Easton Reservoir Project as a Tool to Raise Students Awareness of Water as a Key Natural Resource

Larisa Rowe
Department of Biology
University of Bridgeport, Bridgeport, CT

Introduction

Using ecosystem of Easton water reservoir (Easton, CT) as a model this project is designed to develop awareness of students of integrity of hydrosphere and impact of humans on local water systems, how quality of water is important to human health and safety.

Project focuses on the following topics:
What is water quality?
What affects water quality?
Prevention of water pollution
Impact of pollution on aquatic and terrestrial life
Impact of pollution on humans

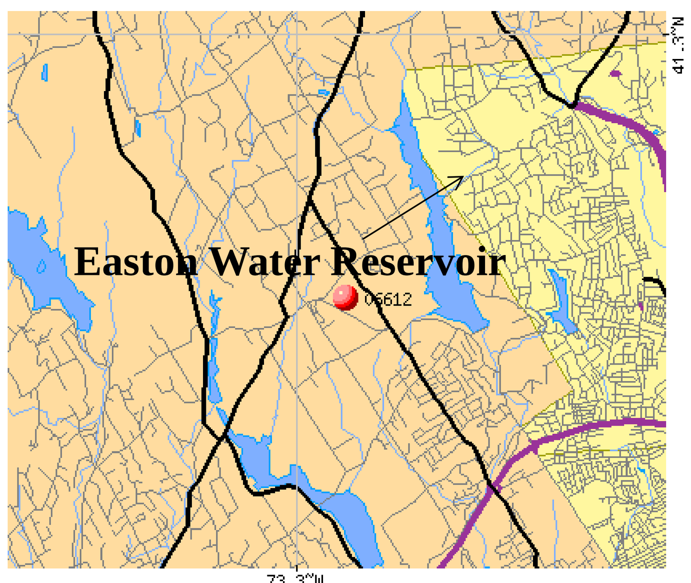
Objectives

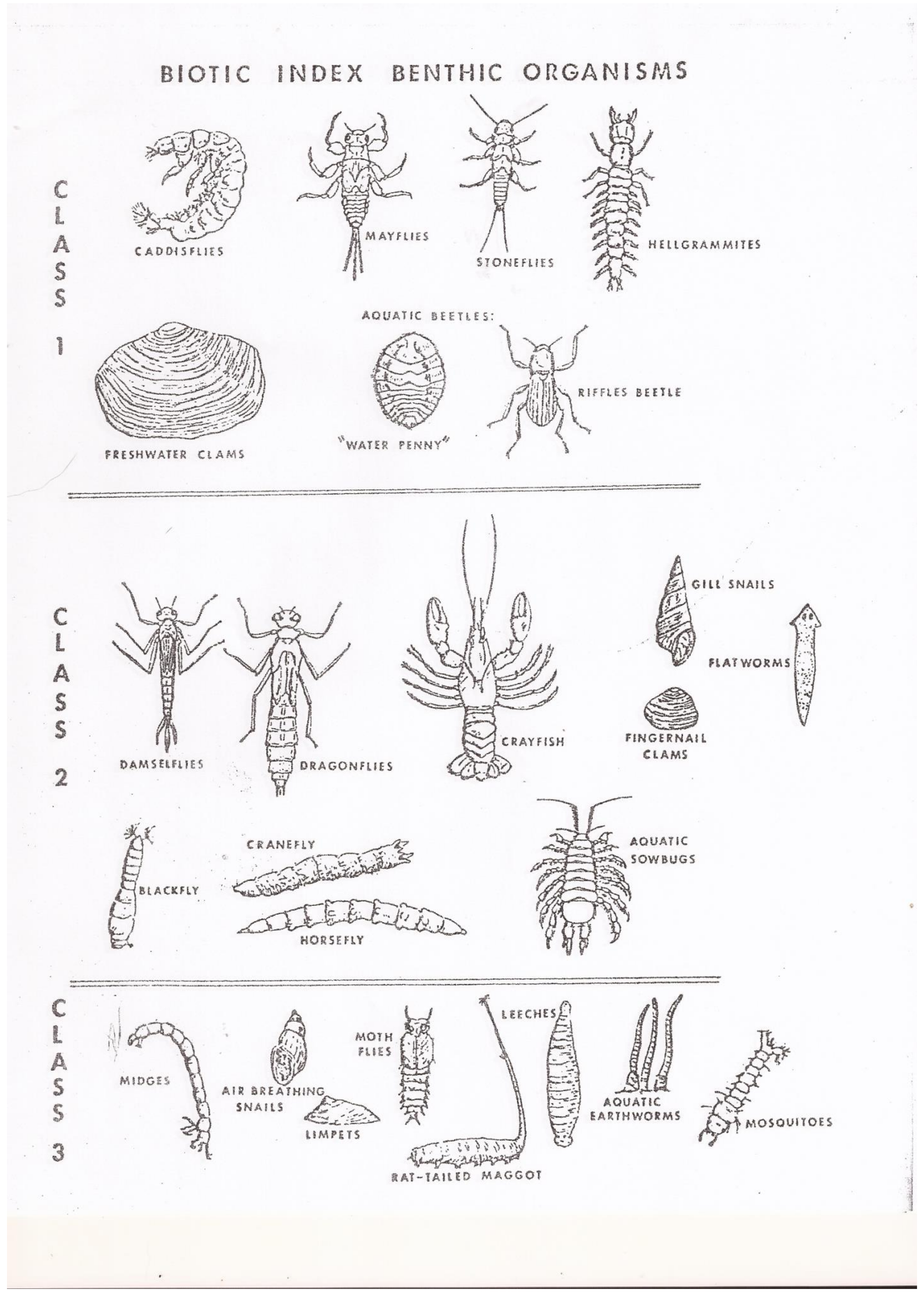
Students will determine the quality of the water in a brook supplying water to Easton water reservoir through water testing and aquatic organism sampling.
Students will learn which aquatic organisms are associated with clean water.

Students will learn the importance of water as a resource for humans, plants, and wildlife and the ways to minimize human impact on hydrosphere.

Methods and Sources

Water and animal samples collected in different areas of a brook
Water test kit – includes pH, temperature, phosphates, nitrates, dissolved oxygen
Small plastic magnifying boxes for looking at individual organisms





Water Quality Indicator	Safe Levels	Sources	Effects of Unsafe Levels
pH	Between 6.5 and 9	Decaying matter causes acidic conditions;	Too high or too low can kill organisms; NOT all organisms can live in 6.5 to 9 range
Nitrate	<1mg/L for aquatic life; <10mg/L for drinking	Fertilizers, animal wastes, decomposing matter	Can cause excessive plant and algae growth in a process called eutrophication; this process harms or kills animals and can kill plants due to overcrowding
Phosphate	0.01 to 0.03mg/L	Phosphate containing rocks and solids; animal waste, fertilizers, pesticides, cleaning products, and industrial processes	Can also cause excessive plant and algae growth in a process called eutrophication; (see above);
Chloride	0.01mg/L for aquatic life; <1.0mg/L for drinking	Added to drinking water and swimming pools to kill microorganisms that might cause disease	High levels can harm larger organisms; Chlorine gas is toxic, can irritate eyes, nasal passages, and lungs
Source: http://www.h2ou.com/h2wtrqual.htm			

	Levels	Life Found
Temperature	Greater than 65 F	Most plant s, catfish
	Less than 65 F	Caddis fly, water beetles, striders, bass, carp, crappie, some fish diseases Best for trout, caddis fly, stonefly, mayfly
Dissolved oxygen	Bellow 5 ppm	Very little life can survive
	Above 5 ppm	Large variety of life

Results

Water Quality Indicator	Test Results	Interpretation of Water Quality
pH	6.5	Can support high variety of organisms
Nitrate	1 mg/L	Acceptable
Phosphate	0.02	
Chloride	0.01	
Useable oxygen	7 ppm	Good
Temperature	67 F	Good
Biotic Index Organisms	Riffles Beetle(1 class)	Good
	Gill snails (2 class)	
	Dragonfly (2 class)	
	Aquatic Sowbug (2 class)	


Organisms found: Riffles Beetle (Class 1)


Gill snails (Class 2)


Dragonfly (Class 2)


Aquatic Sowbug (Class 2)

Discussion

Water pollution causes a drastic effect on aquatic life as well as much illness among urban residents all over the world. Learning about local watersheds, possible sources of contamination and the ways to prevent it with hands-on approach is a very important part of environmental education. The particular water source (brook) runs through a populated area where pollutants resulting from farm run off and lawns containing pesticides, fertilizers and other chemicals potentially can reach local water bodies. Chemical, physical and biological results from our project suggest that water in the brook feeding Eason's reservoir, which supplies drinking water to a large part of Fairfield county, is acceptable quality for human consumption and can support a variety of aquatic organisms.

Another positive outcome of the project resulted in the development of students understanding of the human impact on the environment and the way they personally can contribute to the conservation of water as a valuable but susceptible natural resource. Before and after project testing of the students environmental awareness is planned in the future.

Selected References

Milliken et al.(1971).Field study manual for outdoor learning, Burgess Publishing Co, Minneapolis, MN
http://www.h2ou.com/h2wtrqual.htm