

MAPPING HUMAN STRESS

INTRODUCTION:

Human well-being and environmental security are issues of concern at all levels of activity, ranging from local to regional to global. Such issues have social, economic, and political implications, especially when some countries are unable to meet the basic needs of their populations. It is often difficult, however, to visualize the scope of the stress created by unmet basic needs, particularly when the indicators of stress are presented in statistical form. In this activity, students working in small groups will use measures of human stress to classify and map data in order to identify patterns and speculate on factors contributing to different types of stress facing people around the world.

Grade Level:

6-12

Time Required:

One to two class periods

Standards Addressed:

Geography standards

1.

Knows and understands how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

Science standards

F, grades 5-8

Populations, Resources, and Environments

F, grades 9-12

Population growth, Natural resources, Environmental quality, and Science and Technology in local, national, and global challenges

Skills:

This learning activity requires students to:

- ask geographic questions
- acquire geographic information
- organize geographic information
- analyze geographic information
- answer geographic questions

Vocabulary/Concepts:

basic needs, per capita water availability, per capita cropland availability, malnutrition, access to safe water, access to adequate sanitation, child mortality

Objectives:

As a result of completing this learning activity, students will:

- identify measures of water, food, and health stress.
- apply measures of stress to classify data.
- map countries experiencing stress.
- speculate on factors contributing to stress.
- compare countries experiencing stress and the United States.

Materials:

(You will need supplies for seven groups)

- Paper copies of blank world maps (enlarge to 11" x 17" if possible)
- Transparencies of blank world maps
- *World Population and the Environment Data Sheets*, including glossary of terms
- Colored pencils
- Atlases

THE LEARNING ACTIVITY:

Background:

Data from the *World Population and the Environment Data Sheet* can be used to assess levels of human stress in selected world countries. Continuing from Lesson 1, "What Humans Need," indicators of water stress, food stress, and health stress can be used to create a global picture of human needs stress. Students will discover that maps are especially effective tools for "seeing the big picture," since they enable us to observe patterns that are difficult to discern in columns of data in a statistical table.

MAPPING HUMAN STRESS *continued*

Introducing the Activity:

Ask students how they might identify those countries experiencing human needs stress. Discuss some of the difficulties in using tabular data for making comparisons. Ask students how they might use maps to simplify large data sets. Point out the advantages of maps in presenting patterns in data.

Executing the Activity:

1. Divide the class into seven groups, assigning each group one of the following categories:
 - a. Per Capita Water Availability (cubic meters) 1990 and Per Capita Cropland Availability (hectares) 1990
 - b. Per Capita Water Availability (cubic meters) 2025
 - c. Population with Access to Safe Water (percent)
 - d. Population with Access to Adequate Sanitation (percent)
 - e. Child Mortality Rate (under age 5)
 - f. Children Suffering from Moderate or Severe Underweight (percent)
 - g. Per Capita Cropland Availability (hectares) 2025

NOTE: The first group is required to produce two maps.

2. Distribute a copy of the *World Population and the Environment Data Sheet*, including a copy of the glossary of terms, a blank world map (or two), colored pencils, and an atlas to each group. (See "Extensions and Variations" for recommendations about overhead transparencies.)
3. Have each group read the description of their category in the data sheet definitions in the glossary section of this classroom guide. Then have each group identify those countries experiencing stress in its assigned category, based on the information provided in the glossary. (Students mapping water and cropland availability should use the stress indicators. Those students mapping access to safe water should map the countries with 50 percent or less; sanitation, 40 percent or lower; child mortality rate, 125 or higher; and underweight, 35 percent or higher.)
4. When countries experiencing stress have been identified, have students use the atlas to locate these countries. Then they should shade and label each country on the blank map. Maps should include title (with date) and source.
5. When all maps are complete, post them on a bulletin board or on the chalk board so that the class can observe the patterns revealed.

Concluding the Activity:

Invite students to speculate on factors that might account for the patterns of stress presented in their maps (e.g., climate, poverty, population pressure, political instability, etc.).

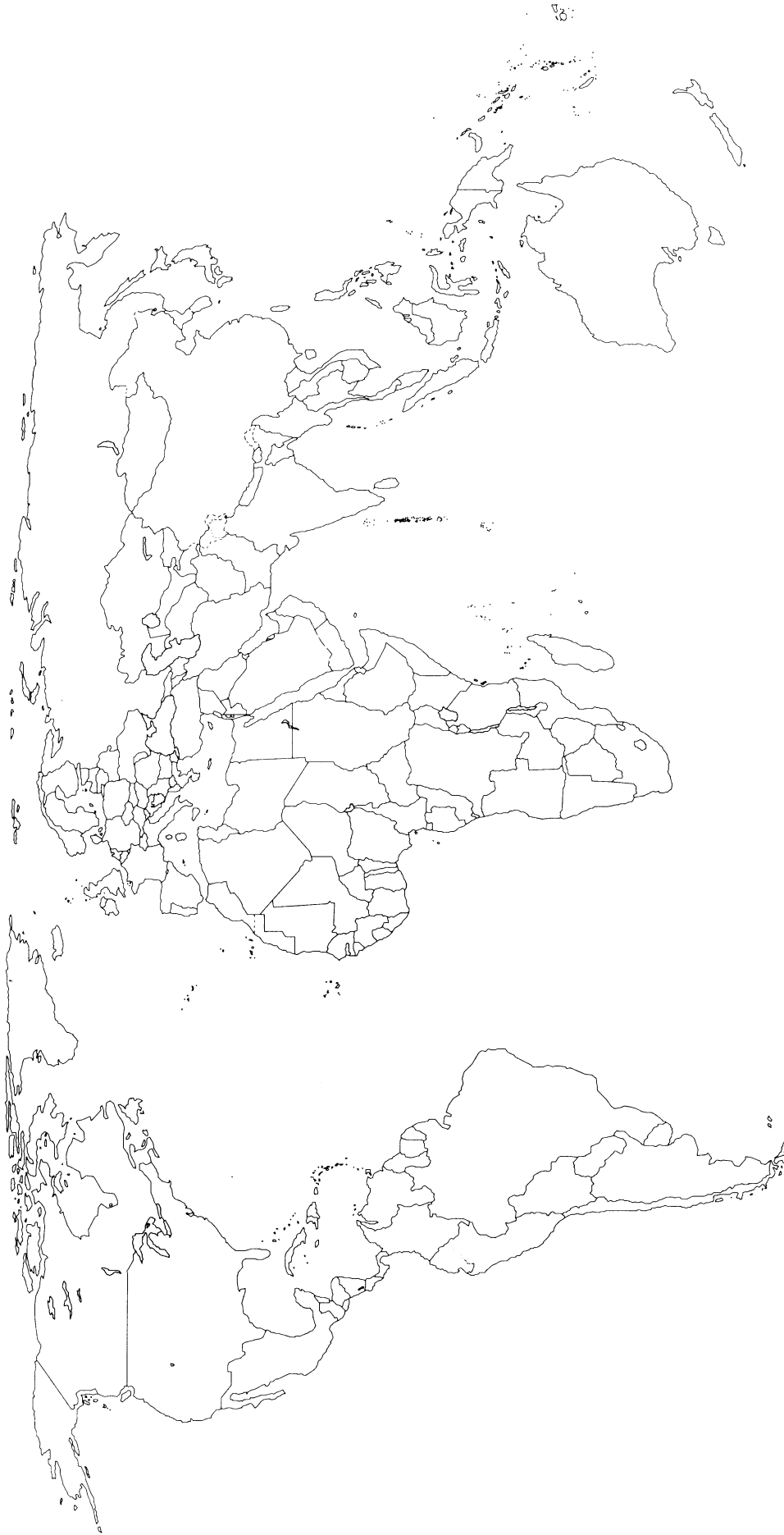
Ask students where the United States fits into the picture presented in the maps. Note that the United States is conspicuously absent. Have various students refer to the *World Population and the Environment Data Sheet* to determine the level of the United States in each category. How do they account for the absence of human needs stress in the United States?

Point out that the data table presents only national averages. Ask whether there may in fact be "pockets" of stress, even in the United States. And conversely, does *everyone* in the countries shaded on the maps suffer from human needs stress?

MAPPING HUMAN STRESS *continued*

Extensions & Variations:

1. Transparencies could be used in addition to or instead of paper maps. If students color the transparencies they can be overlaid to show differences. However, the paper maps can be posted on the wall and used for reference during the unit. I would use both. Simply have each group do a color map and a color transparency.
2. Have students read local newspapers or use other sources to identify pockets of stress in their state or community.
3. Students could also map population variables such as population density or rate of natural increase to assess the correlation between population distribution and change and stress.
4. Discuss or research the factors that cause or contribute to stress locally and in other areas.
5. Older students could examine data categories available in the U.S. census for their state, and then develop a set of indicators for measuring patterns of stress among the counties of the state. Working in groups, the students could repeat the steps of this learning activity to examine and analyze patterns within the local state.



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