



The GLOBE Program



The 2008 GLOBE Program: Promoting Student Research at Local to Global Scales

Dr. Edward E. Geary, Director----- 23 September 2008

GEO Capacity Building Committee Meeting, Boulder, CO





Talk Overview

- GLOBE --- Mission, and Goals
- Accomplishments and Assets
- GLOBE Student Research
 - GLOBE Learning Expeditions
 - Earth System Science Projects
 - Research Campaigns
 - The GLOBE Research Collaboratory
- GEO and GLOBE



GLOBE---Mission and Goals

GLOBE is--- a worldwide community of students, teachers, scientists, and citizens working together to better understand, sustain, and improve Earth's environment at local, regional, and global scales.

Mission: To promote the teaching and learning of science, enhance environmental literacy and stewardship, and promote scientific discovery.

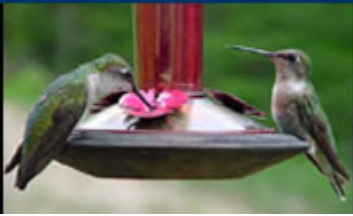
Goals

- ***Increase*** student achievement across the curriculum with a focus on student research in environmental and Earth system science;
- ***Enhance*** awareness and support activities of individuals and groups throughout the world to benefit the environment;
- ***Contribute*** to scientific understanding of Earth as a system; and
- ***Inspire*** the next generation of global scientists.



Accomplishments & Assets

- **Longevity = 14th Year of Operation**
- **Scope and Scale**
 - 110 countries
 - 21,182 schools
 - 43,431 teachers
 - >1.5 million students
 - >18,000,000 environmental measurements
 - >150 Publications
 - >10 Years of Evaluation data (SRI, Learning Partnership)
- **Assets:**
 - GLOBE Networks, Protocols, Teacher's Guide, ESSPs, Staff, Materials translated in 6 U.N. languages



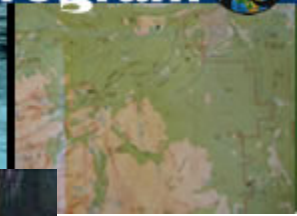
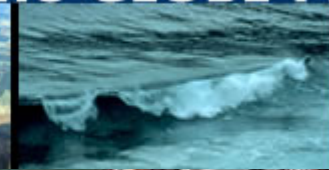
GLOBE Student Research



GLOBE Learning Expedition 2008



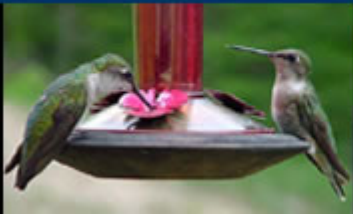
Cape Town, South Africa



To promote global understanding of local and regional sustainability issues



Student Research Presentations



To increase student understanding of science

Students and scientists collaborate in the field



Local to Global Environmental Investigations

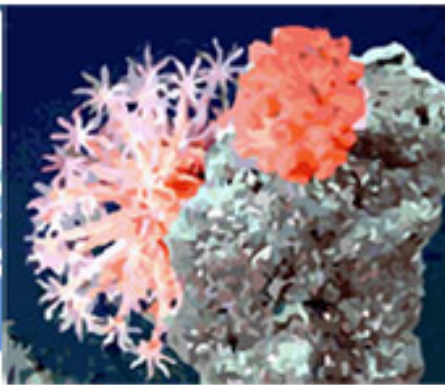
- **Single classroom**---students investigate topics of local interest and relevance (ongoing)
- **Earth System Science Projects (ESSPs)**---students from multiple classrooms collaborate with scientists around a common topic area (e.g. Carbon cycle, Watersheds, Biomes) (by 2010)
- **Research Campaigns**---students from many countries and classrooms collaborate on investigations ranging from: **Climate Change**, to Water, Energy, and Human Health (>2010)



Earth System Science Projects



**Watershed
Dynamics**



FLEXE
From Local to Extreme Environments



**SEASONS
& BIOMES**

**CARBON
CYCLE**

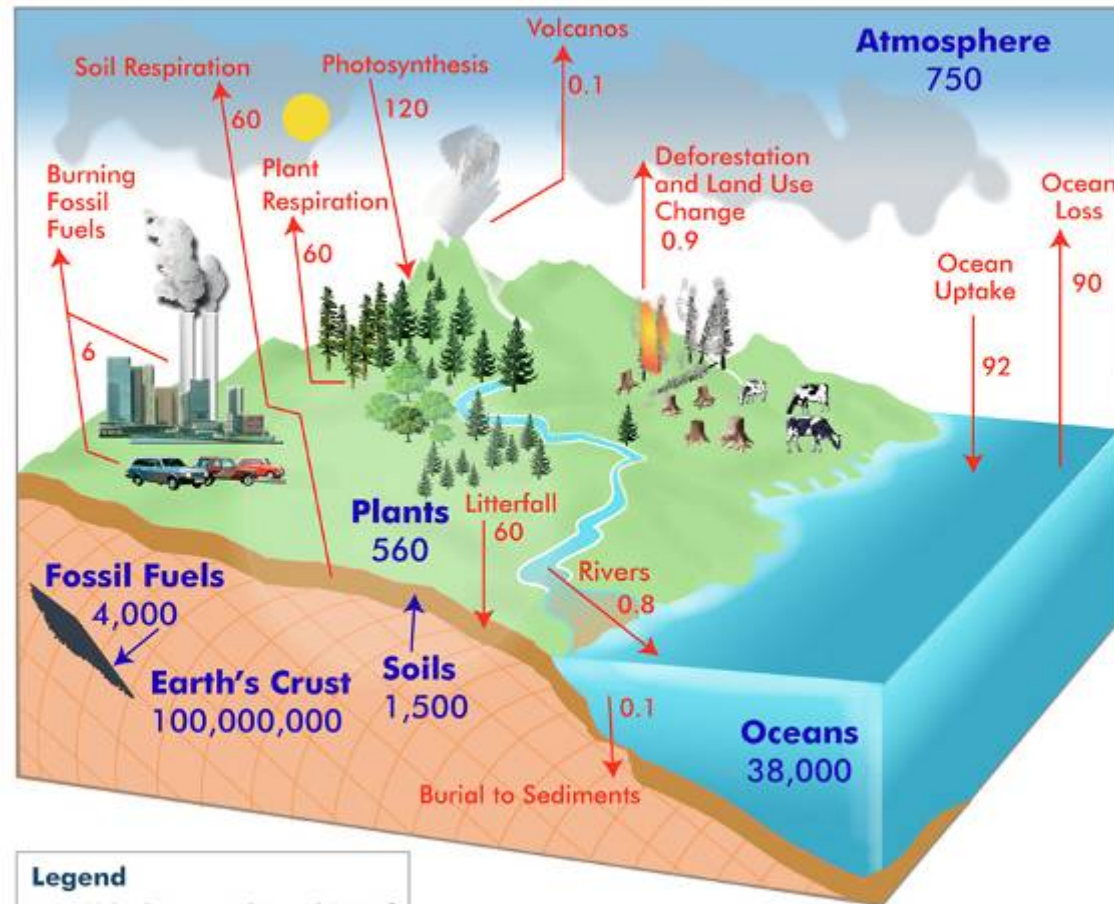
Investigating the Carbon Cycle
in Terrestrial Ecosystems



The Carbon Cycle



Global Carbon Cycle



Legend
Units: Petagrams (Pg) = 10^{15} gC
● Pools: Pg
● Fluxes: Pg/year

University of New Hampshire: Rita Freuder, Lara Gengarely, Mary Martin, Scott Ollinger, Annette Schloss, Sarah Silverberg

Czech Republic: Jana Albrechtova, Kateřina Čiháková, Zuzana Lhotakova, Barbora Semeráková, Premek Stych, Dana Votapkova

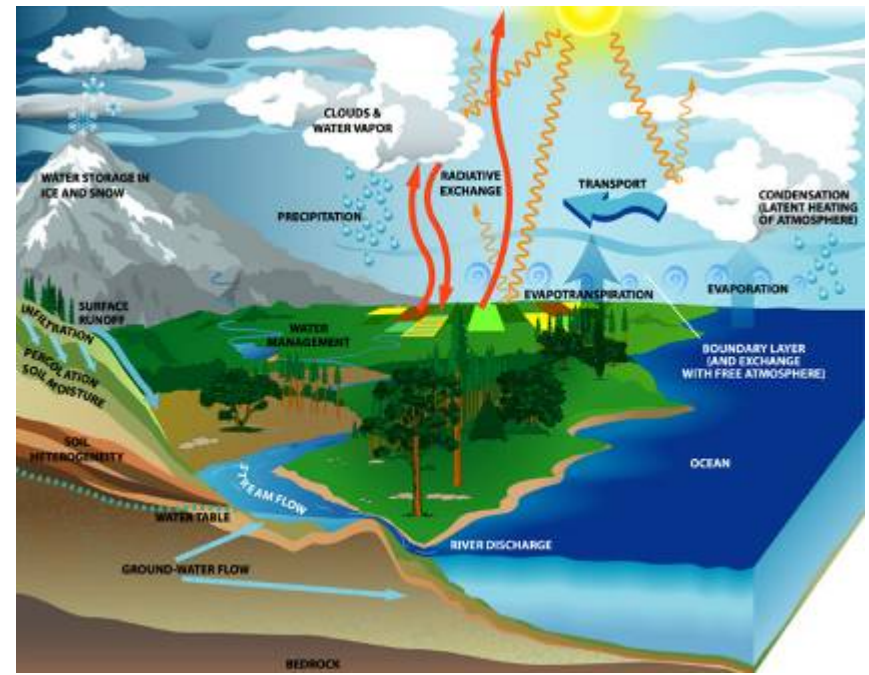
GLOBE Program Office: Gary Randolph



Watershed Investigations

Students will engage in authentic scientific investigations of watershed dynamics

- using real-time and archival data sets
- at local, regional, and continental scales





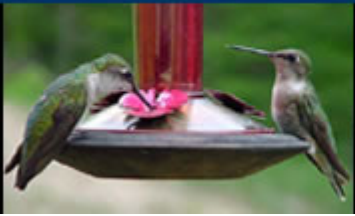
Student Research Campaign on Climate Change: 2011-2013

- Engage > 1 million K-16 students in climate change research
- Enhance Climate literacy and understanding for millions of people around the world
- Empower students, teachers, and citizens to “take action” on climate and environmental issues affecting their communities.
- Create a compelling model for integrating environmental research and data into K-16 classrooms



GLOBE Student Research Collaboratory

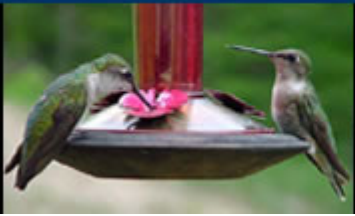
- Earth system science teaching and learning resources
 - Tutorials, modules, digital library resources, professional development opportunities, assessments
- Data sets, tools and services
 - GIS, Mapping, Graphing, Modeling, Remote sensing
- Online collaboration tools and services
 - School-school and Scientist-Teacher-Student
- GLOBE Student Research Projects---online library/archive
- Student Research---campaigns and events



GEO----GLOBE:

Mutual Interests and Features

- | | |
|--|---|
| <ul style="list-style-type: none"> • Climate, Water, Ecosystems, etc. • Scientist-centered data collection and use (GEOSS) • International: 70 countries • Network of data systems, providers, and users | <ul style="list-style-type: none"> • Climate, Water, Biomes, etc. • Student-centered data collection and use (in situ +) • International: 110 countries • Network of Partners, teachers, scientists, students |
|--|---|



GEO and GLOBE

Questions and Discussion



For Additional GLOBE Information see
the following slides or
visit www.globe.gov



GLOBE Around the World



140 U.S. Partners

GLOBE Regions (countries)

- Africa (23)
- Asia-Pacific (17)
- Europe-Eurasia (38)
- Latin America-Caribbean (18)
- Near East (11)
- North America (2)

6 New Countries since Oct 2003

- 105: Maldives — 8 December 2003
- 106: Mauritania — 6 July 2004
- 107: France — 4 October 2004
- 108: Congo — 28 June 2005
- 109: Niger — 11 August 2005
- 110: Ethiopia — 24 August 2005
- 111: Malta --- 1 December 2007

**Capacity Building:
98 Master Trainers
41,000 Teachers
21,000 Schools**



Collaborating Organizations





Evaluation... student impacts

- Improved observational skills
- Improved measurement skills
- Improved technology skills
- Ability to understand data
- Improved critical thinking
- Improved map skills



Evaluation---Teacher Needs

- More student investigation and analysis ideas
- Modularized Teacher Guidebooks
- Additional Teacher Training
- Help with Equipment
- Mentoring
- Help with classroom/curriculum integration



Evaluation---Community Input

- Put Education First
- Focus Resources
- Integrate Evaluation
- Become More International
- Emphasize Local and Regional Relevance
- Become even more of a Leader in ESE
- Diversify Funding and Leverage Partnerships
- Create More Opportunities for Collaboration
- Increase Effectiveness of Technology Spending



Inspiring the Next Generation of Earth System Scientists

