Volunteer Monitoring Quarterly Data Report

Beaver Lake Watershed - Benton, Washington and Madison counties in Arkansas

February 2019

Monitoring Period: Feb 2-19, 2019

A project of Ozarks Water Watch in Arkansas

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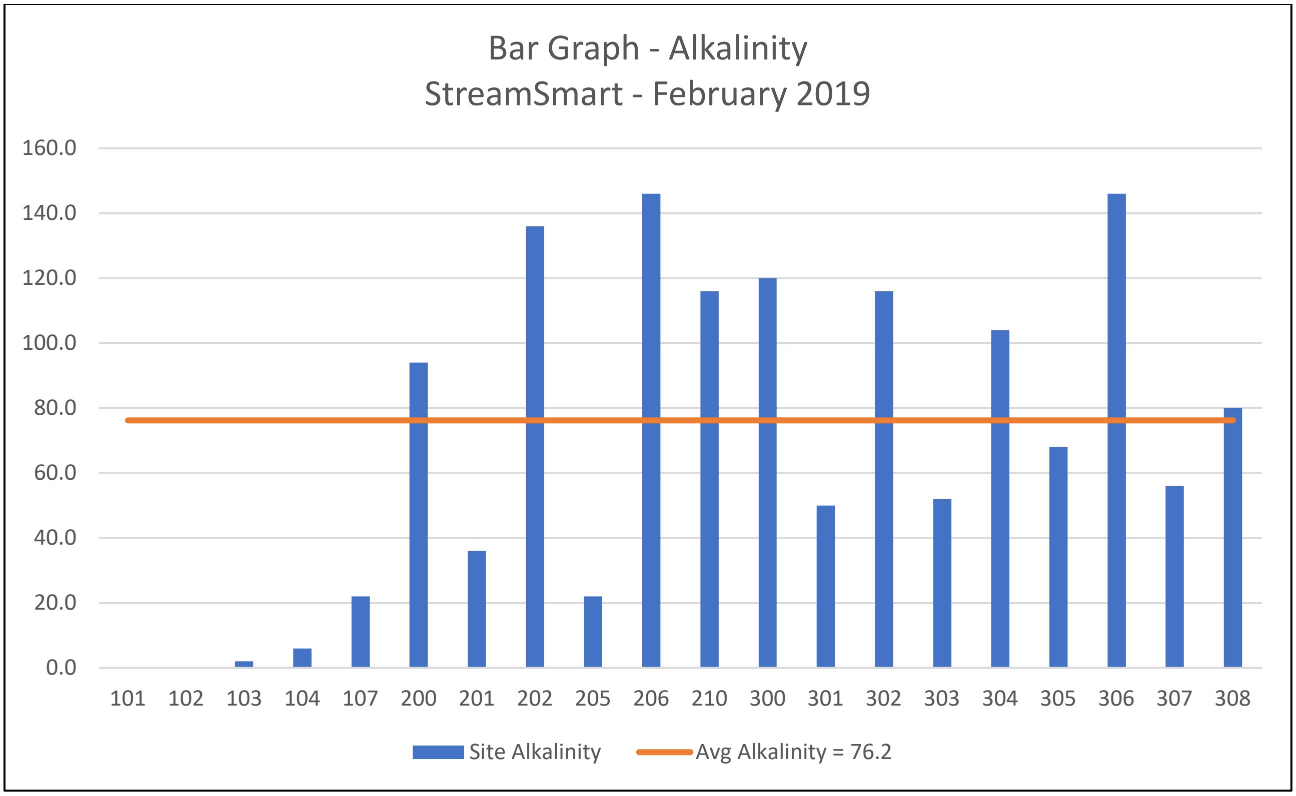
StreamSmart Monitoring Sites – 2018

Site Number	Site Name	Lat/Long	Watershed
101	West Fork (Baptist Ford Bridge)	35.982714, -94.173129	West Fork
102	West Fork (Brentwood Park)	35.865723, -94.117257	West Fork
103	Baldwin Creek Near St. Paul	35.822256, -93.758937	Headwaters
104	White River Near St. Paul	35.818676, -93.779774	Headwaters
107	War Eagle Creek	35.888319, -93.679017	War Eagle
108	Ogden Creek	35.887777, -93.679069	War Eagle
200	Ward Slough	35.997178, -94.173949	West Fork
201	Middle Fork of W.R. at Harris Rd	35.995825, -94.072894	Middle Fork
202	Mullins Creek - U of A	36.058808, -94.177805	West Fork
205	Hock Creek	36.022453, -93.859784	Richland Creek
206	Spout Spring Branch	36.055019, -94.161107	West Fork
210	Town Branch (White River Ball fields)	36.043179, -94.135852	West Fork
300	Brush Creek	36.131947, -93.947956	Beaver Reservoir
301	War Eagle Creek (Huntsville)	36.149997, -93.740137	War Eagle
302	Glade Creek	36.159851, -93.811690	War Eagle
303	Clear Creek	36.195153, -93.789276	War Eagle
304	Clifty Creek	36.239342, -93.907653	War Eagle
305	War Eagle (Mill)	36.267597, -93.943130	War Eagle
306	Prairie Creek	36.341208, -94.096513	Beaver Reservoir
307	Holman Creek Upstream of Huntsville	36.104418, -93.756750	War Eagle
308	Holman Creek Downstream of Huntsville	36.124453, -93.734211	War Eagle

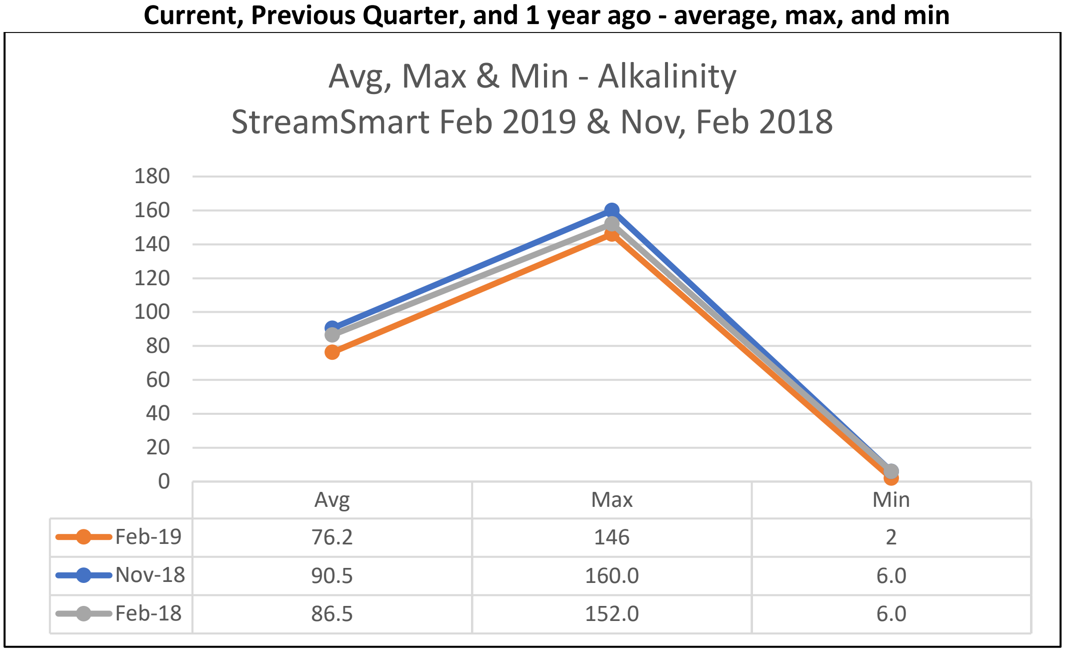
Alkalinity Data – February 2019 StreamSmart



Feb 2019 Data

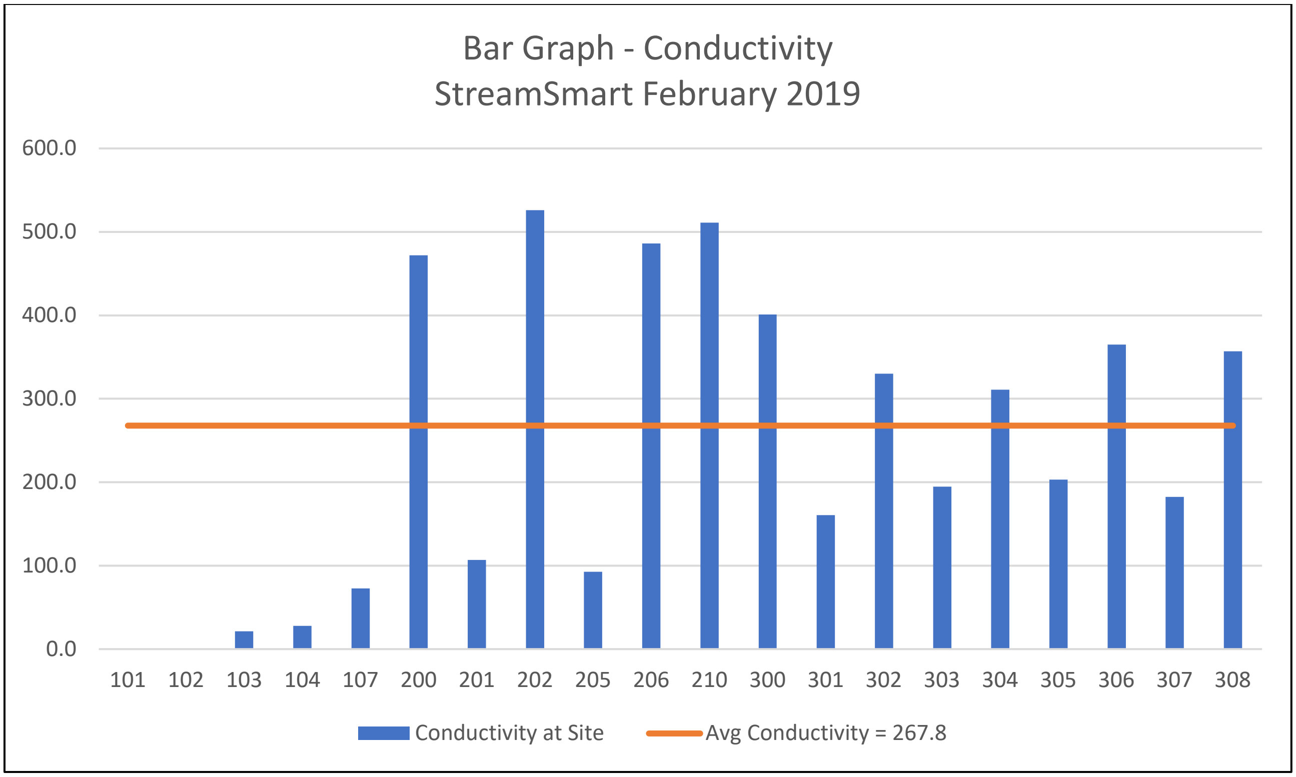
Site	Alkalinity
101	NA
102	NA
103	2.0
104	6.0
200	22.0
201	94.0
202	36.0
205	136.0
206	22.0
210	146.0
300	116.0
301	120.0
302	50.0
303	116.0
304	52.0
305	104.0
306	68.0
307	146.0
308	56.0

Current, Previous Quarter, and 1 year ago - average, max, and min



	Max	Min
Feb-19	306 - Prairie Creek	103 - Baldwin Creek
Nov-18	300 - Brush Creek	103 - Baldwin Creek
Feb-18	306 - Prairie Creek	103 - Baldwin Crek

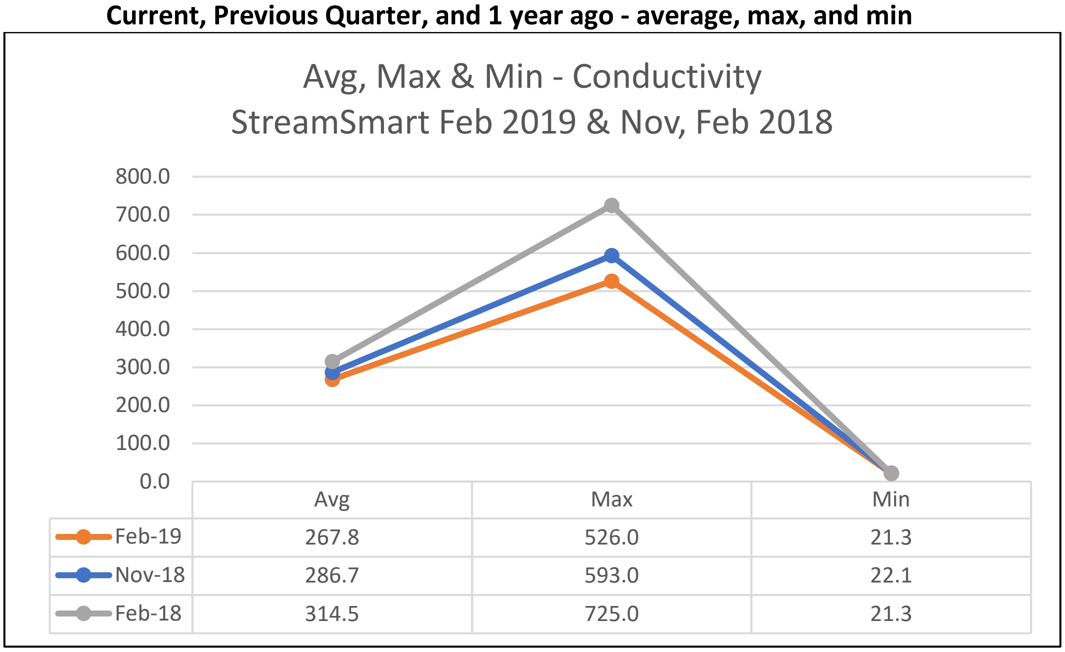
Conductivity Data – February 2019 StreamSmart



Feb 2019 Data

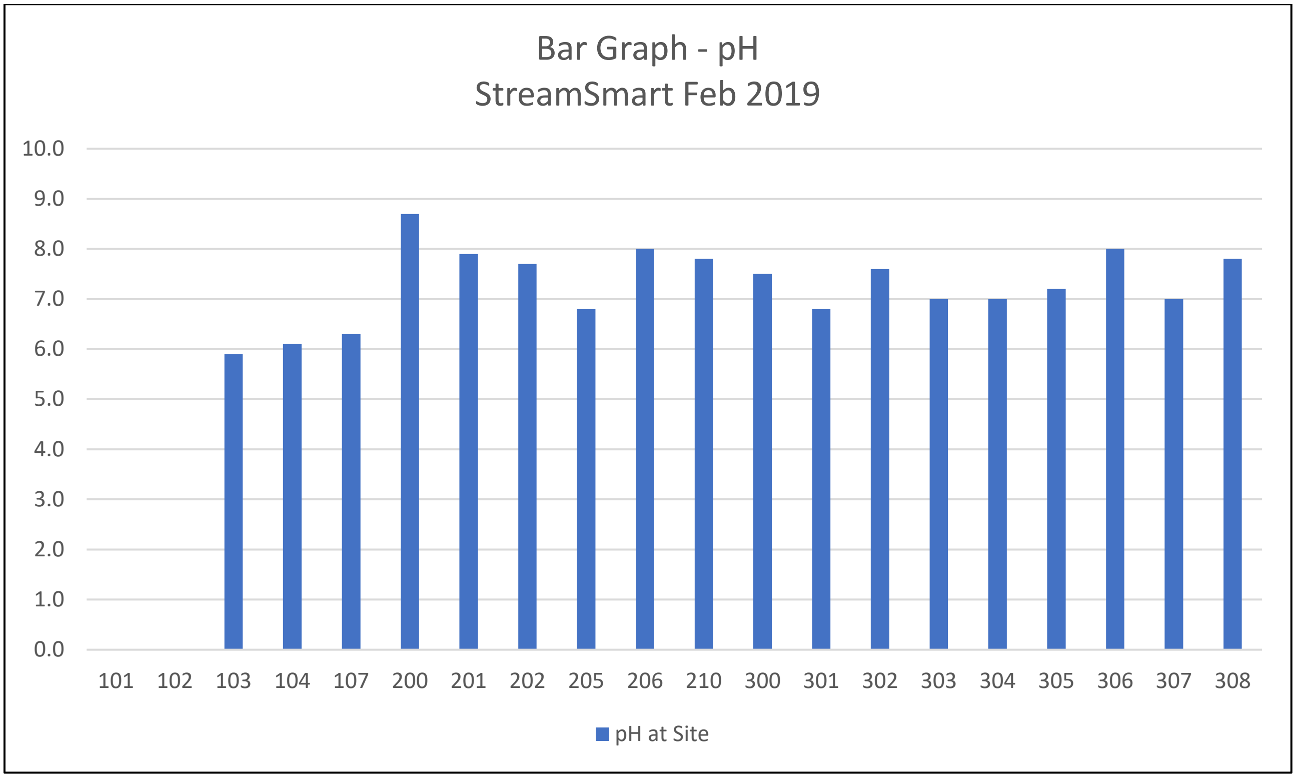
Site	Conductivity
101	NA
102	NA
103	21.3
104	27.8
200	72.8
201	472.0
202	106.7
205	526.0
206	92.6
210	486.0
300	511.0
301	401.0
302	160.6
303	330.0
304	194.7
305	311.0
306	203.0
307	365.0
308	182.3

Current, Previous Quarter, and 1 year ago - average, max, and min



	Max	Min
Feb-19	202 - Mullins Creek	103 - Baldwin Creek
Nov-18	200 - Ward Slough	103 - Baldwin Creek
Feb-18	202 - Mullins Creek	103 - Baldwin Creek

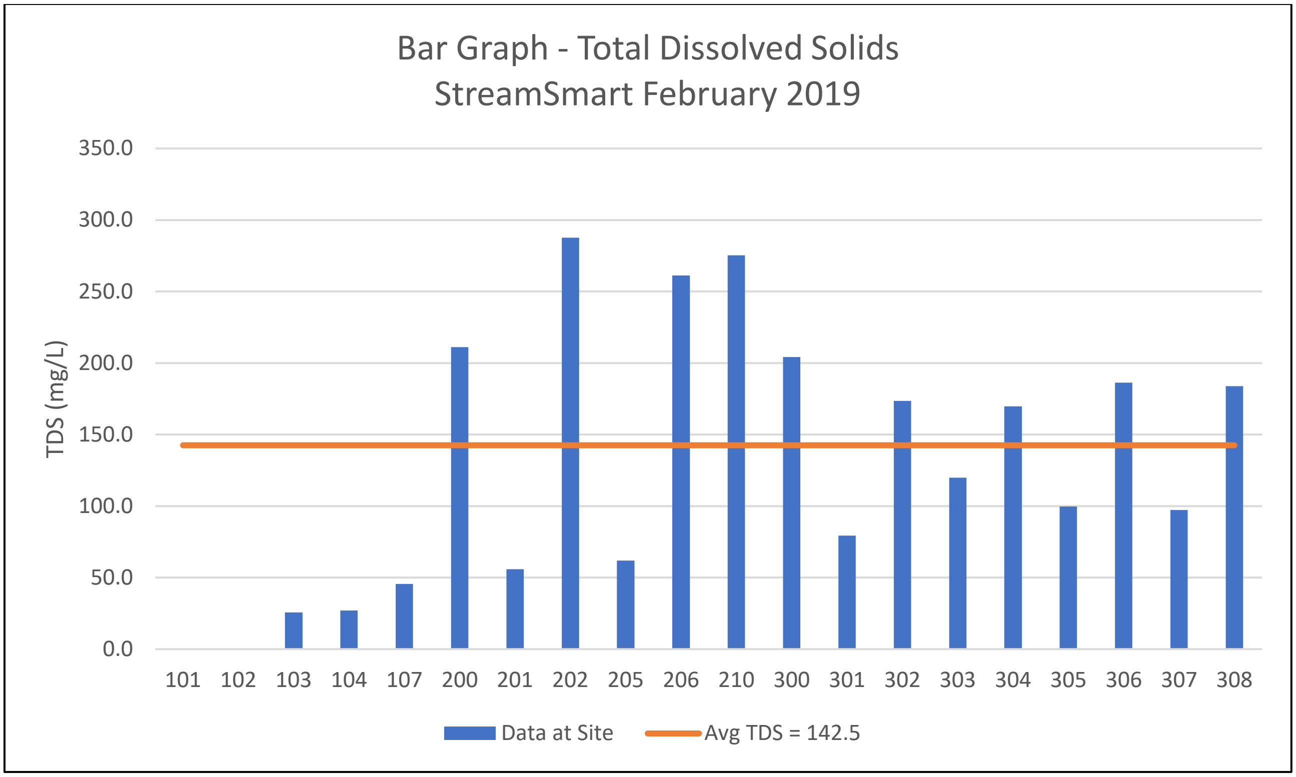
pH Data – February 2019 StreamSmart



Feb 2019 Data

Site	pH
101	NA
102	NA
103	5.9
104	6.1
200	6.3
201	8.7
202	7.9
205	7.7
206	6.8
210	8.0
300	7.8
301	7.5
302	6.8
303	7.6
304	7.0
305	7.0
306	7.2
307	8.0
308	7.0

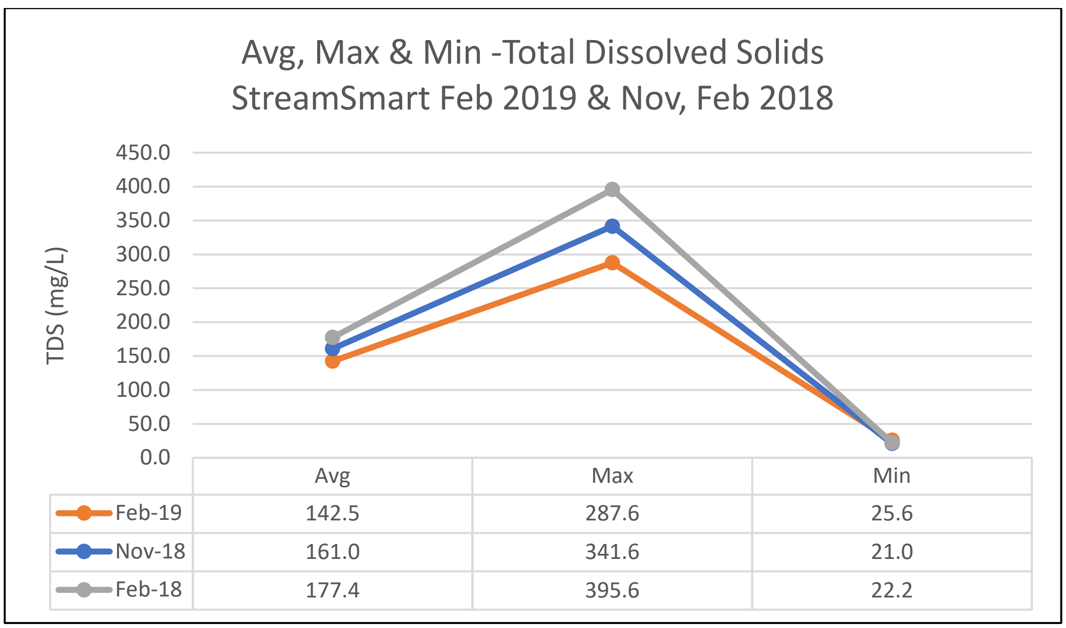
Total Dissolved Solids – February 2019 StreamSmart



Feb 2019 Data

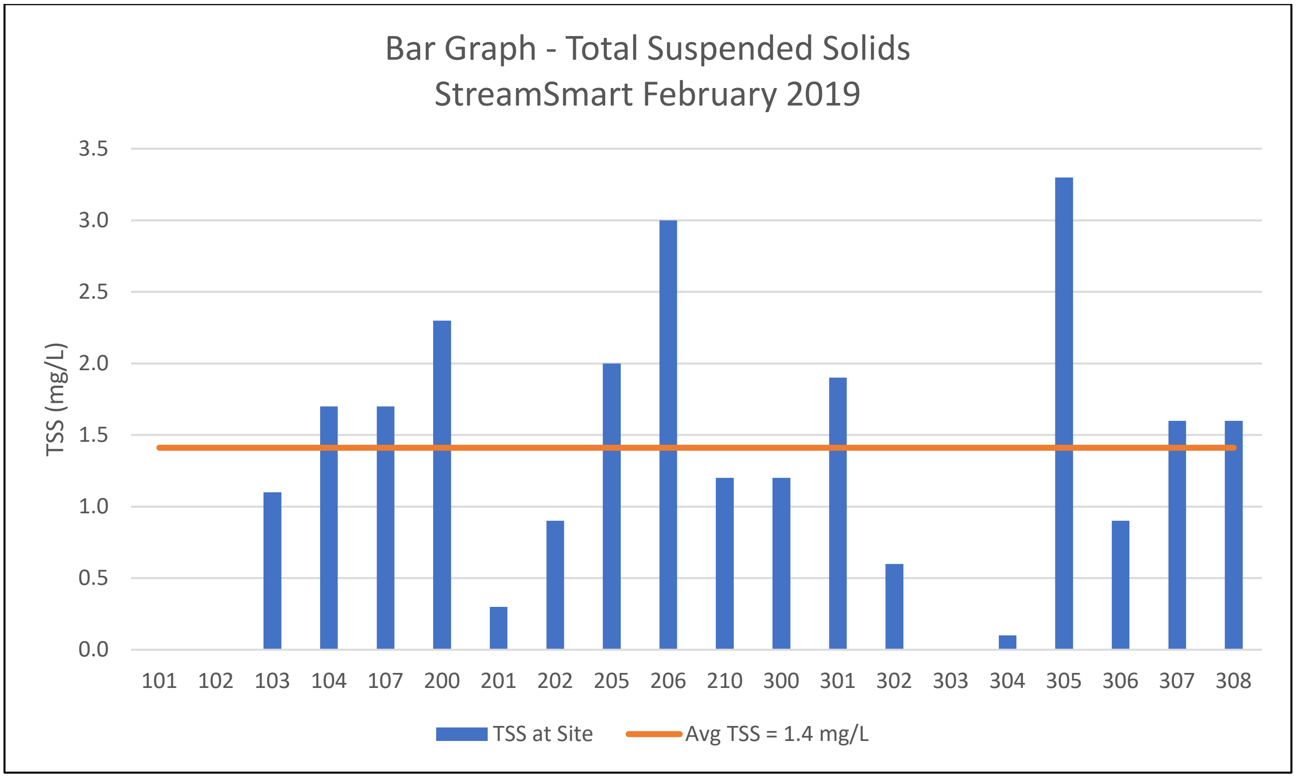
Site	TDS (mg/L)
101	NA
102	NA
103	25.6
104	27.1
200	45.6
201	211.1
202	55.8
205	287.6
206	61.8
210	261.3
300	275.2
301	204.2
302	79.3
303	173.6
304	119.8
305	169.8
306	99.8
307	186.2
308	97.3

Current, Previous Quarter, and 1 year ago - average, max, and min



	Max	Min
Feb-19	202 - Mullins Creek	103 - Baldwin Creek
Nov-18	200 - Ward Slough	210 - Town Branch
Feb-18	202 - Mullins Creek	104 - White River near St. Paul

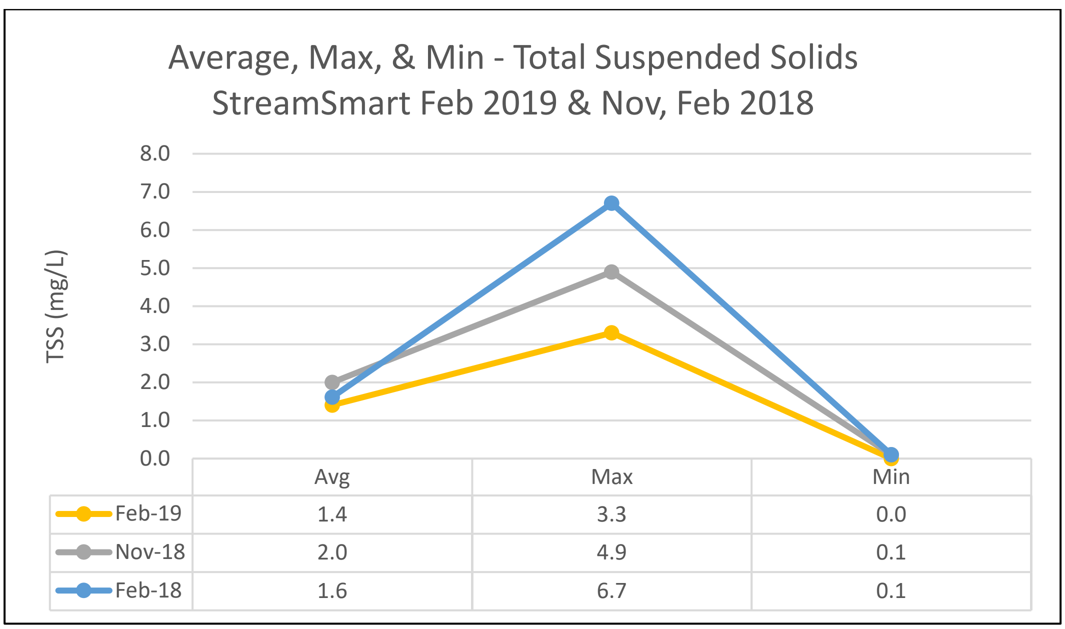
Total Suspended Solids – February 2019 StreamSmart



Feb 2019 Data

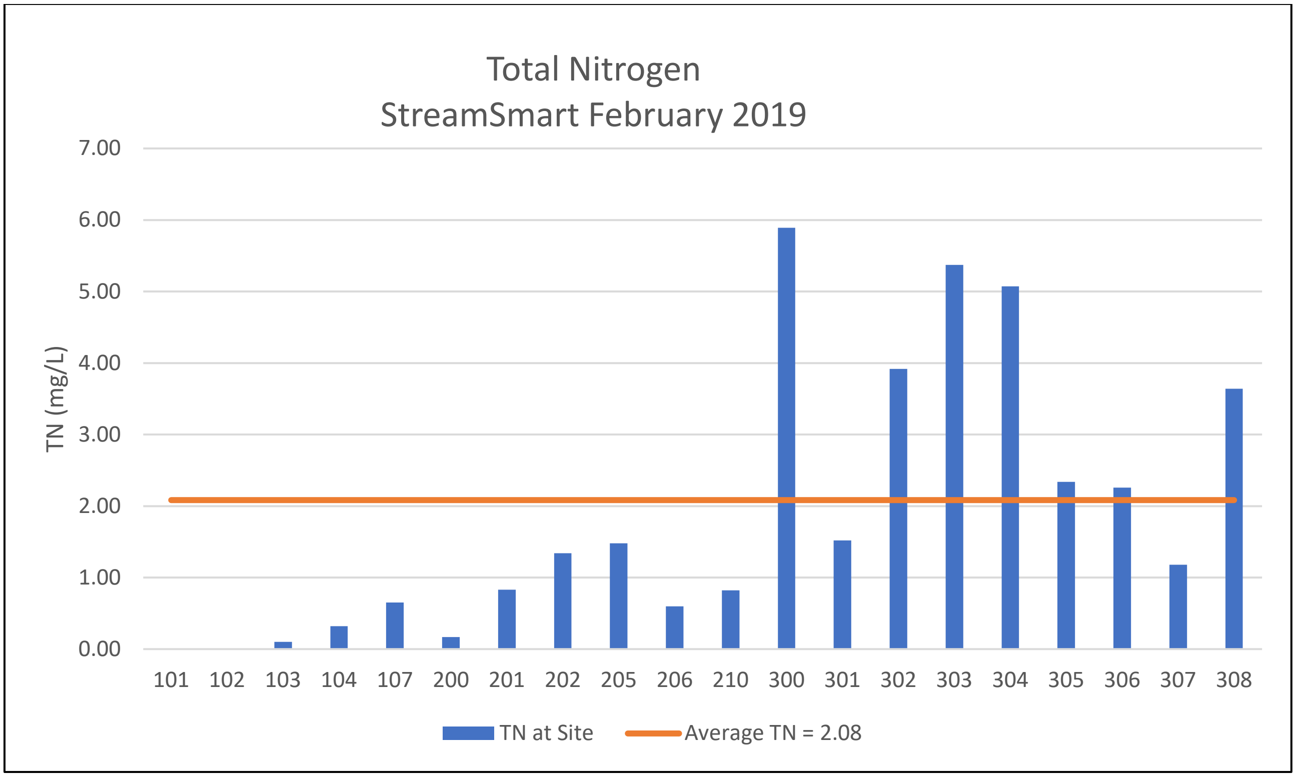
Site	TSS (mg/L)
101	NA
102	NA
103	1.1
104	1.7
200	1.7
201	2.3
202	0.3
205	0.9
206	2.0
210	3.0
300	1.2
301	1.2
302	1.9
303	0.6
304	0.0
305	0.1
306	3.3
307	0.9
308	1.6

Current, Previous Quarter, and 1 year ago - average, max, and min



	Max	Min
Feb-19	305 - War Eagle Mill	303 - Clear Creek
Nov-18	200 - Ward Slough	308 - Holman Creek Downstream Huntsville
Feb-18	307 - Holman Creek Upstream of Huntsville	302 - Glade Creek

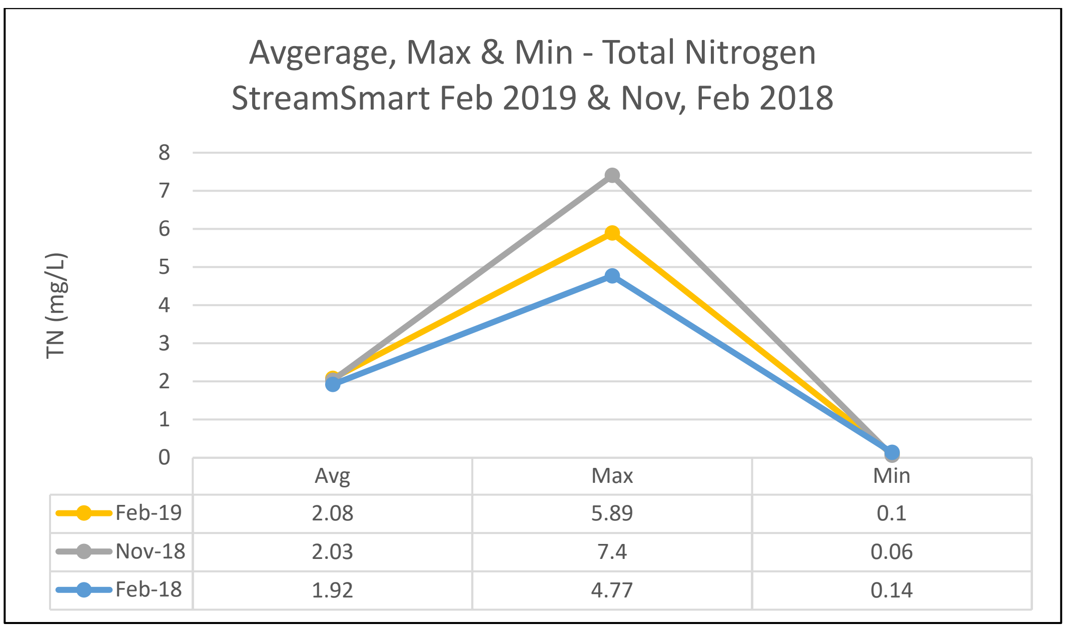
Total Nitrogen – February 2019 StreamSmart



Feb 2018 Data

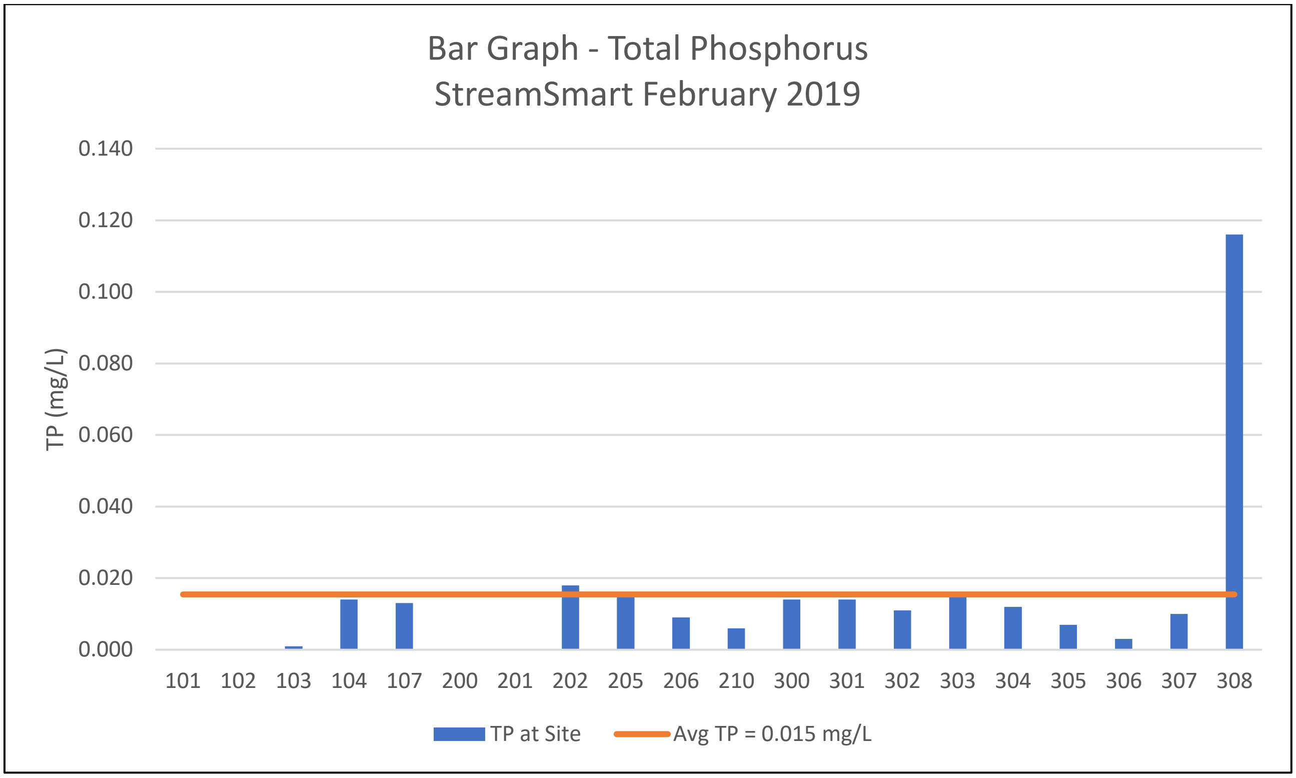
Site	TN (mg/L)
101	NA
102	NA
103	0.10
104	0.32
200	0.65
201	0.17
202	0.83
205	1.34
206	1.48
210	0.60
300	0.82
301	5.89
302	1.52
303	3.92
304	5.37
305	5.07
306	2.34
307	2.26
308	1.18

Current, Previous Quarter, and 1 year ago - average, max, and min



	Max	Min
Feb-19	300 - Brush Creek	103 - Baldwin Creek
Nov-18	308 - Holman Creek DS of Huntsvillie	103 - Baldwin Creek
Feb-18	308 - Holman Creek Downstream of Huntsville	200 - Ward Slough

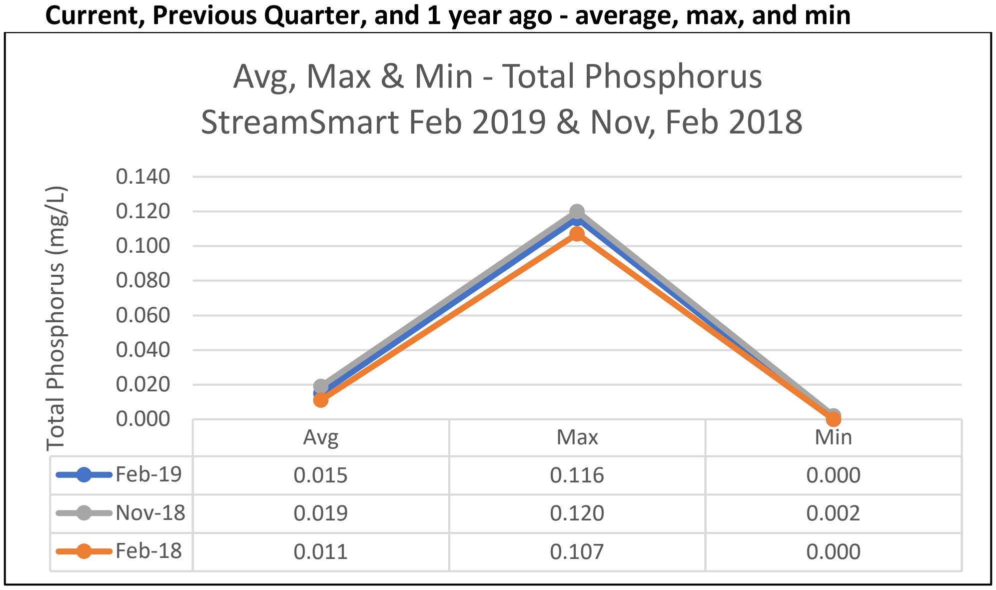
Total Phosphorus – February 2019 StreamSmart



Feb 2019 Data

Site	TP (mg/L)
101	NA
102	NA
103	0.001
104	0.014
200	0.013
201	0.000
202	0.000
205	0.018
206	0.015
210	0.009
300	0.006
301	0.014
302	0.014
303	0.011
304	0.015
305	0.012
306	0.007
307	0.003
308	0.010

Current, Previous Quarter, and 1 year ago - average, max, and min



	Max	Min
Feb-19	308 - Holman Creek DS of Huntsville	201 - Middle Fork of W.R.
Nov-18	308 - Holman Creek DS of Huntsville	201 - Middle Fork of W.R.
Feb-18	Site 308 - Holman Creek DS of Huntsville	Site 101 - WF at Baptist Ford Bridge/Site 102 - WF at Brentwood Park

What is Alkalinity?

Alkalinity is the water's capacity to resist changes in pH that would make the water more acidic. Alkalinity refers to the capability of water to neutralize acid. The alkalinity of natural water is determined by the soil and bedrock through which it passes. The main sources for natural alkalinity are rocks which contain carbonate, bicarbonate, and hydroxide compounds. Limestone is rich in carbonates, so waters flowing through limestone regions or bedrock containing carbonates generally have high alkalinity - hence good buffering capacity. Conversely, areas rich in granites and some conglomerates and sandstones may have low alkalinity and, therefore, poor buffering capacity.

Alkalinity is important for fish and aquatic life because it protects or buffers against rapid pH changes. Living organisms, especially aquatic life, function best in a pH range of 6.0 to 9.0. Alkalinity is a measure of how much acid can be added to a liquid without causing a large change in pH. Higher alkalinity levels in surface waters will buffer acid rain and other acid wastes and prevent pH changes that are harmful to aquatic life.

http://www.water-research.net/index.php/the-role-of-alkalinity-citizen-monitoring

What is Conductivity:

Conductivity is a measurement of the ability of an aqueous solution to carry an electrical current. Typically, the units of measure are microhms/cm (uohms/cm) or microsiemens/cm (uS/cm). Conductivity or specific conductance is a measure of the ability of a fluid to carry a charge which is directly related to the concentration of dissolved substances. As the total dissolved substances in the water increases, the conductivity of the water also increases.

http://www.water-research.net/index.php/drinking-water-testing-and-conductivity-of-water

What is pH:

pH measurements run on a scale from 0 to 14, with 7.0 considered neutral. Solutions with a pH below 7.0 are considered acids. Solutions with a pH above 7.0, up to 14.0 are considered bases. Living organisms, especially aquatic life, function best in a pH range of 6.0 to 9.0.

The pH scale is logarithmic, so every one-unit change in pH represents a ten-fold change in acidity. In other words, pH 6.0 is ten times more acidic than pH 7.0; pH 5 is one hundred times mores acidic than pH 7.0.

The pH of a body of water is affected by several factors including the bedrock and soil composition through which the water moves. Some rock types such as limestone can, to an extent, neutralize acid. Another factor which affects the pH is the amount of plant growth and organic material within a body of water. When this material decomposes carbon dioxide is released. The carbon dioxide combines with water to form carbonic acid. Although this is a weak acid, large amounts of it will lower the pH. A third factor which determines the pH of a body of water is the dumping of chemicals into the water by individuals, industries, and communities.

Changes in the pH value of water are important to many organisms. Most organisms have adapted to life in water of a specific pH and may die if it changes even slightly. This is especially true of aquatic macroinvertebrates and fish eggs and fry.

http://www.water-research.net/index.php/ph-in-the-environment

What is Total Dissolved Solids?

A water quality parameter defining the concentration of dissolved organic and inorganic chemicals in water. After suspended solids are filtered from water and water is evaporated, dissolved solids are the remaining residue. An elevated total dissolved solids concentration does not mean that the water is a health hazard, but it does mean the water may have aesthetic problems, such as taste and odor, or cause nuisance problems.

http://www.water-research.net/index.php/water-treatment/tools/total-dissolved-solids

What is Total Suspended Solids?

The suspended or colloidal particles, commonly referred to as total suspended solids (TSS), are all the extremely small suspended solids in water which will not settle out by gravity. TSS is measured on a sample of water (which has been settled) and are those particles which will not pass through a very fine filter.

TSS in streams in northwest Arkansas usually range from 0.1 to 20 mg/L but can get as high as 500 mg/L during storm flows because the faster water moves the more sediment it can carry and the more force it has to cause erosion of the stream banks and channel.

What is Total Phosphorus?

Phosphorus occurs naturally in rocks and other mineral deposits. During the natural process of weathering, the rocks gradually release the phosphorus as phosphate ions which are soluble in water and the mineralize phosphate compounds breakdown. Phosphorus is one of the key elements necessary for the growth of plants and animals and in lake ecosystems it tends to be the growth-limiting nutrient.

Total phosphorus is a measure of all the forms of phosphorus in the sample (orthophosphate, condensed phosphate, and organic phosphate). This is accomplished by first "digesting" (heating and acidifying) the sample to convert all the other forms to orthophosphate. Then the orthophosphate is measured by the ascorbic acid method. Because the sample is not filtered, the procedure measures both dissolved and suspended orthophosphate. Monitoring phosphorus is challenging because it involves measuring very low concentrations down to 0.01 milligram per liter (mg/L) or even lower. Even such very low concentrations of phosphorus can have a dramatic impact on streams.

What is Total Nitrogen?

There are three forms of nitrogen that are commonly measured in water bodies: ammonia, nitrates and nitrites. Total nitrogen is the sum of total kjeldahl nitrogen (ammonia, organic and reduced nitrogen) and nitrate-nitrite. It can be derived by monitoring for organic nitrogen compounds, free-ammonia, and nitrate-nitrite individually and adding the components together. An acceptable range of total nitrogen is 2 mg/L to 6 mg/L, though variations from this range can occur. We measure total Nitrogen as part of our on-going monitoring of nutrients concentrations in surface water.