“NSTA Symposium: Watershed Dynamics”
Saturday, October 22, 2005

8:00 AM – 8:15 AM
Registration

8:15 AM – 8:45 AM
Welcome, Introductions, Goals for the Symposium
Al Byers, Assistant Executive Director of Government Partnerships and e-Learning, NSTA
Claire Reinburg, Director NSTA Press, NSTA
Flavio Mendez, Symposia and Web Seminars Program Manager, NSTA
• About NSTA Symposia
• Agenda/Goals
• Forms/Credit Info/Logistics
• Introductions
William S. Carlsen, Prof. of Science Education and Director of the Center for Science and the Schools, Pennsylvania State University

8:45 AM – 9:15 AM
An Overview of Watershed Dynamics and the NSTA Series
Bill Carlsen, Penn State University
Learning Outcomes:
• In an essay learners will define “authentic” research experiences and how such experiences contribute to scientific understanding.
• Learners will identify the characteristics of protocols and interactive research and how they differ from conventional school science activities.

9:15 AM – 9:30 AM
Identification of Participants’ Aquatic Study Goals, Strategies, and Questions

9:30 AM – 10:00 AM
Activity 1: Object Recognition Using Maps and Airphotos
Learning Outcomes:
• Learners will identify and interpret 10-15 objects and other features on airphotos and topographic maps.

10:00 AM – 10:15 AM
Analyzing Habitats Using Remote Sensing
Learning Outcomes:
• Learners will rate the quality of a stream section by evaluating its riparian habitat.

10:15 AM – 10:30 AM
Break
10:30 AM - 11:15 AM
Activity 2: Assessing Invertebrate Biotic Integrity
Learning Outcomes:
• Learners will rate the biological integrity of a stream using two different methods to analyze stream sampling data.

11:15 AM - 11:30 AM
Habitat and Biotic Integrity: Developing a Watershed Perspective
Learning Outcomes:
• Learners will use computer software and data collected across a watershed to generate graphs showing the relationship between riparian habitat integrity and aquatic community composition.

11:30 AM - 12:00 PM
Activity 3: Computer Modeling: Land Use and Streamflow
Learning Outcomes:
• Learners will use computer modeling software to predict the effects of land use changes on streamflow dynamics.

12:00 PM - 12:30 PM
Final Words
• Post-assessment form
• Evaluation form/Survey
• NSTA Web Seminars
• Raffle of door prizes

Standards Addressed:
Teaching Standards
A. Plan Inquiry-Based Science Programs
• Address the interests, knowledge, and experience of students
• Nurture a community of learners
• Work within and across disciplines

B. Guide and Facilitate Learning
• Encourage and model the skills of scientific inquiry

Professional Development Standards
A. Teachers Learn through Inquiry
• Address issues, problems, and topics significant in science and of interest to teachers

Assessment Standards
C. Assessment Data Quality is Matched to Subsequent Actions
• Assessment tasks are authentic
• Students have adequate opportunity to demonstrate their achievements
Content Standards, 9-12

Unifying Concepts and Processes in Science:
- Systems, order, and organization
- Constancy, change, and measurement

A. Science as Inquiry
- Abilities necessary to do scientific inquiry
  - Use computer tools to analyze and interpret data
- Understandings about scientific inquiry
  - Use mathematics in analysis and modeling

C. Life Science
- Interdependence of organisms
  - Competition among organisms
- Matter, energy, and organization in living systems
  - Distribution and abundance of organisms
- Behavior of organisms
  - Evolutionary and ecological foundations of behavior

E. Science and Technology
- Understanding the interdependence of new technologies and new scientific approaches

F. Science in Personal and Social Perspective
- Environmental quality
  - Factors influencing environmental quality
- Science and technology in local, national, and global challenges
  - Understanding the science is necessary but not sufficient for informed policymaking

G. History and Nature of Science
- Science as a human endeavor
  - Science is not separate from society
- Nature of scientific knowledge
  - Scientific knowledge claims are made public and subjected to challenge