

INTERMEDIATE WATER QUALITY ASSESSMENT REPORT FOR THE CONFEDERATED TRIBES OF COOS, LOWER UMPQUA AND SIUSLAW INDIANS



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Contents

I. Introduction3

II. Integrated water quality monitoring program and assessment methods6

III. Data Analysis Results20

IV. Discussion of Issues of Tribal Concerns41

V. Water Quality Data Submission41

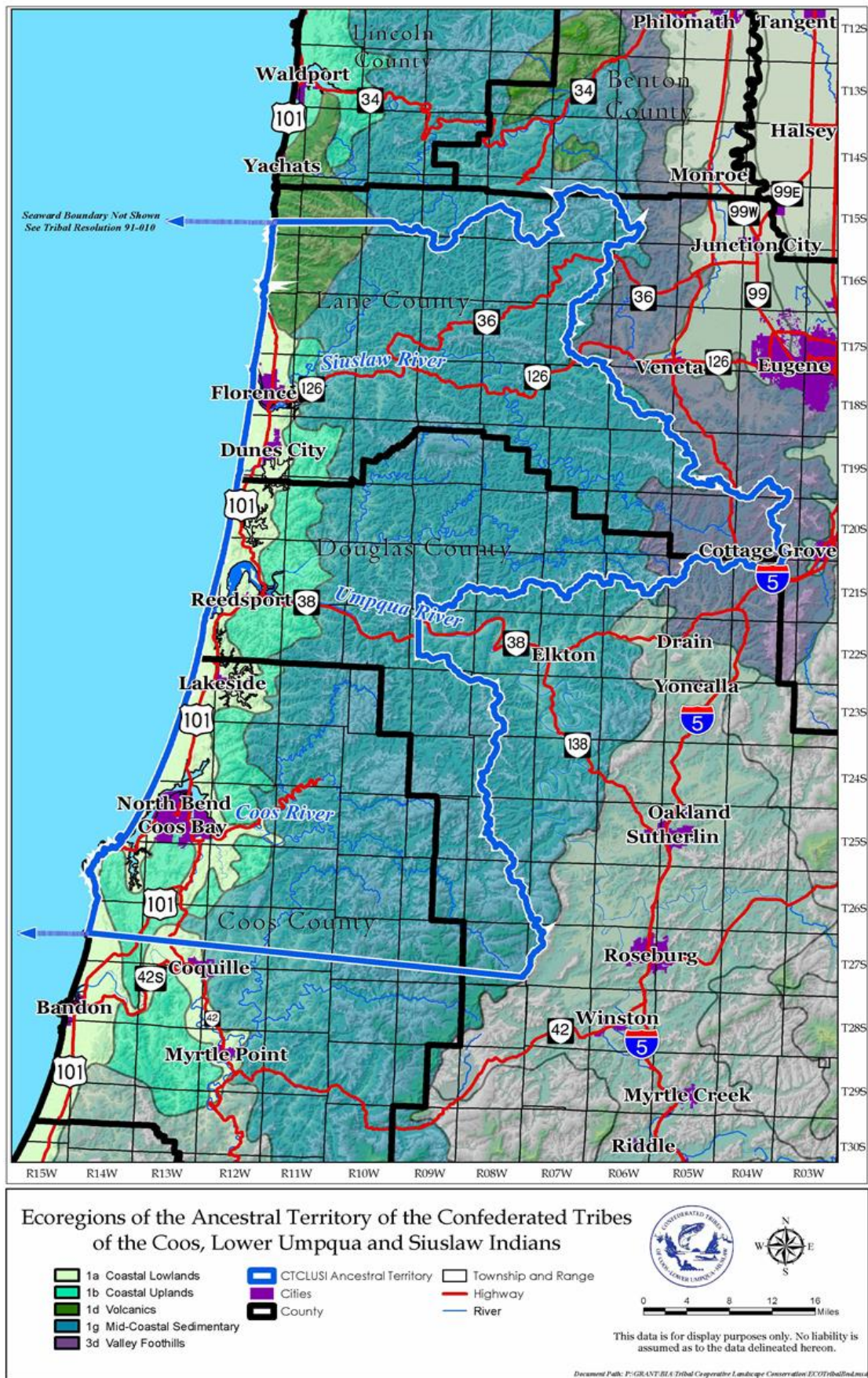
I. Introduction

This assessment report focuses on data collected by the Tribes' Integrated Water Quality Monitoring Program in waters of or pertaining to the Confederated Tribes of the Coos, Lower Umpqua and Siuslaw Indians' (CTCLUSI) Reservation or other Tribal lands.

Environmental issues within our ancestral watersheds can take many years to develop or may have an immediate impact on our cultural and natural resources as well as the environment. The Tribes' Culture and Natural Resources Department's overarching goal is to continually strengthen and modify the Tribes' capacity to develop and sustain environmental programs that address cultural and natural resource issues and concerns on and off Tribal lands. Below is a broad list of cultural and natural resource issues and concerns within our ancestral watersheds in no particular order of importance.

- Downward trend of salmonid, lamprey, herring, eulachon, flounder, and green sturgeon returns
- Degradation of salmonid, lamprey, herring, eulachon, flounder, and green sturgeon habitat
- Downward trend of other aquatic/marine traditional foods, such as abalone
- Cultural and natural resource impacts linked to natural resource extraction and recreation.
- Water quality degradation due to point and non-point source pollution, including agricultural, timber harvesting, road construction, outfalls, and storm sewer runoff.
- Urban, industrial, and energy production discharges.
- Environmental changes attributed to climate change, such as the reoccurrence of harmful algal blooms.
- Shellfish closures due to harmful algal blooms and
- Spreading of existing and new non-native invasive species.
- Toxins within water, sediments, cultural resources, natural resources, and traditional foods.
- Maritime spill response and impacts to cultural resources, natural resources, and traditional foods

Figure 1. Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians' Ancestral Territory



Overview of the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians' (CTCLUSI) Reservation and Tribal lands:

- CTCLUSI Reservation and Tribal lands total approximately 547 acres.
- This land base includes approximately 18 acres of tidelands and 3.18 miles of shoreline.
- Tribal lands are dispersed among 4th and 5th field HUCs.^{[1](#)}
 - Sixes: 85,760 acres²
 - Coos: 467, 200 acres²
 - Tenmile 62,720 acres²
 - Siuslaw: 497, 720 acres²
- Waters located on Tribal property consist of:
 - 0.94 miles of rivers and streams.
 - 143 acres of wetlands, excluding tidelands.
- There are three drinking active water wells that depend on a potable aquifer system located on Tribal lands.

¹ https://cfpub.epa.gov/surf/locate/hucperstate_search.cfm?statepostal=OR

II. Integrated water quality monitoring program and assessment methods

1) Introduction

The purpose of the Tribes' Integrated Water Quality Monitoring Program (IWQMP) is to determine whether water quality criteria/benchmarks are being met and beneficial uses are being supported for waterbodies of or pertaining to the reservation and other Tribal lands. Establishing a baseline of water quality conditions for all Tribal waters and periodically reassessing baseline water quality to evaluate short-term variability and long term trends is an important component of this program objective.

Monitoring Objectives	
Program Area	Objectives
Overall Integrated Water Quality Program	<ol style="list-style-type: none">1. Establish baseline water quality conditions for all pertinent uses.2. Document short term and long-term water quality trends.3. Assess whether water quality standards are being met and beneficial uses are being supported.3. Develop and test ecological indicators and monitoring designs.4. Assess local water quality issues such as: low dissolved oxygen, eutrophication, chemical & biological (e.g. bacteria) contamination, HAB's, habitat modification, and cumulative impacts.
Non-point Source Pollution Program	<ol style="list-style-type: none">1. Identify and employ monitoring techniques to determine and quantify the effectiveness of watershed improvement projects.2. Build partnerships with local agencies and water quality stakeholders to reduce non-point source water pollution.
Water Quality Standards	<ol style="list-style-type: none">1. Identify reference conditions for the development of numerical and biological criteria.2. Develop and refine Tribal water quality standards.3. Determine if water resources are meeting Tribal water quality standards.
Wetlands Program	<ol style="list-style-type: none">1. Develop Wetlands Monitoring Program.2. Develop indicators and assess beneficial use attainment.
HAB Program	<ol style="list-style-type: none">1. Develop HAB's Monitoring Program.2. Develop indicators and assess beneficial use attainment.

2) **Monitoring Program Overview**

Water quality monitoring is conducted by the CTCLUSI Department of Culture and Natural Resources staff and is implemented according to the Tribes' Quality Assurance Project Plan (QAPP) for the IWQMP. This QAPP is approved by the Environmental Protection Agency.

During the 2017 water year, the integrated water quality monitoring program continued to collect baseline estuarine water quality monitoring data at four continuous monitoring stations. These data were collected at 15 minute sample intervals year round. The station locations and parameters measured are listed in the table below. The Tribes' continuous estuarine water monitoring was developed by integrating a combination of the National Estuarine Research Reserve (NERR) System-wide Monitoring Program (SWMP) and USGS recommended equipment and protocols for the collection and management of these data (see [CDMO NERR SWMP Data Management Manual](#) and the USGS manual '[Guidelines and Standard Procedures for Continuous Water-Quality Monitors: Station Operation, Record Computation, and Data Reporting](#)').

The Tribes' Integrated Water Quality Monitoring Program also collects discrete water quality data on a quarterly to annual basis (as staff and resources allow) at two freshwater sites, Sixes River and North Tenmile Lake (station location and parameters measured are listed in the table below). Protocols implemented for the collection of these data are primarily those outlined in the Oregon Department of Environmental Quality (ODEQ) '[Watersheds Assessment Field Sampling SOP's](#)'.

Monitoring Locations:

Waterbody Name	Lat./Long	Parameters monitored	Monitoring frequency	303d List Parameter(s)
Siuslaw River, Cox Island – Siuslaw Watershed	43° 58' 27" N 124° 04' 16" W	Field Measurements: Water Temperature, Dissolved Oxygen, Salinity/Specific Conductivity, pH, Turbidity, and Depth	Year Round: 15 minute intervals	<p>Parameter: Alkalinity Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic Life Status: Insufficient data, potential concern</p> <p>Parameter: Ammonia Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic Life Status: Attaining some criteria/uses</p> <p>Parameter: Biological Criteria Season: Year Round Listed: 2010 Beneficial Use(s): Aquatic Life Status: Water quality limited, 303(d) list, TMDL needed</p> <p>Parameter: Chloride Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic Life Status: Insufficient data</p> <p>Parameter: Chlorophyll a Season: Fall, Winter, Spring; Summer Listed: 2004 Beneficial Use(s): Water supply; Water contact recreation; Fishing; Aesthetics; Livestock watering Status: Insufficient data; Attaining some criteria/uses</p> <p>Parameter: Dissolved Oxygen Season: Year Round (Non-spawning); Year Round Listed: 2004; 2002 Beneficial Use(s): Estuarine water, Cold-water aquatic life; Anadromous fish passage; Salmonid fish rearing; Salmonid fish spawning Status: Attaining some criteria/uses; Water quality limited, 303(d) list, TMDL needed</p> <p>Parameter: Fecal Coliform Season: Year Round Listed: 2004 Beneficial Use(s): Water contact recreation, Shellfish growing Status: Water quality limited, 303(d) list, TMDL needed.</p> <p>Parameter: Nutrients Season: Undefined Listed: 1998 Beneficial Use(s): Aesthetics Status: Insufficient data</p> <p>Parameter: pH Season: Year Round Listed: 2004 Beneficial Use(s): Water contact recreation; Salmonid fish spawning; Resident fish and aquatic life; Anadromous fish passage; Salmonid fish rearing Status: Attaining some criteria/uses</p> <p>Parameter: Phosphate Phosphorus Season: Summer Listed: 2004 Beneficial Use(s): Aquatic life Status: Insufficient data</p> <p>Parameter: Sedimentation Season: Undefined Listed: 1998 Beneficial Use(s): Salmonid fish rearing; Resident fish and aquatic life; Salmonid fish spawning Status: Insufficient data</p> <p>Parameter: Temperature Season: Year Round (Non-spawning) Listed: 2004 Beneficial Use(s): Salmon and trout rearing and migration Status: Water quality limited, 303(d) list, TMDL needed.</p>
		Laboratory: Bacteria (<i>e.coli</i>)	Monthly/After storm events	
		Laboratory: Nutrients (TN and TP), and Chlorophyll	Seasonally to Quarterly (as staff and resources allow)	

North Fork Siuslaw River – Siuslaw Watershed	43° 58' 40" N 124° 04' 48" W	Field Measurements: Water Temperature, Dissolved Oxygen, Salinity/Specific Conductivity, pH, Turbidity, and Depth	Year Round: 15 minute intervals	Parameter: Sedimentation Season: Undefined Listed: 1998 Beneficial Use(s): Resident fish and aquatic life, Salmonid fish rearing, Salmonid fish spawning Status: Water quality limited, 303(d) list, TMDL needed
		Laboratory: Bacteria (<i>e.coli</i>)	Monthly/After storm events	Parameter: Temperature Season: Year Round (Non-spawning) Listed: 2004 Beneficial Use(s): Salmon and trout rearing and migration Status: Water quality limited, 303(d) list, TMDL needed.
		Laboratory: Nutrients (TN and TP), and Chlorophyll	Seasonally to Quarterly (as staff and resources allow)	
North Tenmile Lakes—Tenmile Lakes Watershed	43° 35' 59" N 124° 7' 34" W	Field Measurements: Water Temperature, Dissolved Oxygen, Salinity/Specific Conductivity, pH, Turbidity, and Depth	Seasonally to Quarterly (as staff and resources allow)	Parameter: Alkalinity Season: Year Round Listed: 2004 Beneficial Uses: Aquatic Life Status: Insufficient data
		Laboratory: Bacteria (<i>e.coli</i>)	Seasonally to Quarterly (as staff and resources allow)	Parameter: Ammonia Season: Year Round Listed: 2004 Beneficial Uses: Aquatic Life Status: Insufficient data
		Laboratory: Nutrients (TN and TP), and Chlorophyll	Seasonally	Parameter: pH Season: Summer Listed: 2004 Beneficial Uses: Resident fish and aquatic life; Water contact recreation Status: Insufficient data
		Laboratory: Toxic Algae	Seasonally	Parameter: Phosphate Phosphorus Season: Summer Listed: 2004 Beneficial Uses: Aquatic life Status: Insufficient data Parameter: Dissolved Oxygen Season: Year Round (Non-spawning) Listed: 2004 Beneficial Uses: Cold-water aquatic life Status: Insufficient data Parameter: Iron Season: Year Round Listed: 2012 Beneficial Uses: Aquatic life Status: Insufficient data Parameter: Nutrients Season: Undefined Listed: 1998 Beneficial Uses: Aesthetics Status: Insufficient data Parameter: Sedimentation Season: Undefined Listed: 2010 Beneficial Uses: Status: Water quality limited, TMDL approved
Coos River, Lower Bay, North Spit, BLM boat ramp – Coos Watershed	43° 24' 54.83" N 124° 16' 42.60" W	Field Measurements: Water Temperature, Dissolved Oxygen, Salinity/Specific Conductivity, pH, Turbidity, and Depth	Year Round: 15 minute intervals	Parameter: Ammonia Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic life Status: Insufficient data
		Laboratory: Bacteria (<i>e.coli</i>)	Monthly/After storm events	Parameter: Chlorophyll a Season: Summer Listed: 2004 Beneficial Uses: Water contact recreation; Aesthetics; Livestock watering; Water supply; Fishing Status: Insufficient data
		Laboratory: Nutrients (TN and TP), and Chlorophyll	Seasonally to Quarterly (as staff and resources allow)	Parameter: Fecal Coliform Season: Year Round Listed: 2004 Beneficial Use(s): Shellfish growing; Water contact recreation Status: Water quality limited, 303(d) list, TMDL needed Parameter: pH Season: Year Round Listed: 2004 Beneficial Use(s): Resident fish and aquatic life; Water contact recreation Status: Insufficient data Parameter: Sedimentation Season: Undefined Listed: 1998 Beneficial Use(s): Salmonid fish rearing; Salmonid fish spawning; Resident fish and aquatic life Status: Insufficient data

Coos River, Lower Bay, Empire Docks – Coos Watershed	43° 23' 39.37" N 124° 16' 49.80" W	Field Measurements: Water Temperature, Dissolved Oxygen, Salinity/Specific Conductivity, pH, Turbidity, and Depth	Year Round: 15 minute intervals	<p>Parameter: Ammonia Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic life Status: Insufficient data</p> <p>Parameter: Chlorophyll a Season: Summer Listed: 2004 Beneficial Uses: Water contact recreation; Aesthetics; Livestock watering; Water supply; Fishing Status: Insufficient data</p> <p>Parameter: Fecal Coliform Season: Year Around Listed: 2004 Beneficial Use(s): Shellfish growing; Water contact recreation Status: Water quality limited, 303(d) list, TMDL needed</p>
		Laboratory: Bacteria (<i>e.coli</i>)	Monthly/After storm events	<p>Parameter: pH Season: Year Round Listed: 2004 Beneficial Use(s): Resident fish and aquatic life; Water contact recreation Status: Insufficient data</p>
		Laboratory: Nutrients (TN and TP), and Chlorophyll,	Seasonally to Quarterly (as staff and resources allow)	<p>Parameter: Sedimentation Season: Undefined Listed: 1998 Beneficial Use(s): Salmonid fish rearing; Salmonid fish spawning; Resident fish and aquatic life Status: Insufficient data</p>
Pacific Ocean, Gregory Point – Coos Watershed	43 °20' 21.4" N 124° 22' 06.5" W	Field Measurements: Water Temperature, Dissolved Oxygen, Salinity/Specific Conductivity, pH, Turbidity, and Depth	Seasonally	<p>Adjacent Location Listings (Sunset Bay and Bastendorf Beach)</p> <p>Parameter: Enterococcus Season: Fall, Winter, Spring; Summer Listed: 2010 Beneficial Use(s): Water contact recreation Status: Water quality limited, 303(d) list, TMDL needed</p>

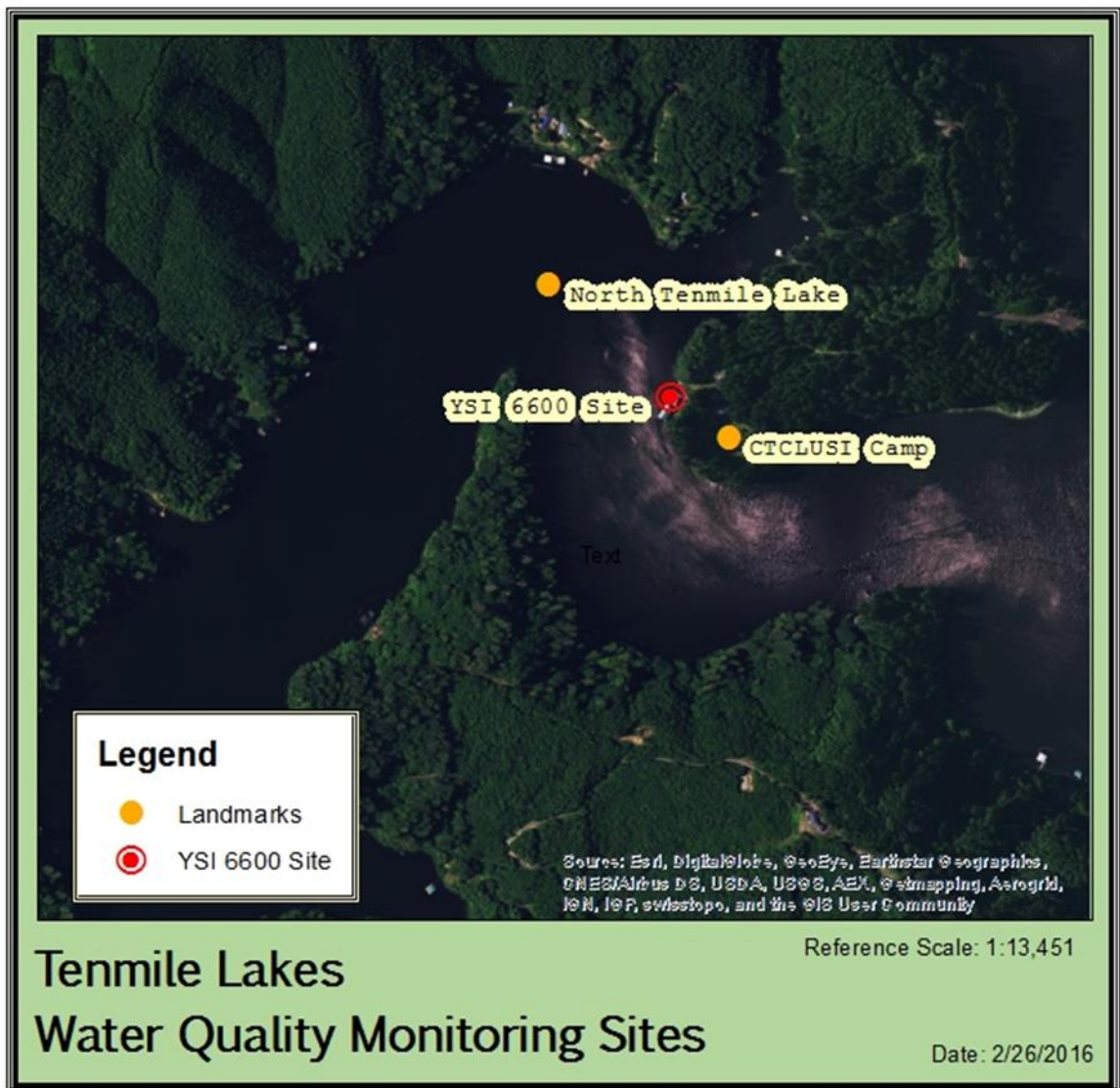
Sixes River – Sixes Watershed	42° 48' 39.5" N 124° 26' 43.3" W	Field Measurements: Water Temperature, Dissolved Oxygen, Salinity/Specific Conductivity, pH, Turbidity, and Depth	Seasonally to Quarterly (as staff and resources allow)	<p>Parameter: Alkalinity Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic life Status: Insufficient data, potential concern</p> <p>Parameter: Ammonia Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic life Status: Attaining some criteria/uses</p> <p>Parameter: Biological Criteria Season: Year Round Listed: :2010 Beneficial Use(s): Aquatic Life Status: Water quality limited, 303(d) list, TMDL needed</p> <p>Parameter: Chloride Season: Year Round Listed: 2004 Beneficial Use(s): Aquatic Life Status: Insufficient data</p> <p>Parameter: Chlorophyll a Season: Fall, Winter, Spring; Summer Listed: 2004 Beneficial Use(s): Fishing; Aesthetics; Livestock watering; Water supply; Water contact recreation Status: Insufficient data; Attaining some criteria/uses (Summer)</p> <p>Parameter: Dissolved Oxygen Season: Year Round (Non-spawning); Oct. 15 to May15 Listed: 2010; 2004 Beneficial Use(s): Cold-water aquatic life; Salmon and steelhead spawning Status: Water quality limited, 303(d) listed, TMDL needed.</p> <p>Parameter: E.Coli Season: Year Around Listed: 2004 Beneficial Use(s): Water contact recreation Status: Attaining some criteria/uses</p> <p>Parameter: Fecal Coliform Season: Year Around Listed: 1998 Beneficial Use(s): Water contact recreation Status: Attaining some criteria/uses</p> <p>Parameter: pH Season: Year Round Listed: 2004 Beneficial Use(s): Water contact recreation; Salmonid fish spawning; Resident fish and aquatic life; Anadromous fish passage; Salmonid fish rearing Status: Attaining some criteria/uses</p> <p>Parameter: Sedimentation Season: Undefined Listed: 1998 Beneficial Use(s): Salmonid fish rearing; Salmonid fish spawning; Resident fish and aquatic life Status: Insufficient data</p> <p>Parameter: Temperature Season: Year Round (Non-spawning) Listed: 2004 Beneficial Use(s): Salmon and trout rearing and migration Status: Water quality limited, 303(d) list, TMDL needed.</p>
[AR1]		Laboratory: Bacteria (<i>e.coli</i>)		
		Laboratory: Nutrients (TN and TP), Chlorophyll, Basic Habitat Information, and Macroinvertebrates		

3) Maps of Monitoring Sites

North Fork and Cox Island Siuslaw Sonde Stations



North Tenmile Lake Sample Site



Coos Bay Sonde Stations



Baldich Sample Site



Sixes River Sample Site



4) Total Extent of Waters Assessed

During the 2017 water year, our program continuously monitored baseline water quality at 4 locations on two rivers pertaining to Tribal lands (the Coos Bay Estuary and North Fork Siuslaw River). Those data collected at the continuous monitoring stations represent approximately 36% of the total stream and 3% of the total tideland miles (approx. 0.94 miles of rivers and streams and 3.18 miles of tideland) of or pertaining to Tribal lands. Additional water quality assessment data such as nutrient, bacteria and benthic macroinvertebrate data were collected less frequently and included sample sites other than the continuous monitoring sites. The reduced sampling frequency and disparity among parameters monitored at different sites is due primarily to funding and staff resource constraints (see table above for parameters measured at each site and monitoring frequency). The program did not do any significant monitoring of wetlands or lakes due to funding and staff resource constraints.

Also, due to funding and staff resource constraints, only one microcystin test was performed for the 2017 year at our North Tenmile Lakes site.

5) Data Analysis and Assessment

The goal for all waters of or pertaining to Tribal lands is to support the following Tribal and/or state designated beneficial uses.

Tribal Goals/Designated Beneficial Uses for the Waters of or Pertaining to Tribal Lands

BENEFICIAL USES	MISERY CREEK	MAINSTEM SIUSLAW RIVER	NORTH FORK SIUSLAW RIVER	KENTUCK SLOUGH	COOS RIVER	SIXES RIVER	TENMILE LAKE
RESIDENT FISH AND AQUATIC LIFE	X	X	X	X	X	X	X
ANADROMOUS FISH PASSAGE	X	X	X	X	X	X	X
SALMONID AND PETROMYZONTID FISH REARING	X	X	X	X	X	X	X
SALMONID AND PETROMYZONTID FISH SPAWNING	X					X	X
WATER CONTACT RECREATION		X	X	X	X	X	X
SHELLFISH GROWING/SHELLFISH HARVESTING		X	X		X		
AESTHETICS/CEREMONIAL PURPOSES	X	X	X	X	X	X	X
TRADITIONAL/ CULTURAL USES	X	X	X	X	X	X	X

CTCLUSI does not yet have Tribal or EPA approved water quality standards. Therefore, our program primarily refers to ODEQ water quality standards to evaluate water quality data generated by our Integrated Water Quality Monitoring Program. In addition to ODEQ criteria, our program refers to the Oregon Watershed Enhancement Board (OWEB) recommended indicator criteria to evaluate total nitrogen, total phosphorus and turbidity data generated by the Tribes' integrated water quality monitoring program. In addition to the water quality parameters listed below, the Tribes' water quality monitoring program also collects annual macroinvertebrate samples from the Sixes River sample site. Macroinvertebrate data collected by our program are evaluated per the Benthic Invertebrate Index of Biological Integrity – BIBI (modified Karr 1998).

Designated Uses	Water Quality Parameter			
Salmon and Aquatic Life	Temp*	Dissolved Oxygen	Turbidity	pH
Salmon and Trout Rearing and Migration	Not greater than 18° C 7-day max daily average	Ocean Waters: No measurable reduction allowed Estuarine Waters: <6.5 mg/L Cold Waters: <8.0 mg/L 30 day mean min; <6.5 mg/L seven-day min mean; <6.0 mg/L absolute min Cool Waters: <6.5 mg/L 30 day mean min; <5.0 mg/L seven-day min mean; <4.0 mg/L absolute min Warm Waters: <5.5 mg/L 30 day mean min; <4.0 mg/L absolute min % Saturation: May not fall outside of 90-110% (>110% Lethal)	>10 FNU	Marine Waters: May not fall outside of 7.0-8.5 range Estuarine and Fresh Waters: May not fall outside of 6.5-8.5 range
Salmon Habitat (Healthy Adult)	May not fall outside of 7.2-15.6 °C (>25 °C Lethal)			
Salmon Habitat (Healthy Juvenile)	12.2-13.9°C (>25 °C Lethal)			
	Citation			
	OAR 340-041-0028* WATER POLLUTION DIVISION 41 WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON	OAR 340-041-0016 WATER POLLUTION DIVISION 41 WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON	DEQ WQS Turbidity Technical Review	OAR 340-041-0021 WATER POLLUTION DIVISION 41 WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON
Water Contact Recreational Uses	Enterococci organism levels (fresh and marine)	E.coli organism levels	HABs	
	No more than 70 colony forming units (70 MPN) per 100 ml of marine water	No more than 235 CFU or 235 MPN per 100 ml of fresh water	Anatoxin-A- 20 µg/L Cylindrospermopsin- 6 µg/L Saxitoxin- 100 µg/L Microcystin- 10 µg/L	
	Citation			
	EPA-823-B-14-001	EPA-823-B-14-001	OHA PHD Office of Environmental Public Health	
Aesthetics	Nutrients		Turbidity	
	Total Phosphorus (streams): >100 µg/L		No more than a 10% cumulative increase in natural stream	

	<p>Total Phosphorus (Lakes w/o thermal stratification, reservoirs, rivers, and estuaries): >50 µg/L</p> <p>Total Phosphorus (Lakes/reservoirs): >25 µg/L</p> <p>Total Nitrogen (Marine Waters): >200 µg/L /L</p> <p>Total Nitrogen (Fresh Waters): >750 µg/L</p> <p>Chlorophyll a (Lakes with Thermal Stratification) >10 µg/L</p> <p>Chlorophyll a (Lakes without Thermal Stratification, Reservoirs, Rivers, and Estuaries): >15 µg/L</p> <p>Ammonia: May not fall outside 270 µg/L- 33,000 µg/L once every 3 years depending on pH, temperature, and salinity</p>	<p>turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity.</p> <p>However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied.</p>
	Citation	
	USEPA/ Commonwealth of the Northern Mariana Islands Water Quality Standards/ OAR 340-041-0019	OAR 340-041-0036

* OAR 340-041-0028, (7): Oceans and Bays. Except for the Columbia River above river mile 7, ocean and bay waters may not be warmed by more than 0.3 degrees Celsius (0.5 degrees Fahrenheit) above the natural condition unless a greater increase would not reasonably be expected to adversely affect fish or other aquatic life. Absent a discharge or human modification that would reasonably be expected to increase temperature, DEQ will presume that the ambient temperature of the ocean or bay is the same as its natural thermal condition

III. Data Analysis Results

A. Summary of Data Collected

The following data summaries of Tribal discrete (grab) and continuous (sonde) water quality monitoring data are for the 2017 water year (unless otherwise indicated) and are presented in tabular format.

Lower Coos Surface Water Quality Monitoring Data for Water Year 2017
(Oct 2016 to Sept 2017)

BLM Discrete Data Summary **							
BLM Grabs Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	11.24	33173.25	20.83	96.45	9.31	7.68	5.57
Median	11.27	35339.90	22.27	96.50	9.42	7.67	3.76
Minimum	7.86	20423.40	12.16	92.70	8.29	7.50	2.01
Maximum	13.62	44034.50	28.41	99.80	10.18	7.88	15.68
Count	6	6	6	6	6	6	6
BLM Grabs Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	12.74	51268.73	33.62	98.70	8.48	7.72	2.68
Median	12.61	51605.10	33.82	98.60	8.59	7.85	2.86
Minimum	11.99	47750.60	31.09	89.60	7.68	7.38	1.54
Maximum	13.61	54450.50	35.94	107.90	9.16	7.94	3.64
Count	3	3	3	3	3	3	3
BLM Continuous Data Summary **							
BLM Sonde Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	11.38	36480.36	23.12	97.87	9.27	7.78	3.04
Median	11.21	36776.50	23.23	97.60	9.45	7.80	2.25
Minimum	6.00	9038.60	5.07	71.10	6.60	7.30	-1.35
Maximum	16.42	51905.90	33.84	126.60	11.26	8.02	220.40
Count	23320	23320	23320	23320	23320	23320	23319
BLM Sonde Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	14.17	48155.01	31.39	96.91	8.21	7.60	2.91
Median	14.46	49208.70	32.16	95.70	8.07	7.62	2.66
Minimum	8.54	58.90	0.03	50.20	4.67	7.19	0.02
Maximum	18.32	56085.90	37.30	138.20	12.57	7.97	27.18
Count	11709	11709	11709	11709	11709	11709	11709

* Values in **bold** represent exceedances in single values for a particular designated use. However, these exceedances can be possible anomalies attributable to seasonal extremes (temperature) or localized conditions (turbidity). Values highlighted in represent exceedances in temperature for healthy juvenile salmon habitat. Likewise, values highlighted in represent exceedances in temperature for both healthy juvenile and healthy adult

salmon habitat and values highlighted in ■ represent exceedances in temperature for both healthy juvenile and healthy adult salmon habitat as well as salmon and trout rearing and migration. ** Estuary habitat tends to have tidal (salinity/ temp) and open water characteristics (high temp/ low DO) that are not comparable to mainstem and side channel water quality parameters.

Data Summary (cont.)

Lower Coos Surface Water Quality Monitoring Data for Water Year 2017 (Oct 2016 to Sept 2017)

Empire Discrete Data Summary**							
Empire Grabs Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	11.41	37489.50	23.80	98.07	9.24	7.76	4.89
Median	11.46	36591.80	23.14	98.85	9.34	7.76	4.95
Minimum	8.09	25149.80	15.24	92.70	8.47	7.58	1.80
Maximum	13.71	47701.40	31.05	102.00	9.92	7.95	7.70
Count	6	6	6	6	6	6	6
Empire Grabs Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	11.69	52264.67	34.29	97.80	8.53	7.73	1.03
Median	11.77	51708.00	33.89	97.00	8.49	7.82	1.17
Minimum	10.97	50439.90	32.92	80.60	7.22	7.39	0.01
Maximum	12.34	54646.10	36.07	115.80	9.88	7.99	1.92
Count	3	3	3	3	3	3	3
Empire Continuous Data Summary **							
Empire Sonde Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	11.42	40361.74	25.80	97.52	9.07	7.84	3.66
Median	11.17	41598.45	26.59	97.70	9.14	7.88	3.10
Minimum	6.38	7229.40	4.00	45.30	3.86	7.35	-0.40
Maximum	15.79	52100.40	34.08	128.80	11.49	8.09	44.05
Count	23320	23320	23320	23320	23320	23320	23316
Empire Sonde Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	13.38	48955.93	31.95	96.83	8.30	7.64	2.34
Median	13.53	49900.70	32.64	96.40	8.22	7.64	2.24
Minimum	8.67	39341.90	25.12	31.40	2.92	7.24	-0.33
Maximum	17.60	52122.90	34.10	133.60	11.46	7.94	16.99
Count	8528	8528	8528	8528	8528	8528	8528

* Values in **bold** represent exceedances in single values for a particular designated use. However, these exceedances can be possible anomalies attributable to seasonal extremes (temperature) or localized conditions (turbidity). Values highlighted in ■ represent exceedances in temperature for healthy juvenile salmon habitat. Likewise, values highlighted in ■ represent exceedances in temperature for both healthy juvenile and healthy adult salmon habitat and values highlighted in ■ represent exceedances in temperature for both healthy juvenile and healthy adult salmon habitat as well as

salmon and trout rearing and migration. ** Estuary habitat tends to have tidal (salinity/ temp) and open water characteristics (high temp/ low DO) that are not comparable to mainstem and side channel water quality parameters.

Data Summary (cont.)

Lower Siuslaw Surface Water Quality Monitoring Data for Water Year 2017 (Oct 2016 to Sept 2017)

North Fork Discrete Data Summary**							
North Fork Grabs Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	10.32	2282.03	1.29	94.45	10.55	6.67	3.19
Median	9.84	181.45	0.09	94.50	10.78	6.64	3.02
Minimum	7.38	43.60	0.02	88.80	9.03	6.32	1.90
Maximum	14.40	12106.30	6.95	98.60	11.66	6.99	5.00
Count	6	6	6	6	6	6	6
North Fork Grabs Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	18.41	30456.65	19.03	87.75	7.34	7.43	1.38
Median	18.41	30456.65	19.03	87.75	7.34	7.43	1.38
Minimum	17.92	23460.10	14.25	81.40	7.09	7.36	1.09
Maximum	18.91	37453.20	23.80	94.10	7.59	7.50	1.66
Count	2	2	2	2	2	2	2
North Fork Continuous Data Summary **							
North Fork Sonde Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	9.66	4283.42	2.55	96.30	10.98	6.77	4.82
Median	9.64	243.10	0.12	95.60	11.04	6.70	3.44
Minimum	2.87	32.20	0.01	73.20	6.60	5.99	0.01
Maximum	17.23	58621.70	37.78	155.70	16.30	8.13	243.77
Count	19558	23321	23321	23321	23321	23321	23321
North Fork Sonde Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	17.21	20903.96	12.85	83.10	7.44	7.05	4.67
Median	17.13	23021.45	13.96	83.50	7.30	7.02	3.41
Minimum	11.14	298.90	0.14	32.00	2.81	6.46	0.68
Maximum	21.88	46233.60	29.92	142.70	14.13	8.13	233.05
Count	8676	8676	8676	8676	8676	8676	8539

* Values in **bold** represent exceedances in single values for a particular designated use. However, these exceedances can be possible anomalies attributable to seasonal extremes (temperature) or localized conditions (turbidity). Values highlighted in represent exceedances in temperature for healthy juvenile salmon habitat. Likewise, values highlighted in represent exceedances in temperature for both healthy juvenile and healthy adult salmon habitat and values highlighted in represent exceedances in temperature for both healthy juvenile and healthy adult salmon habitat as well as salmon and trout rearing and migration. ** Estuary habitat tends to have tidal (salinity/ temp) and open water characteristics (high temp/ low DO) that are not comparable to mainstem and side channel water quality parameters.

Data Summary (cont.)

Lower Siuslaw Surface Water Quality Monitoring Data for Water Year 2017
(Oct 2016 to Sept 2017)

Cox Island Discrete Data Summary**							
Cox Island Grabs Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	10.83	3753.33	2.17	96.30	10.62	7.09	4.10
Median	10.14	199.40	0.11	97.70	11.05	7.09	3.94
Minimum	7.08	67.10	0.03	89.90	8.62	6.81	2.36
Maximum	16.69	17448.00	10.32	101.00	11.91	7.52	6.68
Count	6	6	6	6	6	6	6
Cox Island Grabs Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	18.10	29252.70	19.50	93.05	7.84	7.26	2.88
Median	18.10	29252.70	19.50	93.05	7.84	7.26	2.88
Minimum	17.30	22615.20	16.29	91.20	7.41	7.15	2.43
Maximum	18.90	35890.20	22.70	94.90	8.26	7.37	3.33
Count	2	2	2	2	2	2	2
Cox Island Continuous Data Summary **							
Cox Island Sonde Wet Season: 10/01/2016 to 05/31/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	10.29	5155.31	3.07	96.68	10.72	7.04	5.40
Median	10.18	289.40	0.14	97.60	10.98	6.97	3.53
Minimum	2.93	10.50	0.00	74.10	6.59	6.36	0.29
Maximum	18.98	47392.90	30.77	127.50	13.43	8.04	435.82
JCount	20061	20061	20061	20061	20061	20061	20053
Cox Island Sonde Dry Season: 06/01/2017 to 09/30/2017	Temp (°C)	SpCond (µS/cm)	Salinity (ppt)	Dissolved Oxygen (%)	Dissolved Oxygen (mg/l)	pH	Turbidity (NTU)
Mean	17.53	25972.81	16.16	82.86	7.25	7.16	4.63
Median	17.47	26702.80	16.41	83.20	7.20	7.13	3.87
Minimum	10.43	214.40	0.10	37.00	3.26	6.56	0.88
Maximum	22.20	53339.10	35.00	148.00	12.50	8.06	166.64
Count	11709	9418	9418	9418	9418	11709	9418

* **Bold** values represent exceedances in single values for a particular designated use. However, these exceedances can be possible anomalies attributable to seasonal extremes (temperature) or localized conditions (turbidity). Values highlighted in represent exceedances in temperature for healthy juvenile salmon habitat. Likewise, values highlighted in represent exceedances in temperature for both healthy juvenile and healthy adult salmon habitat and values highlighted in represent exceedances in temperature for both healthy juvenile and healthy adult salmon habitat as well as

salmon and trout rearing and migration. ** Estuary habitat tends to have tidal (salinity/ temp) and open water characteristics (high temp/ low DO) that are not comparable to mainstem and side channel water quality parameters.

Bacteria Data

Baldich 1 <i>Enterococci</i>		Baldich 2 <i>Enterococci</i>	
Sample Date	MPN/100 ml	Sample Date	MPN/100 ml
10/11/2016	<10	10/11/2016	<10

Siuslaw - Cox Island 1 <i>E. coli</i>		Siuslaw - Cox Island 2 <i>E. coli</i>		Siuslaw – North Fork 1 <i>E. coli</i>		Siuslaw – North Fork 2 <i>E. coli</i>	
Sample Date	MPN/100 ml	Sample Date	MPN/100 ml	Sample Date	MPN/100 ml	Sample Date	MPN/100 ml
11/30/2016	31	11/30/2016	10	11/30/2016	75	11/30/2016	10
1/24/2017	10	1/24/2017	41	1/24/2017	20	1/24/2017	<10
3/1/2017	10	3/1/2017	10	3/1/2017	<10	3/1/2017	10
4/4/2017	10	4/4/2017	10	4/4/2017	<10	4/4/2017	10
5/31/2017	10	5/31/2017	10	5/31/2017	31	5/31/2017	41
7/5/2017	<10	7/5/2017	10	7/5/2017	41	7/5/2017	<10
8/7/2017	10	8/7/2017	10	8/7/2017	<10	8/7/2017	10
10/2/17	<10	10/2/17	<10	10/2/17	10	10/2/17	<10

Tenmile 1 <i>E. coli</i>		Tenmile 2 <i>E. coli</i>	
Sample Date	MPN/100 ml	Sample Date	MPN/100 ml
09/21/17	<10	09/21/17	<10

Coos - BLM 1 <i>E. coli</i>		Coos - BLM 2 <i>E. coli</i>		Coos - Empire Dock <i>E. coli</i>		Coos - Empire Dock <i>E. coli</i>	
Sample Date	MPN/100 ml	Sample Date	MPN/100 ml	Sample Date	MPN/100 ml	Sample Date	MPN/100 ml
11/1/2016	10	11/1/2016	20	11/1/2016	10	11/1/2016	10
12/5/2016	10	12/5/2016	20	12/5/2016	<10	12/5/2016	<10
1/11/2017	<10	1/11/2017	31	1/11/2017	31	1/11/2017	41
2/14/2017	<10	2/14/2017	20	2/14/2017	<10	2/14/2017	<10
5/17/2017	31	5/17/2017	10	5/17/2017	61	5/17/2017	20
7/6/2017	<10	7/6/2017	<10	7/6/2017	<10	7/6/2017	<10
8/8/2017	10	8/8/2017	10	8/8/2017	<10	8/8/2017	<10
9/18/2017	20	9/18/2017	<10	9/18/2017	<10	9/18/2017	<10

Sixes River 1 <i>E. coli</i>		Sixes River 2 <i>E. coli</i>	
Sample Date	MPN/100 ml	Sample Date	MPN/100 ml
6/6/2017	<10	6/6/2017	<10
9/26/17	<10	9/26/17	20

Bold values exceeded criteria (Enterococci 70 MPN/100 ml of marine water: *E.coli* 235 MPN/100 ml of water)

Nutrient Data – Total Nitrogen (TN), Total Phosphorous (TP) and Chlorophyll *a*, Phaeopigment, and Ammonia

Station	Date	Total Phosphorus	Total Nitrogen	Chlorophyll <i>a</i>	Phaeopigment	Ammonia
		[TP] (ug/L)	[TN] (ug/L)	(ug/L)	(ug/L)	[NH ₄] (ug/L)
North Fork 1	6/17/17	49.5	371.3	7.072	4.518	29.7
	10/02/17	41.5	309.3	1.493	2.011	54.3
North Fork 2	6//17/17	50.8	363.9	2.855*	2.628	29.4
	10/02/17	43.2	316.3	1.743	2.018	55.9
North Fork 3	6/17/17	47.0	372.1	3.390	2.708	30.3
	10/02/17	41.7	322.4	2.381	2.775	55.4
Tenmile 1	6/17/17	40.7	401.7	6.91*	-	10.5
	9/21/17	78.90	902.77	16.12	-	17.2
Tenmile 2	6/17/17	42.0	414.2	7.46*	-	11.9
	9/21/17	77.59	880.91	8.29	-	6.7
Tenmile 3	6/17/17	40.3	395.6	13.13	-	12.5
	9/21/17	72.99	882.35	19.31	-	6.0
Empire 1	6/17/17	34.7	166.6	1.032	0.877	24.0
	9/21/17	38.7	260.7	1.321	0.735	44.8
Empire 2	6/17/17	33.1	175.3	1.211	0.880	36.5
	9/21/17	41.2	262.9	1.189	0.957	46.7
Empire 3	6/17/17	33.0	171.6	1.748	1.152	27.8
	9/21/17	41.2	269.6	1.475	0.799	43.9
Sixes 1	6/17/17	18.9	105.3	1.15	-	12.0
	9/26/17	19.6	58.7	0.31	-	1.7
Sixes 2	6/17/17	17.8	105.3	1.88	-	13.1
	9/26/17	19.5	64.7	0.05	-	2.2
Sixes 3	6/17/17	17.2	104.8	1.69	-	12.9
	9/26/17	17.7	51.4	0.16	-	2.0

* Cracked tube

Bold values exceeded criteria ([TP] >100 ug/L streams, >50 ug/L streams that enter lakes/reservoirs, and >25 ug/L lakes/reservoirs; [TN] > 200 ug/L marine waters and >750 ug/L fresh waters; [Chlorophyll *a*] >10 ug/L lakes with thermal stratification, >15 ug/L lakes without thermal stratification, reservoirs, rivers, and estuaries; [NH₄] outside of 270 ug/L- 33,000 ug/L depending on pH, temperature, and salinity.

Macroinvertebrate Data

Benthic Invertebrate Index of Biological Integrity-BIBI (modified Karr 1998)

OR: Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians. Analysis by ABA, Inc., Corvallis, OR.

Sampling method: D-frame net, riffle/run habitat, 8 square feet composite, 500 micron mesh.

Subsampling: 500 organism minimum or entire sample. Level 3 PNW standard taxonomic effort.

Abundances adjusted to a full sample and square meter basis.

[illegible]

Microcystin Data

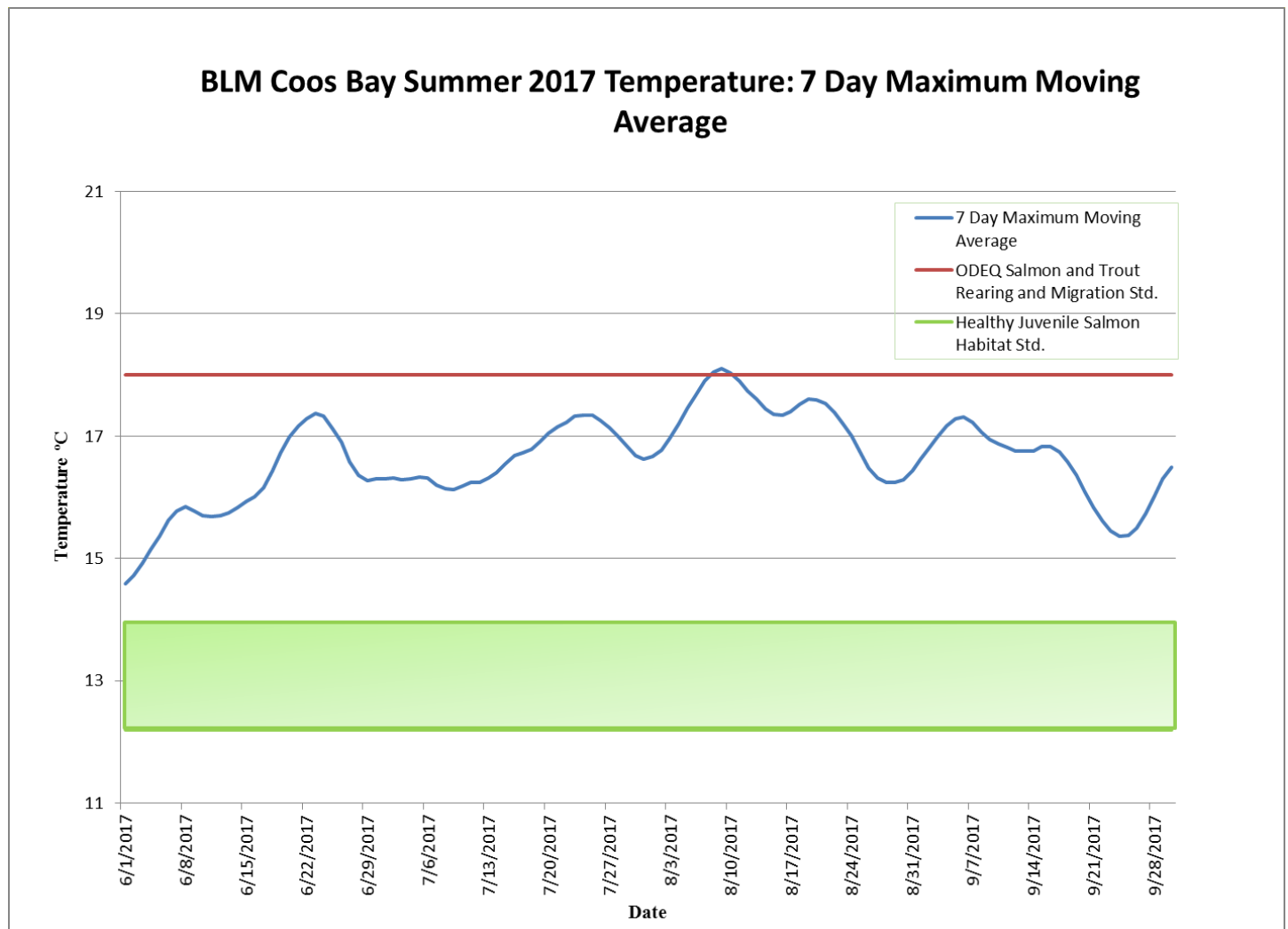
Tenmile 1	
Sample Date	ppb
06/13/17	0

B. Comparison of Data to Benchmark Criteria of Parameters of Concern

Temperature

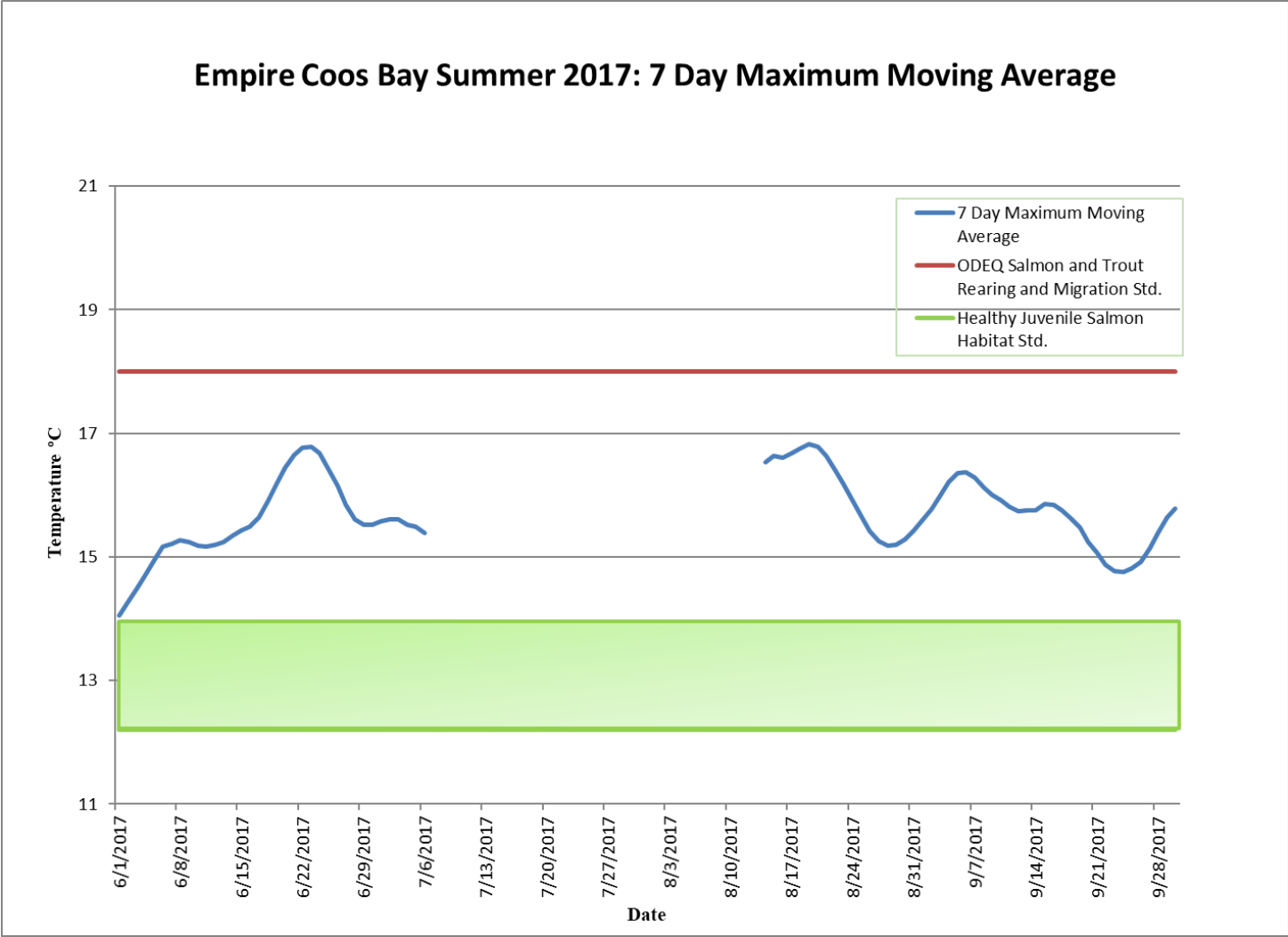
BLM Site – Lower Coos Bay Estuary:

The maximum temperature measured at the BLM Coos Bay Sonde Station was 18.32 °C. The 2017 summer and early fall 7 day maximum average for temperature at this site exceeded the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C), on June 20th from 1400 to 1515 hours; August 4th from 430 to 500 hours; August 5th from 500 to 545 hours; August 6th from 530 to 615 hours August 7th from 600 to 700 hours and August 8th at 715 hours. The 2017 summer and early fall 7 day maximum average also did exceed the healthy juvenile salmon habitat temperature standard (12.2°C -13.9°C).



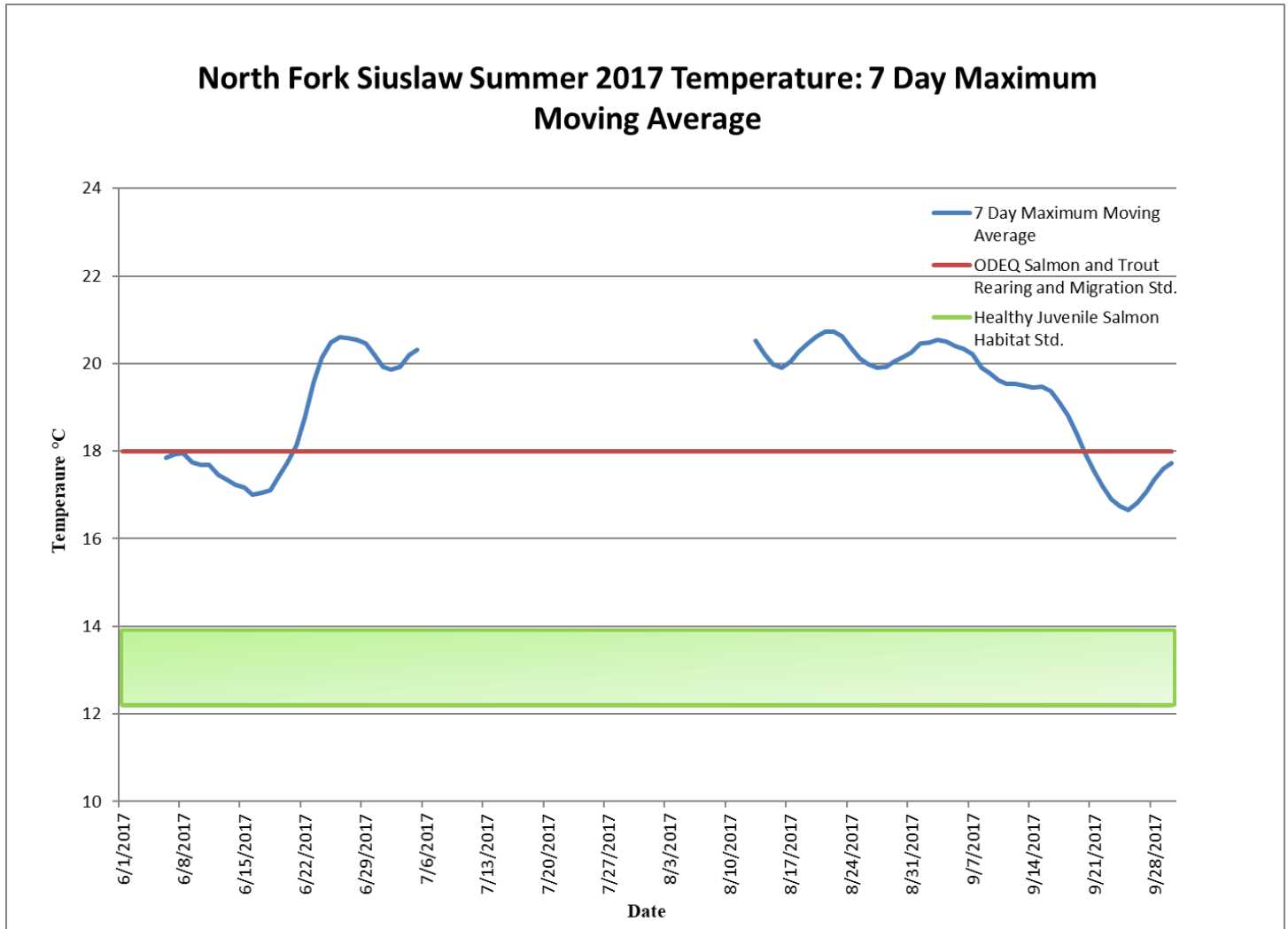
Empire Docks Site – Lower Coos Bay Estuary:

The maximum temperature measured at the Empire Docks Sonde Station was 17.60 °C. The 2017 summer and early fall 7 day maximum average for temperature at this site did not exceed the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C) based on qc'd data. It should be noted, however, due to unforeseeable equipment failures, the data collected at this site may not be implicative of actual water temperatures. The 2017 summer and early fall 7 day maximum average did exceed the healthy juvenile salmon habitat temperature standard (12.2°C -13.9°C).



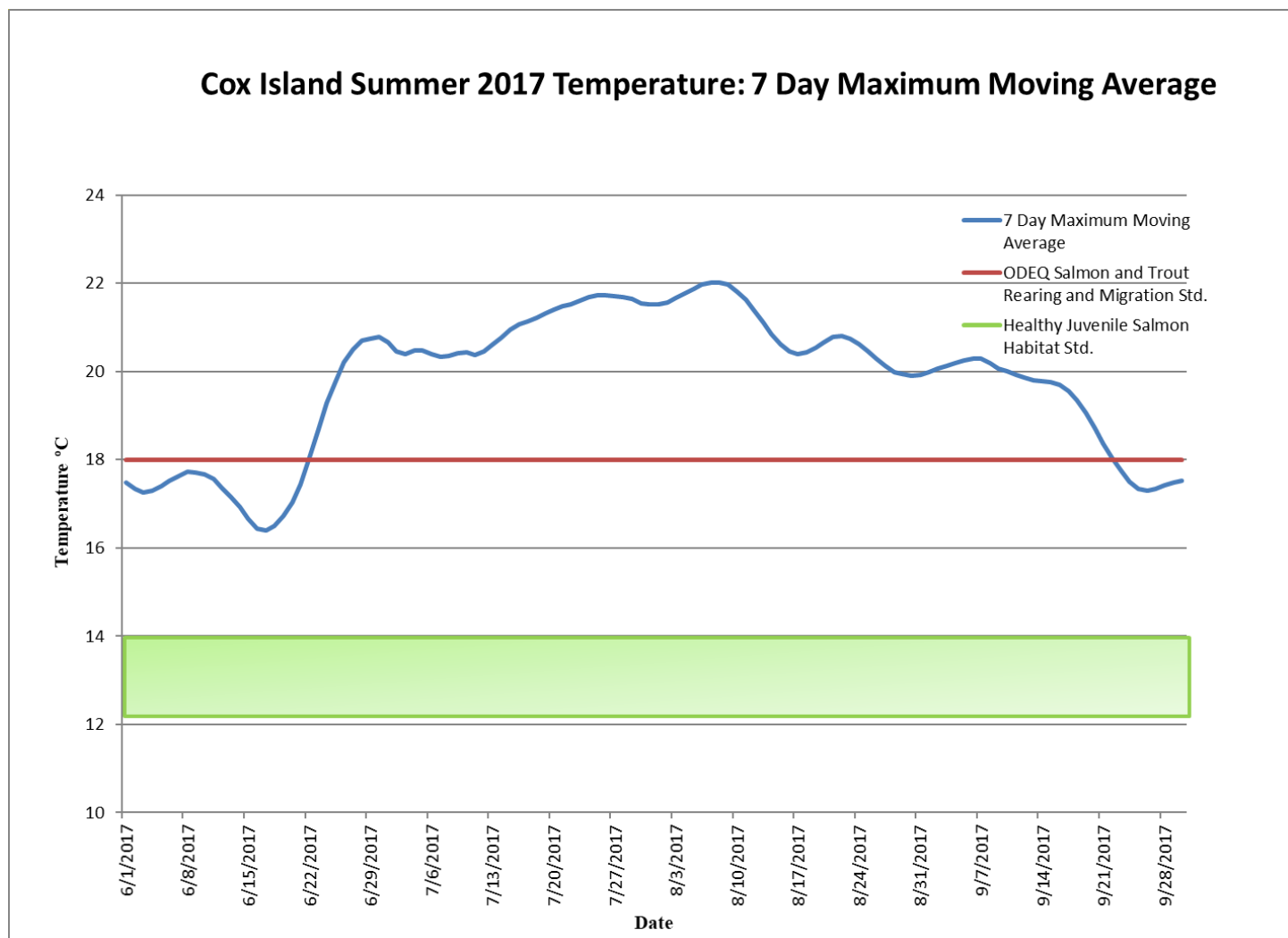
North Fork Siuslaw– Lower Siuslaw Estuary:

The maximum temperature measured at the North Fork Siuslaw Sonde Station was 21.88 °C. The 2017 summer and early fall 7 day maximum average for temperature at this site exceeded the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C) for most of the summer, based on available trends. The 2017 summer and early fall 7 day maximum average also exceeded the healthy juvenile salmon habitat temperature standard (12.2°C -13.9°C).

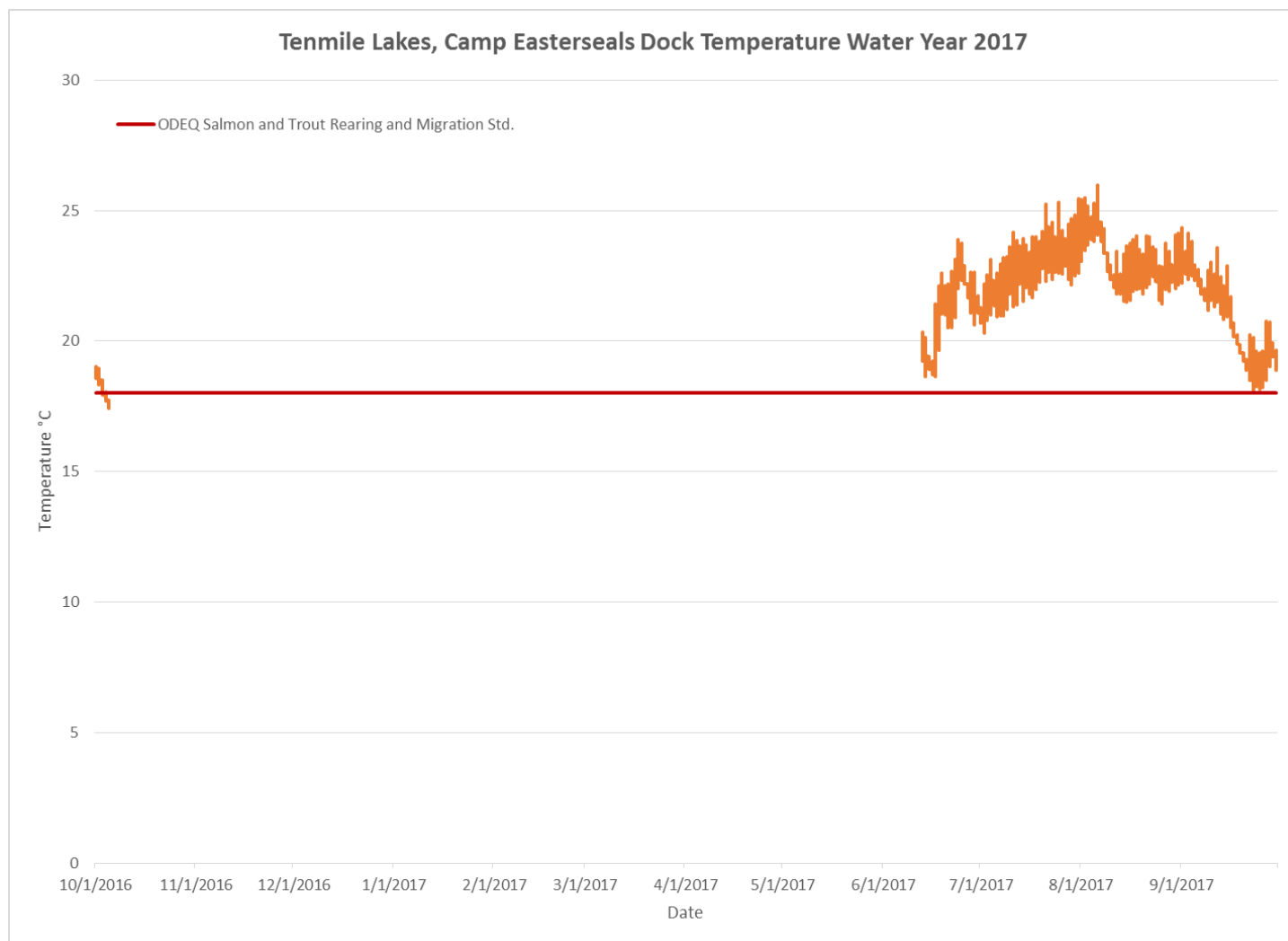


Cox Island– Lower Siuslaw Estuary:

The maximum temperature measured at the Cox Island Sonde Station was 22.2 °C. The 2017 summer and early fall 7 day maximum average for temperature at this site exceeded the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C) for most of the summer. The 2017 summer and early fall 7 day maximum average also exceeded the healthy juvenile salmon habitat temperature standard (12.2°C -13.9°C).



Camp Easter Seals Dock– North Tenmile Lake:

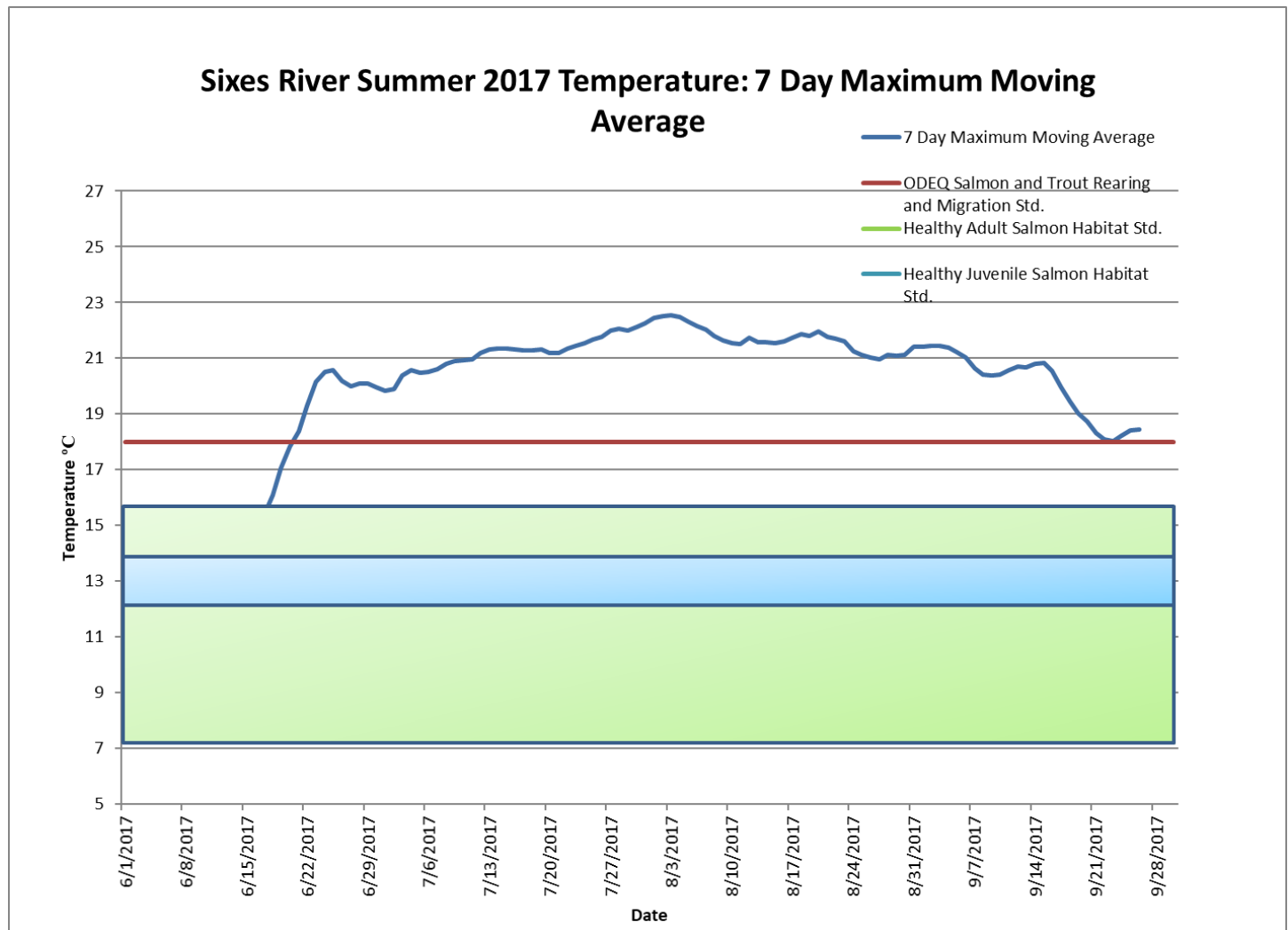


*Note: the gap in data between October 2016 to June 2017 was due to either an animal or human that had pulled the data logger up out of the water column, leaving it on the dock.

The maximum temperature measured at the Camp Easter Seals Hobo Station was 26°C. The 2017 summer and early fall 7 day maximum moving average for temperature at this site exceeded the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C) and peaked at over lethal levels (25°C). 2017 summer and early fall 7 day maximum moving average also exceeded the healthy juvenile salmon habitat temperature standard (12.2°C -13.9°C).

Sixes River – Freshwater

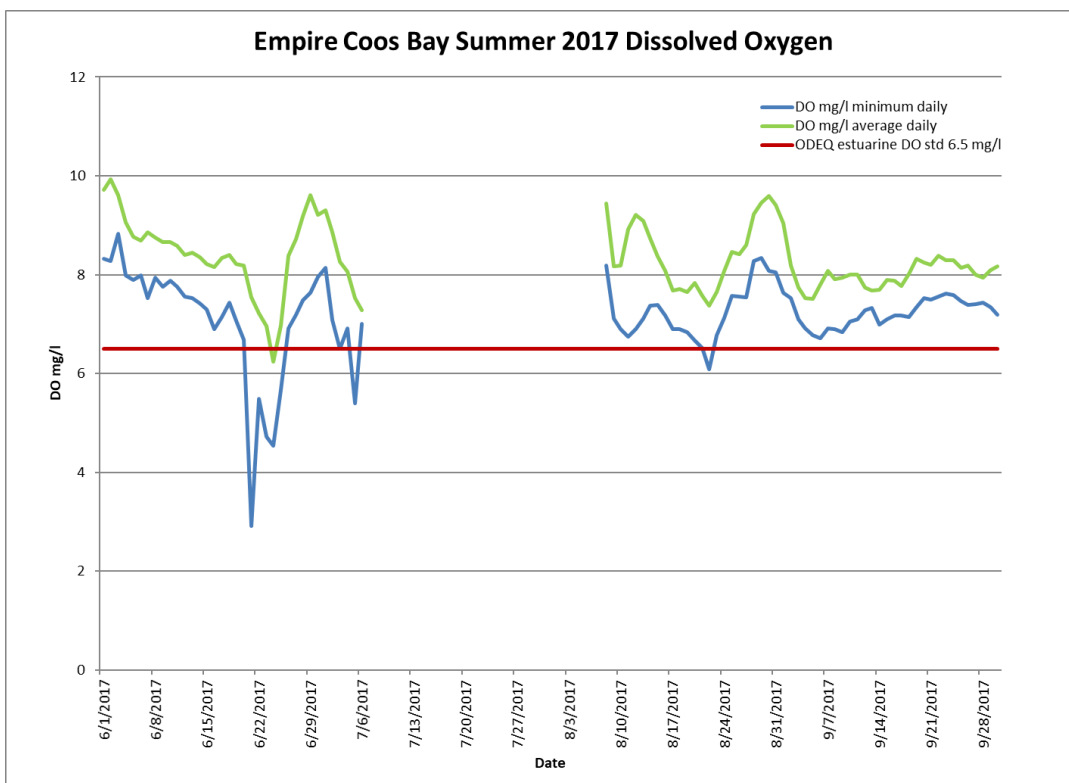
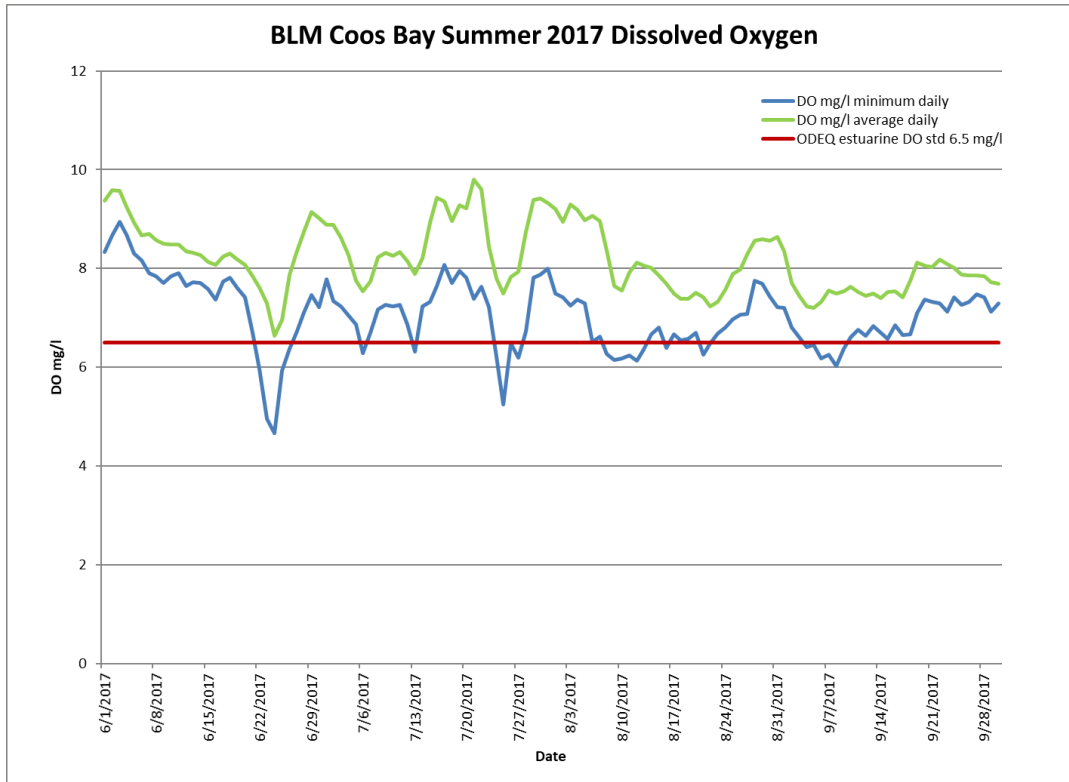
The maximum temperature measured at the Sixes River Hobo Station was 23.26 °C. The 2017 summer and early fall 7 day maximum average for temperature at this site exceeded the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C) for most of the summer. The 2017 summer and early fall 7 day maximum average also exceeded the healthy juvenile salmon habitat temperature standard (12.2°C -13.9°C) as well as the healthy adult salmon habitat temperature standard (7.2°C-15.6°C).



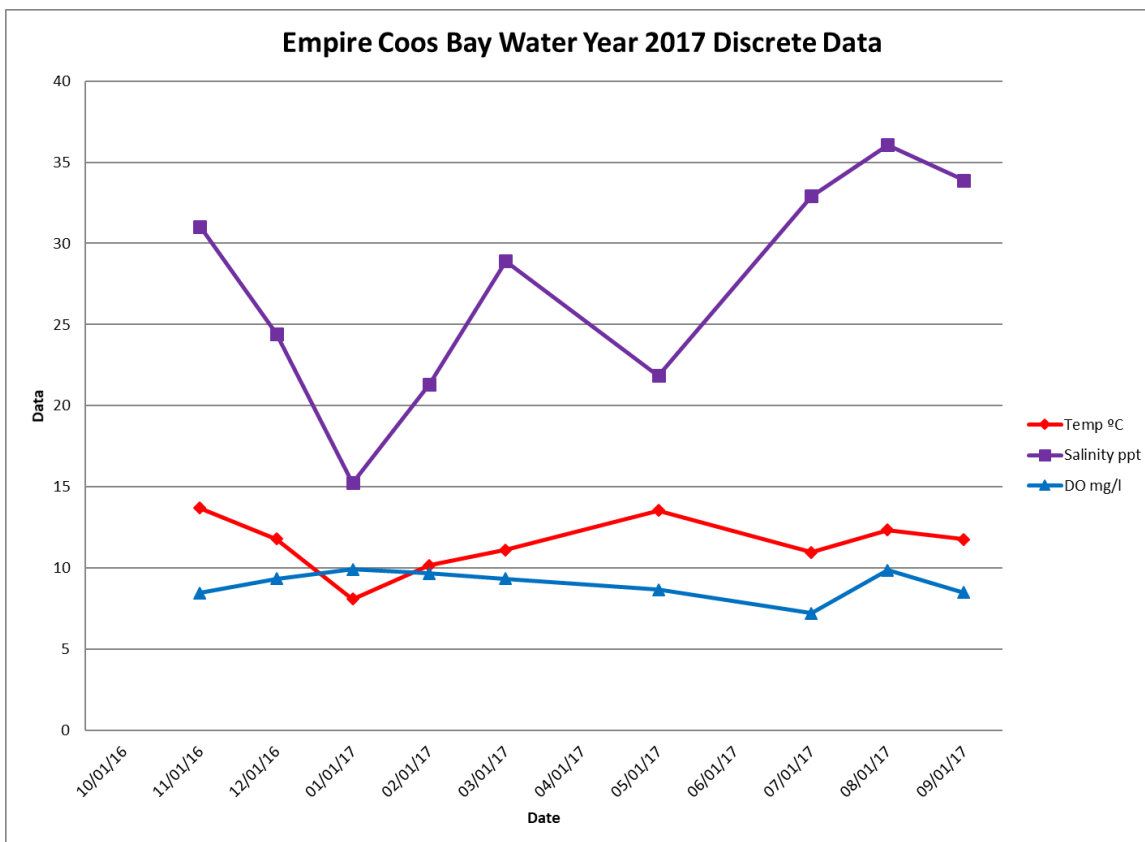
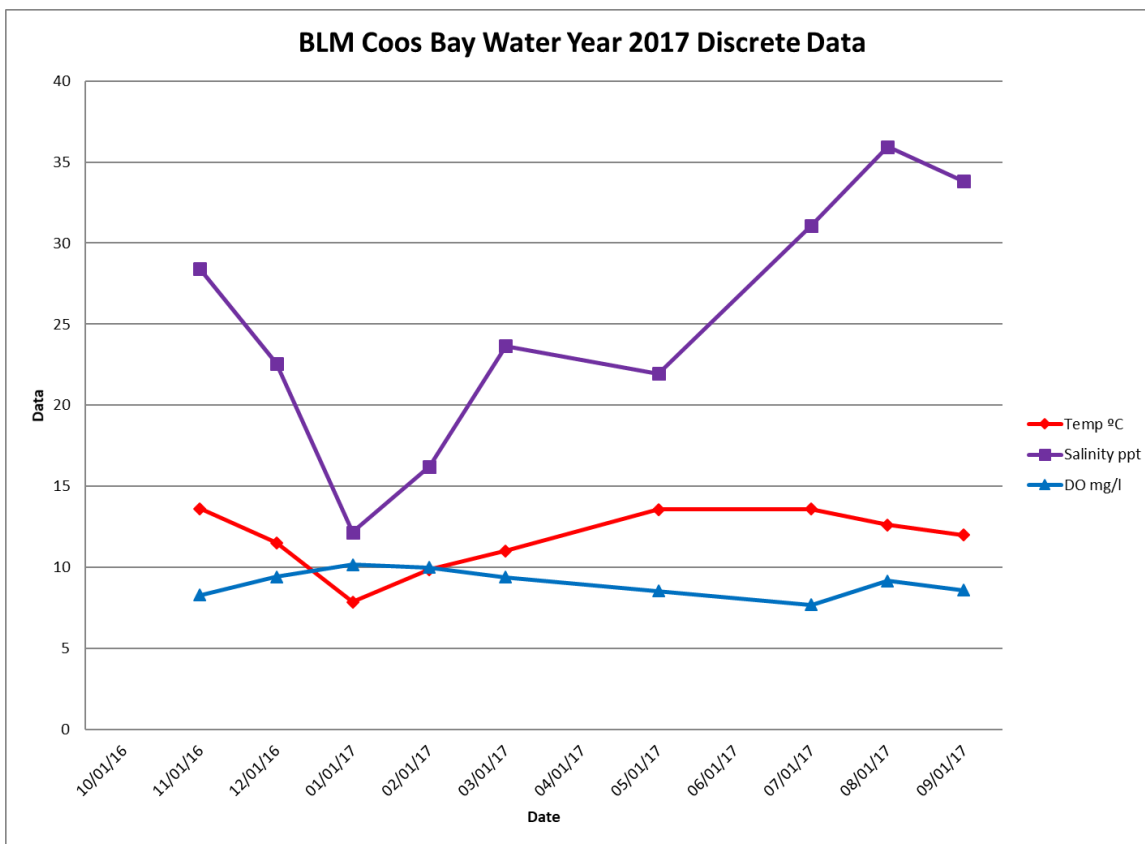
Dissolved Oxygen

BLM and Empire Dock Sites – Lower Coos Bay:

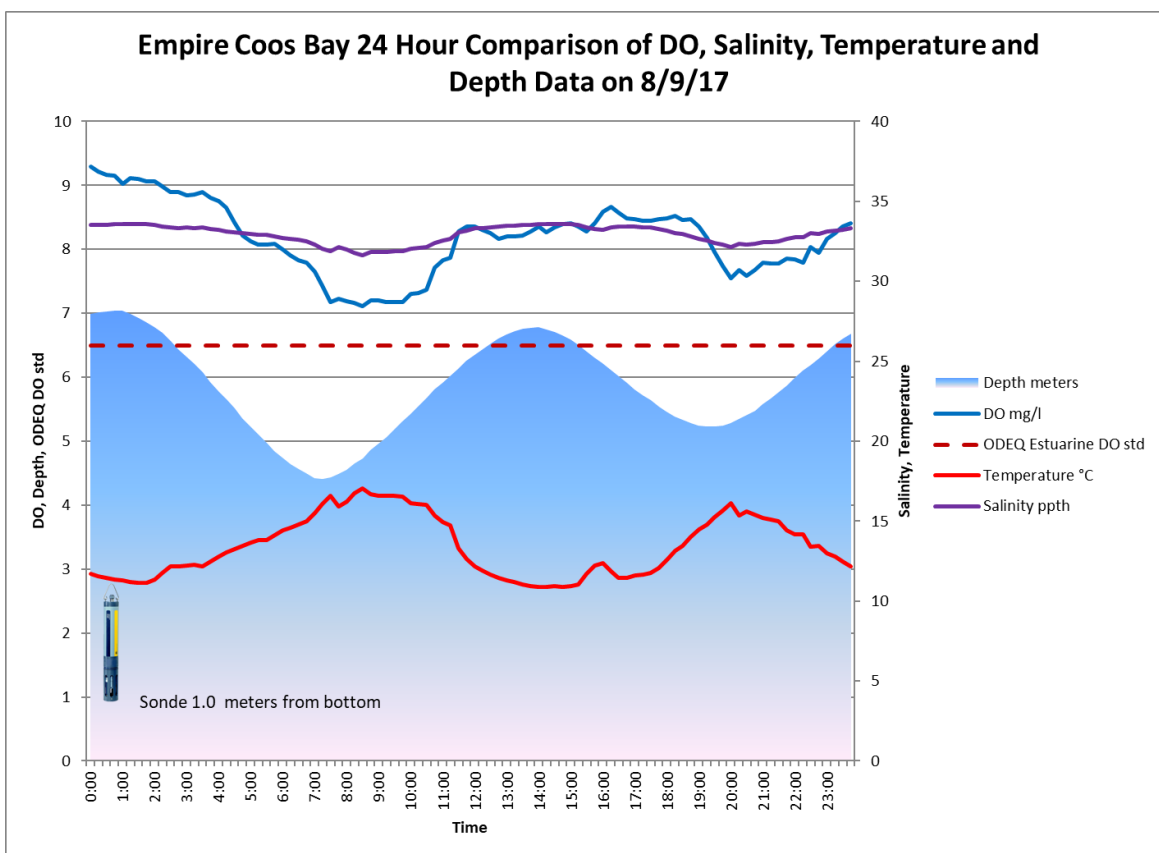
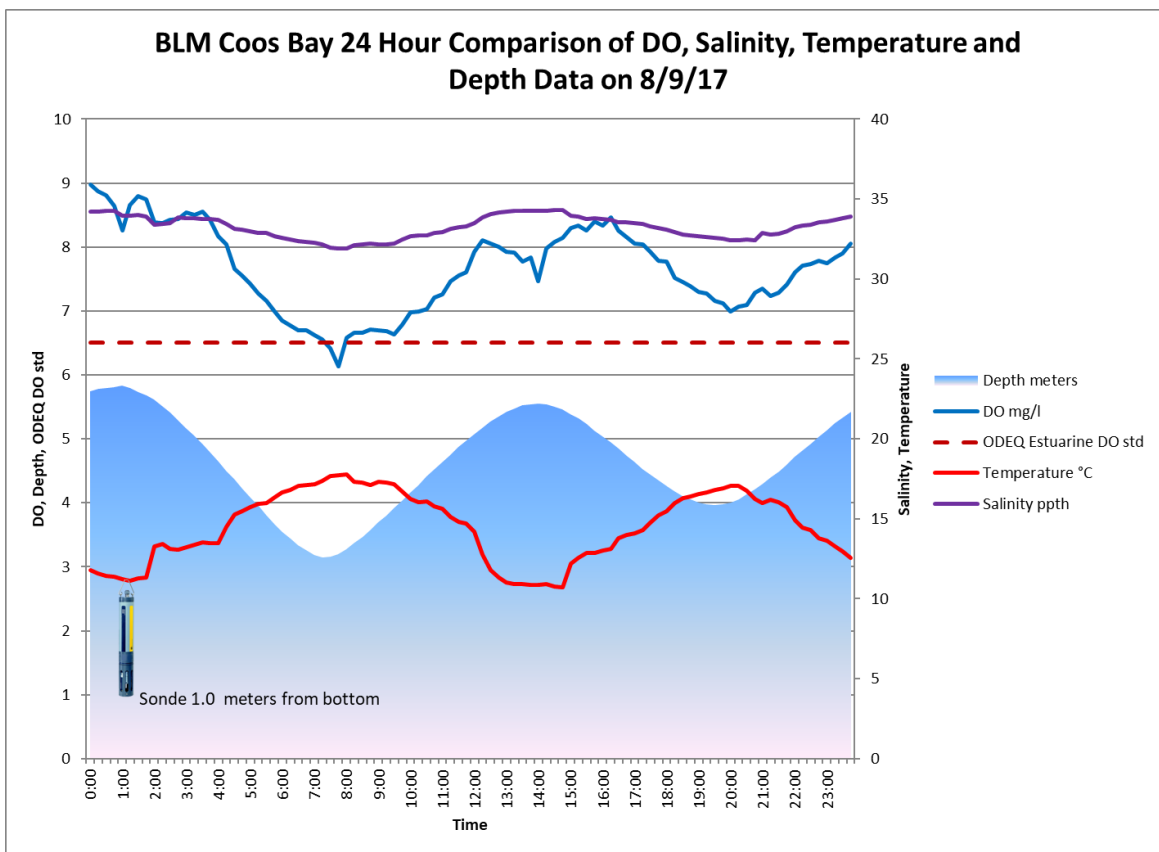
Although minimum dissolved oxygen recorded at the Coos Bay BLM and Empire Dock stations failed to meet the ODEQ estuarine dissolved oxygen criteria of not less than 6.5 mg/l for a portion of the summer, continuous data collected at these sites does not indicate consistent low DO measurements and are likely anomalies attributable to seasonal variability and/or localized site conditions.



The following charts display dissolved oxygen, temperature and salinity data collected by our program for Water Year 2017. These charts show a relationship between increasing water temperature and declining dissolved oxygen levels.

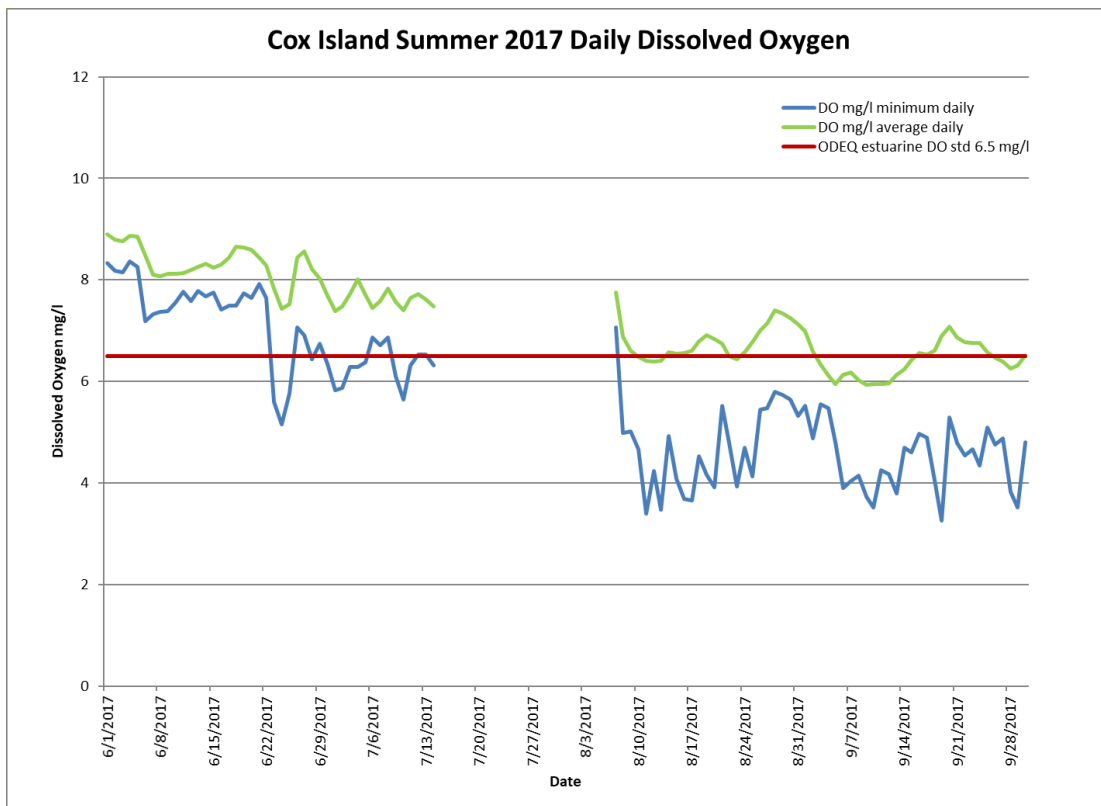
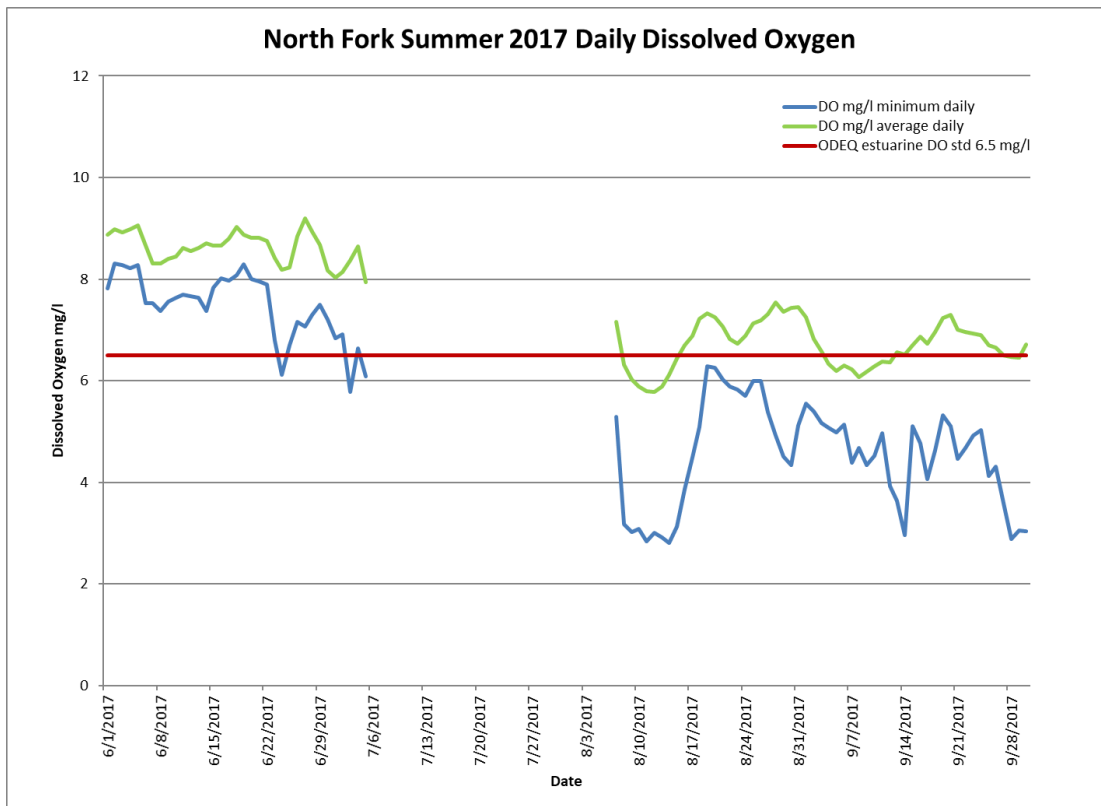


The following charts show the tidal influence in the Coos Bay estuary on select water quality measurements over a 24-hour period on selected days in 2017. The influx of marine water during incoming tides is associated with decreasing temperatures and increases in dissolved oxygen.

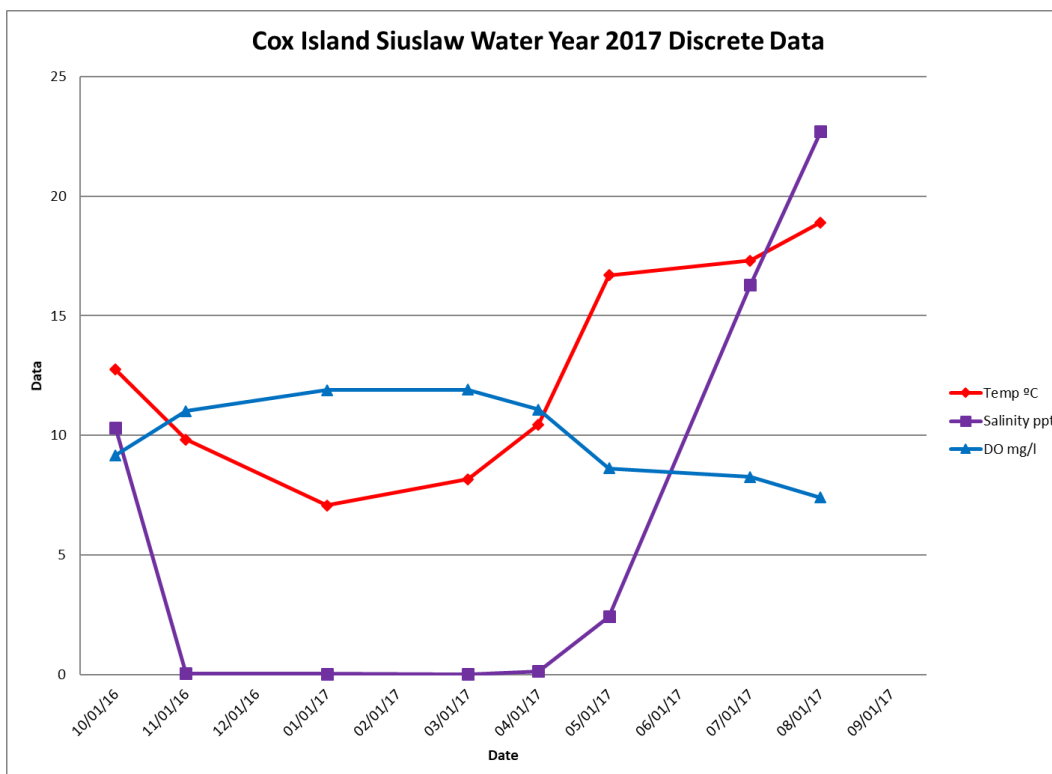
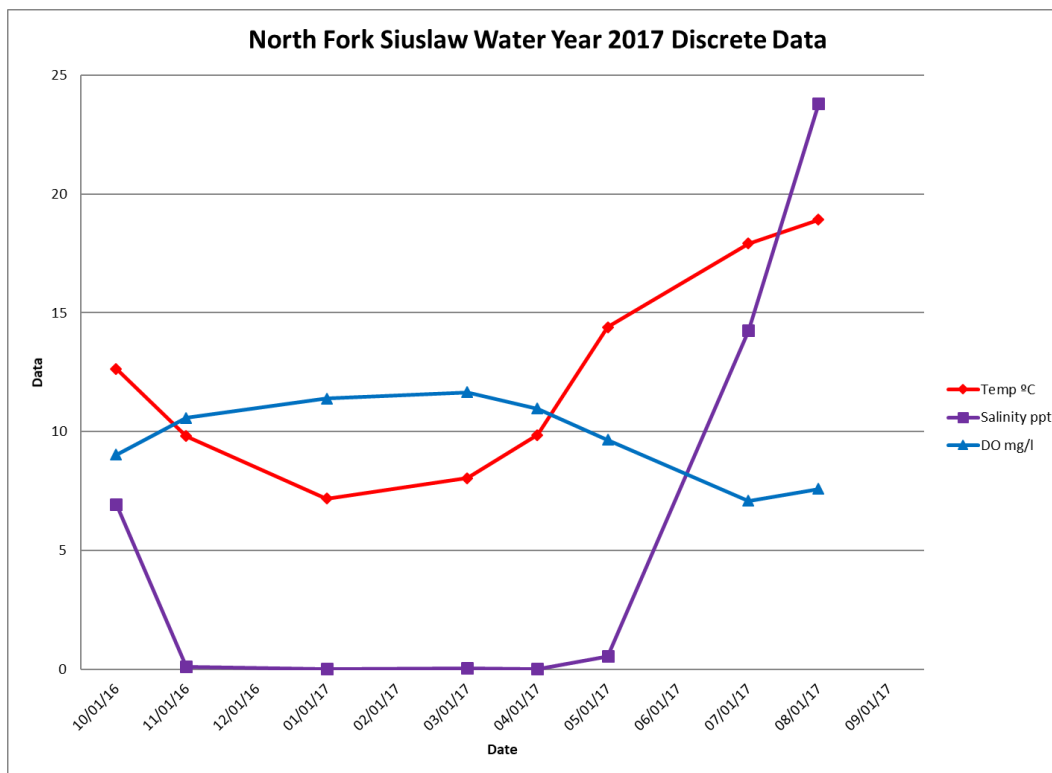


North Fork Siuslaw and Cox Island Sites – Lower Siuslaw Estuary:

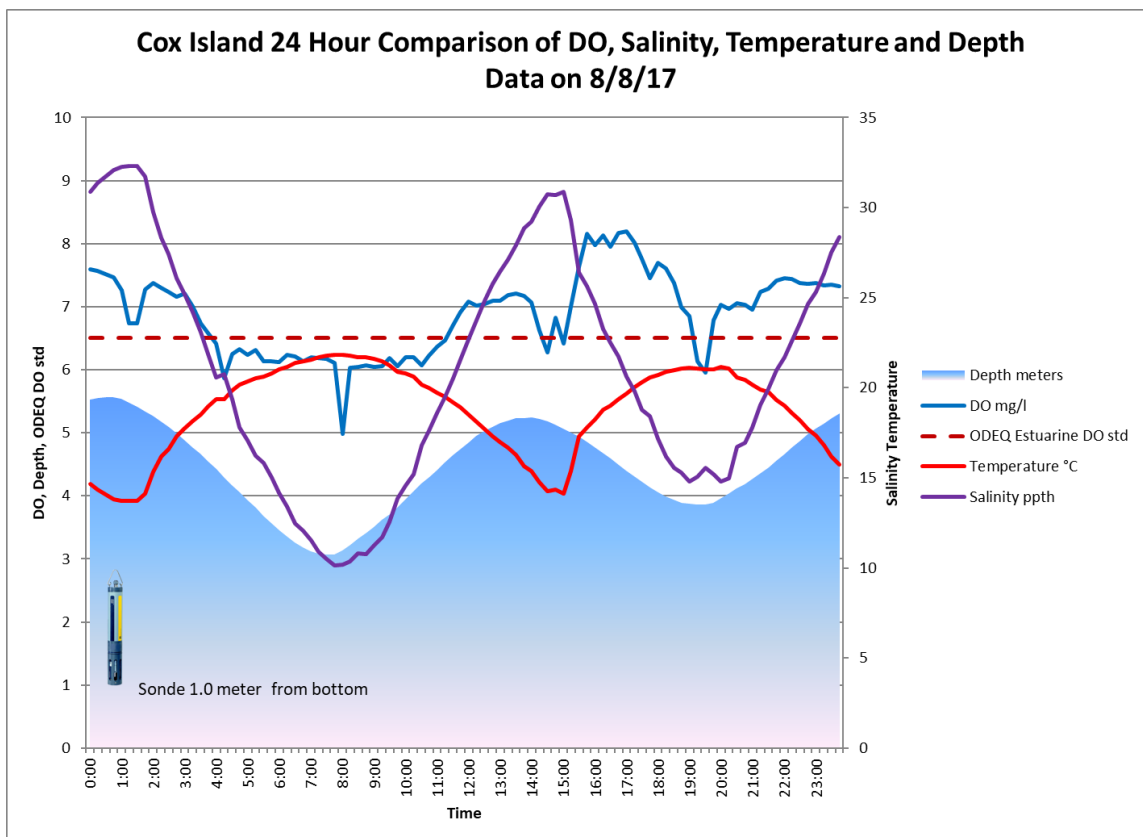
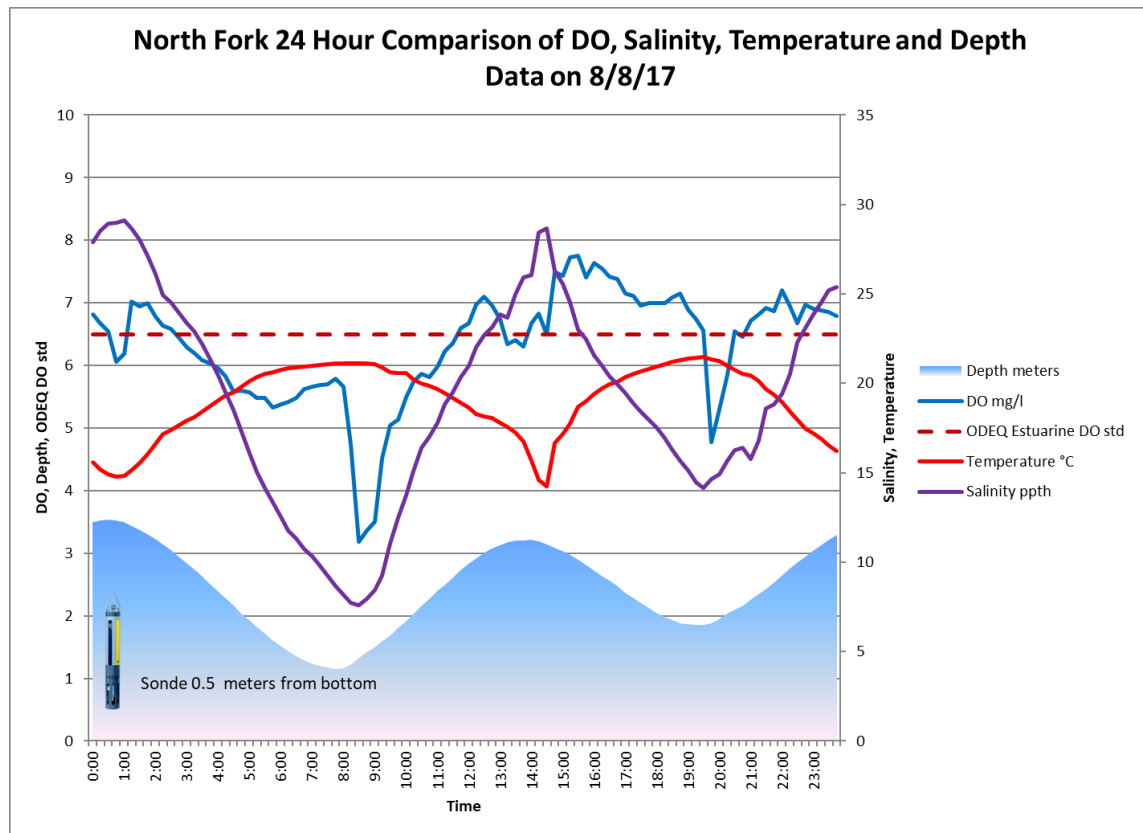
Analysis of historic continuous dissolved oxygen readings indicate that dissolved oxygen levels at the Siuslaw River estuary sites typically fail to meet the ODEQ estuarine dissolved oxygen criteria daily during the summer and early fall. This pattern has been observed since the Tribes began continuously monitoring water quality at these sites in 2006.



Discrete and continuous dissolved oxygen data collected by the Tribes' Integrated Water Quality Monitoring Program at the North Fork and Cox Island stations indicate that the concentration of dissolved oxygen at these sites consistently declines every year beginning in late spring/early summer through fall. The following charts display dissolved oxygen, temperature and salinity data collected by our program for Water Year 2017. These graphs show a relationship between increasing water temperature and declining dissolved oxygen levels.



The following charts show the tidal influence in the Siuslaw estuary on select water quality measurements over a 24 hour period on selected days in 2017. The influx of marine water during incoming tides is associated with decreasing temperatures and increases in salinity and dissolved oxygen.



C. Summary of the Extent of Waters that Meet Designated Uses or Tribal Goals

BENEFICIAL USES	MISERY CREEK	MAINSTEM SIUSLAW RIVER	NORTH FORK SIUSLAW RIVER	KENTUCK SLOUGH	COOS RIVER	SIXES RIVER	TENMILE LAKE
RESIDENT FISH AND AQUATIC LIFE	NOT ENOUGH DATA TO DETERMINE	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT ENOUGH DATA TO DETERMINE	NOT ENOUGH DATA TO DETERMINE	NOT FULLY SUPPORTED	STATUS PENDING
ANADROMOUS FISH PASSAGE	NOT ENOUGH DATA TO DETERMINE	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT ENOUGH DATA TO DETERMINE	SUPPORTED	NOT FULLY SUPPORTED	STATUS PENDING
SALMONID AND PETROMYZONTID FISH REARING	NOT ENOUGH DATA TO DETERMINE	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED		NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	STATUS PENDING
SALMONID AND PETROMYZONTID FISH SPAWNING	NOT ENOUGH DATA TO DETERMINE	N/A	N/A	N/A	N/A	NOT FULLY SUPPORTED	STATUS PENDING
WATER CONTACT RECREATION	N/A	NOT ENOUGH DATA TO DETERMINE	NOT ENOUGH DATA TO DETERMINE	NOT ENOUGH DATA TO DETERMINE	NOT ENOUGH DATA TO DETERMINE	NOT ENOUGH DATA TO DETERMINE	NOT FULLY SUPPORTED
SHELLFISH GROWING/SHELLFISH HARVESTING	N/A	NOT ENOUGH DATA TO DETERMINE	NOT ENOUGH DATA TO DETERMINE	N/A	NOT ENOUGH DATA TO DETERMINE	N/A	N/A
AESTHETICS/CEREMONIAL PURPOSES	NOT ENOUGH DATA TO DETERMINE	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED
TRADITIONAL/ CULTURAL USES	NOT ENOUGH DATA TO DETERMINE	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED	NOT FULLY SUPPORTED

D. Description of Why Waters are Potentially Not Meeting Designated Uses or Goals

North Fork Siuslaw

Temperature and Dissolved Oxygen – Resident Fish and Aquatic Life, Anadromous Fish Passage, & Salmonid and Petromyzontid Fish Spawning and Rearing

The North Fork Siuslaw River experienced prolonged high summer and early fall temperatures that exceeded the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C) (based on available trends) accompanied by regular minimum dissolved oxygen readings that do not meet the ODEQ Estuarine Standard of 6.5 mg/l. The riparian habitat upstream of the site is highly disturbed and lacking in shade producing canopy. The lack of shade provided in the upstream riparian corridor likely contributes to the high summer and early fall temperatures recorded at the North Fork Siuslaw Sonde site. Elevated temperature likely contributes to the low dissolved oxygen levels recorded at the site. Mechanisms for lower summer DO, related to increasing temperature, include lower mg/l at saturation, increasing salinity, lower turbulence and increased biological demands.

Nitrogen– Water Contact Recreation, Aesthetics/Ceremonial Purposes, & Traditional/Cultural Uses

The North Fork Siuslaw River experienced total nitrogen levels that exceeded the Tribes' adopted standard of > 200 ug/L for marine waters in summer and early fall. These high levels of nitrogen could be contributing to low dissolved oxygen levels that are observed during the summer and early fall as well as accelerated algae growth that could potentially affect water contact recreation, ceremonial purposes, and cultural uses if those particular algal species in question produced toxins that affected designated uses.

Cox Island

Temperature and Dissolved Oxygen – Resident Fish and Aquatic Life, Anadromous Fish Passage, & Salmonid and Petromyzontid Fish Spawning and Rearing

The Mainstem Siuslaw River experienced prolonged high summer and early fall temperatures that exceeded the ODEQ summer/early fall water temperature standard for salmon and trout rearing and migration (18°C) accompanied by decreasing dissolved oxygen readings that do not meet the ODEQ Estuarine Standard of 6.5 mg/l. The riparian at this site as well as up and downstream has been highly disturbed and lacks shade producing canopy. The lack of shade likely contributes to the high summer and early fall temperatures recorded at the Cox Island Sonde site. Elevated temperature likely contributes to the low dissolved oxygen levels recorded at the site. Mechanisms for lower summer DO, related to increasing temperature, include lower mg/l at saturation, increasing salinity, lower turbulence and increased biological demands.

North Tenmile Lake

Temperature– Resident Fish and Aquatic Life, Anadromous Fish Passage, & Salmonid and Petromyzontid Fish Spawning and Rearing

The Camp Easter Seals Dock site withstood high temperatures during most of the summer and early fall. Temperatures at times peaked at above lethal levels (25°C), which suggests that dissolved oxygen levels may not be adequate to support resident fish and aquatic or salmonid and petromyzontid fish spawning and rearing. More research is warranted.

Nutrients– Water Contact Recreation, Aesthetics/Ceremonial Purposes, & Traditional/Cultural Uses

North Tenmile Lake experienced high total phosphorus levels that exceeded the Tribes' adopted standard of >25 ug/L for lakes/reservoirs in addition to early fall total nitrogen levels that exceeded the Tribes' adopted standard of >750 ug/L for fresh waters. The Camp Easter Seals Dock site also did not meet the Tribes' adopted standard of >15 ug/L for lakes without thermal stratification for chlorophyll *a* during the early fall. These high levels of nutrients could be expediting eutrophication and contributing to low dissolved oxygen levels. High levels of nutrients have also been accelerating toxin producing algal blooms (*Microcystis Spp*), which has greatly impacted the Tribes' designated uses for this particular waterbody, especially water contact recreation, aesthetics/ceremonial purposes, and traditional/cultural uses.

Coos Bay

Temperature and Dissolved Oxygen – Resident Fish and Aquatic Life, Anadromous Fish Passage, & Salmonid and Petromyzontid Fish Spawning and Rearing

The Coos Bay Estuary bore relatively lower summer and early fall temperatures as compared to the Siuslaw River. Although minimum dissolved oxygen levels did dip below the ODEQ Estuarine Standard of 6.5 mg/l, these levels were not consistently low and are likely anomalies attributable to seasonal variability and/or localized site conditions.

Nitrogen– Water Contact Recreation, Aesthetics/Ceremonial Purposes, & Traditional/Cultural Uses

The Empire Docks site experienced high early fall total nitrogen levels that exceeded the Tribes' adopted standard of > 200 ug/L for marine waters. These high levels of nitrogen could be contributing to low dissolved oxygen levels that are observed during the summer and early fall. More research is warranted.

Sixes River

Temperature – Salmon and Trout Rearing and Migration

Historically, the Sixes River site has combated predictively high summer and early fall temperatures that peak at lethal levels (25°C). Although located in a completely different watershed, riparian conditions at this site are similar to those found upstream of the North Fork Siuslaw Sonde site discussed above. Lack of shade provided in the upstream riparian corridor likely contributes to the high summer and early fall temperatures recorded at the Tribes' Sixes River monitoring site, which suggests that dissolved oxygen levels may not be adequate to support resident fish and aquatic or salmonid and petromyzontid fish spawning and rearing. More research is warranted.

IV. Discussion of Issues of Tribal Concerns

Data Gaps

Dissolved Oxygen

In order to better understand the cause of low summer dissolved oxygen levels, the Tribes are planning to collect diel nutrient and Chlorophyll samples where plausible. The expected result of these sampling events is a better understanding of whether the summertime low dissolved oxygen levels are potentially associated with algae production that may be caused by nutrient loading.

Nutrients

A more robust nutrient and phytoplankton/harmful algal bloom monitoring program will need to be instituted to determine if nutrients are a contributing factor to HAB's resurgence in the last 3 years.

Conclusion

Data collected by our program in the 2017 water year appears to indicate that trends are occurring at our sites similar to those observed by our program in previous years. Daily impairments to water quality (e.g. temperature and dissolved oxygen) continue to occur during the Dry Season. Also, nutrients appear to be increasing dramatically compared to years passed.

V. Water Quality Data Submission

Water Quality data (discrete-grabs) for WY2017 has been formatted for submission. Continuous data will not be uploaded to WQX due to the size of data sets. The Tribes are currently working with ODEQ, however, on a template that will allow for continuous data submission in the future. The continuous data will be submitted to ODEQ as soon as the template is complete. The Tribes will provide the raw QC'd data by request. The discrete-grab data will be uploaded to WQX. Nutrient, Chlorophyll, and bacteria data for WY2017 will be uploaded via WQX by June 2018.