determination
of Nutrients General Permit



Nutrient permitting: Not **IF** but **HOW**

Discharges of excess nutrients from domestic WWTPs are **contributing** to low DO levels in Puget Sound.

Therefore

Ecology **must** require WWTPs to control nutrients consistent with the Clean Water Act and Washington's Water Pollution Control Act.

Ecology implements this requirement through NPDES permits.



Preliminary Determination to develop a Nutrients General Permit

Comment period:

August 21 - October 21, 2019

Primary purpose was to obtain feedback

- Whether or not a general permit is the appropriate tool to control and reduce nutrients in discharges from WWTPs to Puget Sound.

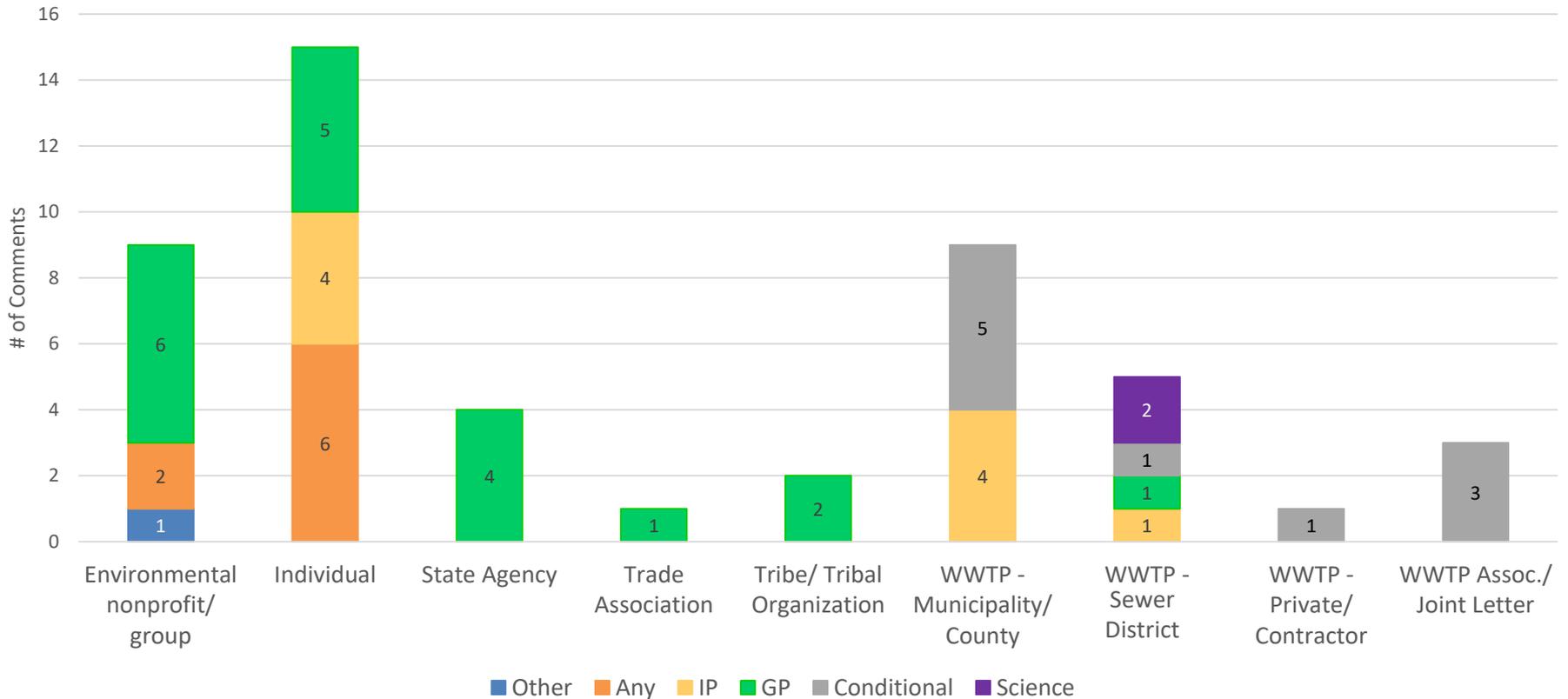
Also an opportunity to obtain

- Additional information about WWTPs.
- Additional information about Puget Sound water quality.



Preliminary Determination Comment Summary

Preliminary Determination Comment Overview
49 comments received



Comment summary:

Support of a general permit

19 comments supported a general permit for controlling nutrients from WWTPs.

Key messages included:

- A general permit is a good tool, but nutrient reductions must be implemented more quickly than 10-15 years (or 2-3 permit cycles).
- A general permit cannot work alone. Ecology should pursue other tools to support nutrient reduction.
- A general permit process will allow for collaboration and engagement with dischargers and the public.
- A general permit approach offers some certainty on the strategy for controlling nutrients.



Comment summary:

Conditional support of a general permit

10 comments conditionally supported a general permit for controlling nutrients from WWTPs.

Key messages included:

- Nutrient reduction solutions must result in positive change to the health of Puget Sound.
- There should be a strong stakeholder group to foster collaboration on solutions and guide permit development.
- Watershed sources (point & nonpoint) must also be reduced.
- Address concerns and uncertainties about the technical basis for permitting nutrients, including the Salish Sea Model and DO WQ standards.



Comment summary:

Support of using individual permits

9 comments supported using individual permits for controlling nutrients from WWTPs.

Key messages included:

- There is too much uncertainty on how a general permit would work for it to be a viable option.
- Individual permits allow for differences in permit conditions based on facility-specific characteristics.
- Concerns about increased effort (time and money) to manage two permits.
- A general permit may allow for collaboration, but concerns that the conversation would be dominated by the larger WWTPs.



Comment summary:

Support of nutrient controls, regardless of permitting approach

8 comments supported controlling nutrients from WWTPs using any mechanism.

Key messages included:

- Ecology has waited long enough. The problem will only continue to grow and action needs to be taken now.
- Any permit structure must include water quality-based effluent limits.



Comment summary:

Support of investing in science before permitting

2 comments supported continued investment in science before pursuing permitting.

Key messages included:

- Time and money should be invested in efforts to collaborate on evaluating available research and modeling.
- Quantify nonpoint contributions and possible reductions before requiring upgrades to WWTPs.



Want to read the comments...

All comments received during the preliminary determination are viewable online

<http://ws.ecology.commentinput.com/?id=HMk9A>



What are we considering as we plan and move forward?

- Pace and sequence of permitting
- Stakeholder engagement
- Watershed and non-point nutrient reduction



Pace and sequence of permitting

We are discussing if and how we may proceed with a general permit

- Timeline
- Stakeholder process options
- Mechanics of overlaying a general permit on individual permits



Pace and sequence of permitting

Ecology will begin to reissue expired or expiring individual permits with nutrient control requirements

- Consistent with Ecology's response to the petition for AKART rule-making
- Consistent with recently issued Suquamish WWTP 401 certification
- Ecology Facility Managers/Permit Writers will contact likely affected permittees
- Public Notice of Draft permits will be shared with the Nutrient Permit listserv <http://listserv.ecology.wa.gov/scripts/wa-ECOLOGY.exe?SUBED1=NUTRIENTS-PERMIT&A=1>



Stakeholder engagement in permitting process

We are considering what a stakeholder advisory group focused on permitting might look like in conjunction with or separately from stakeholder engagement with the model.

- How can we ensure all interested and affected parties are represented equally.



Stakeholder engagement on the model

- Nutrient Forum
 - Discuss model input data and assumptions
 - Develop model scenarios for 2020 – 2021
 - Discuss criteria for determining if proposed nutrient management load reductions meet our water quality target
- Puget Sound Partnership
 - Winter science workshop to discuss influence of nutrient and carbon loads on DO and ocean acidification conditions in Puget Sound



Engagement on watershed and non-point nutrient reduction

Nutrient Forum:

- Discuss tools and data needed to understand human nutrient loads within watersheds
 - [McCarthy, Sheelagh. 2019. Puget Sound Nutrient Synthesis Report, Part 2: Comparison of Watershed Nutrient Load Estimates. Washington Department of Ecology, Publication #19-03-019.](#)
- Develop a long-term plan to develop the tools and data necessary for understanding human nutrient loads in watershed
- Discuss near-term nutrient reduction actions for the “low-hanging fruit”



Next Forum

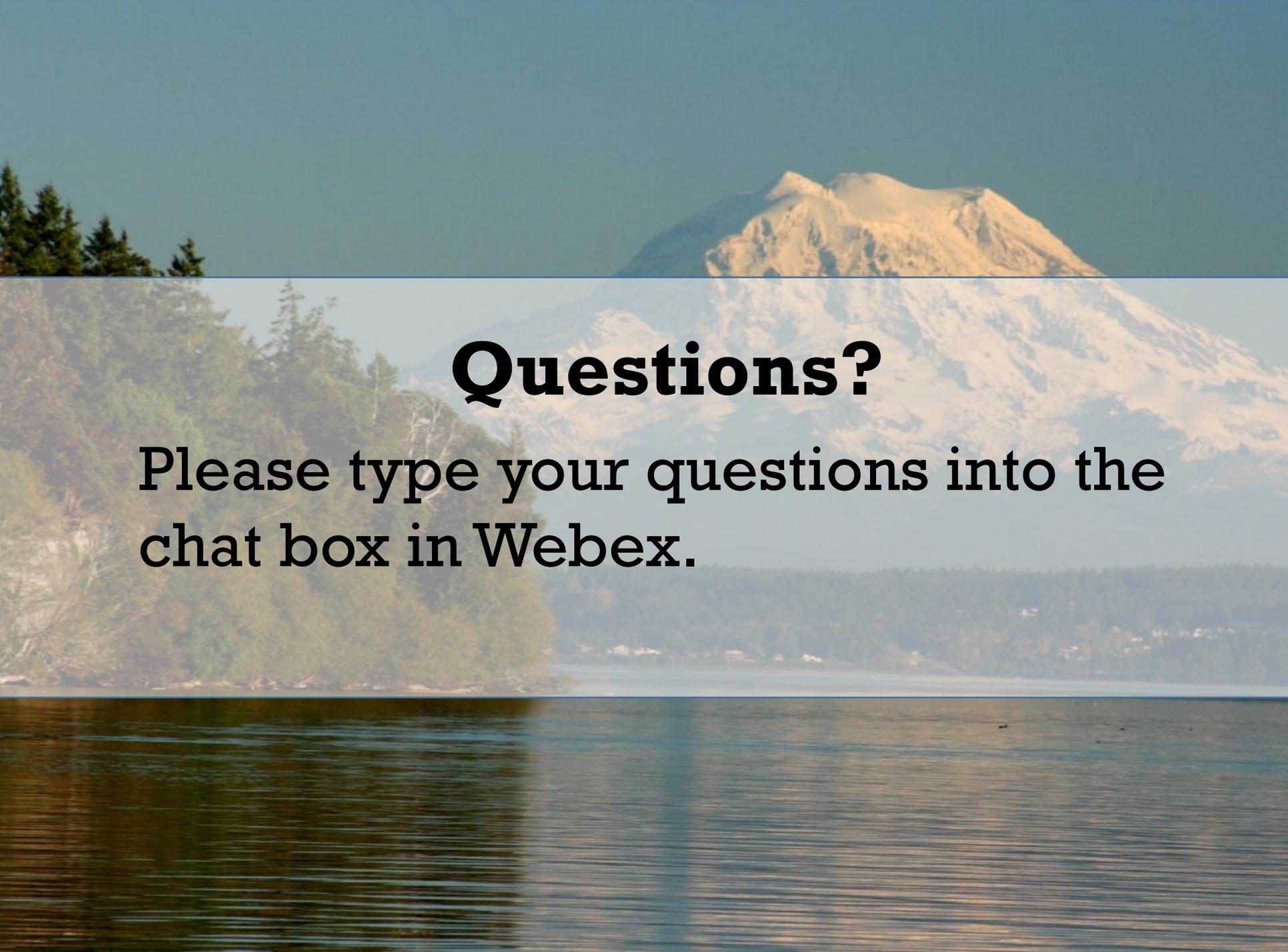
Mark your Calendar for January 30, 2020

Ecology's decision on nutrient permitting controls

- In-person Forum for better discussion
- Stakeholder engagement process
- Process and governance options

Beyond January, expect:

- Mix of in-person and WebEx Nutrient Forums
- More interactive
- More specific/robust discussions around the model



Questions?

Please type your questions into the chat box in Webex.



Thank you!
We'll see you on January 30, 2020.