

Water Quality Study Using Macroinvertebrates

Course: Environmental Geology,

Instructor: Paul Lowery,

Teammates:

Amy Wood,

Sam Taylor,

John Long,

Spring 2020



EMPACTS



Introduction

We created a map with points plotted on 3 different streams that show water quality. We tested water quality using the benthic macroinvertebrates test. We also made observations on things like,

- Signs of active erosion,
- Human influence on stream channel,
- What type of watershed the stream has,
- Stream-bed composition,

We compiled all the notes, and from the observations we made we concluded that urbanized watersheds typically have a negative effect on streamlife.

Project Overview

- We tested the water by looking at what bugs were in the stream and then calculating the water quality based off that.
- This is called the macroinvertebrate test.



Community

- Our map helps the Beaver Watershed Alliance in their mission to improve water quality around the NorthWest Arkansas area.
- We helped this community by providing our map of research to them.
- We sent our information to them by email.

Beaver Watershed Alliance

Becky Roark

info@beaverwatershedalliance.org

(479) -750- 8007



Curriculum



Our project addressed these learning outcomes from the syllabus:

- Describe the geologic factors affecting the use, supply, contamination, and treatment of surface and groundwater resources.
- Demonstrate the ability to utilize Global Positioning Systems and GIS technology.



Technology used

- Google Slides
- Arc GIS story mapping software
- Microsoft Word
- Macroinvertebrates Test

Methodology

The processes we used to collect the data were influenced by Professor Carey Chaney. He took his time to meet with some of our teammates and gave us advice on how to sample the macroinvertebrates. We searched under large rocks and in the gravel to find the bugs, when we located a bug we would identify it and then record it.

We created the map by getting training from Nathan Sorey and using the software Arcgis.





Methodology

Division of Labor:

Amy Wood - Designing the final presentation and creating the timeline of our work,

Sam Taylor - Recording the data in our data sheets and calculating the data to create the biotic index, helper of creating timeline dates

John Long - Taking samples and creating the map.

Timeline:

February 13th - Initial proposal

February 24th - Meeting with Carey Chaney

April 6th - Taking water samples from the streams

April 7th - Calculating the biotic index

April 14th - Returning to the streams because John forgot to take any pictures.

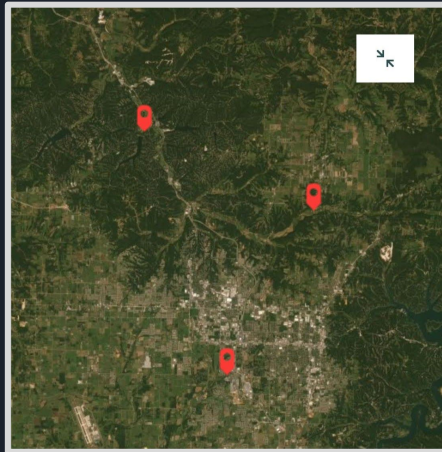
April 16th - Creating the map and plugging in the data

May 7th - Composing the final presentation

May 8th - Final presentation finished

Project Results

The result of this project was a story map of three streams around Northwest Arkansas.



Skills developed because of this project include,

- Building connections with NWACC faculty and environmental workers of the community.
- How to work together on a project whilst not being able to see each other due to COVID-19.
- How to create a story map using Arc GIS positioning systems.

<https://arcg.is/0LCajK>

<https://storymaps.arcgis.com/stories/4a4be1b8d4e2ef1010cab8a51>



Content Knowledge

- Our project does convey the knowledge of the subject matter of the audience we were shooting for. We were testing the water quality across the Northwest Arkansas water streams. Overall, the team developed a much better understanding of macroinvertebrates and how they relate to water quality.



Acknowledgements

Paul Lowrey, [plowrey@nwacc.edu] - Course Instructor

Dianne Phillips, [dphillips@nwacc.edu] - EMPACTS Program Facilitator

Carey Chaney, [cchaney@nwacc.edu] - Macroinvertebrates specialist

Nathan Sorey, [nsorey@nwacc.edu] - Map specialist

Becky Roark [info@beacerwatershedalliance.org] - Beaver Watershed Alliance contact



References

Storymap we created:

<https://arcg.is/0LCaiK>

Other references we used to study macroinvertebrates:

<https://www.youtube.com/watch?v=ReCOmps2jel>

http://cfb.unh.edu/StreamKey/html/biotic_indicators/indices/Hilsenhoff.html

<https://leafpacknetwork.org/biotic-index/#f1p23>

<https://leafpacknetwork.org/learn/macroinvertebrates/>

https://tnf9u43u8s42cg8l3sksfn28-wpengine.netdna-ssl.com/wp-content/uploads/4_LPNDData_Sheets_2012.pdf

[https://en.wikipedia.org/wiki/Tanyard_Creek_\(Arkansas\)](https://en.wikipedia.org/wiki/Tanyard_Creek_(Arkansas))

https://en.wikipedia.org/wiki/Lake_Atalanta