ECURE

EXPANDING COURSE-BASED UNDERGRADUATE RESEARCH EXPERIENCES PROJECT

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Department: Geography and Environmental Studies

Course: GEOG 1115, Maps and GIScience

ECURE Engagement Level: PREP

PREP Activity: ECURE Research Literacy Performance-based Assessment

Purpose: Performance-based assessments align well to research experiences students have in courses. This assessment is designed to determine how the course material influences your research literacy.

This assessment includes two important assessments covering aspects of research literacy:

1. Project design: Assesses students' comprehension of the practice of research in their discipline.

2. Analytical ability and communication skills - Assesses students' ability to extract and communicate the core of a research argument that they are presented with and critique such data.

Problem Description: Imagine you are working on a research project and you are writing instructions that your classmate will carry out. The purpose of the research is to map the distribution of horned lizards at Petroglyph National Monument and determine the quantity and types of change in population (if any) that has occurred from 2000 to 2020 within the Park. More specifically, the project investigates whether there has been a change in the population and range of horned lizards at Petroglyph NM associated with changes in adjacent commercial and residential development during this time period.

Discussion Prompt (300-350 words): Explain how you would investigate this question. Be as specific as you can be about what types of geographic data and the sequence of steps you would take to answer the question above. Provide detail (how, when, where, what, and who) such that your classmate could follow your instructions.

Important considerations

1. What geographic data types would be important to include?

2. What geographic methods that you learned about in this class can be applied?

3. How would you analyze the results of your selected methods?

4. How would you visualize and display your results?

PREP Activity: Developing Successful Research Questions

When you "Think Like a Researcher"" you are focused on a research question rather than a research topic. You must also be able to articulate the problem that underlies the question. This problem must have social significance. The solution you argue for in your proposal must be arguable and feasible based on reliable evidence.

Forming a Research Question: By asking a research question, you are keeping an open mind about what the research may reveal. As you develop a research question, consider these criteria. Once you have an existing research question, see if your question is TRUE for these five criteria. If so, then your research question is probably workable.

Criteria:

1. It is not easily answered with a simple yes or no. It has some substance and requires explanation.

2. The question has an underlying problem with social significance (local, national or international). It is important to someone other than just you!

3. Question poses a genuine question and aims for neutrality. It avoids using loaded language or suggesting a pre-determined answer.

4. Can be answered with reliable evidence. It is re-searchable. Others have already been contributing to this conversation.

5. Question has appropriate scope. It is not too narrow, nor too broad; it does not leave you with too much or too little information.

Research Topic: Mapping and Monitoring Wildlife and Visitor Activities at Petroglyph National Monument

1. Fill out the table below for three potential research questions.

> A. Issue (Broad)
>
> B. Research Question (Narrower)
>
> C. Underlying Problem(s)
>
> D. Social Significance
>
> E. Proposal/Solution

2. Read through your potential questions and select the question that you think best fits the criteria described above.

3. List five examples of geographic data that would best support this research question."

PREP Activity: Getting your Data to Match the Map

Geospatial technology applications often use multiple types of data layered together, so getting everything to match correctly is essential. This week's activity has interactive tools to allow you to experience manipulating multiple layers of georeferenced maps from the past and present.

In this activity you will use the Spyglass app in Esri Story Maps. By georeferencing a map, you can view the georeferenced map and the source simultaneously. It is sort of like looking through a movable lens. Esri Story Maps are great Web applications that have a variety of different layouts and tools. The Spyglass app allows you to view a portion of one map on top of another. In the case of historical maps, the Spyglass Story Map allows you to view an old georeferenced map on top of current satellite imagery, as viewed through a movable lens (the ""spyglass""). Wherever you move the spyglass, you see the historical map in the georeferenced location.

For example, check out the Spyglass Story Map of 1851 Washington, D.C., at http://bit.ly/1ch2gb5. When the Story Map opens, you see the spyglass placed over current satellite imagery of Washington, D.C. Within the spyglass you see a David Rumsey historical map of Washington, D.C., from 1851. By dragging the spyglass around the imagery, you can see the historical georeferenced map underneath. If you zoom in and out, the amount of area shown under the spyglass changes.

Questions:

1. Based on your examination of the 1851 Washington, D.C., map using the spyglass, what prominent items were to the immediate east and west of the U.S. Capitol in 1851 that are not there now?

2. Based on your examination of the 1851 Washington, D.C., map using the spyglass, how was the White House referred to?

3. Based on your examination of the 1851 Washington, D.C., map using the spyglass, were any of the following three things built in 1851: the Washington Monument, the Lincoln Memorial, or the Smithsonian Institution?"

PREP Activity: Annotating Google Earth

In this exercise you will learn how to add placemarks, paths, polygons, photos and YouTube videos to Google Earth Desktop. You will be following the Google Earth Outreach Tutorial: Annotating Google Earth Desktop for this assignment. The purpose of this exercise is to familiarize students with creating and editing digital geographic information for subsequent exercises in this course.

1. Please follow the tutorial instructions exactly, using the same locations and links provided in the tutorial.

2. Access the Tutorial here: Google Earth Outreach Tutorial: Annotating Google Earth DesktopLinks to an external site.

3. After completing the tutorial, save your .kmz file with the following naming convention>firstname_lastname.kmz (e.g., cait_lippitt_tutorial.kmz)

4. Attach your tutorial.kmz file to this submission link"

PREP Activity: Data Needs at Petroglyph NM

Please read pages 9-31 in the Petroglyph National Monument Foundation Document (attached).

The fundamental resource or value analysis table (pages 10-25) includes current conditions, potential threats and opportunities, planning and data needs, and selected laws and NPS policies related to management of the identified resource or value.

1. Select a section within the Fundamental Resource or Value Analysis table (e.g, Flora and Fauna, Recreational Opportunities)

2. Summarize the 'Data and/or GIS Needs' and 'Planning Needs' from the section you selected and Post to this Discussion Board.

PREP Activity: StoryMap

Discussion Prompt: Before beginning work on the 'Getting Started with ArcGIS StoryMaps' tutorial, you should first select a StoryMap topic and decide what text descriptions and photos/figures you want to include. You may select any topic of interest to you for this exercise (eg., favorite hiking spots, favorite music venues, locations for potential community gardens, best sunset locations in your area, etc...)

For example, if you were going to be creating a StoryMap of the best breakfast burrito spots in your local area, you should first figure out which restaurants you want to include information about in your StoryMap, and if there are enough of them nearby to make a good StoryMap from.

1. Take time to gather some basic information (location, title, description, photos, maps) about each of your selected location before you build your StoryMap.

2. For this activity, five sites are the minimum number of locations for full credit - additional locations are welcome!

3. You may use photos/videos you take yourself, or you may select media from the web. If using photos/videos/maps/figures that are not your own, be sure to reference/credit the photographer to avoid copyright infringement.

4. After completing the tutorial, share your StoryMap with the class by posting it to this Discussion Board."

Engagement with Academic Literature: Students engaged with peer-reviewed academic literature and National Park Service (NPS) reports to support the development of their project research questions. A list of peer-reviewed academic journals in GIScience were provided to students. Students selected 2-3 peer-reviewed journal articles to review to assist with the development of research questions and methodologies related to visitor activities at Petroglyph National Monument.

Petroglyph National Monument staff and NPS provided SOP and visitor planning and management documents to students to support their projects. NPS Regional GIS Program staff visited from Colorado to provide field-based training and presentations on the NPS GIS Program and protocols."

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