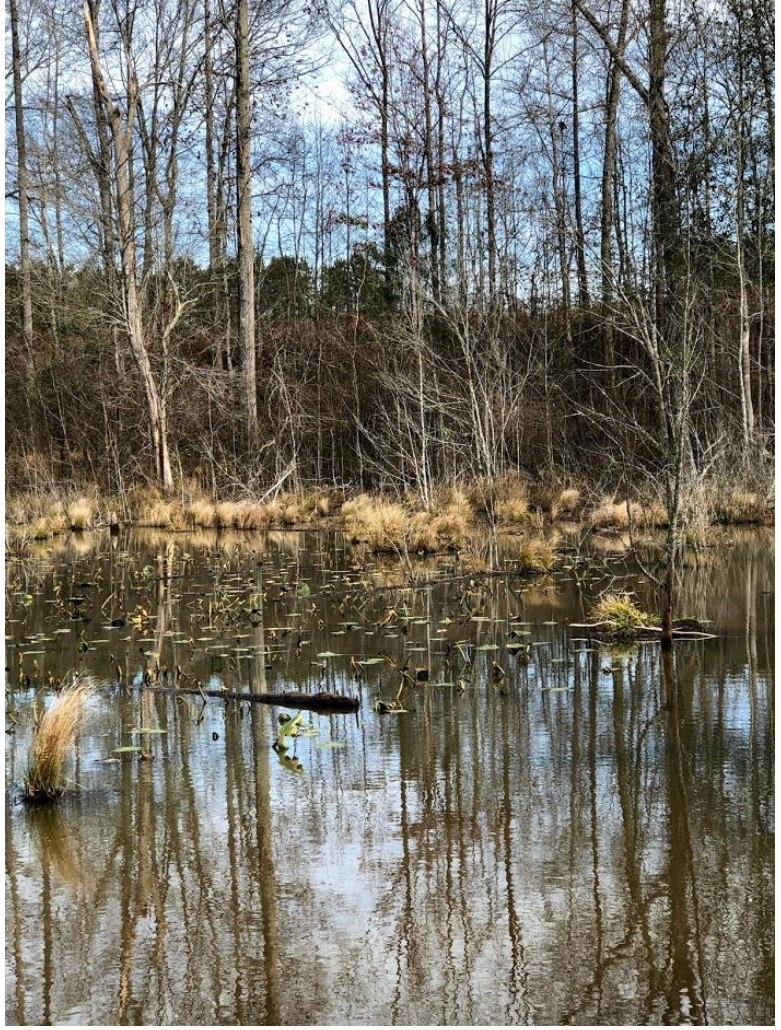


# South Paulding High School Wetland Research & Data

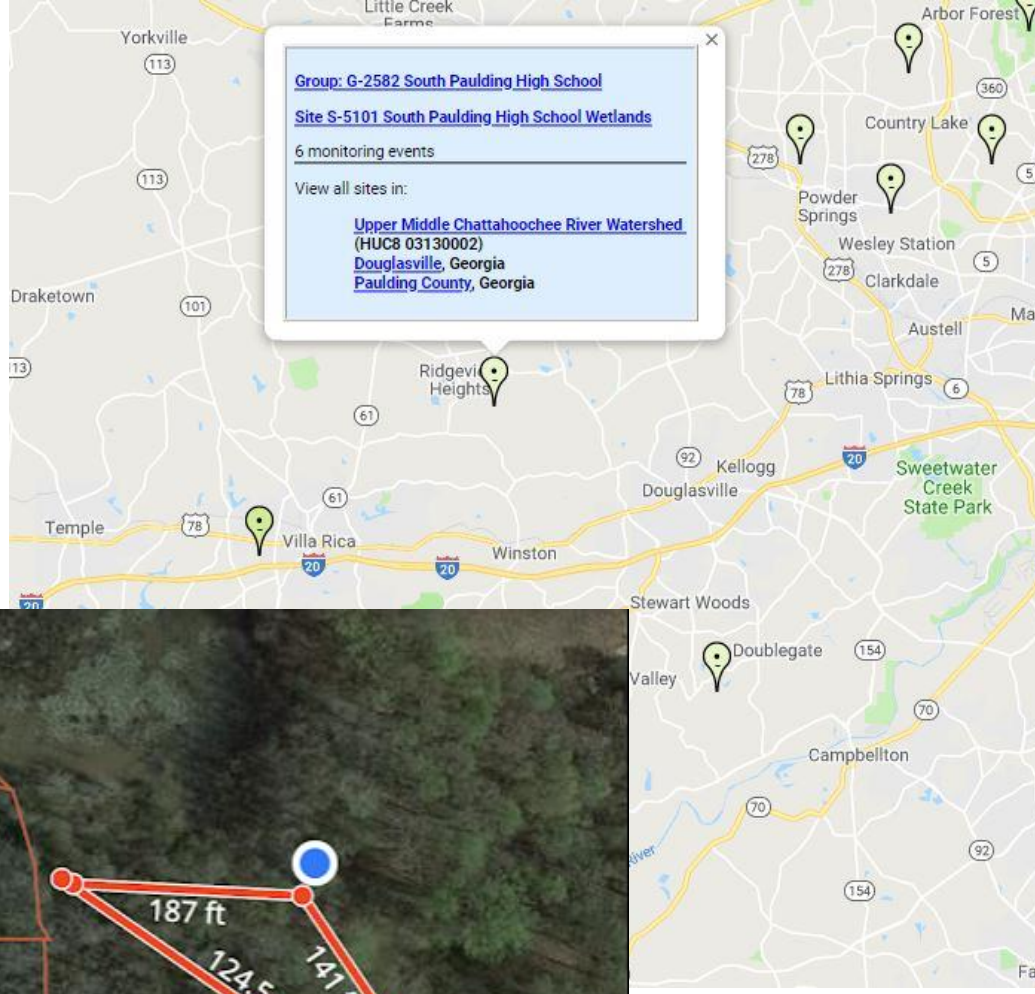
**The Adventures of Spartan Swamp**

followus.com/spartanswamp

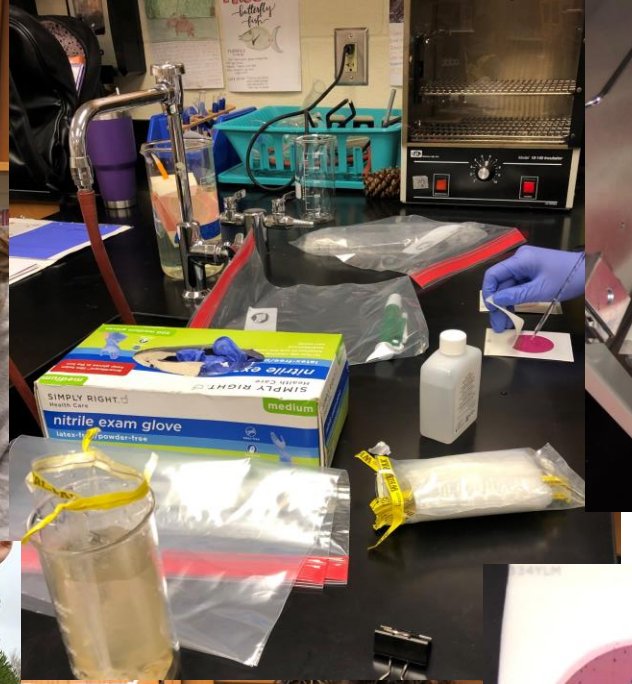
# Our Wetland

PAULDING COUNTY
SCHOOL DISTRICT
Sweetwater Creek

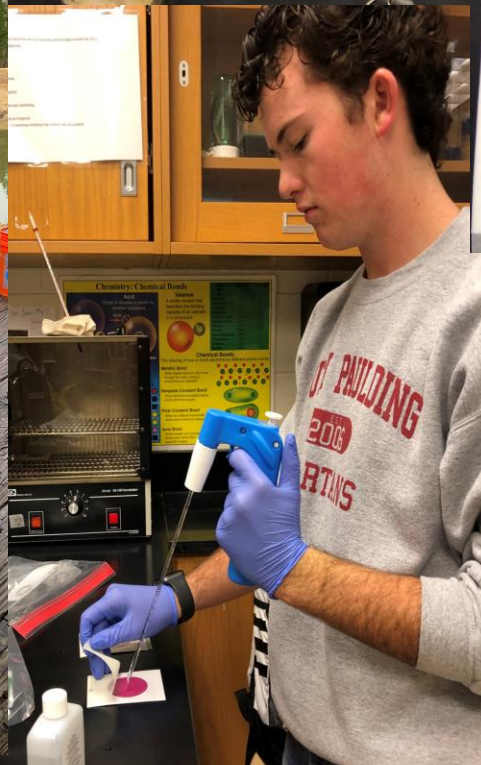
PAULDING COUNTY
SCHOOL DISTRICT
300.0 yds
423.8 yds
349.9 yds
153.2 yds

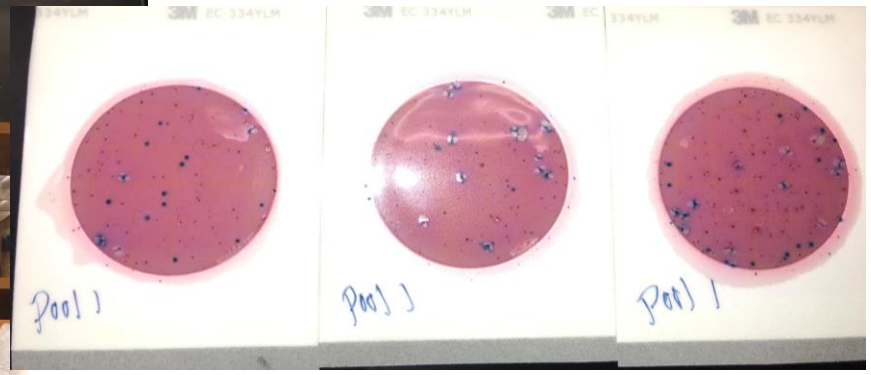

Group: G-2582 South Paulding High School
Site S-5101 South Paulding High School Wetlands
6 monitoring events
View all sites in:
Upper Middle Chattahoochee River Watershed
(HUC8 03130002)
Douglasville, Georgia
Paulding County, Georgia
Yorkville
Draketown
Ridgevi
Heights
Temple
Villa Rica
Winston
Douglasville
Kellogg
Lithia Springs
Austell
Clarkdale
Wesley Station
Powder
Springs
Country Lake
Arbor Forest
Sweetwater
Creek
State Park
Stewart Woods
Doublegate
Valley
Campbellton

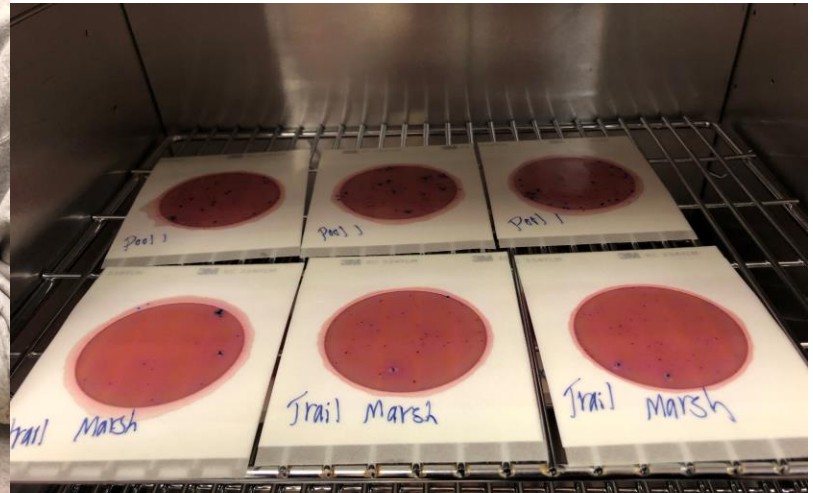
187 ft
124.5 yds
141 ft
108 ft
111.7 yds


SIMPLY RIGHT
nitrile exam glove
medium

Deep Marsh
Deep Marsh
Deep Marsh

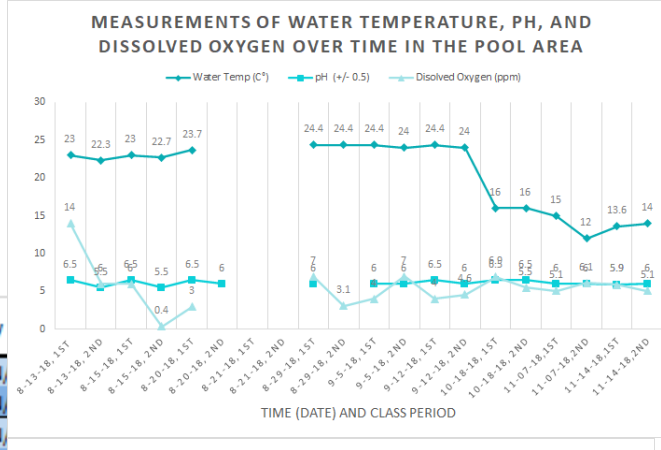

Chemistry: Chemical Bonds

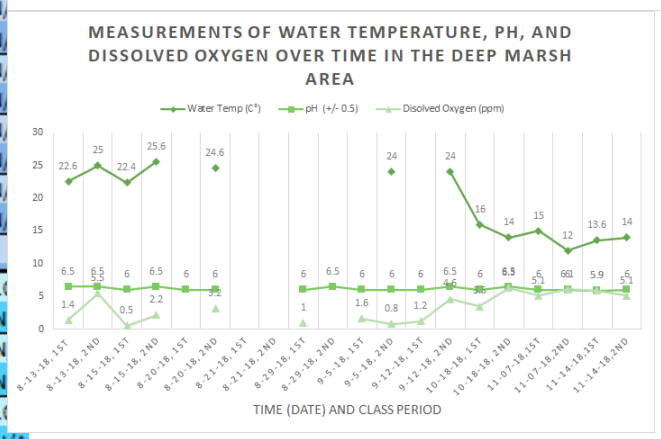

Pool 1
Pool 1
Pool 1

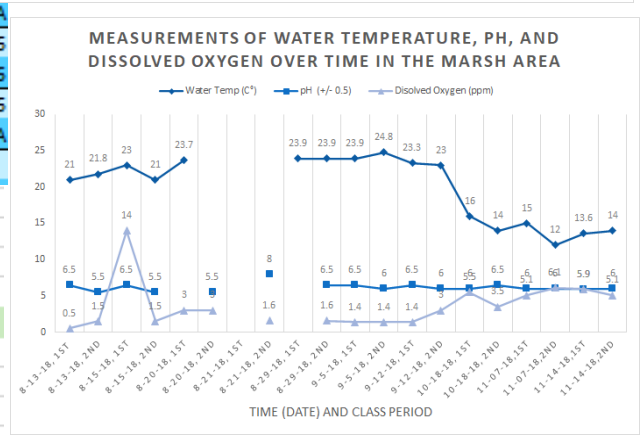

Trail Marsh
Trail Marsh
Trail Marsh

# Locations and General Data

| 0 | Date | Air Temp (C°) | Weather Conditions | Hardness | Chloride (ppm) | Water Temp (C°) | pH (+/- 0.5) | Disolved | Conduct | Alkalinity (ppm) | Secchi Depth (+/- ???) | Turbidity | Iron (ppm) | Salinity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shallow Land (Marsh | 8/13/2019 | 30.44 | Sunny | N/A | N/A | 25.7 | 6.87 | 0 | N/A | N/A | N/A | N/A | N/A | N/ |
| | 8/15/2019 | 23.8 | Sunny | N/A | N/A | 26.1 | 5.01 | 5 | N/A | N/A | N/A | N/A | N/A | N/ |
| | 8/22/2019 | 27.7 | Sunny | N/A | N/A | 25.8 | 7.1 | 3.2 | 113 | N/A | N/A | N/A | N/A | N/ |
| | 8/26/2019 | 21.6 | Overcast | N/A | N/A | 21 | 7.11 | 3.3 | 135 | N/A | N/A | N/A | N/A | N/ |
| | 9/5/2019 | 27.2 | Sunny | N/A | N/A | N/A | 6 | 1.6 | N/A | N/A | N/A | N/A | N/A | N/ |
| | 9/9/2019 | 26.6 | Sunny | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/ |
| | 9/12/2019 | 28.8 | Sunny | N/A | N/A | N/A | 6 | 1.2 | N/A | N/A | N/A | N/A | N/A | N/ |
| | 9/16/2019 | 25.9 | Sunny | N/A | N/A | 26.6 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/ |
| | 9/30/2019 | 26.6 | Sunny | N/A | N/A | 20.7 | 7.5 | 3.6 | N/A | N/A | N/A | N/A | N/A | N/ |
| | 10/24/2019 | 10 | Sunny | N/A | N/A | 9.8 | 6.86 | 6.7 | 84 | N/A | N/A | N/A | N/A | N/ |
| Pool | 8/13/2019 | 24.4 | Sunny | N/A | N/A | 25.7 | 6.88 | 1.9 | N/A | N/A | 3.1 | N/A | N/A | 0.0 |
| | 8/15/2019 | 23.8 | Sunny | N/A | N/A | 23.3 | 6.66 | 3.5 | 137 | N/A | 15.1 | N/A | N/A | N |
| | 8/22/2019 | 29.5 | Sunny | N/A | N/A | 23.9 | 7.1 | 5.1 | 114 | N/A | 2.8 | N/A | N/A | N |
| | 8/26/2019 | 21 | Overcast | N/A | N/A | 21.8 | 7.33 | 1.5 | 134 | N/A | N/A | N/A | N/A | N |
| | 9/5/2019 | 27.8 | Sunny | N/A | N/A | 22.7 | 7.1 | 1.9 | 104 | N/A | N/A | N/A | N/A | 0.0 |
| | 9/9/2019 | 26 | Sunny | N/A | N/A | 20.6 | 7.4 | 2.3 | 114 | N/A | N/A | N/A | N/A | N/A |
| | 9/12/2019 | 26.6 | Sunny | 48 | 60 | 22.3 | 7.8 | 2.4 | N/A | 160 | N/A | N/A | 5 | 0.06 |
| | 9/16/2019 | 25.9 | Sunny | N/A | N/A | 21.9 | 6.55 | 3.5 | 109 | N/A | N/A | N/A | N/A | 0.06 |
| | 9/30/2019 | 27 | Sunny | N/A | N/A | 21.2 | 6.9 | and 7 | N/A | N/A | N/A | N/A | N/A | 0.06 |
| | 10/24/2019 | 12.2 | Sunny | N/A | N/A | 8.8 | 7.15 | 4.5 | 77 | N/A | N/A | N/A | N/A | N/A |
| Deep Marsh | 8/13/2019 | N/A | Sunny | N/A | N/A | 26.6 | 7 | 1.5 | N/A | N/A | N/A | N/A | N/A | 0.07 |
| | 8/15/2019 | 26.6 | Sunny | N/A | N/A | 25 | 6.58 | 2.2 | 129 | N/A | N/A | N/A | N/A | 0.13 |
| | 8/22/2019 | 27.5 | Sunny | N/A | N/A | 24 | 6 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 8/26/2019 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 9/5/2019 | 21.6 | Sunny | N/A | N/A | 24 | 6.5 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 9/9/2019 | 26 | Sunny | N/A | N/A | 21 | 7.89 | 3.5 | 108 | N/A | N/A | N/A | N/A | N/A |
| | 9/12/2019 | 23.9 | Sunny | N/A | N/A | 23.5 | 7 | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 9/16/2019 | 24 | Sunny | N/A | N/A | 21.4 | 6.55 | 3.5 | 109 | N/A | N/A | N/A | N/A | 0.06 |
| | 9/30/2019 | 27 | Sunny | N/A | N/A | 21.3 | 5.5 | 0.06 | N/A | N/A | N/A | N/A | N/A | N/A |
| | 10/24/2019 | 10 | Sunny | N/A | N/A | 12.1 | 7.3 | 4.6 | 67 | N/A | N/A | N/A | N/A | N/A |



# Spartan Swamp Fecal Coliform Bacteria Analysis:

Question: Does septage from the school's leachfield contaminate the wetland with fecal coliform bacteria, an idicator of E. coli?

E. coli Lab Procedure:

1. Turn on the incubator and set it to 35 degrees (celcius) before collecting samples.

2. Obtain a sterile data sample from each sampling site. Be sure to record the location, date, time, current weather, and temperature.

3. Within 1 hour of sample collection, return to the lab to start the plates. Obtain 3 plates for each sample site plus a control plate. Mark all plates with the sample location.

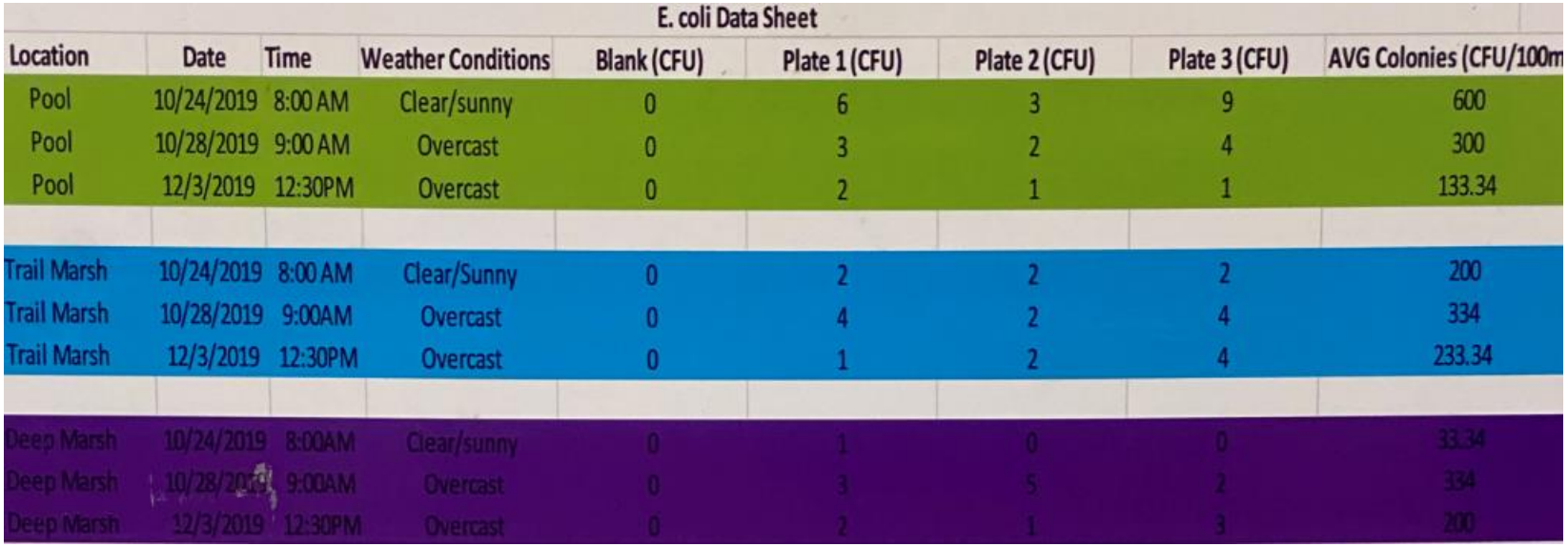
4. Drop 100 mL of de-ionized water on the control plate using a sterile dropper.

5. Drop 100 mL of each site's sample onto 3 plates for every site.

6. Incubate each plate (3 for every sample site plus 1 control) for 24 hours.

7. After 24 hours, count the total number of colonies for each plate (black dots with gas bubbles). Take the average of all three plates for each site, multiply by 100 and record the total number of colony-forming units per 100 mL (CFU/100mL).

# E Coli Data



E. coli Data Sheet

| Location | Date | Time | Weather Conditions | Blank (CFU) | Plate 1 (CFU) | Plate 2 (CFU) | Plate 3 (CFU) | AVG Colonies (CFU/100m |
|---|---|---|---|---|---|---|---|---|
| Pool | 10/24/2019 | 8:00 AM | Clear/sunny | 0 | 6 | 3 | 9 | 600 |
| Pool | 10/28/2019 | 9:00 AM | Overcast | 0 | 3 | 2 | 4 | 300 |
| Pool | 12/3/2019 | 12:30PM | Overcast | 0 | 2 | 1 | 1 | 133.34 |
| | | | | | | | | |
| Trail Marsh | 10/24/2019 | 8:00 AM | Clear/Sunny | 0 | 2 | 2 | 2 | 200 |
| Trail Marsh | 10/28/2019 | 9:00AM | Overcast | 0 | 4 | 2 | 4 | 334 |
| Trail Marsh | 12/3/2019 | 12:30PM | Overcast | 0 | 1 | 2 | 4 | 233.34 |
| | | | | | | | | |
| Deep Marsh | 10/24/2019 | 8:00AM | Clear/sunny | 0 | 1 | 0 | 0 | 33.34 |
| Deep Marsh | 10/28/2019 | 9:00AM | Overcast | 0 | 3 | 5 | 2 | 334 |
| Deep Marsh | 12/3/2019 | 12:30PM | Overcast | 0 | 2 | 1 | 3 | 200 |

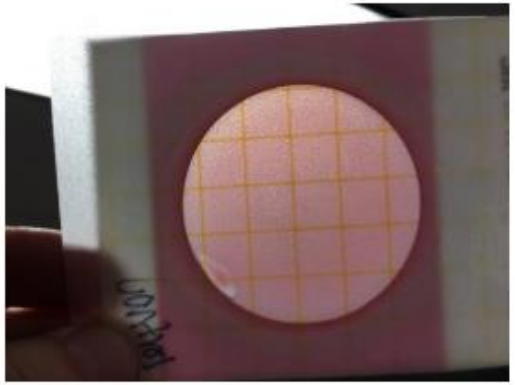
E. Coli Reports

| Location | Date | Time (AM/PM) | cfu/100 mL |
|---|---|---|---|
| Deep Marsh | 10/24/2019 | 9:00 AM | 33.34 |
| | 10/28/2019 | 9:00 AM | 334 |
| | 12/3/2019 | 12:30PM | 200 |
| Trail Marsh | 10/24/2019 | 9:00 AM | 200 |
| | 10/28/2019 | 9:00 AM | 334 |
| | 12/3/2019 | 12:30PM | 233.34 |
| Pool | 10/24/2019 | 8:00 AM | 600 |
| | 10/28/2019 | 9:00 AM | 300 |
| | 12/3/2019 | 12:30PM | 133.34 |

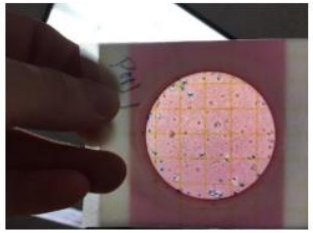
| Site | Site Nun | Air Temp | Weather Con | pH | pH | Barametric P | Ecoli Trial 1 | E Coli trial 2 | Ecoli Trial 3 | Water Temp | DO trial 1 | DO trial 2 | Conducti | Salinity | Secchi De | Secci Dep | Humidity | Wind Cor |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frog | | | | | | | | | | | | | | | | | | |
| | 1 | 12.7 | slight rain | 8.48 | 8.5 | 30.05 inHg | 8 | 4 | 2 | 11.8 | 5.45 | 5.6 | 279 | 0.12 | 20 | 20 | 84 | 9 sse |
| | 2 | 11.4 | Cloudy | 6.57 | 6.6 | 30.05 inHg | 3 | 1 | 2 | 11.6 | 8.2 | 8.1 | 72.2 | 0.02 | 20 | 18 | 84 | 9ssw |
| | 3 | 13 | overcast | 6.34 | 6.3 | 30.05 inHg | 1 | 3 | 4 | 12.4 | 7 | 6.95 | 60.3 | 0.02 | 74 | 74.2 | 84 | 9wsw |
| | 4 | 12.6 | cloudy | 6.9 | 7 | 30.05 inHg | 5 | 10 | 3 | 11.9 | 9 | 9.1 | 39.1 | 0.02 | 66 | 70 | 86 | 10s |
| Spartan Swamp | | | | | | | | | | | | | | | | | | |
| Pre BeaverDam | 1 | 18.4 | partly sunny | 6.5 | 5.5 | 30.05 inHg | 5 | 3 | 3 | 13.2 | 6.6 | 6.4 | 73 | 0.05 | 6.6 | 10 | 86 | 10wsw |
| Swamp/Marsh | 2 | 18.4 | partly sunny | 6.5 | 6.5 | 30.05 inHg | 2 | 4 | 3 | 15.2 | 6.7 | 6.7 | 53.5 | 0.2 | 55 | 54.6 | 83 | 13s |
| Pool | 3 | 18.4 | partly sunny | 6.4 | 6.4 | 30.05 inHg | 1 | 2 | 0 | 14.6 | 6 | 6.1 | 48.6 | 0.02 | 40.8 | 40 | 83 | 13wsw |
| post Beaver Da | 4 | 18.4 | partly sunny | 6.45 | 6.5 | 30.05 inHg | 6 | 7 | 9 | 13.5 | 5.8 | 5.9 | 52.4 | 0.002 | 6 | 7 | 83 | 13wsw |

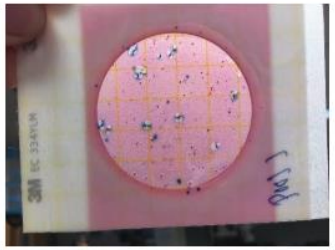
E Coli for 10/24/2019

Control / Blank

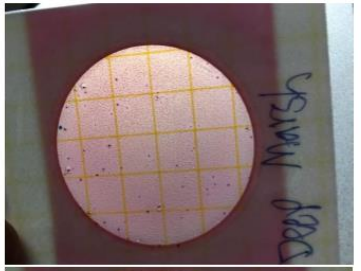


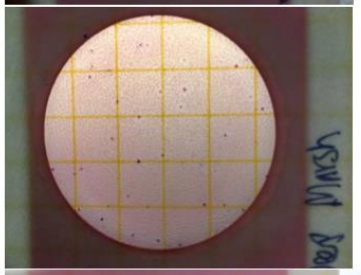
Pool

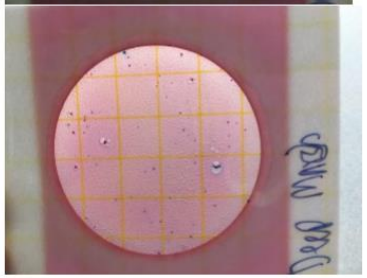




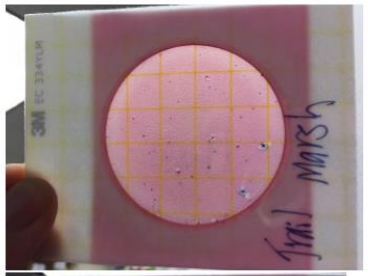
Deep Marsh

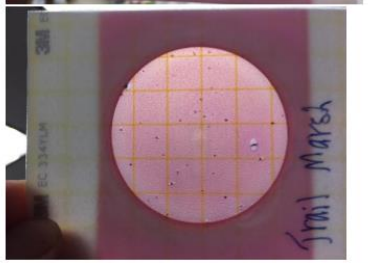


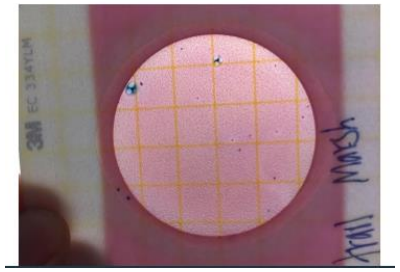




Trail Marsh







Conclusion: According to Adopt-A-Stream's guideline for fecal coliform bacteria levels in waters with human contact, Spartan Swamp is desginated as safe as a moderate-swimming area. The average total CFU per 100 mL was 263.13 across all sampling sites making the wetland safe for moderate swimming but not recomeded for a designated swimming area.

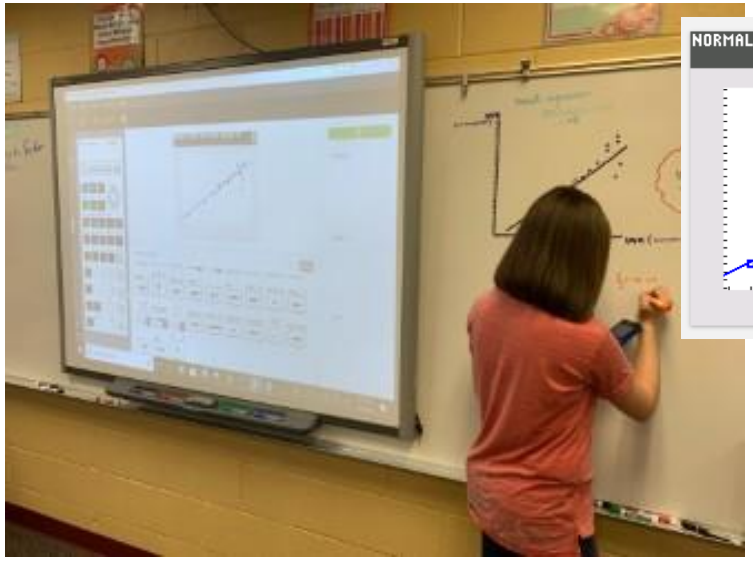
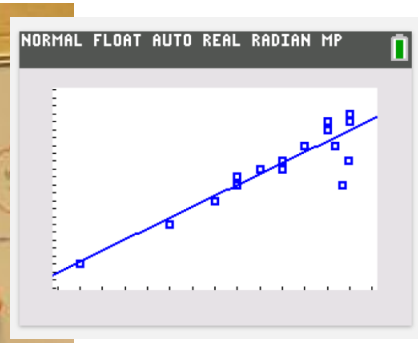
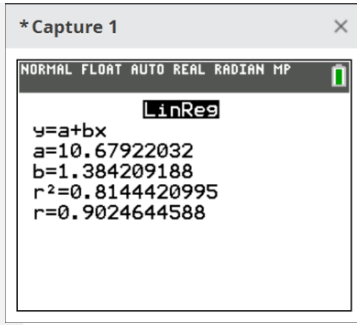
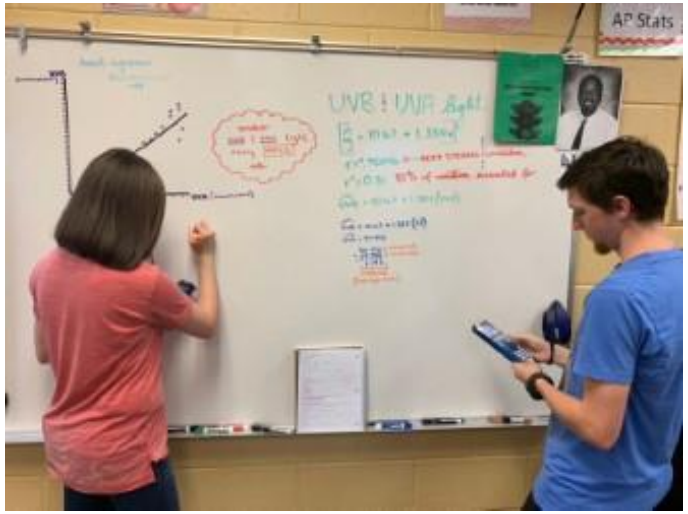
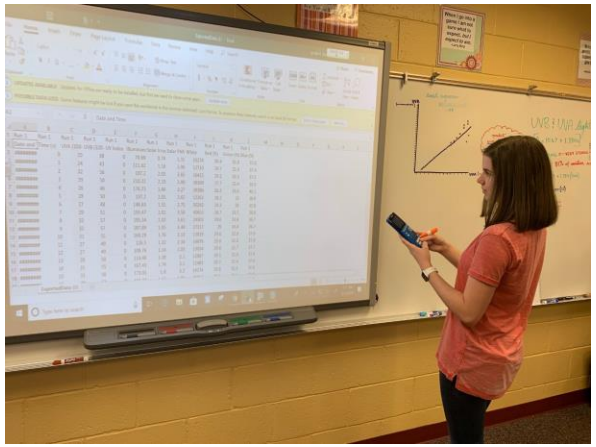
# Chlorophyll a

**Chlorophyll-A Extraction Protocol**

Reagents:

- Saturated magnesium carbonate solution
  - 1 gram magnesium carbonate (finely powdered)
  - 100 ml of distilled water
- 90% aqueous acetone
  - 90 parts acetone (reagent grade)
  - 10 parts saturated magnesium carbonate solution
  - There are special instructions for this solution in the extraction portion of the protocol
- 0.1 N hydrochloric acid (HCl) solution (0.1N is equivalent to 0.1M)
  - Dilute the acid to 0.1N HCl appropriately based on stock acid concentration

| Site Location | Corrected 664b (664b-750b) | Corrected 665a (665a-750a) | Extracted Volume (V1) | Volume Filtered (V2) | Length of Cuvette | Chlorophyll amount (mg/m^3) |
|---|---|---|---|---|---|---|
| 1 | -0.024 | -0.019 | 0.002 | 0.001045 | 1.2 | -0.213157895 |
| 2 | 0.002 | -0.031 | 0.002 | 0.00083 | 1.2 | 1.77126506 |
| 3 | -0.033 | -0.038 | 0.002 | 0.00073 | 1.2 | 0.305136986 |
| 4 | -0.028 | -0.041 | 0.002 | 0.0004 | 1.2 | 1.447875 |
| 5 | -0.015 | -0.027 | 0.002 | 0.00035 | 1.2 | 1.527428571 |

<u>Stewardship</u>
Community members town hall meeting

# Use Bluetooth Technology to collect LIVE data that other classes (AP Statistics) can use that moment in the classroom!