Water Quality and Human Impacts

Impervious Surfaces

Use the following resources to learn about the impacts of impervious surfaces on water quality.

Fifteen to the River: Explaining Stormwater Runoff

Report from New Hampshire Estuaries Project: "The Impacts of Impervious Surfaces on Water Resources"

1. Complete some field testing. Choose a water source that is surrounded by impervious surfaces and compare to one that has vegetation growing along the banks. This could even be at different points along the same water source. Use the chart on the next page or make a class chart to record observations about the area, collect macroinvertebrates to complete a stream quality index, and complete chemical testing of water to determine the amounts of ammonia, nitrites, nitrates, phosphates and dissolved oxygen. (Nitrates create bigger problems in marine ecosystems, while phosphorus is the limiting factor in freshwater ecosystems. Algae can grow rapidly in the presence of phosphorus that runs off fields or from wastewater treatment plants that gets deposited in lakes creating problems for human health, and affecting recreation, tourism and jobs.)

2. Use topographic maps and/or Google Earth to survey the watershed areas upstream from the places observed.

3. Analyze the reasons for the differences found in water quality.

4. Create a case study to describe ways to improve water quality in these areas.

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How do the two areas compare on these measures? Use the chart below or develop a class chart before going to be sure all are looking for the same things.

Location 1

Characteristics:	**Observations:**
Water source and location (GPS)	
Water color	
Water clarity	
Water odor	
Stream bed composition (i.e. boulders, rocks, gravel, sand, mud)	
Stream width	
Stream side vegetation width	
Type of stream side vegetation (i.e. trees, shrubs, grasses, bare soil)	
Stream width	
Stream flow speed (m/sec)	
Area around location (I.e.park, parking lot, housing, industrial)	

Water tests:	**Include units!**
Temperature	
Nitrate	
Nitrite	
Ammonia	
Phosphate	
Dissolved Oxygen	
Stream Quality Index value (Macroinvertebrate counts)	

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Location 2

Characteristics:	**Observations:**
Water source and location (GPS)	
Water color	
Water clarity	
Water odor	
Stream bed composition (i.e. boulders, rocks, gravel, sand, mud)	
Stream width	
Stream side vegetation width	
Type of stream side vegetation (i.e. trees, shrubs, grasses, bare soil)	
Stream width	
Stream flow speed (m/sec)	
Area around location (I.e.park, parking lot, housing, industrial)	

Water tests:	**Include units!**
Temperature	
Nitrate	
Nitrite	
Ammonia	
Phosphate	
Dissolved Oxygen	
Stream Quality Index value (Macroinvertebrate counts)	