Volunteer Monitoring of Regional Streams in the Finger Lakes Through the Efforts of Local Middle and High School Students

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Introduction to the Finger Lakes Regional Stream Monitoring Program

Our Goals:

- Use environmental education as a stepping stone towards a comprehensive stream health network.

- Involve middle and high school students in their local environment

- Use appropriate methodology to effectively monitor regional streams
Why Involve Students?

- First and foremost: Education
- Field-based education as essential part of learning
- Utilization of a geographically diverse network
- Students offer research that may elucidate biological trends.
The structure of the program...

Stream monitoring through local middle and high school students.

Local schools can use this program’s protocol to evaluate their regional streams with effective sampling methods.

The protocol is two-tiered to allow for individual schools to match their personal curriculum and commitment.
My Role
Biomonitoring

Benthic macroinvertebrate biomonitoring is a specific method of stream analysis that uses macroinvertebrate communities as bioindicators of overall stream health.

This program uses major groups of macroinvertebrates to assess water quality and stream health with the understanding that certain groups are more susceptible to environmental impacts (Ephemeroptera, Plecoptera, and Trichoptera).

Analysis methods include:

- **Tier 1:** Presence/Absence model.
- **Tier 2:** Percent Model Affinity
Biomonitoring cont...

Presence/Absence Model –
This model simply evaluates a stream by the presence or absence of major groups (Tier 1).

Percent Model Affinity – New York State’s DEC (M.A. Novak and R.W. Bode) expected assemblage of macroinvertebrates in optimal stream conditions (Tier 2)
Physical Survey

- **Weather** – stream conditions are contingent on weather
- **Land Use** – environmental degradation may be linked to stream location
- **Stream Dynamics** – the presence of physical structures within a stream affects habitat quality
- **Stream Dimensions** – stream size influences habitat and biodiversity
- **Substrate Composition** – characteristics of the stream bottom affects habitat quality
- **Water Appearance/Odor** – the appearance and odor of water gives insight into pollution levels
Chemical Survey

- **pH** – a measure of the stream’s acidity
- **Dissolved Oxygen (DO)** – needed for the respiratory needs of benthic organisms
- **Temperature** – influences DO levels and the metabolic rates of benthic organisms
- **Chloride** – a measure of acute toxicity from primarily road salt runoff
- **Nitrates** – indicates the amount of agricultural runoff present in the stream
Results: Pedagogical and Scientific

- 24 schools and programs involved
- 10 classrooms having already gone out and collected data
- Eight or more schools are planning on going out their streams in the spring
- A comprehensive manual has been developed
- A curriculum is being developed to supplement our protocol
- Baseline data has been collected for 9 of the schools’ streams
- A working database is up and running...
  http://fli-data.hws.edu/streams/
Our Results, cont...

Community Composition of Baseline Streams in Comparison to the PMA Model

- Castle Creek
- Honeoye/Hyde
- Wilkins Creek
- Sucker Brook
- Great Brook
- Dutch Hollow Brook
- Wilson Creek
- Flint Creek - 6/18
- Flint Creek - 4/20
- Oatka Creek
- PMA Model

Legend:
- Ephemeroptera
- Plecoptera
- Trichoptera
- Chironomidae
- Coleoptera
- Oligochaeta
- Other
The Future...

The following spring will bring an increase of participating schools.

With the addition of a curriculum we hope to bring about an effective teaching tool that reinforces classroom projects with field-based studies.

We are on increasing the number of schools involved in the program.

The process of revising and fine-tuning the program is under way.

Baseline data will continue to be collected in the spring.
Questions?

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