

Helene Spring Sampled 2013-2014

Site Information

Helene Spring emerges from the north/west of Sulphur Run in Seminole State Forest. The spring's flow was measured from 2008 to 2010 by the St. Johns Water Management District. The mean discharge was 1.27 cubic feet per second (cfs), and the median discharge was 1.36 cfs, putting it in category as a fourth magnitude. One vent is located at the bottom of a large pool, which is lined with limestone rock. The spring run is long, but often wetland-like, with a soft bottom comprised mainly of detritus. It discharges to Sulphur Run. The riparian zone consist of a normal, expected community of native plants, trees, and shrubs including cabbage palms, sweet gum trees, pine trees, oaks, and little evidence of human disturbance.

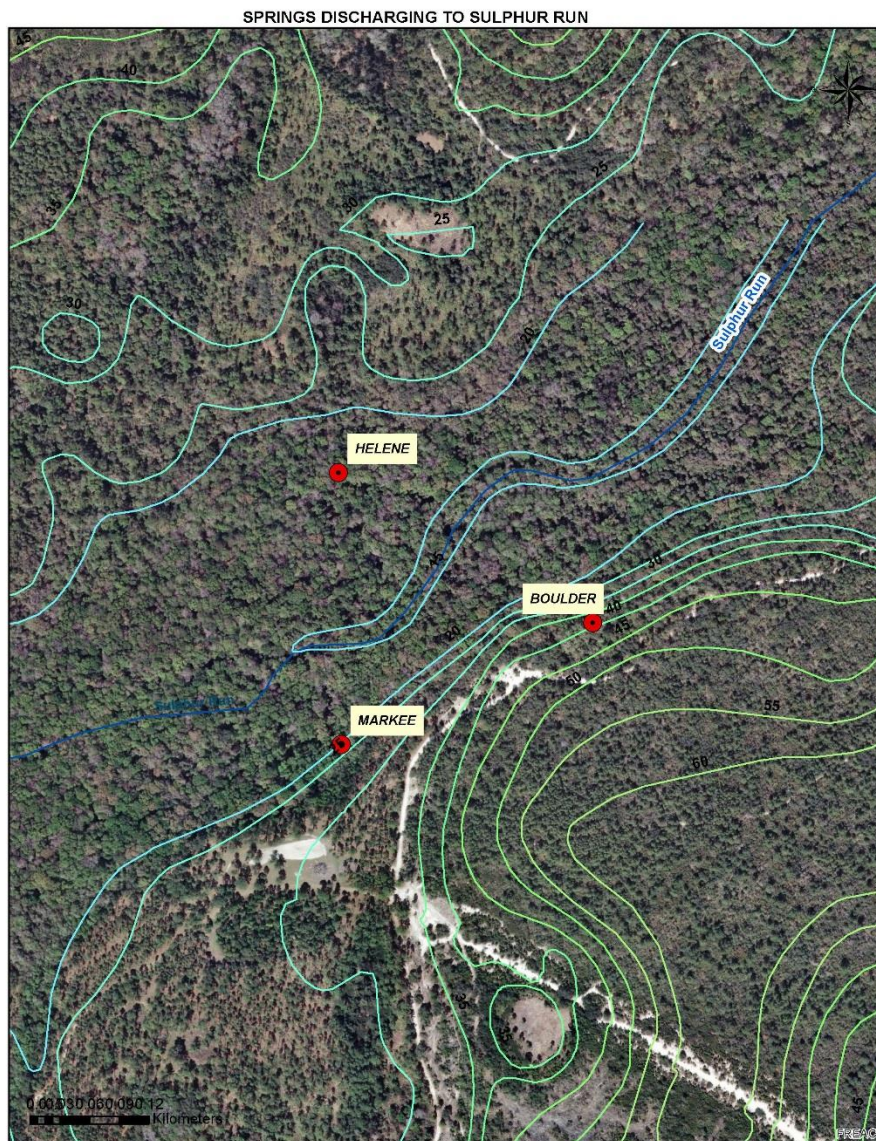


Figure 1-HE. Location of Helene Spring in Seminole State Forest in Lake County

(A)



(B)



(C)



Figure 2-HE. Helene Spring (A), Spring Vent (B), and Spring Run (C)

Results

Water Quality

Water quality was fairly constant throughout all four sampling events (Table 1-HE). The dissolved oxygen (DO) results were low, but that is a natural condition for ground water. Sucralose was not detected and boron results were low. Nitrate/nitrite (NO_{3+2}) results were not detectable during the first sampling in July 2013 and last sampling in April 2014 and barely detected during October 2013 sampling. There are only three NO_{3+2} results. Due to sample contamination, the January 13 sample result was not valid. The data suggest that human activities have not impacted water source of the spring. There is not sufficient data to calculate annual geometric means for nitrate/nitrite for Helene, however, all three sample results indicate that NO_{3+2} limit is well within the springs water criteria rule 62-302.531(2)(b)2 which states: "For spring vents, the applicable numeric interpretation of the narrative nutrient criterion ...is 0.35 mg/L of nitrate/nitrite as an annual geometric mean, not to be exceeded more than once in any three calendar year period." All other nutrients were also low.

Table 1-HE. Water Quality Results for Helene Spring

Date Sampled	7/15/2013	10/7/2013	1/13/2014	4/14/2014
pH	7.5	7.6	7.4	7.6
DO mg/L	0.23	0.15	0.43	0.4
DO %	2	2	5.2	5
Specific Conductance ($\mu\text{mhos/cm}$)	425	441	430	433
Water temperature ($^{\circ}\text{C}$)	23.07	23.1	23.12	23.03
Fecal Coliform (cfu/100mL)	2 B	2 B	2 U	2 U
Enterococci (cfu/100mL)	30 B	6 B	n/a	n/a
Turbidity (NTU)	0.1	0.15	0.1	0.15
Alkalinity (mg CaCO_3/L)	132 A	133	134	133
Chloride (mg Cl/L)	20	21	21	20
Color true (PCU)	5.2 I	7.6	3.8 I	2.5 U
Fluoride (mg/L)	0.18	0.2	0.19	0.19
Sulfate (mg SO_4/L)	48	50	51	50
TDS (mg/L)	270 A	245	224	252 A
TSS (mg/L)	2 I	8 I	2 I	2 I
Ammonia (mg N/L)	0.13	0.14	0.16	0.13
Nitrite/Nitrate (mg N/L)	0.004 U	0.005 I	n/a	0.004 U
Total Phosphorous (mg P/L)	0.099	0.096	0.094	0.098
Total Kjeldahl Nitrogen (mg N/L)	0.25	0.78	0.22	0.22
Organic Carbon (mg C/L)	1.6	1.5	1.2	1.1
Ortho-phosphate (mg P/L)	0.092	0.089	0.095	0.095
Sucralose ($\mu\text{g}/\text{L}$)	0.010 UJ	n/a	n/a	n/a
Calcium (mg/L)	57.3	57.8	55.7	56.8
Magnesium (mg/L)	12.7	13.5	12.7	13
Potassium (mg/L)	1.0 I	1.0 I	1.1	1.0 I
Sodium (mg/L)	12.2	12.5	n/a	n/a
Boron ($\mu\text{g}/\text{L}$)	19.2	19.1	19.9	19.8

A- Value reported is the mean of two or more determinations
B- Results based on colony counts outside the acceptable range
I- The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U - Indicates that the compound was analyzed for but not detected.
n/a - not collected or not reported due to data quality concerns

Habitat Assessment

A Habitat Assessment was not performed due to accessibility issues of the spring run.

Aquatic Macroinvertebrate Community

Aquatic macroinvertebrates were not collected due to accessibility issues of the spring run.

Periphyton Survey

Periphyton was present around the pool and in the spring run. A sample of periphyton was collected on January 13, 2014 and submitted for taxonomic identification to the DEP Biology Laboratory. The dominant taxon was *Cladophora glomerata*, which belongs to Class Chlorophyceae. Other filamentous algae were present in the sample, including *Oscillatoria* sp. (Cyanophyceae) and *Oedogonium* spp. (Chlorophyceae). There were many diatoms present in the sample including *Gomphonema* sp. and *Nitzschia* sp.

Linear Vegetation Survey

A Linear Vegetation Survey was not performed, but *Ceratophyllum demersum* was noted in the spring run.

Summary

Helene Spring is a fourth magnitude spring located within Seminole State Forest. It is surrounded by natural area with minimal human disturbance. The spring's discharge and water quality are consistent throughout a year. Water quality meets surface water criteria specified in Chapter 62.302, F.A.C. T