GIS: Investigating Africa

Summary

The goal of this lesson is for students to understand the patterns of living standards across Sub-Saharan Africa and to appreciate the value of thematic maps in comparing and contrasting demographic data among countries within that region.

Materials

    ArcView or ArcVoyager Software
- *Memo From the White House*
   handout (one per student)
- *Memo From the White House*
   Data Sheet (one per student)
   Metadata sheets (one per student)
- *Using and Viewing the ArcView Maps*
   handout (one per student)
- *Let ArcView Do It for You*
   handout (one per student)
- *Memo From the White House: Directions for Final Project*
   handout (one per student)
   Africa outline maps (one per student)
   Data Files

Intended Learning Outcomes

Upon successful completion of this lesson, students will be able to:
    Identify statistical indicators that can be used to investigate the concept of standard of living.
    Compare and contrast demographic characteristics among Sub-Saharan nations.
    Use demographic data to identify Sub-Saharan nations under stress

Instructional Procedures

1 .
    A. If you have ArcView GIS software,
      open the project memo.apr. You will see a View named "Africa" containing fourteen themes.
    B. If you have ArcVoyager Special Edition software,
      prepare the project as follows:
            Open the project "Turn Me Loose Startup Project"
            Add the theme cntry94.shp from the Data folder
            Rename the theme cntry94.shp "World Countries"
               Add the theme subsa.shp from the Data folder
               Rename the theme subsa.shp "Sub-Saharan Africa"
               Zoom in to focus the map on Africa
               Open the theme attribute table for "Sub-Saharan Africa"; in the Table Properties, hide all of the fields EXCEPT *Name, Pop_k, Grwrate, Pop_15, Pop65_, Lifexpct, Infmortrt, Poppdoc, Safewater, Literate, Yrsschl, Phones_k, Radios_k, Tvs_k*
               Copy the theme "Sub-Saharan Africa" and paste it into the View twelve times
               Using the Legend Editor, create a graduated color map for each of the fields listed above. Use a different monochromatic scheme for each (some color ramps will be

used twice). Note: The darkest shade of the color should coincide with value representing the greater level of stress (less developed). Set the Null Value to -99 and check the box labeled "Include No Data Class" in the Legend. Make the No Data class gray.

Rename each theme to correspond with its Classification Field

2. Introduce the lesson, distribute *Memo from the White House* handout, and introduce the White House memo scenario. Students will work on this project in pairs.

3. Distribute Data Sheets, Metadata sheets, and *Using and Viewing the ArcView Maps* handout. Explain the procedure students will follow to identify the countries they will recommend for the President's visit. Their first task will be to identify the indicators upon which they will base their recommendation. After selecting six indicators students will use the project maps and data to identify countries that are experiencing the greatest stress in each category. When stressed countries have been identified, students will select five destination countries from that group.

4. If possible, model the investigation process with a projector before students begin. *Remind them that they can only use one theme at a time.* (See Extension 1)

5. Allow 20-25 minutes for initial exploration and investigation. Students will complete the *Memo From the White House* Data Sheet as they explore.

6. After students have worked for some time, tell them that you are going to show them a way to use the power of GIS to make their explorations easier. Introduce them to sorting the database using the handout *Let ArcView Do It for You*. Give students additional time to complete their Data Sheets.

7. When students have completed their data collection, they should analyze their results to complete the task of identifying five countries for the President to visit. They may need to use the project here as well to assure that their selected countries represent the entire region.

8. Distribute the handout *Directions for Final Project* and give students some class time to prepare.

Extensions

Introduce students to the Query Builder. After selecting six indicators to use in identifying destination countries, students will create a query expression to identify countries experiencing stress in all six categories.

Students should plan an efficient route for the President's visit. Using ArcView or ArcVoyager they should create a map layout illustrating the capital cities he would visit and the sequence his trip would follow. In detailing the itinerary, students should create a data table identifying key cultural and geographic landmarks which might be seen in each capital city. The student-created tables should be joined to the capital cities table (in ArcVoyager) to create a customized map of the Presidents visit to Africa.

Assessment Plan

Each student will complete a Data Sheet which identifies ten stressed countries for each of six indicators and the specific data for each country.

Each student will prepare a map that shows the five countries selected for the President's visit.

Each pair of students will present their recommendations for the President's trip to the class. The presentation should identify the indicators used in the selection process and the reasons for choosing the five selected countries.

Each student will write a paragraph summarizing information they have learned about Sub-Saharan Africa from working on the Memo From the White House Project.

Bibliography

Authors

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