National Science Teacher's Assn. Conference – Philadelphia, 3/18-21/2010

Title:
"*Climate Change Here and Now: Forest Ecosystem Impacts*"
(Pairs with the NOAA title – "Climate Change Here and Now: Ocean Ecosystem Impacts")

Symposium Date: Sat. 3/20/10 AM
Steve McNulty & ???

Description:
During this half-day Symposium, scientists and education specialists from Sally Ride Science and the U.S. Forest Service will discuss the basic science behind our understanding of climate change, highlighting global impacts on forest ecosystems. The Symposium will cover the important role of forests in the carbon cycle, and will include U.S. regional climate change impacts. This will help you engage your students through learning about the impacts of climate change that affect them where they live. The presenters will draw upon the latest science to provide a story of our changing climate and lead participants in classroom ready activities that are inquiry oriented and hands-on. Current ideas for facing our climate challenge and creating a healthier planet will also be discussed.

All participants will receive educational materials and information about resources that are available to educators. A drawing for door prizes will take place at the end of the program. Refreshments will be available.

USFS Workshops

Carbon, Oxygen, Water and Shade: Putting a Price on the Benefits of Your School Yard Trees!
David Bloniarz & Vicki Arthur

Target: Middle & High School

Short:
Trees play a vital role in the carbon cycle. Use the *i-Tree* tree benefits calculator to inventory schoolyard or community trees and calculate the benefits and services they provide.

Long:

The i-Tree Learning Lab is an educational curriculum that brings scientific tools to students, teachers, and communities to help them discover the benefits of trees and the urban forest around them. Using a curriculum called, *"i-Tree in the Classroom,"* the students will learn about the ecosystem services of trees such as carbon sequestration, energy savings, and clean air and water benefits. The curriculum is correlated to National Education Standards of Science as Inquiry, Life Sciences, Earth and Space Science, History and Nature of Science, and Mathematics. They can apply their investigations in their school yard, and other areas in the community. This curriculum connects teachers and students to a

greater understanding of the benefits of trees and contribution to sustainable healthy living. The first of a series of lab exercises is currently undergoing classroom testing, and additional modules are planned.

National Education Standards

Science as inquiry - Abilities necessary to do scientific inquiry
Design and conduct a scientific investigation
Think critically and logically to make the relationships between evidence and explanations

Life science - Populations and ecosystems
For ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis. That energy then passes from organism to organism in food webs.

Earth and space science - Structure of the earth system
The atmosphere is a mixture of nitrogen, oxygen, and trace gases that include water vapor. The atmosphere has different properties at different elevations

Science in Personal and Social Perspectives - Science and technology in society
Science cannot answer all questions and technology cannot solve all human problems or meet all human needs

History and nature of science - Science as a human endeavor
The work of science relies on basic human qualities, such as reasoning, insight, energy, skill, and creativity– as well as on scientific habits of mind, such as intellectual honesty, tolerance of ambiguity, skepticism, and openness to new ideas

History and nature of science - Nature of science
Scientists formulate and test their explanations using observation, experiments, and theoretical and mathematical models

Mathematics - Compute fluently and make reasonable estimates
Develop and use strategies to estimate the results of rational-number computations and judge the reasonableness of the results.

Introducing the Climate Change, Wildlife, and Wildlands Toolkit
Vicki Arthur

Target: Middle School

Short:

Developed by six federal agencies to aid educators in teaching how climate change is affecting our nation's wildlife and public lands, and how everyone can become "climate stewards."

Long:

The new kit is designed for classroom teachers and informal educators in parks, refuges, forest lands, nature centers, zoos, aquariums, science centers, etc., and is aimed at the middle school grade level. The U.S. Forest Service joined Environmental Protection Agency, National Park Service, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, and Bureau of Land Management, to develop the kit to aid educators in teaching how climate change is affecting our nation's wildlife and public lands, and how everyone can become "climate stewards."

The new toolkit's materials are grounded in government approved, current information (including IPCC reports, US Global Change Research Program assessments, recent research by federal agencies) on climate science and impacts to wildlife and their habitats in specific eco-regions of the U.S.

Specifically, it features:

- An easy to understand overview of the science of climate change in question/answer format
- A glossary of climate change terms to build vocabulary
- Case studies of 11 eco-regions in the U.S., highlighting regional impacts to habitats and wildlife, and information on what kids can do to help
- A 12-minute, high-definition video on climate science, impacts on, and solutions for wildlife and wild lands; segmented for ease of use in any setting
- Classroom activities keyed to national science standards, developed by participants in the 2008 Albert Einstein Distinguished Educator Fellowship Program
- Links to a wide variety of educational resources developed by all 7 federal agencies for use in formal and informal settings

On behalf of all the agencies involved in the creation of the Climate Change, Wildlife and Wildlands Toolkit for Formal and Informal Educators, we invite you to use the information and lessons contained in it to educate, inspire, and engage students everywhere to become stewards of our nation's wildlife and the habitats on which they depend!

National Science Education Standards:

Grades 5-8

Science as Inquiry

Abilities necessary to do scientific inquiry
Understandings about scientific inquiry

Physical Science
Properties and changes in properties in matter

Life Science
Structure and function in living systems
Diversity and adaptations of organisms
Regulation and behavior
Populations and ecosystems
Reproduction and heredity

Earth and Space Science
Structure of the earth system

Science in Personal and Social Perspective
Personal health
Populations, resources, and environments
Risks and benefits
Science and technology in society
Natural hazards

History and Nature of Science
Science as a human endeavor
Nature of science

Science and Technology
Understandings about science and technology

Natural Inquirer Science Journals: Climate Change Collection
Michelle Andrews? Don Howlett?
Target: Middle School

Short:
Incorporate the *Natural Inquirer* science education journal into your classroom to teach climate change topics. Hands-on climate change activities for your classroom will be provided.

Long:

The *Natural Inquirer* is a middle school science education journal where U.S. Forest Service scientists share their research with students. The *Natural Inquirer Climate Change Collection*, contains several editions highlighting climate change research in an easy to read format for students.

All of the research in this journal is concerned with nature, trees, wildlife, insects, outdoor activities and water. First students will "meet the scientists" who conduct the research. Then students read special information about science, and then

about the environment. Students will also read about a specific research project, written in a way that scientists write when publishing their research in journals. Students become scientists when they do the Discovery FACTivity, learning vocabulary words that help in understanding articles.

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History and Nature of Science
Science as a human endeavor
Nature of science

Science and Technology
Understandings about science and technology

Two webinars in April:
TBD