Secondary Science Teaching in Rural Michigan

A Model Program for Teacher Retention and Renewal
We are part of a world-wide reform in science education

• Traditional science teaching
  – Emphasized content coverage & memorization
  – Effective with only the top students

• Reform movement
  – Emphasizes teaching ALL STUDENTS for understanding & application of science knowledge
Rationale

• Science Education Reform puts new demands on science teachers
  – To teach a wider spectrum of students
  – To teach for understanding and application of science knowledge

• Our project addresses these demands
  – Using LTER research
  – Using Research on Teaching & Learning
Objective: To test a model to enhance teacher retention & renewal

- Expand & deepen teachers’ understanding of ecological content & pedagogy
- Provide access to appropriate applications of educational technology
- Nurture development of a group of local teacher leaders to stimulate reform
- Assess the effectiveness of the model
Key Players

• 60 teachers grades 4 - 12 in 12 small to mid-sized rural districts in Michigan
• Research scientists from MSU and the Kellogg Biological Station
• Science educators from MSU & beyond
• Graduate research assistants who work with teachers in schools
Key Activities

• Academic Year Workshops
  – New content knowledge
  – New pedagogical knowledge from research on teaching and learning
  – Internet support

• Summer Institutes
  – Similar approach but greater depth
  – Experiential Science
  – Leadership training
Key Activities (continued)

• Building level support
  – Graduate research assistants working with teachers as a science content resource

• Mini-grants
  – Support teachers in improvements in school-based work

• Scholarships
  – Support teachers for further academic work
Questions Teachers Struggle to Answer

How can we keep up with new teaching trends in science?

How can we keep up with the changes and advances in Science?

How can we meet the needs of our students?
Current Participating Districts

- Plainwell Community Schools
- Martin Public Schools
- St. Charles School Coldwater
- Gull Lake Community Schools
- Otsego Public Schools
- Pennfield Community Schools
- Olivet Community Schools
- Galesburg-Augusta Community Schools
- Lawton Community Schools
- Marshall Public Schools
- Delton-Kellogg Community Schools
- Harper Creek Community Schools
Building Level Scientists

Advanced Ph.D. Students

Post Doctoral
Scientist’s Share Their Talents and Knowledge
Resources

• Link to teachers and other scientists
  • Communication
    • Grants
  • Time to share ideas and work with peers
    • New classroom instructional methods
  • Long-term Commitment
    • Data Access
Kellogg Biological Station

Wonderful Facilities and a Fabulous Location
• Forming a Partnership and creating Lead Teachers
• Linking Research Scientists and Building Level Scientists
• Improving Science content knowledge
• Improving classroom instruction
• Providing Resources
• Improving Science Literacy