Volunteer Monitoring Quarterly Data Report

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

February 2018

Monitoring Period: Feb 3-16, 2018

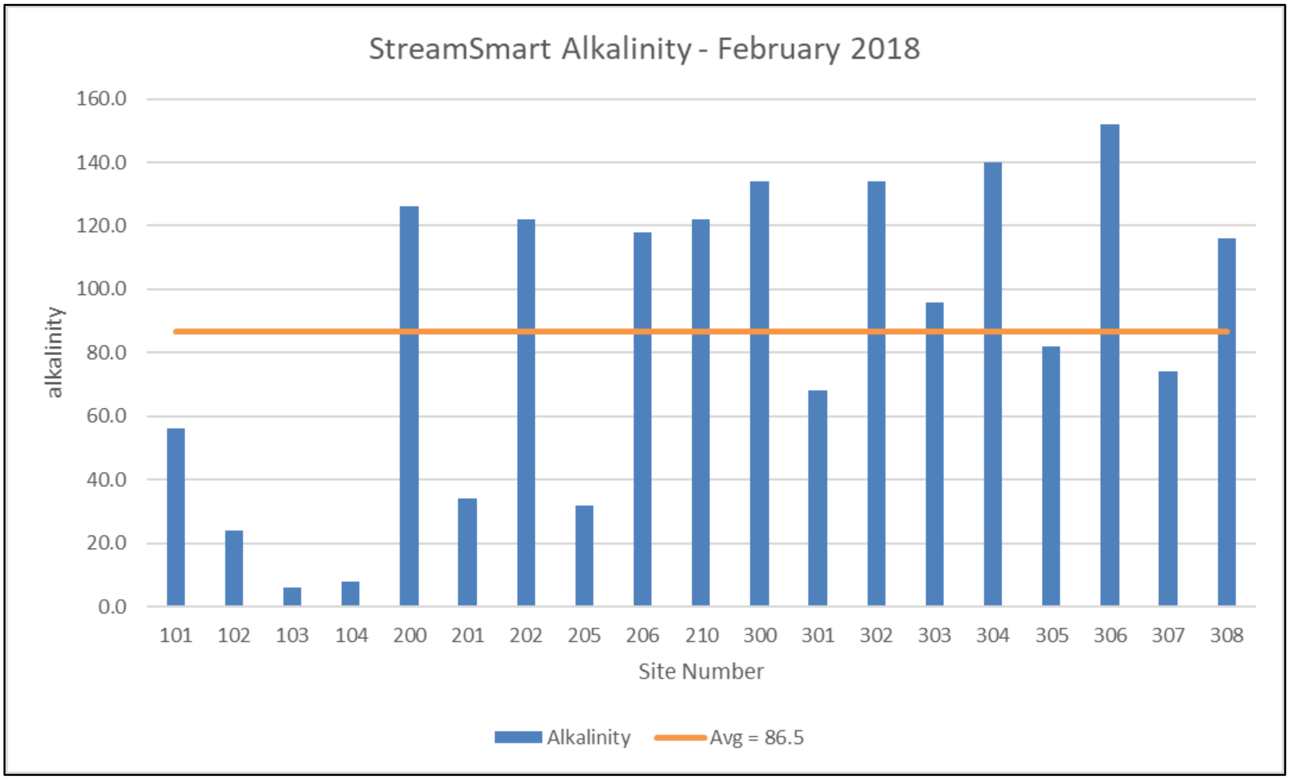
A project of Ozarks Water Watch in Arkansas

Prepared by: Angela Danovi
StreamSmart Coordinator
Ozarks Water Watch
1200 W. Walnut Street, Suite 3405
Rogers, AR 72745

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	College Branch - U of A		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

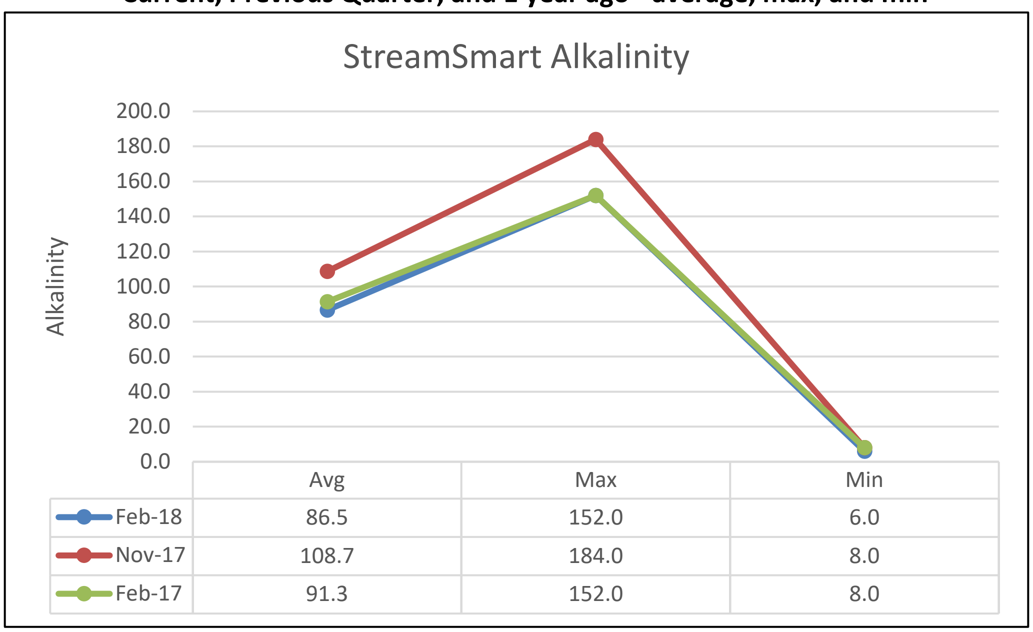
Alkalinity Data – February 2018 StreamSmart



Feb 2018 Data

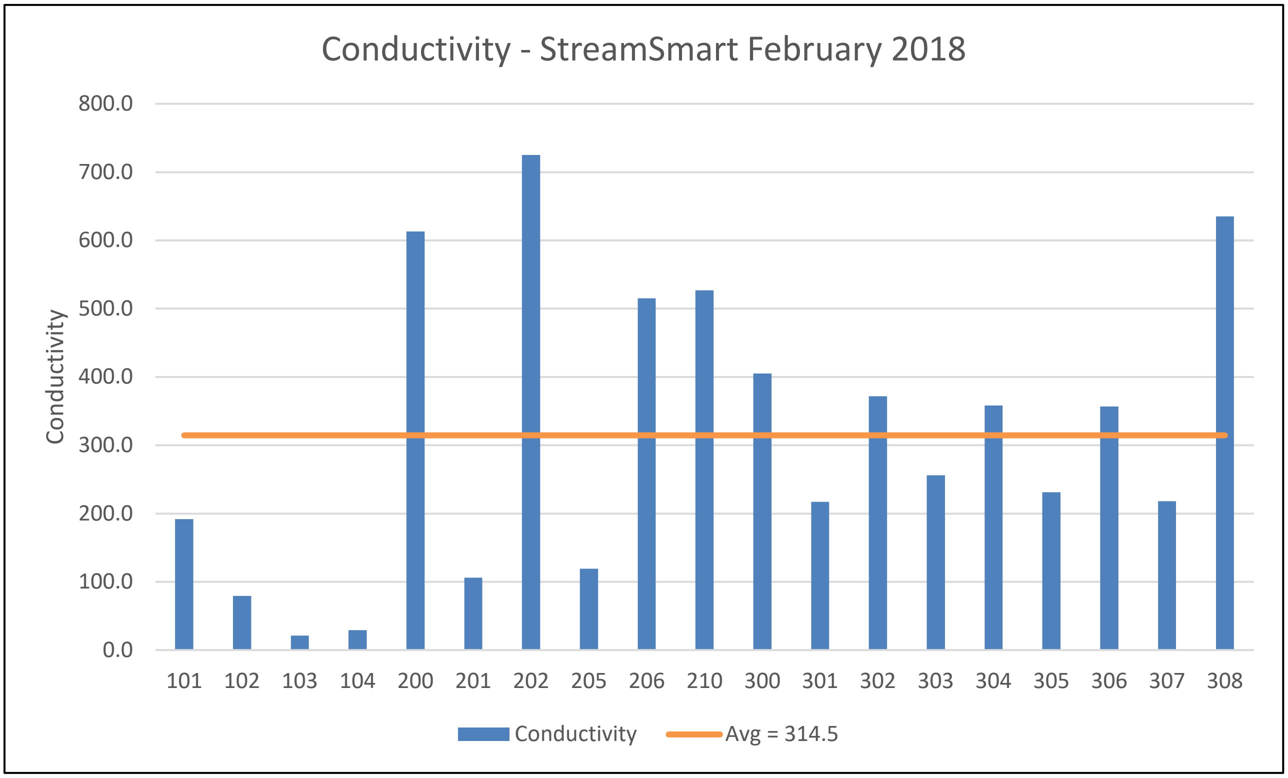
Site	Alkalinity
101	56.0
102	24.0
103	6.0
104	8.0
200	126.0
201	34.0
202	122.0
205	32.0
206	118.0
210	122.0
300	134.0
301	68.0
302	134.0
303	96.0
304	140.0
305	82.0
306	152.0
307	74.0
308	116

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



	Max	Min
Feb-18	306 - Prairie Creek	103 - Baldwin Creek
Nov-17	302 - Glade Creek	103 - Baldwin Creek
Feb-17	300 - Brush Creek / 302 - Glade Creek / 306 - Prairie Creek	103 - Baldwin Creek

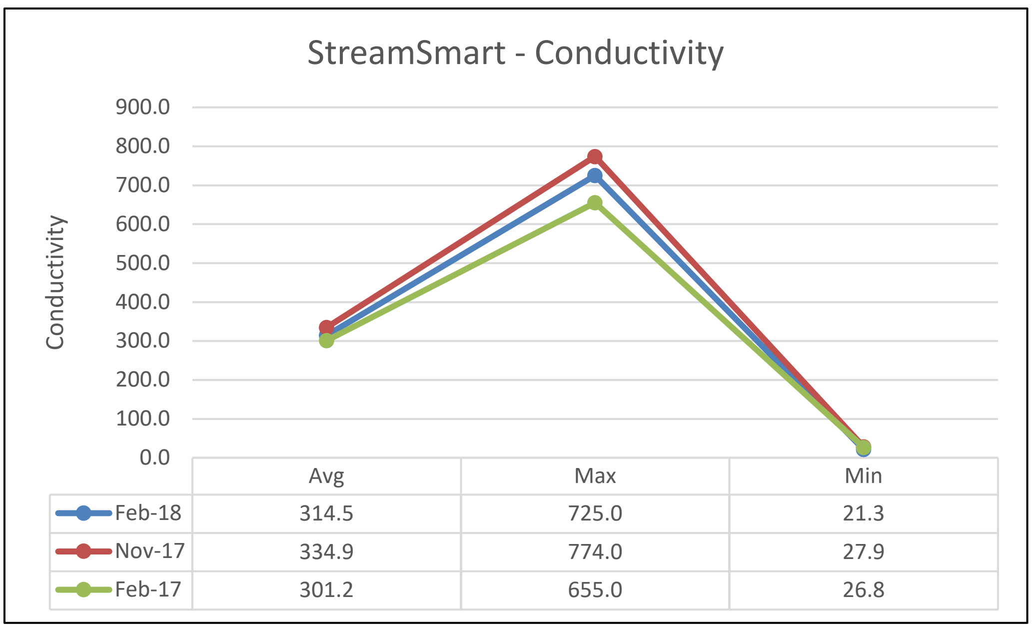
Conductivity Data – February 2018 StreamSmart



Feb 2018 Data

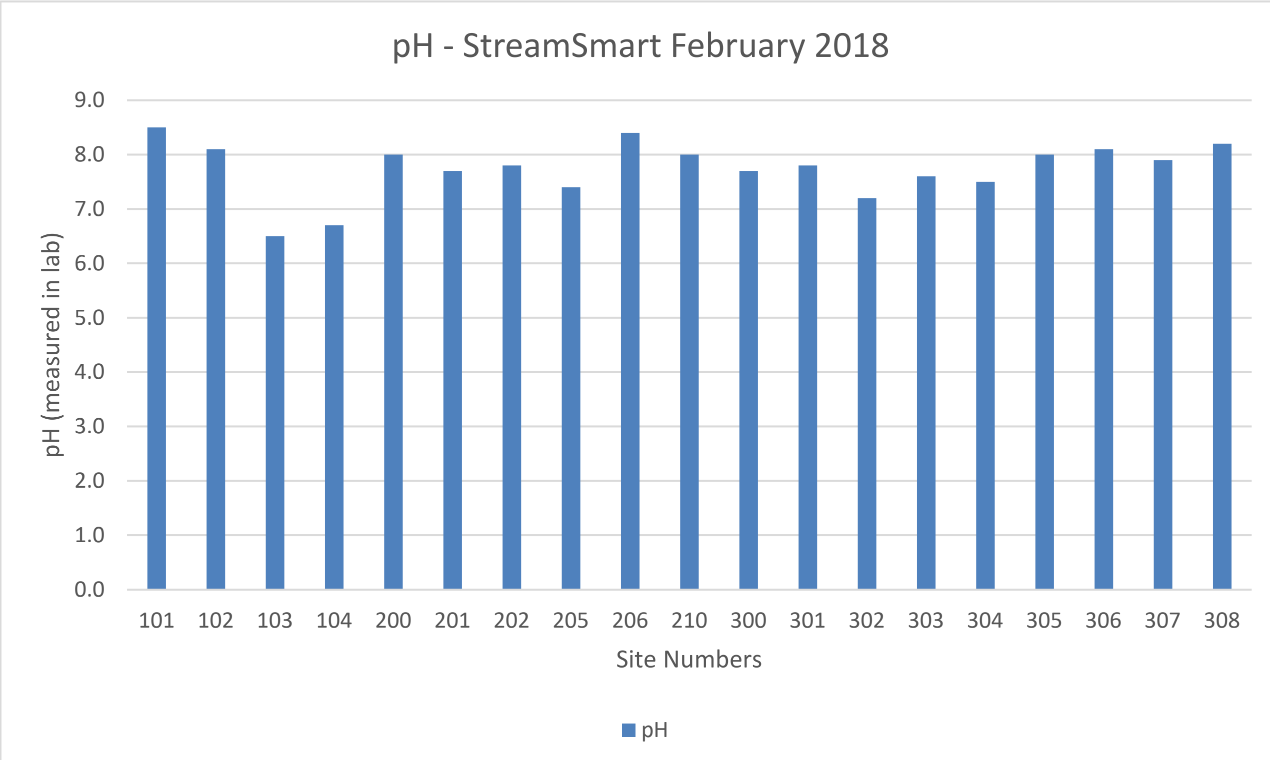
Site	Conductivity
101	191.6
102	79.5
103	21.3
104	29.2
200	613.0
201	106.0
202	725.0
205	119.1
206	515.0
210	527.0
300	405.0
301	217.0
302	372.0
303	256.0
304	358.0
305	231.0
306	357.0
307	218.0
308	635.0

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



	Max	Min
Feb-18	Site 202 - Mullins Creek	Site 103 - Baldwin Creek
Nov-17	Site 308 - Holman Creek DS of Huntsville	Site 103 - Baldwin Creek
Feb-17	Site 200 - Ward Slough	Site 103 - Baldwin Creek

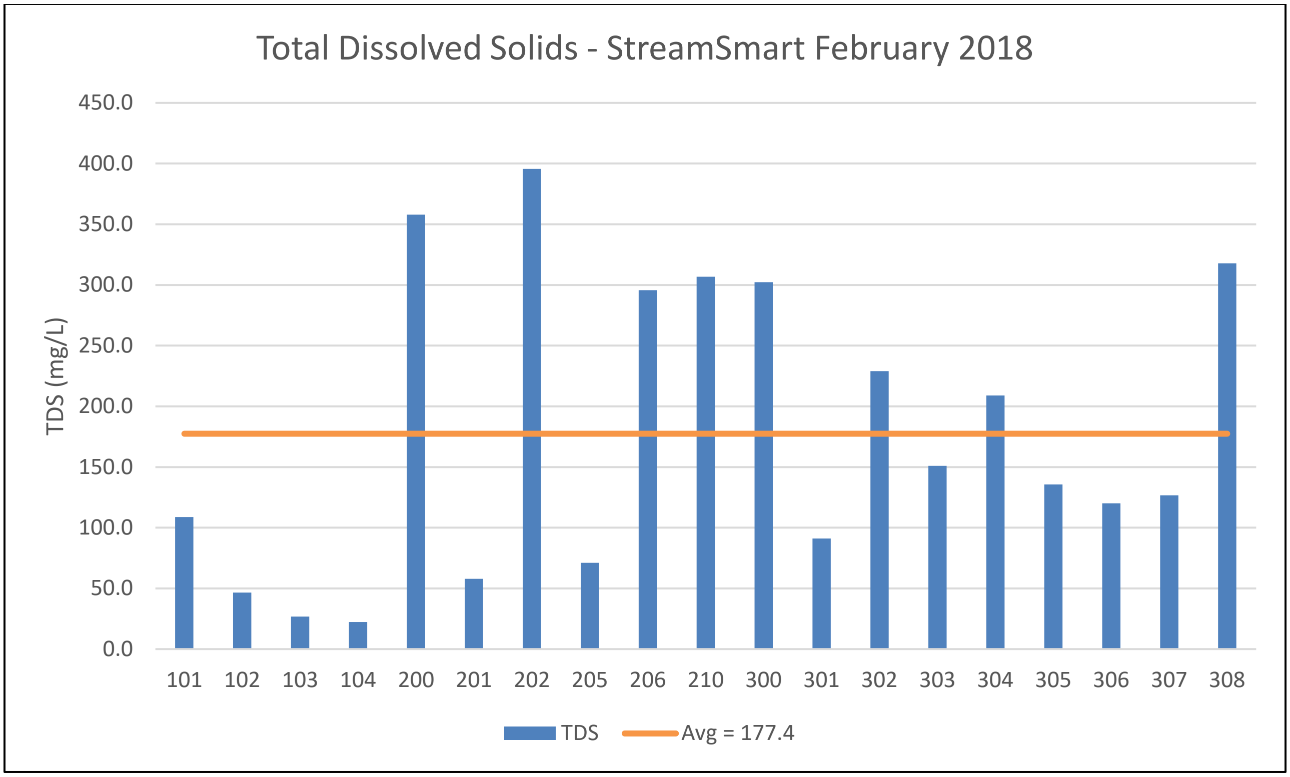
pH Data – February 2018 StreamSmart



Feb 2018 Data

Site	pH
101	8.5
102	8.1
103	6.5
104	6.7
200	8.0
201	7.7
202	7.8
205	7.4
206	8.4
210	8.0
300	7.7
301	7.8
302	7.2
303	7.6
304	7.5
305	8.0
306	8.1
307	7.9
308	8.2

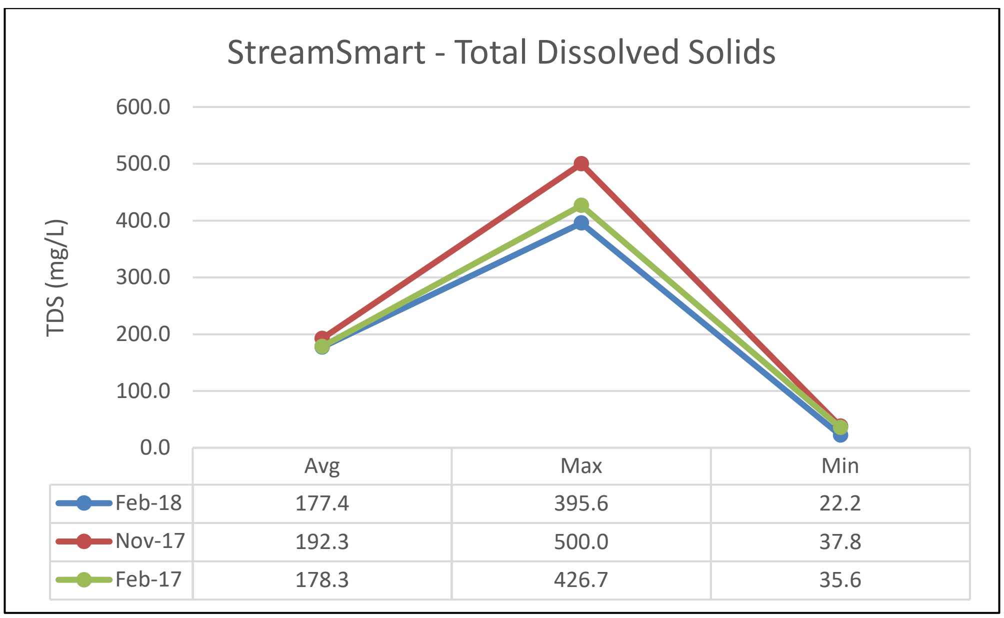
Total Dissolved Solids – February 2018 StreamSmart



Feb 2018 Data

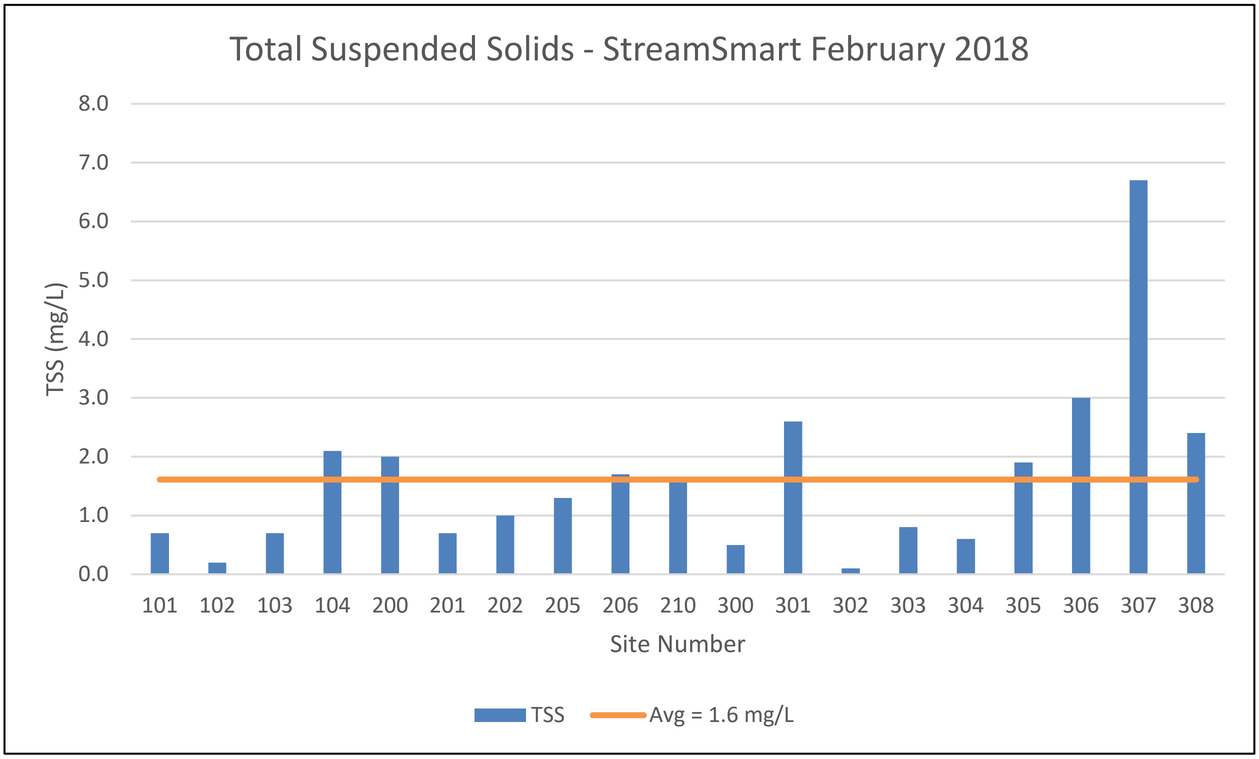
Site	TDS (mg/L)
101	108.9
102	46.7
103	26.7
104	22.2
200	357.8
201	57.8
202	395.6
205	71.1
206	295.6
210	306.7
300	302.2
301	91.1
302	228.9
303	151.1
304	208.9
305	135.6
306	120.0
307	126.7
308	317.8

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



	Max	Min
Feb-18	Site 202 – Mullins Creek	Site 104 – White River near St. Paul
Nov-17	Site 308 – Holman Creek DS of Huntsville	Site 103 – Baldwin Creek / Site 104 – White River near St. Paul
Feb-17	Site 210 – Town Branch	Site 104 – White River near St. Paul

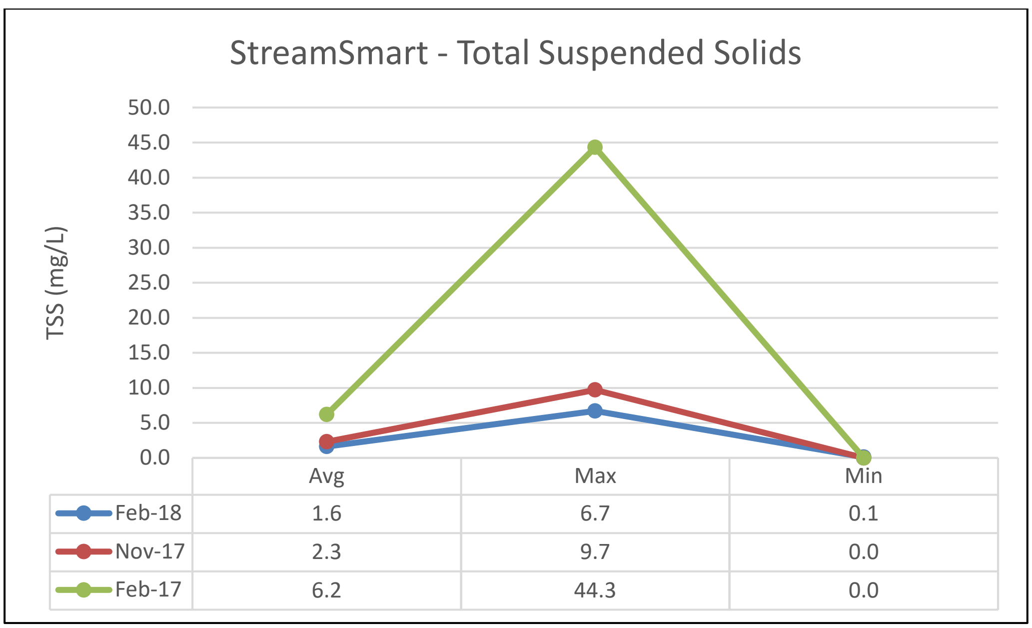
Total Suspended Solids – February 2018 StreamSmart



Feb 2018 Data

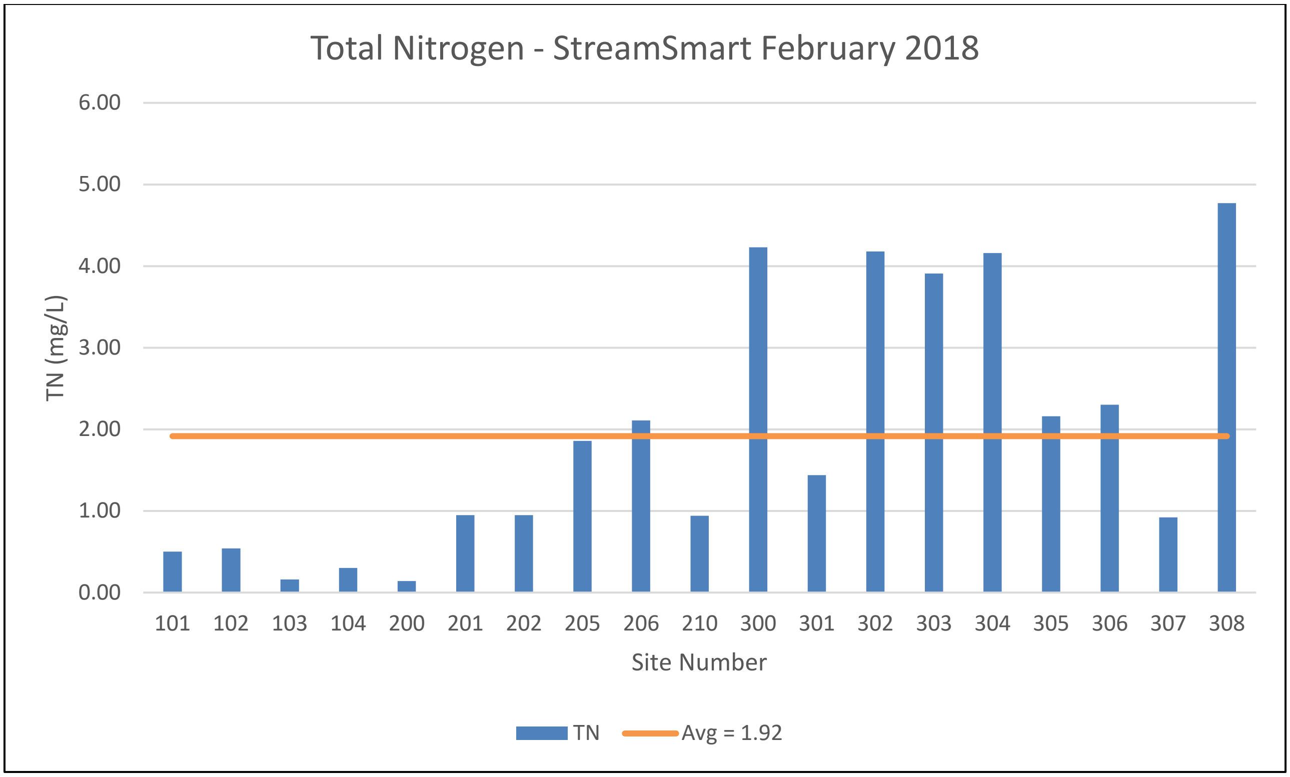
Site	TSS (mg/L)
101	0.7
102	0.2
103	0.7
104	2.1
200	2.0
201	0.7
202	1.0
205	1.3
206	1.7
210	1.6
300	0.5
301	2.6
302	0.1
303	0.8
304	0.6
305	1.9
306	3.0
307	6.7
308	2.4

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



	Max	Min
Feb-18	Site 307 - Holman Creek Upstream of Huntsville	Site 302 - Glade Creek
Nov-17	Site 305 - War Eagle Mill	Site 210 - Town Branch
Feb-17	Site 210 - Town Branch	Site 206 - Spout Spring Branch

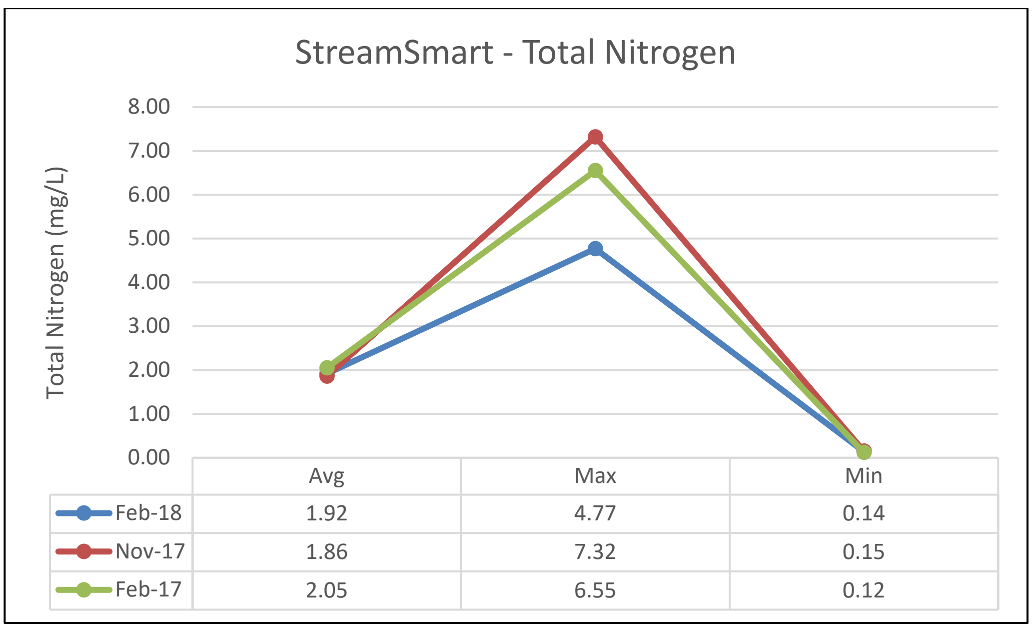
Total Nitrogen – February 2018 StreamSmart



Feb 2018 Data

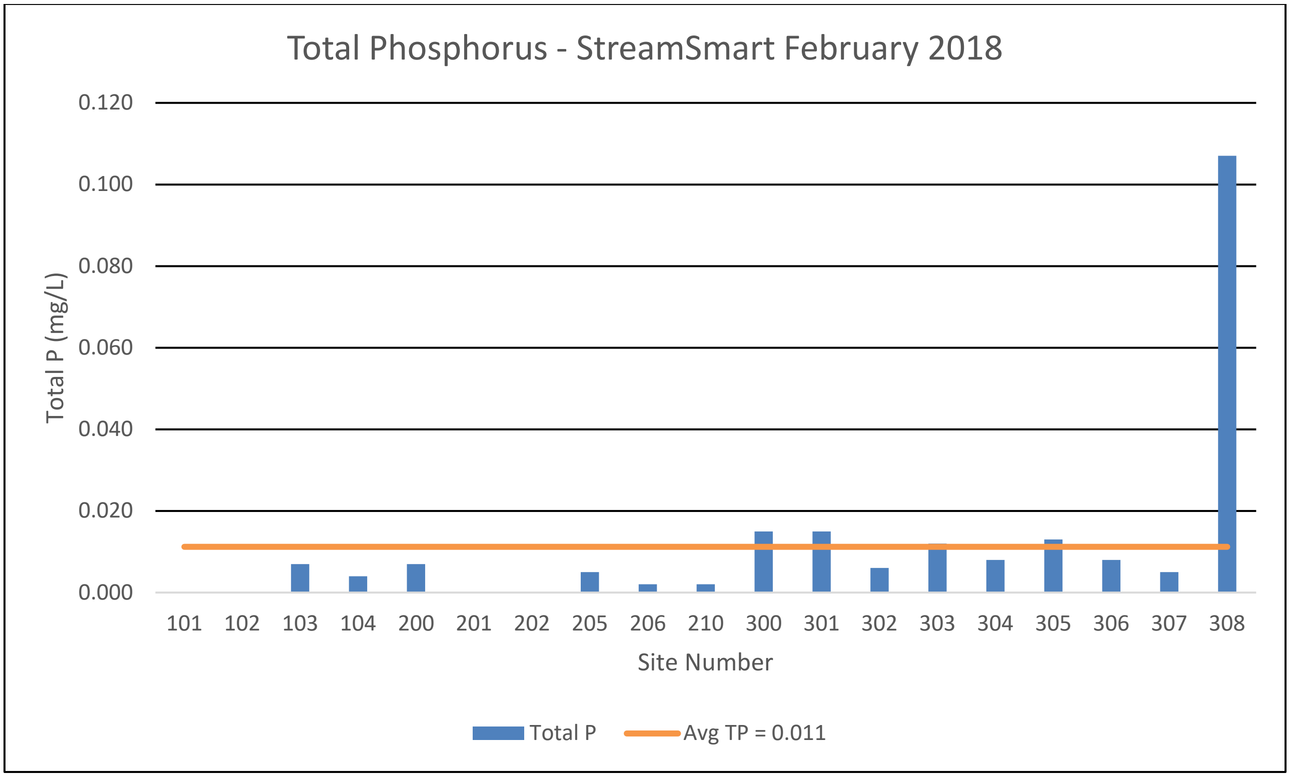
Site	TN (mg/L)
101	0.50
102	0.54
103	0.16
104	0.30
200	0.14
201	0.95
202	0.95
205	1.86
206	2.11
210	0.94
300	4.23
301	1.44
302	4.18
303	3.91
304	4.16
305	2.16
306	2.30
307	0.92
308	4.77

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



	Max	Min
Feb-18	Site 308 - Holman Creek Downstream of Huntsville	Site 200 - Ward Slough
Nov-17	Site 308 - Holman Creek Downstream of Huntsville	Site 103 - Baldwin Creek
Feb-17	Site 210 - Town Branch	Site 103 - Baldwin Creek

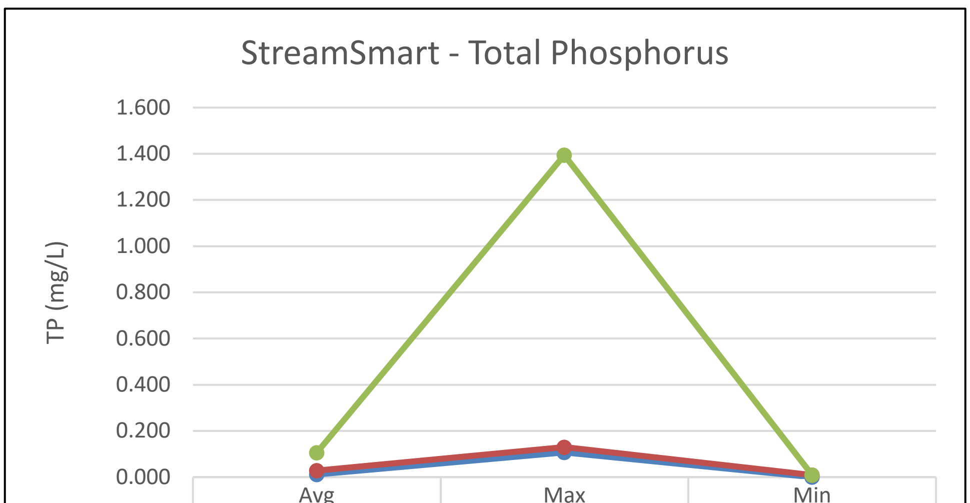
Total Phosphorus – February 2018 StreamSmart



Feb 2018 Data

Site	TP (mg/L)
101	0.000
102	0.000
103	0.007
104	0.004
200	0.007
201	0.000
202	0.000
205	0.005
206	0.002
210	0.002
300	0.015
301	0.015
302	0.006
303	0.012
304	0.008
305	0.013
306	0.008
307	0.005
308	0.107

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



	Avg	Max	Min
Feb-18	0.011	0.107	0.000
Nov-17	0.028	0.130	0.009
Feb-17	0.106	1.394	0.009

	Max Site Number - Location	Min Site Number - Location
Feb-18	Site 308 - Holman Creek DS of Huntsvillie	Site 101 - WF at Baptist Ford Bridge/Site 102 - WF at Brentwood Park
Nov-17	Site 308 - Holman Creek DS of Huntsvillie	Site 201 - White River at Harris Bridge Rd
Feb-17	Site 210 - Town Branch	Site 205 - Hock Creek

Habitat Assessment – February 2018 StreamSmart Data

	103	104	200	201	202	205	206	210	300	301	302	303	304	305	306	307	308
Epifaunal Substrate & available cover	13	11	16	10	14	17	18	1	14	18	14	14	17	14	17	17	16
Embeddedness	19	17	9	12	14	17	11	0	18	16	11	17	15	13	12	14	10
Velocity/Depth Regime	19	18	5	16	15	13	10	9	14	16	11	15	16	13	16	13	14
Sediment Deposition	17	14	6	10	8	10	6	8	17	16	15	16	15	13	8	13	16
Channel Flow Status	12	16	14	15	12	11	9	7	9	15	14	16	14	12	9	8	15
Channel Alteration	16	14	13	8	10	15	13	7	8	15	15	15	17	12	10	15	15
Frequency of Riffles	19	13	5	5	12	17	11	5	14	15	15	17	13	11	18	9	10
Bank Stability Left	8	9	3	3	7	8	8	5	5	1	8	7	7	7	2	5	7
Bank Stability Right	6	8	6	1	8	8	6	7	8	5	8	9	7	7	4	5	7
Vegetative Protection Left	8	1	4	3	7	7	5	5	5	3	8	8	8	6	2	8	8
Vegetative Protection Right	6	3	4	2	8	9	4	5	7	6	8	2	7	6	2	6	3
Riparian Vegetative Zone Width Left	10	8	5	4	8	8	2	2	2	3	8	7	9	6	4	6	2
Riparian Vegetative Zone Width Right	3	3	1	2	6	8	2	2	5	6	8	2	7	4	2	5	3
Total Score	**156**	**135**	**91**	**91**	**129**	**148**	**105**	**63**	**126**	**135**	**143**	**145**	**152**	**124**	**106**	**124**	**126**

Habitat Assessment Monitoring Statistics – February 2018

	Avg		Max Score	Site Numbers		Min Score	Site Numbers
Epifaunal Substrate & available cover	14		18	206 / 301		1	210
Embeddedness	13		19	103		0	210
Velocity/Depth Regime	14		19	103		5	200
Sediment Deposition	12		17	103		6	200/206
Channel Flow Status	12		16	104 / 303		7	210
Channel Alteration	13		17	304		7	210
Frequency of Riffles	12		19	103		5	200/201/210
Bank Stability Left	6		9	104		1	301
Bank Stability Right	6		9	303		1	201
Vegetative Protection Left	6		8	103/302/303/304/307/308		1	104
Vegetative Protection Right	5		9	303		2	201/303/306
Riparian Vegetative Zone Width Left	6		10	103		2	206/210/300/308
Riparian Vegetative Zone Width Right	4		8	205		1	200
Total Score	123		156	103		63	210

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.