Activity 35: A Measure of Maine's Water in a Typical Year

Maine Geological Survey

Objectives:

The student will use a water budget graph to gather statistics and interpret what the statistics mean. They will view and discuss the correlation between the various forms of water within the hydrologic cycle. They will relate the graph to their knowledge of water use and analyze the relationship.

Time:

The graph interpretation itself can be done in one class period or for one homework assignment. Any further writing assignments (i.e. an essay on "Human influence on the water cycle") may take additional non-class time.

Background:

This activity is more successful if the students have had some exposure to the hydrologic cycle as well as some discussion on domestic water use. The USGS pamphlet entitled "How Much Water in a Twelve Ounce Can?" is a great starter for water use discussions. The graph activity presented here is an excellent way to wrap up a unit on the hydrologic cycle because it deals with Maine's water statistics. You may wish to gather the same information for the current year or for your particular area/school district.

Materials:

Each student should have a hydrologic measures graph (Figure 1), data table (attached), schematic copy of the hydrologic cycle (Figure 2), pens and a notebook.

Procedure:

This activity works well as a class discussion, a small group activity, or as an individual activity. Provide as much or as little introduction as you feel each group needs.

1. Introduce the activity with a general discussion of the graph and the information contained on it.
2. Allow students to answer the questions individually or in small groups.

Follow-Up:

This activity can be nicely followed with an independent writing assignment (2 pages minimum) on "Human Influence and the Water Cycle." It provides an opportunity for the student to sum up information on water budgets, water use, and the water cycle.

References:

The graph that serves as the center of this activity was taken from the *Ground Water Handbook for the State of Maine*, by W. B. Caswell (Maine Geological Survey, Bulletin 39, 1987).

Activity developed by Donna Casavant, in conjunction with the 1991 CREST intern program.

Name_____

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Student Sheet

Purpose:

To gather statistics and data from the water budget graph and relate this information to water use and the hydrologic cycle.

Materials:

Each student will need a copy of the Hydrologic Measures graph, a questions sheet, pens and notebook, and a copy of the hydrologic cycle diagram.

Background:

The hydrologic cycle is the name given to the natural system which continually moves, purifies, and stores water in an ongoing system all over the planet. The graph shows certain aspects of this cycle for water in the state of Maine for a given year, in this case 1971. Based on previous class work and discussion, study the graph and extract some of the graph's data into a data table. Then use this data to answer the following questions.

PROCEDURE:

Fill in the attached data table with values for each variable (air temperature, evaporation, precipitation, streamflow and water table) for each month.

Calculate the averages for each of the following categories:

Air temperature for the year: _____

Ground water table level for the year: _____

Stream flow for the year: _____

Precipitation for the year: _____

Evaporation for the year: _____

Evaporation for May through October: _____

USE the data from the chart and your averages to answer the following questions

1. When does Maine receive the most precipitation?

2. When does it receive the least precipitation?

3. Why does ground water decrease from the month of May on?

4. Why does streamflow increase starting in November?

5. What is the correlation between air temperature and evaporation?

6. When does the ground water table begin to rise? Discuss a possible reason for this.

7. What is the correlation between precipitation and the ground water table?

8. What is the relation between precipitation and stream flow?

9. Think of three questions you could ask using information from this graph. List the questions and the answers.

10. How does water use by humans relate to the graph? Explain.

11. A woman from Australia has just bought a piece of land in your area with the intent of raising vegetables commercially. She asks you to fill her in on the nature of the water cycle in your area. Write at least two paragraphs telling her what she can expect in terms of water availability in this area. She will NOT be using artificial irrigation techniques.

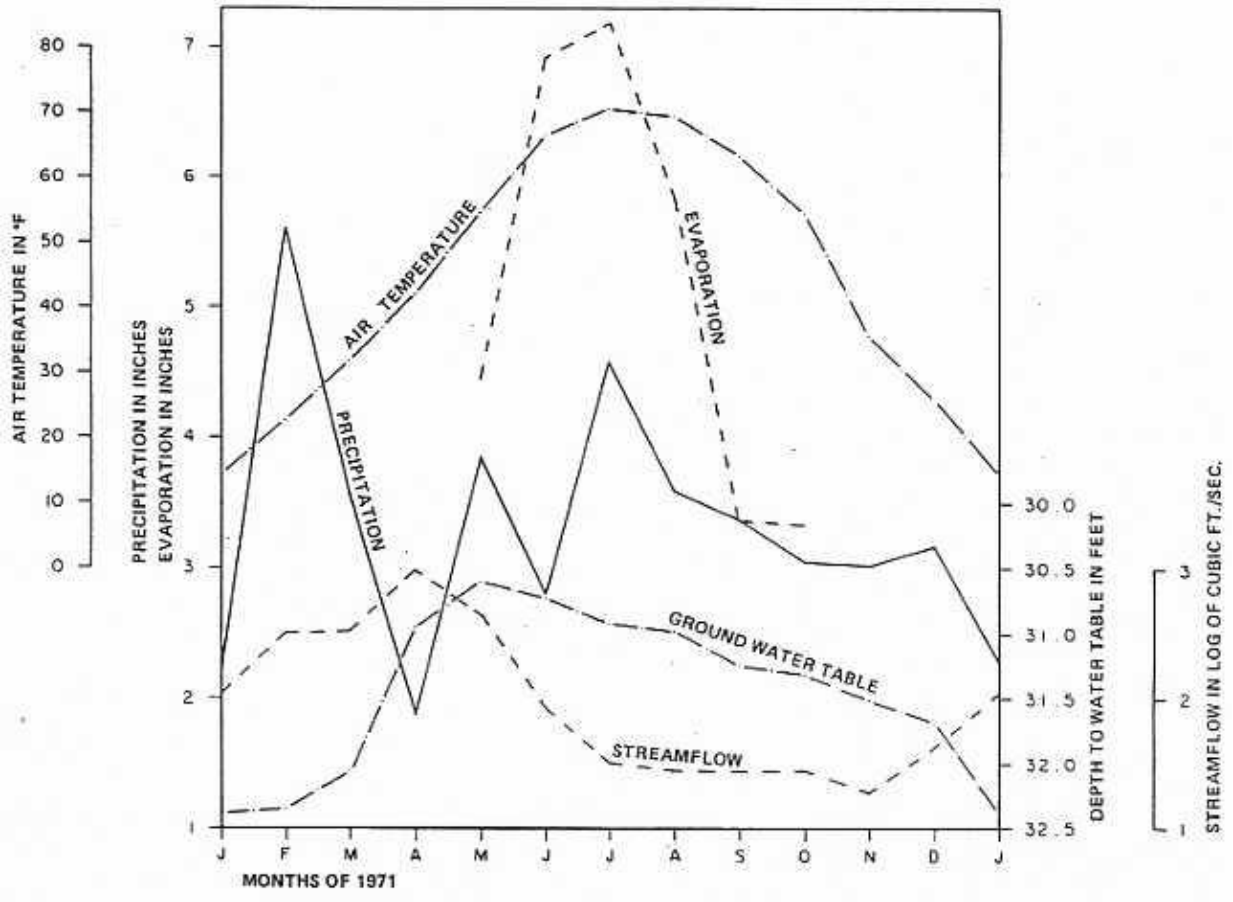

Figure 1. Hydrologic measures of Maine's water (source: W. B. Caswell, 1987).

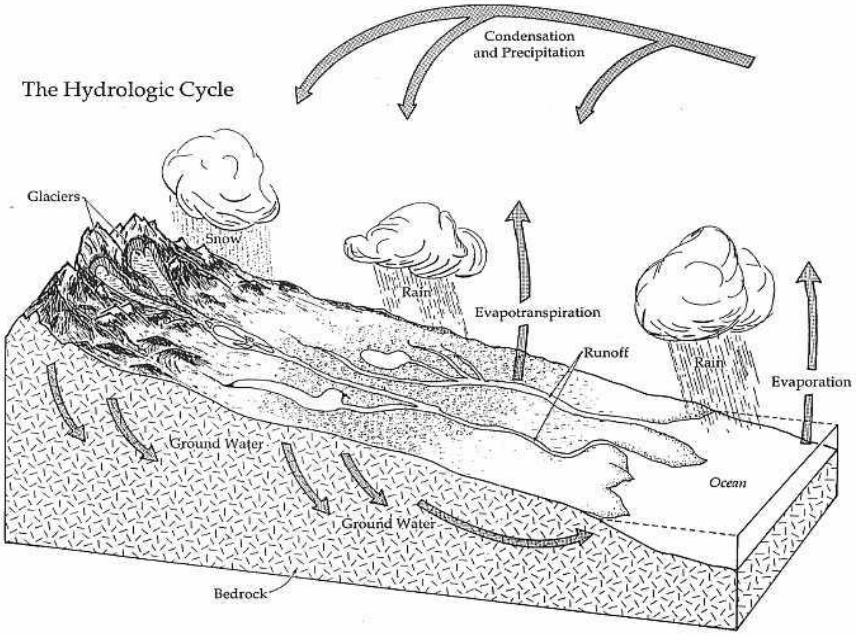

Figure 2. Diagram of the hydrologic cycle.

Month	Air Temperature	Evaporation	Precipitation	Streamflow	Water table
Jan					
Feb					
Mar					
Apr					
May					
June					
July					
Aug					
Sept					
Oct					
Nov					
Dec					