

Using Geographic Information System to Support Sustainable Green Technology

Introduction

Have you ever looked at a lake, walked in a stream or even seen in a river? Have you ever stopped to think whether that body of water is polluted or harmed by any of your actions or the actions of others? Water is everywhere. How did water appear in all these rivers, creeks, and streams. Rewind back to the fifth grade lesson on precipitation- where evaporated water condenses and falls from the sky- well that's the main contributor to how water appears in a water shed. Looking for a watershed near you is easy, just use the 303d list and you're set. A 303d list is a list that gives you all the information you need on any watershed. You would think that nothing can affect water because there's so much of it. well let me let you in on a secret everything can be harmed even in the smallest way. That wrapper, you threw out the window when you were going 30 MPH on the highway will appear at the lake or river miles away. See no one notices how their actions can affect something that's been harmed before. Many water bodies have been polluted because of decisions that weren't completely thought through. Perry Creek is the Impacted Creek that the maps will be focusing on.

Objective/Problem

- Which watershed will receive funding?
- What is a watershed?
- In the big scheme of hydrological things, where do watersheds fall?

Background Information

G.I.S stands for Geographic Information System. What GIS basically is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. A watershed is an area of land where all of the water that is in it, or under it, ends up in one common location. Watersheds are a big deal. Paving roads, harvesting an acre of forest land and even planting poplar trees all end up in or under watersheds. Lately many states have been required to submit a list of impaired waters, or those not meeting the water quality standard of the state which is part of the Clean Water Act. Watersheds need to be protected from our actions.

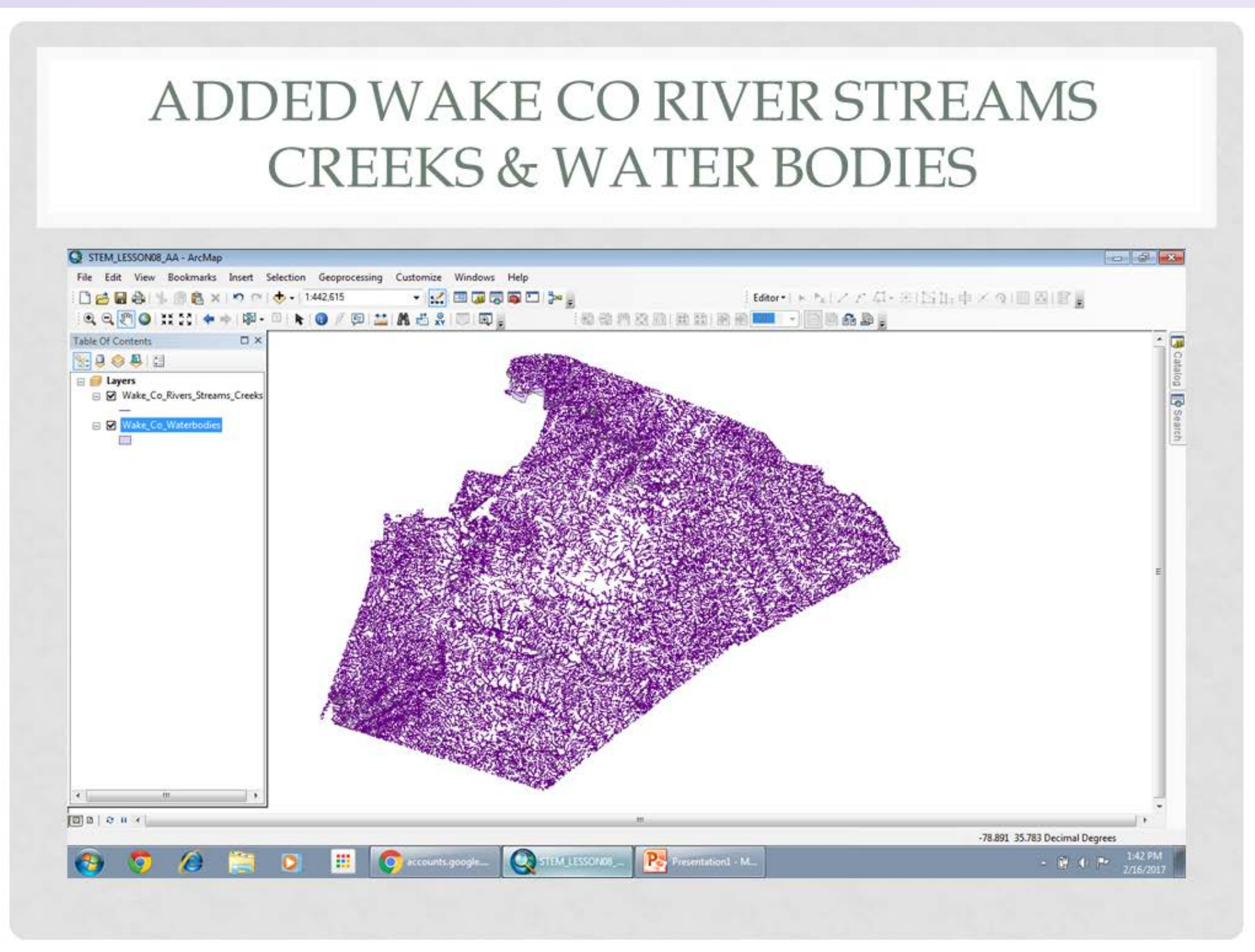


Figure 1: All watersheds in North Carolina

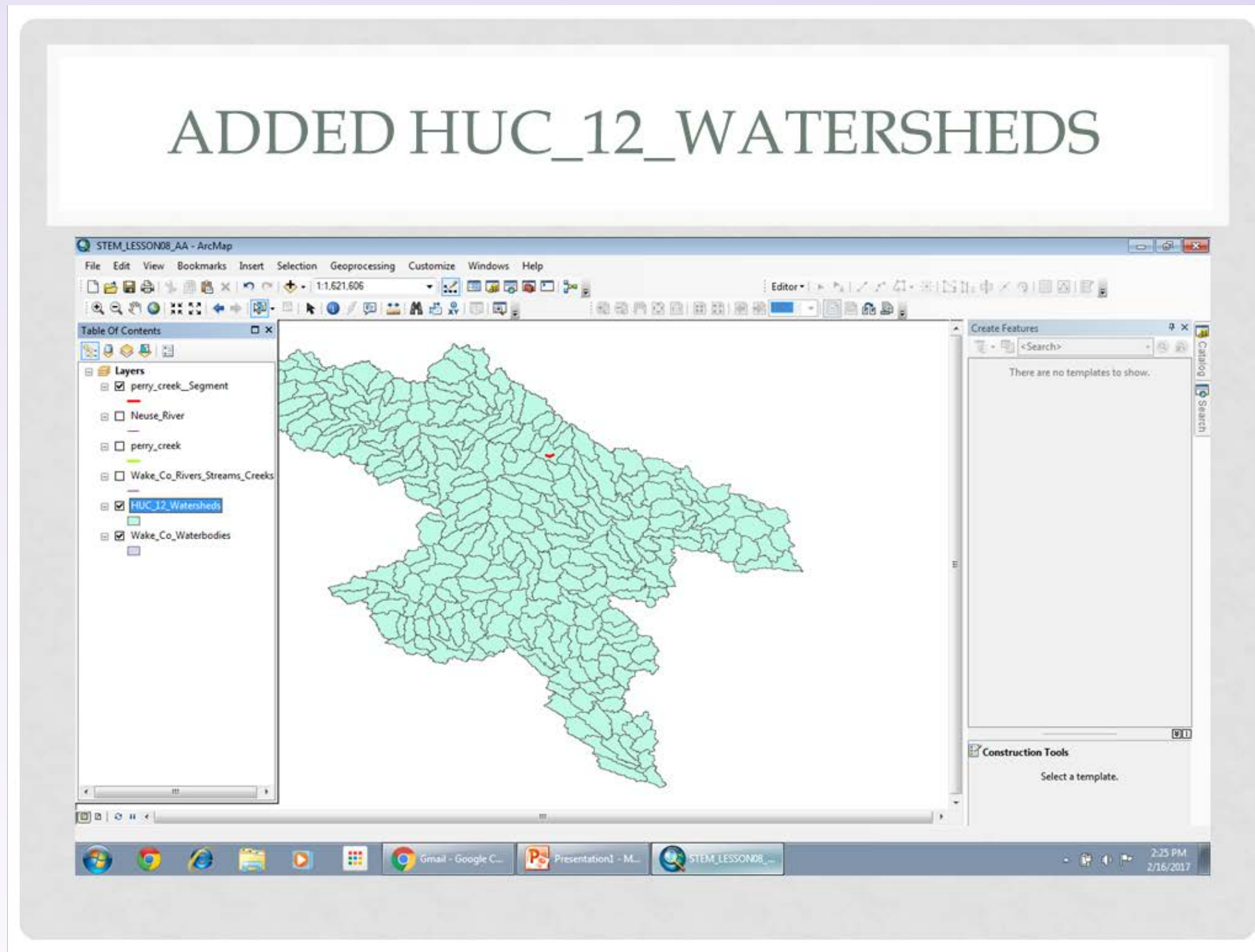


Figure 2: Hydrologic Units of North Caroline

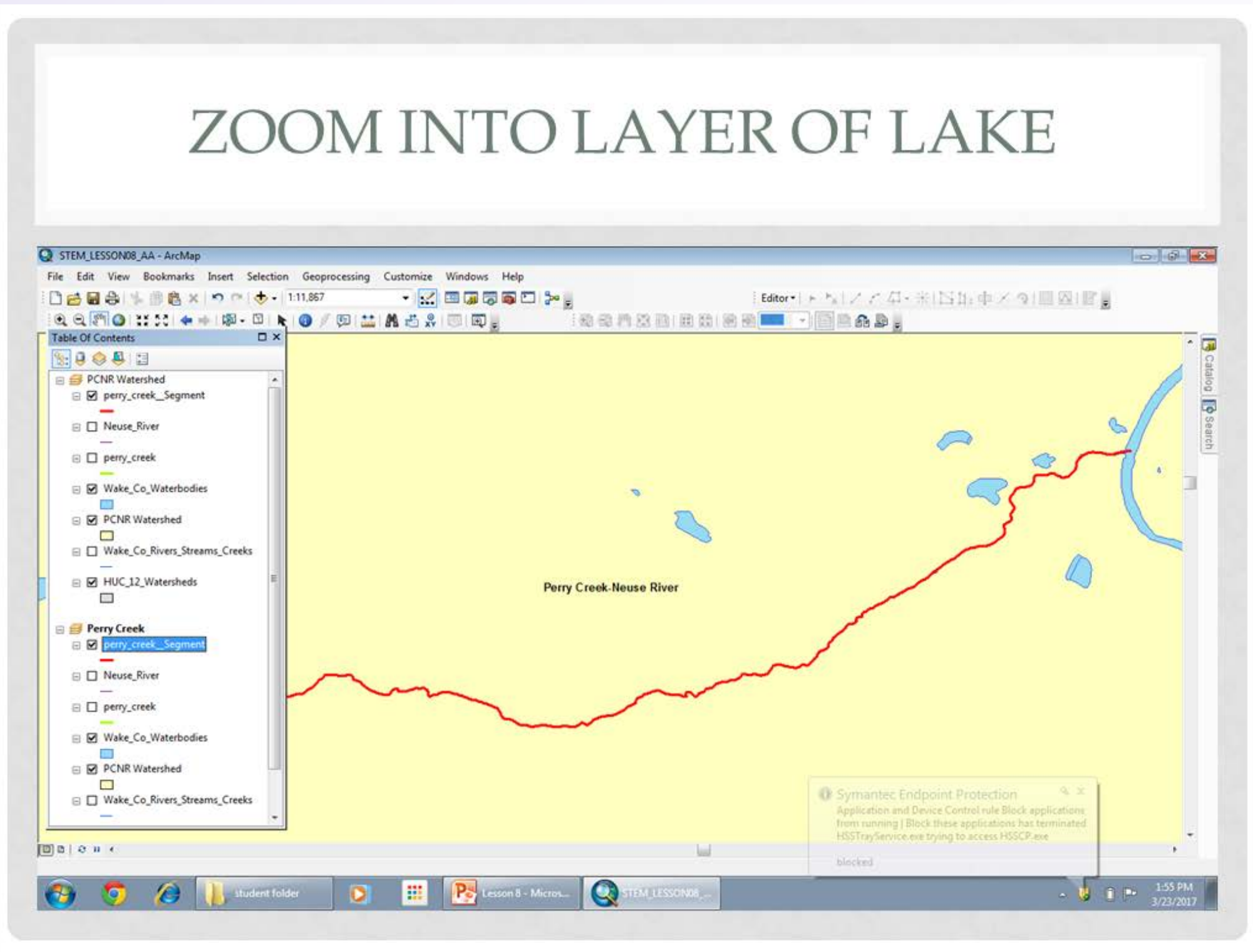


Figure 3: Zoom in layer of most impaired watershed

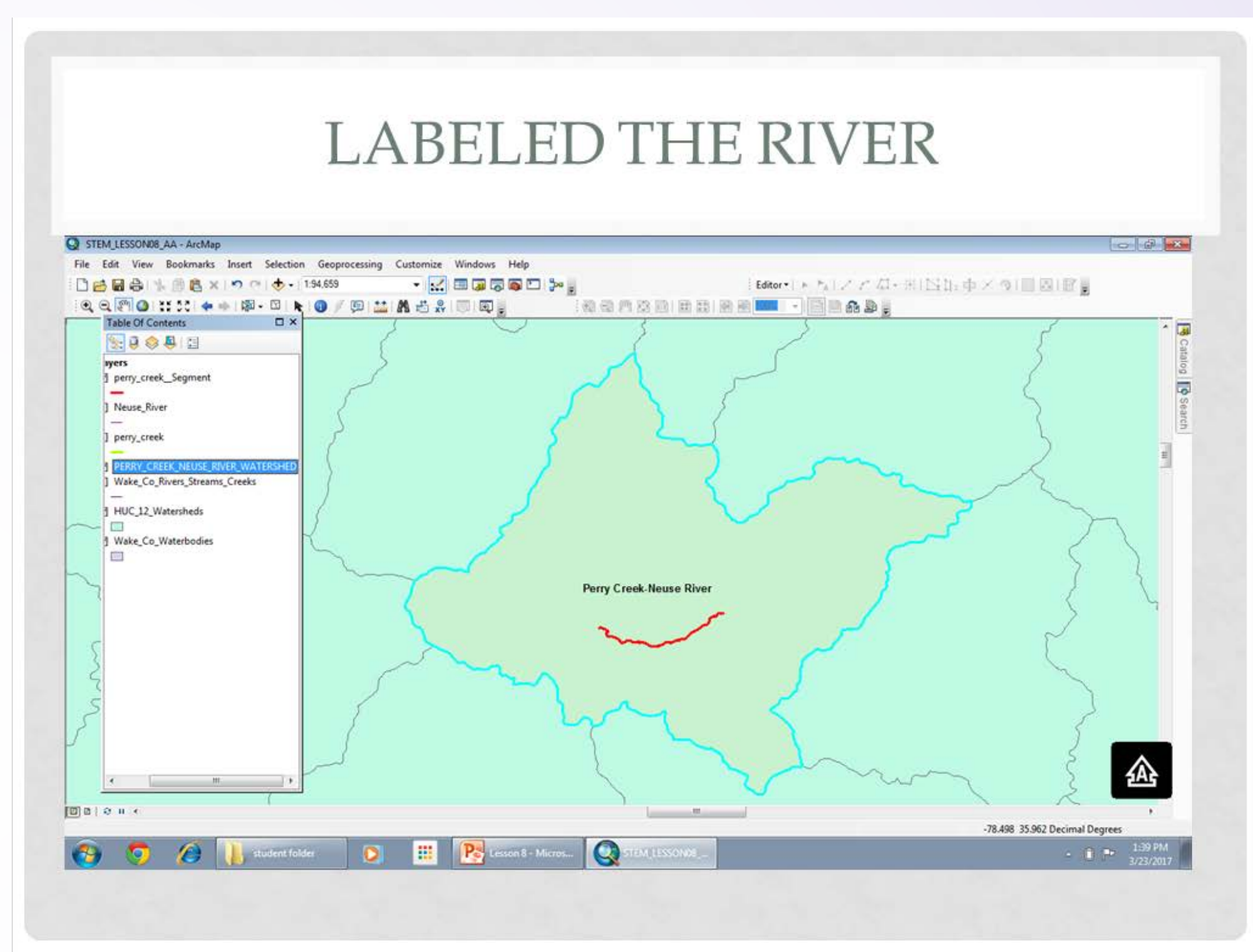
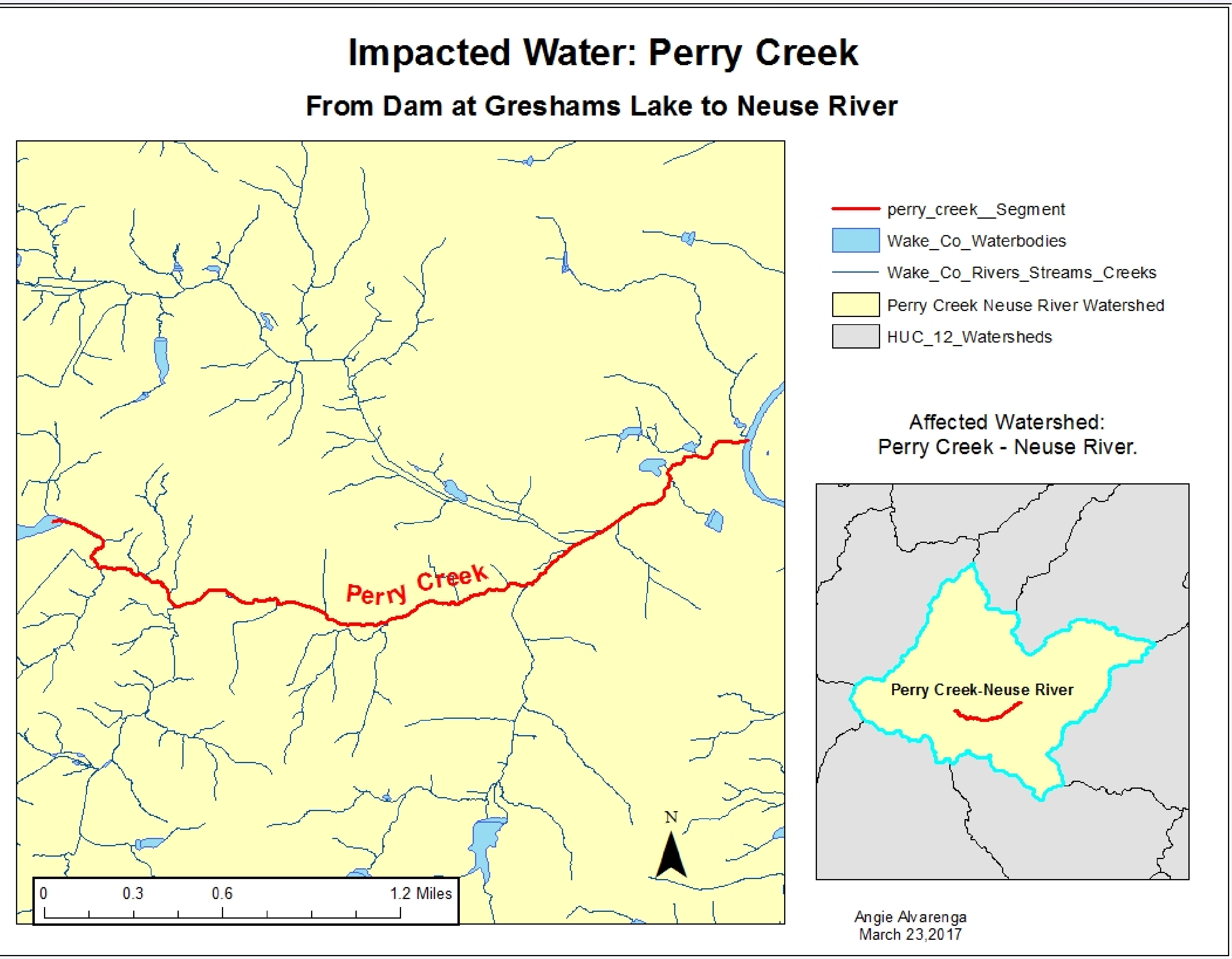


Figure 4: Zoomed out visual of Most impaired river



Methods

The most critical part of this investigation was Locating a Specific Impaired Water body segment. To find a impaired body of water you need to look at the 303d list for the state of North Carolina and add hydrographic lines to it for Wake county. Which will point to HUC 12 watersheds Perry creek-Neuse River The usage of exporting data, zooming into layers, Splitting, Adding data, and labeling a map correctly. These watersheds are impacted because of Overexploitation , Overgrazing, Unadjusted Irrigation Techniques, Socio-economic and Political Causes and of course natural causes. To help stop these watersheds from continuing to damage states have started to enforce the Nature act which helps people be informed of watersheds around them that are impaired and are in danger. The 303d list has given scientist, Researchers and even civilians a list of impaired watersheds in locations near them. Its an easy tool to use and learn many people can benefit from this and help make a change. The 303d list helped me see the most impaired watersheds in North Carolina you can see which watersheds are affected by any form of pollution or any their reasons. This method has helped me to have a more in depth analysis of this topic.

Results

Figure 5 is the finish product of all data that was collected from many other factors. This map can be used to help locate the location of most impacted areas. This map can also be used to expand the knowledge of civilians living near the area of these affected watersheds to figure out what they can do to help the environment so this will help change occur more rapidly. Problems I have encountered were there wasn't much information to help me make a final conclusion of why this Watershed was more impacted than others, To help find a solution to this problem the 303d list can expand their information to opinions of civilians to why the watersheds are impaired. To improve watersheds overall all states should impellent rules to help impaired watersheds recover and not cause them to become worse.

Bibliography

Credits to the following organizations that helped this journey be as easy and soothing as possible :

Digital Quest
Environmental Systems research institute
Mississippi Enterprise for technology
A GIS in Science, Technology, Engineering & Mathematics.
North Carolina district watershed information
https://energypedia.info/wiki/Causes_and_Features_of_Watershed_Degradation_related_to_MHP_Projects