Volunteer Monitoring Quarterly Data Report

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

November 2018

Monitoring Period: November 6-20, 2018

A project of Ozarks Water Watch in Arkansas

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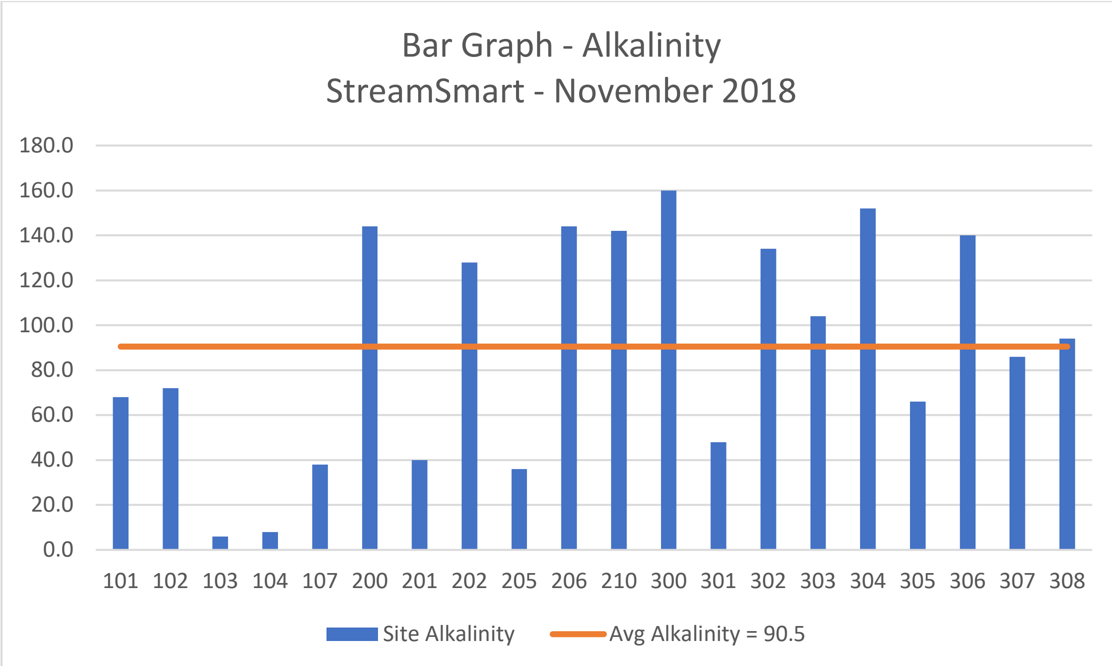
StreamSmart Monitoring Sites – 2018

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 – new 11/2018 upstream from Huntsville	36.041893, -93.704921	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 Branch - U of A	36.059112, -94.178213	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

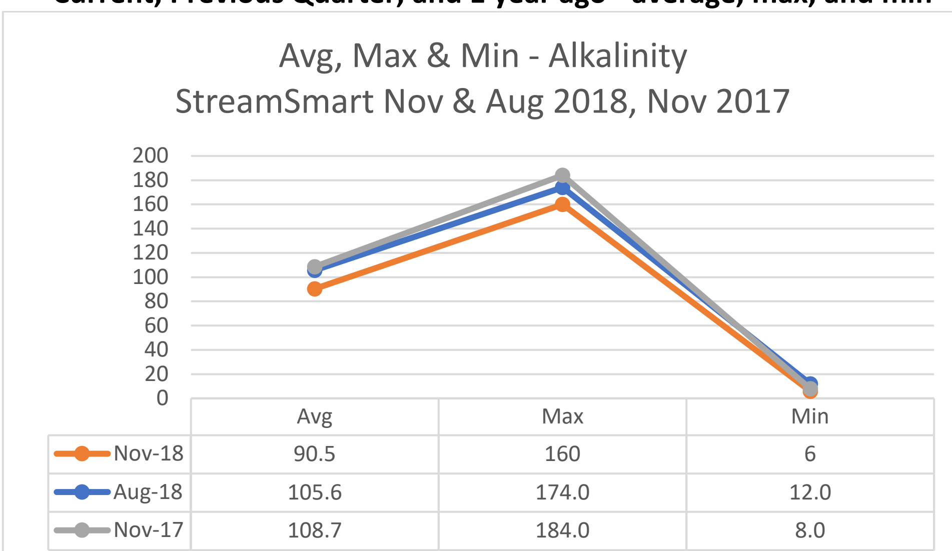
Alkalinity Data – November 2018 StreamSmart



Nov 2018 Data

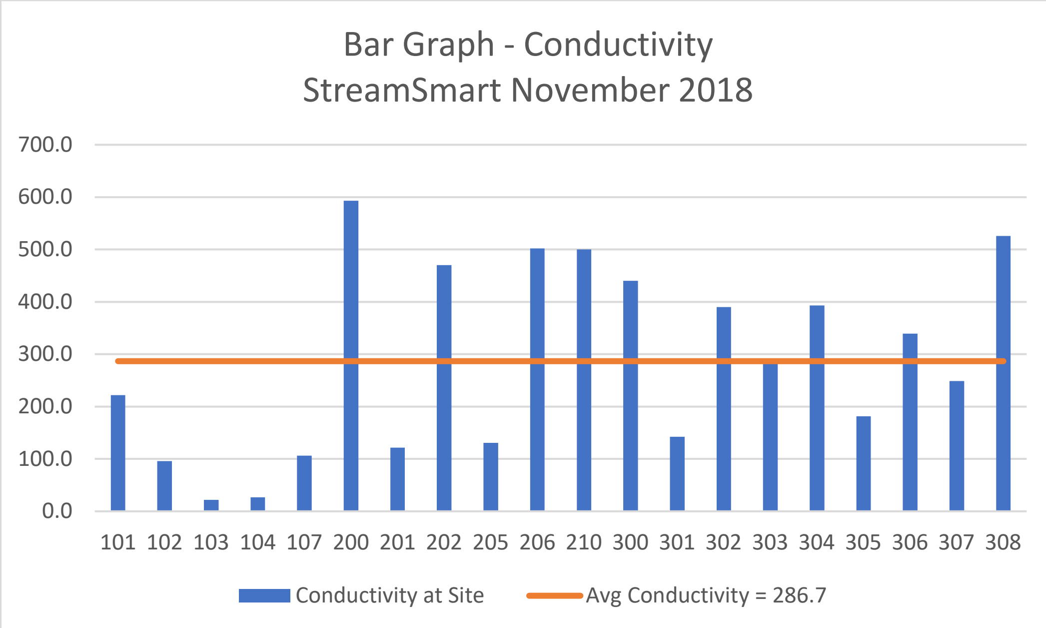
Site	Alkalinity
101	68.0
102	72.0
103	6.0
104	8.0
107	38.0
200	144.0
201	40.0
202	128.0
205	36.0
206	144.0
210	142.0
300	160.0
301	48.0
302	134.0
303	104.0
304	152.0
305	66.0
306	140.0
307	86.0
308	94.0

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



	Max	Min
Nov-18	300 - Brush Creek	103 - Baldwin Creek
Aug-18	202 - Ward Slough	300 - Brush Creek
Nov-17	302 - Glade Creek	103- Baldwin Creek

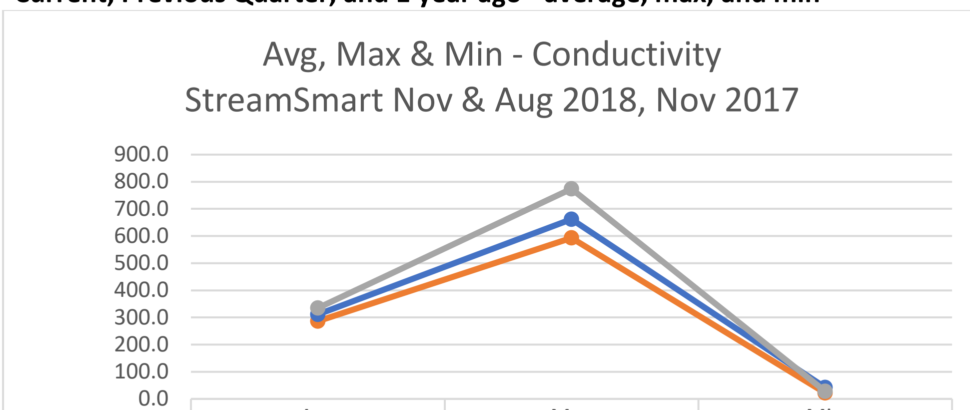
Conductivity Data – November 2018 StreamSmart



Nov 2018 Data

Site	Conductivity
101	222.0
102	95.7
103	22.1
104	26.9
107	106.3
200	593.0
201	121.5
202	470.0
205	130.6
206	502.0
210	500.0
300	440.0
301	142.5
302	390.0
303	283.0
304	393.0
305	181.2
306	339.0
307	249.0
308	526.0

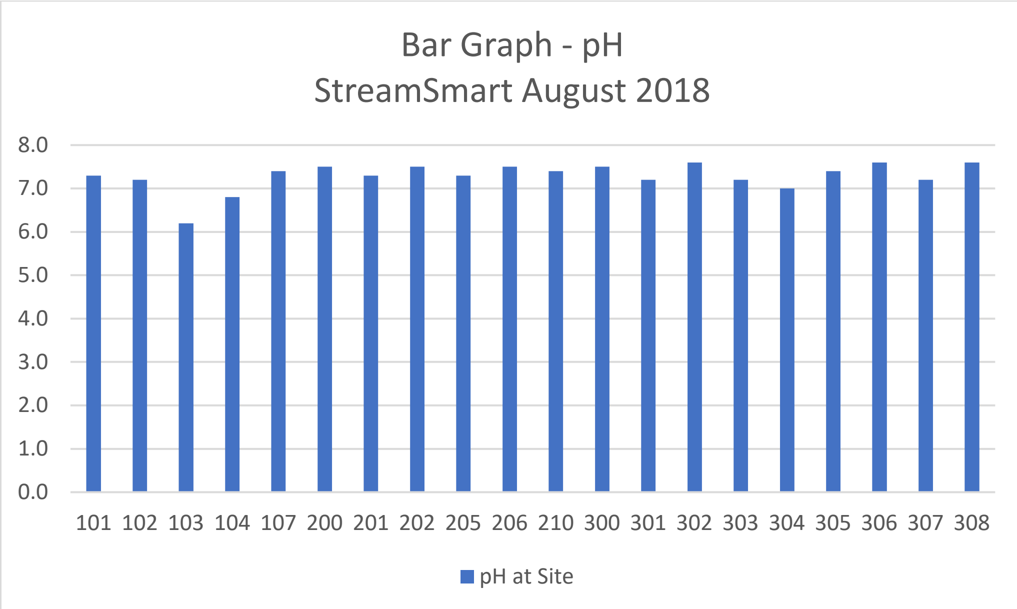
Current, Previous Quarter, and 1 year ago - average, max, and min



	Avg	Max	Min
Nov-18	286.7	593.0	22.1
Aug-18	310.7	662.0	41.9
Nov-17	334.9	774.0	27.9

	Max	Min
Nov-18	200 - Ward Slough	103 - Baldwin Creek
Aug-18	202 - Mullins Creek	300 - Brush Creek
Nov-17	308 - Holman Creek DS Huntsville	103- Baldwin Creek

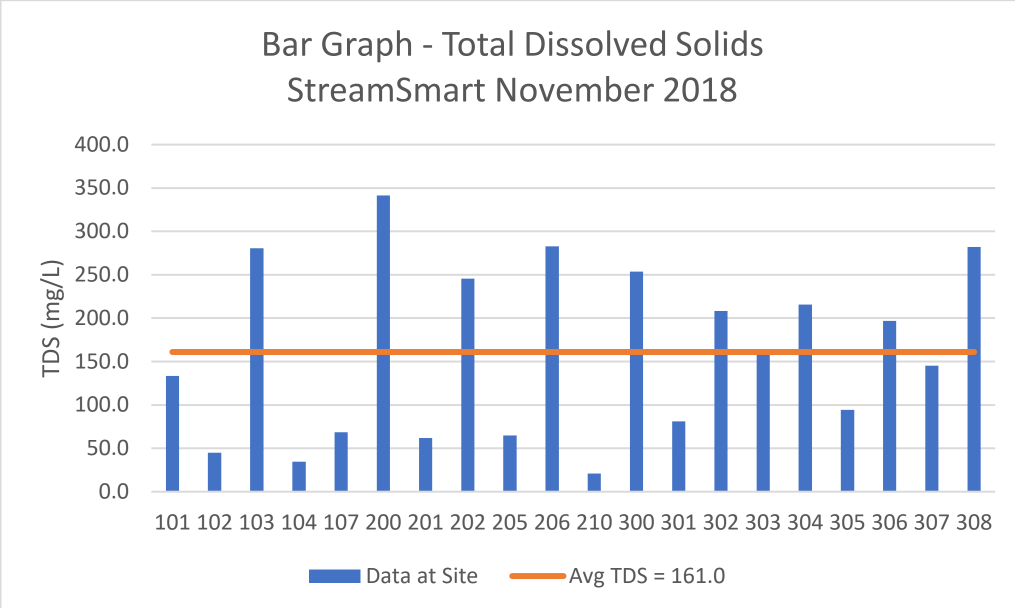
pH Data – November 2018 StreamSmart



Nov 2018 Data

Site	pH
101	7.3
102	7.2
103	6.2
104	6.8
107	7.4
200	7.5
201	7.3
202	7.5
205	7.3
206	7.5
210	7.4
300	7.5
301	7.2
302	7.6
303	7.2
304	7.0
305	7.4
306	7.6
307	7.2
308	7.6

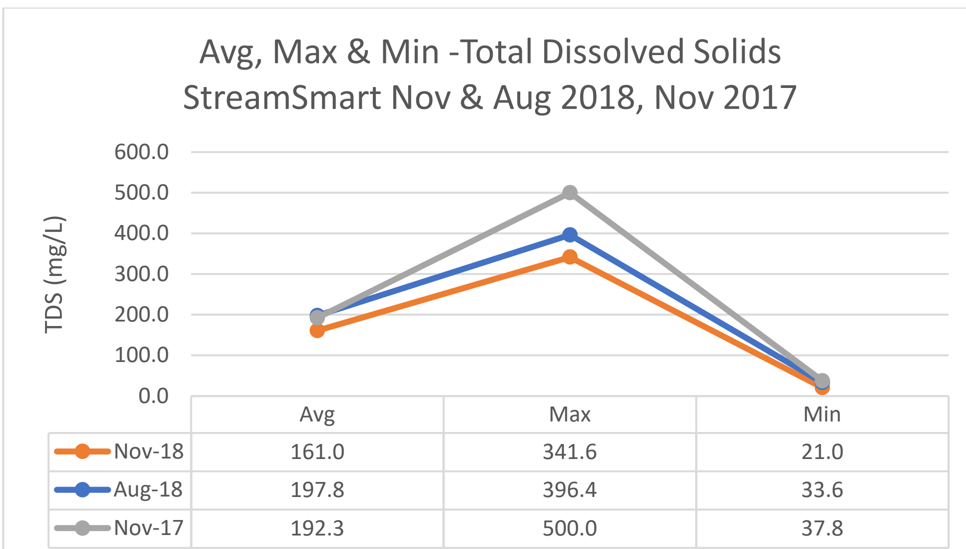
Total Dissolved Solids – November 2018 StreamSmart



Nov 2018 Data

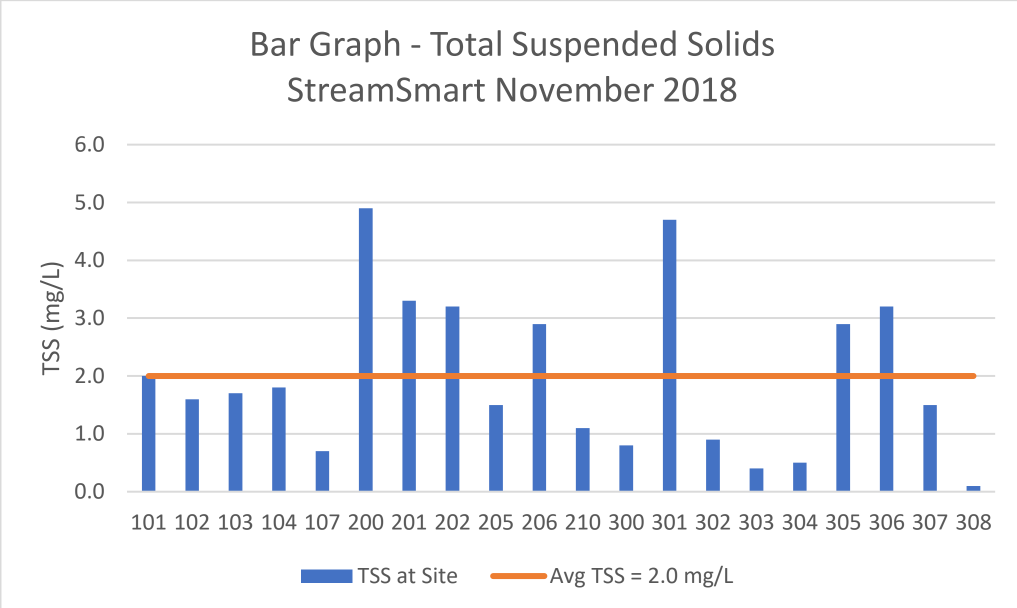
Site	TDS (mg/L)
101	133.3
102	44.9
103	280.7
104	34.4
107	68.6
200	341.6
201	61.7
202	245.5
205	64.9
206	282.7
210	21.1
300	253.5
301	80.9
302	208.4
303	163.1
304	215.6
305	94.2
306	196.9
307	145.3
308	282.2

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



	Max	Min
Nov-18	200 - Ward Slough	210 - Town Branch
Aug-18	300 - Brush Creek	302 - Mullins Creek
Nov-17	308 - Holman Creek Downstream of Huntsville	103/104 - Baldwin Creek/White River Near St. Paul

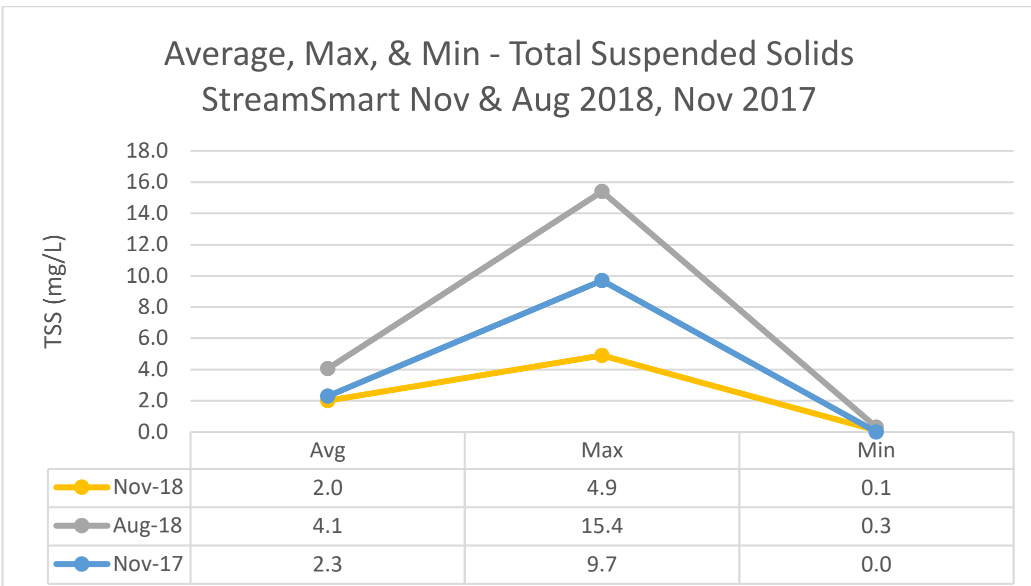
Total Suspended Solids – November 2018 StreamSmart



Nov 2018 Data

Site	TSS (mg/L)
101	2.0
102	1.6
103	1.7
104	1.8
107	0.7
200	4.9
201	3.3
202	3.2
205	1.5
206	2.9
210	1.1
300	0.8
301	4.7
302	0.9
303	0.4
304	0.5
305	2.9
306	3.2
307	1.5
308	0.1

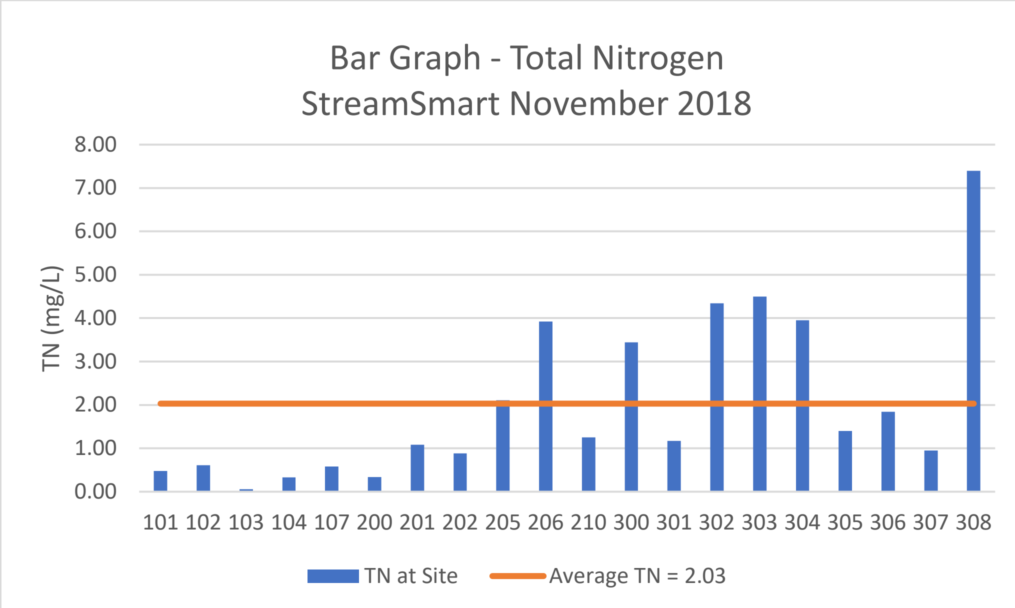
Current, Previous Quarter, and 1 year ago - average, max, and min



	Avg	Max	Min
Nov-18	2.0	4.9	0.1
Aug-18	4.1	15.4	0.3
Nov-17	2.3	9.7	0.0

	Max	Min
Nov-18	200 - Ward Slough	308 - Holman Creek Downstream Huntsville
Aug-18	300 - Brush Creek	103 - Baldwin Creek
Nov-17	305 - War Eagle Mill	210 - Town Branch

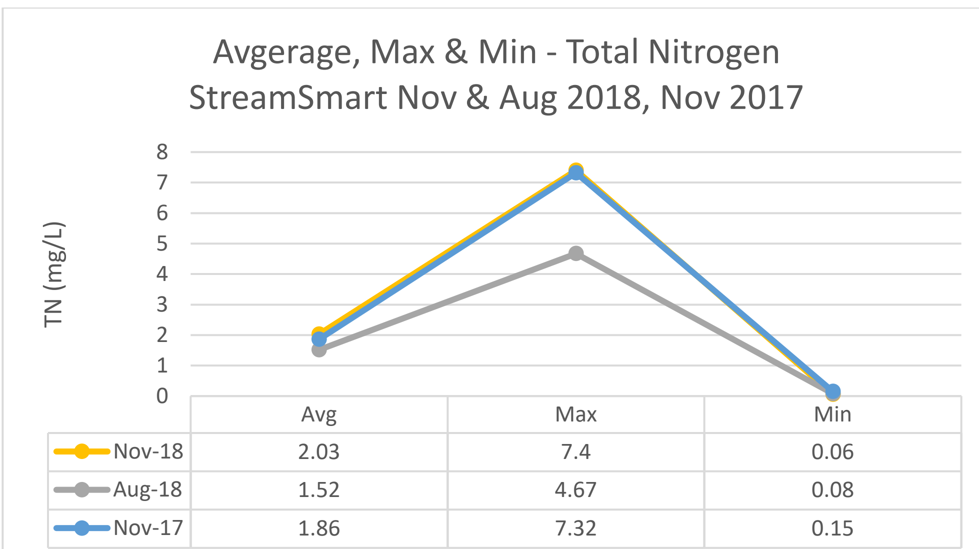
Total Nitrogen – November 2018 StreamSmart



Nov 2018 Data

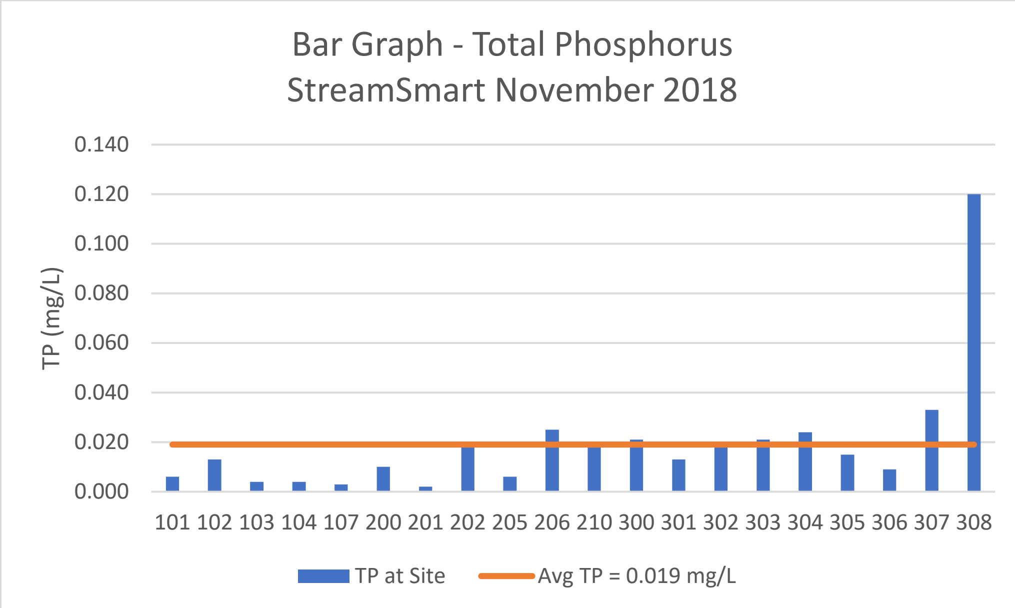
Site	TN (mg/L)
101	0.48
102	0.61
103	0.06
104	0.33
107	0.58
200	0.34
201	1.08
202	0.88
205	2.11
206	3.92
210	1.25
300	3.44
301	1.17
302	4.34
303	4.50
304	3.95
305	1.40
306	1.84
307	0.95
308	7.40

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



	Max	Min
Nov-18	308 - Holman Creek DS of Huntsville	103 - Baldwin Creek
Aug-18	308 - Holman Creek DS of Huntsville	201 - Middle Fork of White River at Harris Bridge
Nov-17	308 - Holman Creek DS of Huntsville	103 - Baldwin Creek

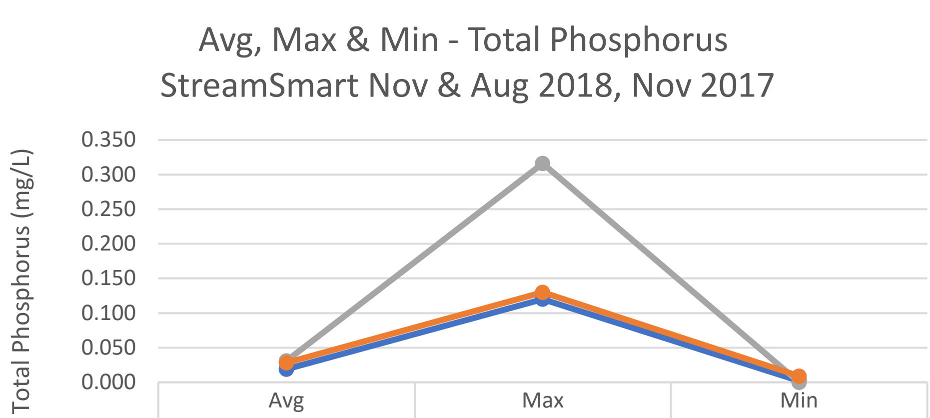
Total Phosphorus – November 2018 StreamSmart



Nov 2018 Data

Site	TP (mg/L)
101	0.006
102	0.013
103	0.004
104	0.004
107	0.003
200	0.010
201	0.002
202	0.018
205	0.006
206	0.025
210	0.020
300	0.021
301	0.013
302	0.018
303	0.021
304	0.024
305	0.015
306	0.009
307	0.033
308	0.120

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



	Avg	Max	Min
Nov-18	0.019	0.120	0.002
Aug-18	0.031	0.316	0.000
Nov-17	0.028	0.130	0.009

	Max Site Number - Location	Min Site Number - Location
Nov-18	308 - Holman Creek DS of Huntsville	201 - Middle Fork of W.R.
Aug-18	308 - Holman Creek DS of Huntsville	104 - White River Near St. Paul
Nov-17	308 - Holman Creek DS of Huntsville	201 - Middle Fork of W.R.

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.