

NSF Innovative Technology Experiences for Students and Teachers (ITEST) Program

Curriculum Showcase

October 2, 2008

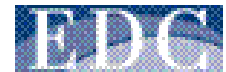


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Agenda

- ITEST Overview
- Project curriculum presentations
 - RSSIT (Karen Michaelson)
 - EcoScience Works (Walt Allan/Jeri Erickson)
 - ESTEEM (Claudia Morrell)
 - Urban Ecology (Mike Barnett)
 - SeaTech (Harry Helling)
- Q&A/Discussion



ITEST Questions



- What does it take to interest and PREPARE students for the STEM workforce?
- What are the knowledge, skills and dispositions needed for productive participation, especially in ICT areas and how do students acquire these?
- What will ensure that our nation has this capacity?
- How can we assess and predict inclination?



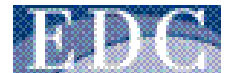
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ITEST Portfolio

- The ITEST experience—including more than 100 projects across 37 states—helps young people and teachers build the skills and knowledge needed to succeed in a technologically rich society.
- Starting in 2003, through a \$115 million federal investment, ITEST impacts more than:
 - 130,000 students, grades 6–12
 - 4,300 teachers
 - 1,700 parents and caregivers



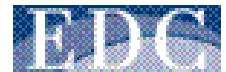
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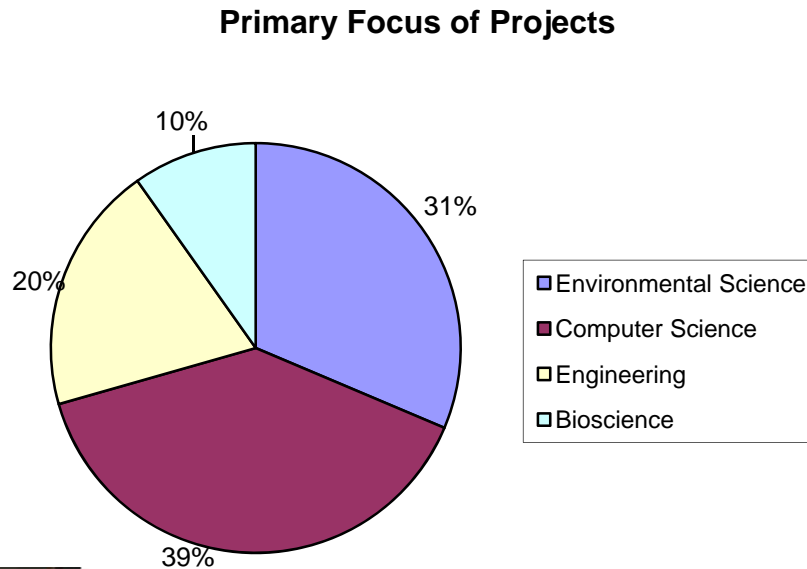


ITEST Portfolio

Computer Science includes programming; multimedia – audio, video and animation; gaming/simulation; web development; computer hardware; mathematics; and nanotechnology



Bioscience includes bioinformatics, biotechnology, DNA analysis/sequencing, and biomedicine



Environmental Science includes GIS/GPS, remote sensing technology, climate modeling, and ecological research and analysis

Engineering includes aerospace, design and robotics

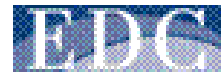


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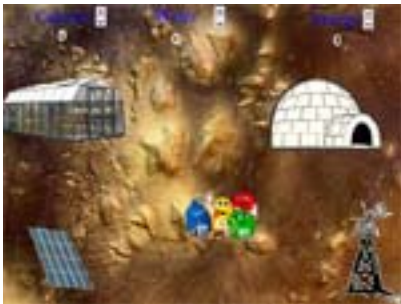
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Rural Schools Science and Information Technology

- **Audience(s):** Secondary School teachers and students
- **Content areas covered:** geographic information systems, modeling and simulation, game development
- **Description:** Teachers integrate three different technologies with science content, primarily in the environmental sciences.

Sample Games

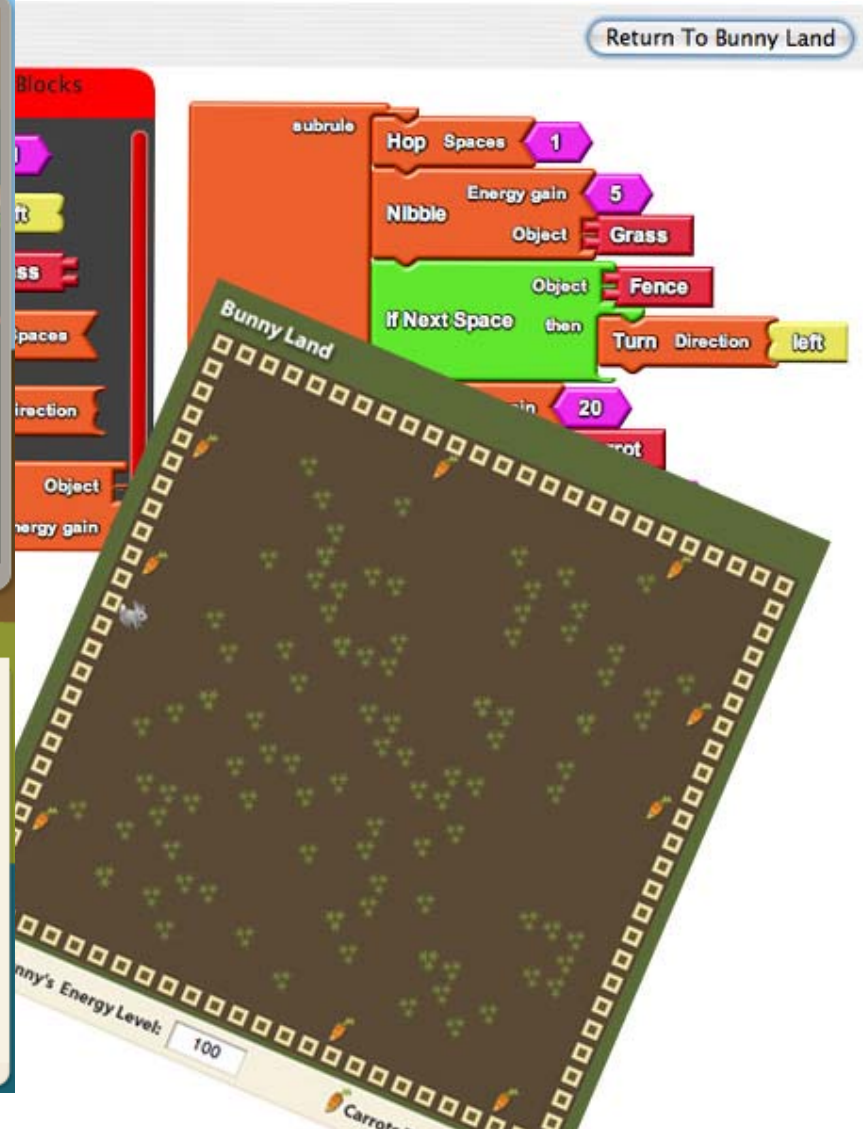
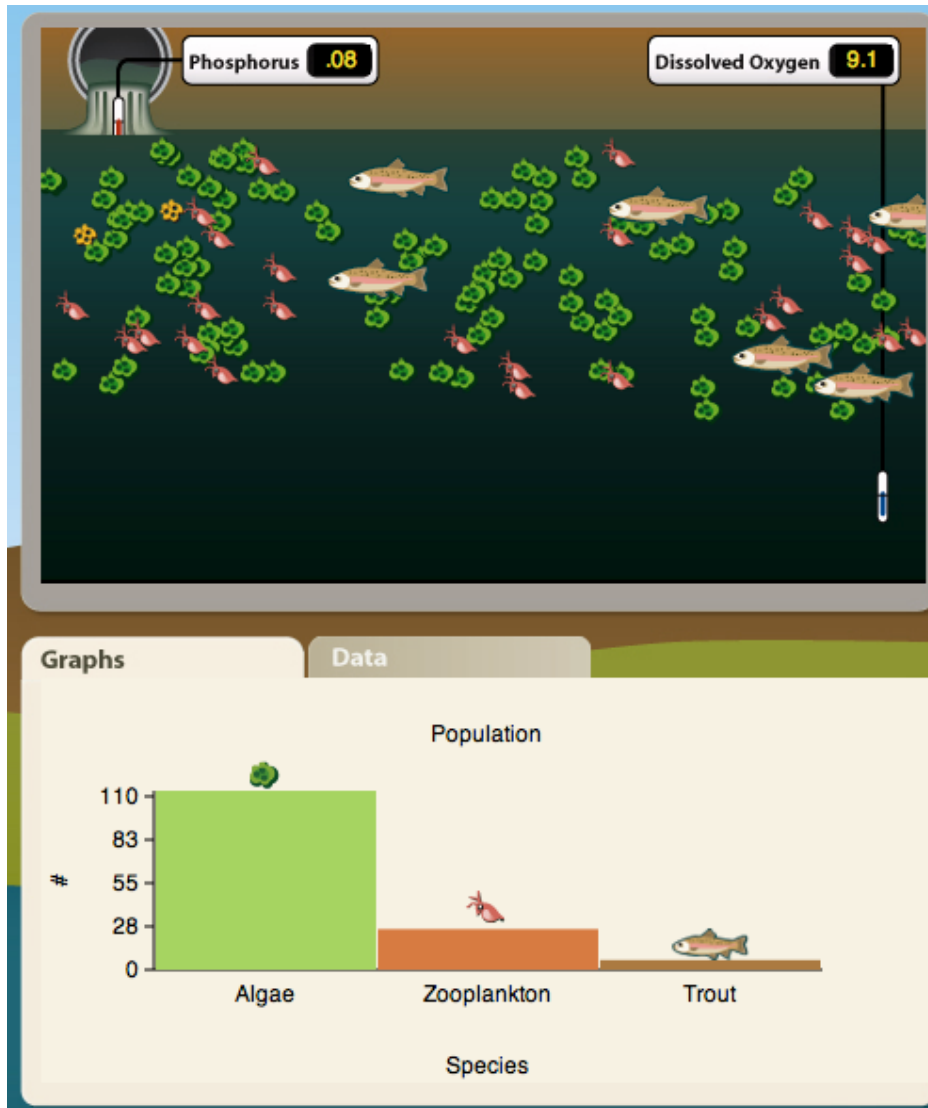


<http://rssit.tincan.org/2008summer.htm>

EcoScienceWorks



- **Audience:** 7th & 8th grade science classes
- **Content areas covered:** environmental science and computer programming
- **Description:** EcoScienceWorks is a computer-based curriculum for the Maine laptop program that will spur student interest in computer modeling in science while learning ecology.



<http://www.fbr.org/swksweb/esw.html>

A Taste of ESSEN

ANOTHER LOOK AT CURRICULUM

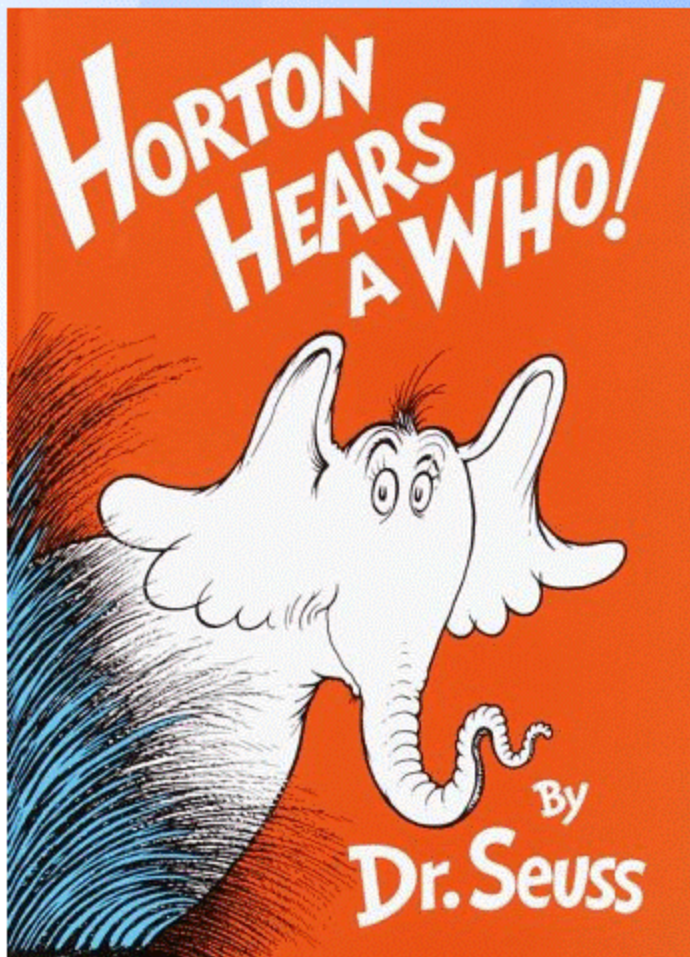
Audience: Seventh and eight grade students, with a focus on girls

Content Area: Information technology and engineering

Description: A UMBC-based program to serve six middle schools over three years to increase the number and diversity of students, and particularly girls, pursuing an interest in technology fields

*Ice breakers,
criminal checks,
and dress
codes!*





Bigger Pictures and Elephants in the Room!



<http://www2.edc.org/itestlrc/projects/youthbased/ESTEEM.asp>

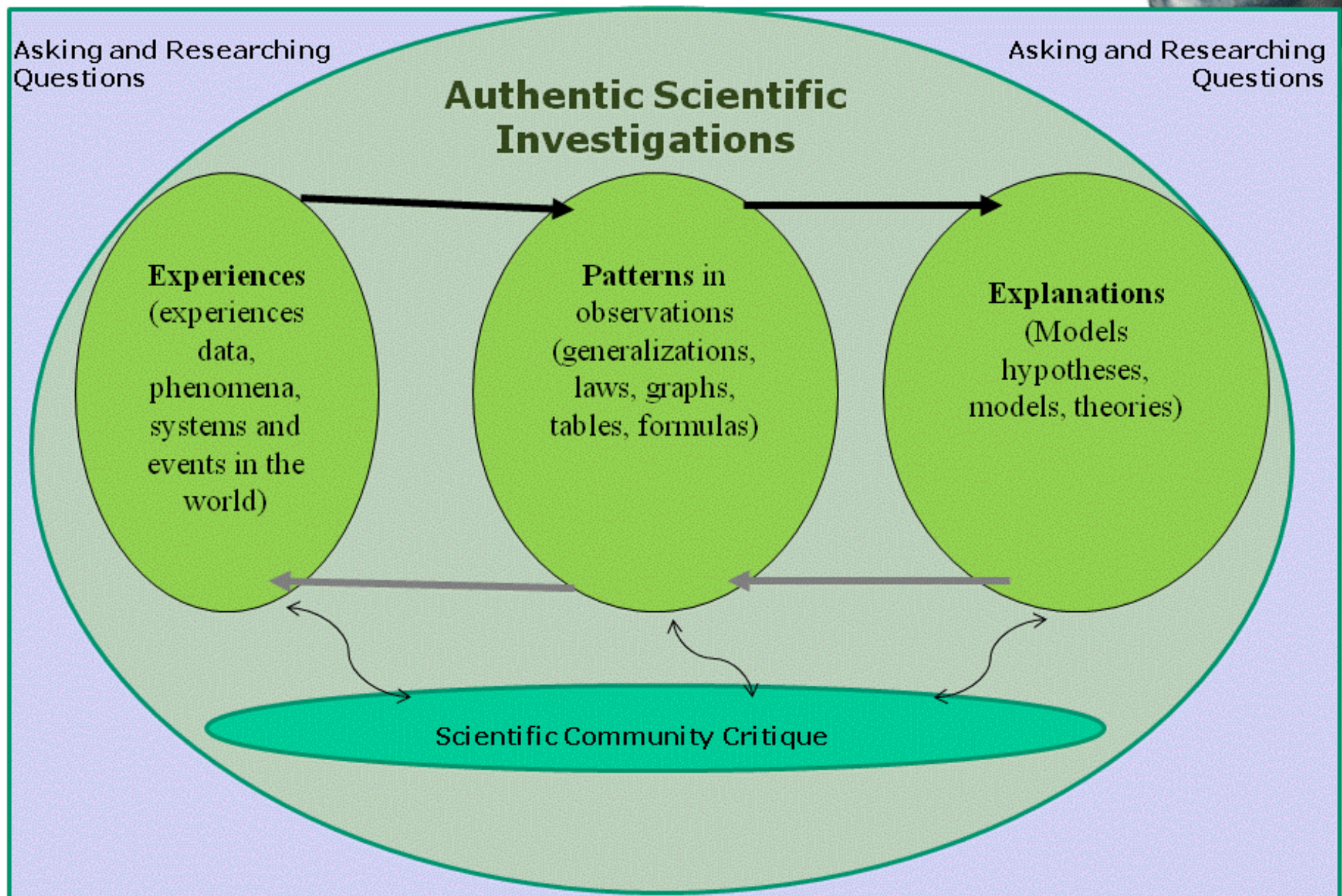
Technology-enhanced Urban Ecology Field Studies



- Audience(s): Middle and High School Students and Teachers
- Content areas covered: Urban Ecology
- Description: Our project engages students in the investigation of the health of their urban ecosystem through the use of advanced computer analysis and modeling technologies

This work is supported in part through a National Science Foundation Information Technology Experiences for Students and Teachers (ITEST) program (Grant # 0525040); Hewlett Packard Foundation – Technology and Teaching Foundation (Grant# 189660) and the Cornell Lab of Ornithology

Framework for Curriculum Design



Curriculum Modules



- Technology-Enhanced Field Studies
- Educatively Designed_(Davis & Krajcik, 2006)
 - Materials have
 - Support materials for teachers
 - Misconceptions
 - Suggested teaching alternatives
 - Pre-post assessment



More Information

- ITEST Project website: <http://www.urbanecologyscience.org>
- Urban Ecology Institute: <http://www.urbaneco.org/>

SeaTech: Under Served Students Hooked on Ocean Technology!

ESI ITEST #0524799/cohort 3/05-09

Location: Ocean Institute, Dana Point, CA

Description: SeaTech developed an interest-building pipeline program called Ultimate Oceans, a core 2-year experience, and a 6-week Workplace Training Internship. The Ocean Institute partnered with Scripps Institution of Oceanography, Boys & Girls Clubs of Capistrano Valley and the Institute of Electrical and Electronics Engineers.

Content area: Oceanography, whale bioacoustics, processes of science, communication of science.

Curriculum/resources available:

1. Lesson Plans:

- A. Ultimate Oceans (grades 4-7) - 24 lessons combining art, science, and technology strands
- B. SeaTech (grades 8-10) - 37 lesson plans for Yr 1 and 16 lesson plans for Yr 2 curriculum in ocean science, marine bioacoustics, and college and careers
- C. Internship (grades 10–12) - 9 lesson plans for a 6-week workplace training program

2. Professional Development Workshop:

Two-day 'Working with Teens' training for after-school providers

3. Capacity Rubric:

A modified Boys and Girls Clubs of America 'Commitment to Quality' document provides evaluation of after-school provider's ability to deliver rigorous STEM programming.



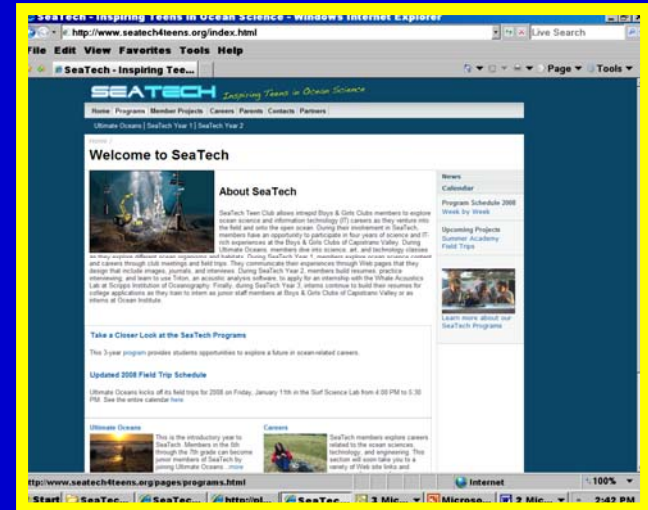
For More Information on SeaTech:

SeaTech multi-year youth-based program:

Visit the SeaTech web site at www.setech4teens.org to learn more about the program, member projects, internships, careers, and to view program pictures and video footage.

Curriculum/resources and additional questions contact:

Angie McErlain,
SeaTech Coordinator,
Ocean Institute.
Tel: (949) 496- 2274
Email: amcerlain@ocean-institute



Rhode Island Information Technology Experiences for Students and Teachers

- Audience(s): High school teachers and students.
- Content areas covered: Physics, Chemistry, and Biology
- Description: Through a variety of PD opportunities, including face-to-face workshops and online courses, teachers learn to implement atomic level interactive models and connect these with possible career paths for their students.


Sample/Link

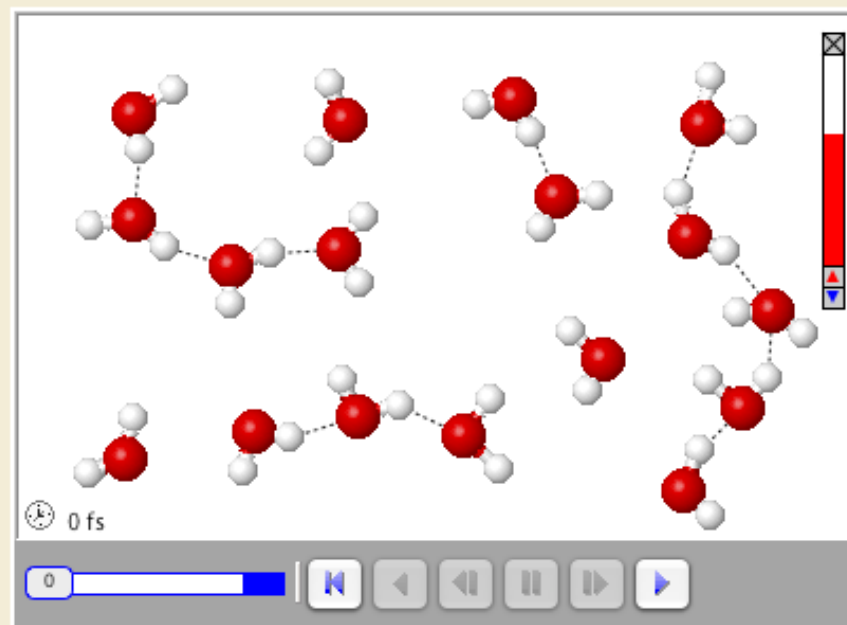
To the right is a model of gaseous water (*i.e.* water vapor). To see the effect the hydrogen bonds have on water, run the model (▶) and experiment with the controls below. Then **take a snapshot of the model and annotate your image so that you indicate where you see at least one hydrogen bond** in the model.

Heat

Cool

- ☒ show hydrogen bonds
- ☐ show partial charges
- ☐ slow motion

 Take a snapshot



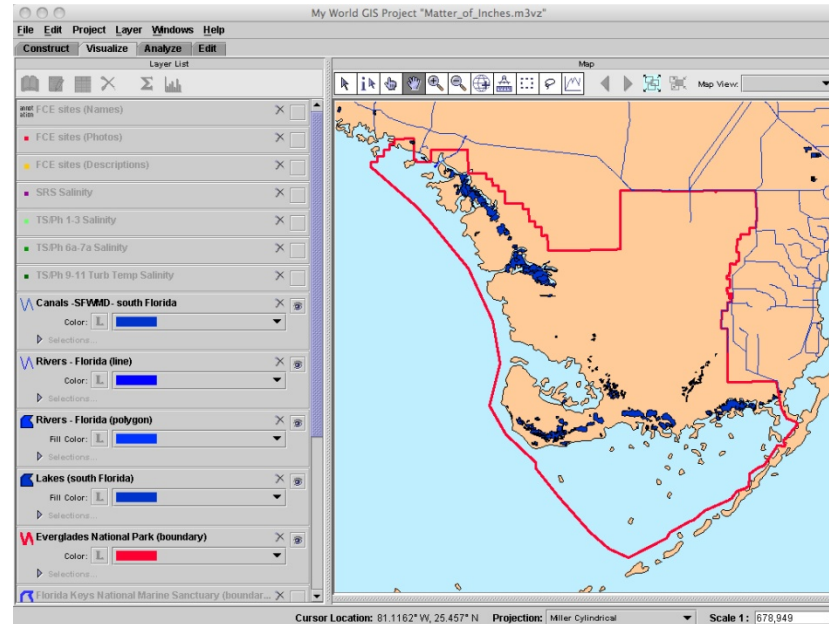
<http://ri-itest.concord.org>

CoastLines

- Audience(s): middle school and high school science classes
- Content areas covered: environmental science, ecology, ocean science
- Description: The CoastLines project has created and converted lessons on coastal issues that use My World GIS software as the analysis tool.

Sample/Link

Sample Page from “A Matter of Inches”



<http://www.coastlines.ws/content/view/142/134/>

Q&A/Discussion



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