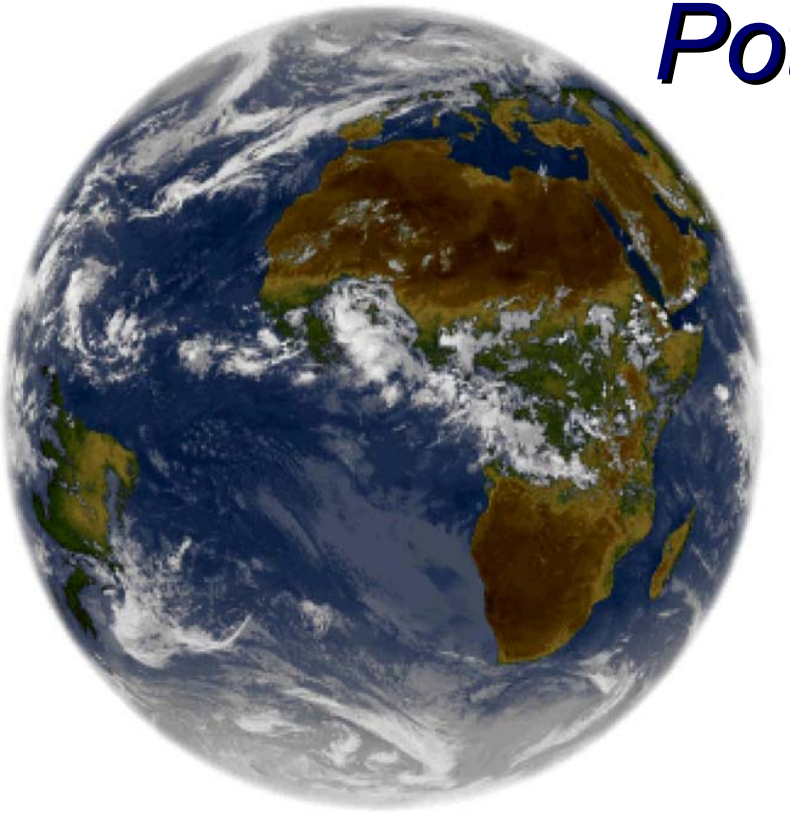
The GLOBE Program

NEESPI

GLOBE in Northern Eurasia and Potentials for the NEESPI

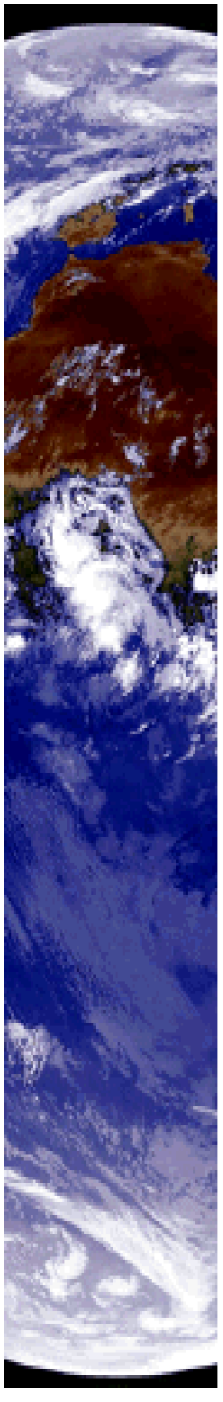


Eric Stonebraker

Regional Director

Russia and the CIS, Asia and the Pacific

NASA



Presentation Outline

- Brief overview of The GLOBE Program
- Update on recent events
- GLOBE in Northern Eurasia
- Potentials for the NEESPI

The GLOBE Program

The GLOBE Program

Students collaborate with scientists

Hands-on science

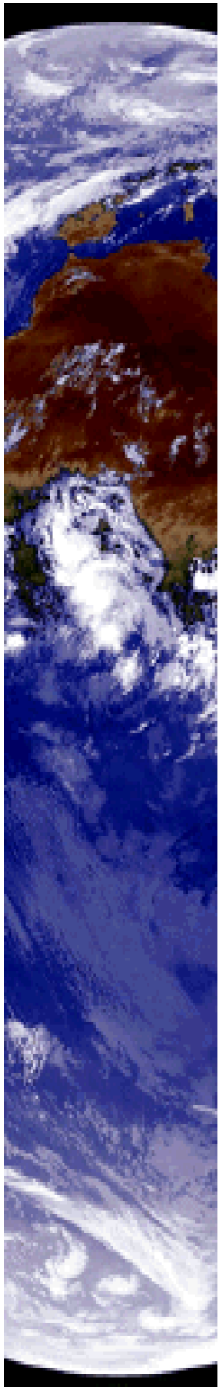
International Program in 107 countries

http://www.globe.gov

Atmosphere/Climate
Hydrology
Soil
Land Cover/Biology
Phenology

Over 11 million environmental measurements taken

Cooperating Organizations



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NATIONAL SCIENCE FOUNDATION

UNITED STATES DEPARTMENT OF STATE

INTERNATIONAL SPACE UNIVERSITY

United States Department of Education

NTSG Numerical Terradynamic Simulation Group

Sister Cities International

FIRE ECOLOGY Special Measurement Fire Effects Project at Rocky Mountain Research

United States Peace Corps

KNMI Royal Netherlands Meteorological Institute

CALIPSO

CLOUDSAT Cloud Sat CSU & Jet Propulsion Laboratory

RoyalCaribbean INTERNATIONAL

AWS / International Partners in Education

America-Israel Friendship League

ASA Austrian Space Agency

CIRES Cooperative Institute for Research in Environmental Sciences University of Colorado

Lilacs Special Measurement

IEEE Networking the World™ Institute of Electrical and Electronics Engineers

Operation RubyThroat The Hummingbird Project Hilton Pond Center for Piedmont Natural History

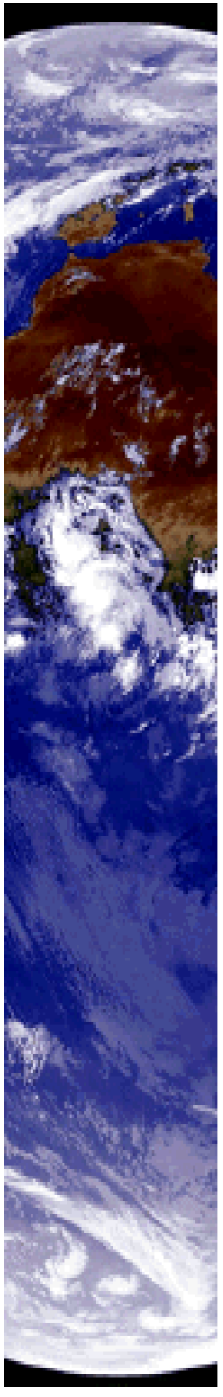
USAID United States Agency for International Development

Geosynchronous Imaging Fourier Transform Spectrometer

Organization of American States

UNEP United Nations Environment Program

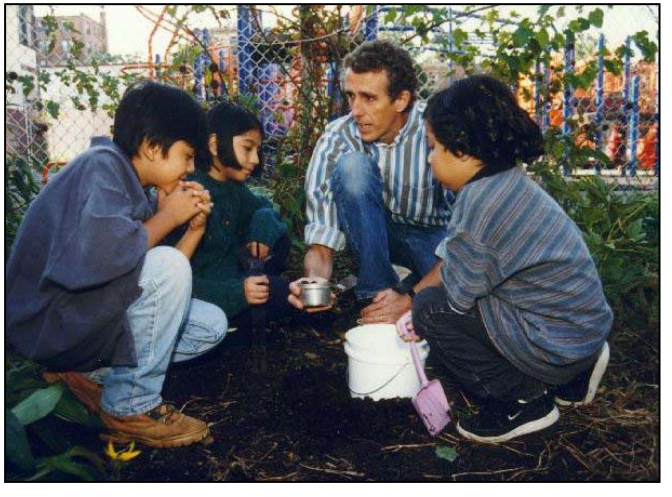
UNESCO United Nations Educational, Scientific and Cultural Organization



GLOBE is Science and Education

GLOBE VISION

- GLOBE students, educators, scientists and communities around the world work together to improve education, achieve a more complete scientific understanding of the Earth as a system, and enhance environmental awareness.



GLOBE MISSION

- GLOBE brings together students, teachers and scientists to:
  - Support improved student achievement in science and math
  - Gather important scientific data for the global Earth science community

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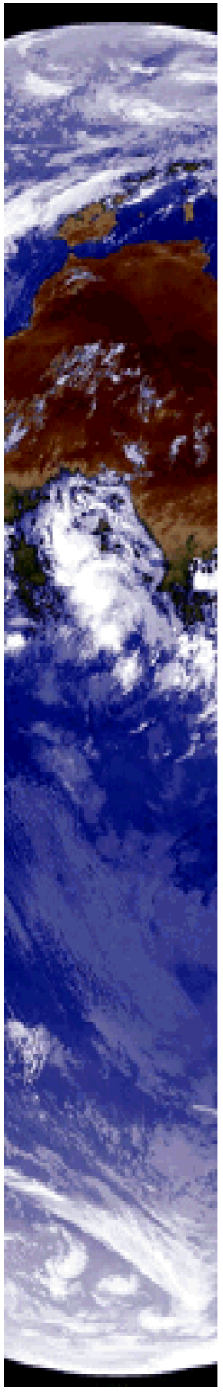
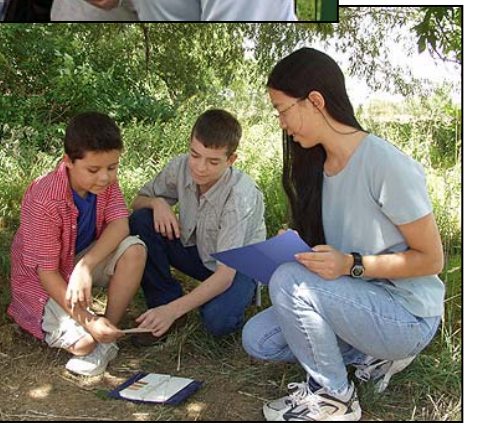
GLOBE Measurements





Atmospheric/Climate Studies

- Air temperature (Maximum, Minimum, Current)
- Precipitation (Rain, Snow, pH)
- **Cloud Cover/Type including contrails**
- Relative humidity
- Barometric pressure
- Surface ozone
- **Aerosols, water vapor**

Hydrology Studies

- Water temperature
- Transparency
- Water chemistry
  - pH, dissolved O_2 , alkalinity, nitrate, salinity or conductivity
- Freshwater macro-invertebrates

Soils Studies

- **Soil temperature, soil moisture**
- Soil bulk density, pH, particle size distribution, particle density, fertility
- Soil characterization
  - Structure, color, texture, consistency

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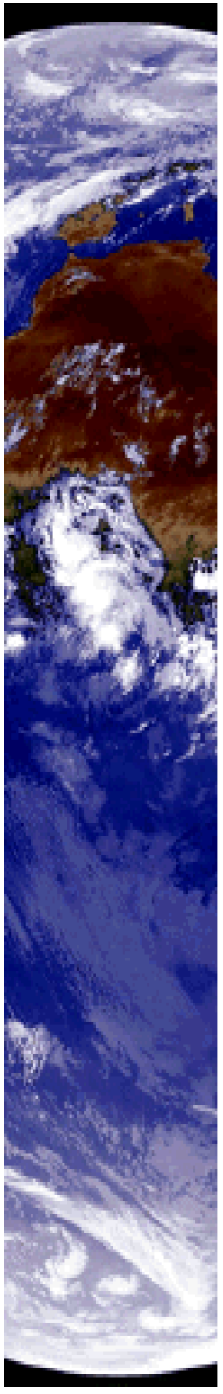
GLOBE Measurements



Land Cover Biology

- **Land cover mapping (manual and computer-aided)**
- Biometry (canopy and ground cover, tree and shrub height and diameter, grass biomass, species id)
- **Land cover change detection**
- Fire fuel ecology

Phenology

- **Green-up and green-down, budburst**
- Ruby-throated hummingbird monitoring
- Phenological gardens
- Common and clonal lilacs
- Seaweed reproductive phenology
- Arctic bird migration monitoring

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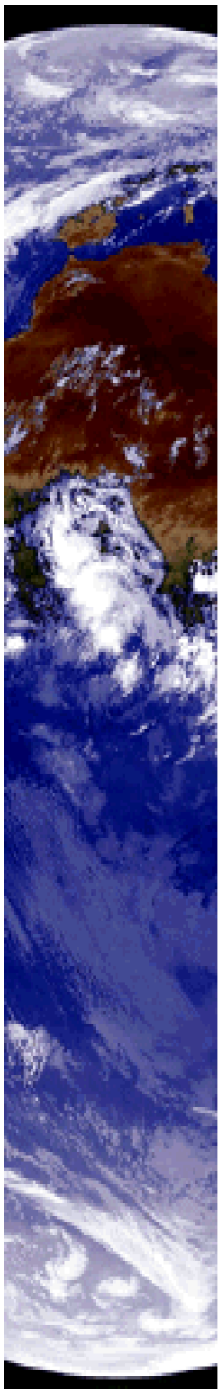
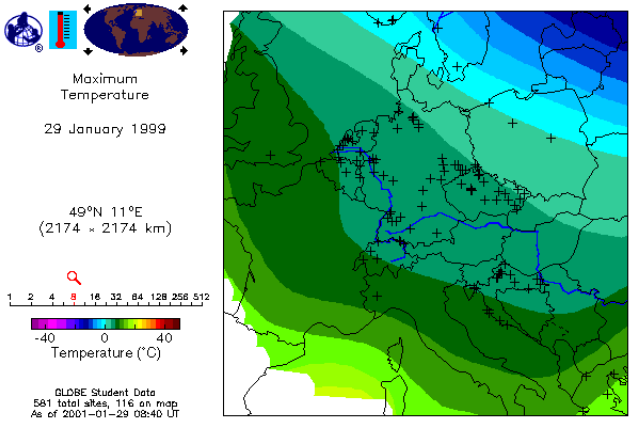


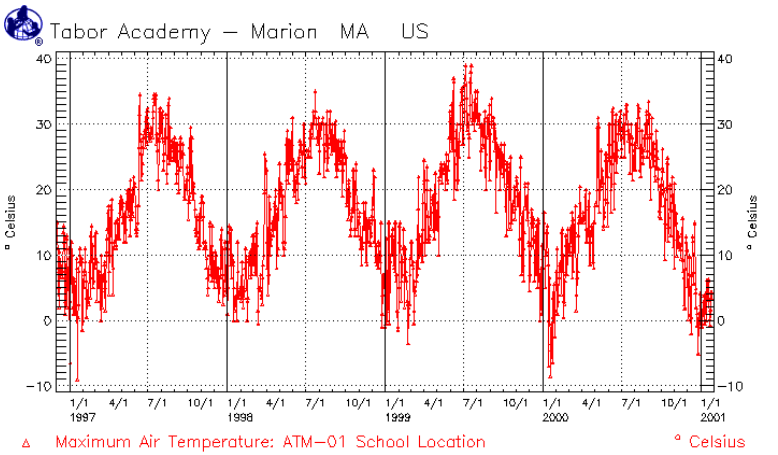
GLOBE Visualizations

Students can visualize data in several different ways.

Maps



Graphs



Raw Data

Air Temperature

YYYYMMDD	LATITUDE	LONGITUDE	ELEVATN	SITEID	CTTMP	MXTMP	MNTMP
20000819	64.8497	-147.8268	133.0	ATM-01	10.0	-99.0	-99.0
20000819	64.8618	-147.7217	203.0	ATM-01	10.0	12.0	4.0
20000819	38.7777	-120.8897	454.0	ATM-02	32.0	34.0	24.0
20000819	32.1832	-110.9775	836.0	ATM-01	40.5	40.5	22.5
20000819	36.5197	-119.5463	27.0	ATM-02	30.5	32.0	-99.0
20000819	33.7769	-118.0386	7.0	ATM-01	27.0	29.5	14.0
20000819	39.1167	-105.0167	1647.0	ATM-02	31.0	31.0	18.0
20000819	31.7535	-106.4733	1165.0	ATM-02	36.0	37.0	20.0
20000819	31.7694	-106.5066	1154.0	ATM-01	30.0	31.0	20.0
20000819	48.5467	-117.9044	774.0	ATM-01	20.5	28.0	7.0
20000819	36.0612	-90.9550	84.0	ATM-02	31.0	33.0	18.0
20000819	29.0892	-97.2763	68.0	ATM-01	36.5	39.0	22.5
20000819	36.0906	-94.9200	280.0	ATM-01	29.0	29.0	19.0
20000819	29.0382	-82.6903	5.0	ATM-01	39.0	39.0	23.0
20000819	36.3720	-109.6243	1658.0	ATM-02	26.0	31.0	15.0
20000819	35.9510	-97.2358	278.9	ATM-01	36.0	36.0	19.0
20000819	35.2969	-94.0361	198.0	ATM-01	32.5	38.5	21.5
20000819	36.0000	-93.0032	834.0	ATM-01	32.0	38.0	21.0
20000819	28.1390	-82.5071	8.0	ATM-01	30.0	34.0	23.0
20000819	34.8982	-96.1000	239.0	ATM-01	35.0	-99.0	-99.0

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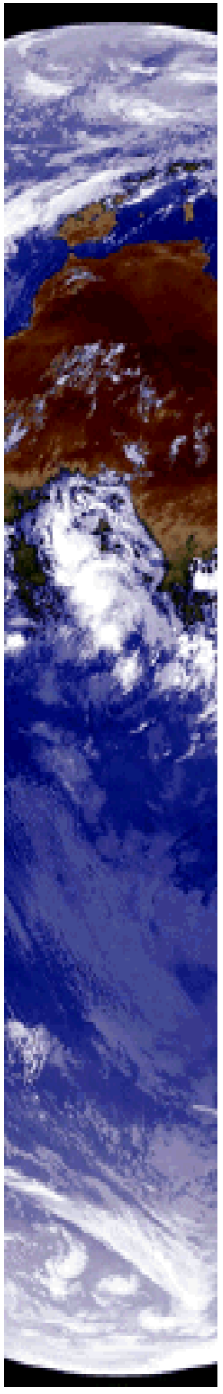
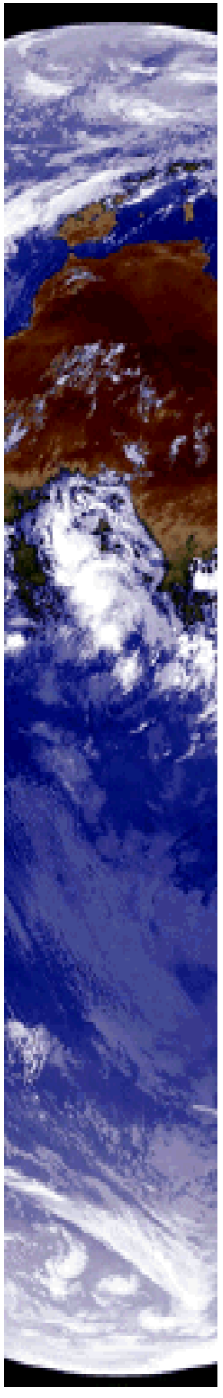


GLOBE: A School-Wide Interdisciplinary Program

Science: Concentrate on all protocol areas: Earth as a System.
Math: Research methodologies.
Technology: Create visualizations (maps and graphs).
Industrial Technology: Build instrument shelters.
Social Studies: Study different countries and their cultures.
Geography: Latitude, longitude, map elements, spatial analysis.
Agricultural Education: Assist scientists and farmers in the field to better track environmental events effecting crop production.
Art Education: Work with contour maps, draw landscape diagrams and study soil colors.
Humanities: Foreign language, drama, music, photography.
Language Arts: Authentic opportunities for communication through use of field notebooks, creative writing, independent research, and report writing.

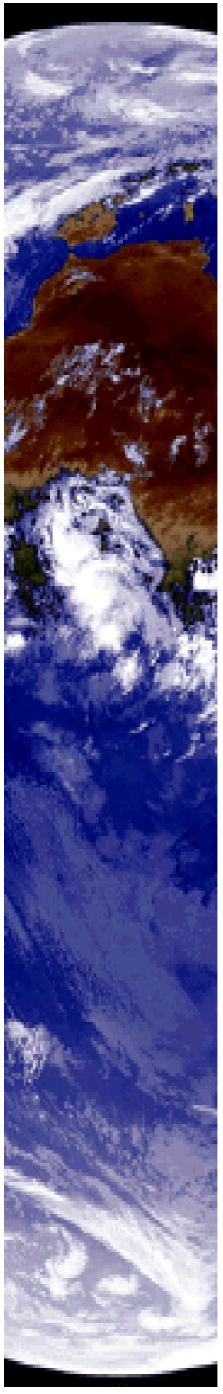
The GLOBE Program



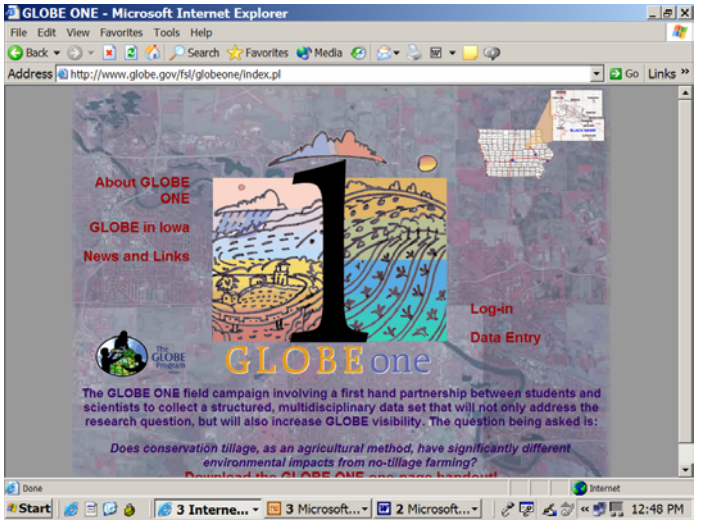
GLOBE in 2004

- One year in Boulder, Colorado
- Field Campaigns
  - GLOBE1
  - GUPY (GLOBE Urban Phenology Year)
- UNESCO and GLOBE
- Internationalization and Regionalization
- GLOBE Learning Communities

The GLOBE Program



GLOBEone



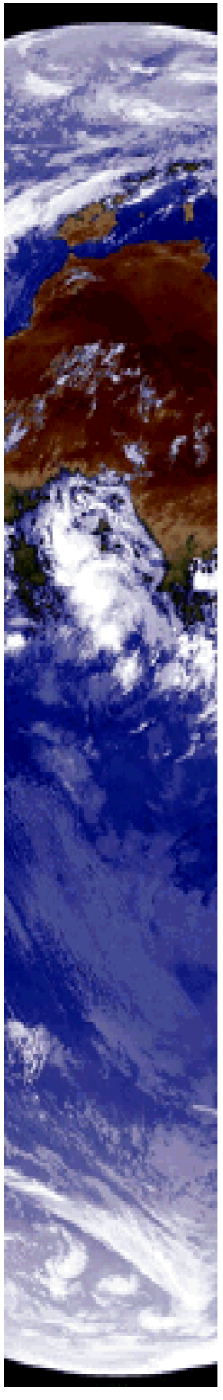
•GLOBE ONE is a field campaign that partners students and scientists to investigate the impacts of tilling soil for farming.

•Research Questions:

what are the environmental impacts associated with different frequencies and intensities of soil tillage farming?

What are the impacts of different amounts of crop residue left after planting as compared to prairie and urban sites?

The GLOBE Program



GLOBE Urban Phenology Year

- Investigate impacts of urbanization on vegetative phenology around the world

- Does the urban environment affect the timing of leaf development?

- Focuses on urban/rural gradient

- Utah State University Funded Program

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GLOBE AROUND THE WORLD

107 GLOBE Countries as of October 4, 2004

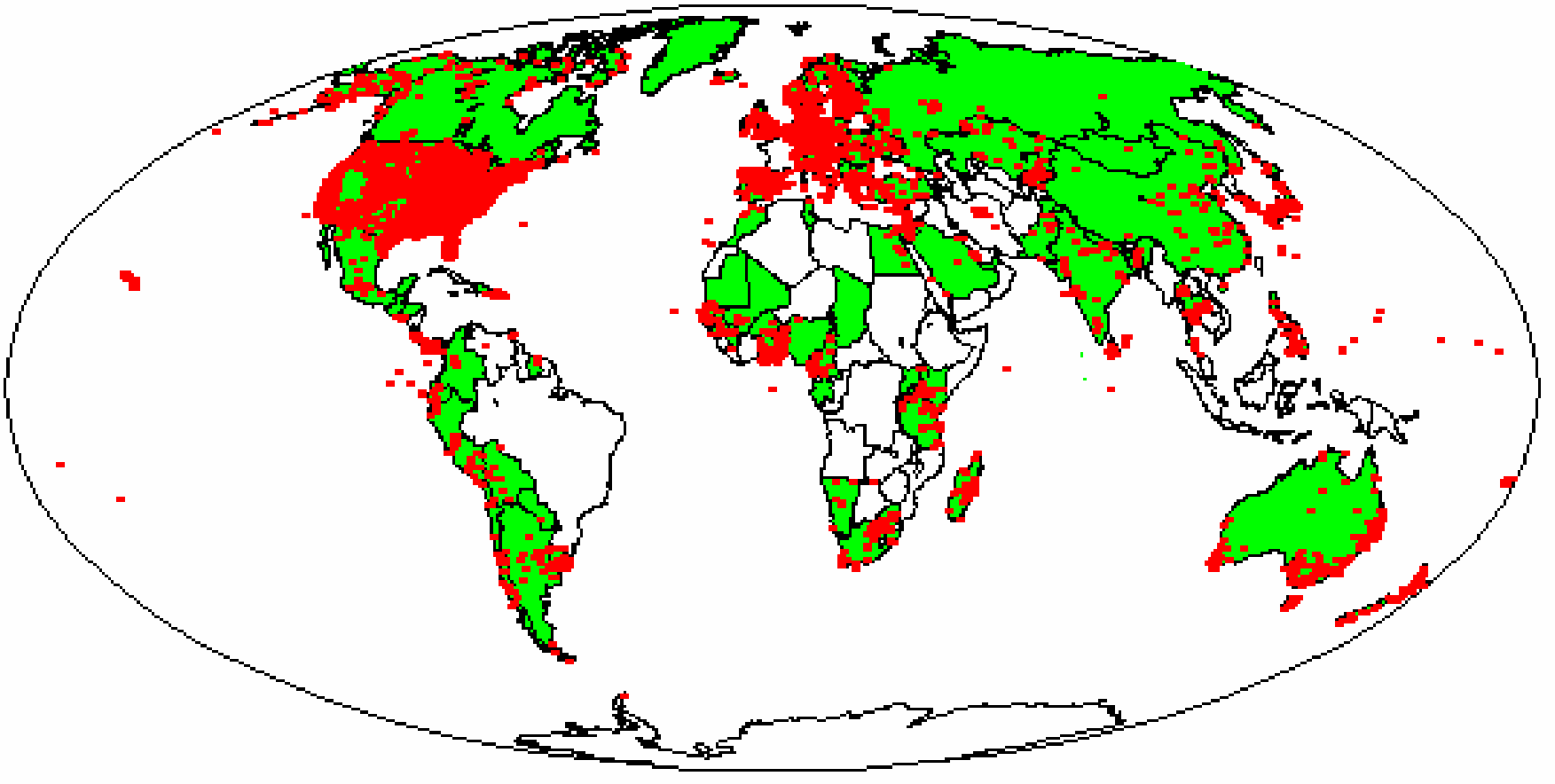
GLOBE has trained over 27,000 teachers representing more than 15,000 schools worldwide.

Students have entered over 11 Million Measurements to date.

GLOBE SCHOOLS AROUND THE WORLD

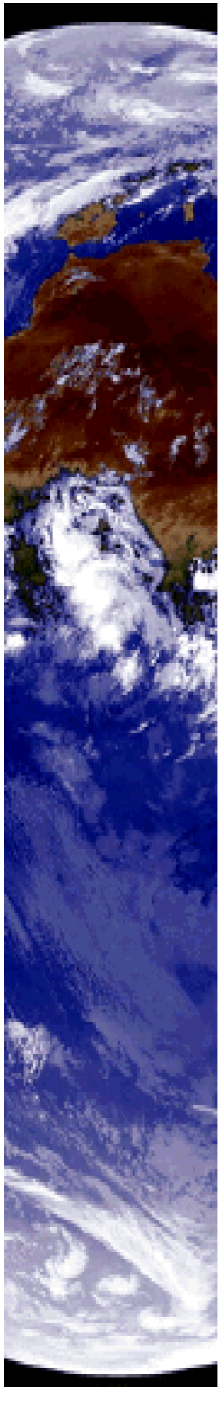
Active GLOBE Schools

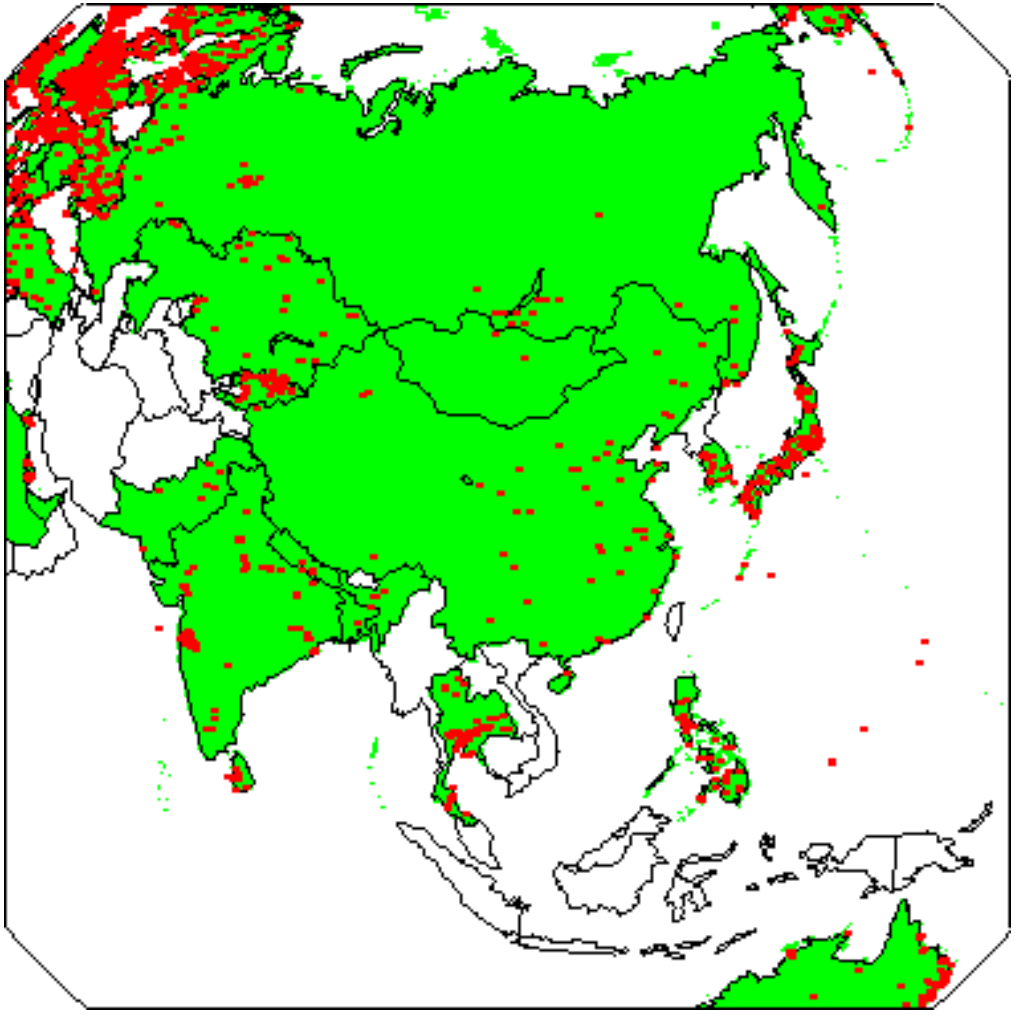
GLOBE Program through
2004 August 18



1x 2x 4x 8x 16x 32x 64x 128 256 512

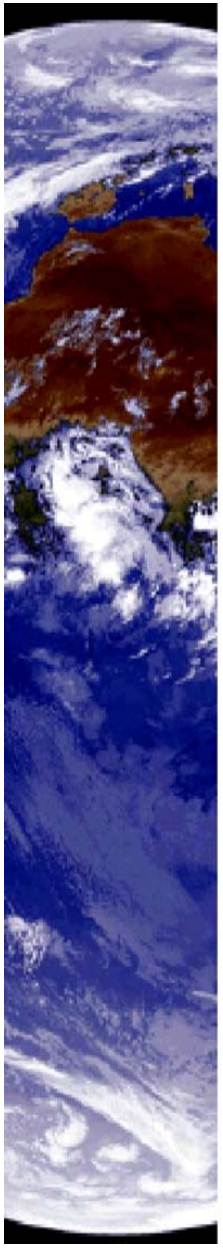
GLOBE Student Data
15204 total schools, 15112 on map
As of 2004-08-18 03:24 UT





GLOBE in Asia and the Pacific

GLOBE Partner Countries within the NEESPI Region



- China
- Bulgaria
- Czech Republic
- Estonia
- Finland
- Japan
- Hungary
- Kazakhstan
- Kyrgyzstan
- Latvia
- Moldova
- Mongolia
- Norway
- Poland
- Russia
- Sweden
- Turkey
- Ukraine

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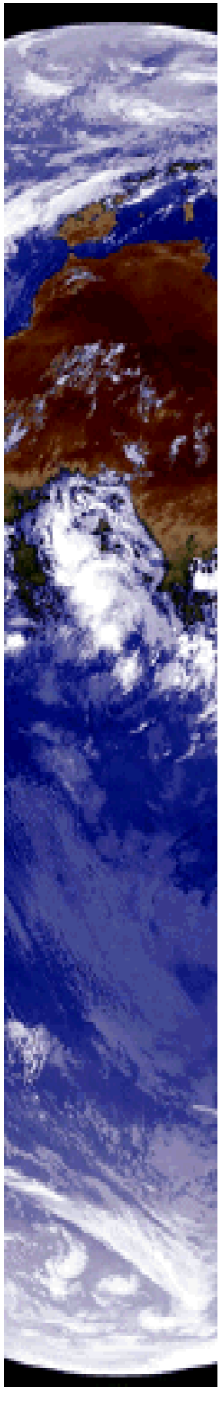
Recent GLOBE Developments in the NEESPI Region



(5) Teacher / Trainer Trainings

Field Campaigns GUPY – Japan,
KygryzstanWHEREELSE???
Baikal Co-coordinator, Regional Center

Joint UNESCO / GLOBE – World Heritage Sites

9th Annual GLOBE Conference, July 31st-August 4th, 2005, Prague, Czech Republic

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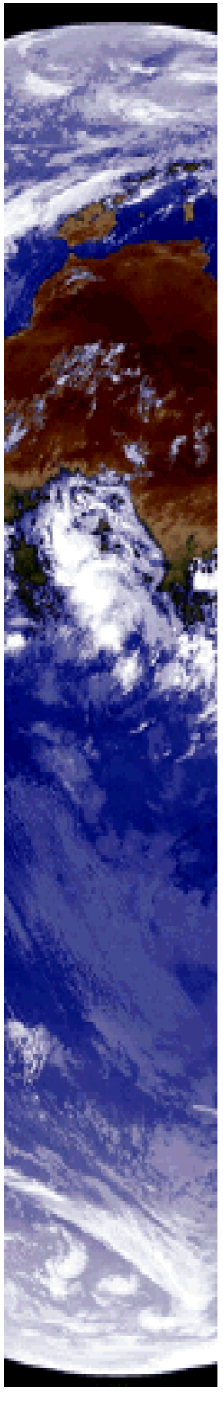
What GLOBE can provide the NEESPI



•Fulfills mandate for meeting "Successful NEESPI Project"

> **"… the presence of an education component will be among the funding requirements of *successful* NEESPI projects…"**

• GLOBE provides pre-existing program

• Execute international field campaigns

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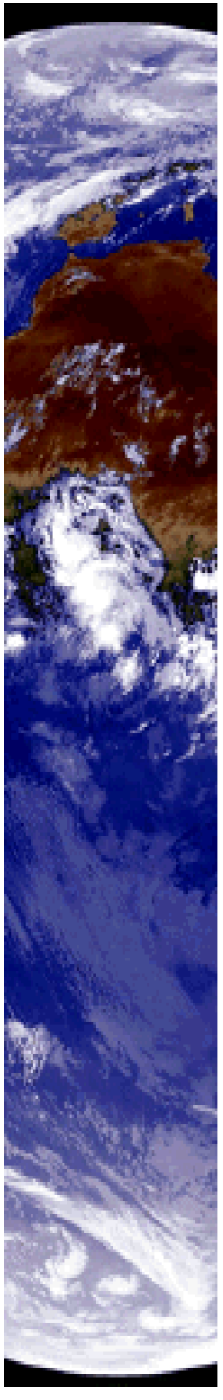

What the NEESPI can provide GLOBE

- Incentives to participate
- Financial support
- Increased Visibility
- More partners

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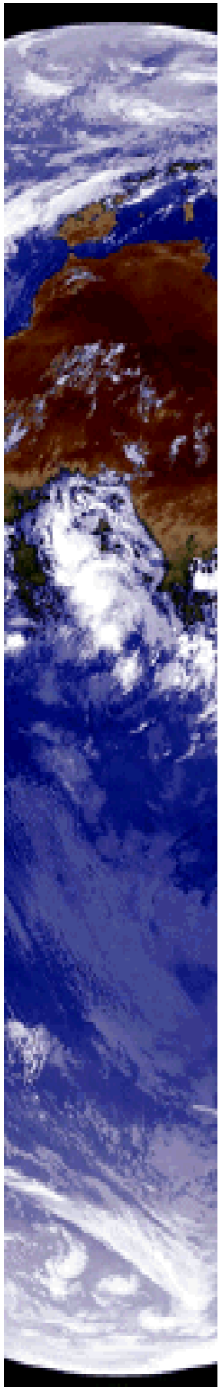

Новости и события Вице-президент Индии открывает веб-сайт ГЛОУБ-Индия

Мистер Раджиндер Мехта, Координатор Программы ГЛОУБ в Индии, был рад объявить о торжественном открытии веб-сайта ГЛОУБ-Индия (www.globeindia.org) 29 ноября. Веб-сайт был официально открыт Вице-президентом Индии Шри Бхейрон Сингх Шехават.

*Новости и события*ГЛОУБ получает Приз Фонда "Голдмен Сакс" за высокое качество международной образовательной деятельности

The GLOBE Program