RiverWeb Test

WRITE YOUR ANSWERS ON A SEPARATE SHEET OF PAPER

1. At the mouth of the Monocacy River, unhealthy concentrations of nitrogen are found in the water. Nitrogen is usually found in fertilizers used on lawns and farmland as well as in human and animal waste. The shores at the mouth of the river are forested. Hypothesize where in the Monocacy River watershed the nitrogen might be coming from and justify your hypothesis.

2. According to the March 21, 2003 issue of the Burtonsville Gazette, the Baitur Rahman Mosque will pay a $50,000 fine for illegally clearing 3 acres of land in the headwaters of the a Paint Branch watershed. A mosque representative said that the volunteers who cleared the land for parking for a national convention did not know about the special protection designation of the area. This was a violation of Montgomery County environmental laws. However, the mosque representative also pointed out that a new federal law stipulates that governments may not enact or enforce any land-use regulations that impose a substantial burden on the religious exercise of a person or religious institution unless there is a compelling government with interest.

    Write a paragraph to the mosque leadership from the point of view of a Montgomery County environmentalist. In your paragraph, explain the importance of trees as a stream buffer. Also, explain the type of damage to the Paint Branch watershed that could occur if the land next to the stream remained cleared of trees and available as a parking lot.
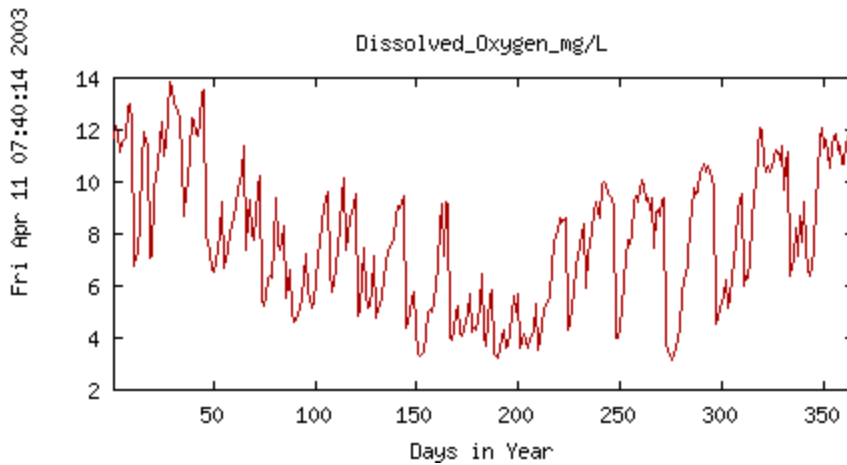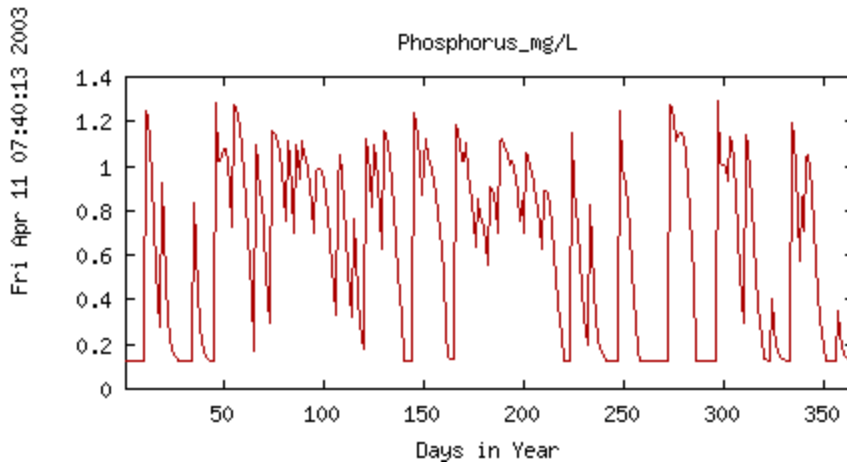
3. A rise in the Charles County population has officials concerned with the amount of pollutants there. The county has hired Blair Environmental Consultants to evaluate the quality of water in the lower Patuxent River, which flows through the county. The land use has changed drastically since the early 1970's. Once mainly rural farmland now has been developed into housing complexes, shopping malls, and factories.   The county has been collecting data over the past 30 years. Below is a table of the data collected.

Year	Sediment	Nitrogen	Phosphorus	Heavy Metals	Toxins (oils)
1972	40 mg/L	2.4 mg/L	0.04 mg/L	0.05 mg/L	0.002 mg/L
2002	120 mg/L	2.6 mg/L	0.05 mg/L	6.8 mg/L	7.25 mg/L

    You have been hired to evaluate the data above. Hypothesize which land use could be causing the water quality problems. Explain the possible source of the pollutants.

4. Most water quality indicators vary from day to day, but some also vary season to season.
   a) Does the Phosphorus graph show seasonal variation? (yes/no)
   b) Does the Dissolved Oxygen graph show seasonal variation? (yes/no)
   c) Describe how a graph with seasonal variation differs from one without seasonal variation.
   d) Hypothesize the reasons that a water quality indicator might vary with the seasons of the year.

5. The scatter plots below show the relationship between sediment and nitrogen in different land use areas within the same watershed.

   a) Describe what each graph shows about the relationship between nitrogen and sediment.
   b) Hypothesize the reason different land use areas have different nitrogen/sediment relationships.
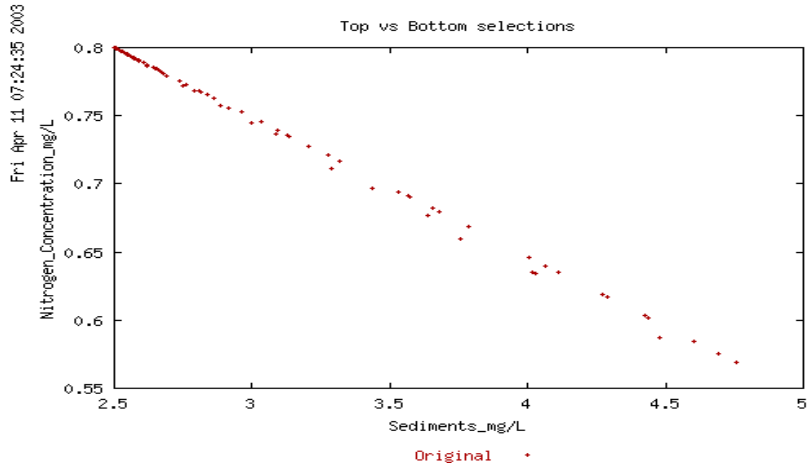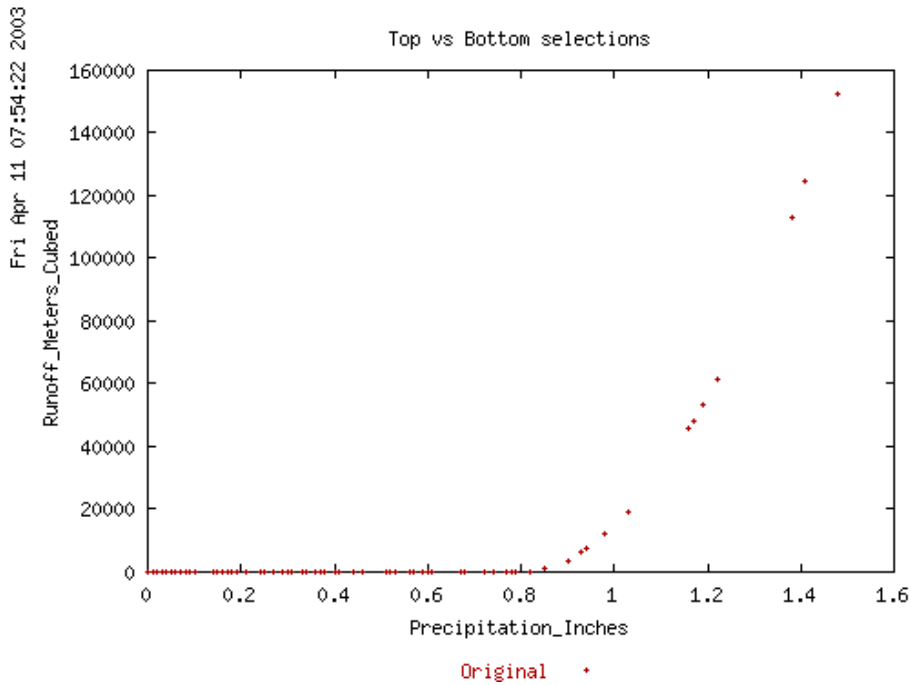
Pristine Forest
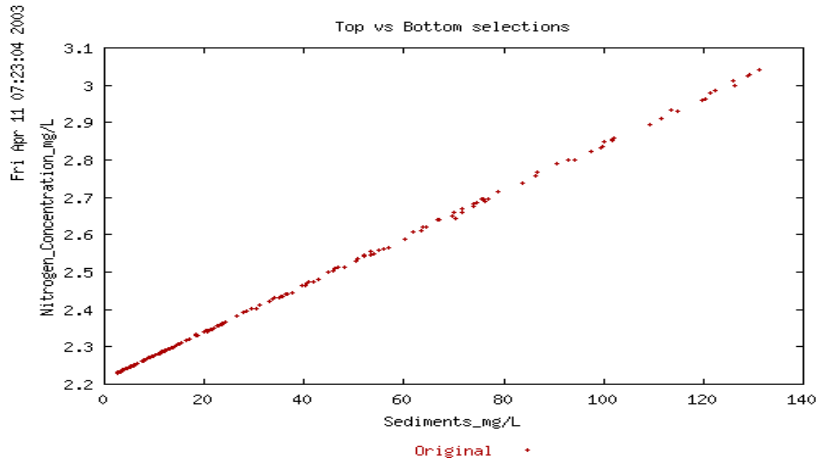
Suburbs
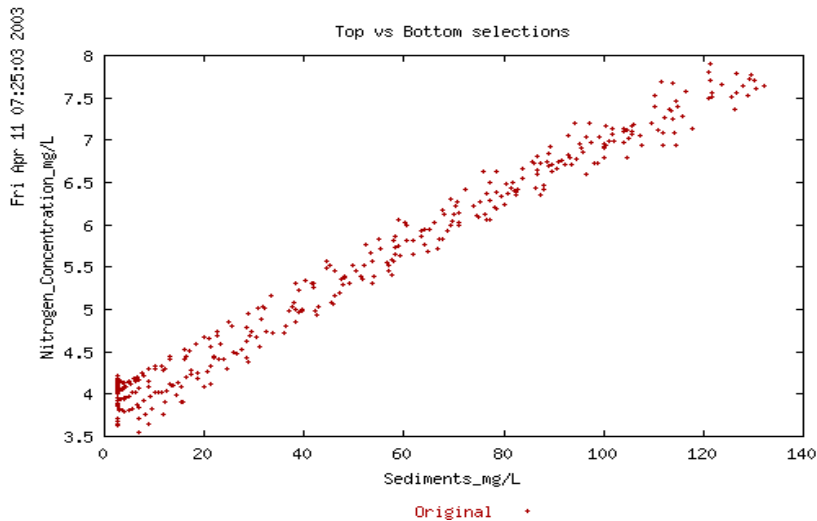
River Mouth

6. The graphs below show runoff versus precipitation at two land use areas in the same watershed.
    Notice that the scale on the y-axis is different on each graph.
    a) Describe the ways in which the two graphs are similar.
    b) Describe the ways in which the two graphs are different.
    c) Explain what the graphs tell you about the relationship between precipitation and runoff.
    d) Hypothesize the reasons that the two land use areas have different amounts of runoff.

Pristine Forest
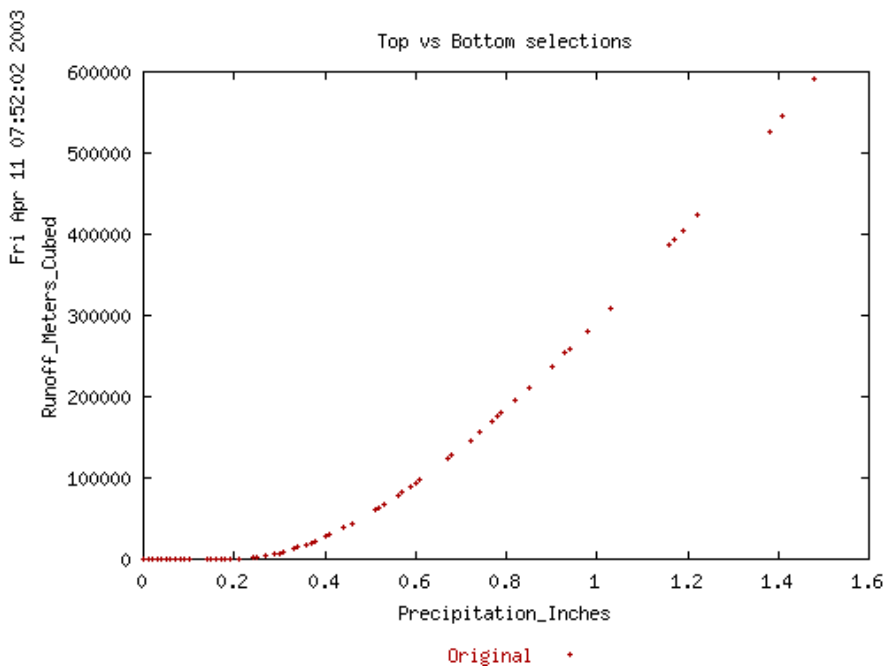
Urban area

7. Create a concept map which connects the terms below with arrows:

   Air temperature, land use, D. O. (dissolved oxygen), heavy metals, nitrogen, phosphorus, precipitation, runoff, sediments, toxins, water temperature.

   The linking phrases below should be used to label the arrows in your concept map. These are provided for you. You do not have to use all of them in your concept map.

   Acts on
   Affects
   Causes
   Contains
   Decreases
   Improves
   Increases
   Influences