

Upper Yaquina River Watershed Total Maximum Daily Loads – Rule Advisory Committee Meeting #1

Watershed Management

Aug. 25, 2022

9 a.m. – 12 p.m.

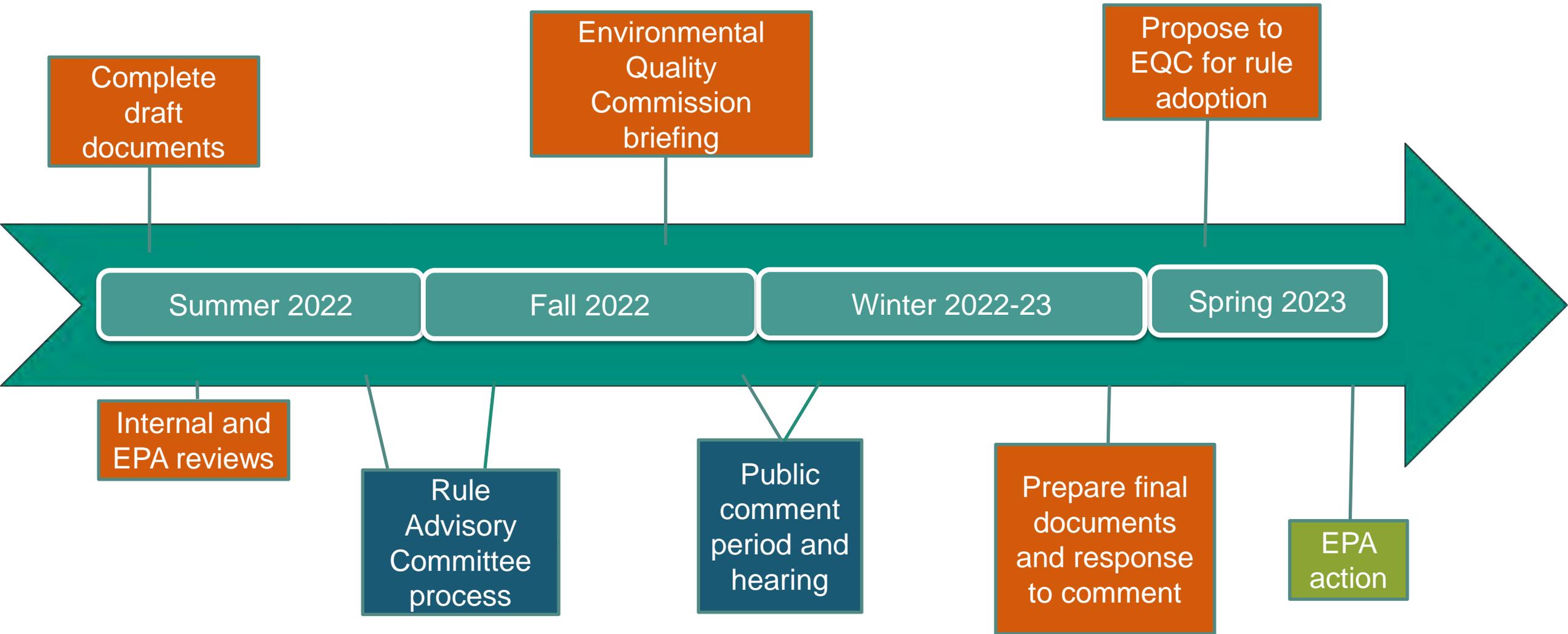
Virtual meeting



Meeting agenda summary

1. Welcome, introductions, agenda review and Zoom logistics
2. Upper Yaquina TMDLs issuance process
3. Rule Advisory Committee process – charter review
4. TMDL basics and Upper Yaquina Watershed overview
5. Bacteria and dissolved oxygen
 - Analyses overview
 - Draft pollutant allocations
 - Water Quality Management Plan overview
6. Draft fiscal impact statement
7. Next steps, wrap-up and adjourn meeting

Upper Yaquina TMDLs process



Rule Advisory Committee charter review

- Objectives and Scope
- Roles
- DEQ Support and Website
- Committee Meetings
- Membership
- Public Records and Confidentiality
- Information Exchange
- Public Involvement

Objectives and Scope

Policy Objectives

DEQ is conducting a rulemaking to establish a Total Maximum Daily Load to address the impairments to water quality standards and beneficial uses caused by excess bacteria, phosphorus and solar radiation in surface waters in the Upper Yaquina Watershed. The TMDL process identifies and quantifies pollutant sources. This rule will also establish a water quality management plan that includes implementable management strategies, a list of parties responsible for implementing strategies or developing management plans and a timeline to reduce pollutant contributions and attain water quality standards.

Fiscal and Economic Impact

ORS 183.333 requires that DEQ ask the committee to consider the fiscal and economic impact of the proposed rules including:

- - Whether the rules will have a fiscal impact, and if so, what the extent of that impact will be.
 - Whether the rules will have a significant adverse impact on small businesses, and if so, how DEQ can reduce the rules' negative fiscal impact on small businesses.

Roles

DEQ Facilitator

The facilitator:

- Encourages open, candid and robust dialogue;
- Starts and ends the meetings and agenda items on time;
- Encourages innovation by listening to all ideas;
- Tries not to lose good ideas to the consensus process; and
- Recognizes when the discussion is outside the scope of the meeting and steers the discussion back to the focus of the meeting.

DEQ Staff

DEQ is committed to making the most effective use of committee member's time by:

- Establishing clear committee goals, meeting objectives and agendas;
- Giving committee members reasonable access to staff;
- Encouraging all members to take part in discussions; and
- Providing a clear description of members' roles, the committee timeline, the level of agreement expected and feedback on how members' input is used.

DEQ staff also avoids representing to the public or media the views of any other committee member or the committee as a whole.

Roles

Committee Members

Advisory committee members must attend each meeting to ensure continuity throughout the process. An alternate may be assigned if needed. However, it is each committee member's responsibility to fully brief their alternate on all relevant issues and prior committee discussions in order to meet the meeting objectives and keep the project on schedule. The primary and alternate members of the committee cannot participate in the same meeting. If a member's absence is unavoidable, please notify the DEQ project manager.

The committee member:

- Prepares for and sets aside time for the meetings;
- Provides DEQ staff with copies of relevant research and documentation cited during the meeting;
- Stays focused on the specific agenda topics for each meeting;
- Comments constructively and in good faith;
- Consults regularly with constituencies to inform them on the process and gather their input;
- Treats everyone and his or her opinions with respect;
- Allows one person to speak at a time;
- Is courteous by not engaging in sidebar discussions;
- Avoids representing to the public or media the views of any other committee member or the committee as a whole.

Roles

Non-Committee Member Attendees

Those who attend the committee meetings but are not members of the committee are there only to observe and not to actively participate. If non-committee members are present at a meeting, DEQ may allow time during the meeting for their comments.

DEQ Support and Website

DEQ will post agenda and meeting materials on the advisory committee website at least one week in advance. DEQ administrative staff will provide meeting summaries that highlight committee discussions, different perspectives and input of committee members. DEQ will not prepare a formal committee report. DEQ will send draft meeting summaries to the advisory committee for review and input. Final meeting minutes will be posted to the advisory committee website and will be part of the public record.

The advisory committee charter, a full roster of the committee, meeting agendas and minutes, and background materials will all be located on the advisory committee webpage [LINK](#).

<https://www.oregon.gov/deq/rulemaking/Pages/upperyaquinaTMDL.aspx>

Committee Meetings

Committee Meetings

1. All committee meetings will be:
 - Open to the public, although the committee can choose whether the public can actively participate in committee meetings
 - Advertised on DEQ's webpage calendar two weeks before the meeting at: [DEQ Event Calendar](#)
 - [Noticed by email](#) using GovDelivery lists for rulemaking and TMDLs
 - Accessible via a call-in number or webinar
2. The committee is expected to meet two times virtually using the Zoom or MS Teams platform. The meeting duration times may vary depending on topics and committee progress.
3. Meeting materials and agenda will be posted to the advisory committee webpage

Decision Making

The committee's discussions will be used by DEQ in forming its draft rule, which will then be proposed for broader public review and comment as part of DEQ's rulemaking process.

When DEQ shares information with the group, DEQ will allow a reasonable timeframe for comments.

Advisory Committee Membership

Name	Affiliation	Title or Role	Interest Represented
Rebecca McCoun	Oregon Dept of Forestry - Forest Resource Division	Riparian & Aquatic Specialist	State Agency
Paul Engelmeyer	Wetlands Conservancy	Land manager	Conservation
Cheryl Hummon	Oregon Dept of Agriculture - Water Quality Program	Riparian specialist	State Agency
Randy Hereford	Starker Forests	Manager	Commercial Timber owner
Mark River	Weyerhaeuser Co	Hydrologist	Commercial Timber owner
Evan Hayduk	Mid-Coast Watersheds Council	Council Coordinator	Oregon Plan for Salmon and Watersheds
Onno Husing (alternate)	Lincoln County	Director, Planning Dept	Local Government
Roy Kinion	Lincoln County	Director, Public Works Dept	Local Government
Alan Fujishin	Lincoln Soil and Water Conservation District	Director Zone 2, Board Vice Chair	Special District
Glen Spain	Pacific Coast Federation of Fishermen's Associations	Director	Commercial fishing
Joe Steere	Small Woodlands Association Lincoln County Farm Bureau	Lincoln Co. representative	Small Woodlands, Agriculture
Mike Kennedy	Confederated Tribes of the Siletz Indians	Director, Natural Resources	Tribal Nation
Greg Verret	Benton Co Community Development	Deputy Director for Policy & Program Development	Local Government
Russ Glasscock	Local landowner	Local landowner	Agriculture/small woodlot
Matthew Koon	Genesee & Wyoming Inc (parent company of PNWR)	Director of Safety and compliance	Transportation - Railroad

Committee Charter Review (cont.)

Public Records and Confidentiality

Committee communications and records, such as formal documents, discussion drafts, meeting summaries and exhibits are public records and are available for public inspection and copying. DEQ does not assume responsibility for protecting proprietary or confidential business information shared during committee or subcommittee meetings. However, the private documents of individual committee members generally are not considered public records if DEQ does not have copies.

Information Exchange

Committee members will provide information as much in advance as possible of the meeting at which such information is used. The members will also share all relevant information with each other to the maximum extent possible. If a member believes the relevant information is proprietary in nature, the member will provide a general description of the information and the reason for not providing it.

Public Involvement

All meetings will be open to the public. The committee can choose whether to allow public input during a committee meeting. DEQ may set aside time for the public to speak.

Once the committee process is complete, DEQ will develop draft rules and conduct a public rulemaking process. That process will include a specified period during which the public can submit comments on the proposed rules. DEQ will also hold a public hearing during which any member of the public can submit written or verbal comments. Individual committee members may provide comments to DEQ on the full draft rule at this time. DEQ may modify the final proposed rules based on public comment. DEQ intends to take a final proposed rule to the EQC for consideration at its meeting.

Charter affirmation

- Any questions or discussion?
- Members all affirm charter?



What is a Total Maximum Daily Load (TMDL)?

1. Regulatory definitions - OAR 340 Division 42 and Clean Water Act regulations at 40 CFR 130.2(i)
2. Narrative descriptions
3. A mathematical equation with quantitative elements

OAR 340 Division 42 definition of TMDL

“Total Maximum Daily Load (TMDL)” means a written quantitative plan and analysis for attaining and maintaining water quality standards and includes the elements described in OAR 340-042-0040. These elements include a daily load calculation of the maximum amount of a pollutant that a waterbody can receive and still meet state water quality standards, allocations of portions of that amount to the pollutant sources or sectors, and a Water Quality Management Plan to achieve water quality standards.

Narrative description of a TMDL

A TMDL is a science-based approach to cleaning up polluted water so that it meets state water quality standards. TMDLs are expressed as a numerical load value that represents the highest amount of a pollutant a surface water body can receive and still meet the water quality standards.

<https://www.oregon.gov/deq/wq/tmdls/Pages/default.aspx>

TMDL equation for a pollutant/impairment

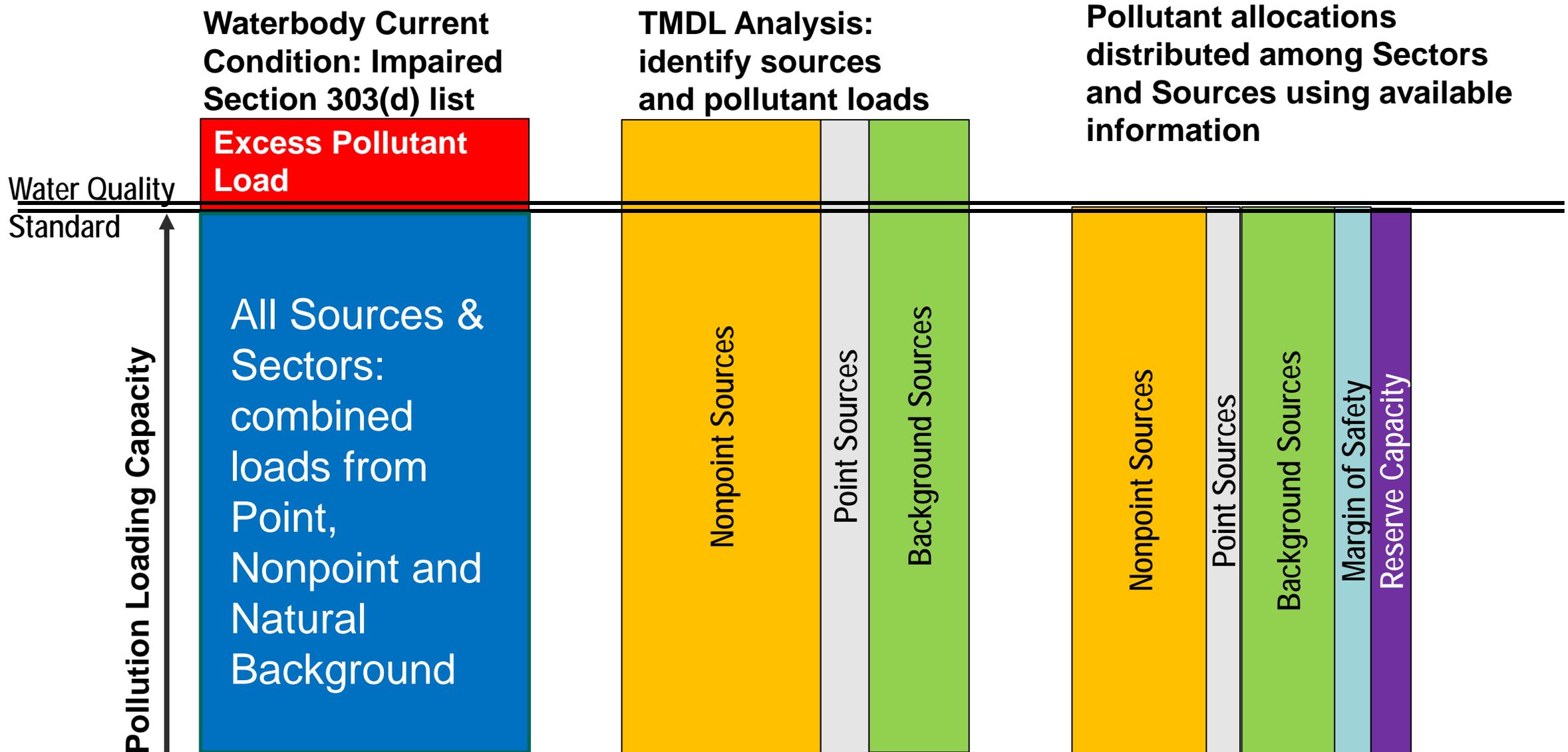
$$\text{TMDL} = \Sigma \text{WLA} + \Sigma \text{LA} + \text{MOS} + \text{RC}$$

- Sum of wasteload allocations (point sources),
- Sum of load allocations (nonpoint sources and background)
- MOS is the margin of safety
- RC is reserve capacity

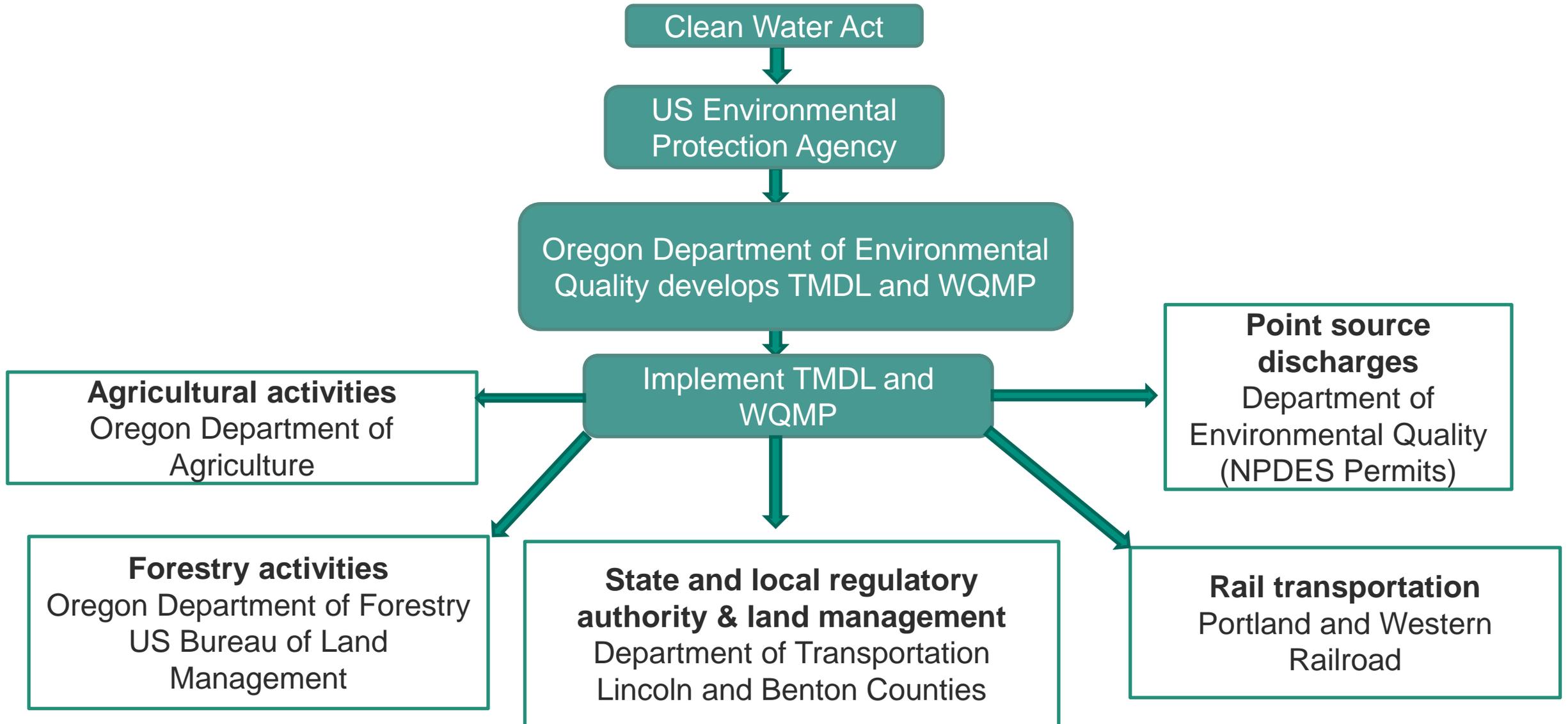
What triggers the need for a TMDL?

- Clean Water Act requires each state to develop TMDLs for all the waters identified on their Section 303(d) list of impaired waters, according to their priority ranking on that list.
- Yaquina River placed on 303d list for several impairments in past and most recent cycles
- Oregon's effective 303d list: final in November 2020

TMDL - conceptual illustration



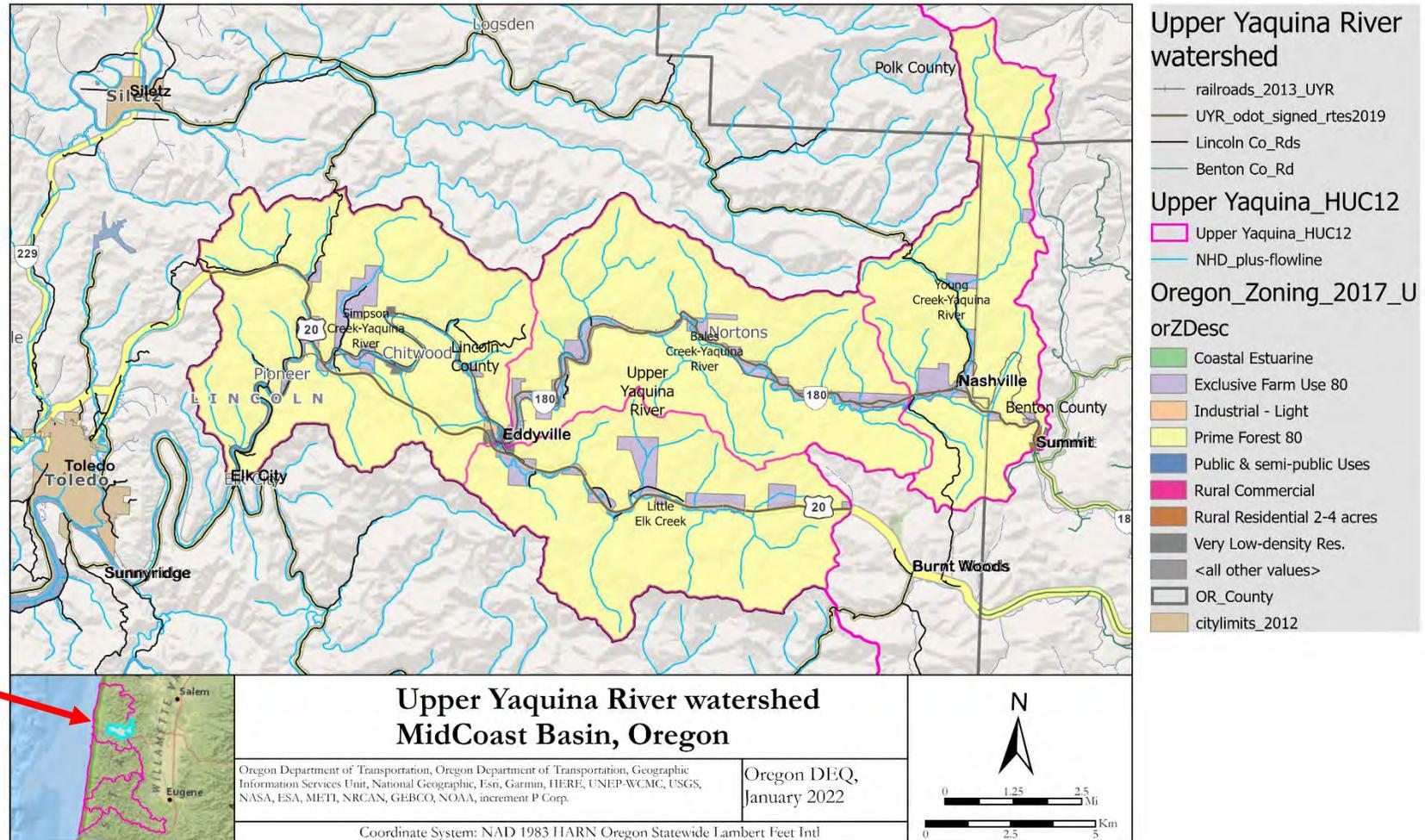
TMDL Authorities and Responsibilities



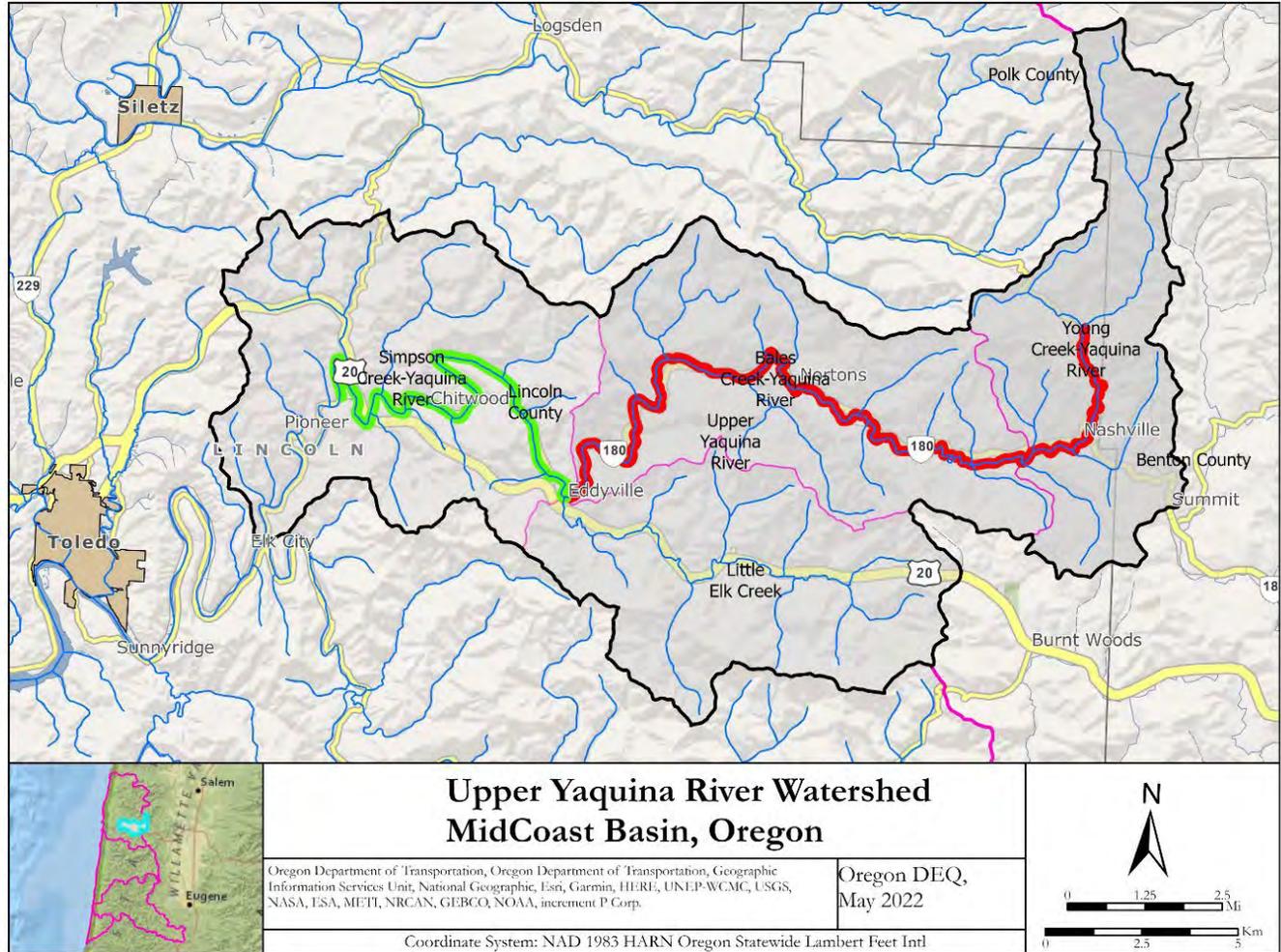
Questions on TMDLs generally or elements?



Upper Yaquina River Watershed – Geographic setting



Yaquina River (freshwater) 303(d) List - *E.coli*



Upper Yaquina watershed (freshwater) - 2018/2020 IR *E.coli* assessment status

- █ OR_SR_1710020401_02_105951_Ecoli_303d
- █ OR_SR_1710020401_02_105953_Ecoli_Cat2
- OR_county
- citylimit_2019
- NHDplus_1710020401



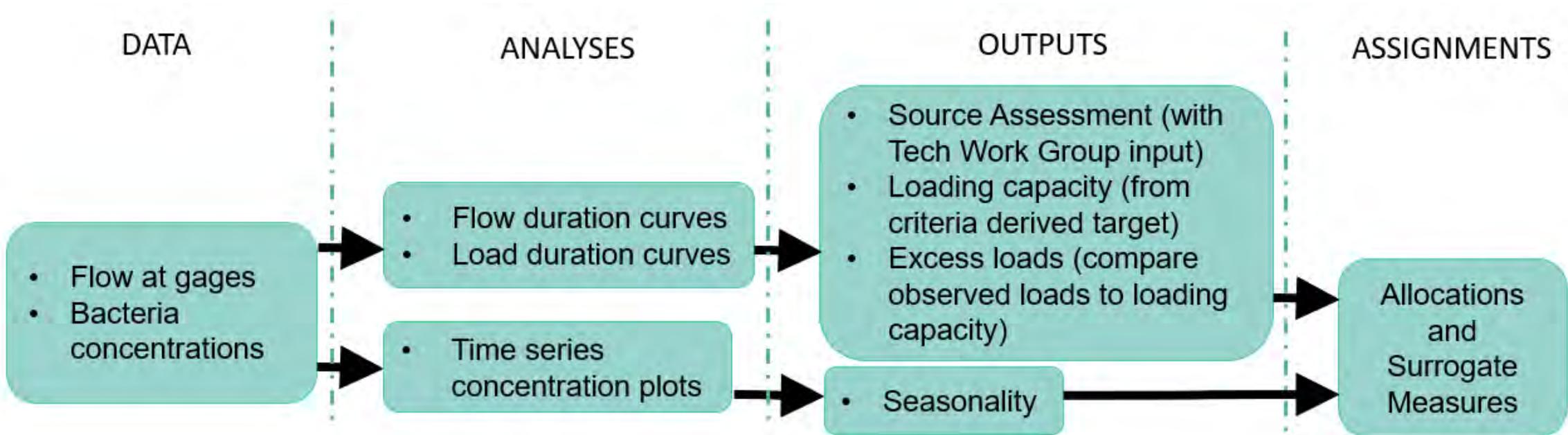
**Upper Yaquina River Watershed
MidCoast Basin, Oregon**

Oregon Department of Transportation, Oregon Department of Transportation, Geographic Information Services Unit, National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

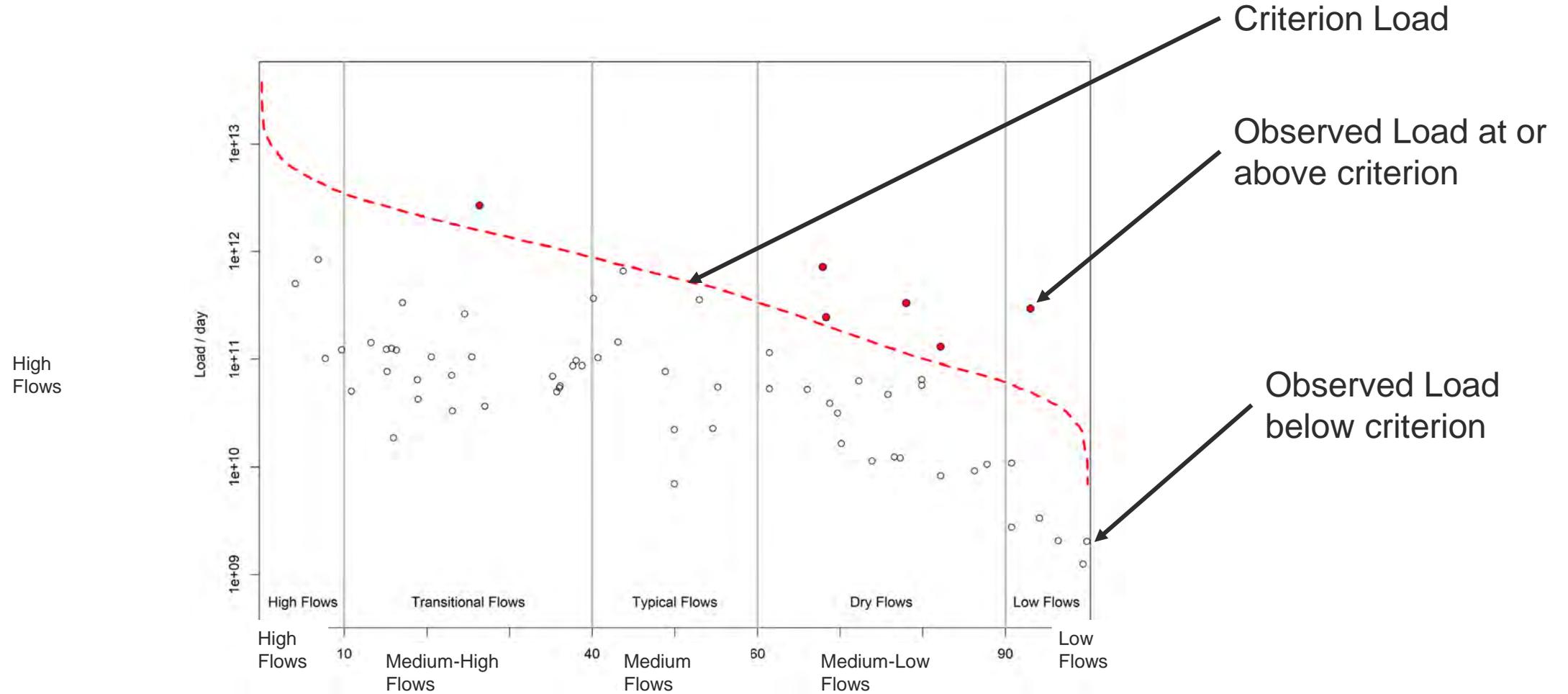
Oregon DEQ,
May 2022

Coordinate System: NAD 1983 HARN Oregon Statewide Lambert Feet Intl

Bacteria (*E. coli*) analyses overview

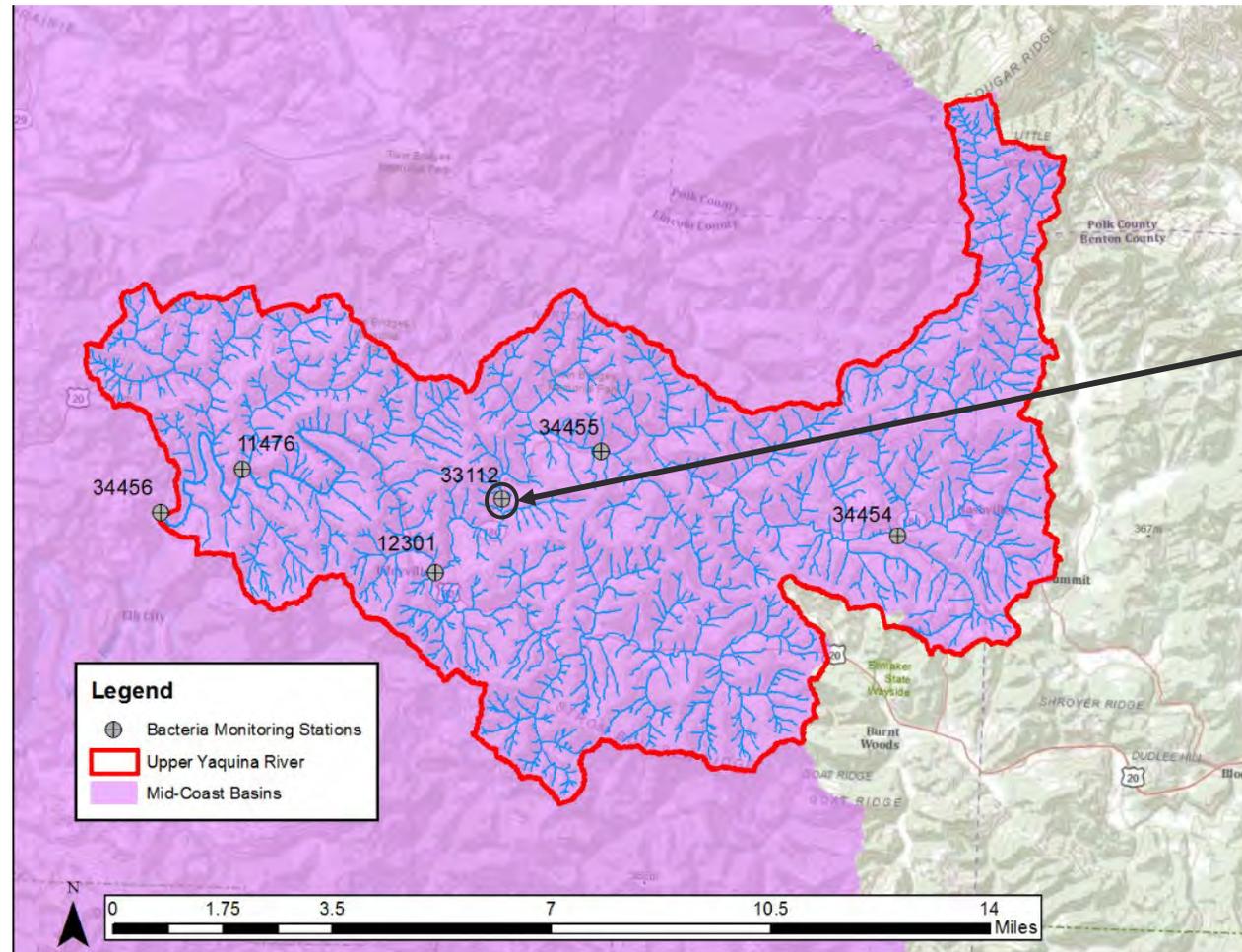


Example Bacteria Load Duration Curve: observed concentrations and criterion



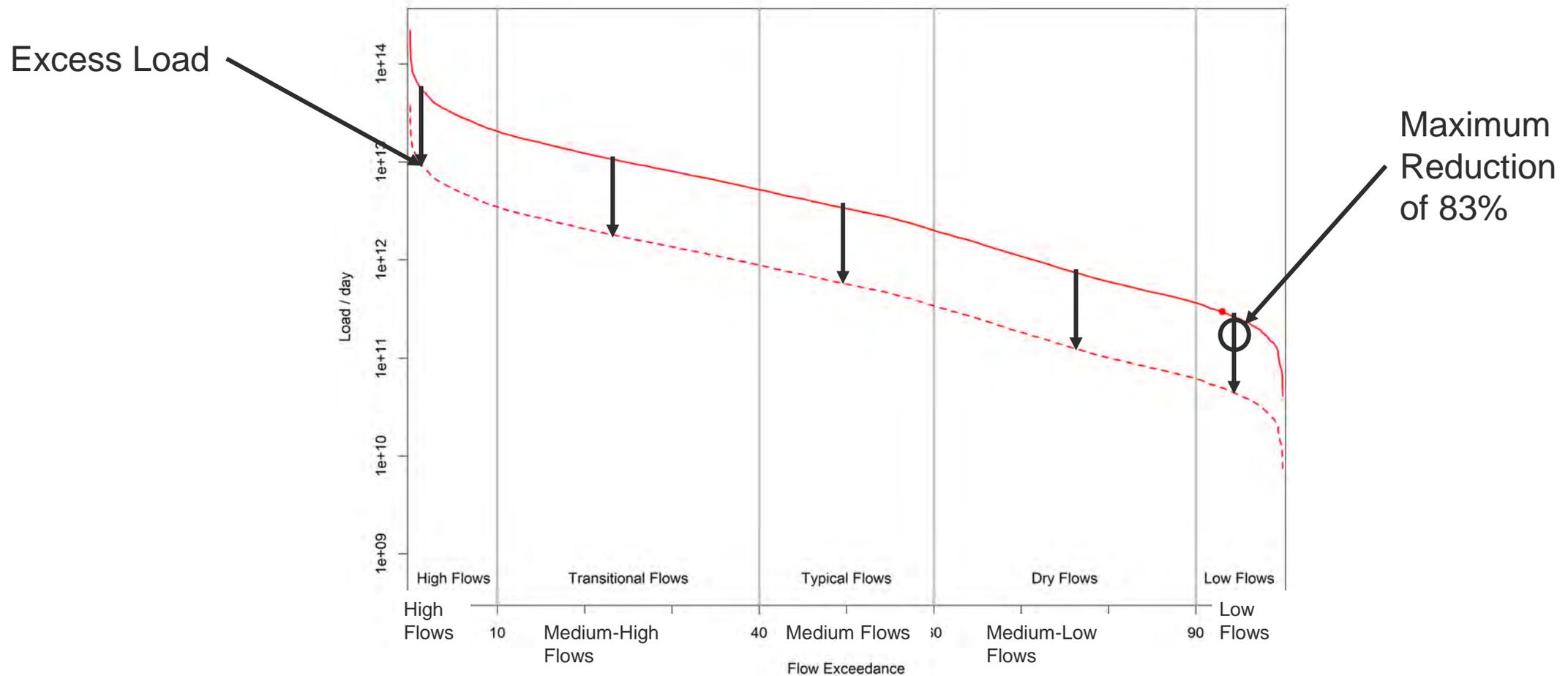
Maximum *E. coli* reductions to meet criterion

Station	Max Reduction
34456	0%
11476	37%
12301	0%
33112	83%
34455	0%
34454	80%



Maximum Reduction of 83%

Maximum reduction Load Duration Curve for watershed



Bacteria sources loading potential rank by flow regime

Potential Sources	High Flow	Medium-High Flow	Medium Flow	Medium-Low Flow	Low Flow
Point Sources				M	H
On-site systems – proximity to stream					
Failure-Direct Discharge			M	H	H
Malfunction-Surface Loading	L	M	H		
Domestic Wading Animals				M	H
Wildlife					
Aquatic Mammals			M	H	H
Waterfowl			M	H	H
Terrestrial Mammals			M	H	H
Riparian Areas					
Within Bankfull Area			M	H	H
Floodplain in Close Proximity to Stream	M	H	H	M	

H-High, M-Medium, and L-Low relative importance of source

Bacteria draft allocations

Sources		Relative Allocation of Load Capacity	
		Low Flows	All Other Flows
Nonpoint and background	Runoff in contact with failing septic systems and livestock grazing areas, livestock and elk in and around streams	90%	89%
Point	ODOT MS4 Stormwater Permit	0%	1%
Reserve Capacity		0%	0%
Margin of Safety		10%	10%
TOTALS		100%	100%

Pollutant sources and sectors - conclusions

- LDC analysis alone does not distinguish among sources
- Based on input from Tech Work Group, ODFW and GIS assessment:
 - Excess bacteria load primarily associated with livestock managed near-stream at during low flow period
 - Wildlife represents small portion of bacteria load during low flow period, but more information is needed to quantify
 - Septic systems represent small portion of bacteria loads due to low housing density, but more information is needed to quantify
- ODOT stormwater point source not significant

Bacteria reductions and allocations

- Questions?

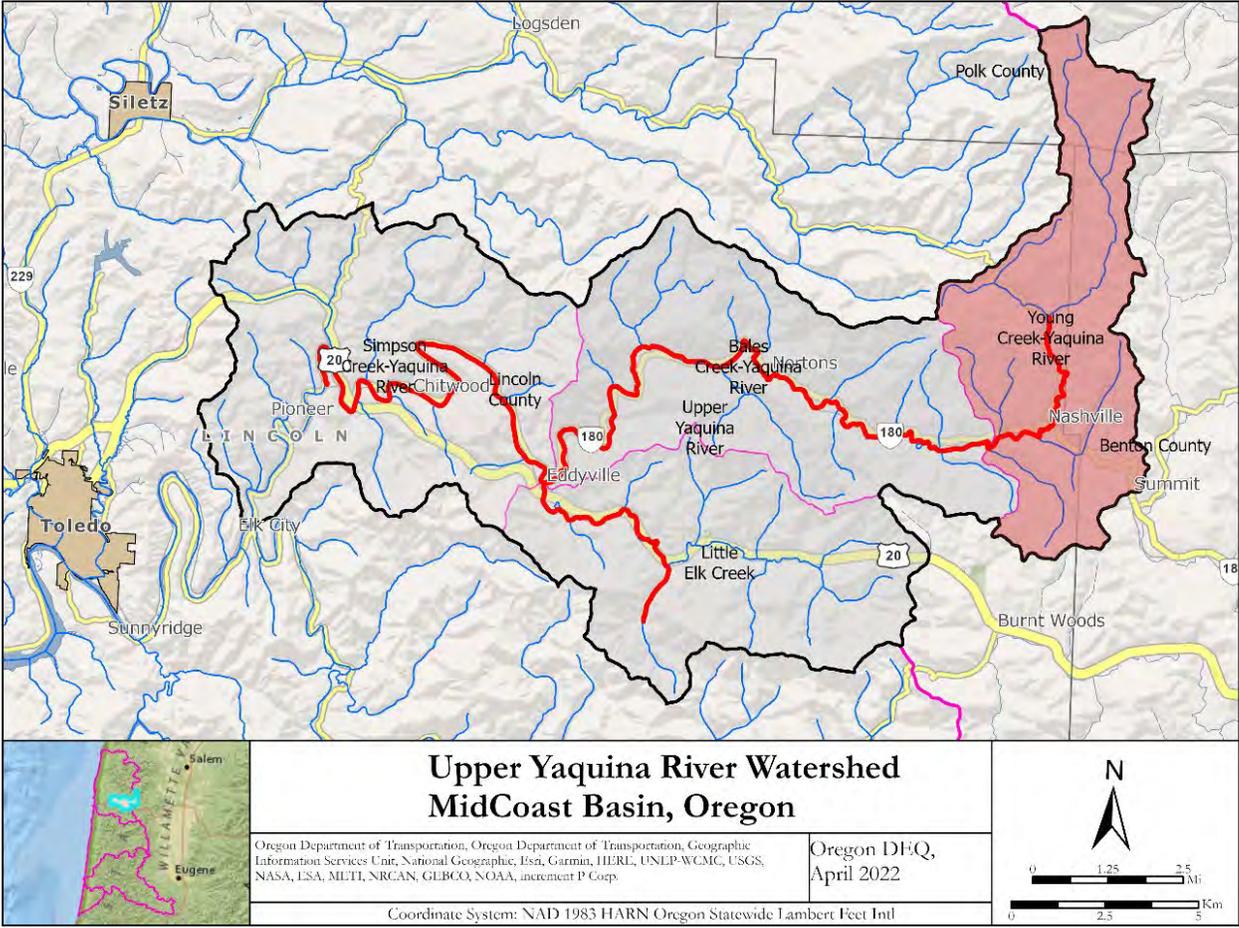


BREAK (10 min)



Yaquina River above Chitwood

Yaquina River (freshwater) 303(d) List – dissolved oxygen



Upper Yaquina watershed (freshwater) - 2018/2020 IR Category 5 Dissolved Oxygen impairments

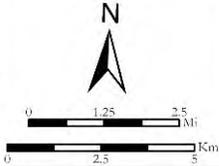
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- OR_SR_1710020401_02_105950_DO_303d
- OR_WS_171002040101_02_106126_DO_303d
- OR_county
- citylimit_2019
- NHDplus_1710020401

Upper Yaquina River Watershed MidCoast Basin, Oregon

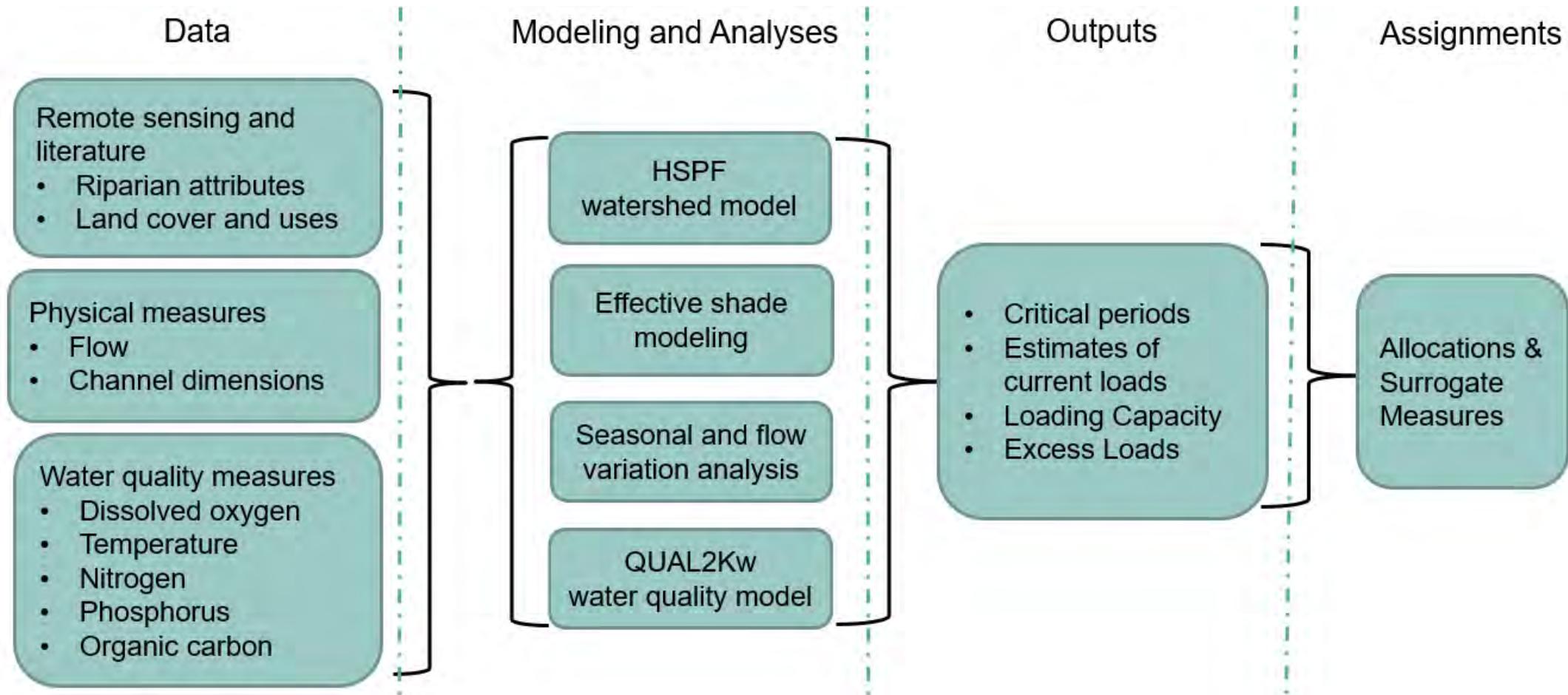
Oregon Department of Transportation, Oregon Department of Transportation, Geographic Information Services Unit, National Geographic, Irsa, Garmin, HERE, UNLP-WCMC, USGS, NASA, ESA, METI, NRCAN, GLBCO, NOAA, increment P Corp.

Oregon DEQ,
April 2022

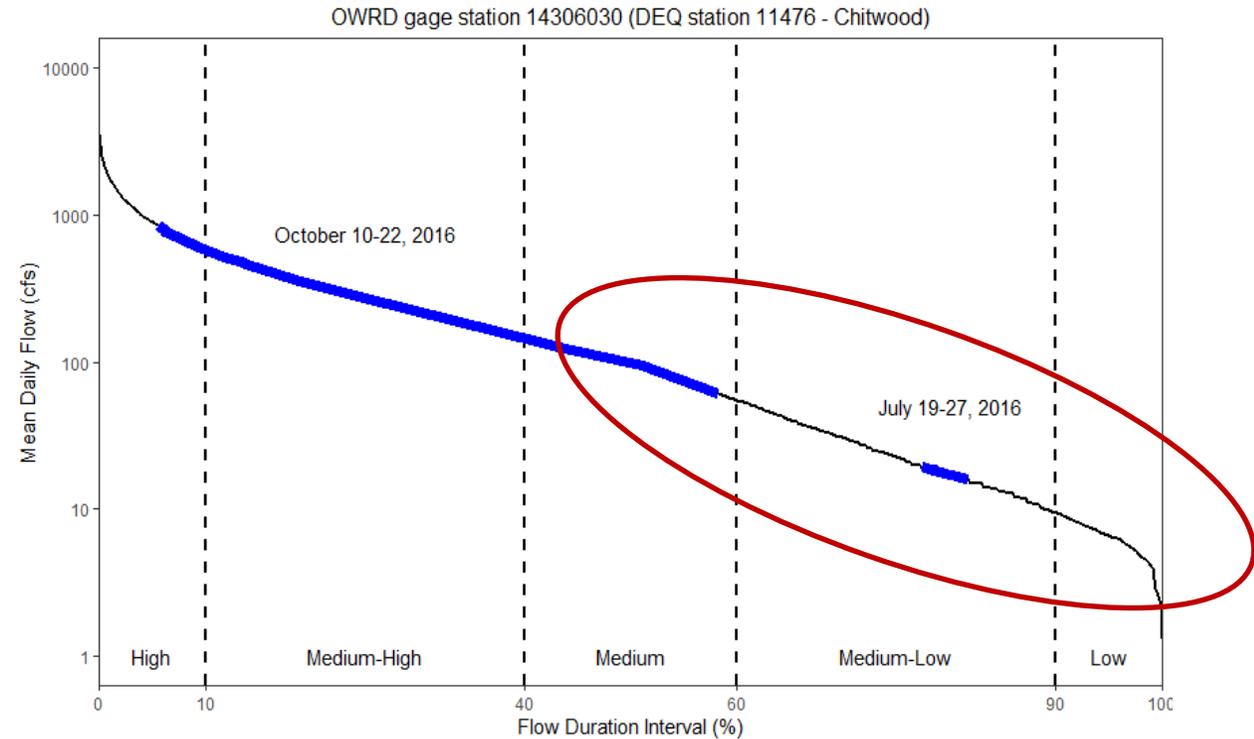
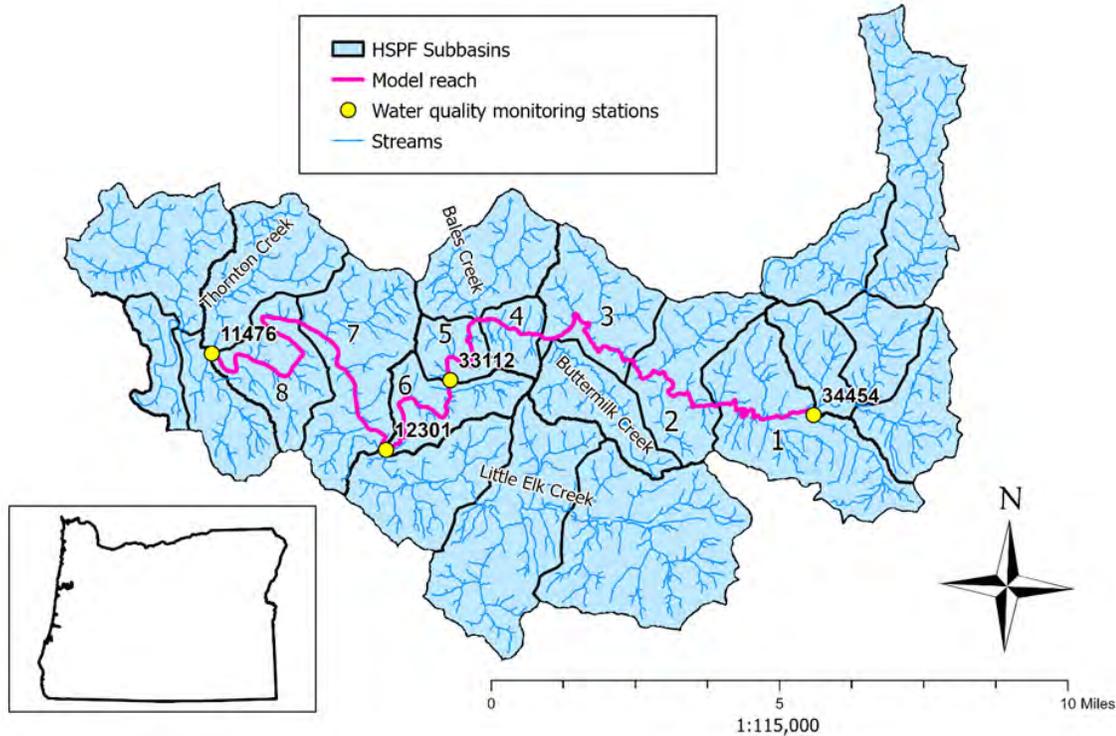
Coordinate System: NAD 1983 HARN Oregon Statewide Lambert Feet Intl



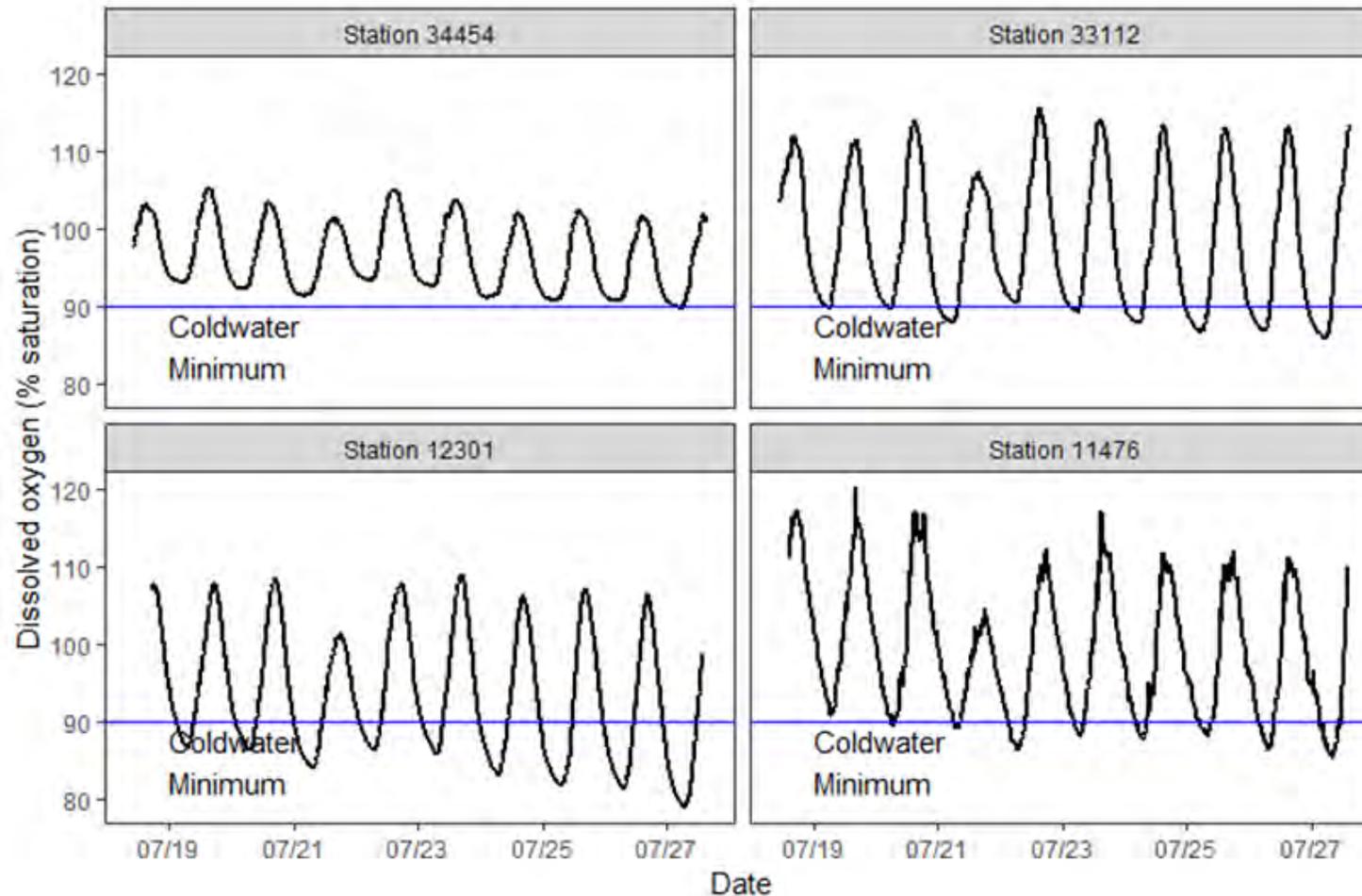
Dissolved oxygen analyses overview



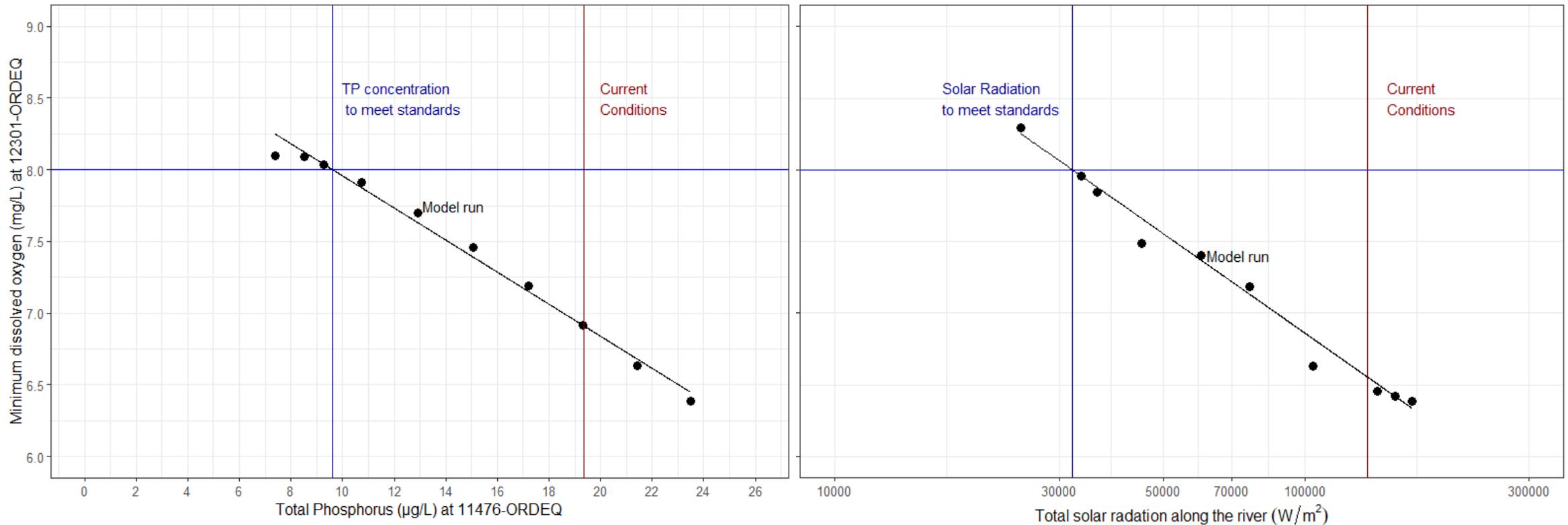
Dissolved oxygen TMDL studies (2016) - identify critical period(s) for impairment



Dissolved oxygen TMDL study, July 2016



Identify controlling pollutants using TMDL models



Dissolved oxygen analysis summary

- Mid-summer to early fall during medium-low and low flows identified as the critical period(s)
- A linked watershed-water quality model identifies the most important factors affecting whether criteria are met:
 - Solar radiation (amount of effective shade)
 - Total phosphorus

Draft pollutant loads - dissolved oxygen

Pollutant	Loading Capacity	Excess Load	Reductions Needed
Solar Radiation (Model Reach during mid-summer/early fall)	8,197,207,223 kcal/day	25,957,846,948 kcal/day	76%
Total Phosphorus (Watershed Load during Medium to Low flows)	2.13 lbs/day	2.16 lbs/day	50%

Note that calculations for reduction are rounded to the nearest percent

Upper Yaquina River - draft total phosphorus allocations

Sources		Total Phosphorus Loading Capacity: 2.13 lbs/day				
		Existing Load (lbs/day)	Relative Contribution to Total Load	Percent Reduction Needed	Allocation (lbs/day)	Relative Allocation of Loading Capacity
Nonpoint and background	Livestock manure	2.46	57%	50%	1.22	57%
	Runoff from roadways, silviculture and background*	1.80	42%	50%	0.89	42%
	Failing septic systems	0.03	<1%	50%	0.01	<1%
Point	ODOT MS4 stormwater permit	0**	0%**	0**	0.01	1%
Reserve Capacity					0	0%
Margin of Safety					Implicit	
TOTALS			100%		2.13	100%

Notes: * Background includes atmospheric deposition, soil leaching and erosion, wildlife

**Highway stormwater captured in roadways nonpoint source

Pollutant sources and sectors - conclusions

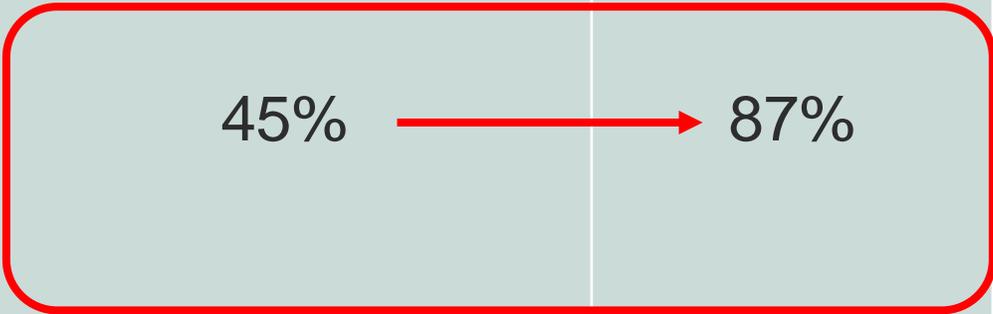
- Excess phosphorus load is a complex combination of
 - livestock direct manure input and pasture runoff
 - fine sediment from landscape and channel erosion and runoff
 - potential phosphorus from glyphosate degradation sorbed to sediment
- Septic systems are a small portion of phosphorus loading but could be progressively significant as more systems age and fail.

Upper Yaquina River - draft solar radiation allocations

Solar Radiation Loading Capacity: 8,197,207,223 kcal/day					
Nonpoint Sources	Existing Load (kcal/day)	Relative Contribution to Total Load	Percent Reduction Needed	Allocation (kcal/day)	Relative Allocation of Loading Capacity
Insufficient height and density of riparian vegetation	34,155,033,534	100%	76%	8,197,207,223	100%
Reserve Capacity				0	0%
Margin of Safety				Implicit	
TOTALS		100%		8,197,207,223	100%

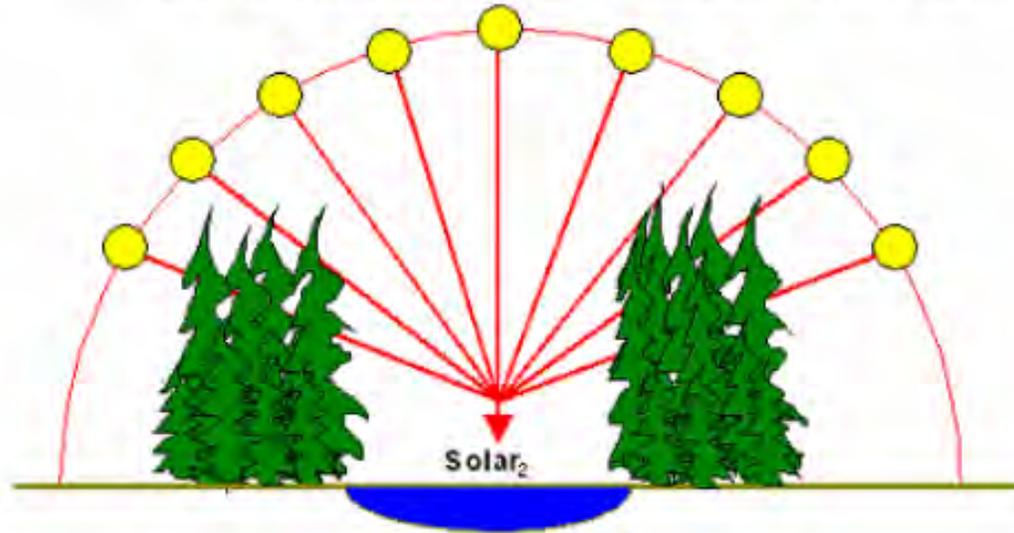
Yaquina River - solar radiation loading capacity for effective shade (surrogate measure)

Pollutant	Surrogate Measure	Current conditions	Loading capacity
Solar Radiation	Effective shade from 120-foot distance on both banks	45%	87%



Effective Shade defined

Solar₁ – Potential daily direct beam solar radiation load adjusted for julian day, solar altitude, solar azimuth and site elevation.



$$\text{Effective Shade} = \frac{(\text{Solar}_1 - \text{Solar}_2)}{\text{Solar}_1}$$

Where,

Solar₁: Potential Daily Direct Beam Solar Radiation Load

Solar₂: Daily Direct Beam Solar Radiation Load Received at the Stream Surface

Source: Boyd, M., and Kasper, B. 2003. Analytical methods for dynamic open channel heat and mass transfer: Methodology for heat source model Version 7.0

Pollutant sources and sectors - conclusions

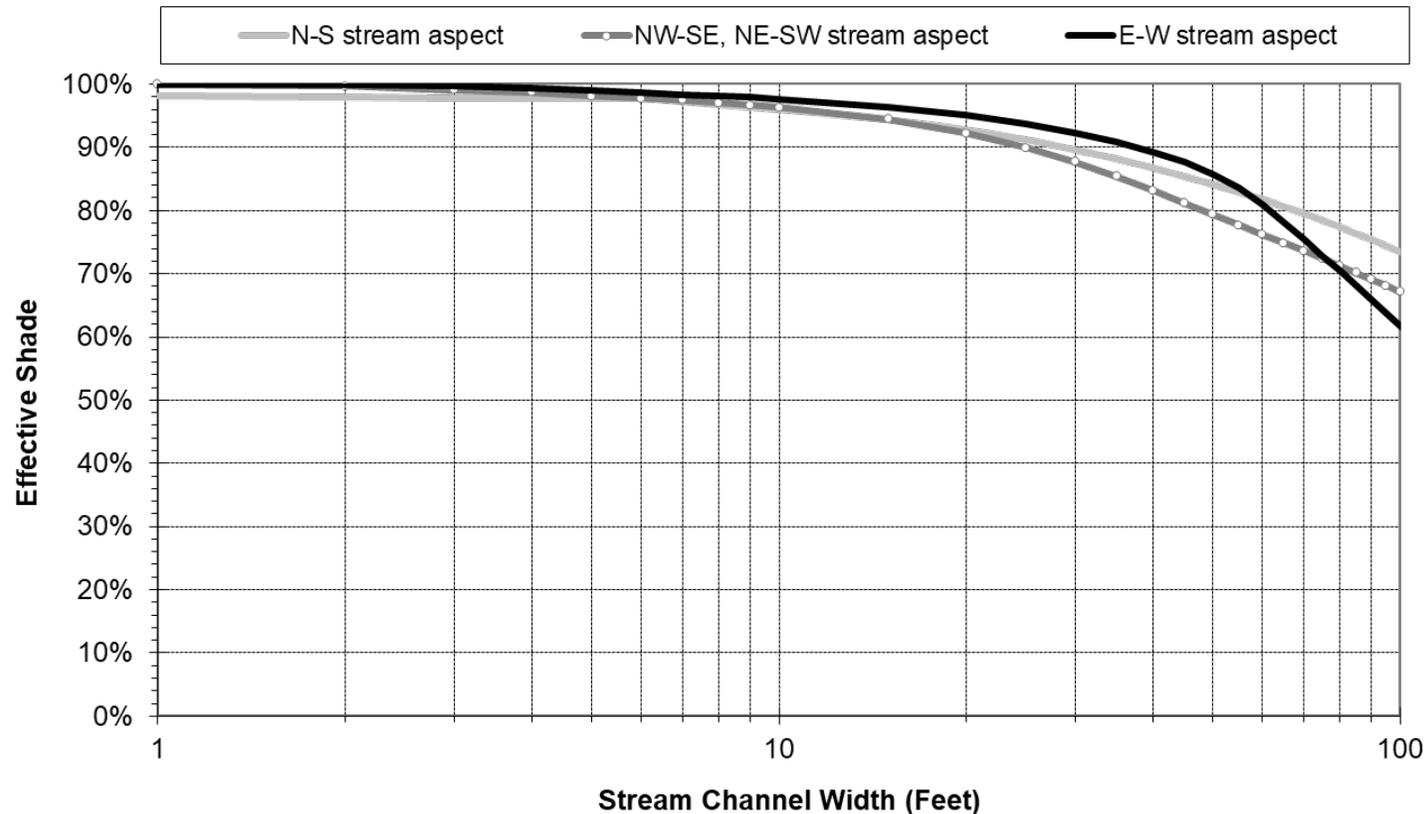
- Excess solar radiation from insufficient riparian height and density of vegetation (all Sectors)
- Surrogate Measure = Effective Shade
 - Target = Site Potential (restored) shade values
- Riparian condition may be limited by altered or simplified channel morphology in some areas (e.g., adjacent roads)

Watershed surrogate measure allocations of effective shade (conifer-deciduous mix)

Stream Width (ft)	90% Density		
	Stream Orientation		
	North-South	NW-SE or NE-SW	East-West
10	96%	96%	98%
20	93%	92%	95%
30	90%	88%	92%
40	87%	83%	89%
50	84%	79%	86%
60	82%	76%	81%
70	79%	74%	75%
80	77%	71%	70%
90	75%	69%	66%
100	74%	67%	62%

Effective shade curves for restored vegetation in the Upper Yaquina Watershed

SP_Code 201 - Mixed Deciduous and Conifer
Height: 43.3 m, Density: 90%, Overhang: 2.1 m



Dissolved oxygen analyses summary

To attain dissolved oxygen criteria during critical period:

- 76% reduction in solar radiation load to the mainstem Yaquina River; meet effective shade target
 - Shade tables and curves determine surrogate shade for other streams
- 50% reduction in total phosphorus load to the mainstem Yaquina River
 - Loading capacity (total phosphorus) for other streams are calculated based on stream flow

Questions on dissolved oxygen reductions?



A short break - Take 5



Water Quality Management Plan

“Water Quality Management Plan (WQMP)” means the element of a TMDL describing strategies to achieve allocations identified in the TMDL to attain water quality standards. The elements of a WQMP are described in OAR 340-042-0040(4)(I)

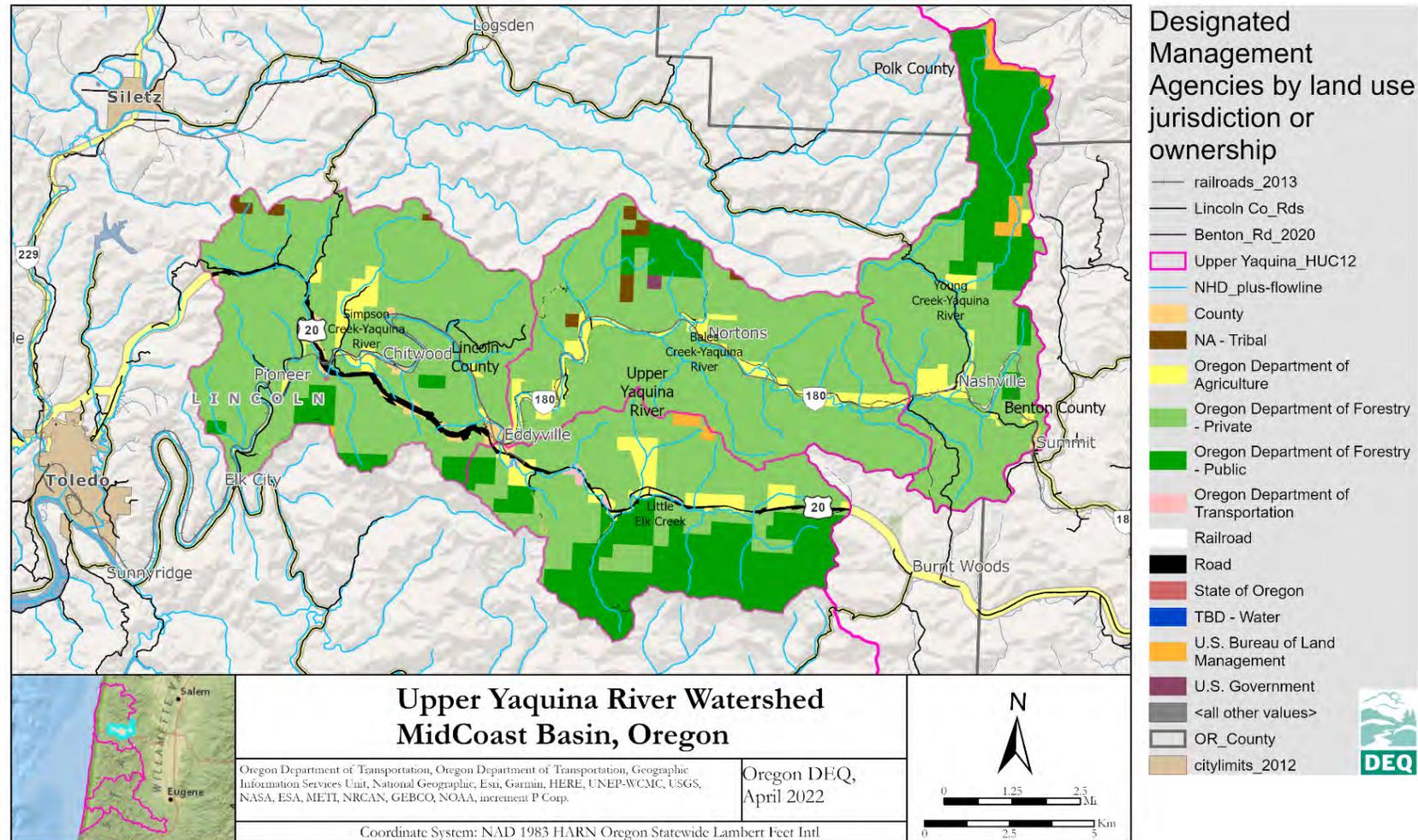
- Provides the framework of management strategies to attain and maintain water quality standards.
- Provide reasonable assurance that implementation will occur through regulatory or voluntary actions

Water Quality Management Plan – Key pieces for RAC

See full list in OAR 340-042-0040(4)(I)

- **Proposed management strategies** to meet the allocations in the TMDL
 - Priority strategies and best management practices
 - Categorization of sources and a description of the strategies proposed for each source category
- **Identify persons responsible for implementing management strategies** and developing and revising sector-specific or source-specific implementation plans
- **General discussion of costs and funding for implementing management strategies**
 - covered in draft fiscal impact statement discussion
- **Administrative requirements:** Plan revision, periodic reporting, schedules, timelines

Implementation responsibilities by land ownership or jurisdiction



Entities to develop TMDL implementation plans

Entity	Jurisdiction
Oregon Department of Forestry	Non-federal forestlands: State and private forest operations, practices and activities (including roads)
Oregon Department of Agriculture	Agricultural lands and activities
Oregon Department of Transportation	Highways, rights-of-way and facilities
Lincoln County	County-owned lands, county roads and rural land use
Benton County	County-owned lands, county roads and rural land use
US Bureau of Land Management	BLM and O&C managed lands and roads
Portland & Western Railroad, Inc	Rail line right-of-way

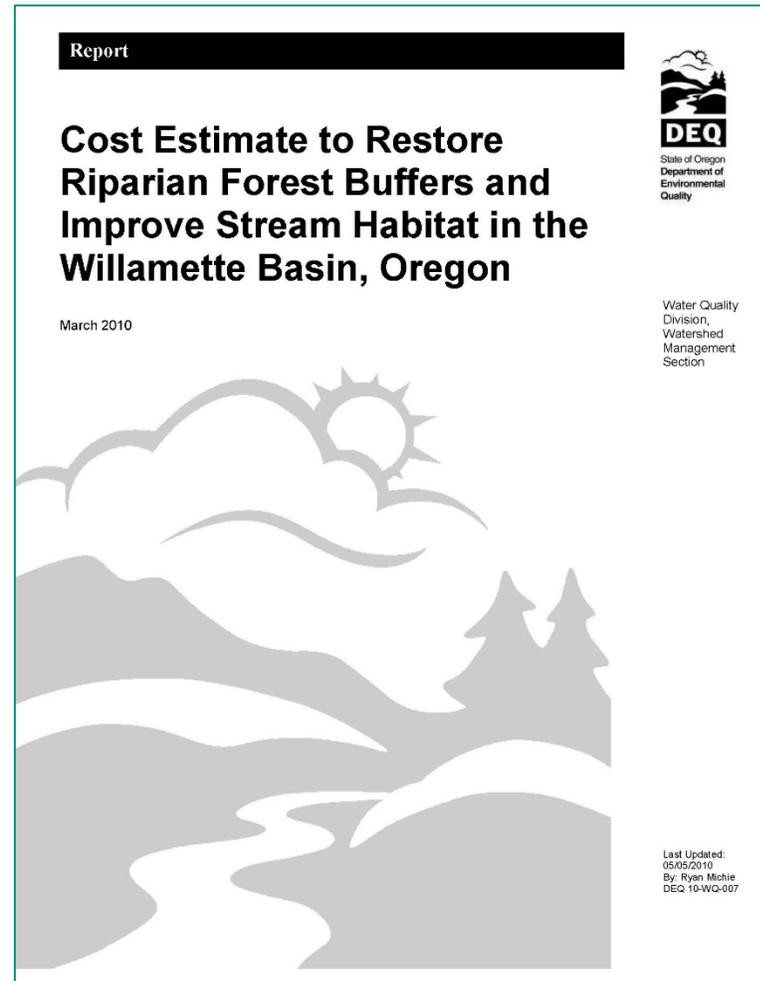
Summary of priority strategies for bacteria and phosphorus

- Reduce direct and indirect inputs of livestock manure
 - Grazing & pasture mgt, livestock exclusion, off-channel water, stream crossing improvements
- Provide adequate landscape filtration capacity for organic matter and nutrients
- Reduce surface erosion and fine sediment reaching streams from all land uses through additional best management practices (control anthropogenic sources)
- Septic system assessment, inspections, repairs/upgrades
- Wildlife: Determine whether elk are consistently congregating or actively attracted to specific locations during critical low-flow period

Strategies to reduce solar radiation on streams

- Riparian plant establishment (native woody vegetation)
- Riparian vegetation maintenance, growth and protection
 - Voluntary riparian tree retention
- Vegetation thinning and management (ensure survival and optimal growth of the desired vegetation)
- Invasive plant removal and control
- Riparian fencing (or other livestock exclusion) where needed

Cost estimates for riparian buffer restoration



Rural Riparian Forest
Restoration
(NRCS/CREP buffer)

Avg Cost per acre ~ \$4700

(2008 dollars from NRCS data)

WQMP and TMDL implementation summary

Questions?



Draft fiscal impact statement - overview

- Purpose of the rule is to address bacteria and dissolved oxygen water quality impairments, as required by the federal Clean Water Act program
- No fees or housing costs are involved
- Fiscal and economic impacts are anticipated for some farms/ranches, forestlands, railroad and road rights-of-way and county, state and federal lands
- Impacts are not different for the TMDL issued by rule or order
- On-going costs of impairment not quantified

Costs of compliance

- Born by landowners or operators that contribute to bacteria and/or dissolved oxygen impairments
- Lack of info for determining specific costs which vary due to:
 - Location in watershed
 - Level of controls already in place
 - Level of understanding of sources by sector, not property
 - Significance of contributions
 - Range of organizational capacity to develop/implement plans

Economic analysis methods

- Experience/knowledge of government agency practices
- Review of Oregon Employment Dept business database
 - No large business locations
 - Few small businesses registered
 - Small farms/ranches and woodlots not included
- Costs associated with match for standard BMPs and riparian restoration projects eligible for OWEB grants
- Identified sources of funding available for nonpoint source and restoration projects

Racial equity and environmental justice

- ORS 183.335(2)(a)(F) is a new requirement to identify how rule adoption will affect racial equity in Oregon
- Environmental Justice statement also now required, though not as part of the fiscal impact analysis

Request for Rule Advisory Committee input

- Are the sources and sectors accounted for in the TMDLs ?
- Are the factors considered for the allocations clear?
- Are additional management strategies/practices needed?
- Do you have specific economic information or comments for consideration in the draft fiscal impact statement?

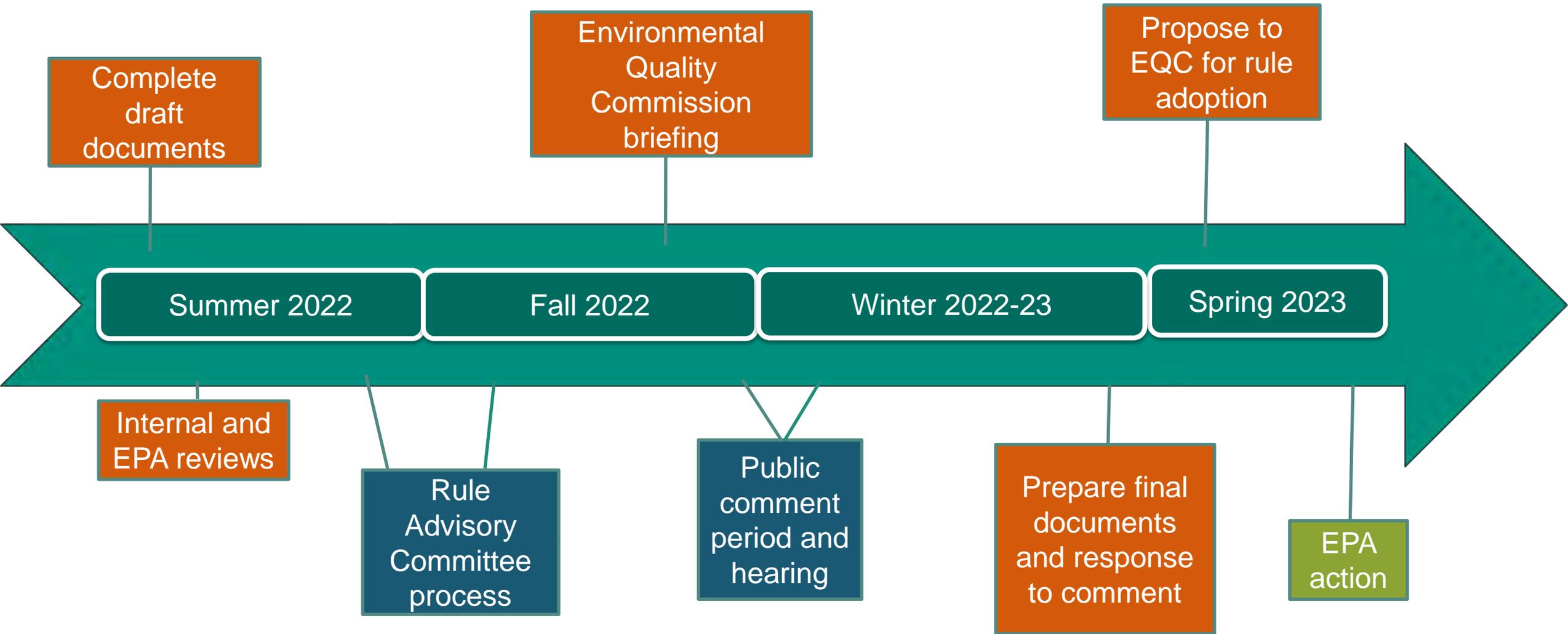
Specifically on:

- Whether the proposed rules would have a fiscal impact,
 - The extent of the impact, and
 - Whether the proposed rules would have a significant adverse impact on small businesses; if so, then how to reduce that impact.
- Is there any additional information you need in order to provide input?

Next steps

- Requested input should be provided within two weeks of the meeting (by Sep 12th)
- DEQ will hold a 2nd RAC meeting to discuss RAC input received and how it will be incorporated into the process
- DEQ will consider all input from the RAC for incorporation into the fiscal impact statement and draft TMDL documents
- DEQ will brief the EQC on the process
- DEQ will publish draft TMDL documents for public comment

Upper Yaquina TMDLs process



DEQ contacts

- Upper Yaquina TMDL Rulemaking webpage:
<https://www.oregon.gov/deq/rulemaking/Pages/upperyaquinaTMDL.aspx>

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Adjourn



Yaquina River at bridge on HWY 180 upstream of Eddyville