



HOT HOT HOT!!!
WHAT'S WITH OUR WEATHER?
How was your summer???

It could have been worse!!! In 1966 New York had the hottest most miserable summer. The temperature hit 90 degrees or higher on 35 days. Four days it was 100 degrees or higher – something not repeated since – with a peak of 103 degrees on July 3. It was reported that the asphalt was so hot that walking on the street became difficult, even dangerous. A drawbridge failed to close twice in two days because the metal had expanded after allowing ships to pass underneath

Highest temperature recorded in North America was 134 degree in Death Valley, CA on July 10, 1913. It can feel more than 15 degrees warmer in direct sunlight. EPA reports that air conditioning accounts for 15% of home energy costs, on average. That can increase to more than 40% in hot and humid climates.

So what is heat????

1. The sensation or perception of such energy as warmth or hotness. 2. The warming of a room or building by a furnace or another source of energy. 3. A hot season, a spell of hot weather. 4. Intensity, as of passion, emotion, color, appearance or effect.

Did you enjoy summertime?

Did you know that Benjamin Franklin invented summer time or daylight savings time? His thoughts about springing forward and falling back were written over 200 years ago in his pamphlet "An Economical Project." Franklin figured that changing the clocks would offer a novel way of conserving energy. At that time, people were using oil lamps and candles to light their way in the evenings. By shifting daylight to the evenings when more people are likely to be active, Franklin reasoned, there would be huge savings in oil, wicks, candle wax, and therefore, money. Franklin wrote the piece as a joke, parodying himself and his desire to play chess into the wee hours of the morning and sleep until noon. Although initially intended as nothing more than a joke, Franklin's idea was adapted and put into use in the United States as an energy saving device during World War I and World War II. Finally, in 1966 Congress made the policy official.

(And current plans are to expand the months using daylight savings time)

For teachers and educators, summer is the time to “restore tattered psyches, revive tired lessons, and regenerate passion,” according to Max Fischer, “Voice of Experience” contributor for EducationWorld.com. He goes on to say that “summer downtime constitutes a significant opportunity for vital renewal” through travel adventures, summer jobs that teach new skills, and professional development.”

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Science News

EXTREME WEATHER

Between 1994 and 2003 the U.N. reported that more than 2.5 billion people were affected by earthquakes, hurricanes, and other natural disasters - a 60% increase over the previous two decades. And these numbers don't include the millions displaced by the terrible December 26th tsunami of 2004 – a disaster that killed an estimated 180,000. And insurance calculations suggest as much as \$4 billion in losses from the four Florida hurricanes of 2004 – Charley, Ivan, Frances, and Jeanne. Remember the local impact – especially from Ivan. Some of our areas are still in recovery.

Category 4 and 5 hurricanes hold the impact of hundreds of nuclear weapons and have the most potential to devastate huge swaths of land.

The 2005 Katrina-Rita hurricanes have drowned cities, obliterated coastlines, closed ports and vital fuel pipelines, and paralyzed governments. Chaos still reigns as millions of people fled areas of impact. Natural disasters in the United States have reached a dangerous new level. Some experts think the U.S. can expect to be hammered by more of these mega-catastrophes over the next 20-30 years as a result of changing weather patterns, changing demographics, and political denial. Katrina was forecast accurately, as was Rita. But elected officials were slow to react to scientist's warnings. Even the "war-game" of hurricane impact on New Orleans held in 2004 did not lead to timely governmental preparation.

"The first rule of sustainability is to align with natural forces, or at least not try to defy them", said environmentalist Paul Hawken, a leading voice in green design and green commerce movements.

The population of the United States has been migrating to coastal areas over the past several decades, with an increase in the value of their possessions. More than half of the nation's 297 million people live in coastal areas. Florida's population has increased fivefold since 1950 and 80% live within 20 miles of salt water. Infrastructures that supply food, energy and materials are also at risk from severe weather impact.

Related Factors

- FEMA bases much planning on 100-year old storm estimates that do not account for today's more intense storms.
- Where Americans live makes the nation especially vulnerable to extreme weather.
- Predicted effects of global warming is a less obvious factor. But nevertheless oil companies have been raising their off-shore drilling platforms in the Gulf of Mexico by 15 feet anticipating higher storm surges.
- An aging population and growth of assisted living communities and dependent-care facilities have increased in warm weather states.
- Immigrant populations where English is not widely understood makes evacuations more difficult.
- Not all people in coastal and vulnerable areas have cars.
- Researchers from the Max Planck Institute for Meteorology in Hamburg, Germany predict that global temperature could rise by 7 degrees F by the end of the century. This could cause the sea level to rise almost a foot. These results seem to confirm decades of speculations that humans are "fueling global warming through their unprecedented influence on the environment".
- A team of British scientists have found that global warming is causing soil to release huge amounts of carbon into the atmosphere. This may increase the rate of climate change. Reported in the *Journal Nature*, the carbon content of soil around England fell steadily from 1978 to 2003, regardless of how the soil was used. They concluded that warmer temperatures during that time must have caused much of the carbon to be released into the atmosphere in the form of carbon dioxide and methane.

What have we learned?

Experts advise that the infrastructure should be expanded and hardened: Communications systems, power grids, roads, and flood control measures (especially levees). If the levees could have protected a little more, the New Orleans flood and the large displaced population would not have happened. The neglected and 50 year old highway system of roads and bridges was clogged with evacuees.

Even locally impounded water is a risk. Pennsylvania has at least 3,000 dams with 800 considered to be at risk of failing (some estimate 7,000 dams if smaller and privately owned dams are included). DEP monitors the dams and hires engineers to inspect the 778 high-hazard dams. The 1889 South Fork Dam burst that killed 2,200 people in Johnstown and the 1977 dam failures killing 45 people there point to the need for regular monitoring of Pennsylvania dams.

KATRINA'S IMPACT

Rising Energy Prices

Gasoline prices over \$3/gallon have been one effect, shortages, crippled oil refineries, rising heating costs -----all have been merely a part of the impact of Katrina. Julie Rochman, spokeswoman at the American Insurance Association said, "This will be one of the – if not the- biggest single events in terms of insured losses in U.S. History".

Some estimates are that the disaster insured losses would go up to \$25 billion. The disruption of businesses, rising energy costs, reduced consumer spending and business investment all work to slow economic growth. Release of some oil from the emergency stockpiles offer a temporary easement - since some 90% of the Gulf of Mexico's oil output was out of service. Temporary sales of higher-polluting gasoline allowed by the EPA is another effort to provide needed fuel.

Education Complexities

Health and survival were foremost concerns in the wake of the Katrina disaster. Yet students in Louisiana, Mississippi, Alabama and other sites need to return to school as soon as possible. Some schools have been destroyed or damaged. And those evacuees in temporary shelters and even new housing situations face complex issues. Some schools may not be able to open until January 2006. At least 372,000 students are displaced and over 725 schools were closed

Displaced teachers are needed in schools taking in additional students. Records must be transferred or even located. Communication challenges include reconstruction of destroyed telephone systems and other technology. Replacement costs are estimated to reach hundreds of millions of dollars. Virtual schooling can help ease overcrowded situations, and some schools are waiving tuition fees.

See www.eSchoolnews.com for further information Vol. 8, No. 10

Root Shock

Many people experienced "root shock" as they were displaced by Katrina's destruction. According to Dr. Mindy Thompson Fullilove, "root shock" ruptures bonds, dispersing people to all directions of the compass", and causes destruction of the interconnections that are "essential to the survival of [communities]". Visit www.rootshock.org for further information. *[abstracted from Cool Space Locator*

<info@coolspacelocator.com.>] For teaching about natural phenomena use the National Science Teachers Association's online "Severe Weather SciGuide".

Mental Health impact from Katrina may last years according to the JAMA [Journal of the American Medical Association October 5, 2005-Vol.294,No.13]. Many mental health professionals set up shelters with physician-led teams. An unprecedented number of people have been displaced and their lives traumatically disrupted. "As people become more aware of what they've lost, and that this situation is not going to go away any time soon, we anticipate a lot of trauma reactions, a lot of grief reactions", added Elizabeth Connell Henderson, President, Mississippi Psychiatric Association.

Carbon Monoxide Poisoning from Hurricanes-Associated Generators – Florida 2004

This study reports on the results of the need for interim power supplies after power outages from hurricanes. Portable, gasoline powered generators are a common unintentional CO poisoning after power outages. The exhaust produced by a typical 5.5 kW generator contains as much CO as that of six idling automobiles. [JAMA September 28, 2005 – Vol. 295,No.12]

Wetlands

Approximately 40% of the costal wetlands of the lower 48 states are located in Louisiana. These wetlands have been disappearing at alarming rates – 40 square miles of marsh a year lost for several decades. That is 80% of the nation's annual coastal wetland loss. The devastation from Katrina is yet to be documented and understood.

Yet – the impact from such a horrendous storm was predicted. See the 2004 article from National Geographic -

<http://www3.nationalgeographic.com/ngm/0410/feature5/>

Also see a related opinion piece by Sydney Blumenthal in Salon –

http://www.salon.com/opinion/blumenthal/2005/08/31/disaster_preparation/index.html

TEACHING ENERGY ALTERNATIVES

A lead article in the Sept.-Oct. 2005 issue of NSTA Reports points to how energy topics can illustrate the concepts detailed in the National Science Education Standards (NSES). Energy topics can also be easily used to align lessons with the Pennsylvania standards Science/Technology and Environment/Ecology and the new Assessment Anchors. The Energy Policy Act of 2005 signed in August is a \$12.3 billion bill that extends tax credits for wind, biomass, landfill, gas, and other renewable electricity sources.

Renewable resources are those that can keep producing indefinitely without being depleted. These include water, solar, geothermal, wind, and combustible waste as renewable energy sources. The article notes that new technological advances and innovative ideas in areas such as cleaner coal and biofuels are being evaluated by the federal government and individual states.

Pennsylvania has come up with a way to convert waste coal into a diesel fuel and home heating oil. Construction is scheduled to begin next spring in Schuylkill County of the first commercial plant for this conversion. An estimated 258 million tons of “Culm” that has piled up in Pennsylvania’s coal regions will be converted using an updated version of a technology developed by German scientists in the 1920s. Culm is waste coal – the smallest pieces left behind when the marketable coal was sifted out.

Biodiesel production development is also underway.

PRCST News

- PRCST recently conducted Professional Education Workshops that included geocaching, the Globe program, Food-Land-People, NASA Programs, and energy conservation and green design in Pittsburgh. News of these summer programs will appear in the issue of Synergy – coming soon!
- Fall programs included (see Synergy issue)
 - Sept.24 – GLOBE – Soils Protocol workshop. Free for 20 teachers (with support from the PA Space Grant Consortium) 6 Act 48 hours.
 - Oct. 15 – Antarctica and Meteorites 4 Act 48 hours, Fee \$75.00 was waived with major support from the .PA Space Grant Consortium and support from the Society for Analytical Chemists of Pittsburgh (SACP).

Education News

- On June 24, 2005 **Kip Bollinger**, Pennsylvania Department of Education Science Education Advisor, resigned his position to become coordinator of the Masters in Science Education Program at Lebanon Valley College.
- New Education Secretary, **Margaret Spellings** called improving the quality of high school education in America “a national priority” at the Feb.27 National Governors Association’s High School Summit. The secretary said the president’s 2006 budget request includes a comprehensive proposal for improving the quality of secondary education that builds on the standards and accountability provision of No Child Left Behind. As one of the principal authors of NCLB, she said the law has already proven successful at the lower grades as evidenced by rising student test scores. For the full text of the secretary’s remarks, visit www.ed.gov/news/speeches/2005/02/02272005.html
- The newest installment of the report **Why Rural Matters 2005** emphasizes that “rural schools and communities are increasingly invisible in a mass society that is fundamentally preoccupied with its urban identity, its urban problems, and its urban future.” The authors’ intent is to help explain the complex nature of rural education so that the needs of the 8.8 million students who attend rural schools will not be lost in ignorance or indifference. To access the report online, visit www.ruraledu.org/whyruralmatters.

Legislative News

- The Eisenhower National Clearinghouse (ENC) lost its U.S. Department of Education funding at the end of September 2005, and its website at www.enc.org no longer exists. To continue to have access to ENC's numerous resources, register your school to subscribe to www.goENC.com, a comprehensive website for K-12 science and math teachers. A full year costs \$349.
- Guidelines issued recently by the Department of Education directed all educational institutions that receive federal dollars to offer students **instruction on the U.S. Constitution each September 17**. Congress mandated such a day of instruction in the final federal spending bill for 2005 approved late last year. For further information contact: Alex Stein, U.S. Department of Education, 400 Maryland Avenue, SW., room 4W218, Washington, DC 20202 – 5910. Telephone: (202)895-9085 or via internet: Alex.Stein@ed.gov. Visit this related link: www.ed.gov/legislation/FedRegister/other/2005-2/052405b.html

NSTA News

- NSTA Strategic Goals and Objectives have been approved by the NSTA Board of Directors as of February 2005 and follows:

Strategic Goal 1: Engage all teachers of science continually to improve science education.

Strategic Goal 2: Improve student learning by supporting and enhancing science teaching.

Strategic Goal 3: Advocate for the importance of science, both science literacy and the development of scientific expertise.

Strategic Goal 4: Enhance science education through research-based policy and practice.

- NSTA's newest position statement concerns itself with the responsible use of animals in the classroom and dissection in the science classroom.

“NSTA supports the decision of science teachers and their school or school district to integrate live animals and dissection in the K-12 classroom . . . NSTA opposes regulations or legislation that would eliminate an educator's decision-making role regarding dissection or would deny students the opportunity to learn through actual animal dissection.”

It is essential that teachers establish specific and clear learning goals that enable them to appropriately plan and supervise the activities.

This particular position statement was presented to NSTA members in *NSTA Express* and comments and suggestions from members were encouraged by NSTA and incorporated into the final draft.

To view NSTA's position statement in its entirety, visit www.nsta.org/position.

LOCAL NEWS: The Pennsylvania Society for Biomedical Research sponsored a one-day workshop in cooperation with the University of Pittsburgh on September 29, 2005 at the Biomedical Tower. During the workshop "Rx for Science Literacy Workshop" teachers were welcomed by Jeremy Somers, Ph.D., Member, PA Society for Biomedical Research, John Ellis, Ph.D., Executive Director, and G. Kip Bollinger, Ed.D., Educational Consultant. Teachers were treated to sessions highlighting current research in many areas involving the care and use of research animals. Group tours of research areas, animal facilities and labs were enlightening and valuable. The summary addressed animal issues in biomedical research. Each teacher was given a binder of information and classroom activities, "Rx for Science Literacy: The What, Where, and How and Why of Health Science Research. A Teacher's Manual About Biomedical research"

* NSTA and the Big Sky Institute with support from the National Science Foundation, recently released proceedings from the Lone Mountain Retreat where leading teachers, academics and technologists convened. In addition to the widely discussed digital divide that separates the inner city and rural schools from their more affluent suburban counterparts, other issues arose including new and emerging information technologies that are making their way into K – 12 curriculum. Conditions with respect to access, curricula, teacher preparation, appropriate assessments, support from School Boards and administrations and support from communities are needed in order for students to succeed and for technology to improve the teaching and learning of science and other disciplines. To read the complete proceedings, visit <http://science.nsta.org/enewsletter/lmr.pdf>

Curriculum and Instruction News

- According to the Association for Supervision and Curriculum Development's (ASCD) Brain Compatible Learning Network, teachers and educators are now using **brain research** to tailor instruction according to learning styles. According to Renate Caine, a professor of education at California State University in San Bernardino, successful implementation of brain-friendly strategies requires three primary classroom conditions: relaxed alertness, immersion in complex experiences, and active processing of experiences. Above all students must be able to review and, where applicable, repeat concepts in order to incorporate them into their everyday lives. For more information visit: www.ascd.org.
- PA Dept. of Education has convened a conversation with selected interested high schools/districts and IU's to address key questions regarding high school curriculum design. This is considered to be challenging work since high schools have remained largely untouched by the education reform movements of the last few decades. Referred to as **Project 720**, the idea is to learn from the work many

of the schools and districts are already doing and to work together to achieve the overall goals of a) increased rigor of educational programs, b) enhance secondary access and credentialing for increasing number of students, and c) produce active and productive citizens. To learn how to participate in Project 720 contact: Amy Hodges, Assistant Director, Bureau of Teaching and Learning Support. Email: amhodges@state.pa.us phone: 717.705-6359

- An article in Spectrum, the ERS's quarterly journal of school research and information, says that there is a growing body of evidence that the use of **quality, targeted assessment data, can improve instruction**. A key step in using data to make decisions is developing the right questions. Furthermore, for analysis, data must be easily disaggregated by school, classroom and specific groups of students and results analyzed by objective or skill, in addition to overall scores. Many districts find that effective use of assessment data may require an intensive review of the curriculum. The data not only help teachers see specific areas of difficulty for each student, it also helps teachers and principals to pinpoint objectives that either need to be covered more thoroughly or taught in a different way. Finally support can be given to the students and staff who need it.

Educators across the country who have learned how to effectively use assessment data have achieved positive results at the district, school, classroom, and student levels. To read the entire article visit: www.ers.org/spectrum/sum01a.htm.

What's New at NASA

- NASA has a new administrator as of April. **Michael D. Griffin** began his duties as the 11th NASA Administrator, replacing Sean O'Keefe, who resigned in February. When President Bush nominated Griffin he was serving as head of the Space Department at Johns Hopkins University's Applied Physics Laboratory in Baltimore. In addition to other positions, Griffin was an adjunct professor at the University of Maryland, Johns Hopkins University, and George Washington University where he taught courses in spacecraft design, applied mathematics, guidance and navigation to mention a few.
- NASA Educator Resource Center's (ERC's) are located on or near NASA Field Centers, as well as in planetariums, museums, colleges, universities, and other nonprofit organizations around the United States. **NASA Goddard Space Flight Center (GSFC) in Greenbelt Maryland** services the following states: Connecticut, Delaware, District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, **Pennsylvania**, Rhode Island and Vermont. To learn more visit: www.gsfc.nasa.gov/vc/erc.html.

The new ERC Coordinator at Goddard Space Flight Center is Richard Blackmon. He will work with ERCs in all the states linked to GSFC. Richard came to Pittsburgh to help the PA NASA ERC display educational materials during the

Sally Ride Festival in May that focused on girls enrolled at the middle levels. NASA careers and engaging scientific materials were exhibited.

The PA NASA ERC is located in the School of Education, Department of Instruction & Learning, University of Pittsburgh – Jane Konrad, Director.

- NASA recently experienced highs and lows On July 3rd, NASA’s \$333 million Deep Impact probe successfully smashed into an ancient comet with the mission to answer questions about the conditions of the early solar system. A little over a week later, NASA cancelled the Discovery launch countdown when a fuel sensor malfunctioned about two hours before the planned liftoff. A new launch time was selected.
- (Ed. Note:A recent Spectroscopy Society of Pittsburgh (SSP) meeting had an outstanding speaker on this probe.)

Passings

- Renowned science educator, science communicator, and physicist Phillip Morrison died on April 22 at his home in Cambridge, Massachusetts. He was 89. Morrison is best known for his participation in the Manhattan Project, the group of scientists who assembled the first atomic bomb. After witnessing the bomb’s devastating effects, Morrison voiced strong opposition to nuclear proliferation.

In the field of science education, he will be remembered as the founder, in 1960, of the Elementary Science Study (ESS), a National Science Foundation-funded curriculum project that produced interactive, hands-on science activities for elementary students.

He attended public schools in Pittsburgh and earned his bachelor’s degree from the Carnegie Institute for Technology (now Carnegie Mellon) in 1936. He received his doctorate in theoretical physics from the University of California at Berkeley and was professor emeritus at MIT at the time of his passing.

- Earth Day Network announced the death of Senator Gaylord Nelson, Founding Chairman of Earth Day Network. Among Senator Nelson’s many accomplishments was the creation of Earth Day on April 22nd, 1970. Today Earth Day is celebrated in 174 countries by over a half billion people, making it the most celebrated secular holiday in the world.

Point CounterPoint – Are U.S. High Schools at Risk?

What’s Wrong with U.S. High Schools – and how can we make them better. <i>From a speech Gates delivered at the National Governors Association’s</i>	The Big Con in Education <i>From the Center for the Study of Jobs & Education in WI & the U.S. – Dennis W. Redovich</i>
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<i>national Summit on High Schools</i>	
“When I compare our high schools to what I see when I’m traveling, I am terrified for our workforce of tomorrow”	The Big Con in Education in the United States: Every student must achieve at the highest academic standards to graduate from high school and to be employable in a family living wage job.
America’s high schools are obsolete. By obsolete, I mean that our high schools – even when they’re working exactly as designed – cannot teach our kids what they need to know today.	For the majority of the jobs in the world and the U.S., other than reading, writing, arithmetic, and developing a work ethic, there is not a direct relationship between education and jobs.
We have one of the highest high-school dropout rates in the industrialized world. Many who graduate do not go on to college.	The small decreases in graduation rates are the result of increasing numbers of poor minority students who are not promoted or graduated because they fail useless standardized academic tests, particularly in higher mathematics, and higher-level course requirements that are not required for most jobs.
How bad is it?	Are we being “conned”?

SCIENCE SNIPPETS

WORLD YEAR OF PHYSICS – 2005

One hundred years ago a young physicist working as a patent clerk laid the foundation for the most famous equation in science. It was a great year for Albert Einstein. And a century later United National has declared the *International Year of Physics* and the International Union of Pure and Applied Physics designated 2005 the *World Year of Physics*. Some countries have designated 2005 as “*Einstein Year*”. A web site titled World Year of Physics 2005, Einstein in the 21st Century is available at <http://www.physics2005.org/> and provides access to a collection of information and resources, a collection of WYP projects and classroom projects.

Quote from Einstein – “Logic will get you from A to B. Imagination will take you everywhere”.

It is noted that: the right side of the brain is responsible for our imagination, dreams and intuitive and subconscious thoughts. Most people use their left side more often – focusing on logic, reason and facts. Those who utilize both sides have better memories and intellectual abilities.

METHANE’S IMPACT ON CLIMATE CHANGE

Science faces great challenges in understanding and predicting how our climate is changing. Typically the focus is on greenhouse gases (GHGs) and how they exist in the atmosphere. A new focus is on the GHGs at the Earth’s surface. According to new calculations, the impacts of methane on climate warming may be double the standard

amount attributed to the gas. Molecule for molecule methane is 20 times more potent than carbon dioxide as a greenhouse gas; but CO₂ is much more abundant than methane and the predicted growth is far greater. See

<http://earthobservatory.nasa.gov/Newsroom/NasaNews/2005/2005071819594.html>

Canada will host the annual climate change conference Nov. 28-Dec. 9, 2005 at the Palais des Congres de Montreal. <http://unfccc.int>

HURRICANE HAZZARD

Forecasters at the National Oceanic and Atmospheric Administration (NOAA) predicted at least seven Atlantic hurricanes this year, with as many as five matching Ivan's fall of 2004. (Ed. And we have already experienced the worst. See article.) There have been 27 Category Five hurricanes since record keeping began in 1886. Three occurred recently in seven weeks. Hurricane Wilma is the latest threat.

CRAYFISH were recently identified as the second most imperiled aquatic group in North America, only after mussels. Scientists are worried that invasive crayfish from the Midwest are changing the food chain in eastern waters, (from Penn State Agriculture).

BLIGHT-RESISTANT CHESTNUT TREES CLOSE TO REALITY

Scientists with the American Chestnut Foundation are confident that blight resistance is holding up across various generations. "These trees are the direct descendents of a 1935 cross between a Chinese and an American chestnut, and the first generation back-cross to American chestnut was made in 1946. (from Penn State Agriculture)

DIRECTIONS

Journey North engages students in a global study of wildlife migration and seasonal change. K-12 students share their own field observations with classmates across North America. They track the coming of spring through the migration patterns of Monarch butterflies, bald eagles, robins, hummingbirds, manatees, whooping cranes, other birds and mammals, the budding of plants, changing sunlight, and other natural events. Standards-based lesson plans, activities and information help students make local observations and fit them into a global context. Visit at

www.learner.org/jnorth/

The **Earth Explorers series** on the NASA Portal features students, teachers and scientists who are working with NASA Earth science imagery and data to better understand our home planet. This monthly series highlights NASA Earth Explorers, young and old, with a variety of backgrounds and interests. Special versions of articles are written specifically for students in grades K-4 and 5-8. Please visit!

http://science.hq.nasa.gov/education/earth_explorers/.



The National Oceanographic and Atmospheric Administration's (NOAA) National Marine Sanctuary Program has launched a new website to provide teachers with resource and training to support ocean literacy in America's classrooms. It contains

curriculum, lesson plans, and activities that can excite students about science and technology. To learn more visit: <http://sanctuaries.noaa.gov/education>.

The Florida Institute for Human and Machine Cognition (IHMC) designed a concept-mapping software, called Cmap Tools, to map out scientists' knowledge in diagram form. IMCH is providing the software at no cost to schools and NASA and the U.S. Defense Department paid for most of the research. Cmap Tools can be used to assess student knowledge, encourage thinking and problem solving instead of rote learning, organize information for writing projects, and help teachers write new curricula. To see more about this product visit: www.ihmc.us.

RESEARCH AND MENTORING EXPERIENCES FOR TEACHERS – The ARMADA Project provides K-12 teachers opportunities to actively participate in ocean, polar, environmental science research and peer mentoring. Master Teachers develop ways to bring their research experiences, including scientific data, methodologies, and technology into the classroom. ARMADA teachers mentor new teachers and present at NSTA conventions. <http://www.armadaproject.org>

COMING SOON NASA Earth Science Education Roadmap. The roadmap will be a 10 year plan that guides the NASA Earth Science Education program and ensures that future generations of Earth explorers have the knowledge and ability required to understand and protect our home planet and contribute to NASA's Vision for Space Exploration.

Note:

On AUGUST 17 – CARNEGIE SCIENCE CENTER hosted an Astronomical Lecture and Book Signing by Dr. William K. Hartmann , “The Grand Tour: A Traveler’s Guide to the Solar System”. Dr. Hartmann is a native Pittsburgher, internationally known astronomer, writer, and painter. He won the first Carl Sagan Metal from the American Astronomical Society. A light desert buffet followed and astronomical viewing from the rooftop observatory. \$25 for the event included a copy of Dr. Hartmann’s book. This was an outstanding event.

FEB 16-20 AAAS 2006 – St Louis, MO Two symposia of note aligned with the theme” Grand Challenges and Great Opportunities”. 1) Beyond the Horsed Race: Improving Student Learning Through TIMSS and PISA, and 2) TIMSS Science Video Study: Viewing Science Teaching in Five Countries.

MAR. 24-26, 2006 PAEE CONFERENCE - Atiochian Village Conference Center, Ligonier, PA. New professional focus, silent auction, exhibits, entertainment, lots of music. Check www.pace.net for further information.

DATABASE OF RESOURCES

SPACE WEATHER a site with news and information about the Sun-Earth environment. Good for following up your EarthDay activities. Images and links to external resources. Latest data on near-Earth asteroids, solar flares and geomagnetic storms. Visit <http://spaceweather.com>

COLOR MATTERS Can color suppress your appetite?. Site has interesting information and facts about color and color theory: a color and science section, content on color theory, resources, discussion board. www.colormatters.com/entercolormatters.html

LIVESCIENCE looks at new discoveries, scientific inquiries, and oddities in the world around us. Chosen by editors of PC Magazine for their list of Top 100 Undiscovered Sites for Spring 2005. Latest advances in science and technology. www.LiveScience.com

LEARNING PAGE is a site with a collection of professionally produced instructional materials you can download and print – lesson plans, books, worksheets. Free samples include science materials. www.learningpage.com

SPACE STORE – free education resources: worksheet for K-12 teachers, newsletter with news of space launches and private space exploration. Links to other websites. Visit www.thespacestore.com/chceforspace.html

CLIFFORD THE BIG RED DOG For preschool and elementary students. Three hands-on activities in Fishing Lessons – develop appreciation and respect for sea life. Counting, listening, reading skills, crafts. http://pbskids.org/clifford/caregivers/activities/act_218a.html

GREEN SQUAD for MS students. Learn how to make their schools healthier and greener – by the National Resources Defense Council. Fact sheets cover air, water, health, and the planet. Also available in Spanish. www.nrdc.org/greensquad

REVELED AND REVERED WEBSITE from the Smithsonian Office of Education. For grades 3-8 Uses five lessons to help student examine misconceptions about herps. Lesson plans and links to other sites. www.smithsonianeducation.org/educators/lesson_plans/herps/start.html

ASTRONOMY CAFE Astronomy careers, articles, “Ask An Astronomer” section. Visit www.astronomycafe.net

EDUGREEN An environmental website for elementary students. Topics include life on Earth, energy, water, air pollution, climate change, biotechnology, and solid waste. Crossword puzzle, word search, memory games. <http://edugreen.teri.res.in>

EDHELPER for K-12 teachers features theme units for 18 science topics: weather, simple machines, animals and biomes, energy. See www.edhelper.com/Science.htm

WEBWATCHERS SCIGUIDES from NSTA Go to online lessons and resources organized by content themes, and pre-evaluated and aligned with NSES. New titles continually in development for K-4, 5-8, and 9-12 Each SciGuide includes URLs for as many as 100 web-accessible resources. All are aligned with NSES and vetted across eight educational rubrics. A “drill-down” structure with linked lesson plans, vignettes, samples of student work, and audio descriptions. Learn more or purchase a SciGuide at <http://sciguides.nsta.org>

NEW BLOG FOR PRE-K-2 TEACHERS NSTA’s Science and Children Journal and NSTA have established an online blog devoted to early childhood science. Share and receive teaching advice, management tips, favorite resources, activity ideas, and more! <http://science.nsta.org/earlyyearsblog>

GLOBAL WARMING EPA website dedicated to teaching children about global warming. Animations that illustrate the concepts involved. Visit www.epa.gov/globalwarming/kids
Another website addressing uncertainties and unknowns is <http://yosemite.epa.gov/par/globalwarming.nsf/content/index.html>

EDUCATION FOR AGRICULTURE, MATH, AND STATISTICS – from PA Agricultural Statistics Services. Has “Family Fun Pages”, “NASS Kids Page”, “Ag for Teachers” with lesson plans, and related links. Visit www.nass.usda.gov/pa

NASA SPINOFFS – What have we done for you lately?? “What we do in space is much more than just science. We really do inspire people and change lives, and create new technology that goes far beyond the boundaries of just pure science”, says Dr. Howard Ross, NASA’s Acting Deputy Associate Administrator for Science in the Office of Biological and Physical Research. ex. Communication satellites track hurricanes, wildfires, and volcanoes; the cochlear implant; detecting cataracts and other eye diseases, breast cancer screening; Lifeshears; and even helping Hasbro with the aerodynamics of the Nerf Glider.

POPULATION CONNECTION – Education section contains teacher training and resources in a variety of areas; ex. Biodiversity, Middle School Curriculum on CD-ROM – activities, worksheets. Formerly Zero Population Growth. Current world population is 6,501,424,660. Visit http://www.populationconnection.com/About_Us/

FISH OF THE GREAT LAKES - WI Sea Grant Institute provides a wide variety of teaching materials and information. Kid’s page, database of fish profiles, research news, full text of George C. Becker’s book “Fishes of Wisconsin”. Visit <http://www.seagrant.wisc.edu/greatlakesfish/>

NOAA's **Ocean Explorer Web Site** has been redesigned. Promotes ocean literacy through the excitement of exploration. Team with other players to answer puzzling questions. New ocean puzzle challenge. Printable calendar and images of the deep ocean. Visit www.oceanexplorer.noaa.gov

Federal Resources for Educational Excellence (FREE) has new resources in math and science. 1) "Seeing Math" – US Dept. of Education. Interactive software that clarifies key mathematical ideas for teachers and students of algebra.

<http://seeingmath.concord.org.html>

2) "Dinosaurs" Participate in a virtual dinosaur discovery and follow milestones in dinosaur evolution. National Museum of Natural History, Smithsonian Institution

www.nmnh.si.edu/paleo/dinosaurs

3) "Molecular Logic Database" 130 model-based activities for learning about interactions of atoms and molecules, and rule-based genetics. National Science Foundation.

<http://molo.concord.org/database>

4) "Physics Education Technology" Fun, interactive simulations of physical phenomena including velocity, acceleration, sound waves, and the Doppler effect. National Science Foundation. www.colorado.edu/physics/phet

CALENDAR OF EVENTS

OCT. 23 NATIONAL MOLE DAY!

OCT. 25-29 34th ANNUAL NAAEE CONFERENCE "Sustainability and Environmental Education: Focus on the Future". Albuquerque, NM Special tracks for K-12 teachers, Spanish-language speakers and EE Researchers. <http://www.naaee.org> and <http://eelink.net>

NOV.1-2 FARADAY LECTURE - Soldiers and Sailors Memorial Hall, "Science That You Can See". www.pitt.edu/~chemed

NOV.30-DEC 2 PSTA ANNUAL CONFERENCE, Hershey, PA Look for a reunion of GLOBE Teachers on Thursday night before the banquet. And be sure to visit the NASA Exhibit Booth for resources and program information. Contact Bill Ayers for registration. 610/262-9287 or weahea@enter.net

NSTA FALL CONVENTIONS

Oct. 20-22 Hartford, CN - "Connections for Student Achievement"

Nov. 10-12 Chicago, IL – "World Class Science"

Dec. 1-3 Nashville, TN – "Celebrating Science Through Best Practices"

Scroll agendas, register, make housing reservations at www.nsta.org/conventions

LOOKING AHEAD

FEB.16-20, 2006 AAAS Annual Conference, St. Louis, MO Two symposia of note aligned with the theme” Grand Challenges and Great Opportunities”.

MAR. 24-26, 2006 PAEE CONFERENCE - Atiochian Village Conference Center, Ligonier, PA. Exhibits, Coffee House, Music, Green Building Tour and preconference Wild Resources Workshop, Silent Auction and Workshops. rroperti@zoominternet.net

APR 6 - 9, 2006 [NSTA National Convention, Anaheim, CA](#)

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