Connecting learning to life

A symposium is held every spring for students and teachers to share what they have learned with others in the program. The symposium provides a forum for website (www.uwgb.edu/watershed) and at an annual Student Watershed Symposium. The symposium is managed by the Department of Natural Applied Sciences at UW-Green Bay, with additional assistance provided by scientists and students from the UW-Milwaukee Biology Department and the UW-Green Bay Cohn Center for Biodiversity.

Major funding for the program is through a four year grant from Arjo Wiggins Appleton, Inc. and a successful program in Oregon, modeled after a cooperative watershed monitoring and research program being conducted by university and agency scientists within the basin. Modeled after a successful program in Oregon, standardized methods and annual teachers training sessions allow students to collect quality-assured data in their watersheds. Data from the student monitoring is shared on the project website (www.uwgb.edu/watershed) and at an annual Student Watershed Symposium. The monitoring program is administered by the Department of Natural Applied Sciences at UW-Green Bay, with additional assistance provided by scientists and students from the UW-Milwaukee Biology Department and the UW-Green Bay Cohn Center for Biodiversity.

During their senior year, students involved in the program can enroll in the course Stream Ecosystem Monitoring Field Experience (ENV 232) at UWGB. Course Objectives:

- Provide hands-on experience in watershed sciences, including water quality, habitat and biotic monitoring procedures.
- Enhance student knowledge and understanding of land use impacts on water quality and stream ecosystems.
- Develop ability to communicate scientific results in oral and written formats.

Course Requirements:

- Participate in monitoring technique training and a minimum of 35 field monitoring hours.
- Participate full day with university staff.
- Maintain a log of activities.
- Present oral or poster presentation at annual symposium.
- Prepare a report of monitoring activities and interpretation.
- Participate in online discussions with other participating high school teams.

References:

- Various bird CDs.

Water Action Volunteers, Key to Microinvertebrate Life in the River. UW-Extension and Wisconsin DNR.

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**Who’s Involved and Where’s the Monitoring Taking Place?**

Four student/teacher teams each monitor a watershed, with 2 stations on their stream. Each team consists of two teachers and 10-15 students.

- Appleton East High School
  - Apple Creek
  - Middle School
  - Markesan High School
  - Duck Creek
  - Black Creek

**School-Based Monitoring Program Goals:**

- Education: learning by doing and interpreting
- Community Involvement: connection to local watershed issues
- Program: answer questions
- Management: informed decision making

**Program Objectives:**

1. Enhance student understanding of landscape and land use impacts on water quality and stream ecology.
2. Enhance teacher capacity to teach watershed science by providing hands-on training.
3. Collect meaningful data that:
   - Provides a picture of existing conditions within and between watersheds (Baseline).
   - Provides a record of conditions over time (Trends).
   - Can be used by students, teachers, scientists and managers to answer questions about watershed dynamics and integrity (Cause and effect relationships).

**What’s being measured? When does the monitoring occur? How is it done?**

### Water Quality

**Physical**

- Temperature
- Transparency (Turbidity)
- Conductivity
- pH
- Dissolved Oxygen
- Nutrients

**Chemical**

- Nitrate nitrogen
- Ammonia nitrogen
- Nitrite nitrogen
- Total phosphorus
- Chloride

**Equipment**

- Floating Caddis: YSI 6600 (DO/Temp.
- YSI 60 (DO), YSI 5 (ORP) Probe
- YSI 55 (ORP) Probe
- Oakton EC2 probe
- Oakton EC2
- Oakton pH meter
- Oakton fluorescence probe
- Oakton DO sensor
- Oakton Turbidity probe
- Oakton Conductivity probe
- Oakton pH meter
- Oakton temperature meter
- Oakton turbidity probe
- YSI 55 (ORP) Probe
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**Method**

- Water and wetland
- Stream

**What’s Measured?**

- Water Quality
- Chemical
- Physical

**Stream Habitat**

- In-stream Biotic Integrity
- Fish and Birds

**Stream Corridor**

- Habitat
- Water Quality

### Data Management: What happens to the data?

Data collected by the students is entered into the project database online through the project website (www.uwgb.edu/watershed). Data is audited by project staff, and is available for all-kids/teachers.

Students and teachers can also access university and agency data and online watershed information via the project website:

- Real-time and rainfall data from UW-Milwaukee
- Real-time (previous day) continuous and hourly averaged water quality data (1 Do, T, conductivity, pH).
- Weather and climate data from various sources.
- Water quality references to help interpret what the data means.

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**Annual Teacher Training Workshop**

- Held each summer at UWGB for 5-7 days
- Training in science of watershed monitoring
- Hands-on practice in lab and field
- Water quality
- Habitat & macroinvertebrates
- Birds & frogs
- Learn how to access and utilize university and agency monitoring data
- Curriculum integration
- Plan program activities and improvements

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- Share student research projects
- Present findins in oral and poster formats
- Learn about other watersheds in the Fox River Basin
- Interact with visiting researchers, managers, and as well as community members

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**Monitoring Approach: How do we collect data?**

Modeled after established programs:

- Student Watershed Research Project (SWRP), Oregon
- UWES Water Action Volunteers

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**Program Components:**

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