

Water Quality Testing in WHS Science Labs

WIMBERLEY EDUCATION FOUNDATION GRANT #5

Denise Garza, Brannon Gilley | WHS Science Department | 3/19/2019

Project Summary

Through our grant, the WHS Science Department was able to add a wide range of tools to complement several labs designed for our new AP Environmental Science Course. The largest portion of this grant purchased a Texas Stream Team Water Testing Kit that is used with conjunction with training we received from the Meadows Center at Texas State. As official junior scientists we can test water sites at and around Wimberley and record that data for use with data being collected all over the state in an effort to monitor water quality.

In addition to this we were able to purchase several digital/analog sensors for monitoring various metrics in and out of the water with our Vernier LabQuests. The sensors included turbidity, UVA, UVB, conductivity, dissolved oxygen, and flow rate.

Photo 1: Students using the LaMotte Texas Stream Team Testing Kit to test water at the Blanco River.



Photo 2: Liam Short and Macy Waldman testing the dissolved oxygen content in a water sample from the Blanco river located behind them.

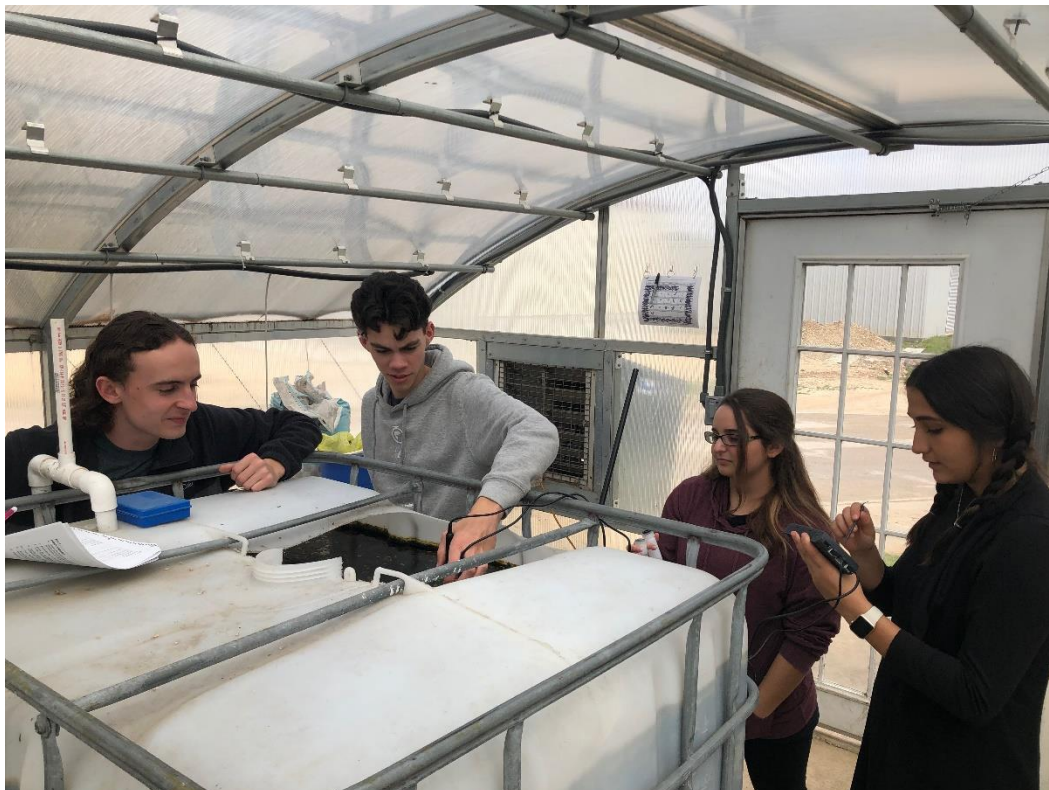


Photo 3: Liam Short, Jesse Daniel, Macy Waldman, and Gabriela Perez test dissolved oxygen and temperature and store the data in our Vernier LabQuest used in the fish tank in the aquaponics greenhouse near the ag building.



*Photo 3:
Cossette Snyder
and Gabriela
Perez test the
turbidity of the
water at the
Blanco River.*

*Photo 4: Liam
Short, Cossette
Snyder, and
Gabriela Perez
test water
quality at
Cypress Creek at
the Wimberley
Square.*





Photo 5: Liam Short tests the water flow rate at the Blanco River.

Student Learning

One of the major advantages of receiving these new tools is that throughout this class we have been learning about different metrics that can be used to determine the quality of water, and what effects those metrics have on human populations and local biodiversity. Now students are able to go out and put that knowledge to work in the real world through water testing which in a way is a summation of much of the science they have learned at WHS. Environmental issues are a hot topic in the world today, so for students to be able to quantitatively see what water quality is near where they live, as well as monitor a site over time at a particular area, this further enriches the learning experience. We are also in communication with the Meadows Center to obtain a specific water testing site that this class can regularly monitor and then relay that data to them for Texas water quality records.

We hope to continue to use these sensors and water testing kit in environmental science, and we have the opportunity to use parts of them in other science classes including chemistry. We are very grateful for WEF giving us this opportunity to expand our department's teaching effectiveness.

Prepared in cooperation with
the Texas Commission on
Environmental Quality and
the United States Environmental
Protection Agency.

THE MEADOWS CENTER FOR WATER AND THE ENVIRONMENT

Texas Stream Team

ENVIRONMENTAL MONITORING FORM

PLEASE PRINT (Black Ink or #2 Pencil)

Send to:

Texas Stream Team
Texas State University
Ivey-Moore House
601 University Dr
San Marcos, TX 78666-4616
Phone: (512) 245-1346
Email: txstreamteam@txstate.edu

Group ID #

Monitor's Name WHS Environmental Science

Station ID #

Site Description Blanco River

Sample Date 030719
M M D D Y Y

Sample Time (military) 1300
H H M M

Sample Depth (meters) 0.20
(not total depth)

Meter Calibration: (Within 24 hours of sampling.) Store and calibrate standard at room temperature.

Calibration	Date	Time	Standard Value	Standard Temp (°C)	Initial Meter Reading	Meter Adjusted To	Post Test
Conductivity							
pH (7.0)							

Core Tests and Measurements:

450 CONDUCTIVITY (µS/cm)
☐ TDS Tester 3 (Low) ☐ TDS Tester 4 (High) ☐ Other

14.3/15 WATER TEMPERATURE (°C)

20°C AIR TEMPERATURE (°C)

9.1 DISSOLVED OXYGEN (mg/L)
Average 1st titration 9 2nd titration 9.2

8.25 pH (standard units)

☒ SECCHI DISK TRANSPARENCY (meters)

☒ TOTAL DEPTH (meters)

☒ TRANSPARENCY TUBE (meters)

Reagents/Media: Are any reagents (or media) expired? ☐ Yes ☐ No
List any expired:

Bacteria Test:

☐ E. COLI (cfu/100 mL)

Average Sample 1 Sample 2

INCUBATION: Period (hrs) (28-31 hrs) Temp. (°C) (33+/-3°C)

SAMPLE 1: Sample size mL Dilution factor (100/sample size)

Colonies counted x dilution factor = cfu/100 mL

SAMPLE 2: Sample size mL Dilution factor (100/sample size)

Colonies counted x dilution factor = cfu/100 mL

FIELD BLANK: Any colony growth (circle one) YES / NO

DATA QUALITY REVIEW: Checklist completed (circle one) YES / NO

Field Observations:

3 FLOW SEVERITY: 1-no flow 2-low 3-normal 4-flood
5-high 6-dry

1 ALGAE COVER: 1-absent 2-rare (<25%) 3-common (26-50%)
4-abundant (51-75%) 5-dominant (>75%)

1 WATER COLOR: 1-no color 2-light green 3-dark green
4-tan 5-red 6-green/brown 7-black

1 WATER CLARITY: 1-clear 2-cloudy 3-turbid

1 WATER SURFACE: 1-clear 2-scum 3-foam 4-debris
5-sheen

2 WATER CONDITIONS: 1-calm 2-ripples 3-waves
4-white caps

1 WATER ODOR: 1-none 2-oil 3-acrid (pungent) 4-sewage
5-rotten egg 6-fishy 7-musky

3 PRESENT WEATHER: 1-clear 2-cloudy 3-overcast 4-rain

 DAYS SINCE LAST SIGNIFICANT PRECIPITATION (runoff)

 RAINFALL ACCUMULATION (inches, last 3 days)

Additional Tests Conducted (nutrients, etc.):

☐ TYPE:

☐ FECAL COLIFORM (colonies/100 mL)

Source of readings: ☐ Certified Lab ☐ Monitor

Coastal Area Salinity Tests and Observations:

☐ SALINITY (ppt) ☐ SAMPLE TEMP (°C)

☐ TIDE STAGE: 1-low 2-falling 3-slack 4-rising 5-high

Measurement Comments and Field Observations:

Did you find monofilament at your site? Y N (please circle Y or N and size)
Location: Size Removed: 0-5 ft 6-15 ft 16 ft+

 minutes TOTAL TIME SPENT SAMPLING
AND TRAVELING

 miles TOTAL ROUNDTRIP
DISTANCE TRAVELED

 TOTAL NUMBER OF
PARTICIPANTS

I certify that all procedures, including the items listed in the Quality Control Checklist in the Quality Assurance Officer's Manual, have been followed.

Brian Dyle
CERTIFIED MONITOR'S SIGNATURE

3/22/19
DATE

DATA MANAGER'S SIGNATURE

DATE