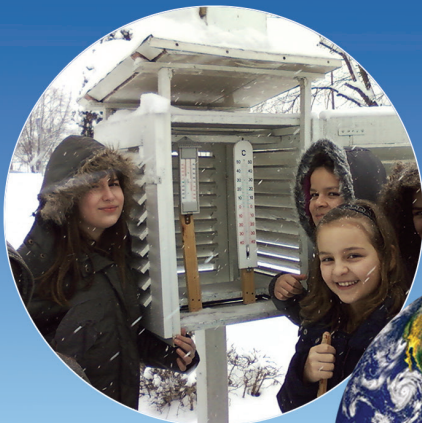


## 2014–15 GLOBE Annual Review



**Atmosphere**



**Biosphere**



**Hydrosphere**



**Pedosphere**



Sponsored by:



Supported by:



Implemented by:



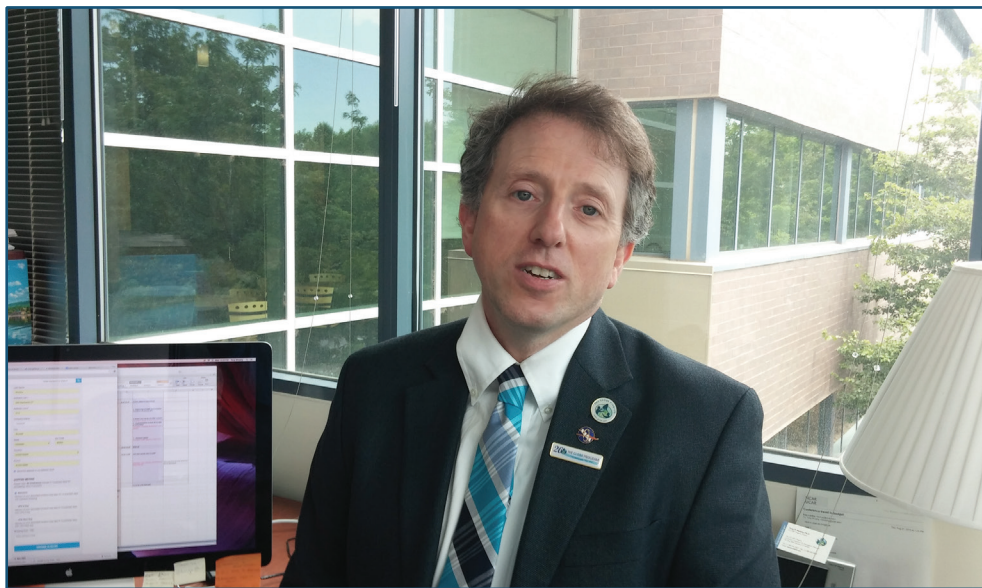
## Major GLOBE Milestones

- 1994: Earth Day, U.S. Government announces The GLOBE Program as a multiagency effort
- 1995: Earth Day, The GLOBE Program launches (with 11 protocols); 33 countries join the Program in the first year.
- 1997: U.S. hosts first GLOBE Teacher Conference.
- 1998: Finland hosts first GLOBE Learning Expedition (GLE) in Helsinki.
- 2000: USA hosts second GLE in Fayetteville, Arkansas.
- 2003: GLOBE offers 53 protocols across the spheres: atmosphere, biosphere, hydrosphere, and pedosphere (soil).
- 2003: Croatia hosts third GLE held in Sibenik.
- 2004: GLOBE receives the Goldman Sachs Award for being an “outstanding program that makes use of media/technology to educate students or teachers about other world regions and cultures, or international issues”.
- 2005: Earth Day; GLOBE celebrates its 10th birthday, with 15,000 schools in 106 countries; GLOBE Alumni independently create their own organization.
- 2008: South Africa hosts fourth GLE in Cape Town.
- 2009: GLOBE established Regional Offices in Africa, Asia and Pacific, Europe and Eurasia, Latin America and the Caribbean (LAC), and the Near East and North Africa (NENA) to support professional development workshops, capacity building, and regional sustainability efforts; measurements in GLOBE database reaches 20 million.
- 2011: GLOBE launches concept of Student Research Campaigns, with first topic focused on climate.
- 2014: Europe and Eurasia Region host first regional Student Aerosols Research Campaign; student research campaigns with NASA Earth observing satellites Global Precipitation Measurement (GPM) and Soil Moisture Active Passive (SMAP) launch.
- 2014: India hosts fifth GLE in New Delhi.
- 2015: Earth Day, GLOBE celebrates its 20th birthday! GLOBE launches new mobile data entry app for schools, enhances the GLOBE website, and updates the Teacher’s Guide; offers 51 protocols; reaches 127 million measurements in the GLOBE database.



## Table of Contents

A Message from the GLOBE Implementation Office Director	2
Celebrating Twenty Years: GLOBE - 1995 to 2015	4
GLOBE's Earth Day 2015 Celebrations Around the World	5
GLOBE at a Glance	8
GLOBE Working Groups and U.S. Partner Forum	9
Enduring Collaborations - Earth Observing Satellites	10
Making the Data Count	12
Community-based Campaigns	15
The GLOBE International Scientists Network	15
The GLOBE Teacher's Guide - Updated and Improved	16
Distinguished Educator Fellowship Program	17
Calendar Art Competition	18
Annual Survey - A Snapshot of Responses	20
GLOBE and the National Wildlife Federation's Eco-Schools USA	20
The GLOBE Program and Founding Members Recognition Awards	21
Website Refresh and Technology Tune-Up	22
GLOBE Community Support Team	24
18th Annual Partner Meeting and 2014 GLOBE Learning Expedition	25
GLOBE Around the World - Regional Pages	28
The GLOBE Program - Looking Ahead	40
The GLOBE implementation Office Summary Report	41



## A Message from the Director

### The GLOBE Implementation Office

This year we celebrate the 20th Anniversary of the GLOBE Program. What began as a citizen science concept of connecting students, teachers and scientists in meaningful examination of the environment is now a worldwide program that has empowered us and transformed how we think about the world and how we live in it.

Twenty years is indeed a significant milestone, and the path has been filled with passion, dedication, and hard work on the part of all of our community members. GLOBE is now operating in more than half the countries on Earth. More than 50,000 teachers have benefitted from the structure and training provided by GLOBE. Our teachers recognize the power of hands-on science and millions of students have responded by taking their knowledge and tools and applying them to research in their communities.

In the 20 years since GLOBE began its operation, over 127 million measurements have been entered into the GLOBE database, which describes the ever-evolving environmental conditions on Earth. During this time, we have also become part of the digital revolution with a continually evolving technology that provides us with new web tools and improved ways of communicating. This transformation provides the means to expand solitary efforts into large-scale collaborations with the power to create far-reaching benefits. Importantly, 20 years represents



a generation; we have now raised a generation of students who are using the knowledge they acquired from GLOBE as a lens through which they observe the world around them and engage with it. We have an Alumni Network so inspired by their exposure to GLOBE as students, that they have committed to working to benefit the environment in their adult years, many of them through careers in science, technology, engineering, and mathematics (STEM).

Looking ahead at the next 20 years of GLOBE, we will need to provide students with a broader set of “21st century skills” to thrive in a rapidly changing, technology-saturated world. Critical skills must include collaboration and teamwork, creativity and imagination, critical thinking, problem solving, global and cultural awareness, as well as direct contact with their environment. These skills are already a hallmark of the GLOBE learning experience. We must continue to provide high-quality Earth Science education to greater numbers of students worldwide in order to protect our collective future and to tackle the increasing number of environmental challenges at our door.

This is our call to action and reason for hope. Whenever we see students observing clouds for clues about the day’s weather or examining long-term trends of temperature, precipitation, and phenology for clues about the climate, we see students trying to make sense of their changing world. Wherever we find students investigating their drinking water, air quality, crop productivity or biodiversity issues, we know we have planted the seed for a deeper understanding of the interconnectedness of the Earth system.

What has made this incredible 20-year journey possible is the hard work and dedication of our community of sponsors, supporters, students, teachers, and friends committed to GLOBE’s vision and mission. As the stewards of this incredibly powerful international citizen-science program, we hold the key to the next 20 years of GLOBE by sharing our passion, inspiring those around us, and creating the future we want to pass on to subsequent generations.

Sincerely,



Dr. Tony Murphy  
Director, The GLOBE Implementation Office

**Vision:** 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.

## Celebrating Twenty Years: GLOBE – 1995 to 2015

Since Earth Day 1995, The GLOBE Program has been encouraging students, teachers, and professional scientists around the world to journey outside and put their toes in the water, their hands in the soil, and their heads in the clouds. The idea was never to forego classroom or laboratory; the idea was to enhance the learning equation with hands on inquiry-based scientific investigations intentionally designed to garner insight into our local-to-global environment.

Officially launched on Earth Day 1995, GLOBE's mission has always been to promote the teaching and learning of science, enhance environmental literacy and stewardship, and promote scientific discovery. Today, the international GLOBE network has grown to include representatives from 114 participating countries coordinating GLOBE activities that are integrated into their local and regional communities.

### ***Notable Numbers\****

*114 GLOBE countries*

*21,124 GLOBE-trained teachers around the world*

*28,028 schools around the world*

*700,700 students worldwide have participated*

*126,746,293 million measurements in the GLOBE database*

\* 1995-Dec 2014

GLOBE is sponsored by the U.S. National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF), with support from the National Oceanic and Atmospheric Administration (NOAA) and Department of State. The University Corporation for Atmospheric Research (UCAR) has hosted the GLOBE Program as one of the UCAR Community Programs (UCP) since 2003.

The GLOBE Implementation Office (GIO) works in close collaboration with NASA, and the GLOBE Working Groups (WGs) to provide robust support for the common elements of education, evaluation, science, technology, and ongoing operational tasks. The GIO serves the worldwide GLOBE community by providing community training and technical support services, undertaking activities to encourage community engagement and growth, coordinating and facilitating projects and meetings, and generating high-quality education and science materials and resources. After twenty years, The GLOBE Program remains committed to its core science and education concepts:

- **Connecting Students to High Caliber Scientific Research** – GLOBE's scientific protocols are developed by scientists, tested by teachers, and executed by students. Students, in turn, produce meaningful, standardized "science-grade" data that can be used in support of student scientific research.
- **Connecting Teachers with Inquiry-Based Instruction** – GLOBE partners provide teacher training and professional development both in-person and online. The hands-on projects can be integrated into curricular areas such as sciences, language arts and geography and across grade levels. In addition, using GLOBE activities students progress from observations and questions to their own research projects and address the requirements of national and international science standards.

- **Connecting Students Globally through Science** – GLOBE students collaborate with community members from around the world in order to contribute to the global study around our common bond: Earth. GLOBE gets students involved in scientific discovery at an early age and allows them to experience the scientific processes and contribute to environmental research.

GLOBE continues to provide high quality, and regularly updated, educational materials to enrich the learning experience of participating students. These materials include a wide variety of classroom and field activities that help students place their measurements in a broader context and relate their own local observations to global environmental issues. Using state-of-the-art technology, GLOBE creates a forum for students to communicate with their peers around the world, thus, fostering alliances among students and increasing not only their environmental understanding but also their awareness of other cultures, and their sense of global responsibility.

## GLOBE's Earth Day 2015 Celebrations Occur Around the World

This year, the international GLOBE community celebrates twenty years of involvement, inspiration, and interaction among students, teachers, and professional scientists.

### The GLOBE Implementation Office

The GLOBE Implementation Office (GIO, located in Boulder, Colorado, USA) hosted several events and activities designed to highlight the dedicated work of the entire GLOBE community, and unveiled new facets and features of the Program, including:

- **Data Entry Challenge** – During the week of Earth Day, the GIO held a Data Entry Challenge, inviting schools to enter current, and past, data. The GIO gave special recognition to the schools contributing the greatest number of measurements in their region, per GLOBE investigation area or Earth sphere, over the week.
- **Data Entry Recognition** – During the week of Earth Day, the GIO gave special recognition to the schools that have reported the greatest number of measurements in their region, per GLOBE investigation area or Earth sphere, over the past 20 years.
- **New Mobile Data Entry App** – As part of the Earth Day celebrations, a new mobile data entry app was released that allows users to perform data-entry on a large number of GLOBE science protocols directly from any iOS or Android device.
- **Google+ Hangout: Global Environmental Education** – On Earth Day, the GIO hosted an online conversation with GLOBE community members around the world.
- **Website Refresh** – As part of the Earth Day celebrations, and based on feedback, GLOBE launched a new and improved GLOBE website that includes a simplified navigation structure and expanded features.
- **Updated Teacher's Guide** – As part of the Earth Day celebrations, an updated edition of the GLOBE Teacher's Guide, which is now an online collection of background information, protocols (data-collection procedures), and learning activities organized by Earth spheres (atmosphere, biosphere, hydrosphere, and pedosphere (Soil)) was released on the website.



Country	Regional Event	2015
	<b>Africa</b>	
Tanzania	Kilimanjaro Xpedition	23 Sept - 2 Oct
	<b>Asia and Pacific</b>	
Sri Lanka	World Water Day	22 March
India	Activities in Delhi, Udaipur, Goa	22 April
Thailand	Mosquito Activities Event	22 April
Nepal	Water Biodiversity Expedition	9 January
	<b>Europe and Eurasia</b>	
Netherlands	Royal Meteorological Institute Celebrates 20 Years of GLOBE	22 April
Czech Republic	GLOBE Games	28 - 31 May
Estonia	Regional Learning Expedition with Nordic, Baltic, and Ukraine participants	4 - 7 August
Israel	Salute to GLOBE Schools and 20 Years of GLOBE	10 June
Germany	Earth Day Student Conferences in Hamburg and Koln	22 April
	A film and video competition - Best of GLOBE Germany	November
Italy	Celebration of GLOBE at Expo 2015 in Udine	22 April
Croatia	GLOBE Games	11 - 13 May
	National Teachers Conference - Evaluation of The GLOBE Program	October
	Simre Budinica Primary School Green Clean Up of Forest Park Musapstan	22 April
Macedonia	Dimitar Miladinov School Celebrates Earth Day	22 April

## GLOBE Community Celebrations

Numerous celebrations commemorating The GLOBE Program's 20th Anniversary are taking place around the world throughout the year. Many, but not all, of them are outlined in the tables.



Europe and Eurasia - GLOBE Games - Czech Republic



Africa - Planting Trees on Earth Day - Cameroon



Asia and Pacific - Art for Earth Day - India



**North America - Adopt-A-Highway - USA**

Country	Regional Event	2015
<b>Latin America and Caribbean</b>		
Argentina	Annual Training Workshop	22 - 23 April
Costa Rica	Gregoria Jose Ramirez Castro High - Environmental Fair in Alajuela	22 April
	Liceo Mercedes - Recycling Fair	22 April
Uruguay	4th GLOBE Training Workshop in Tala, Canelones, Uruguay	22 April
<b>Near East and North Africa</b>		
Oman	GLOBE Camp	17 - 19 March
Lebanon	Teacher Training	18 April
	Environthon for Schools	29 April
United Arab Emirates	Aisha bint Abdullah Model School Celebrates Earth Day	22 April
Saudi Arabia	GLOBE training workshops and field study	15 - 19 February
	Earth Day and 20th Anniversary Celebrations	22 April
	Earth Day in Taif - field studies at Damascus Rose plantation	22 April
Jordan	Earth Day Celebration at the Dead Sea with ceremony and hydrology protocols	25 April
<b>North America</b>		
USA	Earth Day festivities at Union Station in Washington DC	22 April
	Hawkins School, Texas, Adopt-a-Highway CleanUp	22 April
	Wayne County Michigan Green Schools Celebration	6 May
Canada	Altado School and Connect Charter School in Calgary	22 April



**Near East and North Africa -  
International Environmental Camp - Oman**



**Latin America and Caribbean - GLOBE Training - Chile**

The 20th anniversary celebrations end on Earth Day 2016. Additional events added to this table can be found on the GLOBE website ([www.globe.gov](http://www.globe.gov)).

## GLOBE at a Glance

Thanks to the continuing efforts of the GLOBE community, there's always more activity throughout the Program than meets the eye. The table below shines a light on some of the critical results of the community's ongoing efforts – the invaluable number of schools joining the Program, as well as the number of measurements entered into the GLOBE database during 2014.

Region	Countries	Cumulative* Schools	Schools Joining in 2014	Cumulative* Measurements	Measurements Entered in 2014
Africa	22	745	54	945,110	3,619
Asia and Pacific**	17	2,808	126	1,299,741	356,066
Europe and Eurasia	41	4,112	163	42,057,853	4,282,989
Latin America and Caribbean	19	797	21	966,170	48,825
Near East and North Africa	13	474	14	578,817	14,216
North America	2	19,092	386	80,898,602	2,735,388
<b>TOTAL</b>	<b>114</b>	<b>28,028</b>	<b>764</b>	<b>126,746,293</b>	<b>7,441,103</b>

\* Since the beginning of the Program in 1995

\*\* Including Taiwan Partnership



## The GLOBE Program's Working Groups and the U.S. Partner Forum

### The GLOBE Program's Working Groups

In April 2014, The GLOBE Program began the process of forming four Working Groups (WGs) in the areas of education, evaluation, science and technology. The goal of these WGs is to help shape an inclusive and productive future for the Program, support the development and implementation of GLOBE worldwide, and provide an open forum for community feedback and discussion of programmatic priorities with NASA, co sponsors, and supporters.

Each WG is composed of eight members from the GLOBE community with relevant expertise who serve on a rotating basis. And, with equal representation in mind, a focused effort has been made to ensure that members of all of the six GLOBE regions (Africa, Asia and Pacific, Europe and Eurasia, Latin American and Caribbean, Near East and North Africa, and North America) are included in the groups to the fullest extent possible.

The inaugural face-to-face meeting of the WGs was held on 2 August 2014 (in connection with the GLOBE Learning Expedition in August 2014 in New Delhi, India). Apart from one in-person meeting annually, the groups meet electronically on an ongoing basis throughout the year. Since their inaugural meeting, the WGs focused on various topics including:

- Education WG: virtual science fair rubrics; new protocols; video festival
- Evaluation WG: current evaluation tools; creation of teacher questionnaire
- Science WG: new protocols; field campaigns; data retrieval
- Technology WG: redesign of website; app development; priority setting of technological enhancements

### The U.S. Partner Forum

The GLOBE U.S. Partner Forum was also established in 2014. The purpose of the Forum is to facilitate discussion of ways to enhance the contribution of GLOBE to the improvement of science, technology, engineering, and mathematics (STEM) education in the U.S. locally, regionally, and nationally.

With the goal of encouraging collaboration and mutual support, the U.S. was divided into six geographic areas. At least one GLOBE partner was selected from each of these areas to serve on the Forum. The Forum held its inaugural face-to-face meeting in Washington D.C. in October 2014. As with the WGs, GIO staff work to support the effective functioning of the Forum and to facilitate regular meetings. Since its inaugural meeting, the Forum members focused on diverse topics such as:

- offering guidance on new Program messaging with WestEd, an educational research and development organization and U.S. GLOBE partner, and its partnering communications firm, +gmmb;
- providing leadership on a science fair proposal to the NSF; and
- contributing to regular telecom meetings (called 'watercoolers') regarding Program implementation.

## The GLOBE Program Highlights: 2014-2015

There were a large number of “highlights” in 2014 – as well as during the first few months of the Program’s twentieth year, 2015; in fact, more than can be presented in this Annual Review. Consequently, this review contains a select number of stories and events. However, every story or event that moved the Program forward in the hearts and minds of GLOBE community partners, sponsors, students, teachers, and professional and citizen scientists is a highlight that GLOBE values and honors.

### Enduring Collaborations: Earth Observing Satellites

Observing, examining, and monitoring Earth’s ever-changing environment is one of the primary activities of The GLOBE Program. Students from all over the world have been involved in hands on data collection since the Program began on Earth Day 1995.



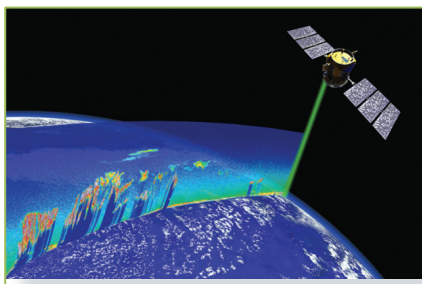
In order to increase the connections with Earth Science scientists, a closer collaboration was forged with NASA. The symbiotic relationship is based on the collection and analysis of data—GLOBE students collect data in the field, while NASA scientists use satellites to collect them. The data are combined to validate and calibrate satellite instruments. This collaboration provides an especially exciting and unique citizen-science opportunity for students to engage in research campaigns related to four NASA Earth observing satellites: CloudSat, CALIPSO, Global Precipitation Measurement (GPM), and the Soil Moisture Active Passive (SMAP).

#### In 2014-2015, GLOBE maintained collaboration with two NASA Earth observing satellites:

**CloudSat** – Launched in 2006, this mission focuses on gathering data on how clouds influence Earth’s weather and climate. CloudSat uses cloud-penetrating radar to allow even small cloud droplets to be detected (with data showing that it rains three times more often than previously observed by satellites). The CloudSat/GLOBE collaboration

allows students and teachers to help calibrate the instruments aboard the satellite by collecting and entering data through cloud observations.

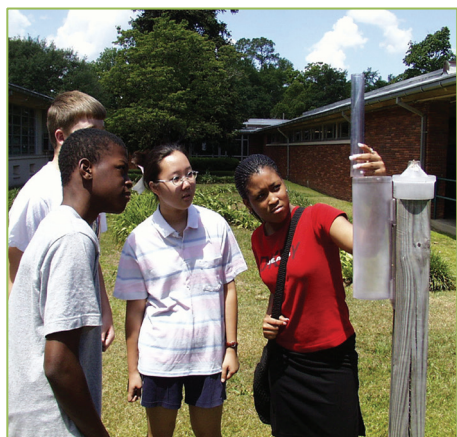
A CloudSat/GLOBE online training for Thailand teachers and students was organized in February 2014 by the CloudSat team. The focus was to cover some background science on clouds, remote sensing and CloudSat, demonstrate the CloudSat protocol and interact virtually with the teachers and students on their project work. GLOBE atmosphere protocols were also covered during the workshop. Eighty teachers and 10 students from over 40 schools received the training. Data reporting has increased since the training.



**CALIPSO** – (Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observations) Launched in 2006, this is a joint NASA and CNES (Centre National d’Etudes Spatiales, French space agency) mission focused on helping scientists better understand Earth’s weather, climate, and air quality. The CALIPSO/GLOBE

collaboration also focuses on studying clouds, but adds an aerosol-observation component. This component allows students to learn about the interconnections between weather, climate, and air quality. GLOBE students can provide valuable aerosol, cloud, and contrail data to assist CALIPSO mission scientists.

In 2015, the CALIPSO staff collaborated with GLOBE Partner UCAR Center for Science Education to create an Elementary GLOBE book about aerosols, “What’s Up in the Atmosphere? Exploring Colors in the Sky.” This book supports NASA’s mission to educate children about Earth sciences and will become a part of the Elementary GLOBE materials designed to introduce K-4 students to the study of Earth System Science.



### **In 2014-2015, GLOBE established collaborations with two new NASA Earth observing satellites:**

**Global Precipitation Measurement (GPM)** – Launched in February 2014, it uses a number of satellites to study rain, snow, and other precipitation data (collecting worldwide data every 3 hours). GPM is a joint NASA and JAXA (Japan Aerospace Exploration Agency) mission building on the legacy of the TRMM mission (Tropical Rainfall Measuring Mission), with improved instruments and spatial coverage that includes higher latitudes – allowing scientists to “see” the cloud-to-ground structure of storms.

This GPM/GLOBE collaboration provides an opportunity for GLOBE students to participate in ground validation for the GPM satellite, investigating the question, “How do ground-based observations compare to satellite rainfall estimates?” Students are able to compare their data with that of participating schools around the world, networks of “official” rain gauges, as well as to long-term climatological data, and determine any patterns and/or anomalies.

From February through mid-April 2015, a Student Precipitation Field Campaign occurred, during which time, GLOBE students and teachers from around the world collected precipitation data. GPM scientists wrote GLOBE blogs that explained GPM satellite data visualization resources, landslides, rain gauges, and the importance of collecting data in remote regions; they also provided real world examples of how the campaign data will be used by NASA scientists.

- **Field Campaign Metrics:** During February, data reports were received from 134 different sites. From 1 February through 15 February, there were 662 data entries from the United States and 20 countries.
- **Webinars:** More than 124 attendees from 26 states and numerous countries, including Croatia, Poland, Taiwan, the United Kingdom, the Czech Republic, Puerto Rico, and the Dominican Republic participated in the GPM webinar series.
- **Blog Posts:** As of 6 March, ten posts by scientists/educators were aggregated on the GPM blog page, and have now been viewed 2,917 times.





**Soil Moisture Active Passive (SMAP)** – Launched in January 2015, the satellite is on a 3-year mission to take measurements of soil moisture and the freeze/thaw state of soil. SMAP’s instruments are producing the highest-resolution, most accurate soil moisture maps ever obtained from space. SMAP observations will aid in the accuracy of models used in weather prediction and climate projections, flood assessment and drought monitoring, and in identifying unknown values in global carbon calculations.

As part of the SMAP/GLOBE collaboration, SMAP scientists are using data collected by GLOBE students to help validate the satellite moisture measurements and monitor their accuracy. GLOBE students,

having determined when the satellite is overhead by entering GPS coordinates and finding the flyover time, can take their own soil moisture measurements simultaneously on the ground – providing valuable gravimetric and volumetric data to assist SMAP scientists.

The GIO staff worked with NASA’s SMAP science and education team to modify one of the soil protocols (Gravimetric Soil Moisture) used with this mission – making soil moisture data collection a significant part of the SMAP/GLOBE relationship.

As of 15 June 2015, over 210 volumetric soil moisture measurements have been collected and submitted by 21 schools (representing five regions). SMAP has already produced a global map of soil moisture from its radiometer instrument. A composite image of SMAP radiometer data for 22 April 2015 shows the volumetric water content in the top 5 centimeters of soil: blue areas represent wetter areas, yellow represent drier areas and white represent snow, ice or frozen ground.

## Making the Data Count!

Data collection and analysis are at the core of The GLOBE Program. When measurements are not entered, students, and scientists, are deprived of investigating their questions and completing research. It is incumbent on every GLOBE member to ensure that the scientific and environmental measurements that help GLOBE fulfill its mission to promote the teaching and learning of science, enhance environmental literacy and stewardship, and promote scientific discovery are contributed to the global database.

With this in mind, and in celebration of Earth Day 2015 and GLOBE’s 20th Anniversary, The GLOBE Program focused attention on this critical element of the Program – data (collection and entry) – by highlighting schools that have submitted the greatest number of measurements in their region over the years and schools that participated in the week-long Data Entry Challenge (held over the course of the week of Earth Day, 20-24 April).

The GIO recognizes every student and every school that has participated in making the data count over the last twenty years – and will continue to recognize these efforts as the Program moves forward. These extraordinary efforts are invaluable in helping GLOBE further promote the teaching and learning of science and scientific discovery.

## GLOBE Salutes Schools Submitting the Most Data Over the Past 20 Years

GLOBE began as a pioneering effort to create a record of the evolving condition of Earth's environment through measurements taken by students. The GIO recognizes the following schools for having reported the greatest number of measurements in their region per GLOBE investigation area or Earth sphere.

Schools with the Greatest Contribution of Measurements 1995 - 2015			
AFRICA		LATIN AMERICA AND THE CARIBBEAN	
<b>ATMOSPHERE</b>		<b>ATMOSPHERE</b>	
CEG1 Lokossa	Benin	Escuela Rural de Niebla	Chile
GBHS Ndop	Cameroon	Esc. Sec. Dna. Núm. 315 "José Vasconcelos"	Mexico
Lycee Behanzin	Benin	Escuela Primaria Particular Incorp. N°1345 Nuestra Sra. del Carmen	Argentina
<b>BIOSPHERE</b>		<b>BIOSPHERE</b>	
Kintampo Secondary School	Ghana	Fundación Escuelas San Juan	Argentina
King's College Budo	Uganda	Escuela Primaria Particular Incorp. N°1345 Nuestra Sra. del Carmen	Argentina
Lycee Miandrivazo	Madagascar	CEI San Ignacio - Fundación Cruzada Patagónica, Argentina	Argentina
<b>HYDROSPHERE</b>		<b>HYDROSPHERE</b>	
Kintampo Secondary School	Ghana	Colegio de Estudios Científicos y Tecnológicos, Plantel Ecatepec	Mexico
University Practice Secondary School	Ghana	Universidad Tecnológica de Nezahualcoyotl	Mexico
Lycee Jean Laborde	Madagascar	CEI San Ignacio - Fundación Cruzada Patagónica, Argentina	Argentina
<b>PEDOSPHERE</b>		<b>PEDOSPHERE</b>	
Kintampo Secondary School	Ghana	Colegio de Bachilleres Plantel 3, Francisco I. Madero	Mexico
CEG1 Savalou	Benin	Colegio Internacional	Paraguay
CEG1 Natitingou	Benin	Escuela Preparatoria Oficial de Irapuato	Mexico
<b>ASIA AND THE PACIFIC</b>		<b>NEAR EAST AND NORTH AFRICA</b>	
<b>ATMOSPHERE</b>		<b>ATMOSPHERE</b>	
Banyangsong	Thailand	The 25th Secondary Girls School at Al-Madinah Al-Monawarah	Saudi Arabia
Ecopolis Center Junior Eco Club	Japan	Yamama Secondary School at Riyadh	Saudi Arabia
Kizu Town Recyrcing Education Station	Japan	King Saud Educational Complex at Riyadh	Saudi Arabia
<b>BIOSPHERE</b>		<b>BIOSPHERE</b>	
Osaka Higashiumiyoshi Technical High School	Japan	American Community School	Lebanon
Cavite National Science High School	Philippines	Irbid Pioneer Centre	Jordan
Nanzan Girls' Junior High School	Japan	Orientation and Education	Lebanon
<b>HYDROSPHERE</b>		<b>HYDROSPHERE</b>	
Suanmon School	Thailand	The 25th Secondary Girls School at Al-Madinah Al-Monawarah	Saudi Arabia
Uwajima Fisheries High School	Japan	Al-Hayathem Intermediate and Secondary Girls School at Al-Kharj	Saudi Arabia
Banyangsong	Thailand	Hittin Intermediate School at Najran	Saudi Arabia
<b>PEDOSPHERE</b>		<b>PEDOSPHERE</b>	
Banyangsong	Thailand	Hamzah Bin Abdulmutalib Secondary School at Jeddah	Saudi Arabia
St. George Girls' High School	Australia	Al-Farouq Intermediate School at Jeddah	Saudi Arabia
Public Hikijidai Junior High School	Japan	Al-Fath Secondary School at Abha	Saudi Arabia
<b>EUROPE AND EURASIA</b>		<b>NORTH AMERICA</b>	
<b>ATMOSPHERE</b>		<b>ATMOSPHERE</b>	
Mittelschule Elsterberg	Germany	Norfolk Elementary School	United States
Offene Schule Babenhausen	Germany	Waynesboro Senior High School	United States
Ratsgymnasium Wolfsburg	Germany	Hartland Consolidated School	United States
<b>BIOSPHERE</b>		<b>BIOSPHERE</b>	
OS Bedekovcina	Croatia	Mat-Su Career And Technical High School	United States
Akmenes gimnazija	Lithuania	Wasilla High School	United States
Sekundarschule Uzwil	Switzerland	Barnette Elementary School	United States
<b>HYDROSPHERE</b>		<b>HYDROSPHERE</b>	
Vang barne- og ungdomsskule (6-16)	Norway	Tabor Academy	United States
Offene Schule Babenhausen	Germany	Waynesboro Senior High School	United States
Pasvalio Levens pagrindine mokykla	Lithuania	Wanaka Field Station	United States
<b>PEDOSPHERE</b>		<b>PEDOSPHERE</b>	
Mittelschule Elsterberg	Germany	Norfolk Elementary School	United States
3rd Lyceum of Aigaleo	Greece	GLOBE One Automated Weather Stations	United States
XI Liceum St. Konarskiego in Wrocław	Poland	Wanaka Field Station	United States

## GLOBE Salutes Schools Submitting the Most Data for the Data Entry Challenge

Data never goes out of date! In 2015, the GIO asked students to enter any and all data that had not yet been entered into the GLOBE database. In order to focus attention on this data-entry effort, a week-long Data Entry Challenge was held as part of the Program's Earth Day celebrations.

Students from more than 240 schools answered this call to not just count the data, but to make the data count. During the Data Entry Challenge, more than 160,000 measurements were added to the GLOBE database. The measurements included both those collected during the week, and those from years past that were not previously entered into the database.

The GIO recognizes the following schools for contributing the greatest number of measurements in their region per GLOBE investigation area or Earth sphere.

Schools with the Greatest Contribution of Measurements During the Earth Week Challenge April 20-24 2015	
<b>AFRICA</b>	
<b>ATMOSPHERE</b>	
Hibernia Primary School	South Africa
Conville Primary School	South Africa
Heidedal Primary School	South Africa
<b>ASIA AND THE PACIFIC</b>	
<b>ATMOSPHERE</b>	
Kaohsiung Girls Senior High school	Partnership
Kwangju Science High School	South Korea
Feng-Shan senior high school	Partnership
<b>PEDOSPHERE</b>	
Feng-Shan senior high school	Partnership
PEACE Schools Network	Japan
<b>EUROPE AND EURASIA</b>	
<b>ATMOSPHERE</b>	
Janka Leskovara	Croatia
OS prof. Franje Viktora Signjara	Croatia
IES Cañada Real	Spain
<b>BIOSPHERE</b>	
OS kraljice Jelene	Croatia
OS Valentin Klarin	Croatia
XV. Gimnazija	Croatia
<b>HYDROSPHERE</b>	
Complex of Secondary Schools no 1 Jana Pawla II in Przysucha	Poland
ZS Trebic	Czech Republic
OS Hugo Badalic	Croatia
<b>PEDOSPHERE</b>	
ZS Trebic	Czech Republic
Ekonomsko-birotehnicka i trgovacka skola	Croatia
III. osnovna skola Varazdin	Croatia
<b>LATIN AMERICA AND THE CARIBBEAN</b>	
<b>ATMOSPHERE</b>	
Brazil High	Tobago
Facultad de Estudios Superiores Cuautitlan	Mexico
Liceo de Alta Exigencia Paulo Freire Quellón	Chile
<b>HYDROSPHERE</b>	
Colegio de Estudios Científicos y Tecnológicos, Plantel Ecatepec	Mexico
Universidad Tecnológica de Nezahualcoyotl	Mexico
CEI San Ignacio - Fundación Cruzada Patagónica, Argentina	Argentina
<b>PEDOSPHERE</b>	
Brazil High	Tobago
<b>NEAR EAST AND NORTH AFRICA</b>	
<b>ATMOSPHERE</b>	
Al-Hayathem Intermediate and Secondary Girls School at Al-Kharj	Saudi Arabia
Yamama Secondary School at Riyadh	Saudi Arabia
Makkah Al-Mukarramah Secondary School at Makkah Al-Mukarramah	Saudi Arabia
<b>HYDROSPHERE</b>	
The 61st Secondary Girls School at Jeddah	Saudi Arabia
Al-Hayathem Intermediate and Secondary Girls School at Al-Kharj	Saudi Arabia
The 9th Secondary Girls School at Al-Karj	Saudi Arabia
<b>PEDOSPHERE</b>	
Al Muabila Al-shamaliah Girls school	Oman
Makkah Al-Mukarramah Secondary School at Makkah Al-Mukarramah	Saudi Arabia
Muhammed bin Masood AlBusaidi	Oman
<b>NORTH AMERICA</b>	
<b>ATMOSPHERE</b>	
Lourdes Public Charter School	United States
McKnight Middle School	United States
Trinity School	United States
<b>BIOSPHERE</b>	
Alexander Dawson School	United States
Hawkins Middle School	United States
Crestwood High School	United States
<b>HYDROSPHERE</b>	
Mt Vernon Middle School	United States
Waynesboro Senior High School	United States
Sound to Sea - Trinity Center	United States
<b>PEDOSPHERE</b>	
Hawkins Middle School	United States
Ramey School	United States
Lourdes Public Charter School	United States



## Community-based Campaigns: The 2014 Surface Temperature Field Campaign

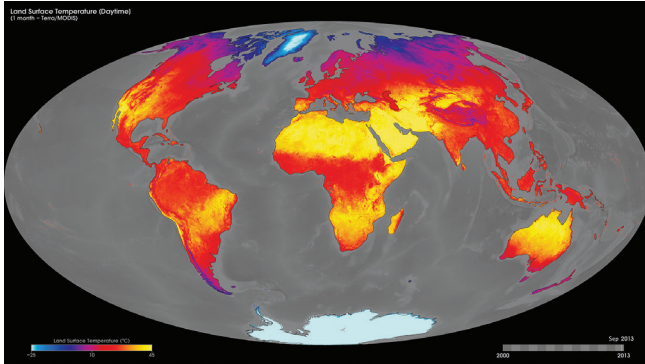


Image from video of monthly daytime land-surface temperature from MODIS, Feb. 2000 – present. NASA Science Mission Directorate Hyperwall Presentation

GLOBE field campaigns are regional and worldwide projects that provide students with hands-on opportunities to collect data with GLOBE protocols and explore and learn about their environment with the assistance and support of a network of fellow students, teachers, and scientists. Recent examples of campaigns include the measurement of aerosols in Europe and Eurasia, and the observation of budburst of cherry trees in Ukraine.

A wonderful and ongoing example is the Surface Temperature Field Campaign, organized by GLOBE Partner Dr. Kevin Czajkowski (Director of the Geographic Information Science and Applied Geographics Lab at the University of Toledo (Ohio, USA). During the month of December, Dr. Czajkowski encourages students to go outside and gather the data necessary to answer the question “How does surface cover affect surface temperature?” With the significant changes that have occurred in the polar regions, this campaign serves as an effective way for students to learn about the impacts of snow on Earth’s temperature.

For the 2014 campaign, Dr. Kevin Czajkowski updated the community on the progress of the students in entering data through a regular blog. At the end of the campaign, he noted that 28 schools from around the world had entered data – for a total of 782 observations.

## The GLOBE International Scientists Network Doubles in Size

The GLOBE International Scientists Network (GISN) has nearly doubled its membership in the past year, making it an even more valuable resource to the GLOBE community! The GISN is an international network of scientists who work with GLOBE students around the world. Scientists join the GISN to connect with the GLOBE community, through activities such as visiting a GLOBE school, judging student research at virtual science fairs, learning new ways to conduct outreach, proposing field campaigns, and conducting scientific investigations with GLOBE data. GLOBE students and teachers can connect with these scientists to aid in their use and analysis of GLOBE data and visualizations.

Originally launched in 2007, the GISN (as of June 2015) has 226 members representing all six GLOBE regions and disciplines. In 2014-2015, the GIO staff also conducted a series of GISN webinars to showcase stories of GISN scientists, and to provide pathways for new GISN members. The webinars included both

GIO staff and GISN members covering topics such as “How to Use GLOBE Earth System Science Data in Your Research and Teaching.” In this webinar, four GLOBE partners discussed how to use GLOBE data and visualization in research and as a teaching tool for undergraduate science classes:

- Dr. Mullica Jaroensutasinee and Dr. Krisanadej Jaroensutasinee (GLOBE Thailand) presented their mosquito protocol, research, and educational activities with students;
- Bárá Semerákóva (GLOBE Europe and Eurasia) discussed the GLOBE Europe Aerosols Campaign;
- Dr. Todd Ellis (NASA CloudSat Satellite Mission) discussed how he uses GLOBE as a tool for inquiry in undergraduate classes; and
- Travis Andersen (GIO) discussed GLOBE data quality.

## **The GLOBE Teacher’s Guide: Updated and Improved**

In 2015, The GLOBE Program successfully launched an updated edition of the Teacher’s Guide. Originally developed in 1995, the Teacher’s Guide has always been a core component of the Program – containing all of the information necessary for teachers to successfully implement GLOBE activities in their schools.

Over the last 20 years, four major editions of the Teacher’s Guide have been published. In 2011-2012, the National Science Foundation (NSF) convened a panel of experts to review the Teacher’s Guide – investigation area by investigation area – and concluded that although the science content of the protocols was relevant some minor updates were necessary.

The latest edition of the GLOBE Teacher’s Guide is an online collection of background information, protocols (data-collection procedures), and learning activities organized by Earth spheres: atmosphere, biosphere, hydrosphere, and soil (pedosphere).

The GIO staff worked with expert authors and editors, and NASA Langley Research Center staff in tandem to revise the guide. The revisions included:

- reducing the number of pages in pdf documents for quicker downloads;
- standardizing fonts;
- creating glossaries;
- generating key words for searching content;
- meta-tagging of the text, allowing readers to locate linked resources in the text more quickly;
- a more logical presentation of materials;
- updating protocols and other text; and
- adding new visualization images throughout the guide.

The GLOBE Program is pleased to offer this updated and enhanced edition of the Teacher’s Guide to the GLOBE community. This edition of the Teacher’s Guide can now even more effectively serve as a core component of the GLOBE journey into inquiry-based science and education.

## GLOBE Establishes Distinguished Educator Fellowship

As part of its goal to continue offering high quality, innovative, and relevant learning activities to the community, the GIO established the GLOBE Distinguished Educator Fellowship in 2014. Under this new fellowship, the GIO provides two educators (one international and one from the U.S.) with the opportunity to create these activities while receiving a small stipend for their work. The appointments last for one year.

The winners of the first GLOBE Distinguished Educator Fellowship were John Moore (U.S.) and Dr. Umarporn Charusombat (Thailand). The first Fellowship recipients began crafting their unique activities in May 2015.



**John Moore** is developing a “Space to Earth: Earth to Space” (SEES) model using GLOBE atmosphere protocols and geostationary satellite data, including data from GOES-R. He is developing a way for students to investigate and document hazardous and severe weather in their region and then share data, local media, and personal accounts of weather issues. Additionally, he is creating a reference library of GLOBE protocols and activities, as well as data apps, and other useful resources for educators and students.

**Umarporn Charusombat** is creating a series of activities on climate change including activities related to climate change basics, climate change and agriculture, climate change and human health, natural disasters and land use, and carbon measurement, emissions, and stock calculations. Activities will include GLOBE student data from all four spheres and from GLOBE collaborating Earth observing satellites, GPM and SMAP, as well as NASA satellites MODIS, AVHRR, AQUARIUS, GHRST, OCO-2, and LANDSAT.

These new materials will compliment, and be a wonderful additional to, existing GLOBE learning activities. Future applicants can locate information for the fellowship on the GLOBE website ([www.globe.gov](http://www.globe.gov))



## 2015 Calendar Student Art Competition

### GLOBE Students Rise to the Artistic Challenge

While GLOBE is primarily founded on the collection, entry and analysis of data, the Program realizes that there are many ways that students become inspired and maintain an interest in science and the environment. These include reading, journaling and art. Now in its third year, the GLOBE Student Art Calendar Competition is a wonderful example of students illustrating science concepts.

From September through October 2014, GLOBE hosted the Third Annual Student Art Calendar Competition. Winning entries were published in the 2015 GLOBE Calendar.

For the competition, GLOBE students were encouraged to create - and share - original art based on the theme: "See Globally, Act Locally: How GLOBE Connects to Earth Observing Satellites." Students were invited to express, through their unique artwork, how satellites help them better monitor their local environment or community, how satellites help support GLOBE investigations, or how satellite missions contribute to their school or community.

GLOBE students from around the world heard the call – with 332 students from all six GLOBE regions submitting their vibrantly visual artwork for the competition. All entries were shared on GLOBE's social media networks, including Facebook, Instagram, Twitter, and Pinterest.

Africa		Latin America and Caribbean	
Nigeria	1	Dominican Republic	19
Kenya	5	<i>Total</i>	19
<i>Total</i>	6		
Asia and Pacific		Near East and North Africa	
India	11	Jordan	1
Thailand	6	Oman	77
<i>Total</i>	17	Saudi Arabia	84
		<i>Total</i>	162
Europe and Eurasia			
Czech Republic	6	North America	
Israel	7	Ohio	1
Jerusalem	33	West Virginia	63
Latvia	10	<i>Total</i>	64
Netherlands	2		
Poland	4		
Switzerland	1		
Turkey	1		
<i>Total</i>	64	<b>Total</b>	<b>332</b>

Student Entries to the 2014 Calendar Art Competition



### STUDENT ART COMPETITION 2015 CALENDAR










[www.globe.gov](http://www.globe.gov)

Sponsored by:




Supported by:




Implemented by:

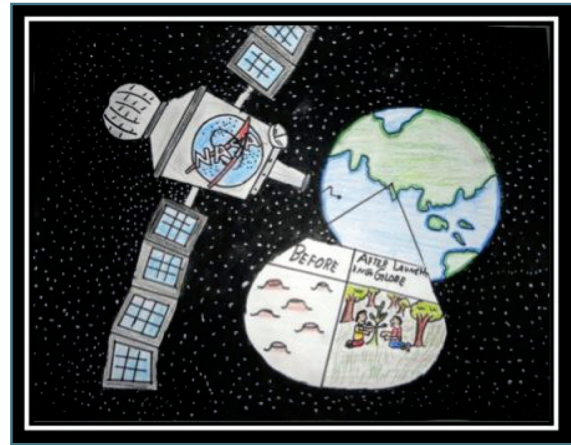




## Calendar Competition 1st Place Winners in the Regions



Africa



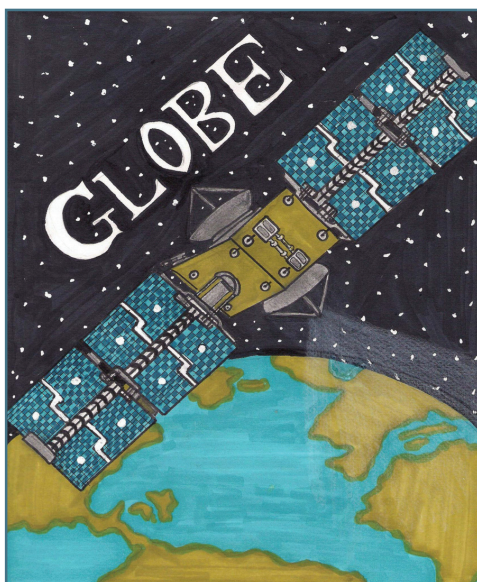
Asia and Pacific



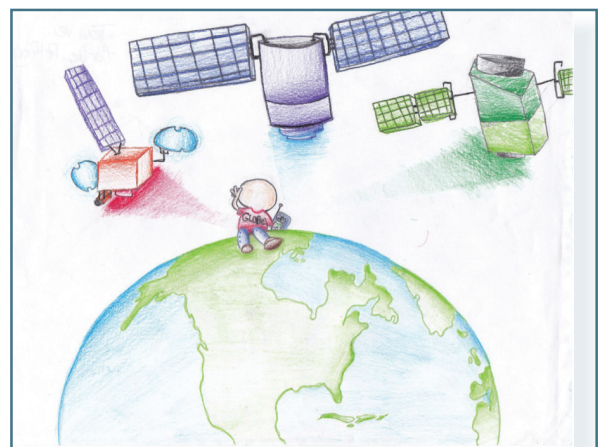
Europe and Eurasia



Latin America and Caribbean



Near East and North Africa



North America

## The GLOBE Program's Annual Survey – A Snapshot of the 2014 Survey Responses

The 2014 GLOBE Program Annual Survey was distributed to GLOBE Partners in order to gather valuable information to help GIO and Program sponsors regarding the current state of the Program and the community, how we are meeting our strategic goals as a community, and how to move the Program forward.

The following is presented as a “snapshot” of the 2014 responses to the survey.

- What type of organizations are GLOBE partners affiliated with?  
Approximately one-third of the respondents categorized their partnership as higher education (university or college).
- With whom do GLOBE partners work?  
The majority of GLOBE partners work with public school organizations, with the majority of partners working with Secondary grade levels (grades 7-12).
- How do GLOBE partners prioritize and spend their time?  
Providing training, or training new teachers, ranked as the number one activity by almost half of the survey respondents, with approximately 40% of the respondents conducting in-service teacher trainings once a year. More than half of the respondents reported that they supported GLOBE trained teachers by:
  - assisting in instrumentation set-up and use;
  - providing supplemental materials (i.e. implementation tips, classroom activities, etc.); and
  - arranging or participating in site visits to schools to provide mentorship to teachers.
- Which GLOBE events did most GLOBE partners participate in last year?  
Approximately 44% of GLOBE partners participated in GLOBE regional meetings; GLOBE webinars were also popular among partners, with close to one-third of respondents participating in them last year.
- How much interaction is there among GLOBE partners?  
The majority of GLOBE partners communicate with each other on a monthly basis, primarily through e-mail. Only one-third of GLOBE partners are involved in collaborative projects with each other; however, half of the respondents reported collaboration with government agencies and/or non-governmental organizations (NGOs).
- Do GLOBE partners assess the quality of their teacher trainings?  
Approximately 75% of the survey respondents reported assessing the quality of the training workshops, with teacher feedback after workshops (75%) and customized surveys or questionnaires (55%) being the most common methods for gathering this data.
- Are scientists engaged in GLOBE student projects?  
Although only 36% of the respondents reported having student-related GLOBE projects in the local service area (or country), the majority of respondents (62%) reported scientist involvement.

## GLOBE and the National Wildlife Federation's Eco-Schools USA – A Collaboration of Local to Global Proportions

In November 2014, The GLOBE Program initiated an exciting new collaboration with the National Wildlife Federation's (NWF's) Eco Schools USA program. Eco-Schools is an internationally acclaimed program that provides a framework to help educators integrate sustainability principles throughout their schools and curriculum.



The Eco-Schools program was started in 1994 by the Foundation for Environmental Education (FEE), with support by the European Commission. In 2003, the United Nations Environment Program (UNEP) identified Eco-Schools as a model initiative for Education for Sustainable Development (ESD). Currently, there are over 59 countries around the world participating in the program; many of these are also GLOBE countries.

The goal of GLOBE's collaboration with Eco-Schools USA is to integrate school sustainability and Earth system's observations, data collection, and action in an effort to protect and conserve wildlife and wild places. (Eco-Schools uses NASA data and tools as part of the Eco-Schools USA Climate Change Connections program, including data generated by the SMAP Satellite Mission.) As of 2015, there are 443 schools in the U.S. that belong to both programs.

## The GLOBE Program and Founding Members Receive Recognition

In 2014-2015, The GLOBE Program and two of the Program's "founding" members – former Director Dr. Dixon Butler and former Chief Scientist Dr. Barrett Rock – received special recognition for their ongoing service to the GLOBE community:

### The GLOBE Program Receives Distinguished Educator Recognition Award from AMS

In January 2015, the American Meteorological Society (AMS) presented The GLOBE Program with the Distinguished Educator Recognition Award for Outstanding Contributions to Non-Formal Education. AMS recognized GLOBE for excellence and innovation in the promotion of Weather, the Ocean, Climate, the Water Cycle, and Space Weather Studies.



#### Dixon Butler Receives Distinguished Service Award

In January 2015, the AMS presented former GLOBE Director Dr. Dixon Butler with The Cleveland Abbe Award for Distinguished Service to Atmospheric Sciences. The award honored Dr. Butler's "visionary, dedicated leadership in Earth observation, science, education, and federal management of science that has had lasting impact on the development of Earth System Science."

From 1996 to 2003, Dr. Butler worked with The GLOBE Program as Chief Scientist and GLOBE Director. In this capacity, as well as in his current role as special assistant to Program sponsor (Dr. Ming-Ying Wei of NASA), Butler has served GLOBE for almost two decades.



#### Barry Rock Receives First YES Medal

In March 2015, YLACES (Youth Learning as Citizen Environmental Scientists) presented the founding Chief Scientist of The GLOBE Program, Dr. Barrett Rock, with the first Youth Environmental Science (YES) Medal. The YES Medal is presented annually in recognition of a significant contribution to youth learning as citizen environmental scientists.

At the ceremony, Dr. Rock spoke of his experiences in founding New England Forest Watch and how this prepared the way for his role in helping establish The GLOBE Program. Dr. Rock stated that in May of 1994, he read a story in the Boston Globe describing the announcement by the Clinton White House that a program was being organized that would involve students in the collection of environmental measurements. Dr. Rock contacted the White House and was invited to Washington, D.C., to present his views. Soon thereafter, he became the founding Chief Scientist of the Program.

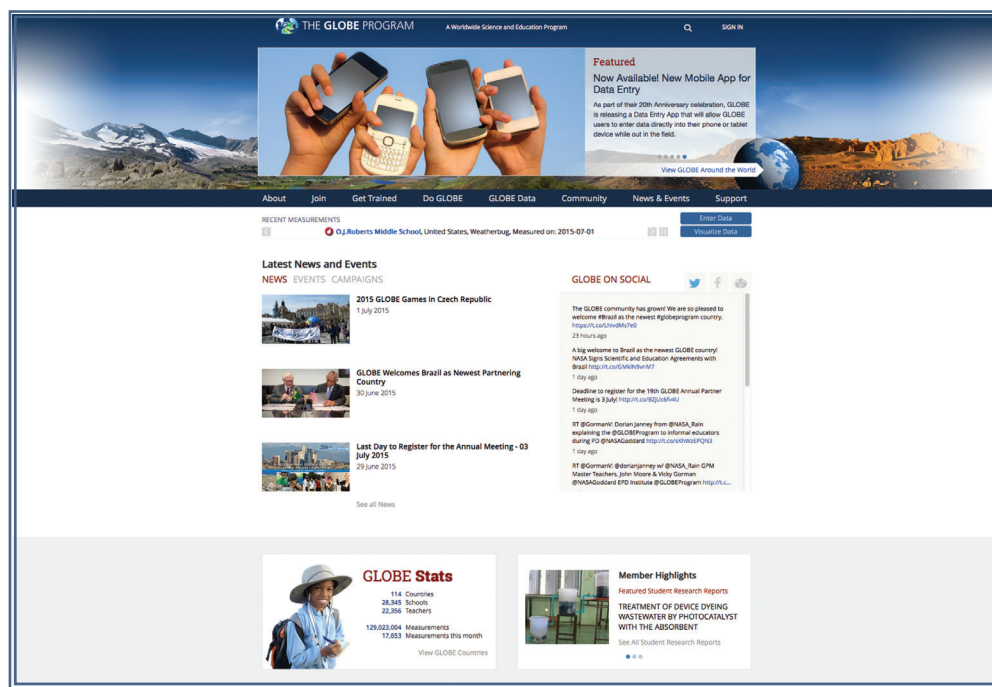
## The GLOBE Website Refresh and Technology Tune-Up

The Data and Information Systems (DIS) Team composed of NASA Goddard Space Flight Center personnel and Raytheon Web Solutions staff communicates regularly with the GIO on technology developments, website enhancements and database management. The DIS Team also interacts with the Technology WG on an ongoing basis to receive feedback and seek input on new features and priorities.

### A Revamped Website

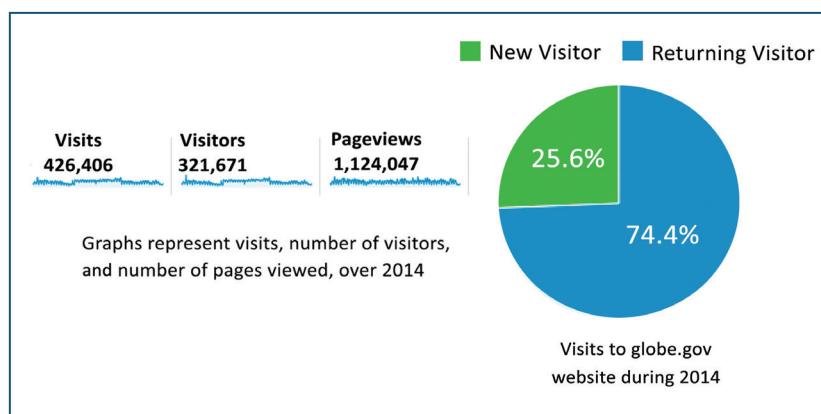
Just as the GLOBE community continues to evolve – responding to new scientific, technological, and educational needs – so does the GLOBE website. An updated and fully refreshed version of the GLOBE website was launched for Earth Day (22 April 2015). Based upon community feedback, the new site is simplified and includes a new navigation structure and expanded features. These features include:

- a recent measurements real-time ticker tape across the top of the home page;
- featured stories, as well as location-based GLOBE Around the World stories;
- live feeds of GLOBE on Twitter, Facebook, and website activity;
- image-based news, events, and campaigns featured on the home page;
- easy-to-read GLOBE Stats on the home page; and
- dynamic “Member Highlights” for student reports and user profiles on the home page.





The GIO continues to use Google analytics to monitor the elements of all Program pages in order to determine the effectiveness of the website in meeting the needs of the GLOBE community. Of these analytics, perhaps the most important have been the visitor statistics. These statistics provide information on traffic to the GLOBE website, including the types of visitors (new or returning), and their movement on the website. (The illustration below shows the numbers of visitors to the website; how long they stay and how many pages they visit.) The GLOBE community also now has access to new tools and advanced technological features – all designed to help students, teachers, and professional scientists more easily, and more effectively, accomplish the work of GLOBE.



Between the Program's annual meeting in August 2014 and Earth Day 2015, the following technological enhancements were released to the community:

A Collaboration Partner Search Tool that allows teachers to find other GLOBE members who are interested in collaborating on GLOBE projects, protocols, or other activities. This new feature can be used to help community members identify potential collaboration partners based on their country, language, school

grade level, protocol interests, GLOBE projects/campaigns, and more.

The new version of the visualization system, which includes a much improved, and much simpler interface for teachers and students to locate and visualize their data. Specific improvements include:

- Simplified Interface – with management tools for layers and filters placed in a centralized location; and a cleaner top banner/navigation process implemented with the date map always visible.
- Improved Site Information Window – with plot data for both measurements and data counts now immediately available for each measurement type and any custom plot-date range; the ability to view portions (or all) of the data in a single step; the ability to compare data for up to six sites; and a cleaner view of site and school information.

A School Status Reporting Tool that allows country coordinators and U.S. partners to view the data reporting status of schools in their country or partnership and to send out emails to teachers of a selected school. Schools can be filtered by: country, city, school name, school ID, report date ranges, protocols reported, and reporting status (currently reporting, have reported in the past, not yet reporting).

In addition to website enhancements, a GLOBE Data Entry App, which allows GLOBE users to enter measurements, and upload images, directly from any iOS or Android device was released. GLOBE users can record measurements in the field and enter them directly into the database. If an Internet connection is not available, measurements are stored and uploaded when the user is online. Since the App was released, 8.7 percent of the schools entering data have used the app, and 9.5 percent of the data entered is from the app.

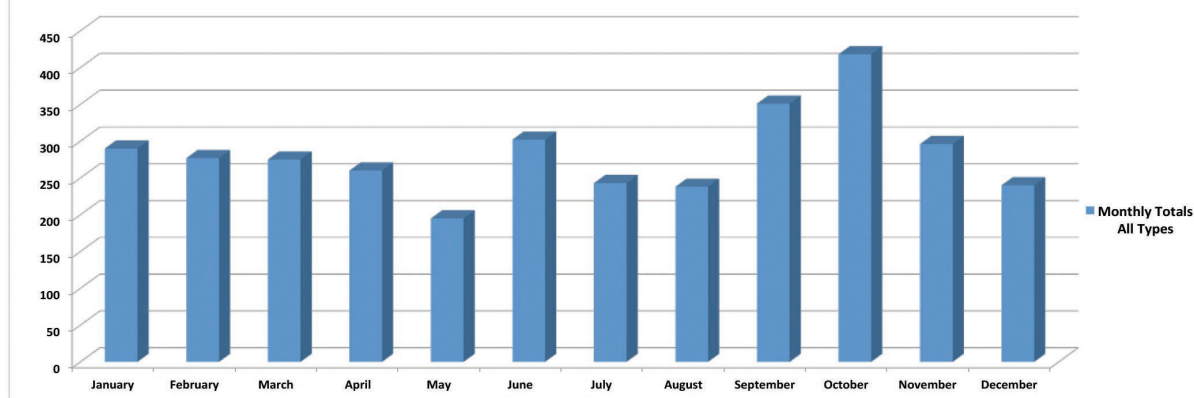
## The GLOBE Community Support Team – Serving the Community

Meeting the needs, addressing issues and concerns, and providing assistance to the GLOBE community is a primary focus of the GIO. In order to achieve that goal on a day-to-day basis, the Community Support Team (CST) continues to work toward resolving technical and programmatic issues.

Once the CST receives a request for assistance (“tickets”), the CST classifies the requests according to categories for more responsive processing. In 2014, there were a total of 3,385 tickets.

In order to respond to each ticket, the CST also works with other GIO staff to answer programmatic questions and with the Data and Information Systems (DIS) Team to resolve technical issues.

Monthly Metrics Based On Type 2014									
Month	Data Entry	Data Access	Workshop	Log In	Programmatic	Misc. Technical	Translation	New Accounts	Monthly Totals All Types
January	7	5	8	9	42	12	0	207	290
February	21	1	1	13	37	21	1	182	277
March	21	2	9	7	49	11	0	176	275
April	6	9	9	2	57	12	3	162	260
May	7	6	7	10	40	16	1	108	195
June	8	2	9	14	48	12	0	209	302
July	1	1	4	3	31	7	0	196	243
August	7	1	3	5	18	8	0	196	238
September	5	3	5	33	23	4	0	278	351
October	13	0	2	8	42	9	2	342	418
November	9	0	7	14	62	10	0	194	296
December	9	3	2	6	92	9	1	118	240
Total (Running)	114	33	66	124	541	131	8	2368	3385



## The 18th Annual GLOBE Partner Meeting and 2014 GLOBE Learning Expedition

### The 18th Annual Partner Meeting

GLOBE's Annual Partner Meeting took place before the GLOBE Learning Expedition (GLE) in New Delhi, held in August 2014. As always, the purpose of this meeting is to engage the GLOBE community in an interactive, inclusive, and iterative process where participants could share concerns and contributions – and generate momentum for the ever-expanding implementation of the Program.

US partners, regional coordinators, country coordinators, and members of the four newly-formed working groups attended the 18th Annual Partner Meeting. (This was the inaugural face-to-face meeting of the WGs, whose purpose is to help shape the future of the GLOBE Program and to support the development and implementation of GLOBE worldwide.)

The focus of this particular meeting was to bring the GLOBE community members together to better learn about the new initiatives and operation of the GLOBE Implementation office (based at UCAR, Boulder, Colorado, USA) and to understand the transition of the GLOBE Program Office previously located at UCAR to NASA Headquarters, Washington, D.C.

The new GLOBE initiatives included closer collaborations with NASA Observing Satellites (including new protocol training in SMAP), the new GLOBE Distinguished Educator Fellowship Program, and re-engaging alumni.

### The 2014 GLOBE Learning Expedition

In 2014, the GLOBE Learning Expedition (GLE) was held in New Delhi, India (3 -8 August) at the elegant Hotel Mapple Emerald. During a GLE, students share their well-prepared and innovative GLOBE research in poster sessions and presentations, and answer questions regarding their study. The theme of this meeting was GLOBE for Sustainable Communities (with a focus on water quality). More than 300 participants including GLOBE students, teachers, scientists, and alumni from 29 countries, attended the GLE.

Keynote speakers included Dr. Narendra Das, Soil Moisture Active Passive (SMAP) Research Scientist, NASA Jet Propulsion Lab, California, USA; Dr. Dev Niyogi, Purdue University, Associate Professor and Indiana State Climatologist, Indiana, USA; Dr. Steven P. Neeck, Deputy Associate Director, Flight Program, Earth Science, Science Mission Directorate, NASA, Washington, D.C., USA; and Mr. B.M.S Rathore, Joint Secretary, the Ministry of Environment, Forests and Climate Change, Government of India.

During the GLE, students investigated a number of inquiry-based questions dealing with the local weather conditions. The GLOBE protocols used to answer these questions included atmosphere, biosphere, and pedosphere (soil). In addition, the new SMAP Protocol was taught, with the goal of preparing students for NASA's SMAP satellite (which launched in January 2015). GLOBE students are now involved in collecting and analyzing SMAP-related data.

Numerous cultural activities took place during the GLE, one popular event was the Eco Engineering Product Display. For this activity, students used various waste materials and effectively and innovatively repurposed them into dresses, mats, hats, and other items. Also, in a memorable salute to GLOBE's continuing commitment to creating opportunities for international collaboration and understanding, students performed national songs and dance, and shared creative videos depicting their local communities.



2014 GLOBE Learning Expedition (GLE) Participation							
REGIONS	AFRICA	ASIA AND PACIFIC	EUROPE AND EURASIA	LATIN AMERICA AND CARIBBEAN	NEAR EAST AND NORTH AFRICA	NORTH AMERICA	
Countries Represented	Benin, Cameroon, Kenya, Nigeria, Rwanda, S. Africa, Tanzania, Mauritius	Nepal, Sri Lanka, Japan, India, Taiwan Partnership	Czech Republic, France, Greece, Hungary, Israel	Argentina, Costa Rica, Trinidad and Tobago, Peru, Uruguay	Bahrain, Jordan, Oman, Qatar	United States	<b>TOTAL</b>
Teachers	8	44	5	4	3	6	70
Students	19	120	8	5	4	13	169
Alumni	2	1	1	0	0	2	6
Others	7	26	4	7	6	24	74

### A Collection of Photos from the 2014 GLOBE Learning Expedition in India









## GLOBE Around the World ~ Africa

### **Annual Regional Meeting: 26–28 February 2014**

#### **Location: Mossel Bay, South Africa**

The 2014 Africa Regional Meeting was held in Mossel Bay, South Africa, from 26 through 28 February. Directed by Mr. Mark Brettenny, of the Africa Regional Coordination Office, the meeting served to engage participants in effective means to greater participation, cooperation, collaboration and innovation to strengthen the GLOBE program in the Africa region. The following countries were represented at the meeting: Benin, Cameroon, Ethiopia, Horn of Africa, Kenya, Madagascar, Namibia, Nigeria, Rwanda, Senegal, South Africa, and Tanzania.

The anticipated outcomes of the meeting included: better cooperation, collaboration and greater participation. The Program will allow for some innovative ideas to make collaborative projects exciting for participation by schools and communities. The GLOBE Program in Africa will be more visible with all activities published on the regional website, social networks and media pages.

### **Highlights from the Region**

#### **South Africa**

North-West University in partnership with the University of Namibia hosted the Teacher, Science Centre Manager Training and University Collaboration on Education for Sustainable Development (ESD) in 2015. The event was attended by teachers, University professors, managers of Science Centers, the Centre for the Advancement of STEM education and the National Department of Science and Technology. Basic atmosphere protocols were trained and the schools received a full set of equipment from the university.

The 2014 South Africa Geographers Conference involved all the geography teachers in private schools in South Africa. This introduction to GLOBE was followed by a SMAP training with Dr. Erika Podest, earth scientist at NASA's Jet Propulsion Laboratory, in the U.S.

#### **Madagascar**

Creating Awareness Earth Day 2015. GLOBE schools, non-GLOBE schools and villagers were invited to this special event. GLOBE learners and teachers spoke about the preservation of the environment and the interrelatedness of earth as a system focusing on water, soils and land cover.

#### **Gabon**

Creating awareness around deforestation workshop in 2014. This event was attended by local communities and GLOBE learners. The objective was to sensitize people around the issues and related problems associated with deforestation.

#### **Cameroon**

Tree planting event and workshop held on Earth Day 2015 to familiarize teachers about the GLOBE website and data entry. Teachers and learners participated and at the event a number of sponsored trees were planted.

#### **Kenya**

The Space secretariat hosted a teacher-training workshop in 2014 for the GLOBE teachers of Kenya in Nairobi. Teachers were trained in all the basic protocols.





Student Exchange Program in Madagascar

### Gambia

Gambia has been inactive for a period due to the death of their country coordinator. It now has a new country coordinator, and he is planning for greater engagement with the Program.

### Benin

GLOBE Alumni coordinator Yliass Lawani has been instrumental in recognizing the achievements of many African students who have progressed to STEM careers as a result of their involvement with GLOBE. The first is Nicodeme of Benin who recently obtained his PhD from Wageningen University, the Netherlands, in crop sciences and agri-food chain management. Also of note; Dr. Ishmael Lawani, a GLOBE learner now is the foremost surgeon in West Africa.

GLOBE Alumni in Africa are among the most proactive in the Program, supporting the expansion of GLOBE. In Benin, for example, GLOBE Alumni initiated a Radio Program named “Ciel-Mer et Terre” which features GLOBE, on Radio Univers, the radio station of University of Benin, broadcasting both on the campus and the capital of Benin Cotonou.

One of the significant developments of the Program’s 20 years in Africa and one of the highlights of Africa’s 20th Anniversary celebration will be the Kilimanjaro Expedition. This is the fifth Kilimanjaro Xpedition and it may prove to have participation from all the GLOBE regions and to exceed the last number of 381,000 participants online.



Upper Left to Lower Right: Students and Teachers in Madagascar, South Africa, Nigeria and Kenya

## GLOBE Around the World ~ Asia and Pacific

### **Annual Regional Meeting: 19– 21 February 2014**

#### **Location: New Delhi, India**

The Asia and Pacific Regional Meeting took place at the Hotel Mapple Emerald in New Delhi, India. Participants included GLOBE country coordinators from nine GLOBE countries in the region (India, Sri Lanka, Thailand, Nepal, Maldives, Marshal Island, Palau, Mongolia and Taiwan) and GIO Director. A representative from UNESCO New Delhi also joined the meeting during the concluding session.

Topics for discussion focused on the status of GLOBE in the region: successes and challenges of GLOBE activities; opportunities for future cooperation through exchange programs and regional joint projects; succession and continuity of the program in the various countries; achievements and hurdles in Program implementation, new partners and the need for training; and planning for the GLOBE Learning Expedition (GLE) in New Delhi, in August 2014. Planning for the GLE included a site visit to the proposed conference hotel, the Mapple Emerald.

### **Highlights from the Region**

#### **GLOBE India and GLOBE Thailand Student Exchange Program**

In November 2014, as an outgrowth of discussions to promote student exchanges and joint regional projects that occurred at the 2014 Asia and Pacific Regional Meeting, GLOBE students and teachers from India visited Bangkok, Thailand. A conference, organized by GLOBE Thailand, brought the students together to discuss their research methodology and findings, and to interact with GLOBE scientists, students, and teachers from both countries. The GLOBE students and teachers from India visited a GLOBE school in Thailand to observe the kind of research projects students have been doing in Thailand, and to present their projects to the students and teachers.

#### **UNESCO-GLOBE Learning Expedition to Pokhara and Kathmandu, Nepal**

During the second week of January 2015, GLOBE students, teachers, and country coordinators from India, Sri Lanka, and Nepal joined together to form the UNESCO-GLOBE Learning Expedition to Lake Pokhara and Kathmandu in Nepal. Students collected water quality data and compared them to data from their local water bodies. Twenty-eight participants, including country coordinators from Sri Lanka and Nepal, were involved in this event.



Youth Conference on Earth Science and Climate Change in India

### World Water Day 2015 in Sri Lanka

GLOBE Sri Lanka organized a World Water Day event (23-24 March, 2015) in Sri Lanka. Entitled “Student Campaign on GLOBE Hydrological Study,” it was organized in parallel with World Water Day 2015. The GLOBE country coordinator, trainers, alumni, and GLOBE students and teachers from Sri Lanka participated in this wonderful event. Participants made their presentations during the event, and GLOBE protocol-based field activities were organized at Akuregoda Lake.

### Celebration of Earth Day 2015 with GLOBE Students in Udaipur and Goa

The GLOBE communities in Goa and Udaipur celebrated Earth Day 2015 with rallies, plantings, message writing, a cleanliness drive, hands-on activities concerning water quality, a poster competition, and lectures.



GLOBE Students in Japan, Nepal and Thailand



## GLOBE Around the World ~ Europe and Eurasia

**Annual Regional Meeting: 29 April– 5 May 2014**

**Location: Prague, Czech Republic**

More than 30 representatives from 21 countries (Belgium, Croatia, Cyprus, Czech Republic, Finland, France, Germany, Greece, Italy, Israel, Latvia, Liechtenstein, Lithuania, Macedonia, Netherlands, Norway, Poland, Russia, Switzerland, Ukraine) attended the regional meeting, including country coordinators, scientists, and teachers.

Highlights and success stories from the countries involved were shared and covered such topics as: cooperation with scientists, and how to involve them more; how to keep schools active (sharing experiences, needs, and concerns from schools, as well as issues regarding the implementation of GLOBE in the schools); regional campaigns and projects (including the Picture Contest Campaign, the Europe and Eurasia Aerosol Campaign, and the Motivate and Attract Students to Science (MASS) Project).

Representatives of GLOBE, coming from places as far north as Finland and as far south as Israel, showed the diversity of approaches to science and environmental education within GLOBE. Participants came with ideas on how to keep schools active and expand the program effectively. The Picture Contest Campaign, which is aimed on activating school profiles on the GLOBE website and enhance mutual collaboration of schools, was introduced by the Board and Regional Coordination Office.

All of the participants agreed that the opportunity to meet once a year gives them the right stimulation for work with the GLOBE Program. The meeting provides room to highlight success of students and teachers, discuss crucial points of program implementation across countries, and learn from each other.

Two days were dedicated to training in GLOBE protocols, focusing on the topic of atmosphere, hydrology, land cover, and web administration. Those attending the training included 25 teachers from Cyprus, Belgium, and Finland – who all joined sessions with country coordinators.

### Highlights from the Region

#### **GLOBE at My School Picture Contest and Calendar**

The 2015 Calendar, with the best images from GLOBE schools all over the region, was distributed to all countries.

#### **GLOBE Day on Earth Day 2015 at the Meteorological Institute (KNMI), Netherlands**

A training and celebration day for students was organized by GLOBE Netherlands, with the cooperation and assistance of scientists. The U.S. Ambassador, Timothy Broas, highlighted GLOBE's value.

#### **International GLOBE Games, Czech Republic 28-31 May 2015**

More than 200 participants from the Czech Republic, Poland, Slovakia, and Germany attended the event. More than 30 schools presented their research projects and exhibited their research at poster sessions.





Students in Italy Celebrate GLOBE's 20th Anniversary

### Celebrating the 20th Anniversary of the GLOBE Program Connected with EXPO 2015

**Italy:** Feeding the Planet, Energy for Life – During the EXPO 2015, (May to October), students and teachers are involved in various activities such as environmental monitoring, scientific laboratories, as well as historical and archeological visits.

### GLOBE Students Conference, Croatia 11–13 May 2015

The Conference included a competition associated with GLOBE students' research projects.

### Phenology Campaign in Ukraine

Approximately 686 students and 89 teachers from 70 schools and educational institutions from all over Ukraine participated in the campaign. From February to May 2015 students observed budburst of two different species of a cherry tree and took over 4,000 measurements. An interactive map with students' data about the beginning of budburst in different parts of Ukraine was created.



Students in Switzerland (above) and Czech Republic (right)



## GLOBE Around the World ~ Latin America and the Caribbean

**Annual Regional Meeting: 27–28 June 2014**

**Location: Buenos Aires, Argentina**

The GLOBE Latin America and Caribbean Regional Meeting took place at the Sheraton Hotel in Buenos Aires, Argentina, from 27–28 June 2014. Country coordinators from Argentina, Costa Rica, Ecuador, Mexico, Peru, Suriname, and Uruguay attended, along with the local U.S. Embassy Environmental Officer and a representative of the Comision Nacional de Actividades Espaciales (CONAE), the National Space Agency of Argentina.

### Highlights from the Region

A collaborative research study on the impact of the El Nino Southern Oscillation (ENSO) was presented at the meeting. Entitled: “Weather Phenomenon ENSO’s Impact on Land Coverage between 10° and 40° Latitude in South America,” the innovative project used GLOBE protocols and data to investigate the impact of the ENSO on three countries: Argentina, Peru, and Uruguay.

#### **Benthic Science Club in Montevideo, Uruguay, Involves Students in Examination of Local Water Supply.**

GLOBE Uruguay Alumni members Melissa Cristobal and Claudio Lacuesta, formed an active research group called Benthic Science Club. Since 2010 they have been working on a research project in the Arroyo Miguelete, one of the most important water sources in Montevideo, Uruguay, performing chemical and biological monitoring in the flow of that fresh water, through the use of GLOBE hydrology protocols. They are exploring the idea of phytoremediation, a process based on the use of plants to clean up or restore contaminated environments and used GLOBE Phenology protocols for the control of aquatic plants during the cultivation time.

With this research, they participated in the Departmental and National Science Club Fairs organized by the Ministry of Education and Culture and received a Special Award to represent Uruguay at the prestigious INTEL International Science and Engineering Fair of INTEL ISEF that took place in May 2014, in Los Angeles, USA.

#### **Train the Trainer Workshop in Buenos Aires, Argentina, Expands GLOBE Reach in the Region**

From 22-23 April 2015 the annual “Train the Trainer” was held, involving more than 20 teachers from 15 schools throughout Buenos Aires and the interior of the country. These were two days of both intense work and celebration as it was Earth Day, the anniversary of The GLOBE Program, as well as the initiation of the Program in Argentina. United States Ambassador Mr. Noah Mamet, and other U.S. Embassy officials, along with the Director of Grupo Educativo Marín and representatives of Colegio Marín were the honored guests at the meeting.





GLOBE Alumnus in Uruguay

A number of GLOBE Master Trainers conducted the protocol trainings. There was also an outstanding presentation by students from the Instituto Huergo de Buenos Aires the use of GLOBE protocols to research and monitor the quality of water throughout the Autonomous City of Buenos Aires.

#### **Fourth GLOBE Training Workshop (Level 1) Introduces GLOBE to New Teachers in Uruguay**

The training workshop was held in Tala, Canelones, Uruguay on 28 May 2015. The workshop was supported by the National Directorate of Environment of the Ministry of Housing, Land Planning and Environment as well as the Embassy of the United States of America and was part of LAC's 20th Anniversary celebration. A total of 21 teachers and students were invited from villages located in San Ramón, Sauce, Tala, San Jacinto, Montes, Soly-mar Norte (Canelones), Montevideo and Tacuarembó, and students studying last year of the IFD (Instituto de Formación Docente) from San Ramón.

The workshop covered several GLOBE protocols from biosphere, hydrosphere, and pedosphere (soil) in five different locations outside the city. Following the protocol training, the group returned to Liceo José Alonso y Trelles Laboratory where they identified the macro-invertebrates in their collected samples, examined carbonates in soil, measured the pH of the soil, and learned about the Soil Humidity Protocol using an oven.

Participants also learned how to calibrate the new instruments, sponsored by the U.S. Embassy, for use in local schools.

#### **The Program Expands In Costa Rica**

Several schools in Costa Rica have been involved in different initiatives, for Earth Day 2015 and also in the last year. These include: the School of Biology of the University of Costa Rica organizing a conference on aquatic macroinvertebrates; Liceo students from Las Mercedes de Cajon collecting waste materials from around the school, and using the objects from artwork with the assistance of a renowned artists; GLOBE students from Liceo San Rafael, generating and promoting a waste classification system. In addition, over the past year, a virtual workshop introduced new teachers to GLOBE. A three-day Master Training Event, to certify a number of the most experienced teachers, was led by Master Trainer Roberto Quiros.



In Peru: Using a Clinometer (left), NASA Administrator Bolden Teaching a Class (center) and Teacher Training Workshop on the Shore of Lake Titicaca.

## GLOBE Around the World ~ Near East and North Africa

**Annual Regional Meeting: 25–27 April 2014**

**Location: Manama, The Kingdom of Bahrain**

In April 2014, country coordinators from eight countries (Bahrain, Saudi Arabia, United Arab Emirates, Lebanon, Oman, Jordan, Pakistan, and Mauritania) in the Near East and North Africa (NENA) region gathered in Manama, Bahrain for their Annual Meeting. Over the course of two days, the participants' discussions ranged from large-scale programmatic issues to successes and implementation challenges within the region. Topics included funding opportunities, translation of materials, developing a mentor system for country coordinators, and website and online training for teachers and country coordinators.

Participants also received training in the new protocol connected with the Soil Moisture Active Passive satellite mission. During the meeting, participants visited with staff from the Ministry of Environment, and with staff from a petroleum company that funds GLOBE in Bahrain. They also toured the Al-Arin Natural Reserve, a location used for GLOBE Games in Bahrain.

The 10th Annual GLOBE Science Fair was also held in conjunction with the regional meeting. Over 100 students from Bahrain, Jordan, Oman, Saudi Arabia, and the United Arab Emirates exhibited their research at the fair.

### Highlights from the Region

#### **GLOBE Camp Oman**

The Oman Ministry of Education organized an international student environmental GLOBE Camp from the 17–19 March 2015 in the Governate of Muscat, Yeti Beach. The event included student participation from a number of countries in the NENA region, including Oman, Saudi Arabia, Bahrain, Lebanon, United Arab Emirates, Jordan and Pakistan. About 120 students from more than 30 schools participated. Students compared results of their research based on GLOBE protocols, such as atmosphere, hydrosphere, pedosphere, and landcover and exhibited their environment-related projects in a science fair.

#### **University Level Initiative**

A meeting was held for higher education level faculty from five countries of the NENA region: Ain Shams University in Egypt, Najah University in Palestinian Territories, Tunis University in Tunisia, Mohammed Fifth University from Morocco and Science and Technology University from Jordan. The meeting, sponsored by the U.S. Embassy, allowed the university faculty to be trained in GLOBE protocols and discuss the value of scaffolded Earth Science education using GLOBE from elementary through higher education. In addition to integrating GLOBE into their coursework, the faculty will train local high school teachers in the protocols.





GLOBE Camp in Oman

### Saudi Arabia

From 15–19 February 2015, a huge GLOBE training workshop took place in Saudi Arabia, which resulted in 150 teachers from 70 new schools joining GLOBE. Organized in cooperation with the General Directorate of Student Activity at the Ministry of Education and the General Directorate of Education at Al-Ahsa, the workshop trained 150 teachers from all educational districts in the country in atmosphere, hydrology, and soil protocols, with special sessions on GPS and data entry. Students from all educational districts, approximately 150 in number, were also included in this event and focused on climate, water and soil studies at the training site and later, in the company of the teachers, on field studies at Al-Maha Farm where they used GLOBE protocols to examine water and soil.



Upper Left to Lower Right: Teacher Training in Jordan, 2014 Meeting in Bahrain, Earth Day Celebration in Jordan and Teacher Training in Saudi Arabia

## GLOBE Around the World ~ North America

### **Annual Regional Meeting: 2 April 2014**

### **Location: Woods Hole, Massachusetts, U.S.**

The 2014 North America Regional Meeting (NARM) convened at the world-famous Woods Hole Oceanographic Institute (WHOI) in Woods Hole, Massachusetts, on 2 April 2014. Thirty-five U.S. partners and GLOBE Program staff attended the event, which was hosted by Ms. Kama Thieler, the WHOI Partnership Coordinator.

NARM was divided up into share-a-thons and general sessions. Share-a-Thon sessions included how to engage teachers in Elementary GLOBE and community-sourced resources. General sessions covered the SMAP Protocol, website user sessions, program updates on (1) the Teachers Guide, (2) the on-line “Earth as a System” Poster, (3) the transition to GIO and (4) Next Generation Science Standards (NGSS). The attendees engaged in discussions and preliminary product development for Common Core and STEM-Science, Technology, Education, Art and Mathematics (STEAM) connections to GLOBE. The NARM concluded with a presentation on ocean acidification by Dr. Raymond Schmitt and a tour of the lab facilities.

The NARM meeting was preceded by two days of training for GLOBE trainers in several hydrosphere protocols, the SMAP Protocol, and learning activities.

### **Highlights from the Region**

#### **Canada**

Dr. Kevin O’Connor, GLOBE Canada and Evaluation WG member presented his paper, ‘Developing Environmental Responsibility Through Place-based Education,’ at the BIONATURE 2015 Conference in Rome, Italy. His paper describes long-term analysis of a program utilizing place-based science education, with GLOBE as a critical component. Dr. O’Connor presentation focused on how these practices have effected the students’ perceptions of their social and environmental responsibilities as citizens. It then explores how these approaches have led to responsible citizenship in northern Canada.

#### **United States**

THE GLOBE community in the United States celebrated Earth Day and the 20th Anniversary of GLOBE on 22 April 2015 with a series of events, including:

- Earth Day in the Nation’s Capital featured NASA exhibits, hands-on activities, science demonstrations, views of Earth from space, and an address by NASA Administrator Charles Bolden;
- Earth Day at Union Station featured NASA Hyperwall and Science Gallery exhibits, hands-on activities and demonstrations featuring NASA Chief Scientist Ellen Stofan and John Grunsfeld,





NASA and GLOBE at Union Station in Washington D.C., Earth Day 2014

associate administrator for NASA's Science Mission Directorate in Washington. GLOBE students from Huntington High School in West Virginia shared their hydrology research at the event. A steady stream of people engaged with the students and with NSF's Einstein Fellow and GLOBE teacher, Beverly Stambaugh, who demonstrated the 'Make a Cloud' activity, showed participants the GLOBE web site, and encouraged teachers to consider getting involved in The GLOBE Program;

- As part of their Earth Day celebration, GLOBE students in Hawkins, Texas combined environmental studies with community service by cleaning two-miles of highway with an Adopt-A-Highway cleanup project;
- Students at Dawson School in Boulder, Colorado, spent Earth Day analyzing data they collected the previous day at Rocky Mountain National Park;
- U.S. presenters at the Earth Day 2015 Google Hangout included former GLOBE Chief Scientist Dr. Barry Rock and GLOBE teachers Henry Ortiz (California), Audra Phillips (Texas) and Bill Meyers (Colorado); and
- During Earth Week, 20 – 24 April 2015, GLOBE Partners Anne Lewis (South Dakota Discovery Center) and Nico Dollar (The Outdoor Campus-West of South Dakota Game, Fish & Parks) co-hosted a Train-the-Trainer Workshop at the Outdoor Campus-West in Rapid City, South Dakota. GLOBE Master Trainers Gary Randolph (GIO), Barry Rock (University of New Hampshire and 1st GLOBE Chief Scientist), Lynne Hehr (University of Arkansas), and Todd Toth (NASA Goddard Space Flight Center) took time out from the workshop to lead the participants in a stream cleanup and planting of native seeds on 22 April in observance of Earth Day.



GLOBE Training at Woods Hole Oceanographic Institute



Earth Day Cleanup, South Dakota GLOBE Training, USA

## The GLOBE Program – Looking Ahead

Just as there are many events, activities, scientific and educational opportunities, and program highlights that all of us within the GLOBE community can look back upon with a sense of enduring achievement – there are many that we can “look forward” to as well, including the 2016 GLOBE International Virtual Science Fair, and results from the collaborations with NASA’s Earth observing satellites.

Expanding the possibilities, and parameters, of participation, The GLOBE Program is pleased to announce as part of its 20th anniversary celebrations the 2016 International Virtual Science Fair. In this online competition, all GLOBE students from any GLOBE country are invited to showcase research highlighting one or more of the following concepts:

- entering and using GLOBE data
- collaboration
- community impact
- connection to a local or network scientist
- international connections
- engineering solutions

Student projects will be graded – and awarded badges – according to a merit-based system scored by scientists from the GLOBE International Science Network. Every project that is submitted will be hosted on the GLOBE website, and qualified entries will be entered for a chance to receive a stipend to attend the 2016 GLOBE Annual Meeting. The deadline for submission of projects through the website is 11 March 2016. And, just like there is no limit to the imaginative ways students can engage in research, there is no limit to the number of entries per student or per school.

Another exciting and unique GLOBE experience is the Kilimanjaro Xpedition, which occurs 23 September through 2 October 2015. Just as in previous expeditions, students around the world will be able to follow the GLOBE participants online for the duration of the event. Students on the trek will record vegetation, air, soil and surface temperature, cloud type and cover, relative humidity and as well as several hydrological measurements. The experience is a wonderful example of the vitality and dedication of community members. In addition, the GIO will support aspects of this expedition.

As part of the ongoing operations of the GIO, staff will continue to facilitate the communication of data and results from the Earth observing satellites when they become available. The GIO will continue to support the growth of the community through the dissemination of relevant communications, facilitating community-based initiatives, and increasing international collaboration and entry of new countries.

Building on the momentum of the past twenty years, there will be innumerable options and opportunities to expand the mission – and the vision -- of The GLOBE Program for many more years to come. For the past twenty years, GLOBE has invited students, teachers, and professional scientists to dive in and “do” science, to expand their educational experiences and their Earth science expertise, and to contribute their observations to a global – and growing – community.



## The GLOBE Implementation Office Summary Report

The GLOBE Implementation Office (GIO), in Boulder, Colorado, continues in its support of the community. A number of GIO initiatives established in 2014 and 2015, as well as operational functions, are outlined below.

### The GLOBE Implementation Office:

- Established the GLOBE Distinguished Educator Fellowship in 2014. Working with the first selected fellows from the U.S. and Thailand to create new GLOBE based learning activities. Additional community members can apply for the fellowship in coming years;
- Working with NASA's GLOBE Program Office, coordinated the establishment of Education, Evaluation, Science, and Technology Working Groups (WGs) composed of community members. The GIO supports the WGs and collaborates with them on the implementation of specific tasks on an ongoing basis;
- Facilitates data collection with GLOBE students for specific Earth observing missions. NASA mission scientists compare these data with satellite-derived data and communicate results with the GLOBE community;
- Supports community-initiated student research campaigns with any associated new science protocols using existing guidelines and processes;
- Communicates and coordinates regularly with the Data and Information Systems (DIS) Team (NASA Goddard Space Flight Center with Raytheon Web Solutions) on numerous tasks, including revision of website, database maintenance, viz system, and app testing;
- Supports international cooperation by inducting new countries, encouraging continuous engagement of countries, and re-engaging countries with the Program;
- Continues to communicate with the community on a regular basis through newsletters, director letters, social media, and other venues. Developing a series of communication materials and presentations that the community can use with a variety of audiences;
- Offers assistance from the Community Support Team on technical and programmatic questions as well as translation of documents and emails into English;
- Collaborates with WestEd, an educational research and development organization and U.S. GLOBE partner, on the refinement of the evaluation rubrics and submission process for the 2016 GLOBE International Virtual Science Fair. This effort is funded by a National Science Foundation grant; and
- Supports a number of events associated with the year-long celebration of the 20th Anniversary of The GLOBE Program.

## Thanks to our GLOBE Partners around the world...

