

GIS: Which Way Did They Go?

Summary

Throughout history, explorers have searched for the quickest, easiest, and most lucrative routes between two locations. In Arizona, the Spaniards sought the "Seven Cities of Cibola", the American explorers sought the best stagecoach and railroad routes, and the Mormons sought new settlements in the eastern mountains. This lesson will delve into how Arizona's topography influenced exploration.

Time Frame

5 class periods of 45 minutes each

Materials

SOFTWARE: ArcView GIS 3.0, Spatial Analyst Extension, whichway.avp project file

ESRI DATA: GAW 1998 CD-ROM, Data & Maps CD-ROM, Spatial Analyst CD-ROM

OTHER DATA: On screen digitized routes of Explorers

Handout for this lesson plan (1 per student)

Intended Learning Outcomes

The purpose of this lesson is to discover what physical factors influence the routes explorers travel.

Students are expected to:

- examine maps and draw exploration routes.
- map actual explorer routes based on historical data provided.
- understand how topography affected exploration.

Instructional Procedures

GENERAL EDUCATION GOALS:

Throughout history, explorers have searched for the quickest, easiest, and most lucrative routes between two locations. In Arizona, the Spaniards sought the "Seven Cities of Cibola", the American explorers sought the best stagecoach and railroad routes, and the Mormons sought new settlements in the eastern mountains. This lesson will delve into how Arizona's topography influenced exploration.

GIS SKILLS REQUIRED BEFORE STARTING

Engage ArcView

Add ArcView extensions

Add feature themes

Create a query

Make a theme "active", Zoom to "all" themes, Zoom to "active" theme

Digitize points to create a new theme

Editing vector points

Create a layout

Pre-Activity Procedures:

Develop folders on your hard drive that represent the groups in each of your classes.

Unzip "whichway.zip" to a folder called "Whichway" on your c:\ Drive.

This is a read-only file, therefore, when the students first access the project they will want to rename the projects and place them in their own folders.

Opening the Lesson:

Review with your students the following concepts:

The steps to developing a clear and concise essay.

The history of Spanish Exploration in the New World. (Gold, God and Glory, etc.)

That Arizona was not only a destination, but also a crossroads, for many different explorer groups.

To start the lesson have the students answer the question: What affect does topography have on exploration? Their responses should refer to mountain ranges, moving rivers, and valleys and how each affects exploration. Your goal is to set the stage for the exercise. Your students should be in a frame of mind that lets them visualize how topography and other physical factors can effect their decision making process while exploring.

Developing the Lesson:

Assign each group a series of explorers. Be sure to assign 1- Spanish, 1- American and 1- Mormon explorer, to each group. For example:

Kino, Sitgreaves, Mormon

Coronado, Whipple, Mormon

Cardenas, Parke, Mormon, etc.

The numbers have been used to prevent the students from clicking on the actual route of their explorers before they have completed the exercise., the actual explorer routes appear as numbers in the legend:

#1 -- Cardenas

#2 -- Coronado

#3 -- Marcos DeNiza

#4 -- Padre Kino

#5 -- Lt. Parke

#6 -- Lt. Sitgreaves

#7 -- Lt. Whipple

#8 -- Lt. Simpson

#9 -- Mormon Honeymoon Trail

Have the students open ArcView GIS and follow the steps on the Student Worksheet.

When the students have completed creating their 3 themes using the line tool, tell them what numbers they should click on in the legend to expose the actual routes of their explorers.

Concluding the Lesson:

With the information they have accumulated through analysis, ask your students to formulate a short essay answering the following questions:

Why is there a difference or similarity between the students' route choice and the actual route of the explorers?

What are some of the important factors that may have influenced the students' decisions versus those of the original explorers?

Did technology (i.e. a map) have anything to do with either party's decision process?

Did climate have any bearing on the decision process?

How did the topography affect the decision process?

Extensions

When you complete the three time periods, use the layers to show the progression of migration within the state. How did routes and direction of migration change over time? Did the migration patterns change with the goal of each group? Did topography or technology play a greater role in the decision processes of the explorers? Do current roads and freeways correlate to patterns of travel by the explorers? There is a theme in the project called "Major Freeways" that you can have the students examine.

Assessment Plan

Mastery of the material:

A layout that depicts the group's perceived routes and the actual routes of the explorers.

A complete essay that answers the following question:

Why is there a similarity or difference between the students' route choice and the actual route of the explorers? The essay should address all of following points:

- the different technologies available (i.e. horses vs. automobile, maps vs. word of mouth, etc.)
- how different climates and seasons of the year affected the decision process
- how differences in topography affected the decision process
- whether the different goals of each explorer affected their decisions.

Acceptable Demonstration of the material:

A layout that depicts the group's perceived routes and the actual routes of the explorers.

A complete essay that answers the following question:

Why is there a similarity or difference between the students' route choice and the actual route of the explorers? The essay should address 2 or more of following points:

- the different technologies available (i.e. horses vs. automobile, maps vs. word of mouth, etc.)
- how different climates and seasons of the year affected the decision process
- how differences in topography affected the decision process
- whether the different goals of each explorer affected their decisions.

Unacceptable Demonstration of the material:

Incomplete layout that would depict the group's perceived routes and the actual routes of the explorers.

A complete essay that answers the following question:

Why is there a similarity or difference between the students' route choice and the actual route of the explorers? The essay should address 2 of following points:

- the different technologies available (i.e. horses vs. automobile, maps vs. word of mouth, etc.)
- how different climates and seasons of the year affected the decision process
- how differences in topography affected the decision process
- whether the different goals of each explorer affected their decisions.

Bibliography

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