Site Report Cards (SRCs)

The figures on the following pages report results from the Skagit County Monitoring Program for dissolved oxygen, temperature, and fecal coliform. Full data listings for each sampling event at each sample site for the entire history of the program are included in Appendix A. A summary of water quality results for each sample site for water year 2020 is included in Appendix B.

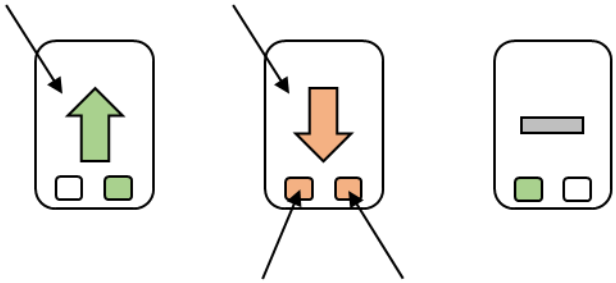
The graphs are meant to give an overall picture of the water quality at a given site over time. They are not intended to fully describe the conditions at that site, only to give an "at a glance" indication of the conditions over the course of the project. Trends analysis statistics tables are included in Appendix C.

Note that the y-axes on the graphs in this section are not all equivalent. The y-axes color schemes for temperature and DO align with the particular state standard that is in accordance with that sampling site. The y-axes for FC counts are vastly different to accommodate the large variance in sampling data for each site. Normalizing these y-axes to each other would render data un-viewable and un-interpretable at several sites. Some data points are outliers to a data set and would stretch the size of the y-axis to a point that this same effect is seen, and have therefore been cropped at the top of the plot, and the quantification of the data point has been added next to the crop to inform the reader of its value. Logarithmic y-axes can help with scientific interpretation, but are not intuitive for most readers to understand the actual large difference in scale of the data.

All photographs in the following section were taken by the author and are therefore public property.

How to interpret the SRCs

- If there is an arrow, the statistic showed significant change on a monthly examination, at 95% confidence. This is our main statistic for determining changes.
- If the arrow is green, the direction of the change is a positive one.
- If the arrow is red, the direction of change is a negative one.



- If the lower left box is shaded in, the statistic showed significant change on a bi-weekly examination. This is more sensitive and less robust.
- If the lower right box is shaded in, then the statistic was nearly significant on a monthly examination, at 90% confidence.
- These extra boxes exist to show a more sensitive view of what may be occurring at a site, rather than simply a binary yes or no statistic using the main monthly metric.
- A site with an arrow and both boxes filled in shows the strongest trend.

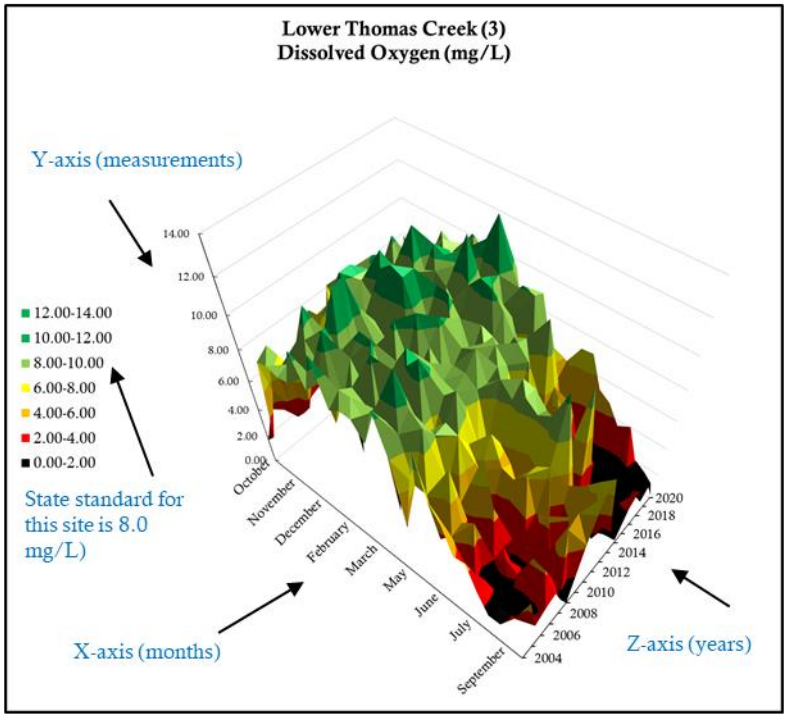
The graphic on the left shows a positive significant monthly trend downward, at 95% and 90% confidence levels.

The graphic in the middle shows a negative significant monthly trend downward, at 95% and 90% confidence levels, and was also significant on a bi-weekly basis, at 95% confidence.

The graphic on the right shows no significant monthly trend at the 95% or 90% confidence levels, but shows a significant trend on the bi-weekly examination, at 95% confidence.

3D Maps

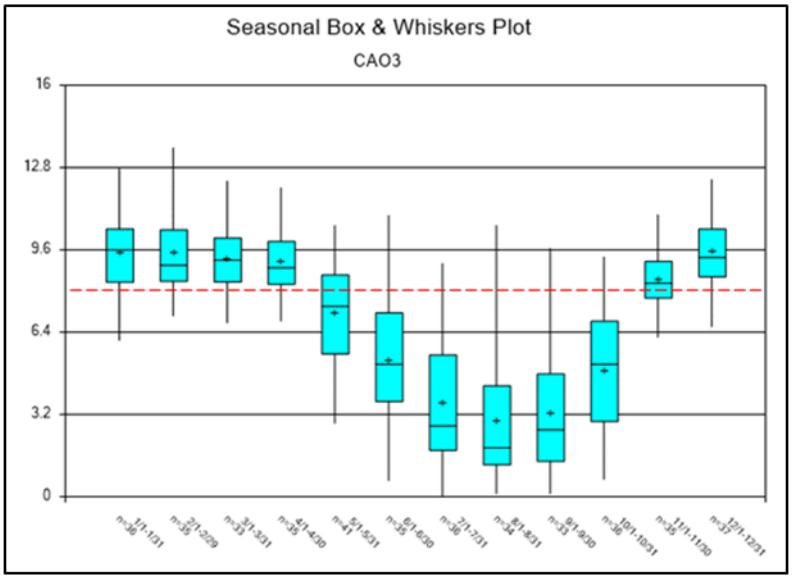
- Each 3D map has a threshold color for that particular metric and sampling site.
- For dissolved oxygen, everything passing state standard is green.
- For temperature, everything failing state standard is red.
- For fecal coliform, everything passing state standard is green.



- The x-axis contains the months of the water year, from October through September.
- The y-axis contains the values of the metric, in this case, mg/L of dissolved oxygen.
- The z-axis contains the years of the program, from 2004 until present.

Boxplots

- Each box is a month, starting with January on the left, and ending in December on the right.
- The box represents 50% of the data. The lines above and below show the extreme range of the data values.
- The horizontal line through the middle of the box is the mean average of the values.
- The + sign in the box is the median of the values.



- The y-axis represents the measurements of the metric, which are the same as the 3D map above it.
- The dashed red line represents the state standard for this site

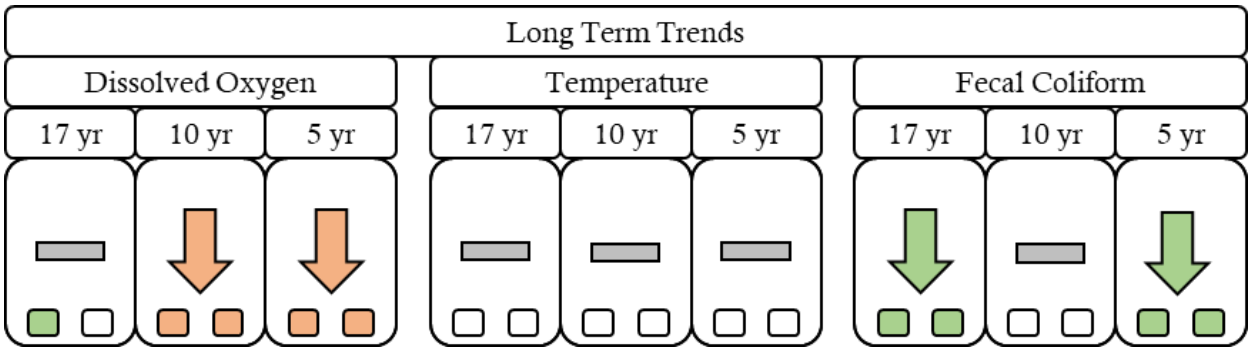
3

Thomas Creek
@ Highway 99

Downstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	20	14	31	49	58	41	60	41	45	53	41	30	37	56

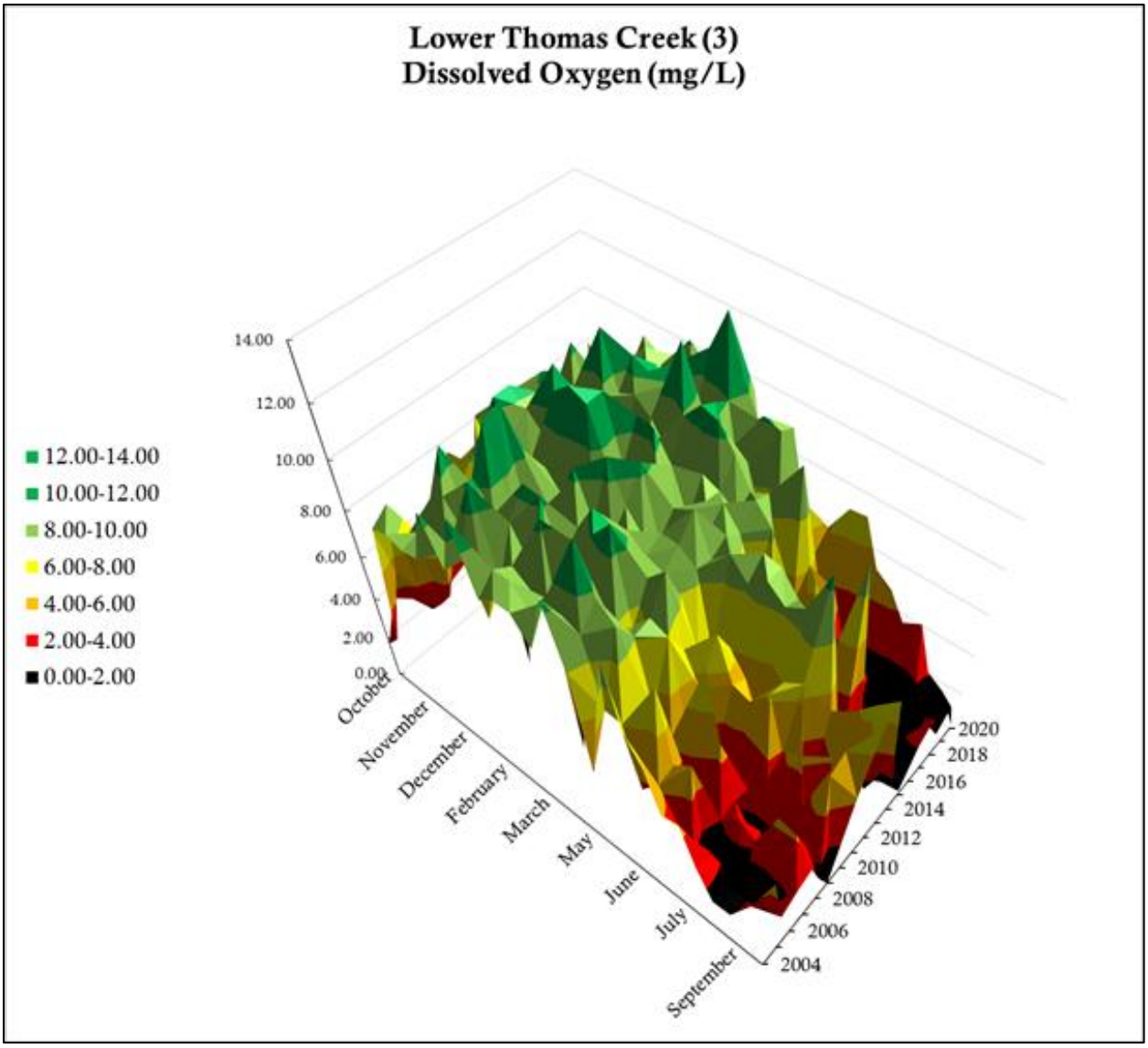


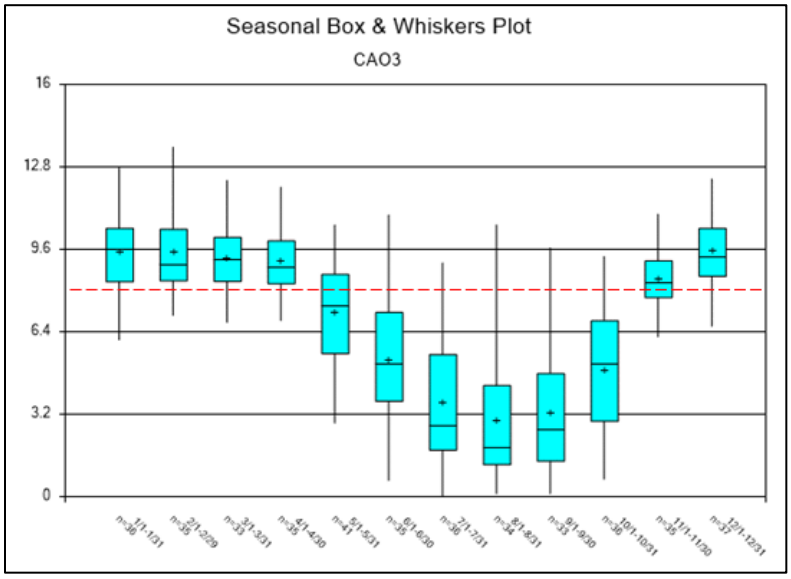
Site 3 is Thomas Creek, downstream from site 4, and sits just prior to the creek joining the Samish River. This section of the creek is more of a slough, with slow-moving, channelized water. This site has substantially lower flow volumes in the summer months. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen has declined over the last ten years and over the last five years. Fecal coliform counts are lower than they were seventeen years ago. WQI scores have improved since monitoring began, but have never reached the category of lowest concern.

Site 3 regularly fails to meet state standards for DO and temperature in the warmer months. Annual FC levels meet state standards.

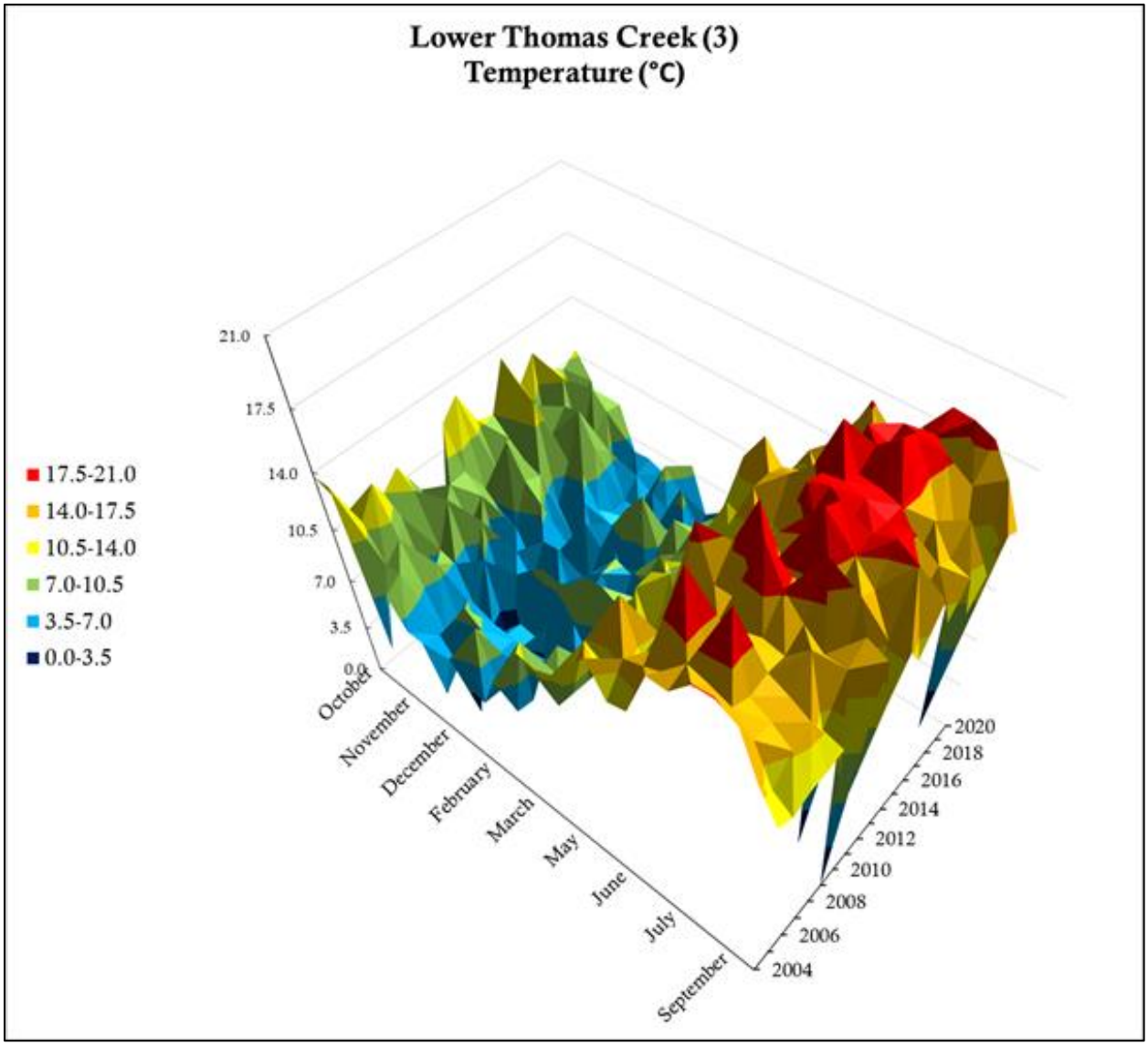
Site 3 is tied for 12th out of 39 sites for number of significant trends, with 13, and 26th out of 39 sites for positive trends, at 54%.

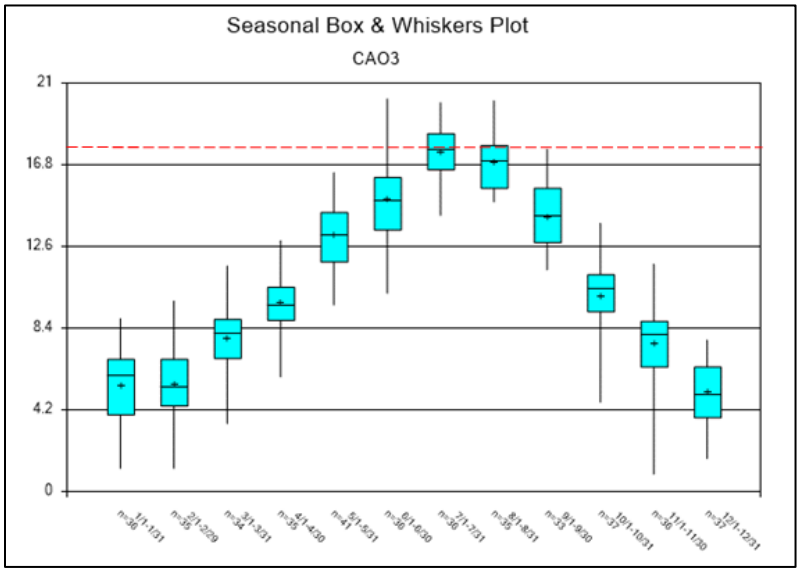




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

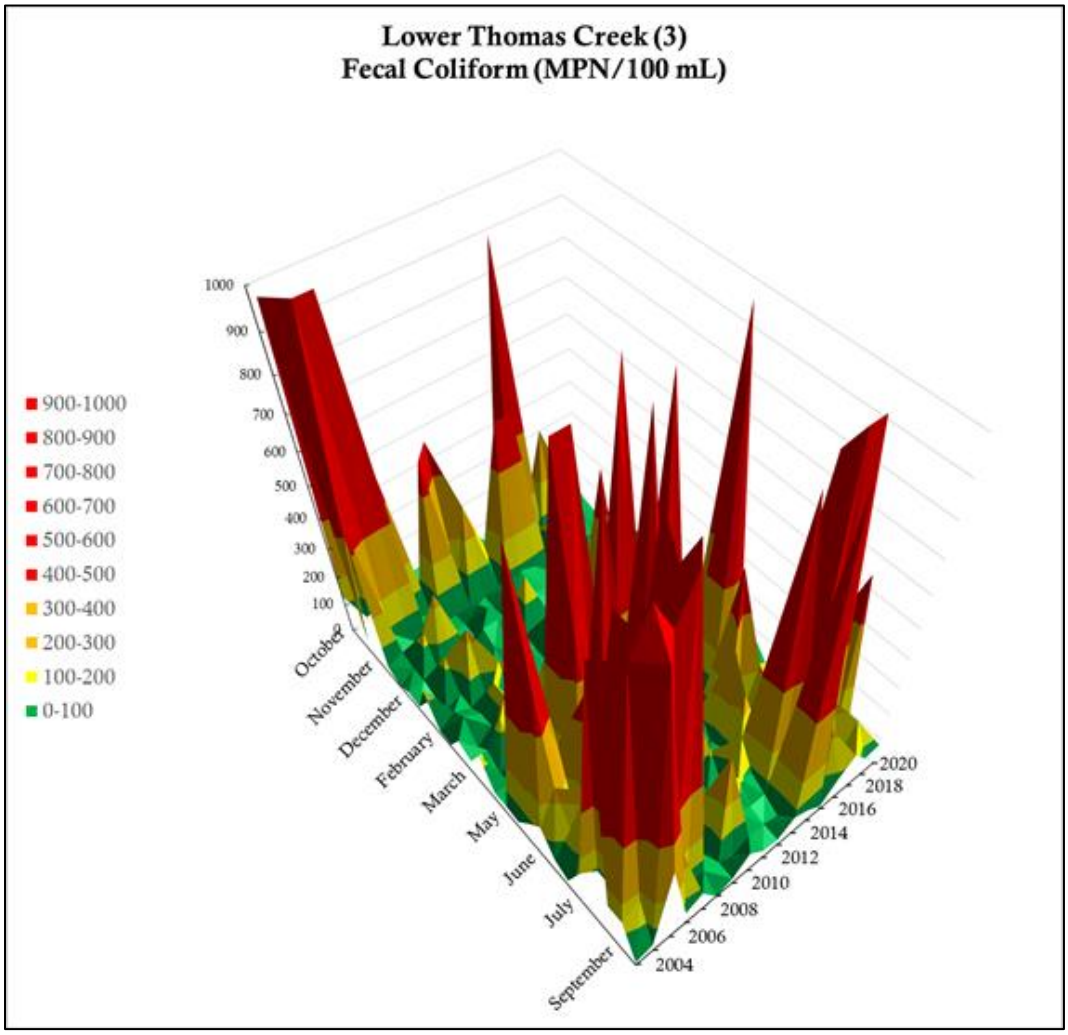
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

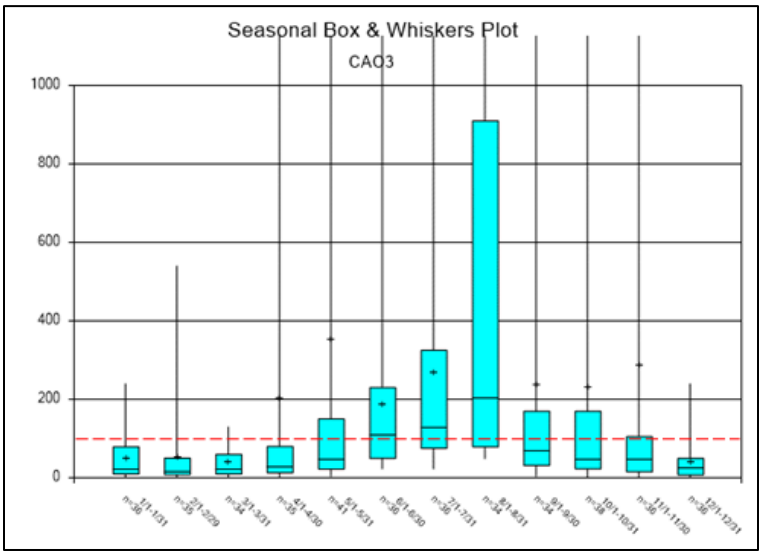




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

4

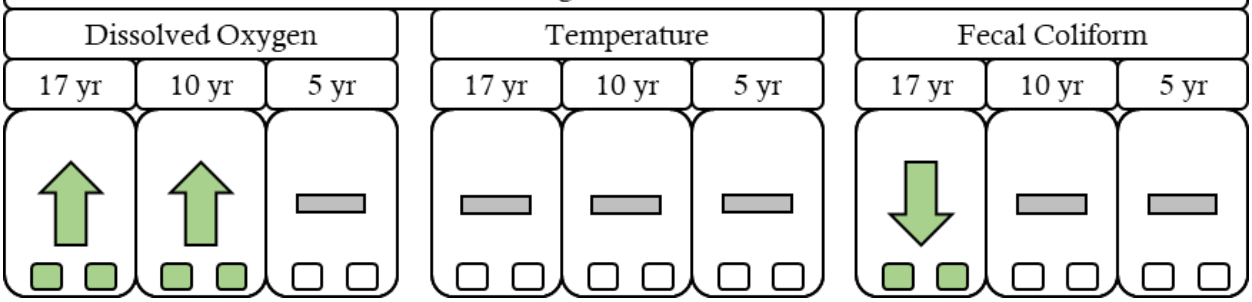
Thomas Creek
@ F&S Grade Road

Upstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
15	54	39	66	76	77	62	81	89	71	52	89	81	65	72

Long Term Trends

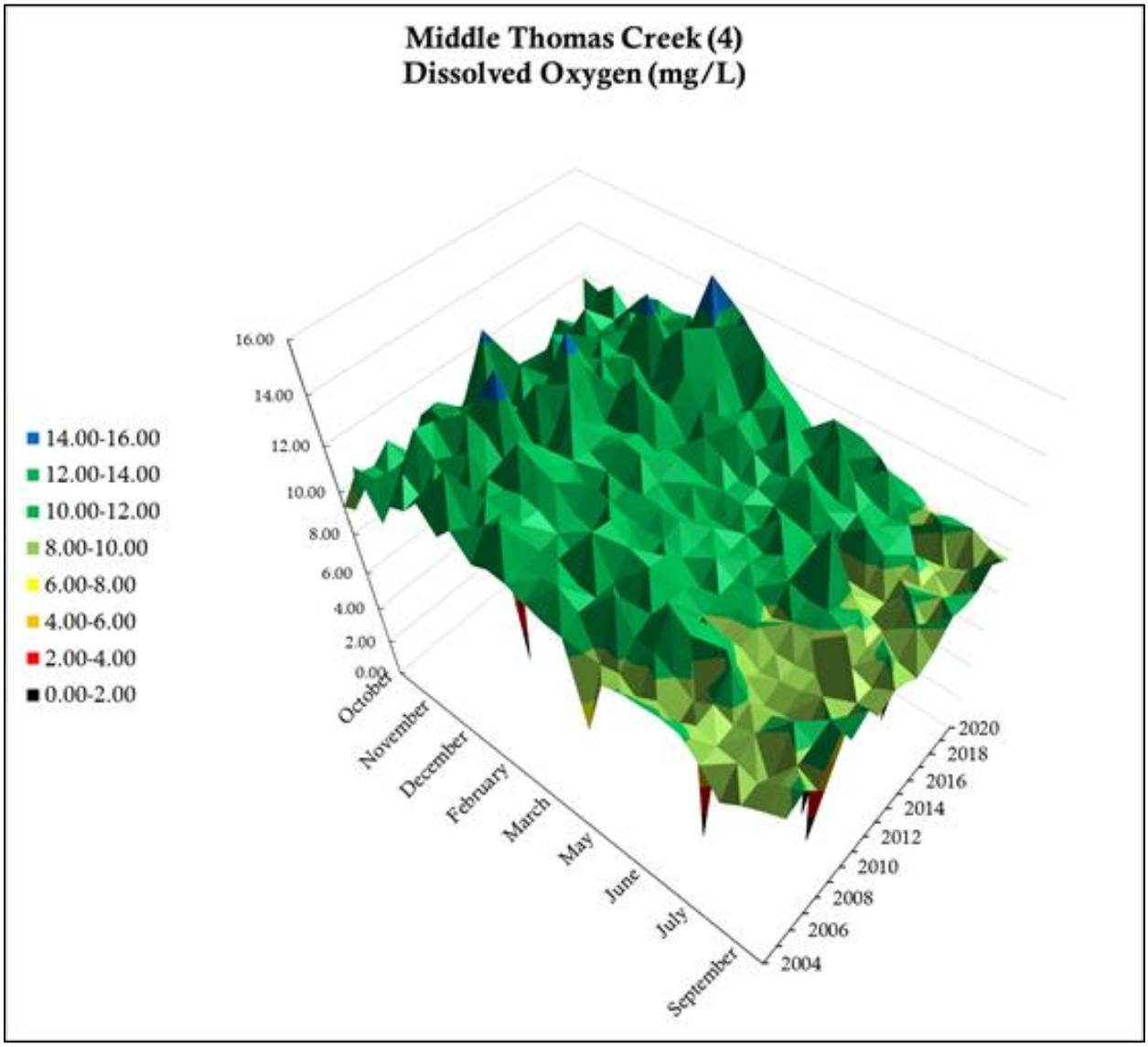


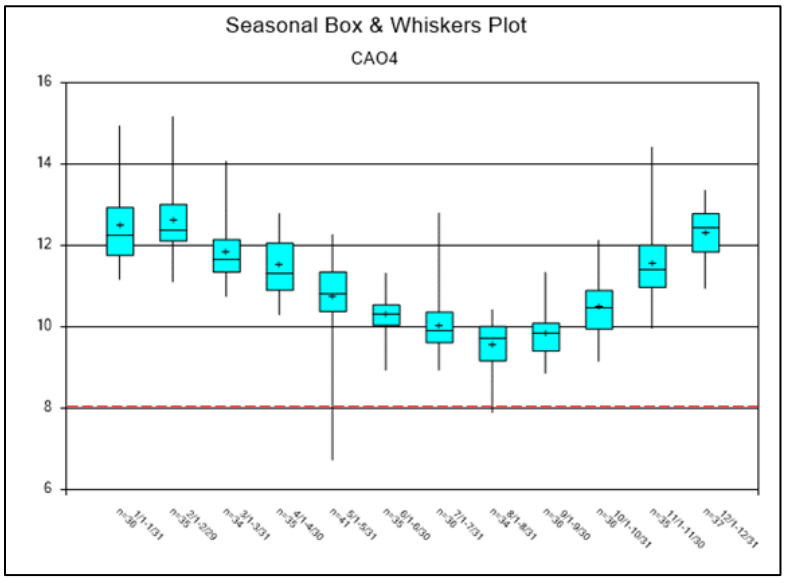
Site 4 is Thomas Creek, upstream of site 3. Upstream of this sampling site, the creek is fairly oxygenated and fast-moving. This site has substantially lower flow volumes in the summer months. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen has increased significantly across the last 17 years and ten years. Fecal coliform counts are lower than they were 17 years ago. WQI scores have substantially improved since monitoring began.

Site 4 regularly meets state standards for temperature and DO year-round. Annual fecal coliform levels for WY2020 were just barely passing the 100 FC standard, but not close to passing the 90th percentile requirement.

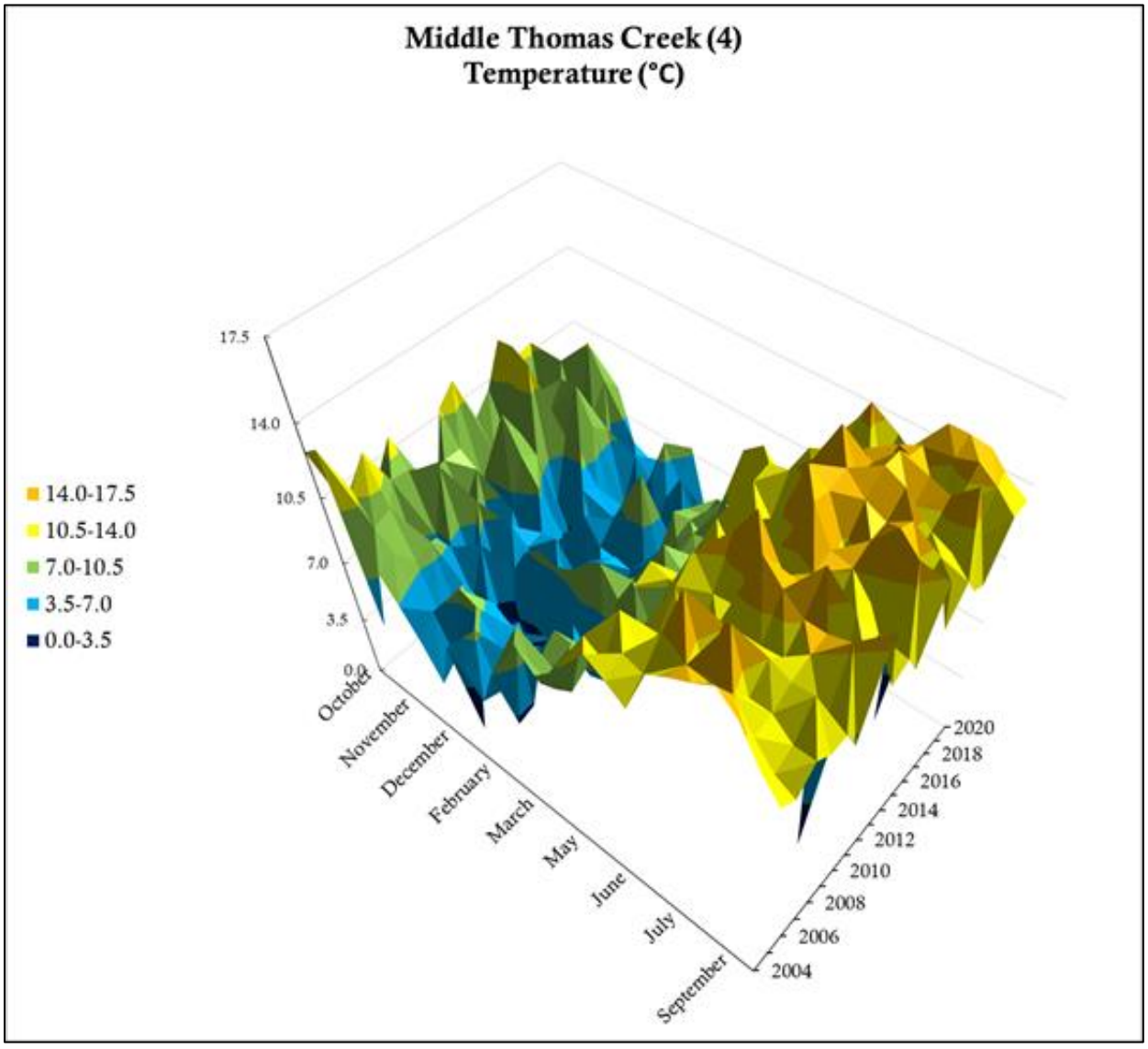
Site 4 is tied for 20th out of 39 sites for number of significant trends, with 12, and 4th out of 39 sites for positive trends, at 83%.

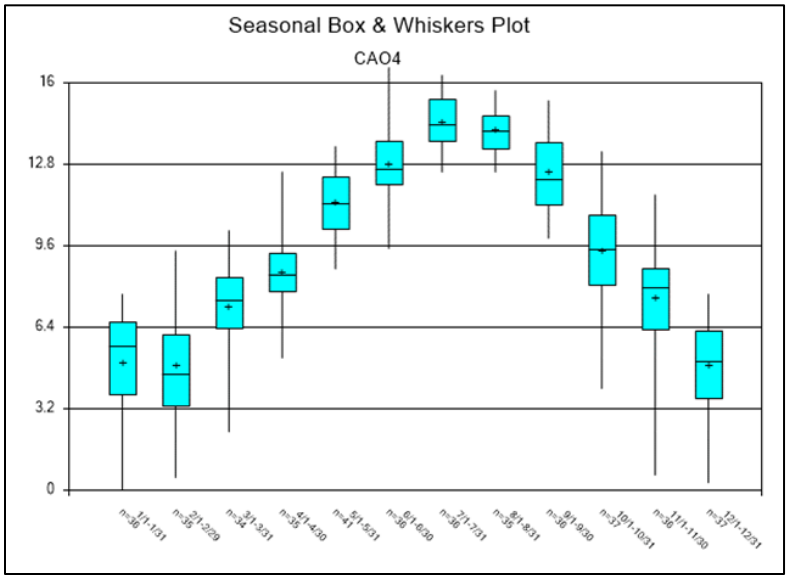




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

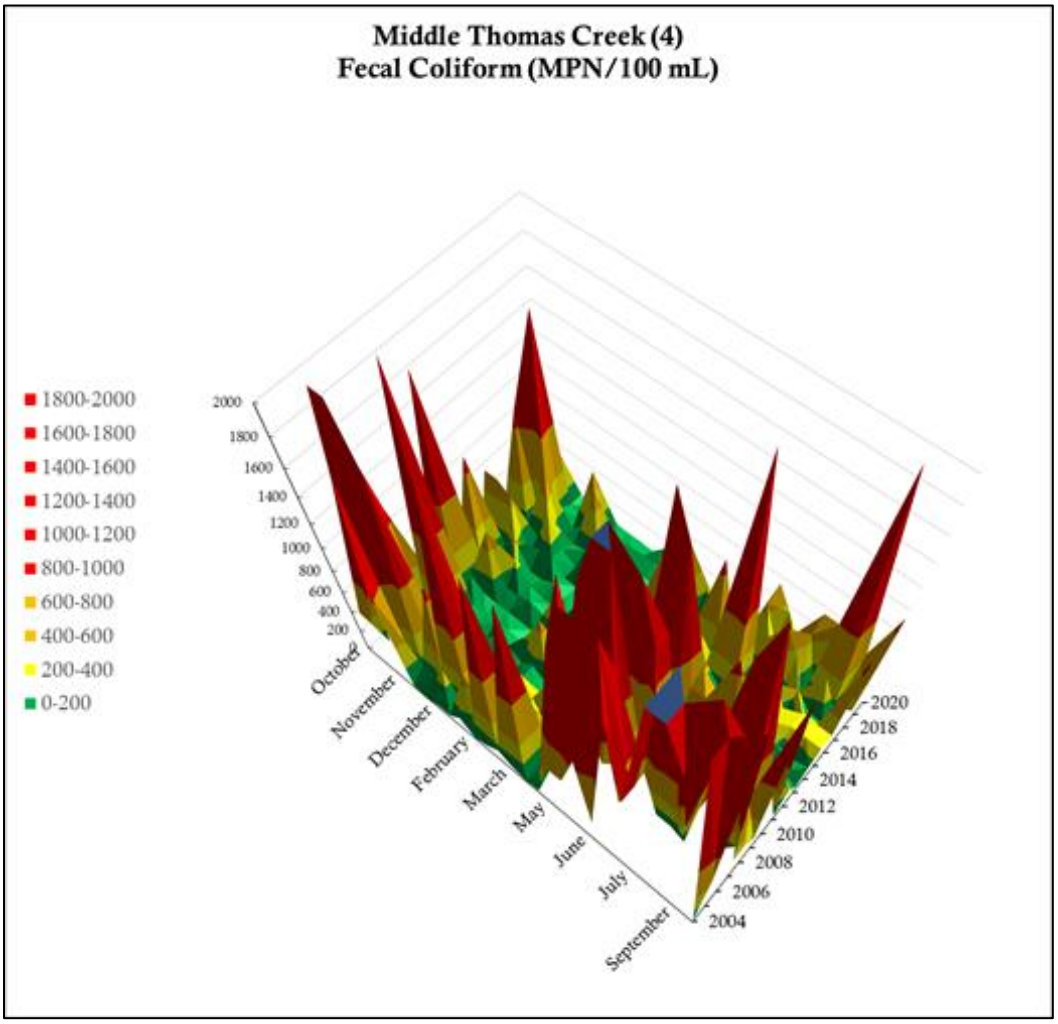
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

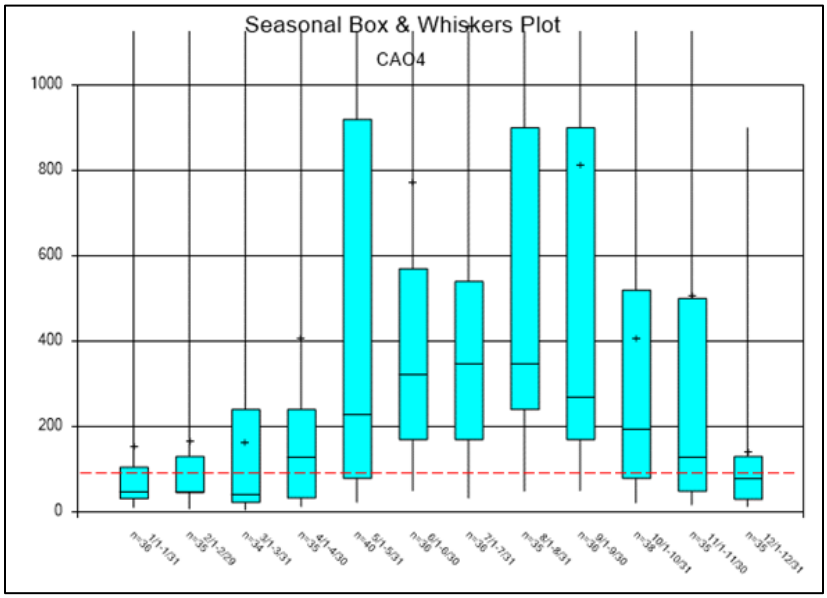




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green almost meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

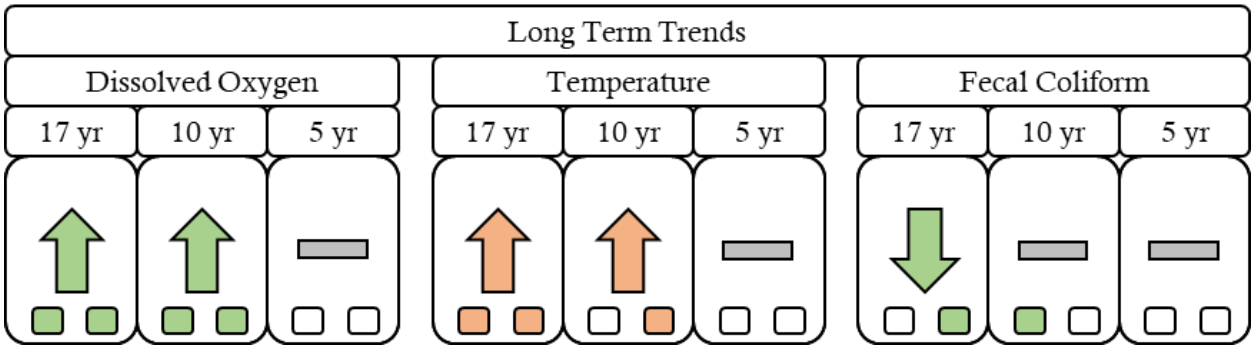
6

Friday Creek
@ Prairie Road

Reference – Rural Reserve

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
45	81	65	86	90	94	81	88	88	90	85	86	91	87	87

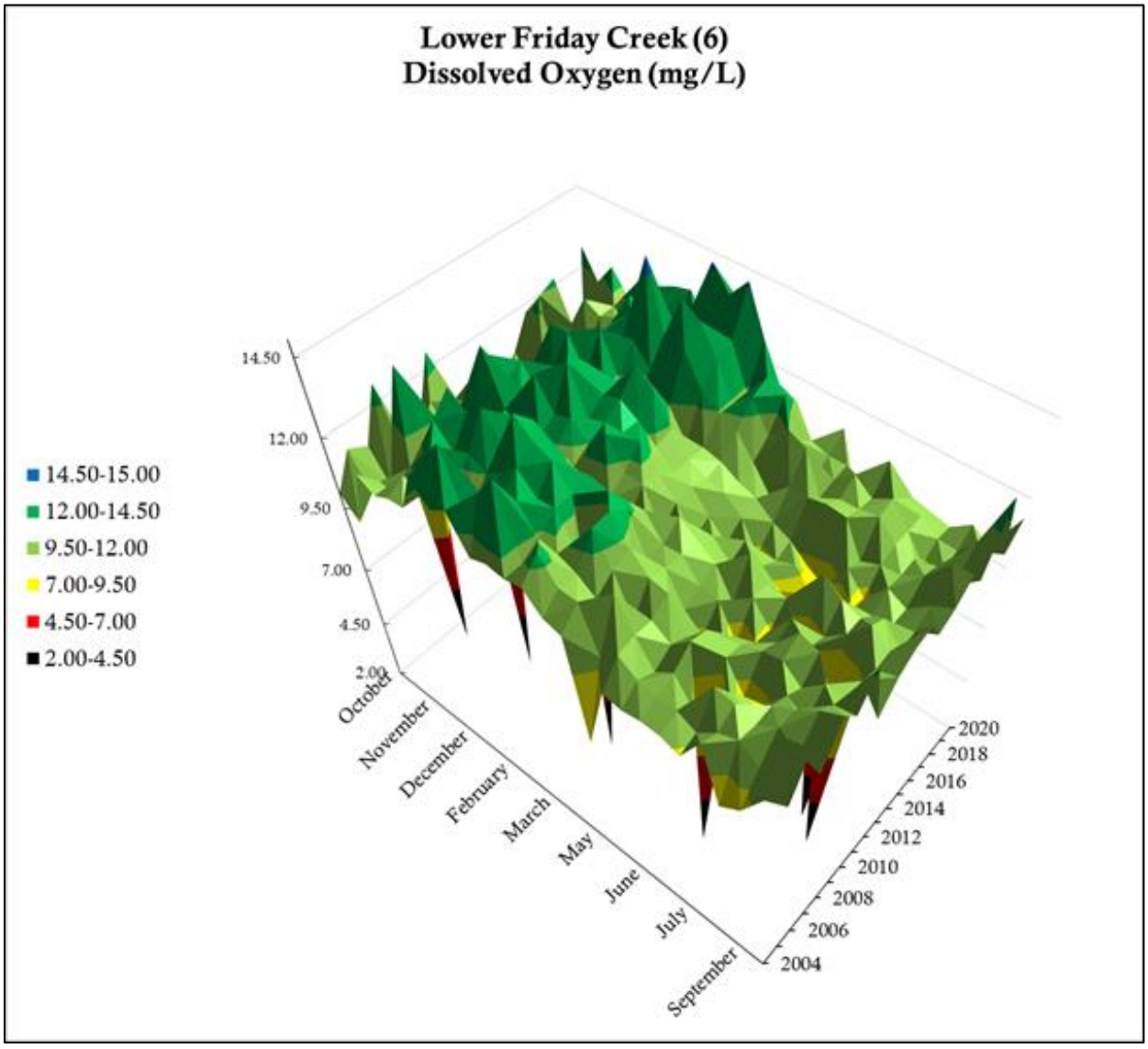


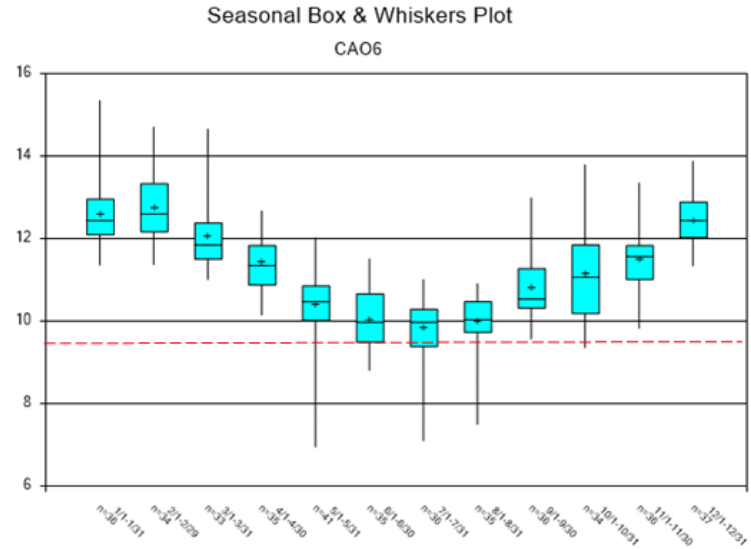
Site 6 is Friday Creek, and sits just prior to the creek joining the Samish River. This creek has a high flow volume and rate, and can seasonally contribute around 40% or more of the total volume of the Samish River. This site is designated as core salmonid habitat.

Dissolved oxygen has significantly increased over the last 17 and ten years. Temperature is significantly higher now than it was 17 years and ten years ago. Fecal coliform is lower than it was 17 years ago. WQI is consistently in the category of least concern.

Site 6 regularly meets state standards for DO year-round. Temperature exceeds state standards during the hottest time of the year. The FC levels for the 2020 water year easily met state standards.

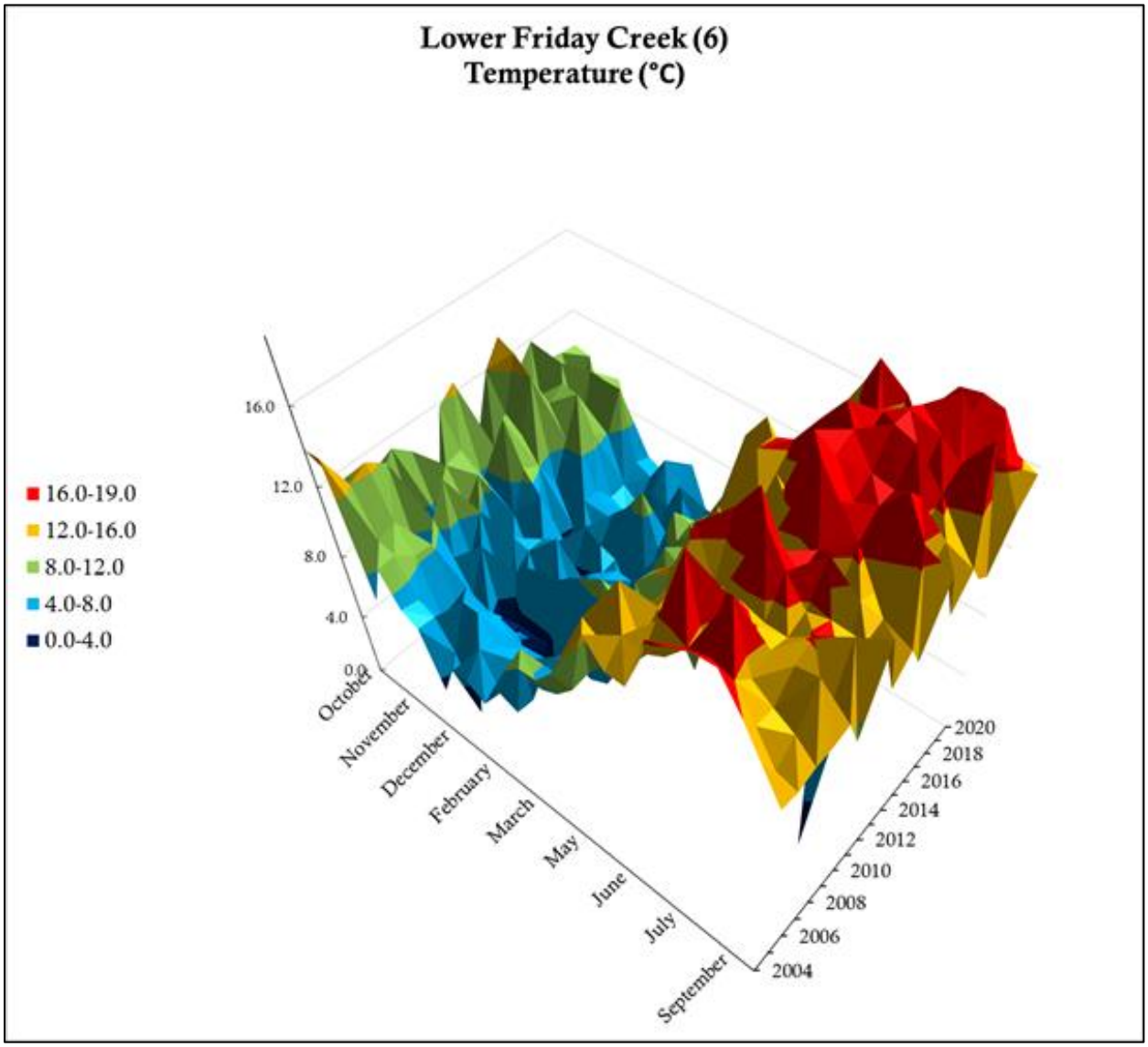
Site 6 is tied for 4th out of 39 sites for number of significant trends, with 16, and is 13th out of 39 sites for positive trends, at 69%.

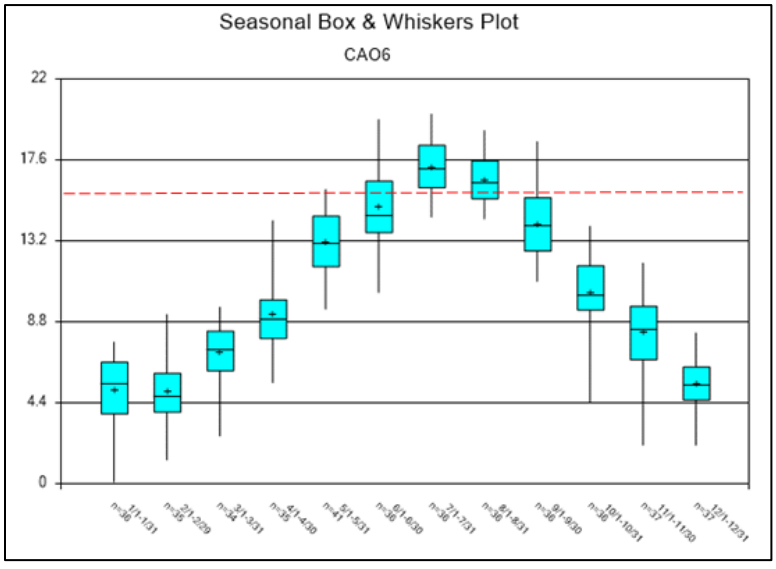




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

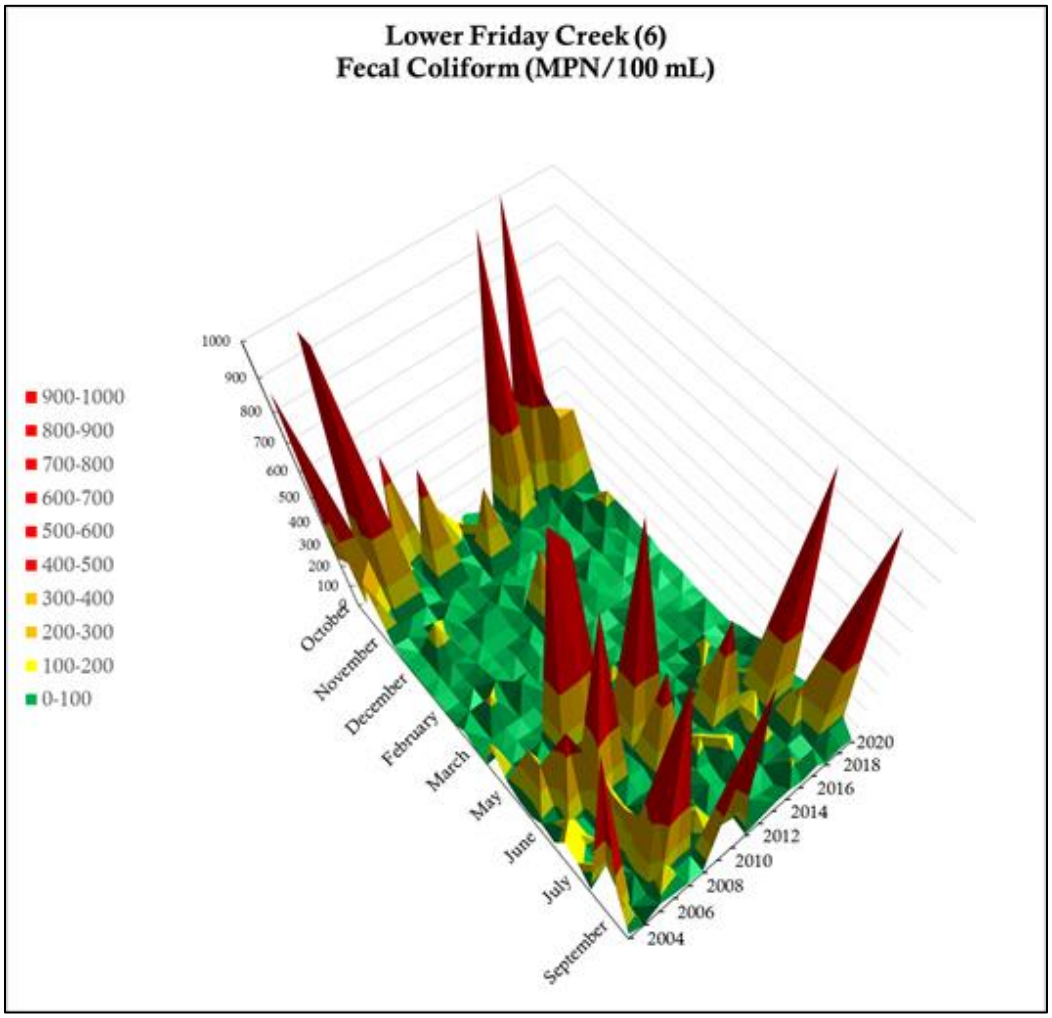
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

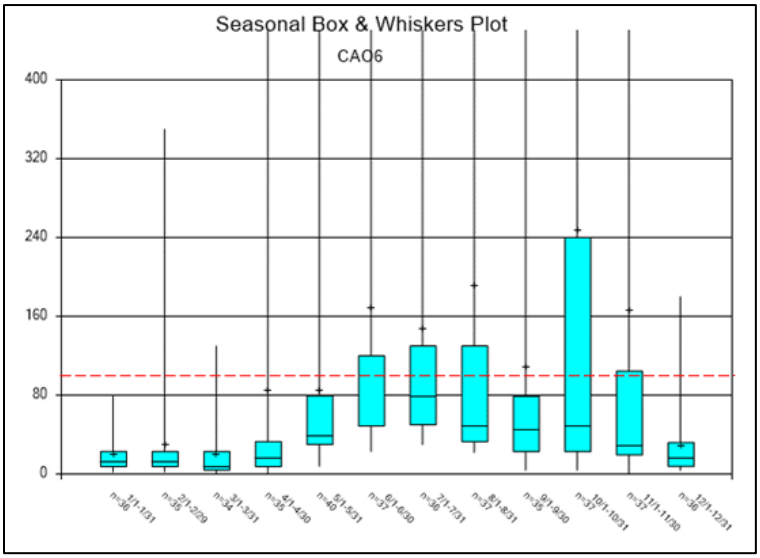




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

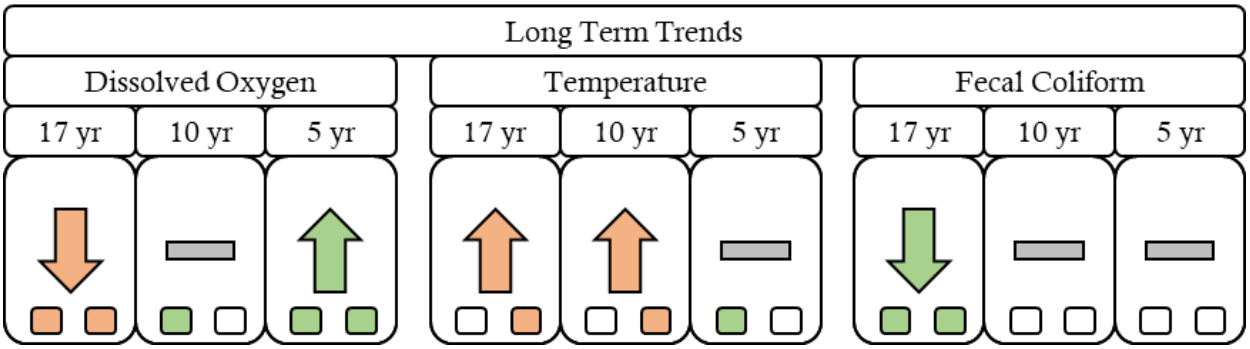
8

Swede Creek
@ Grip Road

Downstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
34	58	48	72	76	90	71	83	77	75	61	75	81	59	75

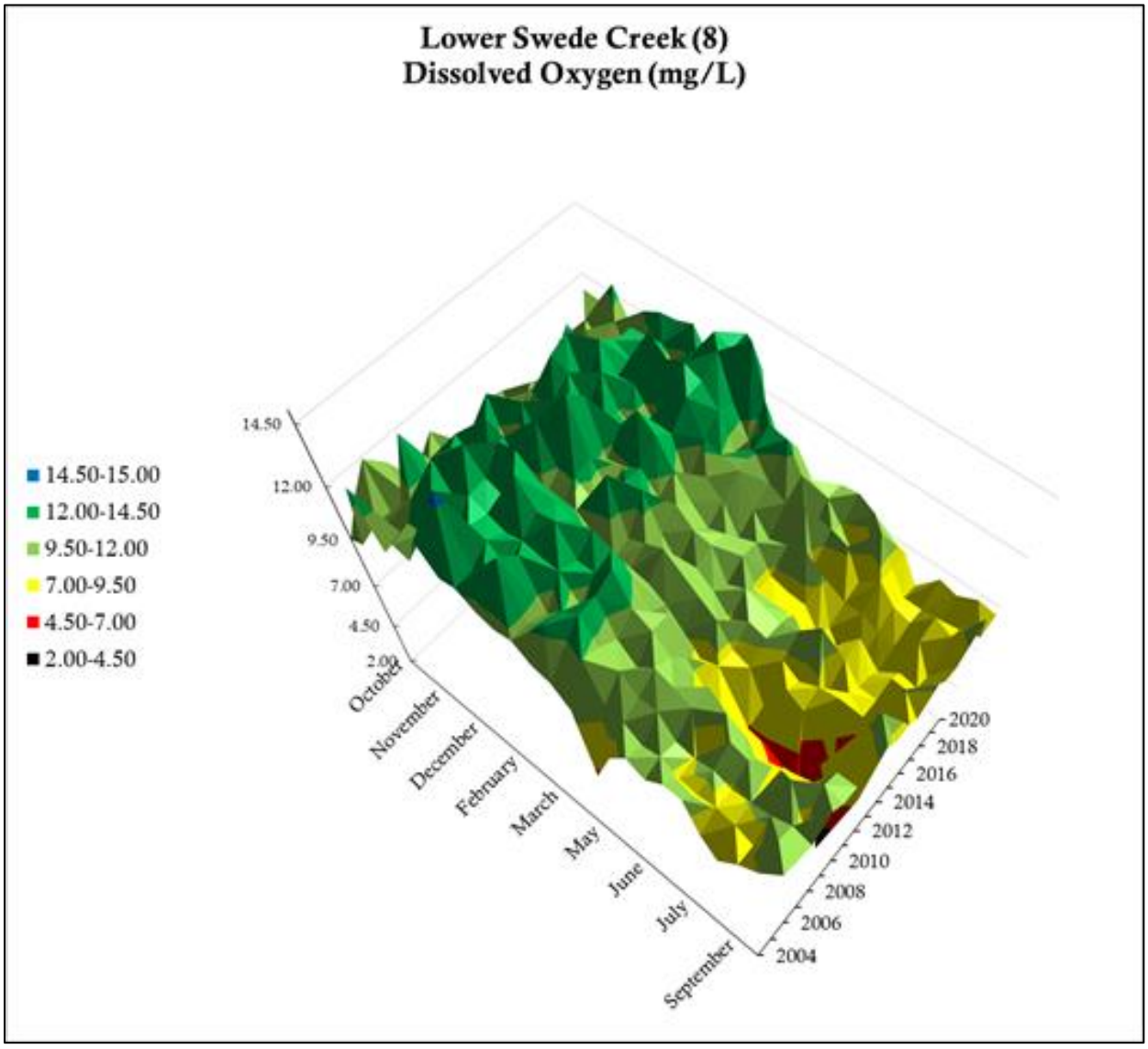


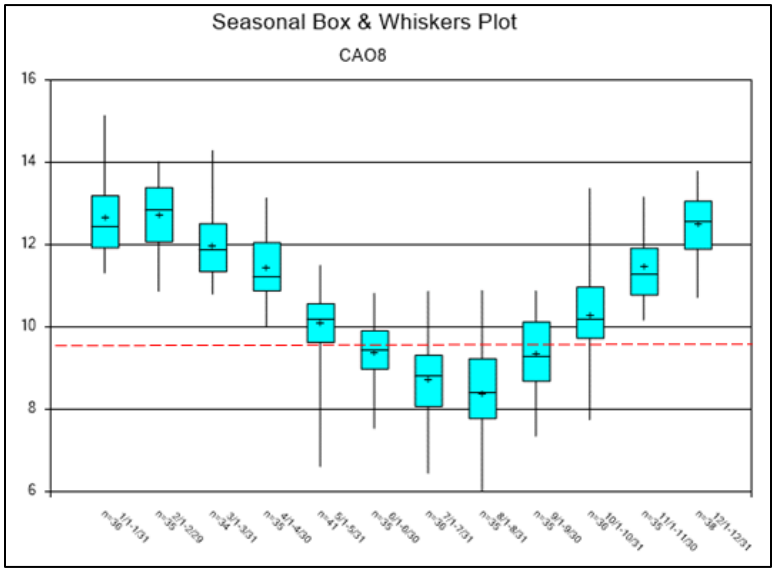
Site 8 is Swede Creek, and sits just prior to the creek joining the Samish River. Swede Creek has been a focus of pollution monitoring efforts in the Samish basin, with rural residential and agricultural sources in the watershed. The site is designated as core salmonid habitat.

Dissolved oxygen has declined as compared to 17 years ago, but has improved over the last five. Temperatures are higher than they were 17 and ten years ago. Fecal coliform counts are lower than they were 17 years ago. WQI scores are generally in the higher-scoring end of the moderate concern category, and sometimes score as least concern.

Site 8 fails to meet state DO standards in the warmer months, and fails to meet state temperature standards only at the warmest time of year. Annual fecal coliform levels for WY2020 easily passed the 100 FC standard, but did not pass the 90th percentile requirement.

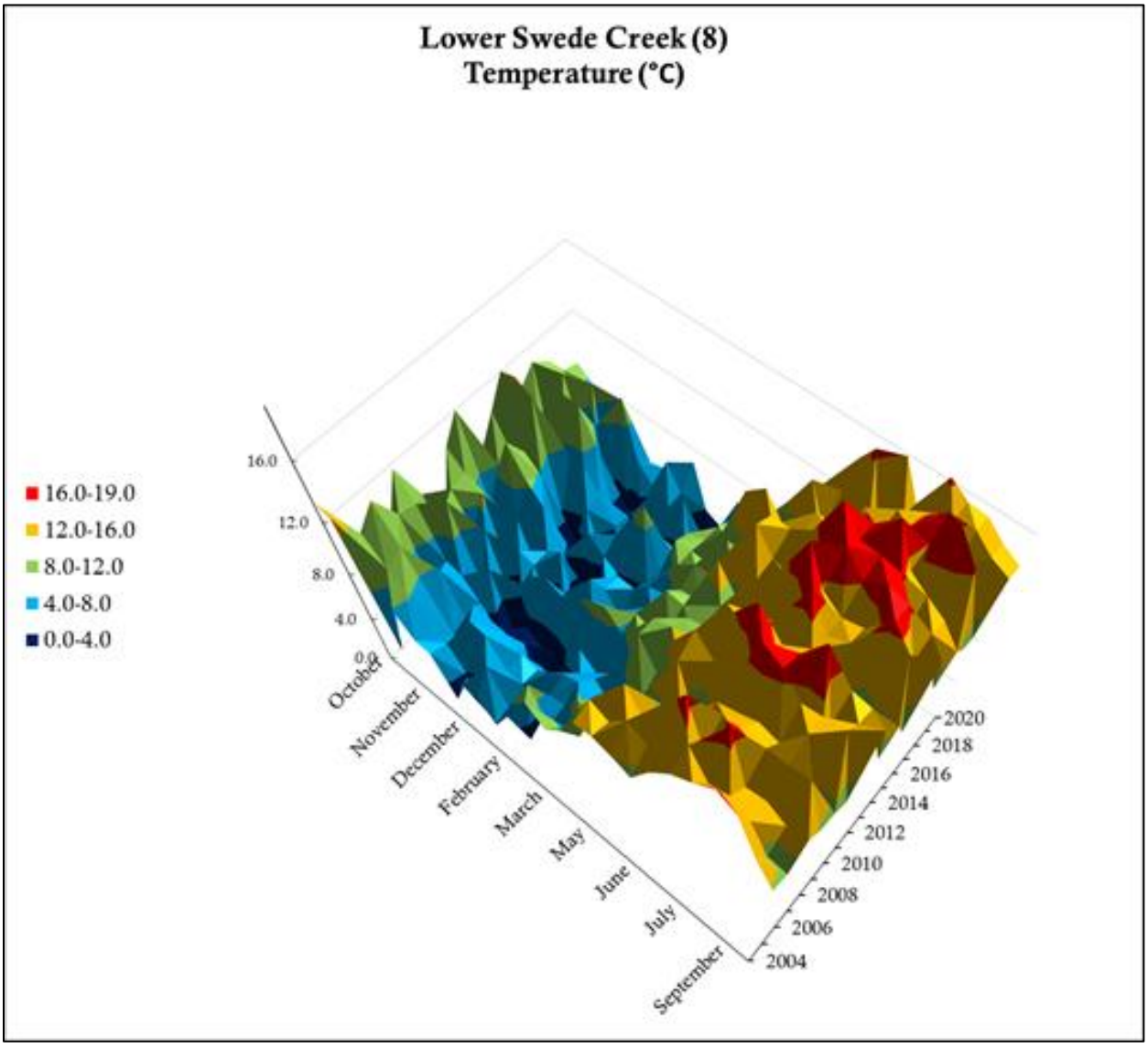
Site 8 is 2nd out of 39 sites for number of significant trends, with 18, and tied for 22nd out of 39 sites for positive trends, at 56%.

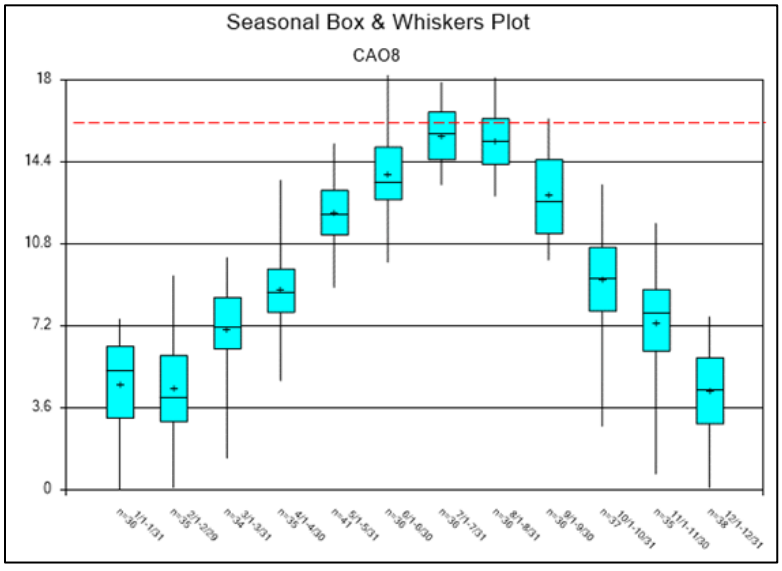




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

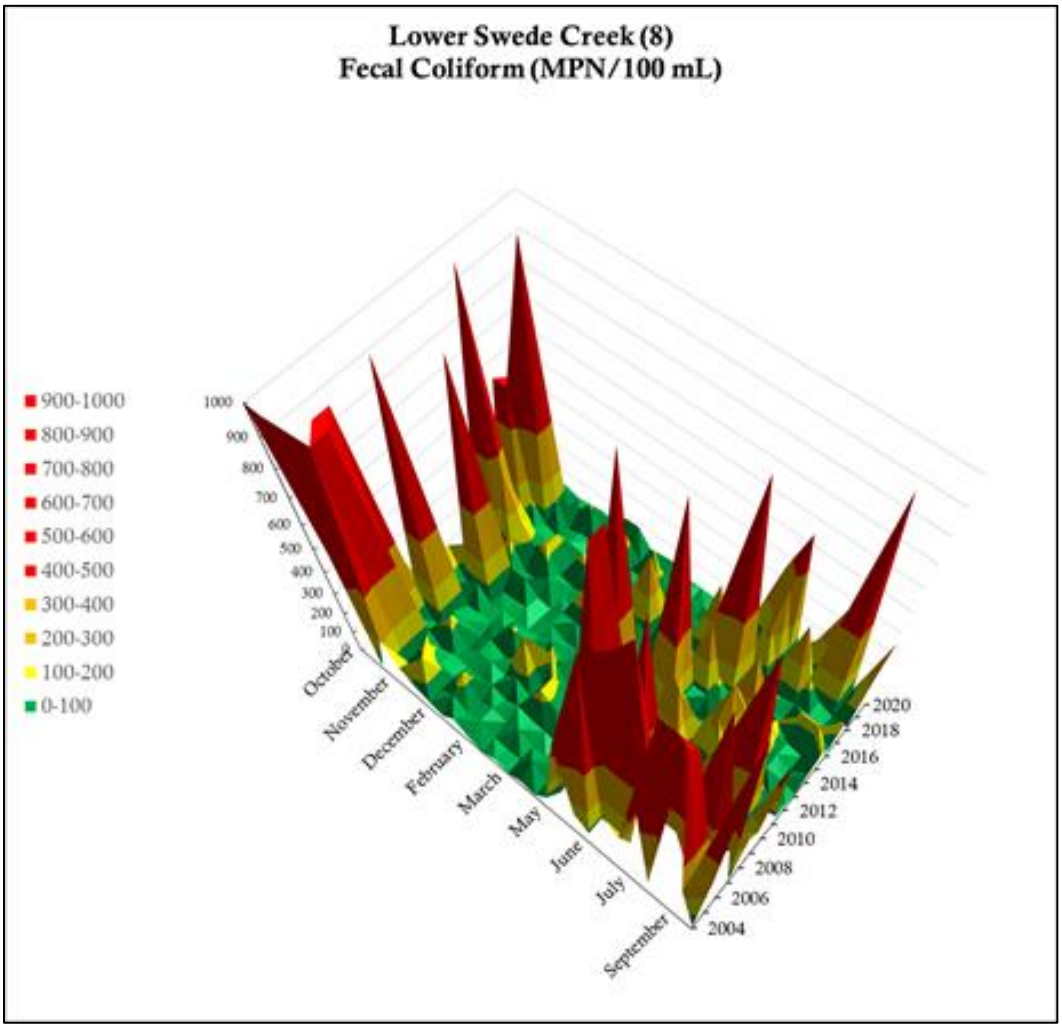
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

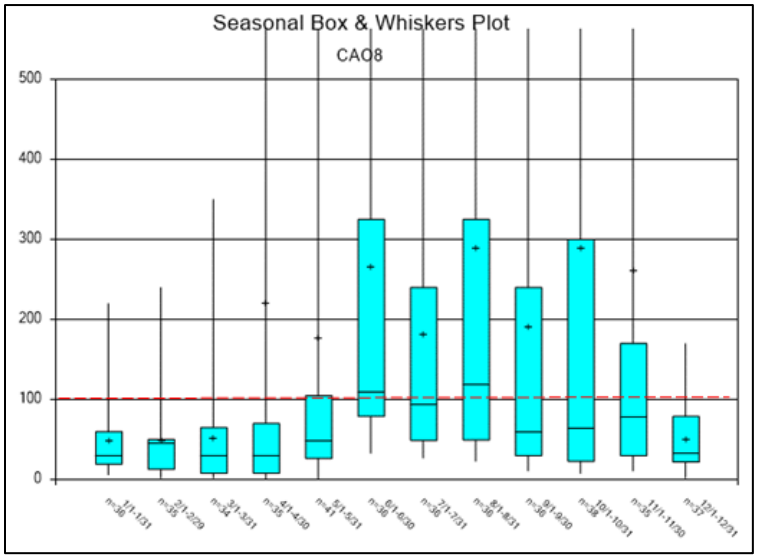




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

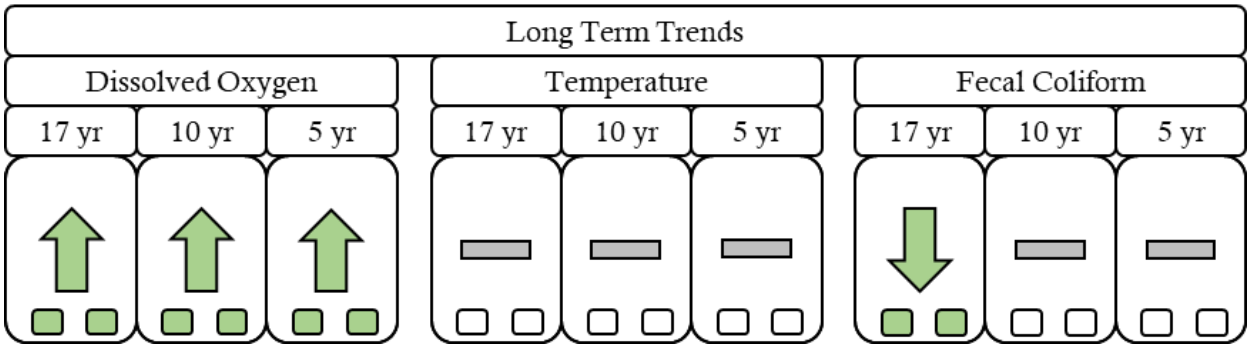
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

11

Samish River
@ Highway 9

Upstream Ag

Water Quality Index (WQI)														
2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
57	85	68	81	78	86	65	72	68	66	80	82	87	81	82

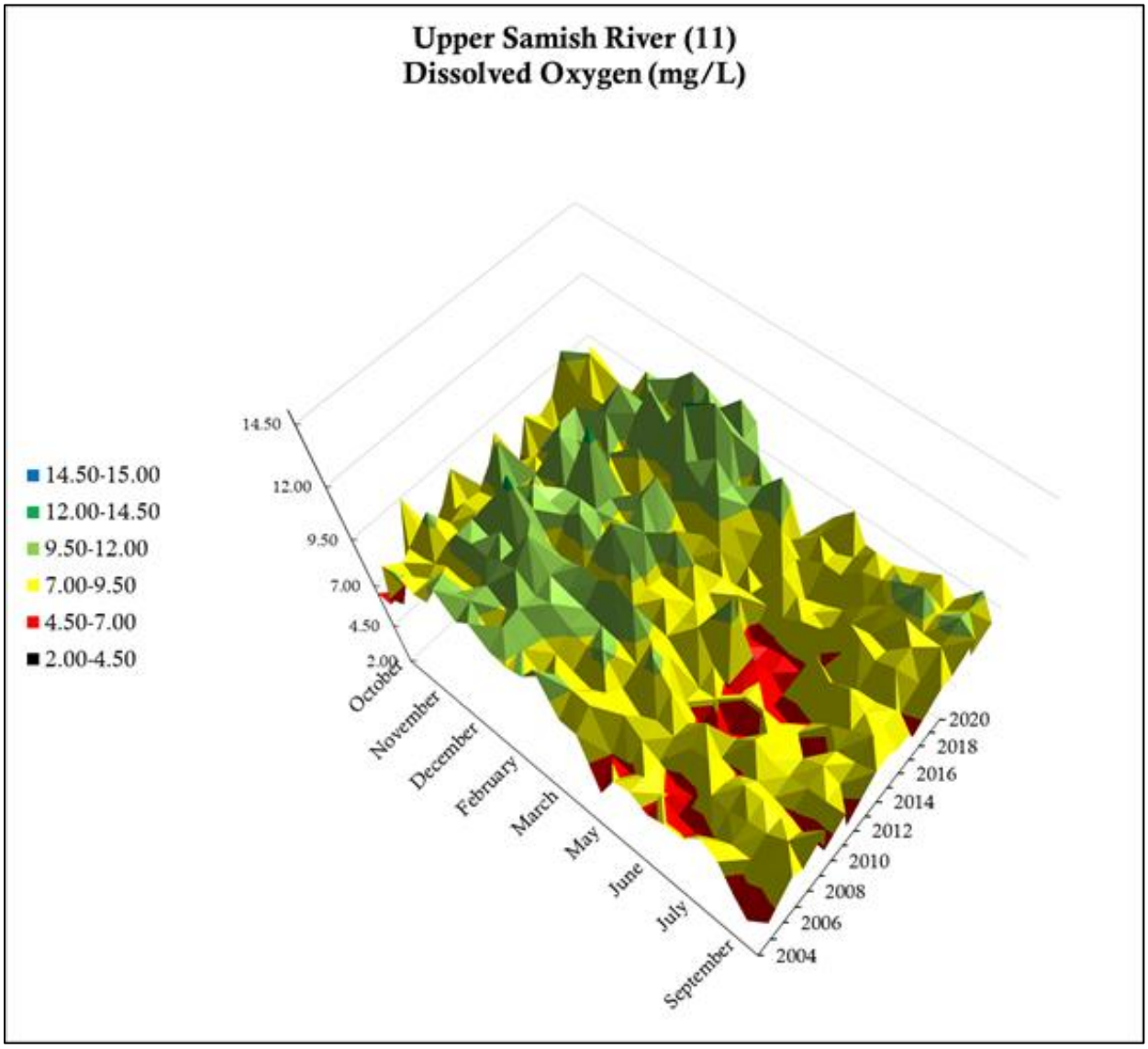


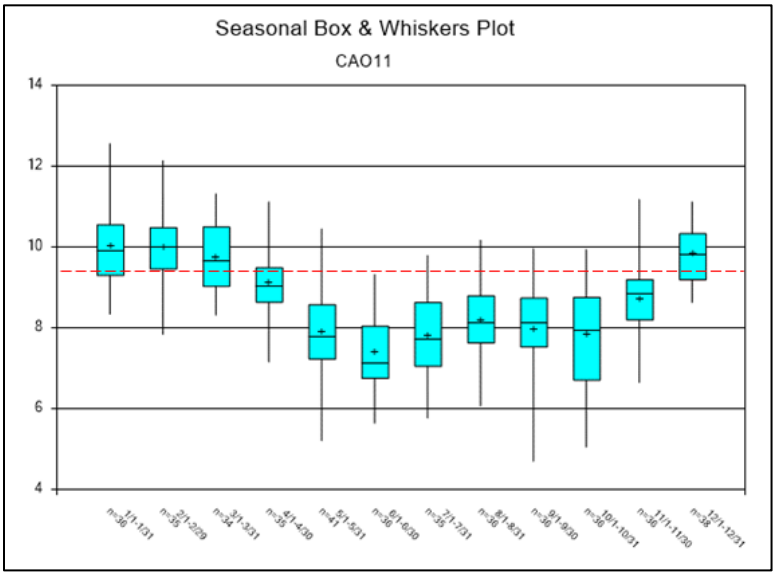
Site 11 is the Samish River, upstream of all other Samish River sampling sites. This site shows the condition of the Samish River prior to all monitored tributaries. This site is designated as core salmonid habitat.

Dissolved oxygen has significantly increased over all time periods. Fecal coliform counts are lower than they were 17 years ago. WQI scores are generally in the higher-scoring end of the moderate concern category, and often score as least concern.

Site 11 regularly fails to meet state standards for DO, but easily passes state standards for temperature, year-round. Annual FC levels easily meet state standards.

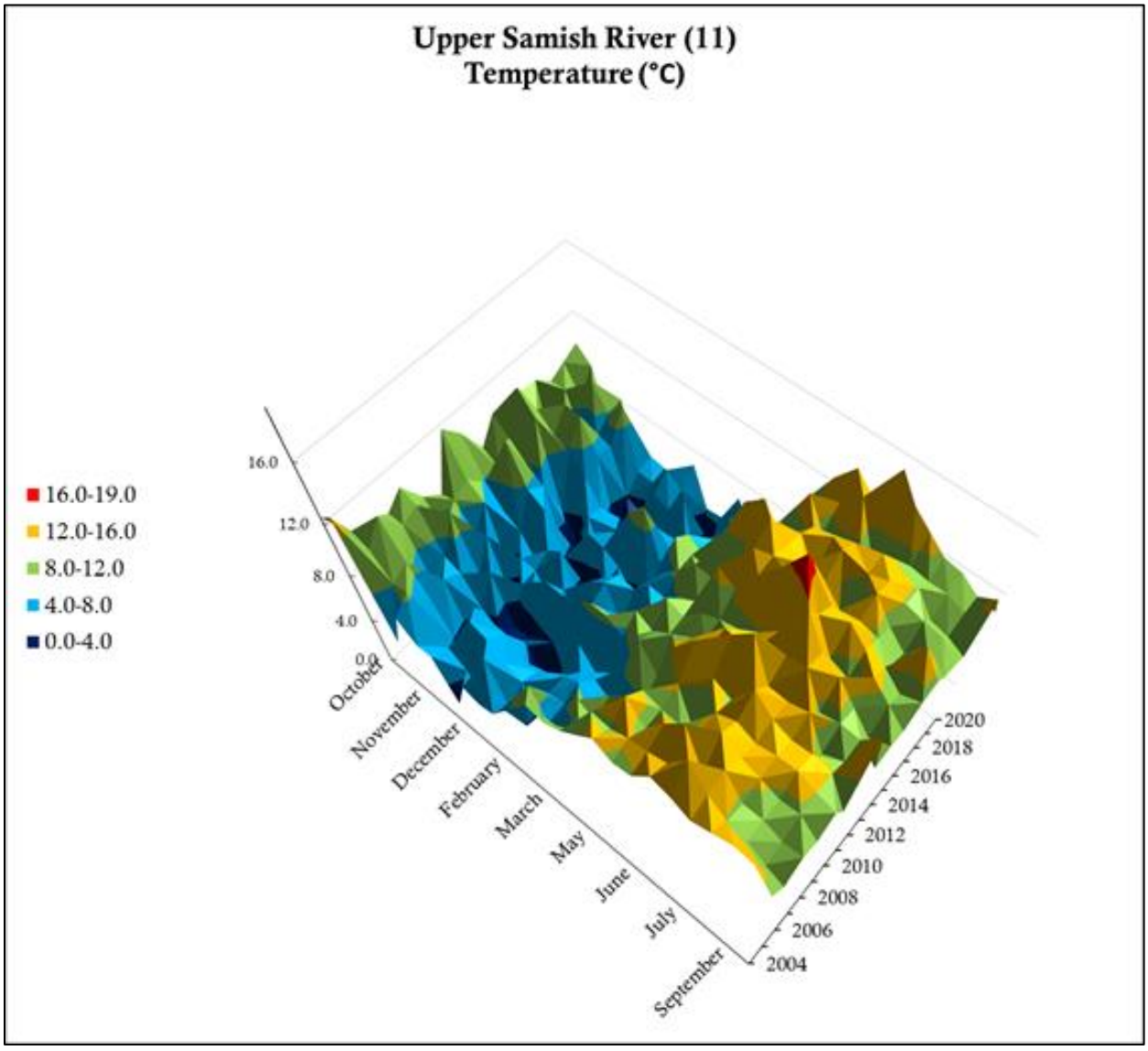
Site 3 is tied for 7th out of 39 sites for number of significant trends, with 15, and 1st out of 39 sites for positive trends, with 100%.

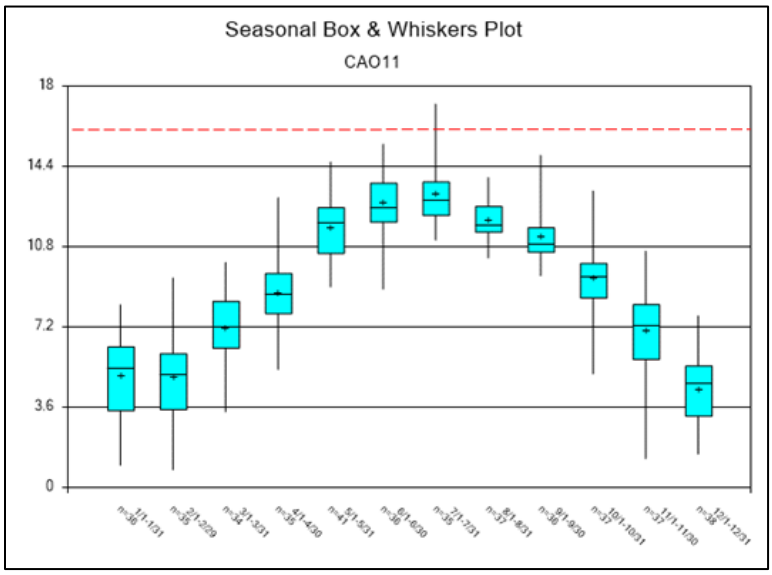




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

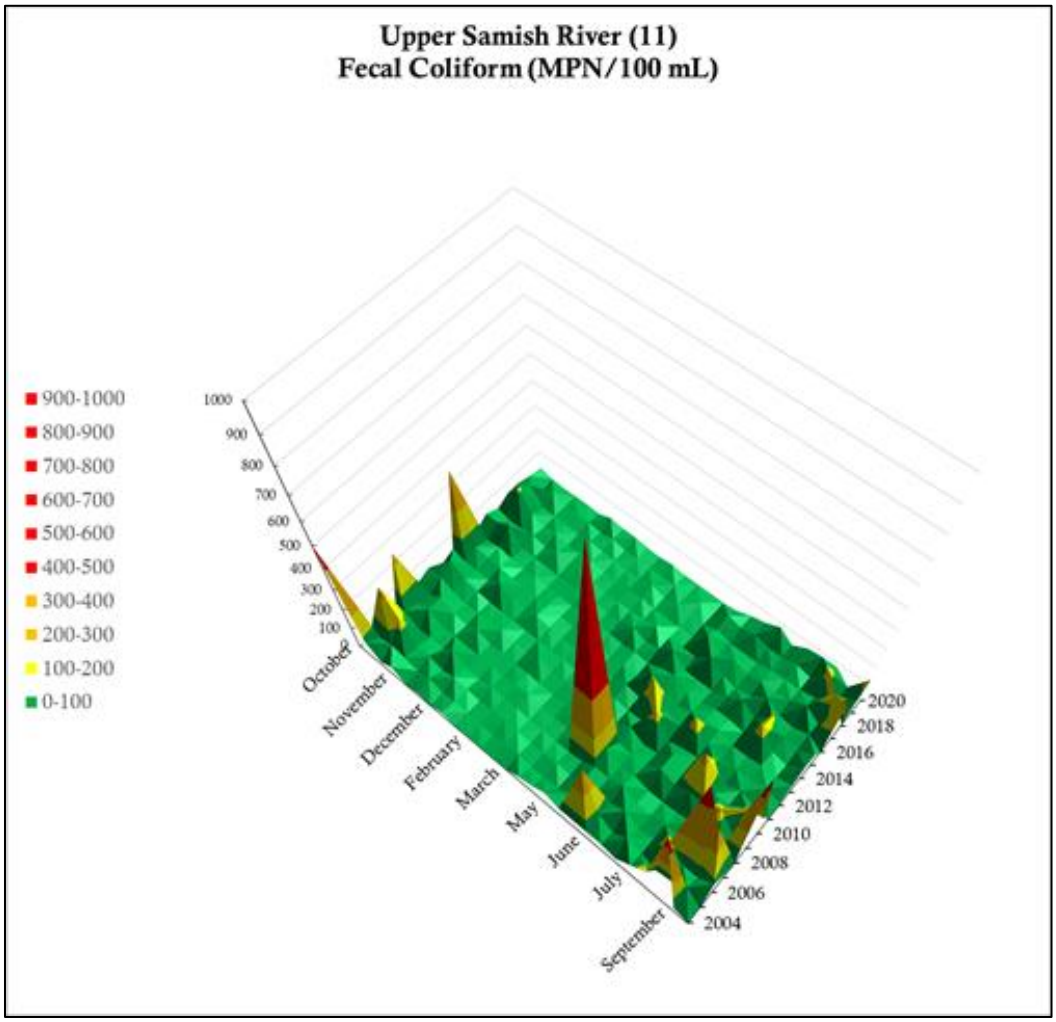
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

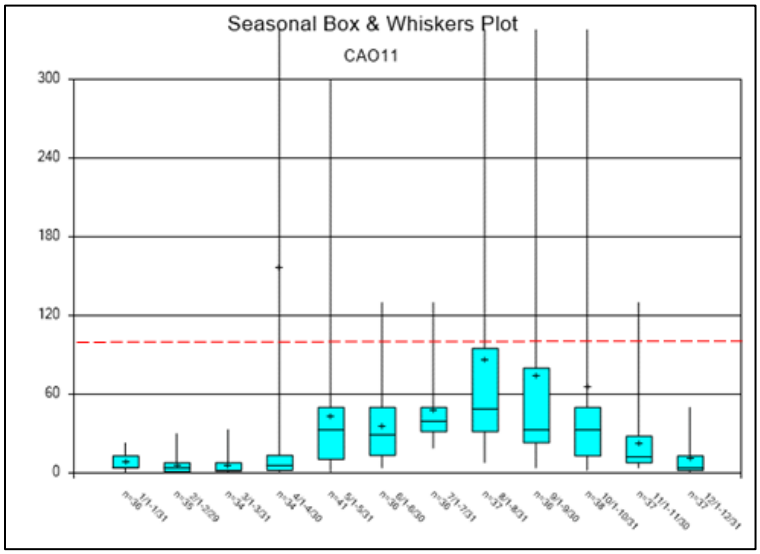




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

12

Nookachamps Creek
@ Swan Road

Downstream Ag, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
63	72	38	72	58	68	50	62	58	59	67	59	49	72	58

Long Term Trends

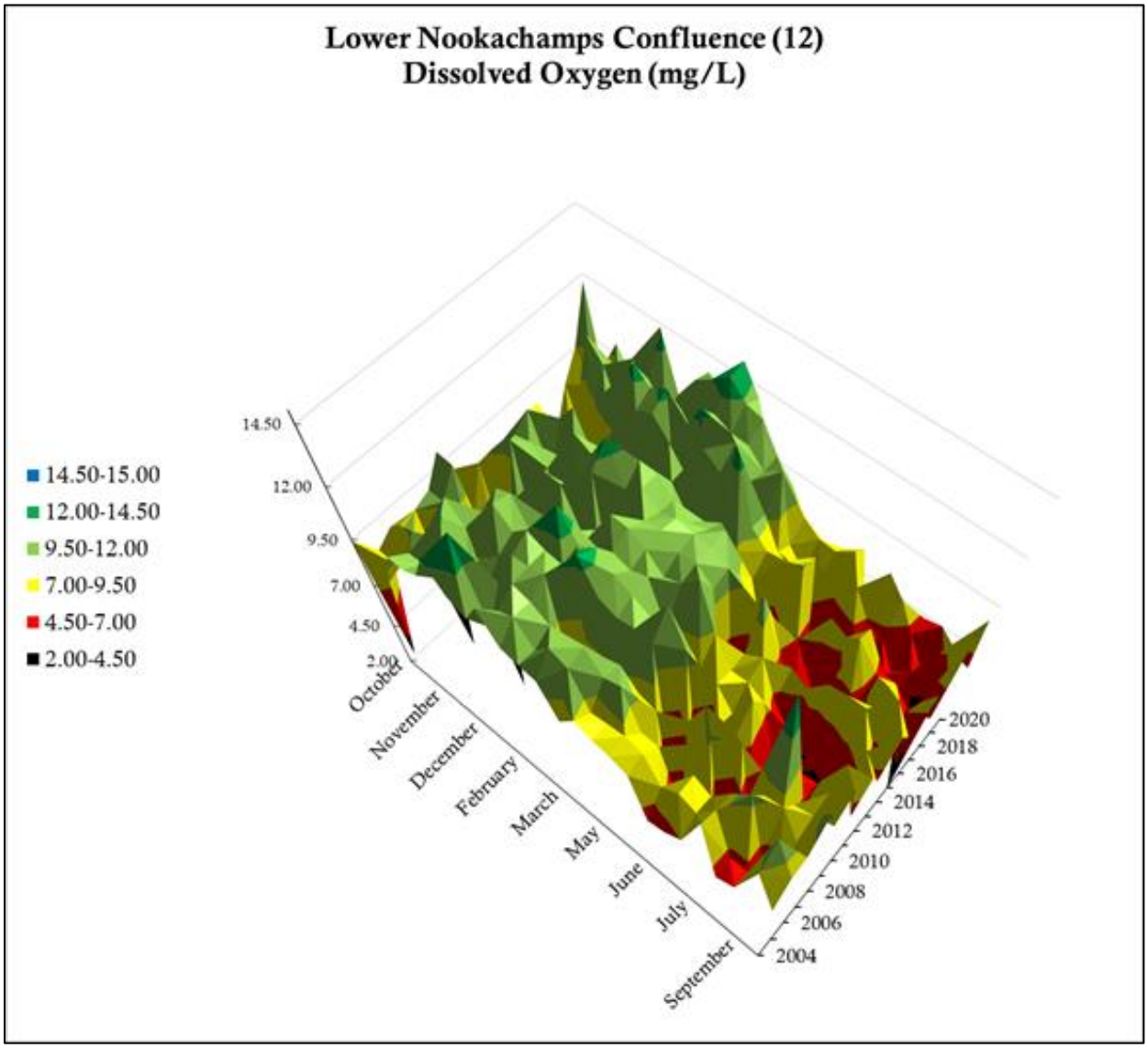
Dissolved Oxygen			Temperature			Fecal Coliform		
17 yr	10 yr	5 yr	17 yr	10 yr	5 yr	17 yr	10 yr	5 yr

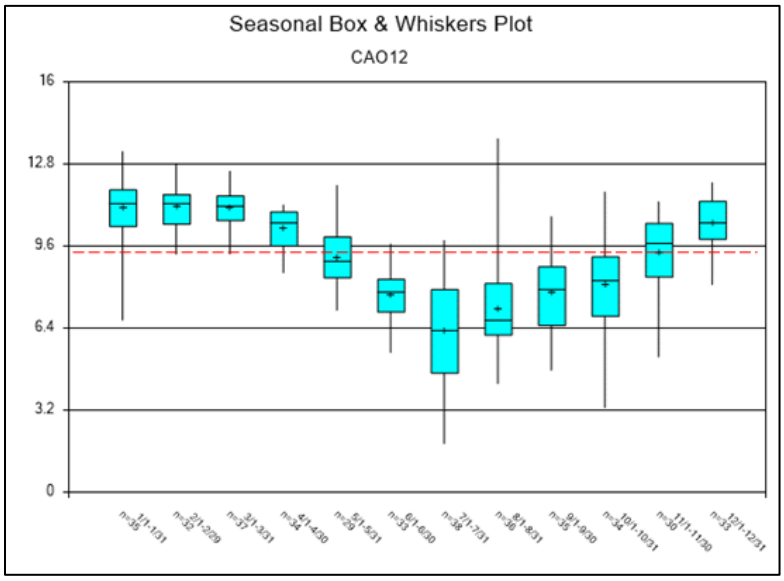
Site 12 is Nookachamps Creek, and is the furthest downstream site of the creek in this program, located just prior to joining the Skagit River. This creek drains a large valley of rural residential and agriculturally-zoned areas. This site is designated as core salmonid habitat.

There have been no significant changes in dissolved oxygen, temperature, or FC during any of the observed time periods. WQI scores are regularly in the category of moderate concern.

Site 12 regularly fails to meet state standards for DO and temperature during the warmer months. Annual fecal coliform levels for WY2020 easily passed the 100 FC standard, but did not pass the 90th percentile requirement.

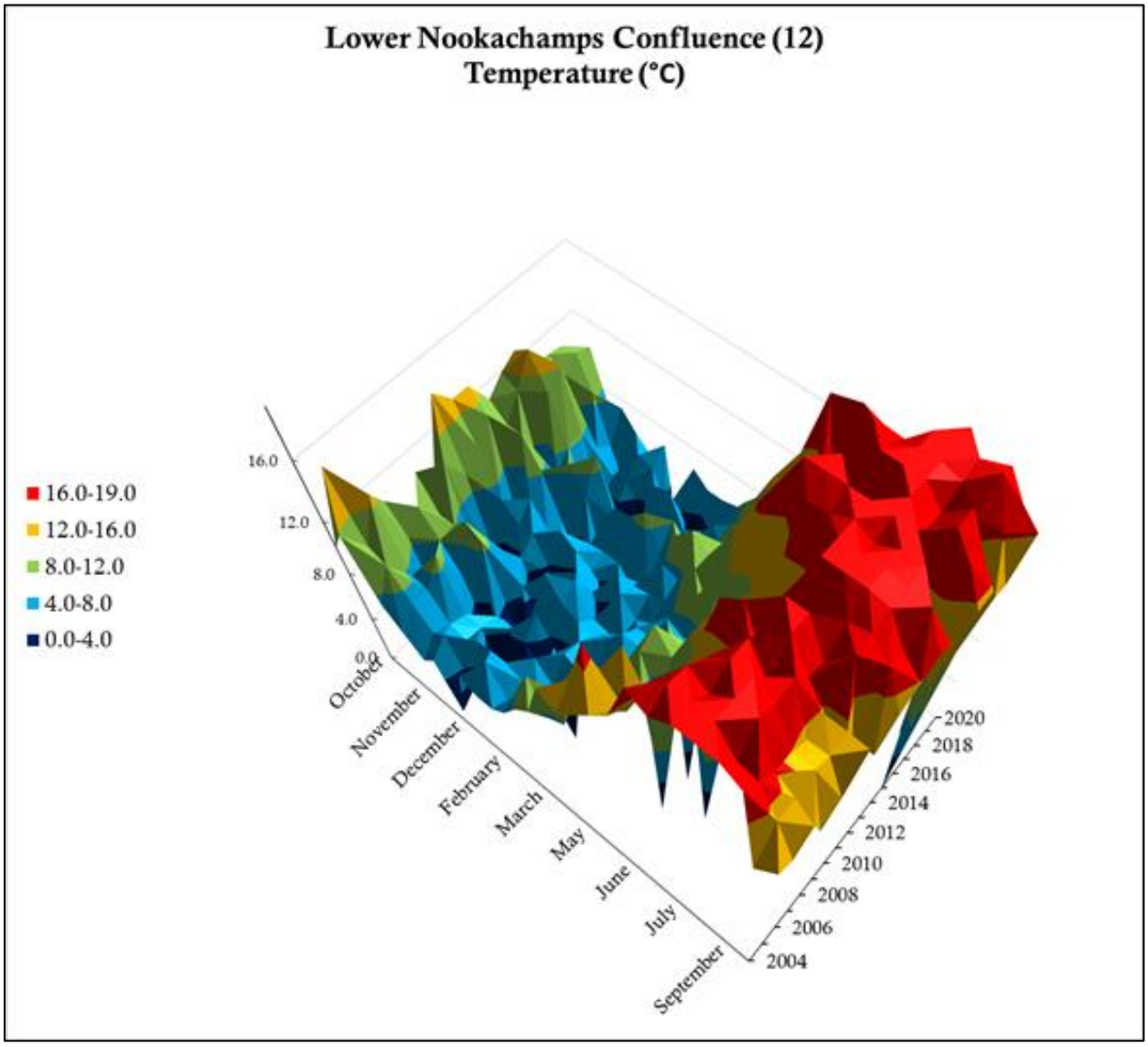
Site 12 is tied for 30th out of 39 sites for number of significant trends, with 9, and is tied for 14th out of 39 sites for positive trends, with 67%.

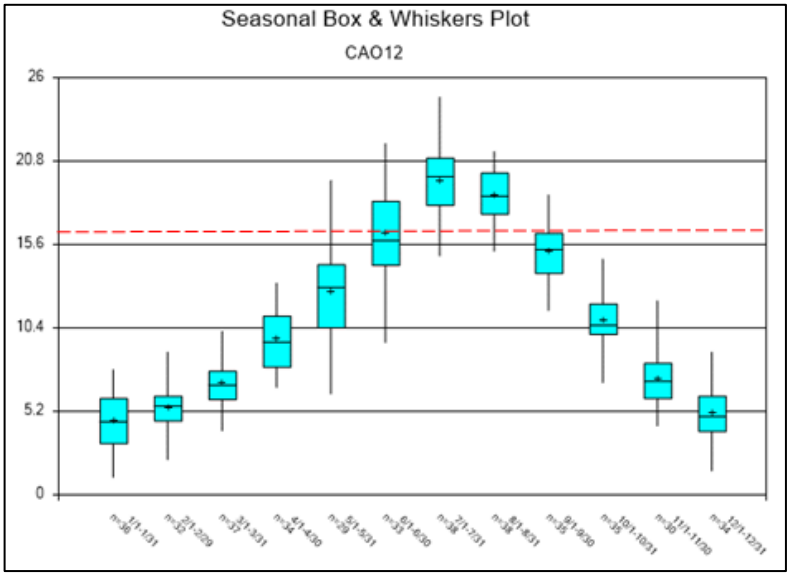




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

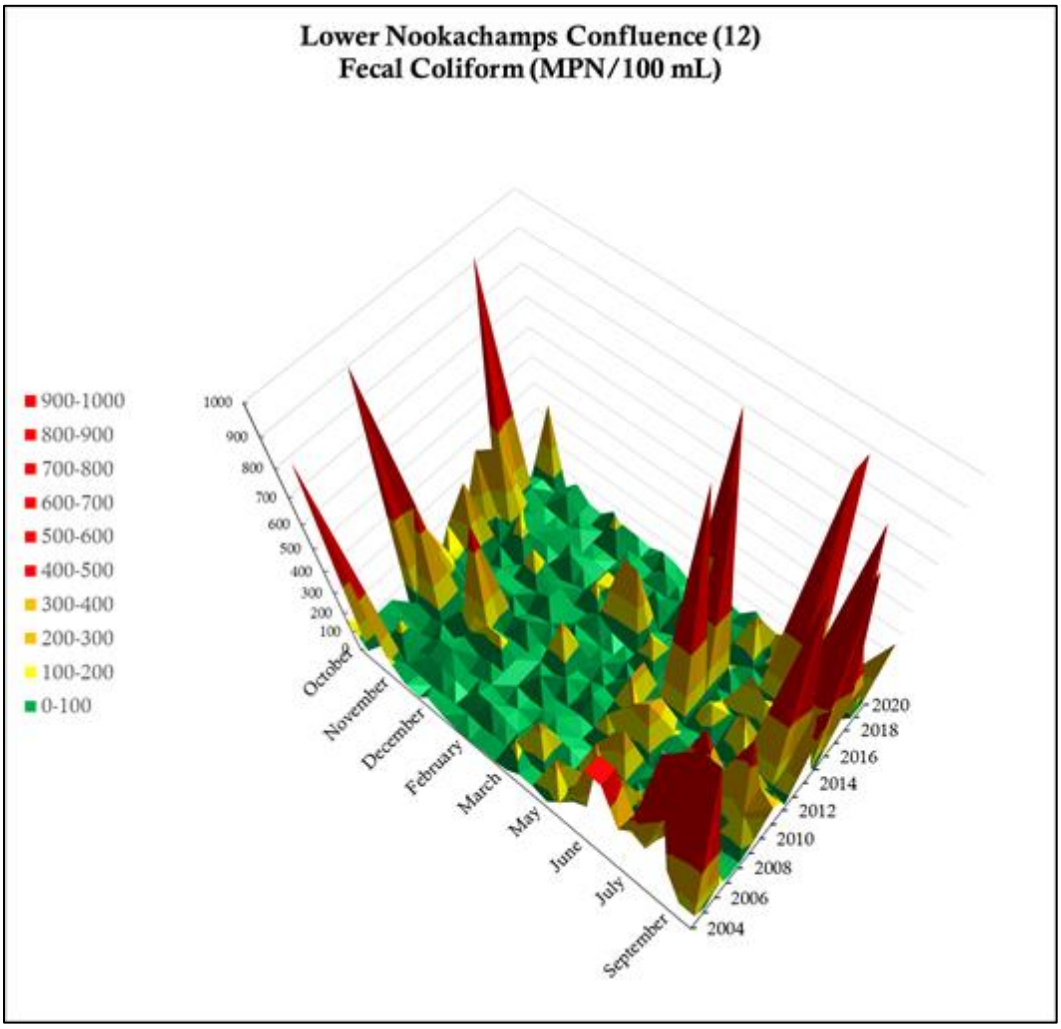
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

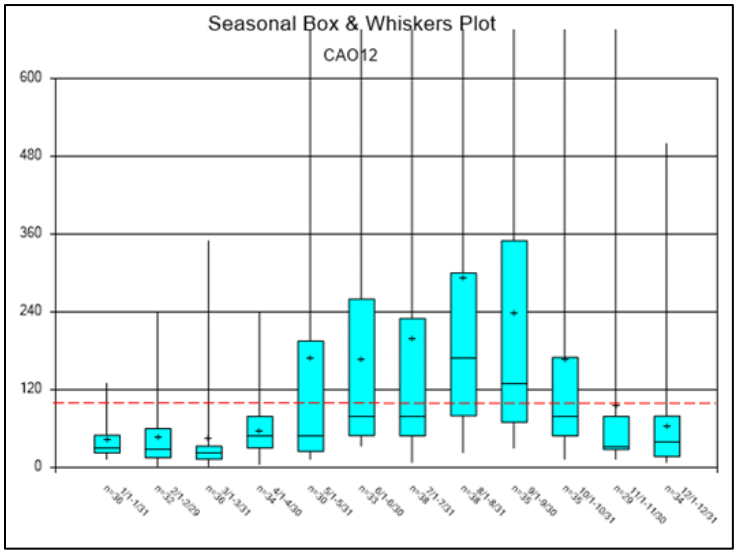




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

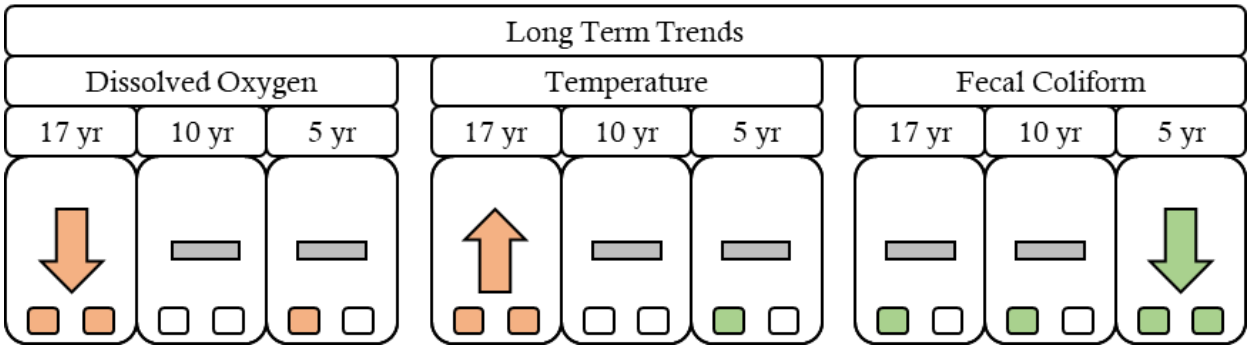
13

EF Nookachamps Creek
@ Highway 9

Downstream Ag, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
74	77	88	85	85	91	65	70	76	74	75	64	80	74	57

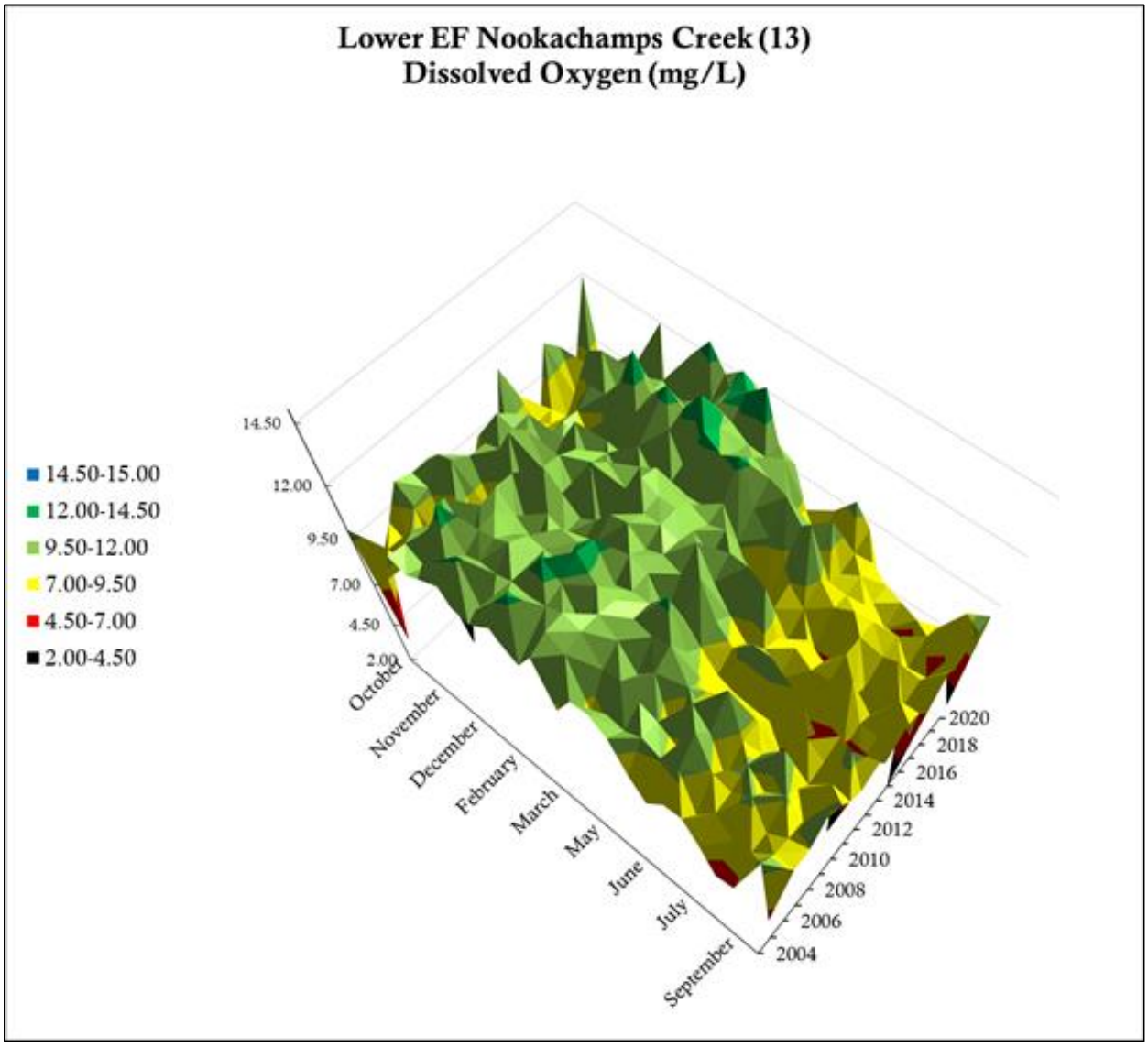


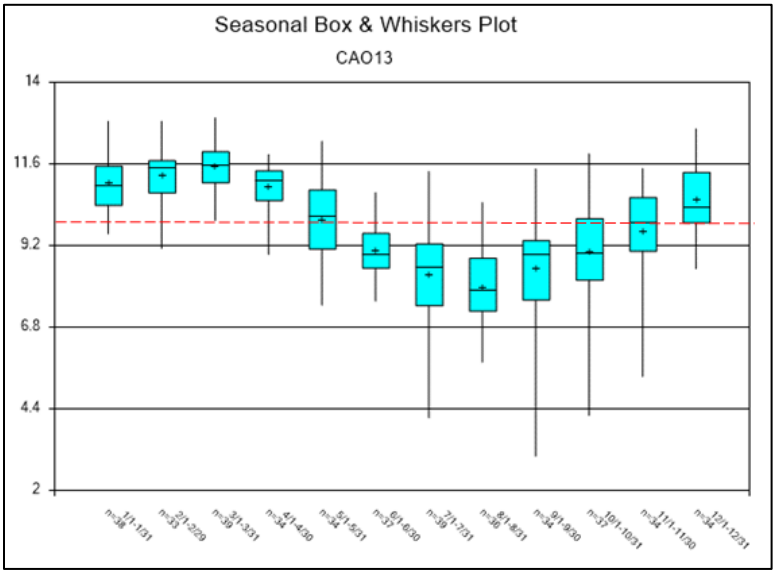
Site 13 is East Fork Nookachamps Creek, downstream of site 16, and sitting just prior to joining Nookachamps Creek and ultimately the Skagit River. It sits downstream of a stretch of agricultural activity. This site is designated as char spawning and rearing status.

Dissolved oxygen has declined since 17 years ago. Temperature is higher than it was 17 years ago. Fecal coliform counts are significantly lower over the last five years. WQI scores are generally in the higher-scoring end of the moderate concern category, and sometimes score as least concern.

Site 13 regularly fails to meet state standards for DO and temperature during the warmer months. Annual fecal coliform levels for WY2020 easily passed the 100 FC standard, but did not pass the 90th percentile requirement.

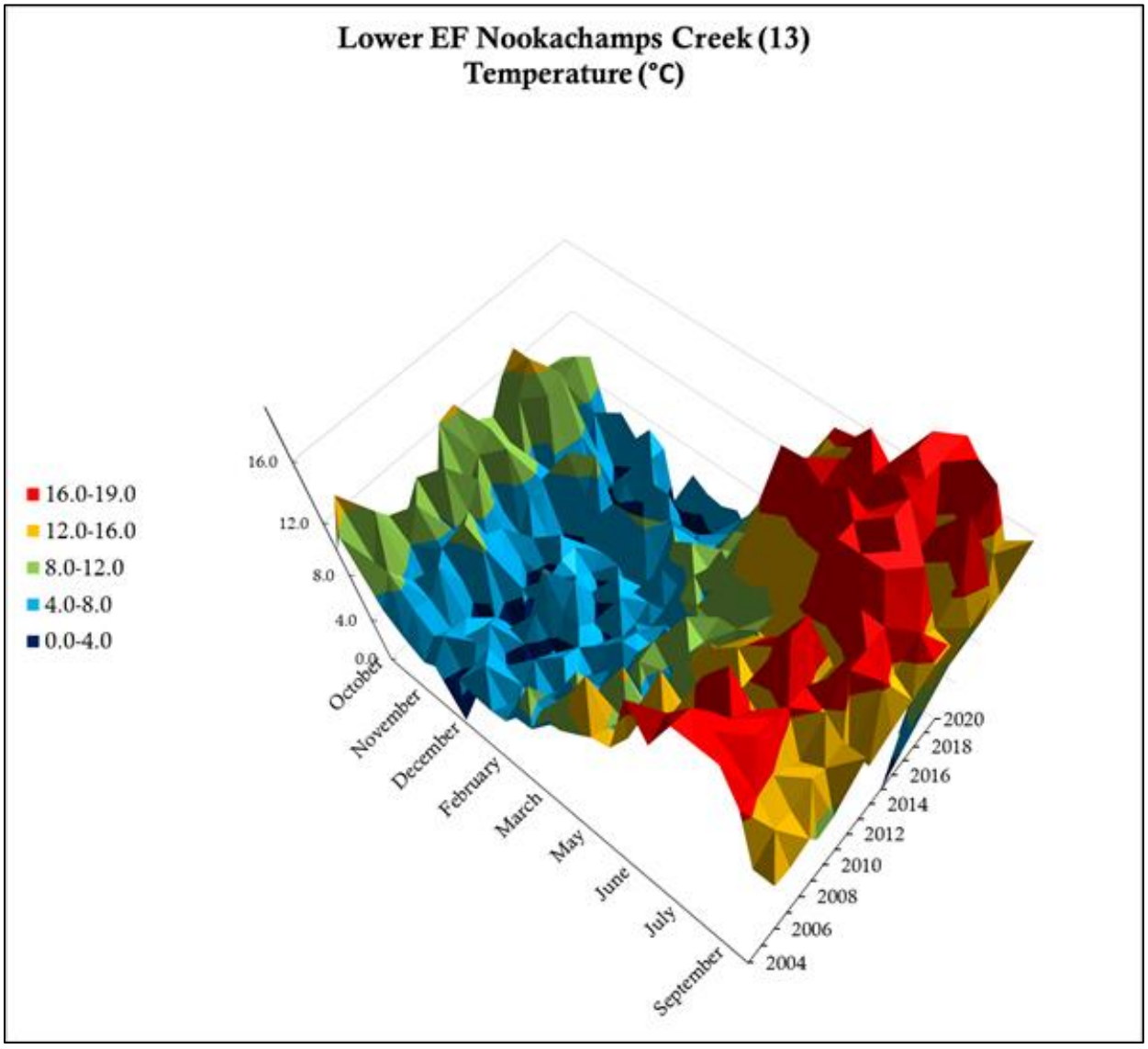
Site 13 is tied for 12th out of 39 sites for number of significant trends, with 13, and tied for 25th out of 39 sites for positive trends, with 54%.

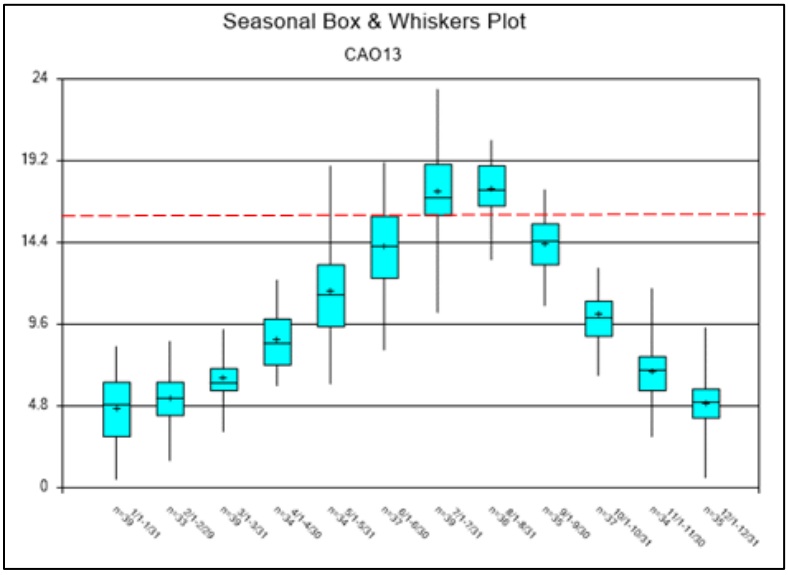




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

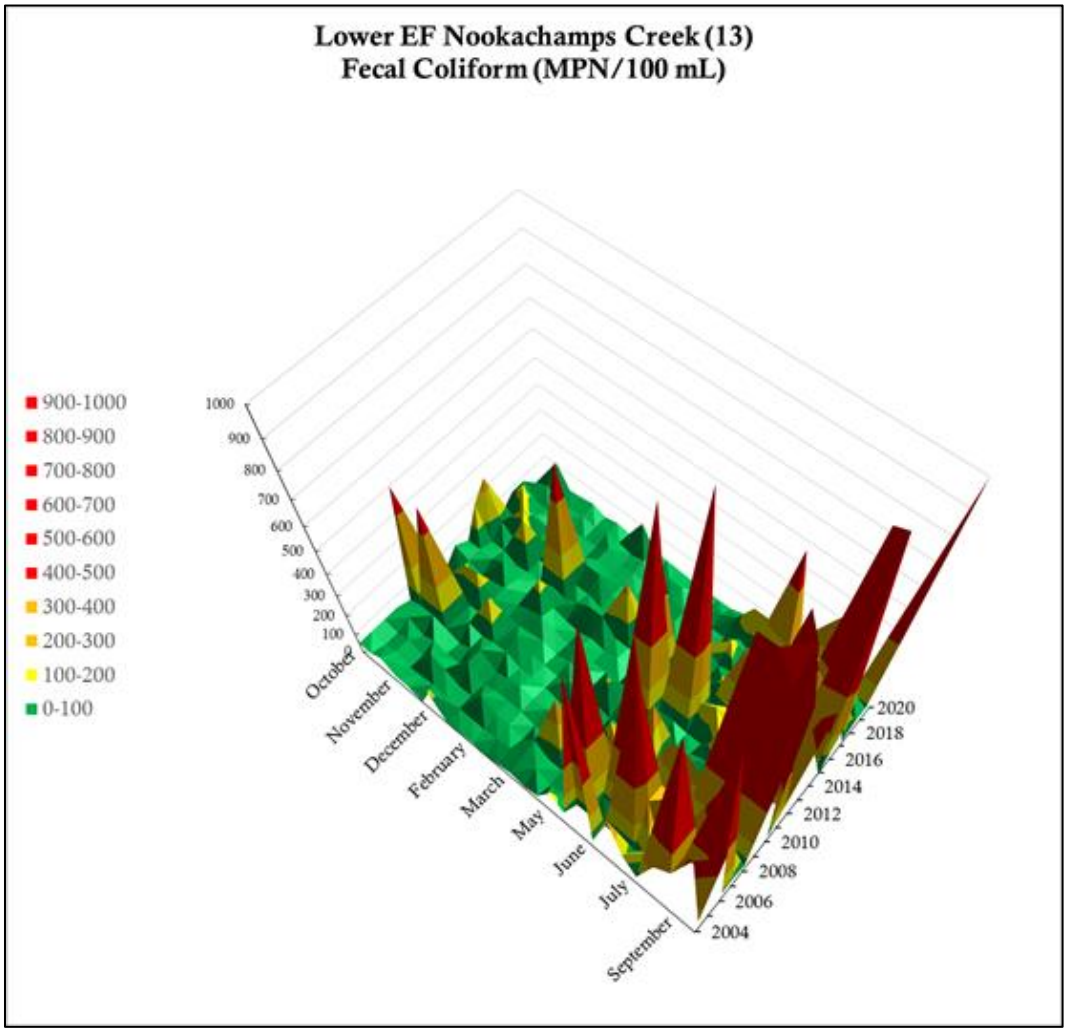
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

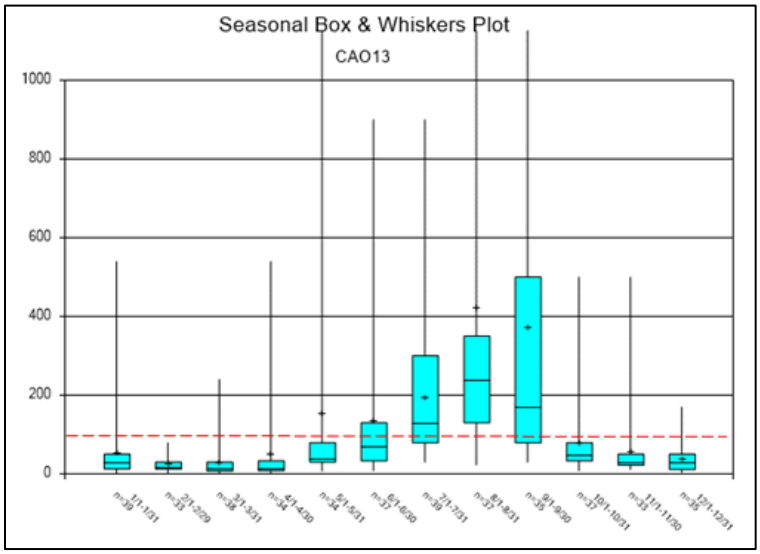




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

14

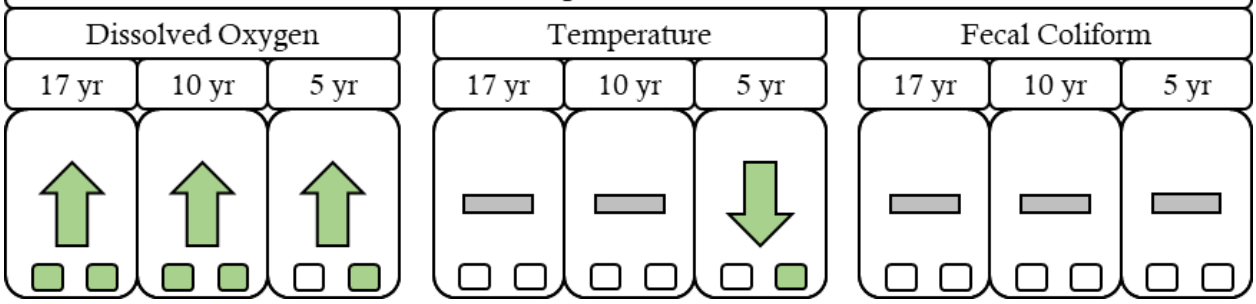
College Way Creek
@ College Way

Reference – Urban/suburban

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
48	35	24	46	44	75	40	47	53	55	73	47	55	54	66

Long Term Trends

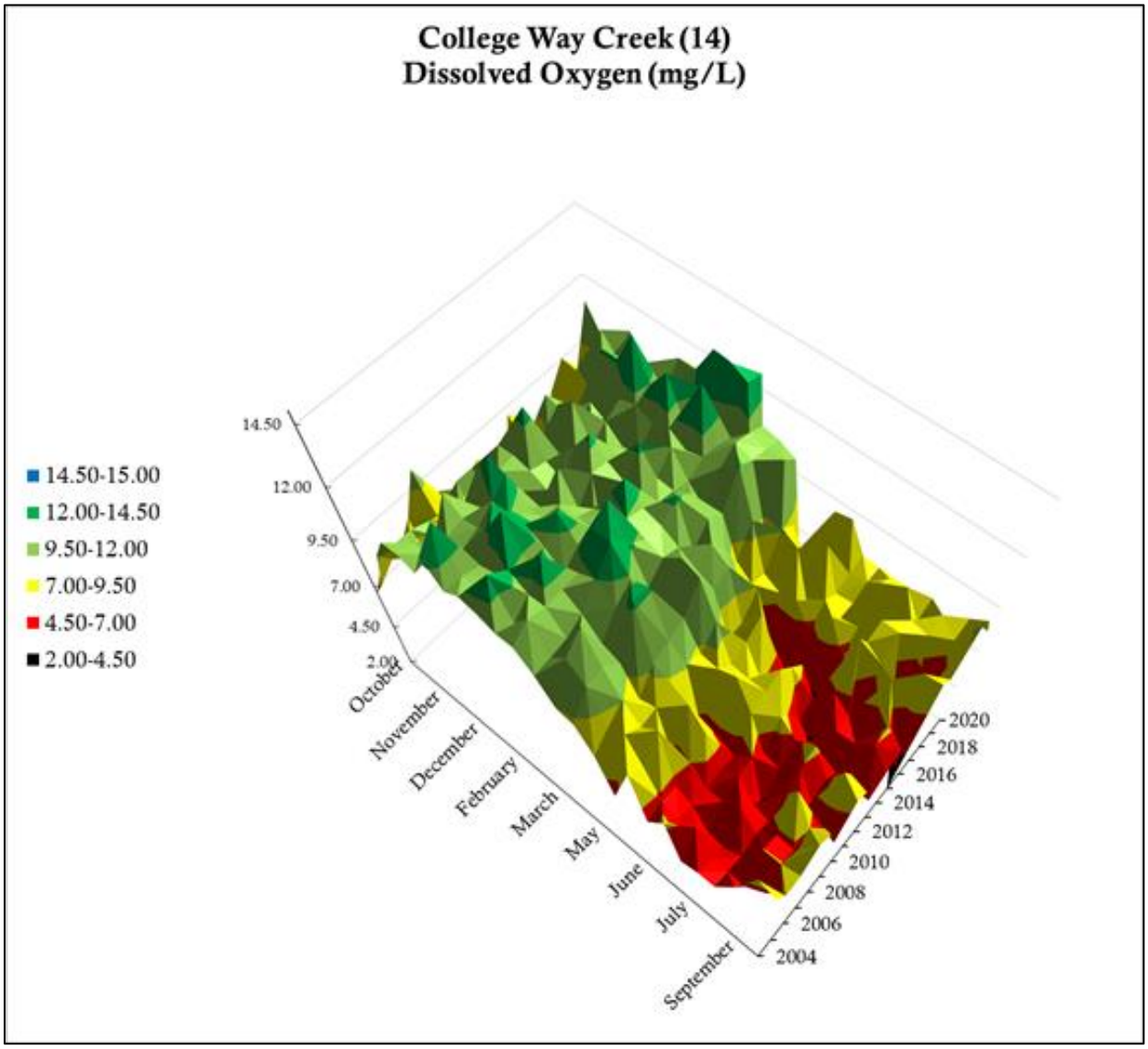


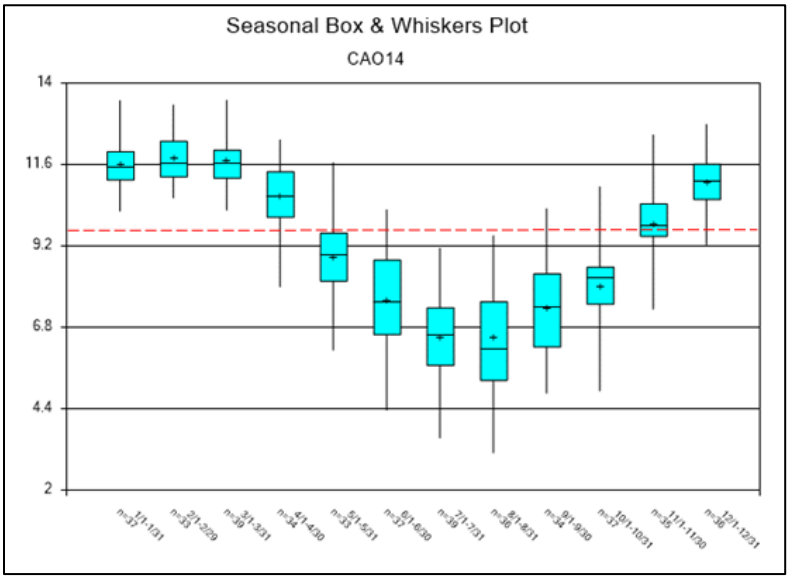
Site 14 is College Way Creek. This creek drains an urban/suburban area of northeast Mount Vernon, and terminates into Nookachamps Creek just prior to Barney Lake, and eventually into the Skagit River. This site is designated as core salmonid habitat.

Dissolved oxygen has significantly increased over all three monitored time periods. Water temperature has decreased over the last five years. WQI scores are regularly in the category of moderate concern.

Site 14 regularly fails to meet state standards for DO during the warmer months, and often fails to meet state standards for temperature during the hottest time of the year. Annual FC levels consistently and exceedingly fail to meet state standards.

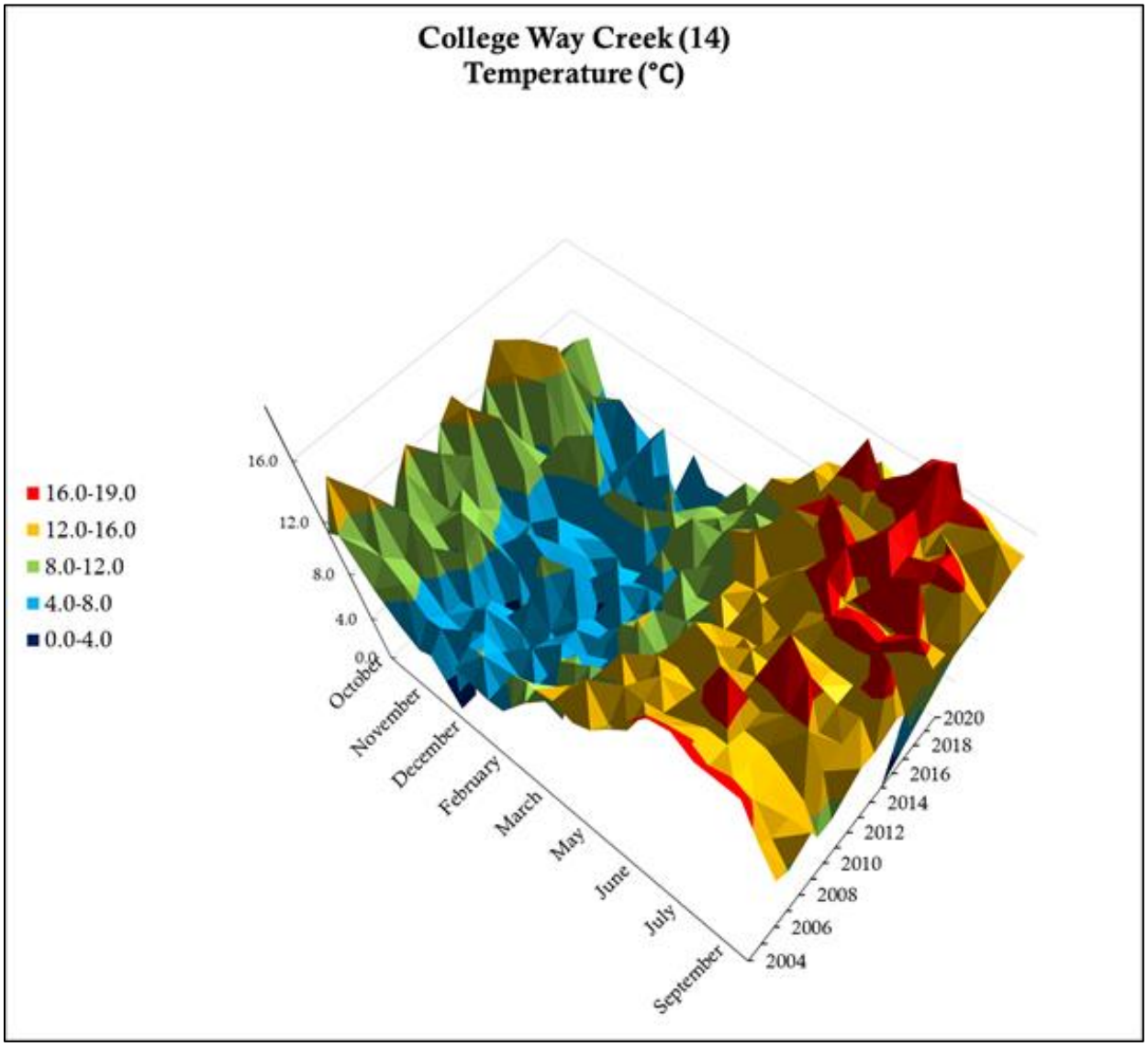
Site 14 is tied for 12th out of 39 sites for number of significant trends, with 13, and is tied for 8th out of 39 sites for positive trends, with 77%.

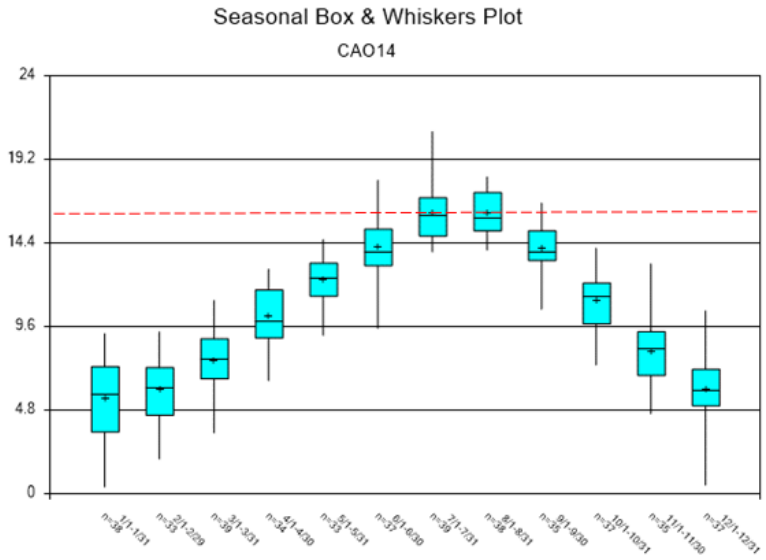




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

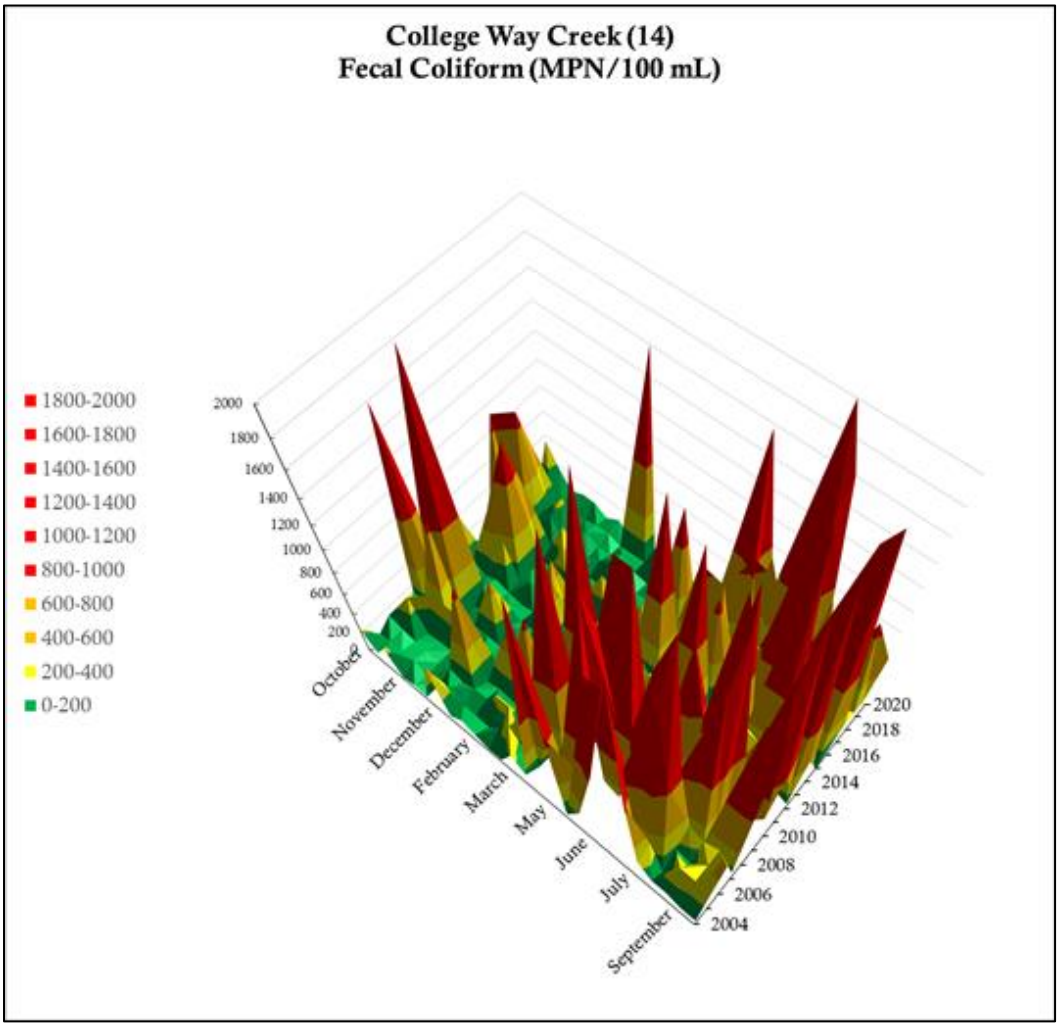
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

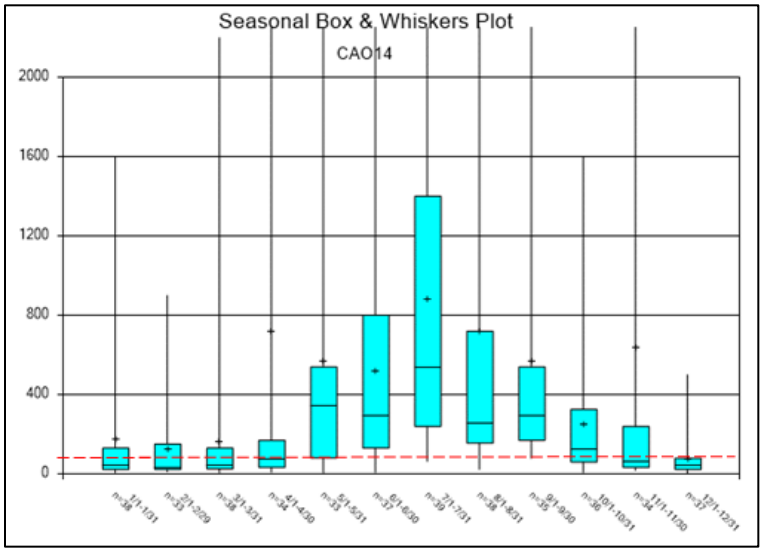




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

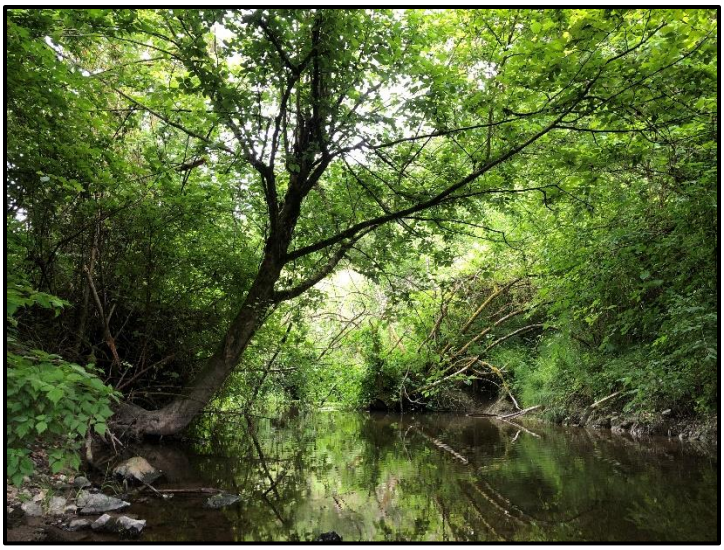
The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green almost meets that standard. The water year on the x-axis begins in October and ends in September.

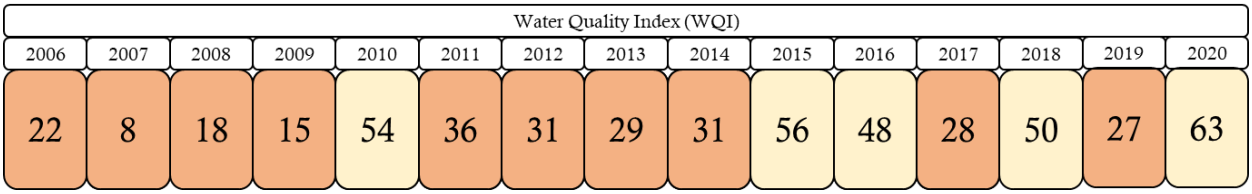
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

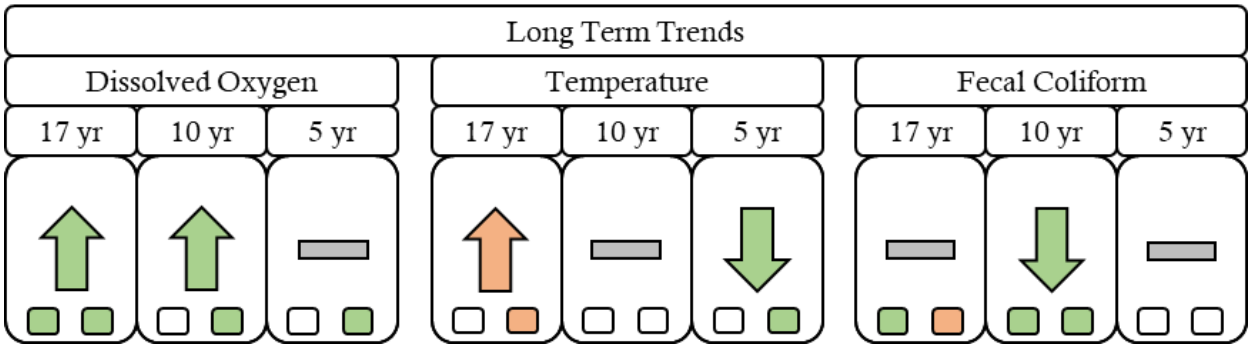


15

Nookachamps Creek
@ Knapp Road

Midstream Ag, TMDL



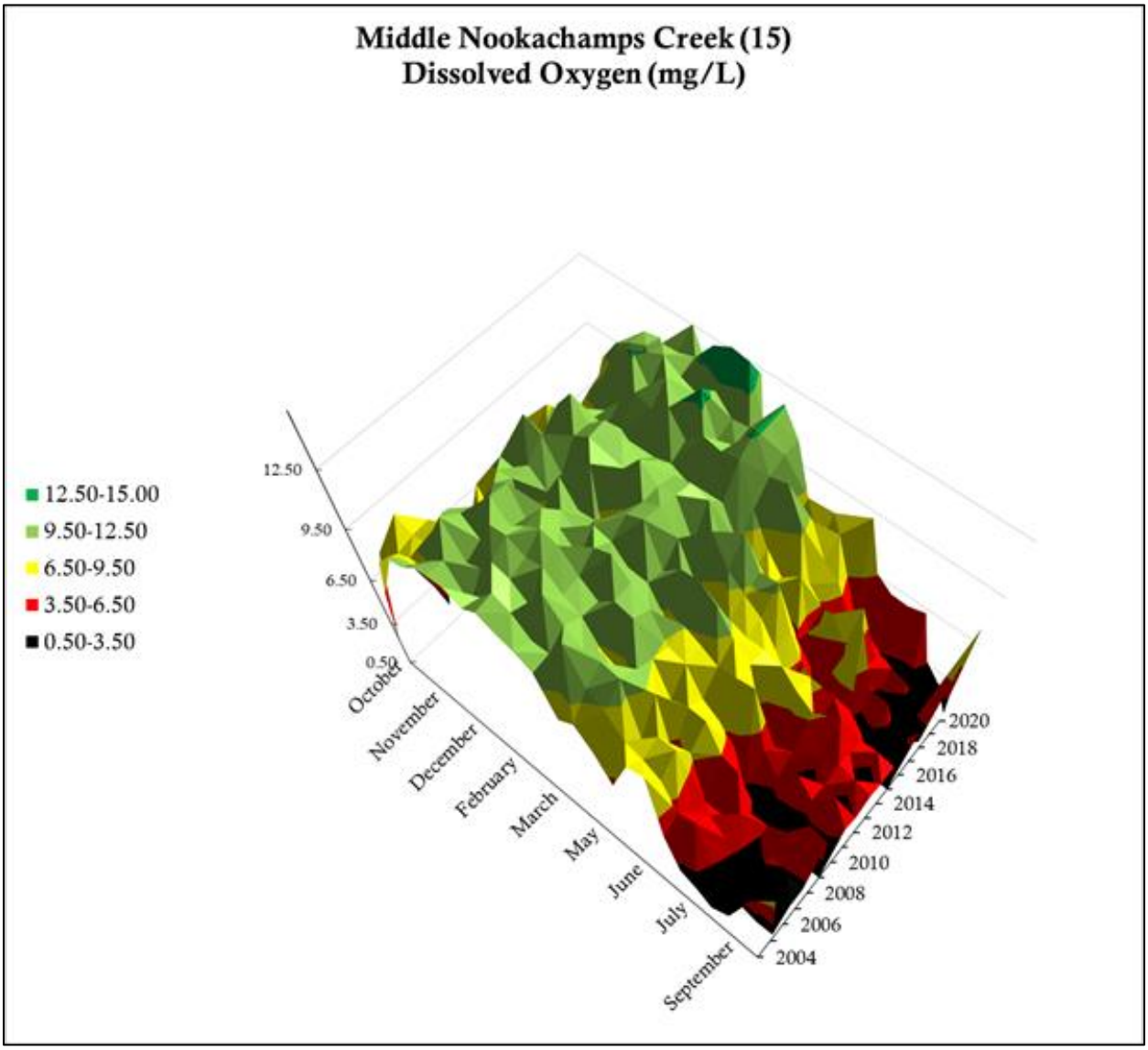


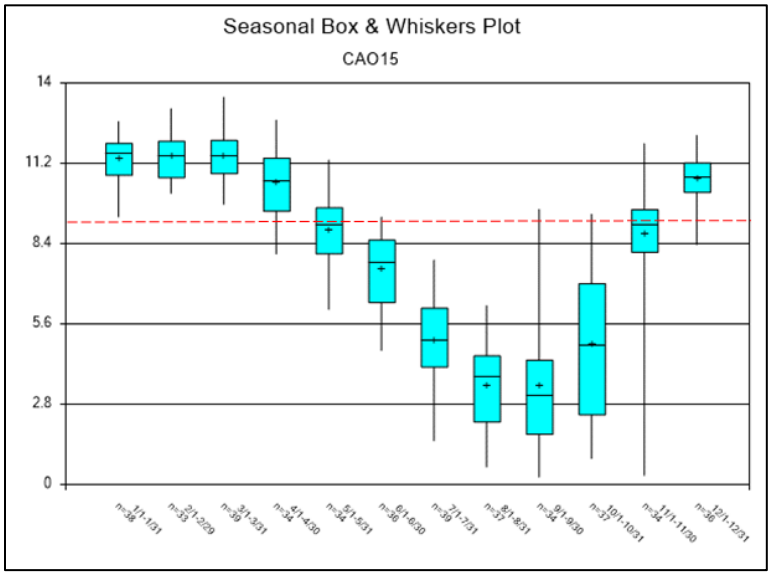
Site 15 is Nookachamps Creek mid-stream, upstream from site 12, and downstream from Big Lake and site 17. This site is designated as core salmonid habitat.

Dissolved oxygen is higher than it was 17 and ten years ago. Water temperature is higher than it was at the beginning of this study, but lower than it was five years ago. Fecal coliform counts are lower now than they were ten years ago. WQI scores are consistently in the category of highest concern, but improving since the beginning of this study.

Site 15 regularly fails to meet state standards for DO and temperature during the warmer months. Annual fecal coliform levels for WY2020 easily passed state standards, and this is a marked improvement.

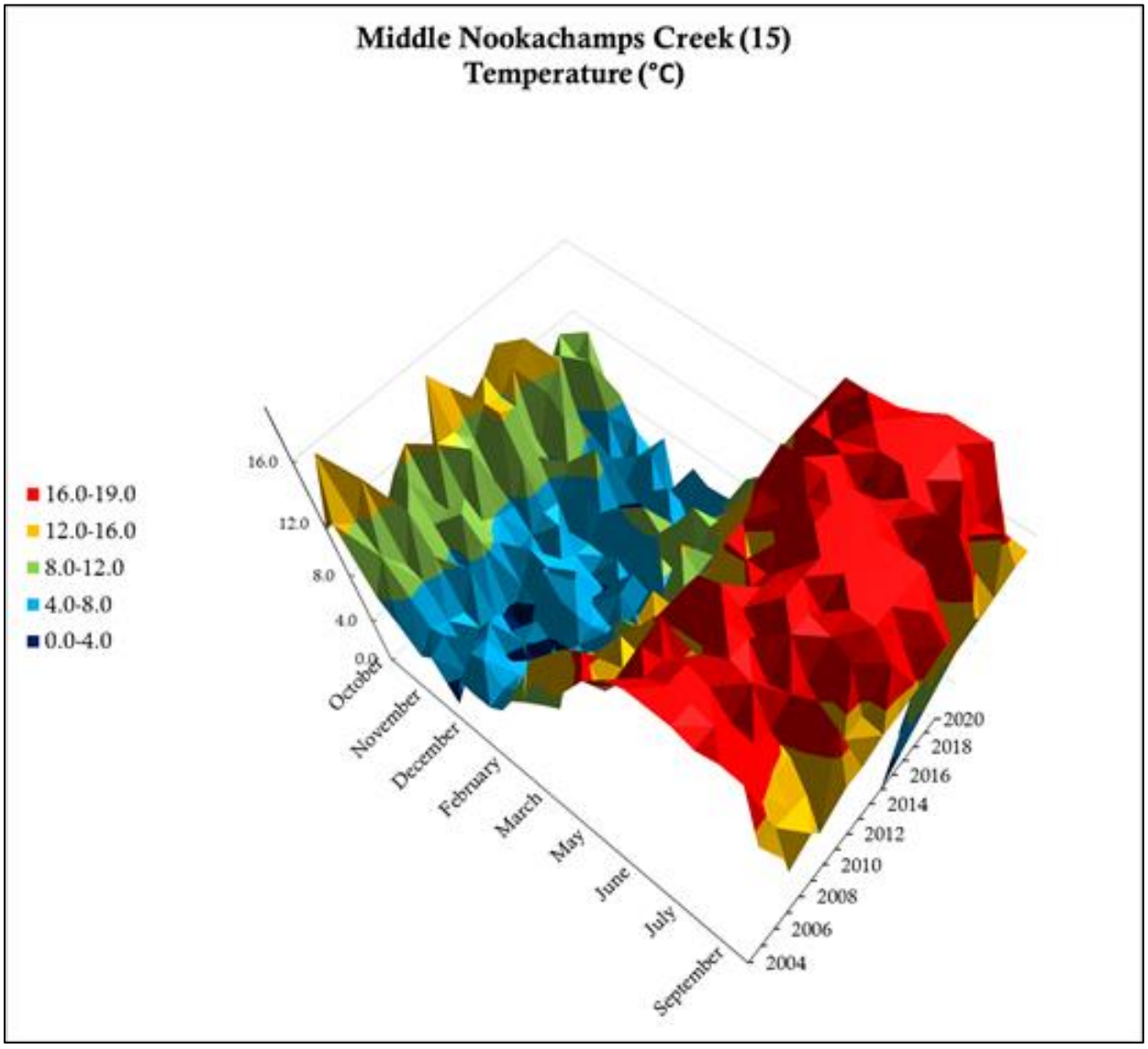
Site 15 is tied for 4th out of 39 sites for number of significant trends, with 16, and is 5th of 39 sites for positive trends, with 81%.

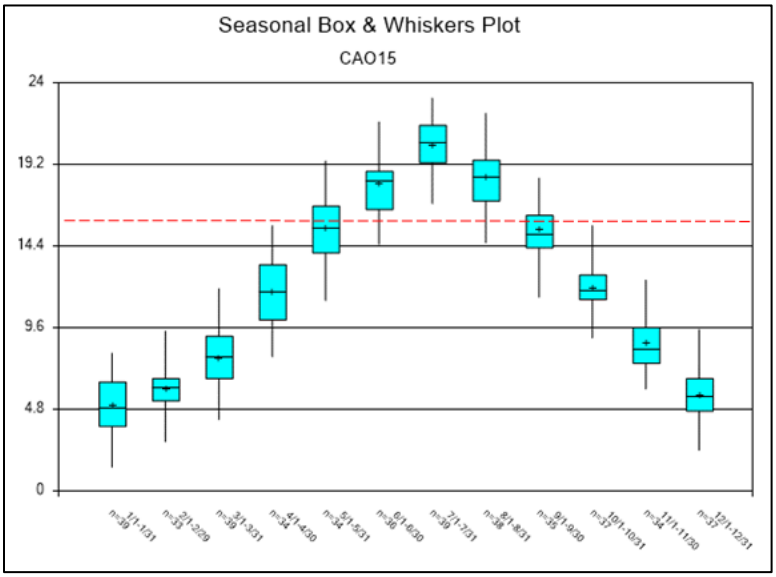




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

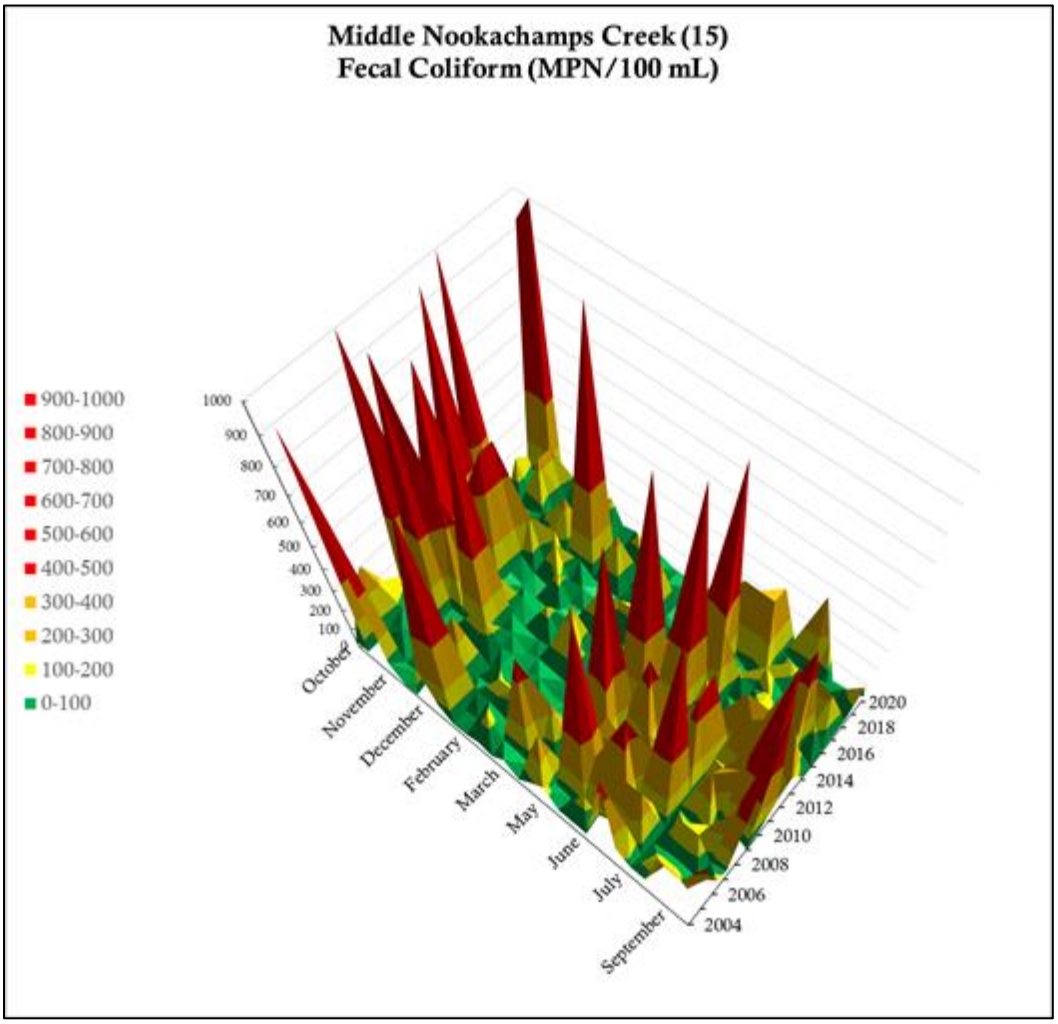
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

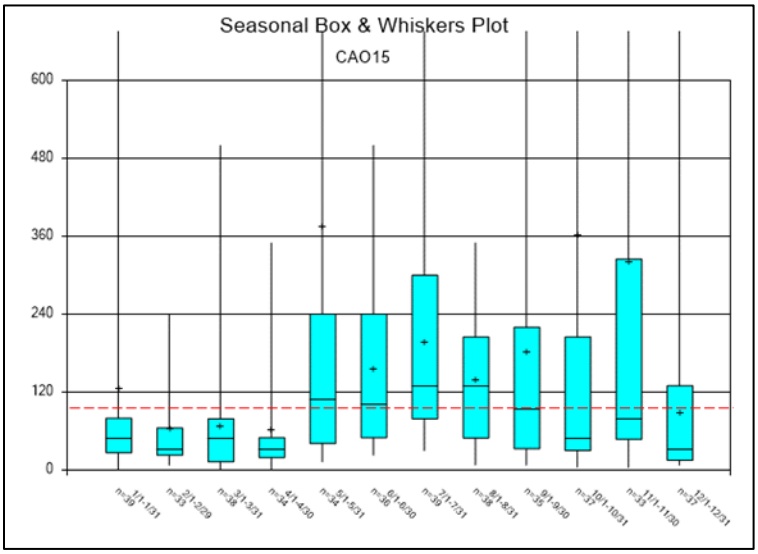




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

16

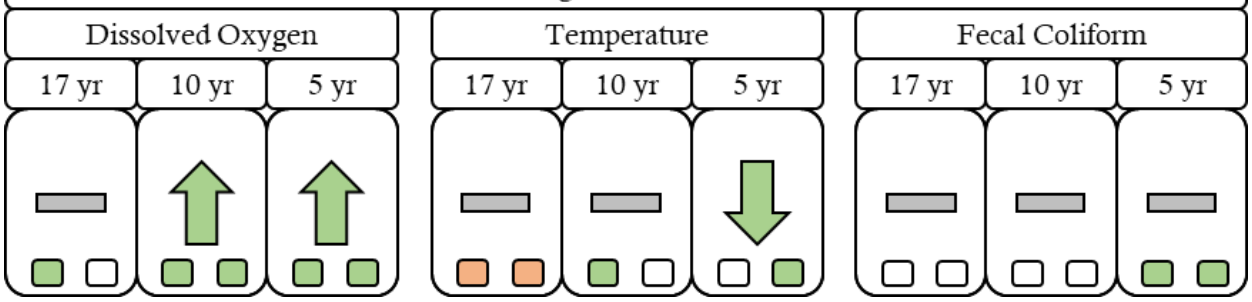
EF Nookachamps Creek
@ Beaver Lake Road

Midstream Ag, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
88	86	89	91	97	84	91	80	92	95	88	83	89	87	90

Long Term Trends

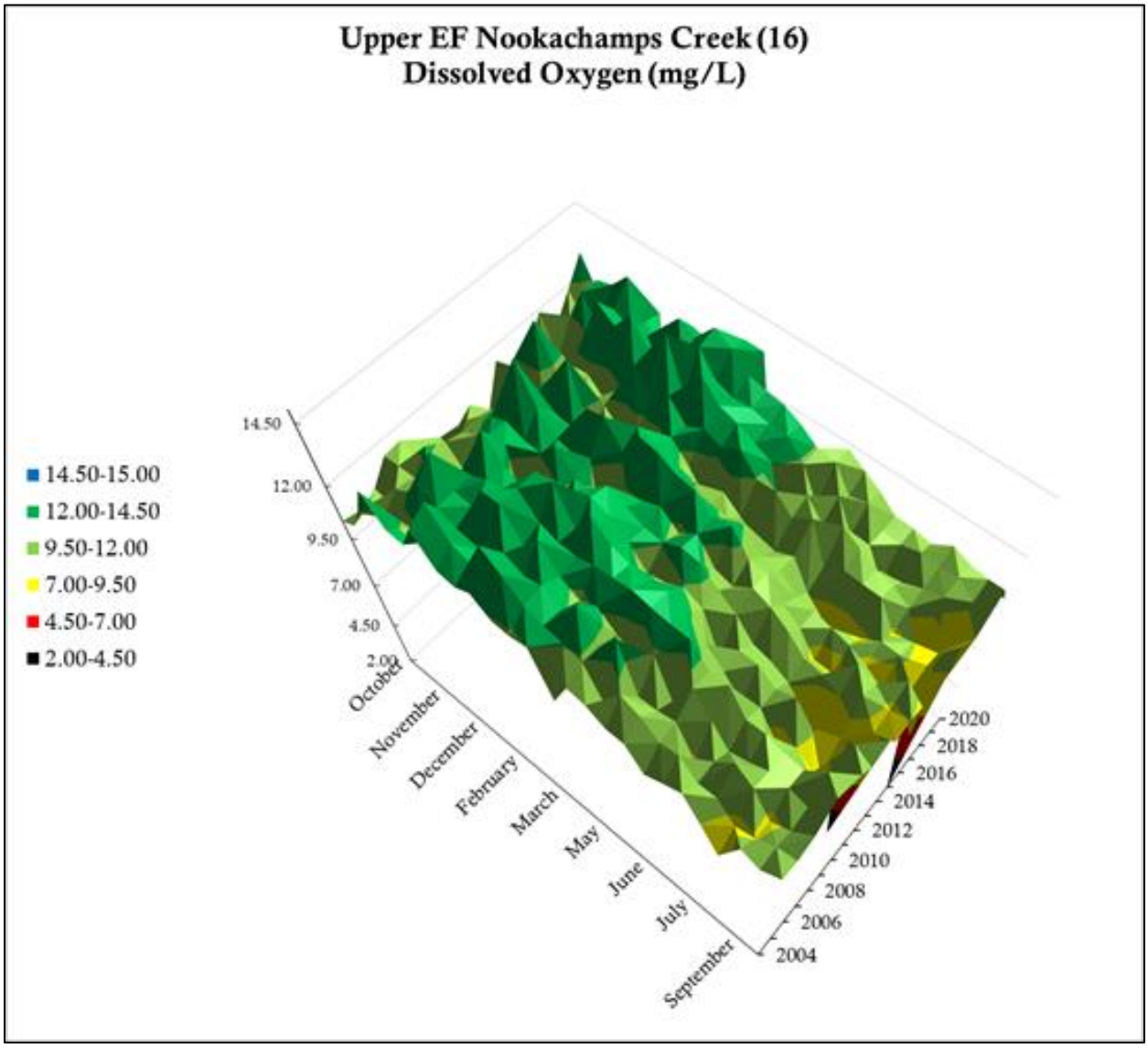


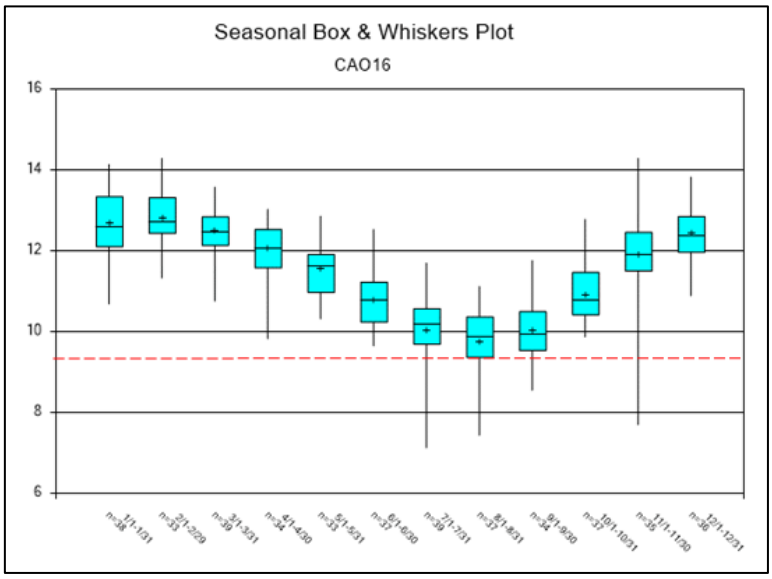
Site 16 is East Fork Nookachamps Creek, upstream of site 13, and immediately after adjoining with Cold Spring Creek. This site is influenced by light agricultural uses and undeveloped land. This site is designated as char spawning and rearing status.

Dissolved oxygen has significantly increased over the last ten years and five years. Water temperatures have decreased in the most recent five years. There were no significant trends in fecal coliform. WQI scores have never been outside of the category of least concern.

Site 16 easily passes state standards for DO, but water temperatures can often exceed state standards during the warmest time of year. Annual FC levels easily meet state standards.

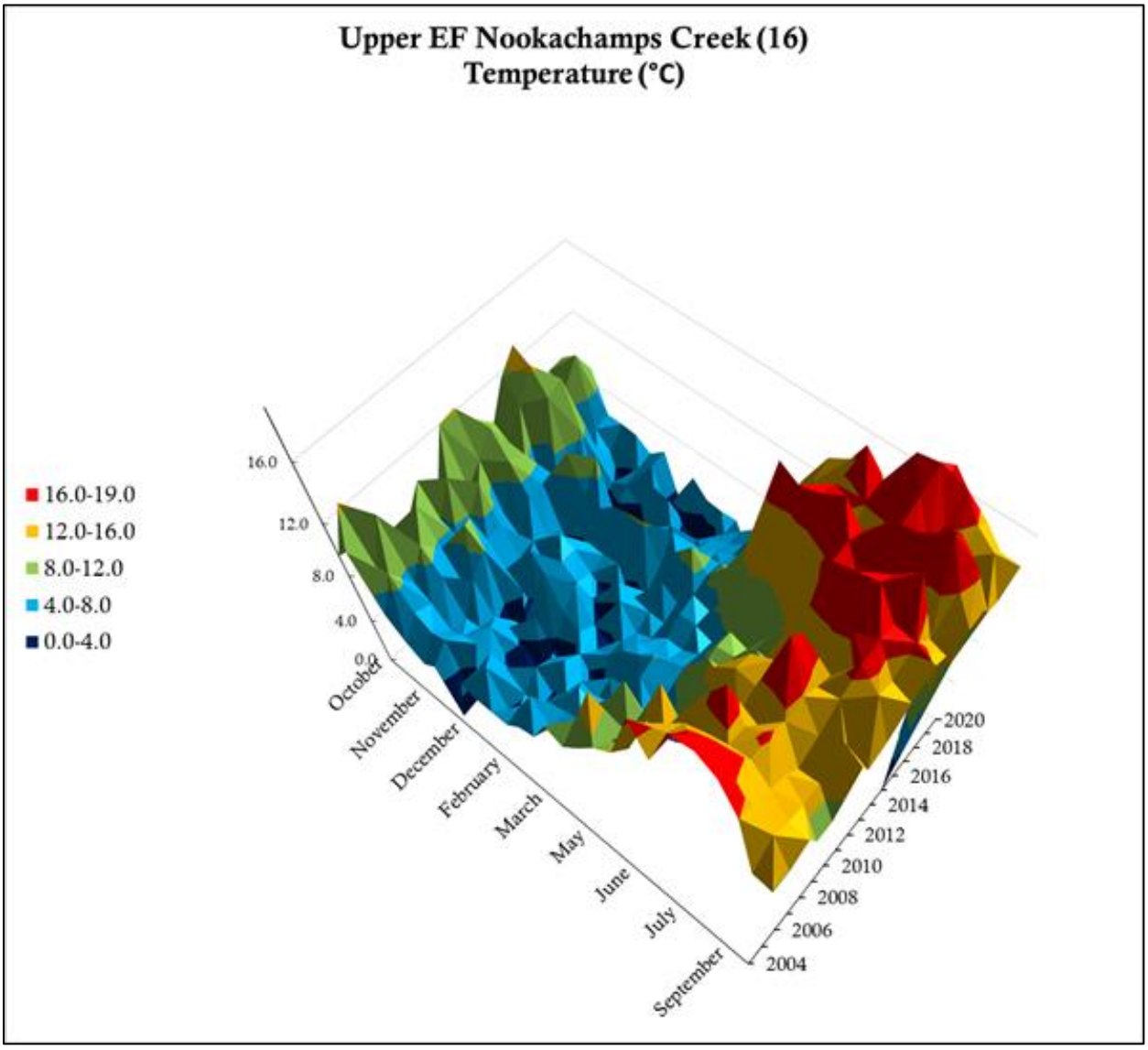
Site 16 is tied for 12th out of 39 sites for number of significant trends, with 13, and is tied for 8th out of 39 sites for positive trends, with 77%.

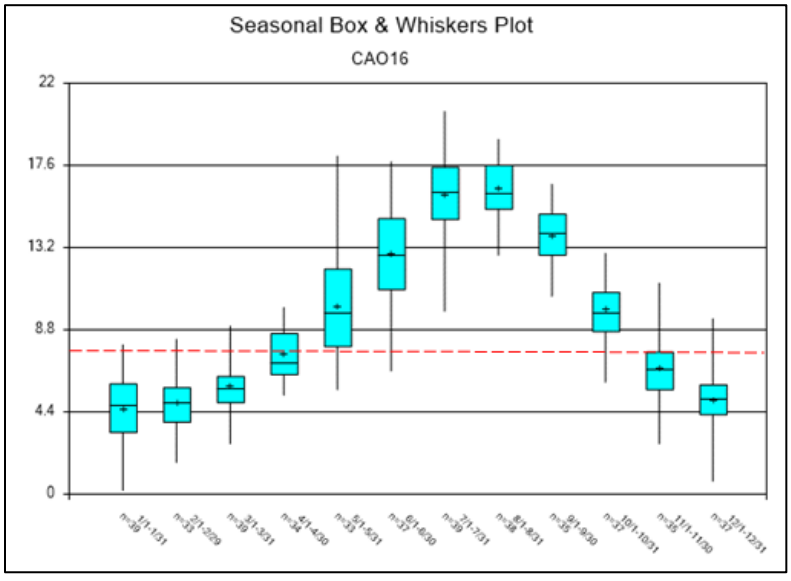




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

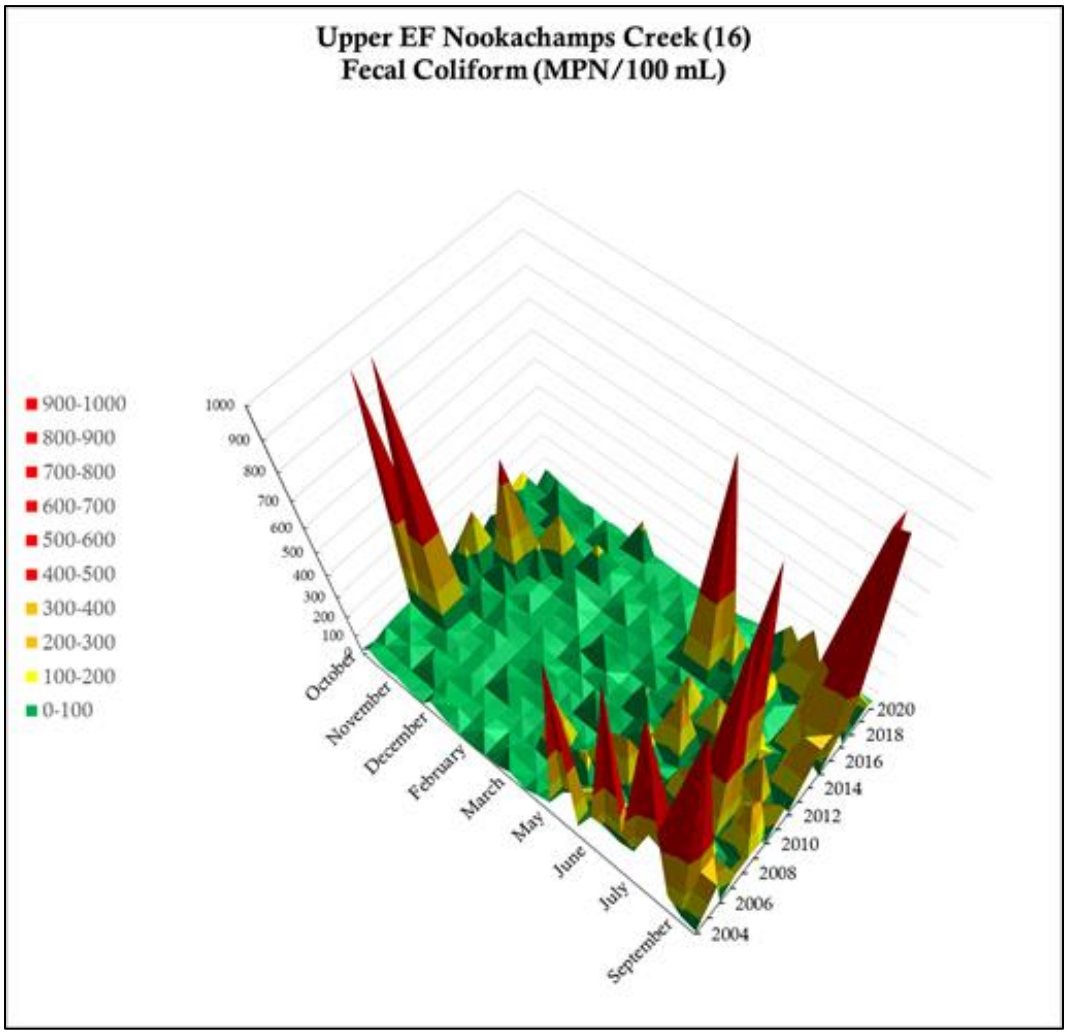
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

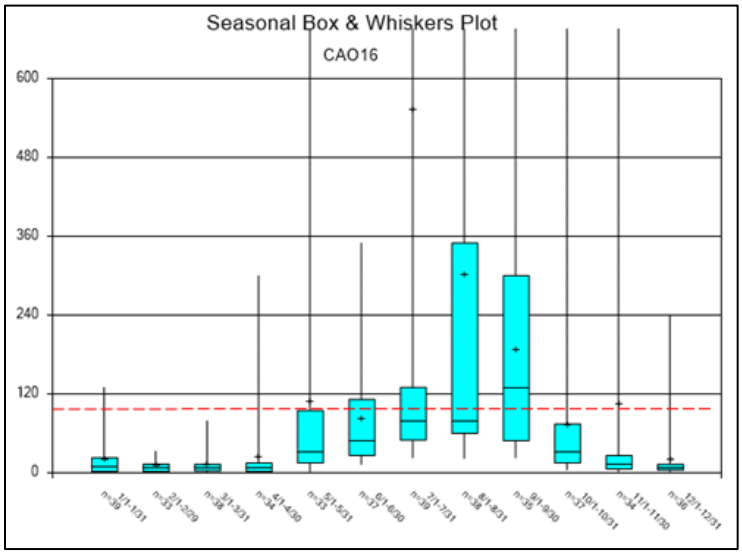




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

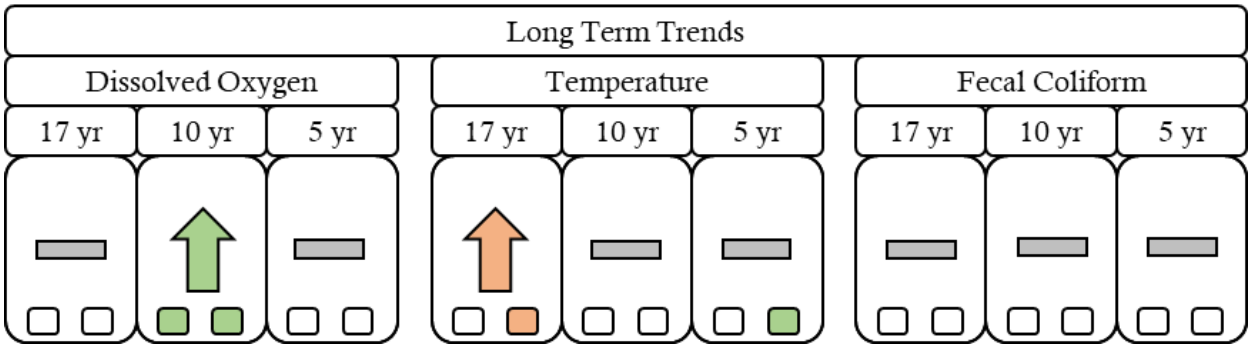
17

Nookachamps Creek
@ Big Lake Outlet

Upstream Ag, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
60	83	69	84	75	91	74	64	60	79	71	78	67	65	69

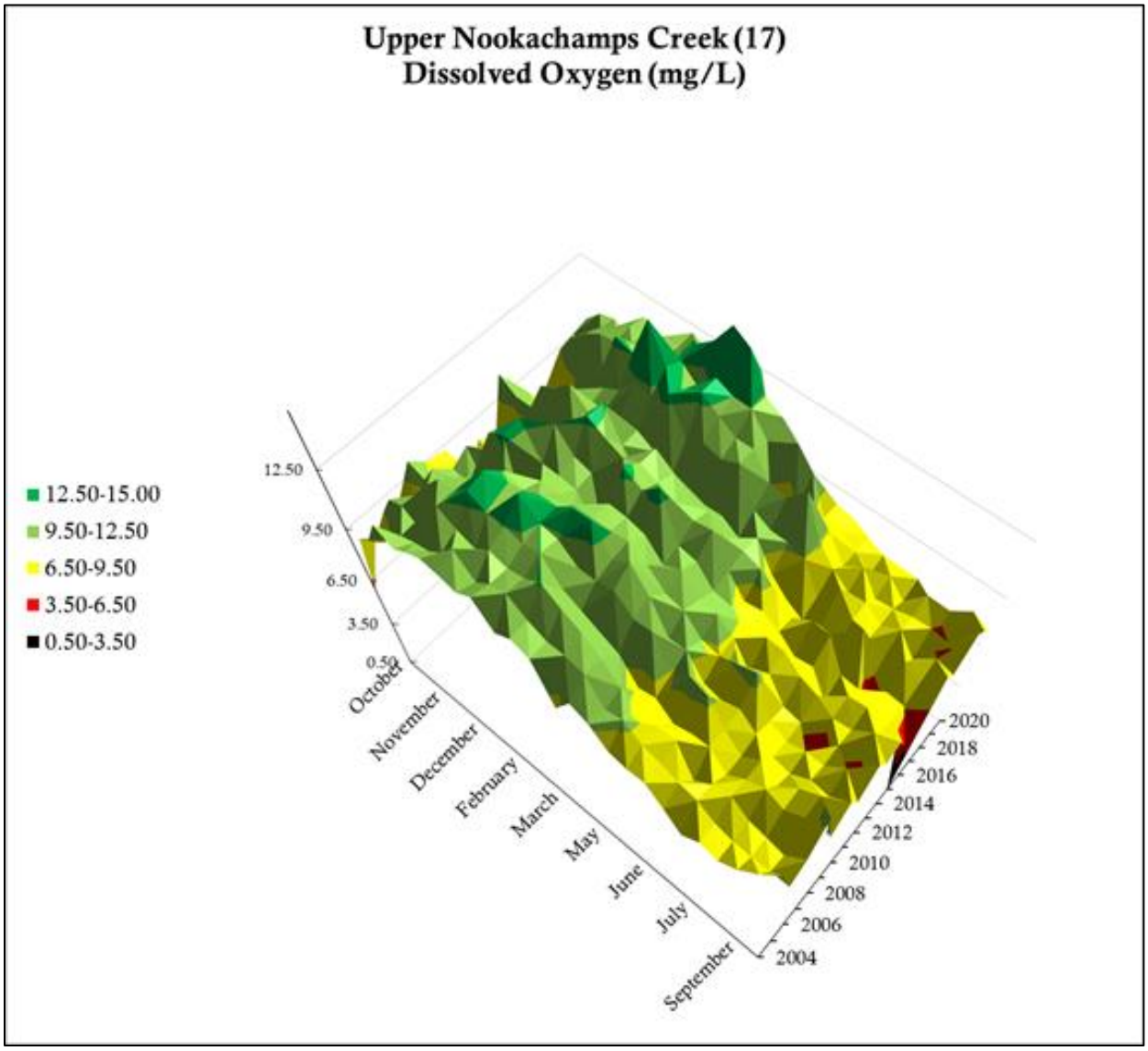


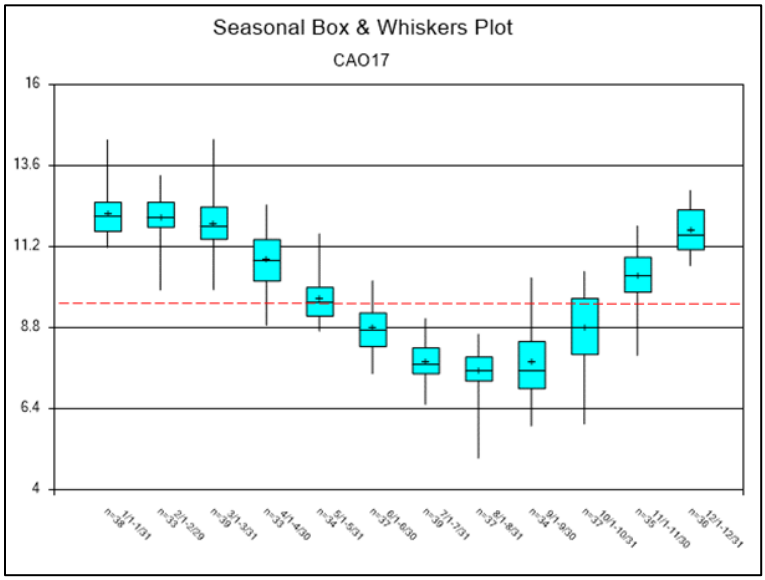
Site 17 is Nookachamps Creek, at its source, immediately after leaving Big Lake. This site is upstream from sties 15 and 12. This site is designated as core salmonid habitat.

Over the most recent ten years, dissolved oxygen has increased. Water temperature has increased since 17 years ago. WQI scores are generally in the upper-score end of the moderate concern category, and has scored in the least concern category in the past.

Site 17 regularly fails to meet state standards for DO and temperature during the warmer months. Annual FC levels easily meet state standards.

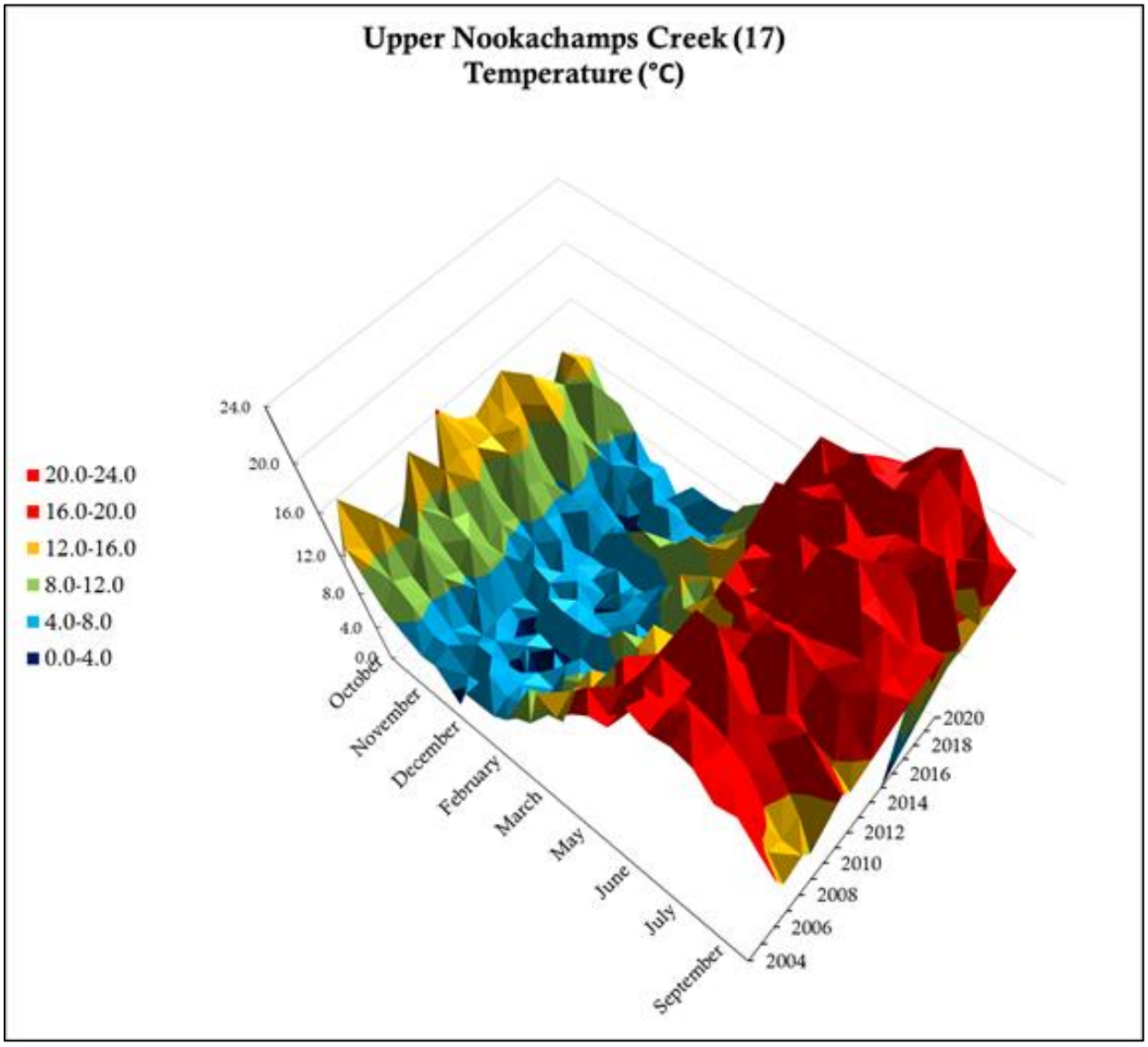
Site 17 is tied for 35th out of 39 sites for number of significant trends, with 7, and is 34th out of 39 sites for positive trends, with 29%.

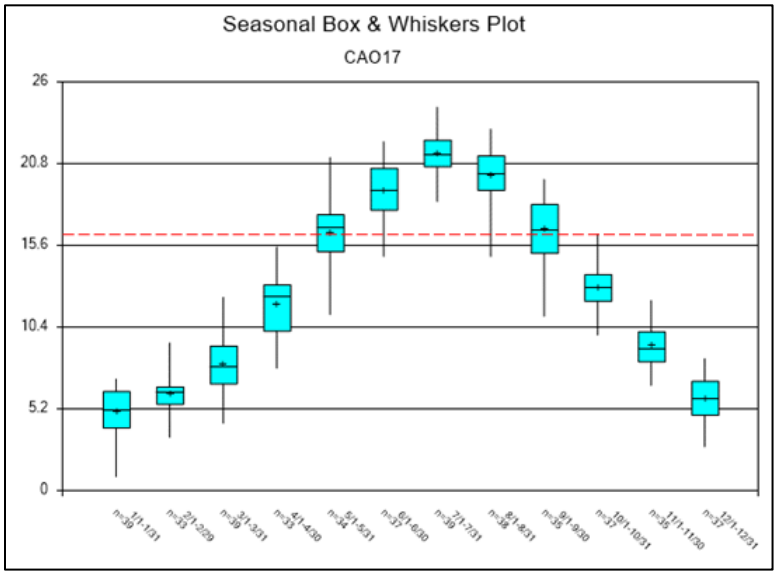




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

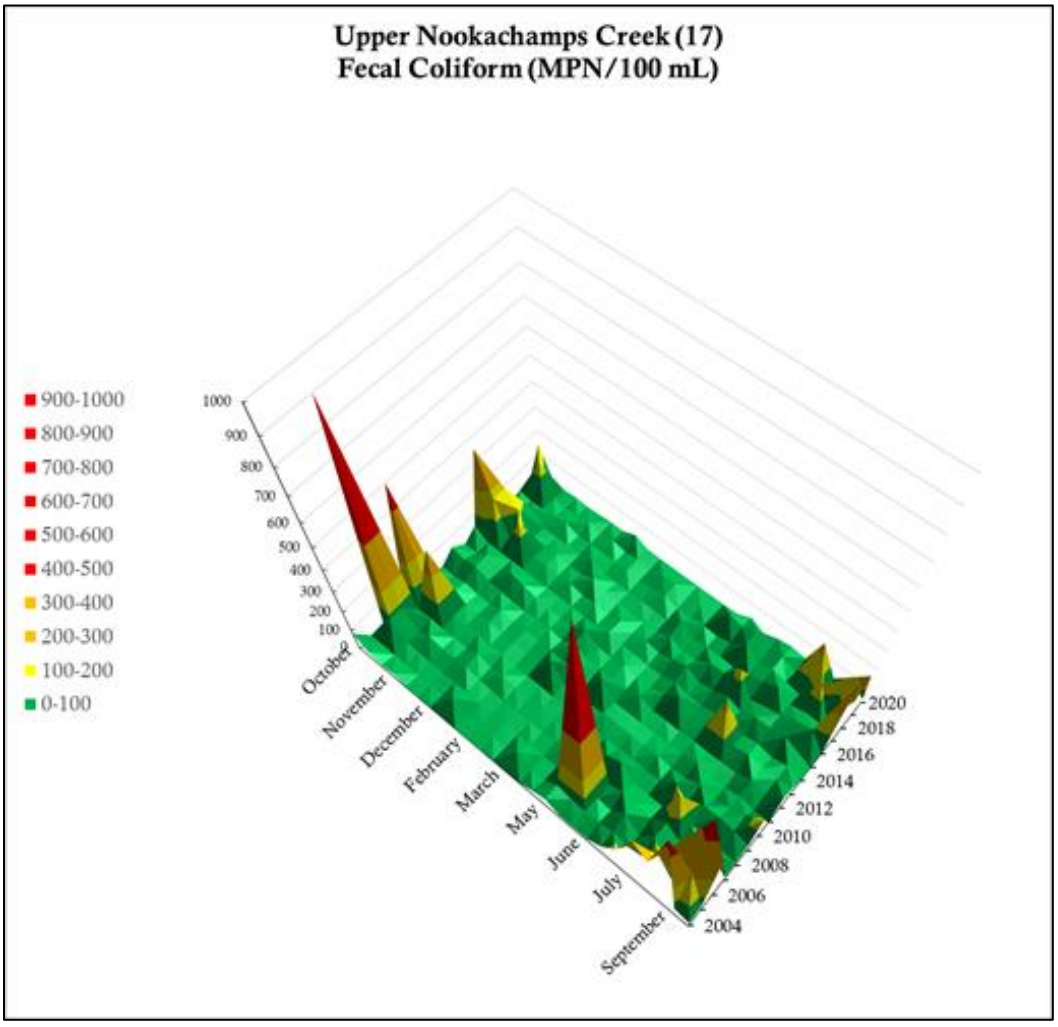
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

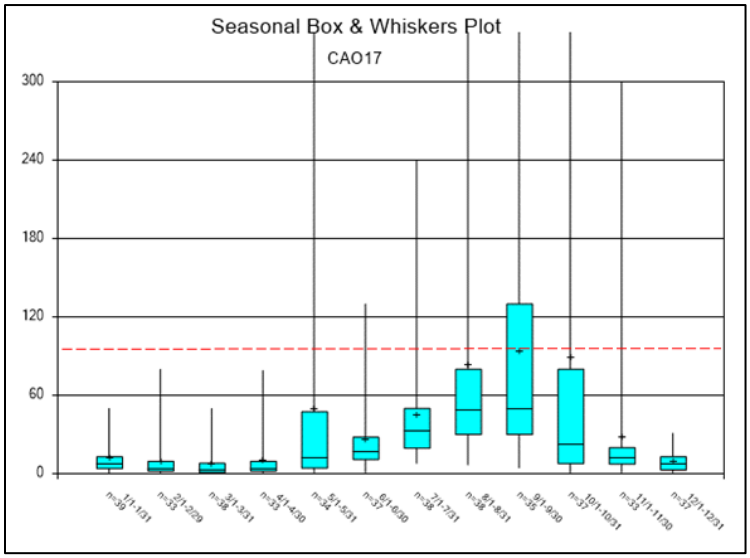




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

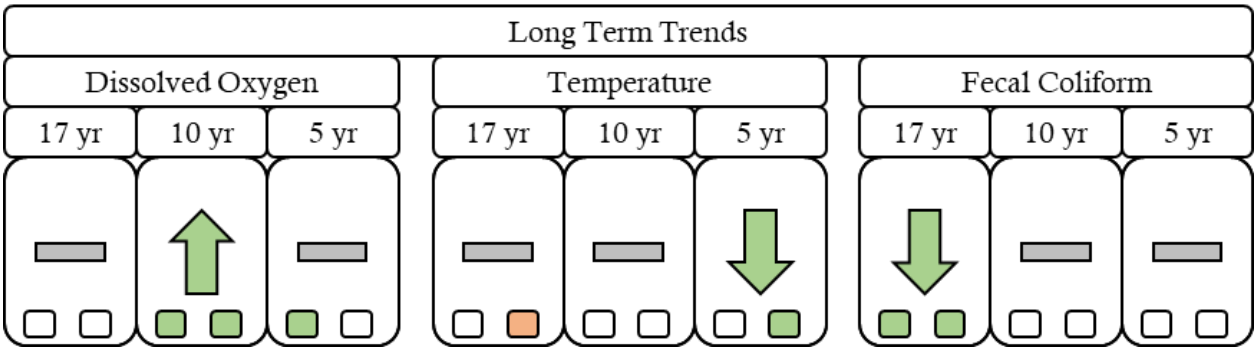
18

Lake Creek
@ Big Lake Boulevard

Upstream Ag, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
84	66	80	93	63	80	87	80	90	88	84	86	87	82	89

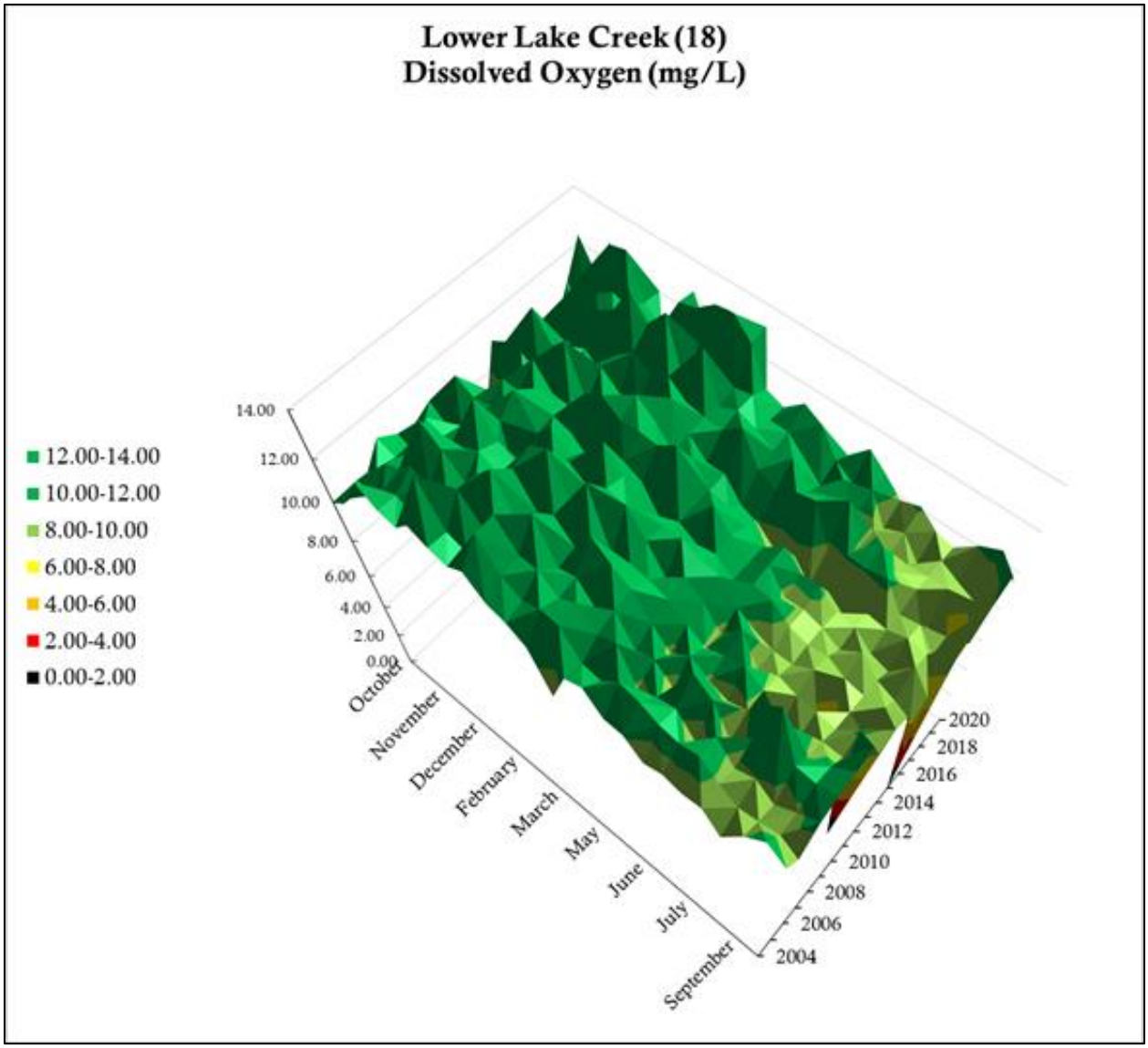


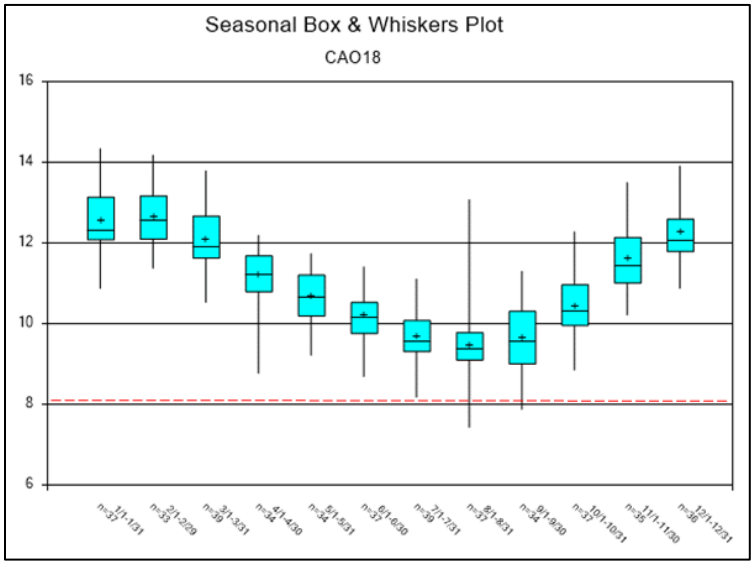
Site 18 is Lake Creek, coming out of Lake McMurray, and just prior to entering Big Lake. This site contributes to water quality data bracketing of Big Lake along with site 17. This site is designated as core salmonid habitat.

Dissolved oxygen has increased in the most recent ten years. Water temperature has decreased in the last five years. Fecal coliform is lower than it was 17 years ago.

Site 18 easily passes state standards for DO, and fails state standards for temperature in the warmest months. Annual FC levels for the 2020WY pass the state standard for geomean of 100, but do closely fail the state standard for a 90th percentile of 200.

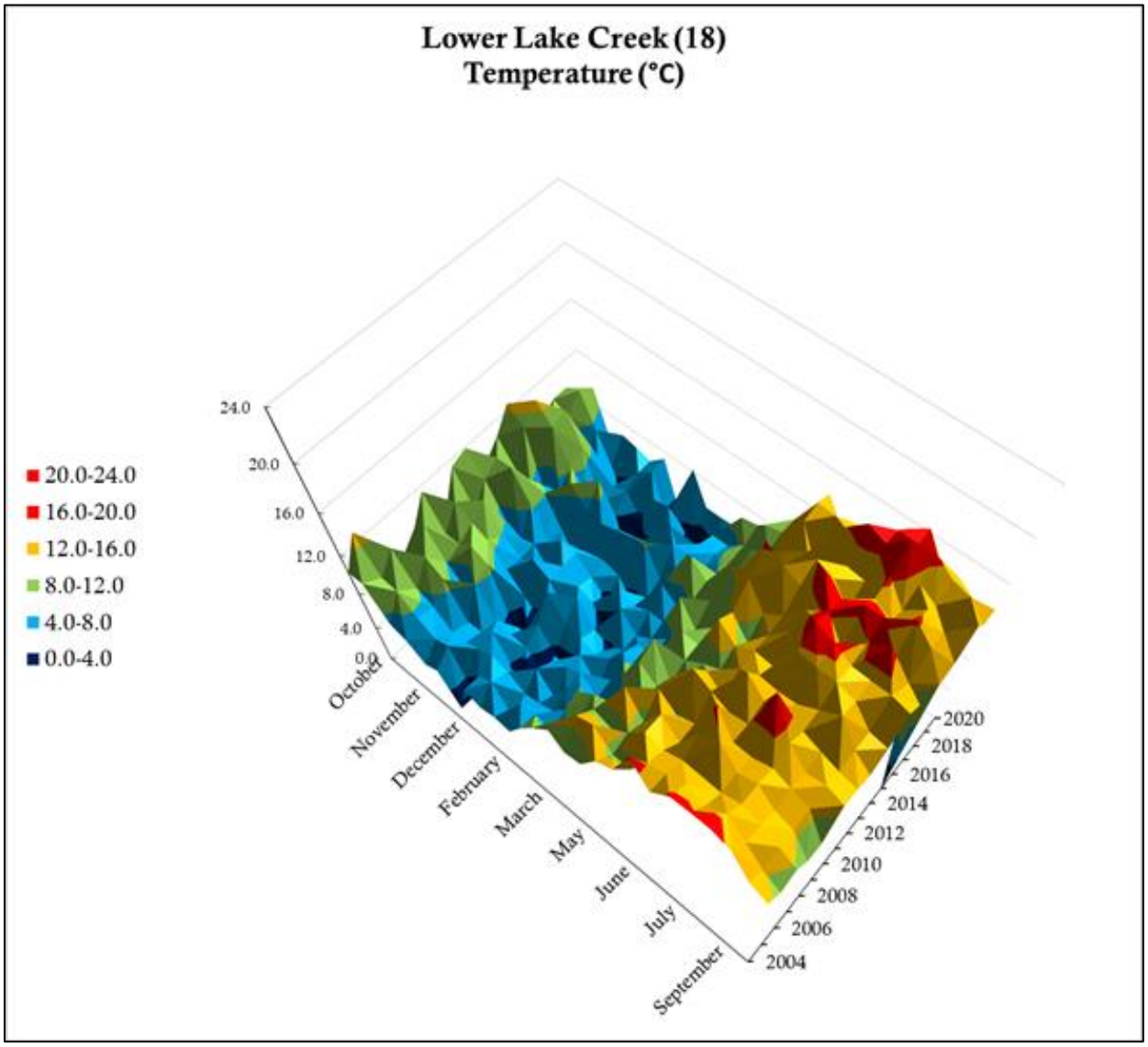
Site 18 is tied for 25th out of 39 sites for number of significant trends, with 10, and is tied for 6th out of 39 sites for positive trends, with 80%.

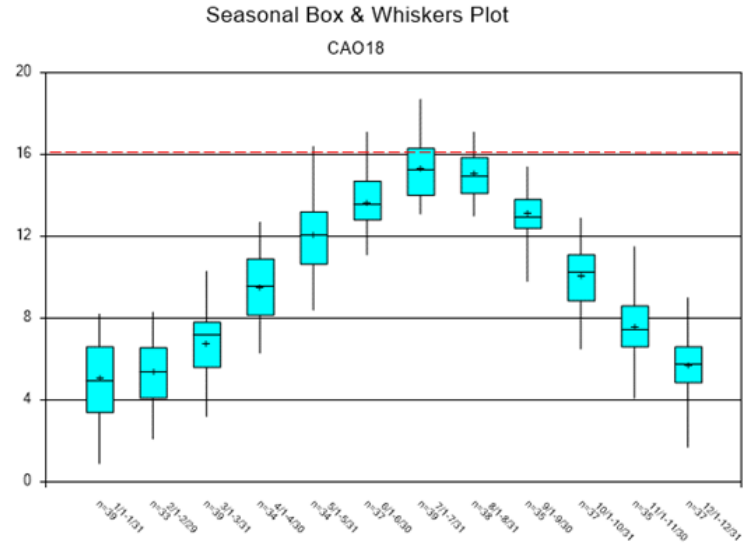




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

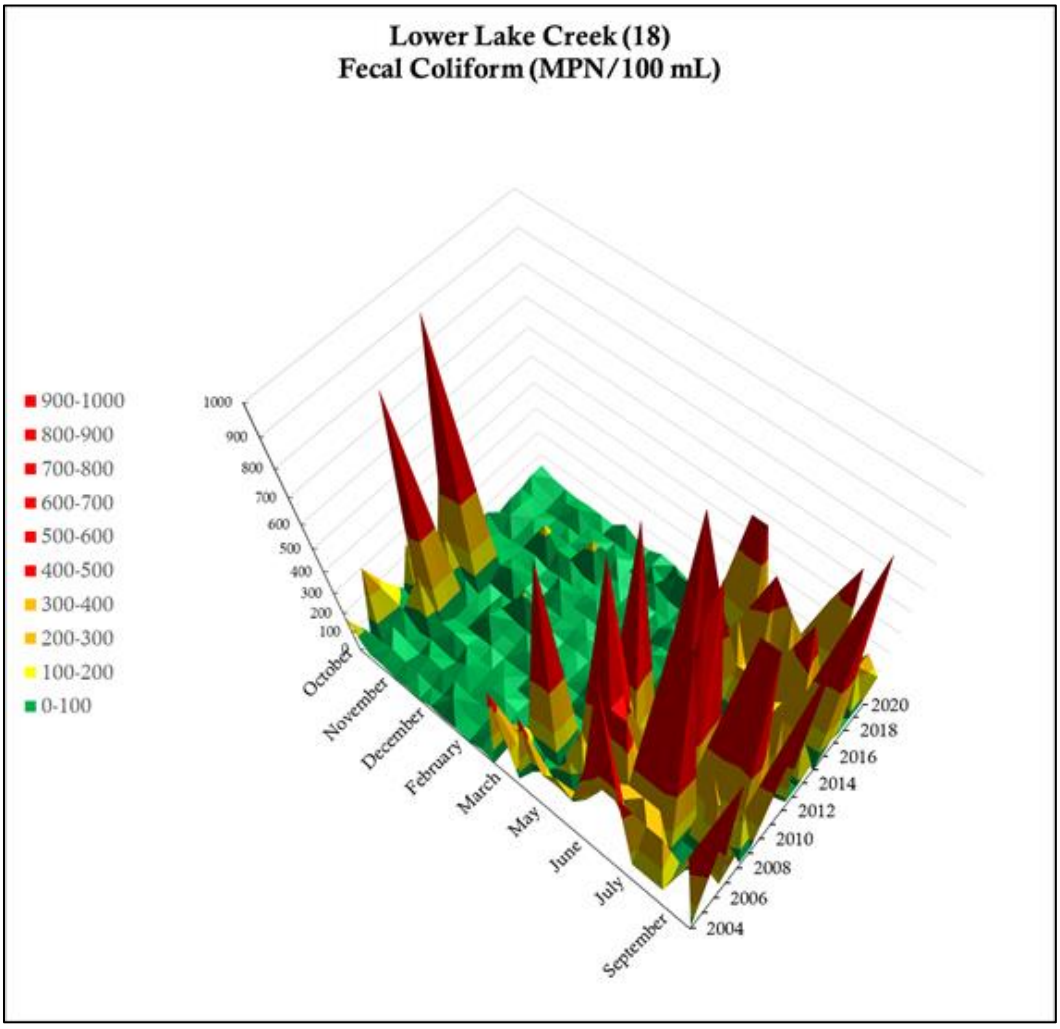
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

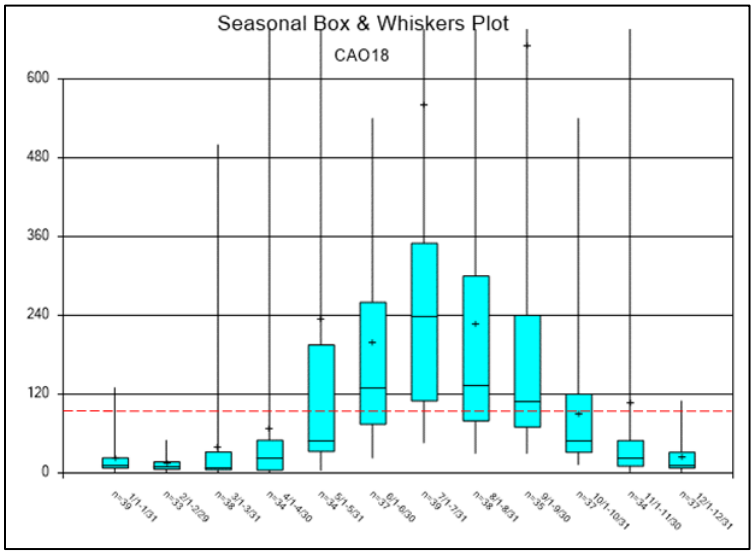




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

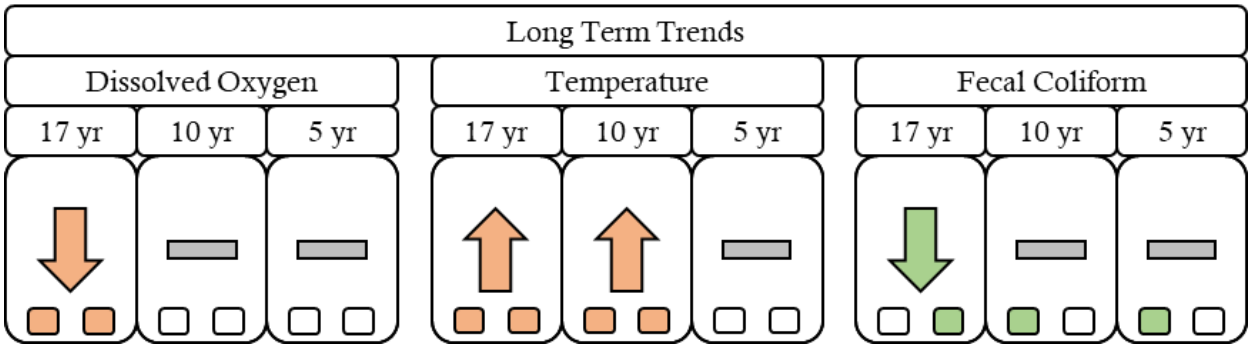
19

Hansen Creek
@ Hoehn Road

Downstream Ag, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
28	40	58	91	72	78	62	74	63	75	71	85	80	73	80

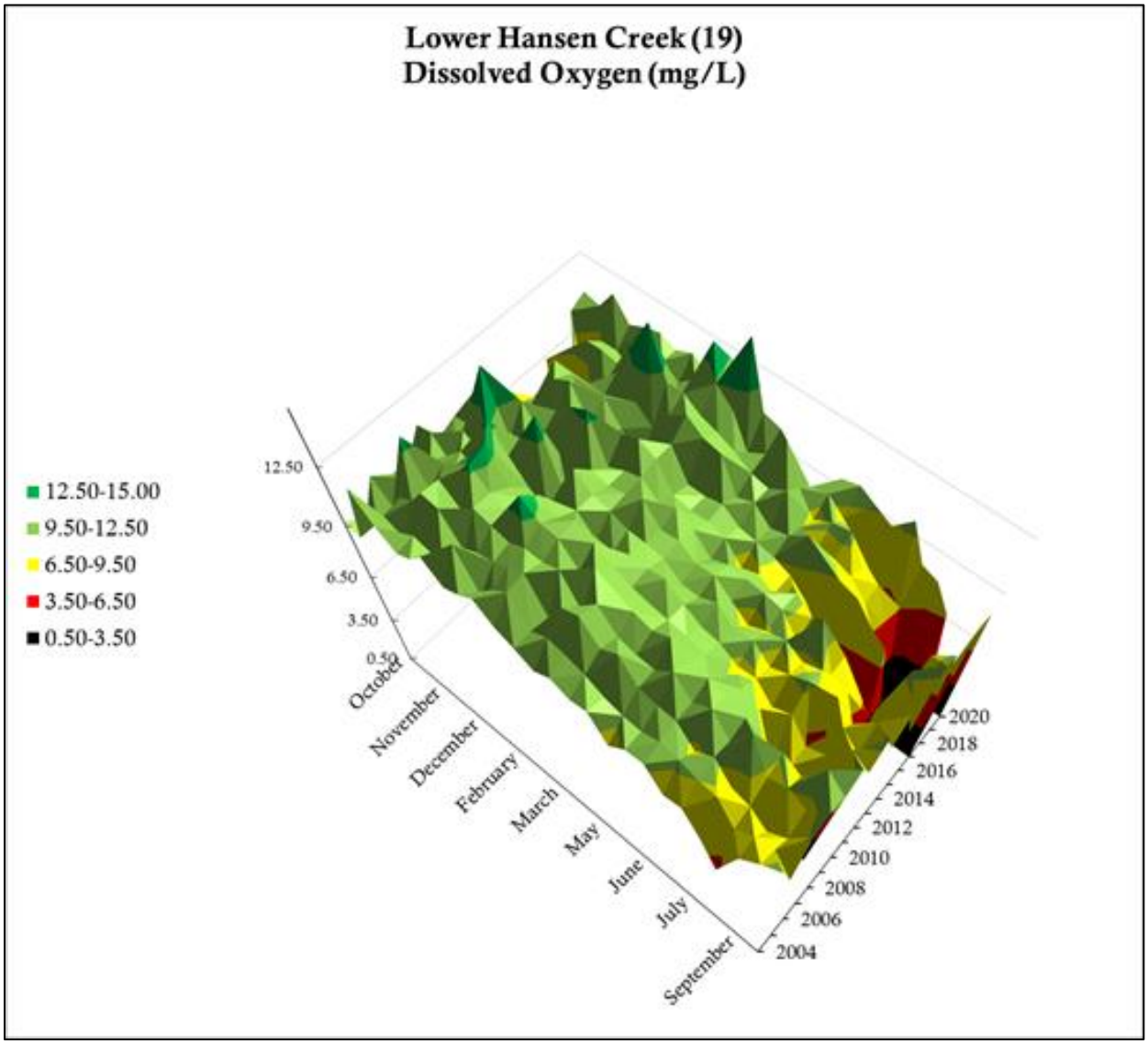


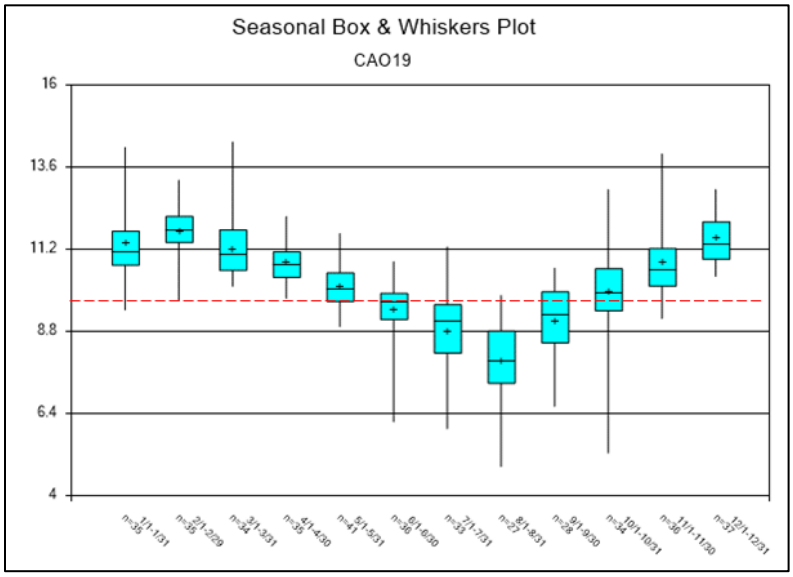
Site 19 is Hansen Creek, downstream from site 20 at the Northern State Recreation Area. This site is pseudo-ephemeral and often can stop flowing by the end of the summer. This site is designated as core salmonid habitat.

Over the 17-year life of this program, DO has declined and water temperatures have increased, while FC has gone down. WQI scores are generally in the upper-score end of the moderate concern category.

Site 19 typically fails to meet state standards for DO during the warmer months when its flow volume becomes extremely low, and often fails to meet state standards for temperature during the hottest time of the year. Annual FC levels for WY2020 easily passed state standards.

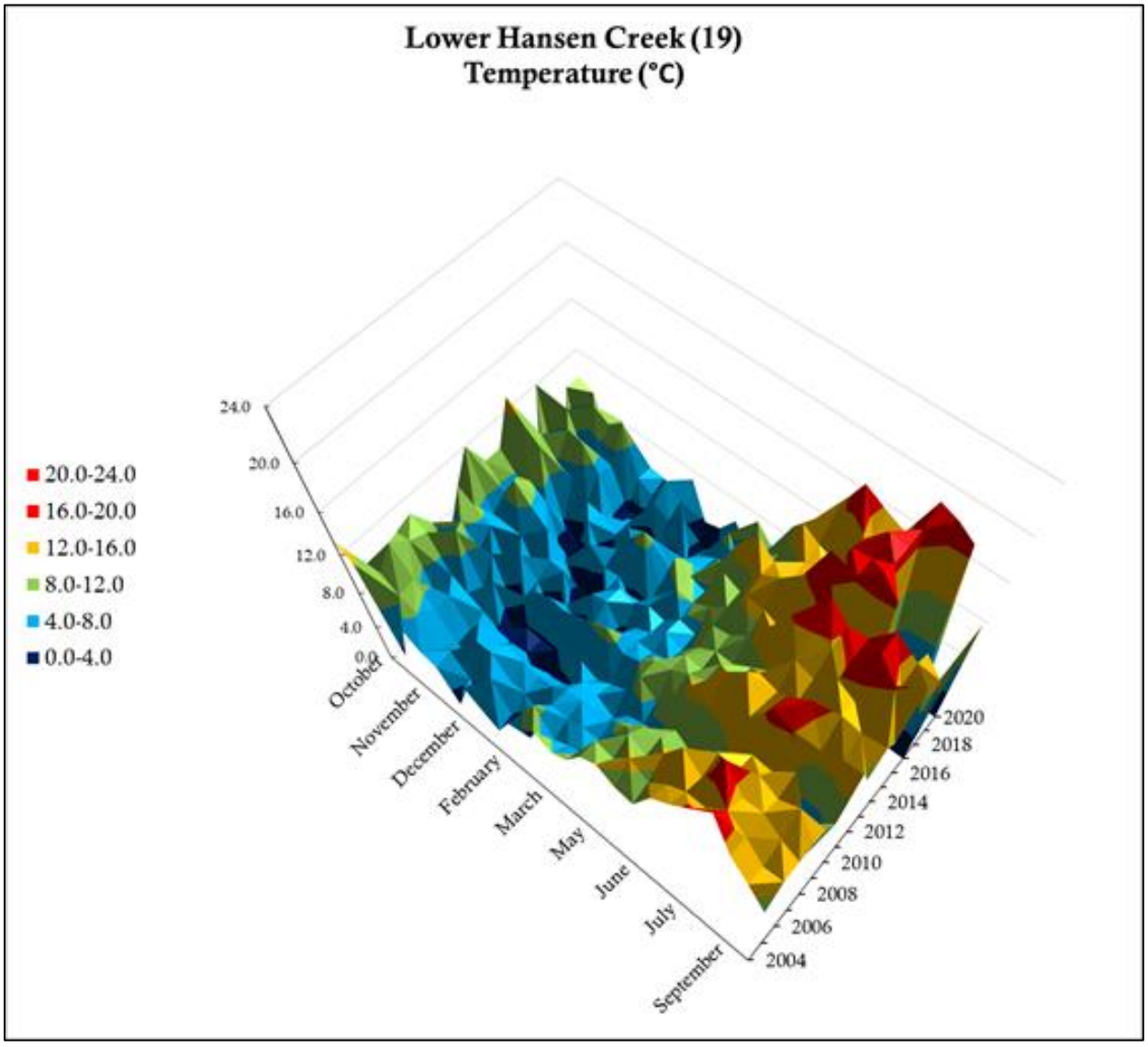
Site 19 is tied for 7th out of 39 sites for number of significant trends, with 15, and is 33rd out of 39 sites for positive trends, with 33%.

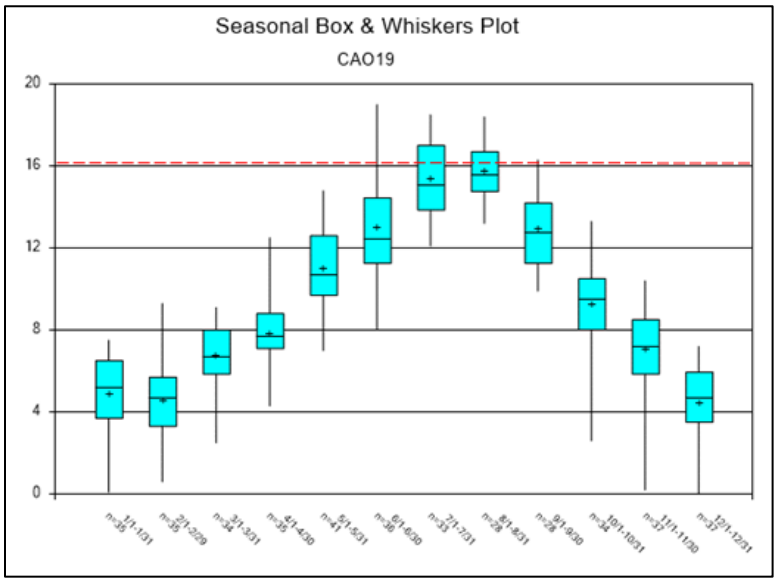




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

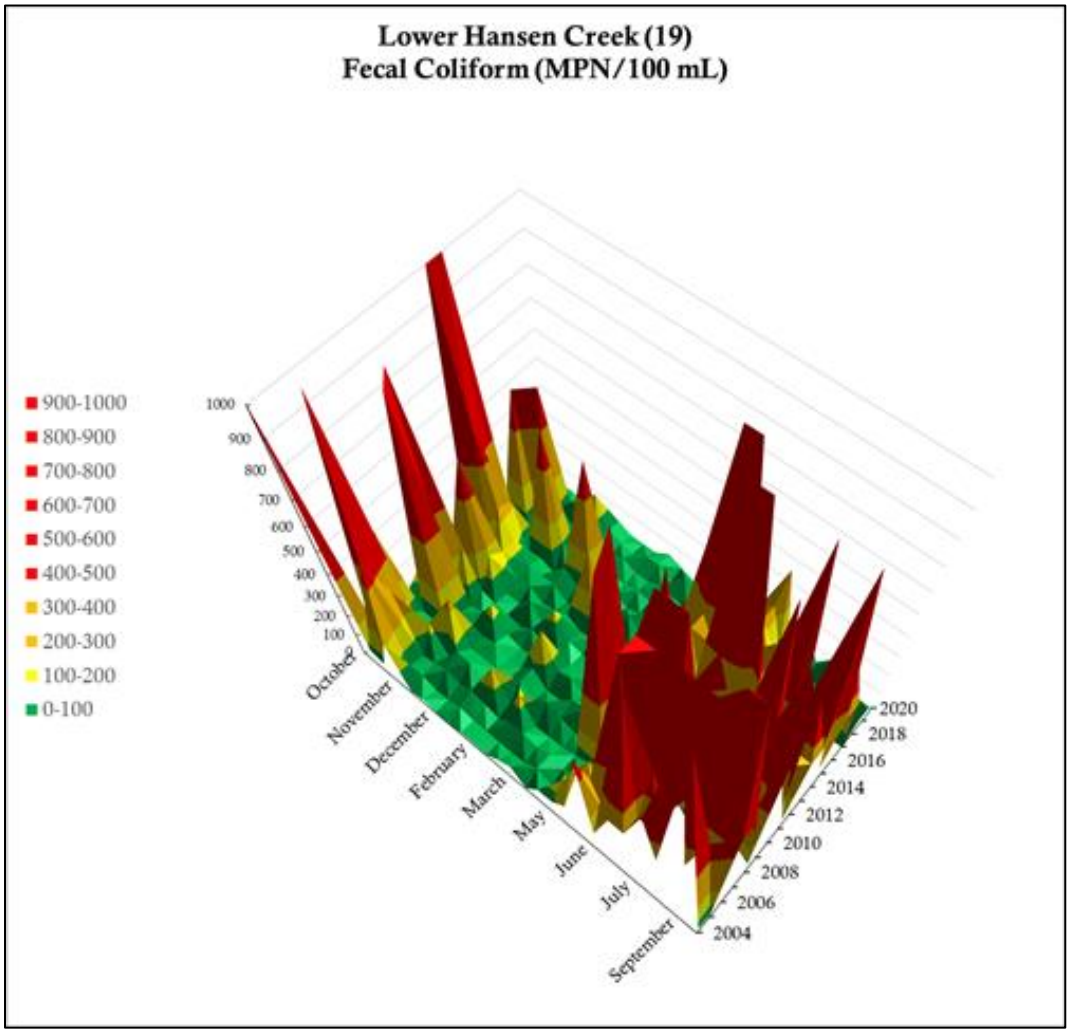
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

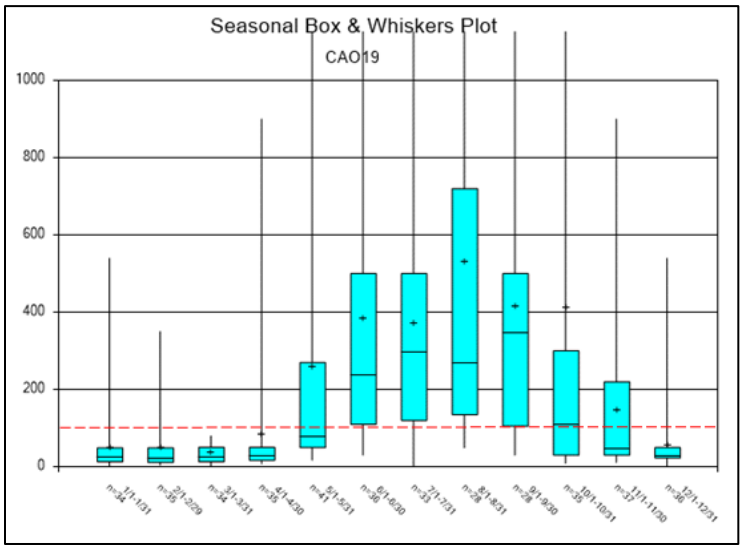




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





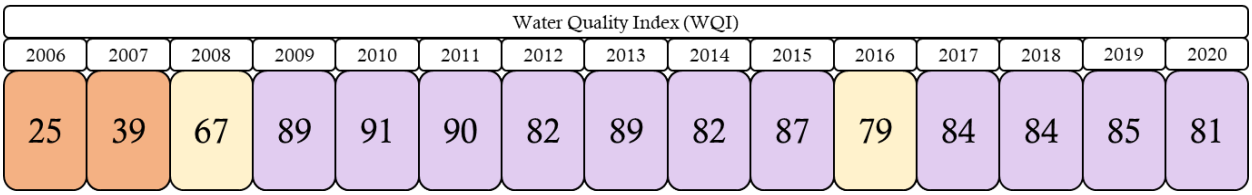
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

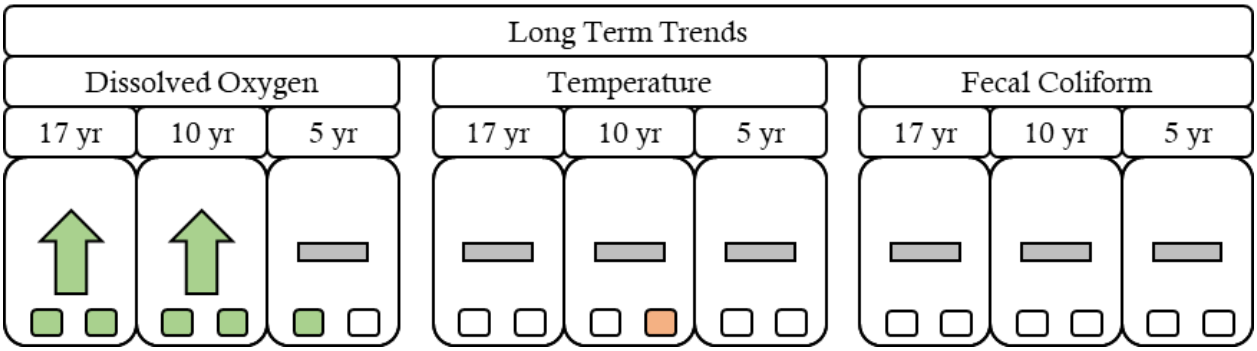
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

20

Hansen Creek
@ Northern State

Upstream Ag, TMDL



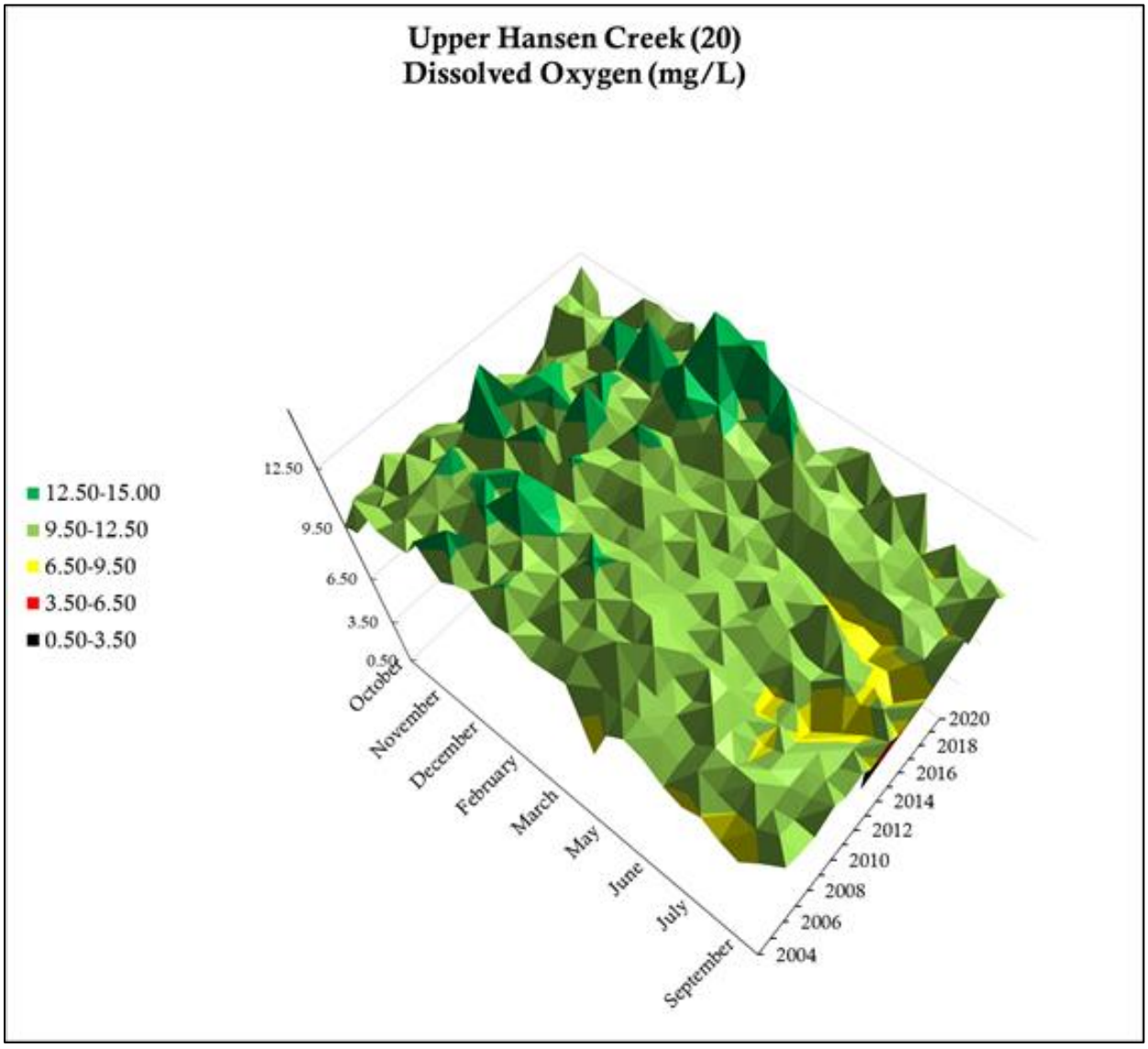


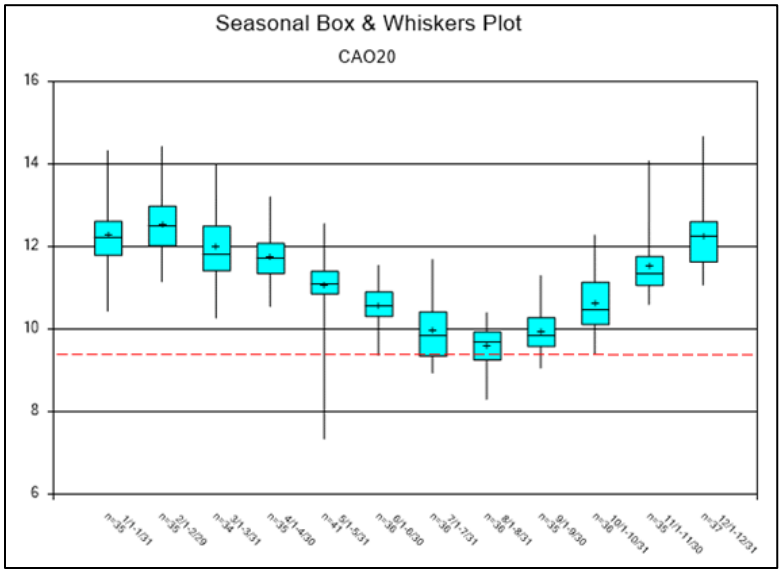
Site 20 is Hansen Creek at the Northern State Recreation Area, upstream from site 19. Water input to this site comes down from Lyman Hill and has very little developed land. This site is designated as core salmonid habitat.

Dissolved oxygen has been increasing over the last 17 years and ten years. Trends at this site are distinctly different than those downstream at site 19. WQI scores have typically been in the category of least concern over the past ten years.

Site 20 rarely ever fails to pass state standards for both DO and temperature, year-round. Annual FC levels for WY2020 easily passed state standards.

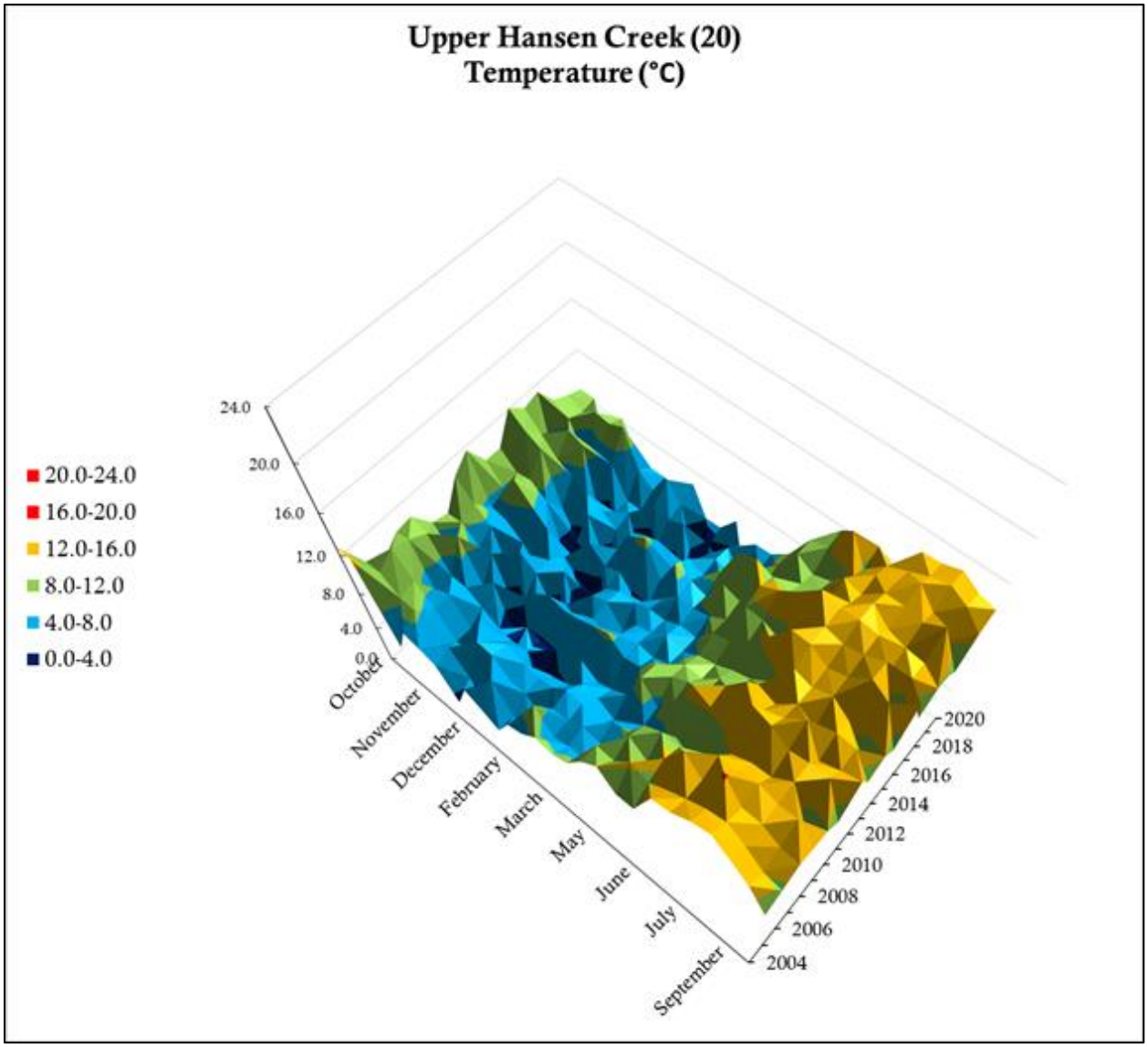
Site 20 is tied for 25^{sth} out of 39 sites for number of significant trends, with 10, and is tied for 6th out of 39 sites for positive trends, with 80%.

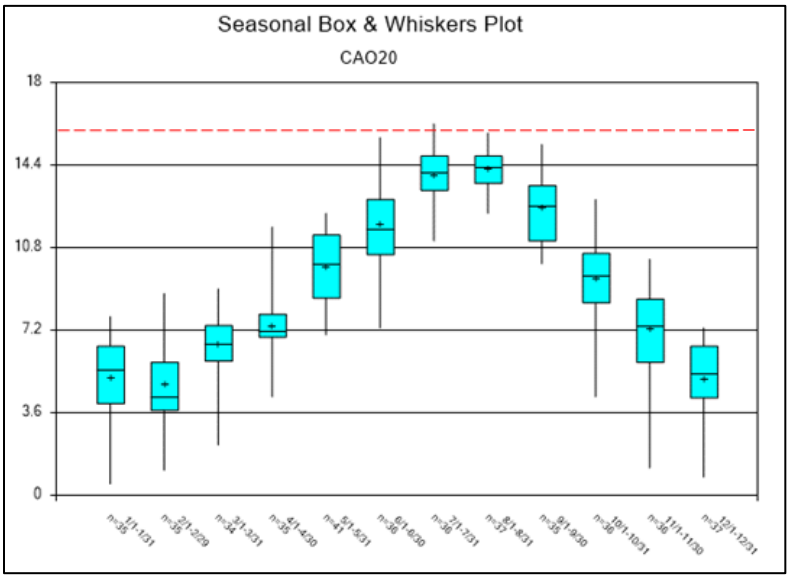




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

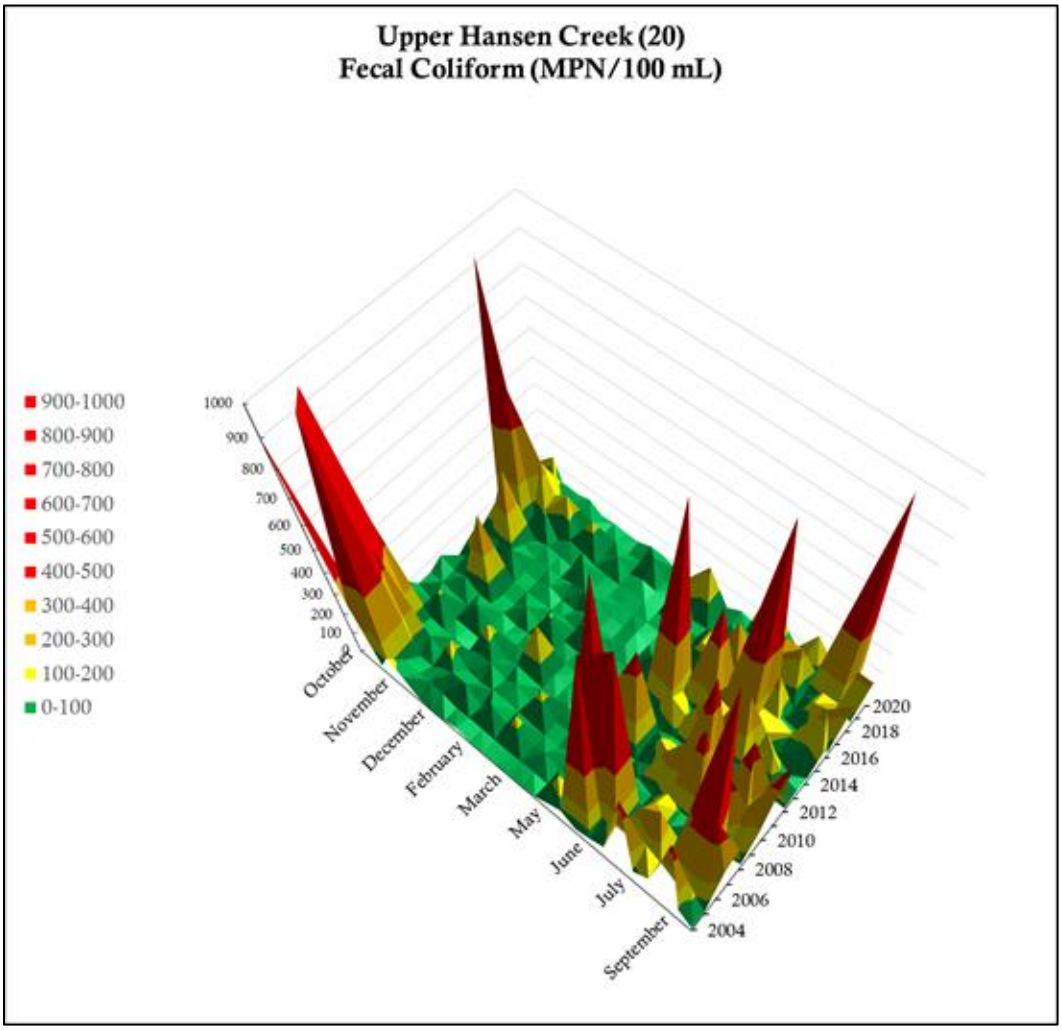
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

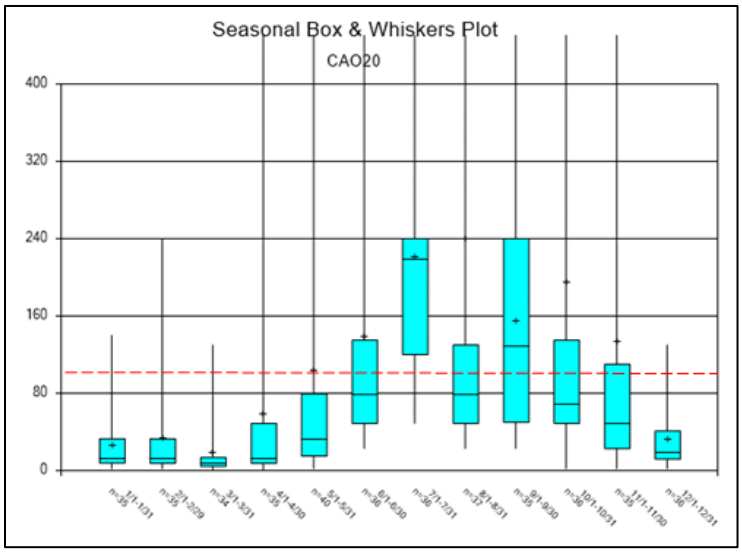




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

21

Coal Creek
@ Hoehn Road

Downstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
36	34	46	87	80	91	82	76	86	68	76	88	80	74	93

Long Term Trends

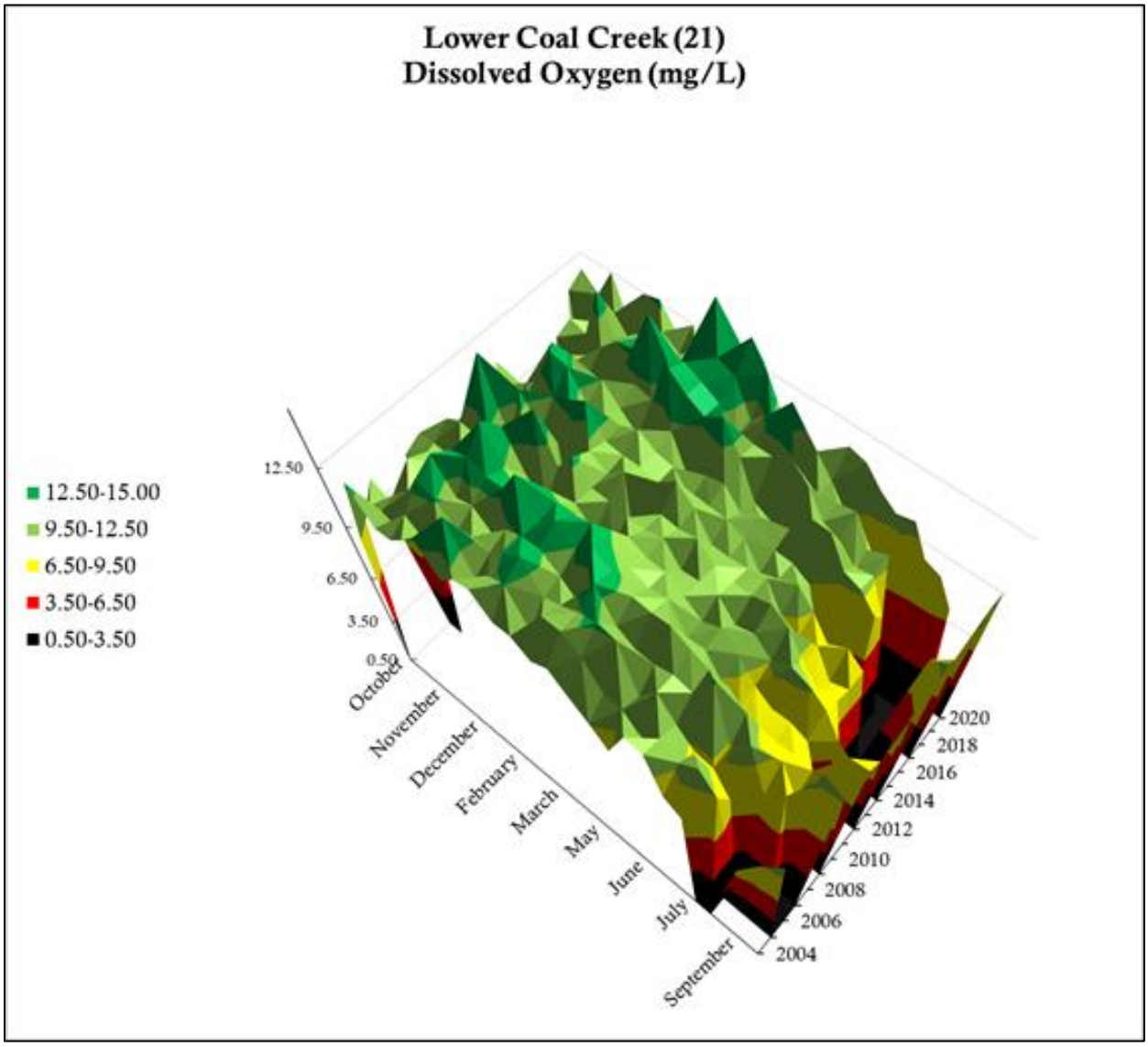
Dissolved Oxygen			Temperature			Fecal Coliform		
17 yr	10 yr	5 yr	17 yr	10 yr	5 yr	17 yr	10 yr	5 yr
–	–	–	–	↑	–	↓	–	–

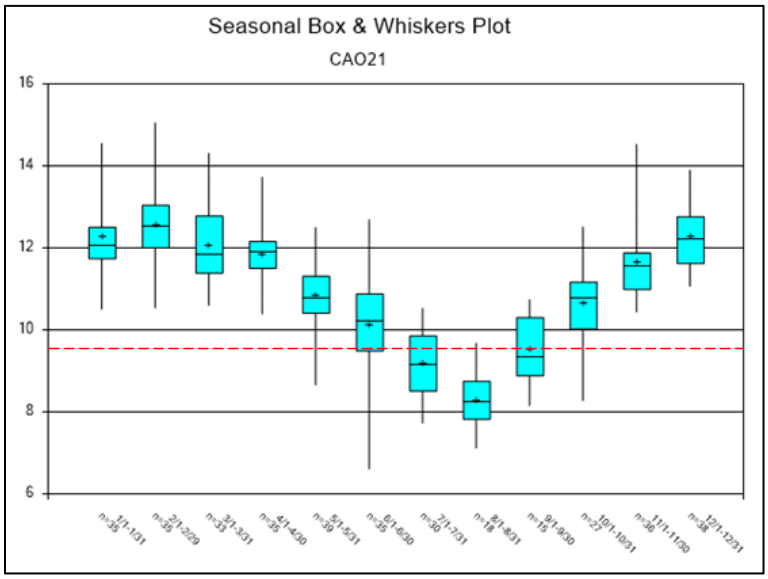
Site 21 is Coal Creek, downstream from site 22, and just prior to arriving in Skiyou Slough and ultimately the Skagit River. This site is pseudo-ephemeral and can often stop flowing by the end of the summer. This site is designated as core salmonid habitat.

Water temperature is higher than it was ten years ago. Fecal coliform counts are lower than they were 17 years ago. WQI scores are generally in the upper-score end of the moderate concern category, and often score as least concern.

Site 21 regularly fails to meet state standards for DO during the warmest months, but rarely fails to meet state standards for water temperature. Annual fecal coliform levels for WY2020 easily passed the 100 FC standard, but did not pass the 90th percentile requirement.

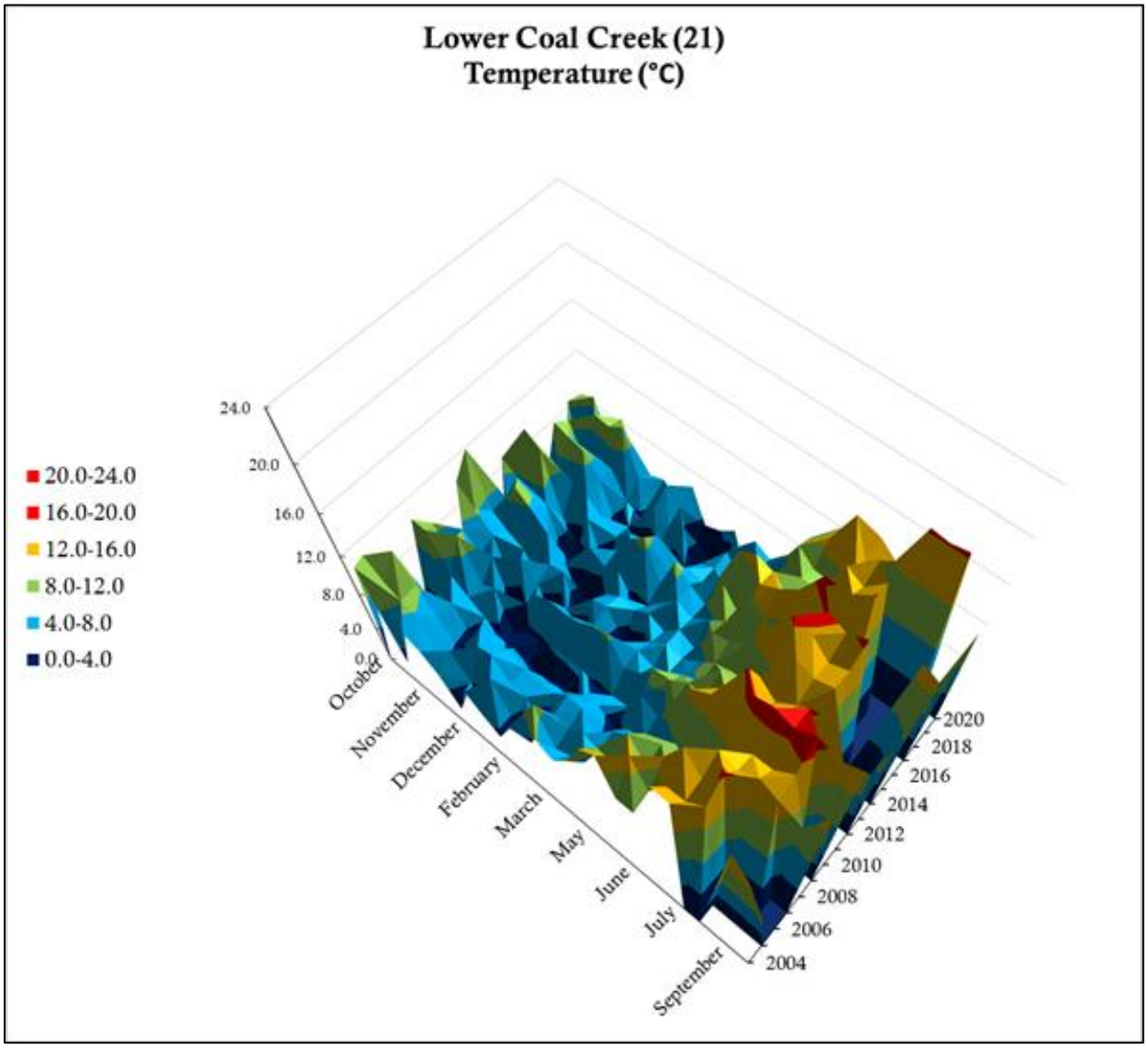
Site 21 is tied for 12th out of 39 sites for number of significant trends, with 13, and is tied for 18th out of 39 sites for positive trends, with 62%.

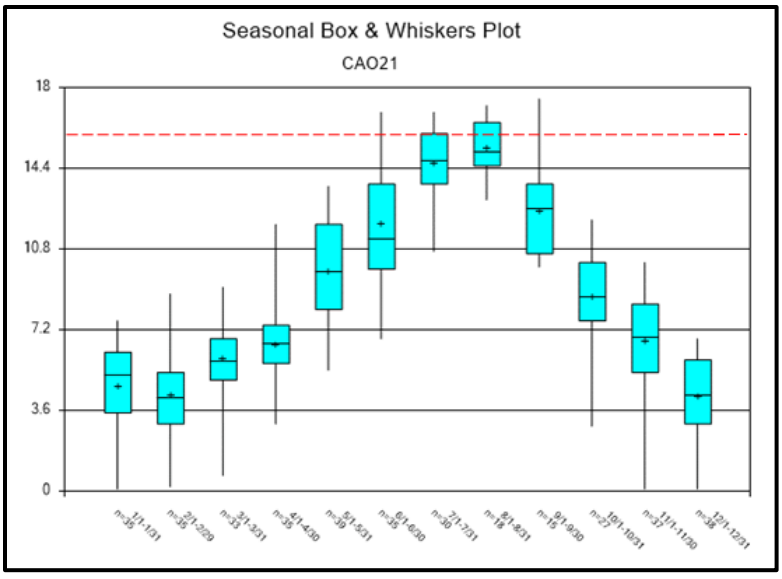




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

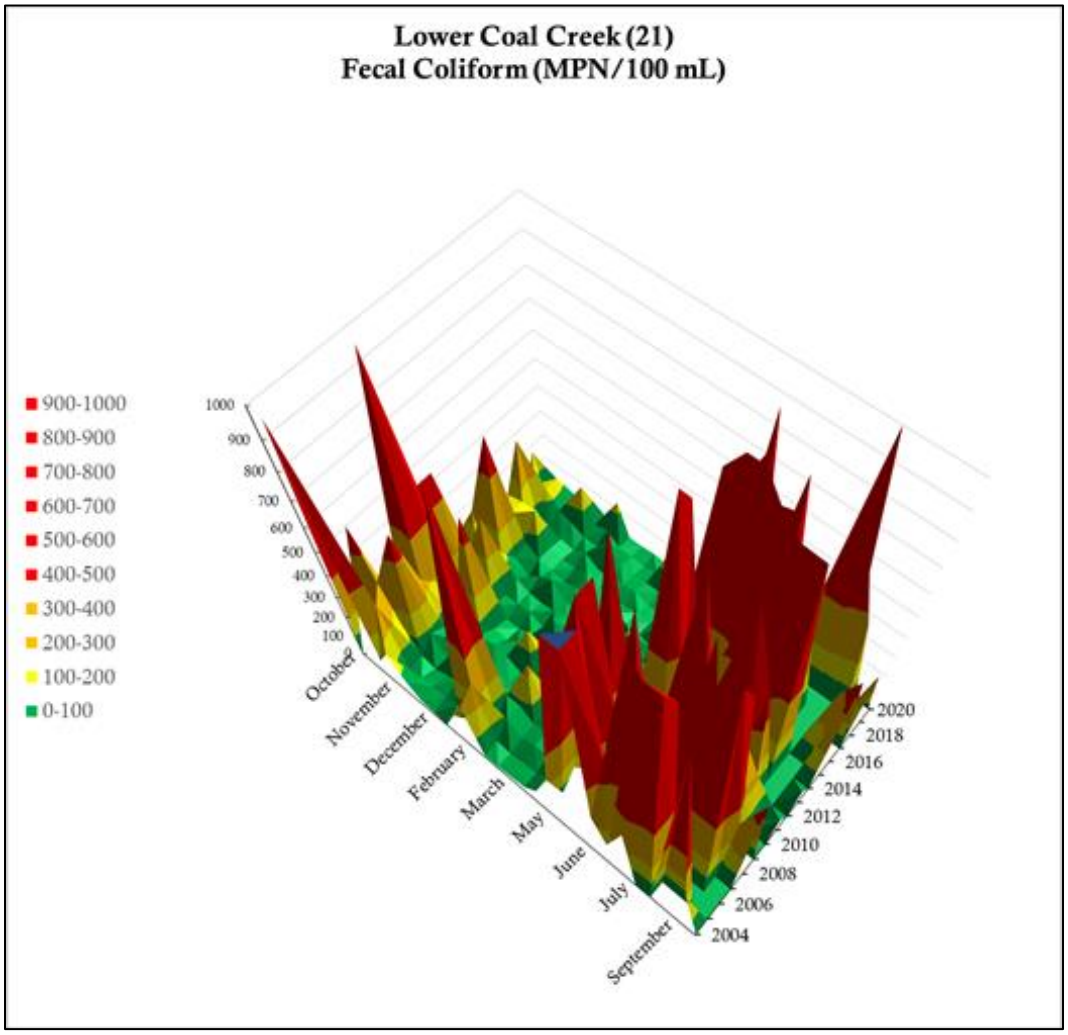
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

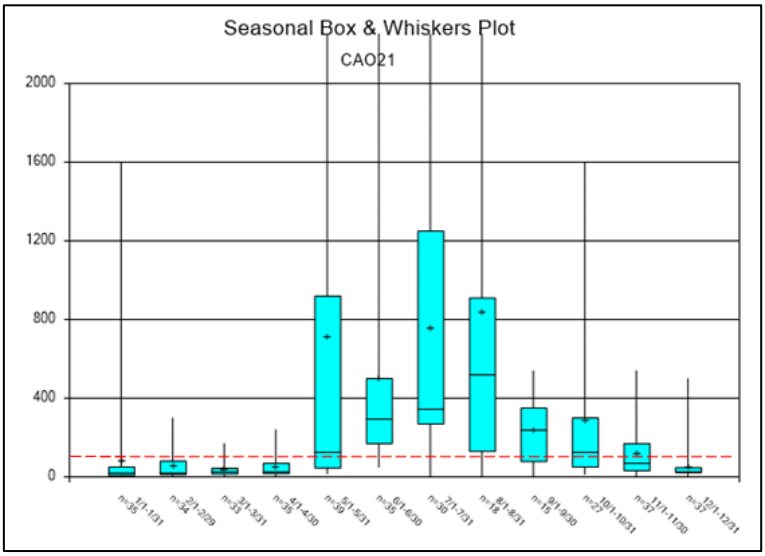




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





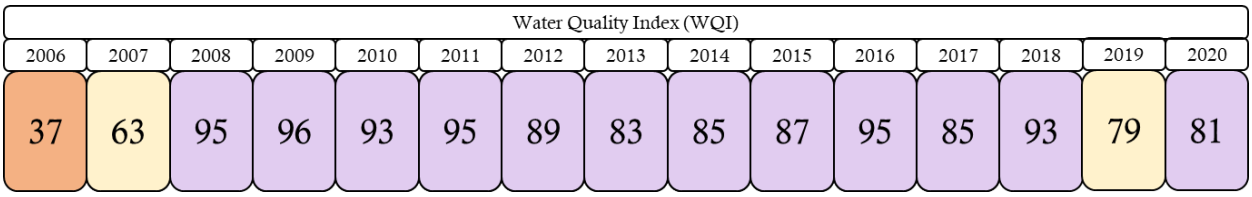
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

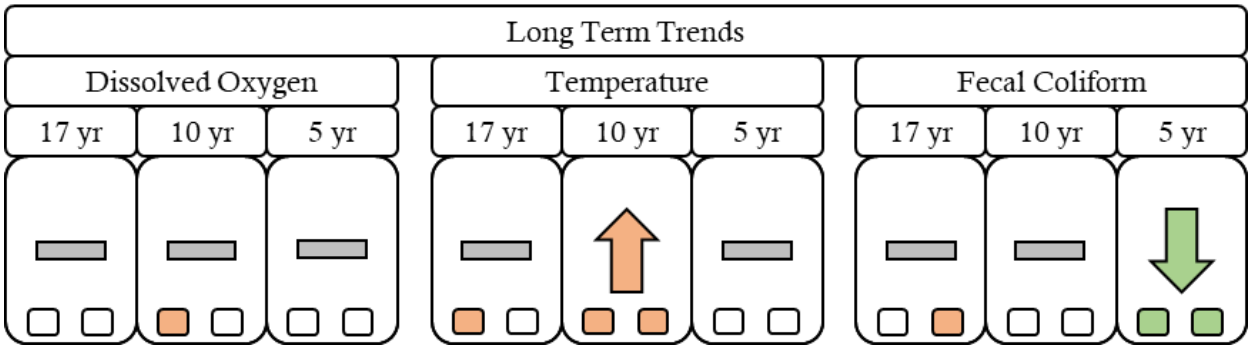
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

22

Coal Creek
@ Highway 20

Upstream Ag



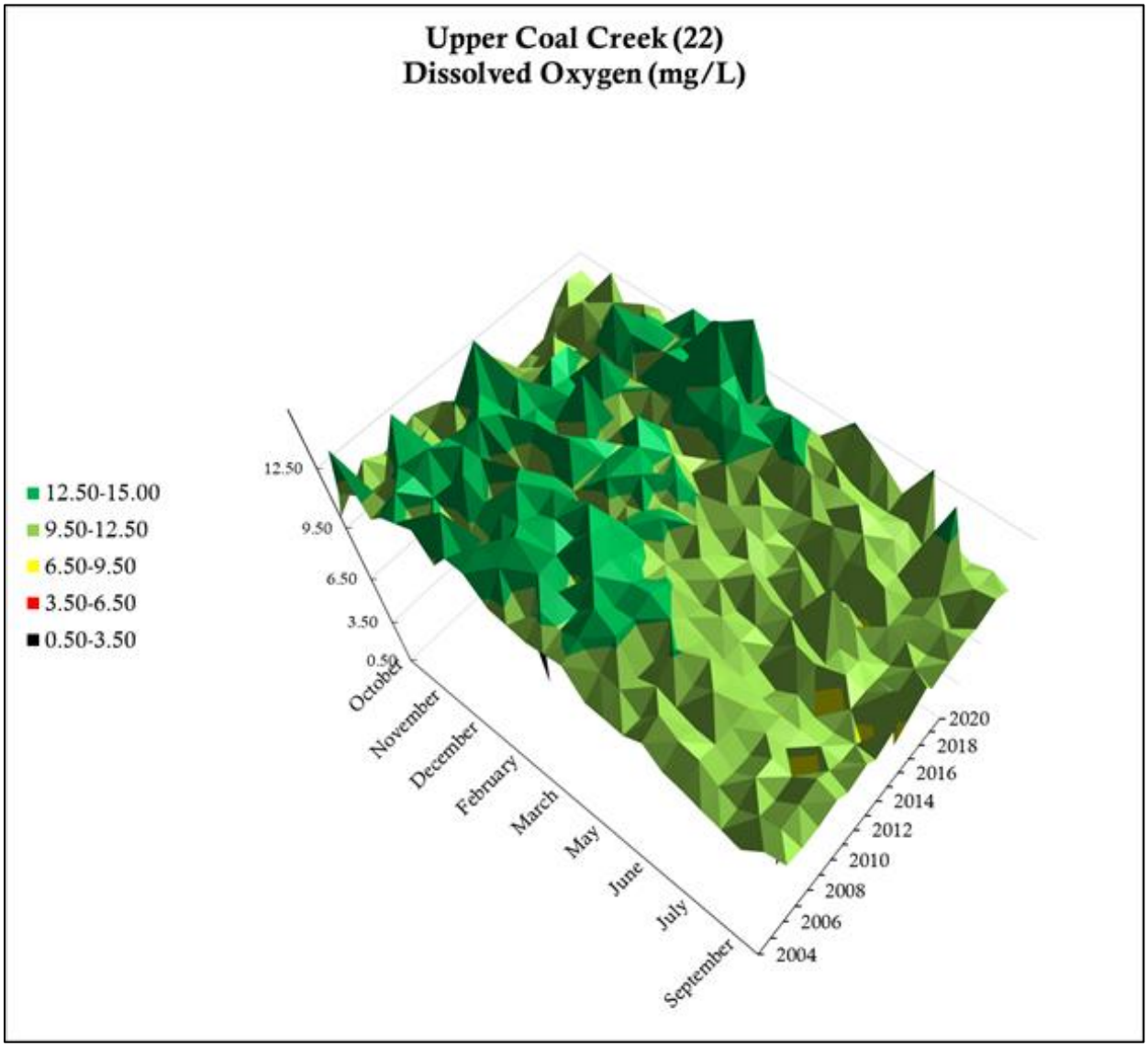


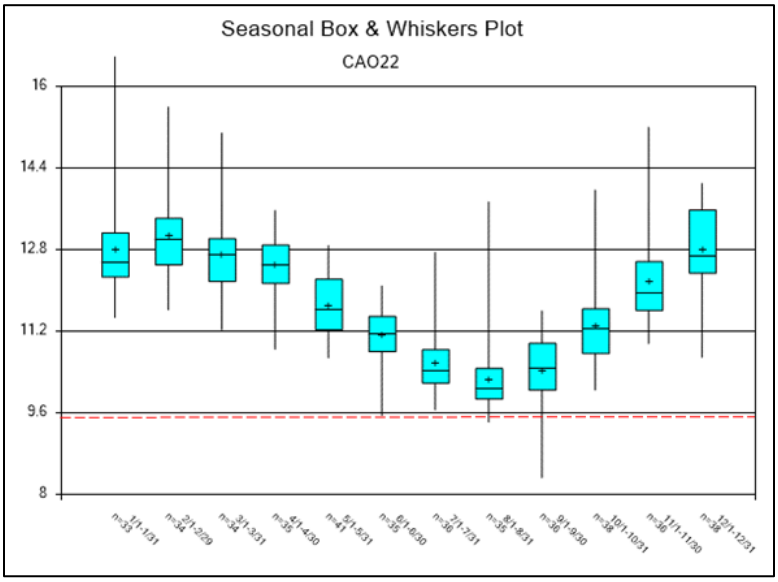
Site 22 is Coal Creek as it comes down off of Lyman Hill, and is upstream of site 21. This site is designated as core salmonid habitat.

Temperature increased since ten years ago, and FC counts are lower than they were five years ago. WQI scores are regularly in the category of least concern.

Site 22 rarely fails to meet state standards for DO or temperature, year-round. Annual FC levels for the 2020WY easily passed state standards.

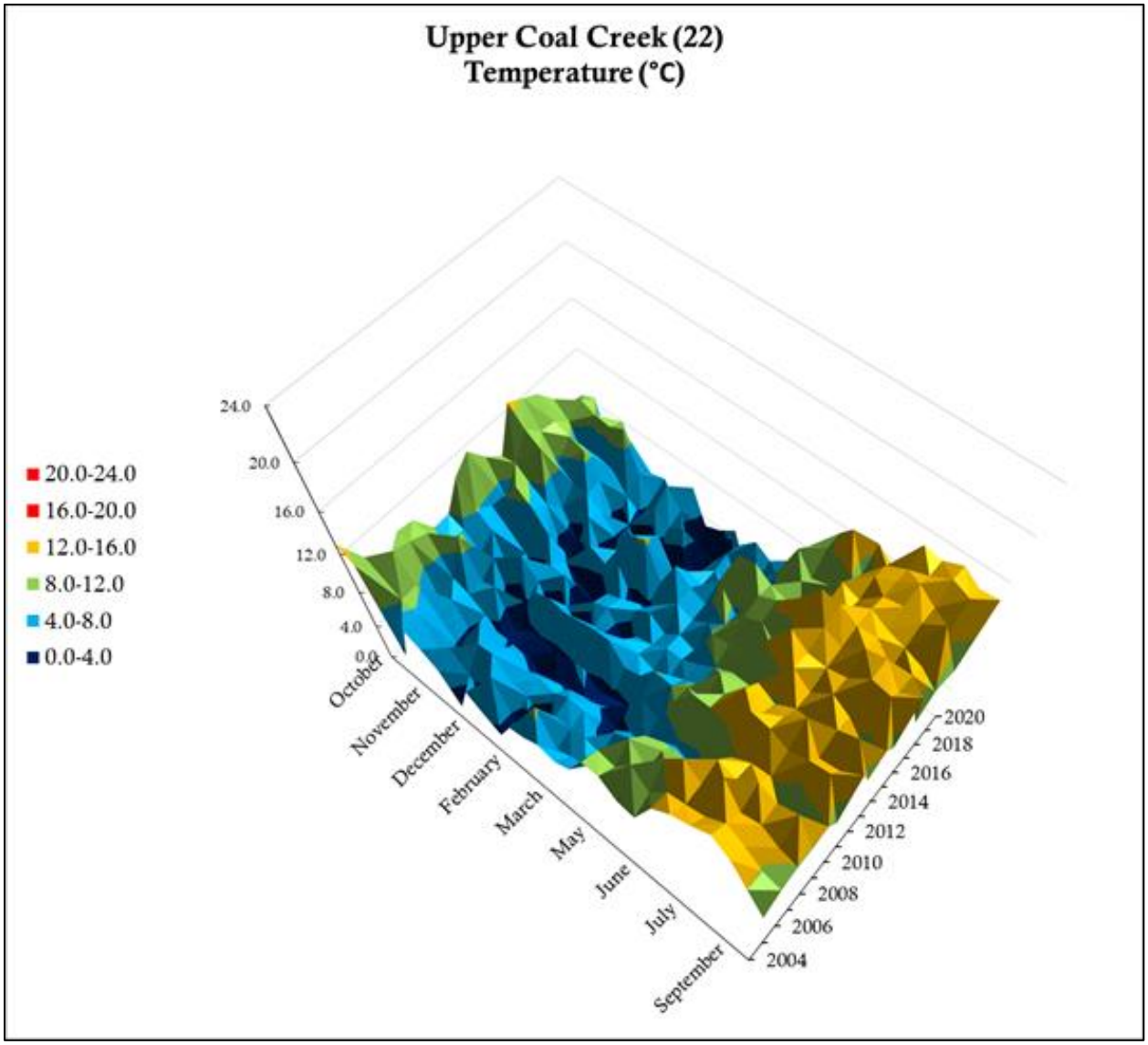
Site 22 is tied for 33rd out of 39 sites for number of significant trends, with 8, and 31st out of 39 sites for positive trends, with 38%.

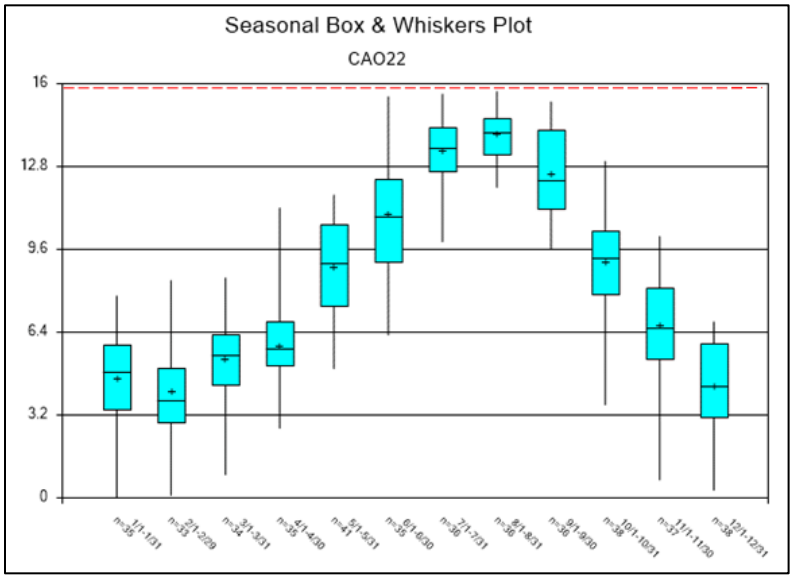




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

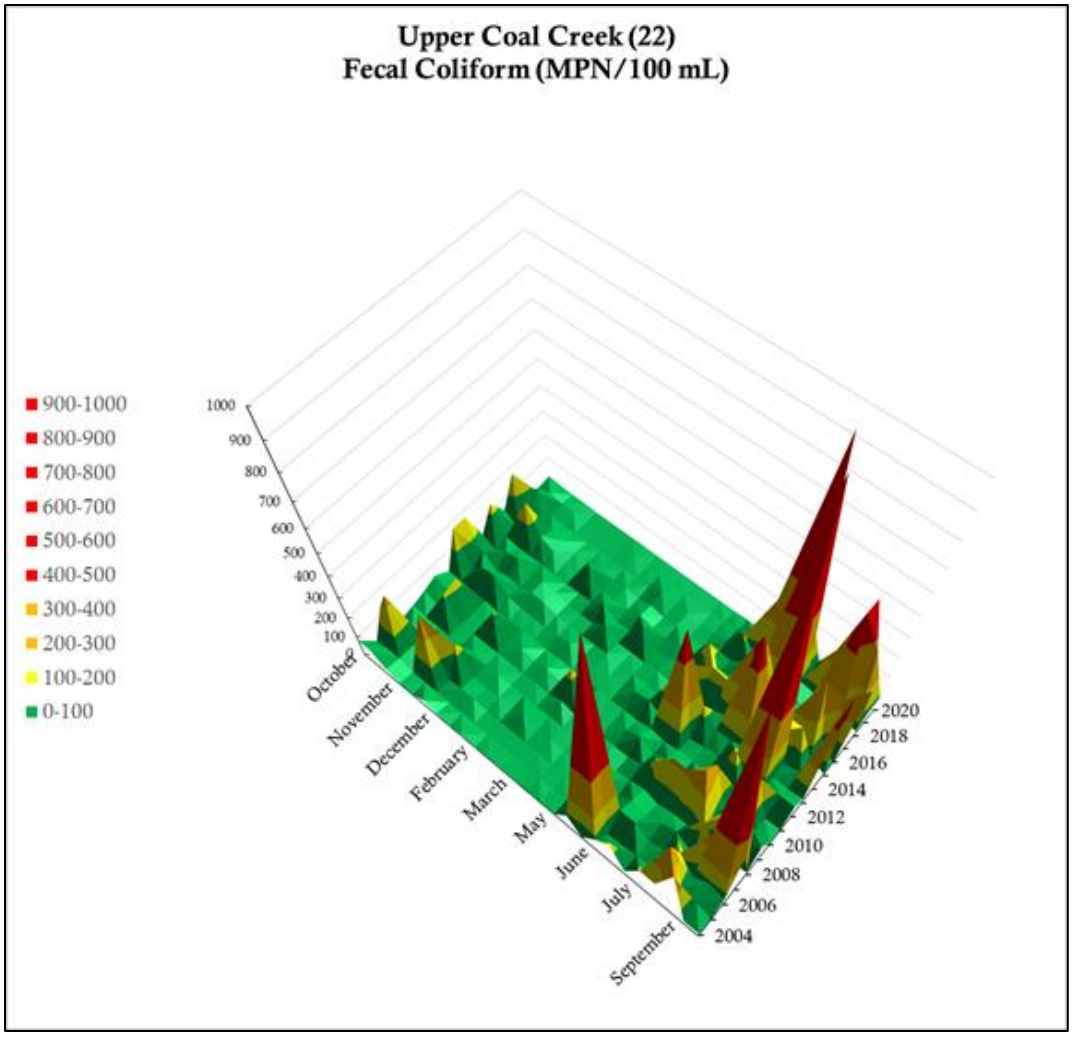
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

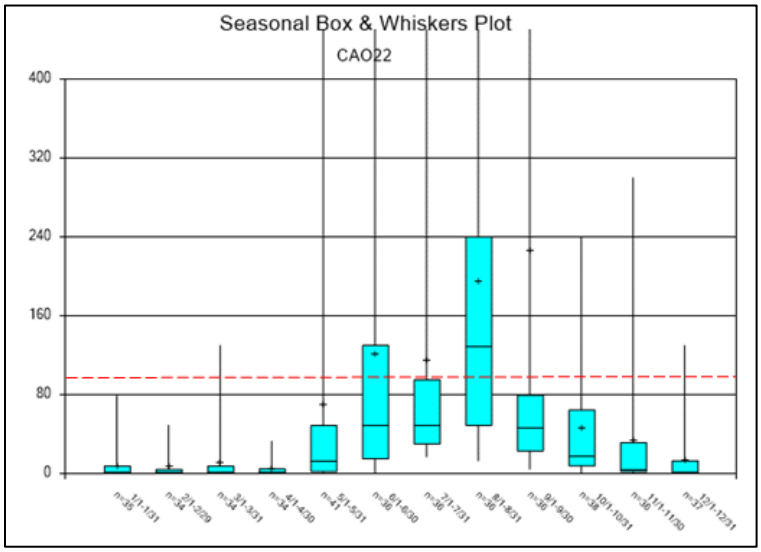




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

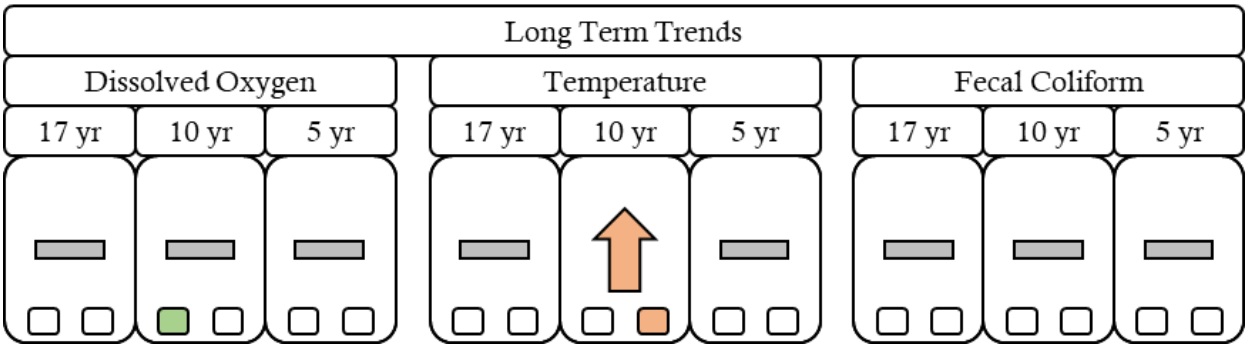
23

Wiseman Creek
@ Minkler Road

Upstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
27	48	85	98	95	98	95	90	96	83	90	95	85	89	96

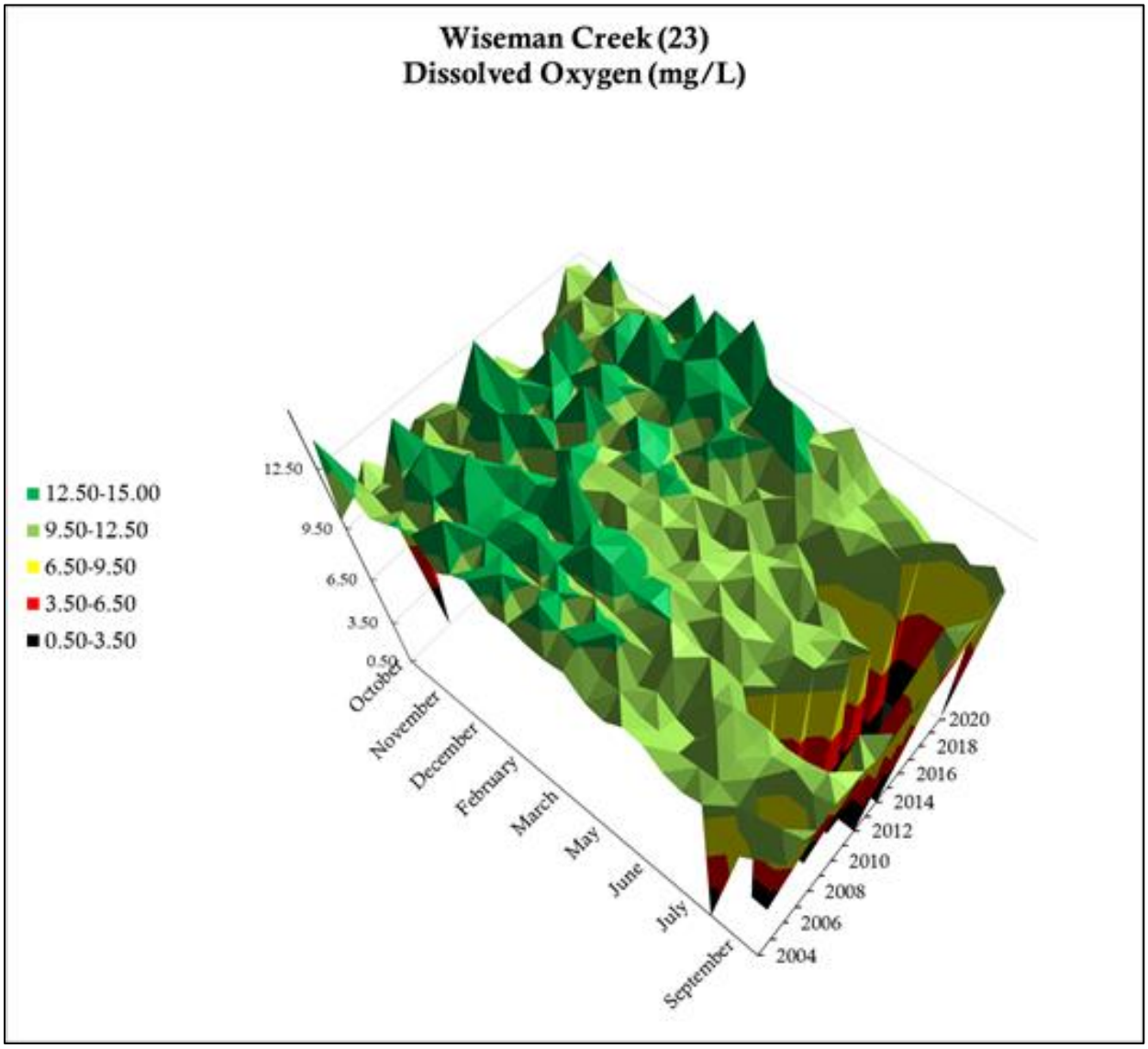


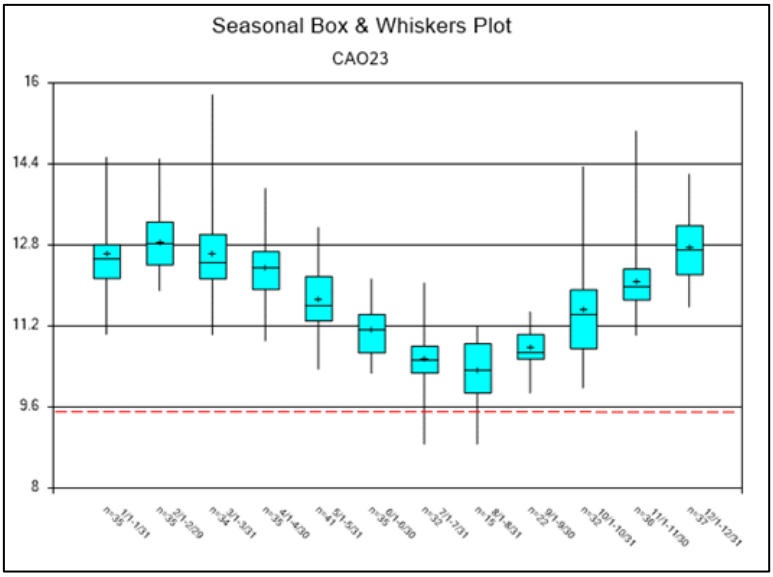
Site 23 is Wiseman Creek as it comes down off Lyman Hill, and prior to entering Skiyou Slough and ultimately the Skagit River. This site is designated as core salmonid habitat.

No significant monthly trends were observed in dissolved oxygen or fecal coliform at this site, over any of the time periods analyzed. Temperature is warmer now than ten years ago. WQI is consistently in the category of least concern.

Site 23 rarely, if ever, fails to meet state standards for DO and water temperature, year-round. Annual FC levels easily meet state standards.

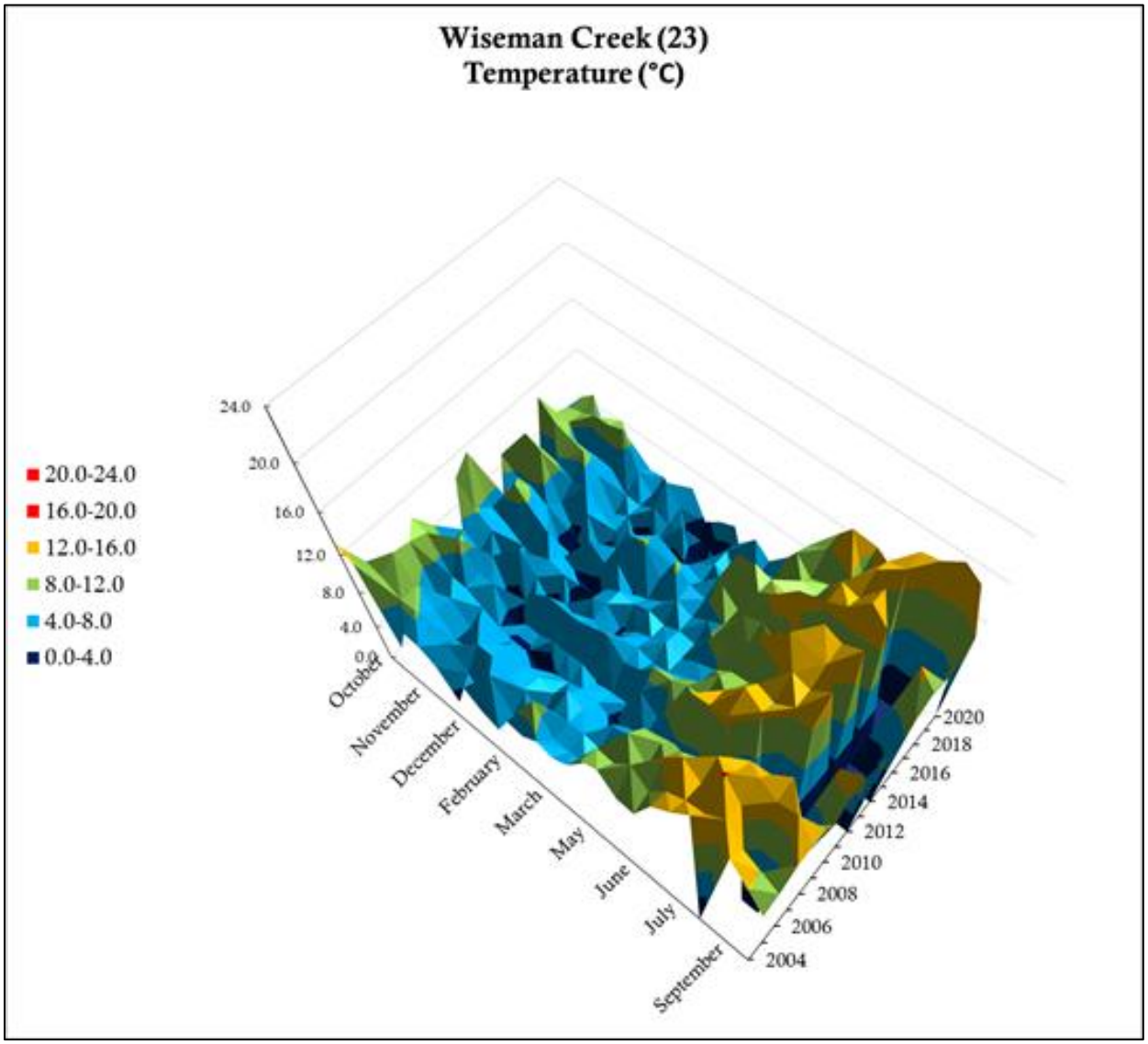
Site 23 is tied for 35th out of 39 sites for number of significant trends, with 7, and 21st out of 39 sites for positive trends, with 57%.

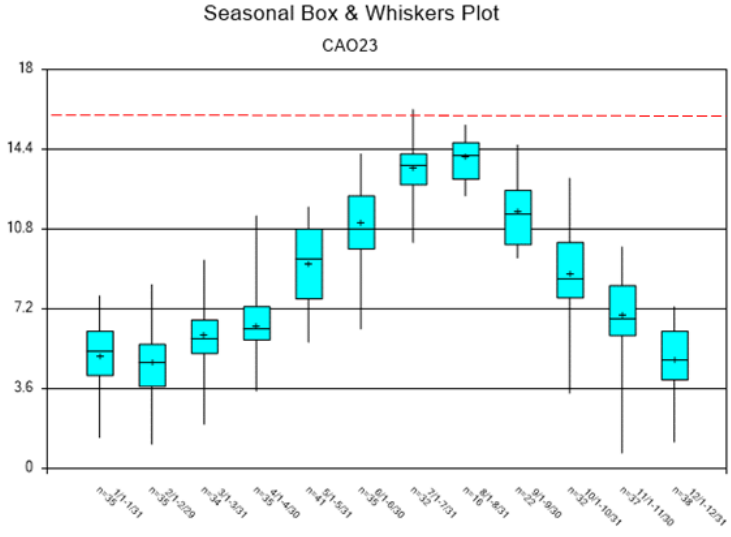




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

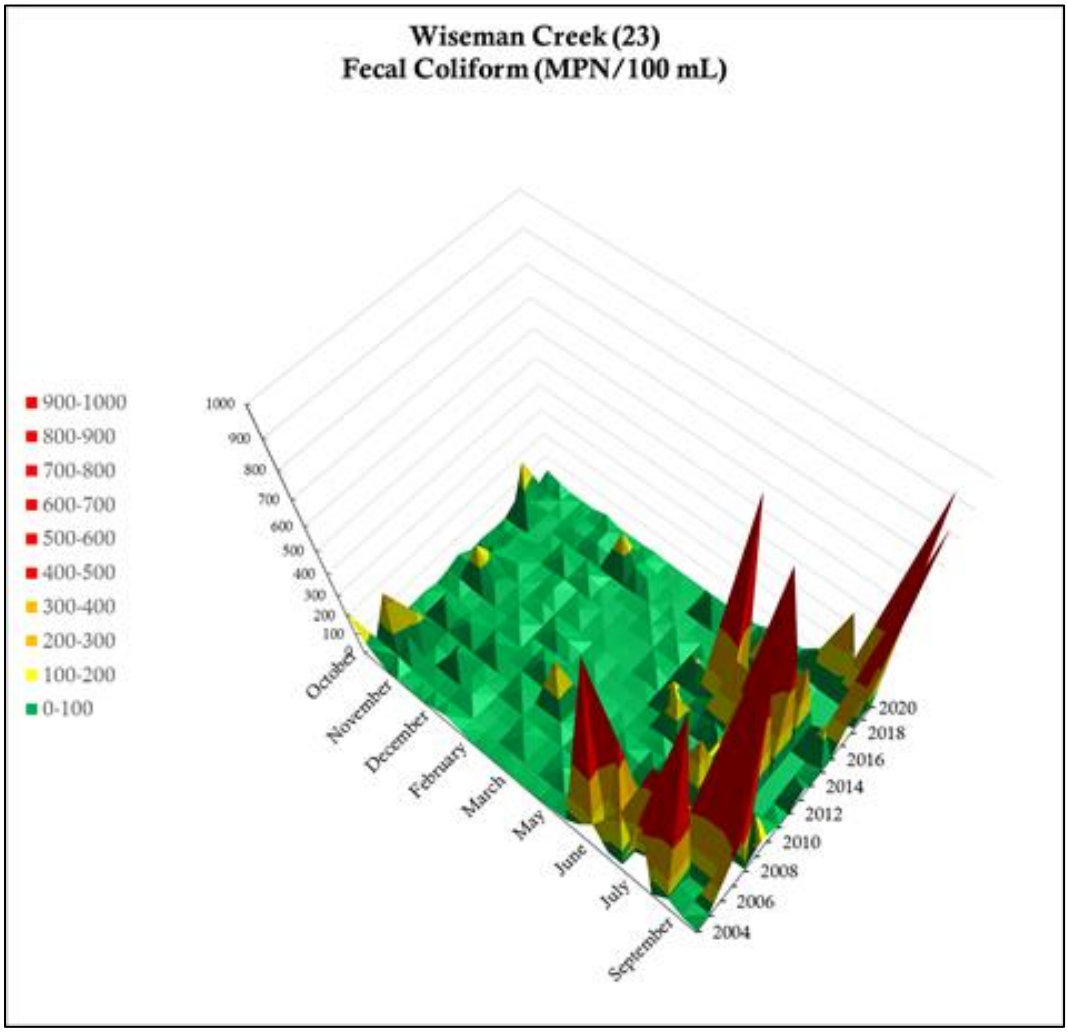
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

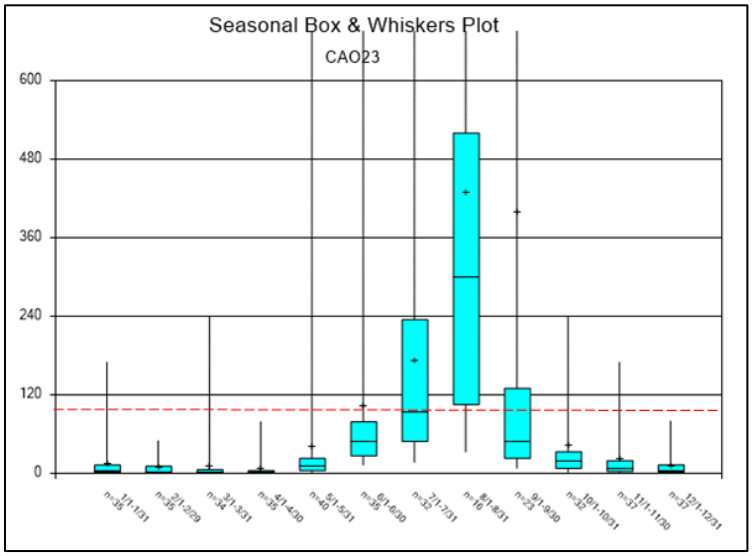




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





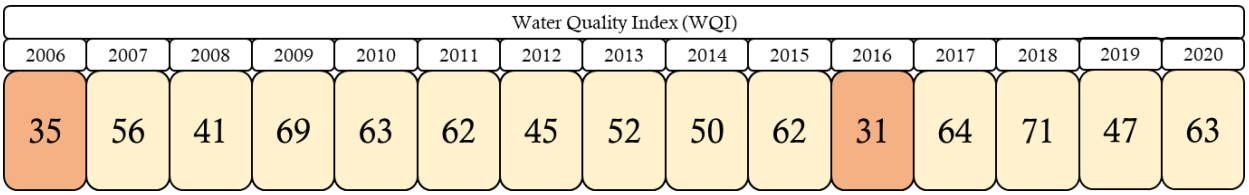
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

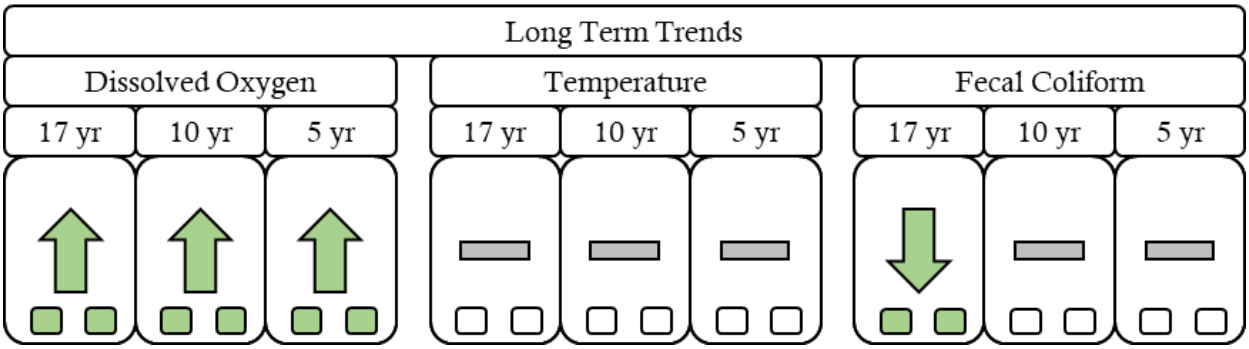
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

24

Mannser Creek
@ Lyman-Hamilton Highway

Midstream Ag



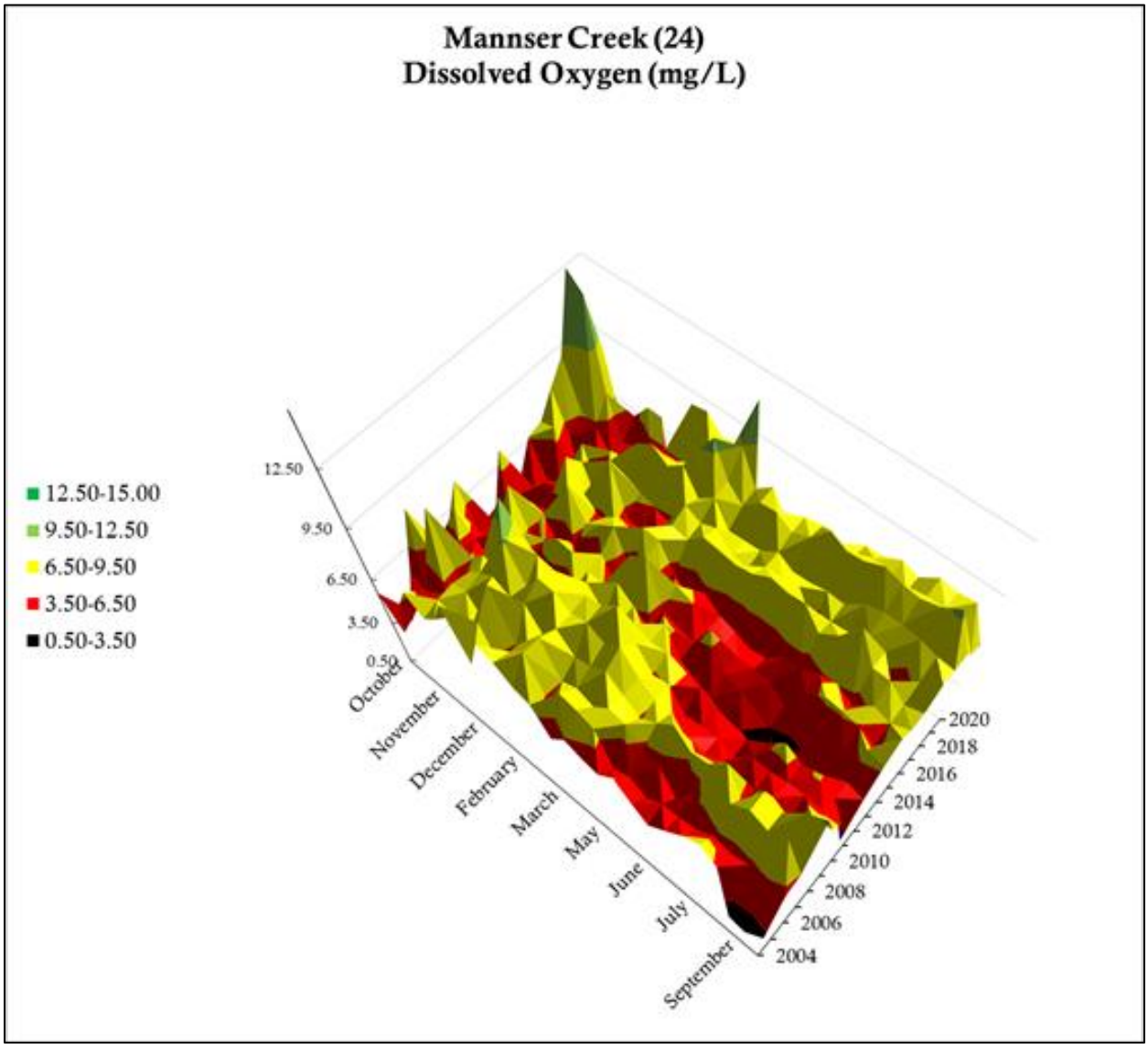


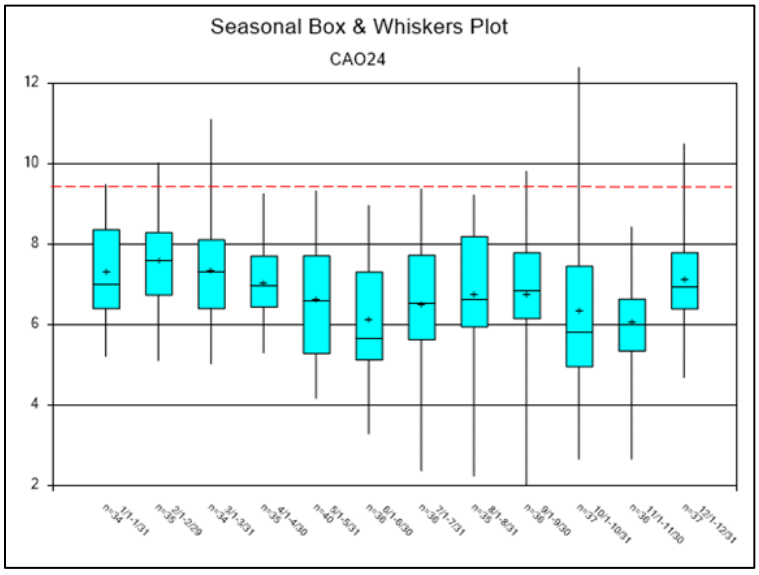
Site 24 is Mannser Creek, after descending off of Mount Josephine and prior to joining the Skagit River, just east of Lyman. This site is designated as core salmonid habitat.

Dissolved oxygen has significantly increased across all three measured time periods. Fecal coliform has decreased compared to 17 years ago. WQI scores are regularly in the category of moderate concern.

Site 24 is slow-moving and inundated with invasive reed canary grass. This has the effect of lowering DO but also decreasing temperature. As a result, this site is almost always below state standards for DO year-round, but has never exceeded state temperature standards even once in the history of this program. Annual FC levels also easily meet state standards.

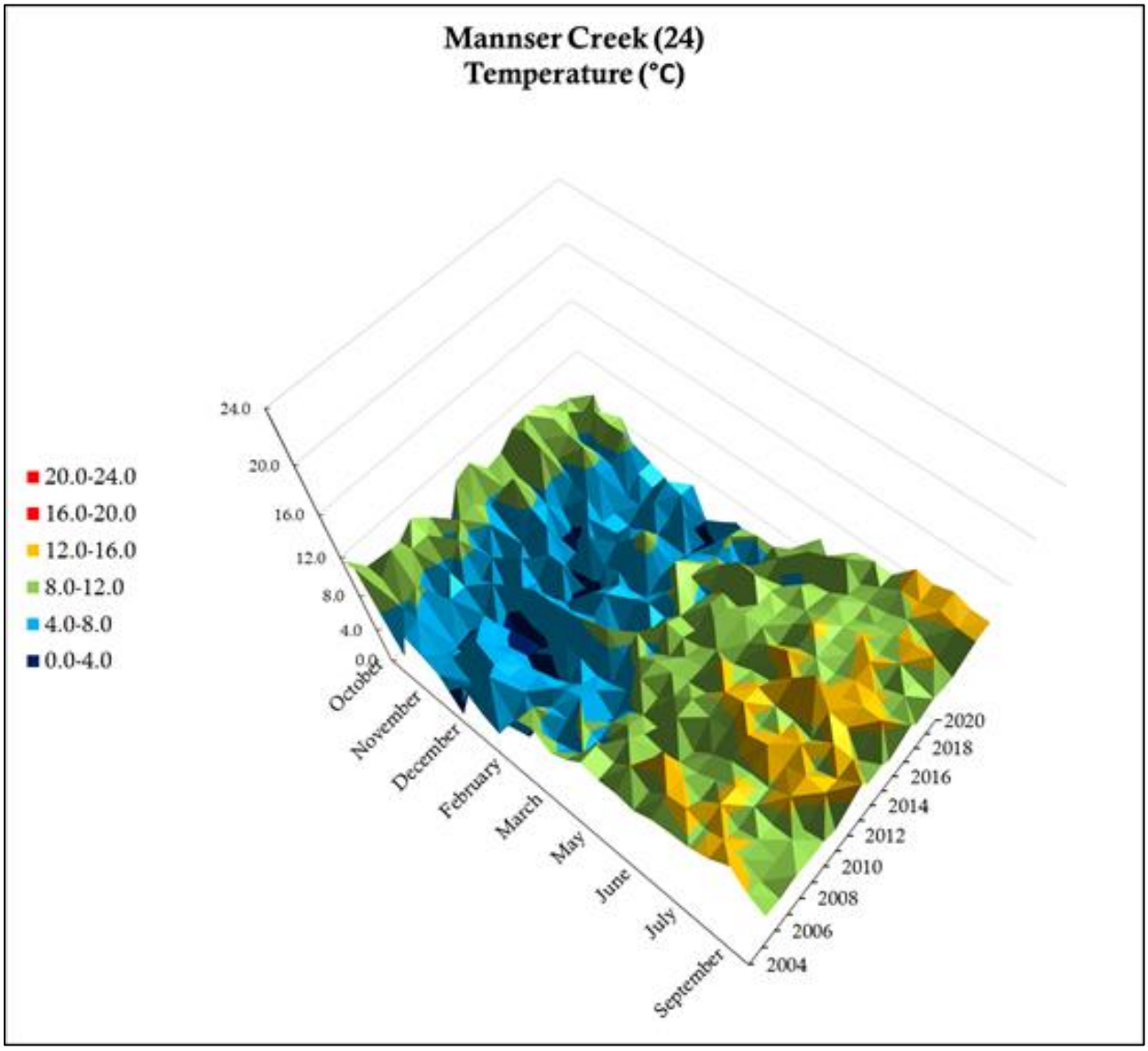
Site 24 is tied for 12th out of 39 sites for number of significant trends, with 13, and is tied for 8th out of 39 sites for positive trends, with 77%.

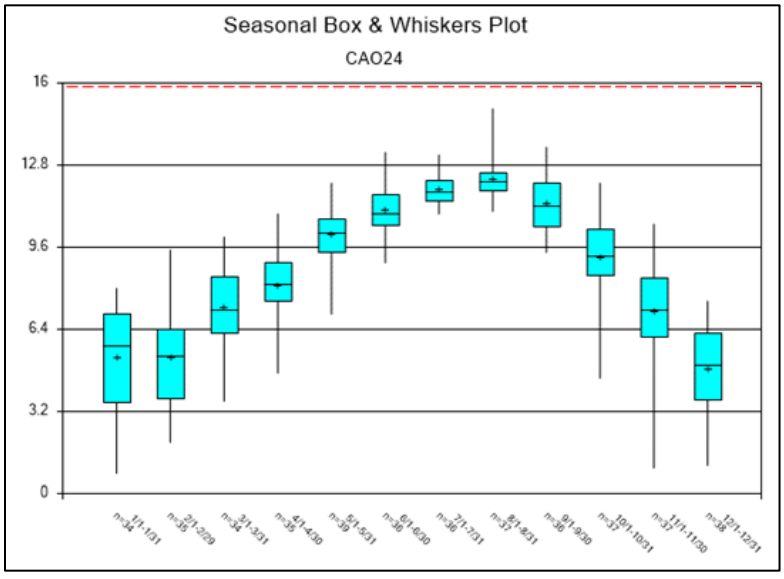




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

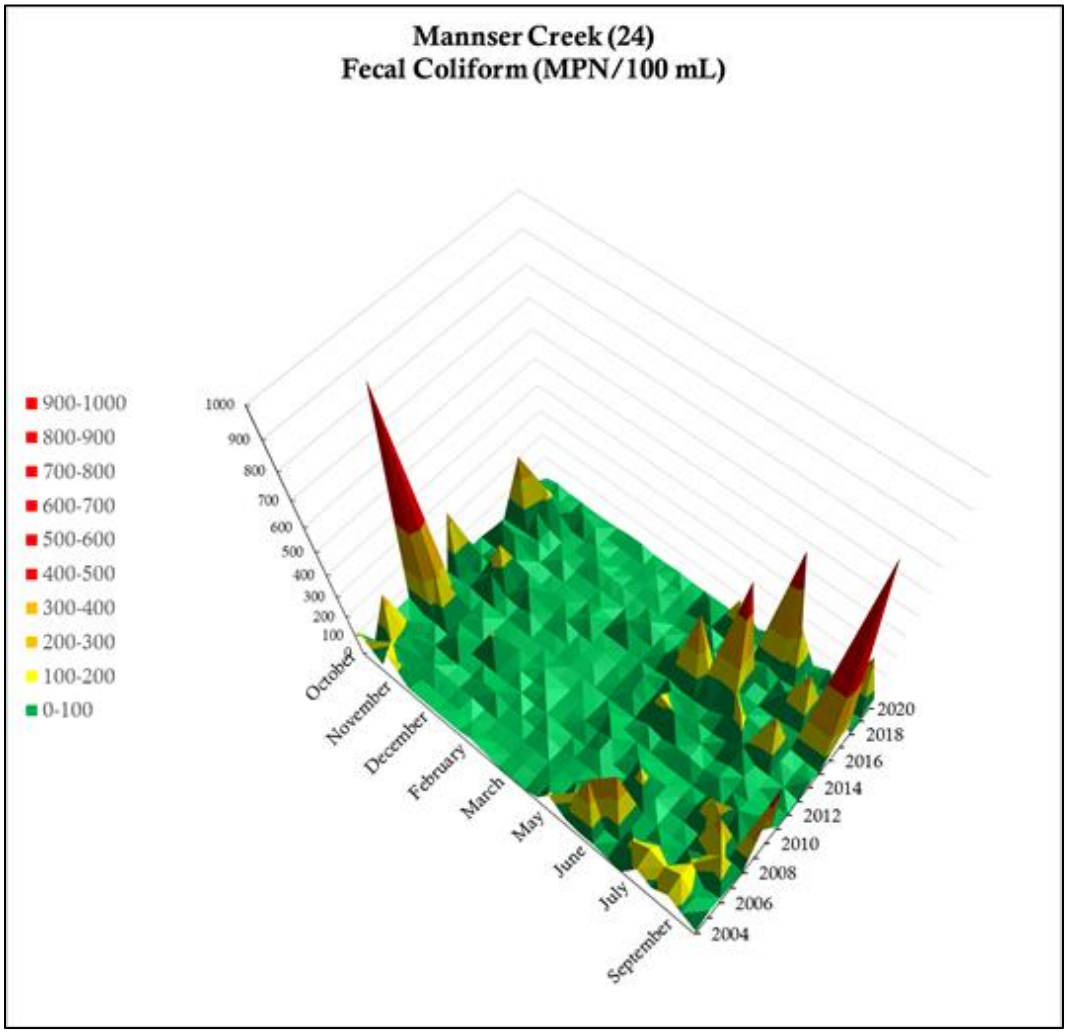
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

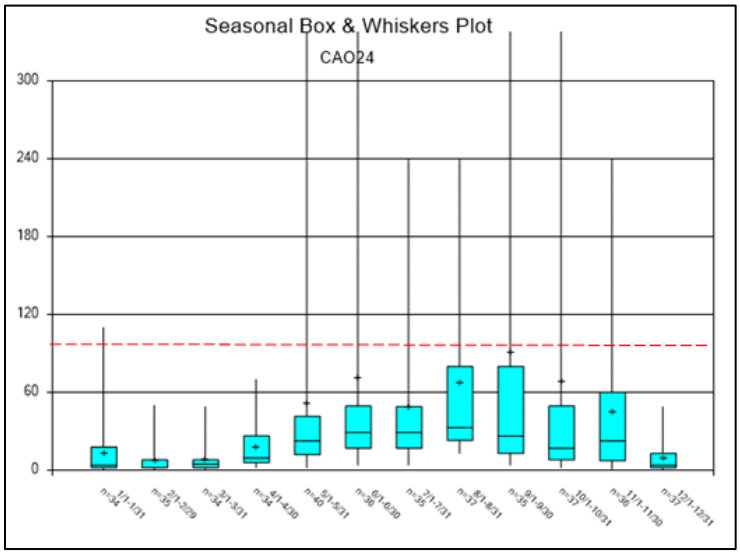




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

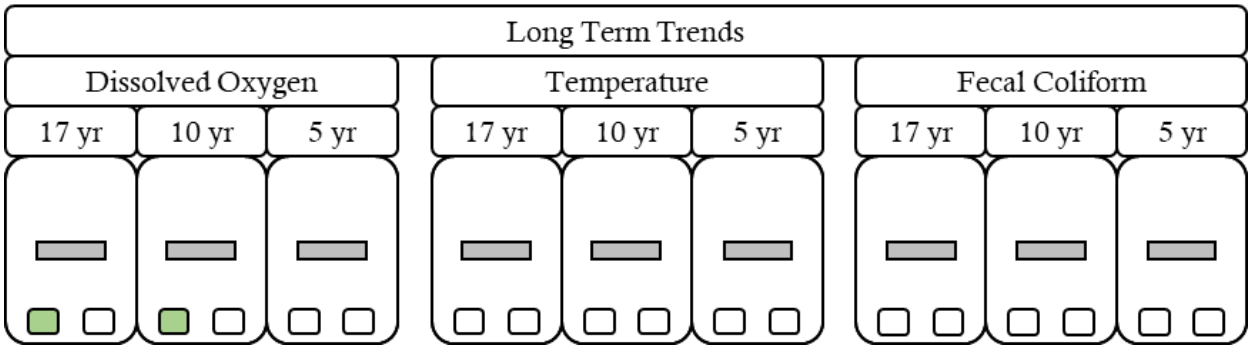
25

Red Cabin Creek
@ Hamilton Cemetery Road

Reference – Rural Reserve

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
74	90	87	97	97	96	96	97	97	94	93	94	96	91	94

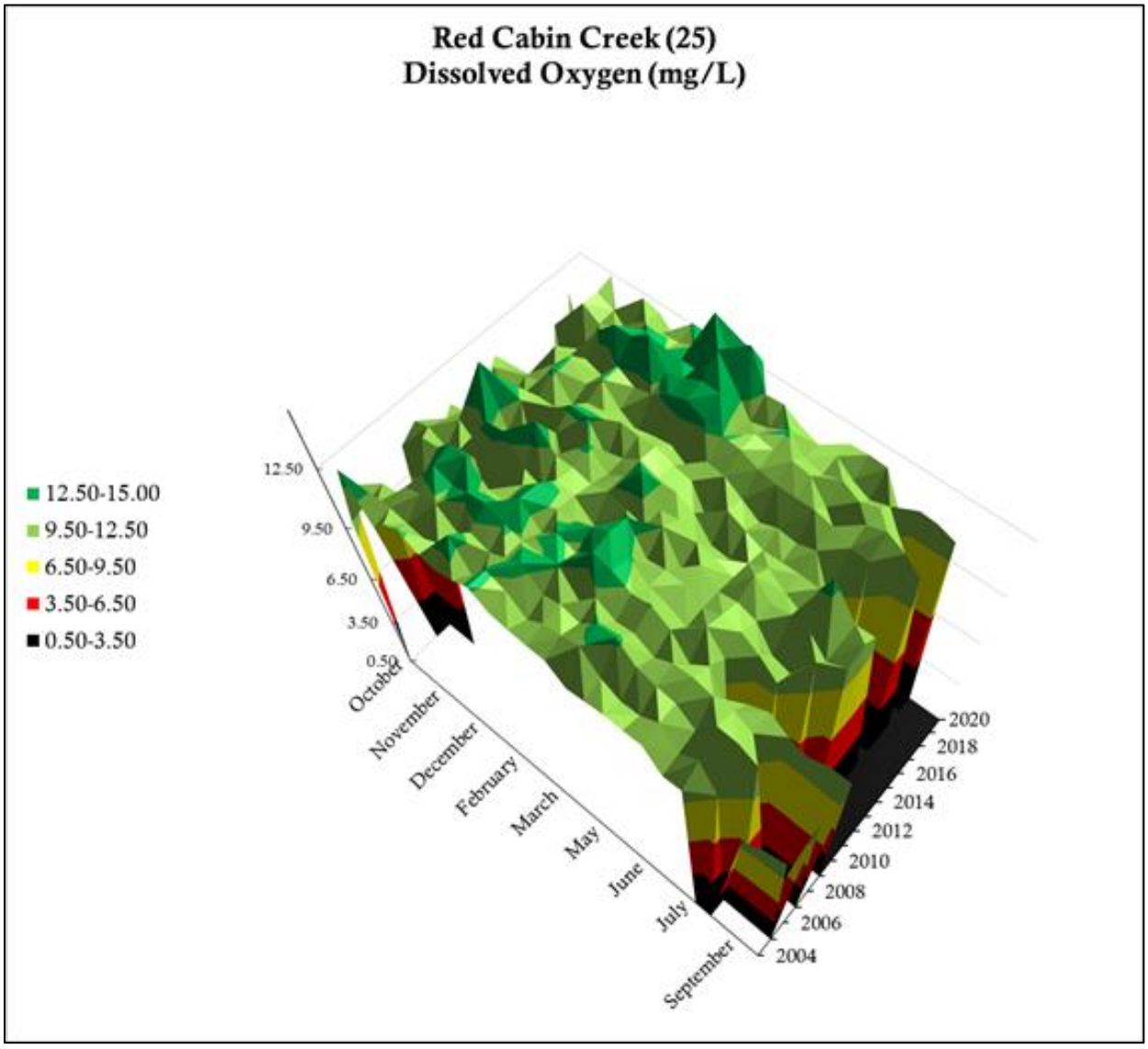


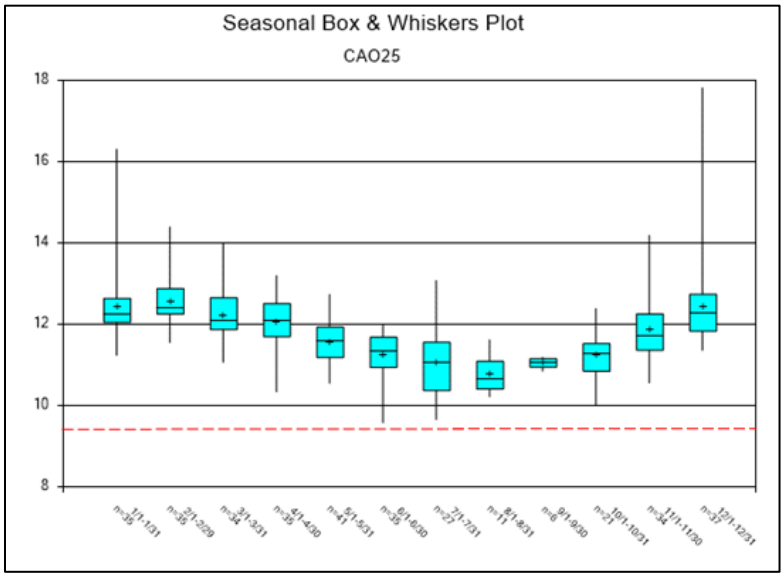
Site 25 is Red Cabin Creek, after it comes off of Mount Josephine, in between Lyman and Hamilton. This is an ephemeral creek that regularly dries up by the end of summer. This site is designated as core salmonid habitat.

No significant trends in DO, temperature, or FC were observed across any time period. Except for the first year of WQI monitoring, this creek has solely been in the category of least concern.

Site 25 has never failed to meet state standards for DO or water temperature on any collection day over the history of this program. Annual FC levels easily meet state standards.

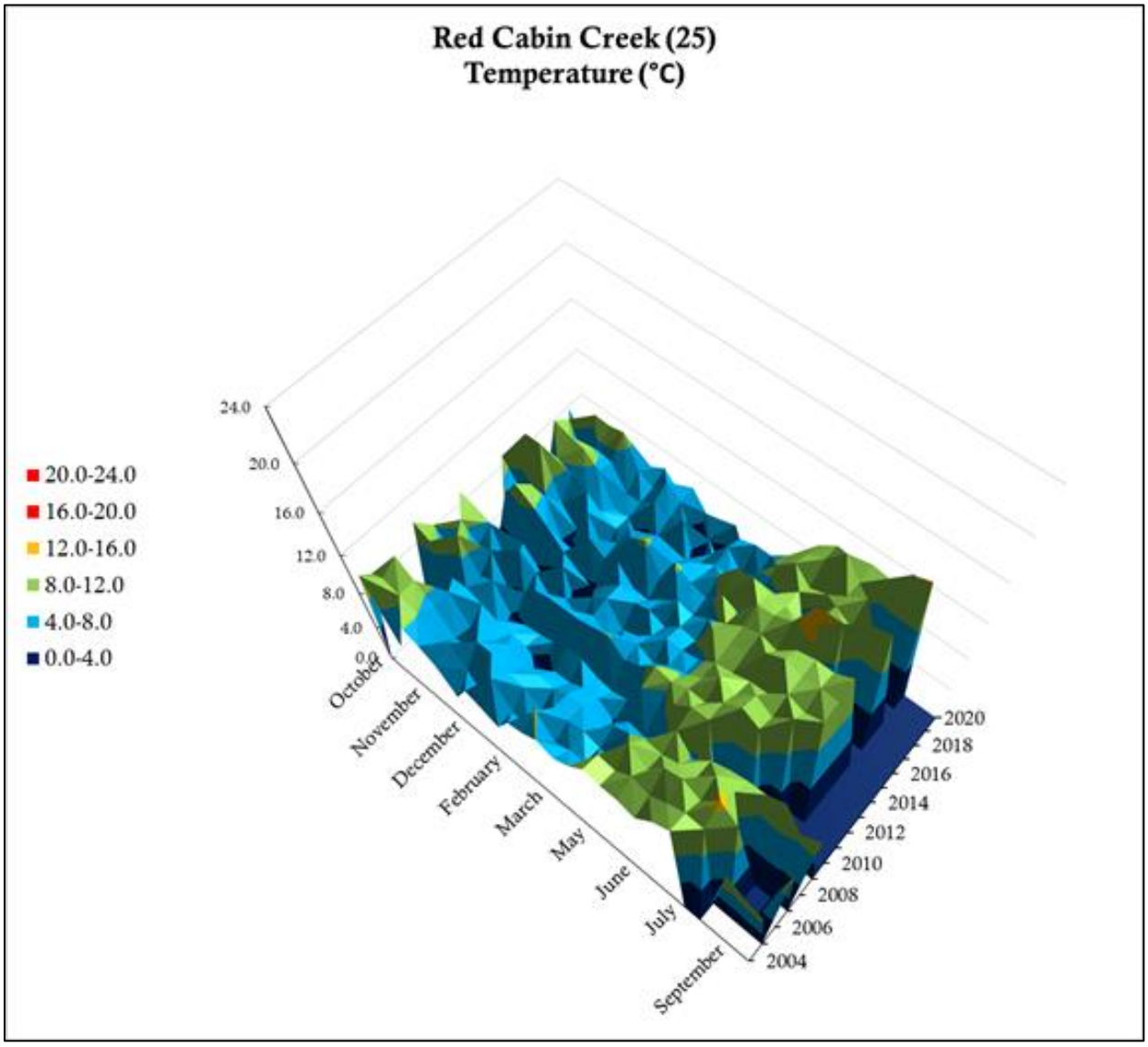
Site 25 is tied for 22nd out of 39 sites for number of significant trends, with 11, and is 24th out of 39 sites for positive trends, with 55%.

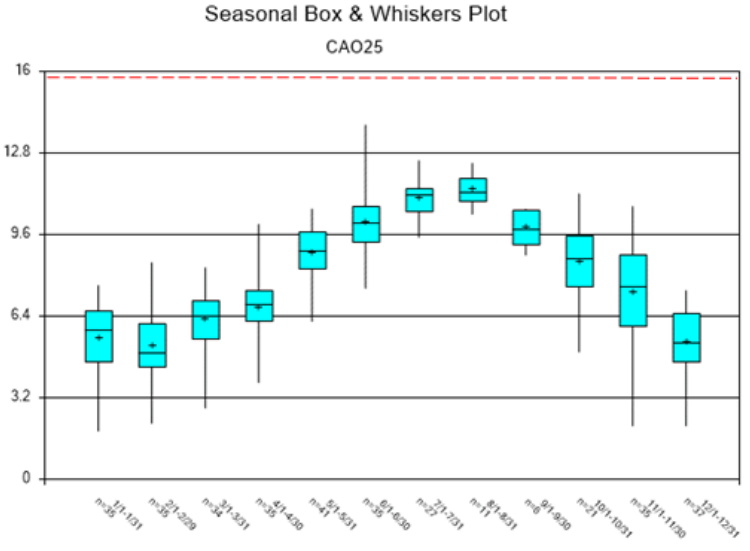




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

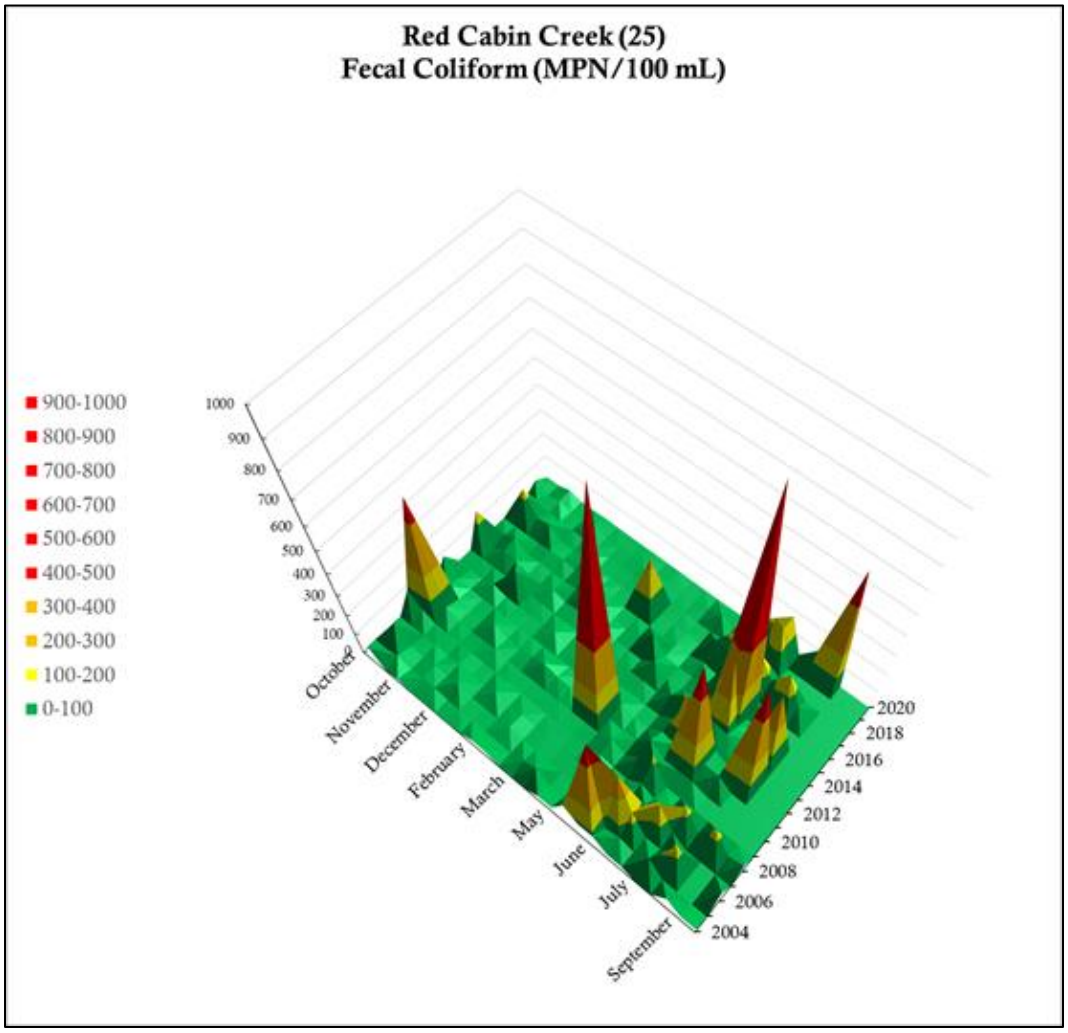
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

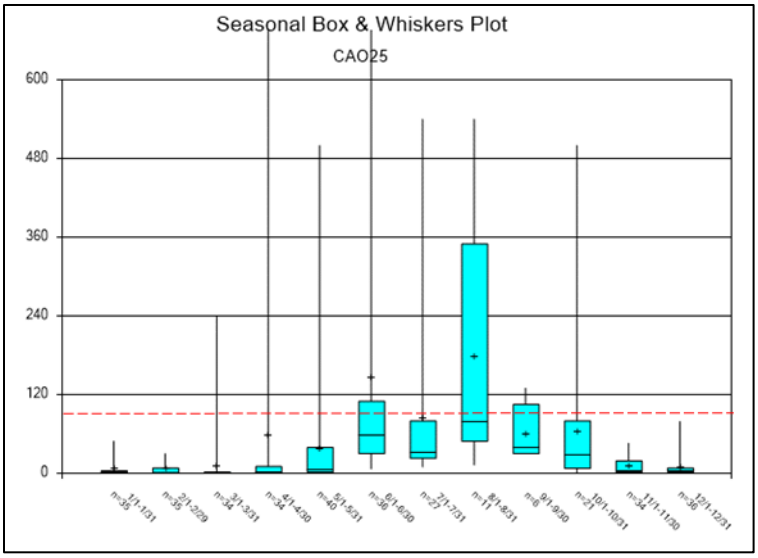




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

28

Brickyard Creek
@ Highway 20

Reference – Urban/suburban

Water Quality Index (WQI)														
2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
62	77	56	71	79	83	65	75	84	88	77	93	84	85	79

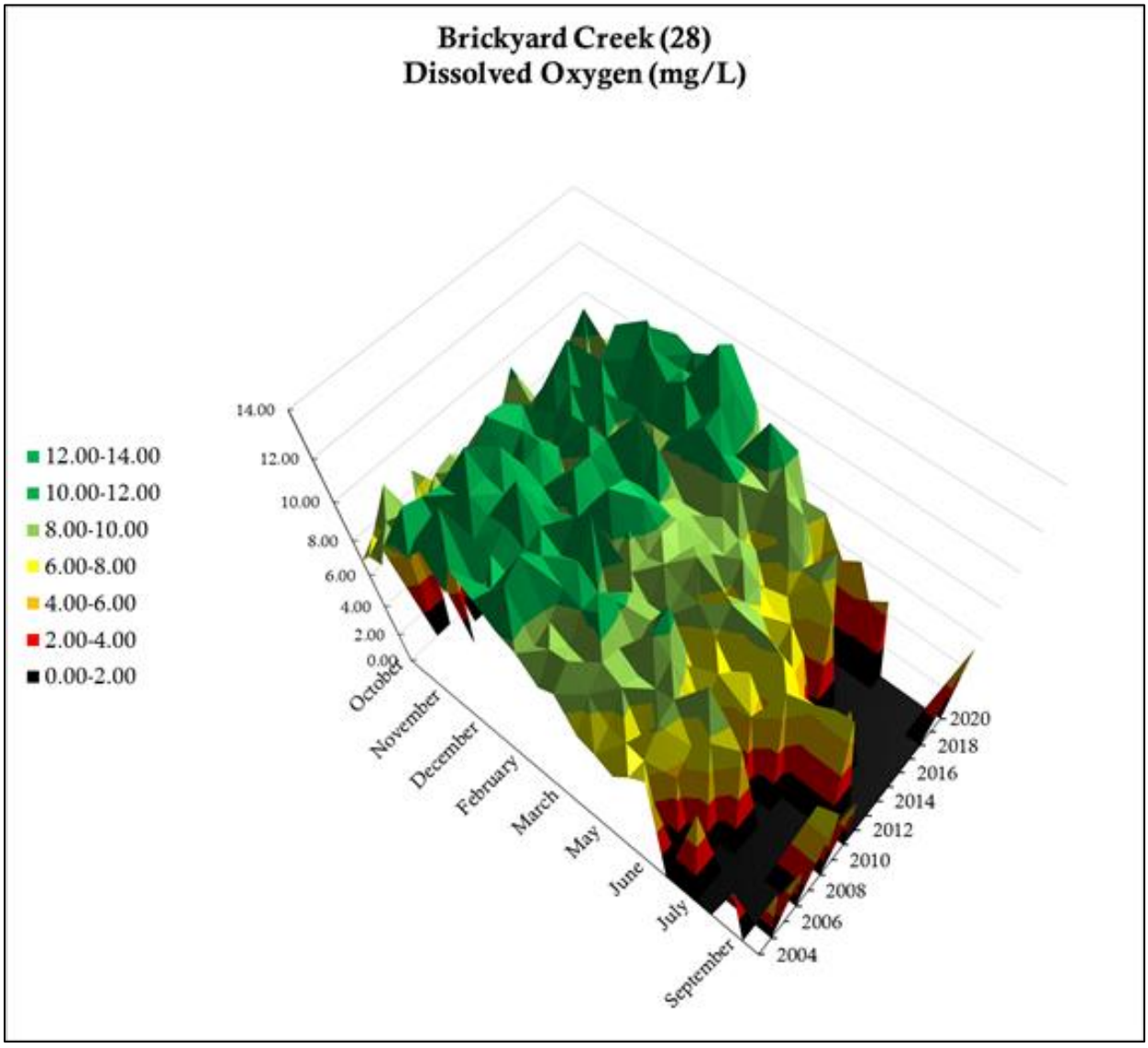
Long Term Trends								
Dissolved Oxygen			Temperature			Fecal Coliform		
17 yr	10 yr	5 yr	17 yr	10 yr	5 yr	17 yr	10 yr	5 yr
		Not Enough Data			Not Enough Data			Not Enough Data

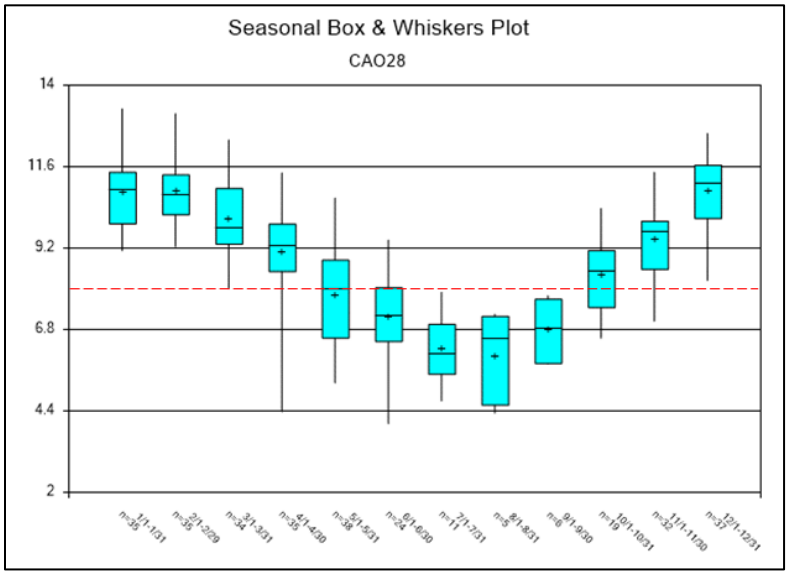
Site 28 is Brickyard Creek, after it has passed through northern Sedro-Woolley, just prior to entering Hart Slough, and eventually the Skagit River. This is an ephemeral creek that regularly dries up by the end of summer. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Due to the ephemeral nature of this creek, there were not enough data points collected to be sufficient for generating five-year monthly trends. No monthly trends for DO, temperature, or FC were observed across any of the time periods analyzed in this report.

Site 28 regularly fails to meet state standards for DO during the warmer months, but rarely fails state standards for water temperature. Annual FC levels for WY2020 easily passed state standards.

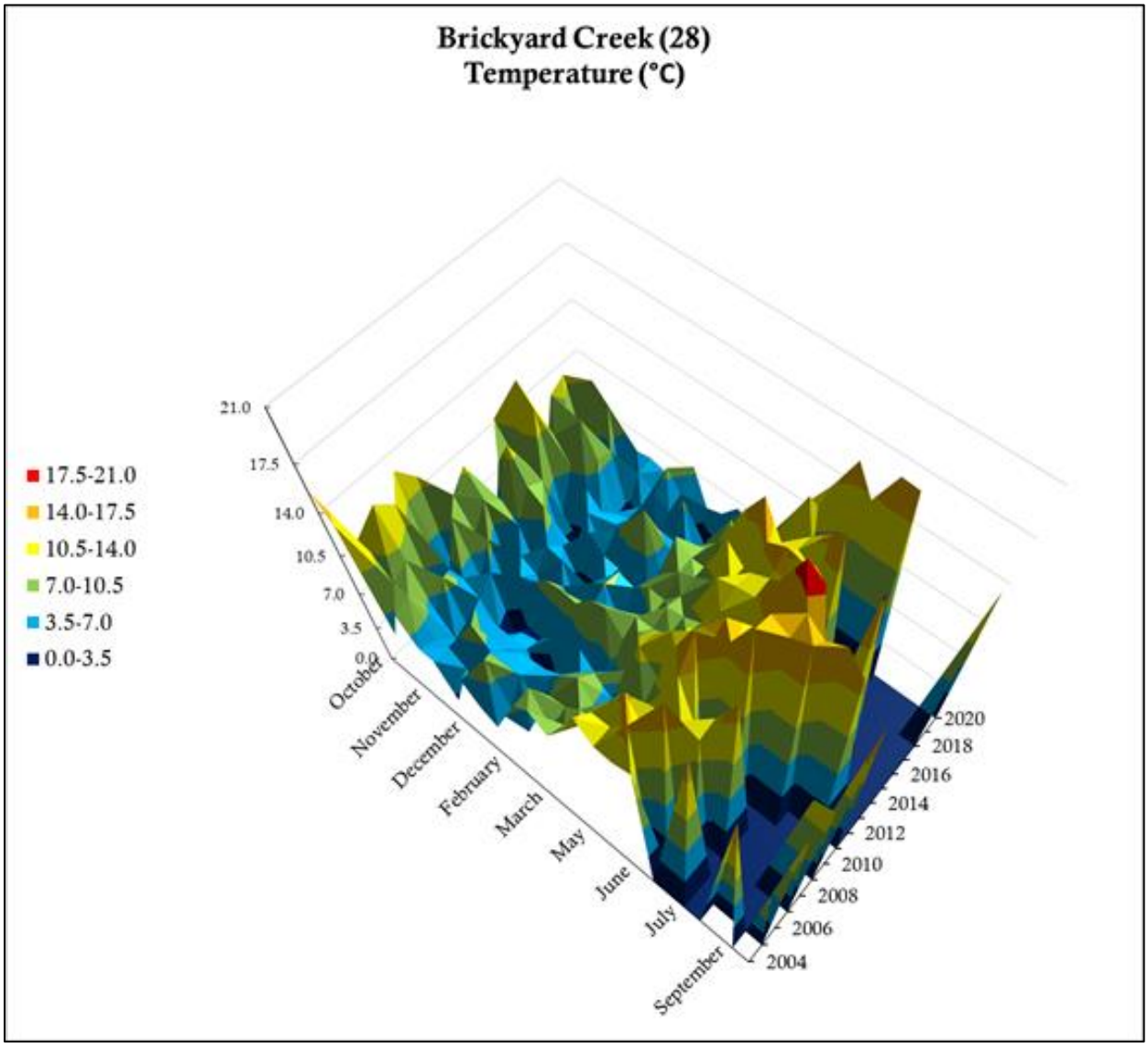
Site 28 is tied for last out of 39 sites for number of significant trends, with 6, and is 28th out of 39 sites for positive trends, with 50%.

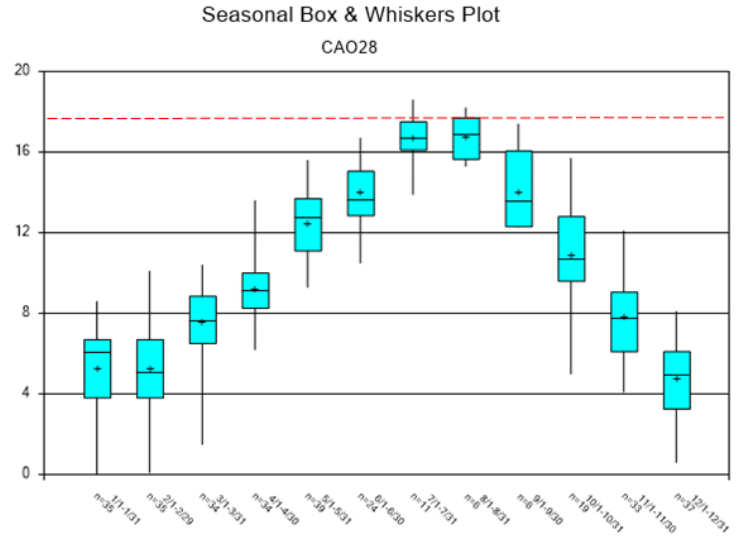




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

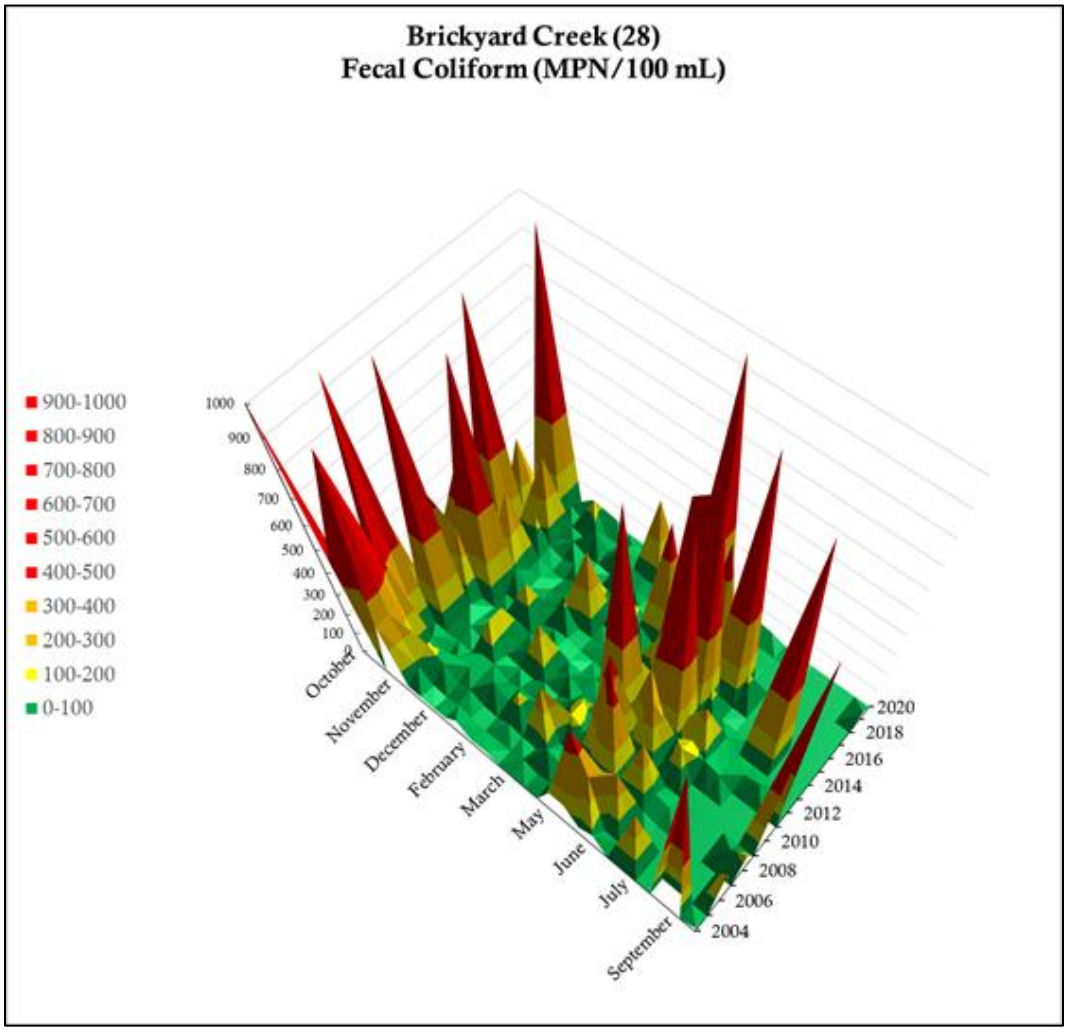
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

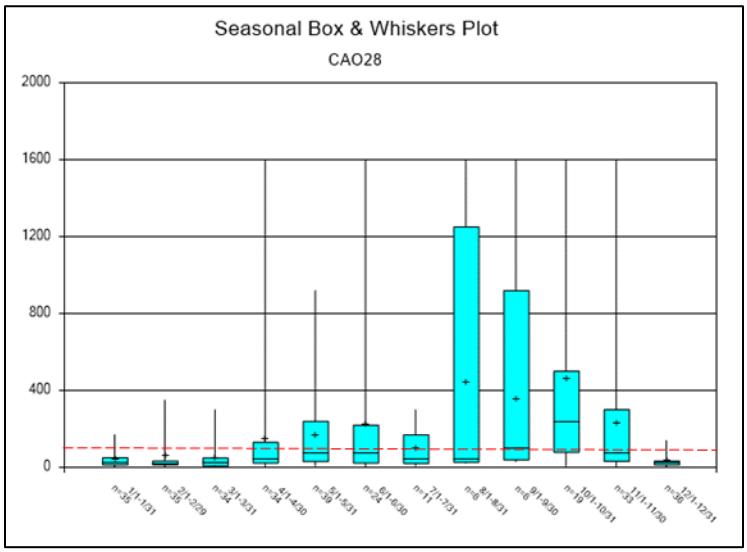




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

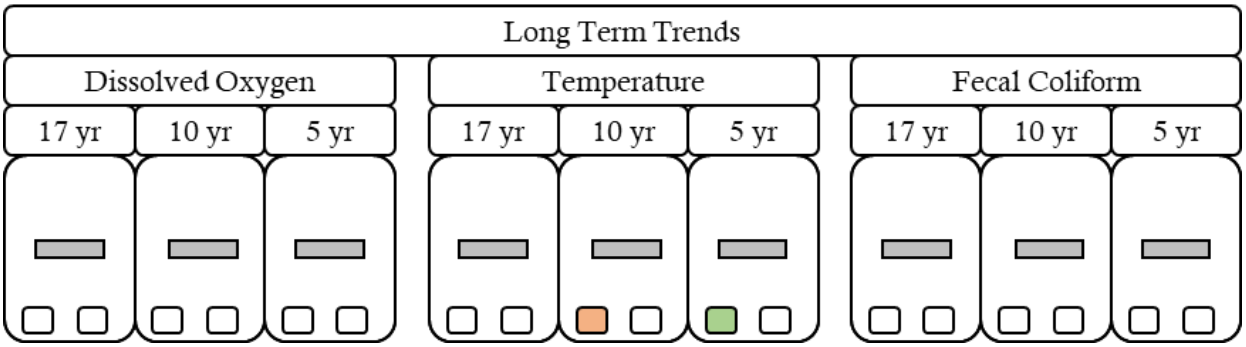
29

Skagit River
@ River Bend Road

Mainstem Skagit – Mid, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
76	63	82	94	92	86	82	87	94	93	93	85	92	81	82

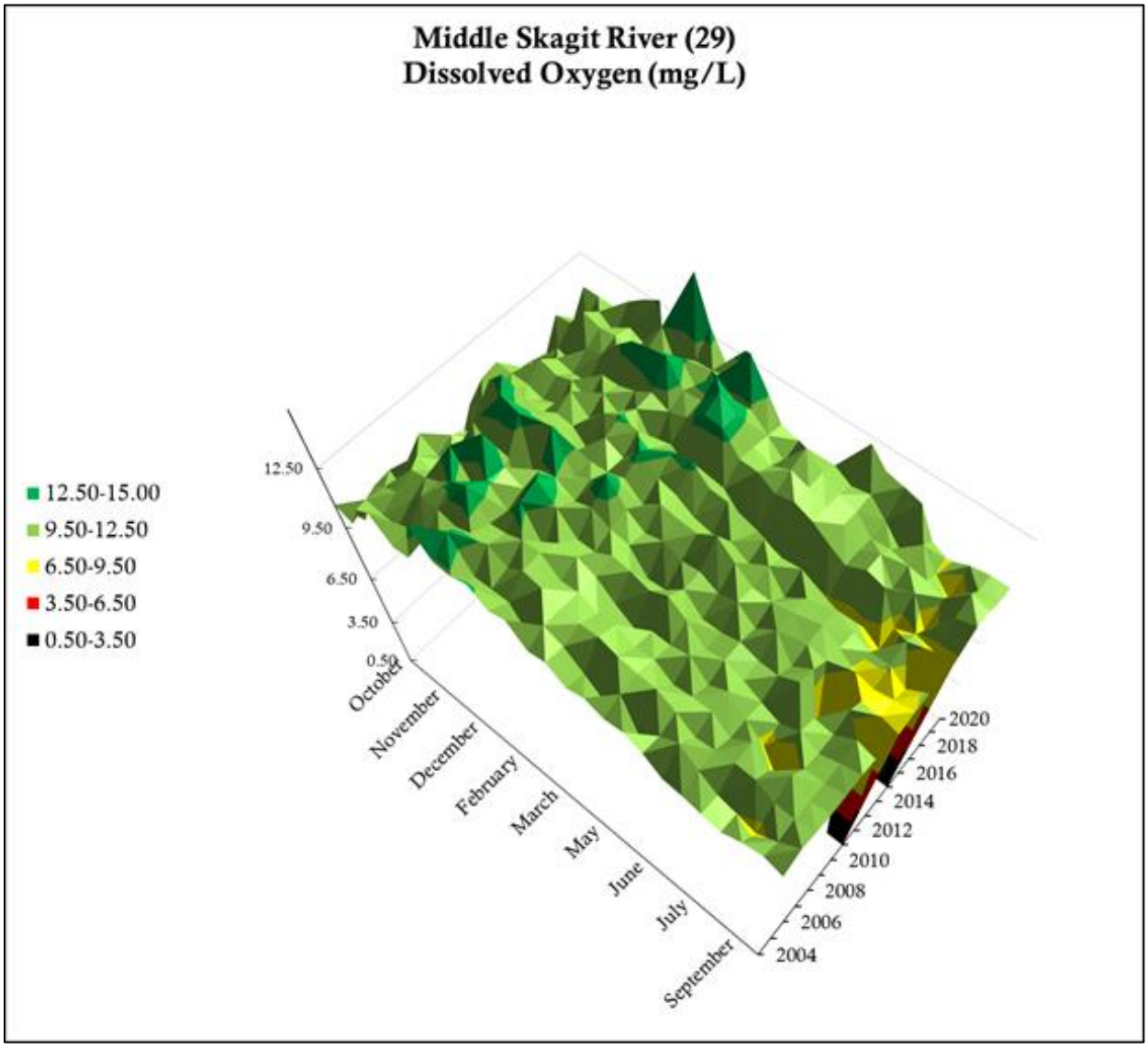


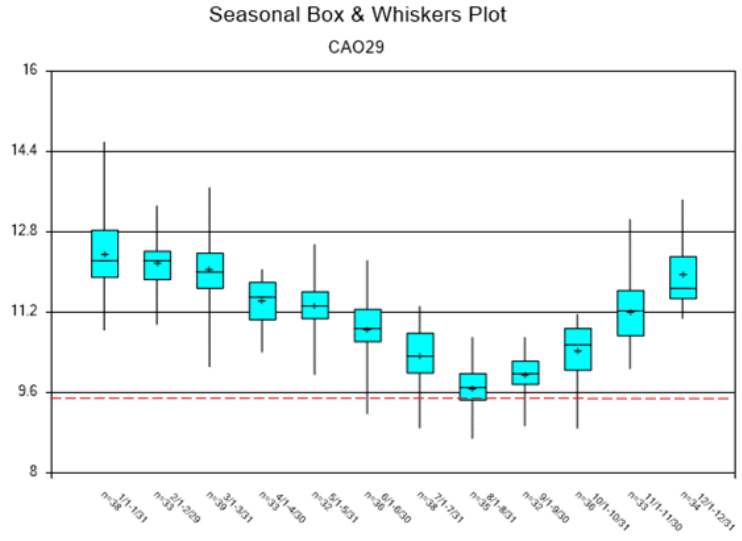
Site 29 is the Skagit River, after it intersects Burlington and Mount Vernon, and prior to the terminal fork. The river is designated as core salmonid habitat and as salmonid spawning, rearing, and migration (SRM) status.

No significant long term trends were observed in DO, temperature, or FC across all time periods measured. WQI scores are consistently in the category of least concern.

Site 29 rarely fails to meet state standards for DO and water temperature, and only ever at the warmest days of the year. Annual FC levels easily meet state standards.

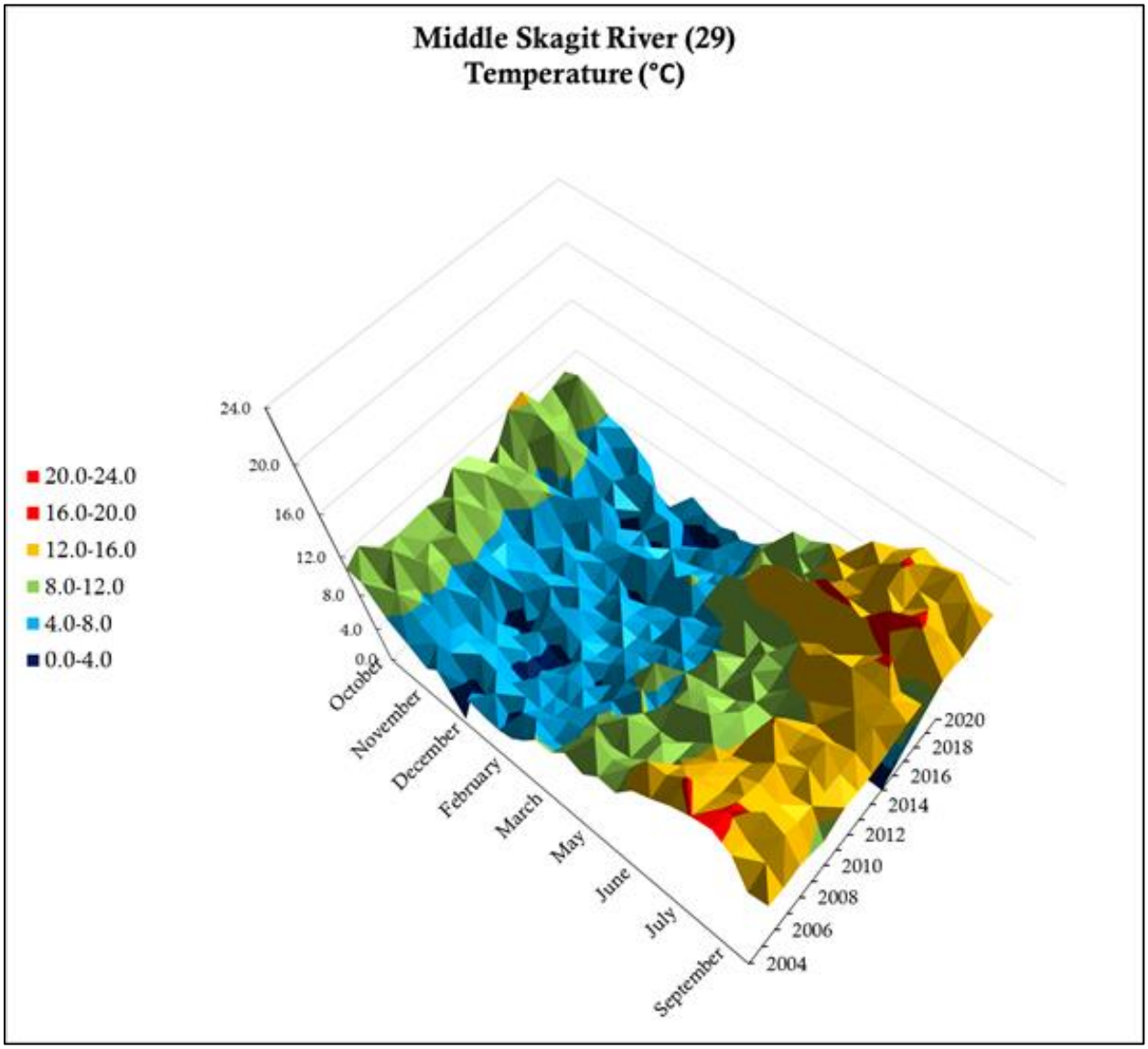
Site 29 is tied for last out of 39 sites for number of significant trends, with 6, and is tied for 14th out of 39 sites for positive trends, with 67%.

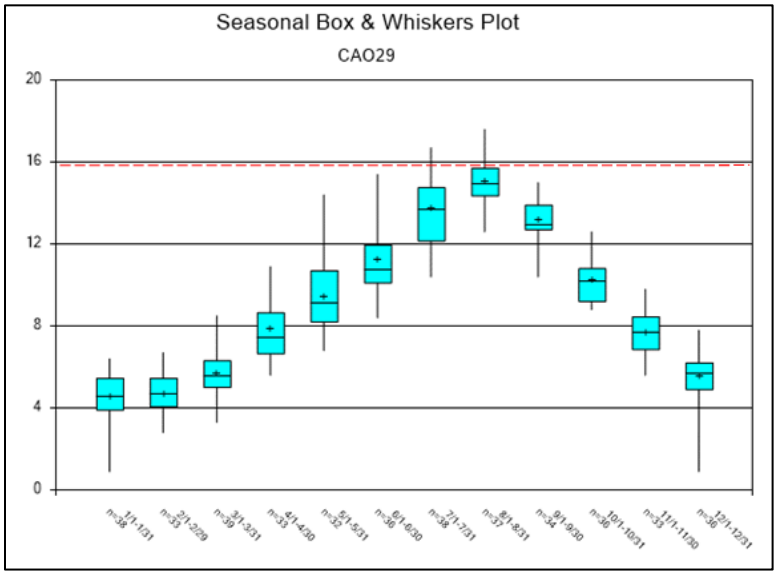




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

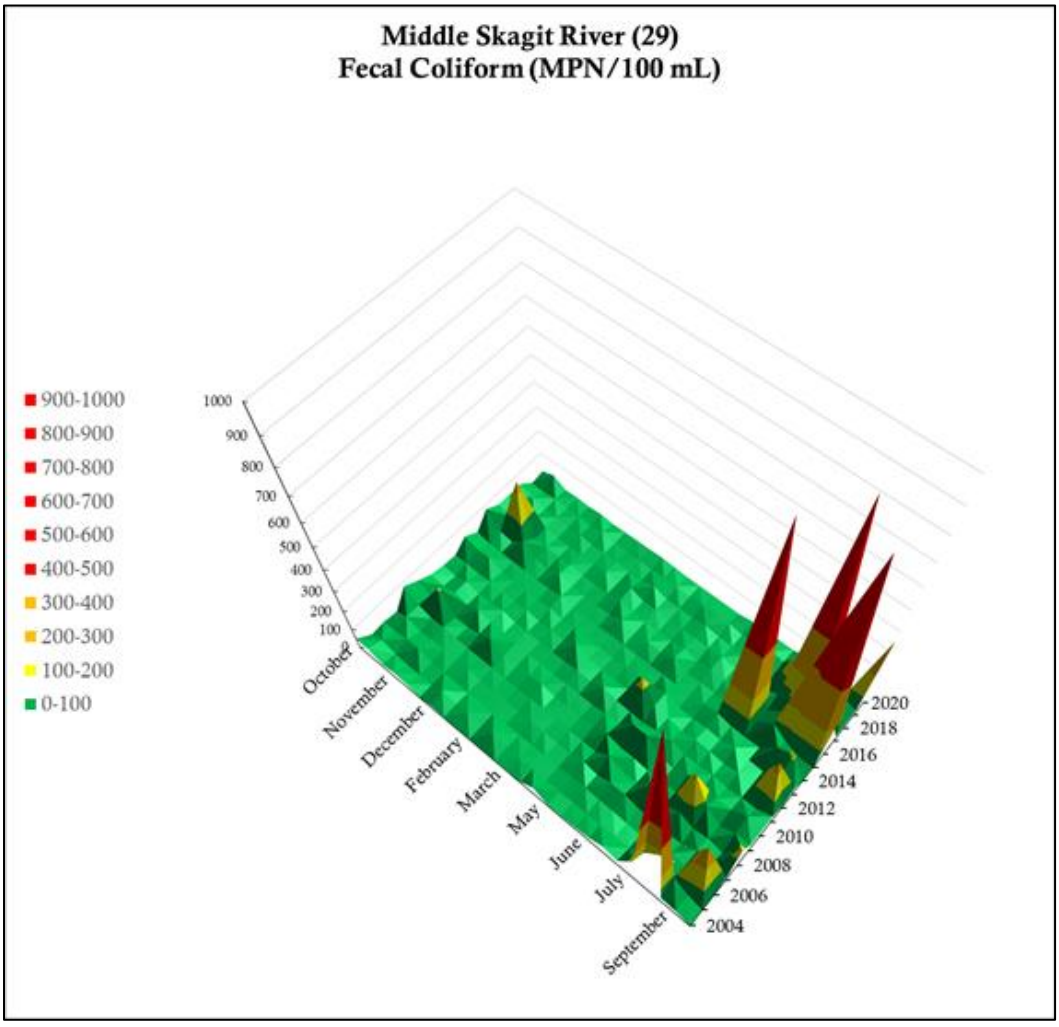
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

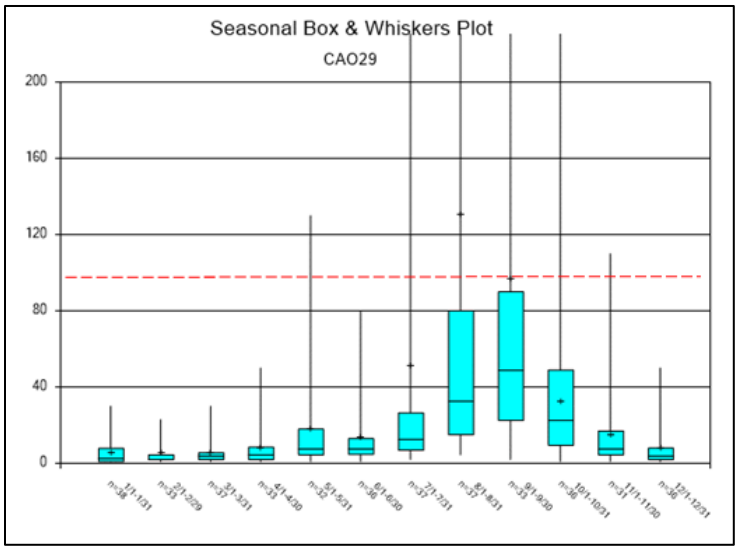




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

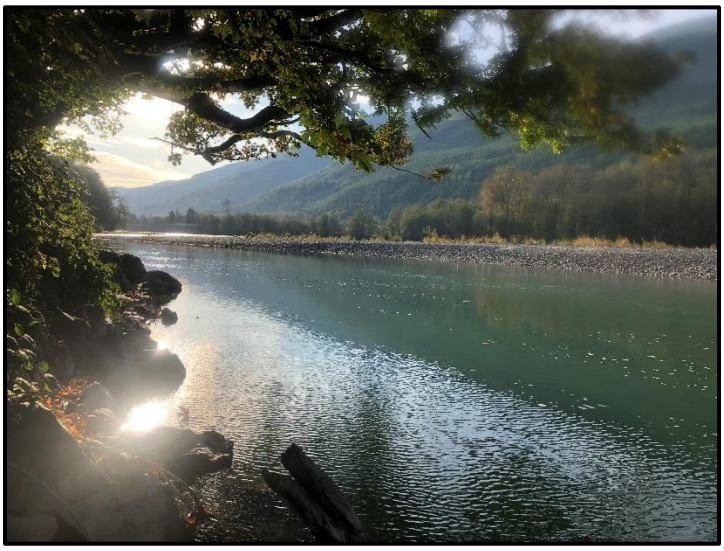
The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.



30

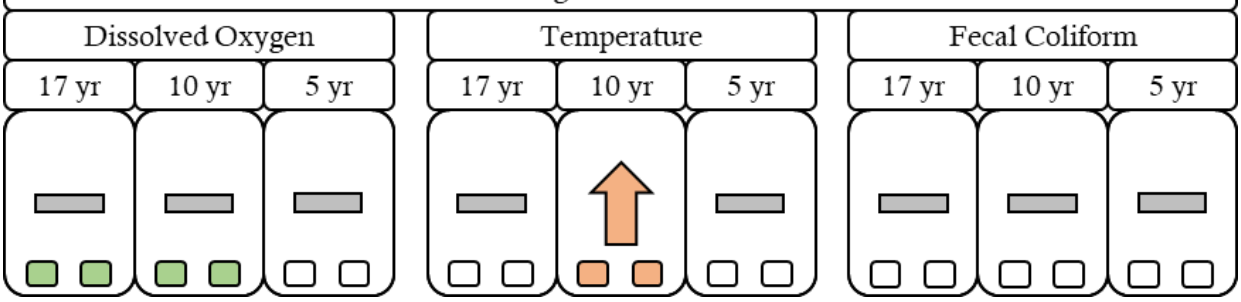
Skagit River
@ Cape Horn Road

Mainstem Skagit - Upper

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
66	78	85	89	93	90	90	94	90	85	92	88	96	93	84

Long Term Trends

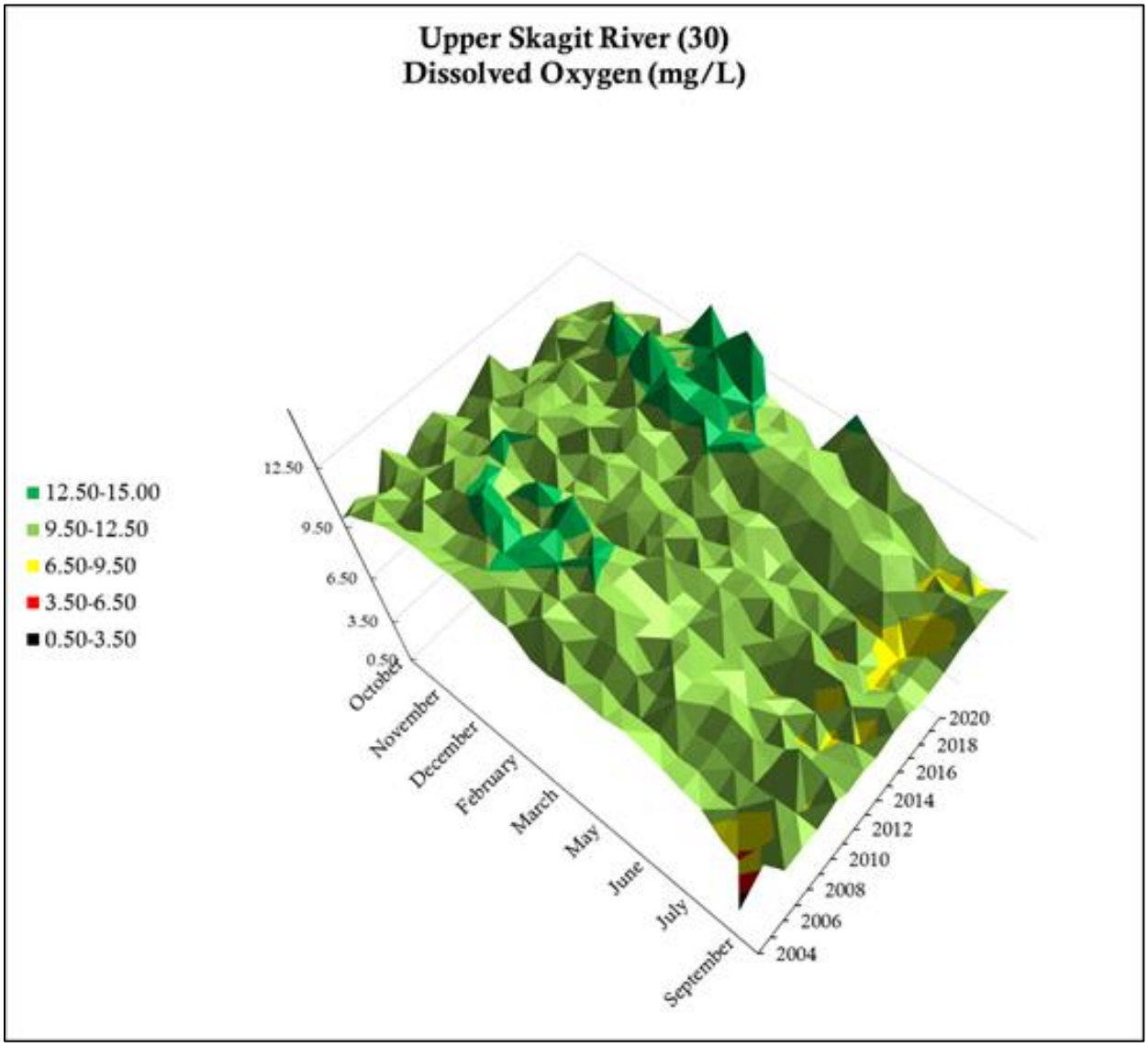


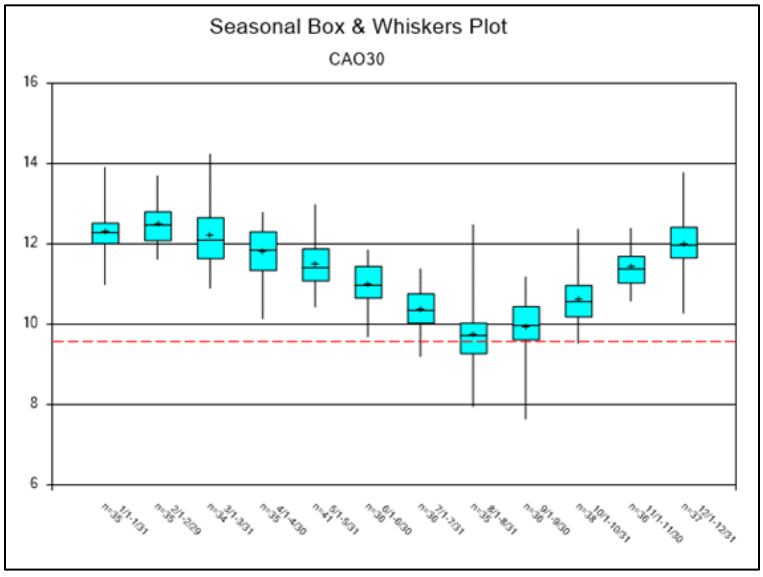
Site 30 is the Skagit River, at its furthest upstream sampling point for this program, east of Hamilton. The river is designated as core salmonid habitat.

Dissolved oxygen has nearly significantly increased over the last 17 years and ten years. Water temperature is warmer now than it was ten years ago. WQI scores are consistently in the category of least concern.

Site 30 rarely fails to meet state standards for DO and water temperature, and only ever at the very warmest days of the year. Annual FC levels easily meet state standards.

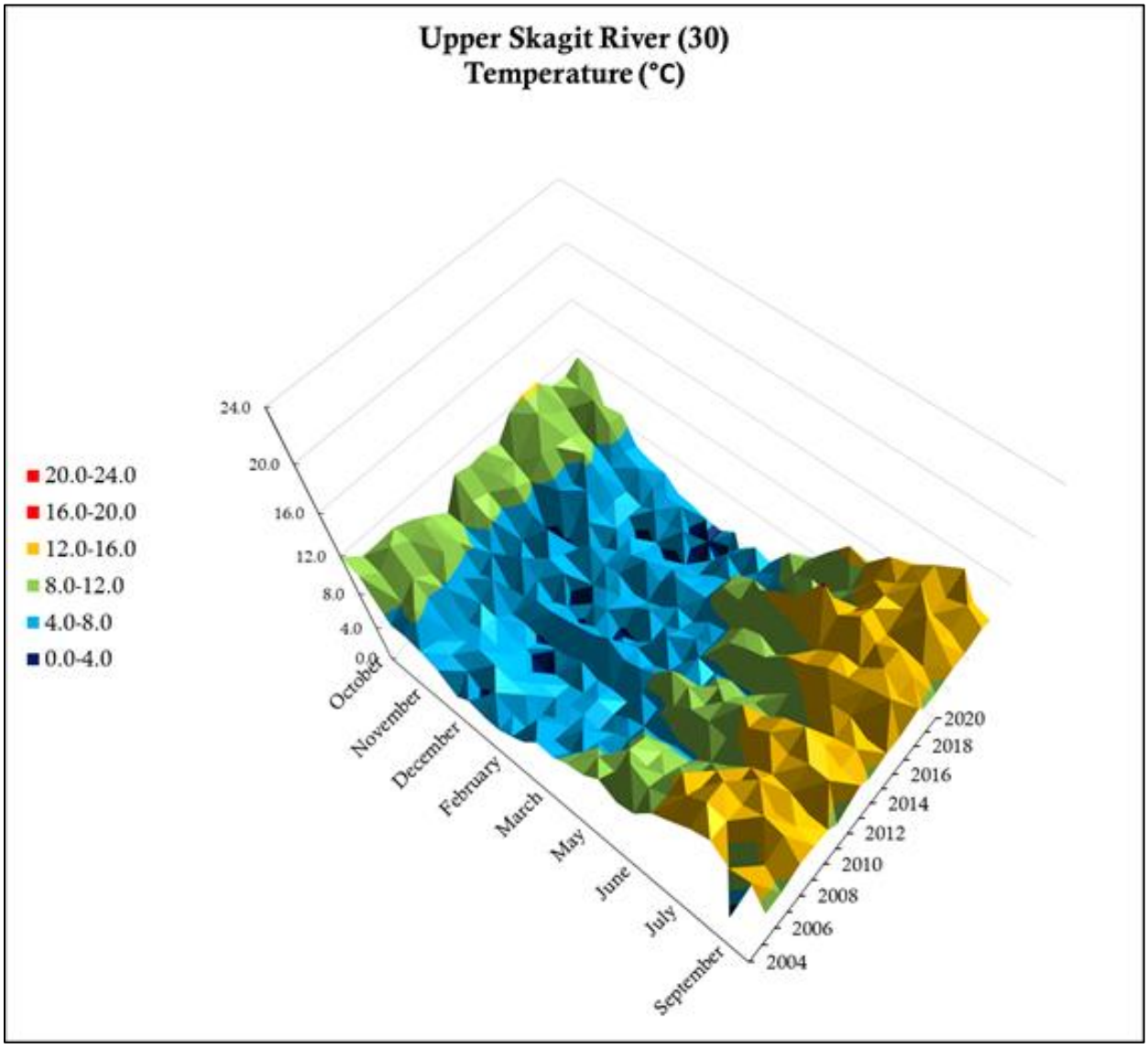
Site 30 is tied for 12th out of 39 sites for number of significant trends, with 13, and is tied for 18th out of 39 sites for positive trends, with 62%.

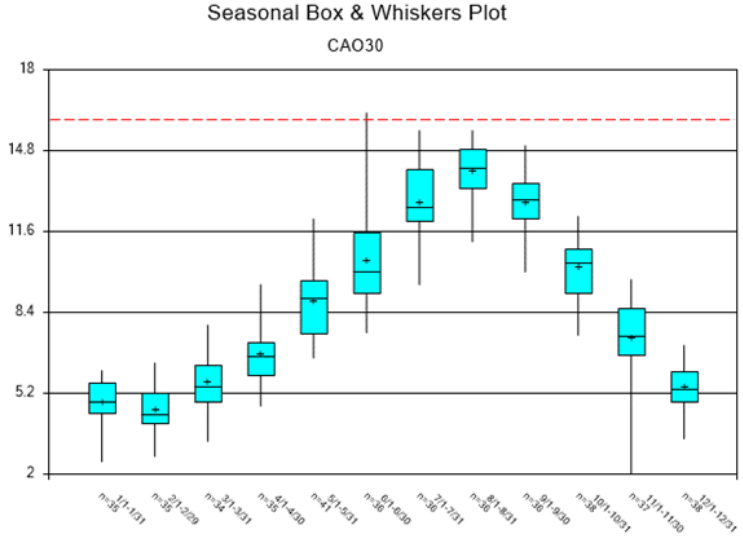




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

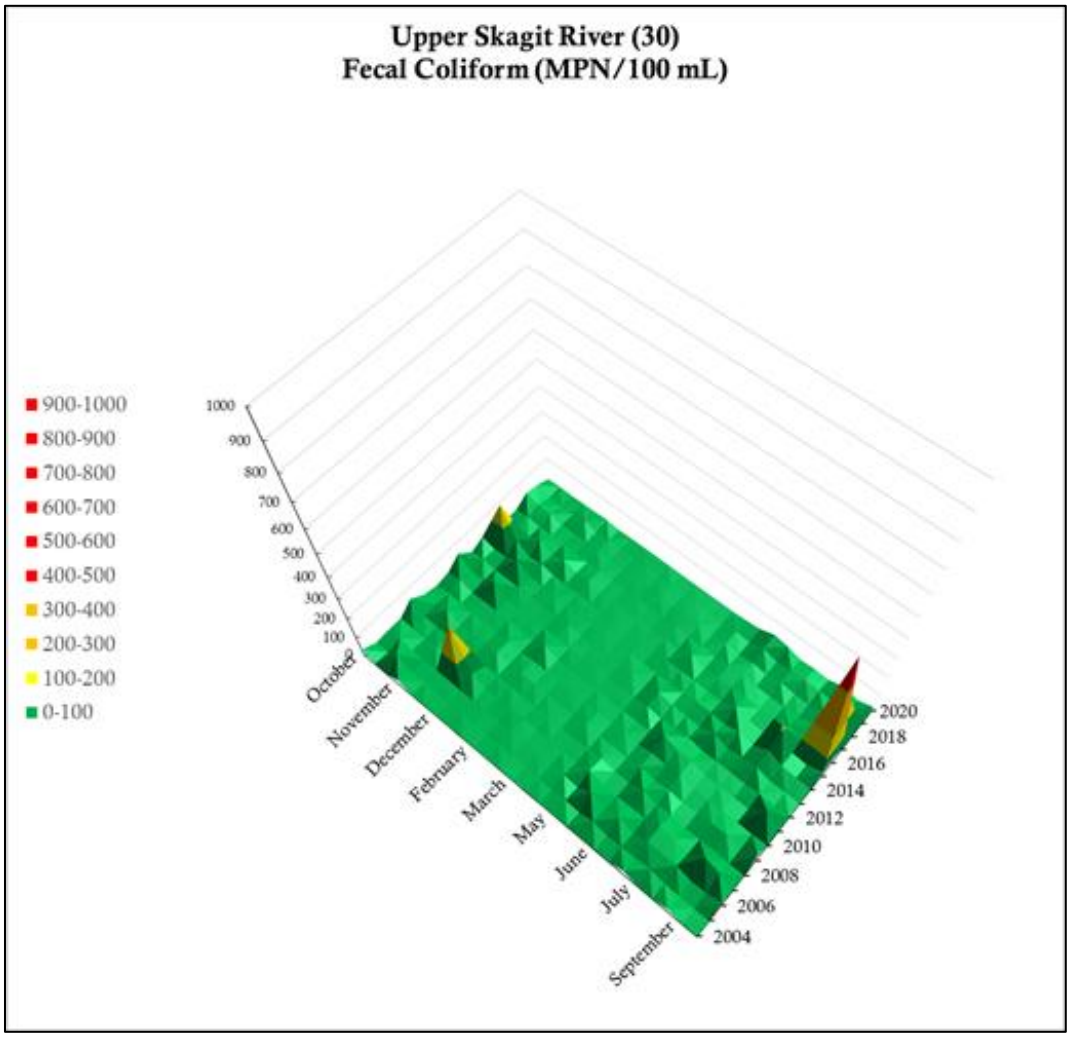
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

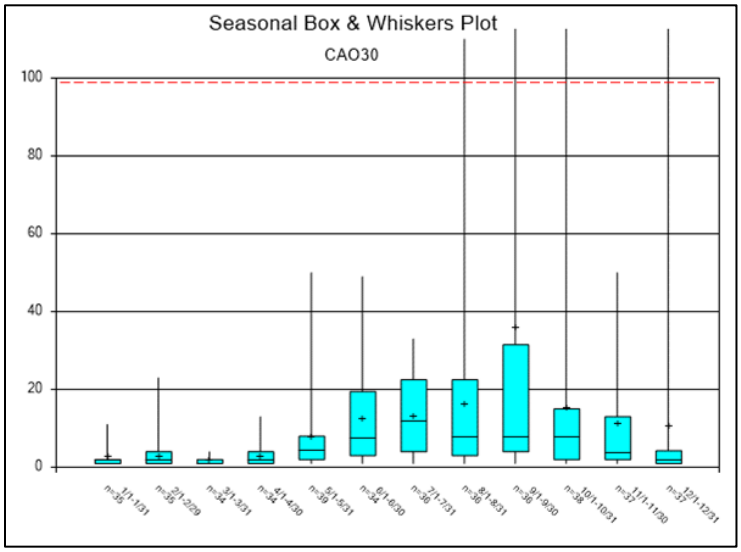




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





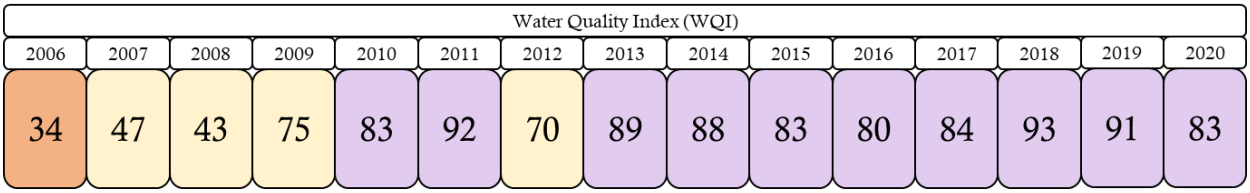
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

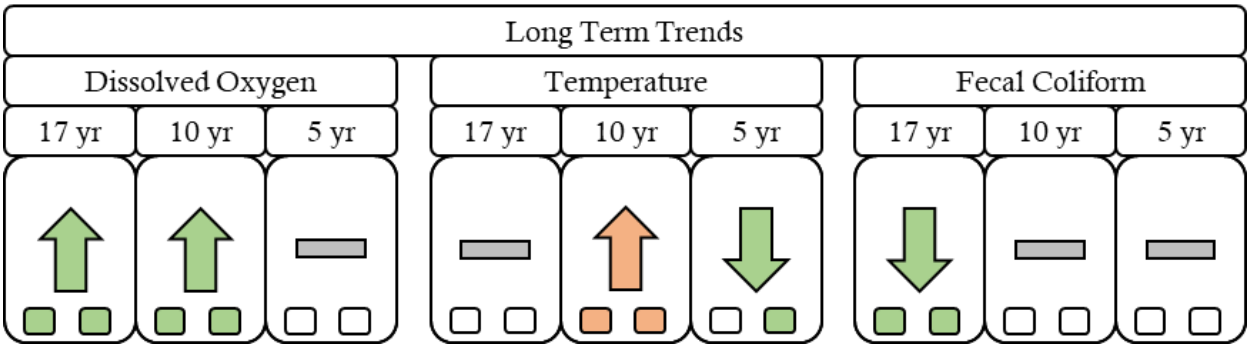
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

32

Samish River
@ Thomas Road

Downstream Ag



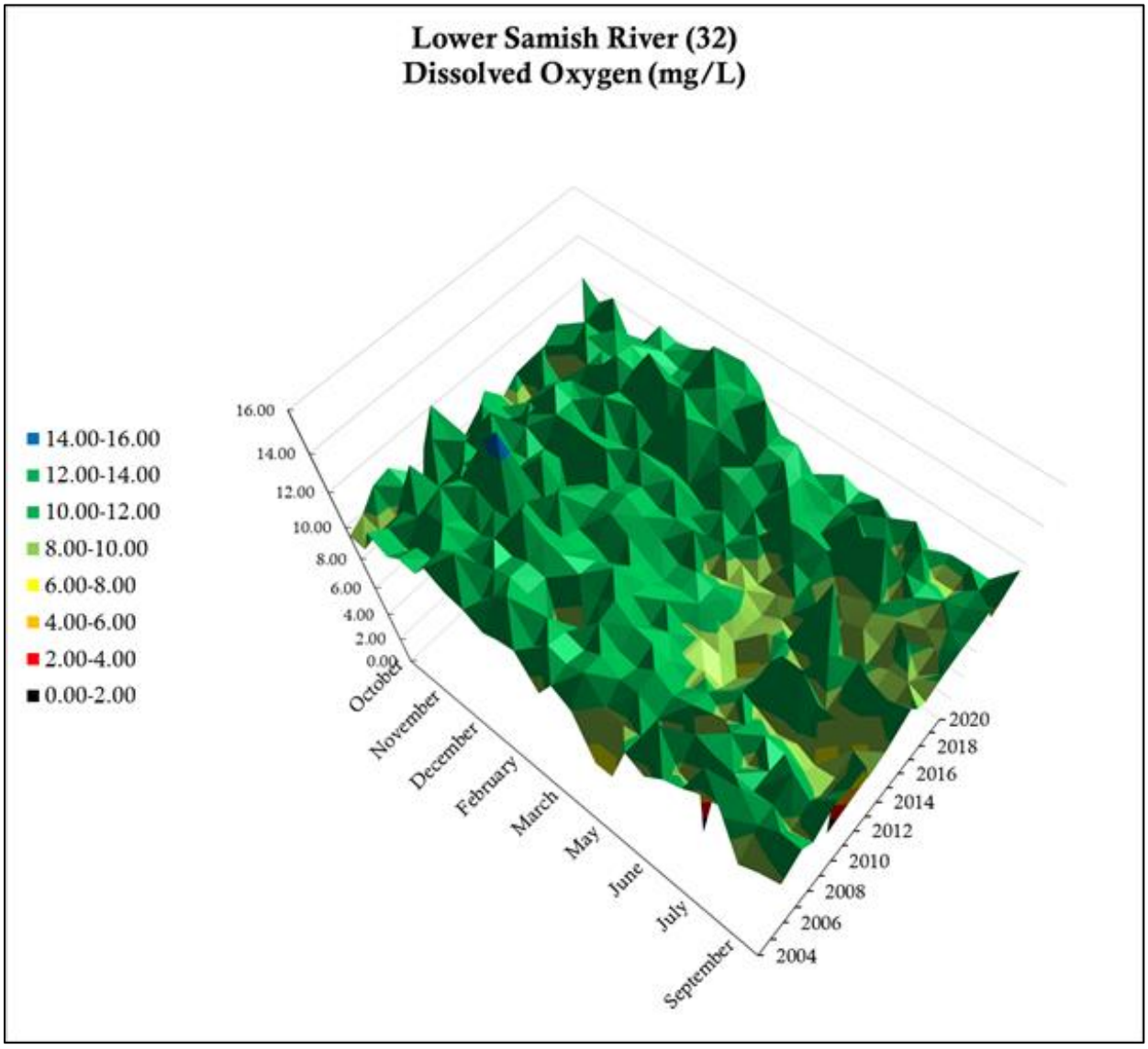


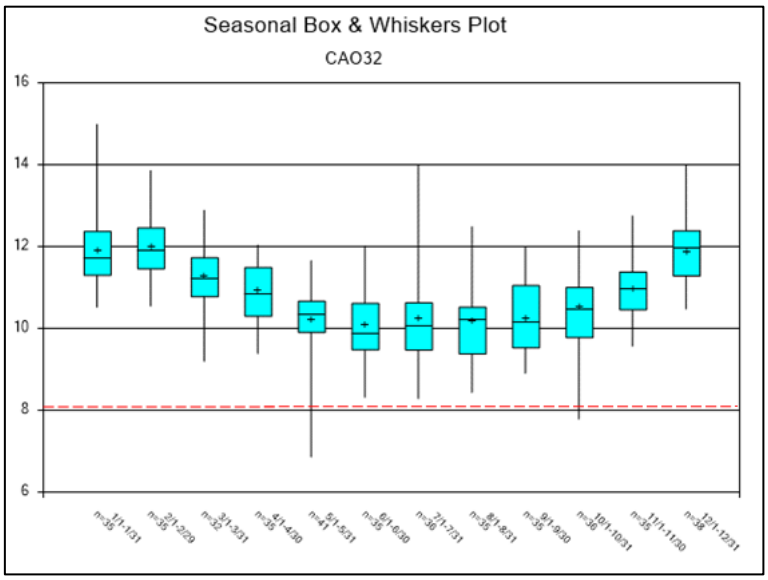
Site 32 is the Samish River, and is the last site that is sampled by this program prior to the river terminating in Samish Bay. The Samish River's watershed contains expansive agricultural activity. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen has increased over the last 17 and ten years. Water temperatures have increased since ten years ago, but have decreased in the most recent five years. Fecal coliform counts are lower now than they were when this program began. WQI Scores have improved over the length of this program and are now consistently in the category of least concern.

Site 32 almost never fails to meet state standards for DO, but typically exceeds state standards for water temperature during the warmer months of the year. Annual FC levels easily pass the state standard for geomean of 100, but fail the state standard for a 90th percentile of 200.

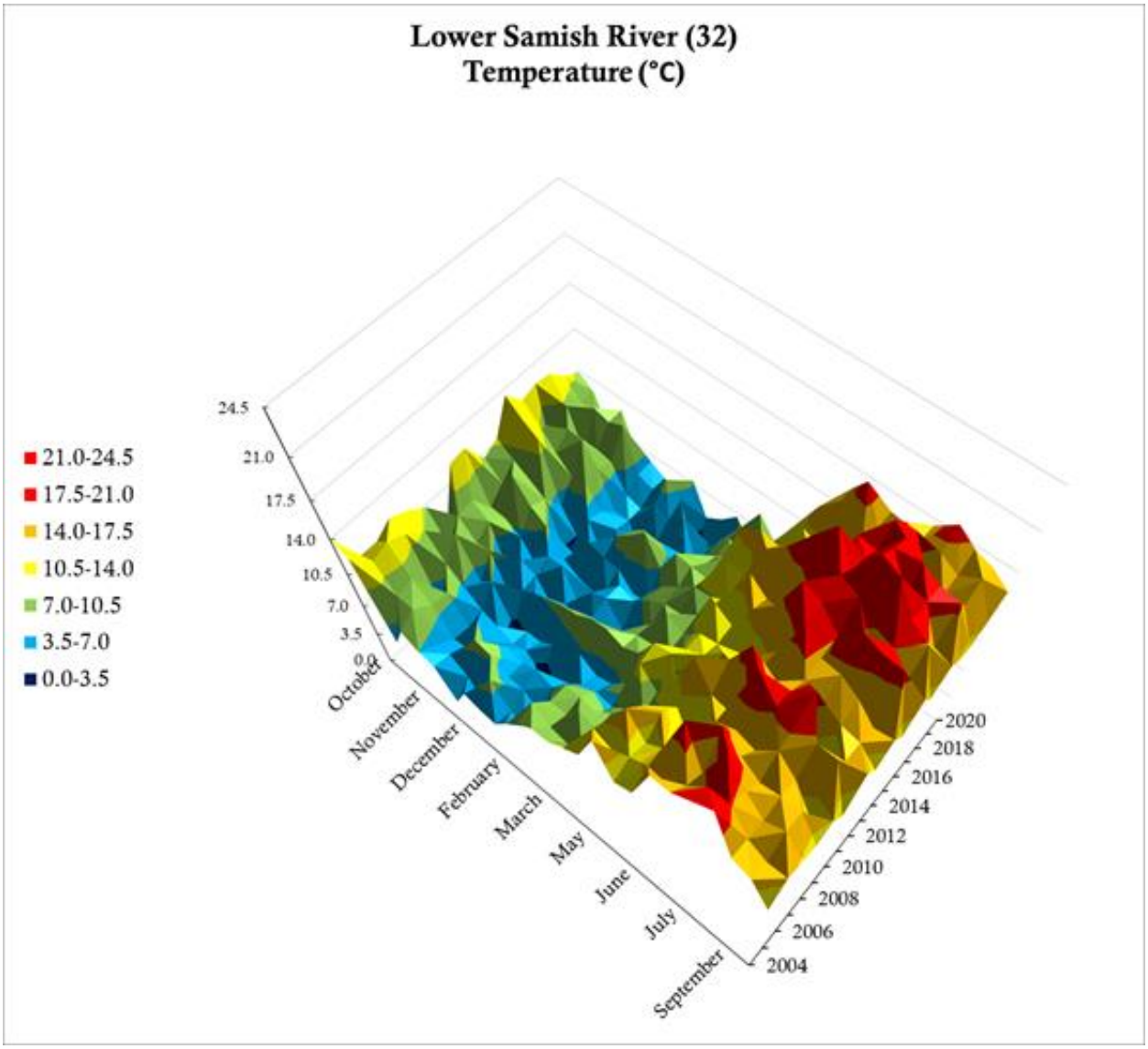
Site 32 is tied for 4th out of 39 sites for number of significant trends, with 18, and is 3rd out of 39 sites for positive trends, with 88%.

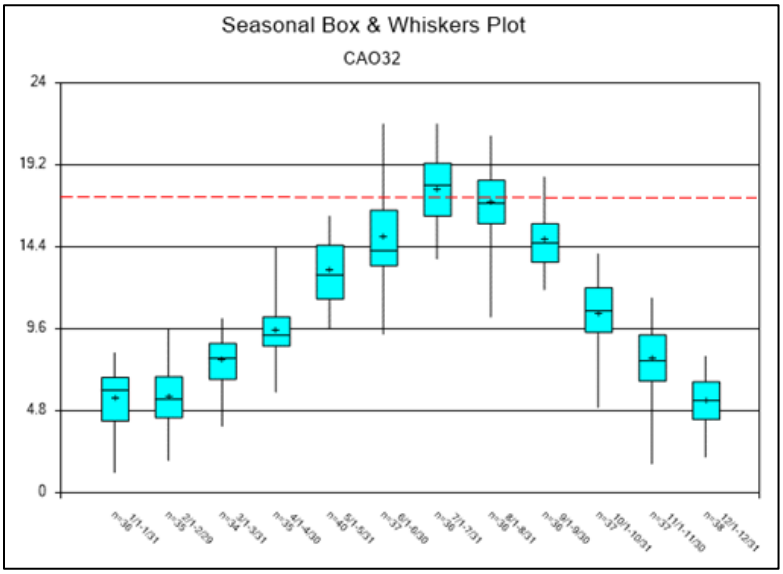




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

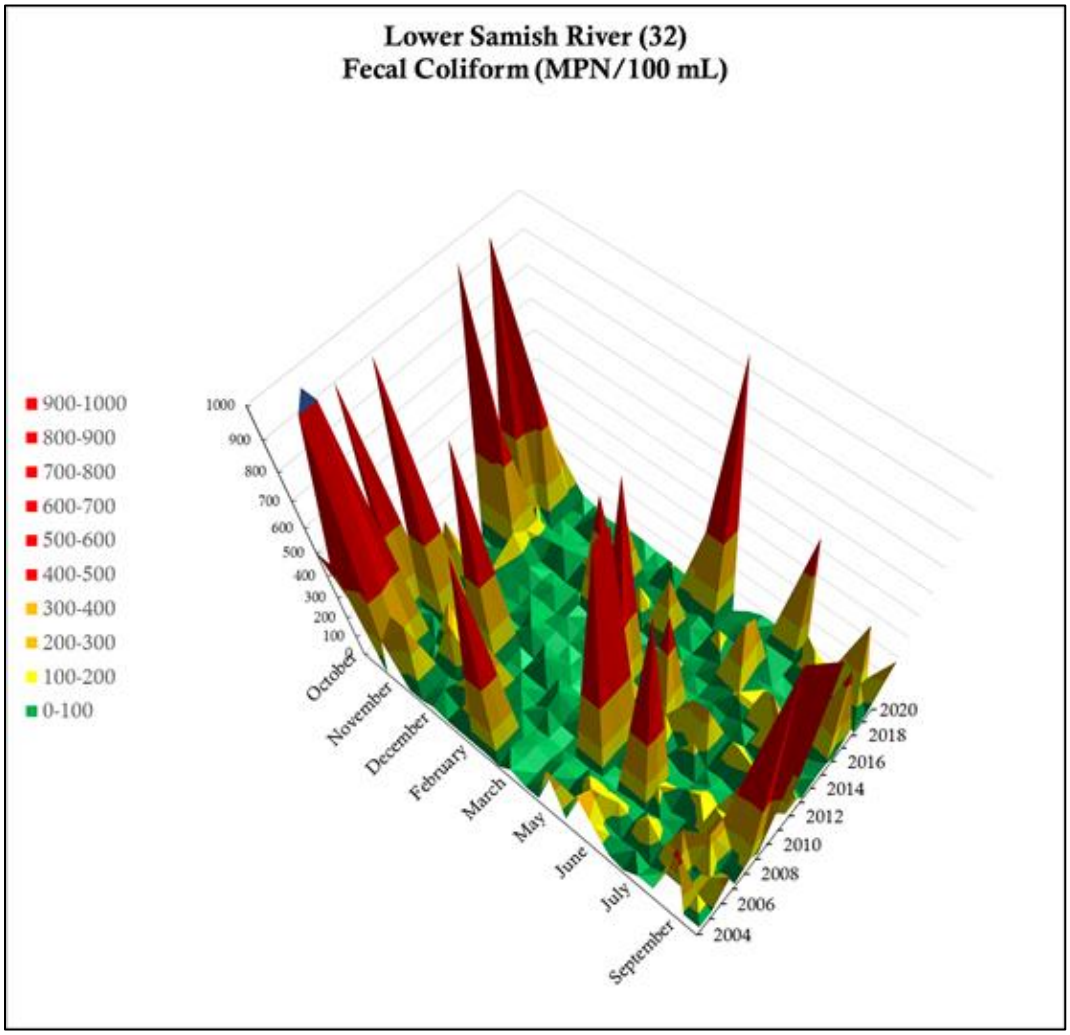
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

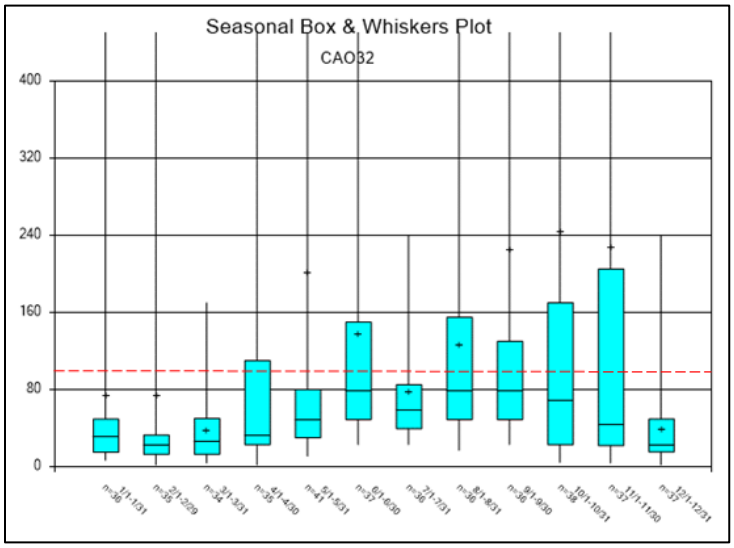




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





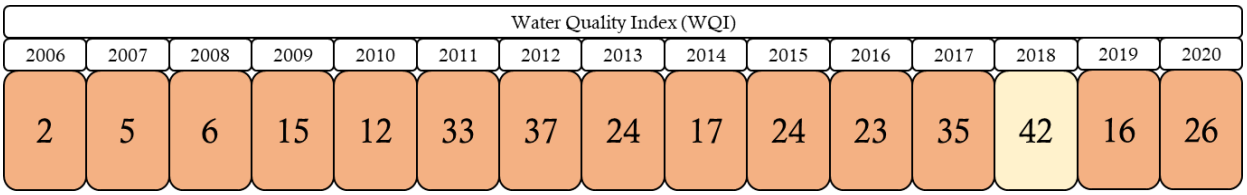
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

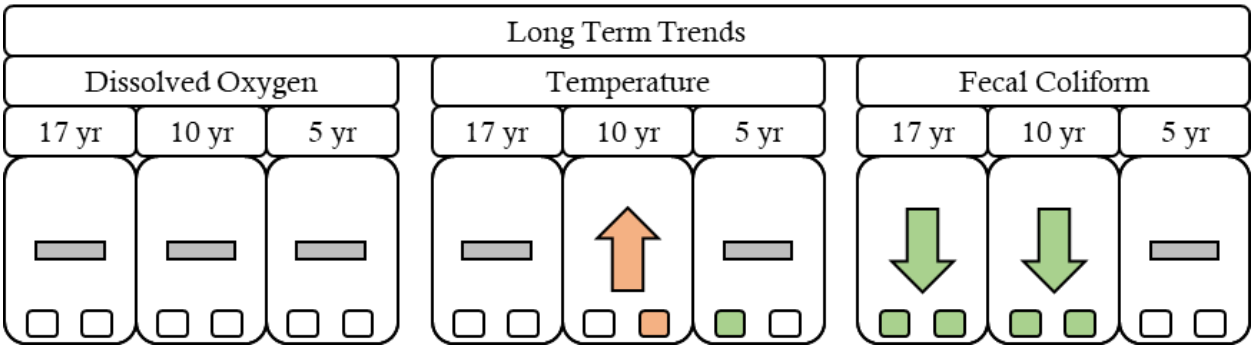
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

33

Alice Bay Pump Station
@ Samish Island Road

Downstream Ag



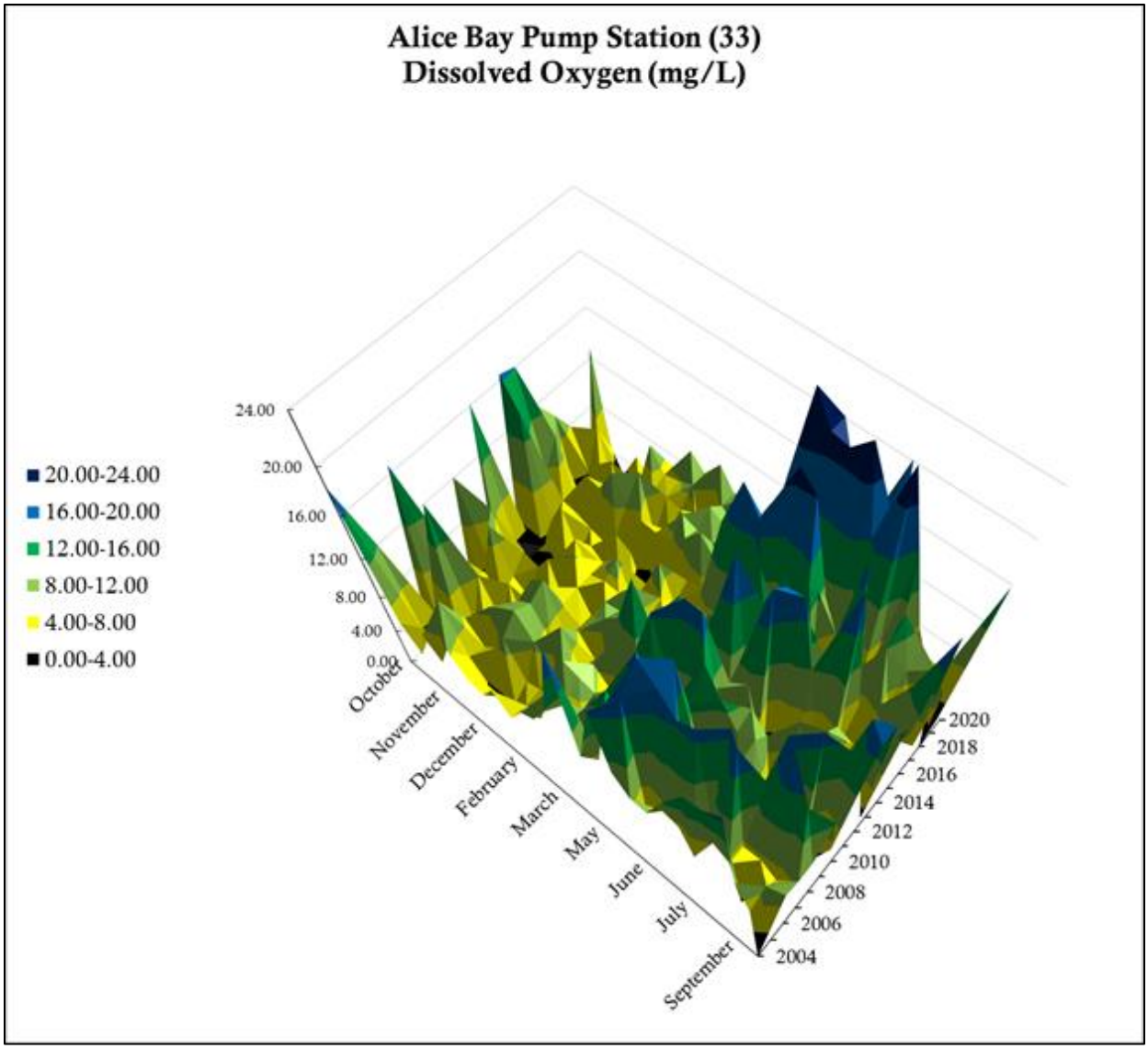


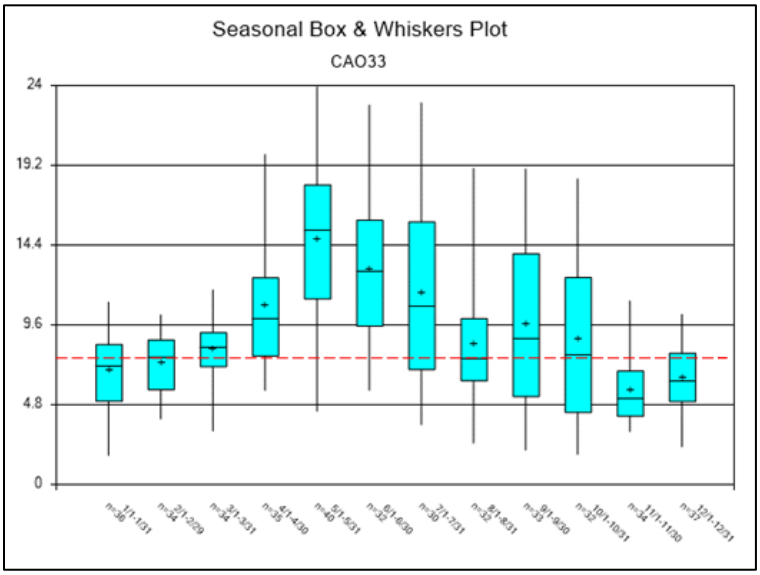
Site 33 is the pump station for the agricultural drainage ditches at Alice Bay, just to the west of the mouth of the Samish River. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

The water temperature has increased since ten years ago. Fecal coliform counts at this site have declined over the last 17 years and the last ten years. WQI scores are consistently in the category of highest concern.

Site 33 regularly fails to meet state standards for DO and water temperature. Annual FC levels pass the state standard for geomean of 100, but narrowly fail the state standard for a 90th percentile of 200.

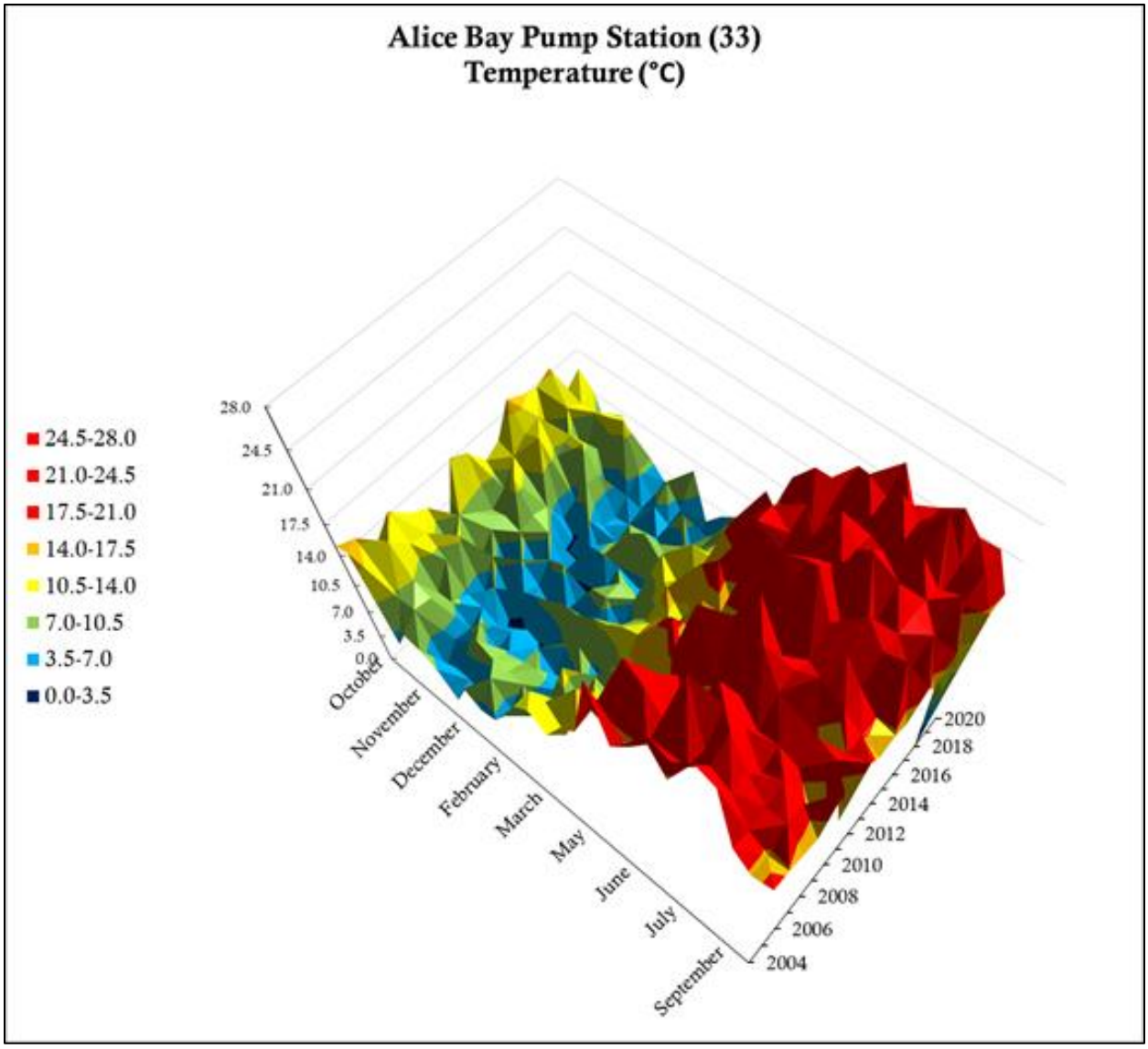
Site 33 is tied for 20th out of 39 sites for number of significant trends, with 12, and is tied for 14th out of 39 sites for positive trends, with 67%.

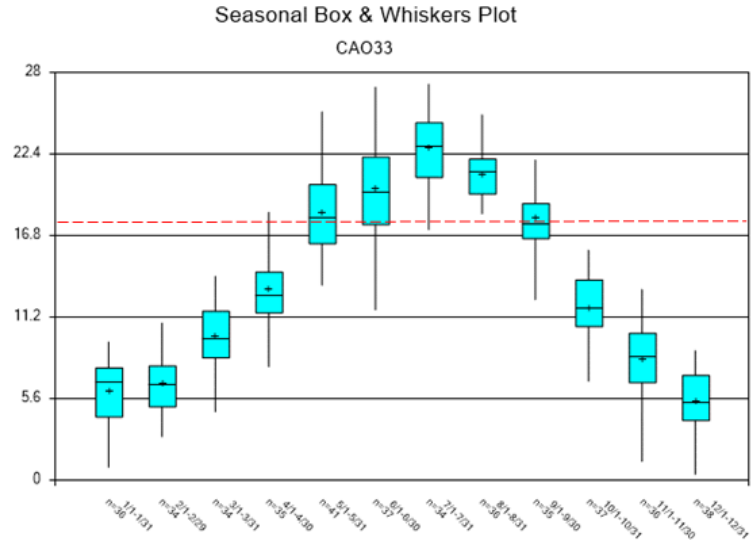




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

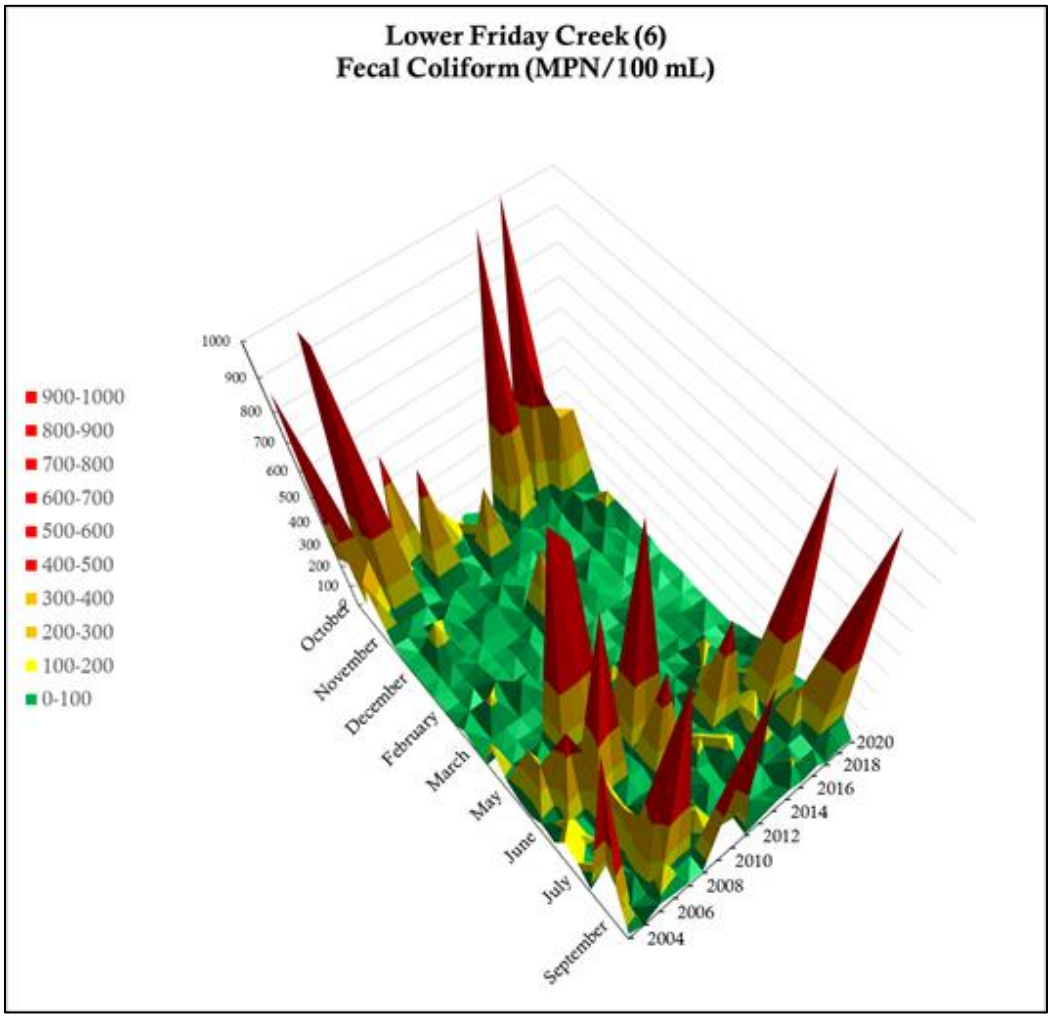
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

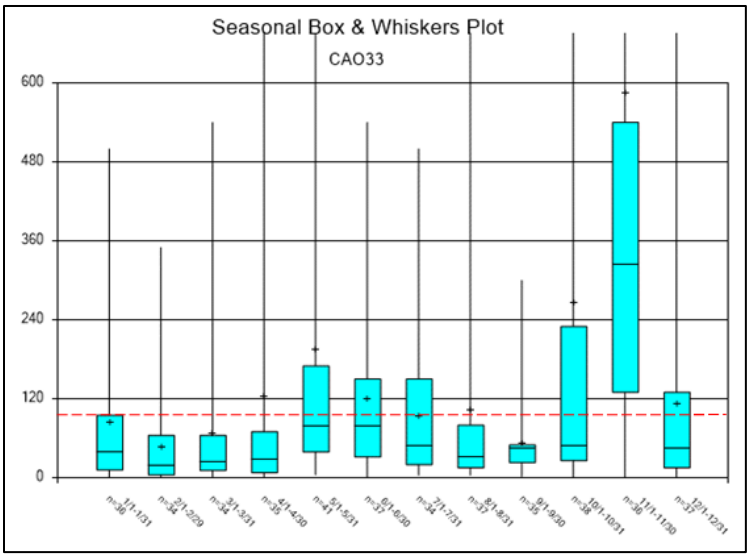




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





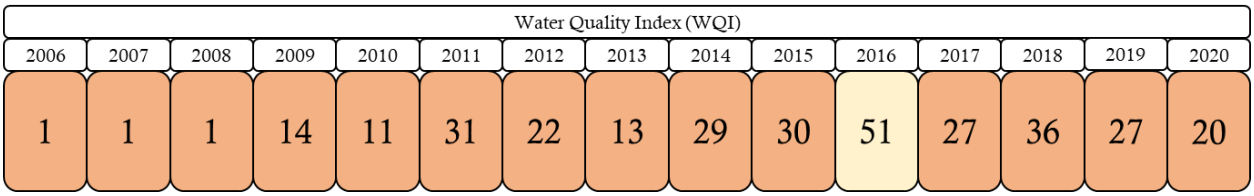
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

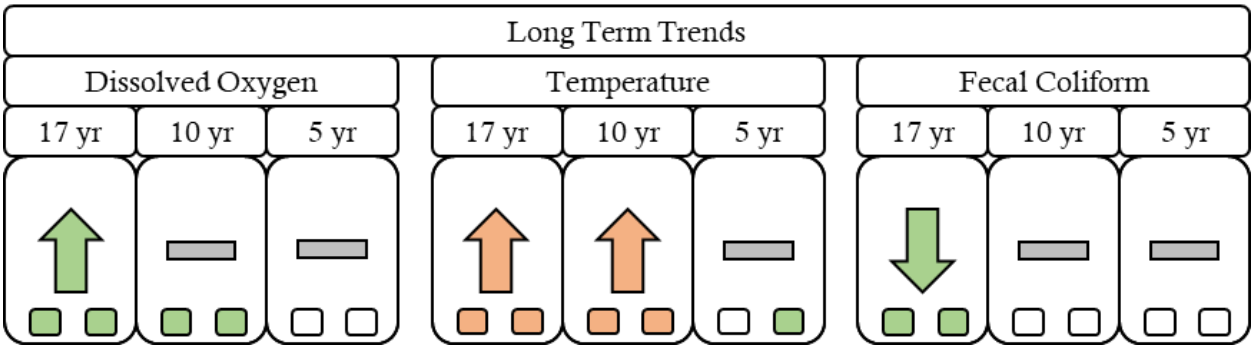
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

34

No Name Slough
@ Bayview-Edison Road

Downstream Ag



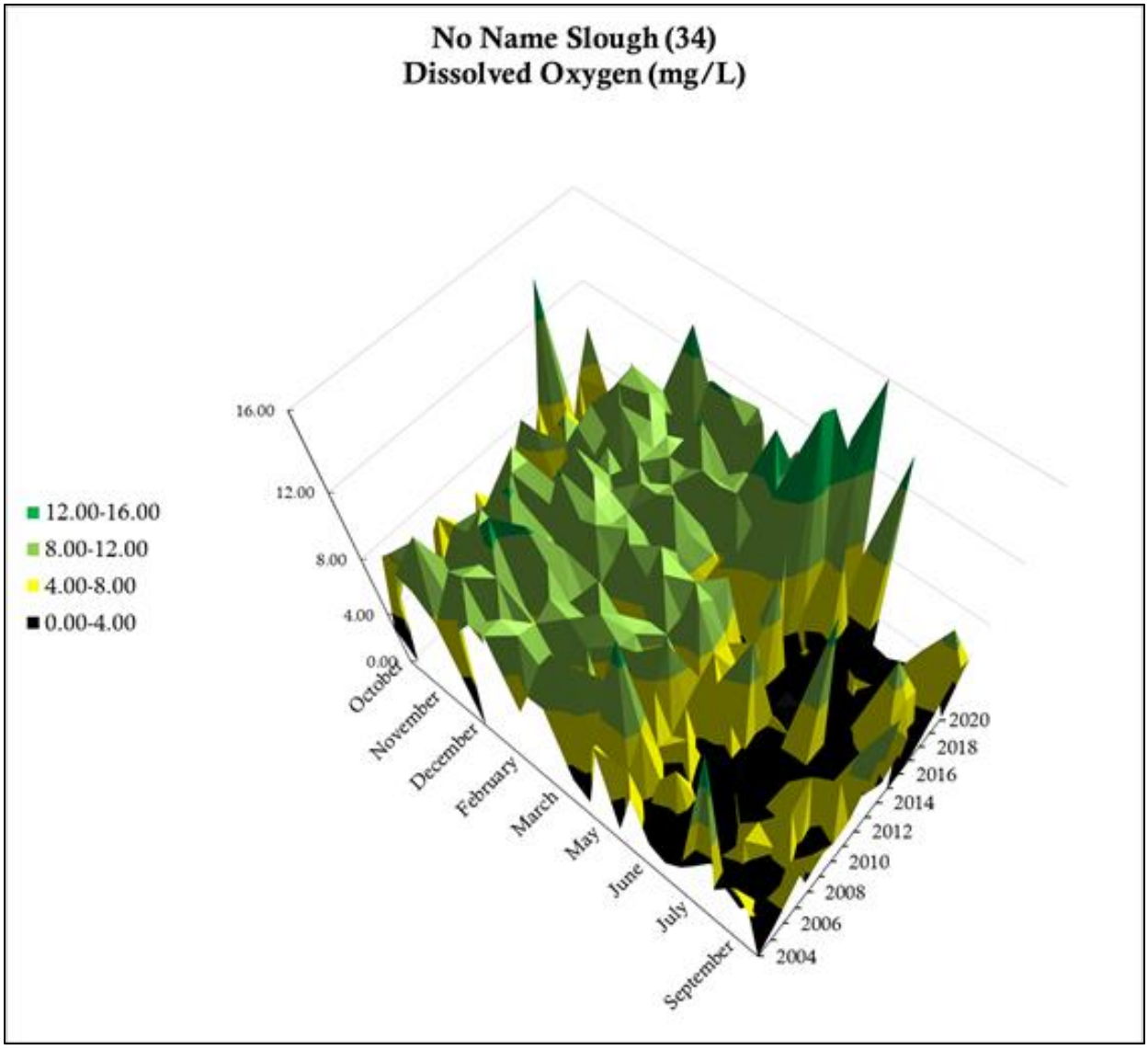


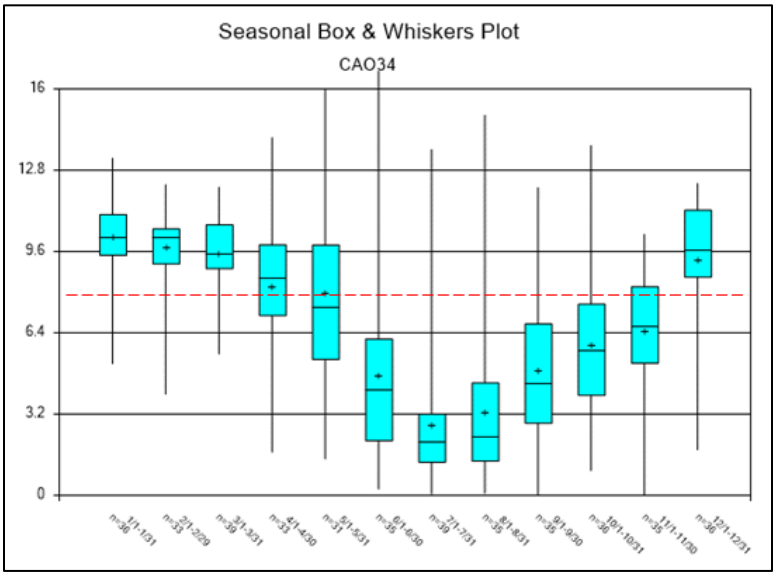
Site 34 is No Name Slough, west of the Skagit Regional Airport, and just prior to terminating in Padilla Bay. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen has increased since this program began 17 years ago. Water temperatures are warmer now than they were at the beginning of the program and 10 years ago. Fecal coliform counts are lower than they were at the beginning of this program 17 years ago.

Site 34 regularly fails to meet state standards for DO and water temperature. Annual FC levels narrowly pass the state standard for geomean of 100, but strongly fail the state standard for a 90th percentile of 200.

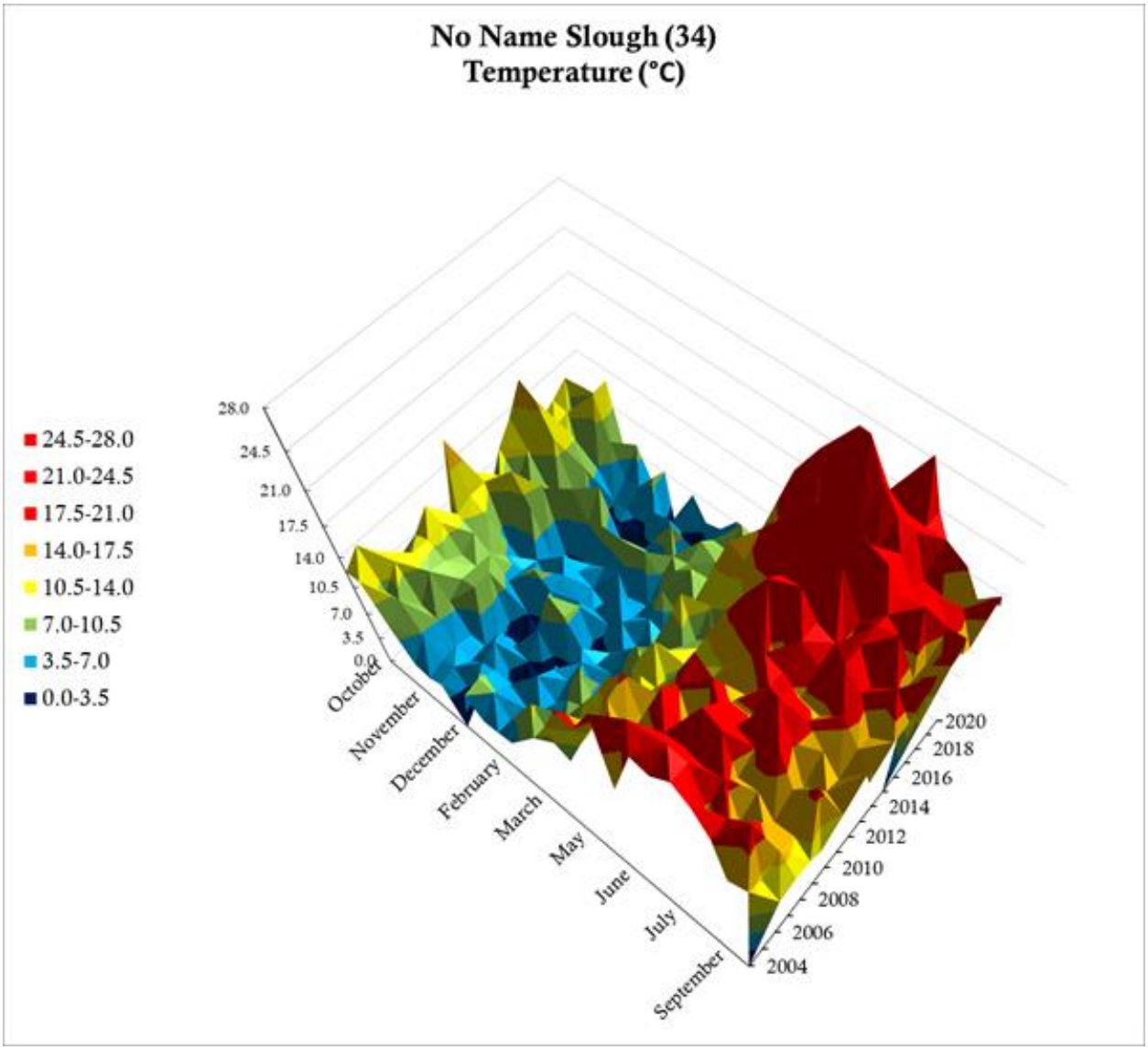
Site 34 is 1st out of 39 sites for number of significant trends, with 19, and is tied for 20th out of 39 sites for positive trends, with 58%.

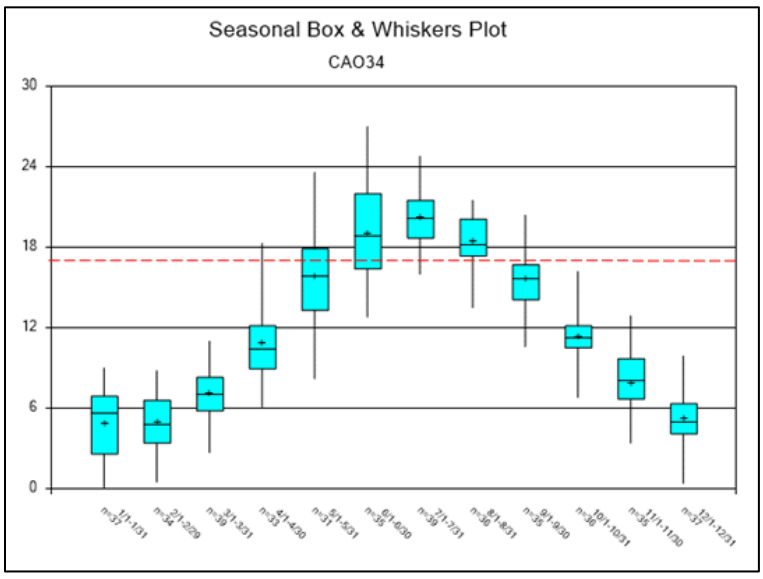




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

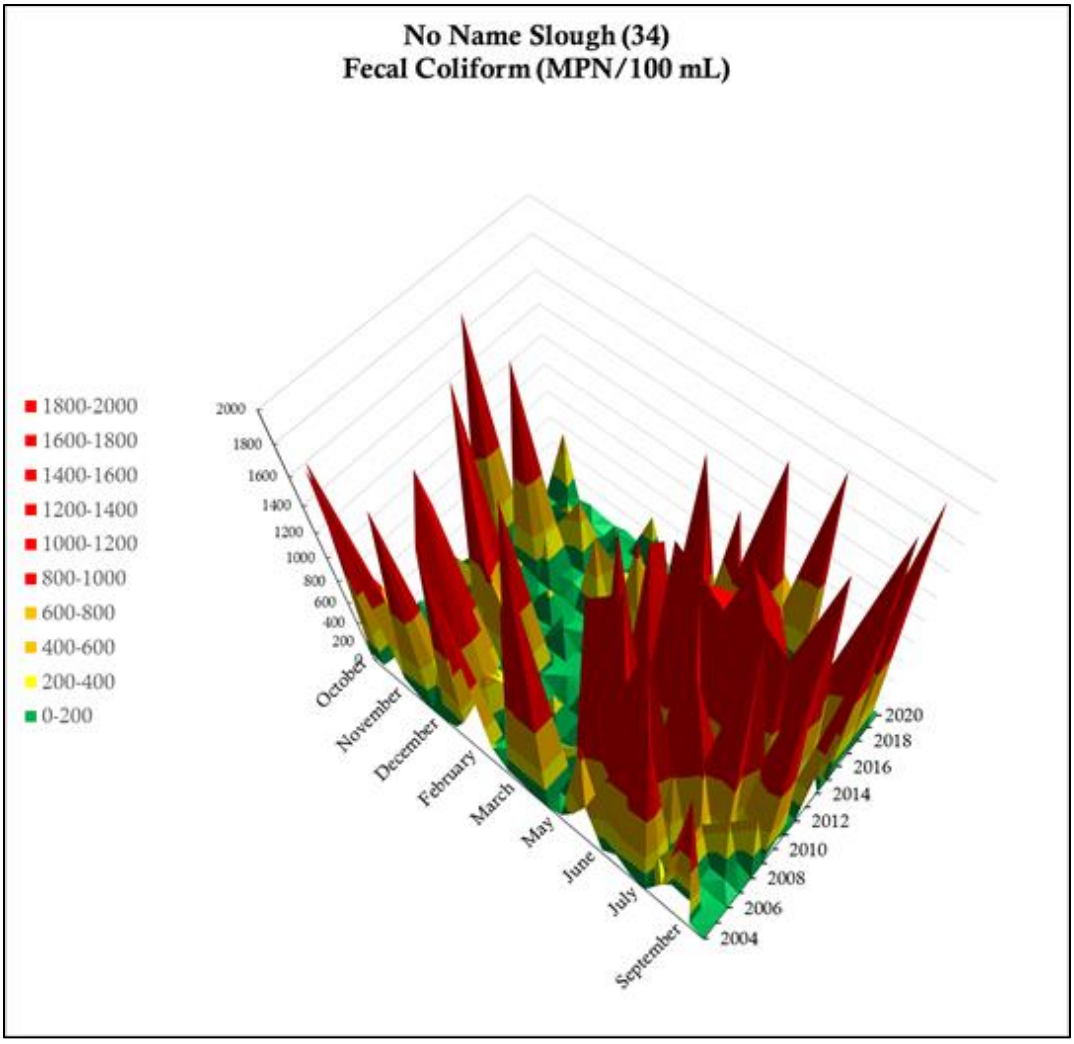
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

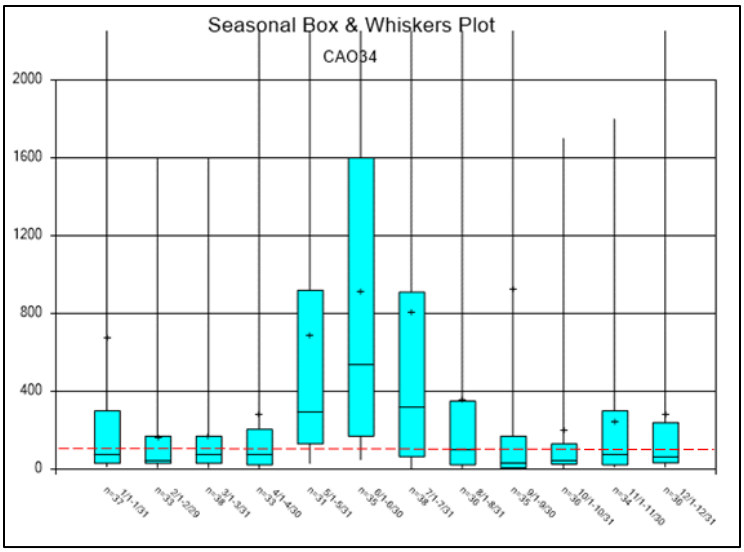




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green almost meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

35

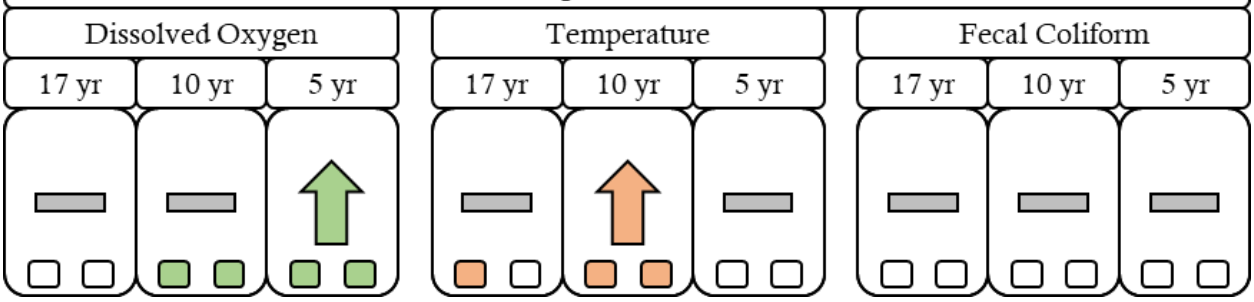
Joe Leary Slough
@ D'Arcy Road

Downstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	1	6	15	9	24	22	14	8	15	13	24	5	15	29

Long Term Trends

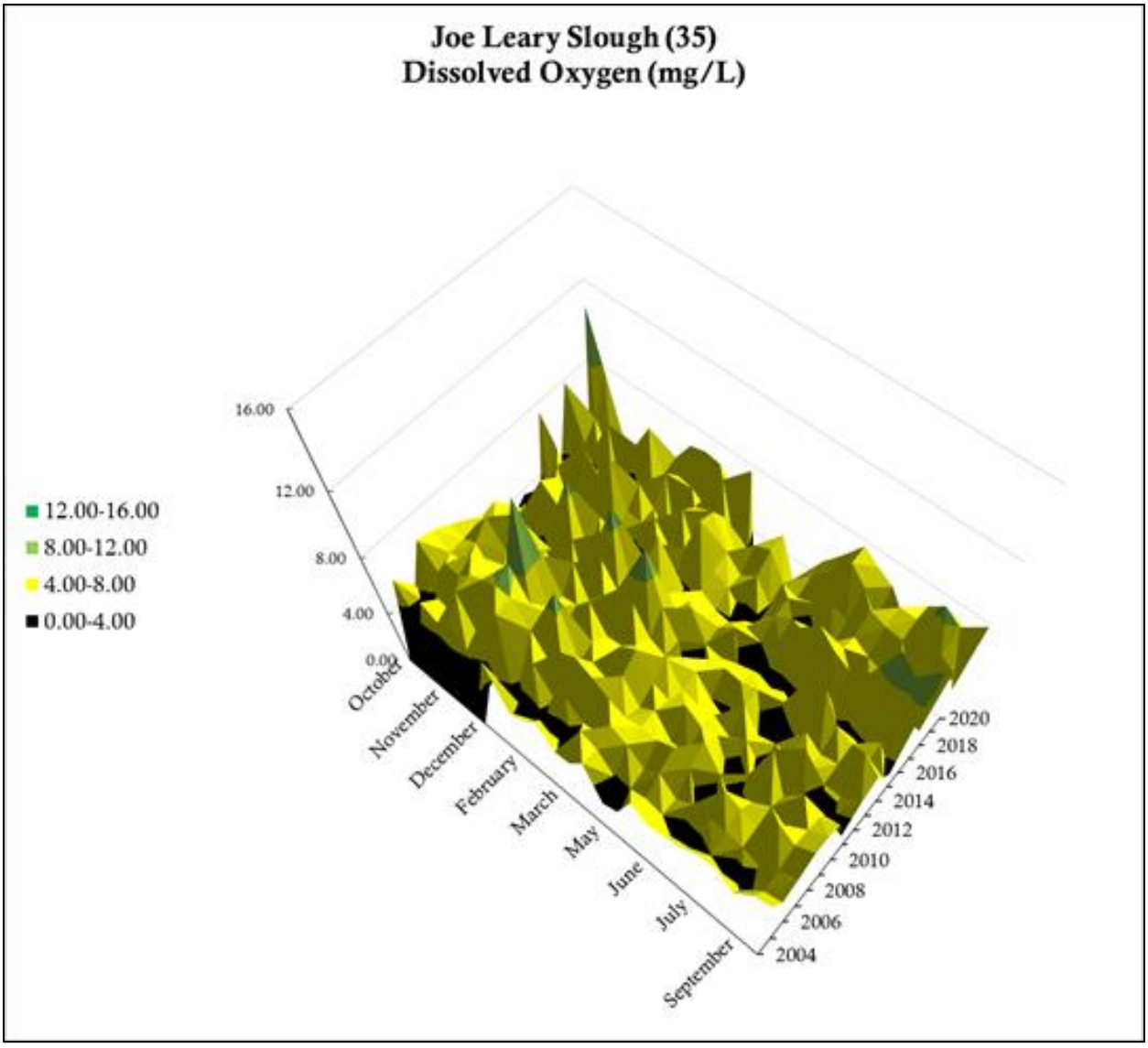


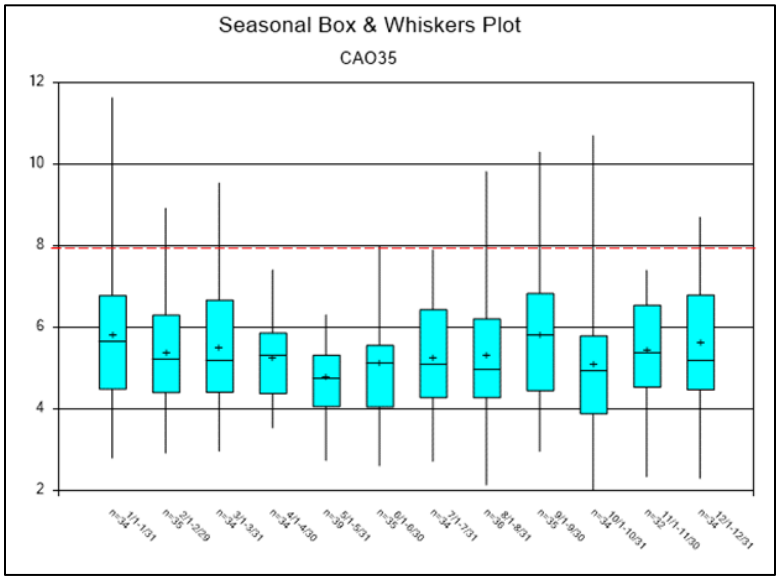
Site 35 is Joe Leary Slough, just prior to where it enters Padilla Bay. This slough was constructed for agricultural drainage and was not naturally formed. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen as increased significantly in the last five years. Water temperatures are higher now than they were ten years ago. WQI scores are consistently in the category of highest concern.

Site 35 very rarely ever meets state standards for DO, and fails to meet state standards for water temperature during the warmer months. Annual FC levels pass the state standard for geomean of 100, but fail the state standard for a 90th percentile of 200.

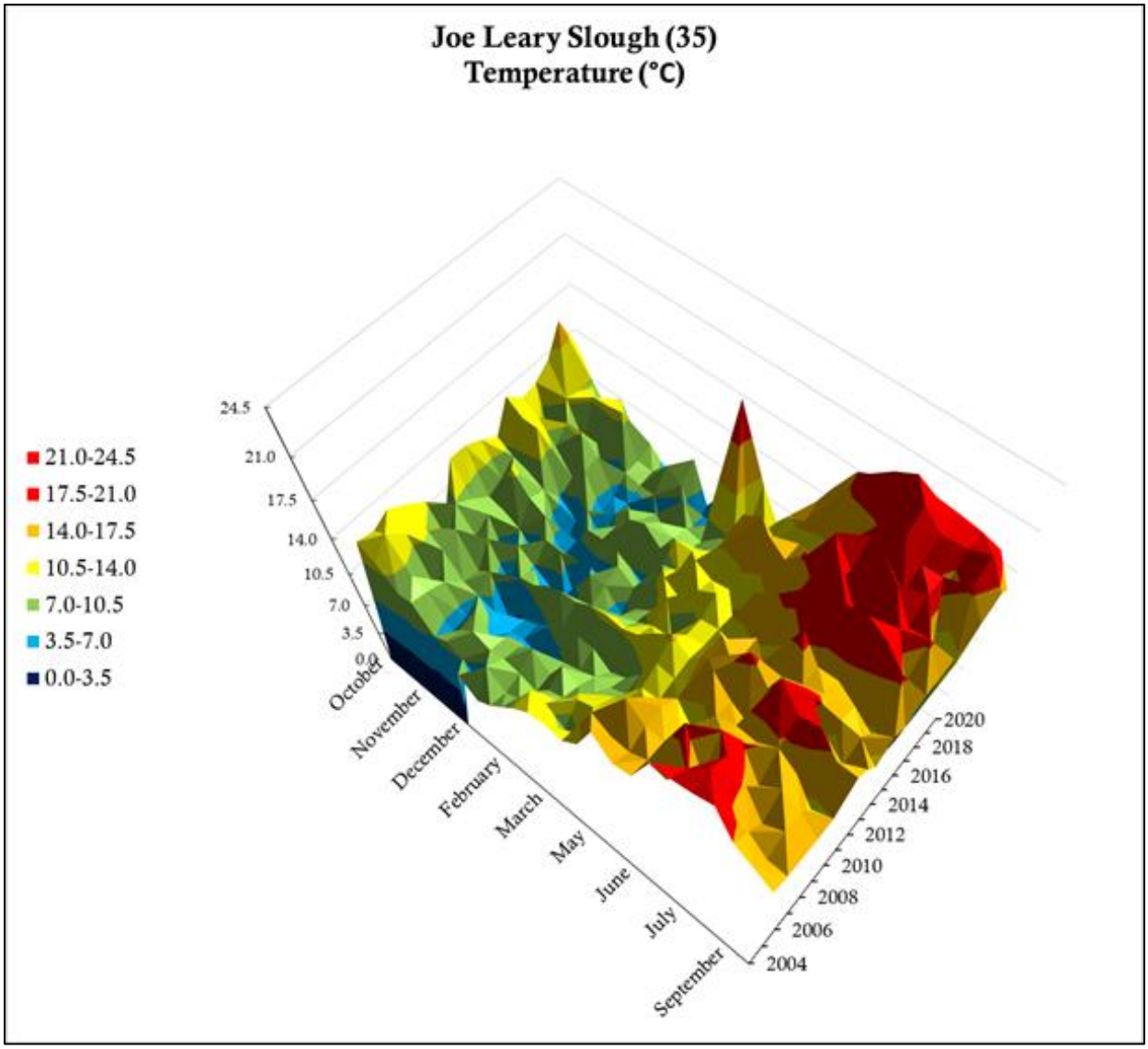
Site 35 is 38th out of 39 sites for number of significant trends, with seven, and is tied for 23rd out of 39 sites for positive trends, with 57%.

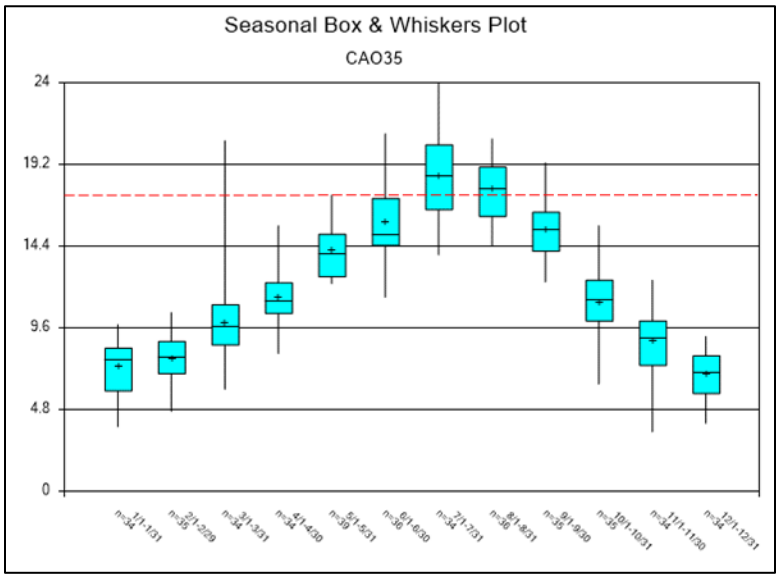




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

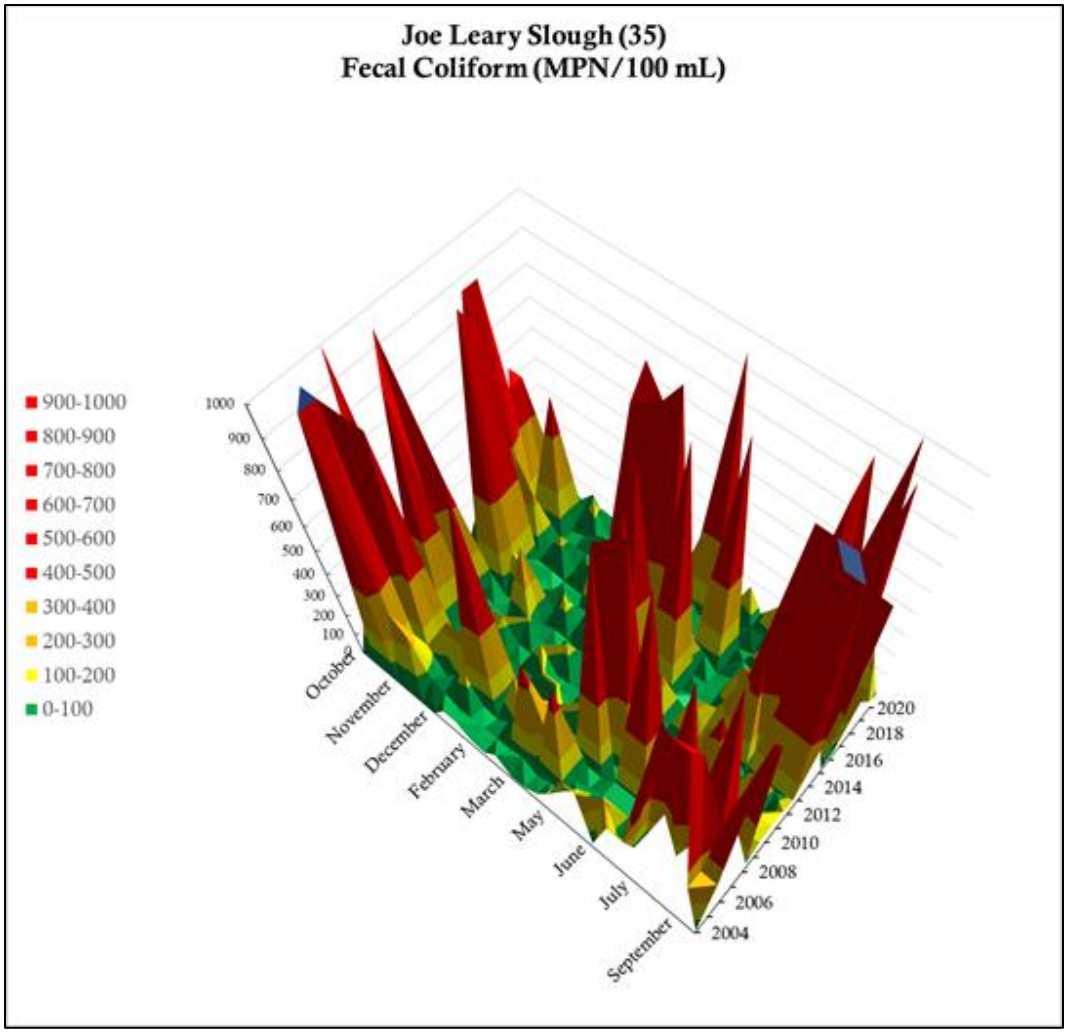
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

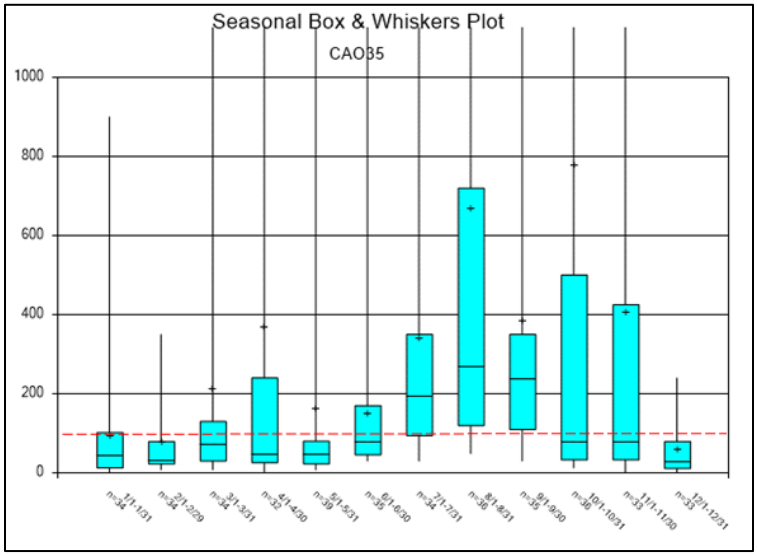




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





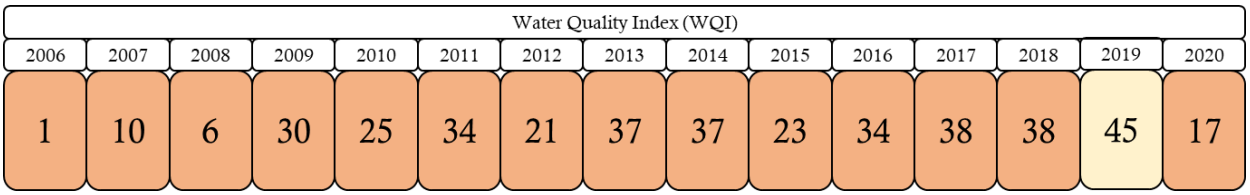
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

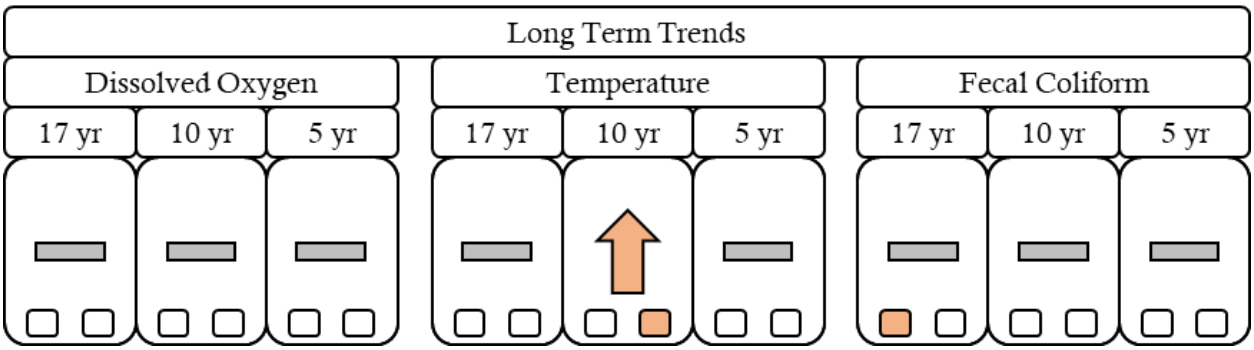
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

36

Edison Slough
@ Edison Elementary

Downstream Ag



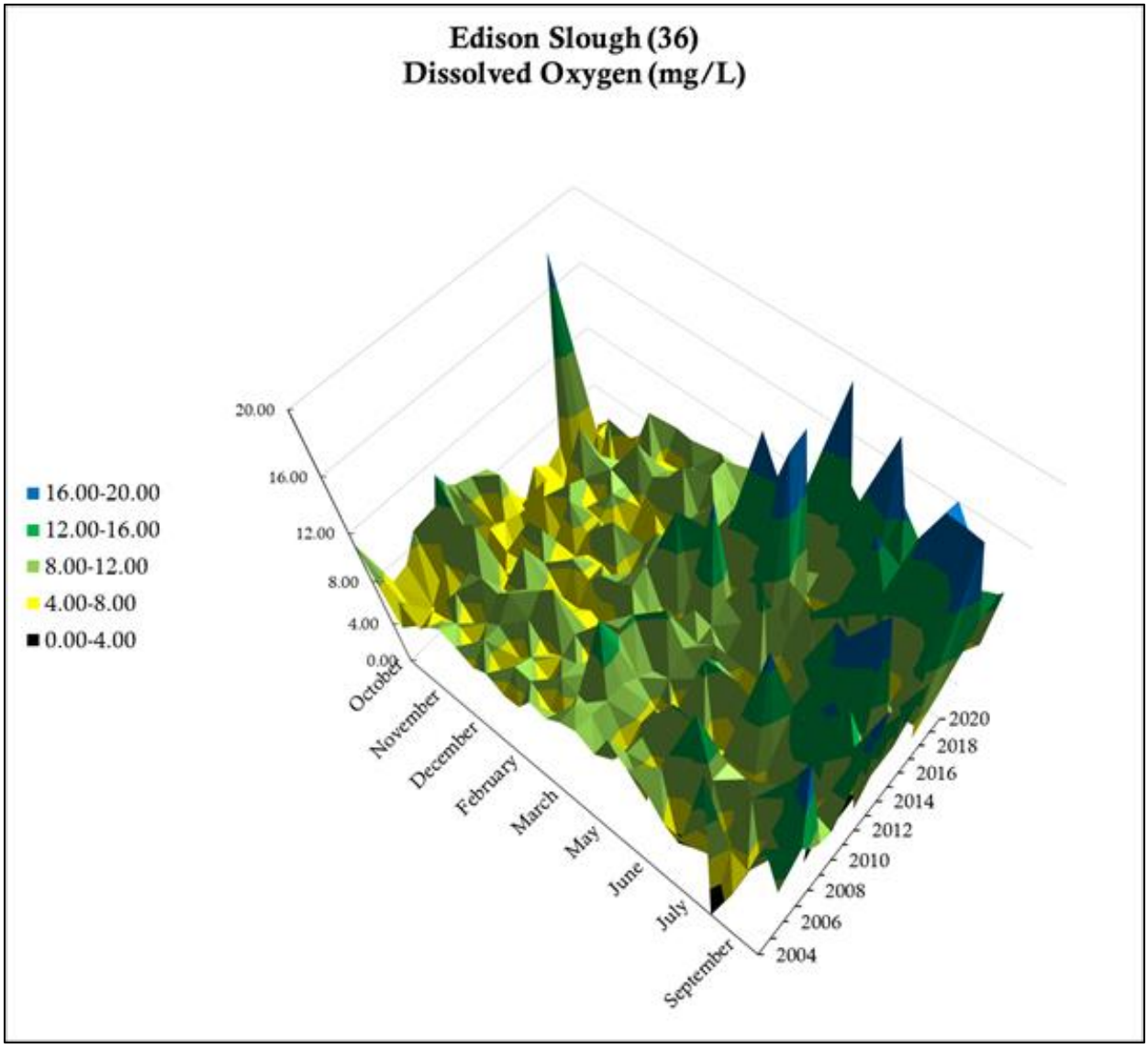


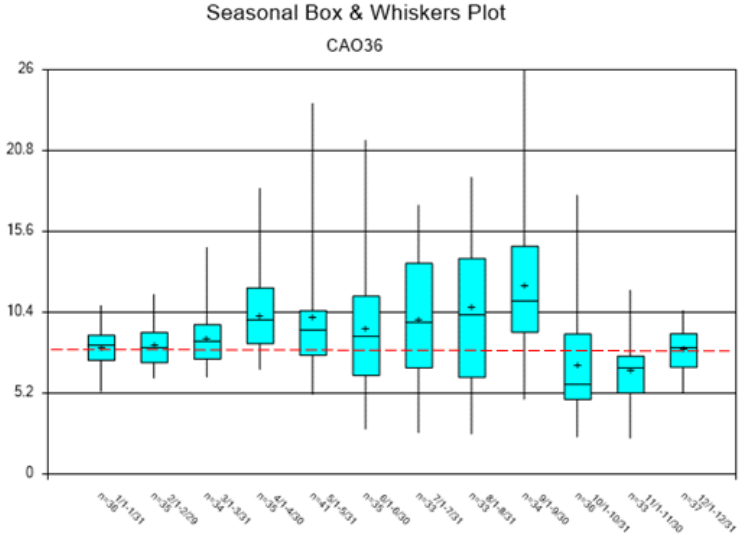
Site 36 is Edison Slough, just prior to the town of Edison and its terminal discharge into Samish Bay. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

No monthly trends for DO or FC were observed across any of the time periods analyzed in this report. Temperature has increased compared to ten years ago. WQI scores are consistently in the category of highest concern.

Site 36 regularly fails to meet state standards for DO and water temperature. Annual FC levels for WY2020 did not pass state standards.

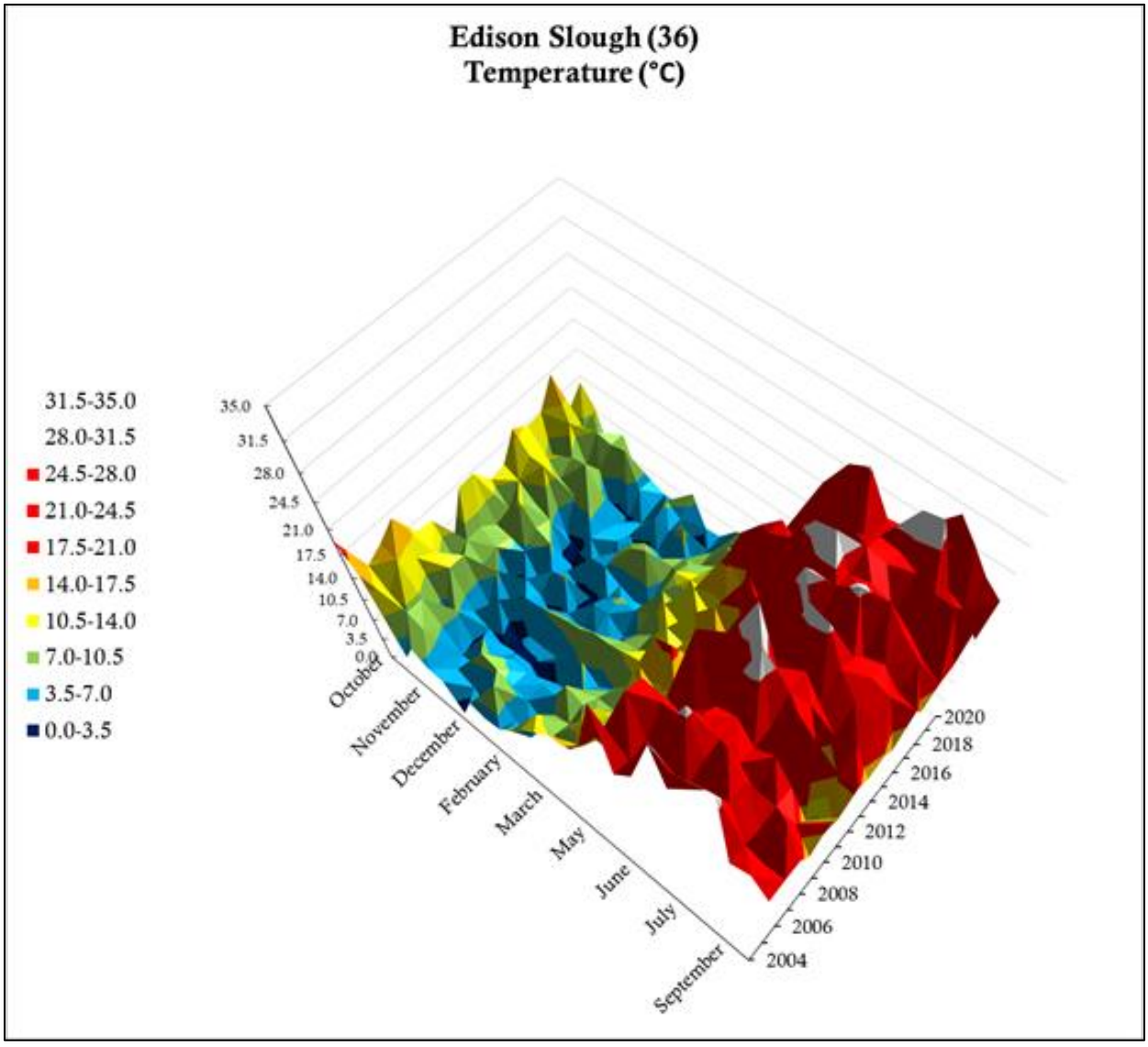
Site 36 is tied for 33rd out of 39 sites for number of significant trends, with 8, and is 35th out of 39 sites for positive trends, with 25%.

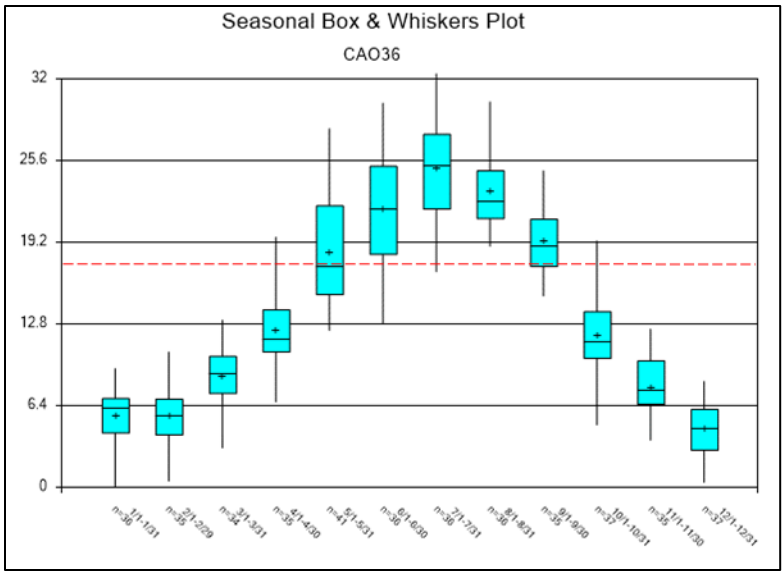




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

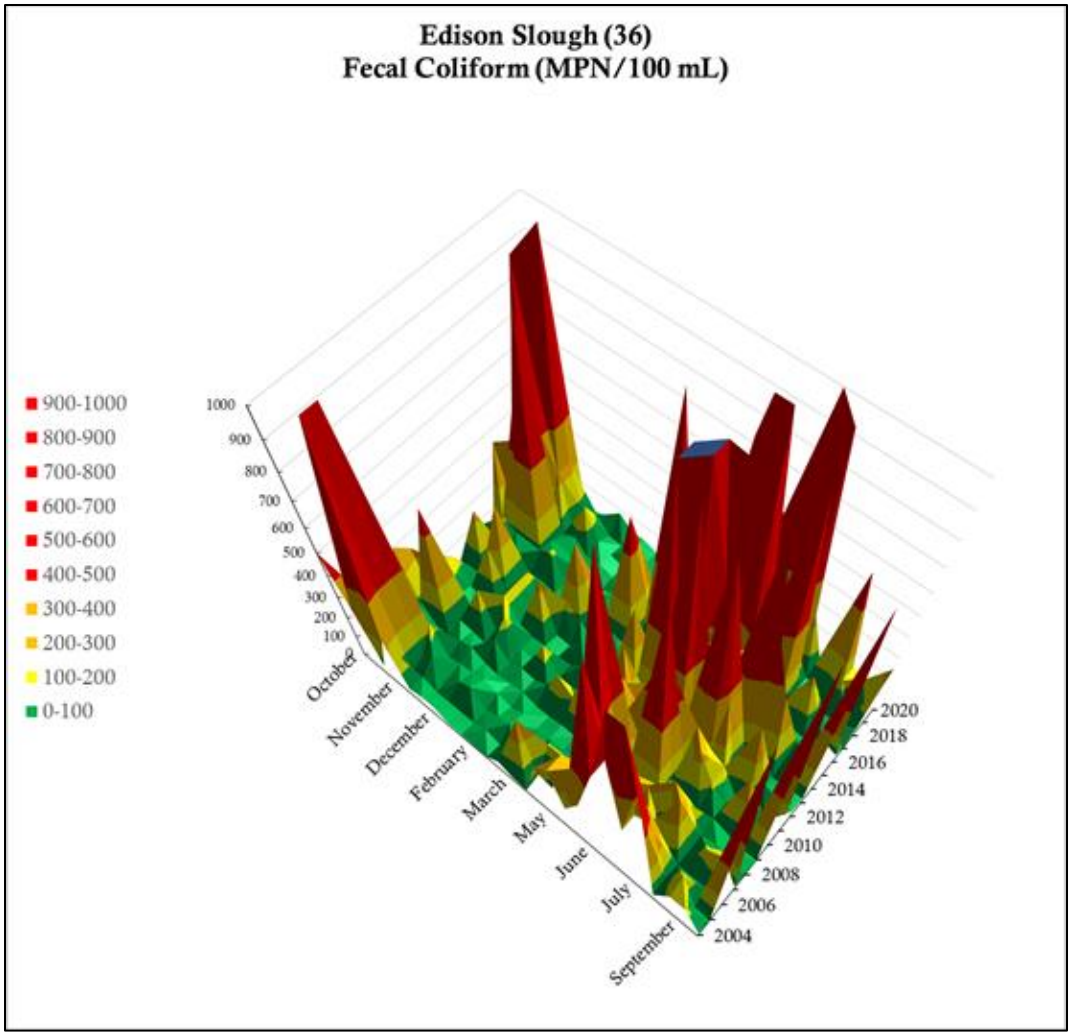
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

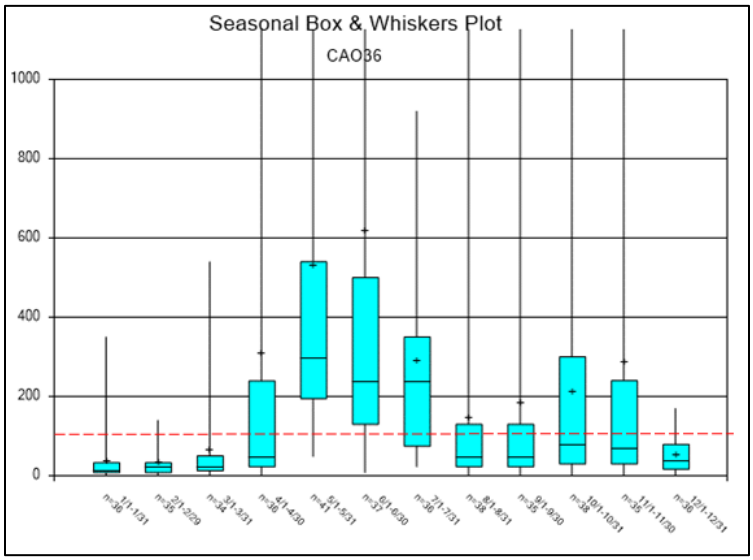




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

37

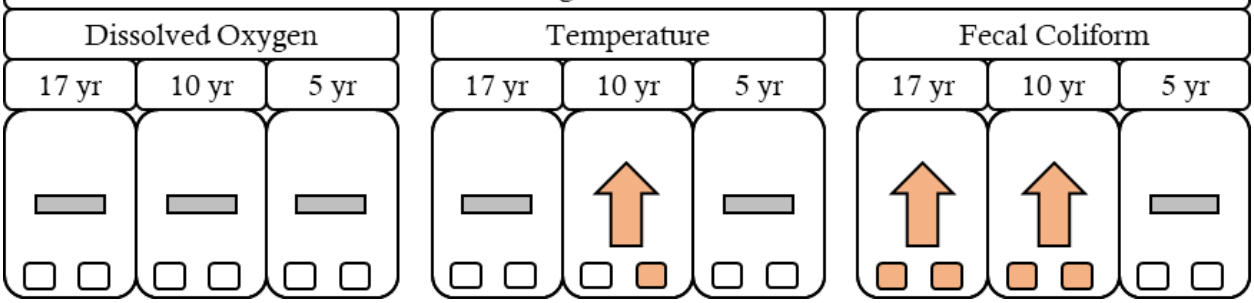
South Edison Drainage
@ Farm to Market Road

Downstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	1	5	18	1	26	16	2	10	1	7	7	9	11	1

Long Term Trends

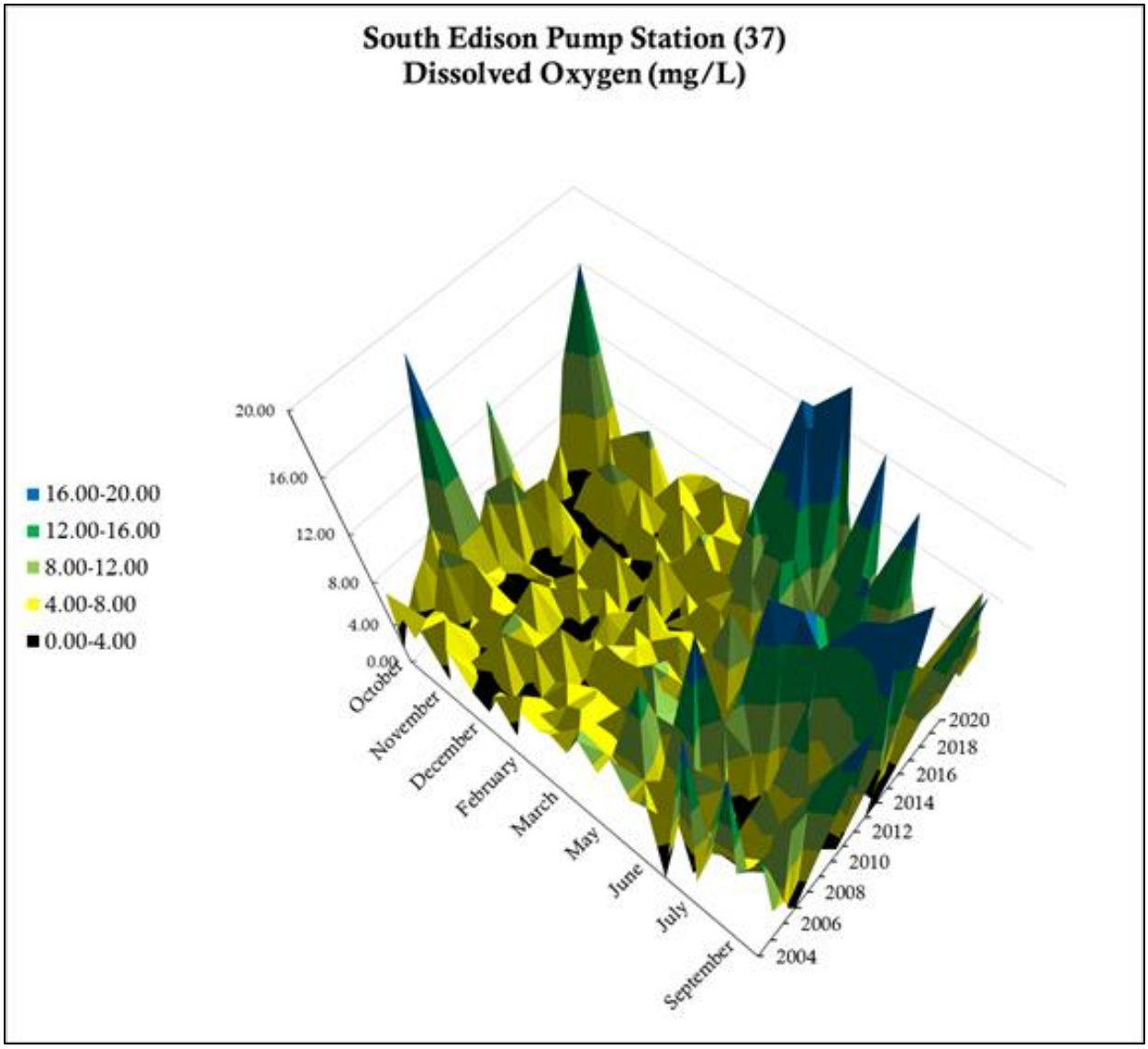


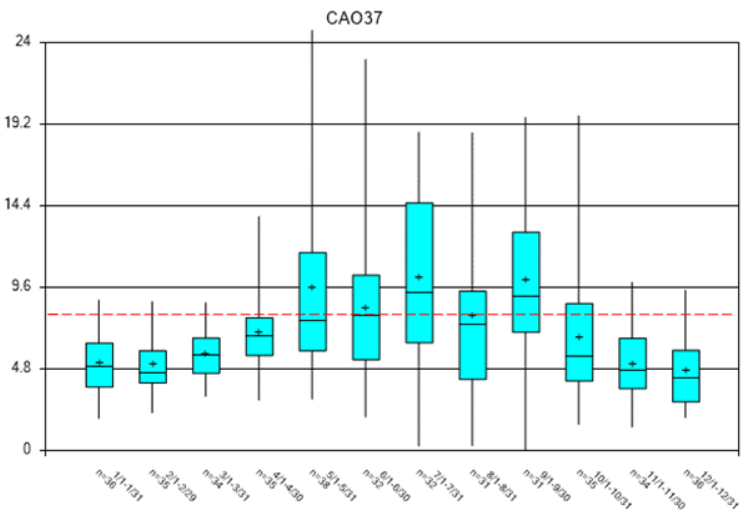
Site 37 is the south pump station of agricultural drainages in the town of Edison, on Samish Bay. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Water temperatures have increased over the past ten years. Fecal coliform counts are higher now than they were at the beginning of the program, and in the most recent ten years. WQI scores are consistently in the category of highest concern, and often in the single digits.

Site 37 regularly fails to meet state standards for DO and water temperature. Annual FC levels strongly fail state standards, and were the highest of all sites recorded in this program.

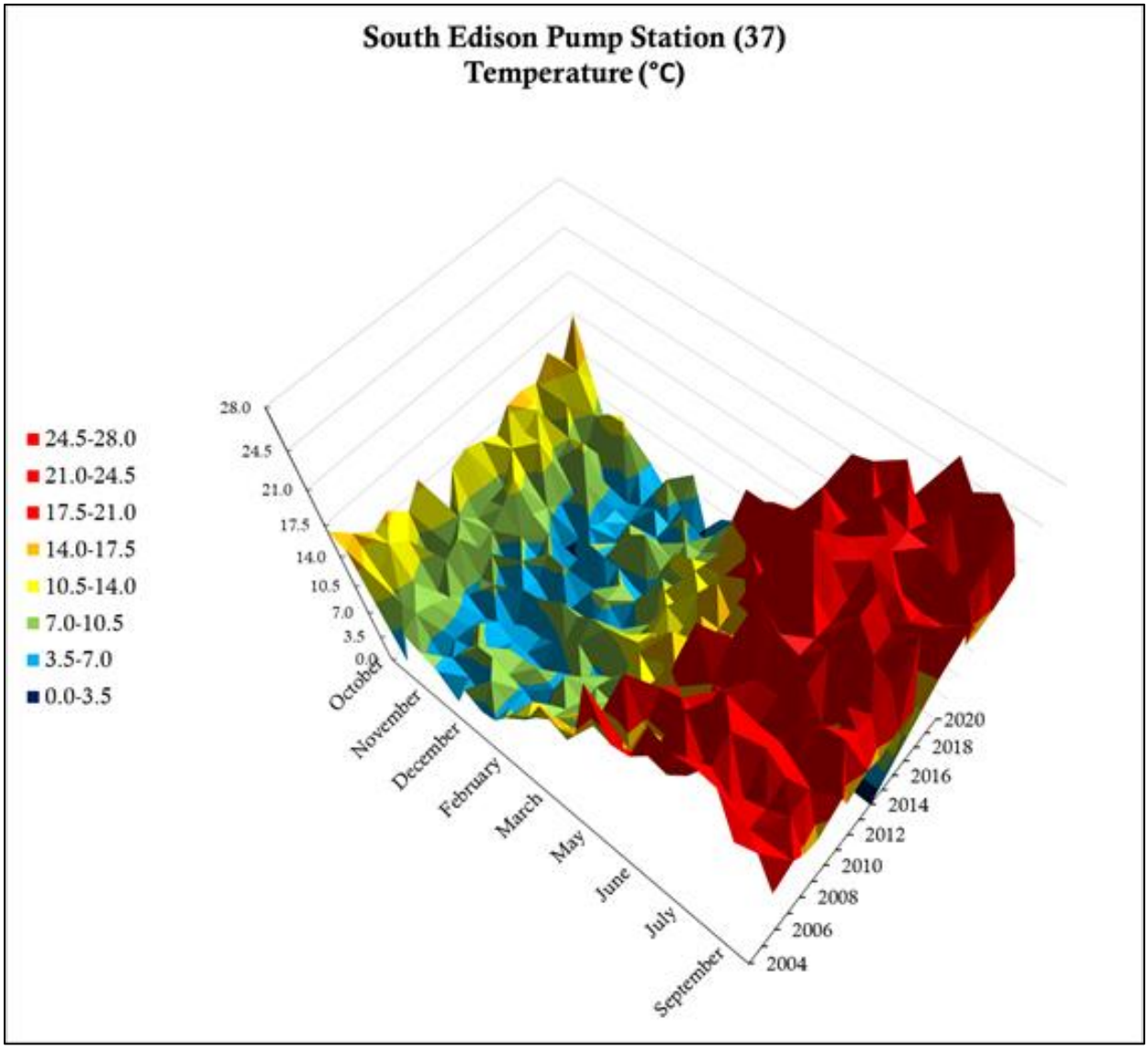
Site 37 is tied for 25th out of 39 sites for number of significant trends, with 10, and 38th out of 39 sites for positive trends, with 10%.

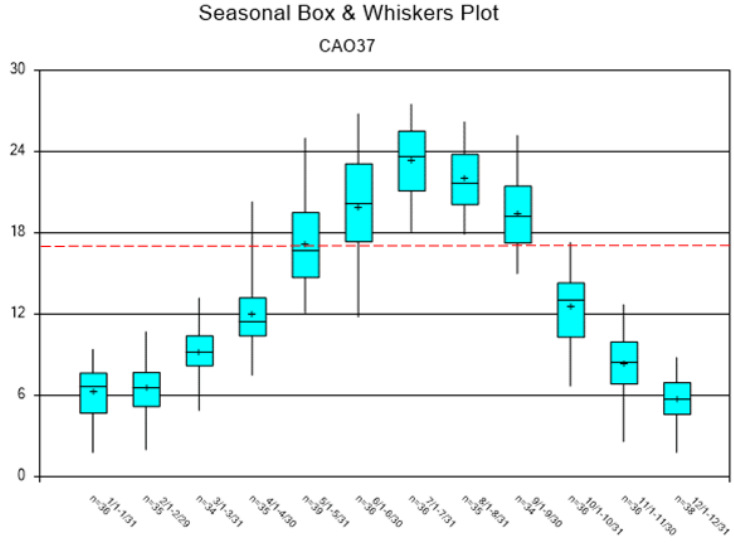




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

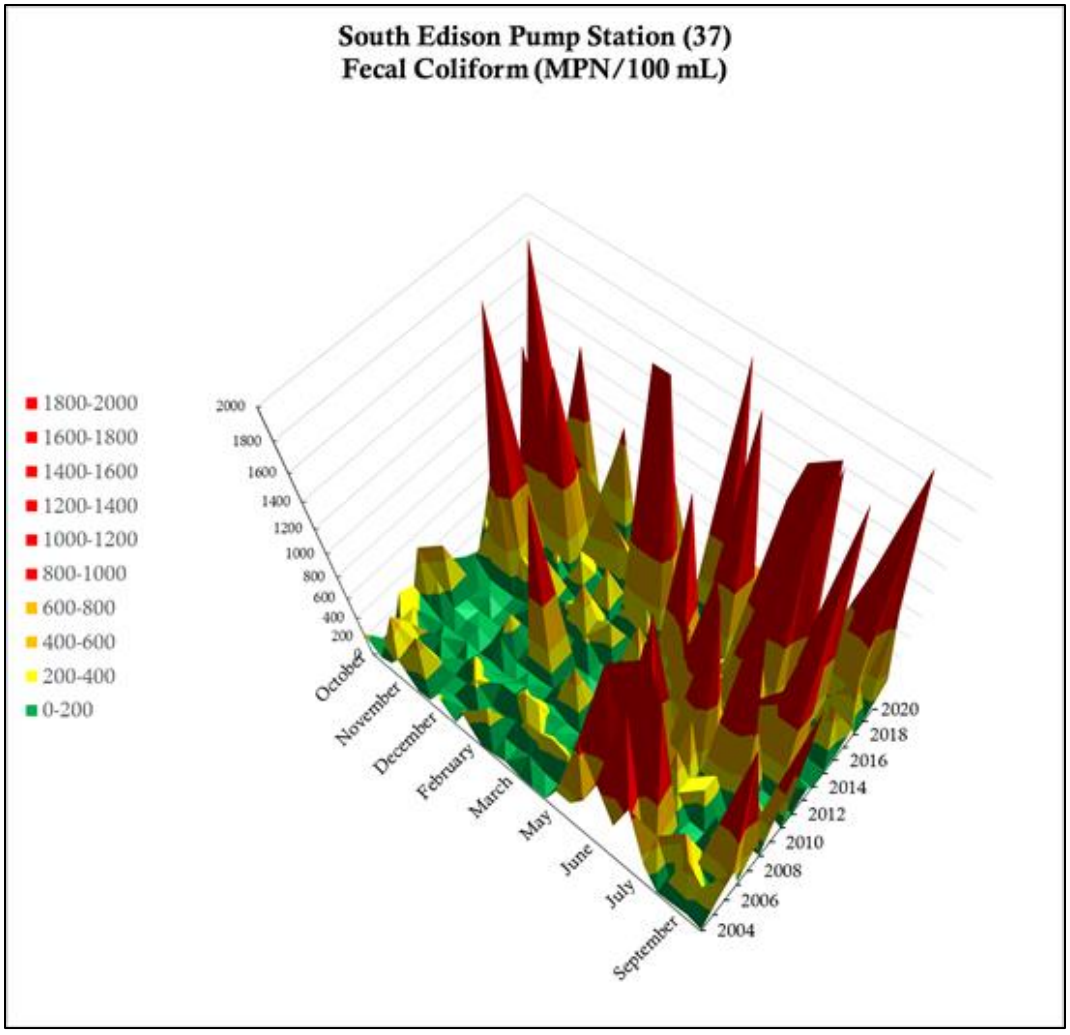
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

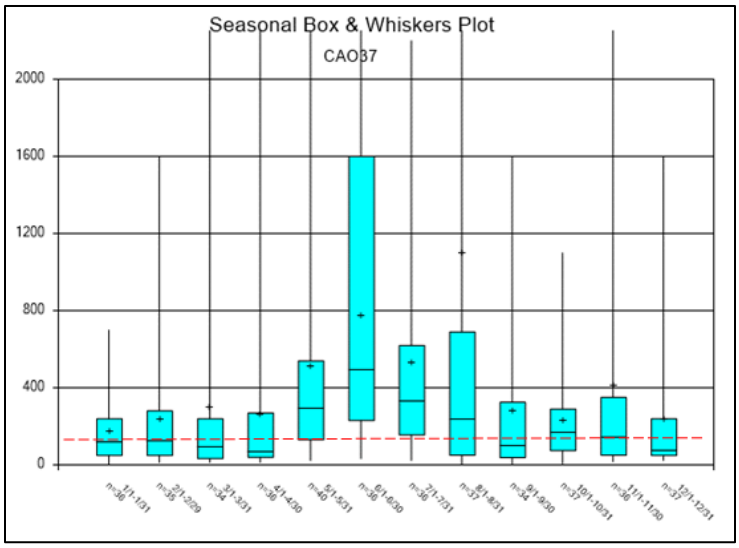




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





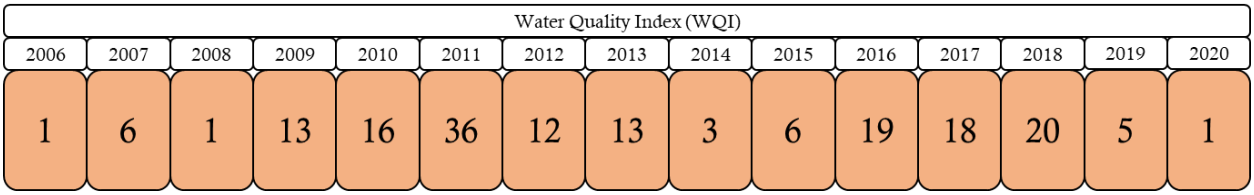
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green almost meets that standard. The water year on the x-axis begins in October and ends in September.

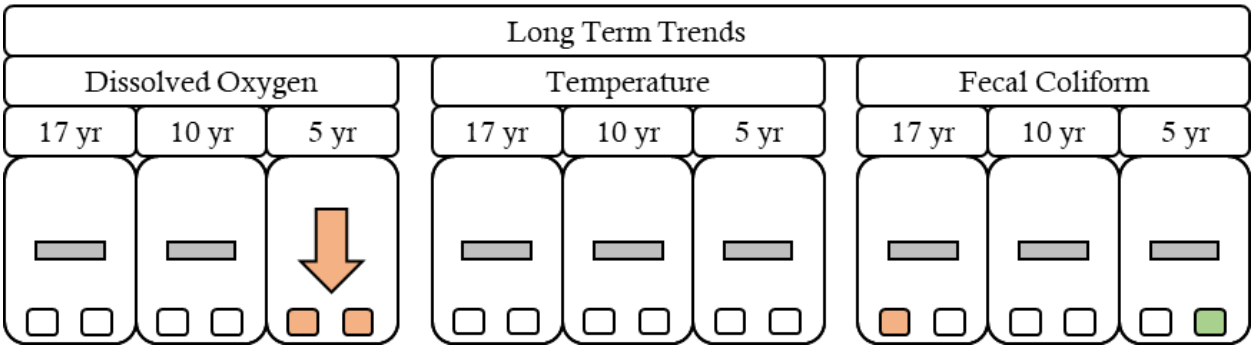
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

38

North Edison Drainage
@ Smith Road

Downstream Ag



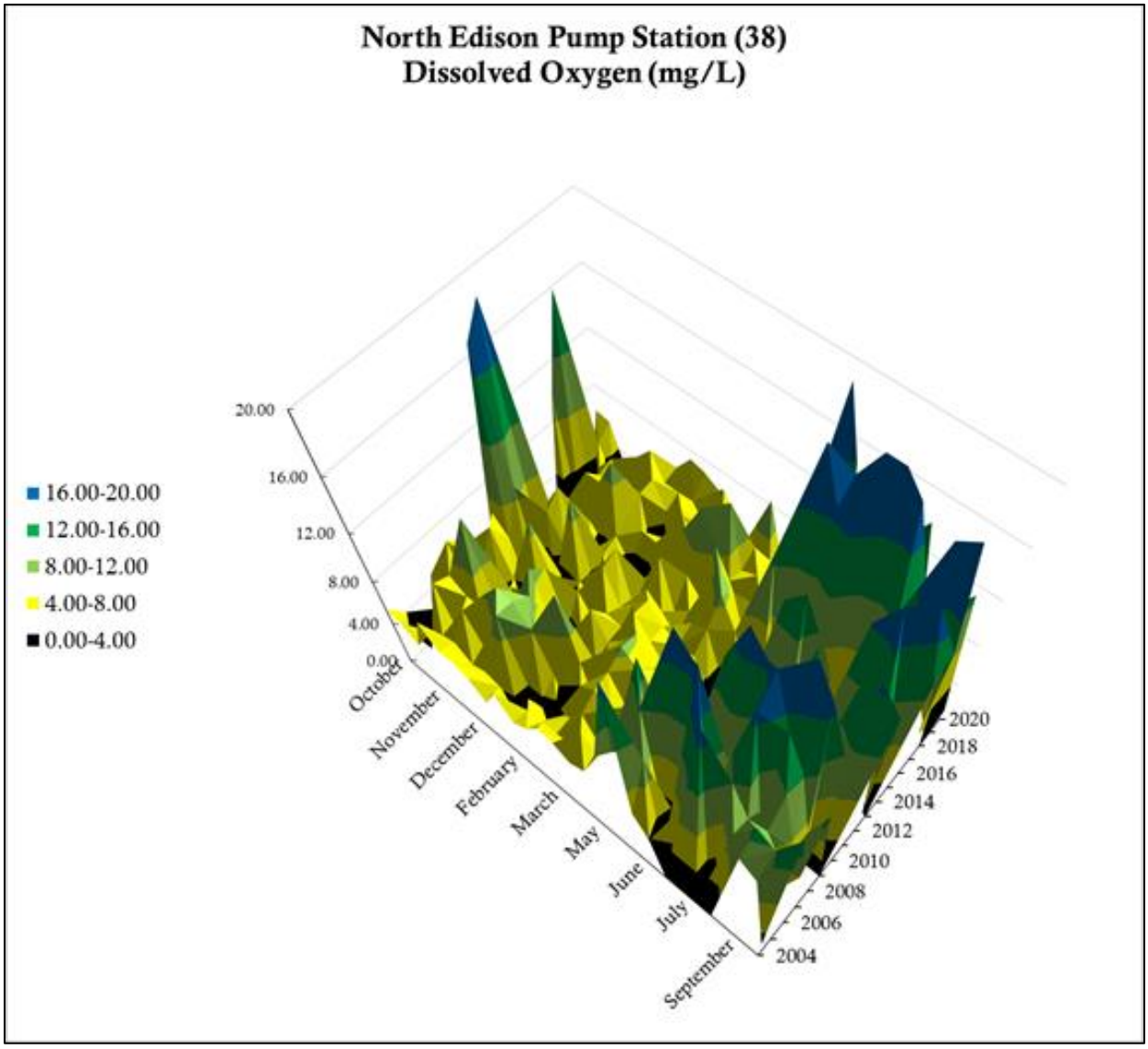


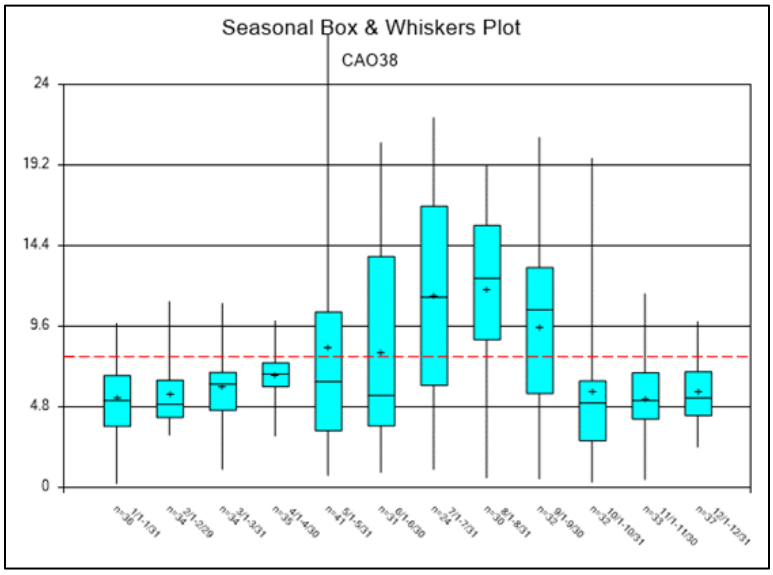
Site 38 is the north pump station of agricultural drainages in the town of Edison, on Samish Bay. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen is lower now than it was five years ago. WQI scores are consistently in the category of highest concern, and often in the single digits.

Site 38 regularly fails to meet state standards for DO and water temperature. Annual FC levels strongly fail state standards.

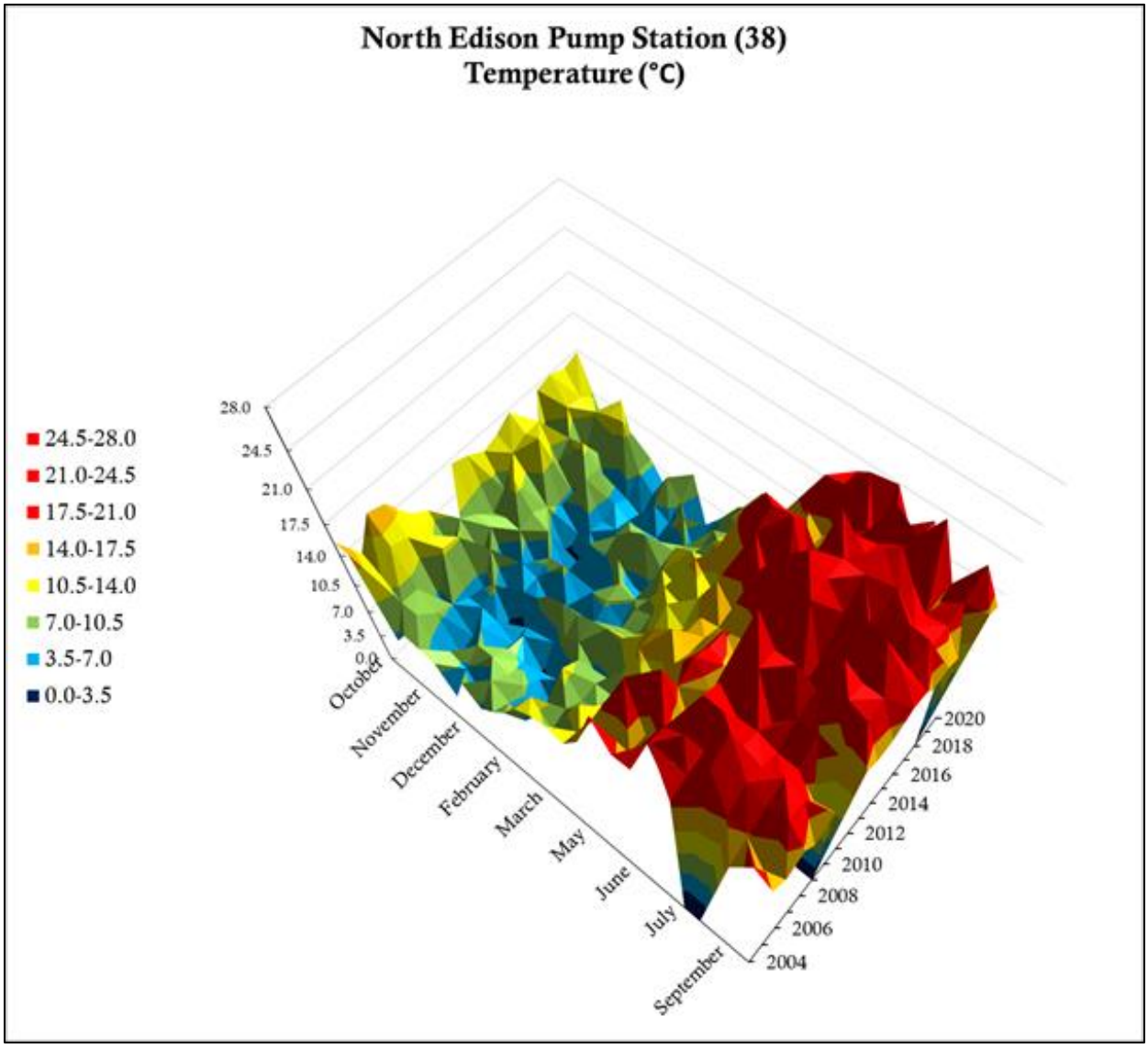
Site 38 is tied for 30th out of 39 sites for number of significant trends, with 9, and is 36th out of 39 sites for positive trends, with 22%.

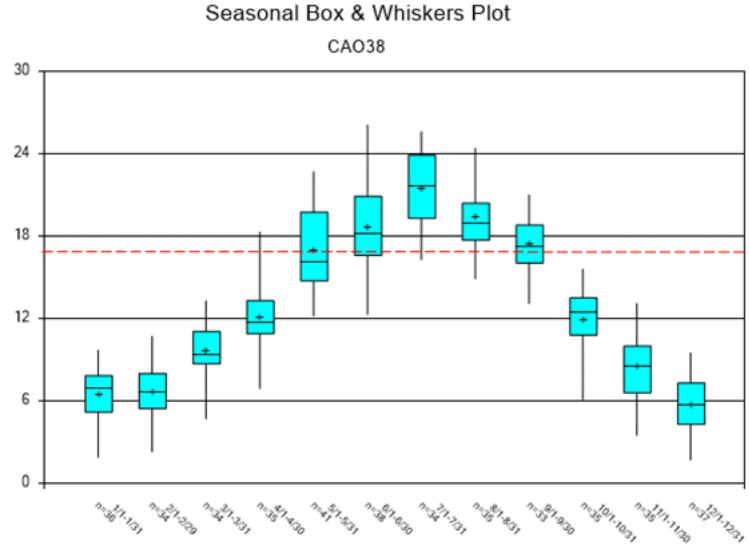




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

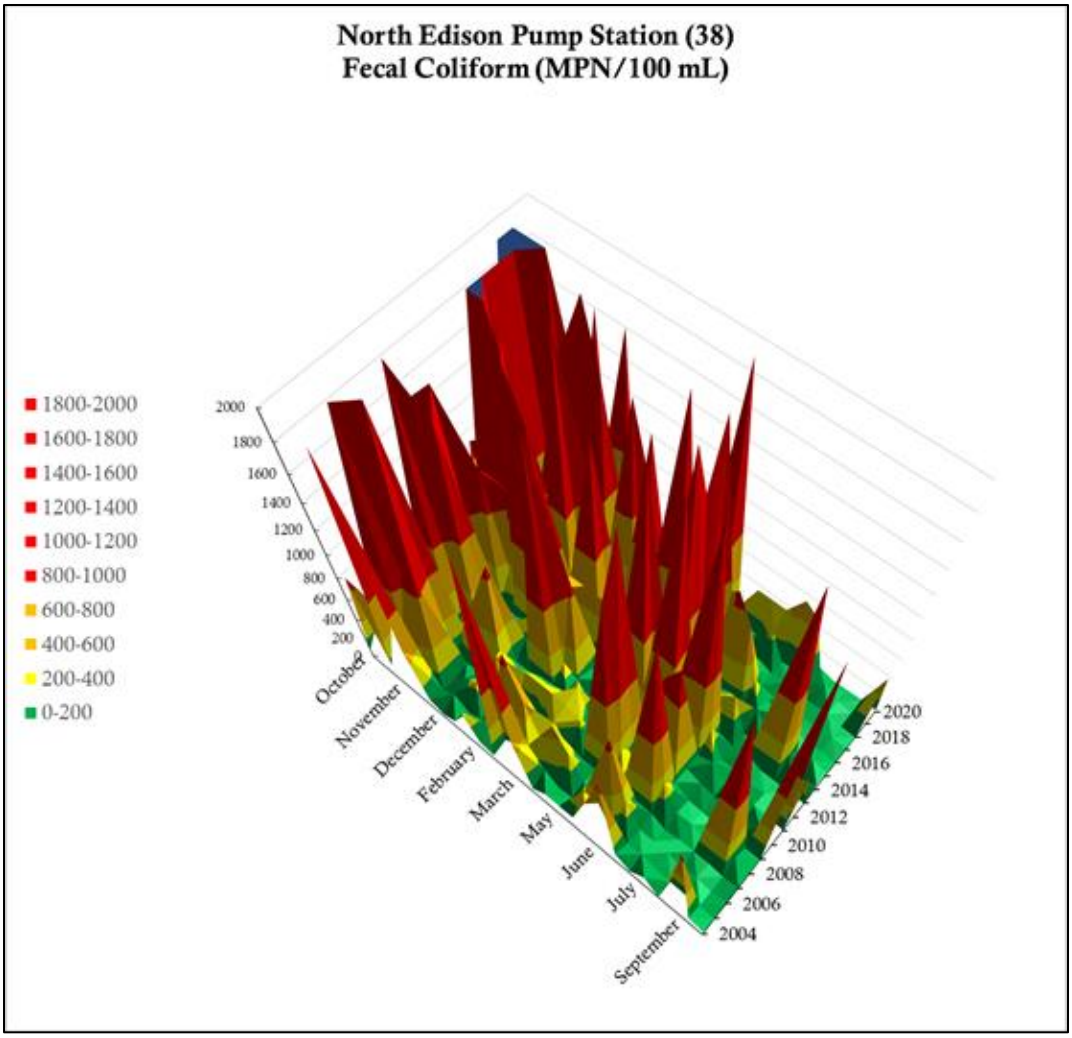
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

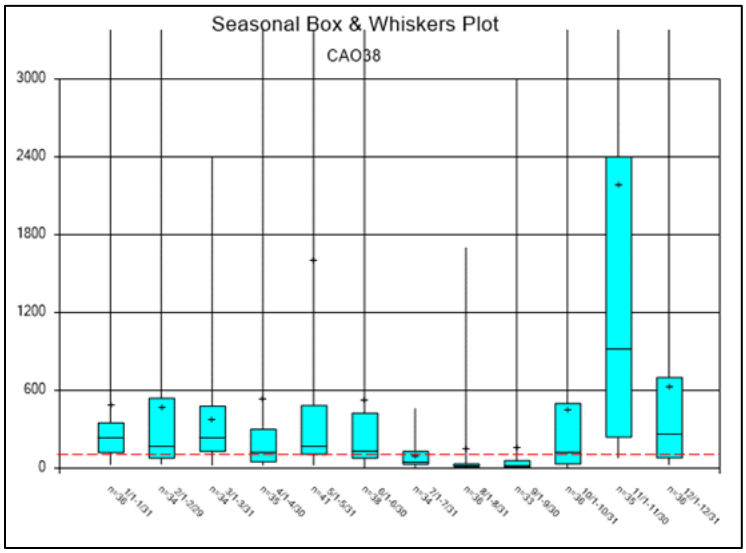




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





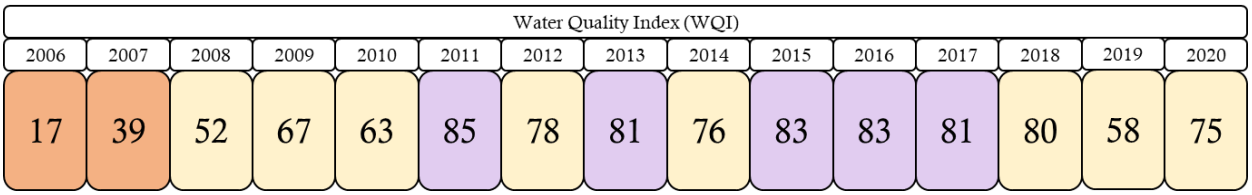
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green almost meets that standard. The water year on the x-axis begins in October and ends in September.

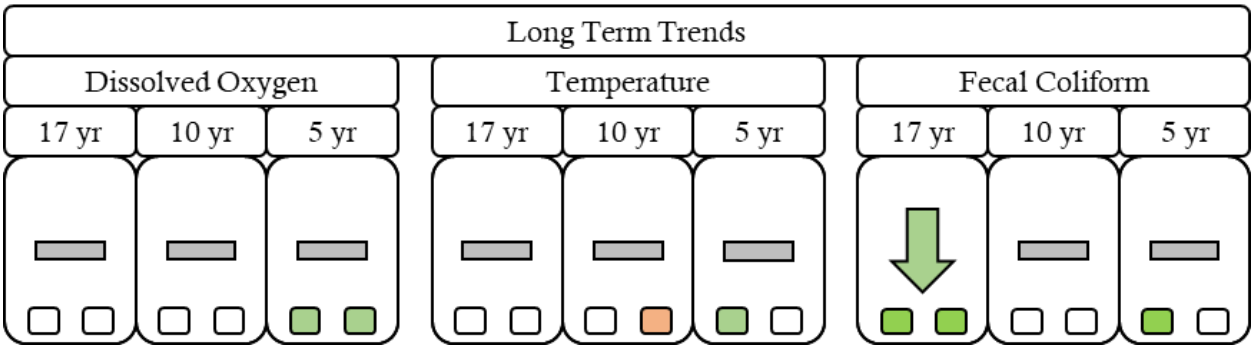
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

39

Colony Creek
@ Colony Road

Downstream Ag



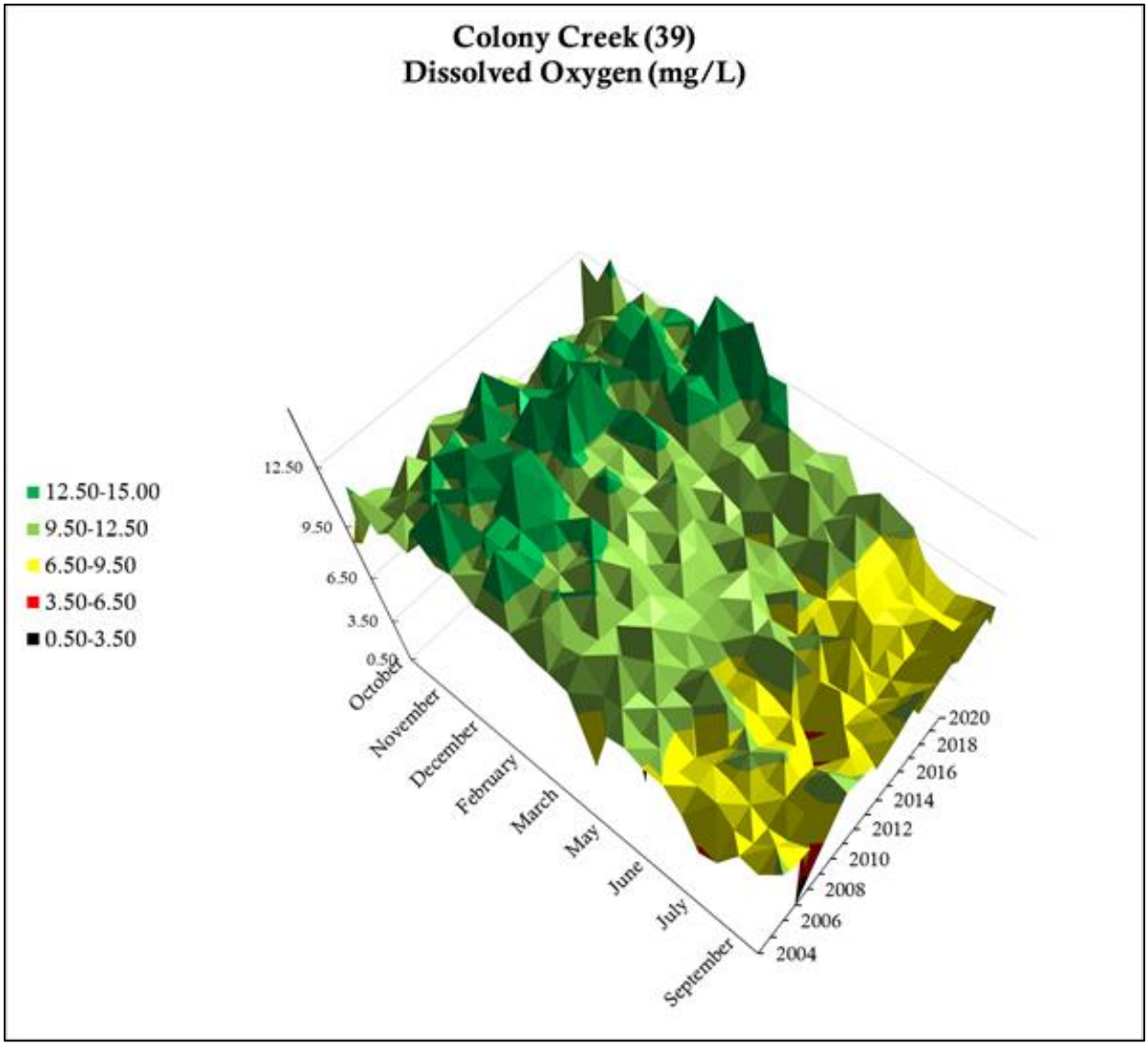


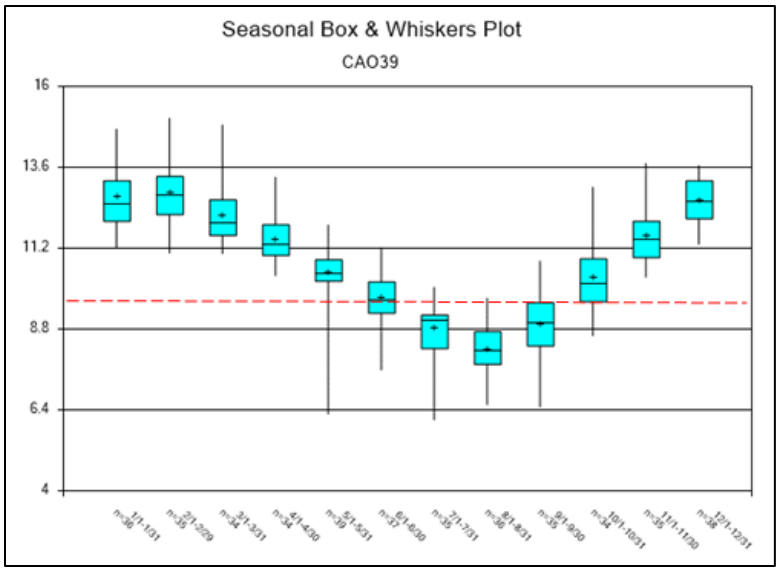
Site 39 is Colony Creek, prior to its convergence with Harrison Creek and termination in to the north end of Samish Bay, and has rural residential and agricultural influences. This site is designated as core salmonid habitat.

Fecal coliform counts are lower than they were 17 years ago. WQI scores are generally in the upper-score end of the moderate concern category, and sometimes score as least concern.

Site 39 rarely fails to meet state standards for DO and water temperature, and only does so at the warmest time of year. Annual FC levels easily pass the state standard for geomean of 100, but fail the state standard for a 90th percentile of 200.

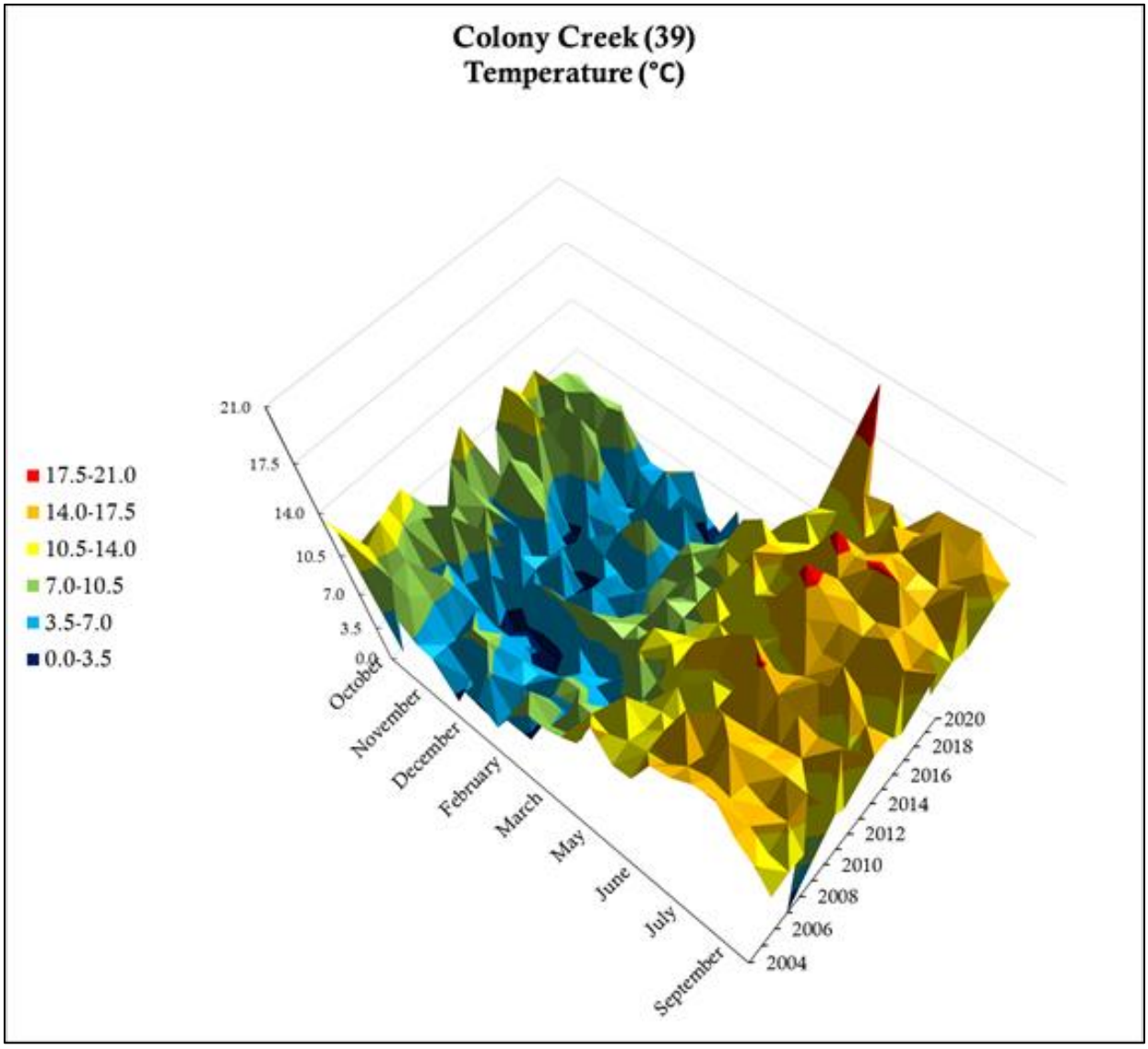
Site 39 is tied for 30th out of 39 sites for number of significant trends, with 9, and is tied for 22nd out of 39 sites for positive trends, with 56%.

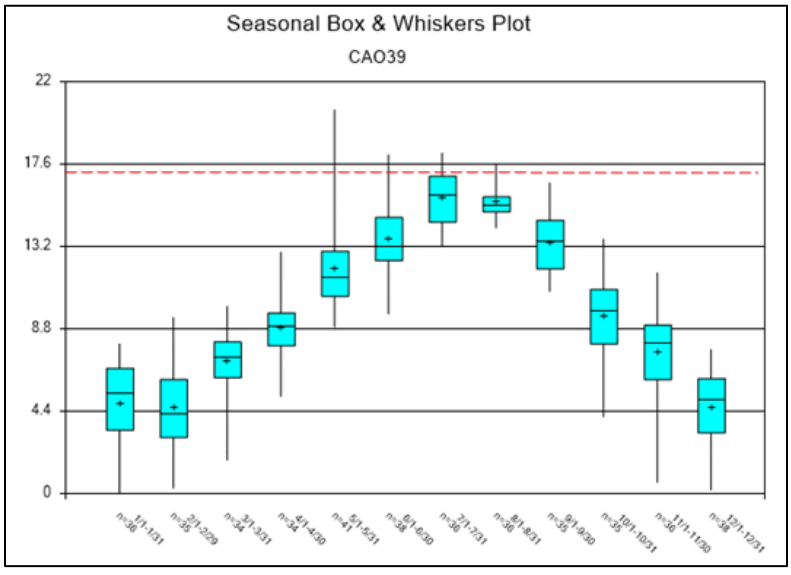




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

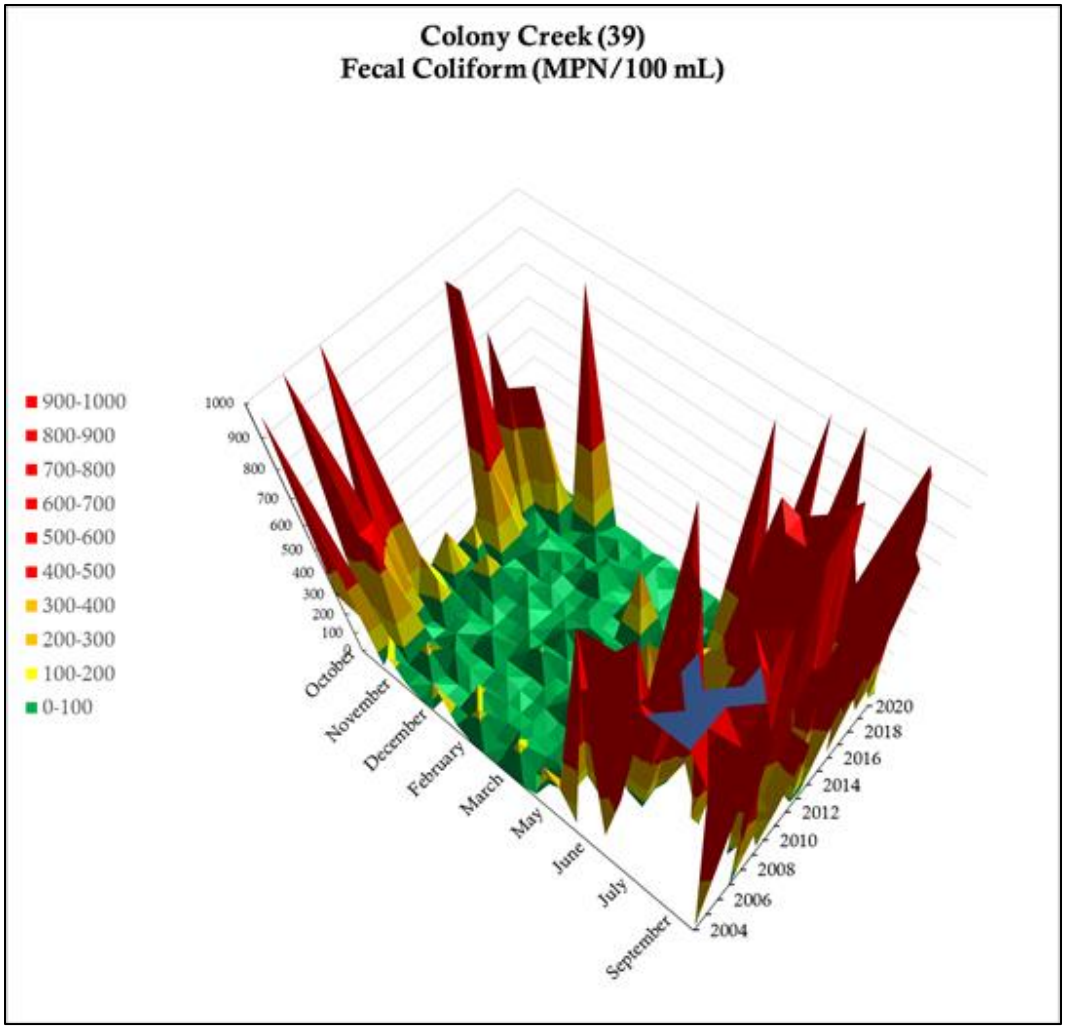
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

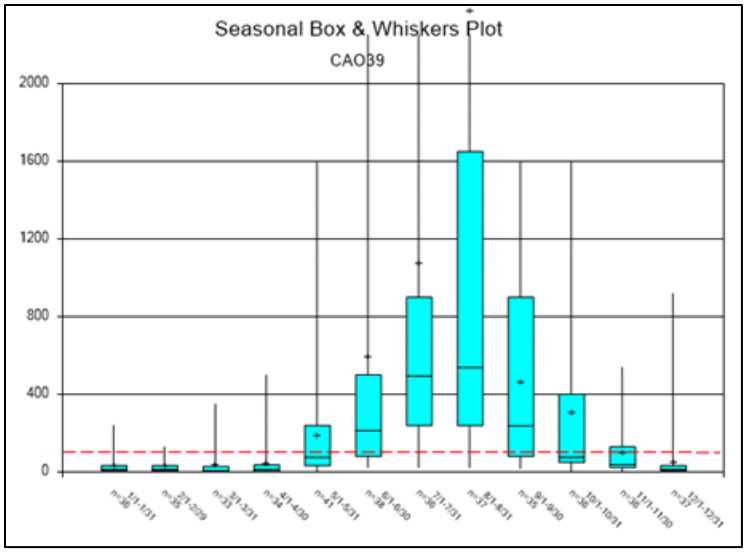




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





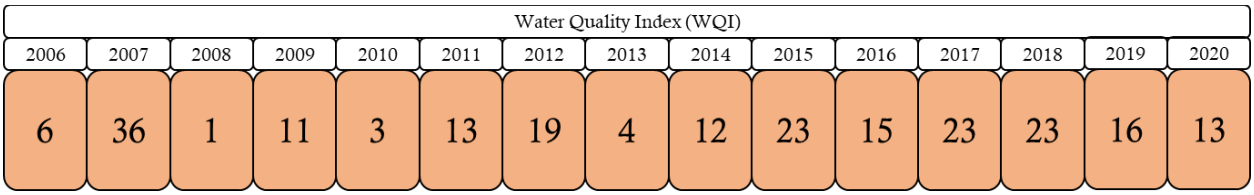
The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

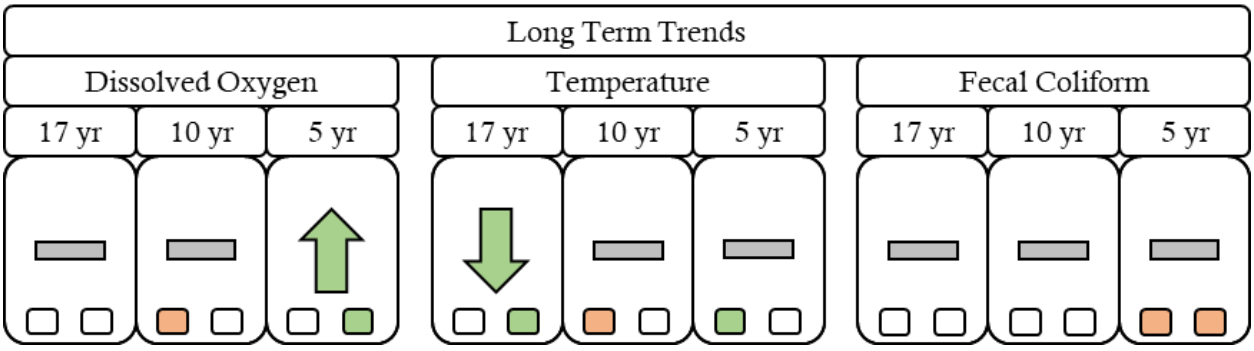
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

40

Big Indian slough
@ Highway 20

Midstream Ag



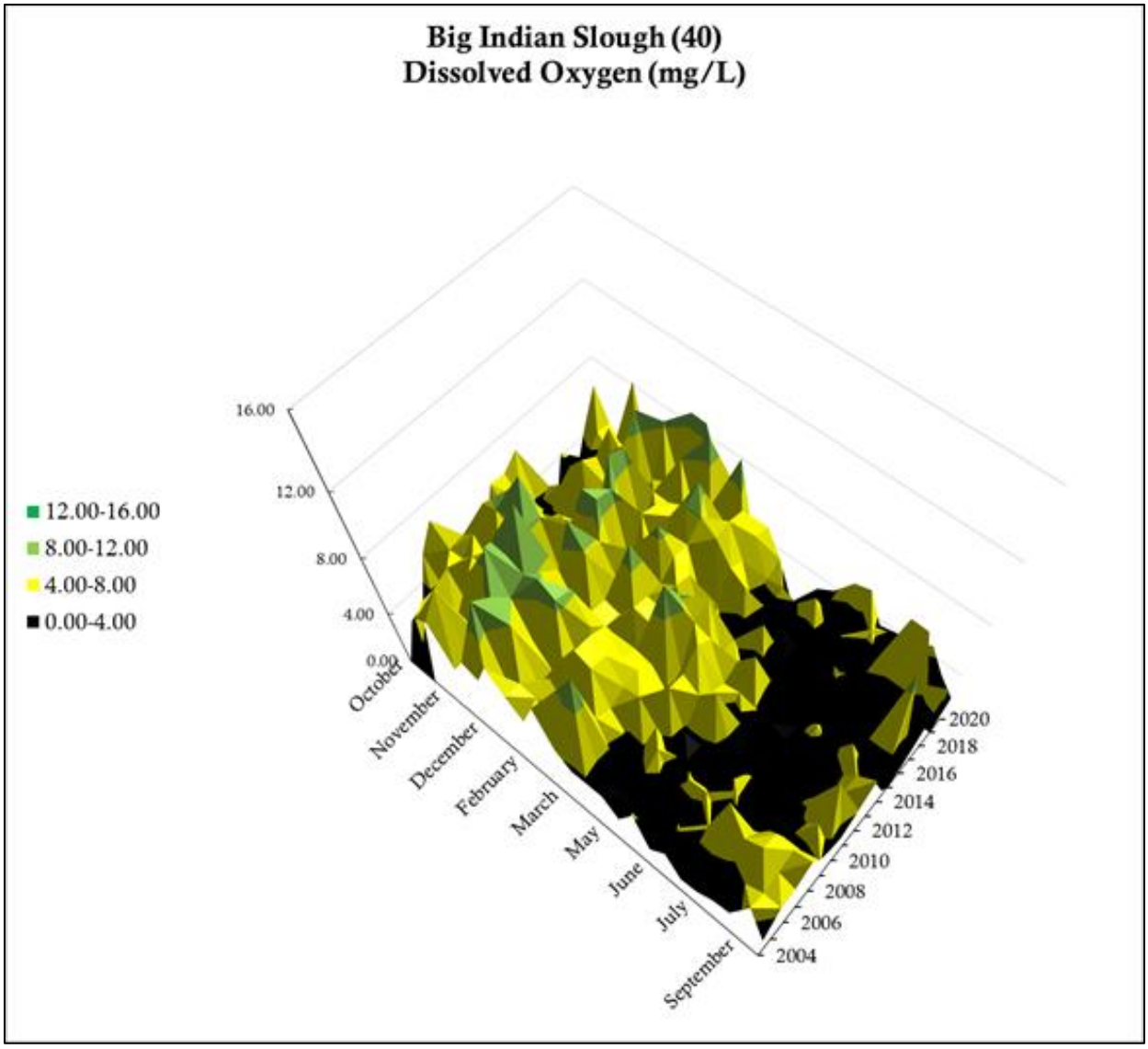


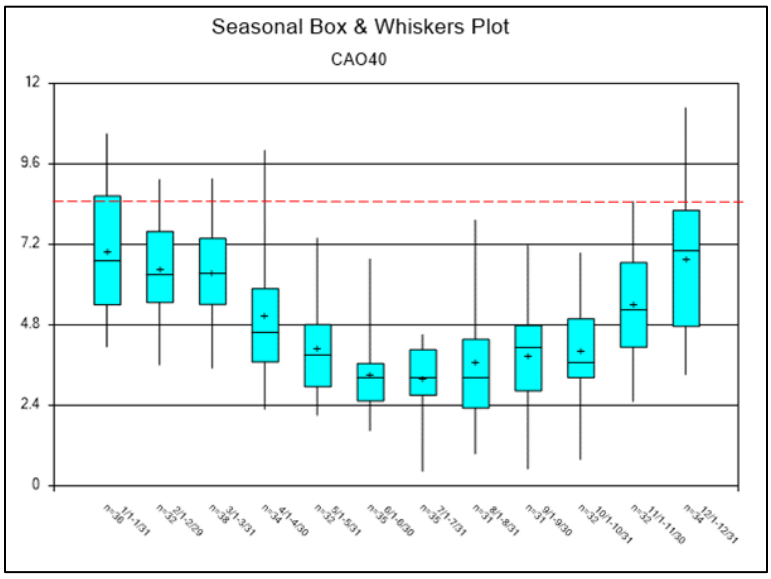
Site 40 is Big Indian Slough, just north of Highway 20 and prior to entering Padilla Bay. This site has industrial, agricultural, and urban influences. Sites like this are characterized by being stagnant or slow-moving, and may be tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen levels have increased since five years ago. Water temperature is lower than it was at the beginning of this program. WQI scores are consistently in the category of highest concern.

Site 40 regularly fails to meet state standards for DO, and fails to meet state standards for water temperature during the warmer months. Annual FC levels narrowly pass the state standard for geomean of 100, but fail the state standard for a 90th percentile of 200.

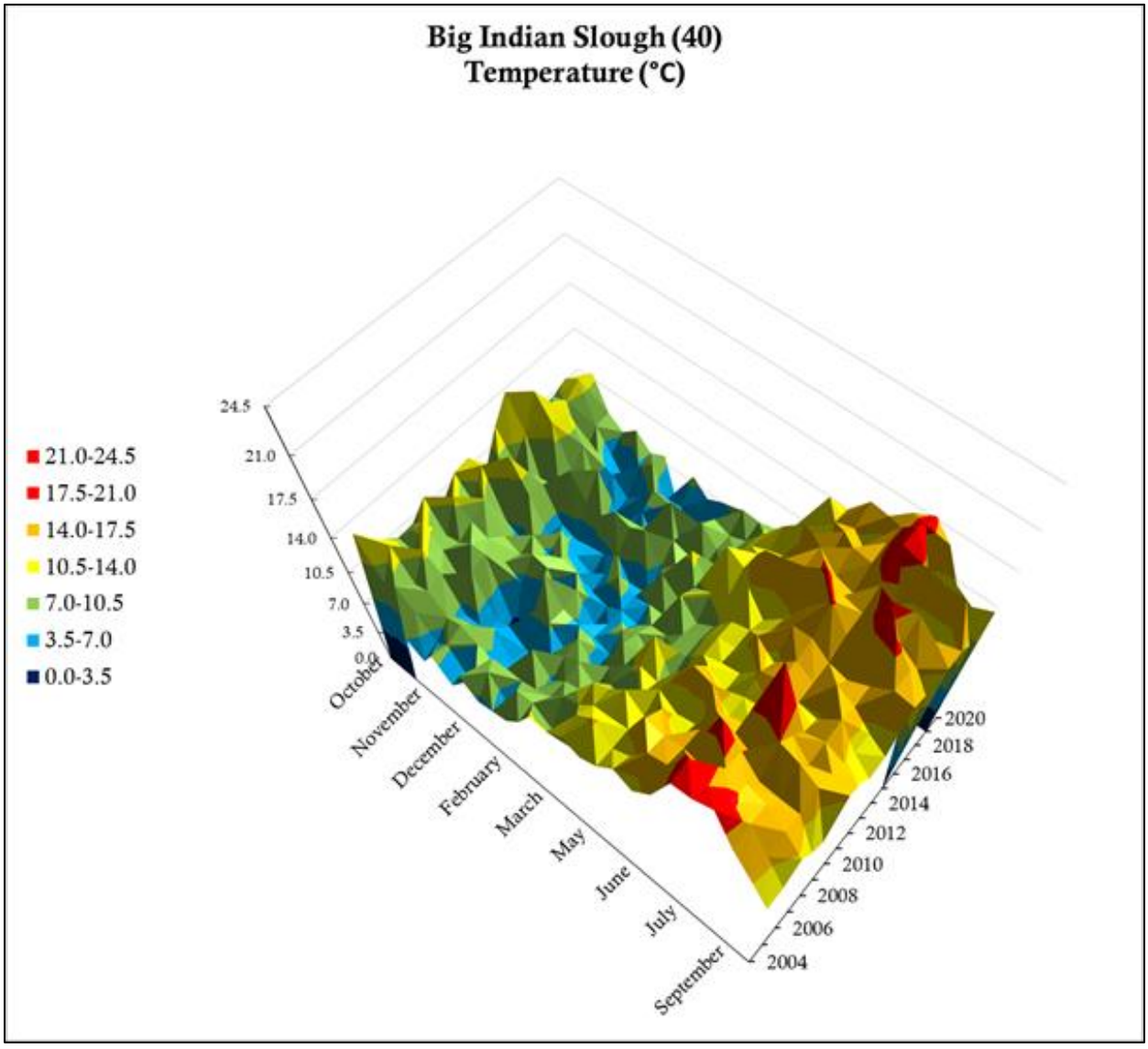
Site 40 is tied for 25th out of 39 sites for number of significant trends, with 10, and is 30th out of 39 sites for positive trends, with 40%.

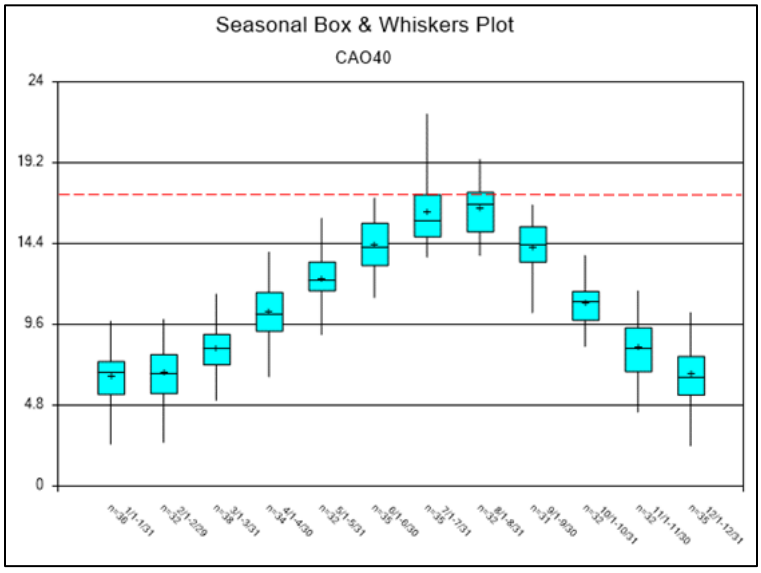




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

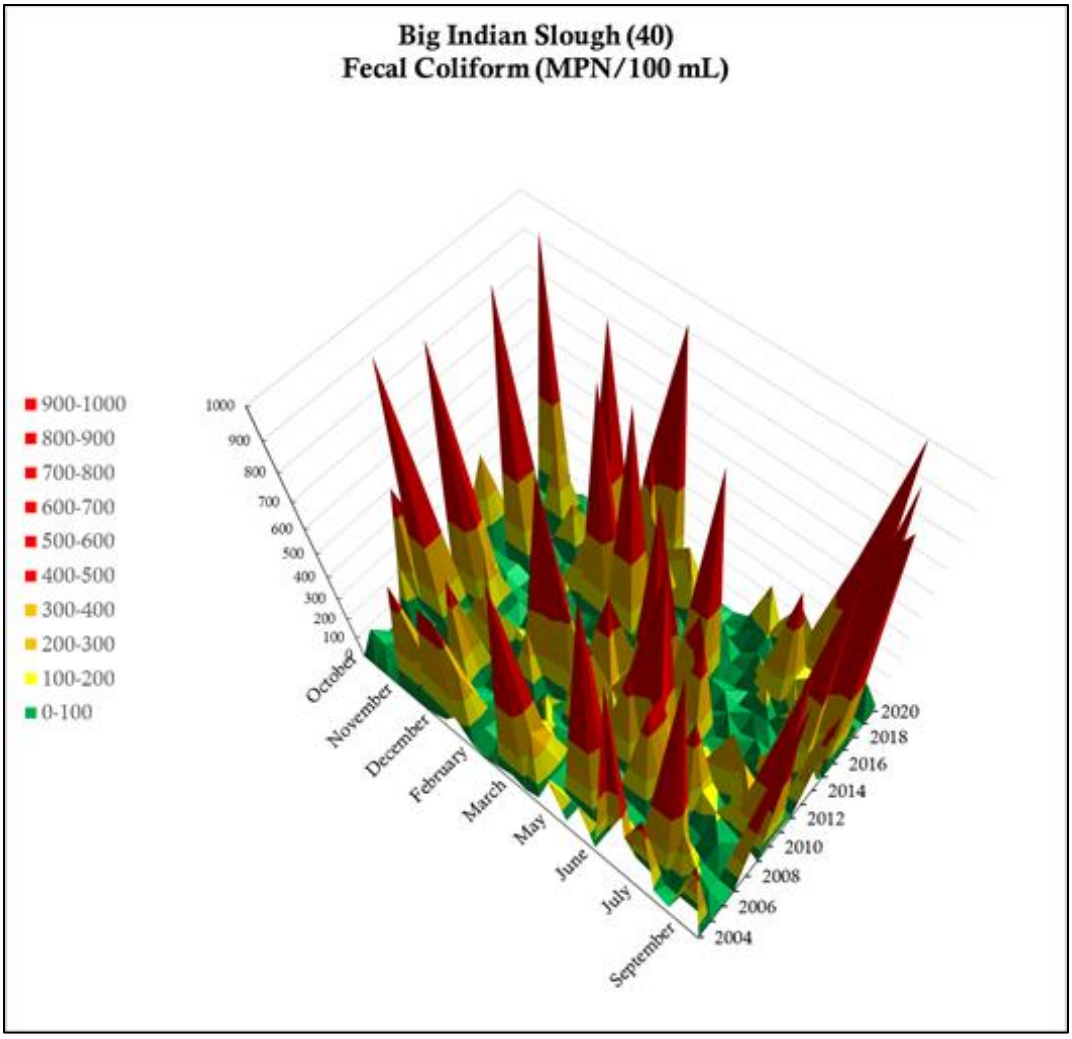
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

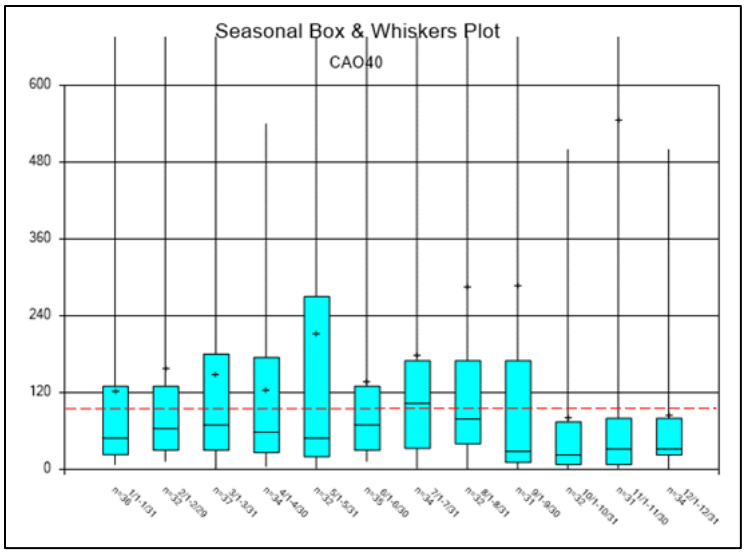




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

41

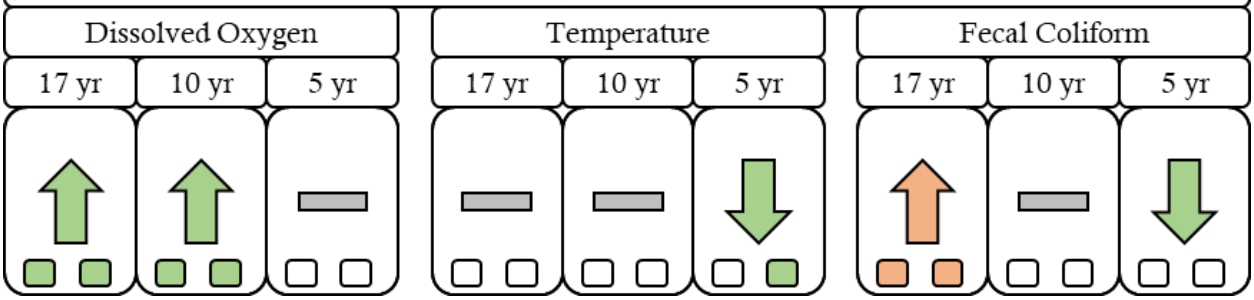
Maddox Slough
@ Milltown Road

Downstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
15	27	23	56	55	27	34	19	24	30	39	39	25	33	18

Long Term Trends

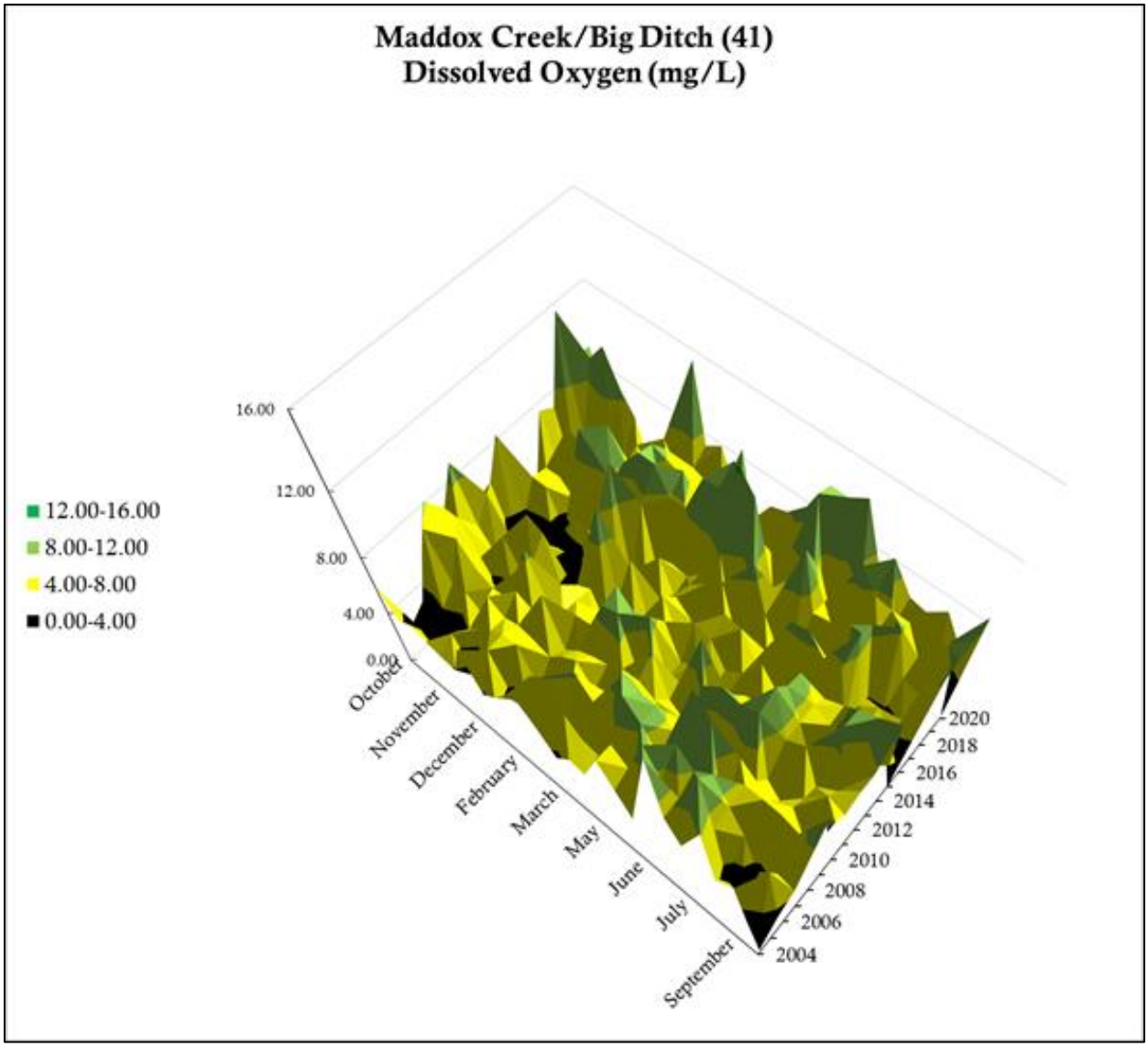


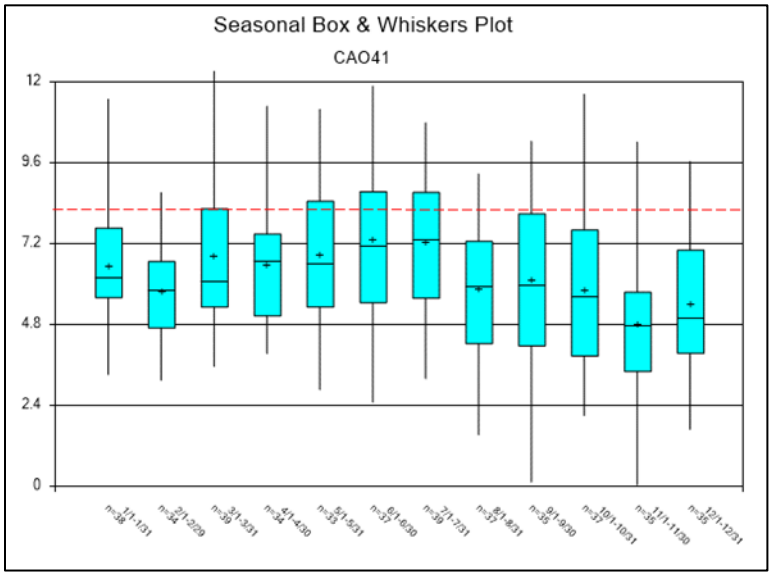
Site 41 is Maddox Slough, or Big Ditch, prior to entering Skagit Bay. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen is higher than it was 17 years ago and ten years ago. Water temperature and FC levels are lower than they were five years ago, though FC levels are still higher than they were at the beginning of this program. WQI scores are consistently in the category of highest concern.

Site 41 rarely meets state standards for DO, and exceeds state standards for water temperature during the warmer months. Annual FC levels pass the state standard for geomean of 100, but narrowly fail the state standard for a 90th percentile of 200.

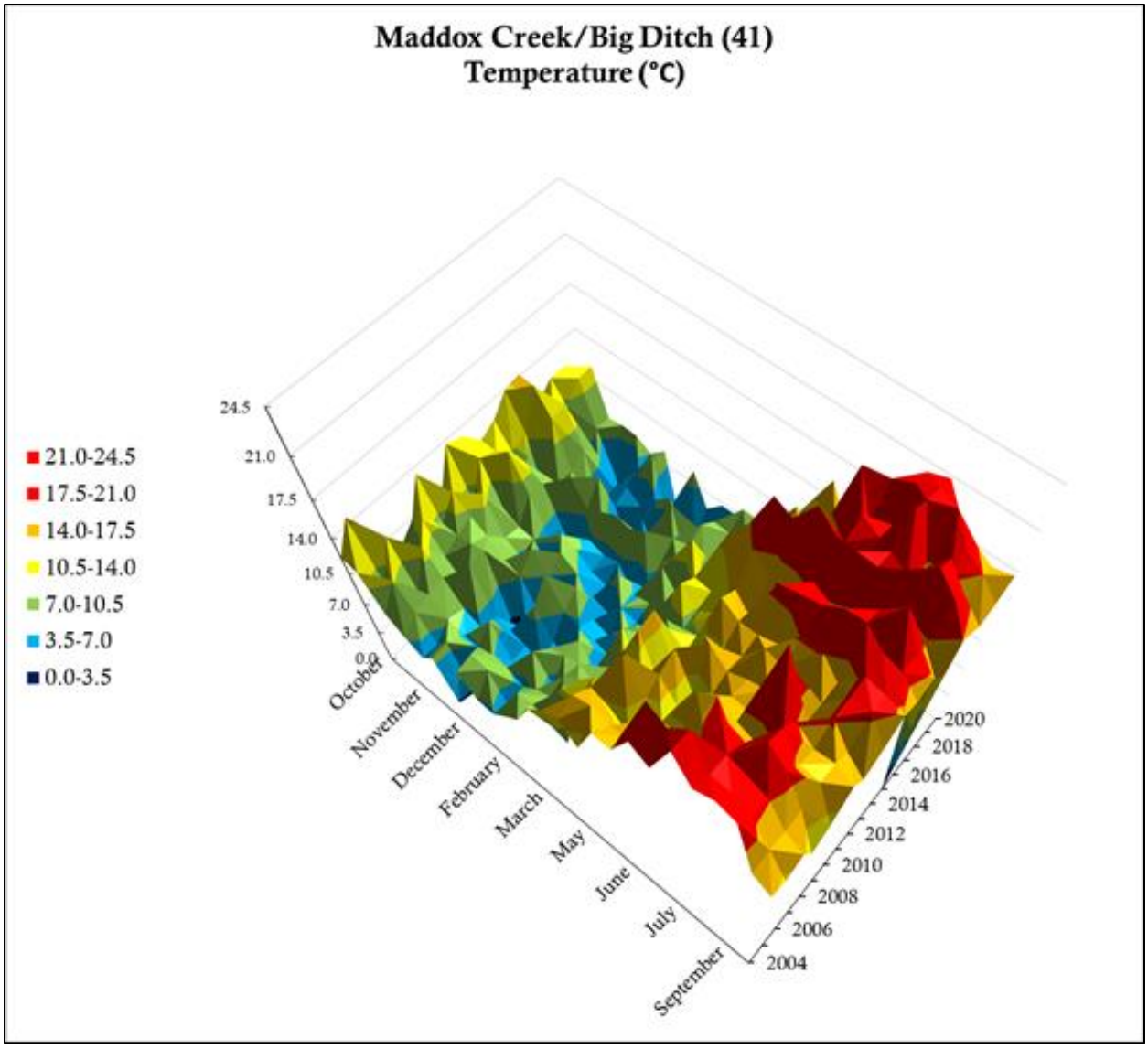
Site 41 is tied for 7th out of 39 sites for number of significant trends, with 15, and is 27th out of 39 sites for positive trends, with 53%.

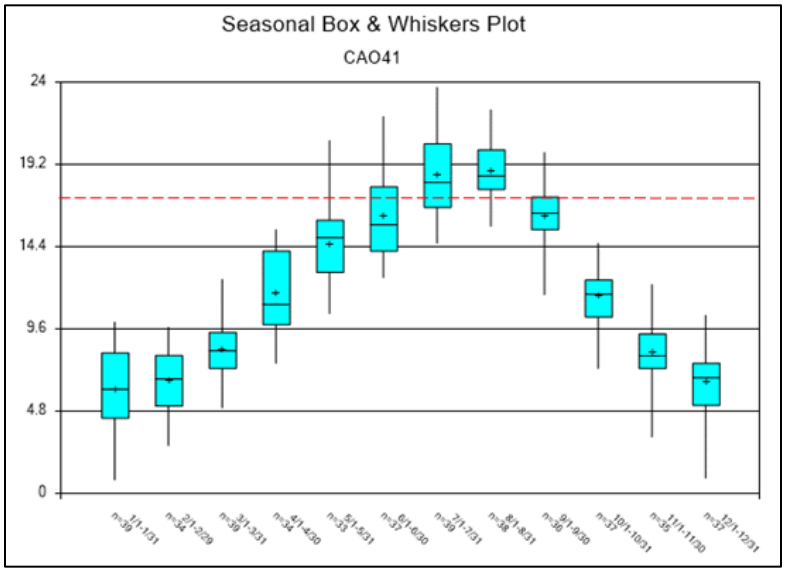




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

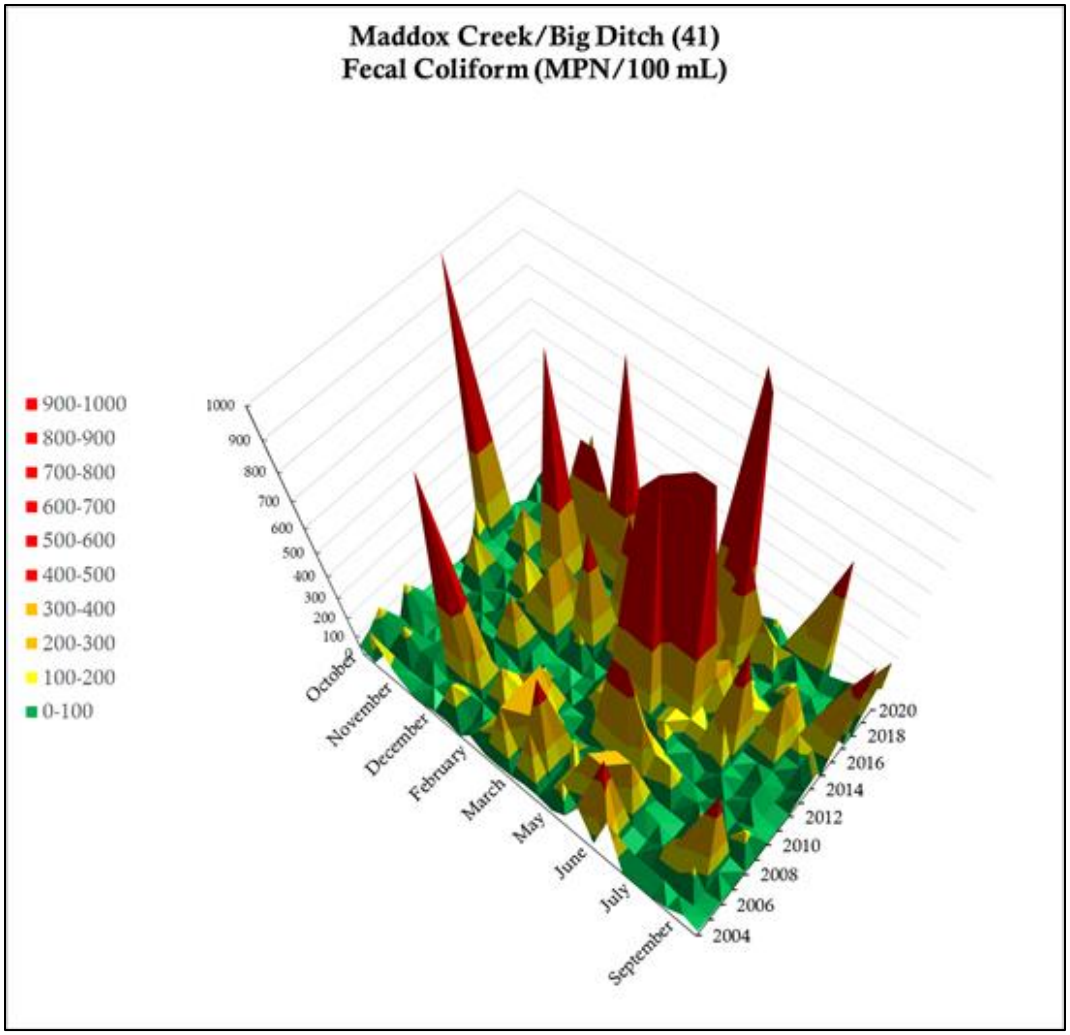
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

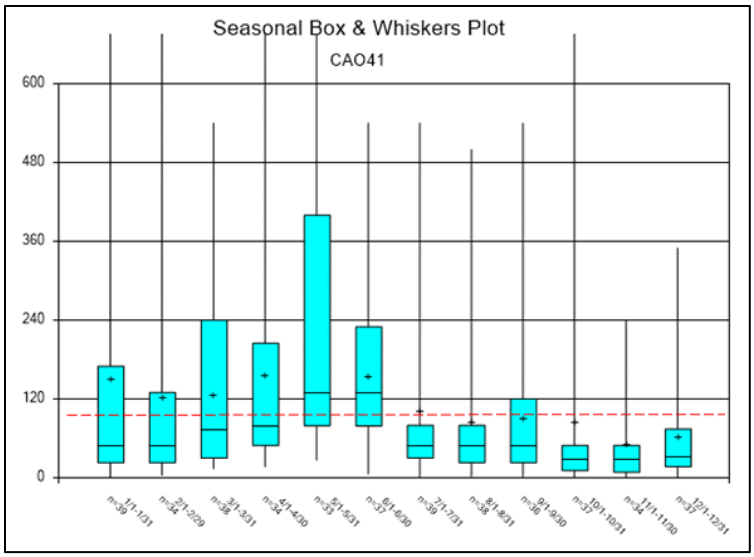




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

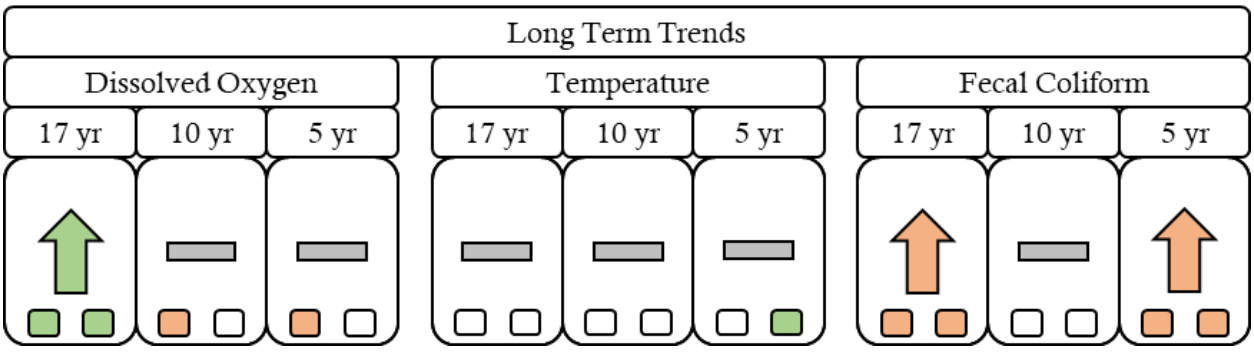
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

42

Hill Ditch
@ Cedardale Road

Downstream Ag

Water Quality Index (WQI)														
2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
50	35	7	39	58	66	70	60	74	77	75	81	80	73	74

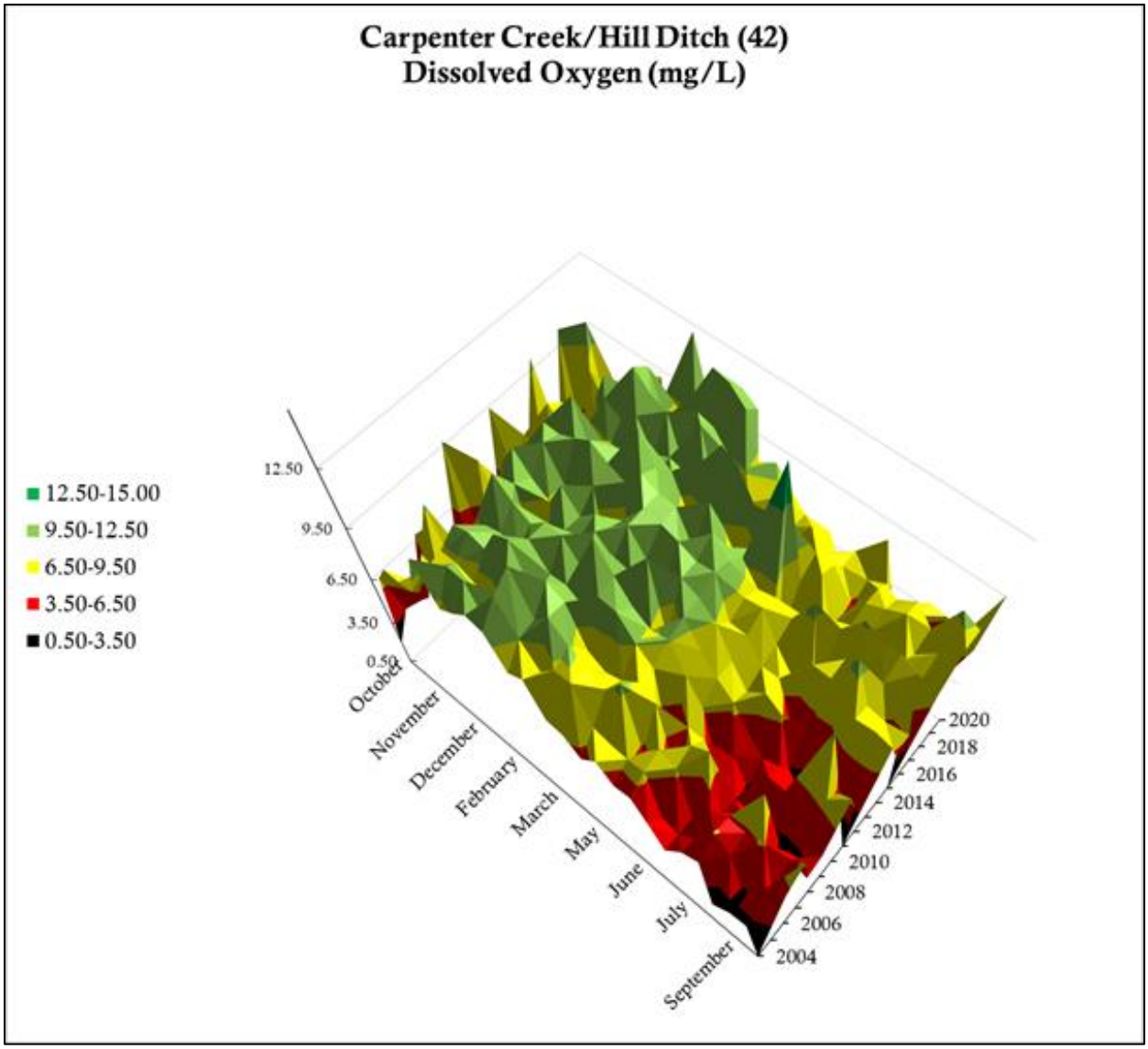


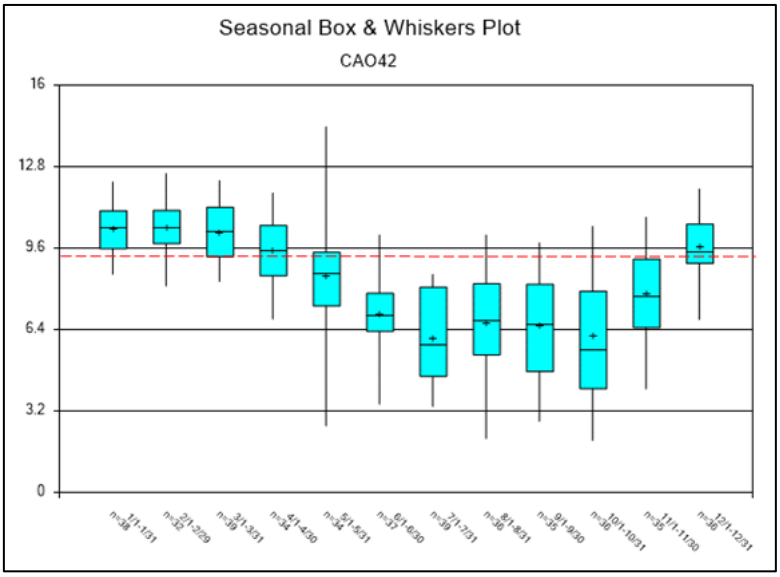
Site 42 is Carpenter Creek, or Hill Ditch, prior to being joined by Fisher Creek and entering Skagit Bay. This watercourse has urban, rural residential, and agricultural influences. This site is designated as core salmonid habitat.

Dissolved oxygen is higher than it was 17 years ago. Fecal coliform counts are higher than they were at the beginning of this program, and as compared to five years ago. WQI scores have improved over the years from the category of highest concern to the category of moderate concern.

Site 42 fails state standards for DO about half of the year, and fails state standards for water temperature during the warmer months. Annual FC levels for WY2020 failed to meet state standards.

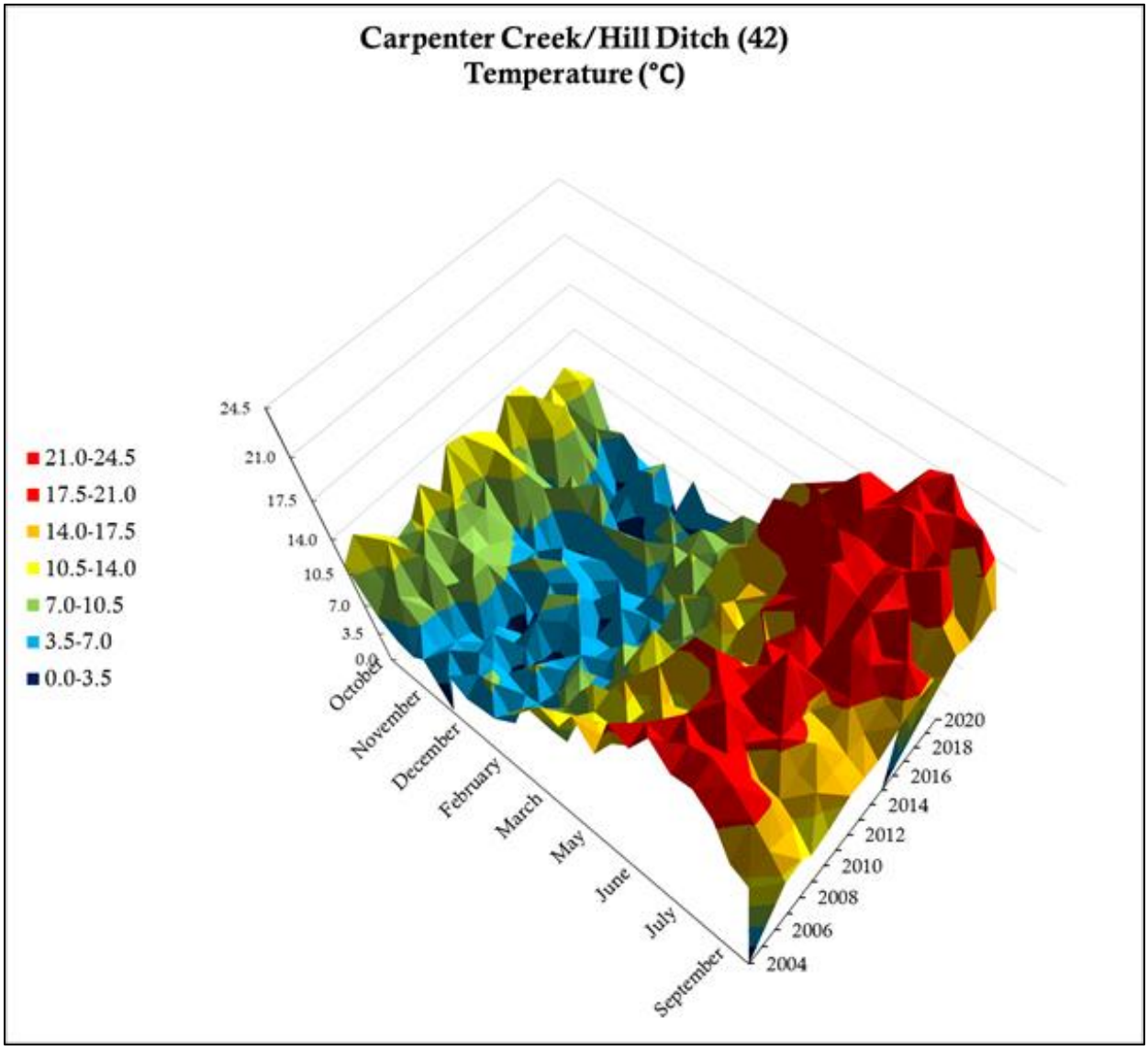
Site 42 is tied for 10th out of 39 sites for number of significant trends, with 14, and is 29th out of 39 sites for positive trends, with 43%.

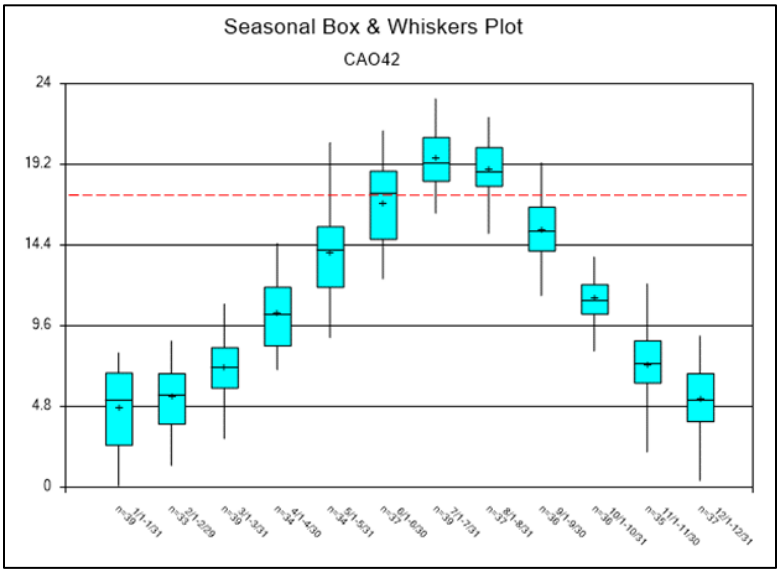




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

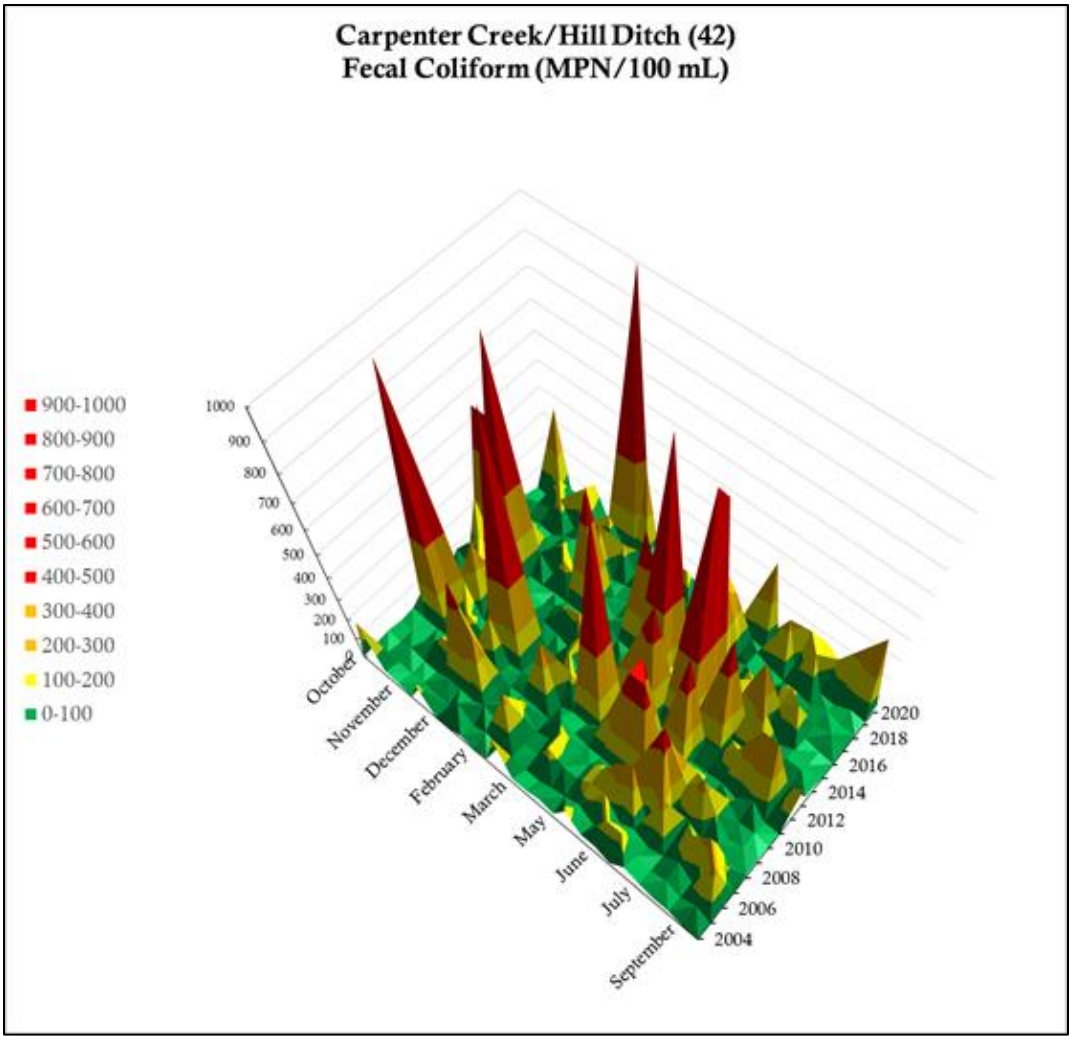
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

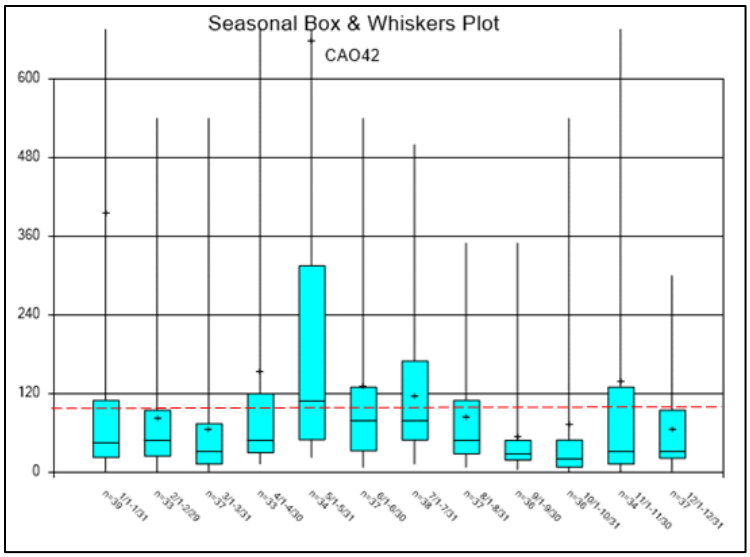




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

43

Wiley Slough
@ Wylie Road

Downstream Ag

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
1	19	17	10	22	6	19	11	12	3	13	1	16	26	7

Long Term Trends

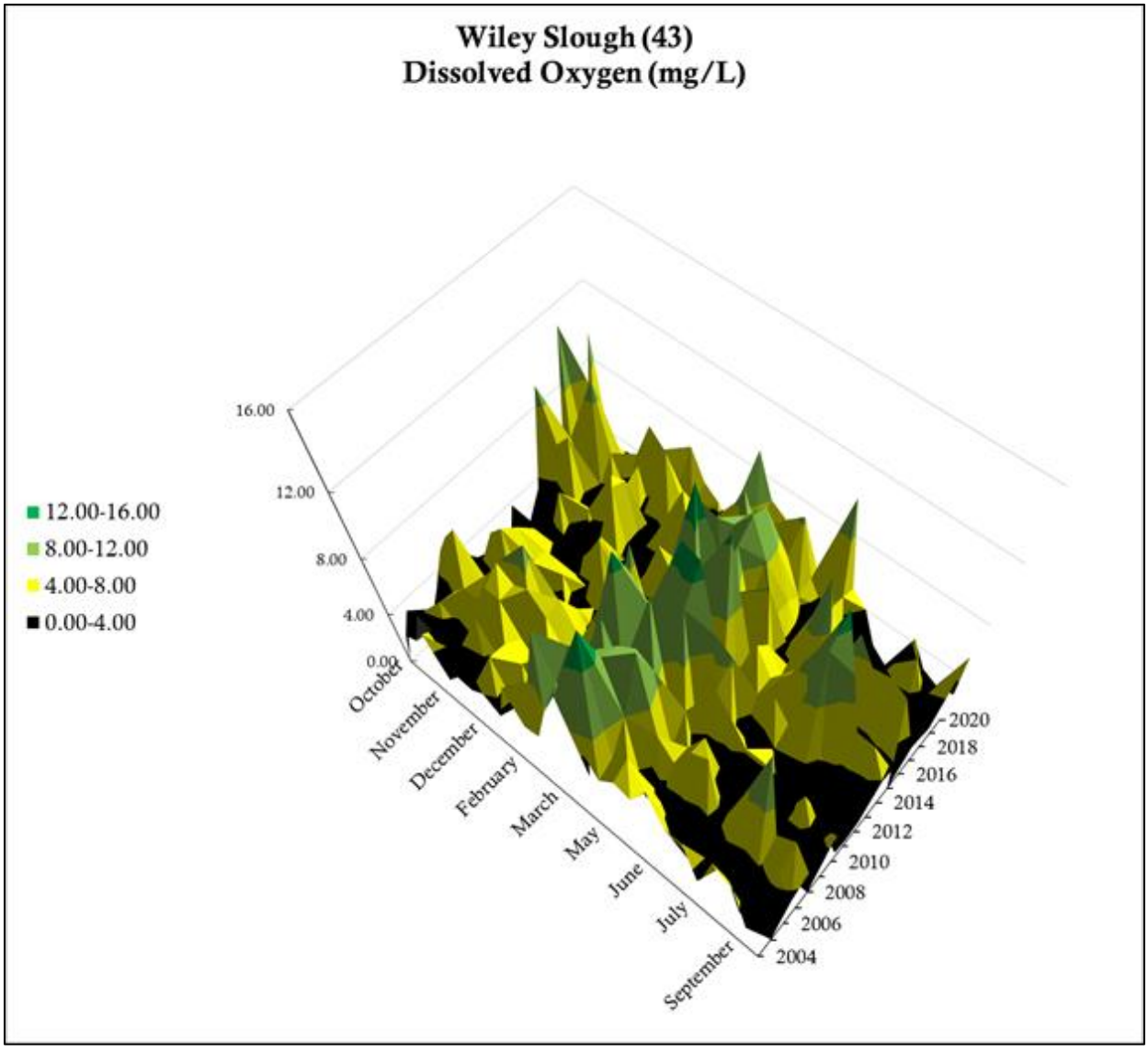
Dissolved Oxygen			Temperature			Fecal Coliform		
17 yr	10 yr	5 yr	17 yr	10 yr	5 yr	17 yr	10 yr	5 yr
—	—	—	—	—	—	↑	—	—

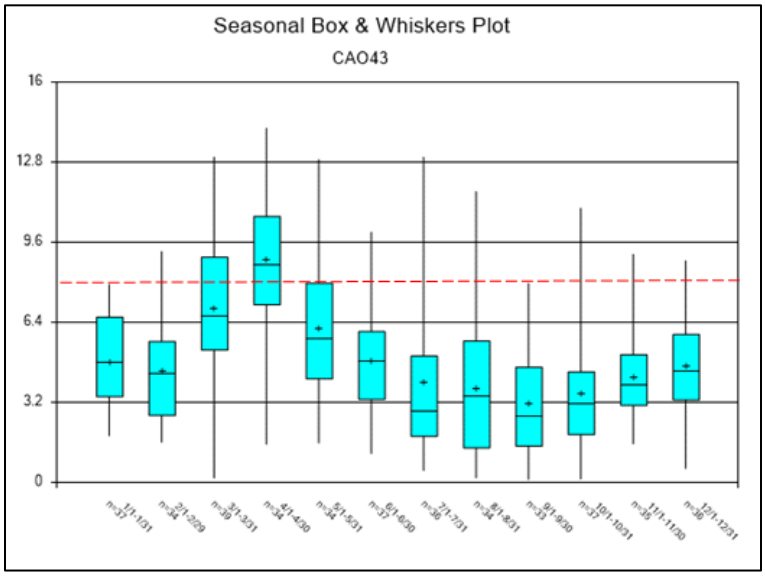
Site 43 is Wiley Slough, prior to its termination into the Skagit Wildlife Area wetlands and Skagit Bay. This site drains a large amount of agricultural area on Fir Island. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Fecal coliform levels are higher now than they were at the beginning of this program. WQI scores are consistently in the category of highest concern.

Site 43 rarely meets state standards for DO, and fails to meet state standards for water temperature in the warmer months. Annual FC levels pass the state standard for geomean of 100, but fail the state standard for a 90th percentile of 200.

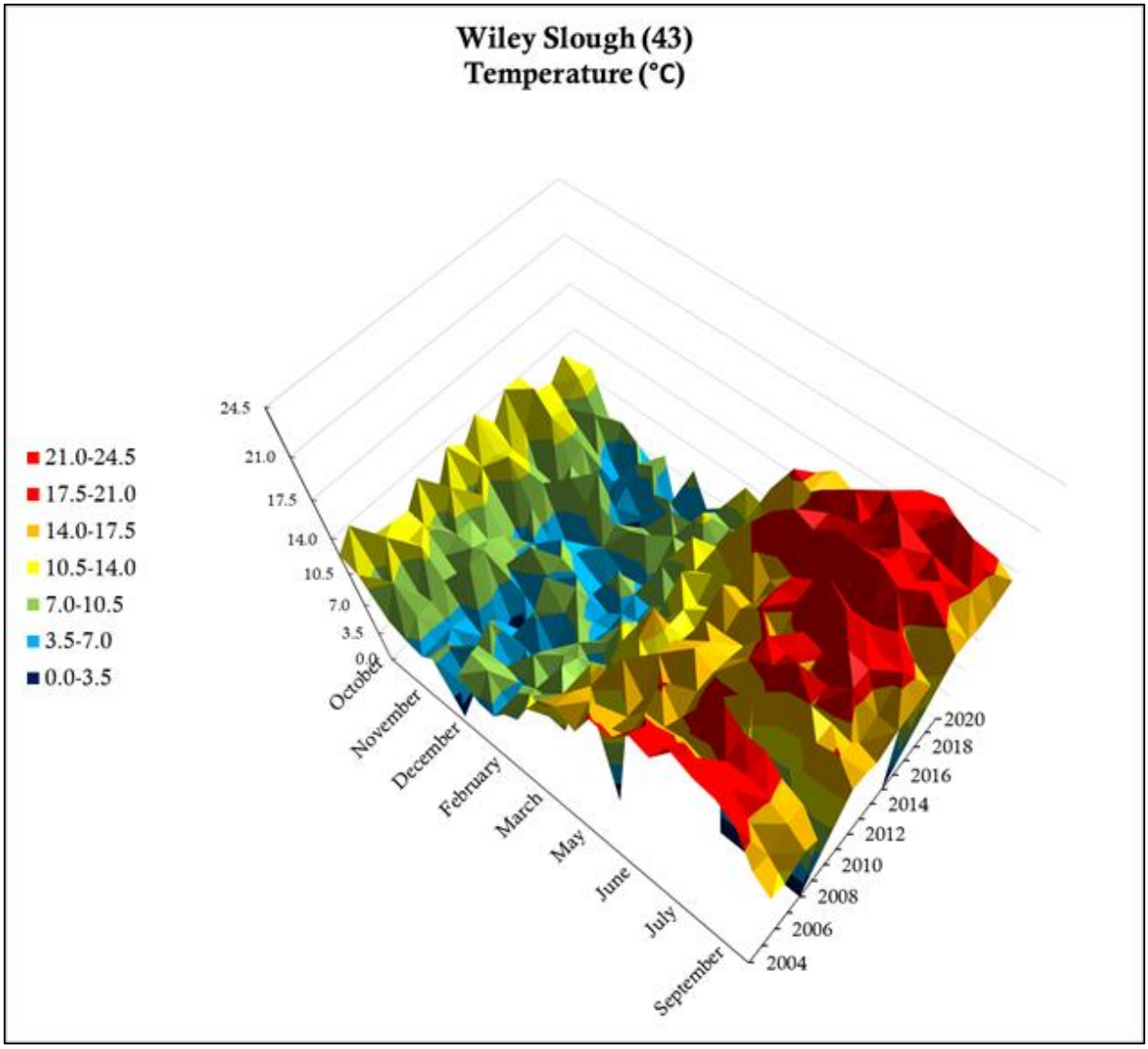
Site 43 is tied for last out of 39 sites for number of significant trends, with 6, and is last out of 39 sites for positive trends, with 0%.

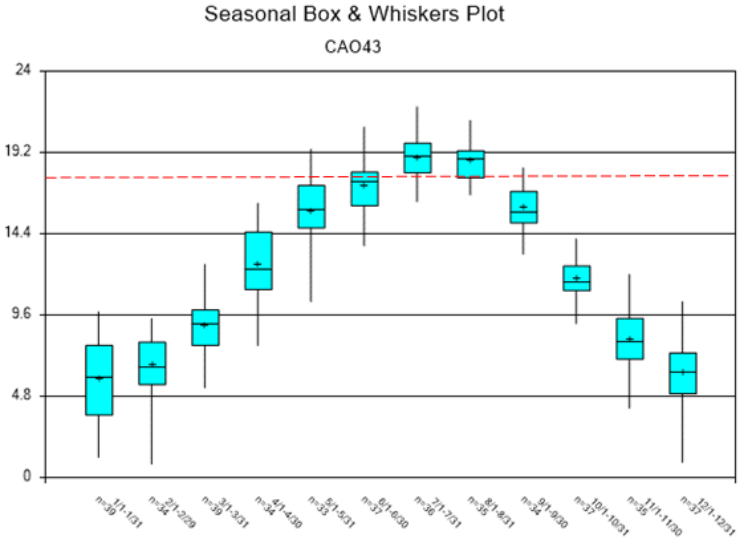




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

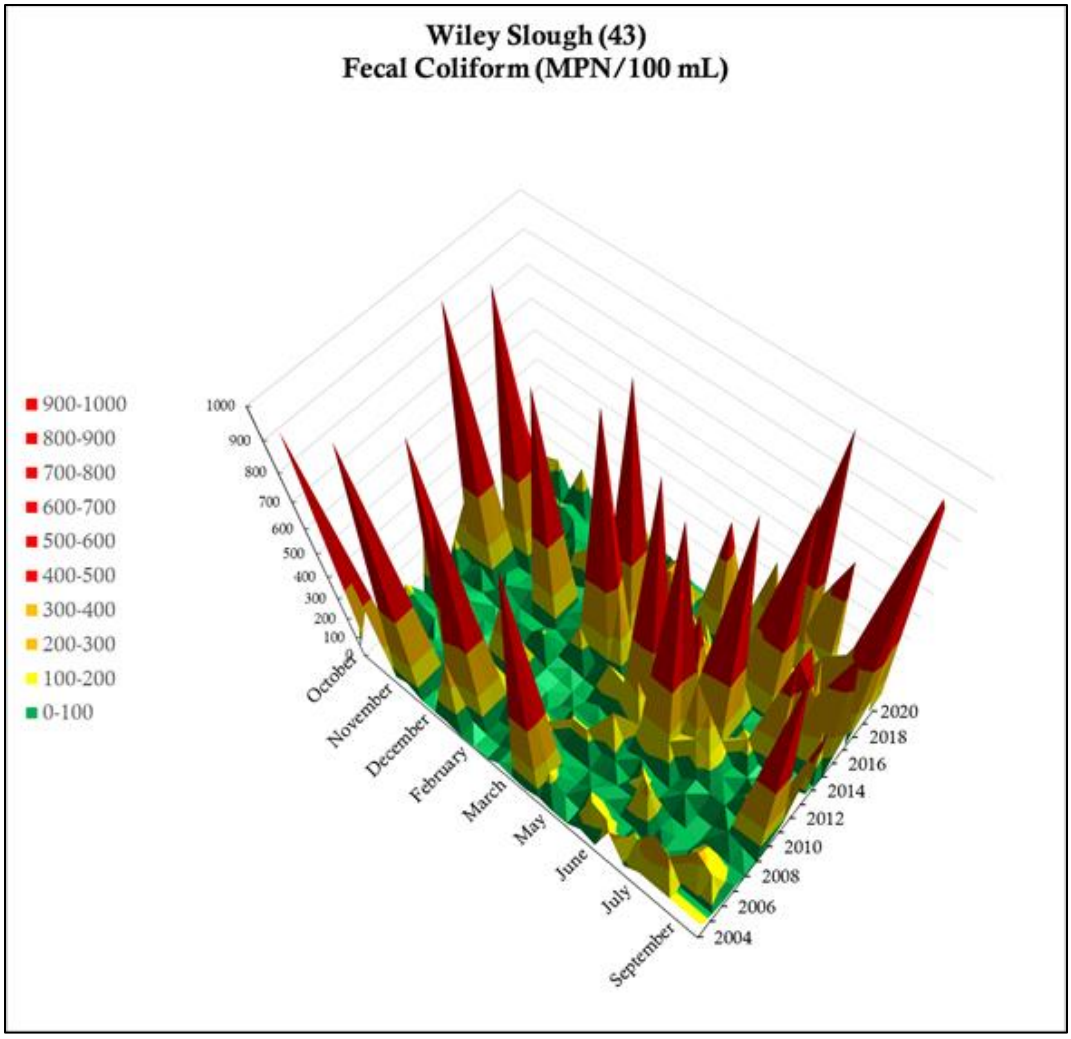
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

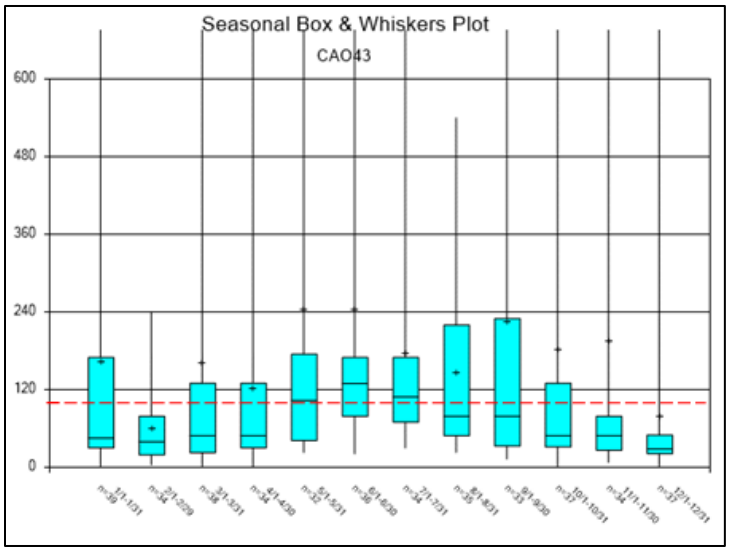




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

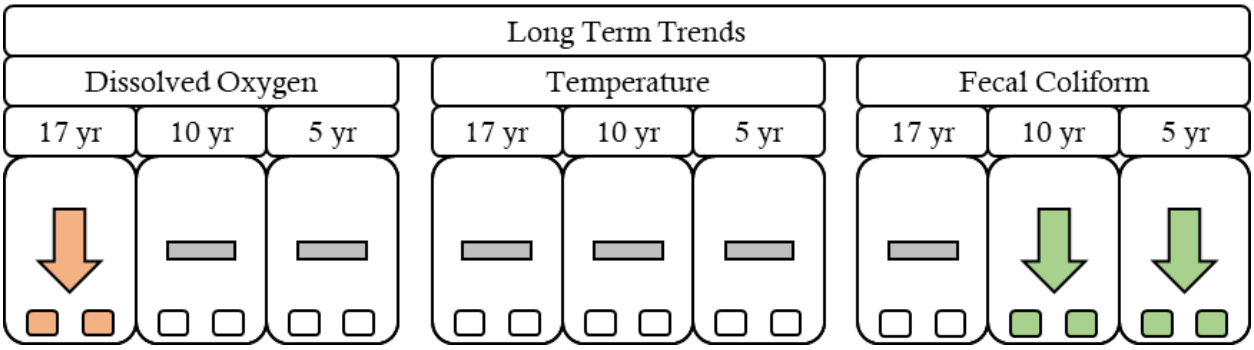
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

44

Sullivan Slough
@ La Conner-Whitney Road

Downstream Ag

Water Quality Index (WQI)														
2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
28	21	2	33	47	29	36	25	12	11	8	16	8	32	23

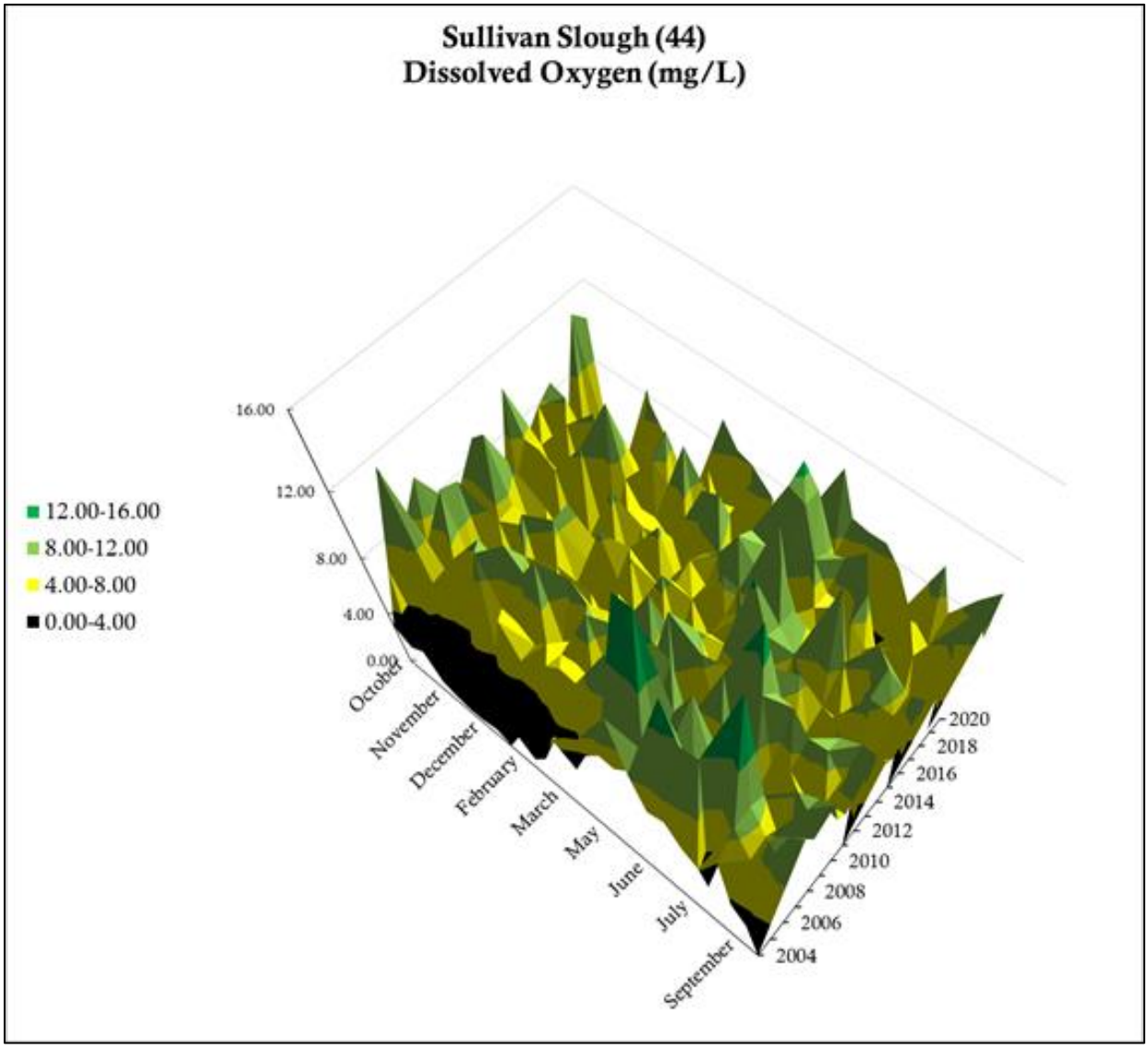


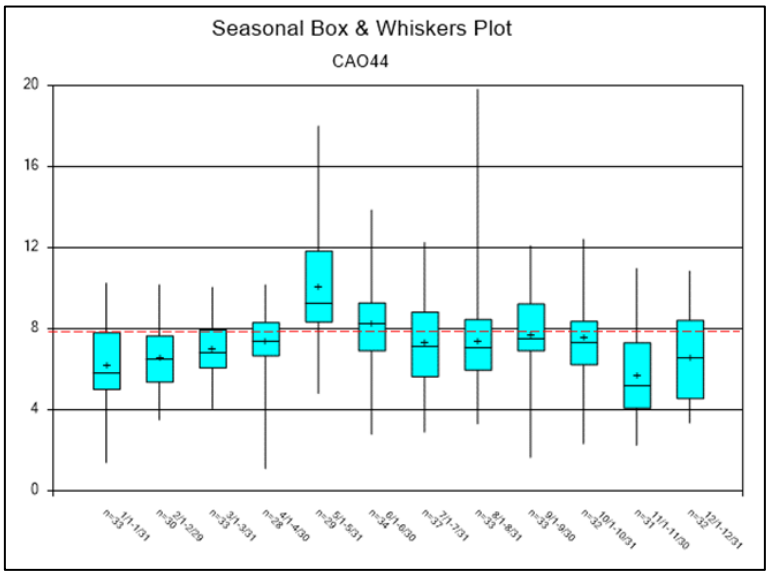
Site 44 is Sullivan Slough, at its west end, just prior to entering the Swinomish Channel. Sites like this are characterized by being stagnant or slow-moving, and are heavily tidally-influenced. This site is designated as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen is lower than it was 17 years ago. Fecal coliform counts have decreased over the last ten years and five years. WQI scores are consistently in the category of highest concern.

Site 44 spends the majority of the year below state standards for DO, and fails to meet state standards for water temperature during the warmer months. Annual FC levels for WY2020 failed to meet state standards.

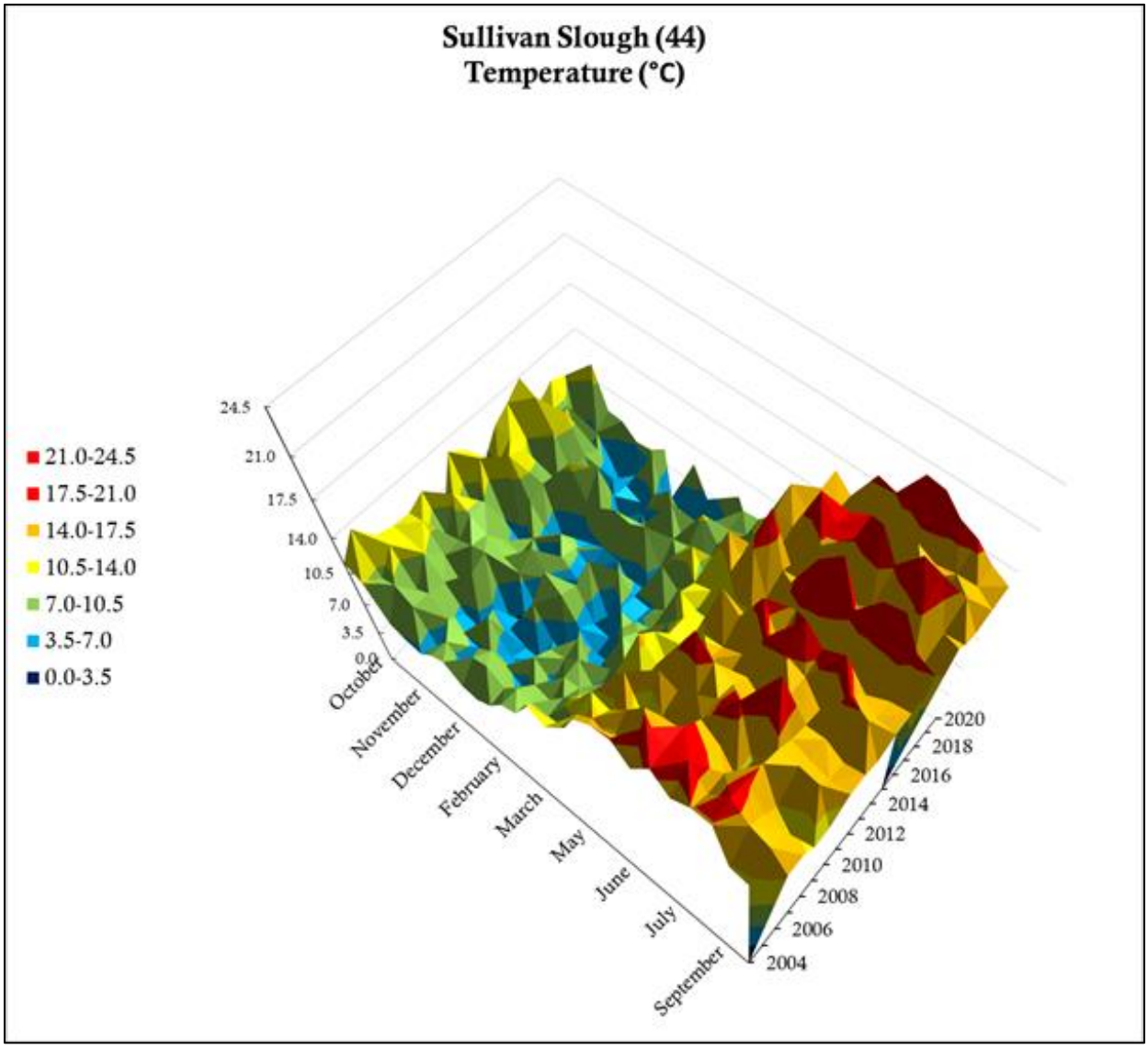
Site 44 is tied for 22nd out of 39 sites for number of significant trends, with 11, and is 32nd out of 39 sites for positive trends, with 36%.

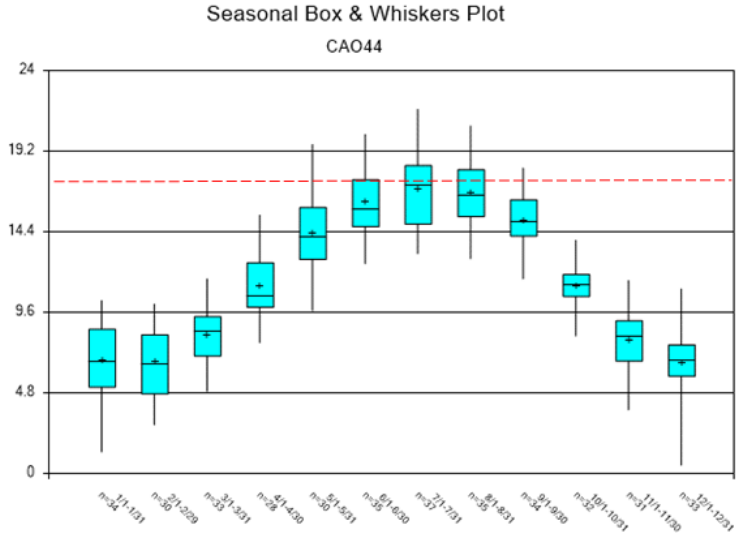




The dissolved oxygen (DO) standard for this site is 8.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

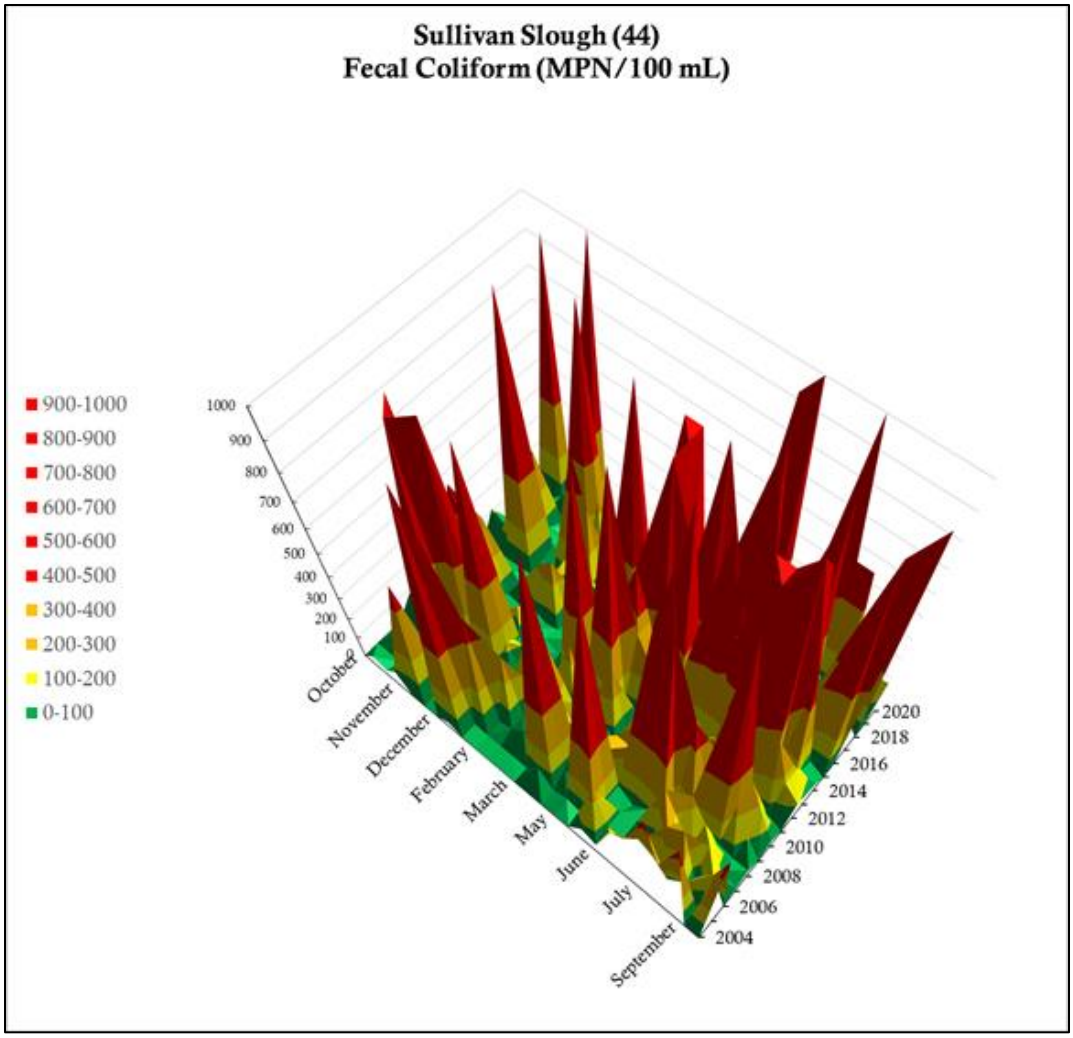
The dashed red line on the monthly box plot represents the 8.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

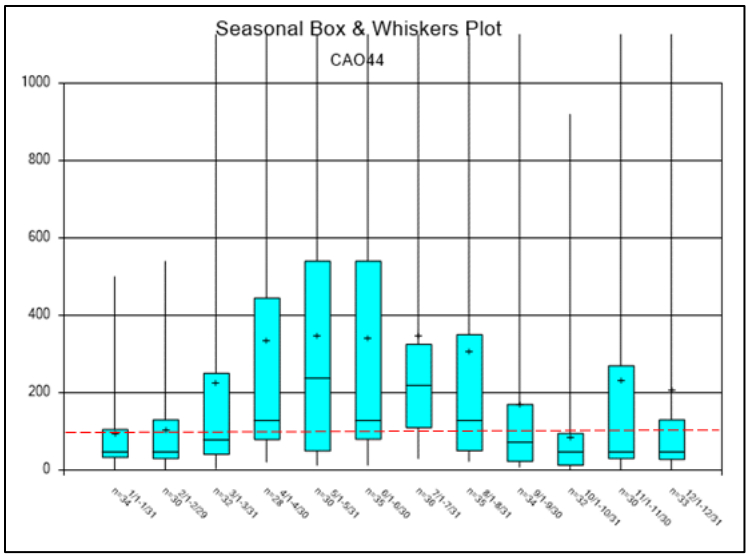




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

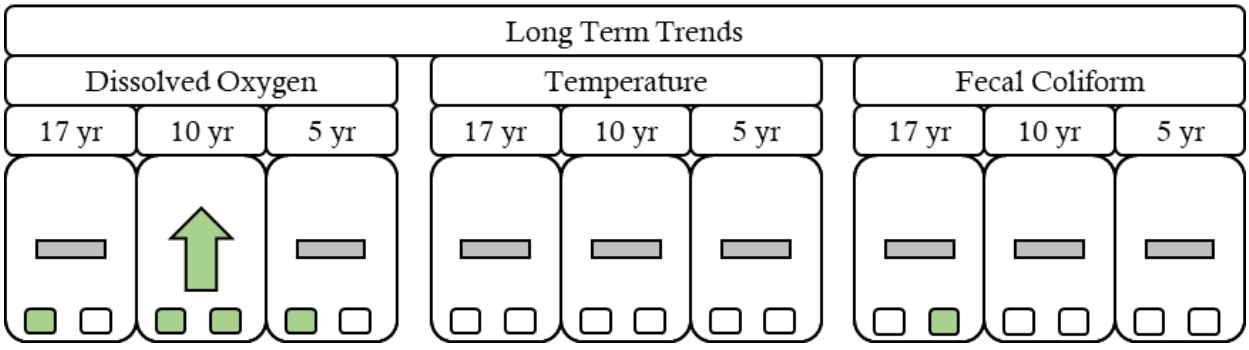
45

North Fork Skagit River
@ Moore Road

Skagit River – Lower, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
78	71	88	95	95	95	80	86	85	93	89	89	89	88	93

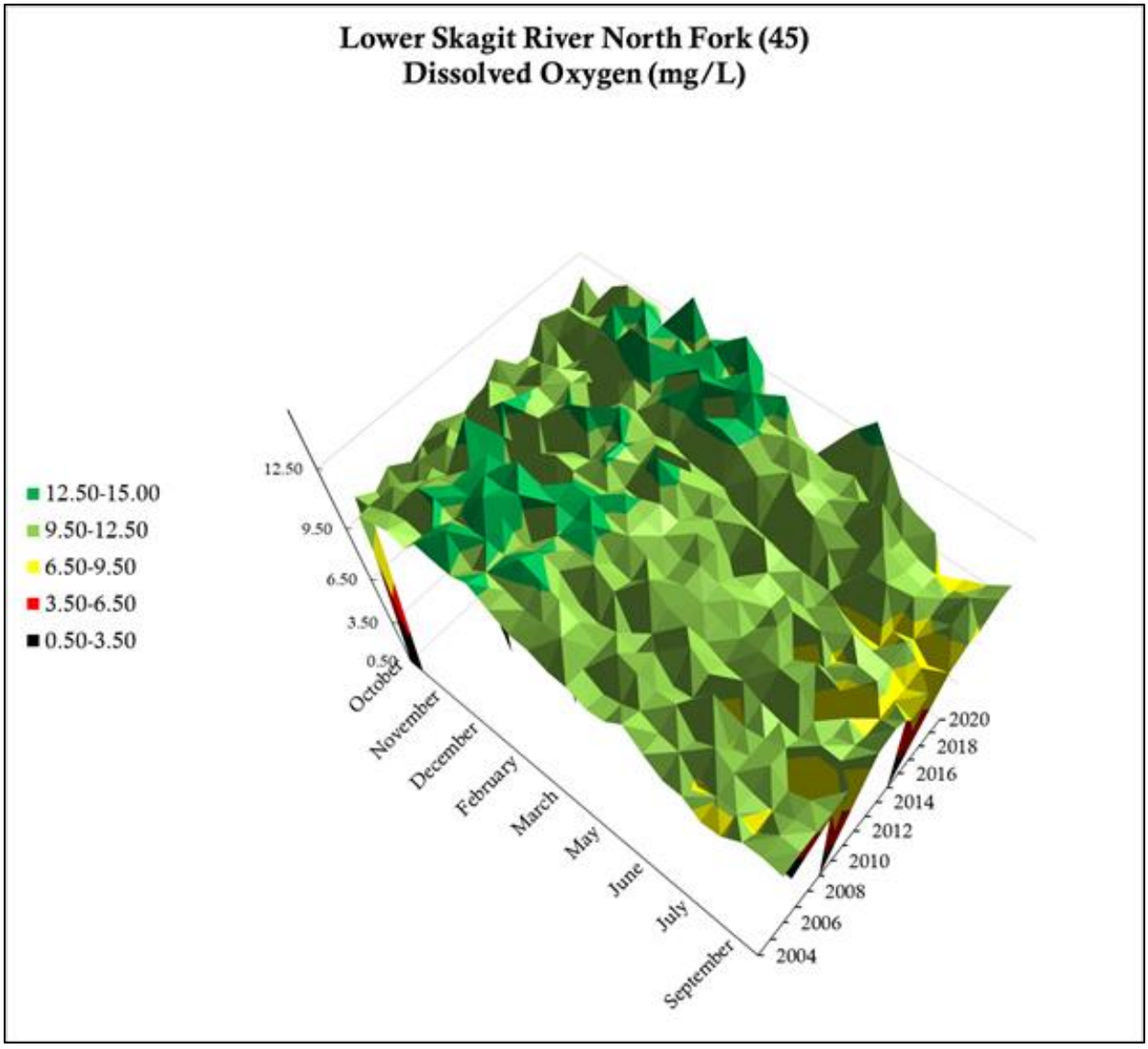


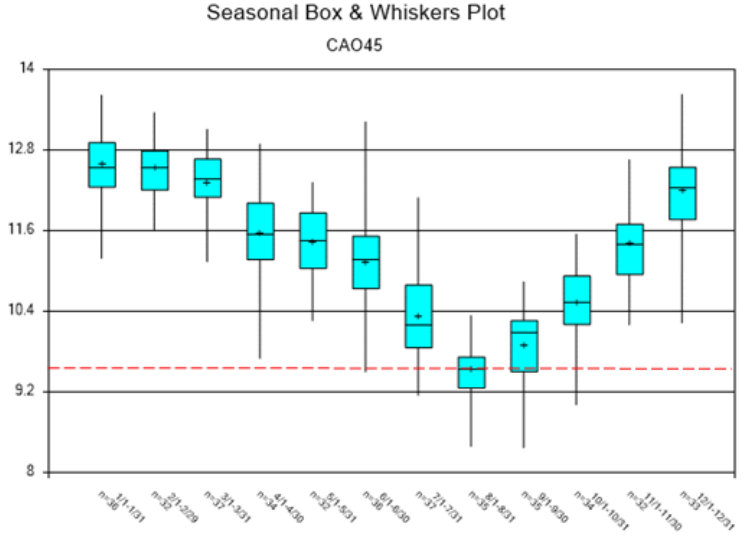
Site 45 is the north fork of the Skagit River, downstream of Mount Vernon. The river is designated as core salmonid habitat and as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen has increased over the most recent ten years. WQI scores are consistently in the category of least concern.

Site 45 rarely fails to meet state standards for DO and temperature. Annual FC counts easily meet state standards.

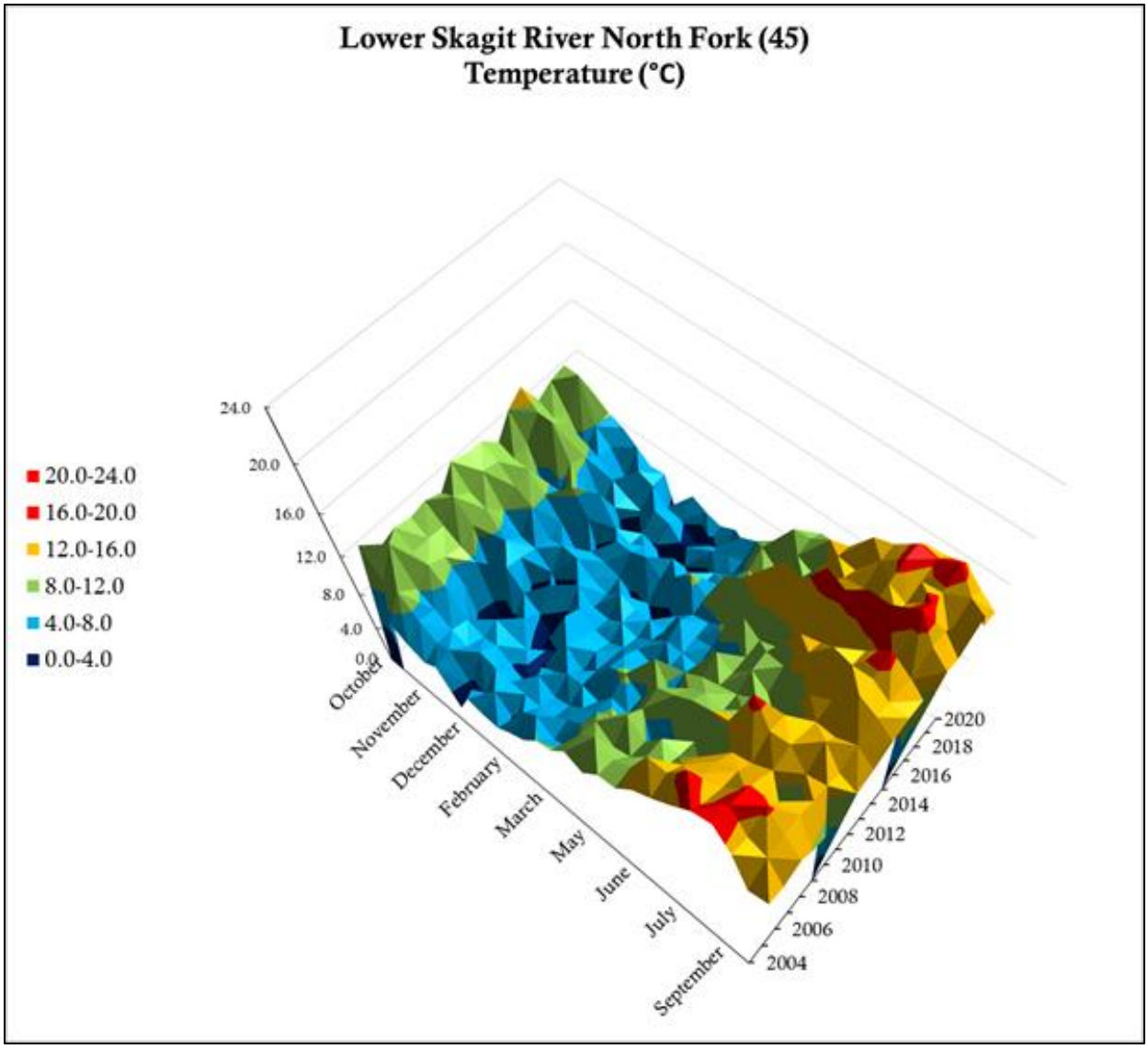
Site 45 is tied for 22nd out of 39 sites for number of significant trends, with 11, and is tied for 2nd out of 39 sites for positive trends, with 91%.

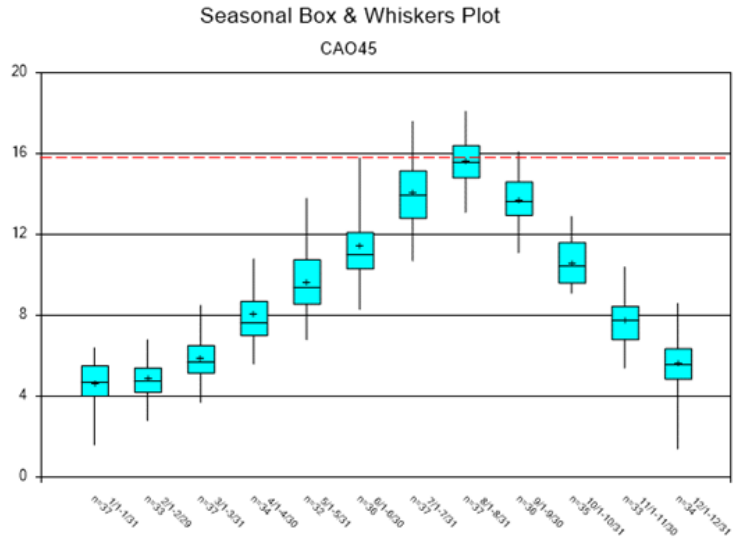




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

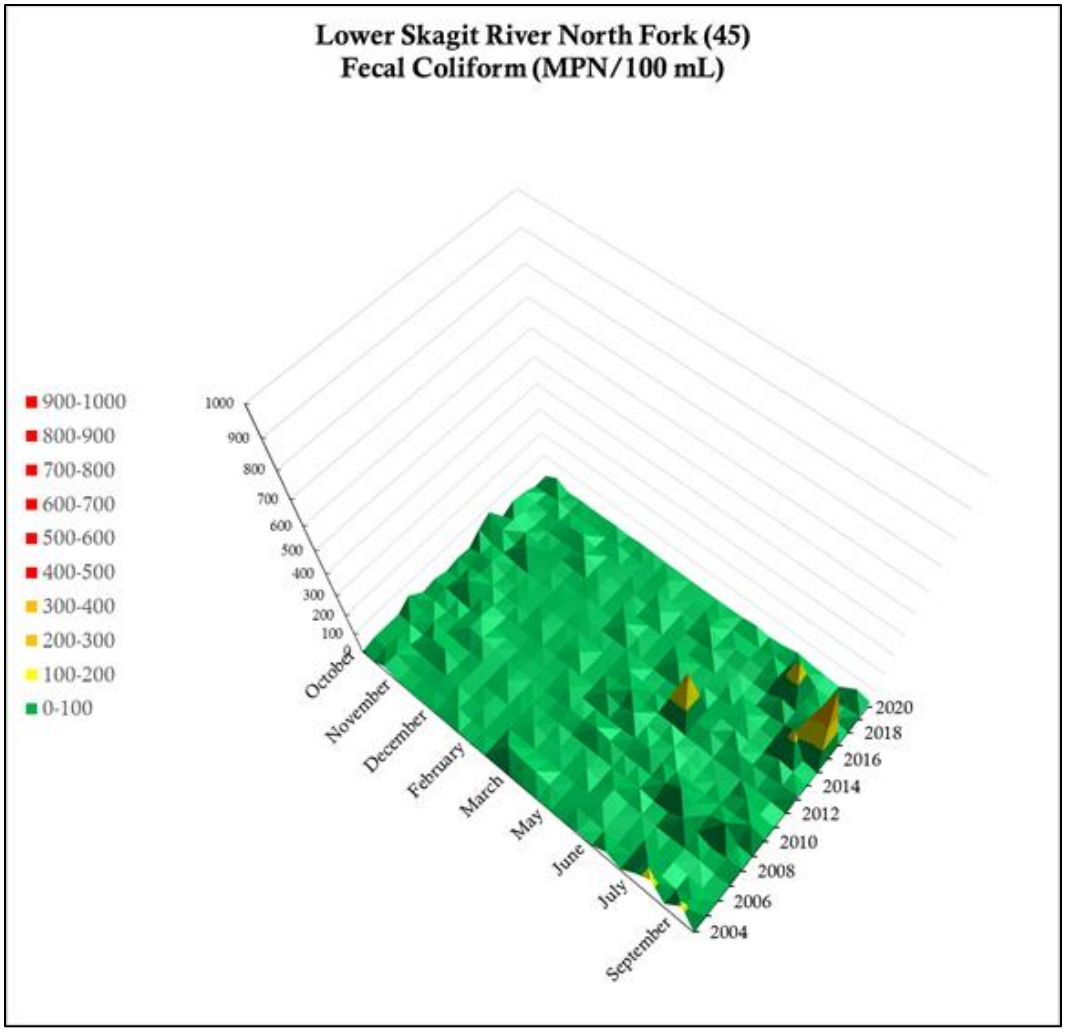
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

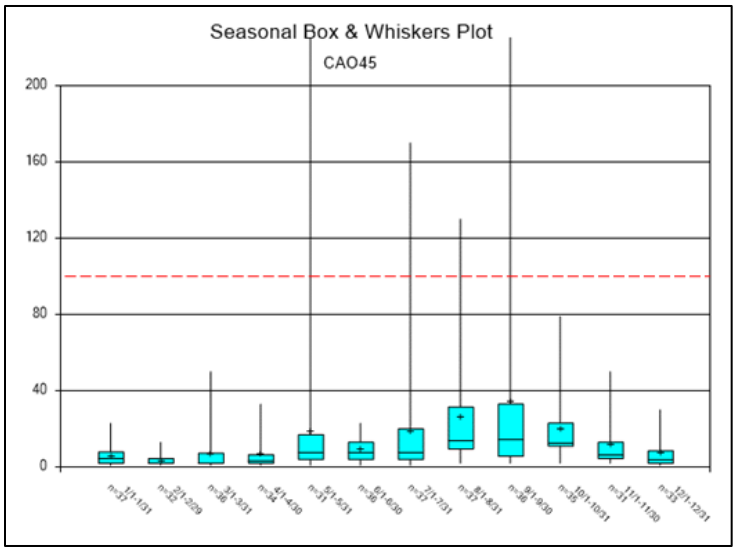




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

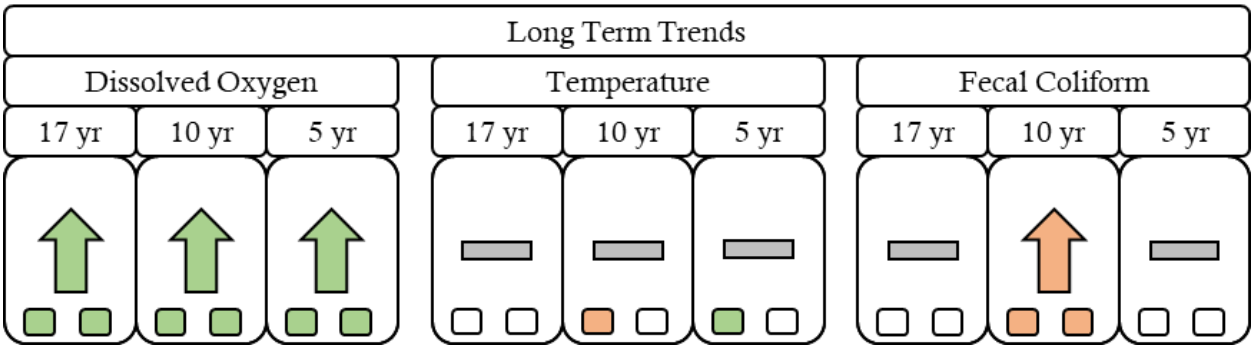
46

South Fork Skagit River
@ Conway Bridge

Skagit River – Lower, TMDL

Water Quality Index (WQI)

2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
81	73	80	93	91	95	89	83	91	91	93	88	92	86	93

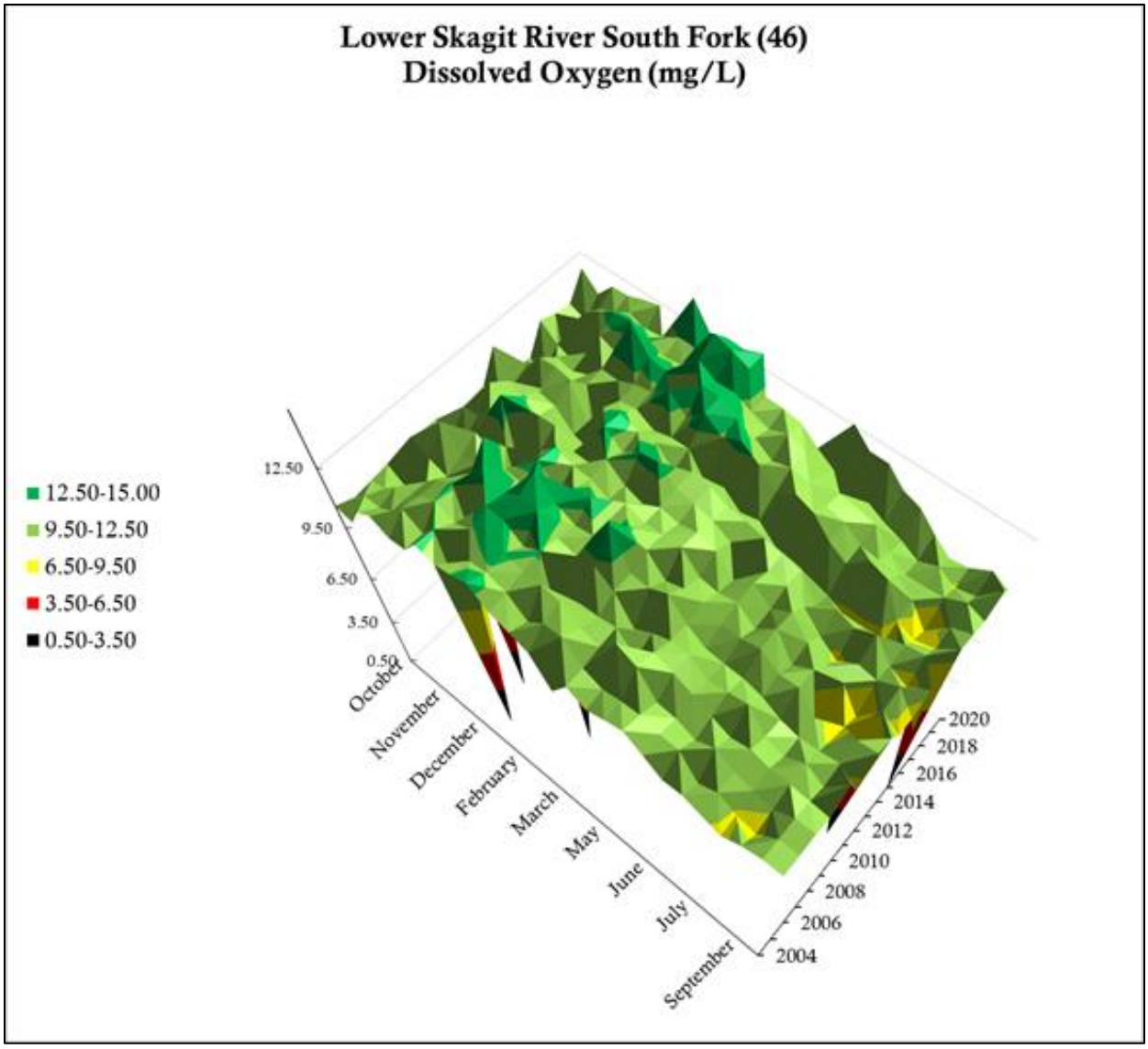


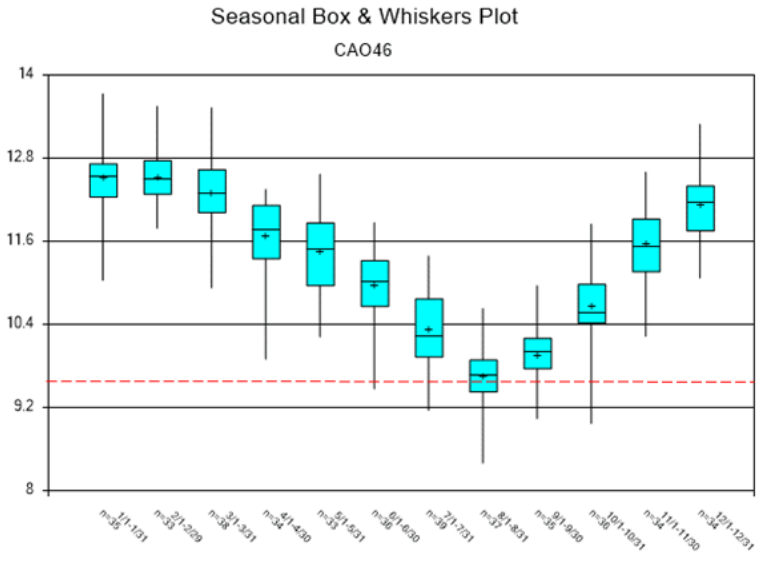
Site 46 is the south fork of the Skagit River, downstream of Mount Vernon. The river is designated as core salmonid habitat and as salmonid spawning, rearing, and migration (SRM) status.

Dissolved oxygen has increased over all analyzed time periods. Fecal coliform counts are higher now than ten years ago. WQI scores are consistently in the category of least concern.

Site 46 rarely fails to meet state standards for DO and water temperature. Annual FC counts easily meet state standards.

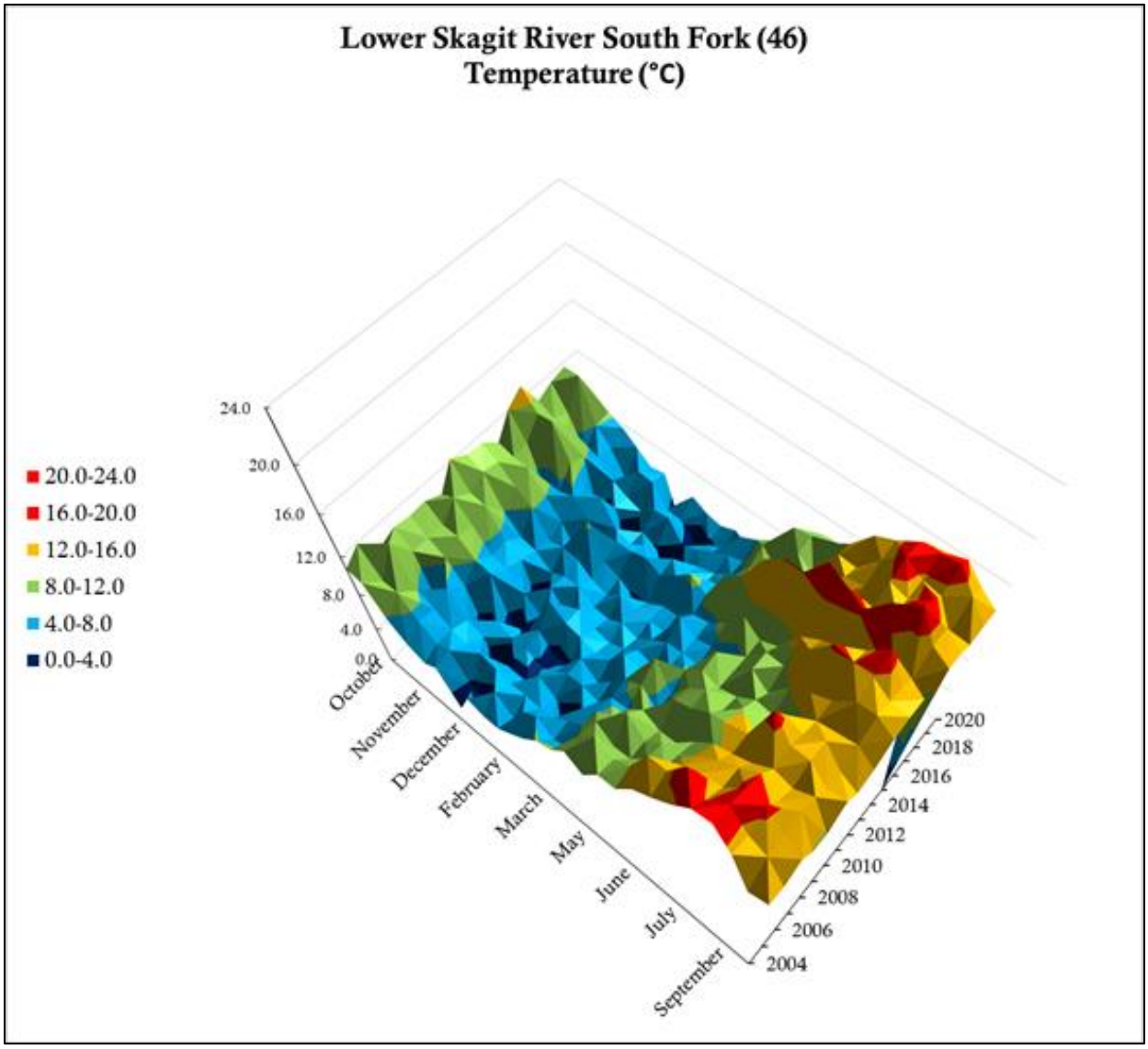
Site 46 is tied for 3rd out of 39 sites for number of significant trends, with 17, and is 11th out of 39 sites for positive trends, with 76%.

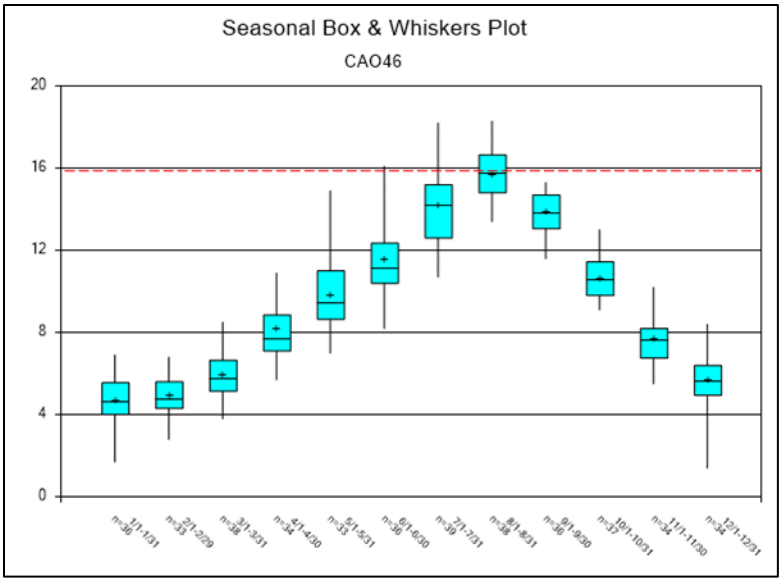




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

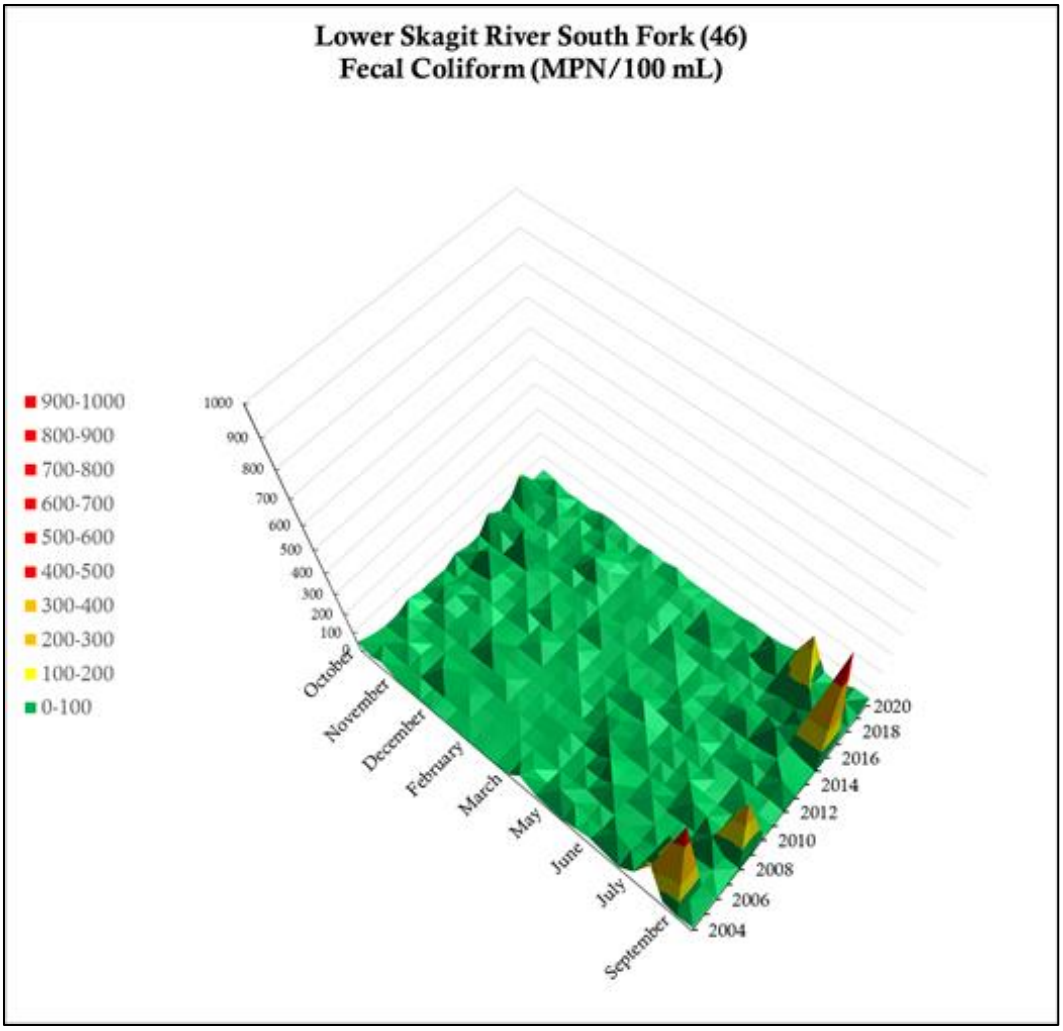
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

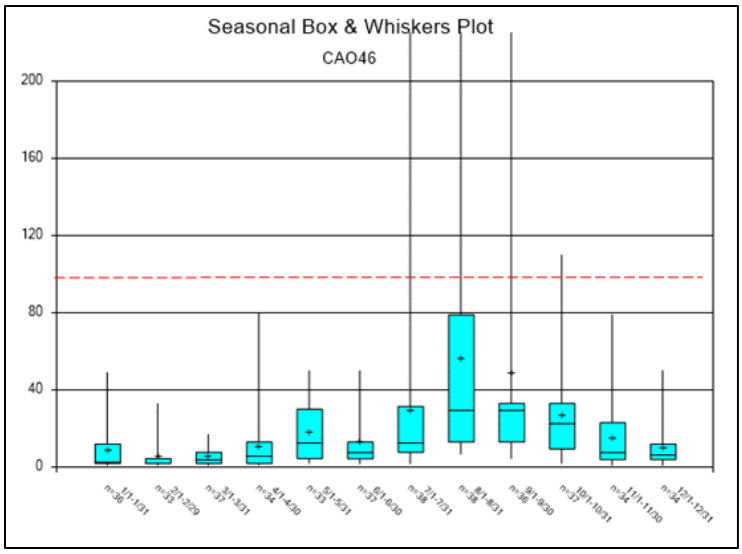




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

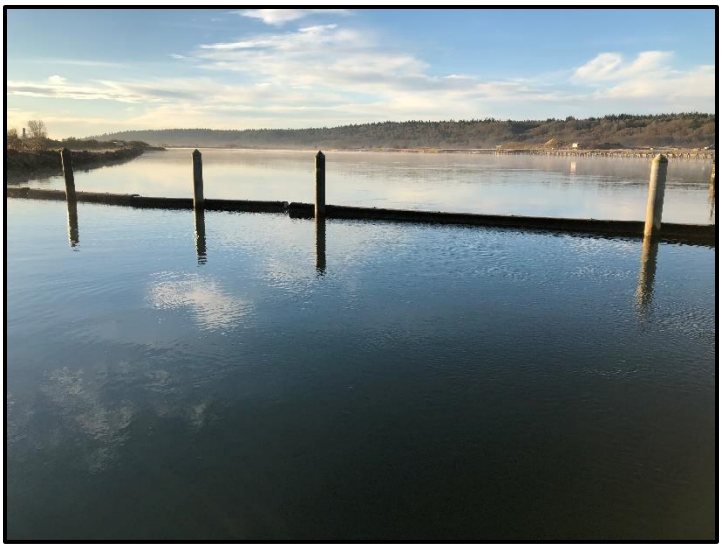
The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

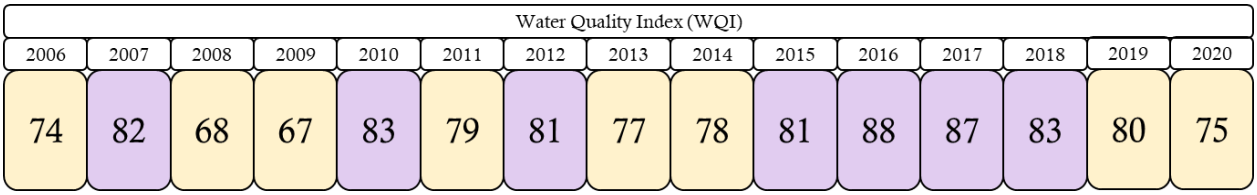
The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

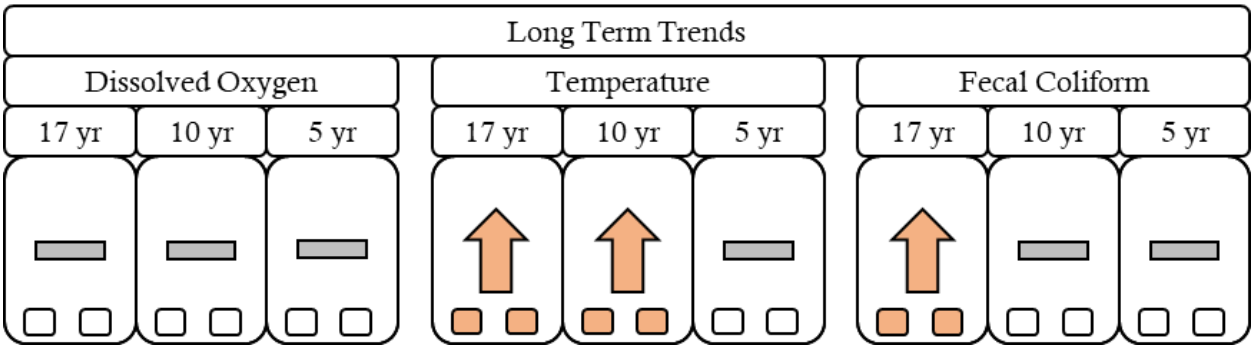


47

Swinomish Channel
@ Berentson Bridge

Reference - Marine



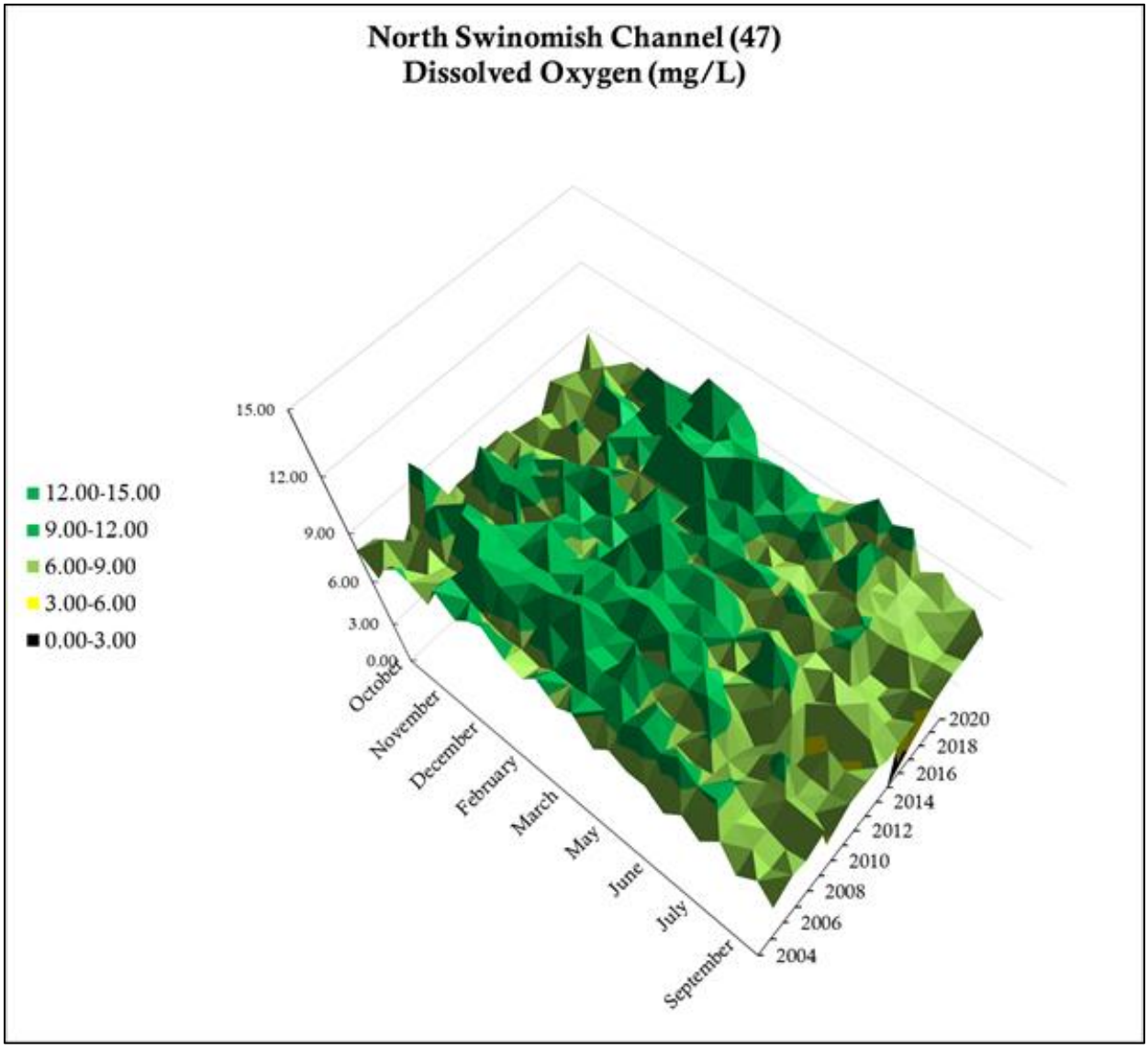


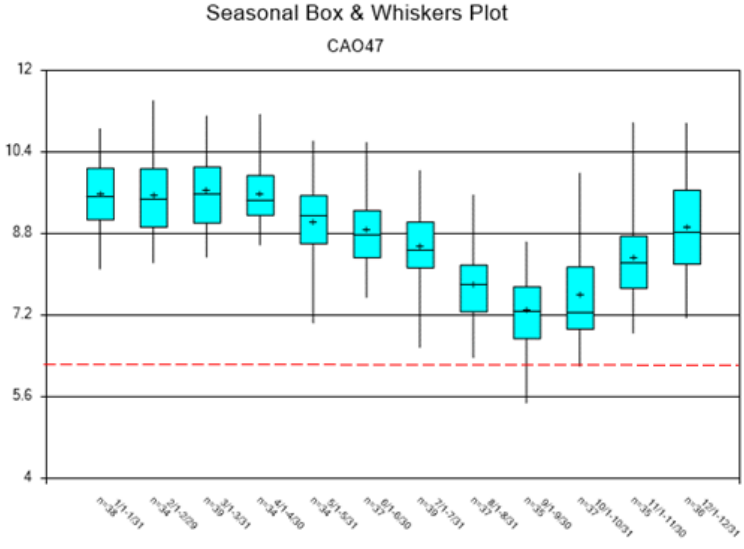
Site 47 is the Swinomish Channel, at the north end, just prior to Padilla Bay, and connects Padilla Bay to Skagit Bay. This site is designated as marine water.

Water temperature is higher than it was 17 years ago and ten years ago. Fecal coliform counts are higher now than they were at the beginning of this program. WQI scores are generally in the higher-scoring end of the moderate concern category, and often score as least concern.

Site 47 rarely fails to meet state standards for DO and water temperature. Annual FC counts easily meet state standards.

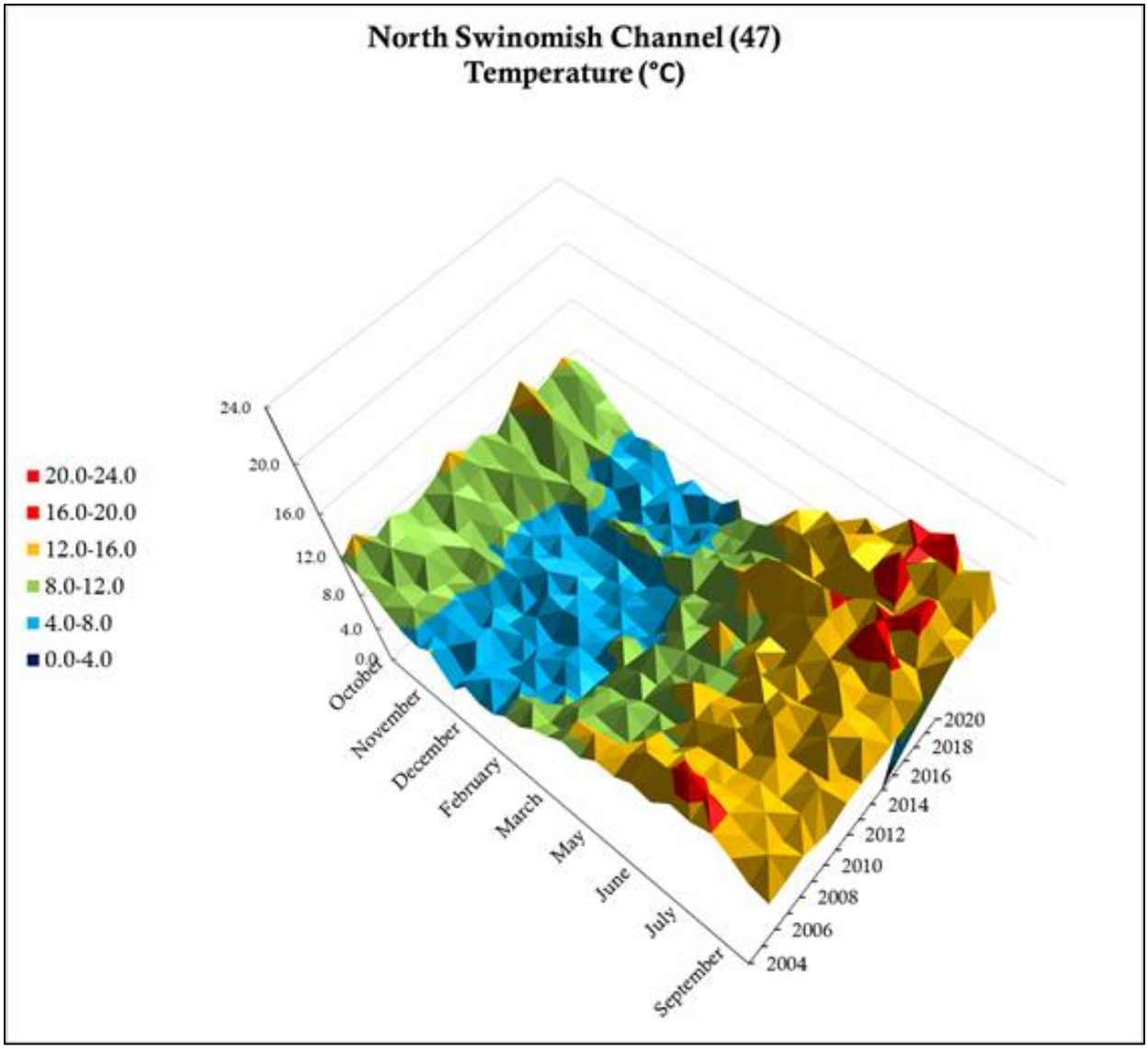
Site 47 is 12th out of 39 sites for number of significant trends, with 13, and is 37th out of 39 sites for positive trends, with 15%.

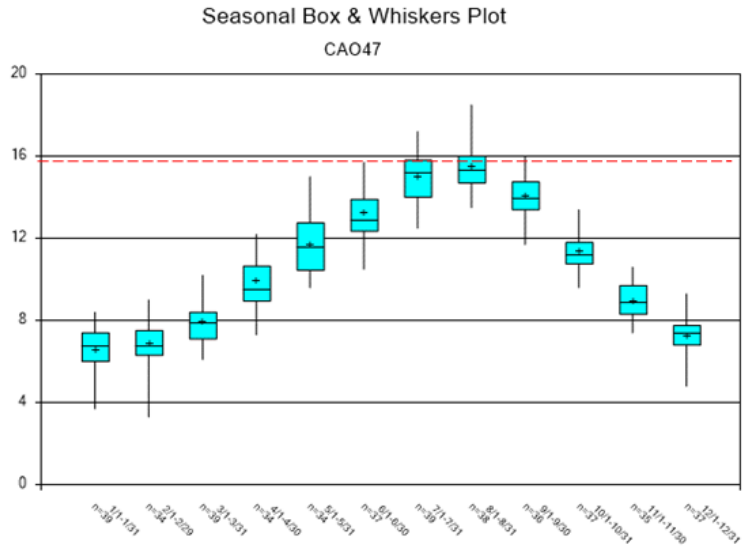




The dissolved oxygen (DO) standard for this site is 6.0 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

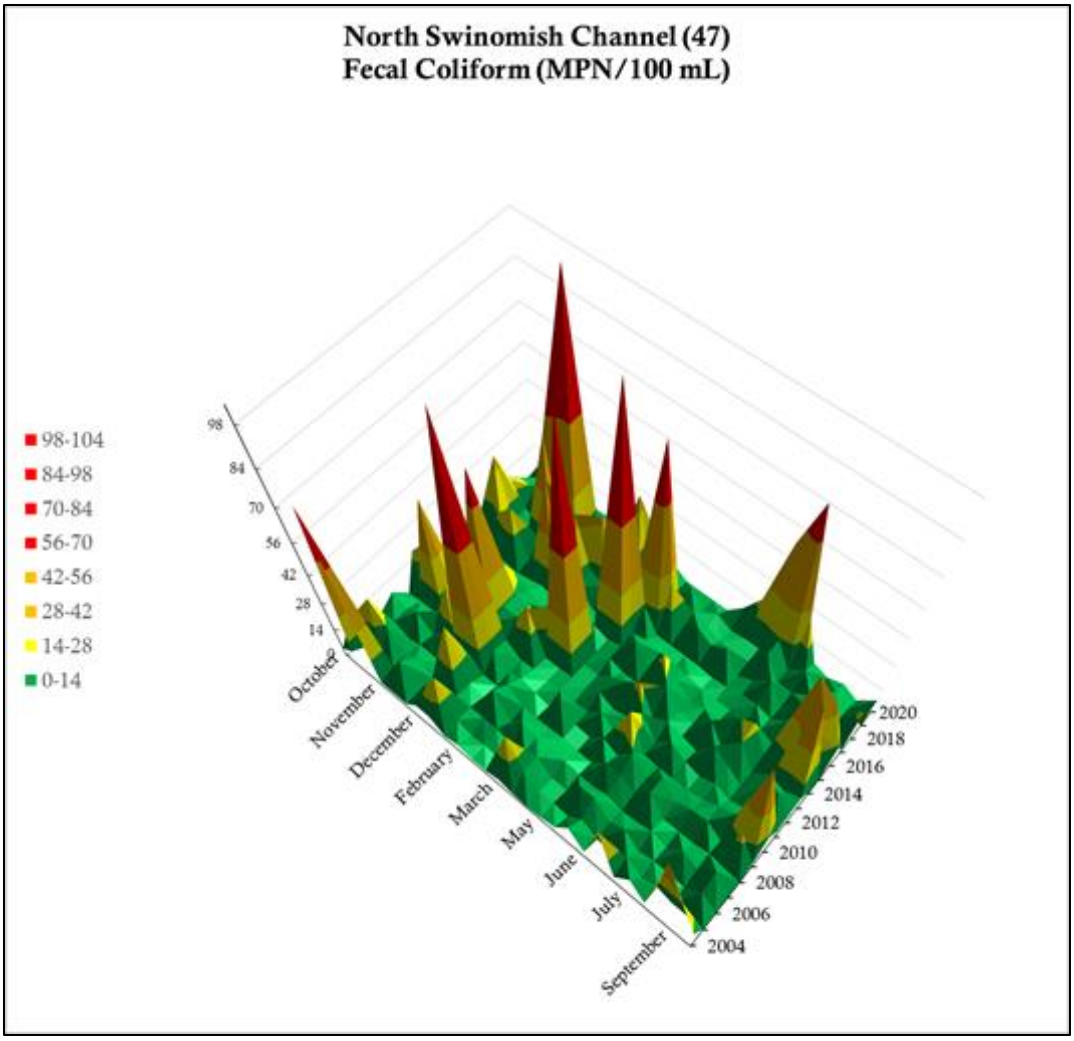
The dashed red line on the monthly box plot represents the 6.0 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

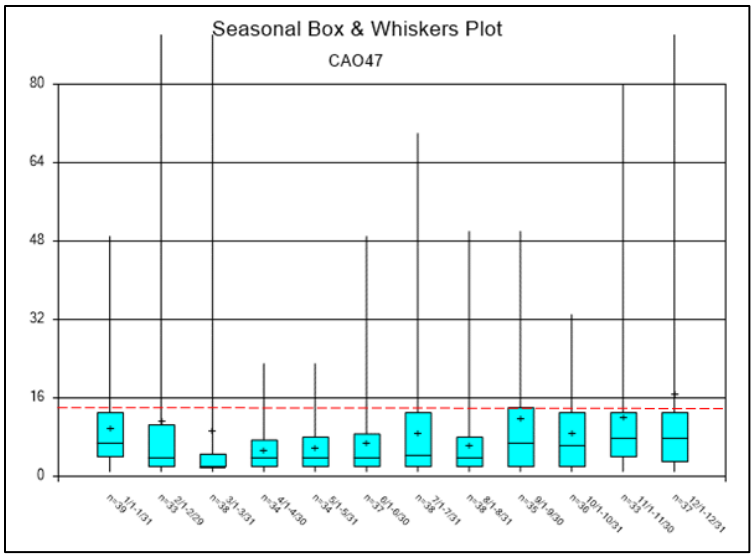




The temperature standard for this site is 16.0 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

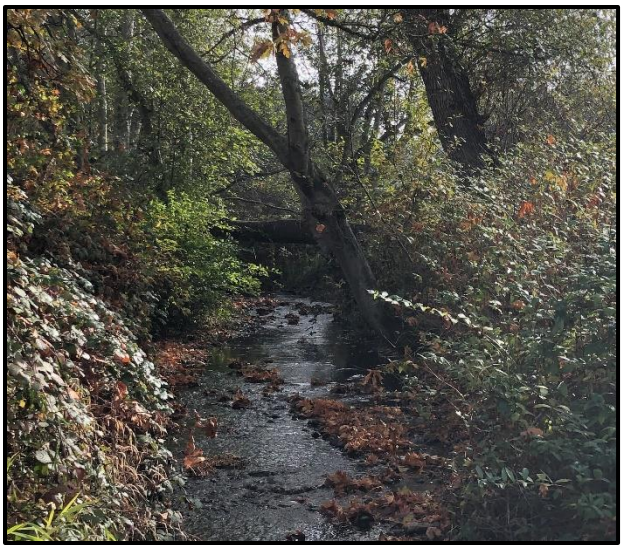
The dashed red line on the monthly box plot represents the 16.0 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 14 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

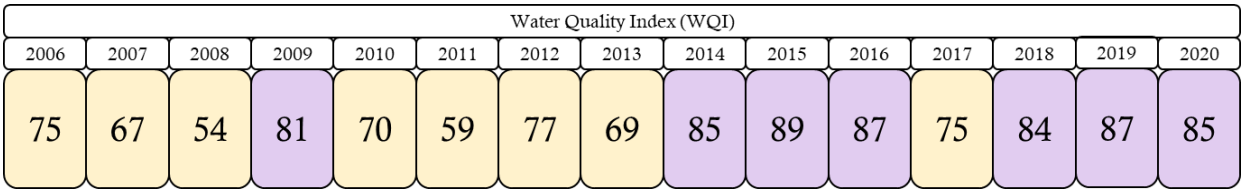
The dashed red line on the monthly box plot represents the 14 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

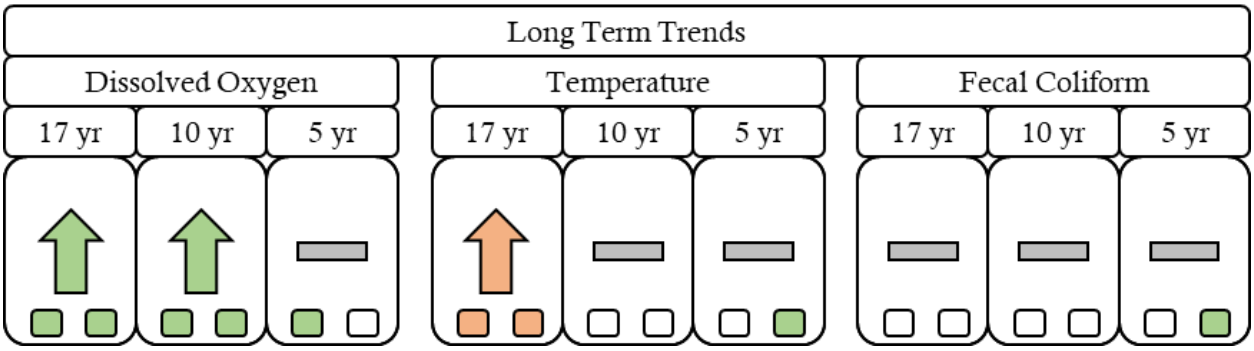


48

Fisher Creek
@ Franklin Road

Downstream Ag, TMDL



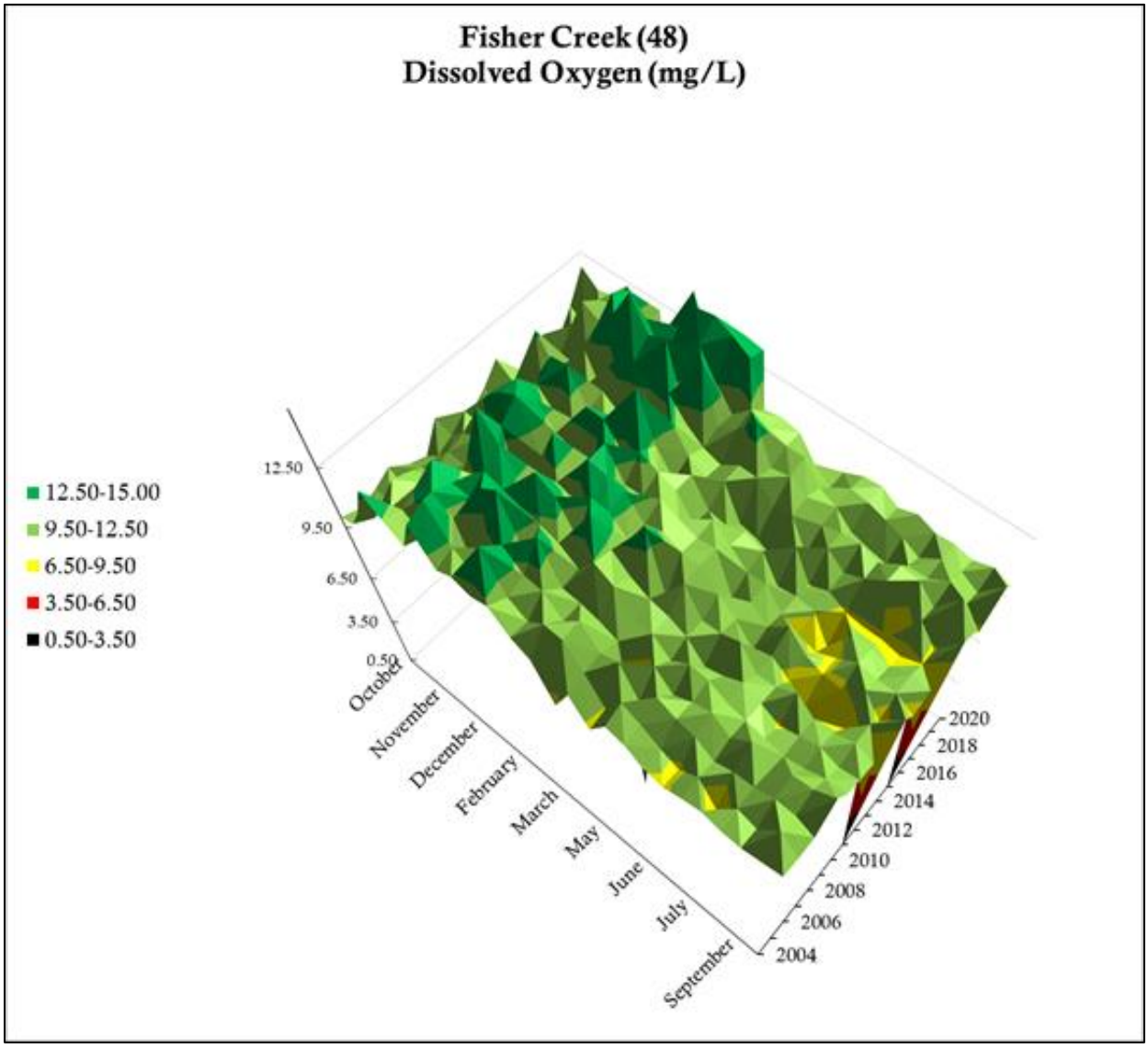


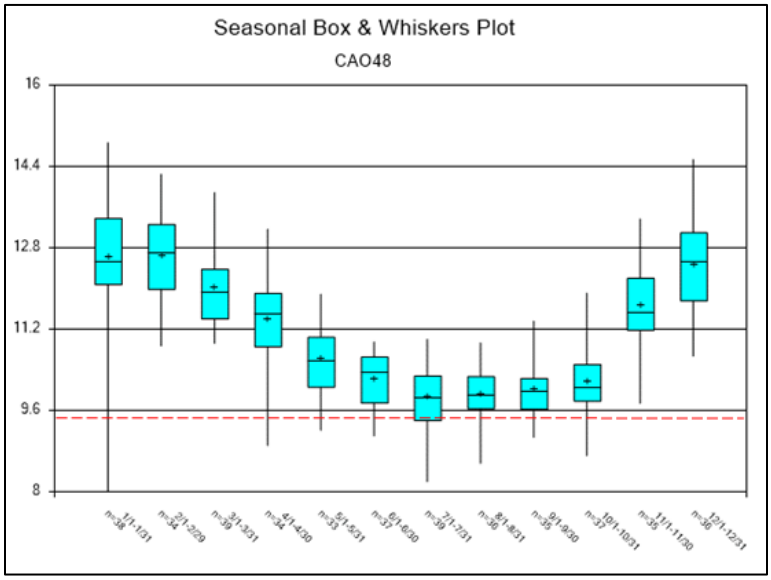
Site 48 is Fisher Creek, just prior to adjoining Carpenter Creek/Hill Ditch, and ultimately Skagit Bay. This site is influenced by rural residential and light agricultural activities. This site is designated as core salmonid habitat.

Dissolved oxygen has increased as compared to 17 years ago and ten years ago. Water temperature is higher than it was 17 years ago. WQI scores are generally in the higher-scoring end of the moderate concern category, and often score as least concern.

Site 48 rarely fails to meet state standards for DO, and has never failed to meet state standards for water temperature across the life of this program. Annual FC levels for WY2020 passed state standards.

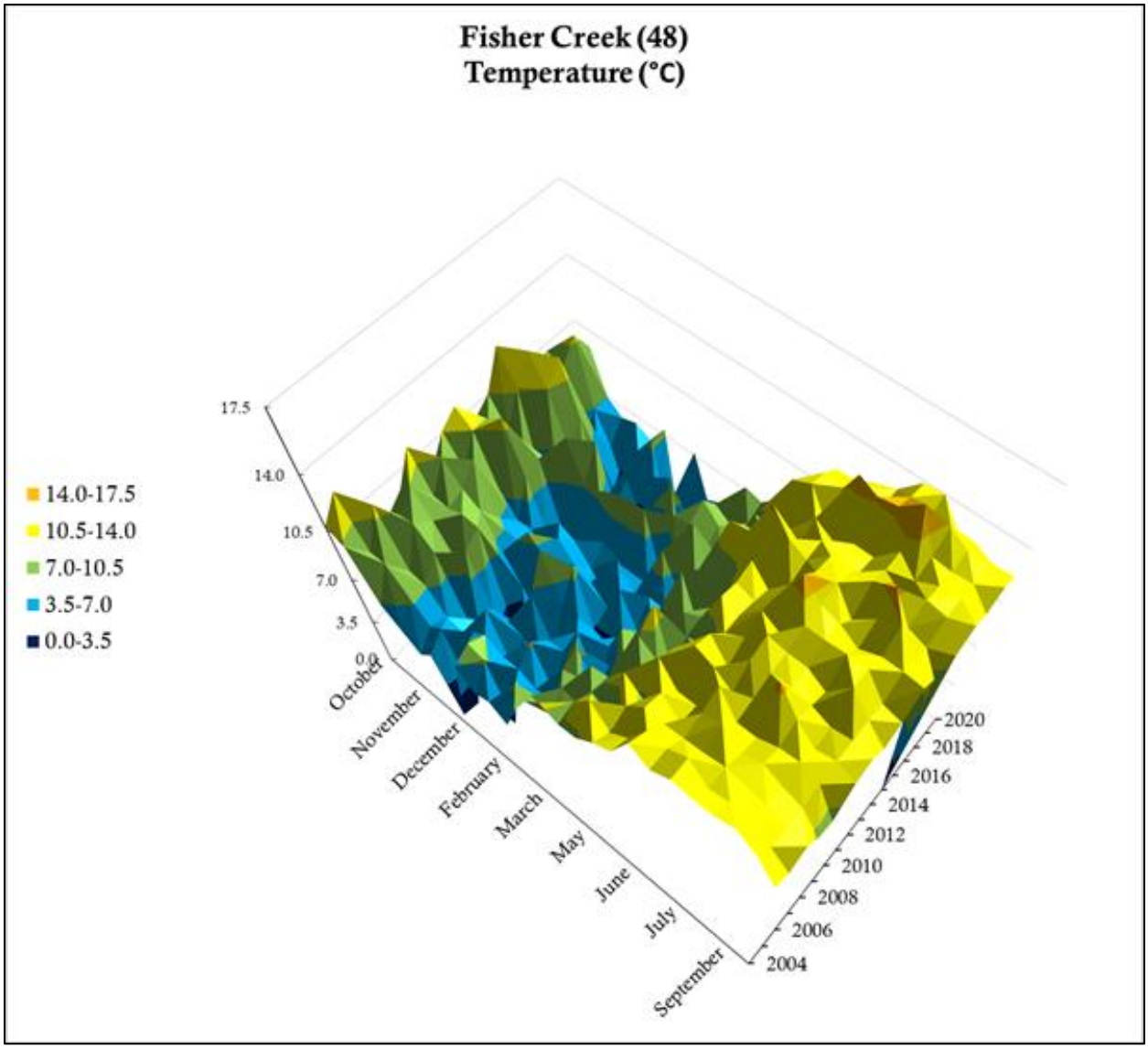
Site 48 is tied for 10th out of 39 sites for number of significant trends, with 14, and is 17th out of 39 sites for positive trends, with 64%.

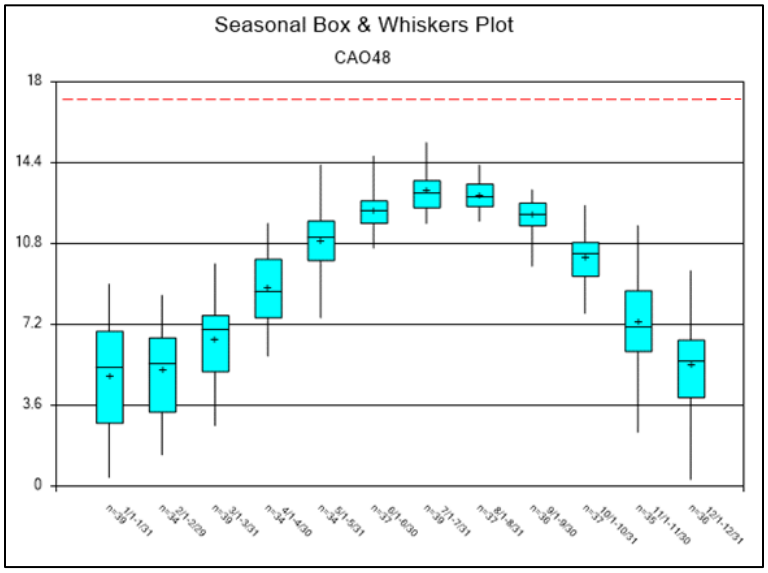




The dissolved oxygen (DO) standard for this site is 9.50 mg/L. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

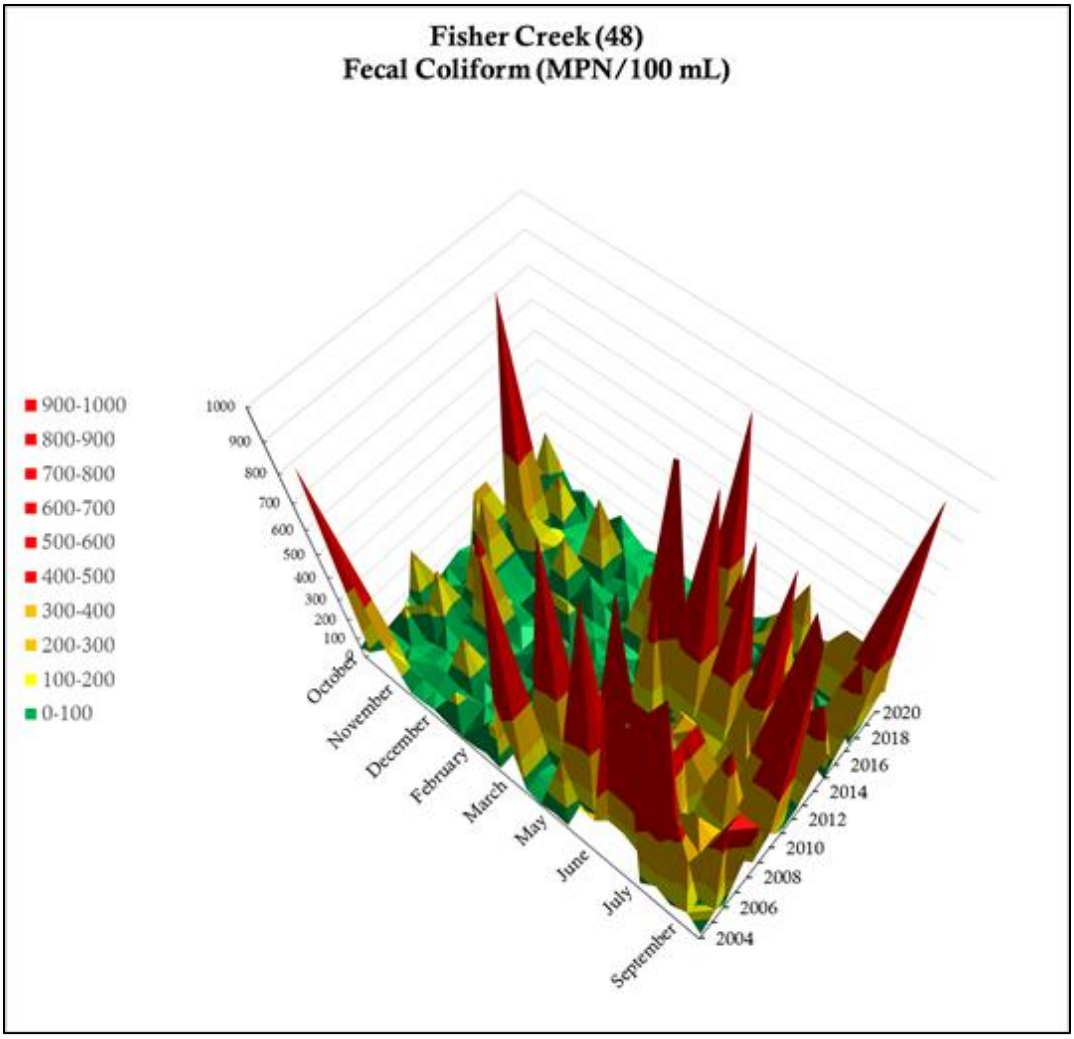
The dashed red line on the monthly box plot represents the 9.5 mg/L standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.

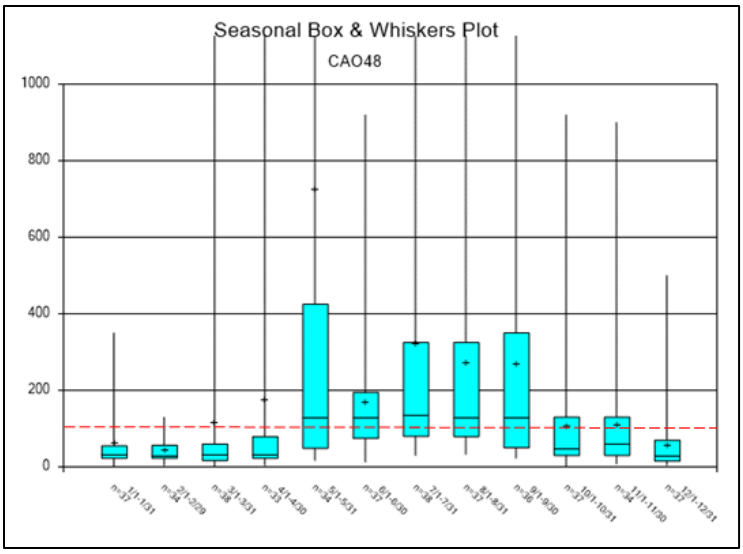




The temperature standard for this site is 17.5 °C. Any part of the 3D plot that is in red is hotter than that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 17.5 °C standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.





The fecal coliform (FC) standard for this site is 100 MPN/100 mL. Any part of the 3D plot that is in green meets that standard. The water year on the x-axis begins in October and ends in September.

The dashed red line on the monthly box plot represents the 100 MPN/100 mL standard, and is approximate. The calendar year on the x-axis begins in January and ends in December.