

# Synergy . . .

**Fall 2006**

Summer 2006 was filled with exciting teacher workshops, building on the Spring NASA GLOBE workshop focusing on the LandCover Protocol. Nineteen teachers gathered at the Carnegie Museum of Natural History in April to explore the variety of landcovers in our area and throughout the world. GLOBE teacher Gary Toptolkowski helped Charylene Philp, GLOBE Partner from the NorthCentral Math/Science Collaboration, to implement the process of determining the site locations to be studied, measurements to be taken and data to be entered into the GLOBE database. Teachers were encouraged to utilize the data in this database in comparison of their sites and those of similar sites throughout the world. Susmita Gohosh, CMU, GLOBE trainer helped as well.

## **GLOBE WORKSHOP – LANDCOVER PROTOCOL**

**APRIL 19, 2006**

Carnegie Museum of Natural History

8:30am – 3:30 pm

Conducted by the Pittsburgh Regional Center for Science Teachers

With Support from the PA NASA Space Grant Consortium

Facilitated by Charylene philp, Director NorthCentral Math/Science Collaborative

### **AGENDA**

- |          |  |
|----------|--|
| 8:30am   | Registration and pre-survey: Refreshments  |
| 9:00am   | Introduction to the GLOBE Program – Charylene Philp, GLOBE Partner                   |
| 9:30am   | Introduction to the LandCover Protocol – Charylene Philp<br>Building the Densiometer |
| 10:15am  | Break  |
| 10:30am  | Building the Clinometer – Gary D.  |
| 11:30 am | Taking landcover measurements  |
| 12:00    | LUNCH  |
| 12:45 pm | Tour CMNH Lewis and Clark – Animals  |

2:00 pm Entering GLOBE Data – Susmita Ghosh

3:00 pm Summary – post survey - PRIZES

You can see what a full day this was.....and so much learned! Lots of great resource material for everyone too. Even in an “urban” setting, there were many outdoor sites to sample.



Teachers participate in the GLOBE LandCover workshop with direction from Charylene Philp, far right.

## **SUMMER 2006 – AIR POLLUTION WORKSHOPS**

June was a very busy month that included a three-day workshop focusing on Air Quality: Environmental Implications. A full three days covered the following:

### **AIR QUALITY – ENVIRONMENTAL IMPLICATIONS**

**What is the status of energy generation and use in Pennsylvania, the United States, and the world?**

**What are some alternative energy sources? Investigate the impacts of air quality, and related environmental health issues.**

*A Hands-on workshop series June 20-22, 2006*

**Fifteen Act 48 Hours**

These all day workshops included field trips, hands-on sessions, and inquiry-based activities aligned with the Pennsylvania Academic Standards.

*The workshops are conducted by the Pittsburgh Regional Center for Science Teachers (PRCST) and sponsored by Department of Environmental Protection.*

**Workshop schedules:**

**June 20, 2006**

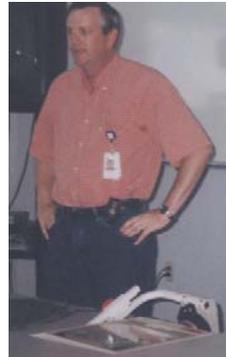
**Field trip to visit Von Roll** – Incinerator located in East Liverpool, OH  
Sessions will address 1) wastes handled, 2) lab analysis, 3) segregation of wastes, 4) incineration process, 5) safety issues, 6) mitigation, 7) Risk-Mangement Plan results and related issues, 8) pollution-prevention practices, 9) environmental protection (pollution controls), and 10) community relations.



Teachers visit the Nature Preserve on-site at Von Roll (former WTI) following a presentation by plant representatives.

**Visit to BASF – Beaver County** – Learning about the adhesives made that we find on many products we use e.g. Post-It notes...surprise!

Teachers enjoy the presentations at BASF!



**June 21, 2006**

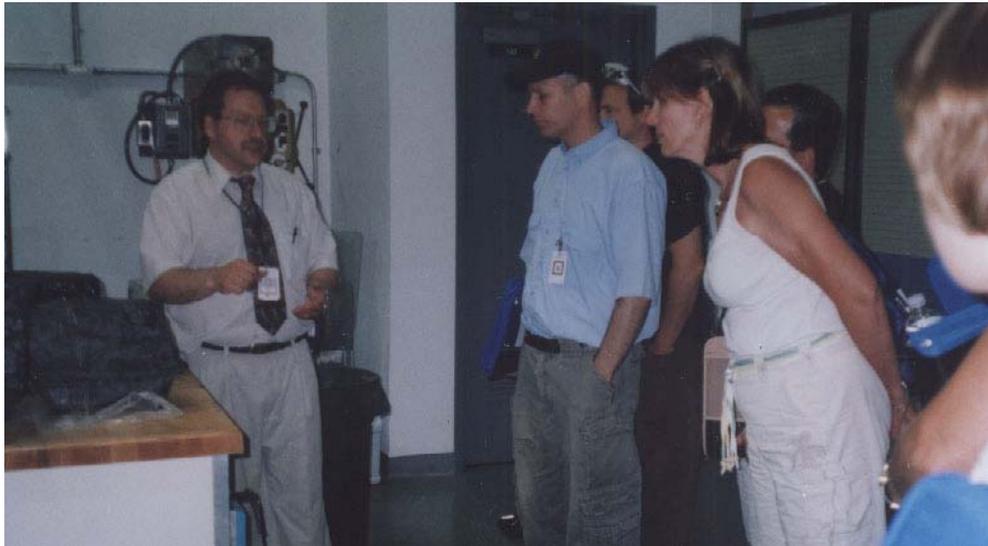
**Field trip to Department of Energy**

National Energy Technology Laboratory – Bruceton, PA

Workshop arranged by the Office of Science , Technology and Analysis

Michael A. Nowak, Senior Management and Technical Advisor.

Sessions will focus on Clean Energy Technology.



Mike Nowak explains the research processes currently undertaken at NETL.

**June 22, 2006**

**All-day workshop at Conservation Consultants, Inc.**

Two half-day sessions:

1 – Pennsylvania Resources Council

2 – Air & Waste Management Association

Both sessions utilized hands-on activities addressing the environmental impacts of air quality.



Teachers participate in the “Dirty Dozen” air pollution skit conducted by the Air and Waste Management Education Committee – complete with costumes!!!



Teachers conducted investigations about carbon and air pollution, conducted by CCI, Inc., GASP, and PRC leaders.

**Air Quality-Environmental Implications**  
**CCI-Air Quality Workshop-June 22, 2006**  
A summary by Rosemary Hutter

**The Dirty “Half” Dozen**

Who are “The Dirty Half Dozen” when it comes to air pollution? Barbara Jo Hall, chemist, educator and environmentalist introduced these infamous pollutants. The six criteria pollutants in the air we breathe are: particulates, carbon monoxide, sulfur dioxide, nitrogen oxide, ozone and lead. These pollutants were explained, discussed and then the teachers who attended the workshop were cast as one of these criteria bad guys in the drama, “The Criteria Pollutants Reunion”. This play is an example of an appropriate hands-on activity for kids that will increase their understanding of air pollution causes and effects.

**Paint the Town GREEN**

Did you know that Pgh leads the nation when it comes to GREEN buildings? Did you know that the Pgh Convention Center is the largest GREEN building in the country? Indigo Raffel, education coordinator at CCI, Conservation Consultant, Inc., gave the participants a tour of their totally GREEN building. GREEN buildings are those that have been built or remodeled using only ecologically and environmentally safe products. GREEN buildings are also energy efficient. The facility uses *daylighting*, natural light, as much as possible. All duct work is exposed eliminating heating and cooling losses that can happen behind walls and ceilings. The floors are covered with “Forbo” marmoleum, a product that is manufactured out of linseed oil, pine resin, and wood flour instead of with petroleum by-products. From the terrace gardens to the recycled brick walkways the building is an earth friendly site on the congested South Side of Pgh.

**O<sub>3</sub>**

Ozone in the stratosphere protects earth from the harmful effects of the sun’s ray, but ozone in the troposphere is a health hazard. On clear and sunny summer days pollutants like nitrogen oxide combine with fossil fuel emission to form O<sub>3</sub>. This oxygen

molecule is not breathe-able and poses a health hazard. Nancy Martin-Silber from PCR, Pennsylvania Resource Council, provided background which explained the reason for Ozone Action days. The only way to improve air quality during the summer is to limit the amount of nitrogen oxide in the air as well as lowering the use of fossil fuels.

## **Stop Idling**

Bridget Yupcavage, Program Coordinator for GASP (Group Against Smog and Pollution), describe the problems caused by PM 2.5. PM 2.5 is particulate matter that is 2.5nm or smaller in the air we breathe. Pgh is # 98 out of 100 cities in the country when it comes to poor air quality. Diesel fuel is one of the leading causes of PM in the air. Factories, buses, railroads, river traffic and truck all use diesel fuel. These factors all contribute to the unhealthy air in southwestern PA. One piece of good news is that school buses are no longer permitted to idle for more than 5 minutes. This will help to improve the air quality around our schools.

## **Every Litter Bit Hurts**

The day ended with a litter prevention presentation from Hal Kaufman, Program Coordinator for PRC. PRC offers many education programs that will increase students' awareness for the need to reduce litter and increase recycling. They sponsor contests, classroom presentations and even a Recycling Olympics. Students and teachers can get involved with projects that will improve the communities in which they live and work.

All the sessions on Day Three addressed the environmental impact of poor air quality. The information and the hands-on activities will help students understand the impact of air pollution on their health and the environment.

Breakfast and break refreshments and lunch were provided.

All teachers received workshop supplies along with related NASA resources.

## **GLOBE HYDROLOGY WORKSHOP**

On June 27, 2006, the summer workshops ended with a fantastic trip aboard the Pittsburgh Voyager – sampling the water in our three rivers. Regardless of the really rainy weather, teachers enthusiastically participated in a variety of activities.

# **UNDERSTANDING EARTH'S NATURAL WATERS: A GLOBE "Hydrology Investigation" Protocol workshop**

*A Hands-on workshop June 27, 2006*

**Five Act 48 Hours**

This all day workshop was held aboard the *Pittsburgh Voyager*.  
The workshop was conducted by the PA NASA Educator Resource Center (ERC)  
and sponsored by the Pennsylvania NASA Space Grant Consortium.

**We ARE water – 50-90% of the weight of all living organisms!  
GLOBE Hydrology Investigations can help us make more intelligent  
decisions about how we use, manage, and enjoy this valuable resource.**

8:30 am	<u>Registration and Coffee</u>
8:45 am	<u>Welcome Aboard/Introductions</u>
9:00 am	<b><u>GLOBE HYDROLOGY INVESTIGATION ACTIVITIES</u></b> GLOBE program hands-on, inquiry-based activities, conducted by NASA-trained GLOBE presenters.
10:15 am	<u>BREAK</u>
10:30 am	<b><u>GLOBE ACTIVITIES /Measurements</u></b>
NOON	<u>LUNCH.</u>
1:45 pm	<b><u>GLOBE ACTIVITIES</u></b> - Continued Globe measurements and hands-on activities.
3:00 pm	<b><u>Summary-evaluations-PRIZES</u></b>

*Of all Earth's water, only about 3 mL out of 100 L is fresh water we can consume. Sampling surface water can help students gain inquiry abilities and understand a number of concepts. Included are science/environment and geography concepts derived from National Standards. Alignment with Pennsylvania standards is included.*



Teachers take water samples from a variety of location in the rivers.



Teachers studied water chemistry, pollution, macroinvertebrate diversity.

### Workshop summary by Pam Jenko

Throughout the day, water samples were collected from several points along the three rivers. After determining the global positions of the sites, the type of cloud cover, and the temperature of the water, chemical tests were conducted to determine the quality of the water. The transparency, which measures suspended solids, was observed using a Secchi disc. Electric conductivity, which measures dissolved solids, was also recorded. A kit and an oxygen probe were used to measure dissolved oxygen. Alkalinity and pH, which measure the concentration of hydrogen ions present, were recorded. The amount of nitrates, which are affected by water treatment plants and fertilizers, was observed. Although it was another of those rainy summer days, all results were within the acceptable range for water quality.

All teachers received GLOBE supplies along with related NASA resources.

