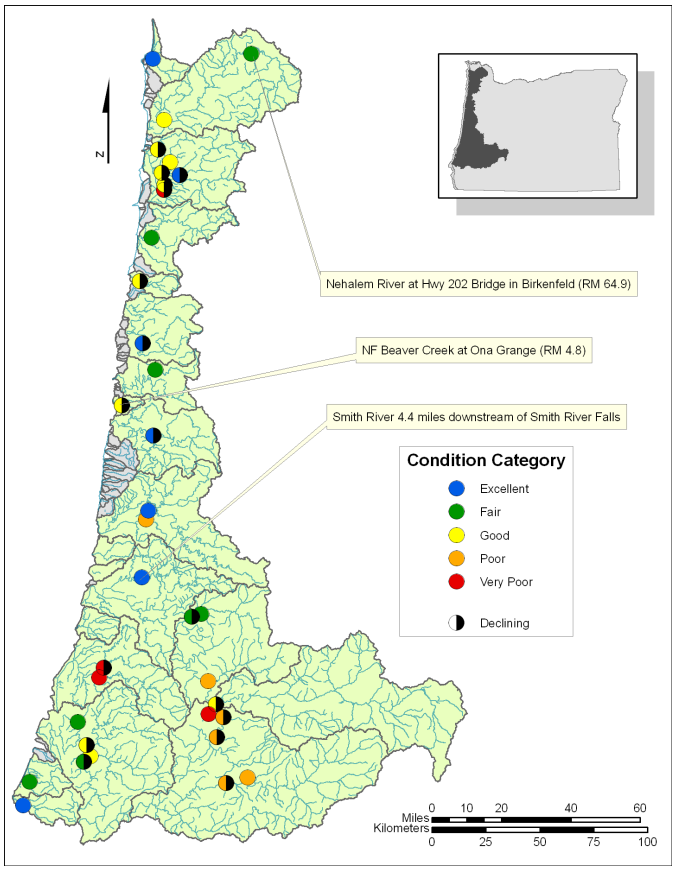
Water Quality Report: Ambient Monitoring Stations in the Oregon Coast Coho Evolutionarily Significant Unit for Water Years 1998-2007

Final Report for Oregon Watershed Enhancement Board Grant R036-06



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List of Abbreviations and Acronyms

ESU: Evolutionarily Significant Unit
ODEQ: Oregon Department of Environmental Quality
OWEB: Oregon Watershed Enhancement Board
OWQI: Oregon Water Quality Index
NC: North Coast Monitoring Area
MC: Mid Coast Monitoring Area
MS: Mid South Coast Monitoring Area
UM: Umpqua Coast Monitoring Area
BOD: Biochemical Oxygen Demand
DO: Dissolved Oxygen
mg/l: milligrams per liter
NTU: Nephelometric Turbidity Units
SU: Specific Units

Abstract

This report summarizes the water quality data collected at 35 ambient monitoring sites in the Oregon Coast Coho Evolutionarily Significant Unit (OCCESU) for the water years from 1998 to 2007. The Oregon Department of Environmental Quality (ODEQ) collected samples at ambient monitoring sites six times per year and analyzed them for 20 water quality parameters. ODEQ used the Oregon Water Quality Index (OWQI) to describe water quality conditions and trends. Seven of the 35 sites had excellent overall water quality, 10 had good water quality, 8 fair, 6 poor, and 4 very poor water quality. For the 34 sites with sufficient data for trending analysis, 17 sites had declining water quality trends, 13 had no significant trends and none had improving trends. Although the specific variables contributing to poor water quality and declining water quality trends varied among sites, high total solids, nitrogen enrichment and high biochemical oxygen demand were frequently the leading causes of impairment and declining trends.

ODEQ wrote a similar report in 2004 summarizing the water quality of the ambient monitoring stations in the OCCESU for water years 1993 to 2002. A comparison of the water quality between the two assessments indicates an overall pattern of decline in water quality, especially for sites with poorer water quality.

This report was partially funded by Oregon Watershed Enhancement Board grant R036-06.

Executive Summary

The Oregon Department of Environmental Quality monitored 35 flowing water sites in the Oregon Coast Coho Evolutionarily Significant Unit (ESU) for water years 1998 to 2007. Sites were sampled bi-monthly for about 20 water quality variables, including total solids, dissolved oxygen, biochemical oxygen demand (BOD), nitrogen and phosphorus nutrients, and fecal bacteria. The seasonal water quality condition and trend was assessed using the Oregon Water Quality Index (OWQI). The majority of stream sites (52%) assessed had at least moderate levels of water quality impairment and rated good to fair condition. Twenty percent of the sites are rated excellent water quality with minimal impairment. Twenty-seven percent of the sites were rated poor to very poor water quality condition with extensive impairment in a number of variables.

Although the individual variables causing water quality impairment vary between seasons, sites and monitoring areas within the ESU, there are some overall patterns in this water quality assessment. High total solids, high nitrogen, and high BOD were frequently the leading causes of impairment at many sites. Also, sites in mostly forested watersheds had better water quality than sites characterized agricultural land use and urban areas.

In general, water quality tended to be worse during the summer months and better during the fall, winter and spring, especially for sites with fair to very poor water quality conditions. Summer warmer water temperatures and decreased dissolved oxygen contributed to this pattern. Over the 10-year period form 1998 to 2007, 17 sites had declining overall water quality scores, 13 had no statistically significant trends, and 5 had insufficient data for trending. No sites had improving water quality trends. Variables responsible for these trends varied among sites and monitoring areas, although worsening trends in total solids, BOD and nitrogen were frequently responsible.

There was also a general trend in water quality from north to south with a greater proportion of poor to very poor water quality sites in the southern portion of the ESU than in the northern portion. This may be because of the greater number of sites in agricultural lands in the southern part of the ESU than in the northern part, and in the effect of occasional salt water on the OWQI scores at two tidally influenced Mid South Coast Monitoring Area sites. The OWQI is designed to assess flowing, freshwater streams, not salt water.

This assessment of the Coastal Coho ESU water quality of 1998-2007 data is an update of a similar assessment prepared in 2004 using data collected in 1993-2002. For the 31 sites in common between the two assessments, there appears to be a pattern of declining overall water quality, especially for the sites with poorer OWQI scores. In the 1993-2002 assessment six of the 31 sites rated poor to very poor water quality while ten out of 31 had poor to very poor scores in the 1998-2007 assessment. A similar number of sites rated excellent to good in both assessments. In comparing the scores of 17 sites with fair to very poor scores in the 1993-2002 assessment with their scores in the 1998-2007 assessment, ten had decreases in OWQI scores, 5 had increases, and 2 had no score change. The reason for this difference was not investigated in this report although we suspect larger, regional effects, such as differences in precipitation and stream flow between the two periods, rather than local effects, such as changes in point source and non-point source pollution, to be responsible.

Introduction

The purpose of this report is to assess the water quality conditions and trends of ambient monitoring stations in the OCCESU, and to contrast the current water quality at these sites with an earlier assessment prepared in 2004. This earlier assessment (ODEQ 2004) was prepared as part of the Oregon Plan for Salmon and Watersheds Oregon Coast Coho Assessment. The ODEQ maintains a network of more than 130 ambient water quality stations throughout the state with 34 stations in the OCCESU to assess long-term water quality conditions and trends (Figure 1). These stations are usually selected on larger flowing rivers and streams. Samples are collected six times per year for approximately 20 water quality parameters (see attached appendices).

ODEQ uses the Oregon Water Quality Index (OWQI) (Cude 2001) as a tool to describe and communicate water quality conditions in a consistent manner among streams, and to evaluate the water quality trends in 10 year blocks of data. Index scores are based on 100 total possible points with higher scoring sites corresponding to better water quality than lower scoring sites.

This report is an update of a 2004 (ODEQ 2004) report by ODEQ on OCCESU water quality ODEQ prepared as part of the Oregon Plan for Salmon and Watersheds Oregon Coast Coho Assessment (http://nrimp.dfw.state.or.us/OregonPlan/).

The Oregon Coast Coho ESU consists of the coastal salmon populations spawning from south of the mouth of the Columbia River to Cape Blanco. The ESU has been further divided into four monitoring areas and 21 Coho populations. Oregon Watershed Enhancement Board (OWEB) grant R036-06 enabled ODEQ to add three new ambient sites to the network in the ESU (Nehalem River at Highway 202 in Birkenfeld, North Fork Beaver Creek at Ona Grange, and Smith River 4.4 miles downstream of Smith River Falls). These new sites enables ODEQ to better describe the water quality at selected sites in the Coho populations. The three new sites were selected with the help of Jeff Rodgers of the Oregon Department of Fish and Wildlife. Here we report on the water quality of 34 monitoring stations in 18 of the 21 populations. Three populations (Siltcoos, Tahkenich and Tenmile) do not have monitoring stations. New sites funded by the OWEB grant are marked with stars in Figure 1.

In addition, the station on the Siuslaw River was moved from river mile 20.5 upstream to river mile 26.3 to avoid tidal influence. Two other tidally influenced stations (Millicoma River and South Fork Coos River) were considered for relocation but have not been moved at this time due to the difficulty of locating a suitable sampling location. The OWQI was designed to evaluate the quality of fresh water streams, not salt water. This tends to result in a lower water quality score for these tidal sites than is probably appropriate. Since we conduct trending analysis on ten year blocks of data the four new sites do not have sufficient data for trending analysis.

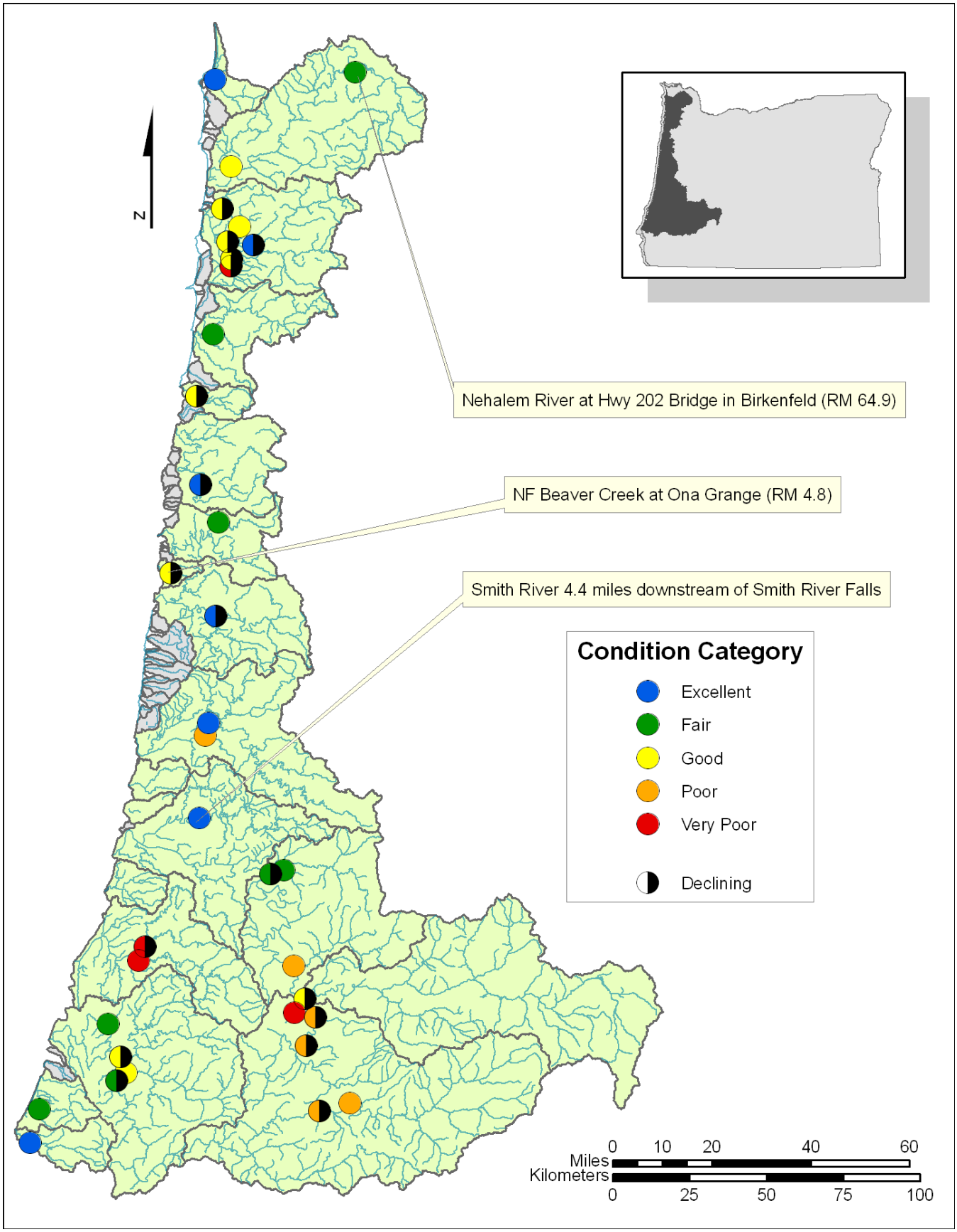

Figure 1. Map of the Oregon Coast Coho Evolutionarily Significant Unit with Monitoring Sites and Coho Populations

Background

The Oregon Water Quality Index (OWQI) uses a defined set of water quality variables to produce a single score describing general water quality for a stream location (Cude 2001). These variables are temperature, dissolved concentration (DO), dissolved oxygen percent of saturation (DO Sat), biochemical oxygen demand (BOD), pH, total solids, ammonia, nitrate, total phosphorus and fecal bacteria. The individual variables are transformed into a unit less sub index number on a 10 to 100 scale and then combined into an overall OWQI score. The OWQI scores range from 10 (worst case) to 100 (ideal water quality). The index was designed to take into account geological variability in pH and total solids. Seasonal water quality average scores were calculated for the summer months (June through September and fall-winter-spring season (October through May). The minimum of these two seasonal averages was used for site ranking. The OWQI provides a standardized assessment for streams across Oregon that is relatively easy to understand and compare. In addition, the Appendices have raw water quality data up to July 2008.

The OWQI results in this report were calculated from bimonthly water samples for the 10 year period from October 1, 1997 to September 30, 2007. These data were also analyzed to determine which variables limited general water quality. Sites with sufficient data were analyzed for significant increasing or decreasing water quality trends using the Seasonal Kendall test (Aroner 2001). New sites added (North Fork Beaver Creek, Nehalem River in Birkenfeld, and Smith River) or sites discontinued during this 10 year period (Siuslaw River at Mapleton) did not have sufficient data for ten-year trending analysis.

Although these monitoring stations may be typical of streams of the region, they are not a randomly selected, representative sub sample of all streams in a population or monitoring area. The water quality at one or a few, hand-selected sites in a population cannot be used as the assessment for an extensive network of many stream miles. These monitoring sites were often selected in order to better describe rivers with water quality problems. For example, the North Umpqua and South Umpqua basins are of similar size but have different numbers of monitoring stations. The North Umpqua basin with relatively good water quality has only one monitoring site while the South Umpqua basin, which has much more severe water quality problems, has five. Also, many of the variables measured, including temperature, dissolved oxygen and pH, can vary significantly over the course of a 24 hour period. This variability is not captured in the single grab sample data reported here.

The bacteria indicator used in the OWQI changed in 2002 from fecal coliform to *Escherichia coli* (*E. coli*) due to a corresponding change in the state water quality standard for bacteria to better evaluate the human health risk from water-borne pathogens. This shift in bacterial indicator presents a potential problem in the continuity of long term trending data sets collected at the ambient monitoring stations. Regression analysis of fecal coliform and *E. coli* data collected from across Oregon over a 4 year period indicated that either bacterial indicator could be used without creating a

discontinuity in the OWQI (Cude 2005) although caution should be used in interpreting results. Overall, it appears that *E. coli* may result in slightly higher bacterial sub index scores (better water quality assessment) than fecal coliform bacteria.

Sources of Water Quality Problems

Although degradation of water quality can have many causes, a common source is the introduction of excess organic matter to streams. As the amount of organic matter increases the biochemical oxygen demand (BOD) increases which decreases the dissolved oxygen available for aquatic life and affects the pH of the water. Untreated animal or human waste increases the risk of water-borne pathogens for swimmers. The enrichment of water with nitrogen and phosphorus nutrients results in the excessive growth of algae and aquatic plants, causing aesthetic, and water quality problems. Through photosynthesis during the day and cellular respiration at night excessive algae and aquatic plants can cause wide swings in pH and dissolved oxygen harmful to aquatic life. When this increased algal and plant growth dies and decomposes it adds BOD and nutrients to the water, further depleting dissolved oxygen. Nutrient sources include discharge from waste water treatment plants, faulty home septic systems, runoff from livestock and fertilized land, urban storm runoff and erosion. High water temperatures compound water quality problems by decreasing the ability of water to contain dissolved oxygen and stimulating plant and algae growth. Sensitive aquatic species such as salmon and trout require cold, well oxygenated water to live. Removal of shading stream-side vegetation and disturbing stream bank areas, among other factors, result in warm stream temperatures and increased erosion and sediment input into streams.

Trending Analysis

Temporal trending analysis was done on 10 year blocks of data to determine if a significant change had occurred in overall water quality OWQI score or in the variables that make up the OWQI using the Seasonal-Kendall trend analysis tool in WQHydro software (Aroner 2001). This analysis provides the magnitude and statistical significance of trends, and if the trend is increasing or decreasing. Trending information is reported for all variables and sub indices with trend significance of 80% or greater. Trends are reported for variables even if the sub index for that variable did not indicate a trend.

Water Quality Ranking

The OWQI scores in this report are the 10 year averages. Scores are averaged separately for summer months (June, July, and August) and fall-winter-spring (September, October, November, December, January, February, March, April, and May). Scores range from 10 for very poor water quality to 100 for ideal water quality. A five level classification scheme of OWQI scores describes general water quality: scores greater than 90 are considered excellent water quality, 89 -85 good, 84-80 fair, 79-60 poor, and less than 60 very poor.

Water Quality Assessments

Oregon Coast Coho ESU

For the 34 stations within the ESU, 21% were considered to have excellent water quality, 28% good, 24% fair, 15% poor and 12% very poor water quality minimal seasonal scores (Figure2). Overall for the ESU as a whole, total solids and BOD were the leading variables negatively impacting water quality. Thirty of the 34 sites had sufficient data for 10 year trending analysis. Seventeen sites had declining water quality trends and 13 sites had no significant trend. No sites had improving water quality trends. The following monitoring area sections provide more information on water quality issues at individual sites.

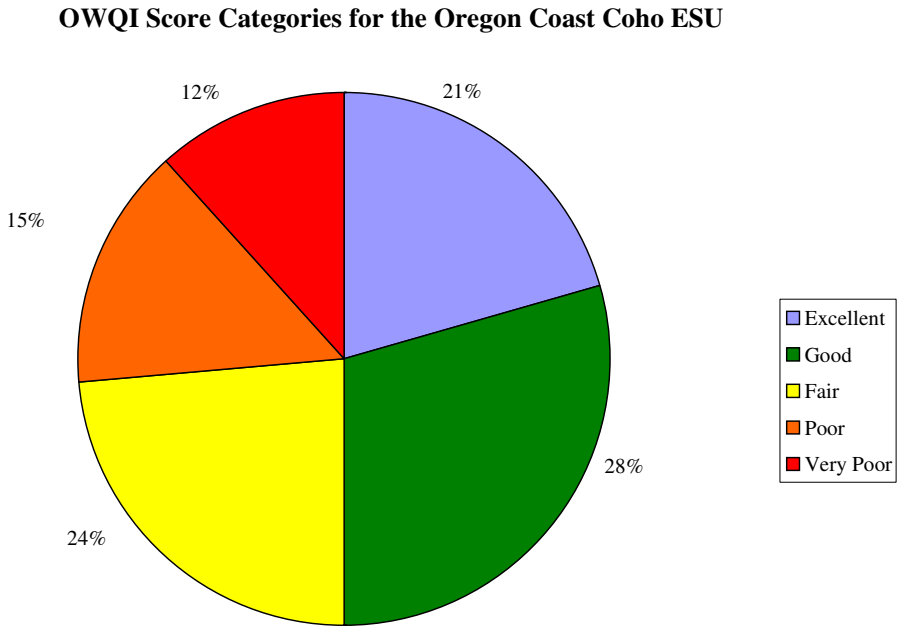

Figure 2. OWQI Scores for the Oregon Coast Coho ESU

North Coast Monitoring Area

The North Coast Monitoring Area extends from the Necanicum River in the north to the Neskowing Creek in the south. It includes the Necanicum, Nehalem, Tillamook and Nestucca Coho populations. All populations have at least one ambient monitoring station and the Nehalem has two stations. Figure 3 summarizes the minimum seasonal average OWQI scores for this monitoring area. Table 1 provides a summary of the seasonal mean OWQI averages, the water quality condition category and the 10-year trending information.

Two sites had excellent water quality, five had good water quality, two had fair water quality and one had very poor water quality

Figure 3. OWQI Minimum Seasonal Average Score Categories for North Coast Monitoring Area.

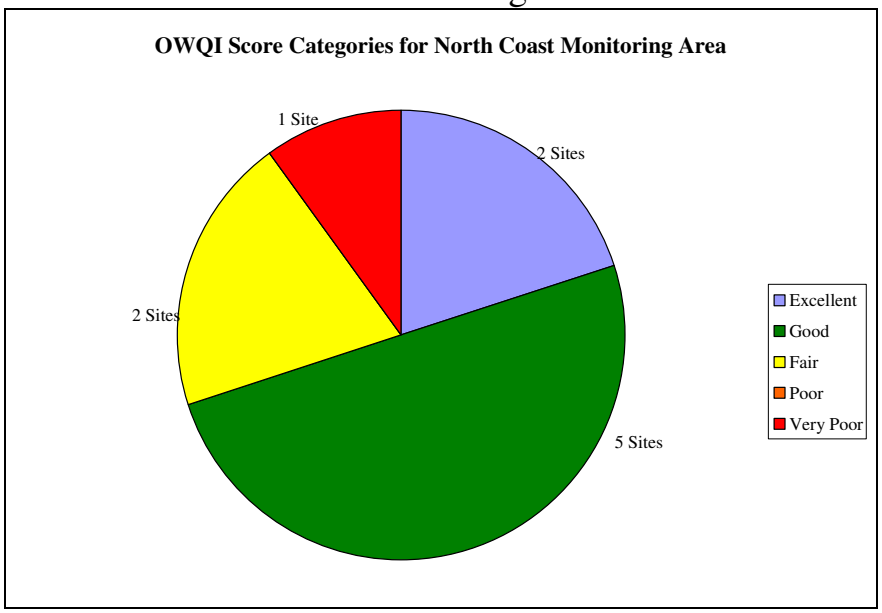

Table 1. North Coast Monitoring Area OWQI scores (WY 1998-2007).

Site	Coho Population	River Mile	LASAR Number	Summer Mean	FWS Mean	Minimum Seasonal Mean	2007 Category	10 Year Trend	Trend Size Significance
Necanicum River at Riverside Lake Camp	Necanicum	5.8	10521	90	91	90	Excellent	NT	
Wilson River at HWY 6	Tillamook	8.5	13424	91	90	90	Excellent	Declining	-3.3[1]
Nehalem River at Foley Road	Nehalem	7.8	11856	90	88	88	Good	NT	
Kilchis River at HWY 101	Tillamook	1	13416	87	89	87	Good	Declining	-2.0[3]
Miami River at Moss Creek Road	Tillamook	1.7	13411	87	87	87	Good	NT	
Trask River at HWY 101	Tillamook	4.2	13433	87	86	86	Good	Declining	-2.5[2]
Wilson River at HWY 101	Tillamook	1.8	13421	86	89	86	Good	Declining	-3.3[4]
Nestucca River at Cloverdale	Nestucca	1.7	10523	88	84	84	Fair	Declining	-3.3[2]
Nehalem River at HWY 202 Bridge in Birkenfeld	Nehalem		34019	83	91	83	Fair	N/A	

Tillamook River at Bewley Creek Road	Tillamook	6.8	13440	59	79	59	Very Poor	Declining	-1.3[4]

Summer: June to September; FWS (Fall, Winter, Spring): October to May
Scores- Very Poor 10-59, Poor: 60-79, Fair: 80-84, Good: 85-89, Excellent: 90-100
Notes: 1-Significance Level of Seasonal-Kendall trend analysis results equals to 99.
2-Significance Level of Seasonal-Kendall trend analysis results equals to 95.
3- Significance Level of Seasonal-Kendall trend analysis results equals to 90.
4- Significance Level of Seasonal-Kendall trend analysis results equals to 80.
NT= No significant 10 year trend
N/A=Not applicable, insufficient data for 10 year trending

The Necanicum River and Wilson River at Highway 6 sites had 'excellent' overall OWQI scores. These sites had only occasional moderate levels of impairment from nitrogen, BOD and total solids particularly during higher flow periods. Impairment from phosphorus and bacteria were rare. These sites are down stream of forested watersheds largely free of the point and non-point sources of pollutions.

Water trending for 'excellent' water quality scoring sites for the 1998-2007 10-year period summarized in Table 2 shows significant decreases in dissolved oxygen percent of saturation and increases in nitrate levels with corresponding decreases in the nitrogen sub index scores for both sites. Although there was a fairly strong significant decreasing trend for dissolved oxygen percent saturation there was no significant trend in the dissolved oxygen sub index. The overall OWQI score had a decreasing trend at the Wilson River at Hwy 6 site but not the Necanicum River site.

Table 2. Significant 10-year trends in OWQI variables for North Coast sites with 'Excellent' Water Quality for water years 1998-2007.

Necanucum River at Riverside Lake Camp

Variable	Magnitude	Significance Level
DO % Saturation	-7.2	100
DO Concentration	-0.9	99
Nitrate	0.1	94
Nitrogen Subindex score	-2.8	93

Wilson River at Hwy 6

Variable	Magnitude	Significance Level
DO % Saturation	-7.5	100
DO Concentration	-1.0	100
Nitrate	0.1	95
Nitrogen Subindex score	-3.8	94
OWQI	-3.3	100

The sites with 'good' overall OWQI scores were the Nehalem River at Foley Road, Kilchis River, Miami River, Trask River, and Wilson River at Highway 101. High nitrogen levels impaired these sites throughout the year, especially at the Kilchis, Miami, Trask and Wilson at Hwy 101 sites and to a lesser extent at the Nehalem at Foley Road site. Total Solids, BOD and bacteria were common occasional impairments, especially

during high stream flow periods. Impairment from warm temperature and phosphorus were also occasionally present at these sites.

Three of the five 'good' sites had fairly strong, significant trends for increased total solids: Nehalem River at Foley Road, Trask River and Wilson River (Table 3). All 'good' sites had small but increasing nitrate trends and decreasing dissolved oxygen trends, although dissolved oxygen did not show a corresponding trend in sub index score. The BOD concentration and subindex trends indicate an increasing BOD trend at Kilchis and Miami River sites. No significant trends in overall OWQI scores were found at the Nehalem River at Foley Road and Miami River at Moss Creek Road. Significant decreasing water quality trends in overall OWQI scores were found at the Wilson River at Hwy 1101, Trask River and Kilchis River sites.

Table 3. Significant 10-year trends in OWQI variables for North Coast sites with 'Good' Water Quality for water years 1998-2007.

Nehalem River at Foley Road

Variable	Magnitude	Significance Level
DO % Saturation	-8.1	100
DO Concentration	-1.0	100
Nitrate	0.1	98
Nitrogen Subindex score	-3.8	99
Total Solids	4.9	86
Total Solids Subindex score	-3.4	86

Kilchis River at Hwy 101

Variable	Magnitude	Significance Level
BOD	-0.4	89
BOD Subindex score	7.5	89
DO % Saturation	-10.0	100
DO Concentration	-1.0	100
Nitrate	0.3	100
Nitrogen Subindex score	-9.1	100
Temperature	-1.0	94
OWQI	-2.0	91

Miami River at Moss Creek Road

Variable	Magnitude	Significance Level
BOD	-0.4	94
BOD Subindex score	6.0	94
DO % Saturation	-10.1	100
DO Concentration	-0.7	100
Nitrate	0.1	99
Nitrogen Subindex score	-3.9	97
Temperature	-1.8	100

Table 3, continued. Significant 10-year trends in OWQI variables for North Coast sites with 'Good' Water Quality for water years 1998-2007.

Trask River at Hwy 101

Variable	Magnitude	Significance Level
DO Concentration	-0.8	89
Nitrate	0.2	99
Nitrogen Sub index score	-6.1	99
Total Solids	10.0	98
Total Solids Sub index score	-7.2	98
OWQI	-2.5	95

Wilson River at Hwy 101

Variable	Magnitude	Significance Level
DO % Saturation	-7.9	100
DO Concentration	-0.8	96
Nitrate	0.1	86
Nitrogen Sub index score	-4.2	84
Total Solids	9.9	99
Total Solids Sub index score	-6.7	99
OWQI	-3.3	86

The Nehalem River at Birkenfeld and Nestucca River at Cloverdale had 'fair' overall OWQI scores. Nitrate enrichment was the leading impairment at both sites throughout the year with BOD, total solids, dissolved oxygen, temperature, bacteria and phosphorus also indicating impairment.

Table 4 summarizes water quality trending for Nestucca River at Cloverdale, a site with for the 1998-2007 ten year period.(the Nehalem River at Birkenfeld had insufficient data for trending) Total solids and nitrogen have the largest increasing trend in concentration and decreasing trend in sub index score. DO percent saturation and water temperature show an increasing trends but without a corresponding significant trend in sub index scores for those variables.

Table 4. Significant 10-year trends in OWQI variables for North Coast sites with 'Fair' Water Quality for water years 1998-2007.

Nestucca River at Cloverdale

Variable	Magnitude	Significance Level
DO % Saturation	4.2	90
Nitrate	0.2	100
Nitrogen Subindex score	-6.9	100
pH	0.1	99
Temperature	2.0	90

Total Solids	11.9	99
Total Solids Subindex score	-8.3	99
OWQI	-3.3	95

One North Coast site had a 'Very Poor' overall OWQI score: Tillamook River at Bewley Creek Road. High nitrate levels were the leading impairment for this site, with bacteria, BOD, total solids and phosphorus also contributing to the poor water quality at this site.

Ten year trends for nitrogen, total solids and BOD at the Tillamook River at Bewley Creek Road all indicate a significant decline in water quality (Table 5). Dissolved oxygen concentration and temperature also show decreasing water quality trends for these variables but without a corresponding trend in sub index scores.

Table 5. Significant 10-year trends in OWQI variables for North Coast sites with 'Very Poor' Water Quality for water years 1998-2007.

Tillamook River at Bewley Creek Road

Variable	Magnitude	Significance Level
BOD	-0.3	86
BOD Subindex score	4.4	86
DO Concentration	-0.7	94
Nitrate	0.2	100
Nitrogen Subindex score	-6.5	100
Temperature	1.5	85
Total Solids	7.4	91
Total Solids Subindex score	-5.6	90
OWQI	-1.3	86

Mid Coast Monitoring Area

The Mid Coast Monitoring Area extends from the Salmon River basin in the north to the Siuskaw River basin to the south. It contains the Salmon, Siletz, Yaquina, Beaver Alsea and Siuslaw Coho salmon populations. Each salmon population has one ambient monitoring station. The monitoring station on the Siuslaw River was moved from river mile 20.5 at Mapleton upstream to river mile 26.3 at the Tide Wayside to avoid summer time salt water that comes upstream with incoming tides. The OWQI is designed to evaluate flowing freshwater, not salt water bodies. This tidal influence resulted in the site at Mapleton being graded more poorly than was actually warranted by the water quality of the river. The two Siuslaw sites do not have sufficient data for 10-year trending analysis. Of the six ambient stations in this Monitoring Area, 3 have seasonal minimum average OWQI scores in the excellent water quality range, two are good, one is fair, and one is poor. Three sites had declining water quality trends, one had no trends, and three have insufficient data for a 10-year trending analysis. Figure 4 and Table 6 summarize the OWQI average scores and trends.

Figure 4. OWQI Minimum Seasonal Average Score Categories for Mid Coast Monitoring Area.

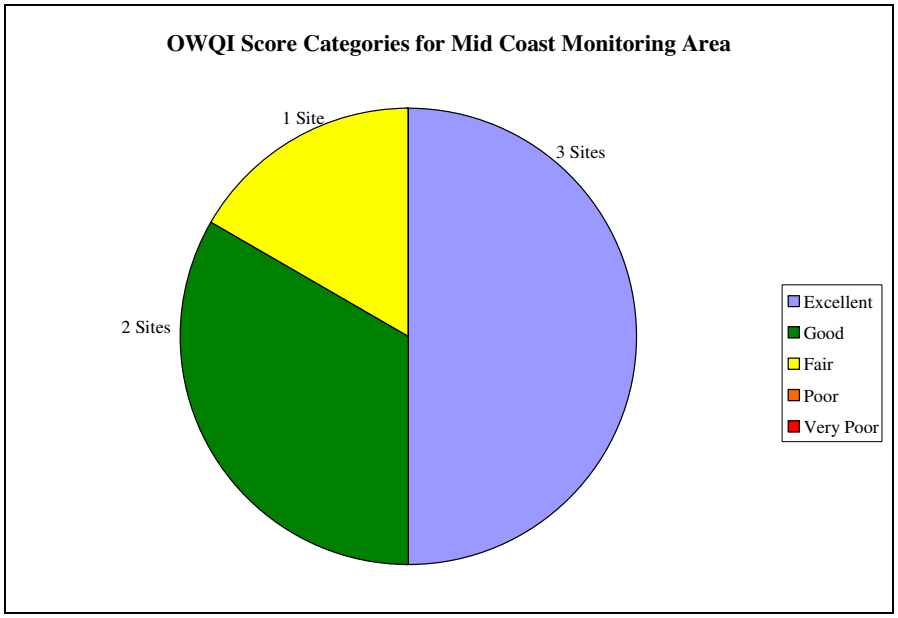

Table 6. Mid Coast Monitoring Area OWQI scores (WY 1998-2007).

Site	Coho Population	River Mile	LASAR Number	Summer Mean	FWS Mean	Minimum Seasonal Mean	2007 Category	10 Year Trend	Trend Size Significance
Siuslaw River at Tide Wayside	Siuslaw	26.3	33642	93	94	93	Excellent	N/A	
Alsea River at Thissell Road	Alsea	17.7	11263	91	91	91	Excellent	Declining	-1.7[3]
Siletz River 5 miles d/s Siletz	Siletz	30.9	10391	93	90	90	Excellent	Declining	-2.0[2]
Beaver Creek North Fork at Ona Grange RM 4.8	Beaver	4.8	33644	90	89	89	Good	N/A	
Salmon River at Otis	Salmon	2.8	11241	88	89	88	Good	Declining	-3.3[2]
Yaquina River downstream of Chitwood	Yaquina	24.9	11476	88	82	82	Fair	NT	
Siuslaw River at HWY 126 (Mapleton)	Siuslaw	20.5	10392	76	91	76	Poor	N/A	-

Summer: June to September; FWS (Fall, Winter, Spring): October to May
Scores- Very Poor 10-59, Poor: 60-79, Fair: 80-84, Good: 85-89, Excellent: 90-100
Notes: 1-Significance Level of Seasonal-Kendall trend analysis results equals to 99.
2-Significance Level of Seasonal-Kendall trend analysis results equals to 95.

3- Significance Level of Seasonal-Kendall trend analysis results equals to 90.
4- Significance Level of Seasonal-Kendall trend analysis results equals to 80.
NT= No significant 10 year trend
N/A=Not applicable, insufficient data for 10 year trending

Three Mid Coast Monitoring Area sites had excellent overall OWQI seasonal average scores but with statistically significant declining trend OWQI scores: Alsea River, and Siletz River and Siuslaw River at the Tide Wayside. The Alsea River site tended to have worse water quality during high flow periods of the fall, winter and spring with elevated levels of nitrogen. BOD and total solids also indicated impairment during higher flows and warm water temperatures during the summer.

The 10-year trends for the Alsea River site shows a small but statistically significant increase in nitrate levels with a corresponding change in the nitrogen sub index score. Dissolved oxygen percent of saturation also had a declining trend (Table 7).

Water quality impairment at the Siletz site was similar to those of the Alsea River site with nitrogen much higher during higher flow periods, along with higher BOD and total solids. Warmer water temperatures were a problem during the summer months.

The 10 year water quality trending for the Siletz site presented in Table 7 shows a statistically significant increase in BOD but not nitrogen. Dissolved oxygen percent of saturation and pH also showed trends but not the corresponding sub index scores for those parameters.

Although the length of the data record at the Siuslaw River at Tide Wayside is shorter than at the other sites, it also shows a similar pattern of impairment with nitrogen and total solids during the higher flow periods and dissolved oxygen and warm water temperature during the summer.

Table 7. Significant 10-year trends in OWQI variables for Mid Coast Monitoring Area sites with Excellent Water Quality for water years 1998-2007.

Alsea River at Thissell Road

Variable	Magnitude	Significance
Dissolved Oxygen % Saturation	-3.3	99
Nitrate	0.0	90
Nitrogen Subindex score	-2.6	84
OWQI	-1.7	93

Siletz River 5 miles down stream of Siletz

Variable	Magnitude	Significance
BOD	0.3	88
BOD Subindex score	-5.4	88
Dissolved Oxygen % Saturation	-1.7	91
pH	0.1	94
OWQI	-2.0	96

Two Mid Coast Monitoring Area sites have good overall OWQI scores: North Fork Beaver Creek and the Salmon River sites. Source water quality impairment at the Salmon River site are high levels of nitrogen during the high flow periods with

impairment from high total solids and BOD intermittently during the year. Dissolved oxygen, temperature, phosphorus and fecal bacteria problems tended to be rare.

The 10-year water quality trend for the Salmon River summarized in Table 8 site shows a statistically significant increasing trend for total solids concentration and sub index score. Temperature also showed an increasing trend.

Although the data record for the North Fork Beaver Creek site is fairly short, it shows a year-round impairment from high nitrogen, especially during higher stream flow periods. Total solids and fecal bacteria were also sources of impairment through out the year.

Table 8. Significant 10-year trends in OWQI variables for Mid Coast Monitoring Area sites with 'Good' Water Quality for water years 1998-2007.

Salmon River at Otis

Variable	Magnitude	Significance
Total Solids Subindex score	-7.2	85
Total Solids	10.0	85
Temperature	1.7	89
OWQI	-3.3	96

One Mid Coast Monitoring Area site had fair overall OWQI scores: Yaquina River down stream of Chitwood. High nitrogen level, especially during high flow periods, was the leading source of impairment measured, followed by total solids and BOD. Warm water temperature, phosphorus and fecal bacteria were also sources of impairment. Total solids and dissolved oxygen were variables with worsening 10-year trends (Table 9).

Table 9. Significant 10-year trends in OWQI variables for Mid Coast sites with 'Fair' Water Quality for water years 1998-2007.

Yaquina River downstream of Chitwood

Variable	Magnitude	Significance
Total Solids Subindex score	-6.8	94
Total Solids	9.9	94
Dissolved Oxygen Concentration	-0.5	94
Dissolved Oxygen % Saturation	-4.5	100

The Siuslaw River at Mapleton site had poor overall OWQI scores. This site occasionally had very high total solids from tidal salt water, along with impairment from high nitrogen, warm water temperatures and low dissolved oxygen. These water quality problems were felt to be due in part to the occasional presence of salt water at this site. The OWQI is designed to evaluate and compare fresh water streams. The Siuslaw River site at Mapleton site was discontinued in July 2006 and relocated 5.8 river miles upstream to the Tide Wayside. The Siuslaw River at Tide Wayside site has excellent overall OWQI scores.

Umpqua Monitoring Area

The Umpqua drainage basin comprises the Umpqua monitoring area. The Lower Umpqua, Middle Umpqua North Umpqua and South Umpqua populations make up this monitoring area. A new monitoring station, Smith River 4.4 miles down stream of Smith River Falls, was recently added in the Lower Umpqua Population.

Figure 4 and Table 10 present the condition and trending information for the Umpqua Monitoring Area. One site was rated by the OWQI as having excellent water quality, one site good, and two sites fair water quality. Five of the sites monitored in the Umpqua Monitoring area rated poor water quality and one site rated very poor. Four sites had declining overall trends in OWQI scores for the 1998-2007 period.

Figure 4. OWQI Minimum Seasonal Average Score Categories for Umpqua Monitoring Area.

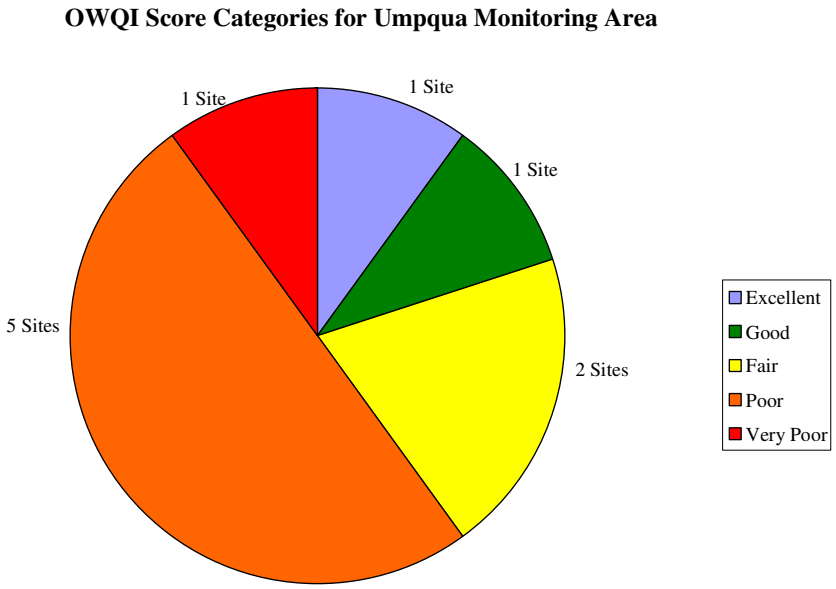

Table 10. Umpqua Monitoring Area OWQI scores (WY 1998-2007).

Site	Coho Population	River Mile	LASAR Number	Summer Mean	FWS Mean	Minimum Seasonal Mean	2007 Category	10 Year Trend	Trend Size Significance
Smith River 4.4 Miles d/s Smith River Falls	Lower Umpqua	24.5	11491	91	92	91	Excellent	N/A	
North Umpqua River at Garden Valley Road	North Umpqua	1.8	10451	88	91	88	Good	Declining	-2.0[3]

Table 10, continued. Umpqua Monitoring Area OWQI scores (WY 1998-2007).

Site	Coho Population	River Mile	LASAR Number	Summer Mean	FWS Mean	Minimum Seasonal Mean	2007 Category	10 Year Trend	Trend Size Significance
Umpqua River at Elkton	Middle Umpqua	48.4	10437	84	89	84	Fair	Declining	-2.5[4]
Elk Creek at Elkton	Middle Umpqua	0.2	10441	80	88	80	Fair	NT	
Calapooya Creek at Umpqua	Middle Umpqua	0.4	10996	78	81	78	Poor	NT	
Cow Creek at Mouth (Riddle)	South Umpqua	0.3	10997	75	90	75	Poor	NT	
South Umpqua River at Days Creek Cutoff Road	South Umpqua	55.5	11484	74	92	74	Poor	NT	
South Umpqua River at HWY 42 (Winston)	South Umpqua	21.2	10443	73	91	73	Poor	Declining	-2.0[4]
South Umpqua River at Stewart Park Road (Roseburg)	South Umpqua	10.7	11522	72	86	72	Poor	Declining	-5.0[2]
South Umpqua River at Melrose Road	South Umpqua	5.1	10442	53	86	53	Very Poor	NT	

Summer: June to September; FWS (Fall, Winter, Spring): October to May
Scores- Very Poor 10-59, Poor: 60-79, Fair: 80-84, Good: 85-89, Excellent: 90-100
Notes: 1-Significance Level of Seasonal-Kendall trend analysis results equals to 99.
2-Significance Level of Seasonal-Kendall trend analysis results equals to 95.
3- Significance Level of Seasonal-Kendall trend analysis results equals to 90.
4- Significance Level of Seasonal-Kendall trend analysis results equals to 80.
NT= No significant 10 year trend
N/A=Not applicable, insufficient data for 10 year trending

One site in the Umpqua Monitoring Area, Smith River 4.4 miles down stream of Smith River Falls, had excellent overall OWQI scores with only moderate impairment from high BOD and total solids. There was insufficient data for this site for 10-year trending.

The site at the North Umpqua River at Garden Valley Road was the one site with good overall water quality in the Umpqua Monitoring Area. The overall leading stressor at this site was high BOD with total solids, warm water temperatures and total phosphorus also occasional stressors. The 10-year trends for this site indicate increases in total solids and decreases in dissolved oxygen with an increase in temperature (Table 11).

able 11. Significant 10-year trends in OWQI variables for Umpqua Monitoring Area sites with 'Good' Water Quality for water years 1998-2007.

North Umpqua River at Garden Valley Road

Variable	Magnitude	Significance
Total Solids	10.0	100
Total Solids Subindex Score	-4.9	100
Dissolved Oxygen Concentration	-0.7	100
Dissolved Oxygen Percent of Saturation	-2.0	83
pH	0.2	94
Temperature	1.6	97
OWQI	-2.0	94

The Umpqua River at Elkton and Elk Creek at Elkton had fair overall OWQI average scores. Total solids and BOD are leading stressors at these sites with other stressors occasional but regular problems. The overall OWQI 10-year trend is of decreasing at the Umpqua River site and there is no trend at Elk Creek (Table 12). The variables responsible for this decreasing trend are increasing trends in the total solids and BOD and temperature with a decreasing trend in dissolved oxygen. Although there was no significant overall trend in OWQI score at the Elk Creek site, some of the variables making up the index score did. Total solids and temperature showed increasing trends while dissolved oxygen showed a decreasing trend.

Table 12. Significant 10-year trends in OWQI variables for Umpqua Monitoring Area sites with 'Fair' Water Quality for water years 1998-2007.

Umpqua River at Elkton

Variable	Magnitude	Significance
Total Solids	6.3	81
Total Solids Subindex Score	-2.8	81
BOD	-0.3	94
BOD Subindex Score	5.8	94
Dissolved Oxygen Concentration	-0.8	100
Dissolved Oxygen Percent of Saturation	-3.3	98
Temperature	1.6	98
OWQI	-2.5	87

Elk Creek at Elkton

Variable	Magnitude	Significance
Total Solids	3.3	84
Total Solids Subindex Score	-1.4	84
Dissolved Oxygen Concentration	-0.5	93
Dissolved Oxygen Percent of Saturation	-5.0	93
Temperature	1.8	92

Four of the South Umpqua Monitoring Area sites had poor overall OWQI scores: Calapooya Creek at Umpqua, Cow Creek at Mouth (Riddle), South Umpqua River at Days Creek Cutoff Road, and South Umpqua River at HWY 42 (Winston). Elevated total solids were the leading stressor at all these sites.

The Calipooya Creek site also had significant impairment BOD with temperature bacteria and phosphorus lesser but significant sources of impairment. Low dissolved oxygen was also a sever source of impairment at the Cow Creek site with high BOD, pH problems and warm water temperatures occasional sources of impairment.

Besides total solids, temperature, BOD, bacteria, pH, and dissolved oxygen were occasional stressors at the South Umpqua at Days Creek Cutoff Road and South Umpqua at Highway 42 in Winston sites. South Umpqua at Stewart Park in Roseburg had significant impairment form total solids, BOD, and warm water temperature, with occasional problems with pH, phosphorus, and fecal bacteria.

All the poor water quality sites had similar 10-year trends for the variables making up the OWQI (Table 13). All had significantly worsening levels of total solids and dissolved oxygen. Calipooya Creek also had an increasing trend for nitrate.

Table 13. Significant 10-year trends in OWQI variables for Umpqua Monitoring Area sites with 'Poor' Water Quality for water years 1998-2007.

Calapooya Creek at Umpqua

Variable	Magnitude	Significance
Total Solids	16.5	93
Total Solids Subindex Score	-6.6	93
Nitrate	0.2	100
Nitrogen Subindex Score	-6.6	100
Dissolved Oxygen Concentration	-0.7	99
Dissolved Oxygen Percent of Saturation	-5.8	93

Cow Creek at Mouth

Variable	Magnitude	Significance
Total Solids	11.4	96
Total Solids Subindex Score	-5.4	96
Dissolved Oxygen Concentration	-1.0	100
Dissolved Oxygen Percent of Saturation	-8.0	100

South Umpqua River at Days Creek Cutoff Road

Variable	Magnitude	Significance
Total Solids	18.0	99
Total Solids Subindex Score	-8.1	99
Dissolved Oxygen Concentration	-0.8	99
Dissolved Oxygen Percent of Saturation	-9.7	100

South Umpqua River at Hwy 42 (Winston)

Variable	Magnitude	Significance
Total Solids	9.1	82
Total Solids Subindex Score	-4.0	82
Dissolved Oxygen Concentration	-1.0	100
Dissolved Oxygen Percent of Saturation	-6.1	100
Temperature	1.4	91
OWQI	-2.0	83

South Umpqua River at Stewart Park Road (Roseburg)

Variable	Magnitude	Significance
Total Solids	20.1	100
Total Solids Subindex Score	-8.7	100
Dissolved Oxygen Concentration	-0.8	98
Dissolved Oxygen Percent of Saturation	-3.3	97
pH	0.2	82
Temperature	1.3	96
OWQI	-5.0	98

The site at the South Umpqua River at Melrose Road received a very poor OWQI. Total solids, BOD, and phosphorus are severe sources of impairment with warm water temperature, low dissolved oxygen and pH problems also causing water quality problems. This site has a significant declining water quality 10-year trend for total solids and nitrate, with declining trends for dissolved oxygen and temperature (Table 14).

Table 14. Significant 10-year trends in OWQI variables for Umpqua Monitoring Area sites with 'Very Poor' Water Quality for water years 1998-2007.

South Umpqua River at Melrose Road

Variable	Magnitude	Significance
Total Solids	13.3	92
Total Solids Subindex Score	-5.6	92
Nitrate	0.0	93
Nitrogen Subindex Score	-2.3	95
Dissolved Oxygen Concentration	-0.7	97
Temperature	1.4	97

Mid South Coast Monitoring Area

The Mid South coast Monitoring Area includes the three, smaller lake-dominated Coho populations of Siltcoos, Takenitch and Tenmile; and the Coos, Coquille, Floras and Sixes populations. The three lake-dominated populations are mostly comprised of many smaller tributaries and not larger rivers and streams that are typically selected for long-term trend monitoring. These populations do not have ambient monitoring stations. The Sixes and Floras populations each have one monitoring station, the Coos has two and the Coquille has four monitoring stations.

One site had excellent overall water quality. Two sites had good water quality, three had fair and tow had very poor overall water quality(see Figure 5 and Table 15). Generally, high levels of total solids were the single greatest source of water quality was the most significant impairment measured at all of the Mid South Coast Monitoring Area sites with high nitrogen and BOD also significant at most of the sites. Half of the sites monitored had declining overall water quality trends for 1998 to 2007.

Figure 5. OWQI Minimum Seasonal Average Score Categories for Mid-South Coast Monitoring Area.

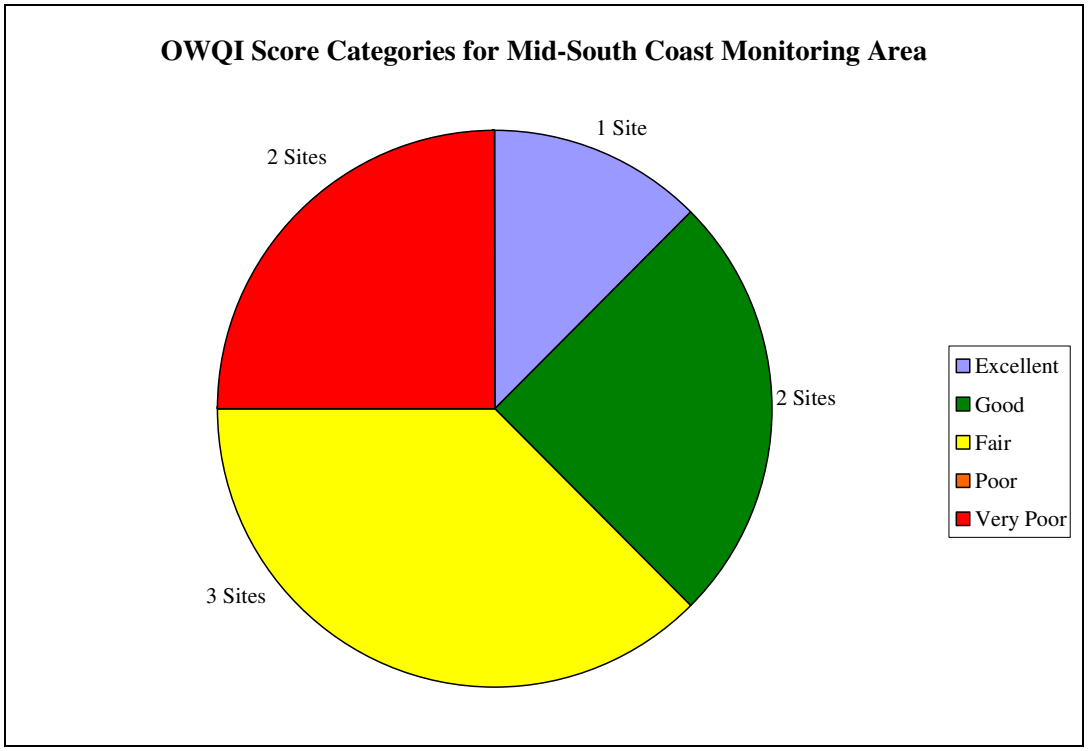

Table 15. Mid-South Coast Monitoring Area OWQI scores (WY 1998-2007).

Site	Coho Population	River Mile	LASAR Number	Summer Mean	FWS Mean	Minimum Seasonal Mean	2007 Category	10 Year Trend	Trend Size Significance
Sixes River at HWY 101	Sixes	5.5	10533	91	90	90	Excellent	NT	
Middle Fork Coquille River at HWY 42	Coquille	0.2	11485	88	87	87	Good	Declining	-3.4[3]
North Fork Coquille River at HWY 42	Coquille	0.2	10393	88	87	87	Good	Declining	-2.5[4]
Floras Creek at HWY 101	Floras	4.1	12590	86	84	84	Fair	NT	
South Fork Coquille River at Broadbent	Coquille	10	11486	83	89	83	Fair	Declining	-3.3[1]
Coquille River at Sturdivant Park Dock	Coquille	24.5	10596	82	84	82	Fair	Declining	-4.0[2]
Millicoma River at Rooke Higgins Boat Ramp	Coos	3.6	13570	52	89	52	Very Poor	NT	
South Fork Coos River at Anson Rogers Bridge	Coos	2.5	13574	38	86	38	Very Poor	NT	

Summer: June to September; FWS (Fall, Winter, Spring): October to May
Scores- Very Poor 10-59, Poor: 60-79, Fair: 80-84, Good: 85-89, Excellent: 90-100
Notes: 1-Significance Level of Seasonal-Kendall trend analysis results equals to 99.
2-Significance Level of Seasonal-Kendall trend analysis results equals to 95.
3- Significance Level of Seasonal-Kendall trend analysis results equals to 90.
4- Significance Level of Seasonal-Kendall trend analysis results equals to 80.
NT= No significant 10 year trend
N/A=Not applicable, insufficient data for 10 year trending

The Sixes River site at highway 101 has overall excellent OWQI scores with only moderate impairment for high total solids with occasional high nitrogen and warm water temperatures. There was no significant 10-year trend in the OWQI scores or most of the index variables except for a declining trend in dissolved oxygen (Table 16).

Table 16. Significant 10-year trends in OWQI variables for Mid South Coast sites with 'Excellent' Water Quality for water years 1998-2007.

Sixes at Hwy 101

Variable	Magnitude	Significance
Dissolved Oxygen Concentration	-0.5	99
Dissolved Oxygen Percent of Saturation	-5.0	98

Both the Middle Fork and North Forks of the Coquille River sites had OWQI scores in the good water quality range. They both showed significant impairment for high total solids with high nitrogen also a source of impairment, especially at the North Fork Coquille site. Other variables that were occasional sources of impairment high BOD, and phosphorus. Both sites had declining overall OWQI trends with total solids and BOD at the Middle Fork site (Table 18).

Table 18. Significant 10-year trends in OWQI variables for Mid South Coast sites with 'Good' Water Quality for water years 1998-2007.

Middle Fork Coquille River at Hwy 42

Variable	Magnitude	Significance
Total Solids	14.9	100
Total Solids Subindex	-9.9	100
Dissolved Oxygen Concentration	-1.2	100
Dissolved Oxygen Percent of Saturation	-7.2	100
BOD	-0.3	95
BOD Subindex	5.7	95
OWQI	-3.4	94

North Fork Coquille at Hwy 42

Variable	Magnitude	Significance
Dissolved Oxygen Concentration	-0.6	99
Dissolved Oxygen Percent of Saturation	-4.0	98
Bacteria Subindex	-0.6	86
OWQI	-2.5	83

Three Mid South Coast sites rated fair overall OWQI scores: Floras Creek, South Fork Coquille River and main stem Coquille River. The most significant sources of impairment at the Floras were high levels of total solids and nitrogen with occasionally high BOD a problem. At the South Fork Coquille site high total solids, BOD and warm water temperatures were sources of impairment. High nitrogen levels were not a source of impairment at this site. High total solids was the leading source of impairment at the main stem Coquille River monitoring site with high BOD, nutrients, and bacteria also contributing to impairment.

The 10-year trend in water quality at the three sites rated fair shows no overall trend at the Floras Creek site with declining overall trends at the South Fork and main stem Coquille River sites. Dissolved oxygen concentration and percent saturation showed declining trends at all the sites with the dissolved oxygen sub index score also showing a declining trend at the main stem Coquille River site (Table 19). Total solids at the south Fork Coquille River site also showed an increasing trend.

Table 19. Significant 10-year trends in OWQI variables for Mid South Coast sites with 'Fair' Water Quality for water years 1998-2007.

Floras Creek at Hwy 101

Variable	Magnitude	Significance
Dissolved Oxygen Concentration	-0.8	100
Dissolved Oxygen Percent of Saturation	-5.0	100

South Fork Coquille River at Broadbent

Variable	Magnitude	Significance
Total Solids	12.9	99
Total Solids Subindex	-8.4	99
Dissolved Oxygen Concentration	-0.7	97
Dissolved Oxygen Percent of Saturation	-5.0	98
OWQI	-3.3	99

Coquille River at Sturdivant Park

Variable	Magnitude	Significance
Dissolved Oxygen Concentration	-1.0	100
Dissolved Oxygen Percent of Saturation	-5.0	100
Dissolved Oxygen Subindex	-1.2	98
OWQI	-4.0	97

Very poor water quality rated sites in the Mid South Coast Monitoring Area were the Millicoma River and South Fork Coos River sites. The Millicoma site was characterized by high total solids, nitrogen and BOD with problems with low dissolved oxygen and high temperature during the summer months. The South Fork Coos River site also had high total solids with high BOD and temperature also significant sources of impairment. Both of these sites salt water during the low flow summer months leading to extremely high total solids and conductivity, leading to lower OWQI scores.

Neither of these sites had significant overall OWQI 10-year trends. Dissolved oxygen showed a slight decreasing trend at the Millicoma River site while temperature showed a slight increasing trend at the South Fork Coos River site (Table 20).

Table 20. Significant 10-year trends in OWQI variables for Mid South Coast sites with 'Very Poor' Water Quality for water years 1998-2007.

Milliccoma River at Rooke Higgins Boat Ramp

Variable	Magnitude	Significance
Dissolved Oxygen Concentration	-0.7	98
Temperature	1.5	94

South Fork Coos River at Anson Rogers Bridge

Variable	Magnitude	Significance
Temperature	1.0	82

Comparison of the 1993-2002 and 1998-2007 Assessments

This assessment of the Coastal Coho ESU water quality of 1998-2007 data is an update of a similar assessment prepared in 2004 using data collected in 1993-2002 (ODEQ 2004). The OWQI scores and trends for these two time periods are summarized and compared in Figure 6 and Table 21.

For the 31 sites in common between the two assessments, there appears to be a pattern of declining overall water quality, especially for the sites with poorer OWQI scores. In the 1993-2002 assessment six of the 31 sites rated poor to very poor water quality while ten out of 31 had poor to very poor scores in the 1998-2007 assessment. A similar number of sites rated excellent to good in both assessments. In comparing the scores of 17 sites with fair to very poor scores in the 1993-2002 assessment with their scores in the 1998-2007 assessment, ten had decreases in OWQI scores, five had increases, and two had no score change. The reason for this difference was not investigated in this report although we suspect larger, regional effects, such as differences in precipitation and stream flow between the two periods, rather than local effects, such as changes in point source and non-point source pollution, may be responsible.

Figure 6. Comparison of 2007 and 2002 OWQI Water Quality Scores and Condition Categories. Scores are 10-year seasonal average minimums.

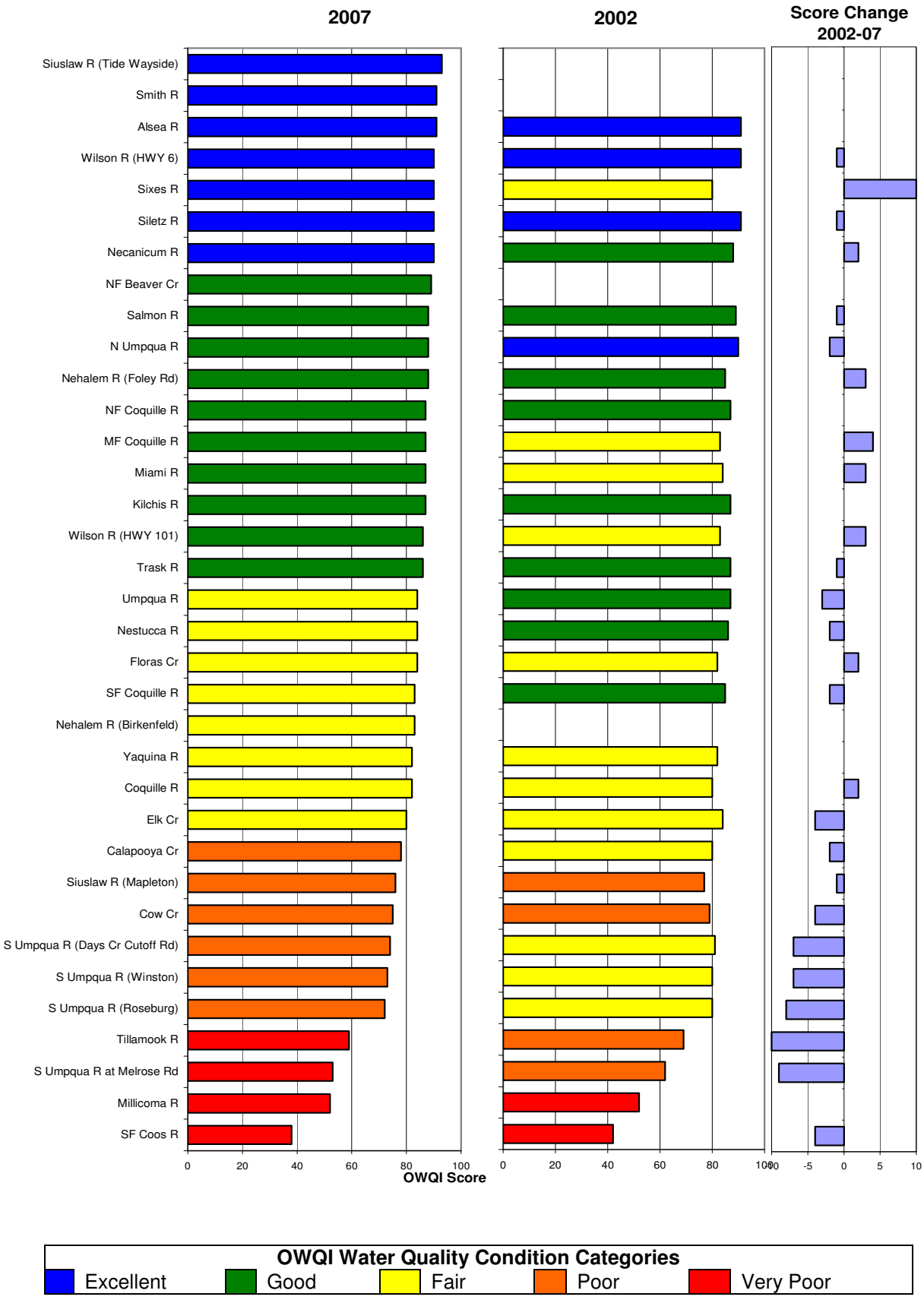

Table 21. Change in OWQI Trends Between 1993-2002 and 1998-2007

Site	Monitoring Area and Coho Population	Water Years 1993-2002			Water Years 1998-2007			Category Change Between 2002 and 2007
		10 Year Trend	Trend Size and Significance	Category	10 Year Trend	Trend Size and Significance	Category	
Necanicum River at Riverside Lake Camp	NC-Necanicum	NT	-	Good	NT	-	Excellent	Improved
Nehalem River at Foley Road	NC-Nehalem	Improving	+3.3[3]	Good	NT	-	Good	No Change
Nehalem River at HWY 202 Bridge in Birkenfeld	NC-Nehalem	N/A	-	-	N/A	-	Fair	N/A
Nestucca River at Cloverdale	NC-Nestucca	Improving	+3.6[1]	Fair	Declining	-3.3[2]	Fair	No Change
Kilchis River at HWY 101	NC-Tillamook	Improving	+3.3[2]	Good	Declining	-2.0[3]	Good	No Change
Miami River at Moss Creek Road	NC-Tillamook	Improving	+3.3[3]	Fair	NT	-	Good	Improved
Tillamook River at Bewley Creek Road	NC-Tillamook	NT	-	Poor	Declining	-1.3[4]	Very Poor	Worse
Trask River at HWY 101	NC-Tillamook	Improving	+3.1[3]	Good	Declining	-2.5[2]	Good	No Change
Wilson River at HWY 101	NC-Tillamook	Improving	+3.3[5]	Fair	Declining	-3.3[4]	Good	Improved
Wilson River at HWY 6	NC-Tillamook	N/A	-	Good	Declining	-3.3[1]	Excellent	Improved
Alsea River at Thissell Road	MC-Alsea	Improving	+2.9[1]	Excellent	Declining	-1.7[3]	Excellent	No Change
Salmon River at Otis	MC-Salmon	NT	-	Good	Declining	-3.3[2]	Good	No Change
Siletz River 5 miles d/s Siletz	MC-Siletz	NT	-	Excellent	Declining	-2.0[2]	Excellent	No Change
Beaver Creek North Fork at Ona Grange RM 4.8	MC-Beaver	N/A	-	N/A	N/A	-	Good	N/A
Siuslaw River at HWY 126 (Mapleton)	MC-Siuslaw	NT	-	Poor	N/A	-	Poor	No Change
Siuslaw River at Tide Wayside	MC-Siuslaw	N/A	-	N/A	N/A	-	Excellent	N/A
Yaquina River downstream of Chitwood	MC-Yaquina	NT	-	Fair	NT	-	Fair	No Change
Smith River 4.4 Miles d/s Smith River Falls	UM- Lower Umpqua	N/A	-	-	N/A	-	Excellent	N/A
Calapooya Creek at Umpqua	UM-Middle Umpqua	NT	-	Fair	NT	-	Poor	Worse
Elk Creek at Elkton	UM-Middle Umpqua	NT	-	Fair	NT	-	Fair	No Change
Umpqua River at Elkton	UM-Middle Umpqua	NT	-	Good	Declining	-2.5[4]	Fair	Worse

Table 21, continued. Change in OWQI Trends Between 1993-2002 and 1998-2007

Site	Monitoring Area and Coho Population	Water Years 1993-2002			Water Years 1998-2007			Category Change Between 2002 and 2007
		10 Year Trend	Trend Size and Significance	Category	10 Year Trend	Trend Size and Significance	Category	
North Umpqua River at Garden Valley Road	UM-North Umpqua	Improving	+2.5[1]	Excellent	Declining	-2.0[3]	Good	Worse
Cow Creek at Mouth (Riddle)	UM-South Umpqua	NT	-	Poor	NT	-	Poor	No Change
South Umpqua River at Days Creek Cutoff Road	UM-South Umpqua	NT	-	Fair	NT	-	Poor	Worse
South Umpqua River at HWY 42 (Winston)	UM-South Umpqua	NT	-	Fair	Declining	-2.0[4]	Poor	Worse
South Umpqua River at Melrose Road	UM-South Umpqua	NT	-	Poor	NT	-	Very Poor	Worse
South Umpqua River at Stewart Park Road (Roseburg)	UM-South Umpqua	NT	-	Fair	Declining	-5.0[2]	Poor	Worse
Millicoma River at Rooke Higgins Boat Ramp	MS-Coos	NT	-	Very Poor	NT	-	Very Poor	No Change
South Fork Coos River at Anson Rogers Bridge	MS-Coos	NT	-	Very Poor	NT	-	Very Poor	No Change
Coquille River at Sturdivant Park Dock	MS-Coquille	Improving	+5.0[3]	Fair	Declining	-4.0[2]	Fair	No Change
Middle Fork Coquille River at HWY 42	MS-Coquille	Improving	+5.0[1]	Fair	Declining	-3.4[3]	Good	Improved
North Fork Coquille River at HWY 42	MS-Coquille	Improving	+2.9[3]	Good	Declining	-2.5[4]	Good	No Change
South Fork Coquille River at Broadbent	MS-Coquille	NT	-	Good	Declining	-3.3[1]	Fair	Worse
Floras Creek at HWY 101	MS-Floras	NT	-	Fair	NT	-	Fair	No Change
Sixes River at HWY 101	MS-Sixes	Improving	+3.1[2]	Fair	NT	-	Excellent	Improved

Summer: June to September; FWS (Fall, Winter, Spring): October to May
Scores- Very Poor 10-59, Poor: 60-79, Fair: 80-84, Good: 85-89, Excellent: 90-100

Notes: 1-Significance Level of Seasonal-Kendall trend analysis results equals to 99.
2-Significance Level of Seasonal-Kendall trend analysis results equals to 95.
3- Significance Level of Seasonal-Kendall trend analysis results equals to 90.
4- Significance Level of Seasonal-Kendall trend analysis results equals to 80.
NT= No significant 10 year trend
N/A=Not applicable, insufficient data for 10 year trending

Conclusion

The Oregon Department of Environmental Quality monitored 35 flowing water sites in the Oregon Coast Coho ESU, most of them bi-monthly for water years 1998 to 2007. The water quality status and trend was assessed using the Oregon Water Quality Index (OWQI). The majority of stream sites (52%) assessed had at least moderate levels of water quality impairment and rated good to fair condition. Twenty percent of the sites are rated excellent water quality with minimal impairment. Twenty-seven percent of the sites were rated poor to very poor water quality condition with extensive impairment in a number of variables.

Although the individual variables causing water quality impairment vary between seasons, sites and monitoring areas, there are some overall patterns in this water quality assessment. High total solids, high nitrogen, and high biochemical oxygen demand (BOD) were frequently the leading causes of impairment at many sites. Also, sites in mostly forested watersheds had better water quality than sites characterized agricultural land use and urban areas.

In general, water quality tended to be worse during the summer months and better during the fall, winter and spring, especially for sites with fair to very poor water quality conditions. Warmer water temperatures decreased dissolved oxygen and less water to dilute sediment and nutrient enrichment contributed to this pattern. Over the 10-year period form 1998 to 2007, 17 sites had declining overall water quality scores, 13 had no statistically significant trends, and 5 had insufficient data for trending. No sites had improving water quality trends. Variables responsible for these trends varied among sites and monitoring areas, although worsening trends in total solids, BOD and nitrogen were frequently responsible.

There was also a general trend in water quality from north to south with a greater proportion of poor to very poor water quality sites in the southern portion of the ESU than in the northern portion. This may be because of the greater number of sites in agricultural lands in the southern part of the ESU than in the northern part, and in the effect of occasional salt water on the OWQI scores at two tidally influenced Mid South Coast Monitoring Area sites. The OWQI is designed to assess flowing, freshwater streams, not salt water.

This assessment of the Coastal Coho ESU water quality of 1998-2007 data is an update of a similar assessment prepared in 2004 using data collected in 1993-2002. For the 31 sites in common between the two assessments, there appears to be a pattern of declining overall water quality, especially for the sites with poorer OWQI scores. In the 1993-2002 assessment six of the 31 sites rated poor to very poor water quality while ten out of 31 had poor to very poor scores in the 1998-2007 assessment. A similar number of sites rated excellent to good in both assessments. In comparing the scores of 17 sites with fair to very poor scores in the 1993-2002 assessment with their scores in the 1998-2007 assessment, ten had decreases in OWQI scores, 5 had increases, and 2 had no score change. The reason for this difference was not investigated in this report although we suspect larger, regional effects, such as differences in precipitation and stream flow between the two periods, rather than local effects, such as increases in point source and non-point source pollution, to be responsible.

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Nehalem River at Foley Road (Roy Creek Campground) , Lasar 11856 Nehalem Population

Sample date	11/14/2002	1/8/2003	3/26/2003	5/14/2003	7/17/2003	11/5/2003	1/22/2004	3/18/2004	5/6/2004	1/5/2006
Sample time	10:00	9:00	9:22	10:00	9:50	10:45	10:05	9:35	9:56	10:00
Alkalinity as $CaCO_3$ (mg/L)	18	14	14	20	26	21	15	19	23	16
Ammonia as N mg/L	<0.02	0.03	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	1.4	1.4	1	0.5	0.5	0.9	0.8	0.9	<0.1
Chemical Oxygen Demand (mg/L)	10	5	<5	<5	7	<5	<5	<5	8	7
Chlorophyll a (µg/L)				3.1	2.6				1	
Pheophytin a (µg/L)				2.6	2				2	
Conductivity (µmhos/cm)	81	58	52	64	77	70	56	63	66	53
E. Coli (CFU/100 mL)	48	9	20	6	6	11	6	9	18	29
Total Kjeldahl Nitrogen (mg/L)	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.04	0.638	0.539	0.276	0.219	0.501	0.511	0.424	0.316	0.724
Dissolved Orthophosphate as P (mg/L)	0.01	0.012	0.015	0.007	0.009	0.01	0.011	0.01	0.01	0.013
Dissolved Oxygen (mg/L)	10.6	12	11.7	10.6	8.2	11.9	12.1	10.7	10.5	11.2
Percent Saturation Dissolved Oxygen (%)	93	97	99	98	87	94	97	93	99	95
pH (SU)	7.3	7.2	7.2	7.5	7.1	7.2	7.3	7.2	7.5	7.3
Total Phosphorus (mg/L)	0.04	0.04	0.05	0.02	0.03	0.02	0.03	0.02	0.02	0.06
Total Solids (mg/L)	69	60	55	53	52	62	52	52	49	66
Total Suspended Solids (mg/L)	9	2	13	4	2	<1	4	2	<1	20
Temperature (°C)	9.4	6.6	8.2	12.1	19.1	5.6	5.8	9.6	12.8	8.4
Turbidity (NTU)	7	7	17	2	2	2	4	3	2	20
Total Organic Carbon (mg/L)	3	1	1	1	1	2	1	1	1	2

Sample date	3/9/2006	5/4/2006	7/19/2006	9/13/2006	11/29/2006	1/24/2007	3/14/2007	5/9/2007	7/8/2004	9/23/2004
Sample time	10:15	9:45	11:11	9:33	9:50	9:50	11:55	12:38	10:10	10:40
Alkalinity as $CaCO_3$ (mg/L)	14	19	28	29	14	11	15	21	22	21
Ammonia as N mg/L	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	<0.1	0.7	0.7	1.8	1.2	1.2	0.6	2.2	0.7	0.2
Chemical Oxygen Demand (mg/L)	7	5	6	9					<5	5
Chlorophyll a (µg/L)		1.5 est	2.1	10					2.1	1.1 est
Pheophytin a (µg/L)		2.4 est	2	4.2					2.2	1.9 est
Conductivity (µmhos/cm)	54	66	80	92	55	62	52	64	76	68
E. Coli (CFU/100 mL)	73	16	8	9	23	11	11	5	16	20
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2					<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.559	0.325	0.197	0.266	0.6	0.527	0.488	0.23	0.245	0.67
Dissolved Orthophosphate as P (mg/L)	0.011	0.006	0.009	<0.005				0.009	0.006	0.012
Dissolved Oxygen (mg/L)	11.1	10.4	8.7	8.3	12.6	12.4	11.5	11.4	8.8	10.1
Percent Saturation Dissolved Oxygen (%)	89	97	92.6	86	100	98	97	108	91	95
pH (SU)	7.1	7.2	7.6	7.2	7.3	7.2	7.2	7.8	7.3	7.2
Total Phosphorus (mg/L)	0.05	0.02	0.02	0.03	0.06	0.03	0.03	0.02	0.02	0.02
Total Solids (mg/L)	75	57	60 est	64	71	58	50	49	49	59
Total Suspended Solids (mg/L)	21	2	2 est	2					<1	3
Temperature (°C)	5.8	12.4	18.8	17.2	5.4	5.5	8.1	13.6	16.9	13
Turbidity (NTU)	18	2	1	3	16	5	8	2	1	3
Total Organic Carbon (mg/L)	2	<1	<1	<1					2	2

Nehalem River at Foley Road (Roy Creek Campground) , Lasar 11856 Nehalem Population

Sample date	11/3/2004	1/12/2005	3/24/2005	5/12/2005	7/27/2005	9/28/2005	11/3/2005	7/11/2007	9/26/2007	11/7/2007
Sample time	9:40	11:01	10:55	9:40	8:45	10:00	10:10	9:40	11:39	11:14
Alkalinity as $CaCO_3$ (mg/L)	17	18	20	23	29	29	18	27	31	26
Ammonia as N mg/L	<0.02	0.02	<0.02	<0.02	0.03	0.03	0.02	0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.7	1.3	2.4	1.3	0.6	1	1.1	0.8	0.8	1.1
Chemical Oxygen Demand (mg/L)	8	8	7	9	<5	6	15	6	8	<5
Chlorophyll a (µg/L)				1.4	2.0 est	1.7 est		1.4	2.8	
Pheophytin a (µg/L)				2.5	2.0 est	2.7 est		1.2	2.3	
Conductivity (µmhos/cm)	61	66	65	63	74	89	66	79	96	80
E. Coli (CFU/100 mL)	199	12	16	67	23	15	194	12	16	19
Total Kjeldahl Nitrogen (mg/L)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			
Nitrate/nitrite as N (mg/L)	0.888	0.704	0.675	0.457	0.252	0.303	1.3	0.152	0.17	0.478
Dissolved Orthophosphate as P (mg/L)	0.01	0.013	0.011	0.014	0.008	0.014	0.012	0.006	0.007	0.012
Dissolved Oxygen (mg/L)	11.6	12.6	11.7	11.2	7.7	9.2	10.7	7.9	9.5	11.3
Percent Saturation Dissolved Oxygen (%)	100	98	98	102	82	88	95	87	91	97
pH (SU)	7.4	7.2	7.4	7.2	7.4	7.4	7.4	7.4	7.5	7.5
Total Phosphorus (mg/L)	0.07	0.03	0.03	0.04	0.02	0.04	0.05	0.02	0.03	0.02
Total Solids (mg/L)	82	44	64	68	57	71 est	83	61	69	70
Total Suspended Solids (mg/L)	22	2	4	6	1	3 est	12	2	3	1
Temperature (°C)	9.2	5.2	8.1	11.7	19.1	13.7	9.8	20.6	14	8.8
Turbidity (NTU)	21	5	6	5	2	7	9	2	2	2
Total Organic Carbon (mg/L)	3	1 est	2	2	1	1	3	2	2	2

Sample date	1/16/2008	3/5/2008	5/21/2008	7/9/2008
Sample time	11:20	11:23	10:40	12:11
Alkalinity as $CaCO_3$ (mg/L)	16	16	22	27
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.8	1.2	1.6 est	0.9
Chemical Oxygen Demand (mg/L)	<5	<5	<5	5
Chlorophyll a (µg/L)			3	2.6
Pheophytin a (µg/L)			2.7	2.1
Conductivity (µmhos/cm)	55	61	66	79
E. Coli (CFU/100 mL)	14	3	28	19
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.552	0.342	0.222	0.212
Dissolved Orthophosphate as P (mg/L)	0.014	0.011	0.005	
Dissolved Oxygen (mg/L)	12.6	12.7	11	8.9
Percent Saturation Dissolved Oxygen (%)	100	103	103	97
pH (SU)	7.3	7.5	7.52	7.4
Total Phosphorus (mg/L)	0.17	0.03	0.03	0.02
Total Solids (mg/L)	110	52	51	76
Total Suspended Solids (mg/L)	47	2	4 est	1
Temperature (°C)	5.6	6.6	12.4	19.9
Turbidity (NTU)	39	4	3	2
Total Organic Carbon (mg/L)	1	1	1	1

Nehalem River at Hwy 202 Bridge in Birkenfeld, LASAR 30419, Nehalem Population

Sample date	11/29/2006	1/24/2007	3/15/2007	5/10/2007	7/11/2007	9/27/2007	11/8/2007	1/17/2008	3/6/2008	5/22/2008
Sample time	14:45	14:10	10:15	10:45	15:30	13:44	10:46	12:45	10:37	9:47
Alkalinity as $CaCO_3$ (mg/L)	14	17	14	21	28	37	34	15	14	18
Ammonia as N mg/L	<0.02	0.03	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.3	0.8	1.2	1	0.8	0.8	1.7	0.6	1.3	1.2 est
Chemical Oxygen Demand (mg/L)					7	15	9	<5	<5	6
Chlorophyll a (µg/L)					1	1.3				4
Pheophytin a (µg/L)					1.2	1.9				3.9
Conductivity (µmhos/cm)	51	59	50	65	85	106	97	51	58	72
E. Coli (CFU/100 mL)	11	54	46	31	19	43	24	22	15	46
Total Kjeldahl Nitrogen (mg/L)										
Nitrate/nitrite as N (mg/L)	0.315	0.265	0.211	0.0067	0.0189	0.0294	0.0316	0.285	0.124	0.0073
Dissolved Orthophosphate as P (mg/L)				0.012	0.033	0.038	0.029	0.014	0.013	Void
Dissolved Oxygen (mg/L)	11.7	12	11.5	10.3	7.4	8.8	10.7	12.3	12	9.6
Percent Saturation Dissolved Oxygen (%)	91	95	93	97	87	86	90	95	95	91
pH (SU)	7	7.1	7	7.5	7.3	7.5	7.5	7.2	7.4	7.4
Total Phosphorus (mg/L)	0.05	0.04	0.03	0.03	0.05	0.07	0.05	0.06	0.03	0.04
Total Solids (mg/L)	80	69	58	62	80	86	86	83	61	62
Total Suspended Solids (mg/L)					3	4	2	22	3	3
Temperature (°C)	4.8	5.3	6.5	12.9	24.1	14.8	7.9	4.3	5.6	13.1
Turbidity (NTU)	11	6	11	3	3	11	5	14	3	6
Total Organic Carbon (mg/L)					3	4	4	2	1	2

Sample date	7/10/2008
Sample time	9:30
Alkalinity as $CaCO_3$ (mg/L)	28
Ammonia as N mg/L	<0.02
Biochemical Oxygen DemandStream (mg/L)	1
Chemical Oxygen Demand (mg/L)	10
Chlorophyll a (µg/L)	1
Pheophytin a (µg/L)	2.4
Conductivity (µmhos/cm)	80
E. Coli (CFU/100 mL)	14
Total Kjeldahl Nitrogen (mg/L)	
Nitrate/nitrite as N (mg/L)	0.0146
Dissolved Orthophosphate as P (mg/L)	0.012
Dissolved Oxygen (mg/L)	7.6
Percent Saturation Dissolved Oxygen (%)	80
pH (SU)	7.3
Total Phosphorus (mg/L)	0.05
Total Solids (mg/L)	74
Total Suspended Solids (mg/L)	3
Temperature (°C)	18.7
Turbidity (NTU)	3
Total Organic Carbon (mg/L)	2

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L

Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L

Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Nestucca River at Cloverdale, Lasar 10523, Nestucca Population

Sample date	11/13/2002	1/7/2003	3/25/2003	5/13/2003	7/16/2003	11/4/2003	1/21/2004	3/17/2004	5/5/2004	7/7/2004
Sample time	14:26	14:10	15:10	14:50	14:35	15:55	13:40	14:09	14:02	15:35
Alkalinity as $CaCO_3$ (mg/L)	18	21	20	24	28	28	20	25	27	28
Ammonia as N mg/L	0.02	0.02	<0.02	0.03	0.03	<0.02	<0.02	0.02	0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	1.8	0.3	1.6	1.1	0.3	1.3	1.4	1	1.2	0.5
Chemical Oxygen Demand (mg/L)	12	<5	<5	<5	<5	<5	11	8	<5	<5
Chlorophyll a (µg/L)				1.6	0.7				0.9	0.7
Pheophytin a (µg/L)				2	1.4				1.7	1.7
Conductivity (µmhos/cm)	83	75	69	77	85	86	73	80	81	86
E. Coli (CFU/100 mL)	435	11	20	13	29	40	6	7	99	225
Total Kjeldahl Nitrogen (mg/L)	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.37	0.918	0.782	0.492	0.35	0.755	0.805	0.767	0.6	0.434
Dissolved Orthophosphate as P (mg/L)	0.012	0.019	0.022	0.012	0.013	0.011	0.015	0.016	0.014	0.012
Dissolved Oxygen (mg/L)	11	11.7	11.1	11.9	9.1	12.2	12.2	11.2	11.3	10.2
Percent Saturation Dissolved Oxygen (%)	98	101	97	114	100	98	100	100	107	107
pH (SU)	7.2	7.4	7.4	7.7	7.6	7.4	7.2	7.5	7.7	7.4
Total Phosphorus (mg/L)	0.04	0.04	0.06	0.03	0.03	0.02	0.02	0.03	0.02	0.02
Total Solids (mg/L)	74	60	70	58	65	47	69	64	56	62
Total Suspended Solids (mg/L)	15	6	13	4	2	1	3	6	2	2
Temperature (°C)	10.6	8.8	9.6	13.8	20.4	5.9	6.9	10.5	13.1	17.8
Turbidity (NTU)	13	7	22	3	2	1	4	4	3	2
Total Organic Carbon (mg/L)	4	<1	<1	<1	1	<1	1	2	1	1

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/8/2006
Sample time	15:20	14:21	15:50	15:10	15:00	14:35	14:40	13:35	14:15	16:13
Alkalinity as $CaCO_3$ (mg/L)	24	25	26	26	28	33	32	20	23	22
Ammonia as N mg/L	0.02	0.02	0.02	0.02	<0.02	0.04	0.03	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	1.2	1.7	0.6	1.6	0.9	0.5	0.7	0.3	1.2
Chemical Oxygen Demand (mg/L)	7	10	<5	<5	5	6	5	7	5	10
Chlorophyll a (µg/L)	0.8 est				1.1	0.9	0.7 est			
Pheophytin a (µg/L)	1.2 est				1.4	1.7	2.1 est			
Conductivity (µmhos/cm)	82	74	80	80	76	88	95	76	72	66
E. Coli (CFU/100 mL)	50	1733	5	16	93	32	49	27	23	517
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.944	0.898	1.09	0.8	0.808	0.572	0.548	1.88	1.14	0.827
Dissolved Orthophosphate as P (mg/L)	0.018	0.022	0.017	0.016	0.021	0.012	0.013	0.018	0.019	0.018
Dissolved Oxygen (mg/L)	10.7	10.6	12.6	11.7	12	10.2	10.9	10.3	10.8	11.3
Percent Saturation Dissolved Oxygen (%)	100	95	98	100	109	109	105	92	92	94
pH (SU)	7.5	7.5	7.5	7.5	7.4	7.8	7.6	7.3	7.4	7
Total Phosphorus (mg/L)	0.03	0.09	0.03	0.03	0.03	0.02	0.03	0.05	0.05	0.1
Total Solids (mg/L)	59	79	51	72	67	65	34 est	76	90	88
Total Suspended Solids (mg/L)	3	19	3	3	5	<1	<1 est	11	20	33
Temperature (°C)	12.7	10.6	5.1	8.8	11.3	19.2	14.1	10.3	8.3	7.2
Turbidity (NTU)	3	17	2	3	17	2	2	12	15	30
Total Organic Carbon (mg/L)	1	2	<1 est	<1	<1	<1	2	1	<1	2

Nestucca River at Cloverdale, Lasar 10523, Nestucca Population

Sample date	5/3/2006	7/18/2006	9/12/2006	11/28/2006	1/23/2007	3/14/2007	5/9/2007	7/10/2007	9/25/2007	11/6/2007
Sample time	15:00	16:30	15:30	14:50	15:03	8:40	9:00	15:15	14:39	15:15
Alkalinity as $CaCO_3$ (mg/L)	25	30	32	22	25	22	28	32	35	28
Ammonia as N mg/L	<0.02	0.06	0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.1	0.2	0.8	0.4	0.6	0.8	0.7	0.9	0.5	1
Chemical Oxygen Demand (mg/L)	6	<5	<5					5	5	6
Chlorophyll a (µg/L)	2.7 est		0.5					0.8	0.7	
Pheophytin a (µg/L)	4.2 est		1.4					1.4	2	
Conductivity (µmhos/cm)	80	90	100	77	80	71	81	91	68	88
E. Coli (CFU/100 mL)	9	20	33	31	5	10	32	141	54	15
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.642	0.515	0.569	0.981	0.873	0.708	0.592	0.4	0.369	0.667
Dissolved Orthophosphate as P (mg/L)	0.01	0.02	0.013				0.014	0.012	0.012	0.01
Dissolved Oxygen (mg/L)	12.4	10	10.1	11.9	11.6	11.3	10.7	9.6	10.7	12
Percent Saturation Dissolved Oxygen (%)	117	107.5	105	96	96	94	97	108	103	105
pH (SU)	7.7	7.5	7.3	7.4	7.4	7.7	7.5	7.5	7.4	7.6
Total Phosphorus (mg/L)	0.02	0.02	0.03	0.06	0.03	0.03	0.02	0.03	0.02	0.02
Total Solids (mg/L)	72	72	72	78	64	60	60	70	70	72
Total Suspended Solids (mg/L)	3	2	1					1	2	<1
Temperature (°C)	12.8	19.5	17.3	6.6	7.6	7.6	11.1	21.7	13.8	9.5
Turbidity (NTU)	2	1	2	17	4	8	2	2	2	2
Total Organic Carbon (mg/L)	<1	<1	<1					2	1	<1

Sample date	1/15/2008	3/4/2008	5/20/2008	11/14/2002	7/8/2008
Sample time	16:20	15:00	15:05	8:55	17:23
Alkalinity as $CaCO_3$ (mg/L)	23	23	25	16	30
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.7 est	1.6	1.8 est	1.6	1.5
Chemical Oxygen Demand (mg/L)	<5	<5	<5	6	<5
Chlorophyll a (µg/L)			2.8		1.9
Pheophytin a (µg/L)			3		2.6
Conductivity (µmhos/cm)	76	75	81	71	91
E. Coli (CFU/100 mL)	42	11	461	201	23
Total Kjeldahl Nitrogen (mg/L)				<0.2	
Nitrate/nitrite as N (mg/L)	0.926	0.559	0.466	1.51	0.443
Dissolved Orthophosphate as P (mg/L)	0.021	0.018	0.014	0.007	0.012
Dissolved Oxygen (mg/L)	12.3	12.2	11	11	11.1
Percent Saturation Dissolved Oxygen (%)	99	101	104	98	119
pH (SU)	7.3	7.6	7.6	7.1	7.6
Total Phosphorus (mg/L)	0.07	0.03	0.03	0.04	0.03
Total Solids (mg/L)	88	60	60	69	61
Total Suspended Solids (mg/L)	25	2	4	14	1
Temperature (°C)	6.6	7.4	13.1	10.3	19.5
Turbidity (NTU)	27	3	3	9	2
Total Organic Carbon (mg/L)	<1	1	1	2	<1

Miami River at Moss Creek Road, Lasar 13411, Tillamook Population

Sample date	11/14/2002	1/8/2003	3/26/2003	5/14/2003	7/17/2003	11/5/2003	1/22/2004	3/18/2004	5/6/2004	7/8/2004
Sample time	8:55	8:20	8:47	9:20	9:15	10:10	9:33	9:06	9:20	9:15
Alkalinity as $CaCO_3$ (mg/L)	16	15	15	19	23	19	16	17	20	21
Ammonia as N mg/L	<0.02	0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.03	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.6	0.3	0.5	1.2	0.2	<0.1	0.8	0.7	1.1	0.6
Chemical Oxygen Demand (mg/L)	6	<5	<5	<5	<5	<5	<5	<5	5	<5
Chlorophyll a (µg/L)				3.6	1.7				0.7	2.7
Pheophytin a (µg/L)				3.1	3				2.5	3.2
Conductivity (µmhos/cm)	71	68	59	65	70	64	62	64	67	71
E. Coli (CFU/100 mL)	201	17	27	55	488	57	7	248	272	172
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.51	1.11	0.947	0.716	0.728	1.06	0.96	0.899	0.845	0.701
Dissolved Orthophosphate as P (mg/L)	0.007	0.009	0.008	<0.005	0.009	0.006	0.007	0.01	0.008	0.006
Dissolved Oxygen (mg/L)	11	11.1	11	11.3	9.3	11.2	11.2	10.4	10.9	10.3
Percent Saturation Dissolved Oxygen (%)	98	92	94	100	89	95	92	90	97	96
pH (SU)	7.1	7.1	7.1	7.3	7	7.1	7.1	7	7.2	7
Total Phosphorus (mg/L)	0.04	0.02	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Total Solids (mg/L)	69	54	41	48	47	48	50	48	47	51
Total Suspended Solids (mg/L)	14	1	2	3	1	<1	<1	2	<1	1
Temperature (°C)	10.3	7.6	8.6	9.9	13.4	8.3	7.1	9.3	10.2	12.7
Turbidity (NTU)	9	2	4	1	1	1	2	2	1	2
Total Organic Carbon (mg/L)	2	<1	<1	<1	<1	<1	<1	1	<1	<1

Sample date	9/23/2004	11/3/2004	1/12/2005	3/24/2005	5/12/2005	7/27/2005	9/28/2005	11/3/2005	1/5/2006	3/9/2006
Sample time	9:55	9:04	10:27	10:00	9:10	8:13	9:25	9:25	9:15	9:42
Alkalinity as $CaCO_3$ (mg/L)	18	18	18	17	21	24	22	15	20	14
Ammonia as N mg/L	<0.02	0.03	<0.02	<0.02	<0.02	0.03	<0.02	0.02	0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.1	0.6	0.5	0.7	0.9	0.4	0.2	0.4	<0.1	<0.1
Chemical Oxygen Demand (mg/L)	<5	<5	6	14	6	<5	<5	6	8	<5
Chlorophyll a (µg/L)	0.5 est				0.8	1.6 est	0.6 est			
Pheophytin a (µg/L)	0.7 est				0.7	2.3 est	1.2 est			
Conductivity (µmhos/cm)	64	59	62	63	59	68	73	58	61	54
E. Coli (CFU/100 mL)	57	517	24	326	53	548	72	179	11	79
Total Kjeldahl Nitrogen (mg/L)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.921	1.14	1.04	1.09	0.844	0.825	0.74	1.27	1.16	0.845
Dissolved Orthophosphate as P (mg/L)	0.008	0.007	0.007	0.009	0.008	0.007	0.008	0.009	0.009	0.008
Dissolved Oxygen (mg/L)	10.2	11.1	11.2	11.2	11.2	9.5	9.8	10.1	10.3	11.1
Percent Saturation Dissolved Oxygen (%)	94	96	93	96	100	89	88	89	91	90
pH (SU)	7.1	7.2	7.1	7.2	7.1	7.2	7	7.3	7.3	7
Total Phosphorus (mg/L)	0.01	0.02	0.02	0.02	0.02	<0.01	0.01	0.03	0.02	0.04
Total Solids (mg/L)	42	49	36	74	55	42	51 est	72	50	60
Total Suspended Solids (mg/L)	<1	3	<1	2	2	<1	<1 est	7	3	10
Temperature (°C)	12	9.1	7.6	9	10.3	12.5	11.2	9.9	10	6.5
Turbidity (NTU)	1	5	2	1	1	1	1	7	2	12
Total Organic Carbon (mg/L)	<1	<1	<1 est	<1	<1	<1	<1	<1	<1	<1

Miami River at Moss Creek Road, Lasar 13411, Tillamook Population

Sample date	5/4/2006	7/19/2006	9/13/2006	11/29/2006	1/24/2007	3/14/2007	5/9/2007	7/11/2007	9/26/2007	11/7/2007
Sample time	9:10	10:37	8:57	9:15	9:20	11:26	11:50	9:00	10:53	10:42
Alkalinity as $CaCO_3$ (mg/L)	20	24	24	17	17	16	20	23	24	24
Ammonia as N mg/L	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	0.3	0.8	0.3	0.5	0.5	2.5	0.7	0.2	0.6
Chemical Oxygen Demand (mg/L)	<5	<5	6					<5	<5	<5
Chlorophyll a (µg/L)	1.0 est	0.9	0.8					0.8	0.7	
Pheophytin a (µg/L)	2.5 est	2	1.4					1.6	1.1	
Conductivity (µmhos/cm)	66	71	76	64	67	59	64	72	76	70
E. Coli (CFU/100 mL)	57	119	133	9	<1	11	16	248	248	37
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.862	0.768	0.755	1.04	0.985	0.831	0.726	0.735	0.69	0.893
Dissolved Orthophosphate as P (mg/L)	0.006	0.008	0.007				0.005	0.008	0.007	0.006
Dissolved Oxygen (mg/L)	10.7	10.3	9.3	11.3	11.3	11	12.4	9.6	9.6	11.3
Percent Saturation Dissolved Oxygen (%)	95	99	85	91	94	95	113	93	90	100
pH (SU)	7.2	7.3	7	7.2	7.1	7.2	7.5	7.1	7.2	7.2
Total Phosphorus (mg/L)	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.01
Total Solids (mg/L)	58	45 est	52	48	58	45	50	56	55	64
Total Suspended Solids (mg/L)	2	1 est	<1					<1	2	1
Temperature (°C)	10	14	11.7	6.6	7.4	9	11.4	14.5	12.4	10.1
Turbidity (NTU)	2	1	2	3	2	5	1	<1	2	2
Total Organic Carbon (mg/L)	<1	<1	<1					<1	<1	<1

Sample date	3/5/2008	5/21/2008	7/9/2008
Sample time	10:50	10:00	11:22
Alkalinity as $CaCO_3$ (mg/L)	18	16	22
Ammonia as N mg/L	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	1.8 est	0.9
Chemical Oxygen Demand (mg/L)	<5	6	8
Chlorophyll a (µg/L)		1.8	1.9
Pheophytin a (µg/L)		4.6	3.5
Conductivity (µmhos/cm)	69	66	74
E. Coli (CFU/100 mL)	40	2420	272
Total Kjeldahl Nitrogen (mg/L)			
Nitrate/nitrite as N (mg/L)	0.864	0.725	0.768
Dissolved Orthophosphate as P (mg/L)	0.008	0.008	0.006
Dissolved Oxygen (mg/L)	12.3	11.1	11.3
Percent Saturation Dissolved Oxygen (%)	102	98	110
pH (SU)	7.3	7.19	7.2
Total Phosphorus (mg/L)	0.01	0.04	0.02
Total Solids (mg/L)	51	59	67
Total Suspended Solids (mg/L)	1	11 est	<1
Temperature (°C)	7.4	10	14.5
Turbidity (NTU)	2	7	2
Total Organic Carbon (mg/L)	<1	2	<1

Kilchis River at Alderbrook Road, Lasar 13411, Tillamook Population

Sample date	11/14/2002	1/8/2003	3/26/2003	5/14/2003	7/17/2003	11/5/2003	1/22/2004	3/18/2004	5/6/2004	7/8/2004
Sample time	8:20	7:50	8:15	8:45	8:40	9:20	9:09	8:33	8:46	8:35
Alkalinity as $CaCO_3$ (mg/L)	13	16	15	19	24	19	14	17	21	23
Ammonia as N mg/L	0.05	<0.02	<0.02	<0.02	0.03	<0.02	0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.5	0.5	1.5	<0.1	0.1	0.8	0.1	0.7	0.6
Chemical Oxygen Demand (mg/L)	7	<5	<5	<5	<5	<5	<5	<5	6	<5
Chlorophyll a (µg/L)				4.5	1				0.5	2
Pheophytin a (µg/L)				3.7	1.7				0.7	2.5
Conductivity (µmhos/cm)	63	61	52	60	68	58	57	61	62	68
E. Coli (CFU/100 mL)	185	2	12	42	108	32	19	13	81	249
Total Kjeldahl Nitrogen (mg/L)	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.71	1.02	0.806	0.762	0.855	0.909	0.896	0.967	0.861	0.753
Dissolved Orthophosphate as P (mg/L)	0.006	0.012	0.012	0.006	0.01	0.009	0.011	0.01	0.011	0.006
Dissolved Oxygen (mg/L)	11	11.3	11.3	10.7	8.1	11.1	11.4	10.5	10.5	9.2
Percent Saturation Dissolved Oxygen (%)	97	93	96	96	79	90	92	91	93	88
pH (SU)	7.1	7.2	7.1	7.1	7	7.2	7.2	7	7.2	7
Total Phosphorus (mg/L)	0.03	0.02	0.02	0.01	0.02	0.01	0.02	0.02	0.02	0.01
Total Solids (mg/L)	66	50	40	44	48	47	50	49	35	69
Total Suspended Solids (mg/L)	17	<1	2	3	<1	<1	<1	<1	<1	<1
Temperature (°C)	9.8	6.8	8.3	10.4	14.8	6.6	6.4	9.2	10.3	14
Turbidity (NTU)	8	2	3	1	1	1	2	2	1	1
Total Organic Carbon (mg/L)	2	<1	<1	<1	<1	<1	<1	1	<1	<1

Sample date	9/23/2004	11/3/2004	1/12/2005	3/24/2005	5/12/2005	7/27/2005	9/28/2005	11/3/2005	1/5/2006	3/9/2006
Sample time	9:20	8:35	9:45	9:25	8:40	7:30	8:55	8:55	8:45	9:07
Alkalinity as $CaCO_3$ (mg/L)	17	16	19	17	20	25	24	16	18	14
Ammonia as N mg/L	<0.02	0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.3	1.2	0.7	0.6	1.3	0.4	0.4	0.2	<0.1	0.8
Chemical Oxygen Demand (mg/L)	<5	<5	7	6	<5	<5	<5	<5	7	<5
Chlorophyll a (µg/L)	0.4 est				0.8	1.7 est	0.8 est			
Pheophytin a (µg/L)	0.5 est				1	2.2 est	1.6 est			
Conductivity (µmhos/cm)	60	52	57	55	54	65	73	55	55	47
E. Coli (CFU/100 mL)	37	66	14	37	24	131	272	93	6	4
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.915	0.963	1	0.904	0.755	0.92	0.917	1.17	1.05	0.649
Dissolved Orthophosphate as P (mg/L)	0.013	0.009	0.011	0.009	0.01	0.013	0.009	0.013	0.012	0.01
Dissolved Oxygen (mg/L)	10.2	11.5	11.6	11	11.3	8.3	8.6	10.4	10.5	12
Percent Saturation Dissolved Oxygen (%)	93	98	95	93	100	80	80	91	92	96
pH (SU)	7.2	7.3	7.1	7.2	7.2	7.1	6.8	7.3	7.2	6.9
Total Phosphorus (mg/L)	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.03	0.02	0.04
Total Solids (mg/L)	51	51	52	60	47	45	47 est	64	44	49
Total Suspended Solids (mg/L)	<1	4	<1	1	<1	<1	<1 est	4	2	9
Temperature (°C)	11.4	8.8	6.8	7.9	10.2	13.9	11.8	9.6	9.5	5.8
Turbidity (NTU)	2	6	2	1	<1	1	1	6	3	13
Total Organic Carbon (mg/L)	<1	<1	<1 est	<1	<1	<1	<1	<1	<1	<1

Kilchis River at Alderbrook Road, Lasar 13411, Tillamook Population

Sample date	5/4/2006	7/19/2006	9/13/2006	11/29/2006	1/24/2007	3/14/2007	5/9/2007	7/11/2007	9/26/2007	11/7/2007
Sample time	8:40	10:00	8:30	8:49	8:50	10:55	11:20	8:30	10:05	9:50
Alkalinity as $CaCO_3$ (mg/L)	20	24	26	17	16	17	18	24	26	23
Ammonia as N mg/L	<0.02	0.05	<0.02	0.02	0.03	0.06	<0.02	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	0.5	0.7	0.8	0.6	0.6	1	0.5		0.9
Chemical Oxygen Demand (mg/L)	<5	<5	<5					<5	<5	<5
Chlorophyll a (µg/L)	1.6 est	0.8	1.5					0.9	1	
Pheophytin a (µg/L)	3.3 est	2.1	2.2					1.5	1.7	
Conductivity (µmhos/cm)	64	69	79	58	61	55	61	70	77	67
E. Coli (CFU/100 mL)	36	517	178	4	2	<1	56	108	172	19
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.895	0.835	0.859	0.931	0.9	0.762	0.764	0.749	0.712	0.835
Dissolved Orthophosphate as P (mg/L)	0.008	0.011	0.007				0.01	0.009	0.007	0.01
Dissolved Oxygen (mg/L)	10.1	9.6	7.8	11.7	11.5	11.2	11.1	8.6	8.6	10.9
Percent Saturation Dissolved Oxygen (%)	89	92.3	73	94	93	95	100	86	80	94
pH (SU)	7	7.2	6.8	7.3	7	7.2	7.3	7	7.1	7.2
Total Phosphorus (mg/L)	0.02	0.02	0.01	0.02	0.02	0.03	0.01	0.01	0.01	0.01
Total Solids (mg/L)	56	48 est	52	47	52	47	51	55	55	59
Total Suspended Solids (mg/L)	1	<1 est	<1					<1	1	<1
Temperature (°C)	10.1	14.2	12.5	5.8	6.3	8.3	11.1	15.8	12.4	9
Turbidity (NTU)	2	<1	1	4	2	5	1	<1	2	1
Total Organic Carbon (mg/L)	<1	<1	<1					<1	<1	1

Sample date	1/16/2008	3/5/2008	5/21/2008	7/9/2008
Sample time	10:30	10:07	9:40	10:50
Alkalinity as $CaCO_3$ (mg/L)	17	15	17	24
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.2	0.6	1.1 est	0.9
Chemical Oxygen Demand (mg/L)	<5	<5	<5	7
Chlorophyll a (µg/L)			1	9.6
Pheophytin a (µg/L)			1.5	3.6
Conductivity (µmhos/cm)	59	59	63	72
E. Coli (CFU/100 mL)	10			50
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.916	0.687	0.718	0.711
Dissolved Orthophosphate as P (mg/L)	0.012	0.011	0.012	0.005
Dissolved Oxygen (mg/L)	11.7	12.3	11.1	10.8
Percent Saturation Dissolved Oxygen (%)	94	99	99	105
pH (SU)	7.2	7.3	7.21	7.2
Total Phosphorus (mg/L)	0.02	0.01	0.02	0.03
Total Solids (mg/L)	54	44	45	72
Total Suspended Solids (mg/L)	3	<1	<1 est	14
Temperature (°C)	6.2	6.3	10.4	14.6
Turbidity (NTU)	4	1	3	7
Total Organic Carbon (mg/L)	<1	<1	<1	<1

Wilson River at Hwy 101, LASAR 13421, **Tillamook Population**

Sample date	11/14/2002	1/7/2003	3/26/2003	5/14/2003	7/17/2003	11/5/2003	1/22/2004	3/18/2004	5/6/2004	7/8/2004
Sample time	8:00	16:10	7:48	8:25	8:20	8:45	8:46	8:09	8:16	8:10
Alkalinity as $CaCO_3$ (mg/L)	18	20	19	25	30	25	20	23	27	28
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	1	0.2	0.5	0.6	0.5	5.6	0.1	1	0.9	1.1
Chemical Oxygen Demand (mg/L)	8	<5	<5	<5	5	<5	<5	<5	<5	<5
Chlorophyll a (µg/L)				3.7	0.9				0.7	2.3
Pheophytin a (µg/L)				3.2	1.9				1	3.3
Conductivity (µmhos/cm)	70	66	59	70	81	71	63	71	73	82
E. Coli (CFU/100 mL)	131	5	19	25	162	108	11	13	65	79
Total Kjeldahl Nitrogen (mg/L)	0.4	0.3	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.14	0.63	0.542	0.468	0.556	0.562	0.572	0.668	0.538	0.49
Dissolved Orthophosphate as P (mg/L)	0.007	0.014	0.015	0.007	0.007	0.008	0.012	0.011	0.013	<0.005
Dissolved Oxygen (mg/L)	11.2	10.8	11.5	9.9	7.7	11.5	11.7	10.8	10.4	8.5
Percent Saturation Dissolved Oxygen (%)	99	90	96	90	81	90	92	94	93	85
pH (SU)	7.3	7.4	7	7.4	7.2	7.3	7.1	7.2	7.4	7.1
Total Phosphorus (mg/L)	0.04	0.03	0.03	0.01	0.02	0.02	0.02	0.02	0.02	0.01
Total Solids (mg/L)	62	49	52	51	54	52	52	53	58	54
Total Suspended Solids (mg/L)	14	4	7	3	1	1	2	2	<1	<1
Temperature (°C)	9.8	7.6	7.8	11.3	17.9	5.2	5.5	9.3	10.6	15.9
Turbidity (NTU)	9	5	10	2	1	1	2	2	2	1
Total Organic Carbon (mg/L)	2	<1	<1	<1	<1	<1	<1	1	<1	1

Sample date	9/23/2004	11/3/2004	1/12/2005	3/24/2005	5/12/2005	7/26/2005	9/28/2005	11/3/2005	1/5/2006	3/9/2006
Sample time	9:00	8:15	9:19	9:00	8:20	16:00	8:35	8:25	8:20	8:50
Alkalinity as $CaCO_3$ (mg/L)	24	22	25	24	28	34	33	13	23	19
Ammonia as N mg/L	0.02	0.03	<0.02	<0.02	<0.02	0.04	0.03	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.2	1.5	0.9	0.1	1.1	0.6	0.4	0.3	<0.1	0.5
Chemical Oxygen Demand (mg/L)	<5	<5	<5	8	5	6	<5	8	7	<5
Chlorophyll a (µg/L)	0.7 est				1.4	0.4	0.9 est			
Pheophytin a (µg/L)	1.0 est				1.5	0.9	2.1 est			
Conductivity (µmhos/cm)	71	59	71	66	66	82	93	65	62	54
E. Coli (CFU/100 mL)	40	141	48	9	43	11	36	276	10	22
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.742	0.741	0.774	0.579	0.502	0.644	0.631	1.1	0.738	0.474
Dissolved Orthophosphate as P (mg/L)	0.013	0.012	0.012	0.009	0.01	0.011	0.007	0.015	0.014	0.013
Dissolved Oxygen (mg/L)	10	11.5	12.2	11.2	10.9	9.1	8.9	10.3	10.9	11.3
Percent Saturation Dissolved Oxygen (%)	91	98	96	92	98	99	82	90	93	88
pH (SU)	7.3	7.7	7.3	7.4	7.5	7.4	7.2	7.6	7.5	7.3
Total Phosphorus (mg/L)	0.02	0.05	0.03	0.02	0.02	0.02	0.01	0.04	0.03	0.05
Total Solids (mg/L)	47	60	44	84	55	66	60	73	51	60
Total Suspended Solids (mg/L)	2	10	<1	2	3	<1	<1	7	4	17
Temperature (°C)	11.6	8.6	5.3	7.2	10.9	19.9	12.2	9.4	8.5	4.8
Turbidity (NTU)	2	13	2	1	1	6	1	6	6	19 est
Total Organic Carbon (mg/L)	<1	2	<1 est	<1	<1	<1	<1	<1	<1	1

Wilson River at Hwy 101, LASAR 13421, **Tillamook Population**

Sample date	5/4/2006	7/19/2006	9/13/2006	11/29/2006	1/24/2007	3/14/2007	5/9/2007	7/11/2007	9/26/2007	11/7/2007
Sample time	8:15	9:30	8:08	8:29	8:30	10:35	11:00	8:15	9:00	9:34
Alkalinity as $CaCO_3$ (mg/L)	26	34	36	23	21	20	25	31	30	26
Ammonia as N mg/L	<0.02	0.06	0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	0.7	0.9	0.7	0.5	1	1.1	1.8	0.4	1
Chemical Oxygen Demand (mg/L)	<5	<5	<5					<5	<5	<5
Chlorophyll a (µg/L)	1.3 est	1.1	0.7					0.9	1.2	
Pheophytin a (µg/L)	2.3 est	2.5	1.8					1.5	2.2	
Conductivity (µmhos/cm)	72	88	105	65	70	60	71	88	85	79
E. Coli (CFU/100 mL)	6	52	56	10	12	14	20	145	78	21
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.3	<0.2							
Nitrate/nitrite as N (mg/L)	0.584	0.572	0.595	0.622	0.615	0.482	0.466	0.476	0.263	0.572
Dissolved Orthophosphate as P (mg/L)	0.01	0.007	0.014				0.009	0.007	<0.005	0.009
Dissolved Oxygen (mg/L)	10.1	8	8	12.2	11.7	11.6	10.9	8.2	9.7	11.1
Percent Saturation Dissolved Oxygen (%)	90	83.3	78	95	94	96	102	89	90	94
pH (SU)	7.1	7.3	7.1	7.5	7.4	7.4	7.5	7.2	7.6	7.4
Total Phosphorus (mg/L)	0.02	0.01	0.02	0.06	0.02	0.08	0.03	0.02	0.01	0.01
Total Solids (mg/L)	66	59 est	61	72	73	65	56	66	61	70
Total Suspended Solids (mg/L)	1	1 est	<1					1	2	2
Temperature (°C)	10.5	17.3	15	5.1	5.9	7.7	12.3	19.8	11.9	8.2
Turbidity (NTU)	3	1	2	22	3	25	1	<1	2	2
Total Organic Carbon (mg/L)	<1	<1	<1					1	<1	<1

Sample date	1/16/2008	3/5/2008	5/21/2008	7/9/2008
Sample time	10:15	9:43	8:50	10:21
Alkalinity as $CaCO_3$ (mg/L)	22	20	23	32
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.5	1.5	1.4 est	1.1
Chemical Oxygen Demand (mg/L)	<5	<5	<5	6
Chlorophyll a (µg/L)			1.6	3.5
Pheophytin a (µg/L)			1.6	2.7
Conductivity (µmhos/cm)	64	63	62	86
E. Coli (CFU/100 mL)	7	4	161	19
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.614	0.364	0.307	0.398
Dissolved Orthophosphate as P (mg/L)	0.016	0.011	0.008	0.005
Dissolved Oxygen (mg/L)	12.2	12.4	11	9.2
Percent Saturation Dissolved Oxygen (%)	96	99	97	95
pH (SU)	7.4	7.4	7.34	7.2
Total Phosphorus (mg/L)	0.15	0.03	0.02	0.02
Total Solids (mg/L)	99	55	49	71
Total Suspended Solids (mg/L)	36	6	2	1
Temperature (°C)	5.7	5.9	10.2	17.1
Turbidity (NTU)	40	5	3	2
Total Organic Carbon (mg/L)	<1	<1	<1	1

Wilson R at HWY 6, LASAR 13424 — Tillamook Population

Sample date	11/14/2002	1/7/2003	3/25/2003	5/14/2003	7/17/2003	11/5/2003	1/22/2004	3/17/2004	5/5/2004	7/8/2004
Sample time	7:30	15:45	16:55	7:50	7:50	8:15	8:05	15:46	16:01	7:20
Alkalinity as $CaCO_3$ (mg/L)	19	19	19	24	28	26	19	22	26	31
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.8	1	0.6	0.3	5.3	1.3	0.5	0.9	4.2
Chemical Oxygen Demand (mg/L)	6	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chlorophyll a (µg/L)				5.4	1.1				0.6	2.7
Pheophytin a (µg/L)				3.6	2.2				0.9	2.8
Conductivity (µmhos/cm)	69	63	56	65	73	67	60	66	68	78
E. Coli (CFU/100 mL)	42	0	1	20	20	6	1	<2	5	18
Total Kjeldahl Nitrogen (mg/L)	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.911	0.539	0.45	0.303	0.263	0.419	0.494	0.48	0.388	0.319
Dissolved Orthophosphate as P (mg/L)	0.007	0.012	0.015	0.006	0.01	0.006	0.01	0.009	0.009	0.007
Dissolved Oxygen (mg/L)	11.2	12	11.5	10.6	8.6	12.2	12	11.1	11.2	9.2
Percent Saturation Dissolved Oxygen (%)	98	100	99	97	90	94	95	99	105	90
pH (SU)	7.2	7.6	7.4	7.4	7.3	7.4	7.2	7.7	7.8	7.4
Total Phosphorus (mg/L)	0.03	0.02	0.03	0.01	0.02	0.01	0.01	0.02	0.02	0.01
Total Solids (mg/L)	59	47	52	49	47	53	48	47	45	64
Total Suspended Solids (mg/L)	8	2	6	2	<1	<1	<1	1	2	<1
Temperature (°C)	9.6	7.3	9	11.3	17.3	4.6	5.3	10.3	12.5	15.1
Turbidity (NTU)	6	4	8	1	2	1	2	1	2	1
Total Organic Carbon (mg/L)	2	<1	<1	<1	<1	<1	<1	1	<1	<1
Sample date	9/23/2004	11/2/2004	1/12/2005	3/24/2005	5/11/2005	7/26/2005	9/28/2005	11/2/2005	1/4/2006	3/9/2006
Sample time	8:25	16:03	8:32	8:20	16:34	16:28	8:00	15:10	16:00	7:38
Alkalinity as $CaCO_3$ (mg/L)	24	23	31	25	27	31	29	24	23	19
Ammonia as N mg/L	<0.02	0.03	<0.02	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.1	3.2	0.9	0.6	1.2	0.5	1	1	0.7	0.2
Chemical Oxygen Demand (mg/L)	<5	15	5	6	<5	5	<5	<5	6	<5
Chlorophyll a (µg/L)	0.9 est				2.4	0.6	0.9 est			
Pheophytin a (µg/L)	1.3 est				1.6	0.8	2.0 est			
Conductivity (µmhos/cm)	71	58	68	63	64	75	82	63	59	54
E. Coli (CFU/100 mL)	11	201	4	4	8	1	7		3	4
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.651	0.623	0.629	0.48	0.367	0.45	0.423	1.07	0.642	0.427
Dissolved Orthophosphate as P (mg/L)	0.01	0.009	0.01	0.009	0.009	0.01	0.006	0.013	0.015	0.011
Dissolved Oxygen (mg/L)	10.4	11	12.4	11.4	12.3	9.8	9.7	10.9	11.4	11.3
Percent Saturation Dissolved Oxygen (%)	96	97	97	95	111	108	90	96	95	87
pH (SU)	7.4	7.6	7.6	7.5	7.7	8.1	7.6	7.6	7.5	7.5
Total Phosphorus (mg/L)	0.02	0.1	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.04
Total Solids (mg/L)	55	83	45	73	52	52	59 est	72	56	54
Total Suspended Solids (mg/L)	<1	29	<1	2	2	<1	<1 est	3	2	10
Temperature (°C)	11.8	10	5.1	7.5	11	20.6	12	10	7.7	4.4
Turbidity (NTU)	2	18	2	<1	7	4	1	4	4	14
Total Organic Carbon (mg/L)	<1	3	<1 est	<1	<1	<1	<1	<1	<1	1

Wilson R at HWY 6, LASAR 13424

Tillamook Population

Sample date	5/4/2006	7/19/2006	9/13/2006	11/29/2006	1/24/2007	3/14/2007	5/9/2007	7/11/2007	9/26/2007	11/7/2007
Sample time	7:45	9:00	7:34	7:50	8:00	10:10	10:39	7:45	9:35	9:08
Alkalinity as $CaCO_3$ (mg/L)	26	30	30	22	20	21	24	29	34	27
Ammonia as N mg/L	0.02	0.04	0.02	0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	1.8	1	Void	1.1	0.3	0.3	0.6	1	0.7
Chemical Oxygen Demand (mg/L)	<5	<5	12					<5	<5	<5
Chlorophyll a (µg/L)	2.0 est	1.3	1.1					0.9	1.8	
Pheophytin a (µg/L)	3.0 est	2.8	2.4					1.6	2.5	
Conductivity (µmhos/cm)	67	79	87	63	64	58	67	78	96	75
E. Coli (CFU/100 mL)	7	14	16	5	<1	2	3	50	214	5
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.448	0.347	0.443	0.53	0.493	0.389	0.341	0.283	0.33	0.465
Dissolved Orthophosphate as P (mg/L)	0.011	0.006	0.006				0.009	0.007	<0.005	0.008
Dissolved Oxygen (mg/L)	10.7	9	9	12.4	12.3	11.8	10.9	8.2	9.2	11.7
Percent Saturation Dissolved Oxygen (%)	95	92.8	88	96	98	98	101	87	87	98
pH (SU)	8.3	7.7	7.4	7.7	7.3	7.5	7.8	7.5	7.4	7.7
Total Phosphorus (mg/L)	0.02	0.01	0.02	0.05	0.01	0.07	0.05	0.01	0.01	0.01
Total Solids (mg/L)	70	51 est	53	68	57	57	52	62	67	66
Total Suspended Solids (mg/L)	1	<1 est	1					<1	2	1
Temperature (°C)	10	17	14.9	4.7	5.7	7.4	11.9	19	13.1	7.9
Turbidity (NTU)	3	<1	2	15	2	17	<1	<1	2	2
Total Organic Carbon (mg/L)	<1	<1	<1					1	1	<1

Sample date	1/16/2008	3/5/2008	5/21/2008	7/9/2008
Sample time	9:50	9:14	9:20	9:27
Alkalinity as $CaCO_3$ (mg/L)	22	20	21	28
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.6	1.1	1.0 est	0.8
Chemical Oxygen Demand (mg/L)	<5	<5	<5	5
Chlorophyll a (µg/L)			2	3.3
Pheophytin a (µg/L)			1.6	3.5
Conductivity (µmhos/cm)	62	60	58	78
E. Coli (CFU/100 mL)	4	1	6	6
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.498	0.282	0.211	0.293
Dissolved Orthophosphate as P (mg/L)	0.014	0.011	0.007	0.007
Dissolved Oxygen (mg/L)	12.7	12.6	11.4	10
Percent Saturation Dissolved Oxygen (%)	100	100	100	102
pH (SU)	7.5	7.7	7.58	7.7
Total Phosphorus (mg/L)	0.12	0.02	0.02	0.02
Total Solids (mg/L)	95	50	42	68
Total Suspended Solids (mg/L)	32	1	2 est	3
Temperature (°C)	5.3	5.5	9.6	16.5
Turbidity (NTU)	35	4	2	2
Total Organic Carbon (mg/L)	<1	<1	<1	<1

Trask River at Hwy 101, LASAR 13433, **Tillamook Population**

Sample date	11/13/2002	1/7/2003	3/25/2003	5/13/2003	7/16/2003	11/5/2003	1/21/2004	3/17/2004	5/5/2004	7/8/2004
Sample time	15:45	15:15	16:22	16:15	16:10	7:25	15:02	15:18	15:28	6:50
Alkalinity as $CaCO_3$ (mg/L)	21	24	24	26	34	36	24	30	31	38
Ammonia as N mg/L	0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	0.04
Biochemical Oxygen DemandStream (mg/L)	1.7	0.7	0.7	0.9	0.4	1.2	1.4	0.8	1.3	0.4
Chemical Oxygen Demand (mg/L)	9	<5	<5	<5	<5	5	7	<5	7	6
Chlorophyll a (µg/L)				1.4	0.8 est				0.7	3.5
Pheophytin a (µg/L)				1.7	1.6 est				1.1	4.6
Conductivity (µmhos/cm)	91	79	69	79	92	90	76	82	84	95
E. Coli (CFU/100 mL)	114	7	3	5	12	20	4	2 est	16	41
Total Kjeldahl Nitrogen (mg/L)	0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2
Nitrate/nitrite as N (mg/L)	0.983	0.864	0.662	0.405	0.334	0.624	0.709	0.652	0.516	0.421
Dissolved Orthophosphate as P (mg/L)	0.008	0.014	0.016	0.009	0.014 est	0.008	0.012	0.01	0.011	0.008
Dissolved Oxygen (mg/L)	11.1	11.9	11.3	11.7	9.4	11.5	12.5	11.1	11.4	8.2
Percent Saturation Dissolved Oxygen (%)	94	100	98	113	103	89	101	99	107	80
pH (SU)	7.1	7.4	7.1	7.6	7.2	7.3	7.1	7.4	7.6	7.4
Total Phosphorus (mg/L)	0.03	0.03	0.04	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Total Solids (mg/L)	78	61	64	59	68	68	67	61	64	67
Total Suspended Solids (mg/L)	12	3	8	4	5	<1	3	3	3	2
Temperature (°C)	10.5	7.9	9.3	14.1	20.6	4.5	6.6	10.7	12.9	15.2
Turbidity (NTU)	13	5	11	2	2	2	2	2	2	2
Total Organic Carbon (mg/L)	3	<1	<1	2	<1	<1	<1	2	1	2

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/9/2006
Sample time	16:40	15:33	16:50	16:20	16:11	15:39	15:55	14:44	15:30	8:10
Alkalinity as $CaCO_3$ (mg/L)	29	28	28	31	31	53	38	25	27	23
Ammonia as N mg/L	<0.02	0.02	0.02	<0.02	<0.02	0.05	0.04	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	3	0.6	0.6	1.8	0.7	0.8	1.3	0.7	0.4
Chemical Oxygen Demand (mg/L)	7	16	9	<5	<5	6	<5	6	<5	6
Chlorophyll a (µg/L)	0.8 est				1.2	0.8	1.0 est			
Pheophytin a (µg/L)	0.9 est				1.2	1.7	2.3 est			
Conductivity (µmhos/cm)	84	73	87	84	79	95	100	80	76	67
E. Coli (CFU/100 mL)	28	1986	21	5	101	17	41	228	13	13
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.876	0.782	0.945	0.82	0.658	0.555	0.44	1.78	1.1	0.736
Dissolved Orthophosphate as P (mg/L)	0.013	0.011	0.014	0.012	0.014	0.012	0.008	0.013	0.014	0.013
Dissolved Oxygen (mg/L)	11	10.8	12.8	11.7	11.9	9.6	10.4	10.8	11.1	11.2
Percent Saturation Dissolved Oxygen (%)	103	96	99	99	109	105	101	96	95	88
pH (SU)	7.6	7.6	7	7.4	7.3	7.5	7.6	7.2	7.3	7.3
Total Phosphorus (mg/L)	0.02	0.11	0.02	0.02	0.02	0.02	0.02	0.04	0.03	0.05
Total Solids (mg/L)	66	110	60	90	71	62	72 est	88	70	80
Total Suspended Solids (mg/L)	2	33	2	3	4	<1	<1 est	6	4	18
Temperature (°C)	12.5	10.2	4.4	8.2	11.4	20.3	14.6	10.2	7.9	4.7
Turbidity (NTU)	3	20	1	2	7	2	2	5	6	16
Total Organic Carbon (mg/L)	1	3	<1 est	<1	<1	<1	<1	1	<1	2

Trask River at Hwy 101, LASAR 13433, **Tillamook Population**

Sample date	5/3/2006	7/19/2006	9/12/2006	11/28/2006	1/23/2007	3/14/2007	5/9/2007	7/10/2007	9/26/2007	11/7/2007
Sample time	16:10	7:45	16:32	16:10	16:30	9:45	10:15	16:30	7:40	8:39
Alkalinity as $CaCO_3$ (mg/L)	30	40	39	26	28	24	31	38	40	34
Ammonia as N mg/L	0.02	0.05	0.03	<0.02	0.1	<0.02	0.02	0.06	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.2	1.1	1	0.8	0.6	1.1	1.2	0.7	0.6	1.2
Chemical Oxygen Demand (mg/L)	<5	6	5					<5	5	<5
Chlorophyll a (µg/L)	0.7 est	2.1	0.8					1	2.6	
Pheophytin a (µg/L)	1.4 est	4.7	1.6					2.1	3.2	
Conductivity (µmhos/cm)	84	97	105	79	82	71	83	96	106	98
E. Coli (CFU/100 mL)	10	28	35	8	1	18	17	31	35	32
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.598	0.414	0.466	0.902	0.754	0.595	0.518	0.348	0.336	0.594
Dissolved Orthophosphate as P (mg/L)	0.01	0.008	0.008				0.01	0.01	<0.005	0.008
Dissolved Oxygen (mg/L)	11	8.3	10.3	11.9	11.7	11.7	10.9	9.5	8.9	11.1
Percent Saturation Dissolved Oxygen (%)	105	82.2	106	95	97	97	100	108	80	92
pH (SU)	7.1	7.3	7.3	7.4	7.3	7.3	7.5	7.4	7.5	7.4
Total Phosphorus (mg/L)	0.03	0.02	0.02	0.06	0.02	0.03	0.02	0.02	0.02	0.01
Total Solids (mg/L)	69	64 est	76	77	69	54	66	73	71	81
Total Suspended Solids (mg/L)	3	2 est	<1					5	3	1
Temperature (°C)	13.3	15.7	16.9	6.1	7.5	7.4	11.4	23.8	11.2	7.4
Turbidity (NTU)	2	2	3	17	2	7	4	2	3	1
Total Organic Carbon (mg/L)	<1	<1	<1					1	1	<1

Sample date	1/16/2008	3/5/2008	5/21/2008	7/9/2008
Sample time	9:20	8:40	8:20	8:53
Alkalinity as $CaCO_3$ (mg/L)	26	25	26	36
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.4	1.5	1.2 est	0.9
Chemical Oxygen Demand (mg/L)	<5	<5	7	5
Chlorophyll a (µg/L)			2.5	2.9
Pheophytin a (µg/L)			2.8	3.9
Conductivity (µmhos/cm)	76	75	76	97
E. Coli (CFU/100 mL)	4			19
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.79	0.456	0.37	
Dissolved Orthophosphate as P (mg/L)	0.016	0.01	0.009	0.01
Dissolved Oxygen (mg/L)	12.5	12.5	11	9.1
Percent Saturation Dissolved Oxygen (%)	99	100	97	90
pH (SU)	7.3	7.5	7.43	7.3
Total Phosphorus (mg/L)	0.11	0.02	0.03	0.03
Total Solids (mg/L)	92	61	63	79
Total Suspended Solids (mg/L)	22	2	5 est	1
Temperature (°C)	5.5	5.7	10.1	15.5
Turbidity (NTU)	22	3	4	2
Total Organic Carbon (mg/L)	1	1	1	<1

Tillamook River at Bewley Creek Road, Lasar 13440 Tillamook Population

Sample date	11/13/2002	1/7/2003	3/25/2003	5/13/2003	7/16/2003	11/4/2003	1/21/2004	3/17/2004	5/5/2004	7/7/2004
Sample time	15:30	14:55	16:00	15:45	15:40	16:50	14:30	14:58	15:05	16:25
Alkalinity as $CaCO_3$ (mg/L)	16	13	13	16	21	22	14	18	17	23
Ammonia as N mg/L	0.03	0.04	<0.02	<0.02	0.04	<0.02	<0.02	0.03	0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	1.1	0.6	0.3	0.4	0.7	0.6	0.8	0.5	1	0.5
Chemical Oxygen Demand (mg/L)	12	<5	<5	<5	5	<5	10	<5	5	<5
Chlorophyll a (µg/L)				1.4	0.8				0.9	0.7
Pheophytin a (µg/L)				1.9	3.9				1.6	1.5
Conductivity (µmhos/cm)	84	67	59	65	77	74	66	67	68	75
E. Coli (CFU/100 mL)	1733	50	228	51	270	248	16	19	122	118
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.13	1.2	0.966	0.626	0.578	0.842	1.03	0.914	0.764	0.662
Dissolved Orthophosphate as P (mg/L)	0.01	0.011	0.01	0.008	0.017	0.008	0.008	0.007	0.008	0.01
Dissolved Oxygen (mg/L)	10.5	11.4	10.8	10.8	9.1	11.9	12.2	10.5	11	9.7
Percent Saturation Dissolved Oxygen (%)	95	98	96	107	99	99	101	96	104	101
pH (SU)	7.3	7.2	7.3	7.2	7.2	7.4	7.2	7.3	7.8	7.4
Total Phosphorus (mg/L)	0.04	0.03	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02
Total Solids (mg/L)	70	51	48	50	61	35	62	50	49	53
Total Suspended Solids (mg/L)	7	3	3	3	2	1	2	2	1	<1
Temperature (°C)	11.2	9.2	10.2	15.6	20.1	7.4	7.5	11.5	13	17.5
Turbidity (NTU)	9	3	4	3	3	2	3	3	2	2
Total Organic Carbon (mg/L)	3	1	<1	1	2	1	1	2	2	2

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/8/2006
Sample time	16:18	15:14	16:30	16:00	15:53	15:24	15:26	14:20	15:10	17:00
Alkalinity as $CaCO_3$ (mg/L)	15	15	15	17	21	25	28	12	18	15
Ammonia as N mg/L	<0.02	0.02	0.02	<0.02	<0.02	0.03	0.04	0.04	<0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	1.8	1.1	0.6	1.5	0.6	0.4	1.3	0.4	2
Chemical Oxygen Demand (mg/L)	<5	15	<5	8	9	7	6	10	6	22
Chlorophyll a (µg/L)	1.3 est				2.9	0.9	0.5 est			
Pheophytin a (µg/L)	1.0 est				2.4	2.2	1.4 est			
Conductivity (µmhos/cm)	68	61	65	69	63	77	86	62	61	54
E. Coli (CFU/100 mL)	411	1733	64	142	488	1986	126		34	1986
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	0.7
Nitrate/nitrite as N (mg/L)	1.01	1.05	1.16	0.912	0.827	0.715	0.621	1.55	1.28	0.789
Dissolved Orthophosphate as P (mg/L)	0.013	0.011	0.008	0.008	0.012	0.01	0.007	0.015	0.01	0.01
Dissolved Oxygen (mg/L)	10.3	10.5	12.1	11.4	11.3	9.9	10.2	10.1	10.7	11.3
Percent Saturation Dissolved Oxygen (%)	97	95	96	99	103	106	99	91	92	94
pH (SU)	7.4	7.2	7.3	7.4	7.3	7.8	7.5	7.1	7.2	7.2
Total Phosphorus (mg/L)	0.03	0.07	0.02	0.02	0.03	0.02	0.02	0.05	0.03	0.16
Total Solids (mg/L)	60	76	45	64	61	60	52 est	81	56	120
Total Suspended Solids (mg/L)	3	18	<1	1	6	<1	<1 est	10	4	68
Temperature (°C)	13.1	10.8	5.4	8.9	11.5	19.5	14.4	11	8.8	7.4
Turbidity (NTU)	4	12	2	2	10	3	2	7	4	60
Total Organic Carbon (mg/L)	2	4	<1 est	1	1	1	1	2	<1	3

Tillamook River at Bewley Creek Road, Lasar 13440 Tillamook Population

Sample date	5/3/2006	7/19/2006	9/12/2006	11/28/2006	1/23/2007	3/14/2007	5/9/2007	7/10/2007	9/26/2007	11/7/2007
Sample time	15:50	8:15	16:12	15:40	15:55	9:30	9:50	16:00	8:15	8:17
Alkalinity as $CaCO_3$ (mg/L)	17	29	29	15	13	15	18	24	30	22
Ammonia as N mg/L	<0.02	0.03	0.04	<0.02	0.02	<0.02	<0.02	0.07	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.9	1.2	1.9	0.8	1	0.8	1.1	0.9	0.6	1
Chemical Oxygen Demand (mg/L)	5	8	9					8	5	9
Chlorophyll a (µg/L)	1.5 est	1.4	1.4					0.8	1	
Pheophytin a (µg/L)	4.4 est	14	7					2.4	4	
Conductivity (µmhos/cm)	67	80	93	65	66	60	68	82	94	78
E. Coli (CFU/100 mL)	579	>2420	>2420	48	8	29	91	>2420	1553	435
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.4							
Nitrate/nitrite as N (mg/L)	0.774	0.739	0.595	1.07	1.01	0.812	0.663	0.727	0.582	0.739
Dissolved Orthophosphate as P (mg/L)	0.008	0.022	0.028				0.007	0.016	0.009	0.008
Dissolved Oxygen (mg/L)	10.7	9.5	9.4	11.5	11.5	11.3	11.7	9	8.9	11.3
Percent Saturation Dissolved Oxygen (%)	104	89.6	90	93	97	95	104	103	80	93
pH (SU)	7.7	7.1	7.2	7.1	7.4	7.2	7.4	7	7.1	7.4
Total Phosphorus (mg/L)	0.02	0.05	0.08	0.02	0.02	0.02	0.02	0.05	0.02	0.02
Total Solids (mg/L)	66	56 est	73	57	54	48	52	66	65	68
Total Suspended Solids (mg/L)	2	4 est	5					5	2	2
Temperature (°C)	14.4	13.2	17.1	6.7	8.2	8.1	9.8	22.4	10.8	7.3
Turbidity (NTU)	3	4	7	4	2	4	2	6	3	2
Total Organic Carbon (mg/L)	<1	1	1					2	1	2

Sample date	1/16/2008	3/5/2008	5/21/2008	7/9/2008
Sample time	9:00	8:10	8:00	8:31
Alkalinity as $CaCO_3$ (mg/L)	16	15	16	20
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.6	1	1.6 est	0.9
Chemical Oxygen Demand (mg/L)	6	<5	10	5
Chlorophyll a (µg/L)			2.7	1.4
Pheophytin a (µg/L)			3.4	2.2
Conductivity (µmhos/cm)	65	69	67	78
E. Coli (CFU/100 mL)	58	32	2420	184
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	1.08	0.748	0.537	0.657
Dissolved Orthophosphate as P (mg/L)	0.011	0.007	0.009	0.008
Dissolved Oxygen (mg/L)	12.2	12.5	11	9.9
Percent Saturation Dissolved Oxygen (%)	96	97	97	95
pH (SU)	7.2	7.4	7.4	7.1
Total Phosphorus (mg/L)	0.02	0.01	0.05	0.02
Total Solids (mg/L)	57	55	58	68
Total Suspended Solids (mg/L)	5	2	10 est	1
Temperature (°C)	5.4	4.8	10.1	13..8
Turbidity (NTU)	3	2	6	3
Total Organic Carbon (mg/L)	1	1	2	1

Necanicum River at Forest Lake RV Camp (Seaside), LASAR 10521, Necanicum Population

Sample date	11/14/2002	1/8/2003	3/26/2003	5/14/2003	7/17/2003	11/5/2003	1/22/2004	3/18/2004	5/6/2004	7/8/2004
Sample time	11:05	10:20	10:23	11:10	11:00	12:30	11:12	10:40	11:03	11:00
Alkalinity as $CaCO_3$ (mg/L)	7	10	8	12	16	14	10	11	11	12
Ammonia as N mg/L	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.8	0.5	0.6	<0.1	0.2	1.4	0.9	1.1	0.5
Chemical Oxygen Demand (mg/L)	9	<5	<5	<5	<5	<5	<5	<5	6	<5
Chlorophyll a (µg/L)				0.7	0.5				0.5	0.6
Pheophytin a (µg/L)				1.3	0.9				0.9	1
Conductivity (µmhos/cm)	59	55	46	54	60	54	52	54	54	61
E. Coli (CFU/100 mL)	214	19	14	15	28	18	11	28	23	96
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.781	0.551	0.453	0.281	0.129	0.354	0.494	0.383	0.285	0.193
Dissolved Orthophosphate as P (mg/L)	<0.005	0.008	0.008	0.005	0.005	0.005	<0.005	<0.005	0.006	<0.005
Dissolved Oxygen (mg/L)	10.8	11.4	11.3	10.7	8.5	12	12.2	11	10.8	9.5
Percent Saturation Dissolved Oxygen (%)	96	95	96	96	89	98	98	93	99	94
pH (SU)	7.2	7.1	7.1	7	7.3	7.3	7.3	7.1	7.2	7.1
Total Phosphorus (mg/L)	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Solids (mg/L)	56	44	36	44	42	46	43	46	44	39
Total Suspended Solids (mg/L)	3	1	2	2	<1	<1	<1	2	<1	<1
Temperature (°C)	10.3	7.5	8.7	10.9	17.5	6.8	6.2	9	11.7	15.7
Turbidity (NTU)	5	2	2	1	1	2	2	2	1	<1
Total Organic Carbon (mg/L)	3	1	<1	<1	<1	1	<1	2	1	1

Sample date	9/23/2004	11/3/2004	1/12/2005	3/24/2005	5/12/2005	7/27/2005	9/28/2005	11/3/2005	1/5/2006	3/9/2006
Sample time	11:45	10:58	12:18	12:00	10:45	9:55	11:12	11:30	11:10	11:40
Alkalinity as $CaCO_3$ (mg/L)	9	11	10	9	18	14	17	11	11	12
Ammonia as N mg/L	<0.02	0.03	<0.02	<0.02	<0.02	0.02	0.02	0.04	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.3	0.7	1.4	0.5	1.1	0.3	0.3	1.2	0.4	0.4
Chemical Oxygen Demand (mg/L)	<5	<5	6	<5	6	<5	<5	21	7	5
Chlorophyll a (µg/L)	0.9 est				0.6	<0.1 est	0.4 est			
Pheophytin a (µg/L)	0.9 est				0.9	3.1 est	1.2 est			
Conductivity (µmhos/cm)	54	50	51	52	51	57	67	48	48	44
E. Coli (CFU/100 mL)	28	47	9	13	22	37	24	548	19	108
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.429	0.641	0.524	0.523	0.422	0.251	0.0791	0.798	0.577	0.569
Dissolved Orthophosphate as P (mg/L)	0.006	<0.005	0.005	0.005	0.006	0.006	0.005	0.006	0.007	0.005
Dissolved Oxygen (mg/L)	10.5	11.4	12.2	11.6	11.2	9.3	9.2	10.5	10.5	11.3
Percent Saturation Dissolved Oxygen (%)	99	99	99	96	102	92	87	93	93	91
pH (SU)	7.1	7	7.1	7.2	7.3	7.1	6.9	7.1	7.1	7.2
Total Phosphorus (mg/L)	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.08	0.02	0.02
Total Solids (mg/L)	51	46	32	60	45	42	51 est	84	40	49
Total Suspended Solids (mg/L)	1	2	1	2	1	<1	<1 est	34	6	8
Temperature (°C)	13	9.2	6.5	7.6	10.5	15.6	13	9.9	9.8	6.2
Turbidity (NTU)	2	5	2	1	<1	1	3	28	6	7
Total Organic Carbon (mg/L)	1	2	<1 est	<1	<1	<1	<1	5	1	9

Necanicum River at Forest Lake RV Camp (Seaside), LASAR 10521, Necanicum Population

Sample date	5/4/2006	7/19/2006	9/13/2006	11/29/2006	1/24/2007	3/14/2007	5/9/2007	7/11/2007	9/26/2007	11/7/2007
Sample time	10:55	12:36	10:30	10:55	10:50	13:33	14:35	10:50	12:53	11:24
Alkalinity as $CaCO_3$ (mg/L)	12	14	17	10	10	10	11	15	17	16
Ammonia as N mg/L	<0.02	0.02	<0.02	<0.02	<0.02	0.07	<0.02	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.2	0.4	0.8	0.9	1.1	0.7	1.8	0.6	0.2	0.8
Chemical Oxygen Demand (mg/L)	5	<5	6					<5	<5	<5
Chlorophyll a (µg/L)	0.8 est	0.7	0.6					0.6	0.4	
Pheophytin a (µg/L)	2.3 est	1.2	1.3					0.8	0.8	
Conductivity (µmhos/cm)	54	61	71	51	55	47	53	63	72	59
E. Coli (CFU/100 mL)	1	26	101	12	15	5	4	48	57	32
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.309	0.187	0.0636	0.541	0.487	0.459	0.274	0.153	0.0732	0.319
Dissolved Orthophosphate as P (mg/L)	<0.005	0.005	<0.005				0.005	0.005	0.005	0.006
Dissolved Oxygen (mg/L)	10.6	9.5	8.3	12	11.6	11.5	10.9	8.5	9.2	11.6
Percent Saturation Dissolved Oxygen (%)	95	99	81	95	94	98	103	89	89	101
pH (SU)	7.6	7.1	6.9	7.2	7.2	7.1	7.2	7.1	7.1	7.2
Total Phosphorus (mg/L)	0.01	0.01	0.01	0.01	<0.01	0.02	0.01	<0.01	0.01	0.01
Total Solids (mg/L)	54	41 est	53	43	46	38	49	53	59	58
Total Suspended Solids (mg/L)	<1	<1 est	<1					<1	1	1
Temperature (°C)	11.2	17.5	14.8	5.5	6.7	8.4	13	17.8	14.6	9.3
Turbidity (NTU)	1	<1	2	3	4	4	<1	1	2	1
Total Organic Carbon (mg/L)	<1	<1	<1					2	1	1

Sample date	1/16/2008	3/5/2008	5/21/2008	7/9/2008
Sample time	12:35	13:05	12:45	13:25
Alkalinity as $CaCO_3$ (mg/L)	10	8	12	12
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.9	1.3	1.4 est	0.6
Chemical Oxygen Demand (mg/L)	<5	<5	11	10
Chlorophyll a (µg/L)			3.9	0.5
Pheophytin a (µg/L)			2.7	0.6
Conductivity (µmhos/cm)	52	57	56	62
E. Coli (CFU/100 mL)	6	9	1553	62
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.572	0.399	0.272	0.239
Dissolved Orthophosphate as P (mg/L)	0.005	0.006	0.005 est	0.006
Dissolved Oxygen (mg/L)	12	12.5	10.9	9.6
Percent Saturation Dissolved Oxygen (%)	96	103	97	99
pH (SU)	7.1	7.2	7.05	7.1
Total Phosphorus (mg/L)	0.01	0.02	0.03	0.02
Total Solids (mg/L)	52	47	52	62
Total Suspended Solids (mg/L)	2	<1	9	<1
Temperature (°C)	6.2	7.2	10.7	16.8
Turbidity (NTU)	5	2	7	2
Total Organic Carbon (mg/L)	<1	1	3	1

Alsea River at Thissell Road (Mike Bauer Park), LASAR 11263, Alsea Population

Sample date	11/13/2002	1/7/2003	3/25/2003	5/13/2003	7/16/2003	11/4/2003	1/21/2004	3/17/2004	5/5/2004	7/7/2004
Sample time	10:00	10:10	10:45	10:25	10:35	10:40	9:50	9:50	10:06	10:45
Alkalinity as $CaCO_3$ (mg/L)	18	14	16	20	23	28	16	21	23	26
Ammonia as N mg/L	0.03	<0.02	<0.02	0.04	0.03	0.03	<0.02	0.02	0.02	0.04
Biochemical Oxygen DemandStream (mg/L)	1.2	0.2	0.3	0.9	0.7	1.5	0.6	0.7	1	0.7
Chemical Oxygen Demand (mg/L)	11	<5	<5	<5	5	7	5	<5	<5	6
Chlorophyll a (µg/L)				1.7	1.4				1.6	1.1
Pheophytin a (µg/L)				3.4	2.2				3.1	2.2
Conductivity (µmhos/cm)	69	57	52	59	66	73	56	60	61	69
E. Coli (CFU/100 mL)	77	15	9	18	4	20	17	14	15	7
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.886	0.625	0.561	0.286	0.0798	0.0662	0.526	0.408	0.296	0.106
Dissolved Orthophosphate as P (mg/L)	0.012	0.014	0.013	0.008	0.007	0.009	0.011	0.011	0.008	0.008
Dissolved Oxygen (mg/L)	10.4	11.4	11.1	11	8.3	11.8	11.6	10.8	10.6	8.4
Percent Saturation Dissolved Oxygen (%)	92	96	96	102	90	94	96	94	99	91
pH (SU)	7.4	7.3	7.3	7.5	7.4	7.5	7.2	7.4	7.6	7.4
Total Phosphorus (mg/L)	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Total Solids (mg/L)	66	46	51	46	53	44	52	49	44	55
Total Suspended Solids (mg/L)	8	5	7	3	1	1	3	3	1	1
Temperature (°C)	10.3	7.9	9.1	11.9	20.2	5.8	7.5	9.7	12.6	20
Turbidity (NTU)	8	6	9	2	2	1	3	2	2	1
Total Organic Carbon (mg/L)	4	<1	<1	1	2	2	1	2	1	2

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/8/2006
Sample time	10:25	10:17	11:10	10:40	9:58	10:02	10:20	9:40	9:50	10:33
Alkalinity as $CaCO_3$ (mg/L)	21	25	17	22	25	28	29	18	15	20
Ammonia as N mg/L	0.03	0.02	<0.02	0.02	<0.02	0.05	0.04	0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.7	1.7	0.6	2	1	0.8	1.3	0.2	1.2
Chemical Oxygen Demand (mg/L)	9	<5	8	6	11	8	6	16	8	5
Chlorophyll a (µg/L)	1.0 est				2.2	1.2	0.8 est			
Pheophytin a (µg/L)	2.2 est				3.9	2.3	3.3 est			
Conductivity (µmhos/cm)	70	65	59	62	61	66	77	67	50	53
E. Coli (CFU/100 mL)	40	49	12	27	86	6	2	20	15	20
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.661	0.605	0.914	0.687	0.522	0.214	0.102	1.74	0.712	0.558
Dissolved Orthophosphate as P (mg/L)	0.011	0.012	0.012	0.011	0.014	0.01	0.012	0.015	0.014	0.011
Dissolved Oxygen (mg/L)	9.8	10.7	11.7	11.1	11.4	8.2	9.5	10.1	10.5	11.9
Percent Saturation Dissolved Oxygen (%)	93	95	94	96	104	87	90	91	89	100
pH (SU)	7.5	7.5	7.2	7.5	7.3	7.6	7.4	7.4	7.2	7.4
Total Phosphorus (mg/L)	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.07	0.06	0.03
Total Solids (mg/L)	56	53	41	51	64	55	56 est	73	60	51
Total Suspended Solids (mg/L)	3	1	3	3	9	<1	1 est	14	16	7
Temperature (°C)	13.5	10.2	6.3	9.2	11.3	19.2	13.5	10.8	8.6	7.8
Turbidity (NTU)	3	3	3	4	11	2	2	13	19	6
Total Organic Carbon (mg/L)	2	2	1 est	1	2	1	2	4	1	2

Alsea River at Thissell Road (Mike Bauer Park), LASAR 11263, Alsea Population

Sample date	5/3/2006	7/18/2006	9/12/2006	11/28/2006	1/23/2007	3/13/2007	5/8/2007	7/10/2007	9/25/2007	11/6/2007
Sample time	9:45	10:45	10:18	9:40	10:00	11:58	11:50	10:00	9:45	10:00
Alkalinity as $CaCO_3$ (mg/L)	22	26	28	16	20	16	22	28	30	27
Ammonia as N mg/L	<0.02	0.03	0.04	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	1.5	0.7	0.6	1	0.6	0.9	0.9	0.7	1.2
Chemical Oxygen Demand (mg/L)	<5	<5	8					<5	8	<5
Chlorophyll a (µg/L)	1.6 est		1.1					1.4	0.7	
Pheophytin a (µg/L)	4.7 est		3.2					1.8	3.1	
Conductivity (µmhos/cm)	61	70	78	53	59	54	59	70	79	73
E. Coli (CFU/100 mL)	6	7	4	25	4	4	10	14	8	
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.356	0.137	0.0796	0.656	0.51	0.417	0.259	0.102	0.0587	0.258
Dissolved Orthophosphate as P (mg/L)	0.005	0.014	0.007				0.006	0.007	0.01	0.009
Dissolved Oxygen (mg/L)	10.4	8.1	8.5	11.5	11.8	11.5	10.6	7.3	9.6	11.2
Percent Saturation Dissolved Oxygen (%)	93	88	88	93	96	100	102	83	91	94
pH (SU)	7.6	7.5	7.5	7.4	7.3	7.4	7.7	7.5	7.6	7.7
Total Phosphorus (mg/L)	0.01	0.02	0.03	0.03	0.02	0.02	0.02	0.02	0.03	0.02
Total Solids (mg/L)	56	55	59	61	56	54	49	53	57	63
Total Suspended Solids (mg/L)	<1	1	3					<1	3	1
Temperature (°C)	10.7	20.1	17.1	6.6	6.6	9.5	14.2	21.4	12.9	8.1
Turbidity (NTU)	3	2	3	5	2	5	2	<1	2	1
Total Organic Carbon (mg/L)	<1	1	<1					2	2	2

Sample date	1/15/2008	3/4/2008	5/20/2008	7/8/2008
Sample time	11:13	10:00	10:00	11:47
Alkalinity as $CaCO_3$ (mg/L)	17	20	22	26
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	2.1 est	2.1	1.7 est	1
Chemical Oxygen Demand (mg/L)	<5	<5	<5	5
Chlorophyll a (µg/L)			2.2	0.8
Pheophytin a (µg/L)			3.9	2.2
Conductivity (µmhos/cm)	53	59	64	68
E. Coli (CFU/100 mL)	8			3
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.587	0.364	0.23	0.0803
Dissolved Orthophosphate as P (mg/L)	0.013	0.012	0.007	0.007
Dissolved Oxygen (mg/L)	12.3	12.3	9.8	9.3
Percent Saturation Dissolved Oxygen (%)	101	100	98	100
pH (SU)	7.3	7.6	7.5	7.7
Total Phosphorus (mg/L)	0.03	0.02	0.02	0.02
Total Solids (mg/L)	57	46	50	57
Total Suspended Solids (mg/L)	12	<1	2	<1
Temperature (°C)	6.7	6.8	15.7	19.7
Turbidity (NTU)	11	2	2	1
Total Organic Carbon (mg/L)	<1	<1	1	1

North Fork Beaver Creek at Ona Grange river mile 4.8, LASAR 33644 Beaver Population

Sample date	7/18/2006	9/12/2006	11/28/2006	1/23/2007	3/13/2007	5/8/2007	7/10/2007	9/25/2007	11/6/2007	1/15/2008
Sample time	11:54	11:24	10:45	11:10	14:25	13:00	11:10	10:45	10:59	13:09
Alkalinity as $CaCO_3$ (mg/L)	20	21	13	14	12	17	16	21	22	13
Ammonia as N mg/L	0.03	<0.02	0.03	0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.5	0.6	0.5	0.5	1.1	0.6	0.7	0.3	1.3	0.9
Chemical Oxygen Demand (mg/L)	<5	5					<5	<5	<5	<5
Chlorophyll a (µg/L)		0.4					0.6	0.4		
Pheophytin a (µg/L)		1.1					1.3	1.4		
Conductivity (µmhos/cm)	76	82	67	69	65	69	75	83	83	65
E. Coli (CFU/100 mL)	160	99	15	9	14	61	131	147	186	10
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2								
Nitrate/nitrite as N (mg/L)	0.49	0.332	1.05	0.838	0.82	0.637	0.424	0.299	0.573	0.987
Dissolved Orthophosphate as P (mg/L)	0.019	0.013				0.011	0.015	0.014	0.01	0.012
Dissolved Oxygen (mg/L)	9.8	9.8	10.9	11	11.3	10.2	9	10.2	10.9	11.5
Percent Saturation Dissolved Oxygen (%)	96.1	93	89	91	97	94	90	91	89	95
pH (SU)	7.2	7.2	7	7.2	6.9	7.1	7.2	7.2	7.2	6.9
Total Phosphorus (mg/L)	0.03	0.03	0.03	0.03	0.02	0.03	0.04	0.03	0.02	0.03
Total Solids (mg/L)	61	60	63	63	58	53	60	59	69	60
Total Suspended Solids (mg/L)	3	<1					2	3	1	8
Temperature (°C)	14.9	13.4	7.2	7.3	9.2	12.2	16.1	10.5	7.2	7.5
Turbidity (NTU)	2	3	4	3	5	3	2	3	2	5
Total Organic Carbon (mg/L)	1	<1					2	1	1	<1

Sample date	3/4/2008	5/20/2008	7/8/2008
Sample time	10:48	11:00	12:48
Alkalinity as $CaCO_3$ (mg/L)	14	15	20
Ammonia as N mg/L	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.6	1.1	1
Chemical Oxygen Demand (mg/L)	<5	<5	5
Chlorophyll a (µg/L)		1.2	0.1
Pheophytin a (µg/L)		2.5	1.3
Conductivity (µmhos/cm)	72	74	76
E. Coli (CFU/100 mL)			66
Total Kjeldahl Nitrogen (mg/L)			
Nitrate/nitrite as N (mg/L)	0.719	0.638	0.478
Dissolved Orthophosphate as P (mg/L)	0.013	0.012	0.019
Dissolved Oxygen (mg/L)	11	9.4	9.7
Percent Saturation Dissolved Oxygen (%)	92	89	96
pH (SU)	7.3	7	7.2
Total Phosphorus (mg/L)	0.03	0.04	0.03
Total Solids (mg/L)	56	60	58
Total Suspended Solids (mg/L)	4	7	3
Temperature (°C)	7.7	12.9	15.6
Turbidity (NTU)	4	4	3
Total Organic Carbon (mg/L)	1	1	1

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L
Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L
Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Salmon River at Old Scenic Hwy 101 (Otis), LASAR 11241 Salmon Population

Sample date	11/13/2002	1/7/2003	3/25/2003	5/13/2003	7/16/2003	11/4/2003	1/21/2004	3/17/2004	5/5/2004	7/7/2004
Sample time	13:30	13:30	14:25	14:15	13:50	15:10	13:06	13:30	13:20	14:50
Alkalinity as $CaCO_3$ (mg/L)	16	20	19	22	28	24	18	26	28	29
Ammonia as N mg/L	0.03	<0.02	<0.02	<0.02	0.05	<0.02	0.14	<0.02	0.07	0.03
Biochemical Oxygen DemandStream (mg/L)	1.5	0.5	0.4	1	0.9	0.8	1	1.1	1.2	0.6
Chemical Oxygen Demand (mg/L)	16	<5	<5	<5	<5	<5	10	<5	<5	<5
Chlorophyll a (µg/L)				2.1	1.6				0.9	1
Pheophytin a (µg/L)				1.9	2.1				1.3	1.6
Conductivity (µmhos/cm)	67	73	61	71	80	72	66	107	76	82
E. Coli (CFU/100 mL)	142	12	9	12	61	22	17	15	23	44
Total Kjeldahl Nitrogen (mg/L)	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2
Nitrate/nitrite as N (mg/L)	0.621	0.731	0.543	0.37	0.16	0.293	0.604	0.512	0.409	0.279
Dissolved Orthophosphate as P (mg/L)	0.007	0.015	0.015	0.01	0.01	0.01	0.012	0.018	0.01	0.01
Dissolved Oxygen (mg/L)	11	11.7	11.2	11.8	11.1	12.6	12.4	11.3	11.8	10.6
Percent Saturation Dissolved Oxygen (%)	98	101	98	111	117	101	100	101	109	109
pH (SU)	7.4	7.5	7.3	7.7	8.3	7.5	7.2	7.5	7.8	8
Total Phosphorus (mg/L)	0.04	0.02	0.03	0.02	0.02	0.01	0.02	0.02	0.02	0.02
Total Solids (mg/L)	74	53	54	53	62	38	57	67	60	89
Total Suspended Solids (mg/L)	17	2	4	3	<1	<1	1	1	<1	1
Temperature (°C)	10.5	8.8	9.4	13.1	18.4	5.8	6.8	10.3	11.9	16.9
Turbidity (NTU)	12	3	6	3	2	1	3	1	2	1
Total Organic Carbon (mg/L)	4	<1	<1	<1	1	1	1	2	1	1

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/8/2006
Sample time	14:35	13:46	15:00	14:05	13:30	13:55	14:05	12:55	13:45	15:34
Alkalinity as $CaCO_3$ (mg/L)	19	17	25	22	23	32	31	17	21	16
Ammonia as N mg/L	<0.02	0.02	0.02	<0.02	<0.02	0.05	0.04	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	1.4	1.5	1.5	1.8	0.7	0.9	1.2	0.3	1.3
Chemical Oxygen Demand (mg/L)	<5	17	<5	6	6	6	7	8	<5	<5
Chlorophyll a (µg/L)	0.7 est				1.4	1.5	0.7 est			
Pheophytin a (µg/L)	1.0 est				1.1	1.3	2.0 est			
Conductivity (µmhos/cm)	66	57	77	65	58	81	88	61	61	55
E. Coli (CFU/100 mL)	75	613	8	3	47	21	50	50	12	142
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.469	0.529	0.815	0.502	0.464	0.329	0.278	1.14	0.736	0.541
Dissolved Orthophosphate as P (mg/L)	0.01	0.012	0.014	0.011	0.012	0.013	0.014	0.011	0.012	0.012
Dissolved Oxygen (mg/L)	11.1	10.6	12.6	12.2	11.8	11.6	11.4	10.8	10.8	11.5
Percent Saturation Dissolved Oxygen (%)	103	95	99	103	106	122	108	96	91	95
pH (SU)	7.7	7.4	7.4	7.6	7.4	8.4	7.9	7.4	7.4	7.3
Total Phosphorus (mg/L)	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.08
Total Solids (mg/L)	54	110	29	69	57	67	53 est	62	64	130 est
Total Suspended Solids (mg/L)	2	41	<1	2	4	<1	<1 est	8	4	28
Temperature (°C)	12.1	10.8	5.4	8.2	10.7	17.8	13	10.2	8.2	7.2
Turbidity (NTU)	2	30	1	3	8	2	2	10	4	27
Total Organic Carbon (mg/L)	1	4	<1 est	<1	1	<1	<1	2	<1	2

Salmon River at Old Scenic Hwy 101 (Otis), LASAR 11241 Salmon Population

Sample date	5/3/2006	7/18/2006	9/12/2006	11/28/2006	1/23/2007	3/13/2007	5/8/2007	7/10/2007	9/25/2007	11/6/2007
Sample time	14:20	15:43	14:47	14:10	14:25	16:30	15:30	14:15	13:53	14:43
Alkalinity as $CaCO_3$ (mg/L)	25	30	32	22	23	17	25	32	31	26
Ammonia as N mg/L	<0.02	0.04	0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.4	0.5	1.1	0.8	0.4	0.5	1.2	2.1	0.6	1.1
Chemical Oxygen Demand (mg/L)	<5	<5	<5					<5	6	<5
Chlorophyll a (µg/L)	2.1 est		0.5					0.8	0.8	
Pheophytin a (µg/L)	2.8 est		1.3					1.1	1.9	
Conductivity (µmhos/cm)	74	84	93	74	72	60	73	84	90	81
E. Coli (CFU/100 mL)	5	22	16	5	1	5	2	45	34	32
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.447	0.322	0.273	0.687	0.57	0.479	0.374	0.268	0.182	0.425
Dissolved Orthophosphate as P (mg/L)	0.009	0.021	0.011				0.013	0.012	0.012	0.01
Dissolved Oxygen (mg/L)	12.2	10.4	10.9	11.9	12	11.6	11.4	10.4	11.4	12
Percent Saturation Dissolved Oxygen (%)	113	109.5	109	98	98	99	108	113	104	104
pH (SU)	7.8	7.8	7.6	7.3	7.4	7.4	7.8	7.8	7.7	7.7
Total Phosphorus (mg/L)	0.02	0.02	0.02	0.07	0.02	0.02	0.02	0.02	0.02	0.02
Total Solids (mg/L)	64	67	65	68	56	51	57	65	63	67
Total Suspended Solids (mg/L)	2	1	1					<1	2	1
Temperature (°C)	12.2	18	16.1	6.8	7	8.5	13	20.1	11.6	9.3
Turbidity (NTU)	2	1	3	5	2	5	1	<1	2	2
Total Organic Carbon (mg/L)	<1	<1	<1					1	1	1

Sample date	1/15/2008	3/4/2008	5/20/2008	7/8/2008
Sample time	15:43	11:15	14:30	16:42
Alkalinity as $CaCO_3$ (mg/L)	22	16	21	31
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.5 est	2.5	1.7 est	0.7
Chemical Oxygen Demand (mg/L)	5	<5	<5	<5
Chlorophyll a (µg/L)			2.4	2.9
Pheophytin a (µg/L)			2.1	2.6
Conductivity (µmhos/cm)	67	62	62	85
E. Coli (CFU/100 mL)	9			43
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.63	0.32	0.234	0.28
Dissolved Orthophosphate as P (mg/L)	0.014	0.013	0.009	0.011
Dissolved Oxygen (mg/L)	12.5	12.6	11.2	10.8
Percent Saturation Dissolved Oxygen (%)	101	103	103	114
pH (SU)	7.4	7.7	7.6	8.5
Total Phosphorus (mg/L)	0.02	0.02	0.02	0.02
Total Solids (mg/L)	66	54	47	67
Total Suspended Solids (mg/L)	7	7	3	1
Temperature (°C)	6.6	7	11.8	18.5
Turbidity (NTU)	6	2	3	2
Total Organic Carbon (mg/L)	1	1	2	1

Siletz River 5 miles downstream of Siletz (River Mile 30.9), LASAR 10391 Siletz Population

Sample date	11/13/2002	1/7/2003	3/25/2003	5/13/2003	7/16/2003	11/4/2003	1/21/2004	3/17/2004	5/5/2004	7/7/2004
Sample time	12:10	12:20	13:00	13:00	12:40	13:10	12:00	12:08	12:10	13:35
Alkalinity as $CaCO_3$ (mg/L)	15	12	12	14	19	19	11	15	17	19
Ammonia as N mg/L	0.02	0.03	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	1.4	0.2	0.7	0.8	<0.1	1.3	1.6	0.5	1.2	0.6
Chemical Oxygen Demand (mg/L)	9	<5	<5	<5	<5	<5	10	<5	5	<5
Chlorophyll a (µg/L)				1.7	1.5				0.7	0.6
Pheophytin a (µg/L)				2.2	1.7				1.3	1
Conductivity (µmhos/cm)	59	51	45	49	55	55	46	51	52	55
E. Coli (CFU/100 mL)	99	9	1	9	2	10	6	2	12	12
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.54	0.623	0.55	0.378	0.0821	0.189	0.541	0.48	0.363	0.176
Dissolved Orthophosphate as P (mg/L)	0.007	0.01	0.011	0.006	<0.005	0.006	0.006	0.005	0.006	<0.005
Dissolved Oxygen (mg/L)	10.5	11.7	11.4	11.2	8.7	12.7	12.1	11	10.9	9.5
Percent Saturation Dissolved Oxygen (%)	94	98	98	107	98	102	98	97	104	105
pH (SU)	7.4	7.2	7.1	7.5	7.5	7.5	7	7.4	7.6	7.8
Total Phosphorus (mg/L)	0.04	0.03	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Total Solids (mg/L)	60	42	48	38	44	29	48	40	41	44
Total Suspended Solids (mg/L)	13	5	7	3	2	<1	2	1	<1	<1
Temperature (°C)	10.6	8.2	8.7	13.4	21.3	5.9	6.6	10	13.4	20.7
Turbidity (NTU)	8	5	10	2	2	1	4	2	1	<1
Total Organic Carbon (mg/L)	3	1	<1	<1	1	1	1	2	1	1

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/8/2006
Sample time	13:20	12:25	13:50	12:57	12:01	12:30	12:20	11:45	11:44	14:10
Alkalinity as $CaCO_3$ (mg/L)	15	18	15	16	18	22	22	12	13	13
Ammonia as N mg/L	0.04	0.03	<0.02	<0.02	<0.02	0.03	0.03	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.2	0.6	1.3	0.8	1.7	0.8	0.5	1.5	0.4	4.7
Chemical Oxygen Demand (mg/L)	<5	<5	5	6	7	7	5	9	7	7
Chlorophyll a (µg/L)	0.8 est				1.5	1.7	0.7 est			
Pheophytin a (µg/L)	1.1 est				2.3	1.6	2.2 est			
Conductivity (µmhos/cm)	51	49	53	50	49	56	62	48	44	45
E. Coli (CFU/100 mL)	26	49	11	7	37	2	33	186	5	13
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2
Nitrate/nitrite as N (mg/L)	0.484	0.521	0.8	0.447	0.555	0.244	0.0971	1.17	0.676	0.552
Dissolved Orthophosphate as P (mg/L)	0.006	0.006	0.009	0.006	0.01	0.007	0.01	0.01	0.01	0.007
Dissolved Oxygen (mg/L)	10.7	11	12.5	11.6	11.7	9.2	10.2	10.8	11	16
Percent Saturation Dissolved Oxygen (%)	100	97	97	97	105	103	98	96	92	134
pH (SU)	7.4	7.4	7.2	7.5	7.3	7.6	8	7.3	7.2	7.2
Total Phosphorus (mg/L)	0.02	0.02	0.02	0.02	0.02	0.01	0.03	0.06	0.04	0.02
Total Solids (mg/L)	46	51	27	57	52	47	31 est	58	51	36
Total Suspended Solids (mg/L)	2	2	<1	3	7	<1	<1 est	16	8	5
Temperature (°C)	12.4	10.1	5.1	8	10.9	21.5	14.1	10.1	8.1	7.2
Turbidity (NTU)	2	3	2	1	8	1	2	16	10	5
Total Organic Carbon (mg/L)	1	1	<1 est	<1	1	<1	1	1	<1	2

Siletz River 5 miles downstream of Siletz (River Mile 30.9), LASAR 10391 Siletz Population

Sample date	5/3/2006	7/18/2006	9/12/2006	11/28/2006	1/23/2007	3/13/2007	5/8/2007	7/10/2007	9/25/2007	11/6/2007
Sample time	12:20	14:28	13:27	12:30	13:20	15:32	14:30	13:00	12:33	12:57
Alkalinity as $CaCO_3$ (mg/L)	15	21	23	12	14	10	16	21	23	20
Ammonia as N mg/L	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.9	0.1	1	0.8	0.6	1	Void	0.2	0.9	0.6
Chemical Oxygen Demand (mg/L)	<5	<5	8					6	<5	<5
Chlorophyll a (µg/L)	1.2 est		1.3					1	0.7	
Pheophytin a (µg/L)	1.9 est		1.7					0.8	1.7	
Conductivity (µmhos/cm)	50	57	65	48	51	43	50	59	64	58
E. Coli (CFU/100 mL)	5	2	2	6	4	2	11	4	12	12
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.392	0.157	0.085	0.691	0.6	0.458	0.299	0.194	0.0187	0.31
Dissolved Orthophosphate as P (mg/L)	<0.005	0.01	<0.005				0.007	0.008	0.009	0.007
Dissolved Oxygen (mg/L)	11.2	9.3	9.5	11.9	11.7	11.9	11.7	8.7	10.4	12.2
Percent Saturation Dissolved Oxygen (%)	104	105.7	100	95	96	100	113	101	101	102
pH (SU)	7.6	7.8	7.8	7.2	7.3	7.2	7.8	7.6	7.8	7.7
Total Phosphorus (mg/L)	0.01	0.02	0.02	0.03	0.01	0.02	0.01	0.02	0.02	0.01
Total Solids (mg/L)	52	44	50	58	43	44	42	47	43	54
Total Suspended Solids (mg/L)	1	2	<1					<1	2	<1
Temperature (°C)	12.1	22	18.7	6.2	6.9	7.9	14	23.5	14.5	8
Turbidity (NTU)	2	<1	2	9	2	9	1	1	2	2
Total Organic Carbon (mg/L)	<1	<1	<1					2	1	1

Sample date	1/15/2008	3/4/2008	5/20/2008	7/8/2008
Sample time	14:41	12:20	12:30	14:40
Alkalinity as $CaCO_3$ (mg/L)	13	12	13	21
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.7	2.1	1.3	0.7
Chemical Oxygen Demand (mg/L)	<5	<5	<5	<5
Chlorophyll a (µg/L)			2.2	0.8
Pheophytin a (µg/L)			2.3	
Conductivity (µmhos/cm)	47	47	43	
E. Coli (CFU/100 mL)	5			
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.656	0.322	0.159	
Dissolved Orthophosphate as P (mg/L)	0.011	0.007	<0.005	0.006
Dissolved Oxygen (mg/L)	12.6	12.5	10.9	9.9
Percent Saturation Dissolved Oxygen (%)	102	102	103	110
pH (SU)	7.1	7.5	7.3	7.8
Total Phosphorus (mg/L)	0.03	0.01	0.02	0.02
Total Solids (mg/L)	53	38	31	48
Total Suspended Solids (mg/L)	13	<1	<1	1
Temperature (°C)	6.6	6.8	13.3	20.9
Turbidity (NTU)	12	2	2	4
Total Organic Carbon (mg/L)	1	<1	1	1

Siuslaw River at Hwy 126 (Mapleton), LASAR 10392 Siuslaw Population

Sample date	11/13/2002	1/6/2003	3/25/2003	5/13/2003	7/16/2003	11/4/2003	1/21/2004	3/17/2004	5/5/2004	7/7/2004
Sample time	8:05	16:00	9:00	8:30	8:18	8:25	8:04	7:55	8:05	8:30
Alkalinity as $CaCO_3$ (mg/L)	14	10	10	15	19	21	11	15	13	14
Ammonia as N mg/L	0.03	<0.02	0.03	0.02	0.04	0.03	0.02	0.03	0.03	0.04
Biochemical Oxygen DemandStream (mg/L)	0.9	0.2	0.6	0.3	0.2	0.6	0.7	0.4	1	0.7
Chemical Oxygen Demand (mg/L)	12		<5	<5	6	8	9	5	7	7
Chlorophyll a (µg/L)				1.5	1.3				1.7	0.8
Pheophytin a (µg/L)				2.8	1.9				2.7	1.3
Conductivity (µmhos/cm)	63	43	41	45	47	214	42	44	46	50
E. Coli (CFU/100 mL)	16	7	15	4	12	11	11	3	66	16
Total Kjeldahl Nitrogen (mg/L)	0.3	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.966	0.591	0.466	0.186	0.0247	0.0323	0.416	0.256	0.199	0.039
Dissolved Orthophosphate as P (mg/L)	0.009	0.009	0.014	0.007	<0.005	<0.005	0.007	<0.005 est	<0.005	0.005
Dissolved Oxygen (mg/L)	10.4	11.4	11.2	10.2	7.7	10.5	11.7	10.3	9.6	8.1
Percent Saturation Dissolved Oxygen (%)	92	97	97	95	87	86	98	91	92	93
pH (SU)	7.2	7.4	7.3	7	6.8	7.2	7.4	7.4	7.3	7.1
Total Phosphorus (mg/L)	0.04	0.04	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02
Total Solids (mg/L)	69	41	46	36	40	120	44	39	38	36
Total Suspended Solids (mg/L)	12	5	7	3	1	5	2	2	<1	<1
Temperature (°C)	10.2	8.5	9.2	12.4	21.7	6.9	7.9	10.2	13.7	22.6
Turbidity (NTU)	6	8	12	4	1	3	4	2	2	1
Total Organic Carbon (mg/L)	4	2	1	2	2	2	2	2	1	2

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/8/2006
Sample time	8:25	8:10	8:55	8:25	8:00	7:45	8:10	7:40	8:00	7:50
Alkalinity as $CaCO_3$ (mg/L)	16	20	11	14	17	18	17	14	11	12
Ammonia as N mg/L	0.03	0.03	<0.02	<0.02	<0.02	0.05	0.04	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	0.8	1.1	0.7	1.6	0.5	0.6	1.3	0.4	2.3
Chemical Oxygen Demand (mg/L)	7	8	15	8	9	9	7	16	9	6
Chlorophyll a (µg/L)	0.6 est				1.9	0.6	1.5 est			
Pheophytin a (µg/L)	1.2 est				3	1.2	4.5 est			
Conductivity (µmhos/cm)	56	53	47	48	46	48	589	58	38	40
E. Coli (CFU/100 mL)	21	12	31	6	60	13	40	31	27	3
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.757	0.564	0.798	0.608	0.44	0.0741	0.0426	1.88	0.578	0.432
Dissolved Orthophosphate as P (mg/L)	0.007	0.006	0.01	0.006	0.009	0.006	0.01	0.008	0.011	0.006
Dissolved Oxygen (mg/L)	9.7	10.6	11.7	10.6	11.1	8.5	8.1	10.2	10.7	12.8
Percent Saturation Dissolved Oxygen (%)	95	95	93	92	101	96	80	92	91	108
pH (SU)	7.2	7.5	7.2	7.1	6.9	7.5	7.1	7.2	7.1	7.2
Total Phosphorus (mg/L)	0.02	0.02	0.03	0.02	0.03	0.01	0.02	0.04	0.03	0.02
Total Solids (mg/L)	52	49	29	86	61	39	300 est	69	53	25
Total Suspended Solids (mg/L)	<1	<1	4	5	8	<1	<1 est	9	19	3
Temperature (°C)	14.9	10.7	5.8	9.1	11.5	21.7	15.3	11.1	8.3	7.9
Turbidity (NTU)	2	2	5	4	10	1	1	8	17	5
Total Organic Carbon (mg/L)	3	2	2 est	2	2	2	2	4	2	2

Siuslaw River at Hwy 126 (Mapleton), LASAR 10392 Siuslaw Population

Sample date	5/3/2006
Sample time	7:45
Alkalinity as $CaCO_3$ (mg/L)	14
Ammonia as N mg/L	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.7
Chemical Oxygen Demand (mg/L)	8
Chlorophyll a (µg/L)	1.3 est
Pheophytin a (µg/L)	2.9 est
Conductivity (µmhos/cm)	45
E. Coli (CFU/100 mL)	5
Total Kjeldahl Nitrogen (mg/L)	<0.2
Nitrate/nitrite as N (mg/L)	0.202
Dissolved Orthophosphate as P (mg/L)	<0.005
Dissolved Oxygen (mg/L)	9.6
Percent Saturation Dissolved Oxygen (%)	90
pH (SU)	8
Total Phosphorus (mg/L)	0.01
Total Solids (mg/L)	56
Total Suspended Solids (mg/L)	1
Temperature (°C)	12.5
Turbidity (NTU)	2
Total Organic Carbon (mg/L)	<1

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L
Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Suislaw River at Tide boat ramp, LASAR 33642 Siuslaw Population

Sample date	7/18/2006	9/12/2006	11/28/2006	1/23/2007	3/13/2007	5/8/2007	7/10/2007	9/25/2007	11/6/2007	1/15/2008
Sample time	8:00	8:18	7:35	8:15	9:30	9:55	7:45	7:17	7:51	8:45
Alkalinity as $CaCO_3$ (mg/L)	19	14	12	11	10	17	17	18	18	12
Ammonia as N mg/L	0.03	0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.5	0.7	0.5	0.8	0.8	1.1	<0.1	0.6	0.9	2.1 est
Chemical Oxygen Demand (mg/L)	5	9					5	9	<5	6
Chlorophyll a (µg/L)		1.5					1.2	1.3		
Pheophytin a (µg/L)		2.8					2.2	2.4		
Conductivity (µmhos/cm)	50	57	42	43	41	44	49	55	56	40
E. Coli (CFU/100 mL)	30	5	19	2	16	13	11	1	5	13
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2								
Nitrate/nitrite as N (mg/L)	0.0627	0.018	0.539	0.345	0.317	0.206	0.0532	0.0127	0.221	0.408
Dissolved Orthophosphate as P (mg/L)	0.009	<0.005				0.007	<0.005	<0.005	0.005	0.01
Dissolved Oxygen (mg/L)	8.6	9	11.7	12.1	11.7	10.5	7.2	9.7	11.2	12.3
Percent Saturation Dissolved Oxygen (%)	91.5	91	96	96	102	101	80	92	95	101
pH (SU)	7.4	7.4	7.3	7.2	7.4	7.6	7.3	7.5	7.6	7.2
Total Phosphorus (mg/L)	0.02	0.03	0.03	0.02	0.02	0.02	0.04	0.02	0.02	0.03
Total Solids (mg/L)	45	41	55	46	39	42	46	41	52	53
Total Suspended Solids (mg/L)	2	1					2	2	1	14
Temperature (°C)	18.9	16.7	7.2	5.6	9.3	14.2	20.7	12.8	8.2	6.8
Turbidity (NTU)	1	2	8	3	5	4	2	2	2	10
Total Organic Carbon (mg/L)	2	1					2	2	2	2

Sample date	3/4/2008	5/20/2008	7/8/2008
Sample time	8:00	8:00	9:00
Alkalinity as $CaCO_3$ (mg/L)	12	14	13
Ammonia as N mg/L	<0.02	0.03	<0.02
Biochemical Oxygen DemandStream (mg/L)	2.1	1.4 est	1.6
Chemical Oxygen Demand (mg/L)	<5	<5	6
Chlorophyll a (µg/L)		2.7	1.2
Pheophytin a (µg/L)		4.2	2.5
Conductivity (µmhos/cm)			49
E. Coli (CFU/100 mL)	44	48	6
Total Kjeldahl Nitrogen (mg/L)			
Nitrate/nitrite as N (mg/L)	0.242	0.126	0.0347
Dissolved Orthophosphate as P (mg/L)	0.007	<0.005	0.005
Dissolved Oxygen (mg/L)	12.1	9.4	8.9
Percent Saturation Dissolved Oxygen (%)	98	97	97
pH (SU)	7.5	7.4	7.4
Total Phosphorus (mg/L)	0.02	0.02	0.02
Total Solids (mg/L)	38	42	40
Total Suspended Solids (mg/L)	<1	2	2
Temperature (°C)	6.8	17.3	19.8
Turbidity (NTU)	2	3	2
Total Organic Carbon (mg/L)	1	2	2

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L
Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L
Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Yaquina River at Trapp Road (Chitwood), LASAR 11476 Yaquina Population

Sample date	11/13/2002	1/7/2003	3/25/2003	5/13/2003	7/16/2003	11/4/2003	1/21/2004	3/17/2004	5/5/2004	7/7/2004
Sample time	11:25	11:30	12:15	12:15	12:00	12:20	11:15	11:20	11:25	12:45
Alkalinity as $CaCO_3$ (mg/L)	24	13	13	16	24	30	13	17	20	25
Ammonia as N mg/L	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.04
Biochemical Oxygen DemandStream (mg/L)	1.6	0.1	0.7	0.6	0.6	0.9	0.3	0.1	1.2	0.6
Chemical Oxygen Demand (mg/L)	16	7	<5	<5	6	11	9	7	6	<5
Chlorophyll a (µg/L)				0.6	13				1	2.2
Pheophytin a (µg/L)				2.2	6.4				2.5	2.9
Conductivity (µmhos/cm)	91	66	59	65	71	90	62	66	67	72
E. Coli (CFU/100 mL)	29	11	20	57	23	2	13	28	51	39
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.424	1.53	1.39	0.907	0.248	0.0752	1.3	1.09	0.816	0.403
Dissolved Orthophosphate as P (mg/L)	0.014	0.012	0.014	0.011	0.019	0.014	0.013	0.011	0.011	0.014
Dissolved Oxygen (mg/L)	9.6	11.2	11	10.8	8.5	10.5	11.6	10.6	10.5	8.9
Percent Saturation Dissolved Oxygen (%)	85	96	96	103	90	84	96	95	99	95
pH (SU)	7.4	7.1	7.2	7.2	7.6	7.4	7.2	7.2	7.4	7.4
Total Phosphorus (mg/L)	0.03	0.04	0.05	0.02	0.04	0.04	0.03	0.02	0.03	0.04
Total Solids (mg/L)	74	47	69	51	55	63	59	54	51	61
Total Suspended Solids (mg/L)	13	8	17	3	2	<1	4	2	<1	2
Temperature (°C)	10.2	8.9	9.4	13.3	19.2	6	7.2	10.7	13.2	19.1
Turbidity (NTU)	4	7	18	3	3	2	5	3	3	2
Total Organic Carbon (mg/L)	5	<1	<1	1	2	3	1	2	1	2

Sample date	9/22/2004	11/2/2004	1/11/2005	3/23/2005	5/11/2005	7/26/2005	9/27/2005	11/2/2005	1/4/2006	3/8/2006
Sample time	12:40	11:44	13:00	12:15	11:20	11:15	11:40	10:55	11:05	13:13
Alkalinity as $CaCO_3$ (mg/L)	20	27	17	23	22	26	29	14	14	17
Ammonia as N mg/L	0.02	0.04	0.02	0.02	<0.02	0.06	0.05	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	0.7	1	0.8	1.9	0.8	1	1.4	0.5	0.8
Chemical Oxygen Demand (mg/L)	8	<5	8	6	10	9	9	17	8	6
Chlorophyll a (µg/L)	0.8 est				1.6	1.3	0.8 est			
Pheophytin a (µg/L)	1.8 est				3.5	2.3	1.5 est			
Conductivity (µmhos/cm)	80	73	68	74	67	73	85	81	60	63
E. Coli (CFU/100 mL)	37	93	6	7	248	26	5	649	18	23
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.27	1.27	1.64	1.02	1.23	0.462	0.168	3.33	1.69	1.25
Dissolved Orthophosphate as P (mg/L)	0.016	0.02	0.014	0.015	0.016	0.018	0.019	0.014	0.013	0.012
Dissolved Oxygen (mg/L)	9.9	10.4	11.9	11.1	11.2	8.4	9	10	10.6	11
Percent Saturation Dissolved Oxygen (%)	95	93	95	95	101	89	84	89	90	92
pH (SU)	7.4	7.3	7.3	7.4	7.3	7.5	7.4	7.3	7.1	7
Total Phosphorus (mg/L)	0.03	0.03	0.03	0.03	0.07	0.04	0.05	0.1	0.08	0.04
Total Solids (mg/L)	70	92	54	71	87	63	59 est	98	77	56
Total Suspended Solids (mg/L)	2	3	5	1	17	3	4 est	26	26	9
Temperature (°C)	13.8	10.6	6	8.6	10.9	18.6	12.7	10.6	8.4	7.9
Turbidity (NTU)	6	5	6	3	22	4	5	30	24	9
Total Organic Carbon (mg/L)	3	2	<1 est	1	2	2	3	4	<1	2

Yaquina River at Trapp Road (Chitwood), LASAR 11476 Yaquina Population

Sample date	5/3/2006	7/18/2006	9/12/2006	11/28/2006	1/23/2007	3/13/2007	5/8/2007	7/10/2007	9/25/2007	11/6/2007
Sample time	11:15	13:20	12:35	11:40	12:25	13:27	13:55	12:25	11:45	11:56
Alkalinity as $CaCO_3$ (mg/L)	20	26	30	14	14	12	20	20	31	28
Ammonia as N mg/L	<0.02	0.03	0.03	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	Void	1.2	0.4	0.6	0.5	0.6	2.1	0.5	1
Chemical Oxygen Demand (mg/L)	<5	6	10					7	10	7
Chlorophyll a (µg/L)	0.7 est		4.9					2.9	1.6	
Pheophytin a (µg/L)	2.5 est		5.4					1.6	2.2	
Conductivity (µmhos/cm)	67	76	87	63	65	60	65	76	92	87
E. Coli (CFU/100 mL)	20	21	8	12	6	4	26	11	68	5
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.2							
Nitrate/nitrite as N (mg/L)	0.938	0.341	0.108	1.51	1.32	1.16	0.758	0.305	0.104	0.463
Dissolved Orthophosphate as P (mg/L)	0.009	0.027	0.008				0.012	0.014	0.018	0.012
Dissolved Oxygen (mg/L)	10.7	8.3	8.3	11.3	11.6	11.3	10.4	8.3	8.2	10.7
Percent Saturation Dissolved Oxygen (%)	98	90.2	84	93	95	99	101	93	78	90
pH (SU)	7.5	7.4	7.3	7.1	7.2	7.1	7.5	7.4	7.4	7.4
Total Phosphorus (mg/L)	0.02	0.04	0.04	0.05	0.02	0.03	0.02	0.04	0.04	0.03
Total Solids (mg/L)	56	63	59	76	61	57	54	62	67	72
Total Suspended Solids (mg/L)	1	3	3					<1	1	2
Temperature (°C)	11.3	19.8	16.3	6.9	7.1	9.3	14.7	21.4	13.4	8
Turbidity (NTU)	3	3	4	11	4	8	3	2	3	3
Total Organic Carbon (mg/L)	<1	2	2					3	3	2

Sample date	1/15/2008	3/4/2008	5/20/2008	7/8/2008
Sample time	14:05	11:39	11:50	13:52
Alkalinity as $CaCO_3$ (mg/L)	16	14	21	23
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.8 est	1.5	1.1 est	1
Chemical Oxygen Demand (mg/L)	<5	<5	<5	10
Chlorophyll a (µg/L)			1.7	4
Pheophytin a (µg/L)			3.6	5.3
Conductivity (µmhos/cm)	62	67	71	73
E. Coli (CFU/100 mL)	11			35
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	1.41	0.976	0.776	0.484
Dissolved Orthophosphate as P (mg/L)	0.014	0.014	0.012	0.014
Dissolved Oxygen (mg/L)	11.9	12	9.5	9.6
Percent Saturation Dissolved Oxygen (%)	99	100	95	102
pH (SU)	7	7.5	7.4	7.4
Total Phosphorus (mg/L)	0.05	0.02	0.03	0.05
Total Solids (mg/L)	72	53	60	77
Total Suspended Solids (mg/L)	19	<1	2	21
Temperature (°C)	7.3	7.4	15.8	19
Turbidity (NTU)	14	3	3	11
Total Organic Carbon (mg/L)	<1	1	1	2

Umpqua River at Elkton Bridge, LASAR 10437 — **Middle Umpqua Population**

Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	11:10	11:20	10:55	11:54	11:30	13:38	11:27	11:25	11:00	10:32
Alkalinity as $CaCO_3$ (mg/L)	33	28	26	37	35	31	34	26	31	30
Ammonia as N mg/L	0.02	0.05	0.05	0.03	<0.02	<0.02	<0.02	0.02	<0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	0.6	0.7	1.7 est	0.8	0.7	0.5	0.9	0.3	0.7
Chemical Oxygen Demand (mg/L)	10	7	9	<5	9	6	<5	<5	6	6
Chlorophyll a (µg/L)					2.9 est	0.5	0.3			0.7
Pheophytin a (µg/L)					0.6 est	0.7	0.6			1
Conductivity (µmhos/cm)	98	82	65	87	82	79	92	65	72	73
E. Coli (CFU/100 mL)	15	82	65	31	<1	122	22	52	6	7
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.3	0.3	<0.2	0.4	0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0544	0.199	0.0446	0.0398	0.005	<0.0050	0.0059	0.112	0.0624	0.006
Dissolved Orthophosphate as P (mg/L)	0.021	0.025	0.019	0.014	0.008	0.012	0.023	0.021	0.015	0.015
Dissolved Oxygen (mg/L)	10.7	11.4	11.2	10.8	8	8.8	11.2	12	10.7	9
Percent Saturation Dissolved Oxygen (%)	95	97	97	101	84	96	95	100	96	91
pH (SU)	7.6	7.8	7.6	7.9	8.3	8	8	7.7	7.5	7.7
Total Phosphorus (mg/L)	0.04	0.05	0.06	0.04	0.02	0.02	0.04	0.05	0.03	0.03
Total Solids (mg/L)	74	82	73	74	64	64	58	60	71	65
Total Suspended Solids (mg/L)	2	5	11	4	<1	<1	<1	6	5	1
Temperature (°C)	10.1	8.7	9.2	12.5	26.5	20.3	8.4	7.8	10.7	16.7
Turbidity (NTU)	3	13	15	6	1	<1	<1	16	7	2
Total Organic Carbon (mg/L)	3	3	3	2	2	2	1	2	2	2

Sample date	7/20/2004	9/23/2004	11/1/2004	1/11/2005	3/31/2005	5/19/2005	7/13/2005	9/22/2005	11/14/2005	1/24/2006
Sample time	11:11	13:30	11:45	11:20	12:45	13:45	14:35	12:35	12:15	10:59
Alkalinity as $CaCO_3$ (mg/L)	41	35	34	40	32	39	42	34	33	31
Ammonia as N mg/L	<0.02	<0.02	0.02	0.03	<0.02	<0.02	0.02	<0.02	0.03	0.03
Biochemical Oxygen DemandStream (mg/L)	0.5	0.6	0.7	0.9	1.5	1	0.8	0.4	0.9	0.2
Chemical Oxygen Demand (mg/L)	<5	5	11	12	15	7	5	5	13	7
Chlorophyll a (µg/L)	1.6	0.3 est				1.3	1.5	0.5		
Pheophytin a (µg/L)	1.1	0.5 est				2.1	<0.1	0.4		
Conductivity (µmhos/cm)	80	86	89	104	71	82	89	93	85	72
E. Coli (CFU/100 mL)	5	12	10	249	139	1203	3	13	110	19
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.3	0.3
Nitrate/nitrite as N (mg/L)	<0.0050	<0.0050	0.0852	0.29	0.156	0.0898	0.0067	0.0062	0.122	0.118
Dissolved Orthophosphate as P (mg/L)	0.011	0.016	0.024	0.029	0.024	0.023	0.005	0.016	0.027	0.02
Dissolved Oxygen (mg/L)	7.9	9.5	11	12.5	11.7	10.2	8.8	9	10.8	11.8
Percent Saturation Dissolved Oxygen (%)	93	100	100	97	102	96	101	95	96	97
pH (SU)	8	8	7.9	7.8	7.6	7.9	8.3	8.6	7.7	7.7
Total Phosphorus (mg/L)	0.02	0.03	0.04	0.08	0.11	0.07	0.02	0.03	0.08	0.07
Total Solids (mg/L)	55	58	76	115	120	140	74	61 est	97 est	83
Total Suspended Solids (mg/L)	<1	<1	1	13	35	25	<1	<1	11	14
Temperature (°C)	24.3	18.1	10.4	4.5	9.5	13.1	23.1	18.7	10	6.9
Turbidity (NTU)	<1	2	3	26	52	20	2	<1	11	21
Total Organic Carbon (mg/L)	1	2	2	3 est	4	3	1	1	3	3

Umpqua River at Elkton Bridge, LASAR 10437 — **Middle Umpqua Population**

Sample date	3/27/2006	5/15/2006	7/24/2006	9/5/2006	11/13/2006	1/10/2007	3/6/2007	5/21/2007	7/16/2007	9/10/2007
Sample time	12:20	12:15	13:25	11:25	11:10	16:00	11:30	13:21	12:00	11:50
Alkalinity as $CaCO_3$ (mg/L)	33	32	32	33	31	28	30	33	29	36
Ammonia as N mg/L	<0.02	0.02	0.04	0.03	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.3	1.3	0.1	0.5	0.8	0.9	0.7	0.6	1.2	0.5
Chemical Oxygen Demand (mg/L)	6	<5	8	7					6	6
Chlorophyll a (µg/L)		0.4 est	3.3	0.7				1.3	3.5	0.4
Pheophytin a (µg/L)		0.5 est	1.6	0.8				0.5	0.8	0.6
Conductivity (µmhos/cm)	67	71	79	82	91	72	68	78	78	85
E. Coli (CFU/100 mL)	9	<1	<1	4	138	36	26	3	4	6
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	0.4						
Nitrate/nitrite as N (mg/L)	0.0315	<0.0050	0.006	0.0133	0.19	0.108	0.0658	<0.0050	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.014	0.016	0.011	0.017				0.012	0.008	0.018
Dissolved Oxygen (mg/L)	11.2	9.7	7.5	8.4	10.8	11.4	11.2	9.6	8.6	8.8
Percent Saturation Dissolved Oxygen (%)	98	84	96	95	94	94	96	99	102	99
pH (SU)	7.7	7.8	8.3	8.1	7.7	7.3	7.6	8.2	8.1	8.3
Total Phosphorus (mg/L)	0.04	0.03	0.03 est	0.03	0.07	0.06	0.06	0.02	0.03	0.04
Total Solids (mg/L)	74	62	75 est	76	100	80	98	65	58	70
Total Suspended Solids (mg/L)	6	2	1	<1					1	2
Temperature (°C)	9.4	18.2	28.4	21.8	9.3	7.2	8.8	16.9	24.2	21.7
Turbidity (NTU)	7	2	1	1	11	18	26	1	2	2
Total Organic Carbon (mg/L)	2	<1	<1	2					2	2

Sample date	11/5/2007	1/7/2008	3/17/2008	5/12/2008	7/14/2008
Sample time	11:50	11:55	12:58	12:10	14:15
Alkalinity as $CaCO_3$ (mg/L)	30	28	29	26	30
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1	1.5	1.6	0.8	0.9
Chemical Oxygen Demand (mg/L)	5	9	9	<5	<5
Chlorophyll a (µg/L)				0.6	3.9
Pheophytin a (µg/L)				1	1.3
Conductivity (µmhos/cm)	89	71	72	62	71
E. Coli (CFU/100 mL)	5	199			<1
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.0227	0.172	0.057	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.026	0.026	0.02	0.016	0.017
Dissolved Oxygen (mg/L)	11.1	11.8	11.9	10.9	8.3
Percent Saturation Dissolved Oxygen (%)	99	95	99	102	99
pH (SU)	8	7.1	7.8	7.9	8.2
Total Phosphorus (mg/L)	0.03	0.11	0.06	0.03	0.03
Total Solids (mg/L)	80	130	73	58	58
Total Suspended Solids (mg/L)	<1	49	11	1	1
Temperature (°C)	10.3	6.4	7.8	12.5	25.1
Turbidity (NTU)	1	58	20	3	1
Total Organic Carbon (mg/L)	2	4	2	1	2

Smith River 4.4 miles downstream of Smith River Falls, LASAR 11491 Lower Umpqua Population

Sample date	11/15/2006	1/10/2007	3/8/2007	5/24/2007	7/19/2007	9/13/2007	11/7/2007	1/10/2008	3/20/2008	5/15/2008
Sample time	13:45	14:55	11:55	12:50	14:00	13:18	13:20	13:09	14:08	13:52
Alkalinity as $CaCO_3$ (mg/L)	12	11	13	14	17	18	22	10	11	13
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.1	0.8	0.7	0.9	1.1	0.9	1.6	1.8	1.3	0.3
Chemical Oxygen Demand (mg/L)					10	9	7	11	6	<5
Chlorophyll a (µg/L)				0.7 est	1.3	1				1.4
Pheophytin a (µg/L)				1.1 est	1.5	1.5				1.8
Conductivity (µmhos/cm)	50	45	42	48	53	66	62	40	45	49
E. Coli (CFU/100 mL)	22	2	3	2	214	26	45	12		
Total Kjeldahl Nitrogen (mg/L)										
Nitrate/nitrite as N (mg/L)	0.868	0.398	0.336	0.0722	<0.0050	0.0051	0.102	0.436	0.345	0.0686
Dissolved Orthophosphate as P (mg/L)				<0.005	<0.005	<0.005	<0.005	0.011	0.009	<0.005
Dissolved Oxygen (mg/L)	10.7	11.5	11.6	9.6	9.4	9.6	12.3	11.8	12	10.1
Percent Saturation Dissolved Oxygen (%)	96	98	100	102	102	100	106	100	102	107
pH (SU)	7.3	7.2	7.5	7.6	8	7.6	7.8	7.2	7.4	7.8
Total Phosphorus (mg/L)	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.05	0.03	0.01
Total Solids (mg/L)	55	52	54	49	42	53	53	67	50	53
Total Suspended Solids (mg/L)					1	3	<1	31	6	1
Temperature (°C)	10.3	8.4	9.3	19.2	21.1	17.3	9	8.5	8.5	18.6
Turbidity (NTU)	8	8	7	3	2	4	2	22	9	3
Total Organic Carbon (mg/L)					3	4	3	2	2	2

Sample date	7/17/2008
Sample time	12:50
Alkalinity as $CaCO_3$ (mg/L)	16
Ammonia as N mg/L	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8
Chemical Oxygen Demand (mg/L)	12
Chlorophyll a (µg/L)	0.8
Pheophytin a (µg/L)	1.4
Conductivity (µmhos/cm)	57
E. Coli (CFU/100 mL)	8
Total Kjeldahl Nitrogen (mg/L)	
Nitrate/nitrite as N (mg/L)	0.0072
Dissolved Orthophosphate as P (mg/L)	
Dissolved Oxygen (mg/L)	9.1
Percent Saturation Dissolved Oxygen (%)	103
pH (SU)	7.5
Total Phosphorus (mg/L)	0.02
Total Solids (mg/L)	37
Total Suspended Solids (mg/L)	<1
Temperature (°C)	22.2
Turbidity (NTU)	1
Total Organic Carbon (mg/L)	3

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L
Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

Sample date
Sample time
Alkalinity as $CaCO_3$ (mg/L)
Ammonia as N mg/L
Biochemical Oxygen DemandStream (mg/L)
Chemical Oxygen Demand (mg/L)
Chlorophyll a (µg/L)
Pheophytin a (µg/L)
Conductivity (µmhos/cm)
E. Coli (CFU/100 mL)
Total Kjeldahl Nitrogen (mg/L)
Nitrate/nitrite as N (mg/L)
Dissolved Orthophosphate as P (mg/L)
Dissolved Oxygen (mg/L)
Percent Saturation Dissolved Oxygen (%)
pH (SU)
Total Phosphorus (mg/L)
Total Solids (mg/L)
Total Suspended Solids (mg/L)
Temperature (°C)
Turbidity (NTU)
Total Organic Carbon (mg/L)

	Elk Creek at Elkton, LASAR 10441				Middle Umpqua Population					
Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	10:30	10:45	10:25	11:25	10:45	12:56	10:35	10:45	10:20	10:00
Alkalinity as $CaCO_3$ (mg/L)	33	21	24	32	41	33	46	22	26	35
Ammonia as N mg/L	<0.02	0.03	0.03	0.03	<0.02	0.02	<0.02	0.03	0.02	0.04
Biochemical Oxygen DemandStream (mg/L)	0.8	0.5	0.4	1	0.1	1.6	0.8	1.4	0.2	0.6
Chemical Oxygen Demand (mg/L)	14	11	8	<5	10	14	9	6	<5	6
Chlorophyll a (µg/L)					1.3 est	3.9	0.3			0.5
Pheophytin a (µg/L)					0.8 est	1.3	0.7			1.3
Conductivity (µmhos/cm)	139	67	69	86	135	136	197	64	70	106
E. Coli (CFU/100 mL)	12	115	55	65	12	980	12	91	23	154
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.2	0.3	<0.2	0.6	0.4	0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.255	0.228	0.212	0.124	<0.0050	0.0249	<0.0050	0.209	0.141	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.014	0.027	0.02	0.022	<0.005	0.007	0.008	0.02	0.017	0.011
Dissolved Oxygen (mg/L)	10.4	11.1	11.2	11	7.2	8.5	10.9	11.4	10.5	8.8
Percent Saturation Dissolved Oxygen (%)	91	97	98	102	85	90	87	98	96	87
pH (SU)	7.4	7.6	7.4	7.6	7.6	7.5	7.7	7.5	7	7.5
Total Phosphorus (mg/L)	0.04	0.1	0.07	0.05	0.01	0.03	0.02	0.06	0.03	0.03
Total Solids (mg/L)	98	98	84	74	79	110	120	59	74	76
Total Suspended Solids (mg/L)	3	19	10	4	<1	3	<1	8	5	<1
Temperature (°C)	9.7	9.7	9.7	12.1	24.5	18.5	6.2	8.7	11.2	15.5
Turbidity (NTU)	7	32	24	10	1	4	2	20	11	3
Total Organic Carbon (mg/L)	5	4	3	2	3	5	3	3	2	2
Sample date	7/20/2004	9/23/2004	11/1/2004	11/22/2004	1/11/2005	3/31/2005	5/19/2005	7/13/2005	9/22/2005	11/14/2005
Sample time	10:30	13:10	11:20	11:46	10:54	13:15	14:05	15:00	13:00	11:50
Alkalinity as $CaCO_3$ (mg/L)	54	45	45	44	27	27	35	47	40	32
Ammonia as N mg/L	<0.02		0.03	0.03	0.04	0.03	0.02	0.03	0.03	0.05
Biochemical Oxygen DemandStream (mg/L)	0.6	0.8	1.4	1.4	1.5	1.3	1.5	0.9	0.7	0.6
Chemical Oxygen Demand (mg/L)	7		12	8	9	13	11	6	10	16
Chlorophyll a (µg/L)	0.8	0.4 est					0.9	0.2	0.5	
Pheophytin a (µg/L)	0.6	0.9 est					2.5	0.4	0.6	
Conductivity (µmhos/cm)	135	170	135	157	79	69	85	120	168	112
E. Coli (CFU/100 mL)	28	26	9		36	148	1046	4	28	210
Total Kjeldahl Nitrogen (mg/L)	<0.2		<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	0.5
Nitrate/nitrite as N (mg/L)	<0.0050		0.248	0.052	0.485	0.416	0.206	0.0061	<0.0050	0.61
Dissolved Orthophosphate as P (mg/L)	<0.005	0.006	0.019	0.018	0.024	0.024	0.024	0.006	0.005	0.03
Dissolved Oxygen (mg/L)	8.2	10.1	11.4	12.2	12.5	11.5	10	10.3	8.6	10.3
Percent Saturation Dissolved Oxygen (%)	96	106	101	102	99	102	95	118	85	94
pH (SU)	7.8	8.1	7.8	7.7	7.5	7.3	7.6	8.9	8	7.4
Total Phosphorus (mg/L)	0.02		0.04	0.03	0.07	0.11	0.08	0.01	0.02	0.09
Total Solids (mg/L)	87	110	100	130	81	100	120	89	96 est	120 est
Total Suspended Solids (mg/L)	<1	<1	<1	<1	7	25	14	<1	<1	9
Temperature (°C)	23.9	17.9	10.2	7	5.4	10.3	13.4	23	15.7	11.3
Turbidity (NTU)	1	1	3	3	25	44	28	2	<1	18
Total Organic Carbon (mg/L)	3		3	3	3 est	3	4	2	3	5

	Elk Creek at Elkton, LASAR 10441				Middle Umpqua Population					
Sample date	1/24/2006	3/27/2006	5/15/2006	7/24/2006	9/5/2006	11/13/2006	1/10/2007	3/6/2007	5/21/2007	7/16/2007
Sample time	10:29	11:20	11:45	13:00	11:00	10:45	15:40	10:30	13:00	11:30
Alkalinity as $CaCO_3$ (mg/L)	24	28	37	34	39	30	24	25	37	40
Ammonia as N mg/L	<0.02	0.03	0.02	0.03	0.07	<0.02	<0.02	0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.2	0.8	0.9	0.3	1.5	1.3	0.5	Void	0.4	0.8
Chemical Oxygen Demand (mg/L)	6	7	5	10	10					7
Chlorophyll a (µg/L)			0.5 est	1.8	5				0.5	1.6
Pheophytin a (µg/L)			1.0 est	0.8	1.9				1.3	0.6
Conductivity (µmhos/cm)	63	72	106	132	166	87	67	63	108	139
E. Coli (CFU/100 mL)	28	32	7	7	91	81	79	21	11	7
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.2					
Nitrate/nitrite as N (mg/L)	0.204	0.16	<0.0050	<0.0050	0.0059	0.658	0.198	0.17	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.017	0.016	0.007	0.005	<0.005				0.005	<0.005
Dissolved Oxygen (mg/L)	11.4	11.1	9.6	8.9	8.5	10.8	11	10.7	10.3	9
Percent Saturation Dissolved Oxygen (%)	95	96	100	117	90	94	94	95	102	104
pH (SU)	7.6	7.3	8.1	8.6	7.9	7.6	7.3	7.6	8.1	8.3
Total Phosphorus (mg/L)	0.06	0.04	0.02	0.02 est	0.03	0.07	0.06	0.07	0.01	0.01
Total Solids (mg/L)	81	74	56	100 est	110	120	78	88	82	74
Total Suspended Solids (mg/L)	15	6	1	2	1					<1
Temperature (°C)	7.7	9.1	17.6	29.7	18.6	9.7	8.4	10.4	15.5	23.4
Turbidity (NTU)	24	15	3	2	2	20	21	22	2	2
Total Organic Carbon (mg/L)	2	2	1	2	3					3

Sample date	9/10/2007	11/5/2007	1/7/2008	3/17/2008	5/12/2008	7/14/2008
Sample time	11:15	11:15	11:32	12:29	11:45	13:40
Alkalinity as $CaCO_3$ (mg/L)	39	40	22	27	33	40
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.5	1	1.5	1.1	0.7	0.2
Chemical Oxygen Demand (mg/L)	10	9	9	7	<5	<5
Chlorophyll a (µg/L)	0.8				0.6	1.5
Pheophytin a (µg/L)	0.8				1.3	0.5
Conductivity (µmhos/cm)	163	157	58	69	105	144
E. Coli (CFU/100 mL)	25	10	109			9
Total Kjeldahl Nitrogen (mg/L)						
Nitrate/nitrite as N (mg/L)	<0.0050	0.0463	0.243	0.21	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	<0.005	0.023	0.025	0.021	0.008	0.006
Dissolved Oxygen (mg/L)	7.5	11.2	11.6	11.5	10.7	10.4
Percent Saturation Dissolved Oxygen (%)	79	98	95	98	102	127
pH (SU)	7.7	7.8	7.2	7.6	8	8.9
Total Phosphorus (mg/L)	0.02	0.04	0.11	0.09	0.03	0.02
Total Solids (mg/L)	110	120	110	89	79	84
Total Suspended Solids (mg/L)	<1	<1	43	17	<1	<1
Temperature (°C)	18.2	9.3	7.2	8.6	13.6	26.1
Turbidity (NTU)	2	3	51	30	4	2
Total Organic Carbon (mg/L)	4	3	3	3	2	3

	South Umpqua at Melrose Road, LASAR 10442					South Umpqua Population				
Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	13:15	13:45	12:40	14:04	13:25	16:12	13:29	13:15	12:40	12:20
Alkalinity as $CaCO_3$ (mg/L)	45	40	32	40	58	57	58	36	39	44
Ammonia as N mg/L	0.14	0.07	0.02	0.04	0.06	<0.02	0.06	0.04	0.04	0.09
Biochemical Oxygen DemandStream (mg/L)	1.1	1.1	1.1	1.5	2.5	1.7	1.1	1.4	0.5	0.9
Chemical Oxygen Demand (mg/L)	11	10	9	8	12	10	9	8	7	7
Chlorophyll a (µg/L)					4.9 est	2.3	2.1			1.5
Pheophytin a (µg/L)					2.6 est	4.3	1.7			1.4
Conductivity (µmhos/cm)	149	109	82	93	158	180	176	88	88	112
E. Coli (CFU/100 mL)	28	1046	33	86	4	166	46	313	18	96
Total Kjeldahl Nitrogen (mg/L)	0.4	0.3	0.2	<0.2	0.7	0.4	0.4	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0988	0.259	0.0457	0.0408	0.236	0.486	0.179	0.132	0.0676	0.0515
Dissolved Orthophosphate as P (mg/L)	0.04	0.031	0.022	0.018	0.096	0.156	0.046	0.025	0.016	0.038
Dissolved Oxygen (mg/L)	11.4	10.9	11.6	11.4	11.2	10.9	11.3	11.7	10.8	9
Percent Saturation Dissolved Oxygen (%)	100	98	101	104	144	126	99	99	99	93
pH (SU)	8	7.9	7.8	7.9	9	9	8.1	7.8	7.6	7.6
Total Phosphorus (mg/L)	0.06	0.06	0.05	0.04	0.13	0.18	0.07	0.07	0.03	0.05
Total Solids (mg/L)	92	95	76	83	98	62	96	82	83	88
Total Suspended Solids (mg/L)	7	7	6	6	4	1	2	15	2	4
Temperature (°C)	10.2	9.8	9.4	11.6	28.9	21.7	8.8	8.3	11.6	16.9
Turbidity (NTU)	3	15	14	9	1	1	2	32	7	4
Total Organic Carbon (mg/L)	4	4	3	3	3	5	3	4	2	2

Sample date	7/20/2004	9/20/2004	11/1/2004	1/11/2005	3/28/2005	5/16/2005	7/11/2005	9/20/2005	11/14/2005	1/24/2006
Sample time	12:58	16:25	13:48	13:30	13:35	15:25	13:43	8:30	14:25	12:38
Alkalinity as $CaCO_3$ (mg/L)	54	57	48	51	49	51	61	60	37	38
Ammonia as N mg/L	0.07	0.02	0.12	0.03	0.04	0.05	0.07	0.17	0.04	0.03
Biochemical Oxygen DemandStream (mg/L)	1.8	1.6 est	0.7	1.2	0.4	0.7	2.9	1.5	1	0.4
Chemical Oxygen Demand (mg/L)	8	11	14	15	26	12	11	10	15	6
Chlorophyll a (µg/L)	2.8	3.9 est				0.7	1.5	2.3		
Pheophytin a (µg/L)	3.7	4.6 est				1	1.1	3.7		
Conductivity (µmhos/cm)	151	168	139	131	114	110	146	199	93	88
E. Coli (CFU/100 mL)	921	23	25	115	2046	649	1	42	435	50
Total Kjeldahl Nitrogen (mg/L)	0.3	0.4	0.2	<0.2	1	<0.2	0.7	0.4	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.228	0.224	0.107	0.305	0.0814	0.102	0.0653	0.446	0.0496	0.134
Dissolved Orthophosphate as P (mg/L)	0.096	0.069	0.042	0.028	0.022	0.027	0.032	0.116	0.026	0.024
Dissolved Oxygen (mg/L)	11.5	14.5	10.6	12.6	10.3	10	12.1	5.8	10.7	11.5
Percent Saturation Dissolved Oxygen (%)	139	158	99	100	91	98	147	60	96	96
pH (SU)	8.9	9.5	8.3	8	7.6	8	9	7.8	7.7	7.8
Total Phosphorus (mg/L)	0.13	0.09	0.06	0.06	0.19	0.05	0.05	0.14	0.07	0.05
Total Solids (mg/L)	95	120	98	110	170	97	100	120	110 est	87
Total Suspended Solids (mg/L)	2	<1	1	2	86	4	1	<1	9	10
Temperature (°C)	25.7	20	11.3	4.9	9.8	15.1	25	17.4	10.1	7.1
Turbidity (NTU)	3	2	2	16	57	11	2	1	24	18
Total Organic Carbon (mg/L)	3	3	3	3 est	3	3	4	3	4	3

	South Umpqua at Melrose Road, LASAR 10442					South Umpqua Population				
Sample date	3/27/2006	5/15/2006	7/24/2006	9/5/2006	11/13/2006	1/8/2007	3/6/2007	5/21/2007	7/16/2007	9/10/2007
Sample time	14:40	14:20	15:43	13:25	12:55	13:10	13:15	15:04	13:45	14:40
Alkalinity as $CaCO_3$ (mg/L)	38	44	57	60	42	32	34	49	46	61
Ammonia as N mg/L	0.03	0.06	0.07	0.07	<0.02	<0.02	0.02	0.13	0.03	0.03
Biochemical Oxygen DemandStream (mg/L)	1.3	1.6	1.3	7.2 est	0.7	0.2	0.9	1	2.4	2
Chemical Oxygen Demand (mg/L)	7	5	10	23					9	11
Chlorophyll a (µg/L)		1.1 est	6.7	2.8				1.2	7.3	2.7
Pheophytin a (µg/L)		0.9 est	3.4	4.7				0.8	2.9	3.8
Conductivity (µmhos/cm)	81	103	153	184	126	86	75	120	156	186
E. Coli (CFU/100 mL)	13	2	3	5	135	37	22	3	10	22
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.2	0.2	0.3						
Nitrate/nitrite as N (mg/L)	0.0297	0.0358	0.0946	0.434	0.059	0.136	0.0619	0.0703	0.156	0.323
Dissolved Orthophosphate as P (mg/L)	0.02	0.027	0.059	0.166				0.048	0.088	0.1
Dissolved Oxygen (mg/L)	11.4	10.7	11.4	15.1	10.5	11.1	11.2	10.6	11.6	14.2
Percent Saturation Dissolved Oxygen (%)	98	116	153	178	91	94	97	112	140	167
pH (SU)	7.6	8	9.2	9.5	7.8	7.4	7.7	8.5	9.1	9.3
Total Phosphorus (mg/L)	0.04	0.04	0.09 est	0.2	0.04	0.07	0.06	0.06	0.12	0.13
Total Solids (mg/L)	72	77	110 est	130	67	98	92	91	95	120
Total Suspended Solids (mg/L)	3	1	2	<1					1	2
Temperature (°C)	9.2	20	31.3	24	9.1	8.6	9.2	18.6	25.9	24
Turbidity (NTU)	10	2	2	1	8	27	24	1	2	2
Total Organic Carbon (mg/L)	2	1	2	3					3	3

Sample date	11/5/2007	1/7/2008	3/17/2008	5/12/2008	7/15/2008
Sample time	13:40	14:10	15:01	14:05	7:40
Alkalinity as $CaCO_3$ (mg/L)	45	36	36	32	45
Ammonia as N mg/L	0.11	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.6	1.4	1.1	1.1	1
Chemical Oxygen Demand (mg/L)	8	9	7	<5	7
Chlorophyll a (µg/L)				1.9	3.3
Pheophytin a (µg/L)				1.2	4.2
Conductivity (µmhos/cm)	138	85	87	84	134
E. Coli (CFU/100 mL)	135	147			55
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.0631	0.189	0.0612	0.033	0.216
Dissolved Orthophosphate as P (mg/L)	0.049	0.028	0.023	0.025	0.074
Dissolved Oxygen (mg/L)	11.8	11.7	12	11.7	6.4
Percent Saturation Dissolved Oxygen (%)	104	94	100	111	75
pH (SU)	8.2	7.2	7.9	8.4	7.2
Total Phosphorus (mg/L)	0.06	0.09	0.05	0.04	0.1
Total Solids (mg/L)	110	120	78	71	84
Total Suspended Solids (mg/L)	1	30	6	1	1
Temperature (°C)	10	6.1	7.8	13.3	23.9
Turbidity (NTU)	2	44	16	3	1
Total Organic Carbon (mg/L)	3	4	3	2	2

	South Umpqua at Hwy 42 (Winston), LASAR 10443				South Umpqua Population					
Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	14:35	15:30	13:35	15:10	14:40	17:34	14:52	14:15	14:10	13:55
Alkalinity as $CaCO_3$ (mg/L)	46	37	32	36	59	55	60	33	35	40
Ammonia as N mg/L	<0.02	0.04	0.02	<0.02	0.02	0.03	<0.02	0.02	0.04	0.02
Biochemical Oxygen DemandStream (mg/L)	0.2	1.1	0.8	1.4	0.3	0.9	1.7	0.1	<0.1	0.6
Chemical Oxygen Demand (mg/L)	9	8	8	7	9	10	12	7	7	7
Chlorophyll a (µg/L)					2.1 est	0.7	0.8			0.9
Pheophytin a (µg/L)					<0.1 est	0.5	1.2			1.1
Conductivity (µmhos/cm)	145	98	78	82	152	168	171	81	82	104
E. Coli (CFU/100 mL)	23	153	12	54	39	770	109	157	4	214
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.6	0.3	0.3	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0484	0.189	0.0326	0.026	0.0101	<0.0050	<0.0050	0.107	0.0561	0.017
Dissolved Orthophosphate as P (mg/L)	0.01	0.021	0.017	0.014	<0.005	<0.005	0.006	0.02	0.015	0.009
Dissolved Oxygen (mg/L)	10.8	11	11.6	11.5	8	9.1	11	11.8	10.7	9
Percent Saturation Dissolved Oxygen (%)	96	98	103	107	103	103	94	100	100	91
pH (SU)	7.9	7.8	7.8	7.9	8.3	8.3	8.1	7.7	7.8	7.7
Total Phosphorus (mg/L)	0.02	0.05	0.04	0.04	0.01	0.01	0.06	0.05	0.02	0.02
Total Solids (mg/L)	81	87	68	78	91	100	84	77	77	84
Total Suspended Solids (mg/L)	1	6	4	9	2	<1	6	2	2	3
Temperature (°C)	9.5	9.4	9.4	11.3	28.2	20.8	8.2	7.6	11.7	15.7
Turbidity (NTU)	3	12	10	10	1	2	2	24	6	4
Total Organic Carbon (mg/L)	4	3	2	3	2	4	4	3	2	2

Sample date	7/20/2004	9/21/2004	11/1/2004	1/11/2005	3/31/2005	5/19/2005	9/20/2005	11/14/2005	1/24/2006	3/27/2006
Sample time	14:15	7:55	14:42	15:05	11:40	12:23	9:30	15:50	13:49	16:15
Alkalinity as $CaCO_3$ (mg/L)	53	57	50	48	36	43	58	32	36	35
Ammonia as N mg/L	0.03	<0.02	0.02	0.03	<0.02	0.03	0.05	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	0.8	1.2	1.1	1.5	0.9	0.6	1.2	0.4	1.3
Chemical Oxygen Demand (mg/L)	8	5	13	13	13	11	8	19	9	7
Chlorophyll a (µg/L)	1	0.8 est				1	0.6			
Pheophytin a (µg/L)	0.6	0.9 est				1.2	0.4			
Conductivity (µmhos/cm)	143	159	135	120	80	88	180	77	82	77
E. Coli (CFU/100 mL)	214	126	29	41	55	236	365	130	16	3
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0085	<0.0050	0.014	0.234	0.125	0.076	0.0062	0.047	0.118	0.0247
Dissolved Orthophosphate as P (mg/L)	0.006	<0.005	0.008	0.021	0.021	0.02	0.005	0.026	0.02	0.014
Dissolved Oxygen (mg/L)	7.9	8.6	11.2	12.5	11.8	10.1	8.5	10.5	11.5	11.5
Percent Saturation Dissolved Oxygen (%)	97	89	101	100	103	94	90	95	97	100
pH (SU)	8.2	8.1	8	8	7.7	7.8	8.4	7.7	7.8	7.8
Total Phosphorus (mg/L)	0.02	0.02	0.02	0.04	0.07	0.06	0.01	0.07	0.05	0.03
Total Solids (mg/L)	90	98	93	89	93	94	120	100 est	78	75
Total Suspended Solids (mg/L)	<1	<1	1	2	18	12	<1	8	8	3
Temperature (°C)	25.6	16.5	11	4.9	8.8	12.1	17.6	10.1	7.4	8.4
Turbidity (NTU)	<1	2	2	13	35	25	1	36	16	8
Total Organic Carbon (mg/L)	2	2	3	3 est	4	4	2	5	3	2

	South Umpqua at Hwy 42 (Winston), LASAR 10443				South Umpqua Population					
Sample date	5/15/2006	7/24/2006	9/5/2006	11/13/2006	1/8/2007	3/6/2007	5/22/2007	7/16/2007	9/11/2007	11/5/2007
Sample time	15:40	16:35	14:30	14:15	14:15	14:15	8:18	15:00	7:20	15:10
Alkalinity as $CaCO_3$ (mg/L)	42	61	61	40	33	32	45	57	59	45
Ammonia as N mg/L	<0.02	0.06	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.8	0.7	0.5	0.6	0.8	0.5	0.8	0.6	1
Chemical Oxygen Demand (mg/L)	<5	8	8					7	7	8
Chlorophyll a (µg/L)	0.4 est	3.1	0.7				0.4	1.7	0.4	
Pheophytin a (µg/L)	0.6 est	1.4	0.3				0.6	0.5	0.8	
Conductivity (µmhos/cm)	99	146	171	114	81	70	110	147	167	136
E. Coli (CFU/100 mL)	15	727	517	68	25	25	13	228	411	19
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.3							
Nitrate/nitrite as N (mg/L)	0.0086	0.0116	0.0302	0.0974	0.116	0.0478	<0.0050	0.0098	<0.0050	0.0077
Dissolved Orthophosphate as P (mg/L)	0.009	0.006	<0.005				0.006	<0.005	<0.005	0.016
Dissolved Oxygen (mg/L)	9.6	7.9	8.9	10.8	11.2	11.2	9.1	8.3	7.9	11.3
Percent Saturation Dissolved Oxygen (%)	104	107	107	94	96	97	92	100	88	102
pH (SU)	8.1	8.4	8.3	7.9	7.5	7.7	7.9	8.5	8.1	8.1
Total Phosphorus (mg/L)	0.02	0.02 est	0.02	0.04	0.06	0.06	0.01	0.01	0.01	0.02
Total Solids (mg/L)	72	100 est	100	110	89	88	87	89	110	100
Total Suspended Solids (mg/L)	<1	2	<1					<1	1	1
Temperature (°C)	19.9	30.5	23.8	8.6	8.7	9	15.4	25.4	20.1	10.2
Turbidity (NTU)	2	1	1	8	25	26	2	<1	1	2
Total Organic Carbon (mg/L)	2	1	2					2	2	2

Sample date	1/8/2008	3/18/2008	5/13/2008	7/15/2008
Sample time	7:50	8:04	8:11	8:36
Alkalinity as $CaCO_3$ (mg/L)	35	35	31	48
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.5	1.3	6.4 est	0.6
Chemical Oxygen Demand (mg/L)	9	6	<5	<5
Chlorophyll a (µg/L)			0.7	1.3
Pheophytin a (µg/L)			0.9	1.8
Conductivity (µmhos/cm)	85	83	78	126
E. Coli (CFU/100 mL)	219			>2420
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.171	0.0308	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.022	0.017	0.012	0.007
Dissolved Oxygen (mg/L)	11.9	11.7	16	7.5
Percent Saturation Dissolved Oxygen (%)	93	98	149	91
pH (SU)	7.7	7.9	7.6	7.9
Total Phosphorus (mg/L)	0.08	0.04	0.17	0.02
Total Solids (mg/L)	100	72	65	86
Total Suspended Solids (mg/L)	20	4	2	<1
Temperature (°C)	5.9	7.3	11.5	24.9
Turbidity (NTU)	44	11	4	1
Total Organic Carbon (mg/L)	4	2	1	2

North Umpqua at Garden Valley Road (Roseburg), LASAR 10451 **North Umpqua Population**

Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	12:40	13:20	12:20	13:30	13:00	15:44	13:00	12:50	12:15	12:06
Alkalinity as $CaCO_3$ (mg/L)	27	24	23	25	30	29	30	23	26	26
Ammonia as N mg/L	<0.02	0.03	0.04	<0.02	0.02	<0.02	<0.02	0.04	<0.02	0.04
Biochemical Oxygen DemandStream (mg/L)	2.6	1.8	1.1	1	0.6	0.9	1	1.4	0.5	0.2
Chemical Oxygen Demand (mg/L)	<5	8	8	<5	7	<5	<5	6	<5	<5
Chlorophyll a (µg/L)					1.0 est	1	0.7			0.9
Pheophytin a (µg/L)					0.6 est	1.1	0.8			0.8
Conductivity (µmhos/cm)	69	61	54	59	67	69	72	53	55	59
E. Coli (CFU/100 mL)	21	387	10	89	7	201	30	153	7	121
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.2	<0.2	<0.2	0.7	<0.2	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0059	0.0401	0.0085	<0.0050	<0.0050	<0.0050	<0.0050	0.0413	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.034	0.027	0.017	0.017	0.019	0.027	0.038	0.02	0.016	0.021
Dissolved Oxygen (mg/L)	12.3	11.8	12.1	11.8	8.8	9.9	12.4	12.4	11.4	10
Percent Saturation Dissolved Oxygen (%)	102	104	103	106	104	106	100	102	102	95
pH (SU)	7.9	7.8	7.7	7.8	8.3	8.4	8	7.7	7.7	7.8
Total Phosphorus (mg/L)	0.04	0.06	0.04	0.04	0.03	0.04	0.05	0.06	0.02	0.03
Total Solids (mg/L)	60	76	57	58	57	64	39	64	55	58
Total Suspended Solids (mg/L)	2	13	4	4	2	2	1	11	3	2
Temperature (°C)	7.4	8.9	8.5	9.8	24.5	17.9	5.7	7.1	10.3	13.3
Turbidity (NTU)	2	18	9	4	<1	1	<1	20	5	2
Total Organic Carbon (mg/L)	1	3	3	2	1	2	<1	3	2	1

Sample date	7/20/2004	9/20/2004	11/1/2004	1/11/2005	3/28/2005	5/16/2005	7/11/2005	9/20/2005	11/14/2005	1/24/2006
Sample time	12:35	16:00	13:25	13:01	13:14	14:50	13:09	8:00	14:05	12:18
Alkalinity as $CaCO_3$ (mg/L)	31	35	29	34	24	34	35	30	23	25
Ammonia as N mg/L	<0.02	<0.02	0.03	0.02	<0.02	0.02	0.06	0.02	<0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	0.6	1	1.8	0.8	4.8	1.2	2.2	0.7	1.3	0.6
Chemical Oxygen Demand (mg/L)	<5	5	10	10	25	10	10	<5	11	5
Chlorophyll a (µg/L)	1	0.9 est				0.7	0.6	1		
Pheophytin a (µg/L)	1.2	0.9 est				1.3	0.6	1.1		
Conductivity (µmhos/cm)	68	73	72	81	49	67	71	75	50	55
E. Coli (CFU/100 mL)	17	33	24	46	411	1120	<1	31	93	17
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.8	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	<0.0050	<0.0050	0.0086	0.0766	0.0663	0.0089	0.007	0.0063	0.0396	0.034
Dissolved Orthophosphate as P (mg/L)	0.016	0.021	0.028	0.025	0.022	0.021	0.016	0.03	0.022	0.021
Dissolved Oxygen (mg/L)	8.7	10.5	12.2	13.3	11.7	10.6	9.1	9.1	11.9	12.4
Percent Saturation Dissolved Oxygen (%)	99	103	109	105	98	101	104	89	107	101
pH (SU)	8	8.3	8.1	7.9	7.4	7.9	7.8	8.1	7.7	7.7
Total Phosphorus (mg/L)	0.03	0.03	0.04	0.05	0.09	0.04	0.03	0.04	0.05	0.04
Total Solids (mg/L)	60	65	62	80	100	66	61	70	67 est	62
Total Suspended Solids (mg/L)	<1	2	1	3	33	7	2	2	5	4
Temperature (°C)	22.2	15	9.4	4.6	8.2	13.5	20.9	14.9	10.1	5.9
Turbidity (NTU)	1	2	2	9	40	11	2	2	16	8
Total Organic Carbon (mg/L)	1	2	1	1 est	6	2	3	<1	3	2

	North Umpqua at Garden Valley Road (Roseburg), LASAR 10451					North Umpqua Population				
Sample date	3/27/2006	5/15/2006	7/24/2006	9/5/2006	11/13/2006	1/8/2007	3/6/2007	5/21/2007	7/16/2007	9/10/2007
Sample time	14:10	13:45	15:15	13:00	12:30	12:45	12:50	14:39	13:25	13:35
Alkalinity as $CaCO_3$ (mg/L)	27	22	31	32	28	22	25	27	32	33
Ammonia as N mg/L	0.03	<0.02	0.04	0.03	0.1	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.2	0.8	0.1	0.9	0.5	1.2	0.9	0.6	1.1	0.6
Chemical Oxygen Demand (mg/L)	7	<5	5	<5					<5	<5
Chlorophyll a (µg/L)		0.2 est	0.6	1				0.5	1.4	1.2
Pheophytin a (µg/L)		0.2 est	0.6	0.9				0.5	0.9	1.2
Conductivity (µmhos/cm)	53	51	65	71	69	58	51	60	68	73
E. Coli (CFU/100 mL)	1	3	20	23	68	27	13	8	26	11
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.106	<0.0050	0.0066	0.0053	0.143	0.0413	0.0111	<0.0050	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.019	0.02	0.015	0.024				0.02	0.014	0.028
Dissolved Oxygen (mg/L)	12	10.2	8.2	9.7	11.5	12	12	10.6	9.2	9.7
Percent Saturation Dissolved Oxygen (%)	101	102	101	105	97	100	101	102	105	103
pH (SU)	7.7	8	8.5	8.4	7.8	7.4	7.7	8.1	8.4	8.2
Total Phosphorus (mg/L)	0.04	0.03	0.03 est	0.04	0.06	0.04	0.05	0.03	0.03	0.04
Total Solids (mg/L)	83	50	74 est	73	110	66	72	62	58	68
Total Suspended Solids (mg/L)	6	2	2	1					2	4
Temperature (°C)	7.8	15.8	26.6	19.8	7.8	7.6	8	14	22.6	18.9
Turbidity (NTU)	5	2	1	1	6	14	13	2	2	3
Total Organic Carbon (mg/L)	2	<1	<1	<1					1	1

Sample date	11/5/2007	1/7/2008	3/17/2008	5/12/2008	7/14/2008
Sample time	13:15	13:35	14:37	13:30	15:35
Alkalinity as $CaCO_3$ (mg/L)	25	28	26	22	29
Ammonia as N mg/L	<0.02	<0.02	<0.02 est	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.6	1.6	0.7	0.8	0.6
Chemical Oxygen Demand (mg/L)	<5	6	<5	<5	<5
Chlorophyll a (µg/L)				0.4	0.5
Pheophytin a (µg/L)				0.6	0.4
Conductivity (µmhos/cm)	67	63	59	50	64
E. Coli (CFU/100 mL)	19	118			4
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	<0.0050	0.08	0.0116 est	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.037	0.028	0.018	0.018	0.019
Dissolved Oxygen (mg/L)	12.2	12.4	12.6	11.5	64
Percent Saturation Dissolved Oxygen (%)	101	98	103	103	109
pH (SU)	7.9	7.3	7.8	7.8	8.5
Total Phosphorus (mg/L)	0.04	0.06	0.04 est	0.03	0.03
Total Solids (mg/L)	74	88	59	53	60
Total Suspended Solids (mg/L)	1	21	4	2	<1
Temperature (°C)	7.7	5.3	6.9	10.5	22.5
Turbidity (NTU)	<1	22	13	3	1
Total Organic Carbon (mg/L)	<1	3	1	1	1

Calapooya Creek at Umpqua, LASAR 10996 **Middle Umpqua Population**

Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	12:05	12:32	11:50	12:50	12:25	14:48	12:21	12:15	11:50	11:25
Alkalinity as $CaCO_3$ (mg/L)	40	29	33	38	50	72	43	26	35	41
Ammonia as N mg/L	0.21	0.04	0.05	0.05	0.02	0.03	<0.02	0.06	0.03	0.03
Biochemical Oxygen DemandStream (mg/L)	1.2	1.4	0.7		1.2	4.1	0.8	1	<0.1	1
Chemical Oxygen Demand (mg/L)	11	11	8	<5	13	19	11	9	<5	7
Chlorophyll a (µg/L)					3.2 est	12	2.2			1.4
Pheophytin a (µg/L)					0.2 est	5.7	1.6			2.2
Conductivity (µmhos/cm)	141	100	95	99	134	227	155	79	91	124
E. Coli (CFU/100 mL)	50	517	88	167	51	770	157	248	105	345
Total Kjeldahl Nitrogen (mg/L)	0.5	0.5	0.2	<0.2	0.5	0.6	0.4	0.7	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.507	0.273	0.16	0.0786	0.241	1.9	0.651	0.272	0.18	0.0614
Dissolved Orthophosphate as P (mg/L)	0.094	0.02	0.014	0.014	<0.005	<0.005	0.1	0.015	0.01	0.01
Dissolved Oxygen (mg/L)	10.8	10.9	11.3	11.1	8.5	10.8	11.4	11.4	10.2	9
Percent Saturation Dissolved Oxygen (%)	94	98	99	100	102	120	94	96	92	90
pH (SU)	7.7	7.7	7.7	7.8	8.3	8.6	7.9	7.6	7.6	7.6
Total Phosphorus (mg/L)	0.11	0.1	0.06	0.04	0.02	0.03	0.12	0.11	0.04	0.02
Total Solids (mg/L)	91	120	93	84	97	160	65	120	93	96
Total Suspended Solids (mg/L)	3	27	15	6	4	3	<1	50	11	2
Temperature (°C)	9.4	9.9	9.3	11.1	25.7	19.7	6.6	8.1	11.1	15.8
Turbidity (NTU)	5	54	24	13	2	2	2	59	15	4
Total Organic Carbon (mg/L)	4	4	2	2	4	8	4	4	2	2

Sample date	7/20/2004	9/20/2004	11/1/2004	1/11/2005	3/28/2005	5/16/2005	7/11/2005	9/20/2005	11/14/2005	1/24/2006
Sample time	12:01	15:35	12:48	12:30	12:40	14:05	12:17	7:30	13:15	11:50
Alkalinity as $CaCO_3$ (mg/L)	42	36	35	39	35	46	51	43	30	30
Ammonia as N mg/L	<0.02	0.03	0.03	0.06	0.03	0.04	<0.02	0.03	0.04	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.9	1.4	1.3	1.9	1.7	2.1	1.3	0.9	0.1
Chemical Oxygen Demand (mg/L)	6	13	11	9	26	8	6	10	15	5
Chlorophyll a (µg/L)	2.7	1.0 est				0.9	1	0.9		
Pheophytin a (µg/L)	1.9	1.6 est				1.9	1.1	1.8		
Conductivity (µmhos/cm)	105	90	106	110	93	105	124	171	91	81
E. Coli (CFU/100 mL)	62	199	187	59	1203	1300	4	261	261	44
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0332	0.233	0.275	0.463	0.639	0.193	0.0564	0.29	0.6	0.232
Dissolved Orthophosphate as P (mg/L)	<0.005	0.017	0.028	0.021	0.026	0.02	0.009	0.019	0.023	0.014
Dissolved Oxygen (mg/L)	8.9	9.8	11.7	11.9	10.6	9.9	9.1	8	10.4	11.4
Percent Saturation Dissolved Oxygen (%)	102	99	106	97	91	95	104	78	97	95
pH (SU)	8.1	8	8.1	7.8	7.7	7.8	8.1	7.9	7.6	7.5
Total Phosphorus (mg/L)	0.02	0.04	0.04	0.07	0.22	0.08	0.02	0.03	0.08	0.06
Total Solids (mg/L)	70	85	84	118	230	130	93	110	110 est	98
Total Suspended Solids (mg/L)	<1	<1	<1	1	119	39	2	<1	9	21
Temperature (°C)	22.6	16.5	10	6	9.1	13.9	21.7	15.2	11.6	7.1
Turbidity (NTU)	2	5	6	34	131	28	3	2	32	30
Total Organic Carbon (mg/L)	2	5	2	3 est	8	3	2	3	5	2

	Calapooya Creek at Umpqua, LASAR 10996				Middle Umpqua Population					
Sample date	3/27/2006	5/15/2006	7/24/2006	9/5/2006	11/13/2006	1/8/2007	3/6/2007	5/21/2007	7/16/2007	9/10/2007
Sample time	13:25	13:15	14:30	12:30	11:55	12:05	12:20	14:12	13:00	13:00
Alkalinity as $CaCO_3$ (mg/L)	35	45	43	47	31	25	29	44	47	53
Ammonia as N mg/L	<0.02	0.03	0.03	0.04	0.04	<0.02	<0.02	0.02	<0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	1.3	1.1	0.1	1.3	1	0.9	0.6	1.2	1.6	1.2
Chemical Oxygen Demand (mg/L)	<5	<5	11	10					9	10
Chlorophyll a (µg/L)		0.7 est	2.7	1.4				1.3	3.4	1.9
Pheophytin a (µg/L)		1.6 est	2.1	1.1				1.6	0.8	2.1
Conductivity (µmhos/cm)	90	127	104	149	119	79	73	129	128	167
E. Coli (CFU/100 mL)	28	23	47	81	326	70	44	44	179	236
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	0.2						
Nitrate/nitrite as N (mg/L)	<0.0050	0.0292	0.0418	0.405	0.786	0.251	0.165	0.138	0.16	0.4
Dissolved Orthophosphate as P (mg/L)	0.011	0.005	0.005	<0.005				0.028	<0.005	0.005
Dissolved Oxygen (mg/L)	11.3	9.1	8.1	8.6	10.7	11	10.9	10.6	8.7	8.2
Percent Saturation Dissolved Oxygen (%)	97	81	107	80	91	96	94	106	99	89
pH (SU)	7.6	7.9	8.5	7.9	7.7	7.2	7.6	8.3	8.2	7.8
Total Phosphorus (mg/L)	0.03	0.02	0.03 est	0.02	0.09	0.08	0.07	0.05	0.02	0.02
Total Solids (mg/L)	59	85	91 est	110	130	120	100	95	82	110
Total Suspended Solids (mg/L)	2	3	2	1					1	3
Temperature (°C)	8.8	10.4	30.5	21.2	8.4	9.6	9	15.9	22.4	19.8
Turbidity (NTU)	18	4	2	2	24	46	35	4	2	3
Total Organic Carbon (mg/L)	1	2	2	3					3	4

Sample date	11/5/2007	1/7/2008	3/17/2008	5/12/2008	7/14/2008
Sample time	12:45	12:44	13:57	13:00	15:10
Alkalinity as $CaCO_3$ (mg/L)	38	29	33	33	43
Ammonia as N mg/L	0.07	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.8	1.4	1.3	1.1	1.2
Chemical Oxygen Demand (mg/L)	11	7	7	<5	11
Chlorophyll a (µg/L)				1.4	5
Pheophytin a (µg/L)				2.5	0.9
Conductivity (µmhos/cm)	141	78	91	97	108
E. Coli (CFU/100 mL)	27	192			33
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.793	0.263	0.161	0.0402	0.234
Dissolved Orthophosphate as P (mg/L)	0.131	0.017	0.016	0.02	0.013
Dissolved Oxygen (mg/L)	12	11.8	11.7	10.8	10.3
Percent Saturation Dissolved Oxygen (%)	103	94	98	103	126
pH (SU)	8.1	7.6	7.7	8	8.8
Total Phosphorus (mg/L)	0.15	0.11	0.07	0.03	0.03
Total Solids (mg/L)	100	150	100	77	73
Total Suspended Solids (mg/L)	2	66	22	3	2
Temperature (°C)	9	6	7.7	14.2	26.2
Turbidity (NTU)	6	68	32	5	3
Total Organic Carbon (mg/L)	3	3	3	2	3

Cow Creek at mouth, LASAR 10997 **South Umpqua Population**

Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	15:25	16:21	14:20	16:00	15:30	18:22	16:10	15:00	14:50	14:42
Alkalinity as $CaCO_3$ (mg/L)	51	35	35	38	59	56	56	36	42	50
Ammonia as N mg/L	0.03	0.04	0.03	<0.02	0.06	0.02	<0.02	0.03	0.02	0.04
Biochemical Oxygen DemandStream (mg/L)	0.1	0.9	0.1	3.8	1.4	0.9	1.2	0.9	<0.1	0.3
Chemical Oxygen Demand (mg/L)	7	22	5	<5	8	7	7	7	5	6
Chlorophyll a (µg/L)					1.1 est	1.1	1.5			1.4
Pheophytin a (µg/L)					0.9 est	1.5	1.3			1.6
Conductivity (µmhos/cm)	142	85	87	95	137	144	143	87	91	123
E. Coli (CFU/100 mL)	20	34	2	5	1	313	141	16	5	59
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.2	<0.2	0.6	0.3	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0204	0.103	0.0291	0.0155	<0.0050	0.0142	0.0236	0.0869	0.0699	0.0184
Dissolved Orthophosphate as P (mg/L)	0.01	0.016	0.009	0.006	0.005	<0.005	0.009	0.01	0.008	0.007
Dissolved Oxygen (mg/L)	11	11.1	11.3	11.1	10.5	10.4	11.5	12	10.3	9.7
Percent Saturation Dissolved Oxygen (%)	98	99	103	107	136	116	98	101	99	97
pH (SU)	8	7.8	8	8	8.9	8.8	8.1	7.8	7.9	7.9
Total Phosphorus (mg/L)	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Total Solids (mg/L)	79	72	63	72	86	93	69	69	68	88
Total Suspended Solids (mg/L)	2	5	1	1	2	<1	<1	2	<1	1
Temperature (°C)	9.7	9.6	10	12.4	27.8	19.7	7.4	7.3	12.4	14.7
Turbidity (NTU)	2	12	6	3	1	1	1	8	3	1
Total Organic Carbon (mg/L)	3	4	2	2	2	3	2	3	2	2

Sample date	7/20/2004	9/21/2004	11/1/2004	1/11/2005	3/29/2005	5/17/2005	7/11/2005	9/20/2005	11/15/2005	1/24/2006
Sample time	15:03	8:45	15:25	15:50	8:40	8:25	15:20	11:30	8:40	15:05
Alkalinity as $CaCO_3$ (mg/L)	56	58	51	46	33	51	66	59	41	35
Ammonia as N mg/L	<0.02	<0.02	0.05	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	2.6	0.8	1.2	1.7	2.1	0.4	1.6	0.6	0.6	0.3
Chemical Oxygen Demand (mg/L)	6	8	13	11	28	9	5	6	12	9
Chlorophyll a (µg/L)	1.1	1.2 est				0.4	0.6	0.8		
Pheophytin a (µg/L)	1	2.1 est				0.5	0.7	1.1		
Conductivity (µmhos/cm)	138	144	130	107	70	110	135	156	100	78
E. Coli (CFU/100 mL)	2	151	30	16	201	25	1	19	32	11
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	<0.0050	0.0088	0.0149	0.121	0.102	0.0771	0.0154	0.0091	0.0382	0.0929
Dissolved Orthophosphate as P (mg/L)	<0.005	<0.005	0.01	0.01	0.016	0.008	0.009	0.007	0.011	0.014
Dissolved Oxygen (mg/L)	10.8	8.9	11.9	13.1	11.4	10	10.4	9.1	10.4	11.4
Percent Saturation Dissolved Oxygen (%)	134	87	109	104	106	95	126	99	94	99
pH (SU)	9	7.9	8.5	8.2	7.4	7.6	8.5	8.4	7.8	7.7
Total Phosphorus (mg/L)	0.01	0.01	0.02	0.02	0.13	0.01	0.02	0.01	0.02	0.04
Total Solids (mg/L)	77	93	90	87	140	73	92	100	76	78
Total Suspended Solids (mg/L)	<1	<1	2	<1	19	<1	<1	<1	<1	7
Temperature (°C)	25.3	13.7	10.7	5	7.6	11.8	23.6	17.8	9.4	7.9
Turbidity (NTU)	<1	<1	2	6	54	3	2	1	6	12
Total Organic Carbon (mg/L)	2	2	2	3 est	6	1	2	2	3	3

Cow Creek at mouth, LASAR 10997 **South Umpqua Population**

Sample date	3/28/2006	5/16/2006	7/24/2006	9/5/2006	11/13/2006	1/8/2007	3/6/2007	5/22/2007	7/17/2007	9/11/2007
Sample time	8:30	8:00	17:15	15:15	15:00	15:00	8:17	9:23	8:30	8:05
Alkalinity as $CaCO_3$ (mg/L)	34	51	57	55	42	33	31	49	55	59
Ammonia as N mg/L	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.2	0.8	0.4	0.9	0.8	1.1	0.3	0.6	0.6	0.7
Chemical Oxygen Demand (mg/L)	<5	6	9	<5					6	6
Chlorophyll a (µg/L)		0.4 est	1.1	0.8				0.5	1.2	1.2
Pheophytin a (µg/L)		0.8 est	0.8	1.2				0.7	1.7	2.8
Conductivity (µmhos/cm)	76	108	129	132	112	78	67	112	131	142
E. Coli (CFU/100 mL)	6	48	3	11	46	23	29	40	23	40
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.019	0.0127	0.0156	0.0103	0.0498	0.105	0.0526	0.007	<0.0050	0.0052
Dissolved Orthophosphate as P (mg/L)	0.007	0.007	0.008	0.006				0.005	<0.005	<0.005
Dissolved Oxygen (mg/L)	11.4	8.7	9.5	10.7	10.8	11.1	10.8	10.1	6.9	7.3
Percent Saturation Dissolved Oxygen (%)	97	92	128	127	96	96	90	98	80	80
pH (SU)	7.6	7.8	9	8.8	7.9	7.6	7.3	8	7.9	7.9
Total Phosphorus (mg/L)	0.02	0.02	0.02 est	0.02	0.03	0.04	0.03	0.01	0.01	0.02
Total Solids (mg/L)	60	84	98 est	98	95	72	71	84	83	92
Total Suspended Solids (mg/L)	1	2	2	<1					1	2
Temperature (°C)	7.4	16.9	30	23.1	8.8	9.1	7.1	13.4	21.4	18.4
Turbidity (NTU)	5	2	<1	<1	4	15	14	1	<1	1
Total Organic Carbon (mg/L)	1	1 est	1	<1					2	2

Sample date	11/5/2007	1/8/2008	3/18/2008	5/13/2008	7/15/2008
Sample time	15:50	8:40	8:50	9:10	8:36
Alkalinity as $CaCO_3$ (mg/L)	46	36	35	45	57
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	1.4	1.2	0.8	0.07
Chemical Oxygen Demand (mg/L)	7	8	5	<5	<5
Chlorophyll a (µg/L)				0.7	1.2
Pheophytin a (µg/L)				0.9	2
Conductivity (µmhos/cm)	125	83	85	109	135
E. Coli (CFU/100 mL)	15	51			29
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.0087	0.144	0.0176	0.0077	0.0055
Dissolved Orthophosphate as P (mg/L)	0.01	0.014	0.009	0.007	0.006
Dissolved Oxygen (mg/L)	12.2	11.9	11.4	10.1	7.7
Percent Saturation Dissolved Oxygen (%)	111	93	97	97	91
pH (SU)	8.4	7.6	7.8	7.8	7.9
Total Phosphorus (mg/L)	0.01	0.05	0.02	0.02	0.02
Total Solids (mg/L)	98	91	67	80	88
Total Suspended Solids (mg/L)	<1	10	<1	<1	<1
Temperature (°C)	9.8	6.1	7.3	12.5	23
Turbidity (NTU)	1	26	5	2	1
Total Organic Carbon (mg/L)	2	3	2	2	2

South Umpqua at Days Creek Cutoff Road (Canyonville), LASAR 11484 South Umpqua Population

Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	16:15	16:50	15:00	16:42	16:00	18:56	16:43	15:35	15:40	15:20
Alkalinity as $CaCO_3$ (mg/L)	39	26	27	27	49	49	51	25	29	30
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	0.7	0.7	1.4	1.5	1	0.8	0.8	0.2	0.4
Chemical Oxygen Demand (mg/L)	6	7	6	6	8	5	5	8	6	8
Chlorophyll a (µg/L)					1.4 est	1.9	0.6			0.7
Pheophytin a (µg/L)					0.3 est	1.2	0.6			0.7
Conductivity (µmhos/cm)	122	67	65	66	129	151	166	58	61	78
E. Coli (CFU/100 mL)	17	23	1	10	2	548	157	16	<2	37
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.4	<0.2	<0.2	0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0058	0.0341	0.0123	0.0147	0.0195	0.009	<0.0050	0.0405	0.0131	0.0072
Dissolved Orthophosphate as P (mg/L)	0.012	0.021	0.02	0.017	<0.005	<0.005	<0.005	0.022	0.016	0.011
Dissolved Oxygen (mg/L)	11.4	11.3	11.9	11.7	9.5	9.7	11.6	12.3	11	10
Percent Saturation Dissolved Oxygen (%)	99	99	104	107	125	108	98	104	101	97
pH (SU)	8	7.8	7.8	7.9	8.8	8.5	8.1	7.7	7.8	7.7
Total Phosphorus (mg/L)	0.02	0.03	0.04	0.04	0.01	0.01	0.01	0.05	0.02	0.02
Total Solids (mg/L)	70	67	65	66	84	98	92	74	67	62
Total Suspended Solids (mg/L)	<1	2	3	3	1	<1	<1	9	1	2
Temperature (°C)	8.3	8.5	8.5	10.2	29	19.6	6.8	6.9	10.5	13.1
Turbidity (NTU)	3	6	10	9	<1	1	<1	17	7	2
Total Organic Carbon (mg/L)	2	3	2	3	2	2	2	3	2	1

Sample date	7/20/2004	9/21/2004	11/1/2004	1/11/2005	3/29/2005	5/17/2005	7/11/2005	9/20/2005	11/15/2005	1/24/2006
Sample time	15:40	9:15	15:53	16:30	9:30	9:30	16:01	12:08	9:23	15:30
Alkalinity as $CaCO_3$ (mg/L)	43	47	40	42	30	34	50	49	28	30
Ammonia as N mg/L	<0.02	<0.02	0.02	0.03	<0.02	<0.02	<0.02	<0.02 est	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.6	0.5	1.6	1.9	0.4	2.1	0.7	<0.1	0.3
Chemical Oxygen Demand (mg/L)	5	7	13	9	23	11	<5	<5	11	6
Chlorophyll a (µg/L)	0.8	0.9 est				0.4	0.6	1.2		
Pheophytin a (µg/L)	0.6	1.1 est				0.9	0.4	0.9		
Conductivity (µmhos/cm)	118	143	106	97	66	71	109	157	65	66
E. Coli (CFU/100 mL)	13	41	28	17	194	59	39	67	29	7
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2	<0.2 est	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0074	0.0093	0.0111	0.0607	0.081	0.014	0.0129	0.0090 est	0.0272	0.036
Dissolved Orthophosphate as P (mg/L)	<0.005	<0.005	0.008	0.02	0.03	0.018	0.007	<0.005	0.024	0.024
Dissolved Oxygen (mg/L)	9.6	9.1	11.8	12.8	11.6	10.5	9.5	9.2	10.7	11.7
Percent Saturation Dissolved Oxygen (%)	121	91	106	100	98	97	116	100	95	99
pH (SU)	8.8	7.9	8.3	8	7.6	7.7	8.3	8.4	7.7	7.7
Total Phosphorus (mg/L)	0.01	0.01	0.02	0.03	0.16	0.03	0.02	0.01 est	0.05	0.04
Total Solids (mg/L)	75	87	80	87	160	69	80	100	66	66
Total Suspended Solids (mg/L)	<1	<1	<1	<1	69	3	<1	<1	1	<1
Temperature (°C)	26.3	14.5	9.7	4.1	6.8	10.8	24.4	18	9.1	7.1
Turbidity (NTU)	<1	1	2	10	84	8	2	1	12	9
Total Organic Carbon (mg/L)	1	2	2	2 est	8	2	1	1	3	2

South Umpqua at Days Creek Cutoff Road (Canyonville), LASAR 11484 South Umpqua Population

Sample date	3/28/2006	5/16/2006	7/24/2006	9/5/2006	11/13/2006	1/8/2007	3/6/2007	5/22/2007	7/17/2007	9/11/2007
Sample time	9:25	9:19	17:48	15:50	15:25	15:35	8:54	9:59	9:00	8:35
Alkalinity as $CaCO_3$ (mg/L)	30	30	51	50	33	27	26	34	47	55
Ammonia as N mg/L	0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.9	0.9	0.8	1.2	0.9	<0.1	0.7	0.8	0.7
Chemical Oxygen Demand (mg/L)	6	6	7	<5					8	<5
Chlorophyll a (µg/L)		0.3 est	0.8	0.9				0.5	2	1.4
Pheophytin a (µg/L)		0.5 est	0.7	0.5				0.6	0.9	2
Conductivity (µmhos/cm)	64	66	122	154	88	66	57	83	128	163
E. Coli (CFU/100 mL)	5	36	517	12	291	12	4	15	26	36
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.0056	<0.0050	0.0069	0.011	0.0302	0.0384	0.0127	<0.0050	0.0085	0.0341
Dissolved Orthophosphate as P (mg/L)	0.019	0.011	0.006	<0.005				0.008	<0.005	<0.005
Dissolved Oxygen (mg/L)	11.8	9.6	9.2	10.2	11.2	11.8	10.4	10.5	6.8	7.5
Percent Saturation Dissolved Oxygen (%)	100	97	72	125	96	97	86	101	80	81
pH (SU)	7.6	7.7	8.8	8.9	7.9	7.5	7.7	7.9	7.9	7.8
Total Phosphorus (mg/L)	0.03	0.02	0.02 est	0.01	0.08	0.05	0.04	0.01	0.02	0.01
Total Solids (mg/L)	62	62	99 est	98	120	75	71	73	87	110
Total Suspended Solids (mg/L)	2	2	6	<1					1	2
Temperature (°C)	7.1	15	29.8	24.8	7.7	7	6.4	12.8	22.1	18.1
Turbidity (NTU)	9	2	7	1	17	16	14	2	1	1
Total Organic Carbon (mg/L)	2	<1 est	1	<1					2	2

Sample date	11/5/2007	1/8/2008	3/18/2008	5/13/2008	7/15/2008
Sample time	16:20	9:20	9:24	9:44	9:50
Alkalinity as $CaCO_3$ (mg/L)	36	32	30	25	40
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.2	2	1.1	0.4	0.6
Chemical Oxygen Demand (mg/L)	6	7	6	<5	<5
Chlorophyll a (µg/L)				0.3	0.8
Pheophytin a (µg/L)				0.4	0.8
Conductivity (µmhos/cm)	111	69		56	103
E. Coli (CFU/100 mL)	12	59	67	60	64
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.0205	0.0676	0.0147	<0.0050	0.0076
Dissolved Orthophosphate as P (mg/L)	0.013	0.024	0.022	0.013	0.005
Dissolved Oxygen (mg/L)	11.7	12.3	11.8	11	8.6
Percent Saturation Dissolved Oxygen (%)	105	94	99	99	101
pH (SU)	8.1	7.5	7.8	7.6	7.9
Total Phosphorus (mg/L)	0.02	0.05	0.05	0.03	0.03
Total Solids (mg/L)	94	84	70	53	74
Total Suspended Solids (mg/L)	<1	6	3	<1	<1
Temperature (°C)	9.7	5.1	6.7	9.5	22
Turbidity (NTU)	<1	23	12	3	<1
Total Organic Carbon (mg/L)	2	4	2	1	1

South Umpqua at Stewart Park Road (Roseburg), LASAR 11522 South Umpqua Population

Sample date	11/18/2002	1/14/2003	3/24/2003	5/5/2003	7/21/2003	9/9/2003	11/4/2003	1/27/2004	3/9/2004	5/18/2004
Sample time	13:45	15:00	13:10	14:33	14:00	16:42	14:07	13:45	13:10	13:06
Alkalinity as $CaCO_3$ (mg/L)	45	40	33	38	59	56	59	36	38	43
Ammonia as N mg/L	0.02	0.03	0.03	0.02	0.03	0.02	<0.02	0.05	0.03	0.03
Biochemical Oxygen DemandStream (mg/L)	0.4	1.5	0.9	1.4	1.5	1.4	1.7	1	0.2	1.1
Chemical Oxygen Demand (mg/L)	10	10	9	7	10	12	7	10	7	8
Chlorophyll a (µg/L)					5.1 est	1.6	5.8			1.7
Pheophytin a (µg/L)					<0.1 est	0.8	2.8			2
Conductivity (µmhos/cm)	148	106	81	91	155	171	176	90	88	113
E. Coli (CFU/100 mL)	31	579	29	115	7	816	63	272	12	1733
Total Kjeldahl Nitrogen (mg/L)	0.3	<0.2	0.2	<0.2	0.6	0.4	<0.2	0.4	<0.2	0.2
Nitrate/nitrite as N (mg/L)	0.0731	0.24	0.0419	0.032	<0.0050	0.0294	0.0493	0.131	0.0649	0.0363
Dissolved Orthophosphate as P (mg/L)	0.012	0.025	0.018	0.014	0.005	0.007	0.005	0.021	0.014	0.024
Dissolved Oxygen (mg/L)	10.3	11	11.5	11.3	7.7	8	11.6	11.8	10.6	8.7
Percent Saturation Dissolved Oxygen (%)	90	98	99	105	97	91	101	99	97	87
pH (SU)	7.7	7.9	7.7	7.9	8.5	8.6	8.1	7.6	7.8	7.8
Total Phosphorus (mg/L)	0.03	0.06	0.04	0.04	0.02	0.03	0.02	0.07	0.03	0.1
Total Solids (mg/L)	87	96	75	81	93	110	91	90	77	130
Total Suspended Solids (mg/L)	3	11	6	6	2	2	1	15	2	28
Temperature (°C)	9.6	9.4	9.2	11.3	28	21	8.4	7.7	11.4	16.1
Turbidity (NTU)	3	19	13	9	1	3	2	35	8	43
Total Organic Carbon (mg/L)	4	4	3	3	3	5	2	4	2	3

Sample date	7/20/2004	9/21/2004	11/1/2004	1/11/2005	3/28/2005	5/16/2005	7/11/2005	9/20/2005	11/14/2005	1/24/2006
Sample time	13:46	7:20	14:15	14:00	14:08	15:50	14:20	9:00	14:55	13:10
Alkalinity as $CaCO_3$ (mg/L)	53	57	48	49	41	53	61	62	34	38
Ammonia as N mg/L	<0.02	<0.02	0.03	0.02	0.02	0.05	<0.02	0.02	0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	0.7	0.8	1.8	2.8	0.7	2.5	0.7	1.7	0.2
Chemical Oxygen Demand (mg/L)	7	10	15	12	22	10	5	10	20	8
Chlorophyll a (µg/L)	1.3	0.4 est				0.5	1.3	0.6		
Pheophytin a (µg/L)	0.3	1.0 est				0.9	0.6	0.3		
Conductivity (µmhos/cm)	146	171	137	127	103	110	144	189	87	87
E. Coli (CFU/100 mL)	89	108	22	72	1120	1733	9	96	345	27
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2	<0.2	0.4	<0.2
Nitrate/nitrite as N (mg/L)	<0.0050	0.0149	0.0458	0.287	0.0703	0.0888	0.0086	0.0073	0.048	0.129
Dissolved Orthophosphate as P (mg/L)	0.008	0.005	0.01	0.02	0.018	0.022	0.006	0.014	0.025	0.021
Dissolved Oxygen (mg/L)	7.2	8.7	10.9	12.5	10.7	10	9	8.6	10.5	11.4
Percent Saturation Dissolved Oxygen (%)	88	89	100	100	94	98	109	91	95	96
pH (SU)	8.4	8.3	8.1	8	7.9	8	8.2	9.2	7.7	7.8
Total Phosphorus (mg/L)	0.02	0.02	0.02	0.05	0.16	0.04	0.02	0.03	0.08	0.05
Total Solids (mg/L)	100	100	94	100	150	93	88	120	100 est	89
Total Suspended Solids (mg/L)	<1	1	<1	2	65	5	<1	<1	11	9
Temperature (°C)	26.1	16.2	10.9	4.8	9.4	14.8	23.9	18.2	10.2	7.3
Turbidity (NTU)	1	1	2	16	52	7	2	1	33	17
Total Organic Carbon (mg/L)	2	2	3	3 est	4	2	2	2	5	2

South Umpqua at Stewart Park Road (Roseburg), LASAR 11522 South Umpqua Population

Sample date	3/27/2006	5/15/2006	7/24/2006	9/5/2006	11/13/2006	1/8/2007	3/6/2007	5/21/2007	7/16/2007	9/11/2007
Sample time	15:20	15:05	16:10	14:00	13:20	13:45	13:50	15:40	14:25	6:40
Alkalinity as $CaCO_3$ (mg/L)	37	44	62	60	42	33	34	48	57	61
Ammonia as N mg/L	0.03	0.02	0.03	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.2	0.8	3.2	1	0.5	1.3	0.7	<0.1	1.2	0.6
Chemical Oxygen Demand (mg/L)	7	<5	10	9					9	7
Chlorophyll a (µg/L)		0.3 est	5.3	0.6				0.5	4	0.5
Pheophytin a (µg/L)		0.4 est	2.5	0.4				0.5	<0.1	0.7
Conductivity (µmhos/cm)	81	103	150	179	123	84	74	115	152	178
E. Coli (CFU/100 mL)	5	6	8	155	104	68	19	4	96	236
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.0341	0.0068	0.0051	0.0281	0.136	0.139	0.0581	0.0069	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.015	0.016	0.011	0.028				0.012	0.048	0.006
Dissolved Oxygen (mg/L)	11.3	9.3	9.8	8.1	10.5	11.3	11.2	9	7.6	8.2
Percent Saturation Dissolved Oxygen (%)	97	103	129	95	91	96	97	93	92	91
pH (SU)	7.7	8.4	8.6	8.9	7.9	7.6	7.7	8.1	8.7	8.7
Total Phosphorus (mg/L)	0.04	0.03	0.03 est	0.06	0.05	0.06	0.06	0.02	0.07	0.02
Total Solids (mg/L)	81	70	110 est	120	100	94	95	90	95	110
Total Suspended Solids (mg/L)	3	1	2	<1					<1	1
Temperature (°C)	9.2	21	30	23.9	9	8.6	9.1	17.7	25.9	21
Turbidity (NTU)	8	2	1	2	9	27	22	1	2	1
Total Organic Carbon (mg/L)	2	<1	1	2					2	3

Sample date	11/5/2007	1/7/2008	3/17/2008	5/12/2008	7/15/2008
Sample time	14:15	14:40	15:28	14:39	8:09
Alkalinity as $CaCO_3$ (mg/L)	44	37	37	32	47
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.5	1.7	1.1	0.7	0.8
Chemical Oxygen Demand (mg/L)	9	10	6	6	10
Chlorophyll a (µg/L)				0.8	1.9
Pheophytin a (µg/L)				0.8	1.8
Conductivity (µmhos/cm)	137	86	87	81	128
E. Coli (CFU/100 mL)	41	140			35 est
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.0296	0.186	0.0335	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.019	0.025	0.019	0.013	0.01
Dissolved Oxygen (mg/L)	11	11.7	12	11	7.4
Percent Saturation Dissolved Oxygen (%)	97	94	100	104	88
pH (SU)	8	7	7.9	8.2	8.2
Total Phosphorus (mg/L)	0.03	0.09	0.05	0.03	0.04
Total Solids (mg/L)	100	120	78	69	81
Total Suspended Solids (mg/L)	1	32	6	<1	1
Temperature (°C)	9.9	6.1	7.5	13.2	24.7
Turbidity (NTU)	2	36.9	15	3	1
Total Organic Carbon (mg/L)	2	4	3	1	0.04

Millicoma River at Rooke-Higgins boat ramp, LASAR 13570 Coos Population

Sample date	11/20/2002	1/16/2003	3/26/2003	5/7/2003	7/24/2003	9/11/2003	11/6/2003	1/29/2004	3/11/2004	5/20/2004
Sample time	12:40	8:15	11:30	10:27	16:35	10:37	10:30	8:40	8:30	8:12
Alkalinity as $CaCO_3$ (mg/L)	15	11	10	12	24	24	25	10	13	14
Ammonia as N mg/L	0.03	0.02 est	<0.02	<0.02	0.02	0.04	0.06	0.02	0.04	0.03
Biochemical Oxygen DemandStream (mg/L)	0.5	0.4	0.4	0.7	0.8	0.9	0.4	1.2	0.5	0.4
Chemical Oxygen Demand (mg/L)	10	<5	10	<5	10	11	12	5	<5	6
Chlorophyll a (µg/L)					7.7	7	1.3			1.1
Pheophytin a (µg/L)					5.7	6.2	2.3			1.7
Conductivity (µmhos/cm)	268	51	42	46	306	814	1501	39	45	52
E. Coli (CFU/100 mL)	23	27	20	20	12	20	19	28	4	20
Total Kjeldahl Nitrogen (mg/L)	0.4	0.3	<0.2	<0.2	0.3	0.3	0.3	0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.835	0.759	0.523	0.484	0.122	0.024	0.0898	0.549	0.499	0.21
Dissolved Orthophosphate as P (mg/L)	0.008	0.011	0.006	0.005	0.006	<0.005	0.016	0.008	0.005	0.016
Dissolved Oxygen (mg/L)	9.3	10.9	11.1	10.5	6.1	6.7	8.4	11.2	10.5	8.9
Percent Saturation Dissolved Oxygen (%)	84	93	98	94	72	72	74	99	93	86
pH (SU)	7.1	7.2	7.1	7.1	7.1	7	7.1	7.2	6.9	7
Total Phosphorus (mg/L)	0.04	0.02	0.06	0.02	0.04	0.05	0.05	0.03	0.01	0.02
Total Solids (mg/L)	160	40	54	39	180	450	850	40	38	37
Total Suspended Solids (mg/L)	18	2	21	1	10	17	14	11	1	4
Temperature (°C)	11	8.6	10.2	10.4	24	19.6	9.8	10.1	9.8	14.2
Turbidity (NTU)	8	3	12	1	7	8	8	10	2	2
Total Organic Carbon (mg/L)	4	1	2	1	3	3	3	2	2	1

Sample date	7/22/2004	9/23/2004	11/3/2004	1/13/2005	3/30/2005	5/18/2005	7/13/2005	9/21/2005	11/17/2005	1/26/2006
Sample time	9:00	10:10	10:00	8:25	15:30	15:05	8:00	16:05	10:05	8:10
Alkalinity as $CaCO_3$ (mg/L)	21	16	13	9	13	16	21	40	15	11
Ammonia as N mg/L	0.02	0.03 est	0.03	0.03	<0.02	0.02	0.04	0.05	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1	0.6	0.6	0.8	1.3	1.1	1.3	0.5	0.5	0.5
Chemical Oxygen Demand (mg/L)	10	8	<5	<5	10	9	7	20	8	5
Chlorophyll a (µg/L)	7.3	0.8 est				1.1	12.4	5.1		
Pheophytin a (µg/L)	6.5	1.9 est				1.8	3.6	2.2		
Conductivity (µmhos/cm)	194	126	54	47	45	47	65	9100	54	45
E. Coli (CFU/100 mL)	30	38	56	18	31	121	23	12	14	10
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0475	1.17	0.736	0.776	0.98	0.704	0.188	0.134	0.944	0.629
Dissolved Orthophosphate as P (mg/L)	<0.005	0.009	0.009	0.006	0.007	0.008	<0.005	0.009	0.006	0.007
Dissolved Oxygen (mg/L)	6.8	9.1	10.1	11.8	11.6	10.4	8.7	7.5	10.9	10.7
Percent Saturation Dissolved Oxygen (%)	78	89	90	97	100	96	100	83	93	89
pH (SU)	6.9	7.1	7.2	6.9	7.3	7.5	7.1	7.4	7.1	7.2
Total Phosphorus (mg/L)	0.03	0.03	0.02	0.01	0.04	0.03	0.03	0.05	0.02	0.03
Total Solids (mg/L)	110	86	49	23	61	49	55	5700	42	40
Total Suspended Solids (mg/L)	5	4	<1	2	18	17	5	12	1	3
Temperature (°C)	23	14.8	10.5	6.8	9.2	12.2	18.8	19.2	8.5	7.4
Turbidity (NTU)	3	4	6	2	14	7	3	8	4	5
Total Organic Carbon (mg/L)	2	4	2	1 est	2	2	2	2	1	1

Millicoma River at Rooke-Higgins boat ramp, LASAR 13570 Coos Population

Sample date	3/29/2006	5/17/2006	7/26/2006	11/15/2006	1/10/2007	3/7/2007	5/23/2007	7/19/2007	9/13/2007	11/7/2007
Sample time	15:50	15:15	10:18	10:55	11:20	13:58	15:35	8:20	11:25	8:10
Alkalinity as $CaCO_3$ (mg/L)	12	17	24	11	10	13	14	24	28	18
Ammonia as N mg/L	<0.02	0.03	0.05	<0.02	<0.02	<0.02	<0.02	0.04	0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.9	0.9	0.6	0.1	0.5	0.5	0.9	0.6	0.8	0.8
Chemical Oxygen Demand (mg/L)	<5	8	11					8	8	7
Chlorophyll a (µg/L)		2.7 est	3.5				1.1 est	2.5	3.8	
Pheophytin a (µg/L)		3.3 est	4.6				1.2 est	2.8	5.1	
Conductivity (µmhos/cm)	43	55	84	49	46	46	50	605	721	88
E. Coli (CFU/100 mL)	6	7	20	35	20	4	4	36	23	9
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.482	0.297	0.0887	0.884	0.59	0.562	0.254	0.101	0.0871	0.401
Dissolved Orthophosphate as P (mg/L)	<0.005	<0.005	0.005				<0.005	0.013	0.008	0.006
Dissolved Oxygen (mg/L)	10.8	9.1	6.6	10.5	11	10.5	9.9	6.1	7	10
Percent Saturation Dissolved Oxygen (%)	96	97	76	92	94	93	99	68	74	84
pH (SU)	7.2	7.4	7	7.1	7	7.2	7.1	7.1	7.2	7.2
Total Phosphorus (mg/L)	0.01	0.02	0.03	0.01	0.02	0.02	0.03	0.03	0.04	0.02
Total Solids (mg/L)	30	38	76	46	46	51	45	330	390	68
Total Suspended Solids (mg/L)	2	1	9					4	11	4
Temperature (°C)	10	18.8	23.1	9.7	8.5	10.3	15.9	21.3	18.9	8.6
Turbidity (NTU)	2	2	6	6	8	4	2	5	9	3
Total Organic Carbon (mg/L)	1	1 est	2					2	3	2

Sample date	1/10/2008	3/20/2008	5/15/2008
Sample time	11:07	11:30	11:00
Alkalinity as $CaCO_3$ (mg/L)	9	11	12
Ammonia as N mg/L	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.3	1.7	0.7
Chemical Oxygen Demand (mg/L)	7	<5	<5
Chlorophyll a (µg/L)			1.3
Pheophytin a (µg/L)			1
Conductivity (µmhos/cm)	42	45	55
E. Coli (CFU/100 mL)	14.6		
Total Kjeldahl Nitrogen (mg/L)			
Nitrate/nitrite as N (mg/L)	0.662	0.54	0.267
Dissolved Orthophosphate as P (mg/L)	0.007	0.006	0.005
Dissolved Oxygen (mg/L)	11.4	11.5	10.5
Percent Saturation Dissolved Oxygen (%)	92	97	103
pH (SU)	7	7.1	7.2
Total Phosphorus (mg/L)	0.03	0.03	0.01
Total Solids (mg/L)	50	47	51
Total Suspended Solids (mg/L)	17	5	<1
Temperature (°C)	8.6	8.2	15.1
Turbidity (NTU)	16	7	1
Total Organic Carbon (mg/L)	1	1	1

South Fork Coos River at Anson Rogers Bridge, LASAR 13574 Coos Population

Sample date	11/20/2002	1/16/2003	3/26/2003	5/7/2003	7/24/2003	9/11/2003	11/6/2003	1/29/2004	3/11/2004	5/20/2004
Sample time	12:06	8:55	11:00	11:10	15:50	11:31	11:17	9:25	9:10	9:00
Alkalinity as $CaCO_3$ (mg/L)	20	14	14	15	31	37	49	13	17	21
Ammonia as N mg/L	0.04	0.03 est	<0.02	0.03	0.03	0.09	0.09	<0.02	0.02	0.04
Biochemical Oxygen DemandStream (mg/L)	0.5	0.6	0.3	0.9	0.6	0.8	0.4	1.1	0.3	0.1
Chemical Oxygen Demand (mg/L)	11	8	9	<5	10	14	17	5	6	7
Chlorophyll a (µg/L)					5.3	3.3	1.9			1
Pheophytin a (µg/L)					3.6	5.9	2.1			1.7
Conductivity (µmhos/cm)	1036	61	52	55	946	4852	14	48	54	65
E. Coli (CFU/100 mL)	37	5	25	12	4	43	4	26	9	18
Total Kjeldahl Nitrogen (mg/L)	0.4	<0.2	0.2	<0.2	0.4	0.4	0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.85	0.521	0.375	0.269	0.0745	0.0847	0.182	0.416	0.293	0.0937
Dissolved Orthophosphate as P (mg/L)	0.01	0.008	0.006	0.006	0.011	0.007	0.012	0.008	0.007	0.006
Dissolved Oxygen (mg/L)	9.1	11	10.5	10.8	5.6	6.5	8.7	11.2	10.4	8.5
Percent Saturation Dissolved Oxygen (%)	83	95	93	97	66	73	82	99	94	84
pH (SU)	7.3	7.2	7.3	7.4	7.2	7.1	7.4	7.2	7	7.1
Total Phosphorus (mg/L)	0.05	0.03	0.03	0.03	0.05	0.07	0.05	0.03	0.02	0.02
Total Solids (mg/L)	560	49	49	49	530	3000	9100	46	50	40
Total Suspended Solids (mg/L)	15	2	9	4	9	25	13	7	3	3
Temperature (°C)	11.3	8.8	9.8	11	24.5	20.4	10.6	9.8	11	15.7
Turbidity (NTU)	11	5	14	2	6	11	8	13	3	2
Total Organic Carbon (mg/L)	5	2	2	2	3	4	3	2	3	2

Sample date	7/22/2004	9/23/2004	11/3/2004	1/13/2005	3/30/2005	5/18/2005	7/13/2005	9/21/2005	11/17/2005	1/26/2006
Sample time	9:40	9:30	10:45	9:05	16:00	15:55	8:40	15:30	9:30	8:50
Alkalinity as $CaCO_3$ (mg/L)	23	20	20	14	15	21	29	50	20	14
Ammonia as N mg/L	<0.02	0.04 est	0.04	<0.02	<0.02	0.03	0.03	0.03	0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	0.1	0.9	1.5	1.3	1.2	1.3	1.1	1	0.3
Chemical Oxygen Demand (mg/L)	12	11	9	<5	12	10	9	13	13	<5
Chlorophyll a (µg/L)	5.6	2.2 est				0.8	8.9	7		
Pheophytin a (µg/L)	5	2.4 est				1.6	2.7	2.8		
Conductivity (µmhos/cm)	498	333	77	59	50	57	107	15600	64	50
E. Coli (CFU/100 mL)	12	49	96	13	31	70	11	6	6	12
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.008	1.04	0.77	0.756	0.756	0.373	0.0057	0.101	0.708	0.394
Dissolved Orthophosphate as P (mg/L)	0.005	0.012	0.009	0.007	0.01	0.009	0.005	0.008	0.008	0.01
Dissolved Oxygen (mg/L)	6.6	8.4	9.8	12.1	11.2	10.2	9.8	8	11	11.1
Percent Saturation Dissolved Oxygen (%)	77	88	88	97	97	95	108	91	94	92
pH (SU)	7.1	7.2	7.1	7.1	7.1	7.2	7.3	7.6	7.3	7
Total Phosphorus (mg/L)	0.04	0.04	0.03	0.02	0.07	0.03	0.02	0.05	0.02	0.03
Total Solids (mg/L)	290	190	60	46	84	50	78	10000	47	51
Total Suspended Solids (mg/L)	7	11	3	2	31	11	4	21	1	4
Temperature (°C)	23.7	15.3	10.8	6	9.1	12.5	20.3	19.1	8.6	7.5
Turbidity (NTU)	4	7	5	3	32	7	3	11	5	9
Total Organic Carbon (mg/L)	3	4	3	2 est	3	3	2	3	2	1

South Fork Coos River at Anson Rogers Bridge, LASAR 13574 Coos Population

Sample date	3/29/2006	5/17/2006	7/26/2006	9/7/2006	11/15/2006	1/10/2007	3/7/2007	5/23/2007	7/19/2007	9/13/2007
Sample time	16:30	16:00	10:55	9:10	10:20	10:55	14:30	16:11	9:00	10:40
Alkalinity as $CaCO_3$ (mg/L)	28	23	27	36	14	18	15	18	28	34
Ammonia as N mg/L	<0.02	<0.02	0.04	0.03	<0.02	<0.02	0.02	<0.02	0.04	0.03
Biochemical Oxygen DemandStream (mg/L)	1	2	0.4	0.7	0.4	<0.1	0.7	1.1	0.4	0.6
Chemical Oxygen Demand (mg/L)	6	11	11	11					7	10
Chlorophyll a (µg/L)		8.3 est	4.2	3.6				2.0 est	2.2	3.7
Pheophytin a (µg/L)		4.0 est	5.1	3.5				1.9 est	2.4	5
Conductivity (µmhos/cm)	48	94	258	2373	64	52	48	62	1187	1414
E. Coli (CFU/100 mL)	5	16	14	1	43	11	8	9	10	7
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	0.2						
Nitrate/nitrite as N (mg/L)	0.23	0.0783	0.0134	0.0306	0.744	0.356	0.302	0.0917	0.0833	0.0532
Dissolved Orthophosphate as P (mg/L)	0.005	<0.005	0.006	<0.005				<0.005	0.013	0.01
Dissolved Oxygen (mg/L)	11.1	9.5	6.3	6.8	10.4	10.3	10.9	9.4	5.9	6.9
Percent Saturation Dissolved Oxygen (%)	97	101	75	73	91	87	95	97	67	73
pH (SU)	7.1	7.2	7.1	7.2	7.2	7.2	7.2	7.2	7.1	7.3
Total Phosphorus (mg/L)	0.01	0.03	0.04	0.04	0.03	0.03	0.02	0.02	0.04	0.05
Total Solids (mg/L)	33	60	160	1500	62	59	53	58	680	780
Total Suspended Solids (mg/L)	<1	1	10	10					4	14
Temperature (°C)	9.6	18.5	24.3	19.4	9.7	8.1	9.6	17	21.9	19.1
Turbidity (NTU)	3	4	6	7	13	14	5	3	6	10
Total Organic Carbon (mg/L)	1	2 est	2	2					3	3

Sample date	11/7/2007	1/10/2008	3/20/2008	5/15/2008	7/17/2008
Sample time	8:45	10:24	10:49	10:29	10:45
Alkalinity as $CaCO_3$ (mg/L)	24	10	13	16	27
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	1.5	0.9	0.8	0.9
Chemical Oxygen Demand (mg/L)	6	9	9	<5	9
Chlorophyll a (µg/L)				1.4	4
Pheophytin a (µg/L)				0.9	3.1
Conductivity (µmhos/cm)	434	47	50	69	196
E. Coli (CFU/100 mL)	6	17.3			15
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.318	0.411	0.303	0.166	0.0065
Dissolved Orthophosphate as P (mg/L)	0.01	0.009	0.007	0.007	0.009
Dissolved Oxygen (mg/L)	10	11.5	11.5	10	6.9
Percent Saturation Dissolved Oxygen (%)	87	97	97	99	78
pH (SU)	7.2	7.3	7.4	7.3	7.4
Total Phosphorus (mg/L)	0.03	0.06	0.04	0.02	0.04
Total Solids (mg/L)	250	87	59	59	110
Total Suspended Solids (mg/L)	6	42	13	<1	6
Temperature (°C)	9.3	8.1	8.2	15.4	22.1
Turbidity (NTU)	4	36	12	3	4
Total Organic Carbon (mg/L)	2	2	3	1	2

North Fork Coquille River at Hwy 42 (Myrtle Point), LASAR 10390 Coquille Population

Sample date	11/20/2002	1/16/2003	3/26/2003	5/7/2003	7/24/2003	9/11/2003	11/6/2003	1/29/2004	3/11/2004	5/20/2004
Sample time	9:40	10:31	8:20	12:45	14:30	13:19	13:00	11:15	10:40	10:15
Alkalinity as $CaCO_3$ (mg/L)	24	15	14	18	34	32	53	13	19	22
Ammonia as N mg/L	<0.02	0.02 est	<0.02	<0.02	0.03	0.03	0.08	0.03	<0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	0.7	0.6	0.7	0.9	0.4	0.9	1.3	1.2	0.2	0.3
Chemical Oxygen Demand (mg/L)	10	6	8	<5	7	9	8	8	<5	6
Chlorophyll a (µg/L)					0.9	2.4	1.3			0.6
Pheophytin a (µg/L)					1.7	3.2	1.1			1.4
Conductivity (µmhos/cm)	80	60	55	58	83	86	134	48	57	66
E. Coli (CFU/100 mL)	110	24	93	27	19	63	36	20	17	79
Total Kjeldahl Nitrogen (mg/L)	0.2	0.3	0.2	<0.2	0.3	<0.2	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.313	0.717	0.556	0.478	0.0278	0.0612	0.03	0.519	0.441	0.213
Dissolved Orthophosphate as P (mg/L)	0.009	0.008	0.024	0.008	0.013	0.011	0.024	0.01	0.008	0.008
Dissolved Oxygen (mg/L)	10	10.6	10.6	10.9	7.8	8.4	10.5	10.8	10.1	9.1
Percent Saturation Dissolved Oxygen (%)	87	92	94	96	89	90	92	96	83	88
pH (SU)	7.4	7	7.2	7.1	7.3	7.4	7.7	7.1	7	7.4
Total Phosphorus (mg/L)	0.03	0.05	0.09	0.04	0.03	0.04	0.05	0.08	0.03	0.02
Total Solids (mg/L)	56	63	66	65	57	69	84	71	76	49
Total Suspended Solids (mg/L)	4	12	22	8	2	4	2	35	16	4
Temperature (°C)	9.7	9.3	9.8	10.2	22.3	19.6	9.4	10	7.1	14.3
Turbidity (NTU)	6	16	24	9	2	5	3	34	12	6
Total Organic Carbon (mg/L)	4	2	3	1	2	3	2	3	3	2

Sample date	7/22/2004	9/23/2004	11/3/2004	1/13/2005	3/31/2005	5/19/2005	7/13/2005	9/22/2005	11/16/2005	1/26/2006
Sample time	10:53	8:30	11:47	10:35	8:50	9:55	10:30	8:58	15:25	10:10
Alkalinity as $CaCO_3$ (mg/L)	29	22	20	16	17	20	31	31	20	16
Ammonia as N mg/L	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.02	0.04	0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	0.5	0.9	1.2	1.2	0.8	1.1	0.7	0.4	0.7	0.8
Chemical Oxygen Demand (mg/L)	10	8	15	6	14	11	6	10	6	9
Chlorophyll a (µg/L)	1	0.5 est				0.8	0.8	0.7		
Pheophytin a (µg/L)	2.2	1.7 est				2	1.7	1.7		
Conductivity (µmhos/cm)	75	72	71	61	54	54	70	90	62	55
E. Coli (CFU/100 mL)	81	130	1553	24	205	166	69	78	38	52
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.4	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	<0.0050	0.727	0.927	0.788	0.991	0.593	0.131	0.0886	0.908	0.579
Dissolved Orthophosphate as P (mg/L)	0.008	0.011	0.013	0.008	0.013	0.011	0.007	0.014	0.008	0.008
Dissolved Oxygen (mg/L)	7.5	8.9	10	11.5	10.4	10	8.4	7.7	10.6	10.6
Percent Saturation Dissolved Oxygen (%)	83	86	90	94	90	93	89	75	92	89
pH (SU)	7.4	7.3	7.2	7.1	7	7	7.3	7.7	7.2	6.9
Total Phosphorus (mg/L)	0.02	0.02	0.12	0.04	0.07	0.07	0.02	0.03	0.04	0.05
Total Solids (mg/L)	49	67	95	59	86	110	62	71 est	61	45
Total Suspended Solids (mg/L)	2	5	24	10	30	36	2	2	7	15
Temperature (°C)	21.1	14.3	10.8	6.9	9.3	11.9	18.9	14.9	9.5	7.9
Turbidity (NTU)	3	8	32	11	38	27	4	4	15	17
Total Organic Carbon (mg/L)	2	4	4	1 est	3	3	2	2	2	2

North Fork Coquille River at Hwy 42 (Myrtle Point), LASAR 10390 Coquille Population

Sample date	3/30/2006	5/18/2006	7/26/2006	9/7/2006	11/15/2006	1/10/2007	3/8/2007	5/24/2007	7/19/2007	9/13/2007
Sample time	9:45	9:08	14:40	10:40	8:30	9:20	8:50	8:48	10:25	8:13
Alkalinity as $CaCO_3$ (mg/L)	16	25	36	39	12	17	16	22	29	38
Ammonia as N mg/L	<0.02	0.02	0.05	0.04	<0.02	0.03	0.03	<0.02	0.03	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.6	0.5	0.4	0.6	0.3	0.5	0.5	0.5	0.8	0.7
Chemical Oxygen Demand (mg/L)	7	6	10	10					9	7
Chlorophyll a (µg/L)		1.3 est	1.4	1.3				0.8 est	1.3	0.5
Pheophytin a (µg/L)		1.7 est	2.2	2.2				1.2 est	2.4	1.9
Conductivity (µmhos/cm)	52	67	78	94	57	56	61	62	76	91
E. Coli (CFU/100 mL)	24	48	21	75	112	52	20	17	131	93
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	0.2						
Nitrate/nitrite as N (mg/L)	0.488	0.229	0.0362	0.0301	1.02	0.55	0.48	0.203	0.0372	0.0196
Dissolved Orthophosphate as P (mg/L)	0.008	0.006	0.014	0.014				0.006	0.011	0.016
Dissolved Oxygen (mg/L)	10.8	8.5	7.4	7.3	10.2	10.4	10.5	9.4	7.6	7.9
Percent Saturation Dissolved Oxygen (%)	93	87	88	77	89	88	91	92	83	81
pH (SU)	7.2	7.6	7.4	7.4	7.2	7	7	7.3	7.4	7.5
Total Phosphorus (mg/L)	0.04	0.03	0.04	0.04	0.06	0.07	0.05	0.03	0.04	0.03
Total Solids (mg/L)	73	51	70	57	69	110	79	55	56	69
Total Suspended Solids (mg/L)	19	4	2	4					4	3
Temperature (°C)	8.8	16.9	24.8	18.6	9.3	8.3	9	14.8	20	17.2
Turbidity (NTU)	14	4	2	4	19	35	19	5	4	4
Total Organic Carbon (mg/L)	2	2 est	2	2					3	3

Sample date	11/7/2007	1/10/2008	3/20/2008	5/15/2008	7/17/2008
Sample time	10:20	8:10	8:49	8:30	8:20
Alkalinity as $CaCO_3$ (mg/L)	26	12	14	20	30
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.2	1.4	1.5	0.5	1.1
Chemical Oxygen Demand (mg/L)	<5	7	9	<5	9
Chlorophyll a (µg/L)				0.6	1.9
Pheophytin a (µg/L)				1.1	2.7
Conductivity (µmhos/cm)	73	50	53	64	77
E. Coli (CFU/100 mL)	57	85.7			47
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.276	0.7	0.584	0.272	0.047
Dissolved Orthophosphate as P (mg/L)	0.01	0.009	0.009	0.009	0.012
Dissolved Oxygen (mg/L)	10.9	11	11.1	9.5	7.7
Percent Saturation Dissolved Oxygen (%)	93	93	94	91	82
pH (SU)	7.4	7.1	7.2	7.2	7.3
Total Phosphorus (mg/L)	0.03	0.07	0.09	0.03	0.04
Total Solids (mg/L)	62	68	100	71	51
Total Suspended Solids (mg/L)	3	21	52	8	3
Temperature (°C)	8.7	8.2	8.4	14	19.1
Turbidity (NTU)	4	29	34	10	3
Total Organic Carbon (mg/L)	2	3	3	1	2

Coquille River at Sturdivant Park Dock (Coquille), LASAR 10596 Coquille Population

Sample date	11/20/2002	1/16/2003	3/26/2003	5/7/2003	7/24/2003	9/11/2003	11/6/2003	1/29/2004	3/11/2004	5/20/2004
Sample time	9:05	9:50	10:10	12:08	15:00	12:44	12:10	10:35	10:15	9:43
Alkalinity as $CaCO_3$ (mg/L)	33	22	22	25	48	60	54	18	27	33
Ammonia as N mg/L	0.03	0.04 est	<0.02	<0.02	<0.02	0.03	0.04	<0.02	0.03	0.05
Biochemical Oxygen DemandStream (mg/L)	0.3	0.5	0.6	1.4	2	1	0.7	1.2	<0.1	0.5
Chemical Oxygen Demand (mg/L)	6	8	5	<5	9	8	8	<5	<5	7
Chlorophyll a (µg/L)					7.5	9.7	3.6			0.3
Pheophytin a (µg/L)					3.9	4.6	1.9			0.6
Conductivity (µmhos/cm)	106	73	69	73	121	180	157	58	72	91
E. Coli (CFU/100 mL)	326	135	105	20	6	23	11	365	12	24
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.2	<0.2	<0.2	0.3	0.3	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.352	0.549	0.443	0.361	0.0247	0.0082	0.048	0.438	0.313	0.106
Dissolved Orthophosphate as P (mg/L)	0.014	0.01	0.008	0.008	0.008	0.009	0.01	0.012	0.011	0.01
Dissolved Oxygen (mg/L)	9.4	10.4	10.8	10.9	7.8	7.7	8.8	10.9	10	8.8
Percent Saturation Dissolved Oxygen (%)	83	90	96	98	91	88	81	96	90	87
pH (SU)	7.2	7.2	7.4	7.3	7.5	7.7	7.7	7.4	7.1	7.3
Total Phosphorus (mg/L)	0.03	0.06	0.04	0.04	0.04	0.04	0.03	0.06	0.03	0.02
Total Solids (mg/L)	59	68	69	49	85	130	100	77	76	53
Total Suspended Solids (mg/L)	4	11	18	7	7	18	6	22	13	6
Temperature (°C)	10.2	9	9.9	11	23.3	21.8	12.1	9.7	11.1	15.6
Turbidity (NTU)	5	18	25	11	4	10	5	29	11	4
Total Organic Carbon (mg/L)	3	3	2	2	2	3	2	2	3	2

Sample date	7/22/2004	9/23/2004	11/3/2004	1/13/2005	5/19/2005	5/19/2005	7/13/2005	9/22/2005	11/17/2005	1/26/2006
Sample time	10:26	8:00	12:10	10:00	8:55	8:56	9:35	8:15	8:30	9:50
Alkalinity as $CaCO_3$ (mg/L)	41	32	29	26	30	28	44	49	29	26
Ammonia as N mg/L	<0.02	0.07 est	0.03	<0.02	0.02	0.02	0.05	0.02	0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	0.7	0.7	1.2	1.5	1.2	1.2	0.6	0.6	0.7	0.9
Chemical Oxygen Demand (mg/L)	10	13	10	7	12	12	5	9	11	9
Chlorophyll a (µg/L)	5.3	0.9 est			0.8	0.7	0.6	7.2		
Pheophytin a (µg/L)	2.8	2.2 est			1.3	1.1	1.1	3.6		
Conductivity (µmhos/cm)	105	94	90	79	71	71	96	140	72	70
E. Coli (CFU/100 mL)	5	20	>2419	135	1120	1414	13	12	35	488
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	<0.0050	0.584	0.532	0.696	0.239	0.235	0.105	0.0137	0.617	0.438
Dissolved Orthophosphate as P (mg/L)	0.007	0.017	0.015	0.01	0.011	0.012	0.011	0.01	0.011	0.009
Dissolved Oxygen (mg/L)	7	8	10	11.6	10	10	8.1	7.6	10.5	10.2
Percent Saturation Dissolved Oxygen (%)	83	79	89	94	93	93	88	79	88	85
pH (SU)	7.4	7.4	7.3	7.1	7.3	7.1	7.4	7.7	7.5	7.1
Total Phosphorus (mg/L)	0.03	0.05	0.11	0.04	0.1	0.1	0.03	0.04	0.04	0.08
Total Solids (mg/L)	69	70	110	64	120	120	70	88 est	58	94
Total Suspended Solids (mg/L)	7	13	31	9	54	59	<1	6	7	30
Temperature (°C)	24.5	15.5	10.6	6.5	12.4	12.6	20.2	17.7	7.7	7.6
Turbidity (NTU)	4	11	32	15	39	42	3	5	11	27
Total Organic Carbon (mg/L)	2	5	4	2 est	4	4	2	2	2	2

Coquille River at Sturdivant Park Dock (Coquille), LASAR 10596 Coquille Population

Sample date	3/30/2006	5/18/2006	7/26/2006	9/7/2006	11/15/2006	1/10/2007	3/8/2007	5/24/2007	7/19/2007	9/13/2007
Sample time	9:00	8:25	12:55	10:05	7:55	10:00	8:20	8:21	9:45	7:20
Alkalinity as $CaCO_3$ (mg/L)	26	38	47	59	18	21	21	33	43	51
Ammonia as N mg/L	<0.02	0.05	0.03	0.04	<0.02	0.03	0.03	0.04	0.04	0.06
Biochemical Oxygen DemandStream (mg/L)	1.3	0.3	1.3	0.7	1	0.7	0.8	0.2	0.6	0.7
Chemical Oxygen Demand (mg/L)	8	<5	10	<5					7	8
Chlorophyll a (µg/L)		0.6 est	4.8	4				0.2 est	7.2	5.7
Pheophytin a (µg/L)		0.7 est	3.6	2.3				0.5 est	3.9	5.7
Conductivity (µmhos/cm)	60	92	113	151	66	68	60	86	114	127
E. Coli (CFU/100 mL)	65	24	15	12	291	613	20	153	13	19
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.31	0.14	<0.0050	0.013	0.671	0.417	0.313	0.124	0.0177	0.0184
Dissolved Orthophosphate as P (mg/L)	0.009	0.011	0.007	0.007				0.01	0.007	0.006
Dissolved Oxygen (mg/L)	11	8.2	7.3	7.5	10.5	10.1	10.8	9.1	6.7	7.1
Percent Saturation Dissolved Oxygen (%)	95	86	86	81	92	86	93	91	76	77
pH (SU)	7.3	8.1	7.5	7.7	7.5	7.1	7.3	7.4	7.5	7.6
Total Phosphorus (mg/L)	0.04	0.02	0.04	0.03	0.07	0.04	0.06	0.03	0.03	0.03
Total Solids (mg/L)	89	61	78	92	94	100	90	64	75	88
Total Suspended Solids (mg/L)	27	3	9	5					8	9
Temperature (°C)	8.9	18.2	24.4	19.7	9.3	8.4	9	16.1	21.7	19.8
Turbidity (NTU)	20	4	6	4	25	35	21	5	6	5
Total Organic Carbon (mg/L)	2	1 est	1	1					2	3

Sample date	10/30/2007	11/7/2007	3/20/2008	5/15/2008	7/17/2008
Sample time	11:45	9:35	8:15	8:00	7:45
Alkalinity as $CaCO_3$ (mg/L)	32	37	17	30	42
Ammonia as N mg/L	0.05	0.06	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.3	0.7	1.5	1.1	0.9
Chemical Oxygen Demand (mg/L)	8	6	11	<5	9
Chlorophyll a (µg/L)	<0.1			0.3	5.7
Pheophytin a (µg/L)	0.3			0.6	3.5
Conductivity (µmhos/cm)	99	100	62	84	107
E. Coli (CFU/100 mL)		19			10
Total Kjeldahl Nitrogen (mg/L)	<0.2				
Nitrate/nitrite as N (mg/L)	0.352	0.212	0.413	0.17	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.015	0.018	0.01	0.01	0.009
Dissolved Oxygen (mg/L)	9.7	9.6	11.5	9.7	7.5
Percent Saturation Dissolved Oxygen (%)	86	86	97	94	84
pH (SU)	7.7	7.4	7.6	7.2	7.2
Total Phosphorus (mg/L)	0.03	0.04	0.12	0.03	0.03
Total Solids (mg/L)	85 est	85	120	78	71
Total Suspended Solids (mg/L)	5	7	70	9	8
Temperature (°C)	10	10.4	8.3	14.6	21.5
Turbidity (NTU)	7	4	59	5	4
Total Organic Carbon (mg/L)	3	2	3	1	2

Middle Fork Coquille River at River Mile 0.2 at Hwy 42 (Hoffman State Park), LASAR 11485 Coquille Population

Sample date	11/20/2002	1/16/2003	3/26/2003	5/7/2003	7/24/2003	9/11/2003	11/6/2003	1/29/2004	3/11/2004	5/20/2004
Sample time	10:10	11:00	9:14	13:14	14:10	13:54	13:45	11:37	11:45	10:44
Alkalinity as $CaCO_3$ (mg/L)	28	20	21	23	39	41	40	18	23	28
Ammonia as N mg/L	<0.02	<0.02	0.03	0.05	0.03	0.02	0.03	0.02	0.02	0.06
Biochemical Oxygen DemandStream (mg/L)	0.7	0.2	0.7	1.5	0.6	0.7	1.5	0.6	0.3	0.9
Chemical Oxygen Demand (mg/L)	11	7	8	<5	5	10	10	<5	6	8
Chlorophyll a (µg/L)					1.4	2.4	0.9			1.1
Pheophytin a (µg/L)					1.2	1.6	0.8			1.6
Conductivity (µmhos/cm)	106	71	68	70	100	108	118	59	67	81
E. Coli (CFU/100 mL)	70	17	70	16	15	73	22	28	23	31
Total Kjeldahl Nitrogen (mg/L)	<0.2	0.2	0.2	<0.2	0.4	0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.295	0.461	0.416	0.352	0.0055	<0.0050	0.0055	0.409	0.322	0.108
Dissolved Orthophosphate as P (mg/L)	0.005	0.009	0.008	0.006	0.007	0.005	0.006	0.01	0.007	<0.005
Dissolved Oxygen (mg/L)	10.6	11.3	11.1	11.4	8.4	9.3	11.2	11.3	10.4	10.3
Percent Saturation Dissolved Oxygen (%)	93	96	98	102	97	102	97	100	94	100
pH (SU)	7.4	7.5	7.5	7.4	7.6	7.7	7.8	7.5	7.5	7.7
Total Phosphorus (mg/L)	0.02	0.04	0.06	0.02	0.02	0.02	0.02	0.04	0.03	0.01
Total Solids (mg/L)	63	62	67	57	72	78	79	68	73	54
Total Suspended Solids (mg/L)	2	7	14	4	1	2	<1	13	12	2
Temperature (°C)	9.6	8.7	9.6	10.4	23.1	21.3	9	10	11	14.5
Turbidity (NTU)	4	18	28	11	1	2	1	30	10	3
Total Organic Carbon (mg/L)	4	3	3	2	2	3	3	2	3	2

Sample date	7/22/2004	9/22/2004	11/3/2004	1/13/2005	3/31/2005	5/19/2005	7/13/2005	9/22/2005	11/16/2005	1/26/2006
Sample time	11:23	17:00	12:43	11:05	9:30	10:26	11:00	9:25	15:45	10:40
Alkalinity as $CaCO_3$ (mg/L)	34	32	25	24	21	26	37	39	26	22
Ammonia as N mg/L	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.03
Biochemical Oxygen DemandStream (mg/L)	0.6	0.5	1.7	1.2	1.3	0.7	0.5	0.8	0.3	0.8
Chemical Oxygen Demand (mg/L)	10	13	23	6	12	9	7	8	12	6
Chlorophyll a (µg/L)	2.9	Void				0.7	0.8	2.5		
Pheophytin a (µg/L)	2	Void				1.2	0.9	3.7		
Conductivity (µmhos/cm)	91	93	85	76	61	69	85	115	70	61
E. Coli (CFU/100 mL)	9	19	435	17	28	579	9	31	17	42
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.5	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	<0.0050	0.56	1.07	0.67	0.589	0.342	0.0658	0.0059	0.661	0.387
Dissolved Orthophosphate as P (mg/L)	<0.005	0.006	0.031	0.009	0.012	0.01	<0.005	0.006	0.009	0.009
Dissolved Oxygen (mg/L)	7.9	9.9	10.5	12.3	11.8	10.5	8.7	8.1	11.3	11.2
Percent Saturation Dissolved Oxygen (%)	90	102	94	100	100	97	96	80	99	93
pH (SU)	7.6	7.8	7.5	7.4	7.1	7.3	7.6	7.6	7.4	7.3
Total Phosphorus (mg/L)	0.02	0.02	0.15	0.04	0.11	0.06	0.01	0.03	0.03	0.05
Total Solids (mg/L)	68	84	140	56	150	110	60	83 est	54	71
Total Suspended Solids (mg/L)	<1	1	38	6	86	20	<1	1	3	20
Temperature (°C)	22.4	17.2	10.4	6.3	8.6	11.8	20.4	15.4	9.4	7.5
Turbidity (NTU)	1	4	62	14	78	27	2	4	15	23
Total Organic Carbon (mg/L)	2	4	7	2 est	3	3	2	2	2	2

Middle Fork Coquille River at River Mile 0.2 at Hwy 42 (Hoffman State Park), LASAR 11485 Coquille Population

Sample date	3/30/2006	5/18/2006	7/26/2006	9/7/2006	11/15/2006	1/10/2007	3/8/2007	5/24/2007	7/19/2007	9/13/2007
Sample time	10:20	9:42	15:00	11:05	8:55	9:00	9:15	9:11	10:50	8:50
Alkalinity as $CaCO_3$ (mg/L)	21	31	38	45	18	19	18	28	30	45
Ammonia as N mg/L	<0.02	0.03	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.1	0.4	<0.1	0.7	0.8	0.5	0.2	1	0.6	0.7
Chemical Oxygen Demand (mg/L)	6	<5	11	9					7	5
Chlorophyll a (µg/L)		1.3 est	2.7	1.7				0.9 est	1.8	2
Pheophytin a (µg/L)		1.5 est	2.3	1.7				1.0 est	1.1	2.1
Conductivity (µmhos/cm)	57	80	96	120	70	64	54	77	94	113
E. Coli (CFU/100 mL)	53	16	41	19	68	66	23	6	93	15
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.322	0.11	0.0076	<0.0050	0.84	0.363	0.292	0.0794	<0.0050	0.0054
Dissolved Orthophosphate as P (mg/L)	0.008	<0.005	0.007	0.01				<0.005	0.005	0.008
Dissolved Oxygen (mg/L)	11.3	8.9	7.3	7.5	10.8	10.7	11.3	9.9	8	7.7
Percent Saturation Dissolved Oxygen (%)	97	92	87	79	93	90	95	98	89	80
pH (SU)	7.2	7.4	7.6	7.6	7.5	7.2	7.3	7.7	7.7	7.5
Total Phosphorus (mg/L)	0.04	0.02	0.02	0.03	0.05	0.07	0.05	0.02	0.02	0.02
Total Solids (mg/L)	80	58	80	79	83	110	80	63	60	93
Total Suspended Solids (mg/L)	13	2	4	2					2	2
Temperature (°C)	8.8	17.5	25.3	18.4	8.9	8.2	7.9	15.4	21.2	17.5
Turbidity (NTU)	18	2	3	2	23	31	21	5	4	2
Total Organic Carbon (mg/L)	2	2 est	1	1					2	2

Sample date	11/7/2007	1/10/2008	3/20/2008	5/15/2008	7/17/2008
Sample time	10:45	8:48	9:20	9:00	8:55
Alkalinity as $CaCO_3$ (mg/L)	33	18	20	26	34
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.1	1.5	1.5	0.7	0.09
Chemical Oxygen Demand (mg/L)	5	9	10	<5	8
Chlorophyll a (µg/L)				0.8	3.5
Pheophytin a (µg/L)				1.3	2.3
Conductivity (µmhos/cm)	92	56	63	77	91
E. Coli (CFU/100 mL)	13	17.9			11
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.118	0.451	0.42	0.14	0.0103
Dissolved Orthophosphate as P (mg/L)	0.007	0.012	0.011	0.006	0.006
Dissolved Oxygen (mg/L)	12	11.7	11.7	9.9	8
Percent Saturation Dissolved Oxygen (%)	103	99	98	97	87
pH (SU)	7.7	7.2	7.6	7.6	7.5
Total Phosphorus (mg/L)	0.02	0.11	0.09	0.02	0.02
Total Solids (mg/L)	74	140	120	68	59
Total Suspended Solids (mg/L)	1	82	50	2	2
Temperature (°C)	8.9	8.2	7.7	14.7	19.7
Turbidity (NTU)	2	71	42	5	3
Total Organic Carbon (mg/L)	2	3	3	1	2

South Fork Coquille River at Broadbent, LASAR 11486 **Coquille Population**

Sample date	11/20/2002	1/16/2003	3/26/2003	5/7/2003	7/24/2003	9/11/2003	11/6/2003	1/29/2004	3/11/2004	5/20/2004
Sample time	10:40	10:12	9:35	13:39	13:45	14:34	14:14	12:05	11:10	11:10
Alkalinity as $CaCO_3$ (mg/L)	39	27	27	32	60	63	60	15	32	38
Ammonia as N mg/L	0.02	0.04 est	<0.02	<0.02	0.02	0.02	0.03	<0.02	0.03	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	1.1	0.6	1.1	0.5	<0.1	1	1.1	0.4	0.5
Chemical Oxygen Demand (mg/L)	7	5	7	<5	<5	7	5	<5	5	6
Chlorophyll a (µg/L)					1	1.2	0.2			0.4
Pheophytin a (µg/L)					0.6	0.5	0.4			0.5
Conductivity (µmhos/cm)	110	77	71	79	135	150	151	65	76	97
E. Coli (CFU/100 mL)	36	12	140	6	6	28	12	22	32	13
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0651	0.192	0.108	0.0957	<0.0050	<0.0050	<0.0050	0.14	0.0939	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.007	0.01	0.007	0.005	<0.005	<0.005	<0.005	0.008	0.008	<0.005
Dissolved Oxygen (mg/L)	10.4	11.3	11.3	11.5	7.8	8.3	10.6	11.4	10.7	9.4
Percent Saturation Dissolved Oxygen (%)	93	96	100	103	92	94	93	101	96	94
pH (SU)	7.6	7.6	7.7	7.6	7.8	7.7	7.9	7.7	7.3	7.7
Total Phosphorus (mg/L)	0.02	0.04	0.07	0.02	0.01	0.02	<0.01	0.04	0.01	0.01
Total Solids (mg/L)	66	63	70	58	85	95	87	55	81	56
Total Suspended Solids (mg/L)	4	8	19	3	2	1	<1	10	16	1
Temperature (°C)	10.5	8.7	9.2	10.6	23.8	21.9	9.7	10	10.4	16.1
Turbidity (NTU)	5	14	31	5	2	1	1	23	6	2
Total Organic Carbon (mg/L)	2	2	2	2	1	2	1	2	3	<1

Sample date	7/22/2004	9/22/2004	11/3/2004	1/13/2005	3/31/2005	5/19/2005	7/13/2005	9/22/2005	11/16/2005	1/26/2006
Sample time	11:50	16:30	13:07	11:39	10:00	10:50	11:35	9:45	16:05	11:10
Alkalinity as $CaCO_3$ (mg/L)	52	56	36	34	28	34	52	56	39	31
Ammonia as N mg/L	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.04	0.02	0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	0.5	0.6	1.7	1	1.4	1.1	0.6	0.5	1.2	0.8
Chemical Oxygen Demand (mg/L)	10	8	19	5	8	11	6	<5	10	7
Chlorophyll a (µg/L)	0.8	1.0 est				0.9	0.5	1		
Pheophytin a (µg/L)	0.6	0.5 est				1	0.6	0.4		
Conductivity (µmhos/cm)	127	132	105	90	68	77	106	143	82	73
E. Coli (CFU/100 mL)	13	58	687	21	34	201	13	22	17	77
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	<0.0050	<0.0050	0.54	0.382	0.234	0.167	0.0173	<0.0050	0.231	0.17
Dissolved Orthophosphate as P (mg/L)	<0.005	0.005	0.01	0.008	0.012	0.01	<0.005	0.006	0.008	0.012
Dissolved Oxygen (mg/L)	7.4	9.2	10.5	12.2	12	10.9	8.4	8.4	11.3	11.2
Percent Saturation Dissolved Oxygen (%)	88	99	94	98	102	98	93	86	99	93
pH (SU)	7.6	7.9	7.7	7.6	7.4	7.5	7.7	8	7.7	7.5
Total Phosphorus (mg/L)	0.01	0.01	0.1	0.02	0.08	0.06	0.01	0.01	0.02	0.05
Total Solids (mg/L)	75	92	120	65	130	91	77	94 est	66	58
Total Suspended Solids (mg/L)	<1	<1	21	3	71	24	<1	<1	1	13
Temperature (°C)	24.4	19.5	10.5	6.2	8.6	11.1	21.1	17	9.3	7.6
Turbidity (NTU)	1	1	36	8	53	26	2	2	6	19
Total Organic Carbon (mg/L)	1	1	7	1 est	2	4	1	1	2	2

South Fork Coquille River at Broadbent, LASAR 11486 **Coquille Population**

Sample date	3/30/2006	5/18/2006	7/26/2006	9/7/2006	11/15/2006	1/10/2007	3/8/2007	5/24/2007	7/19/2007	9/13/2007
Sample time	10:50	10:17	15:30	11:35	9:20	8:25	9:35	9:34	11:15	9:20
Alkalinity as $CaCO_3$ (mg/L)	27	44	57	65	26	25	25	39	54	65
Ammonia as N mg/L	<0.02	<0.02	0.03	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.3	0.6	0.2	0.7	1	0.1	1.1	0.9	0.7	0.6
Chemical Oxygen Demand (mg/L)	6	<5	6	9					5	<5
Chlorophyll a (µg/L)		0.4 est	<0.1	0.7				0.4 est	1.3	0.9
Pheophytin a (µg/L)		0.8 est	<0.1	0.5				0.6 est	0.6	0.7
Conductivity (µmhos/cm)	64	101	128	156	74	72	61	94	126	153
E. Coli (CFU/100 mL)	23	14	25	12	46	67	7	12	770	21
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.1	0.0077	<0.0050	<0.0050	0.219	0.161	0.0807	<0.0050	<0.0050	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.007	<0.005	<0.005	<0.005				<0.005	<0.005	<0.005
Dissolved Oxygen (mg/L)	11.4	8.3	7.6	8	10.9	10.5	11.7	9	7.9	7.6
Percent Saturation Dissolved Oxygen (%)	96	87	93	87	93	88	96	93	90	80
pH (SU)	7.3	7.5	7.8	7.8	7.6	7.3	7.5	7.7	7.8	7.6
Total Phosphorus (mg/L)	0.03	0.02	0.02	0.02	0.03	0.03	0.04	0.01	0.02	0.01
Total Solids (mg/L)	80	59	100	100	77	86	73	75	84	97
Total Suspended Solids (mg/L)	8	2	2	1					2	3
Temperature (°C)	8.2	18	26.4	20	8.6	8.1	7.2	17	21.9	18.5
Turbidity (NTU)	8	2	1	1	18	25	16	3	4	2
Total Organic Carbon (mg/L)	<1	1 est	<1	<1					2	1

Sample date	11/7/2007	1/10/2008	3/20/2008	5/15/2008	7/17/2008
Sample time	11:05	9:18	9:40	9:20	9:20
Alkalinity as $CaCO_3$ (mg/L)	47	26	25	34	53
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.1	1.1	1.8	0.7	0.7
Chemical Oxygen Demand (mg/L)	<5	6	8	<5	<5
Chlorophyll a (µg/L)				0.6	1.8
Pheophytin a (µg/L)				0.9	1.3
Conductivity (µmhos/cm)	110	65	45 est	87	
E. Coli (CFU/100 mL)	4	15.6			
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.0144	0.186	0.16	0.0131	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.005	0.01	0.009	0.005	0.007
Dissolved Oxygen (mg/L)	11.3	11.9	12	9.6	7.8
Percent Saturation Dissolved Oxygen (%)	100	99	99	96	86
pH (SU)	7.8	7.4	7.7	7.6	7.5
Total Phosphorus (mg/L)	0.01	0.09	0.06	0.01	0.02
Total Solids (mg/L)	82	100	100	73	77
Total Suspended Solids (mg/L)	2	46	40	2	<1
Temperature (°C)	10.1	7.8	7.2	16	20.5
Turbidity (NTU)	2	60	31	4	1
Total Organic Carbon (mg/L)	1	2	3	<1	1

Floras Creek at Hwy 101 south of Langlois, LASAR 12590 **Floras Population**

Sample date	11/19/2002	1/15/2003	3/25/2003	5/6/2003	7/24/2003	9/10/2003	11/5/2003	1/28/2004	3/10/2004	5/19/2004
Sample time	15:50	16:45	16:00	17:12	12:00	17:18	18:14	17:23	16:00	15:50
Alkalinity as $CaCO_3$ (mg/L)	27	17	19	23	58	62	54	20	25	36
Ammonia as N mg/L	<0.02	0.03	0.03	<0.02	<0.02	0.02	<0.02	0.03	<0.02	0.02
Biochemical Oxygen DemandStream (mg/L)	0.7	1.3	0.4	0.5	0.9	0.9	0.7	0.8	0.4	0.5
Chemical Oxygen Demand (mg/L)	8	6	6	<5	<5	5	5	7	7	7
Chlorophyll a (µg/L)					0.3	0.5	0.6			0.9
Pheophytin a (µg/L)					1	0.5	0.5			0.8
Conductivity (µmhos/cm)	116	70	67	72	137	151	143	59	75	101
E. Coli (CFU/100 mL)	25	43	111	17	19	7	34	18	5	3
Total Kjeldahl Nitrogen (mg/L)	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	1.05	0.737	0.713	0.531	0.0155	<0.0050	<0.0050	0.635	0.536	0.227
Dissolved Orthophosphate as P (mg/L)	<0.005	0.007	0.008	0.005	<0.005	<0.005	<0.005	0.008	0.005	<0.005
Dissolved Oxygen (mg/L)	10.6	11.3	10.9	10.9	8.8	9.3	10.9	11.3	10.6	10.6
Percent Saturation Dissolved Oxygen (%)	97	99	97	99	94	102	100	100	98	109
pH (SU)	7.5	7.4	7.4	7.6	7.6	7.6	7.6	7.5	7.3	7.6
Total Phosphorus (mg/L)	0.01	0.03	0.06	0.02	0.01	<0.01	0.01	0.04	0.01	<0.01
Total Solids (mg/L)	70	67	72	53	83	98	81	67	55	64
Total Suspended Solids (mg/L)	<1	7	15	3	2	1	<1	16	3	<1
Temperature (°C)	11.8	9.4	10.3	12.1	19.2	20.6	11.6	10	11.8	17.3
Turbidity (NTU)	2	10	22	5	2	2	1	24	6	2
Total Organic Carbon (mg/L)	3	2	2	2	1	2	1	3	3	<1

Sample date	7/21/2004	9/22/2004	11/2/2004	1/12/2005	3/30/2005	5/18/2005	7/12/2005	9/21/2005	11/16/2005	1/25/2006
Sample time	18:00	15:00	15:48	16:48	13:50	13:44	16:55	14:10	14:20	15:35
Alkalinity as $CaCO_3$ (mg/L)	52	48	31	22	22	28	45	53	30	23
Ammonia as N mg/L	<0.02	<0.02	0.04	<0.02	<0.02	0.02	0.02	<0.02	0.03	0.05
Biochemical Oxygen DemandStream (mg/L)	0.5	0.8	0.7	1.1	1.3	1.7	1.2	0.5	0.3	0.3
Chemical Oxygen Demand (mg/L)	9	9	10	9	8	20	<5	<5	8	6
Chlorophyll a (µg/L)	0.4	0.4 est				1.1	0.8	0.2		
Pheophytin a (µg/L)	0.5	0.4 est				2	0.6	0.7		
Conductivity (µmhos/cm)	132	133	97	72	64	64	100	147	85	65
E. Coli (CFU/100 mL)	23	13	>2419	12	35	2419	14	6	16	194
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	0.2	0.3	<0.2	0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.0446	0.491	0.886	0.909	0.914	0.369	0.171	0.0137	0.979	0.594
Dissolved Orthophosphate as P (mg/L)	<0.005	<0.005	<0.005	0.007	0.009	0.016	<0.005	<0.005	0.007	0.01
Dissolved Oxygen (mg/L)	9.5	11.4	10	12.1	11.4	10.8	10.4	9.6	10.8	11
Percent Saturation Dissolved Oxygen (%)	113	120	91	99	96	101	116	99	96	95
pH (SU)	7.9	8	7.6	7.3	7.4	7.5	7.7	7.7	7.5	7.4
Total Phosphorus (mg/L)	0.01	0.01	0.14	0.02	0.07	0.15	0.01	0.01	0.02	0.05
Total Solids (mg/L)	71	89	160	51	110	140	69	91	63	74
Total Suspended Solids (mg/L)	<1	<1	73	4	58	74	<1	<1	2	19
Temperature (°C)	24.8	18.1	11.5	7.2	9.4	12.7	20.8	17.2	10.3	9
Turbidity (NTU)	2	1	107	8	42	79	2	3	13	22
Total Organic Carbon (mg/L)	1	3	3	1 est	2	7	1	<1	2	2

Floras Creek at Hwy 101 south of Langlois, LASAR 12590 **Floras Population**

Sample date	3/29/2006	5/17/2006	7/25/2006	9/6/2006	11/14/2006	1/9/2007	3/7/2007	5/23/2007	7/18/2007	9/12/2007
Sample time	14:30	14:00	17:47	16:35	14:55	15:40	12:45	14:22	14:10	13:25
Alkalinity as $CaCO_3$ (mg/L)	24	35	51	60	16	19	20	35	50	63
Ammonia as N mg/L	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.3	0.1	<0.1	0.9	0.1	1.3	0.5	0.4	0.9	0.6
Chemical Oxygen Demand (mg/L)	<5	6	6	<5					<5	<5
Chlorophyll a (µg/L)		0.5 est	0.4	0.2				0.9 est	0.4	0.7
Pheophytin a (µg/L)		0.8 est	0.6	0.3				0.7 est	0.6	1.1
Conductivity (µmhos/cm)	67	100	121	149	67	69	64	96	124	152
E. Coli (CFU/100 mL)	2	9	66	3	62	15	192	4	47	32
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2						
Nitrate/nitrite as N (mg/L)	0.519	0.241	0.0676	<0.0050	0.839	0.532	0.5	0.197	0.0324	<0.0050
Dissolved Orthophosphate as P (mg/L)	0.007	<0.005	<0.005	<0.005				<0.005	<0.005	<0.005
Dissolved Oxygen (mg/L)	11.1	9.4	8.6	9.3	10.8	11.3	10.8	10.2	9.3	7.2
Percent Saturation Dissolved Oxygen (%)	99	100	101	102	97	98	96	107	102	75
pH (SU)	7.4	7.4	7.8	7.8	7.5	7.3	7.5	7.7	7.6	7.4
Total Phosphorus (mg/L)	0.02	0.01	0.01	0.01	0.07	0.04	0.04	0.01	0.01	0.01
Total Solids (mg/L)	48	56	67 est	87	97	65	69	66	79	97
Total Suspended Solids (mg/L)	2	1	1	<1					<1	3
Temperature (°C)	10.7	18.8	24.1	20.7	10.8	9.2	10	18.2	20.7	17.4
Turbidity (NTU)	6	2	1	2	40	14	18	2	1	4
Total Organic Carbon (mg/L)	1	1 est	<1	<1					1	1

Sample date	11/6/2007	1/9/2008	3/19/2008	5/14/2008	7/16/2008
Sample time	16:00	14:05	12:40	13:54	14:01
Alkalinity as $CaCO_3$ (mg/L)	39	17	19	31	53
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.6	0.7	2	0.5	0.9
Chemical Oxygen Demand (mg/L)	<5	6	13	<5	7
Chlorophyll a (µg/L)				0.6	0.6
Pheophytin a (µg/L)				0.8	0.7
Conductivity (µmhos/cm)	107	61	44	93	131
E. Coli (CFU/100 mL)	4	25			20
Total Kjeldahl Nitrogen (mg/L)					
Nitrate/nitrite as N (mg/L)	0.446	0.555	0.39	0.21	0.0961
Dissolved Orthophosphate as P (mg/L)	<0.005	0.01	0.009	<0.005	0.005
Dissolved Oxygen (mg/L)	12.3	11.9	11.9	10.5	8.9
Percent Saturation Dissolved Oxygen (%)	111	99	102	110	95
pH (SU)	7.6	7.3	7.6	7.6	7.3
Total Phosphorus (mg/L)	<0.01	0.11	0.19	<0.01	0.01
Total Solids (mg/L)	80	120	180	66	78
Total Suspended Solids (mg/L)	<1	70	130	<1	1
Temperature (°C)	11	7.7	8.7	17.3	19.1
Turbidity (NTU)	1	54	24	2	2
Total Organic Carbon (mg/L)	1	2	4	1	1

Sixes River at Hwy 101 bridge, LASAR 10533 Sixes Population

Sample date	1/15/2003	3/25/2003	5/6/2003	7/24/2003	9/10/2003	11/5/2003	1/28/2004	3/10/2004	5/19/2004	7/21/2004
Sample time	16:20	15:36	16:33	11:30	16:45	17:46	16:50	15:06	15:20	17:30
Alkalinity as $CaCO_3$ (mg/L)	14	21	23	34	30	29	21	26	29	33
Ammonia as N mg/L	<0.02	0.02	<0.02	<0.02	0.03	0.02	0.02	<0.02	0.03	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.8	0.4	0.7	0.2	0.3	<0.1	0.4	0.3	0.3	0.3
Chemical Oxygen Demand (mg/L)	<5	5	<5	<5	5	<5	<5	<5	<5	6
Chlorophyll a (µg/L)				0.6	0.6	0.8			0.5	0.3
Pheophytin a (µg/L)				1.2	1.7	1.5			0.6	0.7
Conductivity (µmhos/cm)	68	68	70	88	89	95	60	74	86	93
E. Coli (CFU/100 mL)	3	19	<1	5	4	16	19	<1	1	14
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.361	0.418	0.271	0.113	0.0906	0.078	0.315	0.315	0.155	0.124
Dissolved Orthophosphate as P (mg/L)	0.009	0.01	0.007	0.007	0.007	0.007	0.01	0.007	0.007	0.008
Dissolved Oxygen (mg/L)	10.9	10.8	10.6	9.2	9	9.6	11	10.7	10.1	8.4
Percent Saturation Dissolved Oxygen (%)	96	96	91	97	99	91	97	100	104	95
pH (SU)	7.5	7.4	7.6	7.4	7.5	7.5	7.5	7.3	7.4	7.5
Total Phosphorus (mg/L)	0.02	0.03	0.02	0.01	0.01	0.01	0.04	0.02	<0.01	0.01
Total Solids (mg/L)	60	58	58	54	64	53	59	65	54	56
Total Suspended Solids (mg/L)	4	6	2	<1	2	4	19	3	<1	<1
Temperature (°C)	10.1	10.2	12.8	18.4	20.6	13.1	10.1	12.4	16.9	22
Turbidity (NTU)	8	10	3	<1	2	3	23	4	1	1
Total Organic Carbon (mg/L)	2	1	1	<1	2	<1	2	2	<1	<1

Sample date	9/22/2004	11/2/2004	1/12/2005	3/30/2005	5/18/2005	7/12/2005	9/21/2005	11/16/2005	1/25/2006	3/29/2006
Sample time	14:30	15:24	16:15	13:30	12:40	16:15	13:35	12:40	15:10	13:55
Alkalinity as $CaCO_3$ (mg/L)	35	25	24	24	32	37	28	31	23	26
Ammonia as N mg/L	<0.02	0.03	0.02	<0.02	0.02	<0.02	0.02	0.03	0.05	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.2	0.1	0.9	0.8	1.4	0.8	0.2	0.6	0.4	1
Chemical Oxygen Demand (mg/L)	<5	<5	7	7	14	<5	<5	11	6	<5
Chlorophyll a (µg/L)	0.4 est				1.5	1.4	0.5			
Pheophytin a (µg/L)	0.8 est				2.2	1.2	1.1			
Conductivity (µmhos/cm)	94	87	69	63	69	86	95	78	66	66
E. Coli (CFU/100 mL)	6	20	2	20	816	1	7	12	17	1
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	0.3	<0.2	<0.2
Nitrate/nitrite as N (mg/L)	0.122	0.449	0.485	0.466	0.16	0.0804	0.122	0.486	0.393	0.321
Dissolved Orthophosphate as P (mg/L)	0.008	0.01	0.009	0.011	0.015	<0.005	0.009	0.009	0.01	0.009
Dissolved Oxygen (mg/L)	9.3	9.7	11.7	11.1	10.3	10.6	9	10.4	10.3	10.7
Percent Saturation Dissolved Oxygen (%)	98	91	98	97	96	113	95	94	90	96
pH (SU)	7.6	7.4	7.3	7.4	7.9	7.7	7.6	7.5	7.4	7.4
Total Phosphorus (mg/L)	0.01	0.02	0.02	0.08	0.15	<0.01	0.01	0.02	0.04	0.02
Total Solids (mg/L)	62	71	52	110	150	66	66	54	67	53
Total Suspended Solids (mg/L)	<1	<1	3	50	93	<1	<1	1	10	2
Temperature (°C)	18.6	12.5	7.9	9.7	12.3	19.2	18.5	10.8	9.3	11.2
Turbidity (NTU)	<1	2	6	48	79	5	1	7	13	5
Total Organic Carbon (mg/L)	<1	<1	1 est	2	5	<1	<1	2	1	<1

Sixes River at Hwy 101 bridge, LASAR 10533 Sixes Population

Sample date	5/17/2006	7/25/2006	9/6/2006	11/14/2006	1/9/2007	3/7/2007	5/23/2007	7/18/2007	9/12/2007	11/6/2007
Sample time	13:35	17:18	16:11	14:25	15:05	12:20	14:00	13:45	12:50	15:40
Alkalinity as $CaCO_3$ (mg/L)	33	32	33	20	22	23	31	33	36	31
Ammonia as N mg/L	<0.02	0.03	0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	0.4	0.2	0.4	0.3	0.5	0.3	0.2	0.4	0.3	0.6
Chemical Oxygen Demand (mg/L)	<5	<5	5					<5	<5	<5
Chlorophyll a (µg/L)	2.4 est	0.6	0.4				0.8 est	0.6	0.9	
Pheophytin a (µg/L)	1.8 est	1.1	0.8				0.7 est	0.8	1.6	
Conductivity (µmhos/cm)	85	88	94	66	69	64	84	91	95	90
E. Coli (CFU/100 mL)	20	6	5	31	9	29	<1	18	20	15
Total Kjeldahl Nitrogen (mg/L)	<0.2	<0.2	<0.2							
Nitrate/nitrite as N (mg/L)	0.0897	0.15	0.0999	0.339	0.339	0.319	0.171	0.119	0.0962	0.32
Dissolved Orthophosphate as P (mg/L)	<0.005	0.007	0.006				0.005	0.005	0.008	0.008
Dissolved Oxygen (mg/L)	10.3	8.7	9.2	10.5	10.5	10.5	10.3	9.3	9.3	10.6
Percent Saturation Dissolved Oxygen (%)	107	100	102	96	93	93	106	102	96	98
pH (SU)	7.3	7.5	7.7	7.5	7.1	7.4	7.6	7.5	7.5	7.5
Total Phosphorus (mg/L)	<0.01	0.01	0.01	0.05	0.03	0.02	0.01	0.01	0.01	0.01
Total Solids (mg/L)	51	58 est	59	75	64	59	60	62	62	70
Total Suspended Solids (mg/L)	1	1	<1					<1	<1	<1
Temperature (°C)	17.5	22.4	21	11.3	10	10	16.9	20.4	17	12
Turbidity (NTU)	1	1	1	29	12	8	1	1	2	<1
Total Organic Carbon (mg/L)	<1 est	<1	<1					<1	<1	<1

Sample date	1/9/2008	3/19/2008	5/14/2008	7/16/2008
Sample time	13:35	12:15	13:25	13:30
Alkalinity as $CaCO_3$ (mg/L)	17	22	28	35
Ammonia as N mg/L	<0.02	<0.02	<0.02	<0.02
Biochemical Oxygen DemandStream (mg/L)	1.4	1.2	1.4	0.4
Chemical Oxygen Demand (mg/L)	6	6	<5	7
Chlorophyll a (µg/L)			0.6	0.6
Pheophytin a (µg/L)			0.7	1
Conductivity (µmhos/cm)	59	46	86	95
E. Coli (CFU/100 mL)	7			9
Total Kjeldahl Nitrogen (mg/L)				
Nitrate/nitrite as N (mg/L)	0.327	0.302	0.179	0.138
Dissolved Orthophosphate as P (mg/L)	0.011	0.008	<0.005 est	0.009
Dissolved Oxygen (mg/L)	11.4	11.3	11.4	9.2
Percent Saturation Dissolved Oxygen (%)	97	99	113	99
pH (SU)	7.3	7.5	7.6	7.3
Total Phosphorus (mg/L)	0.11	0.05	<0.01	0.02
Total Solids (mg/L)	110	78	62	59
Total Suspended Solids (mg/L)	62	23	<1	<1
Temperature (°C)	8.4	9.4	15.7	19.6
Turbidity (NTU)	57	24	2	1
Total Organic Carbon (mg/L)	2	2	<1	<1