

South Carolina Department of Natural Resources - Geological Survey Internship

UNIVERSITY OF SOUTH CAROLINA

Department of Geography
Geography 595
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SOUTH CAROLINA GEOLOGICAL SURVEY

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About SCDNR & South Carolina Geological Survey

South Carolina Geological Survey (SCGS) is a part of the Land, Water, and Conservation Division of South Carolina's Department of Natural Resources. Their mission is to provide reliable and unbiased, scientific information to public and private decision-makers involved with land-use planning, environment, and economic development. SCDNR Geological Survey is the second oldest geological survey in the United States.

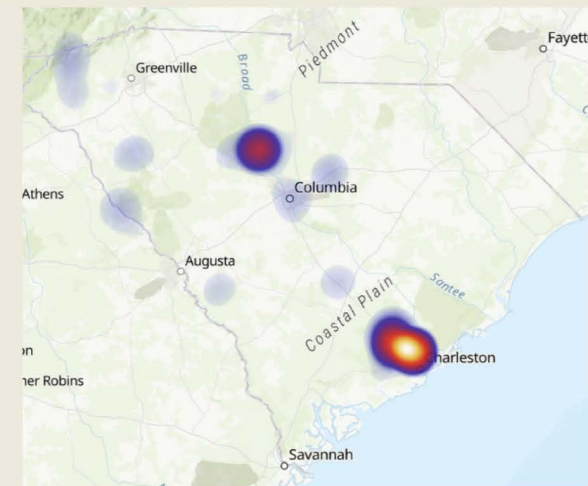
The South Carolina Geological Survey participates in several projects. The STATEMAP program is part of the National Cooperative Geologic Mapping Program in the USGS. The primary objective is to establish the geologic framework of areas that are vital to the welfare of individual states. SCGS and USGS have also partnered to acquire new topographic, geologic, and geophysical information to improve understanding of critical minerals in South Carolina through the Earth Mapping Resources Initiative. Additionally, SCGS studies and maps the risks of geologic hazards such as sinkholes, landslides, liquefaction, and earthquakes.

My Role at South Carolina Geological Survey

I interned for SCDNR - Geological Survey during the fall of 2022. I worked on various assignments throughout the semester, but the project I spent the most time working on was an educational Esri StoryMap about earthquakes. The StoryMap explains earthquake geological concepts, including plate tectonics and faults, and uses maps to show the geographic distribution of earthquakes worldwide. In the StoryMap, I also explain intraplate earthquakes and the fault systems in South Carolina before summarizing major earthquakes in South Carolina history. Finally, the StoryMap details the recent earthquake swarm in Southwest Kershaw County.

The second major project involved georeferencing and digitizing old geologic quadrangle maps. In 2020, the U.S. Geological Survey published the Geologic Map Schema (GeMS), a schema for encoding in digital form the content contained in published geologic maps. Using ArcGIS Pro, I worked on encoding various maps to adhere with the Geologic Map Schema.

Other projects included researching well data in the southeastern United States to compile data on the geological basement depth in this region. After noting the location and depth of hundreds of wells in the southern U.S., I used Python to convert the .csv file to a shapefile and add the data to the current database.



Takeaways

Through this internship, I was able to practice and develop my GIS skills. I had learned how to georeference and digitize maps in an Introduction to GIS class years ago, but this internship allowed me to refresh and develop these skills. I also practiced my spatial programming skills by writing code to turn .csv files into a shapefile. I learned more about the capabilities of ArcGIS Online StoryMaps and how to use Adobe Illustrator to make a map. Additionally, I came into this internship with very limited geological knowledge, but I have learned a lot about earthquakes, geologic basements, and faults.

References:

SCDNR Geological Survey. (n.d.) *About Us*. <https://www.dnr.sc.gov/geology/about.html>
U.S. Geological Survey National Cooperative Geologic Mapping Program. (2020). *GeMS (Geologic Map Schema) - A Standard Format for the Digital Publication of Geologic Maps*. In Book 11, *Collection and Delineation of Spatial Data*. <https://doi.org/10.3133/tm11B10>.



Earthquakes in South Carolina

An overview of geologic concepts and the spatial distribution of earthquakes, with a focus on South Carolina and Southwestern Kershaw County