# 11th GLOBE Annual Conference

Inspiring the Next Generation of Earth System Scientists

# San Antonio, Texas

29 July - 3 August 2007


# Program

The GLOBE Program

*Global Learning and Observations to Benefit the Environment*

*An International Environmental Science and Education Partnership*

29 July 2007

Dear Friends,

Welcome to San Antonio, Texas, and the **11th Annual GLOBE Conference**. The GLOBE Program Office is delighted to be co-hosting the conference with U.S. GLOBE Partners from the University of Texas at Tyler and Austin, in collaboration with Partners from Northern Michigan University and GLOBE Southern Connecticut State.

The Annual Conference brings together teachers, scientists, academics, program managers, and government officials from around the world to address key issues related to the continued recognition and growth of GLOBE as the world's preeminent, hands-on primary and secondary school science and education program. In the next few days, we will get to know one another through a series of panel and roundtable discussions, meetings and field investigations. With firsthand reports from our distinguished international Partners and insight from several keynote speakers, we will learn more about the current worldwide state of GLOBE and be introduced to new program developments, such as GLOBE's new Earth System Science Projects (ESSPs) and your local and regional projects. We will have the opportunity to interact with both students and scientists who are using GLOBE data in their own research, to discuss effective methods to enhance and implement GLOBE in our communities and to constructively address our individual and collective challenges.

This is a time to study, to learn, to form friendships and support networks, and to reignite our enthusiasm for the vital work we do. Your active participation in the days ahead is essential to nurturing and sustaining the strength of the GLOBE Program itself. Thank you for joining us.

Sincerely,

Edward E. Geary, Ph.D.
Director

Teresa J. Kennedy, Ph.D.
Deputy Director
Partnerships, Communication and Evaluation
Conference Co-Chair

Emmett L.Wright, Ph.D.
Deputy Director
Science, Education and Sustainability
Conference Co-Chair

Michael R. L. Odell, Ph.D.
University of Texas at Tyler
Conference Co-Chair

Ms. Marsha Willis
University of Texas at Austin
Conference Co-Chair

*P.O. Box 3000, Boulder, CO 80307 USA (Mailing Address)*

*3300 Mitchell Lane, Suite 2104, Boulder, CO 80301 USA (Physical Address)*

*www.globe.gov Tel: (1) 303-497-2620 Fax:(1) 303-497-2638*

# 2007 Annual Conference Organizing Committee

Dr. Teresa Kennedy — GLOBE Program Office, Co-Chair
Dr. Emmett Wright — GLOBE Program Office, Co-Chair
Dr. Michael Odell — University of Texas at Tyler, Co-Chair
Ms. Marsha Willis — University of Texas at Austin, Co-Chair

Dr. Jason Abbitt — Miami University, Oxford, Ohio
Dr. Scott Graves — Southern Connecticut State University
Dr. Mitchell Klett — Northern Michigan University

Ms. Jan Heiderer — GLOBE Program Office
Ms. Katy Lackey — GLOBE Program Office
Mr. Jamie Larsen — GLOBE Program Office
Mr. Gary Randolph — GLOBE Program Office
Ms. Paula Robinson — GLOBE Program Office
Mr. David Smith —GLOBE Program Office
Dr. Sheila Yule — GLOBE Program Office

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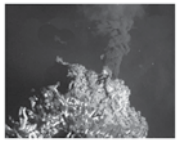
# GLOBE Earth Systems Science Projects (ESSPs)

### Carbon Cycle

"Carbon - the building block of life." You may have heard this phrase, but have you understood what it really means? Carbon is the most abundant element in living things and accounts for approximately 50% of the total mass of plants and animals. Carbon is also present in Earth's atmosphere, soils, oceans and crust, and cycles between these components on varying time and spatial scales. The GLOBE Carbon Cycle Project links an international team of scientists and educational outreach specialists with the GLOBE educational community. Through field exercises, computer modeling, and remote sensing, primary and secondary grade level teachers and students will gain knowledge about current carbon cycle research, develop strong analytical skills, and increase their overall environmental awareness.

### Seasons and Biomes

What is a biome? A biome is a large geographic area of distinctive plant and animal groups that are adapted specifically for a particular environment. Biome type is determined by the climate and geography of a region. Through the GLOBE Seasons and Biomes project, students and teachers will contribute critically needed science measurements to validate satellite data used in research on regional climate change, prevention and management of diseases, and understanding of the water and carbon cycles. By monitoring the seasons in their own biome, students will learn how interactions within the Earth system affect their local environment and how it in turn affects regional and global environments.



**FLEXE (From Local to Extreme Environments)** How extreme is the deep sea? What does it take to flourish along a mid-ocean spreading center 2,500 meters below sea level? Characterized by crushing pressure, near freezing temperatures, and no light, the deep sea is the largest environment on Earth. Scientists are currently conducting investigations to learn more about features that make this ecosystem extreme and unique. The FLEXE project invites students to join the scientists of the NSF-sponsored Ridge 2000 program and associated research programs.

### Watershed Dynamics

Where does your water come from? Do you always have enough or is the supply limited where you live? What factors affect the flow of water in the area where you live? The GLOBE Watershed Dynamics Project will enable students to investigate their own watershed in order to understand the flow of water through the watershed, how human activities within the watershed both depend on and impact its hydrology, and how land use changes can affect the plant and animal communities in the watershed.

# Featured Speakers

**Michael L. Coats**
**(Captain, USN, RET.)**
**Director**
**NASA Johnson Space Center**
**Houston, Texas**

**Keynote Address: "The Ultimate Fieldtrip: Exploring Earth, Moon and Mars"**
**Tuesday, 9:00 - 10:00 AM, Ballroom**
**Sponsored by GLOBE Texas**
**http://www.nasa.gov/centers/johnson/home/index.html**

Michael Coats, former NASA astronaut, is the 10th director of the Johnson Space Center in Houston, Texas. He has served in this capacity since November 2005.

Capt. Coats began his career as a Navy pilot and flight instructor, accomplishing more than 400 aircraft carrier landings. He has logged more than 5,000 hours flying time in 28 different types of aircraft. In 1979, Capt. Coats was selected to be a NASA astronaut. He first served as an astronaut support crew member and quickly advanced to take part in three manned space missions as capsule coordinator, pilot and spacecraft commander, logging more than 463 hours in space. Capt. Coats served as Acting Chief of the Astronaut Office from 1989 -1990.

In 1991, Capt. Coats retired from the U.S. Navy and the Astronaut Office. Subsequently, he has been appointed Vice President of Avionics and Communications Operations for Loral Space Information Systems (1991-1996), Vice President of Civil Space Programs for Lockheed Martin (1996-1998), and Vice President of Advanced Space Transportation for Lockheed Martin Space Systems in Denver, Colorado (1998-2005).

**Ted McCain**
**Associate Director**
**The Thornburg Center for Professional Development**
**Lake Barrington, IL**

**Keynote Address: "Making Schools Work in the 21st Century"**
**Wednesday, 9:00 - 10:00 AM, Ballroom**
**Sponsored by Forestry Suppliers**
**http://www.forestry-suppliers.com**

Ted McCain is currently the Coordinator of Instructional Technology for Maple Ridge Secondary School in Vancouver, British Columbia, where he has taught for 25 years. He is also an author, courseware developer, technology consultant and prizewinning educator.

Having written and co-written six books on effective teaching, educational technology, graphic design, and the future, Mr. McCain is currently at work on three new book projects. He has been an innovator and pioneer in technology education and has designed courses for his school district and the province of B.C. in computer science, data processing, desktop publishing, computer networking, Web site design, digital animation, digital film effects, and sound engineering. In 1997, Mr. McCain received the prestigious Prime Minister's Award For Teaching Excellence for his work in developing a real-world technology curriculum for grade 11 and 12 students designed to prepare them for employment in the areas of Web site design and computer networking directly out of high school. Mr. McCain was recognized for his work in creating his innovative "4 D" approach to solving problems, his unique use of role playing in the classroom, and his idea of progressive withdrawal as a way to foster independence in his students.

In addition to his work as a teacher, for the past twenty-five years Mr. McCain has consulted with school districts and businesses on effective teaching for the digital generation and the implementation of instructional technology. His clients have included Apple Computer, Microsoft, Aldus, and Toyota, as well as many school districts and educational associations in both the United States and Canada. Mr. McCain has now joined the Thornburg Center For Professional Development as an associate director. In this role, he has expanded his work as an educational futurist. Ted McCain focuses on the impact on students and learning from the astounding changes taking place in the world today as a consequence of technological development. He is passionate in his belief that schools must change to prepare students for the future.

**Peggy Foletta**
**Chair, Science Department**
**Kingsburg High School**
**Kingsburg, California**

**PolarTREC Webinar**
**Thursday, 9:00 - 10:00 AM, Ballroom**
**Sponsored by PolarTREC**
**http://www.polartrec.com/**

Peggy Foletta has been a teacher of biology and environmental science at Kingsburg High School in California for the past 31 years. Currently, she is Chair of the KHS Science Department and a PolarTREC teacher.

Ms. Foletta and her students have been involved with the GLOBE Program since its beginning. As a GLOBE teacher, she started an integrated river project at local Kings River. Her AP students have been monitoring water quality and measuring macroinvertebrate biodiversity at various locations along the Merced River in Yosemite since 1999. Ms. Foletta led a team of five science teachers in a three-year Ocean Explorers program in which they produced GIS lessons comparing the Channel Islands to the Galapagos Islands in El Niño vs. non-El Niño years. She received special training to guide her students in monitoring marine ecosystems in the LiMPETS program. In the Coast Alive program last year, Ms. Foletta and her students carried out a project comparing water parameters and plankton in Elkhorn Slough along the California coast. Throughout the years, Ms. Foletta's students have carried out several GLOBE research projects, studying macroinvertebrates with students in Wetzlar, Germany; biomes with students from West Virginia; air-quality with a focus on ozone and particulates; and biome comparison with 17 GLOBE schools as part of the "Match the Biome" contest. Three of her teams were selected to present their research at GLOBE Learning Expeditions. As a GLOBE Master Trainer, Ms. Foletta has had the opportunity to train teachers at more than 50 workshops in the United States. For three years, she carried out GLOBE trainings with teachers and students in U.S. Department of Defense schools in Germany. In addition to her many responsibilities as a teacher, Peggy Foletta is also a grader for the AP Environmental Science exam for the Educational Testing Service and current Coordinator of the San Joaquin Valley (California) GLOBE partnership.

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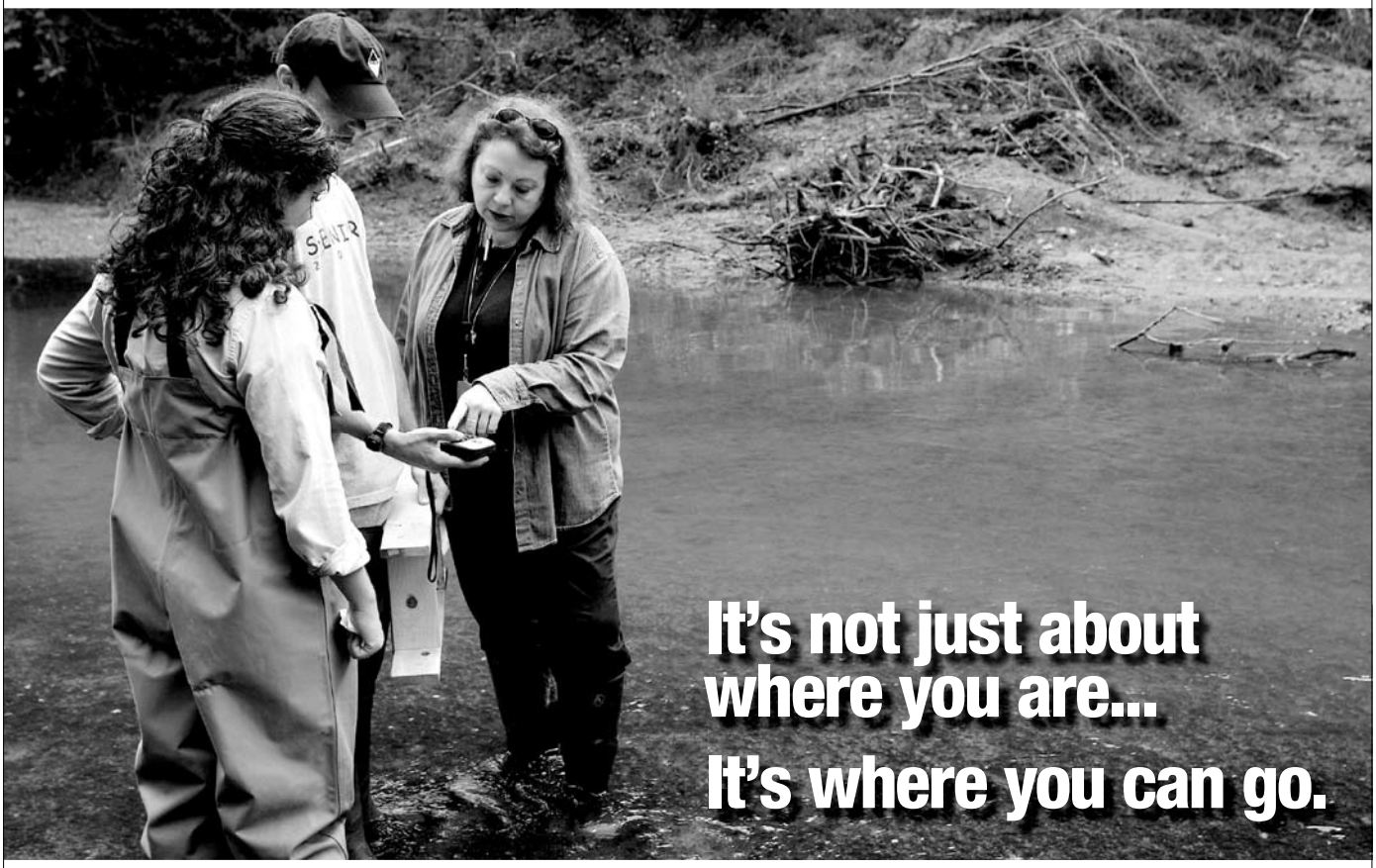
## SCUBAnauts International
## America's Next Generation of Explorers

The mission of SCUBAnauts International is to expand and promote opportunities for young and emerging explorers by involving them in the marine sciences through underwater exploration and research activities, such as environmental and undersea conservation projects, that build character, promote active citizenship, and develop effective leadership skills.

SCUBAnauts International is committed to working with GLOBE to promote improved ocean literacy more broadly in the U.S. and around the world.

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# Hands on GLOBE:

## Partner Administration Page training

Learn how to:

- **Post Workshops**
- **Add Participants and Trainers**
- **Issue School ID's**
- **Locate Support Materials**
- **Access your Annual Survey**

Drop in for guidance with these and any other questions you may have regarding managing your GLOBE Administrative page on the GLOBE Web site.

Sponsored by:

The GLOBE Help Desk

Two sessions: Tuesday, 11:00 - 12:30, Cavalier Room
Tuesday, 18:30 - 19:30, Cavalier Room

# Conference Agenda

## Sunday, 29 July 2007
**Location: Ballroom**

| Time | Activity |
|---|---|
| 9:00 – 16:00 | **Registration, Exhibit and Poster Set Up**<br>Location: Ballroom Lobby Area |
| 17:00 – 20:00 | **Reception, Exhibits and Posters**<br>Location: Ballroom |
| 20:00 | **Adjourn** |

## Monday, 30 July 2007: GLOBE Earth System Science
**Moderator: Dr. Teresa Kennedy, Deputy Director, The GLOBE Program**
**Location: Ballroom**

| Time | Activity |
|---|---|
| 8:30 – 9:00 | **Light Breakfast**<br>Location: Ballroom Lobby & Exhibit Area |
| 9:00 – 9:15 | **Opening Welcome**<br>Conference Co-Chairs:<br>Dr. Teresa Kennedy, Dr. Michael Odell & Ms. Marsha Willis<br>Location: Ballroom |
| 9:15 – 10:00 | **Opening Address**<br>Dr. Ed Geary, Director, The GLOBE Program<br>Location: Ballroom |
| 10:00 – 10:30 | **Keynote: NASA/NSF: GLOBE Program Sponsors**<br>Dr. Ming-Ying Wei, NASA<br>Dr. Jill Karsten, NSF<br>Location: Ballroom |
| 10:30 – 11:00 | **Break & Exhibits**<br>Location: Ballroom Lobby & Exhibit Area |
| 11:00 – 12:00 | **GLOBE ESSPs**<br>Facilitator: Dr. Emmett Wright, Deputy Director, The GLOBE Program<br>Location: Ballroom |
| 12:00 – 12:30 | **GLOBE Networks**<br>Facilitator: Dr. Sheila Yule, GLOBE Networks Coordinator & GPO Project Leader for the Seasons and Biomes ESSP<br>Location: Ballroom |
| 12:30 | **Lunch & Exhibits**<br>Lunch Location: Minuet Room & Patio Room |
| 14:00 -15:30 | **Strand Presentations** |

| **STRAND 1A:**<br>**Location: Ballroom A**<br>**Moderator:**<br>**Mrs. Sue Lini** | **STRAND 1B:**<br>**Location: Ballroom B**<br>**Moderator:**<br>**Mr. Jamie Larsen** | **STRAND 1C:**<br>**Location: Ballroom C**<br>**Moderator:**<br>**Dr. Sheila Yule** | **STRAND 1D:**<br>**Location: Renaissance**<br>**Moderator:**<br>**Ms. Paula Robinson** |
|---|---|---|---|
| **The Ice Cap in Greenland**<br>Mrs. Britta Lohmann & Mrs. Jane Buus Sorensen (Greenland) | **GLOBE in Texas**<br>Ms. Marsha Willis (Texas, U.S.A.) | **"Our Living Soil" – Students Collecting Data (with GLOBE and 5 Newly Developed Protocols) Used by Dutch Soil Research Institutes**<br>Dr. Ido de Haan (Netherlands) | **My Wonderful World**<br>Ms. Anne Pollard (Washington D.C., U.S.A.) |
| **Coast Watch**<br>Ms. Birgit Rademacher (Germany) | **Earth System Science in Preservice Education**<br>Ms. Malulee Pornchokchai (Thailand) | **GLOBE at Night**<br>Mr. Gary Randolph (Colorado, U.S.A.) | **Networking in the GLOBE Africa Consortium to Achieve a Self-supporting and Sustainable Program**<br>Mrs. Margaret Nyoh Tondo Besong (Cameroon) |
| **Bringing Together Ground and A-Train Observations and Measurements to Understand the Role of Aerosols**<br>Ms. Danielle De Staerke, Ms. Adrien Laurenceau, Ms. Annie Carrasset, Ms. Sylvie Dubreuilh & Mr. Eric Abgrall (France) | **Implementing Higher Education Partnerships: Enhancing Inquiry-Based Science Education at Multiple Levels**<br>Dr. Rebecca Dodge (Georgia, U.S.A.) | **InspireData: A Creative Way to Showcase Environmental Data**<br>Dr. Lynne Hehr (Arkansas, U.S.A.) | **GLOBE Program in Trinidad and Tobago 1996-2007: A Case of Sustainable Support, Problems in Integration Implementation and Successful Outreach Programs.**<br>Mr. Henry Saunders (Trinidad) |
| **CloudSat Modular Education Unit: Cloud Type**<br>Dr. Matt Rogers (Colorado) & Mr. Peter Falcon (California) (U.S.A.) | **Ethnicity as a Construct in Influencing Environmental Education Teaching Efficacy Beliefs**<br>Dr. Christine Moseley (Texas) & Dr. Juliana Utley (Oklahoma) (U.S.A.) | **Math Trax: NASA's Free Tool to Graph and Analyze GLOBE Datasets**<br>Ms. Stephanie Smith, Dr. Robert Shelton & Ms. Terry Hodgson (Texas, U.S.A.) | **GLOBE and Business Support – A Case Study of a Water Company**<br>Dr. Andy Tasker & Ms. Linda Lockhart (United Kingdom) |
| 15:30 – 16:00 | **Break & Exhibits**<br>Location: Ballroom Lobby & Exhibit Area | | |
| 16:00 – 17:30 | **Regional Meetings**<br>**Africa:** Patio Room<br>**Asia/Pacific:** Renaissance Room<br>**Europe:** Ballroom B<br>**Latin America/Caribbean:** Ballroom C<br>**Near East:** Kampmann Room<br>**North America:** Ballroom A | | |
| 17:30 | **Adjourn** | | |

## Monday, 30 July 2007: GLOBE Earth System Science

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|---|---|
| 18:30 – 19:30 | **1. Technology Session—Google Earth and World Wind: Using GLOBE Data**<br>Dr. Feodor Surkov (Russia) & Mr. Gary Randolph (Colorado, U.S.A.)<br>Location: Cavalier Room |
| 18:30 | **2. San Antonio Geocaching Adventure**<br>Dr. Mitchell Klett (Michigan), Dr. Scott Graves (Connecticut) & Mr. Todd Ensign (West Virginia) (U.S.A.)<br>Location: Meet in the Lobby! |

## Tuesday, 31 July 2007: GLOBE Around the World

**Moderator: Dr. Michael Odell**
**Location: Ballroom**

| Time | Activity |
|---|---|
| 8:30 – 9:00 | **Light Breakfast**<br>Location: Ballroom Lobby Area |
| 9:00 – 10:00 | **Keynote: Captain Michael Coats**<br>Director, NASA Johnson Space Center, Houston, Texas<br>"The Ultimate Fieldtrip: Exploring Earth, Moon and Mars"<br>***Sponsored by GLOBE Texas***<br>Location: Ballroom |
| 10:00 – 10:30 | **Students as Scholars Institute**<br>Ms. Sarah Cole, Mr. Ori Goldwasser, Mr. Anthony Hogue, Mr. Jordan Jensen, Ms. Darian Johnson, Mr. Conor McMann, Ms. Madison Noll & their teacher, Ms. Melinda Merrill, Center Middle School, Kansas City, Missouri (U.S.A.)<br>Facilitator: Dr. Sheila Yule<br>Location: Ballroom |
| 10:30 – 11:00 | **Break & Exhibits**<br>Location: Ballroom Lobby and Exhibit Area |
| 11:00 – 12:30 | **Strand Presentations** |

| **STRAND 2A:**<br>**Location: Ballroom A**<br>**Moderator:**<br>**Ms. Paula Robinson** | **STRAND 2B:**<br>**Location: Ballroom B**<br>**Moderator:**<br>**Ms. Rebecca Rowe** | **STRAND 2C:**<br>**Location: Cavalier**<br>**Moderator:**<br>**Mrs. Nandini McClurg** | **STRAND 2D:**<br>**Location: Renaissance**<br>**IN SPANISH Moderator:**<br>**Mrs. Cecilia Ramos-Mañé** |
|---|---|---|---|
| **Student Research and Scientist Network**<br>Dr. Sheila Yule (Colorado, U.S.A.) | **COMETS: COMmunities Educating Tomorrow's Scientists (COMETS)**<br>Dr. Tina Cartwright, Mr. Todd Ensign & Dr. Michael Corrigan (West Virginia, U.S.A.) | **Hands on GLOBE: Partner Administration Page Training**<br>Mrs. Nandini McClurg, Mrs. Constance Snyder & Mr. Noah Newman, The GLOBE Help Desk (Colorado, U.S.A.) | **El Programa GLOBE en la Región de América Latina y el Caribe**<br>Mrs. Reyna Guadalupe Camarillo (México) |
| **GLOBE in Germany: Structure, Evaluation, Projects**<br>Ms. Birgit Rademacher (Germany) | **Designing Your Own Students as Scholars Institute**<br>Ms. Melinda Merrill (Missouri, U.S.A.) | | **Actividades GLOBE Enero – Junio 2007**<br>Prof. María del Carmen Galloni (Argentina) |
| **A Watershed Study in France**<br>Mrs. Nicole Herman (France) | **Capturing the Head, Hands and the Heart: the New Zealand Model for Environmental Action**<br>Mr. Aaron Fleming & Mrs. Kathryn Hicks (New Zealand) | | **El Desarrollo del Programa GLOBE en México**<br>Mrs. Reyna Guadalupe Camarillo, Mr. Luis Manuel Guerra Garduño, Mr. Obed Avilés Alatriste & Mr. Cesari Rico Galeana (México) |
| **Watershed Mania!**<br>Dr. Lynne Hehr & Dr. John Hehr (Arkansas, U.S.A.) | **GLOBE Classes: New Techniques of Working with Students**<br>Ms. Katarzyna Jakubowska (Poland) | | **Implementación de GLOBE en la Universidad Tecnológica de Nezahualcóyotl**<br>Mr. Obed Aguston Avilos-Alatriste (México) |
| 12:30 – 14:00 | **Lunch & Exhibits**<br>Lunch Location: Minuet Room & Patio Room | | |

## Tuesday, 31 July 2007: GLOBE Around the World

| | |
|---|---|
| 14:00 – 15:30 | **Round Table Discussions**<br>Facilitator: Dr. Michael Odell<br>Location: Ballroom<br>1. Carbon Cycle ESSP (Mr. Gary Randolph)<br>2. FLEXE ESSP (Mr. Jamie Larsen)<br>3. Seasons and Biomes ESSP (Dr. Sheila Yule)<br>4. Watershed Dynamics ESSP (Mr. David Smith)<br>5. Connecting to Satellite Missions (Mrs. Nandini McClurg)<br>6. Curriculum Needs (Ms. Marsha Willis)<br>7. Barriers/Solutions around School Collaborations (Dr. Ed Geary)<br>8. Barriers to Implementing Student Projects (Dr. Russanne Low)<br>9. Tools for Data Entry, Data Analysis & Collaboration (Mr. Mike Leon)<br>10. Training GLOBE Trainers (Ms. Rebecca Rowe)<br>11. Training GLOBE Teachers (Mr. Eric Stonebraker)<br>12. Undergraduate Teacher Education/Research (Dr. Mitchell Klett)<br>13. Informal Education (Dr. Scott Graves)<br>14. Inquiry and GLOBE (Mr. Martos Hoffman)<br>15. Communicating and Publicizing GLOBE (Ms. Jan Heiderer)<br>16. Sustainability and Capacity Building (Ms. Paula Robinson) |
| 15:30 – 16:00 | **Break & Exhibits**<br>Location: Ballroom Lobby & Exhibit Area |
| 16:00 – 17:30 | **Regional Meetings**<br>**Africa:** Patio Room<br>**Asia/Pacific:** Renaissance Room<br>**Europe:** Ballroom B<br>**Latin America/Caribbean:** Ballroom C<br>**Near East:** Kampmann Room<br>**North America:** Ballroom A |
| 17:30 | **Adjourn** |
| 18:30 – 19:30 | **Technology Session: Help Desk / Administrative Web Site Assistance**<br>Mrs. Nandini McClurg, Mrs. Constance Snyder & Mr. Noah Newman, The GLOBE Help Desk (Colorado, U.S.A.)<br>Location: Cavalier Room |

## Wednesday, 1 August 2007: GLOBE Research and Investigations

**Moderator: Ms. Marsha Willis**
**Location: Ballroom**

| Time | Activity |
|---|---|
| 8:30 – 9:00 | **Light Breakfast**<br>Location: Ballroom Lobby Area |
| 9:00 – 10:00 | **Keynote: Mr. Ted McCain**<br>The Thornburg Center, Canada<br>"Making Schools Work in the 21st Century"<br>***Sponsored by Forestry Suppliers***<br>Location: Ballroom |
| 10:00 – 10:30 | **New Braunfels Field Day Introduction**<br>--Ms. Cindy Loeffler, Texas Parks & Wildlife<br>--Research Questions<br>Facilitator: Ms. Marsha Willis<br>Location: Ballroom |
| 10:30 – 11:00 | **Break & Exhibits**<br>Location: Ballroom Lobby & Exhibit Area |
| 11:00 – 12:00 | **Field Day Introduction (continued)**<br>--GLOBE Watershed Dynamics ESSP<br>--PASCO Product Descriptions<br>--GLOBE FLEXE ESSP<br>--Vernier Product Descriptions<br>--Field Day Logistics<br>Facilitator: Dr. Michael Odell |
| 12:15 | **Buses Depart**<br>Box Lunches Available in the Ballroom Lobby |
| 1:00 – 16:30 | **Field Day Activities**<br>(New Braunfels, TX area)<br>1. **Rockin' R River Raft Trip, Guadalupe River**<br>***Event Sponsored by PASCO***<br>2. **Natural Bridge Caverns**<br>***Event Sponsored by Vernier***<br>*Buses will depart from Field Day Activities and go directly to BBQ at Landa Park.* |
| 17:30 – 20:00 | **BBQ at Landa Park, New Braunfels**<br>Featuring the Shane Howard Band<br>***Event partially sponsored by WARD's Natural Science*** |

## Thursday, 2 August 2007: GLOBE Connections

**Moderator: Dr. Teresa Kennedy**

Location: Ballroom

| Time | Activity |
|---|---|
| 8:30 – 9:00 | **Light Breakfast**<br>Location: Ballroom Lobby Area |
| 9:00 – 9:45 | **PolarTREC Webinar**<br>Ms. Peggy Foletta, California<br>***Sponsored by PolarTREC***<br>Location: Ballroom |
| 9:45 – 10:00 | **GLOBE Web site Update**<br>Mr. Mike Leon & Ms. Karen Milberger, GLOBE Program Office |
| 10:00 – 10:30 | **GLOBE Alumni**<br>Facilitator: Dr. Sheila Yule<br>**Africa:** Ms. Adele Bilong (Cameroon)<br>**Asia/Pacific:** Ms. Watcharee Ruairuen (Thailand)<br>**Europe:** Mr. Martin Pentson (Estonia)<br>**Latin America/Caribbean:** Mr. Guillermo Grimaux (Argentina)<br>**Near East:** Ms. Shaikha Mohamed BuAli (Bahrain)<br>**North America:** Mr. Matt Fenzel (Virginia, U.S.A.)<br>Location: Ballroom |
| 10:30 – 11:00 | **Break & Exhibits**<br>Location: Ballroom Lobby & Exhibit Area |
| 11:00 – 12:30 | **Strand Presentations** |

| **STRAND 3A:**<br>**Location: Ballroom A**<br>**Moderator:**<br>**Dr. Russanne Low** | **STRAND 3B:**<br>**Location: Ballroom B**<br>**Moderator:**<br>**Mr. Eric Stonebraker** | **STRAND 3C:**<br>**Location: Ballroom C**<br>**Moderator:**<br>**Mr. David Smith** | **STRAND 3D:**<br>**Location: Renaissance**<br>**Moderator:**<br>**Mr. Martos Hoffman** |
|---|---|---|---|
| **Science in your Backyard**<br>Dr. Peggy LeMone, GLOBE Chief Scientist (Colorado, U.S.A.) | **Google Earth and World Wind: Using GLOBE Data**<br>Dr. Feodor Surkov (Russia) & Mr. Gary Randolph (Colorado, U.S.A) | **Elementary GLOBE: K-4 Begins!**<br>Dr. Lynne Hehr (Arkansas, U.S.A.) | **Promoting Your Story: Effectively Communicating Successful GLOBE Implementation**<br>Ms. Jan Heiderer (Colorado, U.S.A.) |
| **Partnerships for Promoting Geoscience Education in the Kansas City Metropolitan Area**<br>Dr. Jimmy Adegoke, Dr. Tina Niemi, Dr. Elizabeth Stoddard, Mr. David Ketchum, & Dr. Louis Odom (Missouri, U.S.A.) | **Building Communities: DoDEA, Peace Corps, State Department and UCAR Affiliate Collaborations**<br>Mr. Gary Randolph (Colorado) & Richard Roettger (Puerto Rico) | **GLOBE Approved Microclimate Weather Measurement Systems and Software**<br>Mr. John Johnston, Weatherhawk (Utah, U.S.A.) | **Developing Classroom Activities for Conceptualizing Climate and Climate Change**<br>Ms. Umarporn Charusombat, Mr. Daniel Shepardson, Mr. Dev Niyogi, Mr. So Young Choi, Mr. Leon Walls & Mr. Kenneth Scheeringa (Thailand) |

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|---|---|---|---|
| **A Four-Parameter Fit of Average Daily Air Temperature from Selected GLOBE Schools and Applications**<br>Dr. Diola Bagayoko (Louisiana, U.S.A.), S. Sangaré & K. Konaté (Mali) | **"The GLOBE Buffet" – A "Bite-size" Recipe for Implementing GLOBE on a Large Scale!**<br>Mr. Jerry Cobbs, Ms. Lynn Vaughan, & Ms. Robin Nelson (Alabama, U.S.A.) | **Lewis and Clark Rediscovery Project: Life-Long Learning Online (L3)**<br>Drs. Michael Odell (Texas), Teresa Kennedy (Colorado), Mitch Klett (Michigan), Scott Graves (Connecticut), & John Ophus (Iowa) (U.S.A.) | **Carbon Cycle ESSP: Plant-A-Plant**<br>Dr. Jana Albrechtova, Dr. Zuzana Lhotakova, Mr. Lubos Danek, Ms. Edita Tylova, Dr. Lubomir Natr, Ms. Bara Semerakova, Ms. Dana Votapkova (Czech Republic) & Dr. Scott Ollinger ( New Hampshire, U.S. A.) |
| **The NatureMapping Program Trains K-12 Educators and Students for Field Research Projects with Local Scientists**<br>Karen Dvornich (Washington, U.S.A.) | **Tribal Connections to GLOBE**<br>Mrs. Nandini McClurg (Colorado) & Dr. Georgia Cobbs (Montana (U.S.A.) | **The S2TASK Project: Students and Scientists Together Advancing Science Knowledge**<br>Drs. Henrietta List (Maine), Michael Odell (Texas) & Teresa Kennedy (Colorado) (U.S.A.) | |

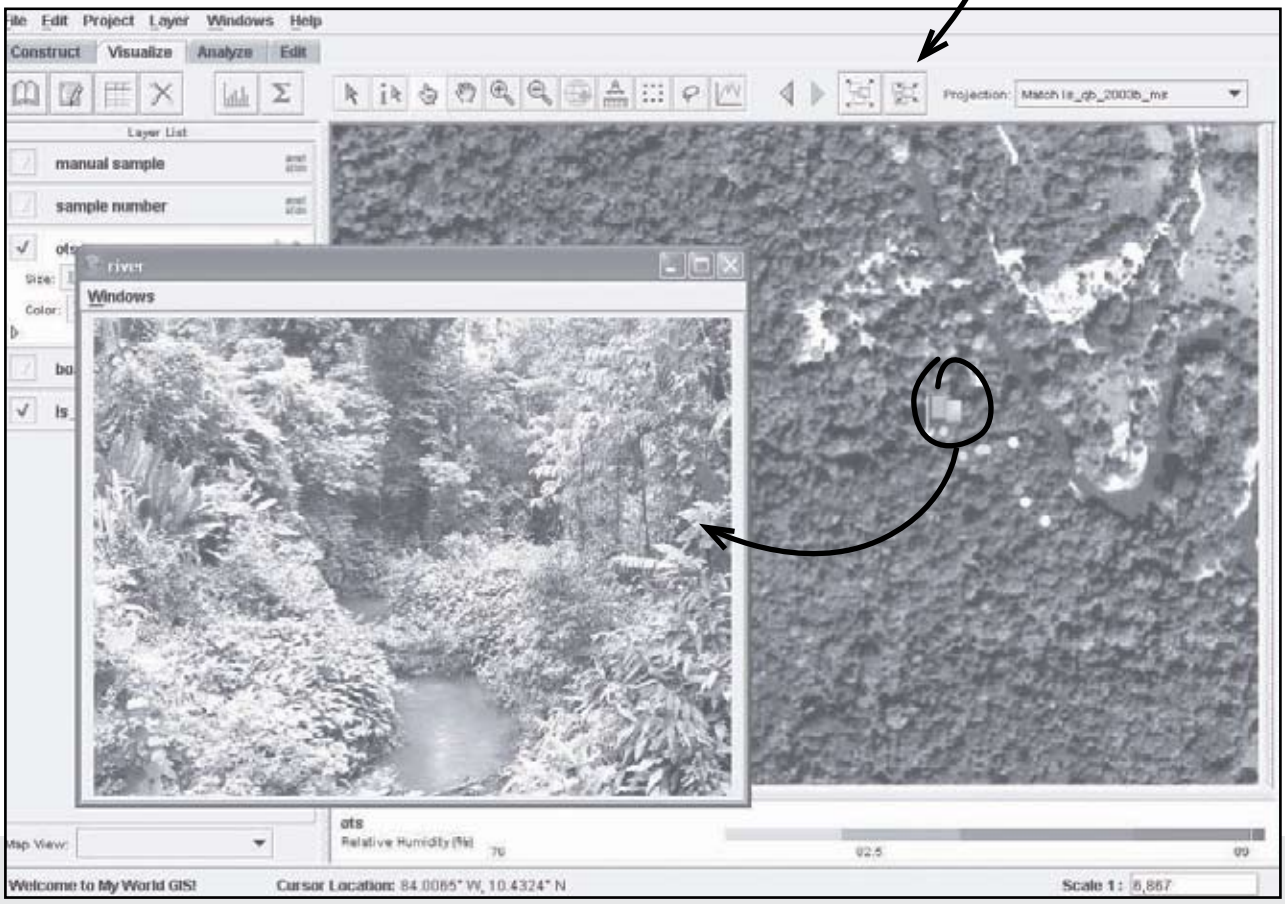
| | |
|---|---|
| 12:30 – 14:00 | **Lunch & Exhibits**<br>Lunch Location: Minuet Room and Patio Room<br>Exhibits close at 14:00 |
| 14:00 – 15:00 | **U.S. Partner Meeting**<br>Location: Ballroom A<br>**Country Coordinator Meeting**<br>Location: Ballroom B |
| 15:00 – 15:30 | **Break**<br>Location: Ballroom Lobby & Exhibit Area |
| 15:30 – 17:00 | **Final Plenary**<br>Closing Ceremony<br>Location: Ballroom |
| 17:00 | **Adjourn** |
| 18:00 | **GLOBE Annual Banquet**<br>Location: Sunset Station (Group Photo)<br>Trolley Shuttle Service will begin at 17:45 from Plaza Side of Hotel |

## Friday, 3 August 2007

| Time | Friday, August 3<br>Conference Workshops |
|---|---|
| 8:30 – 9:00 | **Light Breakfast**<br>Location: Ballroom Lobby Area |
| 9:00 – 12:00 | **Session A**<br>**1. "Using GIS to Analyze Hydrology Data"** ***Watershed Dynamics ESSP***<br>Location: Ballroom A<br><br>**2. "Utilizing Satellite Data to Study Seasons and Biomes"** ***Seasons and Biomes ESSP***<br>Location: Ballroom B<br><br>**3. GLOBE Protocol Mini-Trainings** ***Texas Collaboratives***<br>Location: (off site—bus leaves at 8AM)<br><br>**4. Fundraising** ***GLOBE Program Office Staff***<br>Location: Ballroom C |
| 12:00 – 13:30 | **Lunch on Your Own** |
| 13:30 – 16:30 | **Session B:**<br>**1. "Integrating the Carbon Cycle into Your Classroom through a Simple Computer Model"** ***Carbon Cycle ESSP***<br>Location: Ballroom B<br><br>**2. "Making Connections between Local and Extreme Environments"** ***FLEXE ESSP***<br>Location: Ballroom A<br><br>**3. "Make and Take GLOBE Instruments"** ***Texas Collaboratives***<br>Location: Patio Room<br><br>**4. "Podcasts in Education"** ***Texas Collaboratives***<br>Location: Ballroom C<br><br>**Conference Concluded** |

# Make environmental data more meaningful.

## *Put it on a map.*

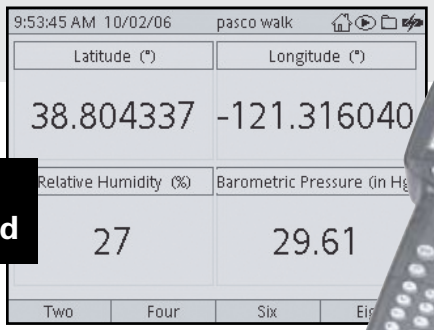



### 1 Collect sensor data and GPS position simultaneously

The new GPS Position Sensor plugs into PASPORT® interfaces along side other sensors. It uses satellite triangulation to determine the position, and even velocity, in outdoor environments. The highly-sensitive GPS receiver can track satellites even under tree canopies often found along rivers.

### 2 Upload data to My World GIS™

My World GIS provides the functionality of a professional Geographic Information System (GIS) with the ease-of-use required by students and the ease-of-administration critical to schools.




### 3 View & analyze data in context

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# Field Day Activities

**Wednesday, August 1**
**Field Trip Options:**
**Buses depart hotel at 12:15 PM. Box lunches available.**

**Exploring the Guadalupe River and Edwards Aquifer**
The hydrology study site of the GLOBE International Conference in San Antonio, Texas, U.S.A., is located along the Guadalupe River near the township of New Braunfels, Texas. As conference participants float the river on rafts, there will be specific locations where the GLOBE facilitators will have established hydrology sampling sites. These sites will be located along the stream where facilitators will have raft stations with sampling equipment including digital sensing/probes for gathering data on stream temperature, pH, turbidity, conductivity, dissolved oxygen and nitrates. For a few of these sampling sites, there will also be traditional GLOBE testing equipment for use in comparing sampling results. Digital Probe-ware in use will be the PASCO Xplorer GLX with multi-measure digital-based probes. The Xplorer GLX captures, analyzes, annotates, stores and prints data quickly and seamlessly, without being connected to a computer. After data is collected, participants will utilize My World GIS to analyze water quality data and then map it along with the GPS position. Representatives from PASCO will be on hand to demonstrate the Xplorer GLX and assist participants. GLOBE facilitators will also be on site to assist with the hydrology stations and collect continuous samples for select data types. Prior to floating the river, there will be a briefing from the Texas Parks and Wildlife Service and a member of the GLOBE Watersheds ESSP team.

**Explore the Natural Bridge Caverns**
The second option for the GLOBE Field day will be an expedition into one of Texas' largest cavern systems. The theme for the cave exploration is Exploring Extreme Environments. Prior to entering the cavern system, participants will be briefed by a representative from Texas Parks and Wildlife, the FLEXE ESSP team, and Cave personnel. Participants will collect GLOBE atmospheric data outside the cave for comparison purposes inside the cave using the Vernier LabPro and sensors to collect temperature, relative humidity, and atmospheric pressure data. Vernier representatives will be available to demonstrate their equipment and assist participants. Data will be analyzed using Logger Pro Software after exiting the cave. GLOBE explorers will take the North Cavern Tour and see an incredible world of natural beauty. This 75-minute tour travels through a half-mile of the largest and most spectacular show cavern in Texas. The main rooms that participants will pass through on this tour include The Bear Pit, Pluto's Anteroom, Sherwood Forest, Purgatory Creek, Castle of the White Giants, and the Hall of the Mountain King. Along the way participants will be surrounded by ancient formations (most still growing) such as stalagmites, stalactites, flowstones, chandeliers, and soda straws. GLOBE activities include collecting temperature and humidity data.

**GLOBE BBQ at Landa Park immediately following Field Day Activites**
Transportation will be provided from the Menger Hotel to New Braunfels, and will depart at approximately 4:00 PM.

# Friday Workshops

**Friday, August 3**
**Session A: 9:00 AM until noon**

**Using GIS to Analyze Hydrology Data**
***Watershed Dynamics ESSP***
Come and join the Watershed Dynamics Project in a 3-hour investigation of Water Availability. This inquiry-based workshop will introduce participants to a middle and high school curriculum that investigates hydrologic processes and watersheds. The Watershed Dynamics investigations include an in-depth data analysis of precipitation, evaporation and surface runoff patterns across the United States using the My World GIS application developed at Northwestern University. The workshop will conclude with an examination of the data collected from the Field Day activity on the Guadalupe River. You will get the opportunity to experience a watershed investigation first-hand while gaining new GIS analysis skills. A 45-day trial My World CD-ROM will be provided to each workshop attendee and access to existing data sets and curricular materials.

**Utilizing Satellite Data to Study Seasons and Biomes**
***Seasons and Biomes ESSP***
Learn how you can obtain and use free satellite data and images in middle- and high-school math and science classes. Participants will learn how to obtain free Landsat images and data of their own schools region, explore classroom activities for analyzing these data, and examine how these activities can help students learn about seasons and biomes. Materials will be provided for these investigations and links for learning more. This workshop models inquiry-based learning, and is highly interactive. Individual computers will NOT be provided for this session. For a hands-on experience, participants may wish to bring a laptop computer.

**GLOBE Protocol Mini-Training**
***Texas Collaboratives***
Refresher training and protocol implementation assistance will occur at Our Lady of the Lake University. Participants will be provided with the opportunity to focus on specific protocols of interest, at their own pace, while visiting different GLOBE investigation sites. GLOBE Trainers will be available to assist with atmosphere, hydrology, soil and landcover protocols.

**Fundraising Workshop**
***GLOBE Program Office Staff***
The development of a case for support is a critical step in seeking funding for program activities at every level. In this interactive workshop, participants will share their creative ideas for explaining the reasons that a funder should support the GLOBE Program, and how to incorporate the case for support into a grant proposal.

**Friday, August 3**
**Session B: 1:30 until 4:30 PM**

**Integrating the Carbon Cycle into Your Classroom Through a Simple Computer Model**
***Carbon Cycle ESSP***
Be among the first to find out about a global carbon cycle computer model and accompanying background materials. What is the carbon cycle? What are its components? Why is the carbon cycle important to humans? How does the carbon cycle relate to climate change? In this workshop, participants will get hands-on experience with the model, and learn how it can support inquiry-based learning and student research projects. Group discussion about integration into existing curriculum and implementation in the classroom will be encouraged. In addition to the workshop, participants will receive a copy of the finalized model and background materials.

**FLEXE—Making Connections Between Local and Extreme Environments**
***FLEXE ESSP***
Join the FLEXE Project team to explore how GLOBE teachers and students can gain an understanding of local and deep-sea environments, the interconnected Earth system, and the process of science. In this workshop you will sample some of the learning activities developed for FLEXE that use existing GLOBE datasets, data collected by students from their local environment, and deep-sea data provided by scientists. Activities feature on-line resources to help students write research reports, and participate in peer review. Attendees will also see how FLEXE students apply what they have learned from their research into the local environment by interacting with deep-sea scientists through the Web-based FLEXE Forum to deepen their understanding of Earth system science. In addition to the workshop, participants will receive a poster they can use to introduce extreme environments into their classroom.

**Make and Take GLOBE Instruments**
***Texas Collaboratives***
Come discover the world of construction. Participants will use power tools, paint, hot glue guns, etc. to make some GLOBE equipment to take back home. Each person will be able to make and take one "tool" in this workshop. Handouts with photos and directions for making the secchi discs, turbidity tubes, Sun Photometer, and soil sieves will also be made available. No previous construction work required!

**Podcasts in Education**
***Texas Collaboratives***
Learn what a podcast is and how podcast content can support both your professional growth and student learning. You will leave this workshop with the skills required to be a consumer of podcasts and a beginner's knowledge of the tools and processes required to publish your own podcast series. The instructor, Dr. Keith Mitchell, is the Technology Initiatives Coordinator for The Texas Collaboratives for Excellence in Science and Mathematics Teaching. He has extensive experience in Web media publishing and promises an engaging exploration of this new and exciting communication medium.

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**Chicago**

**Feb.7-9, 2008**

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- **Science**
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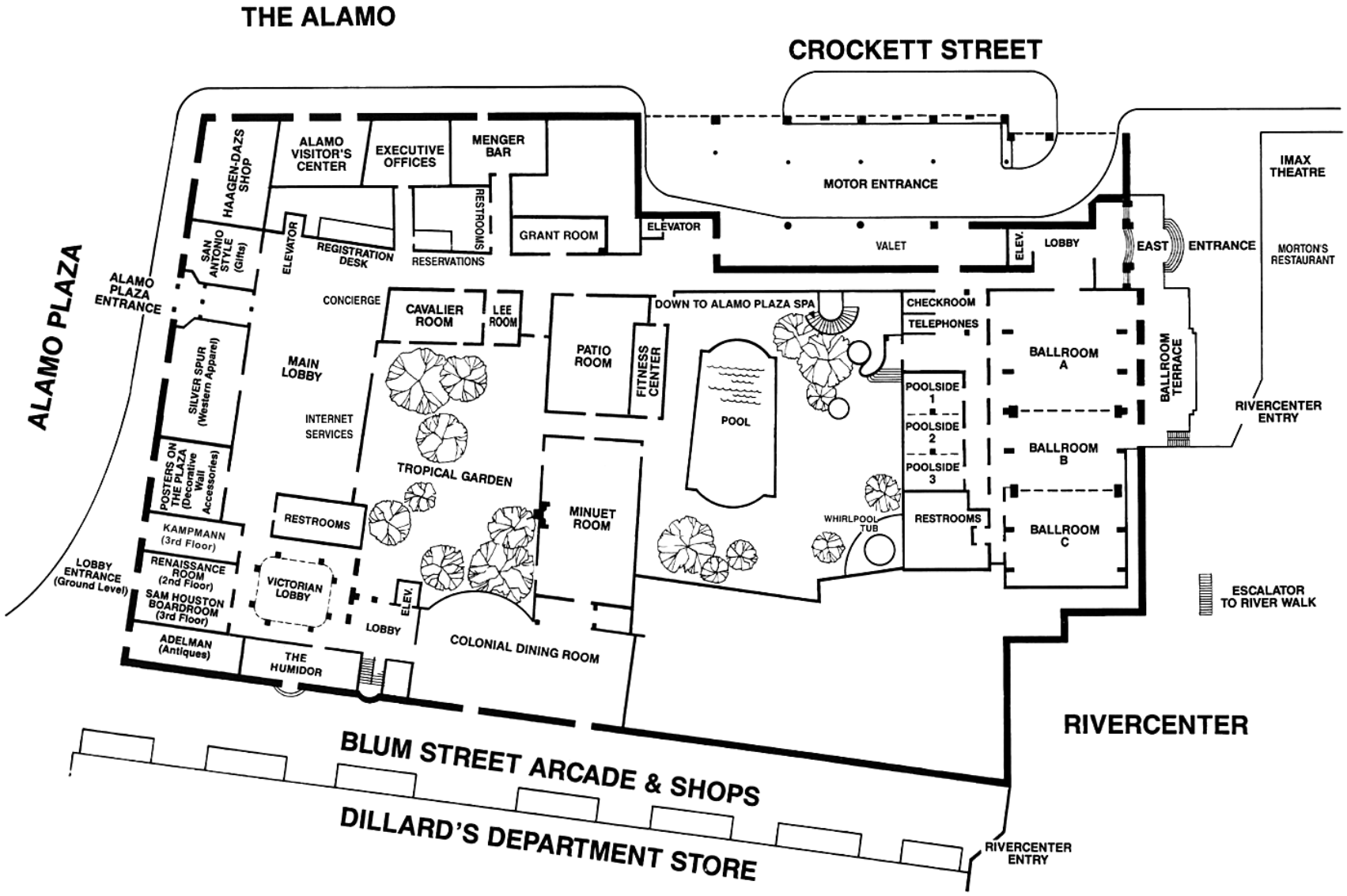

# Agenda, GLOBE Annual Conference 2007

| Sunday, July 29 | Monday, July 30 | Tuesday, July 31 |
|---|---|---|
| **REGISTRATION OPENING DAY** | **GLOBE Earth System Science**<br>***Moderator: Teresa Kennedy*** | **GLOBE Around the World**<br>***Moderator: Michael Odell*** |
| 9:00 – 16:00<br>Registration, Exhibit and Poster Set up | 8:30 Light Breakfast in Exhibit/Poster area | 8:30 Light Breakfast in Exhibit/Poster area |
| | 9:00 Opening Welcome<br>***Conference Co-chairs: Teresa Kennedy, Michael Odell and Marsha Willis***<br><br>9:15 Opening Address,<br>***GLOBE Director Ed Geary*** | 9:00 Keynote:<br>Michael Coats, Texas Director of NASA Johnson Space Center "The Ultimate Fieldtrip: Exploring Earth, Moon and Mars"<br>****Sponsored by GLOBE Texas*** |
| | 10:00-10:30<br>Keynote: NASA/NSF: GLOBE Program Sponsors<br><br>Dr. Ming-Ying Wei, NASA<br>Dr. Jill Karsten, NSF | 10:00 – 10:30<br>Students as Scholars<br>***Facilitator: Sheila Yule*** |
| | 10:30 Break & Exhibits | 10:30 Break & Exhibit |
| | 11:00 – 12:00<br>GLOBE ESSPs<br>***Facilitator: Emmett Wright***<br><br>12:00 – 12:30<br>GLOBE Networks<br>***Facilitator: Sheila Yule*** | 11:00 – 12:30<br>Strand Presentations |
| | 12:30 Lunch & Exhibits | 12:30 Lunch & Exhibits |
| | 14:00 -15:30<br>Strand Presentations | 14:00 – 15:30<br>Round Tables<br>***Facilitator: Michael Odell*** |
| | 15:30 Break & Exhibits | 15:30 Break & Exhibits |
| | 16:00 – 17:30<br>**Regional Meetings** | 16:00 - 17:30<br>**Regional Meetings** |
| 17:00 – 20:00<br>Reception<br><br>Exhibits and Posters Sessions | 17:30 Adjourn<br>***1. Optional Technology session:*** *18:30–19:30*<br>*Google Earth and World Wind: Using GLOBE Data*<br>***2. Optional: San Antonio Geocaching Activity***<br>*18:30–?!* | 17:30 Adjourn<br>***Optional Technology session:*** *18:30–19:30*<br>*Help Desk / Administrative Web site Assistance* |

# 29 July – 3 August 2007, San Antonio, Texas, U.S.A.

| Wednesday, August 1 | Thursday, August 2 | Friday, August 3 |
|---|---|---|
| **GLOBE Research and Investigations**<br>***Moderator: Marsha Willis*** | **GLOBE Connections**<br>***Moderator: Teresa Kennedy*** | **Conference Workshops**<br><br>**Session A: 9:00-12:00**<br>**1.** "Using GIS to Analyze Hydrology Data." ***Watershed Dynamics ESSP***<br><br>**2.** "Utilizing Satellite Data to Study Seasons and Biomes." ***Seasons and Biomes ESSP***<br><br>**3.** GLOBE Protocol Mini-Trainings (off site—bus leaves at 8AM) ***Texas Collaboratives***<br><br>**4.** Fundraising ***GLOBE Program Office Staff***<br><br>***Lunch on Your Own***<br><br>**Session B: 13:30-16:30**<br>**1.** "Integrating the Carbon Cycle into Your Classroom through a Simple Computer Model." ***Carbon Cycle ESSP***<br><br>**2.** "Making Connections between Local and Extreme Environments." ***FLEXE ESSP***<br><br>**3.** "Make and Take GLOBE Instruments." ***Texas Collaboratives***<br><br>**4.** "Podcasts in Education." ***Texas Collaboratives*** |
| 8:30 Light Breakfast in Exhibit/Poster area | 8:30 Light Breakfast in Exhibit/Poster area | |
| 9:00 Keynote:<br>Ted McCain, Canada<br>"Making schools work in the 21st century."<br>****Sponsored by Forestry Suppliers*** | 9:00 PolarTREC Webinar<br>Peggy Foletta, California<br>****Sponsored by PolarTREC***<br><br>9:45 GLOBE Web site<br>Mike Leon and Karen Milberger, GPO | |
| 10:00 – 10:30<br>New Braunfels Field Day Introduction<br>-- Cindy Loeffler, Texas Parks & Wildlife<br>--Research Questions<br>***Facilitator: Marsha Willis*** | 10:00 – 10:30<br>GLOBE Alumni<br>Africa - Adele Bilong<br>Asia - Watcharee Ruairuen<br>Europe - Martin Pentson<br>Latin America - Guillermo Grimaux<br>Near East - Shaikha BuAli<br>North America - Matt Fenzel<br>***Facilitator: Sheila Yule*** | |
| 10:30 Break & Exhibits | 10:30 Break & Exhibits | |
| 11:00 – 12:00<br>Field Day Introduction cont.<br>--GLOBE Watershed ESSP<br>--PASCO Product Descriptions<br>--GLOBE FLEXE ESSP<br>--Vernier Product Descriptions<br>--Field Day Logistics<br>***Facilitator: Michael Odell*** | 11:00 – 12:30<br>Strand Presentations | |
| 12:15 Buses Depart<br>Box Lunches Available | 12:30 Lunch & Exhibits<br>(Exhibits close at 13:30) | |
| Field Day Options<br>(New Braunfels, TX area)<br>1.Rockin' R River Raft trip, Guadalupe River<br>****Event Sponsored by PASCO***<br>2. Natural Bridge Caverns<br>****Event Sponsored by VERNIER*** | 14:00 U.S. Partner and Country Coordinator Meetings<br>15:00 Break<br>15:30 Final Plenary Closing Ceremony | |
| 17:30 – 20:00<br>BBQ at Landa Park, New Braunfels, Featuring The Shane Howard Band<br>****Event co-sponsored by WARD's Natural Science*** | 17:00 Adjourn<br>18:00<br>GLOBE Annual Banquet at Sunset Station<br><br>--Group Photo-- | |

# Presentation Abstracts

## FEATURED STUDENT PRESENTATION

**Students as Scholars Institute**
Ms. Sarah Cole, Mr. Ori Goldwasser, Mr. Anthony Hogue, Mr. Jordan Jensen, Ms. Darian Johnson, Mr. Conor McMann, Ms. Madison Noll & their teacher Ms. Melinda Merrill, Center Middle School, Kansas City, Missouri (U.S.A.)

Students as Scholars Institute is an ongoing process on the middle school level where students spend a day in the field with university research scientists while the scientists conduct authentic scientific research and collect data. The students, in groups of 7-10, rotate between ten different scientists and their field work. After working with the scientists, the students then design their own projects based on what they have learned. Over the course of several months, the students collect data and present their findings in a white paper and on a presentation board. The students and scientists regroup in a "Connections Celebration" to examine the student projects and to further discuss research possibilities. The scientists not only demonstrate field techniques but also mentor and advise the students. Many of the projects in the current Student as Scholars Institute were implemented with GLOBE protocols.

## STRAND PRESENTATIONS / CONFERENCE WORKSHOPS

| | |
|---|---|
| **Strand A:** | **GLOBE Science and Collaborative Research**<br>*Results and techniques in GLOBE student and science research, using data, and promoting project-based research (ESSPs and regional projects).* |
| **Strand B:** | **GLOBE Education, Implementation and Assessment**<br>*Results and Techniques for working with students, preservice and inservice teachers, and informal education.* |
| **Strand C:** | **GLOBE Products, Services, and Materials**<br>*Share-a-thons, and presentations to demonstrate GLOBE materials, products, protocol updates, vendor products, and services created by the GLOBE Program Office, ESSPs and Partners.* |
| **Strand D:** | **GLOBE Learning Communities for Sustainability**<br>*Networking between local, regional and international partners to achieve a self-supporting and sustainable program.* |
| **Conference Workshops:** | **Conference Workshops (Friday, August 3)**<br>*Opportunities for hands-on protocol training (standard GLOBE protocols and new ESSP protocols and activities).* |

**MONDAY STRAND PRESENTATIONS 14:00-15:50**

**STRAND 1A:**
**Location: Ballroom A**

**The Ice Cap in Greenland**
Mrs. Britta Lohmann & Mrs. Jane Buus Sorensen (Greenland)

This session will provide a presentation of a visit to the ice cap.

**Coast Watch**
Ms. Birgit Rademacher (Germany)

Coast Watch, an international project started in 1995, provides wonderful cross-disciplinary activities for GLOBE Students. The students gather baseline data of the state of a designated coastline and the data is used to raise public awareness of coastal resources. Coast Watch gives students many opportunities to observe the coast and coastal life and to discuss data. The observation contains a wide range of parameters, such as levels and types of littering, shore uses, water quality tests and more. This project is ideal for schools located near coastal areas. First results of the survey and participating countries will also be presented.

**Bringing Together Ground and A-Train Observations and Measurements to Understand the Role of Aerosols**
Ms. Danielle De Staerke, Ms. Adrien Laurenceau, Ms. Annie Carrasset, Ms. Sylvie Dubreuilh & Mr. Eric Abgrall (France)

This presentation describes a field campaign which took place in the framework of the educational project Calisph'Air, involving French, American and African schools during the "Voyageurs des Sables" expedition in the desert. The data gathered by the students is cross-correlated with satellite data from different components of the A-train (Calipso, Parasol, Aqua, Cloudsat, etc.) to have a better understanding of aerosols and clouds, the principal uncertainty in the Global Warming process. Calisph'Air focuses on atmosphere and climate, in connection mainly with the PARASOL and CALIPSO satellite missions. This project provides the opportunity to learn by taking scientifically valid measurements (including aerosols), entering results into the GLOBE database and then using the data in connection with data from other schools and satellite data to build a teaching project that suits the curriculum. The main objective is to help students explore and understand their local, regional and global environment through scientific investigation. This project was undertaken in the framework of the international Earth science and education program, GLOBE, and in collaboration with the CALIPSO Education and Public Outreach (EPO) program managed for NASA by Hampton University.

**CloudSat Modular Education Unit: Cloud Type**
Dr. Matt Rogers (Colorado) & Mr. Peter Falcon (California) (U.S.A.)

The CloudSat mission, in collaboration with the GLOBE program, has developed a successful student network of cloud observation sites as part of its outreach mission. Expanding upon this network, Dr. Matt Rogers & Mr. Peter Falcon present a student-scientist collaborative research project suitable for integration with commonly-

taught units in the earth sciences designed to use observations from the CloudSat Education Network (CEN). The research project centers on observation of cloud type (cumulus, cirrus, etc.) and ties the nature of cloud typology to physical processes. The base level of the project (designed for K-5 students) compares cloud observations to the seasons to examine the relationship between the two. The second level, designed for middle/ junior high students, compares cloud observations to weather systems and students learn to forecast the weather by looking at clouds. The third level, designed for high school students, introduces an introductory unit on thermodynamics and begins to delve into cloud morphology using CEN observations to understand why clouds behave the way they do.

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**STRAND 1B**
**Location: Ballroom B**

**GLOBE in Texas**
Ms. Marsha Willis (Texas, U.S.A.)
Find out how a state with over forty partners comes together to develop a working collaborative of GLOBE partnerships. Focus will be on training and delivering statewide training to educators and non-formal educators such as camp personnel, zoo officials, etc. Good quality information to take back home.

**Earth System Science in Preservice Education**
Ms. Malulee Pornchokchai (Thailand)

As we know, the GLOBE Program is a worldwide, hands-on, minds-on, primary and secondary school-based education and science program focusing on the Earth system science education. The teacher plays a primary role in encouraging and guiding his or her students. Therefore, preservice teacher preparation for Earth system science education is required for successful GLOBE implementation. To promote integrating Earth system science into preservice programs for teacher preparation, the Institute for the Promotion of Teaching Science and Technology (IPST) has provided support to universities to strengthen their understanding of Earth system science, has demonstrated the ability of integrating Earth system science into their curriculums, and has provided the innovative Earth system science course designing models. As part of a pilot project begun this year, the IPST has started working to implement teacher training in 10 universities. The February 2007 workshop “Earth system science sducation” stressed the scientific inquiry approach. Collaboration efforts between the Faculty of Science and the Faculty of Education are the major successful implementation strategies. At the end of this year, the IPST will assess implementation success and generate an effective Earth system science implementation model of preservice teacher preparation program for Thailand.

**Implementing Higher Education Partnerships: Enhancing Inquiry-Based Science Education at Multiple Levels**
Dr. Rebecca L. Dodge (Georgia, U.S.A.)

Responsibilities for “Science Education” in higher education settings typically involve separate Colleges of Education and Arts and Sciences. Cooperation between these elements may range from excellent to marginal. A GLOBE Partnership can serve as an outstanding tool to energize cooperation and enhance collaboration. The GLOBE Teacher Training Partnership at the University of West Georgia has developed inquiry-based,

hands-on Science Education "content" courses at multiple levels. Science faculty from the College of Arts and Sciences and Science Education faculty from the College of Education have worked together to create three courses focused on the needs of Early Childhood, Middle Grades, and Secondary Science majors, for both preservice and inservice teachers. Each course has a laboratory component involving GLOBE protocols and learning activities that are tied to state standards at appropriate grade levels, as well as inquiry-focused projects that involve data gathering, analysis, reporting, and presentations using GLOBE guidelines. Course objectives, learning goals and format will be presented for these courses, along with examples of projects and assessment. In addition to creating quality courses, quality partnerships were also facilitated among faculty in different Science Departments and between faculty in the two Colleges. Preservice and inservice teachers also get the opportunity to form partnerships with Science Department and Science Education faculty from both Colleges, who can serve as future mentors and research partners, and who can provide access to data and resources beyond the capabilities of many K-12 schools. This presentation will also highlight access to free Earth Observations satellite imagery and teaching resources available through the AmericaView Consortium, an academic consortium in partnership with the GLOBE Program.

**Ethnicity as a Construct in Influencing Environmental Education Teaching Efficacy Beliefs**
Dr. Christine Moseley (Texas) & Dr. Juliana Utley (Oklahoma) (U.S.A.)

The purpose of this study was to evaluate the environmental teaching efficacy and outcome expectancy of elementary preservice teachers. In addition, the study evaluated the importance of ethnicity as a construct in impacting teaching efficacy and outcome expectancy in regards to environmental education. Between groups, the GLOBE curriculum did not significantly influence preservice teachers' personal environmental teaching efficacy and outcome expectancy. Among groups, GLOBE participants (experimental group) significantly increased in ETOE, but not in PETE. Among groups, non-GLOBE participants (control group) increased significantly in PETE, yet did not significantly increase in ETOE. Ethnicity, as defined in this study as white and non-white, was not a significant construct in influencing personal environmental teaching efficacy and outcome expectancy.

**STRAND 1C:**
**Location: Ballroom C**

**"Our Living Soil" – Students Collecting Data (with GLOBE and 5 newly developed protocols) Used by Dutch Soil Research Institutes**
Dr. Ido de Haan (Netherlands)

In close cooperation with secondary school teachers, existing international GLOBE protocols (e.g., gravimetric soil moisture, soil particle density, soil pH, soil fertility, etc.) have been translated into Dutch. New protocols and educational materials have been developed, which focus in particular on the living component of the soil, (e.g., macrofauna abundance and diversity, microbial activity, and humus profile development). Relevant courses such as biology, chemistry and geography are integrated in these lectures taking into account exam-requirements. These developments have been made in cooperation with all scientific (RIVM, Wageningen University and Alterra) and educational partners. Eleven Dutch secondary schools have been selected to test and evaluate the GLOBE Soil module using educational and scientific criteria. Students conducted field research and sent their data to the GLOBE database, as well as the Dutch soil research organizations, which use the data in their research of sustainable land use. The test module is being evaluated now and a more permanent module will be produced this summer 2007. Our goal is to implement the newly developed protocols/module in The Netherlands and other countries and to find as many schools as possible to participate. The module consists of the following protocols: Basic description of the research site; Determination of physical and chemical soil properties; Soil organic matter and moisture (NEW); pH; Bulk density; Water infiltration; Soil fertility; Description of the humus profile; Determination of soil biota; Sampling and quantification of soil macrofauna (NEW); Identification of earthworms, isopods, millipedes, and centipedes (NEW); and Measurement of soil respiration (NEW).

**GLOBE at Night**
Mr. Gary Randolph (Colorado, U.S.A.)

Looking up at the night sky has always been and will always be educational and inspirational for scientists of all ages. However, for those living in large metropolitan areas, gazing at the stars may be nearly impossible due to light pollution. GLOBE at Night has been implemented during the past 2 years. What can the data tell us and how can you and your teachers and students participate next year? Use GLOBE at Night to inspire your next generation of astronomers!

**InspireData: A Creative Way to Showcase Environmental Data**
Dr. Lynne Hehr (Arkansas, U.S.A.)

Data, difficult enough at times to collect, often goes unused for lack of an accessible way to explore and explain it. A recently developed software program created through TERC, InspireData, is an extremely useful tool that can assist in this process. With a relatively short amount of experience, students can quickly input data and move instantly from data collection to data analysis. Multiple plot types are available to formulate questions and interact with data to identify patterns, trends and relationships, to solve problems and build their own conclusions.

**Math Trax: NASA's Free Tool to Graph and Analyze GLOBE Datasets**
Ms. Stephanie Smith, Dr. Robert Shelton & Ms. Terry Hodgson (Texas, U.S.A.)

GLOBE student scientists have taken many measurements of our Earth's air, water, soil and vegetation. These important datasets can now be imported into a free NASA education tool called MathTrax for analysis, evaluation and project-based research. MathTrax describes information three ways; with "smart" text descriptions, non-verbal sound descriptions, and custom graphics descriptions which suit different learning styles. MathTrax is fully accessible to blind and vision impaired users through the use of screenreader software. These users can immediately access MathTrax' alternative text and sound graph descriptions. All of MathTrax' graphs are described with text, sound and graphics using the Math Description Engine. The Math Description Engine toolkit is also free and available to software and curriculum developers. Educators use the Math Description Engine to make graphing calculators, data analysis programs, computer simulations and Web site displays more accessible. This session will demonstrate the use of MathTrax as applied to GLOBE datasets and participants will learn how to import and plot tabular GLOBE data for analysis and project research.

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**STRAND 1D:**
**Location: Rennaissance**

**My Wonderful World**
Ms. Anne Pollard (Washington D.C., U.S.A.)

Led by National Geographic, My Wonderful World is a five year campaign to raise public awareness among students, parents and educators about the importance of geographic literacy. Backed by a coalition of national partners, including the GLOBE Program, the campaign aims to expand geographic learning in school, at home, and in communities. This session will provide an overview of the campaign, resources available for schools through the campaign Web site <MyWonderfulWorld.org>, as well as ideas for how you can help the campaign and give kids the power of global knowledge.

**Networking in the GLOBE Africa Consortium to Achieve a Self-supporting and Sustainable Program**
Mrs. Margaret Nyoh Tondo Besong (Cameroon)

As the GLOBE Program expands, the GLOBE Africa Consortium is confronted with the challenge of delivering this science, mathematics, environmental education and ICT program, that contributes to the attainment of the MDG, to the greatest number of learners in an interesting and sustainable manner. This presentation identifies challenges encountered in implementing the program in the Africa region. It also provides some examples of good practices that have been successful in not just meeting the objectives of the GLOBE Program, but are also contributing in poverty alleviation among the underprivileged. Finally, the presentation proposes networking as effective in developing a self-supporting and sustainable program in the GLOBE Africa Consortium.

**GLOBE Program in Trinidad and Tobago 1996-2007: A Case of Sustainable Support, Problems in Integration Implementation and Successful Outreach Programs**
Mr. Henry Saunders (Trinidad)

The GLOBE Program was introduced to Trinidad and Tobago in 1996 and has been managed by the Ministry of Education (MOE) from its inception. The Ministry of the Environment collaborates with the GLOBE Program which has been sustainably supported by two GLOBE partners: Petrotrin, from 1998 and BGTT (British Gas Trinidad and Tobago Ltd.), from 2004. Despite this unique partnership and stakeholders' involvement, in which over 60 schools were provided with free training and GLOBE equipment, only 10 schools are presently taking GLOBE data regularly. A new strategy developed with GLOBE partners providing personnel to manage the implementation of the GLOBE Program in schools will be started in 2007. A GLOBE Community Outreach Program was piloted in 2006. This project is being used to popularize science and to help in the reform of Prison Education Programs through the development of basic skills in science, literacy and numeracy among inmates. This paper reports on the success of some of these initiatives and the participation of GLOBE Schools in a Cell Tower Radiation Project with the Department of Physics, University of the West Indies, St. Augustine, Trinidad.

**GLOBE and Business Support: A Case Study of a Water Company**
Dr. Andy Tasker & Ms. Linda Lockhart (United Kingdom)

There are many examples of companies sponsoring GLOBE activities and events, given the positive Public Relations (PR) and publicity returns that they receive. However, this case study shows how one company has developed a partnership with GLOBE so that GLOBE data from schools in its area actually help its own business development. Water Companies in the UK are now all privatized utilities, with different companies having responsibilities for the supply of drinking water and disposal of sewage within defined geographic areas. There are 11 main companies covering most of England, Scotland and Wales, and a few smaller ones dotted about. The predicted impacts of climate change in the UK – warmer wetter winters, hotter drier summers, and more storm events at any time – mean that water companies need to have more accurate and detailed rainfall data than ever before. Too much rain in storm events can lead to rapid flash floods, which can in turn overcome sewage treatment works, causing serious pollution events. Knowing about storm events in advance can ensure appropriate controls are put in place, minimizing pollution and other risks. The case study described focuses on one water company that has developed a unique partnership with GLOBE, whereby it will fund automatic weather stations plus software, GLOBE training and support in up to 85 schools in its area. The company will gain rainfall data fed direct from the schools, in addition to PR, publicity and employee involvement. The schools will gain equipment and support valued at over £1,000 ($2,000) per school and GLOBE UK will gain from a new network of active schools, working together and sending in data. The project will be launched in June 2007, with local television and media closely involved, providing a new way for GLOBE UK to interact with business and a creating a model that could work elsewhere in the world.

**Optional Monday Evening Sessions**
**18:30 – 19:30**

**Google Earth and World Wind: Using GLOBE Data**
Dr. Feodor Surkov (Russia) & Mr. Gary Randolph (Colorado, U.S.A.)
**Location: Cavalier Room**

The GLOBE Database currently holds nearly 17 million student data from over 7,500 schools in 92 countries! But what can teachers and students do with these data? Activities will presented to help guide you through millions of data as well as inspire teachers and students to collect, report and use GLOBE data in their own research. These activities are not only enjoyable, but also aid in developing observational skills and applying prior knowledge to understanding GLOBE student data utilizing visualization tools found on the GLOBE Web site as well as Google Earth and NASA's World Wind.

**Optional Monday Evening San Antonio Geocaching Adventure**
Dr. Mitchell Klett (Michigan), Dr. Scott Graves (Connecticut) & Mr. Todd Ensign (West Virginia) (U.S.A.)
**Location: Meet in the Lobby!**

Looking for a fun way to explore San Antonio? Join Mitch Klett, Scott Graves, and Todd Ensign for an evening adventure in Downtown San Antonio. A number of Geocache sites have been identified to help participants explore San Antonio's sites and nightlife. Bring your GPS and prepare for a Texas treat. There will be a limited number of GPS units available for checkout.

**TUESDAY STRAND PRESENTATIONS: 11:00 – 12:30**

**STRAND 2A**
**Location: Ballroom A**

**Student Research and Scientist Network**
Dr. Sheila Yule (Colorado, U.S.A.)

Participants will learn how the process of student inquiry is framed within the GLOBE School Networks (GSNs) and how scientists will interact with GLOBE students. A model of the inquiry process will be presented.

**GLOBE in Germany: Structure, Evaluation, Projects**
Ms. Birgit Rademacher (Germany)

After more than 10 years of GLOBE in Germany, GLOBE is not just a small group of administrators, but a large community. Therefore, one focus of the presentation is the structure for 13 regional coordinators, 478 schools and 738 teachers, including how we contribute to improve geoscience education and scientific literacy especially on the basis of projects and activities for the schools in past and future like "GLOBE city," GLOBE Phenological garden" and more. Furthermore, first results of a GLOBE-Germany evaluation run, which is to be accomplished in fall 2007, will be discussed. Another focus is the cooperation with the University of Heidelberg with an international survey for satellite images in schools and the development of a satellite image learning center in which all GLOBE countries can take part. The most important part of GLOBE are the participating schools. Therefore, the annual award of the GLOBE Germany school of the year and the variety of wonderful schools and student research will be also presented.

**A Watershed Study in France**
Mrs. Nicole Herman
(France)

This presentation describes a two-year watershed study, including the processes followed to choose the watershed to study using satellite images, the project itself and follow-up activities.

**Watershed Mania!**
Dr. Lynne Hehr & Dr. John Hehr (Arkansas, U.S.A.)

Located in the Northwest Arkansas, Beaver Lake is the primary source of fresh water for more than 300,000 people. For the past ten years, the area that surrounds it has experienced an enormous growth rate that continues to place an ever increasing demand on the reservoir. One result of this growth is that the water quality of the lake is being affected by everything that happens in the entire watershed. The idea of a watershed and its impact on a local region can be a very difficult concept for elementary students to understand. Through active, hands-on modeling and game-playing, the Beaver Lake Watershed Program in conjunction with the University of Arkansas Center for Math and Science Education is in the process of developing classroom materials to assist teachers in helping students better understand the dynamics of a watershed, in general, Beaver Lake Watershed, in particular.

**STRAND 2B**
**Location: Ballroom B**

**COMETS: COMmunities Educating Tomorrow's Scientists (COMETS)**
Dr. Tina Cartwright, Mr. Todd Ensign & Dr. Michael Corrigan (West Virginia, U.S.A.)

The three-year National Science Foundation-supported COMmunities Educating Tomorrow's Scientists (COMETS) project will implement an earth and space science program with the focus of learning science as inquiry. COMETS will target 200 low-income, under-represented, and minority students at several after-school and summer programs for inclusion in a NASA-centered informal science education program using the GLOBE program. Through innovative hands-on investigations coordinated with students' formal curricula, this program will excite, inspire, promote academic achievement and expand regular school time learning experiences for students in grades 3-5. In addition to enhancing achievement, the anticipated outcome of COMETS includes promoting positive attitudes toward science education by both parents and students, inspiring students to choose science for their future education and employment paths, and improving the knowledge and appreciation of Earth and space sciences in participating educators. COMETS will build better teachers through significant training and involvement of preservice teachers in NASA-centered educational programs including the GLOBE program.

**Designing your own Students as Scholars Institute**
Ms. Melinda Merrill (Missouri, U.S.A.)

Students as Scholars Institute is an ongoing process at the middle school level where students spend a day in the field with university research scientists while the scientists conduct authentic scientific research and collect data. The students in groups of 7-10 rotate between ten different scientists and their field work. After working with the scientists in the field, the students design their own projects based on the work of one of the scientists. Over the course of several months, the students collect data and present their findings in both a white paper and on a presentation board. The students and scientists regroup in a "Connections Celebration" to examine the student projects and to further discuss research possibilities. The scientists not only demonstrate field techniques, but also mentor and advise the students. Many of the projects in the current Student as Scholars Institute were implemented with GLOBE protocols.

**Capturing the Head, Hands and the Heart: The New Zealand Model for Environmental Action**
Mr. Aaron Fleming & Mrs. Kathryn Hicks (New Zealand)

Aotearoa, New Zealand, has a predominantly clean, green and pure image, although too often our actions have an adverse impact on our environment which can cause damage lasting for generations. Our aim is to foster life-long feelings of interest and concern for the environment in our young people, to encourage them to become kaitiaki (guardians) of their local environment and encourage environmentally sustainable practices. This presentation will explain the New Zealand model and the delivery of GLOBE through the Environmental Monitoring and Action Project (EMAP).

**GLOBE Classes: New Techniques of Working with Students**
Ms. Katarzyna Jakubowska (Poland)

This presentation provides a summary of the GLOBE Program in Poland and includes a presentation of a typical GLOBE class in one of our schools focusing on GLOBE Program curriculum. In addition, a short film prepared by our students about the research they do will be shown.

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**STRAND 2C**
**Location: Ballroom C**

**Hands on GLOBE: Partner Administration Page Training**
Mrs. Nandini McClurg, Mrs. Constance Snyder & Mr. Noah Newman, The GLOBE Help Desk (Colorado, U.S.A.)

The GLOBE Help Desk staff will be available to assist you in answering any questions you may have regarding accessing the Partner Administration page on the GLOBE Web site. Group sessions or personal one-on-one assistance will be available. Learn how to post workshops, add participants and prainers, issue school ID's, locate support materials and access your annual aurvey. Drop in for guidance with these and any other questions you may have regarding managing your GLOBE Administrative page on the GLOBE Web site. This session is open to all U.S. Partners, Country Coordinators, and any interested community members.

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**STRAND 2D: GLOBE in Latin America and the Caribbean (Sessions in Spanish)**
**Location: Renaissance**

**El Programa GLOBE en la Región de América Latina y el Caribe**
**The GLOBE Program in the Latin American and Caribbean Region**
Mrs. Reyna Guadalupe Camarillo (México)

El año 2006 fue estratégico para los países socios del Programa GLOBE en Latinoamérica, ya que se formó el Consorcio Latinoamericano y del Caribe, en el marco del cual se constituyó un Comité para impulsar nuevas líneas de trabajo en la región. Esta presentación describe las actividades del Comité de Coordinación del Consorcio Latinoamericano y del Caribe (CLAC).

*The year 2006 was strategic for the GLOBE countries in Latin America and the Caribbean due to the formation of the region's Consortium. This presentation describes the activities of the Committee of the Latin American and Caribbean Consortium (CLAC).*

**Actividades GLOBE Enero – Junio 2007 del Consorcio Latinoamericano y del Caribe (CLAC)**
**Latin America and Caribbean GLOBE Activities from January – June 2007**
Prof. María del Carmen Galloni (Argentina)

Esta presentación describe las iniciativas actuales que han ocurrido en 2007 por el Consorcio Latinoamericano y del Caribe (CLAC).

*This presentation describes current initiatives that have occurred in 2007 by the Latin America and Caribbean GLOBE Consortium.*

**El Desarrollo del Programa GLOBE en México**
**The Implementation of the GLOBE Program in México**
Mrs. Reyna Guadalupe Camarillo, Mr. Luis Manuel Guerra Garduño, Mr. Obed Avilés Alatriste & Mr. Cesari Rico Galeana (México)

El pasado 15 de noviembre se cumplieron diez años de la firma del Acuerdo entre Estados Unidos y México, por el cual inició su desarrollo en México el Programa GLOBE (Aprendizaje y Observaciones Globales en Beneficio del Medio Ambiente). Mediante su participación en GLOBE, los maestros y estudiantes han aplicado la ciencia y la tecnología al estudio de la hidrología, atmósfera, suelo y cobertura vegetal de sus respectivas localidades. La SEMARNAT, a través del Centro de Educación y Capacitación para el Desarrollo Sustentable, inició una estrategia de capacitación en todo el país. Al partir del año 2001, se establecieron vínculos institucionales con la Secretaría de Educación Pública en la mayoría de las entidades Federativas del país, con instituciones de educación media superior y superior, así como con organizaciones de la sociedad civil, a efectos de difundir los beneficios educativos del programa y brindar la capacitación a fin de poder implementarlo en las escuelas. Esta presentación describe 10 años de implementación del Programa GLOBE en México.

*November 15th marks the 10th year of GLOBE in México, celebrating the signing of the GLOBE Bilateral Agreement in 1996. Through participation in GLOBE, teachers and students in México have applied science and technology to the study of the hydrology, atmosphere, ground and vegetal cover of their respective*

*localities. The SEMARNAT, through the Center of Education and Qualification for the Sustainable Development, initiated a national GLOBE training strategy throughout the country. Since 2001, institutional bonds with the Secretariat of Public Education in most of the Federal organizations of the country have been strengthen, with institutions of superior and superior average education, as well as with organizations related to civil society, with the objective of spreading the educational benefits of the Program and enabling its implementation in schools. This presentation describes 10 years of GLOBE implementation in México.*

**Implementación de GLOBE en la Universidad Tecnológica de Nezahualcóyotl**
**GLOBE Implementation at the Technological University of Nezahualcóyotl**
Mr. Obed Aguston Avilos-Alatriste (México)

La Universidad Tecnológica de Nezahualcóyotl, es un Organismo Público descentralizado del Gobierno del Estado de México. Proporciona a la comunidad del mismo nombre seis Carreras Tecnológicas orientadas a satisfacer las necesidades de las diversas empresas cercanas a la Institución. La formación de Técnicos Superiores Universitarios en la carrera de Tecnología Ambiental es posiblemente la de mayor compromiso social. En el presente trabajo se hace un análisis histórico de la implementación del Programa en la Universidad, se destaca la importancia de la incorporación de los protocolos GLOBE a la Currícula de la Carrera de Tecnología Ambiental, se detallan las experiencias de la Universidad en el desarrollo de proyectos de investigación con metodología de GLOBE, se presentan los beneficios de su participación en la capacitación del país, así como sus aportes como institución de Educación Superior al cumplimiento de las metas institucionales y su compromiso con la sociedad. Así mismo se analizan los aportes del Programa a la formación de profesionales altamente comprometidos con su entorno, con una visión de colaboración a la solución de problemas comunes de la sociedad y del planeta.

*The Technological University of Nezahualcóyotl is a decentralized Public Organization of the Government of the State of Mexico. It provides the community six technological programs oriented to meet the needs of the different companies near the Institution. The Division of Environmental Technology is one of these six technological programs, possibly the one with the greatest social commitment. Currently, there is an ongoing historical analysis of the implementation of the Program in the University that reflects the importance of having incorporated GLOBE protocols into the curricula of the Environmental Technology program. The analysis details the experiences of the University in the development of research projects using GLOBE methodologies. It shows the benefits of GLOBE participation in meeting the overall needs of the country, GLOBE contributions to a higher level of education, which is in line with institutional goals and its commitment to society. Similarly, the analysis of the GLOBE program demonstrates that it is assisting professionals in becoming highly committed to the vision of collaboration in finding solutions to common*

*problems of the society and the planet.*

**TUESDAY ROUND TABLES**
**14:00 – 15:30**
**Location: Ballroom**

This session is designed to create a structured forum for the GLOBE community to discuss issues, projects, and the continuing evolution of the program. Participants choose a round table based on a discussion topic of interest and share ideas, brainstorm, and communicate their needs. Each round table will have a GPO facilitator to moderate and take notes. Participants will have the opportunity to participate in two round table sessions.

**1. Carbon Cycle ESSP—How to Connect to School Curricula**
Mr. Gary Randolph

**2. FLEXE ESSP—How to Connect to School Curricula**
Mr. Jamie Larsen

**3. Seasons and Biomes ESSP—How to Connect to School Curricula**
Dr. Sheila Yule

**4. Watershed Dynamics ESSP—How to Connect to School Curricula**
Mr. David Smith

**5. Connecting to Satellite Missions**
Ms. Nandini McClurg

**6. Curriculum Needs—Resources, Units, and Other Support Materials**
Ms. Marsha Willis

**7. Barriers and Solutions around School Collaborations**
Dr. Ed Geary

**8. Barriers to Implementing Student Projects**
Dr. Russanne Low

**9. Tools for Data Entry, Data Analysis and Collaboration**
Mr. Mike Leon

**10. Training GLOBE Trainers**
Ms. Rebecca Rowe

**11. Training GLOBE Teachers**
Mr. Eric Stonebraker

**12. Undergraduate Teacher Education and Pedagogical Research**
Dr. Mitchell Klett

**13. Informal Education**
Dr. Scott Graves

**14. Inquiry and GLOBE**
Mr. Martos Hoffman

**15. Communicating and Publicizing GLOBE**
Ms. Jan Heiderer

**16. Sustainability and Capacity Building**
Ms. Paula Robinson

**Optional Tuesday Evening Technology Session**
**Help Desk / Administrative Web Site Assistance**
**18:30 – 19:30**
**Location: Cavalier**

Mrs. Nandini McClurg, Mrs. Constance Snyder & Mr. Noah Newman, GLOBE Help Desk (Colorado, U.S.A.)

The GLOBE Help Desk staff will be available to assist you in answering any questions you may have regarding accessing the Partner Administration page on the GLOBE Web site. Group sessions or personal one-on-one assistance will be available. Learn how to post workshops, add participants and prainers, issue school ID's, locate support materials and access your annual aurvey. Drop in for guidance with these and any other questions you may have regarding managing your GLOBE Administrative page on the GLOBE Web site. This session is open to all U.S. Partners, Country Coordinators, and any interested community members.

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**THURSDAY STRAND PRESENTATIONS 11:00-12:30**

**STRAND 3A:**
**Location: Ballroom A**

**Science in your Backyard**
Dr. Peggy LeMone, GLOBE Chief Scientist (Colorado, U.S.A.)

This presentation will describe simple classroom activities aligned with the GLOBE protocols, including materials referenced on the Chief Scientist blogs.

**Partnerships for Promoting Geoscience Education in the Kansas City Metropolitan Area**
Dr. Jimmy Adegoke, Dr. Tina Niemi, Dr. Elizabeth Stoddard, Mr. David Ketchum & Dr. Louis Odom (Missouri, U.S.A.)

The presentation will describe the implementation and early results of a new NSF funded multi-year initiative entitled Geoscience Education Opportunities: Partnerships to Advance Teaching and Scholarship (GEOPATHS). The project is a partnership between the University of Missouri-Kansas City (UMKC) and the Kansas City Missouri School District (KCMSD). The goal of GEOPATHS is to raise enrollment in the Geosciences, especially among populations that are traditionally underrepresented in the discipline. We are addressing this goal by expanding dual-credit and Advanced Placement (AP) opportunities for high school students and also by serving teachers through enhancing their understanding of geoscience content and inquiry teaching methods using GLOBE resources and protocols. Our focus in the first two years of the project is to increase the number of teachers that are certified to teach AP Environmental Science by offering specially designed professional development workshops for high school teachers in the Kansas City Metropolitan Area. We are also supporting teachers in their use of these best-practice methods by providing materials and supplies along with lesson plans for inquiry investigations for their classes. The last two years of the project will include direct engagement and recruitment of promising minority high school students via paid summer research internships and scholarship offers.

**A Four-Parameter Fit of Average Daily Air Temperature from Selected GLOBE Schools and Applications**
Dr. Diola Bagayoko (Louisiana, U.S.A.), S. Sangaré & K. Konaté (Mali)

This presentation will provide modeling results of the average daily air temperature data at several schools around the world. The data from a given school are influenced by the latitude, altitude, and the local environment of the school. Using the software product GraphPad, we performed four-parameter fits of the average daily air temperatures of the selected schools to the function $T = A_{sin}(?t+F)+ B$, where A, ?, F, and B are the four parameters and T is the temperature. Our analysis shows that the GLOBE data not only reproduce well-known facts of physical geography, but also identify peculiar phenomena like El Niño! The referenced, well-known facts include the annual variation of air temperature, the decrease of stratospheric temperature when altitude increases, and the effect of the proximity of a large body of water. We discuss applications of this work in promoting "the practice of science" by pre-college and college students alike. Further, we underscore the potential value of these local data in informing agricultural and public health activities and in the validation of regional and global climate change models. The non-linearity of the fundamental equations describing climate change, i.e., the inherent "butterfly effect" of these equations, dictates the necessity for the local data.
Acknowledgment: This work is funded in part by NASA (Award No. NNG 05G146G), through Iowa State University (ISU), and by the National Science Foundation (Award No. HRD 0503362), through the Louis Stokes Louisiana Alliance for Minority Participation (www.ls-lamp.org).

**The NatureMapping Program trains K-12 Educators and Students for Field Research Projects with Local Scientists**
Karen Dvornich (Washington, U.S.A.)

The NatureMapping Program was co-founded by the University of Washington and Washington Department of Fish and Wildlife while conducting the Gap Analysis biodiversity mapping project (GAP) in 1992 to ask the public to report wildlife sightings, develop a statewide/national database to use data for research and community environmental stewardship projects, and to involve schools in local research projects with field biologists. Although NatureMapping Programs occur in multiple states, the focus is the development of NatureMapping Learning Centers (e.g., nature centers, zoos, etc.) anywhere to provide progressive levels of training to teachers with the intent their students become active citizen scientists in local biodiversity field research projects. Working with field researchers and using emerging technologies such as NatureTracker software on PDA/GPS units, students collect, map, analyze data, and provide reports to local communities and land planning agencies.

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**STRAND 3B:**
**Location: Ballroom B**

**Google Earth and World Wind: Using GLOBE Data**
Dr. Feodor Surkov (Russia) & Mr. Gary Randolph (Colorado, U.S.A.)

The GLOBE Database currently holds nearly 17 million student data from over 7,500 schools in 92 countries! But what can teachers and students do with these data? Activities will presented to help guide you through millions of data as well as inspire teachers and students to collect, report and use GLOBE data in their own research. These activities are not only enjoyable, but also aid in developing observational skills and applying prior knowledge to understanding GLOBE student data utilizing visualization tools found on the GLOBE Web site as well as Google Earth and NASA's World Wind.

**Building Communities: DoDEA, Peace Corps, State Department and UCAR Affiliate Collaborations**
Mr. Gary Randolph (Colorado) & Mr. Richard Roettger (Puerto Rico)

Broad international participation is an integral part of the GLOBE Program. While both Country Coordinators and U.S. Partner Coordinators are responsible for designing program implementation in their own countries and/or regions, there are a number of resources available to them in the local, national and international communities. Often forgotten resources are found within the U.S. Government and its agencies (such as the U.S. Embassy, Department of Defense Education Activities, and Peace Corps) and scientific bodies (such as UCAR and its' Affiliate Partners), many of which have offices in GLOBE countries around the world. U.S. Agency representatives and national and international scientists are often eager to provide various types of support to the local GLOBE Program. This session will offer examples of how these agencies and scientific bodies can help support and promote GLOBE in your country or region.



**"The GLOBE Buffet" – A "Bite-size" Recipe for Implementing GLOBE on a Large Scale!**
Mr. Jerry Cobbs, Ms. Lynn Vaughan & Ms. Robin Nelson (Alabama, U.S.A.)

With some 60 protocols spread across five content areas, the broad scope of The GLOBE Program can be intimidating to teachers and unwieldy to implement on a large scale. This presentation shows how the AMSTI-GLOBE partnership has divided GLOBE into "bite-sized" pieces by assigning protocols to grade levels according to the objectives outlined in the Alabama Course of Study for science. The presentation also outlines the support structure which has been developed to increase teacher participation in GLOBE. The presentation is organized in the format of a recipe with section titles including "Work With a Master Chef" and "Choose the Right Utensils," among others.

**Tribal Connections to GLOBE**
Mrs. Nandini McClurg (Colorado) & Dr. Georgia Cobbs (Montana) (U.S.A.)

GLOBE initiated a national effort to work with Tribal Colleges in August 2001 through the Weaving Common Threads GLOBE training that took place in Flagstaff, Arizona. Since that time, Tribal Colleges and schools have been combining GLOBE with traditional activities to monitor the environment. This presentation provides a summary of activities to date.

**STRAND 3C:**
**Location: Ballroom C**

**Elementary GLOBE: K-4 Begins!**
Dr. Lynne Hehr (Arkansas, U.S.A.)

This session provides an overview of the K-4 world of Elementary GLOBE! Discover literacy, content, and lab techniques for assisting short-term to year-long implementation while investigating the same type of science experiences found in middle and secondary GLOBE.

**GLOBE Approved Microclimate Weather Measurement Systems and Software**
Mr. John Johnston, Weatherhawk (Utah, U.S.A.)

Microclimate measurement technology has evolved significantly in recent years due to improvements in sensor components, data storage, telemetry and software. These improvements have resulted in reliable, easy to use GLOBE approved measurement systems that take the uncertainty out of weather data acquisition; enabling students in Grades 4-12 to better understand how what they feel in their immediate environment translates to data that they can use. This presentation covers the basics of weather sensor technology, data acquisition, data management and data presentation. The WeatherHawk microclimate weather station will be used as the model system, supported by WeatherHawk-XP/X data management software and InspireData presentation software.

**Lewis and Clark Rediscovery Project: Life-Long Learning Online (L3)**
Drs. Michael Odell (Texas), Teresa Kennedy (Colorado), Mitch Klett (Michigan), Scott Graves (Connecticut) & John Ophus (Iowa) (U.S.A.)

The Lewis and Clark Rediscovery Project: Life-Long Learning Online (L3) is an online interactive experience based on the Lewis and Clark Expedition that utilizes GLOBE to examine the 200 years of change since the Expedition. The online program provides problem-based learning modules to facilitate students in linking science and history. Students have the opportunity to view scientists and historians discuss the Lewis and Clark expedition. Multiple perspectives are contained within the site, including Native American, historical, and scientific. This session will provide an overview of the online modules and suggestions for their use.

**The S2TASK Project: Students and Scientists Together Advancing Science Knowledge**
Drs. Henrietta List (Maine) & Michael Odell (Texas) & Teresa Kennedy (Colorado) (U.S.A.)

The S2TASK Materials provide a bridge between the scientific research and education communities as they endeavor to infuse all students with scientific literacy. This project, Students and Scientists Together Advancing Science Knowledge (S2TASK), developed two products that can increase opportunities for teachers to integrate the GLOBE program into their classrooms. In particular, the S2TASK session will highlight four new instructional units for GLOBE and demonstrate an on-line tool entitled Assemble an Inquiry. These materials combine existing GLOBE materials and tools, merge them with successful classroom experiences, and enrich them with current understandings about inquiry learning.

**STRAND 3D:**
**Location: Renaissance**

**Promoting your Story: Effectively Communicating Successful GLOBE Implementation**
Ms. Jan Heiderer (Colorado, U.S.A.)

The GLOBE Program office wants to hear stories of projects and people who shine. These are our "Stars," the front-page features on our Web Site that spark our imagination and inspire us with news of GLOBE at work in the world. GLOBE Communications Coordinator Jan Heiderer shares her ideas for ways to effectively communicate news of achievements in the classroom, in the field, and in your communities. Come and learn how you can become an active contributor to the GLOBE Web site and share your stories with the greater GLOBE community.

**Carbon Cycle ESSP: Plant-A-Plant Hands-on Indoor Activity**

Dr. Jana Albrechtova, Ms. Zuzana Lhotakova, Dr. Lubos Danek, Ms. Edita Tylova, Dr. Lubomir Natr, Ms. Bara Semerakova, Ms. Dana Votapkova (Czech Republic), Dr. Scott Ollinger & Ms. Sarah Silverberg (New Hampshire, U.S.A.)

Plant-A-Plant Activity is under development as a part of the Carbon Cycle Project. The experiments are designed to demonstrate the necessity of the major requirements for plant growth: mineral nutrition, water, sunlight and Carbon dioxide. The set will comprise different levels of difficulty starting from easy classroom experiments to more advanced lab or greenhouse activities. The first (easiest) level will be tested during the academic year 2007/2008 by pilot schools in the Czech Republic and in the U.S.A. (New Hampshire). The activity should lead students to formulate their own hypotheses about plant growth and the effects of the various requirements, conduct experiments based on given information, record observations and measurements, evaluate obtained data, and make conclusions based on obtained data and evaluate the validity of the hypotheses tested.

**Developing Classroom Activities for Conceptualizing Climate and Climate Change**

Ms. Umarporn Charusombat, Mr. Daniel Shepardson, Mr. Dev Niyogi, Mr. So Young Choi, Mr. Leon Walls & Mr. Kenneth Scheeringa (Thailand)

This presentation will discuss an ongoing project supported by the National Science Foundation Geoscience Education at Purdue University's Departments of Curriculum and Instruction, Agronomy, and Earth and Atmospheric Sciences and the Indiana State Climate Office. The project team is working with middle and high school teachers to develop an innovative instructional program aimed at helping students conceptualize climate change, an important topic for which there is only limited classroom material available. The project will lead to the development of presentation materials that include classroom activities involving data analysis, case studies, and structured debates. The project goal is to provide resources for teachers to present an unbiased and broad view of the scientific perspective on climate variability and change. Preliminary findings from pre-assessments that were designed for the purpose of this project suggest that students have a limited view on what constitutes the impacts and drivers of climate change. Further, the processes such as greenhouse effect, water cycle, and natural versus anthropogenic interactions, that are considered central to the climate change debate, are poorly understood by the sample group. The project is developing a series of modules that includes data interpretation, visualization activities, and case studies that explore climate change issues through an analysis of scientific evidence. Examples of the product resources will be provided.

## POSTER PRESENTATIONS

**1. Poster Title: Integrated Design for Geoscience Education--IDGE at Marshall University**
Dr. Tina Johnson Cartwright, Mr. Todd Ensign & Ms. Deb Hemler (West Virginia, U.S.A.)

Integrated Design for Geoscience Education (IDGE) is an NSF funded project which utilizes on-line learning modules based on The GLOBE Program to increase scientific knowledge and to promote careers in the geosciences for at-risk students. The Upward Bound (UB) program serves high school students from low-income families in which neither parent holds a bachelor's degree and first-generation military veterans who are preparing to enter postsecondary education.

An inquiry-based laboratory science course based on NASA's GLOBE Program protocols and learning activities was developed and infused in the 6-week summer UB program entitled, "Environmental Inquiry." This on-line and field-based course involves UB students in the active collection and analysis of environmental data, promotes a multi-disciplinary integrated approach to geoscience instruction. IDGE will better prepare UB students to succeed in post-secondary laboratory sciences, increase students' critical thinking skills, and promote positive attitudes towards careers in science. The program also strives to increase student's critical thinking skills and to promote positive attitudes towards careers in science.

IDGE activities began in June 2006 and will continue through December 2008. They will include the course development, online learning module creation, facilitation of the 6-week Environmental Inquiry and International Environmental Inquiry course, and a capstone experience. During this poster session, the principal investigators will provide updates on educational resources and research during the implementation of the program.

**2. Poster Title: GLOBE and Science in Santo Domingo**
Ms. Maria L. De Ruiz-Alma (Dominican Republic)

This poster reports on the ongoing efforts and investigations that use GLOBE protocols and GLOBE data, including research presented at the Science Fair, in newspapers, magazines and radio programs.

**3. Poster Title: Environmental Monitoring and Action Project**
Mr. Aaron Fleming & Ms. Kathryn Hicks (New Zealand)

A summary of New Zealand's delivery of GLOBE through the Environmental Monitoring and Action Project, and some key resources that have been produced to assist with its delivery, are provided.

**4. Poster Title: Carbon Cycle ESSP--Plant-A-Plant Hands-on Indoor Activity**
Dr. Jana Albrechtova (Czech Republic)

Plants make up a very important part of global carbon cycle representing a large carbon pool in their biomass. This poster presentation provides a summary of how students manipulate environmental conditions during plant cultivation in order to understand plant requirements for growth and development.

**5. Poster Title: Ten years of GLOBE Program in Poland--Students' Research**
Ms. Katarzyna Jakubowska (Poland)

This poster highlights three GLOBE sections in our school; one which conducts research on the River Wislok (hydrology), one which conducts atmospheric research and observations, and one which conducts research of the land cover. Research and some results and information about our climate and area are provided as well as an introduction to Poland's new regional project entitled "The Purity of the River Wislok and it's Influence on the Local Community."

**6. Poster Title: SCUBAnauts International--Education through Experience for the Next Generation of Earth Explorers**
Dr. Christopher Moses & Dr. Paula Coble (Florida, U.S.A.)

The SCUBAnauts International program was established to increase the attraction to science and technology careers in today's youth. SCUBAnauts International of Tampa Bay, a non-profit 501(c)(3) organization formed in 2001, consists of a diverse group of young men and women (ages 12-18) mentored by federal, state, and academic research scientists in an informal education environment. The program's mission is to expand and promote opportunities for young and emerging explorers by involving them in the marine sciences through underwater exploration and research activities, such as special environmental and undersea conservation projects that educate, promote active citizenship, and develop effective leadership skills. Education and outreach goals include providing research-quality data to meet the needs of ocean scientists and maintaining direct interaction between the scientists and the young men and women in the program. The science component of the program includes collection of benthic habitat, water quality, optics, and coral reef health data. During the school year, the SCUBAnauts are tasked with sharing their experiences to raise the environmental awareness of a larger audience by providing education outreach in formal and informal venues. Results from SCUBAnauts activities including data collection, program methodologies, and future plans for the program are highlighted.

**7. Poster Title: Earth System Science Student Research**
Ms. Malulee Pornchokchai, Ms. Samornsri Kanphai & Ms. Umarporn Charusombat (Thailand)

The student-teacher-scientist collaboration research focused on Earth system science is an ideal way for students to learn and understand the Earth system by doing real science in natural settings, learning the key activities needed to practice the scientific method, taking measurement for quality level acceptable for scientific research, learning underlying principles and processes governing the behavior of environment, using higher order of thinking to inquire, generating research questions based on their own observation knowledge and experiences, using mathematics and technology in their investigations, seeking answers through experiment and inquiry, exploring with their own natural curiosity to understand how the world works, how the world is critical, and how to save the world sustainable.

**8. Poster Title: Understanding the Carbon Cycle through Computer Modeling**
Ms. Sarah Silverberg & Dr. Scott Ollinger, GLOBE Carbon Cycle (New Hampshire, U.S.A.)

The use of models in science is not only prevalent, but essential in gaining a complete understanding of systems. Models can be used to recreate past conditions, understand current conditions, and predict future conditions. They can also help synthesize large amounts of complex data and display it in a simplified way. Another important characteristic of models is their ability to help identify gaps in current knowledge, which can lead to a whole new set of research questions. Because models are so important in science research and GLOBE aims to bring the most current science and science techniques into the classroom, the GLOBE Carbon Cycle project has selected modeling as the first category of carbon cycle activities. Students will explore the carbon cycle at both a local and global level using a set of computer models built in STELLA. The models have accompanying activities and materials so that students at all different starting points will be able to understand the basic concepts of modeling as well as how modeling can teach them about the carbon cycle. Stop by the poster to learn more about the models, the software, and the activities that are under development.

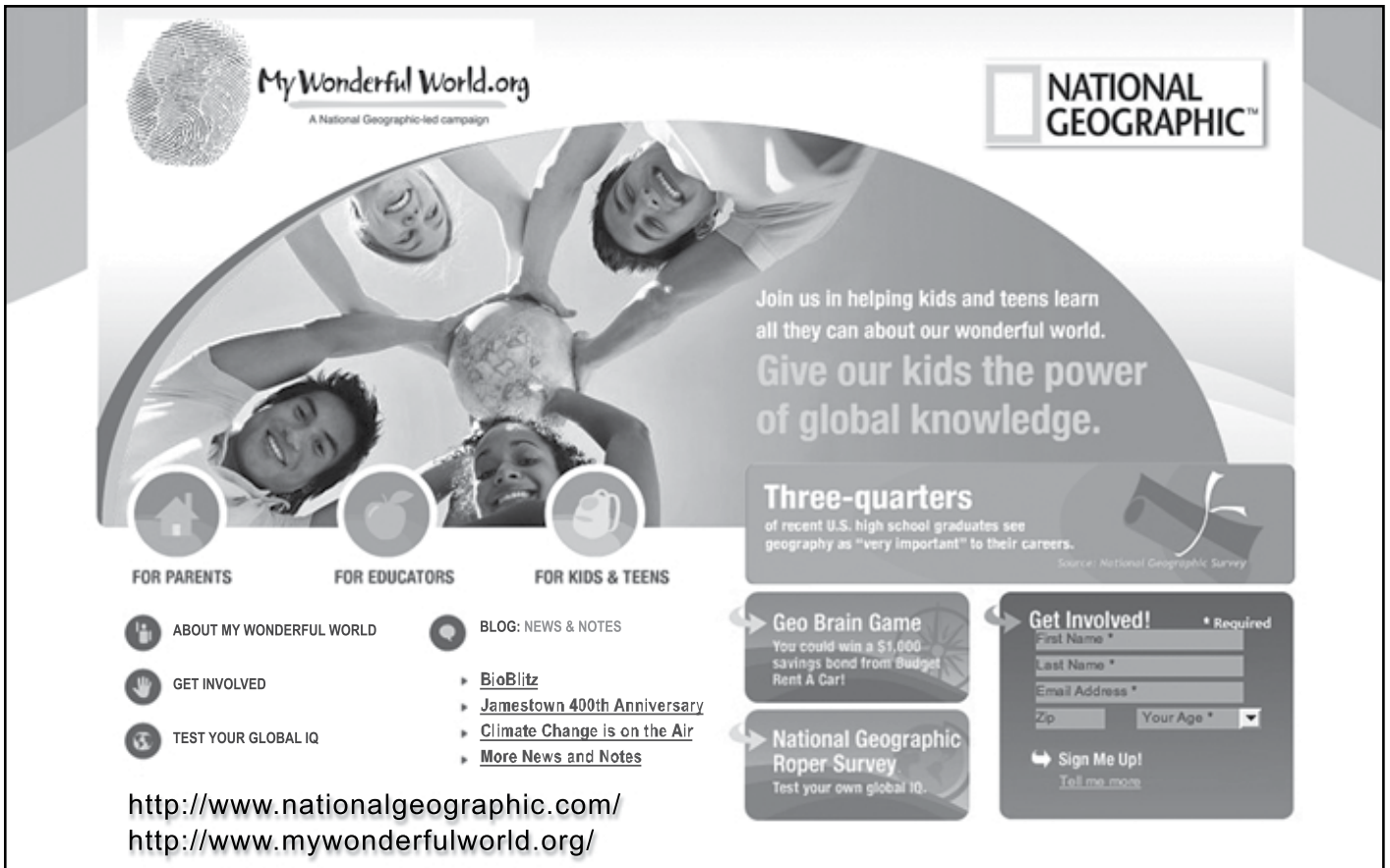
**9. Poster Title: First steps at Elementary School Level for Taking Part in GLOBE**
Ms. Sylvain Taussac & Mr. Alexandre Nicolas (France)

The French project began in 2003 with 4 schools and today more than 40 schools from 6 different countries (France, Morocco, Sweden, Malaysia, Indonesia and Madagascar) participate. Every school in the world can join us and, if it is not already displayed, we will add their country to the map. Since some schools from the GLOBE French project Calisph'Air entered the project in 2005, the "Météo des Ecoles" datasheet is linked to the GLOBE database by automatic email data-generation. Currently available in French and English, the Web site now includes an online translation interface and can be consulted in any language.

**10. Poster Title: Student and Volunteer Monitoring of Arizona Rivers and Riparian Areas**
Dr. James Washburne & Dr. Martha Whitaker (Arizona, U.S.A.)

Science Foundation Arizona has just funded a new $825k three-year effort to "Arizona Rivers" to facilitate local collaborations between students, volunteer monitoring groups, state and local agencies for the purpose of re-energizing the spirit of scientific discovery and inquiry in the classroom. In particular, Arizona Rivers will promote long-term student and volunteer monitoring of rivers and riparian areas by building sustainable partnerships between students and local watershed experts. This effort will partner with, and build upon, a decade of experience with the GLOBE Program. Student and teacher efforts will be coordinated with and integrated into local monitoring networks. Within these organizations, individuals with a solid understanding of local watershed issues and monitoring needs will be encouraged to help program participants develop appropriate study/observation goals and mentor their activities. Partners will vary with each site, and will tend to include, but are not limited to watershed managers; locally-based governmental agency staff (at the city, county, state and federal levels); local chapters of national environmental and volunteer monitoring groups; non-governmental organizations; and academic scientists pursuing research at river field sites. This project represents an exceptional learning opportunity for Arizona teachers who seek to engage their students in real-world math and science applications. By working together, we will establish an innovative network of students and volunteers conducting critical baseline and long-term river and riparian monitoring.

# Notes




http://www.nationalgeographic.com/
http://www.mywonderfulworld.org/

# SCUBAnauts International

## America's Next Generation of Explorers

The mission of SCUBAnauts International is to expand and promote opportunities for young and emerging explorers by involving them in the marine sciences through underwater exploration and research activities, such as environmental and undersea conservation projects, that build character, promote active citizenship, and develop effective leadership skills.

SCUBAnauts International is committed to working with GLOBE to promote improved ocean literacy more broadly in the U.S. and around the world.

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