



DEQ

State of Oregon

Department of Environmental Quality

Integrated Report 2022, Assessment Methodology

Water Quality Assessments Program

Sept. 22, 2020

Webinar 1



Agenda

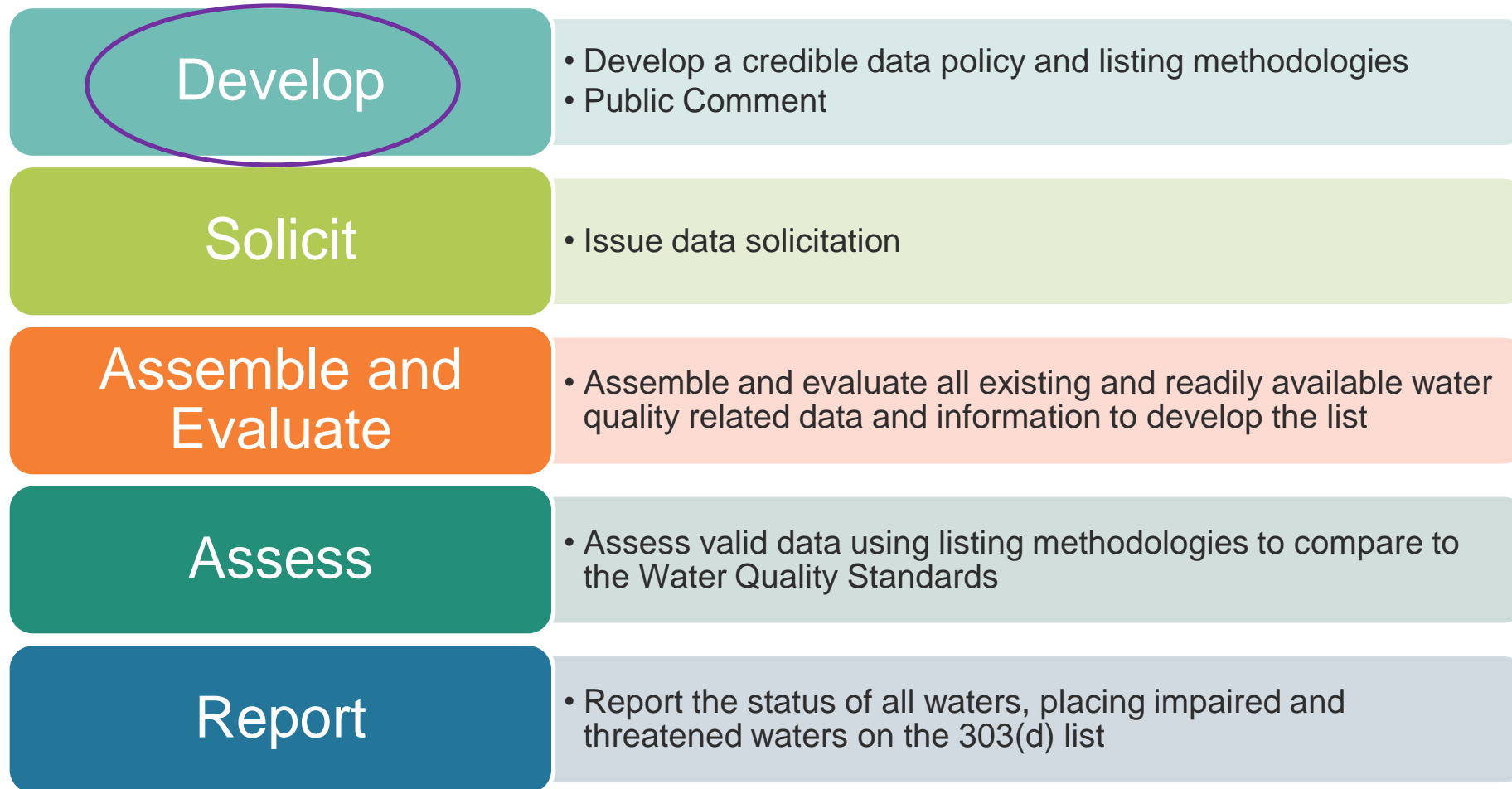
1. Background – Oregon’s 2022 Water Quality Report and List of Water Quality Limited Waters (Integrated Report)
2. Process and Schedule
3. Assessment Methodology short-term updates
4. Assessment Methodology long-term updates
5. Next steps, e.g. Webinar 2 and informal comments due

What is the Integrated Report?

- Assess Oregon's WQ every two years
 - Overall condition of Oregon's waters 305(b)
 - Water quality impaired 303(d)
- Submit to EPA in even numbered years
- Foundation for other WQ regulatory programs.

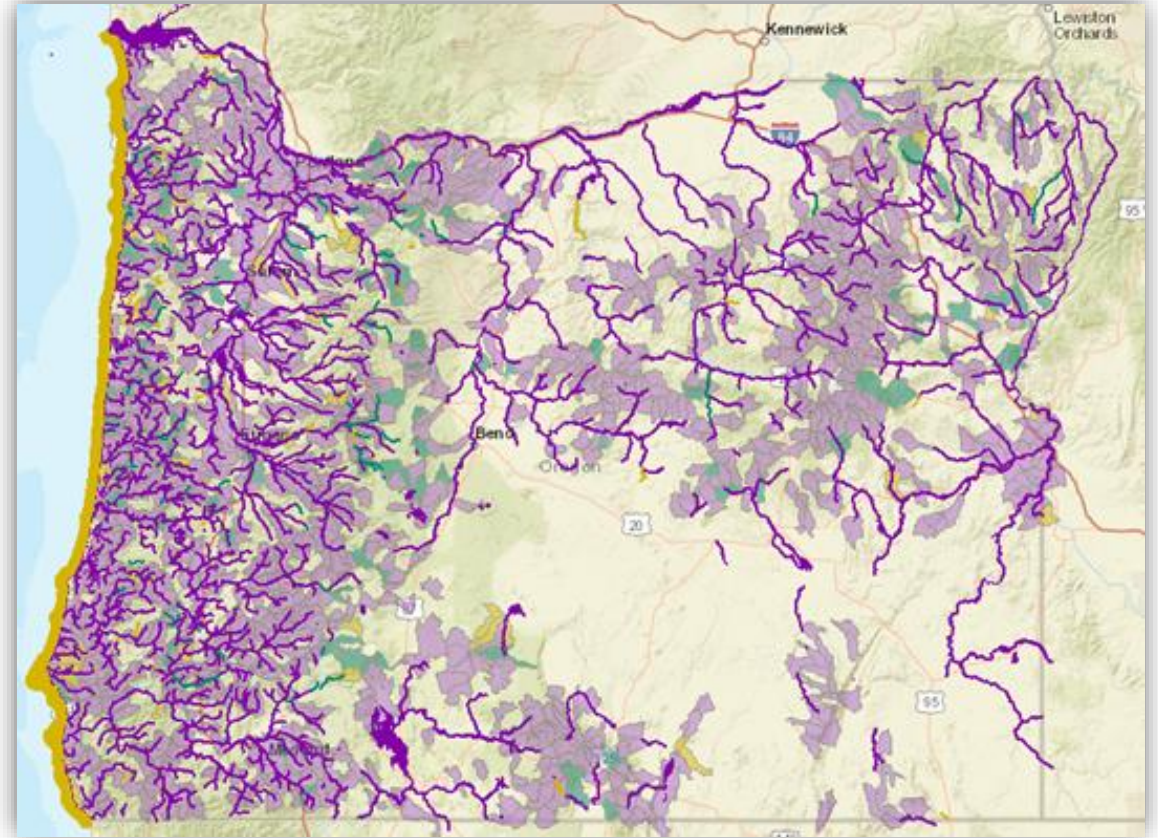


Integrated Report Process

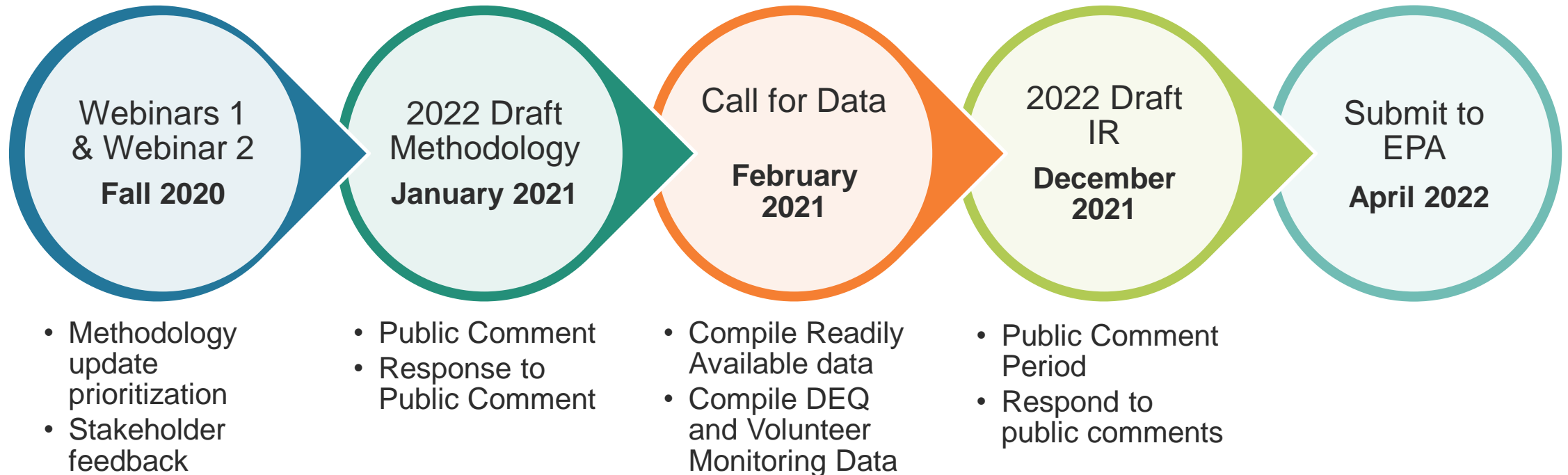


Refresher on 2018/2020 foundational updates

- Fixed assessment units
- Mapped WQ standards and criteria
- New interactive tools
- Improved assessment methods



IR 2022 Schedule



Questions on Integrated Report Process?



2022 Short-term updates

- Delisting for dissolved oxygen
- Assessment of continuous pH
- Delisting for freshwater fecal coliforms
- Minimum data requirements for Category 2
- Assessment of TMDL benchmarks
- Aquatic life aluminum

Dissolved oxygen delisting

Motivation

- DEQ developed new statistical based delisting methodology for 2018/2020 Integrated Report
 - Based on similar binomial process as listing policy
 - 90% confidence level of actual exceedance proportion is $< 10\%$
- The uniqueness of the Dissolved Oxygen (DO) standard and resulting assessment methodology makes the statistical binomial test inappropriate for delisting.

Dissolved oxygen delisting

What type of data should be collected

- Grab samples are inadequate to characterize attainment

Simulated Sampling Program	Average Accuracy of 5000 Simulations
08:00 - 17:00 critical period monthly grab sampling	60%
08:00 - 12:00 critical period monthly grab sampling	62%
03:00 - 17:00 critical period monthly grab sampling	56%
08:00 - 17:00 critical period weekly grab sampling	67%



Dissolved oxygen delisting

What type of data should be collected

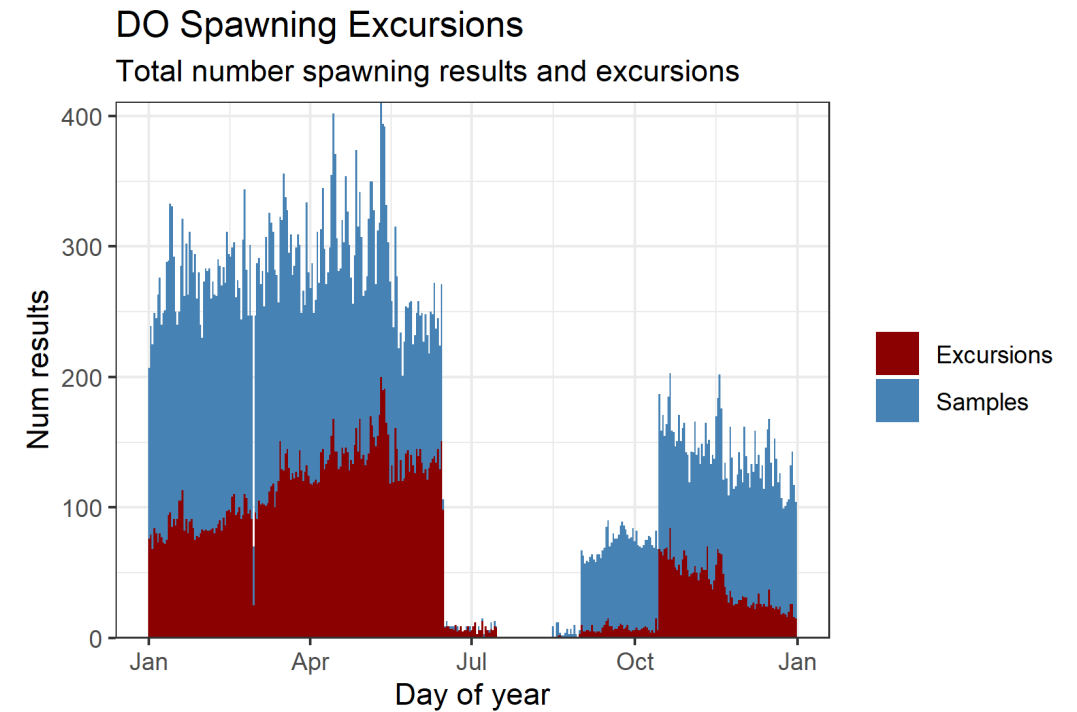
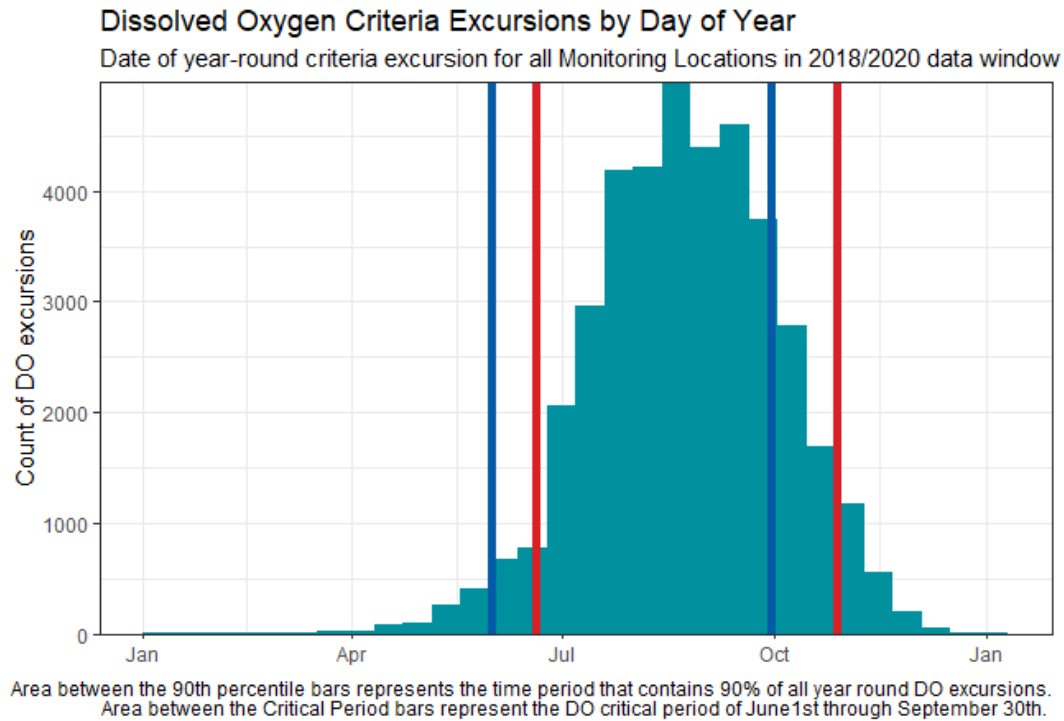
- Short term continuous probe deployments perform better

Simulated Sampling Program	Average Accuracy of 5000 Simulations
2 full day continuous probe deployment per critical period month	84%
3 full day continuous probe deployment per critical period month	86%
4 full day continuous probe deployment per critical period month	87%
5 full day continuous probe deployment per critical period month	89%



Dissolved oxygen delisting

When data should be collected



Dissolved oxygen delisting - Proposal

Full critical period (or spawning option)

- Dataset must include minimum 3 years of data that have 80% of the critical period (July 1st – September 30th) in each year represented *and*
- Continuous metrics analysis results in a category 2 designation of attaining criteria

OR

Short term probe deployments

- Dataset includes minimum 3 years of data that contains at least 5 full days of continuous dissolved oxygen per critical period month per year *and*
- The daily minimum values assess to a attaining condition

Dissolved oxygen delisting - Proposal

In addition, for the 2022 and 2024 Integrated Report cycles only:

- Grab sample method
 - Dataset includes 3 years of data that contain at least 2 results for each critical period month
 - There are no excursions of any applicable criteria
- Allows monitoring partners to adjust to continuous sampling methodologies

Dissolved oxygen delisting – Questions for Webinar #2

1. How many years of data do we need?
2. What is the critical period for spawning listings?
3. Should we include the temporary grab method?
 - What is an appropriate number of samples?

Next steps: Dissolved Oxygen Delisting

- Detailed discussion in Webinar 2 – **Oct. 8, 2020**
 - White paper for review, posted to website – Sept.28, 2020
- Review methods considered
- Justification for method selected
- Discussion of questions
- Solicit feedback prior to release of methodology document

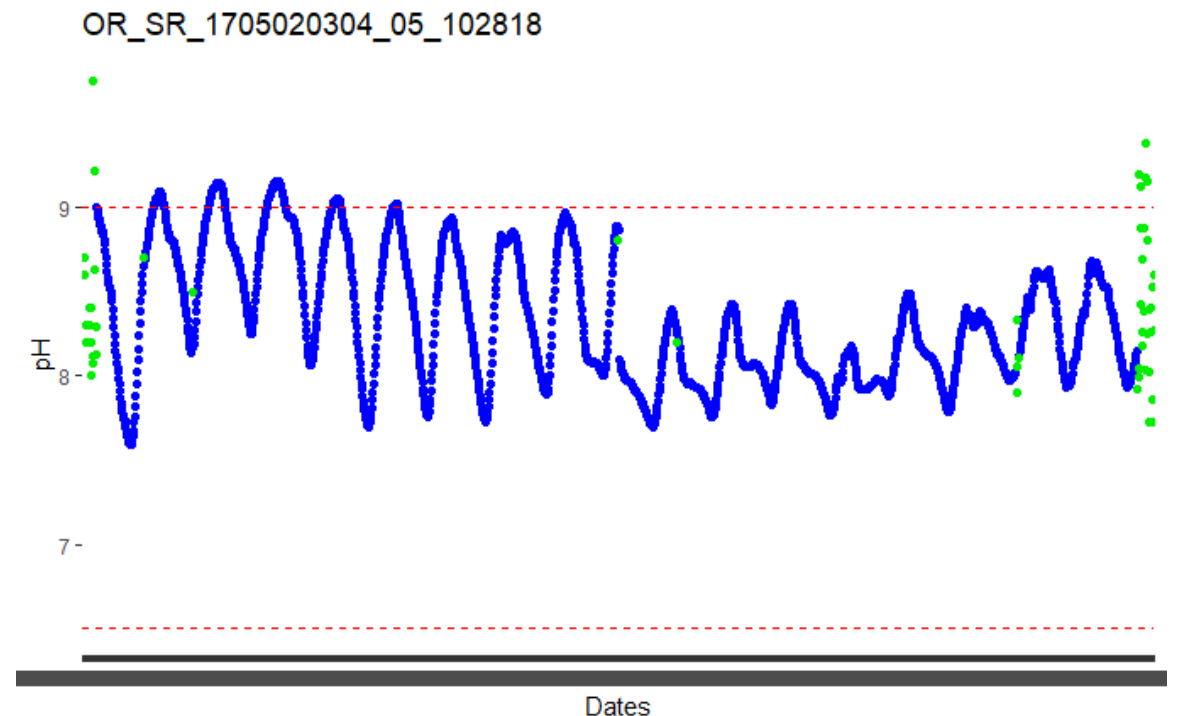
Continuous pH Listing and Delisting

Motivation

- Currently only assess grab pH data
- Increase in collection and accuracy of time series data

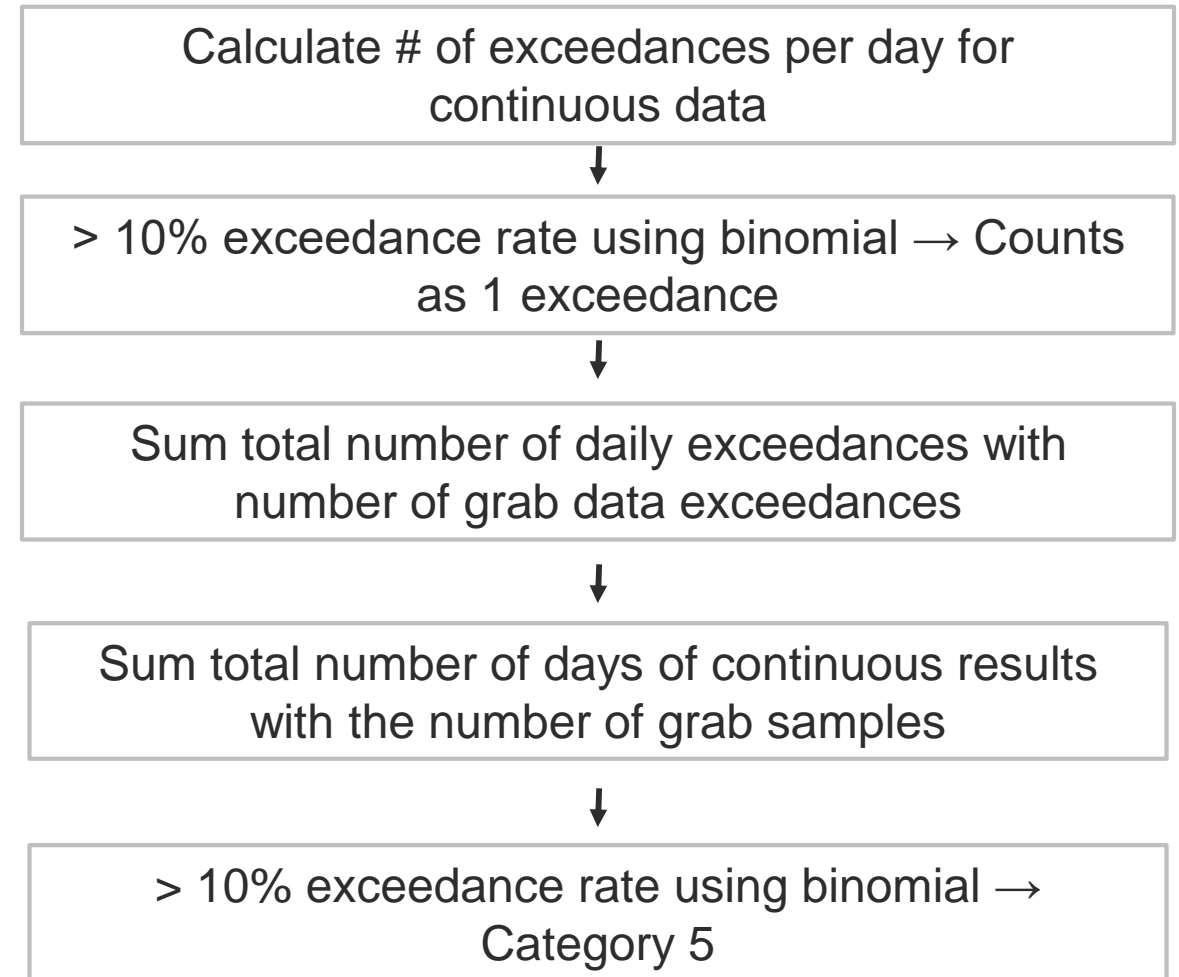
Considerations

- Diurnal - duration and frequency
- Combination of grab and continuous data



DEQ recommendation: Continuous pH

- Utilize the 10 - 10% method
 - Run the exact binomial test twice
 - Incorporates the entire diurnal cycle
 - Combines grab and continuous data sources
- Will also consider rapid (<24 hour) drastic changes in pH to address acute impacts



Next steps: Continuous pH

- Detailed discussion in Webinar 2 – **Oct. 8, 2020**
 - White paper for review posted to website - Sept.28, 2020
- Review methods considered
- Justification for method selected
- Walk through examples
- Solicit feedback prior to release of methodology document

Delisting for freshwater fecal coliforms

- EQC adopted *E. coli* as freshwater indicator in 1996 replacing the fecal coliform criteria
- Category 5 freshwater fecal coliform listings remain

DEQ recommendation

- Use *E. coli* data to retain/delete fecal coliform listing
- Available for fresh waters where current *E. coli* data exist
- Prioritize monitoring for waterbodies with no *E. coli* data

Category 2 minimum data requirements

- 2018/2020 revised method implemented binomial statistical method
 - Strengthened listing/delisting method
 - 90% confidence in category determination
 - Focused on “impairment”
 - May incorrectly categorize waters as attaining
 - Occurs when minimum sample sizes for attainment are not defined

DEQ recommendation: Category 2 minimum data requirements

Set error rate ~10%

	Proposed minimum sample size for Category 2	Incorrectly identify waters as attaining (β)	Power ($1 - \beta$)
Aquatic Life Toxics	10	10%	~ 90%
Conventional Pollutants	8	10%	~ 90%

Assessing TMDL benchmarks

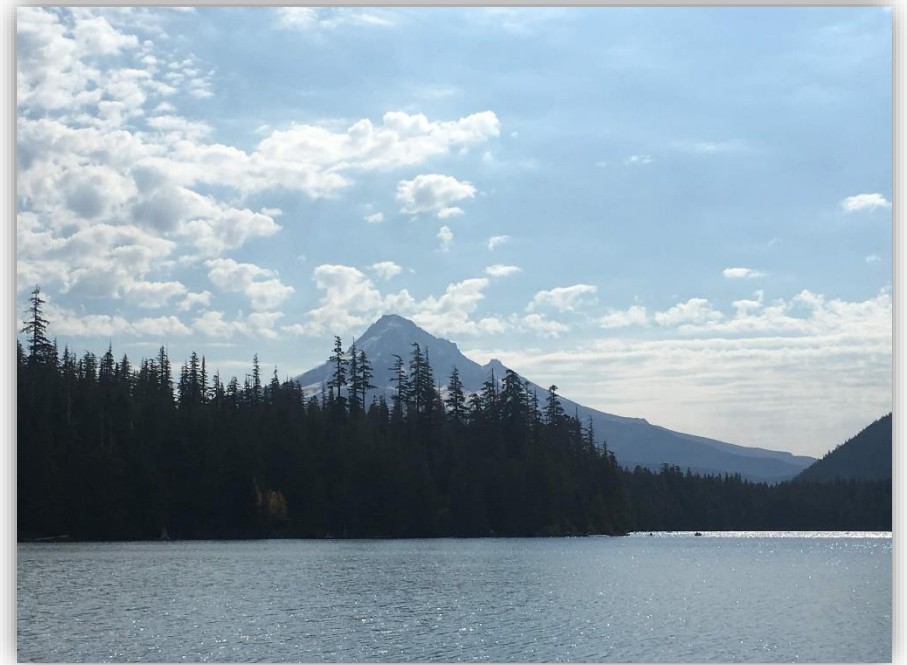
- Can we use TMDL benchmarks to make a Category 2 determination
- For non-numeric criteria
 - i.e. sediment, total phosphorus

Aquatic Life Aluminum

- EPA criteria finalized in early 2021
- pH/DOC/Hardness dependent – similar to copper
- Criteria expressed as total recoverable
- Method will address use of bioavailable aluminum

Questions on **short-term** methodologies?

- Delisting for dissolved oxygen
- Assessment of continuous pH
- Delisting for freshwater fecal coliforms
- Minimum data requirements for Category 2
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Long-term updates

- Biocriteria
- Aquatic weeds/Excessive Algae
- Narrative toxics criteria
- Marine DO and ocean acidification

Biocriteria

- Revamping statewide reference condition approach
- Updating PREDATOR model
- Development of metric thresholds
 - Observed/Expected, Multimetric Index, community composition, etc.
- Linkage to ecological thresholds
- Stressor ID

Aquatic Weeds/Excessive algae

- Data driven methodology update
- Reviewing state methodologies
- Researching assessment and quantification methods
 - Quantify “dominate the assemblage”
- Scoping multiple lines of evidence approach

Narrative toxics criteria

- Initiated evaluation of toxics in tissue (fish, shellfish)
- Researching state methodologies
- Analyzing current toxics tissue data

Marine dissolved oxygen and ocean acidification

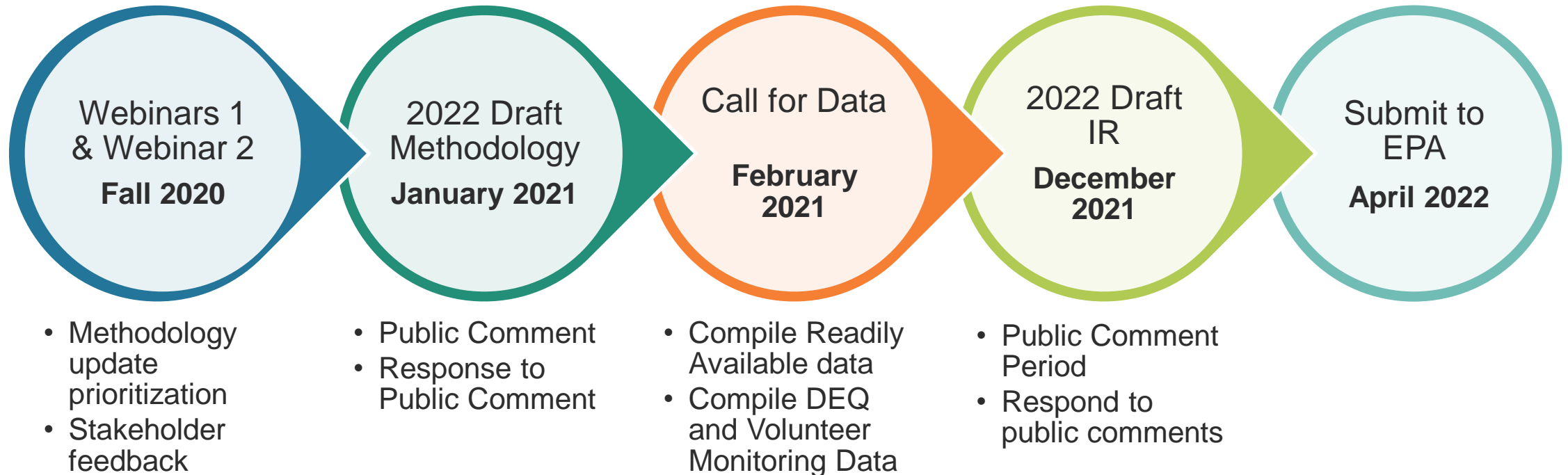
- Partnering with ODFW, DLCD
- Convening scientific technical group
- Scoping methodology/research questions

Questions on **long-term** methodologies?

- Biocriteria
- Marine dissolved oxygen and ocean acidification
- Aquatic weeds/excessive algae
- Narrative toxics criteria



IR 2022 Schedule



Next steps

- Webinar 2 – Oct.8, 2020 from 9:30 a.m. to 12:30 p.m. tentatively
 - Dissolved oxygen delisting
 - Continuous pH
- Accepting **informal** comments on short-term updates until **Oct. 22, 2020**. Email integratedreport@deq.state.or.us
- Finalize draft methodology Winter 2020
- Formal public comment period January 2021

Questions?

- Contact: anthony.becky@deq.state.or.us
- Email: integratedreport@deq.state.or.us
- Sign up for **GovDelivery: WQ Assessment Reporting and 303(d)** to stay up to date. Go to DEQ's webpage: <https://www.oregon.gov/deq/wq/Pages/Integrated-Report-Improvements.aspx>