

William Hecker IV



TO: Professor Rutherford
Director of the MSU Project Grant Fund
Montana State University

RE: WRIT 221 PROJECT PROPOSAL

Dear MSU Project Grant Fund Director, Prof. Rutherford:

I am looking to fund a research project utilizing GIS software to geographically find where the Rocky Mountains can be seen from the great plains. This would result in a website containing maps of Montana, Wyoming, Colorado, and New Mexico, displaying a line some miles east of the Rocky Mountains. This would be used by geographers of U.S. regions to promote the cultural exploration of the region; and city planners of the cities between the mountains and this line to inform their decision making.

My research so far has led me to discover the primary data sets to make this analysis, as well as one documentation of a similar problem. The data will be the one-arc second digital elevation models (DEMs) from the U.S. Geological Survey (2021-2023) for the states of interest. Twenty are cited below for the state of Colorado. These 2021-2023 digital elevation models will be analyzed to find mountain peaks and then a viewshed analysis will be applied to these points. The documentation of a similar problem by Hognogi et. al. (2022) was looking to focus on utilizing a viewshed of Romanian mountains to inform planning; it provided useful information such as how to identify the mountain peaks, and some settings for the GIS tools.

This project will meet the **needs** of geographers a new boundary to consider in their analysis of economic and cultural activity. It will give regional and local planners an understanding of where would have a view of the

mountains. It also could provide a clear sense of identity to those living in this region.

This project will be **approached** in six steps per a state. First, we must gather the initial data, the DEMs. Then we will identify the mountain peaks for each state. After that we can begin the viewshed analysis, giving us our information focus. We then need to clean up our results, create the final map, and upload it to the website which will host this information.

This project will **benefit** the audience by:

- providing useful information for their fields,
- and making a new data set available for their use.

This project will **benefit** me by:

- satisfying my curiosity,
- expanding my skills in GIS,
- and reducing the time spent between class projects, as this project will be parallel to a similar one for another class.

This project will **cost** us:

- the time it takes to find and download the data,
- the time to process the data,
- and the time spent making the map and website.
- Also, the cost of GIS software,
- the price of the computing power,
- and the price of website upkeep.

It will **cost** the audience by taking their time to read the map, and by making a possible paywall to the data download.

I out **compete** similar projects with my skill in GIS software, website design, approach, and genuine interest. This project is also far beyond the scale that anyone has done prior for a viewshed analysis.

Below is the project timeline for six weeks:

Project Timeline

| | Week 1 March 25 - 29 | Week 2 April 1 - 5 | Week 3 April 8 - 12 | Week 4 April 15 - 19 | Week 5 April 22 - 26 | Week 6 April 29 – May 5 |
|-----------------------|--------------------------------------|------------------------------|--------------------------------------|--------------------------------|---------------------------------------------|--------------------------------------|
| Colorado | Gather Data and Identify Peaks | Viewshed Analysis | | | Clean-Up Results And Create Final Map | Create Website And Add Map |
| New Mexico | Gather Data and Identify Peaks | Viewshed Analysis | | | Clean-Up Results And Create Final Map | Create Website And Add Map |
| Montana | | | Gather Data and Identify Peaks | Viewshed Analysis | Clean-Up Results And Create Final Map | Create Website And Add Map |
| Wyoming | | | Gather Data and Identify Peaks | Viewshed Analysis | Clean-Up Results And Create Final Map | Create Website And Add Map |

Thank you for considering my project, sincerely,

William Frederick Hecker IV

Bibliography

Hognogi, G.-G., Pop, A.-M., Mălăescu, S., & Nistor, M.-M. (2022). Increasing territorial planning activities through viewshed analysis. *Geocarto International*, 37(2), 627–637.

<https://doi.org/10.1080/10106049.2020.1730450>

U.S. Geological Survey (2023). USGS 1 Arc Second w107n41 20230314. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w106n41 20230314. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w105n41 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w104n41 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2022). USGS 1 Arc Second w103n41 20220414. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2022). USGS 1 Arc Second w107n40 20220216. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w106n40 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w105n40 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w104n40 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2021). USGS 1 Arc Second w103n40 20211005. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2022). USGS 1 Arc Second w107n39 20220331. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w106n39 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w105n39 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w104n39 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w103n39 20230613. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2022). USGS 1 Arc Second w107n38 20220720. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w106n38 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w105n38 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w104n38 20230602. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>

U.S. Geological Survey (2023). USGS 1 Arc Second w103n38 20230613. *U.S. Geological Survey*. <https://apps.nationalmap.gov/downloader/>