



PRCST LAUNCHES NEW INITIATIVE

ENVIRONMENT and HEALTH: A Systems Approach A report on the Stakeholders' Meeting May 3, 2006

On May 3, 2006 a group of twenty-five participants met to consider the status of educational components that address today's Environment and Health interactions, the education needs and their priorities. The attendees were comprised of four educational administrators, six teachers, eleven representatives of agencies (governmental and NGOs), and two business leaders. The meeting was held with support from the PA Department of Education- Office of Environment/Ecology, Carnegie Mellon University, and the School of Education, University of Pittsburgh.

The group was led by the Pittsburgh Regional Center for Science Teachers (PRCST), chaired by Jane Konrad, Executive Director, who briefly reviewed the previous work of PRCST. Dr. Alan Lesgold, Dean, School of Education, University of Pittsburgh, gave an overview of the proposed program and the morning's charge for the participants.

Dr. John Jakicic, Chair, Department of Health and Physical Activity, School of Education, University of Pittsburgh, spoke to the need for the proposed program of professional development that works across the disciplines of environment/science, health and physical activity. Ed Moretti, PRCST Advisory Board member, explained the procedure for the morning and Dr. Indira Nair informally welcomed the group. Dr. Patricia Vathis, PA Department of Education Environment/Ecology Advisor, was unable to attend, but sent word of support for the proposed program.

The understanding of health in the context of the diverse types of complex environments in which we live is essential to informed decision making. It is essential therefore for students to develop a framework for thinking and learning how to seek relevant information and use it in the best way. An approach that frames these discussions in an interdisciplinary way as the "system of health and environment" is helpful in learning as well as in giving the students a "mental model" which enables them to seek and place new information in context, and to bring various skills to make good decisions. Thinking of the environments –local and global, indoors and outdoors, urban, suburban and rural –,

their interrelationships and how the different environmental aspects promote good health and healthy habits can be a powerful approach to teaching science and technology as well as social studies and health sciences,

This project development of a Professional Development Initiative that would assist teachers in constructing, assessing and revising teaching units suitable to their classes that would enable them to teach about health and the environment as a system. A systems approach enables the students to better understand concepts and issues and their interrelationships.

In today's rapidly changing and complex world, teaching everything students need to know is no longer realistic, and life-long learning is an essential habit to develop early in their education. Content knowledge doubles swiftly, and technological advances alter the applications of knowledge as quickly. Increasingly, we have to make decisions that involve complex systems of environment and health and their impacts on each other that are emerging at levels from local to global. Integrating study of these systems into the existing K-12 curricula calls for professional development opportunities for educators that include not only content, but an understanding of: 1) a systems approach, 2) recent research in brain-based learning, 3) means of curricular integration, and 4) linkage to standards.

“national surveys repeatedly ...find that environmental health is one of the top priorities of the American public. Americans believe that reducing exposures to adverse environmental agents is the best way to protect their health and the health of their children. This belief is supported by a continually growing base of knowledge that environmental chemicals may be important triggers of many human medical problems.”

National Institute of Environmental Health Sciences

Preventive Medicine: Chemical, the Environment and You, 2000, NIH and NIEHS

Stakeholders' Meeting

Participants worked in five groups that included representatives from each of the areas, discussing the needs as seen from the different viewpoints. Participants had been encouraged by Dr. Lesgold to provide examples of their selection of existing needs and their priority ratings. Working from a needs list that was not exhaustive, participants quickly expanded the list and defined more specifically many of the areas they felt were important to address in professional education programs. Groups were asked to agree on three important needs and report out on their work. Two areas emerged as important across the groups: 1) the need for increased online involvement, including a clearinghouse or database of resources and continued communication avenues, and 2) a focus on careers in each of the areas of environment/science, health and physical activity.

Working with and within communities was emphasized; leadership training, specific resources for teachers, and access to help/grants and inexpensive or free programs were also emphasized.

Plans call for a pilot program for 5-6 school districts working with teams of several teachers representing environment/science, health and physical activity. Two all-day workshops in the fall, 2006 would be followed by online and potential site visit

support, with a spring report out meeting. Data would be collected on “what works” as the existing curricula are enhanced and connections made across disciplines.

During the interim, webinars and web-based clearinghouse and communication access will be developed. Tours with a focus on specific curricular needs will be offered. Financial support will be recruited.

Some participant comments included: (condensed)

Need for latest information, especially dealing with teens
Need to make connections
Need for teacher interaction online
Students need help with graduation projects
Have a culture where teachers want to work together to integrate and coordinate activities
More powerful impact when able to “see” and “feel” the aspects of health and environment issues
Career development/internships/opportunities
Very important to have lab activities, equipment, and supplies
Health risks and risk perception
Website with links to programs/resources under specific health/environment issues/standards – clearinghouse – online courses
Decision making – what are the complex issues
Local action/activities – field trips
How to fit into existing curriculum
Community project - outreach programs
Inservice programs-demonstrations
Access to research – simplify
Communicate and educate leadership
Talk about/monitor behavior
Develop a standards based template for decision making
Systems approach – pedagogy

A Steering Committee was selected and will convene in September, 2006.

If you have suggestions related to this initiative, or if you are interested in participating actively, please contact Jane Konrad, PRCST. Schools are being recruited to send teams of teachers to the year-long pilot initiative.

OBESITY – A CRISIS

With so many Environment-Health interactions facing us today, The PRCST Environment and Health Initiative (E-H-I) will focus on two major problem areas:

1) The obesity crisis and 2) air pollution – mercury levels.

1. So – are we big-boned, stocky? Do children have baby fat”? Is a little extra weight like a bank account? Are BMIs alone true indications of “fat” problems? And how do we handle results from these required measurements?

Reports:

One government funded study reported that 64% of Americans are overweight. This includes 30% who are obese. And actually, health advocates and doctors have warned for years that American children were getting fatter. It is reported that obesity rates have tripled over the past 40 years for children and adolescents. This elevates the risk of diabetes and other health problems. Federal officials say that more than one third of American children are overweight, with about 17% considered obese. And there are alarming statistics about the rise of Type 2 diabetes.

This has become such a national issue that many school districts are instituting “wellness” programs that include things like substituting calorie and sweet laden soda pop in vending machines with fruit juices and other low calorie drinks. Some have altered the lunch menus in an effort to promote healthier lunches for children, with more fruits and vegetables and smaller portions. Are there real interactions with the physical education departments?

The amount and kind of physical activity is one obvious connection, along with readily available prepared foods, high calorie fast foods and snacks, and some other environmental components. Relevance of physical activity levels, nutrition and food selection, and body functions are obvious places for nexus.

But where in today’s curriculum do we directly address these connections and possible areas of help. If health and physical education teachers highlight this problem, is it also addressed in the environment/science classroom? Do teachers align classroom work with the Environment/Ecology standard areas

- “Environmental Health”?
- “Humans and the Environment”?,
- “Environmental Regulations”?

And is there a correlation across disciplines in how this issue is addressed and utilized as a basis for risk assessment and decision making opportunities?

*(note: PA School Wellness Programs are now a mandate for all school districts.
This initiative will coordinate with these programs)*

MERCURY LEVEL CONCERNS

2. Air Pollution – Mercury emissions

Can mercury emission from coal burning power plants be reduced? Four out of five Pennsylvanians would like to see this reduction, according to a recent report by a state-wide environmental organization – Citizens for Pennsylvania’s Future. Pennsylvania has 36 coal fired power plants – some are older plants that are among the largest polluters in the nation (Pa is second only to Texas in total emissions of mercury).

Mercury is a heavy metal that is a neurotoxin. It moves from the air to waterways and eventually accumulates in fish flesh. When this is ingested, mercury exposure can be very harmful, especially to babies, children, and pregnant women - causing attention and language deficits, memory loss, and impaired visual and motor functions. Studies of fish eating populations have linked low level mercury exposure in young children to subtle neurological impairments and behavioral functioning such as hearing, eye-hand coordination, and learning ability.

So – how about tuna? There are varying reports. Canned chunk light tuna has been considered the safer choice according to FDA data. However, recent analysis has shown that sometimes this tuna has mercury at albacore levels, even twice as much on occasion – without FDA warning. Currently it is felt that young children up to 45 pounds can safely eat about ½ to one 6-ounce can of chunk light tuna per week. As we address this concern, can we find linkage to our diets? Food Pyramid? School Lunches?

Can we capture/retain these mercury emissions? What alternative energy sources are available? What can be developed? What components of air pollution are the focus of current concern?

(Note: See reports in the Synergy section about summer workshops and field trips related to this subject. Added Note: Synergy will be delayed to add pictures).

WHAT DOES THE ENVIRONMENT HAVE TO DO WITH WOMEN'S HEALTH?

The Center for Environmental Oncology presented a Panel of Environmental Scientists on June 28, 2006 at the University of Pittsburgh Biomedical Science Tower South. After a “Healthy Lunch” panelists presented research findings related to the release of Vassar College’s “Environmental Risks of Breast Cancer”. The panel was introduced and led by Devra Lee Davis, PhD, MPH, Director, Center for Environmental Oncology of the University of Pittsburgh Cancer Institute. Attendees were provided with a CD-ROM of the Vassar report and much related material.

For further information on this program and other resources visit their website www.environmentaloncology.org The site contains a brand new “Guide to Green Living” featuring information on clean air and water, green buildings, safe alternatives to chemicals found in pesticides and household cleaners, and much more. There is a new “Ask a Question” feature.

EDUCATION NEWS

ASCD's COMMITMENT TO HEALTHY SCHOOLS

ASCD debuted their Health in Education initiative in 1998 with support from the Robert Wood Johnson Foundation, to address specific public health issues affecting students within their communities, to educate school communities about those issues, and to create awareness of professions within the public health arena.

With new funds ASCD developed a research-based assessment tool – the Healthy School Report Card. ASCD's Healthy School Communities program is part of a large, multi-year plan that is designed to shift public dialogue about education from an academic focus to a whole child approach to learning that encompasses all factors that comprise successful learning. ASCD intends to “recast the definition of a successful learner from one whose achievement is measured solely by academic tests, to one who is

knowledgeable, emotionally and physically healthy, civically engaged, prepared for economic self-sufficiency, and ready for the world beyond formal schooling.” Visit www.ascd.org and go to Education Issues.

TEACHER-TO-TEACHER INITIATIVE

U.S. Department of Education

A Teacher-to-Teacher workshop was held in Pittsburgh, PA Monday, July 17, 2006 at the Hilton Hotel. A large and diverse group of educators from across the country attended this informative and interactive workshop. This initiative was created by and for America’s teachers. It supports teachers’ efforts in the classroom through professional development workshops and e-learning and by sharing relevant information through e-mail updates.

Research confirms that teachers are the single most important factor in raising student achievement. Highly qualified teachers can maximize every child’s potential to meet high academic standards. Good teachers are essential to closing the achievement gap and ensuring that no child is left behind.

A wide range of topics featured prominent teachers and district officials who shared research-based practices. The topics covered the core content areas and - included research-based professional development, effective use of data, and teaching strategies to reach all students.

To learn more about the Teacher2Teacher initiative visit www.ed.gov/teacherinitiative

EDUCATION NEWS PARENTS CAN USE

The U.S. Department of Education’s monthly television program wrapped up the spring season with its June edition, “Child Health and Nutrition”, which highlighted national and local programs that encourage children to eat right and exercise. The show also discussed nutrition guidelines from the U.S. Department of Agriculture’s new food pyramid and featured a pilot program in Wisconsin that is spreading throughout the Appleton School District.

To view past broadcasts visit www.ed.gov and click on “parents”, then “News Parents Can Use”, or call toll-free 1-800-USA-LEARN

MY WONDERFUL WORLD

The National Geographic Society has launched “My Wonderful World”, a five-year public engagement campaign to combat geographic illiteracy. It aims to motivate parents and educators to increase the geographic resources available to students aged 8 to 17 at home and in the classroom, “Geography exposes children and adults to diverse cultures, different ideas, and the exchange of knowledge from around the world”, says Anna Marie Weselak, president of the national PTA.

The National Geographic-Roper Public Affairs 2006 Geographic Literacy Study surveyed 510 young Americans and revealed the “dire need for geographic awareness among today’s youth and their lack of basic skills required for navigating the international economy and understanding the world around them.” Some findings:

- 48% could not locate Mississippi on a map of the U.S.
- Fewer than 3/10 think it is important to know the locations of countries in the news.
- 47% could not find the Indian subcontinent on a map of Asia

For more information visit [www.mywonderful world.org](http://www.mywonderfulworld.org)
(from ARC News, ESRI International Conference Issue, Summer 2006)

TECH-SAVY TEACHERS

South Carolina’s innovative ePortfolio system is helping educators get up to speed on technology and become more comfortable integrating new tools into their classrooms. The ePortfolio system offers both diagnostic and prescriptive information to meet individual teacher technology needs. The system works in stages:

Self-assessment

Plan creation

Professional development

Verification of proficiency

Final evaluation

“Success of the pilot program has promoted state and district discussions regarding how all stakeholders can work together to streamline data collection, analysis, and decision making. The state is well on its way to creating classrooms in which technology plays a vital role”.

(T.H.E. Journal, July 2006)

PITT IS LEADER IN NANOTECHNOLOGY RESEARCH

According to a recent survey of colleges and universities by the magazine, Small Times, Pitt’s “breadth of expertise, resources, and publishing activities put Pitt near the top for micro and nanotech research”.

A nanometer is about the diameter between two atoms in a solid object. Nanotechnology is not just making objects smaller, said Hong Koo Kim, Professor of electrical engineering and co-director of Pitt’s Institute of NanoScience and Engineering. “It is about building the object from as small a point as possible. We bring in a new functionality...that means that we can open totally new areas of study, industry or economics”.

LEWIS AND CLARK – END OF A CELEBRATION?

September 2006 marks the end of the national celebration of the Voyage of Discovery by Meriwether Lewis and William Clark during 1803-1806. These explorers traveled more than 8,000 miles by land and river opening the Louisiana Purchase to Army exploration and settlement.

As the celebration enters the homestretch, public interest grows less and less. In fact, many commemorative events have drawn smaller crowds than planned for. In Pittsburgh, it seemed as if all interest and focus was lost once the commemorative

expedition launched in August 2003. And the eastern U.S., while playing a very significant role in getting this expedition on its way, has shown little sustained interest.

There were, it is true, many problems connected with this expedition, including treatment of the Native Americans – who actually helped the party survive the grueling trip. But it remains that the journals kept by party members provided a tremendous amount of accurate and valuable information well before this would have been available.

PRCST maintains a viable website that focuses on the scientific aspects of the expedition. www.education.pitt.edu/lewisandclarkpgh

A new addition to this site is development of an interactive education page, funded by The Laurel Foundation, where teacher-generated lesson plans are listed. A “Webquest” is available for student research. As well, a student-centered interactive page is under development where students can find games and puzzles.

If you have lesson plans you care to share, please contact PRCST. Consider the value of this very interdisciplinary study as an on-going resource easily integrated into your existing curriculum...either as a unit of study or to enhance one lesson area. Explore the findings of the microscopist who examined the actual herbarium specimens from the expedition. Compare the plants (and animals) found by Lewis and Clark with those still in existence today...their ecosystems and value.

This expedition was very probably the most significant event in the history of America and its development. The celebration will end this September in St. Louis where fireworks displays are planned, riverboat tours, and a concert by Nikko Smith – a finalist on the 2005 season of “American Idol”.

(Note: The next issue of Synergy will provide additional information about the PRCST website and activities.)

ENVIRONMENTAL NEWS

A SWELTERING SUMMER

How hot was it? How hot were you? Temperature in parts of Europe soared to 104⁰F causing at least six deaths. A searing heat wave swept the United States with Death Valley reaching 125⁰F...resulting in at least 179 American deaths (mostly in CA) and also deaths of animals, especially livestock. Milk production decreased. Here in the Pittsburgh area we melted under 90⁰ and plus while it reached 98⁰ in NY and Philadelphia. But this was better than the 105⁰ in Dallas and 112⁰ in Las Vegas.!

The federal government reported in mid-July that the first half of the year was the warmest in the United States since record keeping began in 1895.....3.4 degrees above average for the 20th century. But it is difficult to draw conclusions about the relationships between the heat waves and global climate change. Severe heat waves occur less often than other weather events and arise from specific weather conditions.

Yet, most of the experts feel it is important to pay attention to these high temperatures. NOAA reported that the first six months in 2006 were the hottest on record in the U.S. and England’s hottest July in record keeping (since 1659). Scientists are particularly worried about the increase in nighttime temperatures – times when people recover from excessive heat during the day. During the last decade 23% of the nation had

hot summer nights. By comparison, from 1964 to 1968 only 2% of the country on average had abnormally hot nights.

GLOBAL WARMING – CLIMATE CHANGE?

The Earth is the hottest it has been for 2,000 years! The National Academy of Sciences, after reconstructing global average surface temperatures for the past two millennia, said that the data are “additional supporting evidence...that human activities are responsible for much of the recent warming”. In the Academy’s report to Congress they outlined how researchers drew conclusions about the Earth’s climate going back thousands of years, before data was available from modern scientific instruments.

Scientists looked at “proxy” evidence such as tree rings, corals, marine and lake sediments, ice cores, boreholes, and glaciers. The report stated. “Recent warmth is unprecedented for at least the last 400 years and potentially the last several millennia”.
<http://earthobservatory.nasa.gov/Newsroom/MediaAlerts/2006/20060622222512.html>

Something is Happening

A large study by Trout Unlimited shows that Pennsylvania’s state fish – the native brook trout – is on the decline here and throughout the eastern U.S. as a consequence of climate change and other factors. The seas are warmer. This year almost none of the 20,000 pairs of Cassin’s auklets nesting in the Farallones will raise a chick that lives more than a few days. Changes in West Coast climate patterns have caused a delay in the seasonal upwelling of cold, nutrient-rich waters from the ocean’s depths. Weak winds and faltering currents have left the Gulf of the Fallarones without krill – a staple of auklet food.

Researchers predict that global warming will lead to the dropping of water levels in Lake Erie over the next 50 years. Some connect severe weather to climate changes. Last year the U.S. had the most extreme weather since 1910 – largely because of the hurricane activity.

The diversity of bees, and of the flowers they pollinate, has shown a significant decline in Britain and the Netherlands during the past 25 years – reported in an article in *Science*, noting that changes in habitat, climate and modern industrial farming are possible factors. Energy systems were strained, resulting in blackouts, brownouts, and voluntary and mandated power reductions.

Scientists wonder whether last years erratic weather was not a fluke – but a troubling beginning trend.

2006 INTERNATIONAL YEAR OF DESERTS AND DESERTIFICATION

According to the United Nations Millennium Ecosystem Assessment, “desertification threatens dry land areas that make up 34% of the earth’s total land are and are home to about 2 billion individuals.” Pressure from population growth, climate change, and poor agricultural practices can cause degradation. (U.S. population in October to be 300 million)

This degradation can cause mass migration, famine, dust storms, and political instability ---all contributing to health problems in affected regions.

(from JAMA, June 7, 2006)

Some effects of warming you may have experienced:

More mosquitoes

More poison ivy

More ragweed

Some Good News!

Some Greenlanders see global warming as a welcome change. Melting glaciers reveal more land for reindeer ranchers – where their reindeer can now munch on wild thyme and other flowers. More water pouring into rivers may provide a source of hydroelectricity. Their growing season has been extended by two weeks already, leading to improved crop production. One man's trash??????

ORGANIC FASHIONS?

Chemical-insecticide-pesticide free cotton is being used in clothing being marketed by several designers. Wal-Mart Stores, Inc. and Nordstrom, Inc. are using it as their private label brands. Armani already markets hemp shorts and sweaters, and now there is a corn-fiber knit shirt – called “ecologically responsible and technically advanced”.

Organic cotton is more available and of better quality than it was in the early 1990s.

MAY RAIN

A gigantic hatch of mayflies actually showed on the radar images along the Mississippi River from counties in Wisconsin, Iowa and Minnesota June 30th. Teachers searched in vain for their larval forms in sediment dredged up during the GLOBE workshop on the Pittsburgh Voyager June 27th on the Ohio, Allegheny and Monongahela Rivers.

AMPHIBIAN EXTINCTION?

Almost a third of the 5,743 known amphibian species are already threatened because of habitat loss, climate change, pollution, invasive species, pesticides, and ultraviolet radiation. 122 species have become extinct since 1980!. And these figures may be an underestimate.

Fifty international amphibian experts have sent out an SOS calling for an urgent global mission to avert a cataclysm –they predict a mass extinction of the world's frogs, toads, newts, and salamanders – in a recent Science journal. This is an extinction of not just one member of a species, but of a WHOLE CLASS of organisms.

Canaries of the environment?

A rapidly spreading fungal disease is predicted to wipe out about half of the amphibian species within six months of its entering a new ecosystem. Chytridiomycosis damages the skin – amphibians are more susceptible to changes in the environment than other animals because their skin absorbs water and oxygen, and their lives depend on clean, fresh water.

This is unprecedented in global impact, and unprecedented in the speed of the extinction according to the Conservation Breeding Specialist Group.

(note: Have you remained current in the status of amphibians – especially frogs? Are you continuing to document/research the deformities reported over the last few decades? Some

reports were developed by teachers participating in the “Standards and Strategies in Science Education” online course at the University of Pittsburgh in the 90s.)

ON THE OTHER SIDE!

James Lovelock, one of the world’s leading atmospheric scientists, predicts that Earth’s population will drop by 80% by the end of this century. He proposes that the earth is about to “catch a morbid fever that may last as long as 100,000 years”. He states that we are well on our way to the hottest we have been since we were 55 million years ago.

He says that “Everybody forgets the greatest damage we’ve done to the earth is not so much the emissions from greenhouse gases, but taking away the natural resistance from the farmland ecosystem. By doing that, we have disabled the planet’s ability to regulate itself.”

You can check these ideas in his latest book, “The Revenge of Gaia”. Have you learned about his Gaia hypothesis?

SOME GOOD NEWS

The most endangered of all sea turtles, the Kemp’s ridley, is coming back from the brink of extinction. Early in July more than 200,000 hatchlings found their way to the sea. Teams of Mexican and American biologist volunteers patrol miles of remote beaches for nests and dig up the eggs to protect them from predators and poachers. The freshly hatched sea turtles are taken from their protective crates and placed one by one on the sand. In about 10 minutes they have made their slow way into the Gulf of Mexico. This release is a new benchmark for the joint conservation effort between Mexico and the United States that began 25 years ago. In 1965 only 702 nests were found.

A second nesting site is being established in Texas, where 94 turtles have come ashore and nine nests were recorded.

NIGHT FLIGHT WARNING

A recent article in the journal Nature reports a new study on global warming that states that restrictions on overnight flights by airlines could reduce the industry’s contribution to climate change. Meteorologists from the University of Reading in southern England say that contrails left behind high-flying jets during the day actually have a cooling effect – they are white and reflect some of the sun’s energy back into space. They warn that those generated by night trap heat emitted by the Earth’s surface, creating a “greenhouse effect” that adds to the warming.

(Note: teachers participating in the GLOBE Atmosphere Protocol workshop conducted by PRCST in 2005 studied the daily cloud cover, including contrails from airplanes. This will also be studied in the October 14, 2006 workshop)

THREATENED MARINE LIFE

The ocean’s pH is changing, threatening corals and other marine creatures in the ocean, caused by carbon dioxide from burning fossil fuels. Researchers estimated that between 1800 and 1994 the world’s oceans absorbed 118 billion metric tons of carbon, reducing the natural alkalinity of seawater. (a metric ton is 2,205 pounds). The panel of

researchers was convened by the National Science Foundation, National Oceanic and Atmospheric Administration and the U.S. Geological Survey.

CO2 EMISSIONS FLAT, BUT U.S. ECONOMY STILL GROWS

The U.S. Department of Energy reports that the U.S. economy grew by 3.5 percent in 2005, but carbon dioxide emissions that cause global warming were essentially unchanged from 2004. So much for the alarmist rhetoric from global warming deniers that limits on carbon will kill economic growth. Conservation and renewable energy that reduce global warming emissions boost our economy.

www.PennFuture.org

PENNFUTURE PROTECTS MCCONNELL'S MILL STATE PARK

Park lovers in Lawrence County had even more reason to celebrate the Fourth of July weekend this year as PennFuture claimed victory in a legal dispute over a landfill proposed for just outside the boundaries of McConnell's Mill State Park. Thanks to the tireless and effective work of our attorney, George Jugovic, Sechan Landfill Industries last week withdrew its appeal of a permit application denial for the landfill. PennFuture joined with Friends of McConnell's Mill to oppose the initial application for the landfill permit, which DEP denied. PennFuture also intervened in the appeal process and provided the legal counsel from start to finish. The landfill would have harmed not only the park but also Slippery Rock Creek, a coldwater fishery and source of drinking water for 40,000 people. www.PennFuture.org

OZONE HOLE RECOVERY

Scientists from NASA and other agencies have concluded that the ozone hole over the Antarctic will recover around 2068, nearly 20 years later than previously believed. The Antarctic ozone hole is a massive loss of ozone that occurs each spring in the Southern Hemisphere – caused by chlorine and bromine gases in the stratosphere, an upper layer of the atmosphere. Those gases come from human-produced chemicals such as chlorofluorocarbons (CFCs). (Note: James Lovelock helped discover the CFCs and their impact.)

SCIENCE SNIPPETS

300 MILLION U.S. POPULATION SOON

The 300 million population number is the target for fall, 2006. Immigrants and Latinos born in this country are driving the population growth. The U.S. is the third largest country in the world behind China and India. 2.8 million people were added last year – a little more than a million from immigration and about 1.7 million from births outnumbering deaths according to an AP writer. “The U.S. adds a person every 11 seconds, according to the clock. A baby is born every eight seconds, someone dies every 13 seconds, and someone migrates to the U.S. every 30 seconds.”

HEALTH ALERT

Are some shampoos, soaps, and body lotions bad for young boys? A preliminary finding by the National Institute of Environmental Health Sciences is that lavender and

tea tree oils – often added for aroma and marketing, may cause hormonal imbalance and breast growth in young boys. Still unknown are the tolerable limits of these compounds. Symptoms subside after boys stopped using the products.

ICE METEOR

A giant ice ball fell out of the sky in Africa on July 7, 2006 – one of Africa’s first known impacts from a meteorological mystery known as a megacryometeor. Such phenomena have been reported since the 19th century – a swarm of the ice balls fell on Spain causing excessive damage.

SPACE DUST – CLUES TO COMETS

The Stardust spacecraft contained blocks of aerogel, a silicon-based solid with a porous, sponge-like structure in which 99.8% of the volume is empty space. This cushioned the impact of the comet-dust particles that stuck up to 6 times the speed of a rifle bullet. (Jet Propulsion Laboratory) Stardust traveled nearly three million miles and a sample-return canister was parachuted onto the desert salt flats of Utah in January. Scientists have been conducting non-destructive studies using X-ray beams to study the elements left along the track made by the particles passing through the aerogel, as well as the particles themselves.

CARBON FIBER CARS

In the future cars might be lighter, cleaner and more fuel-efficient made in part from recycled plastics, lignin from wood pulp and cellulose. Carbon fiber is 1/5th the weight of steel, yet just as strong and stiff. Today the cost is too high to be commercially feasible. Researchers at Oak Ridge National Laboratory are working on the challenge.

FIRST NEUTRONS OBSERVED

Collaborators from six DOE laboratories celebrated observation of “first neutrons” at the Spallation Neutron Source (SNS) on April 28, 2006. Experiments will help lay the groundwork for new materials research. Neutron science plays a significant role in developing new materials that are lighter, stronger and cheaper while performing under severe conditions. For full information see

http://www.anl.gov/Media_Center/News/2006/IPNSo6o421.html

NEW PEARLY PILLS

Pearlescent pigments can be used on any drugs that are swallowed, including pills, tablets, and liquids. The pigments produce a sparkly metallic, satiny and shimmery finish...in hues of red and gold. The FDA final approval came after eight years. The pigments are made by coating the mineral mica with either titanium dioxide or iron oxide. Similar pigments are used in makeup – lipstick, eye shadow, and nail polish – and in inks and automotive paint.

WIND ENERGY AT CANON-MCMILLAN

Students at Canon-McMillan High School will get a first-hand view of how wind energy can be converted into power. PA DEP chose the high school, along with the

Southwestern PA Water Authority in Jefferson, Greene County to receive a 35-foot-high technologically advanced wind turbine.

ENTOMOLISTS GUARD FOR UNWANTED INVADERS

The Asian ambrosia beetle, native to Siberia, was caught near the Pittsburgh International Airport, first captured in the spring of 2005. Not appearing to be a threat, the little alien made its way into the U.S. innocently, probably in a wooden spool or pallet. But this discovery and identification emphasizes the intense scrutiny starting to be focused on invasive insect, plant and animal species after the attack on Sept. 11, 2001. Scientists from the Carnegie Museum of Natural History are including “applied research” to their basic research activities. The Carnegie opened its Biodiversity Services Facility in response to a request from the Department of Agriculture, that needed a place to identify quickly and accurately an increasing backlog of insect specimens collected by a variety of programs. A post-Sept. 11 mandate of the Department of Homeland Security and the Agriculture Department’s Animal and Plant Health Inspection Service is to prevent the introduction of new, potentially destructive species. *(from Pittsburgh Post-Gazette, July 16, 2006)*

DIRECTIONS

GLOBE WORKSHOP –Atmosphere Protocol. Mingo Creek Park, hosted by the PA NASA Educator Center in collaboration with the Amateur Astronomers Association of Pittsburgh (AAAP). Conducted by PRCST.

BECOME A CERTIFIED GLOBE TEACHER!

A certified GLOBE teacher is qualified to guide students in taking GLOBE environmental measurements, report data to the GLOBE database, and use GLOBE Mapping and Graphing utilities to visualize data.

*** Come join in the GLOBE Atmosphere Investigations ***

GLOBE is a hands-on, school-based science and education program that unites students, teachers, and scientists I study and research about the dynamics of the Earth’s environment.

Join the Hands-on Workshop October 14, 2006

Five Act 48 Hours

This workshop will include training for teachers in the GLOBE Atmosphere protocols including hands-on sessions, and inquiry-based activities aligned with the Pennsylvania Academic Standards. Location is the Observatory at Mingo Creek County Park, hosted

by the Amateur Astronomer's Association of Pittsburgh. Solar viewing through the new 24" telescope will be offered, as well as an invitation to a star-gazing party.

The workshop is conducted by the PA NASA Educator Resource Center. PRCST, and sponsored by the PA NASA Space Grant Consortium. GLOBE trainers will be Charylene Philp, NASA GLOBE partner and Lisa Brown PH.D., Director, PA NASA Space Grant Consortium.

Proposed Workshop schedule:

<u>8:00am</u>	Registration and welcome Pre-survey
<u>8:15am</u>	Earth Systems Activity-Global Patterns Introduction to GLOBE
<u>9:30am</u>	Cloud Type Protocol
<u>10:30am</u>	Digital Multi-Day Maximum/Minimum Thermometer
<u>11:00am</u>	Break
<u>11:15am</u>	Cloud Cover Protocol
<u>12:15pm</u>	Precipitation Protocol – Demo Relative Humidity
<u>1:00pm</u>	Data Entry – GLOBE Database
<u>1:30pm</u>	Post-survey:Assessment

Breakfast and break refreshments are provided.

All teachers will receive workshop supplies along with related NASA resources.

Early registration is recommended since space is limited.

There is a small registration fee of \$20.

To register call or write Jane Konrad at the Pittsburgh Regional Center for Science Teachers (PRCST) at 412/648-7315; fax 412/648-7081; email konrad@pitt.edu

GEOGRAPHY MATTERS BLOG is an area on the GIS.com website designed to facilitate communications between users of geospatial technology who would like the opportunity to share how geography and GIS make a difference in our lives.

www.esri.com/geographymatters

GIS DAY 2006 The 8th annual GIS Day celebration. Held as part of the National Geographic Society's Geography Awareness Week and Geography Action! Initiative. Nov. 15, 2006. For more information or to register your GIS Day 2006 events visit

www.gisday.com

WILDLIFE HABITAT COUNCIL 18TH ANNUAL SYMPOSIUM "Connecting People and Nature", explore the complex relationships between society and the natural environment. New indoor workshops and engaging field trips. Keynote speaker is David Sobel, the leading expert on place-based education. A live animal demonstration by the Maryland Zoo in Baltimore. November 13-14, Hyatt Regency Baltimore, Baltimore, MD. Register online www.wildlifehc.org

SCIENCE PROGRAMS at the Rachel Carson Homestead, a five-room, turn-of-the-century farmhouse and its grounds...once the home of the author of “Silent Spring” (that led to the banning of DDT and creation of the U.S. EPA). A quarter of a mile nature trail plus guided tours of the homestead and grounds is available. Visit www.rachelcarson.org or call 724/274-5459.

“The ‘control of nature’ is a phrase conceived in arrogance, born of the Neanderthal age of biology and the convenience of man” – Rachel Carson

VISIT RADTOWN USA This is a new web site launched by EPA using an animated town to provide basic information about radiation in the environment. This is a virtual tour that shows a wide variety of radiation sources commonly encountered in everyday life.....a laser show, x-rays, walking in a summer day, alerts from a smoke detector, or passing through security at an airport. Visit <http://www.epa.gov/radtown>

FERMILAB’S “RESULT OF THE WEEK” For some of the most interesting research results from Fermilab, see the *Result of the Week* Column, each Thursday . Also online archives with graphics and photos give a quick overview of the various items. The archive also includes access to the items from several prior years. See <http://www.fnal.gov/pub/today/resultoftheweek/index.html>

(The above two references are from ReActions and the American Nuclear Reaction, May 2006, Vo. 22)

WATERSHED WORKSHOP IN WESTERN PA Saturday, October 14, 2006 at the Felician Sisters of PA Provincial House in Coraopolis. This workshop is free, but space is limited. To register call 1-800-321-7775. Topics may include stormwater management, wetlands protection, total maximum daily loads, and much more. Light breakfast and lunch provided.

ART CONTEST FOR CHILDREN in grades 2-4. “Polar Exploration: Going to Extremes” relates to the upcoming 2007-208 International Polar year. Students pick a polar region and then draw a picture showing what they learned. Winner - \$250 savings bond; 2nd \$100; 3rd \$50. For more information see <http://www.strategies.org/ArtContest>

DATABASE

FREEBIES FROM NSTA: Many resources and services – many free:
http://science.nsta.org/newsletter/2006-06/high_school.htm

HOWARD HUGHES MEDICAL INSTITUTE (HHMI) An interactive website for primary grades. Cool Science for Curious Kids: <http://www.hhmi.org/coolscience>
Also Biointeractive, with virtual labs and other interactive activities. Visit:
<http://www.hhmi.org/biointeractive>

WRIGHT CENTER FOR INNOVATIVE SCIENCE EDUCATION at Tufts University: workshops for teachers and FREE posters and curricular materials – some available on-line for free download. Materials range from Space Science and Cosmic Evolution to the Physics of Music and Ben Franklin and Electrostatics. Visit http://www.tufts.edu/as/wright_center

THE LAST JOURNEY OF THE LEATHERBACK A 27 minute film about the plight of ancient sea turtles with appearances by leading marine scientists. FREE with a teacher's kit. Visit <http://www.seaturtles.org/teachers.cfm>

NATIONAL SCIENCE DIGITAL LLIBRARY (NSDL) A digital library of exemplary resource collections and services, organized in support of science education at all levels. Consult <http://www.nsd.org> for more information.

DIGITAL LIBRARY FOR EARTH SCIENCE EDUCATION (DLESE) focuses on Earth Sciences. Tips, suggestions for using the resources in addressing concerns like diversity, and other review-like coments. Visit <http://www.dlese.org>

CALENDAR OF EVENTS

NSTA Regional Conventions:

October 19 - 21, 2006
Omaha, Nebraska
NSTA Mid-Western Area Conference

November 2 - 4
Baltimore, Maryland
NSTA Eastern Area Conference

December 7 - 9
Salt Lake City, Utah
NSTA Western Area Conference

AAAS WORKSHOPS:

A workshop on "Using Atlas of Science Literacy" has been scheduled for December 12-14 in Maine, joining two other Atlas workshops that are scheduled for the second half of 2006 (October 16-18 in Washington, DC and November 15-17 at FERMILAB in Batavia, Illinois).

The Maine workshop, co-hosted by the Maine Mathematics and Science Alliance, will take place at the Marriott at Sable Oaks in South Portland, Maine, and is designed for K-12 science teachers, curriculum specialists, and other educators. The workshop will help

participants use the Atlas strand maps and related Project 2061 resources to enhance their own understanding of science literacy and take a benchmarks-based approach to improving curriculum, instruction, and assessment.

Early-bird registration rates are still in effect, but workshop space is limited and fills up quickly. To secure your spot and receive the discounted rate, we encourage you to sign up as soon as possible. For more details and a registration form, please visit <<http://www.project2061.org/060707/events/workshops>>.

For information on workshop scholarships, click on <<http://www.project2061.org/060707/events/workshops/scholarship.htm>>.

Sept. 8 INTERNATIONAL LITERACY DAY

Oct. 14 GLOBE WORKSHOP – Atmosphere Protocol, Saturday morning 8:00-1:pm. Mingo Creek County Park – AAAP Observatory. Five Act 48 hours. Contact PRCST. (see directions)

Oct. 14 WATERSHED WORKSHOP – Coraopolis (see directions)

Nov. 13-16 CONNECTING PEOPLE AND NATURE, Wildlife Habitat Council 18th Annual Symposium, Baltimore, MD, contact symposium@wildlife.org

Nov. 15 GIS DAY 2006

Nov. 29-Dec.1 PSTA, Hershey Convention Center and Lodge, Hershey PA
www.pascience.org for membership and registration forms

2007

APRIL 13-15 PAEE – PA Association of Environmental Educators
Wilkes Barre, PA The 27th Annual PAEE Conference, Genetti's Best Western, register at www.paeenet

**For information usually found in the PRECOSEP insert,
please visit:**

www.sacp.org

www.ssp-pgh.org

Many Thanks to Our Contributors

- ❖ Air and Waste Management Association (AWMA)
- ❖ Carnegie Mellon University
- ❖ Conservation Consultants, Inc.
- ❖ The Laurel Foundation
- ❖ NASA – Goddard Space Flight Center
- ❖ NorthCentral Math/Science Consortium
- ❖ PA DEP Education Grant Fund
- ❖ PA PDE – Office of Environment/Ecology
- ❖ PA NASA Space Grant Consortium
- ❖ PPG Industries Foundation
- ❖ Spectroscopy Society of Pittsburgh (SSP)
- ❖ Society for Analytical Chemists of Pittsburgh (SACP)
- ❖ The Pittsburgh Foundation: Nancy Hannon Gordon Fund
- ❖ University of Pittsburgh
- ❖ Western PA Unit – Herb Society of America