

January 14, 2014

Monitoring Data Analysis for November 19, 2013 – January 6, 2014

Gills Creek Monitoring Sites

During the November to January monitoring period, typical diurnal patterns in water temperature, pH, and dissolved oxygen were observed at all stations. As is generally observed when water temperature decreases in the winter months, dissolved oxygen levels were higher than in previous months at all stations. No water quality violations were observed in any of the monitored parameters during this monitoring period.

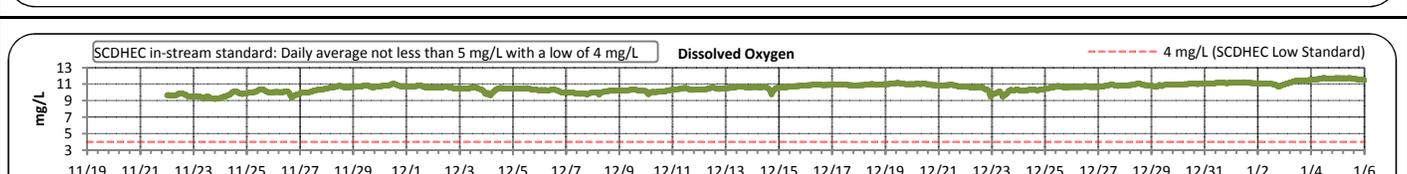
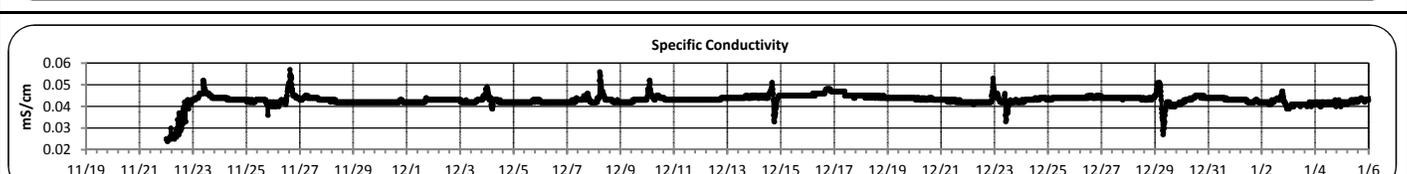
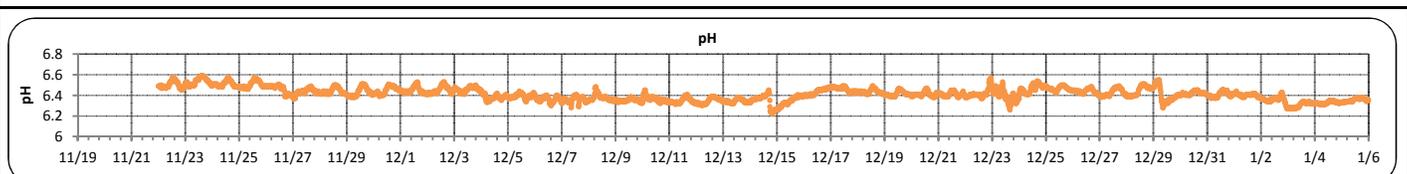
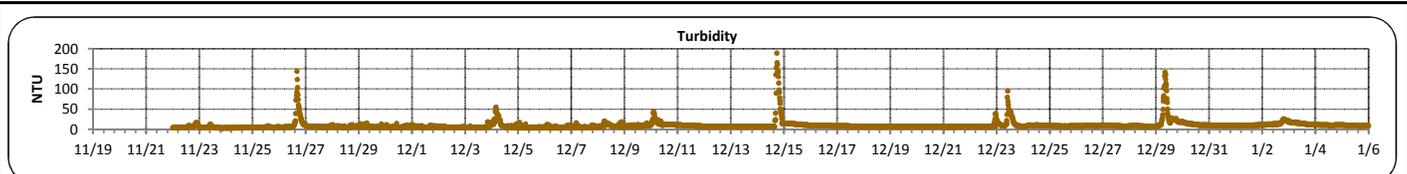
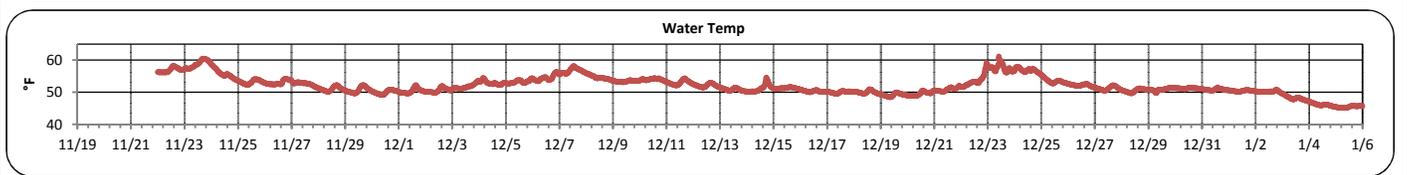
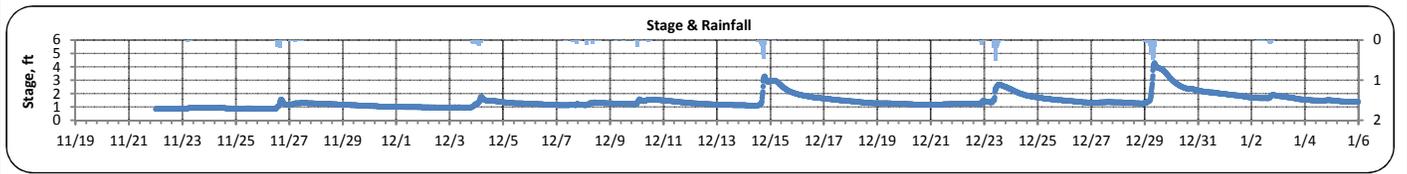
Over previous monitoring periods, submergence issues have been observed at the Gills Creek A monitoring station. Fortunately, during this monitoring period, the stage at this location remained high enough to keep all sensors submerged for the entire duration of the monitoring period.

Over this monitoring period, 13 storms, each greater than 0.1 inches of rain were seen. The maximum daily rainfall observed at all stations was approximately 2.0 inches. During the smaller events, slight fluctuations in water quality parameters were observed. During the more significant events, typical responses, including an increase in turbidity, a decrease in specific conductivity, and a drop in pH were observed at all stations.

Over the course of this monitoring period, there were two instances during which the data deviated from typically observed trends. At the Gills Creek A station, a pattern emerged in turbidity readings which lasted from November 27th to December 7th. Throughout this time, turbidity readings increased during nighttime hours, from approximately 6 pm to 6 am. The turbidity readings were elevated to approximately 15 NTU, with values fluctuating frequently. No correlated patterns were observed in any other parameters. The cause of this turbidity noise is uncertain, but future data should be monitored for similar patterns. The second instance of unexpected measurements occurred at the Gills Creek C station, where abnormalities were observed in the turbidity, pH, and dissolved oxygen readings from approximately November 22nd to December 15th. During this period, leaf clutter was observed, and confirmed by field observations, accumulating near the data sonde. The presence of this detritus was not significant enough to alter the measured water quality parameters outside the bounds of typically observed patterns; however, the leaf clutter did result in more noise in the data than is usually seen. This period of noisy data resulted in an average dissolved oxygen reading of 8.2 mg/L, approximately 2 mg/L less than the average readings at stations A and B over the same time period. This is likely the explanation for the monitoring period mean dissolved oxygen reading at station C of only 9.0 mg/L, compared to period long averages of 10.6 mg/L and 10.5 mg/L at station A and B, respectively. Field maintenance was performed at the station to remove this leaf matter, but the problem was recurring. This is most likely an issue at the Gills Creek C station because of the quantity of upstream deciduous forest, and the slow moving nature of the stream at the location of the stilling well. As we move further into winter and spring, this issue will likely resolve itself.

Gills Creek A (Nov 19, 2013 -- Jan 6, 2014)

PARAMETER	DESCRIPTION	CONTINUOUS WATER QUALITY PARAMETERS:	SUMMARY STATISTICS				
			MINIMUM OBSERVED	MAXIMUM OBSERVED	MEDIAN OBSERVED	MEAN OBSERVED	STANDARD DEVIATION
STREAM NAME:	Gills Creek	STAGE (FT):	0.8	4.3	1.3	1.4	0.5
LOCATION:	Forest Drive Bridge	TEMPERATURE (°F):	45	61	51	52	3
ADDRESS:	4840 Forest Drive, Columbia, SC 29206	TURBIDITY (NTU):	3	189	8	10	12
COORDINATES:	34.019826, -80.963566	pH:	6.2	6.6	6.4	6.4	0.1
TMDL/IMPAIRMENT:	Fecal & Dissolved Oxygen	SPECIFIC CONDUCTIVITY (mS/cm):	0.024	0.057	0.043	0.043	0.003
NEIGHBORING LANDUSE:	Residential and commercial	DISSOLVED OXYGEN (mg/L):	9.2	11.8	10.7	10.6	0.5
APPROX. DRAINAGE AREA:	48 square miles						
SPATIAL LOCATION:	Most upstream site						
TOTAL NO. STORMS OVER 0.1 INCH:	12						
MAX. DAILY RAINFALL:	1.8 inches						
TOTAL RAINFALL (FOR PERIOD):	7.4 inches						



Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

**Continuous Water Quality
Monitoring Periodic Report**

Gills Creek A (Nov 19, 2013 -- Jan 6, 2014)

Explanation of Statistics:

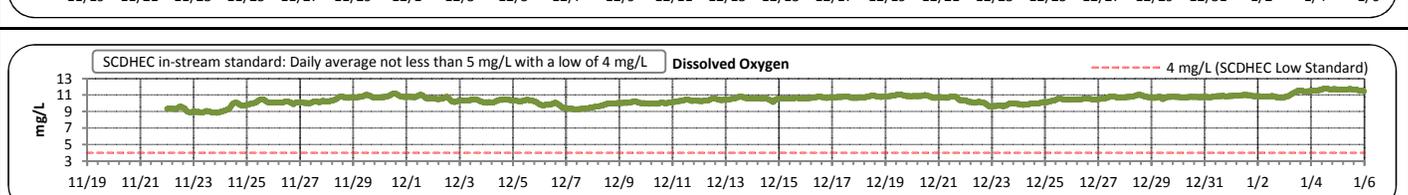
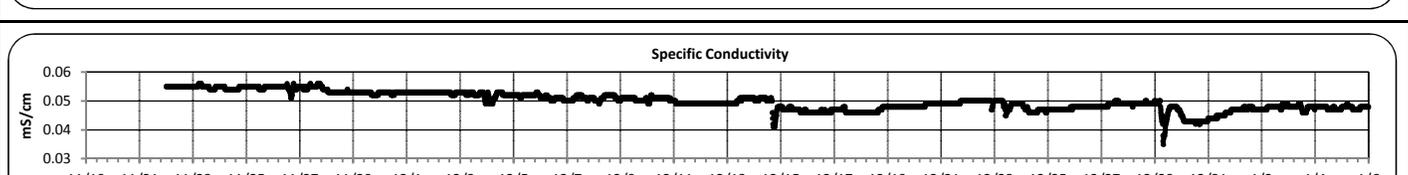
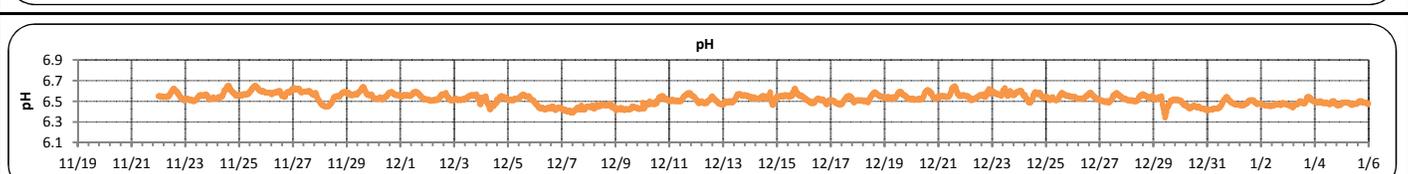
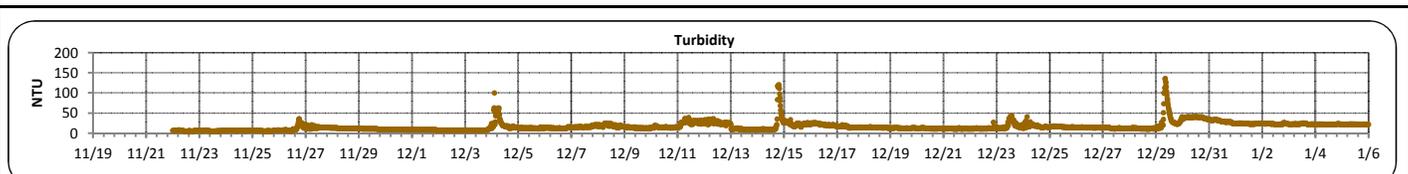
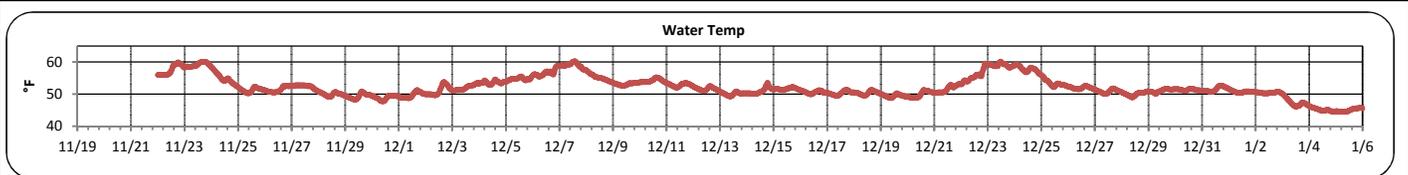
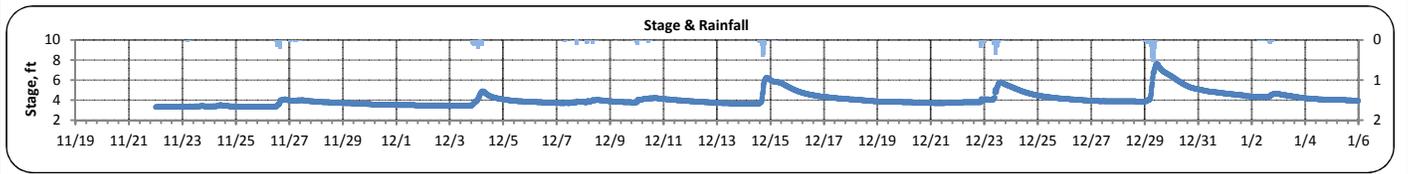
MINIMUM OBSERVED	The minimum of the values recorded by the datasonde in 15 minute intervals.
MAXIMUM OBSERVED	The maximum of the values recorded by the datasonde in 15 minute intervals.
MEDIAN OBSERVED	The median of all the values recorded by the datasonde in 15 minute intervals.
MEAN OBSERVED	The average of all the values recorded by the datasonde in 15 minute intervals.
STANDARD DEVIATION	The standard deviation of all the values recorded by the datasonde in 15 minute intervals.

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REPORT GENERATED ON 1/14/2014

Gills Creek B (Nov 19, 2013 -- Jan 6, 2014)

PARAMETER	DESCRIPTION	CONTINUOUS WATER QUALITY PARAMETERS:	SUMMARY STATISTICS				
			MINIMUM OBSERVED	MAXIMUM OBSERVED	MEDIAN OBSERVED	MEAN OBSERVED	STANDARD DEVIATION
STREAM NAME:	Gills Creek	STAGE (FT):	3.3	7.6	3.9	4.1	0.7
LOCATION:	Devine Street bridge	TEMPERATURE (°F):	44	60	51	52	3
ADDRESS:	4716 Devine Street Columbia, SC 29209	TURBIDITY (NTU):	1	136	14	16	11
COORDINATES:	33.989656, -80.97433	pH:	6.3	6.7	6.5	6.5	0.1
TMDL/IMPAIRMENT:	Fecal & Dissolved Oxygen	SPECIFIC CONDUCTIVITY (mS/cm):	0.035	0.056	0.049	0.050	0.003
NEIGHBORING LANDUSE:	Residential and commercial	DISSOLVED OXYGEN (mg/L):	8.8	11.8	10.6	10.5	0.6
APPROX. DRAINAGE AREA:	59 square miles						
SPATIAL LOCATION:	Middle site						
TOTAL NO. STORMS OVER 0.1 INCH:	13						
MAX. DAILY RAINFALL:	2.1 inches						
TOTAL RAINFALL (FOR PERIOD):	8.1 inches						



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Monitoring Periodic Report**

Gills Creek B (Nov 19, 2013 -- Jan 6, 2014)

Explanation of Statistics:

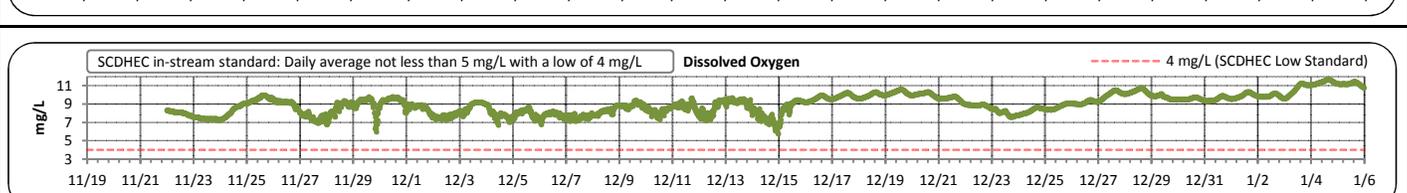
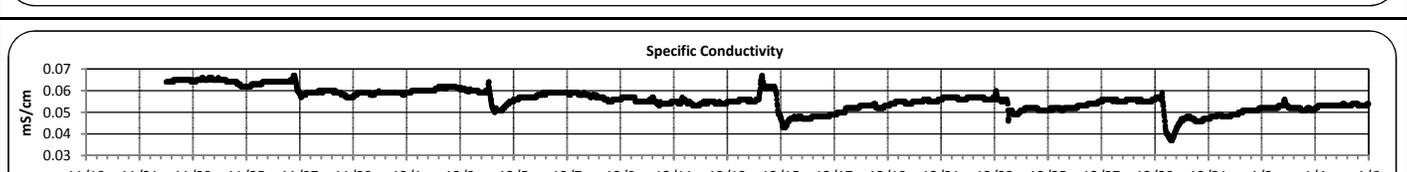
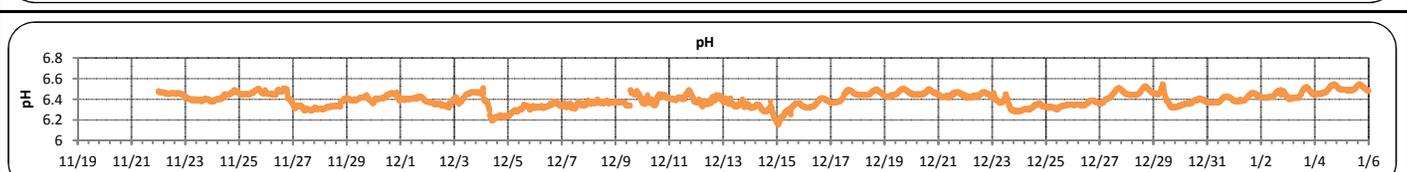
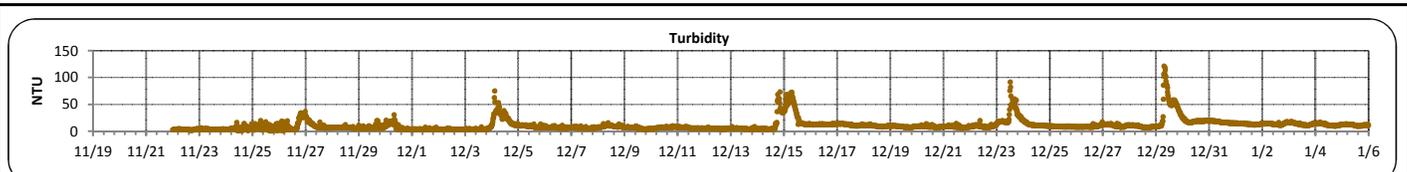
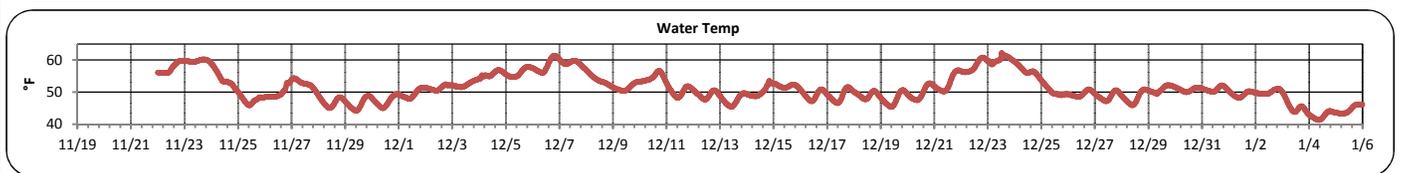
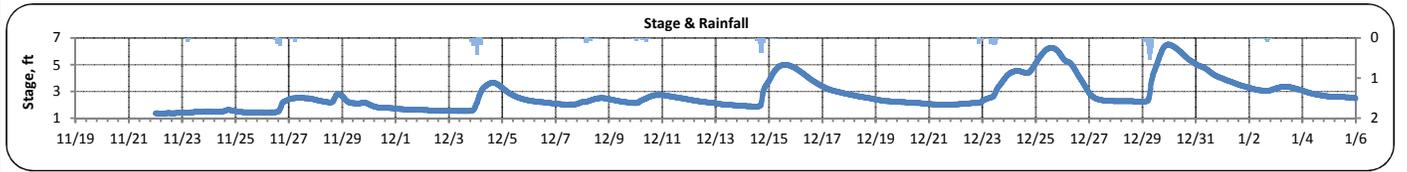
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Gills Creek C (Nov 19, 2013 -- Jan 6, 2014)

PARAMETER	DESCRIPTION	CONTINUOUS WATER QUALITY PARAMETERS:	SUMMARY STATISTICS				
			MINIMUM OBSERVED	MAXIMUM OBSERVED	MEDIAN OBSERVED	MEAN OBSERVED	STANDARD DEVIATION
STREAM NAME:	Gills Creek	STAGE (FT):	1.4	6.5	2.4	2.7	1.2
LOCATION:	Bluff Road bridge	TEMPERATURE (°F):	41	62	51	51	4
ADDRESS:	3009 Bluff Rd. Columbia, SC 29209	TURBIDITY (NTU):	1	121	9	11	11
COORDINATES:	33.948043, -80.9889	pH:	6.2	6.6	6.4	6.4	0.1
TMDL/IMPAIRMENT:	Fecal & Dissolved Oxygen	SPECIFIC CONDUCTIVITY (mS/cm):	0.037	0.067	0.055	0.056	0.005
NEIGHBORING LANDUSE:	Residential and commercial	DISSOLVED OXYGEN (mg/L):	5.8	11.7	9.1	9.0	1.1
APPROX. DRAINAGE AREA:	64 square miles						
SPATIAL LOCATION:	Most downstream site						
TOTAL NO. STORMS OVER 0.1 INCH:	13						
MAX. DAILY RAINFALL:	2.0 inches						
TOTAL RAINFALL (FOR PERIOD):	7.9 inches						



Note: Data gaps appear when the sonde is removed for calibration or when the flow depth is below the sensors

**Continuous Water Quality
Monitoring Periodic Report**

Gills Creek C (Nov 19, 2013 -- Jan 6, 2014)

Explanation of Statistics:

MINIMUM OBSERVED	The minimum of the values recorded by the datasonde in 15 minute intervals.
MAXIMUM OBSERVED	The maximum of the values recorded by the datasonde in 15 minute intervals.
MEDIAN OBSERVED	The median of all the values recorded by the datasonde in 15 minute intervals.
MEAN OBSERVED	The average of all the values recorded by the datasonde in 15 minute intervals.
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