



Water Ecology

Virtual Programming

Grades 4-8

Resources: friendsofnjsoc.org

Overview:

Bodies of water are impacted directly and indirectly by pollutants from human activities (i.e. dumping of waste/chemicals, fertilizer run-off from farms, oil run-off from vehicles on roads). The impacts of pollutants on the health of a body of water can be assessed by sampling benthic macroinvertebrates. These bioindicators can give us an idea of how healthy a body of water is and how it may be impacted by nearby sources of pollution.

Materials/Resources:

- *Water Ecology* video
- Digital Macroinvertebrate Samples (PDFs)
- Macroinvertebrate Key (PDF)
- Indicator Value Calculator (PDF or Excel Spreadsheet)

Process:

1. Discuss sources of pollution and how those pollutants can enter our waterways. Pollutants can enter directly (i.e. oil or gasoline from a boat, illegal or accidental dumping of chemicals by a factory/plant) or indirectly as runoff when it rains (i.e. fertilizer from farms or golf courses, oil and gasoline from roadways, trash/debris flushed from storm drains).
2. Watch *Water Ecology* video to learn about macroinvertebrates as bioindicators and the sampling techniques used to assess waterway health.
 - a. During the 'Pause for Critical Thinking Questions,' pose the following questions to students as individuals or in small groups:
 - i. What did you observe in the tray of the Dock Sample other than macroinvertebrates?
 - ii. What did you observe in the tray of the Spillway Sample other than macroinvertebrates?
 - iii. Which sample had more biodiversity? Why might that be the case?
 - iv. Which sample site appeared healthier? Why do you think so?
3. Distribute Digital Macroinvertebrate Samples, Macroinvertebrate Key, and Indicator Value Calculator documents to individuals or small groups of students. Students identify the macroinvertebrates in each sample using the key and record their findings on the Indicator Value Calculator. Students then calculate an indicator value to quantify the health of the body of water.

Discussion/Conclusion:

1. Which waterway appears to be the healthiest? The least healthy?
2. What factors of the waterway and the surrounding land might affect the health of the waterway and the macroinvertebrates that live in it? How?
3. How might other plants and animals in the waterway be affected?
4. How can we reduce human impacts on waterways?