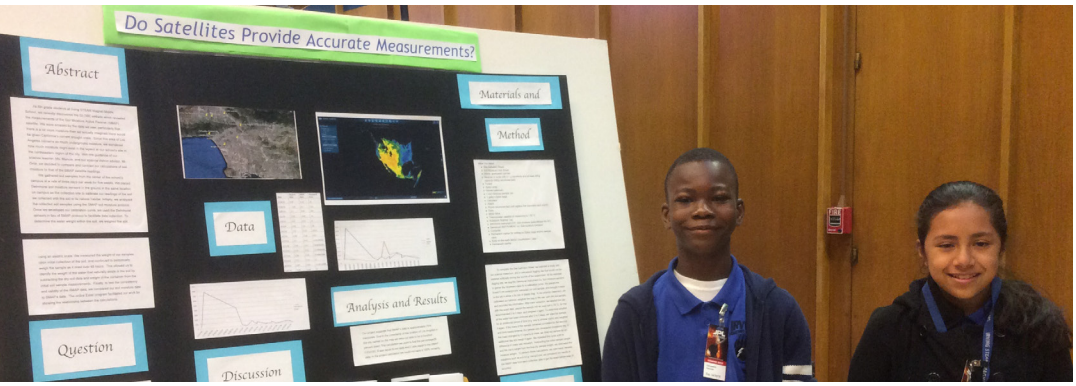
THEGLOBEPROGRAM

ANNUAL REVIEW 2016-2017



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GLOBE Milestones

1994 Earth Day, U.S. Government announces The GLOBE Program as a multi agency effort.

1995 Earth Day, The GLOBE Program launches (with 11 protocols); 33 countries join the program.

1998 Finland hosts the first GLOBE Learning Expedition (GLE) in Helsinki.

2000 USA hosts second GLE in Fayetteville, Arkansas.

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/Pacific, Europe, Latin America and the Caribbean (LAC), and North Africa and the Near East (NENA) to support professional development workshops, capacity building, and regional sustainability efforts; data in GLOBE database reaches 20 million.

2011 GLOBE launches concept of Student Research Campaigns.

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 128 million data entries in the international database.

2016 GLOBE provides online eTraining; hosts highly successful GLOBE International Virtual Science, six regional U.S. science fairs, and various student scientific campaigns.

2016 Data reaches over 140 million measurements; International Virtual Science Symposium increases in number of submitted projects and worldwide representation; and new mosquito protocol.

About the GLOBE Program

The GLOBE Program (GLOBE) is an international science and education program sponsored by the National Aeronautics and Space Administration (NASA); supported by the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA), and the United States Department of State; and implemented by the University Corporation for Atmospheric Research (UCAR). GLOBE provides students and the public (worldwide) the opportunity to participate in data collection and the scientific process, and to contribute in a meaningful way to our understanding of the Earth system and the global environment. For over 20 years, GLOBE has connected students, teachers, and professional and citizen scientists from around the world to conduct hands-on science within their local environment to enhance their awareness of – and their scientific contribution to – the global environment.

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The GLOBE Implementation Office is supported under NASA-UCAR/GLOBE Cooperative Agreement NNX17AD75A awarded to the University Corporation for Atmospheric Research (UCAR).

Section I – The GLOBE Program

A Message from Dr. Tony Murphy
Director, GLOBE Implementation Office

After 22 years, The GLOBE Program is coming of age, now less focused on becoming… and more focused on being. Science provides many metaphors for the process of transformation: trickling streams weave together to form rivers; seeds turn into forests; clouds of dust and gas collide with shockwaves from distant supernovae -- the particles adhere, spin, implode, and become stars.

We are experiencing this transformation now at GLOBE. In the beginning, we were a fledgling organization with high hopes and ideals, a community joined in intention to create space for a global dialogue about what was needed to create "the next generation of scientists and stewards of the Earth." We were united in the effort to impart an appreciation for the rigor of science and the value of precise measurements. From this would come a database of information from which students and scientists alike would be able to understand how the Earth System works. This was, and continues to be, the great experiment of GLOBE.

Through decades of community building, we have become that program we envisioned, and more. At GLOBE, the entire planet is our classroom. We work together in more than half the countries on Earth. We partner with NASA satellite missions to develop a macro-view of the world. We serve students and citizen scientists who are developing a deeper understanding of the Earth System as well as the capacity to sustain it. We guide our students toward expanding their awareness of environmental issues so that they can develop the cognitive skills needed to do research and create the networks vital for collaboration – truly taking their knowledge from local to global.

Now, beyond imparting an appreciation for the rigor of science and the complexity of the Earth System — *what* students learn, GLOBE has become a living laboratory to study *how* students learn.

Through our international Working Groups, we are realizing social, cultural, and motivational factors behind scientific and mathematical interest, and this has led to new questions. How do we foster an interest in science among populations that are underrepresented in sending students into STEM careers? How do we motivate girls to explore science? How do we find local support for this program in all corners of the world? The questions continue.

To the teachers, partners, and sponsors whose unwavering commitment has sustained The GLOBE Program; to the students who participate in data collection and who have displayed their research in regional science fairs and the International Virtual Science Symposium; to the GLOBE alumni who have found new ways to serve by joining the Alumni Network; to our many friends and supporters: you are a constant source of inspiration and transformation. Thanks to all of you for being part of the great and continuing experiment that is GLOBE.

Sincerely,

Dr. Tony Murphy

GLOBE Impacts Around the World

The international GLOBE network includes representatives from 151 U.S. partners and 117 participating countries. GLOBE students have contributed over 140 million measurements to the GLOBE database for use in their inquiry-based science projects and scientific research, such as NASA's Global Precipitation Mission (GPM) and Soil Active Passion Mission (SMAP).

All Regions

Schools/Members | Data | Projects | Training

Name	Schools	Teachers	Pre-Service	Students	Alumni	GLOBE Observers
Africa	833	620	77	11,843	30	184
Asia and Pacific	3,171	1,516	432	28,274	21	1,982
Europe and Eurasia	4,481	3,413	259	74,827	28	3,832
Latin America and Caribbean	1,177	1,343	616	25,782	27	1,029
Near East and North Africa	604	539	135	36,215	8	232
North America	20,662	21,246	2,978	481,860	21	7,617

GLOBE at a Glance

Thanks to the continuing efforts of the GLOBE community, there's always more going on 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 during 2016.

GLOBE at a Glance – 2016					
Region	**Countries**	**Number of Schools**	**Change in Number of Schools Since 2015**	**Total Cumulative Measurements**	**Measurements Entered in 2016**
Africa	23	792	55	796,116	2,888
Asia and Pacific	18	3,016	125	923,961	42,564
Europe and Eurasia	41	4,388	176	48,330,069	3,352,274
LAC	20	1,014	142	964,527	15,923
NENA	13	571	24	732,737	111,463
North America	2	20,061	612	87,087,969	3,652,765
Total	**117**	**29,842**	**1,134**	**138,835,379**	**7,177,877**

The GLOBE Community: An Overview

The GLOBE Program is informed – first and foremost – by ongoing interactions with our worldwide community. GLOBE continuously engages in the development and dissemination of educational and outreach products that use GLOBE-created and NASA-driven tools and resources to engage the community in authentic scientific exploration.

GLOBE Regions

GLOBE administration is divided into six regions: Africa, Asia and Pacific, Europe and Eurasia, Latin America and Caribbean (LAC), Near East and North Africa (NENA), and North America (which consists of Canada and the United States). GLOBE partners (Country Coordinators and U.S. Partners) facilitate the implementation of GLOBE in their country or within a service area of their country.

GLOBE Working Groups

The Working Groups (WGs) support the development and implementation of GLOBE worldwide. The WGs (Education, Evaluation, Science, and Technology) are each composed of eight members of the GLOBE community who serve on a rotating basis.

U.S. Partner Forum

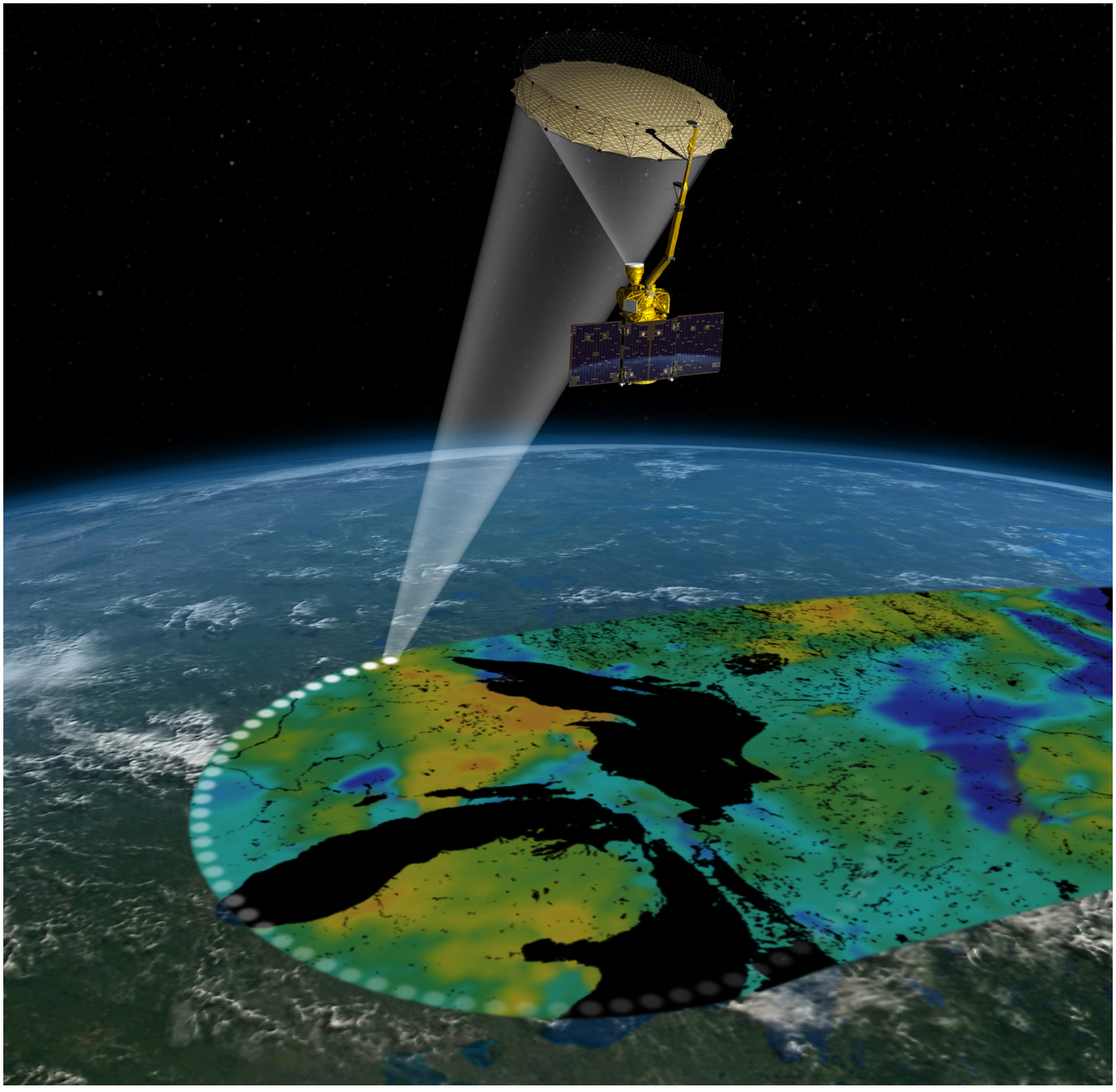
The U.S. Partner Forum facilitates discussion of ways to enhance the contribution of GLOBE to the improvement of STEM education in the U.S. locally, regionally, and nationally. The U.S. is divided into six geographic areas: Pacific, Midwest, Northeast and Mid-Atlantic, Northwest, Southeast, and Southwest. Each region has one representative on the U.S. Partner Forum who works closely to guide the future of GLOBE in the United States.

The GLOBE International STEM Network (GISN)

The GISN is an international network of STEM professionals (Science, Technology, Engineering, Mathematics) who work with GLOBE students around the world. The GISN, which has grown to over 300 members, enriches the GLOBE learning experience, and lets young people see what a science career would look like in action.

GLOBE and NASA: Missions and Measurements

Observing, examining, and monitoring Earth's ever-changing environment is one of the primary activities of GLOBE. In order to increase the connections with Earth science scientists, collaborations were forged with NASA. This interactive relationship is based on the collection and analysis of data – where GLOBE students collect field data that NASA scientists then use to help validate and calibrate satellite instruments. There are two active field measurement campaigns:



GLOBE ENSO Student Research Campaign

In September 2016, the GLOBE ENSO (El Niño Southern Oscillation) Student Research Campaign began. During this campaign (Phase II of the GLOBE El Niño Field Campaign), GLOBE students are collecting data using two or more GLOBE protocols (precipitation, air temperature, surface temperature, soil temperature, SMAP soil moisture, and biometry). This focused input is helping scientists gain a broader context of the impacts of El Niño and La Niña around the world. As of March 2017, over 2,000,000 measurements from 39 countries have been submitted as part of the ENSO Campaign.

The GLOBE Urban Heat Island/Surface Temperature Student Research Campaign

In December 2016, GLOBE – along with Dr. Kevin Czajkowski (Director of the Geographic Information Science and Applied Geographics Lab at the University of Toledo, Ohio, USA) – hosted the Urban Heat Island Student Research Campaign. During this campaign, GLOBE students used collected data to work (as a community) with students from schools around the world. In 2016, 59 schools from around the world had entered data – for a total of 1,306 observations!

Citizen Science and GLOBE Observer App

Since GLOBE released the GLOBE Observer App in September 2016, it has been downloaded nearly 15,000 times! (In March 2017, the GLOBE Observer App released version 1.2, with even more enhanced capabilities.) GLOBE Observer data can be combined with other GLOBE measurements (including those contributed through the GLOBE Data Entry App) to support research led by students and professional scientists related to atmosphere, biosphere, hydrosphere, and soil (pedosphere).

In 2017, NASA Langley's S'COOL (Students' Cloud Observations On-Line) program was integrated into GLOBE, to align cloud protocols and to offer a more inclusive citizen science opportunity. Both programs aim to provide students and the public worldwide with the opportunity to participate in data collection and the scientific process, and to contribute meaningfully to our understanding of the Earth system and global environment.

GLOBE eTraining: Learn How; Learn Now

In 2016, GLOBE made a giant stride forward with its ambitious vision of making participation in the program even more accessible. Teachers no longer have to wait for a face-to-face workshop in order to get their students out collecting data using GLOBE science protocols.

There are now 46 eTraining modules available! There have been almost 10,000 downloads of eTraining modules – and nearly 4,300 people have completed trainings. So, for teachers ready to join the GLOBE community, eTraining is a wonderful vehicle to use to engage with the program.

NASA Funds Three GLOBE U.S. Partners to Lead Earth Science Projects

NASA has funded three GLOBE U.S. partners (in Michigan, Alaska, and Ohio, listed below) to lead NASA Education Earth Science Projects. Check out these innovative, educational, and inspiring projects:

AEROKATS and ROVER Education Network (AREN)

This project seeks to train the next generation of scientists, engineers, and other professionals to observe and understand our planet through experiential learning using NASA technology and data in real-world settings.

Impacts and Feedbacks of a Warming Arctic

Engaging Learners in STEM using NASA and GLOBE Assets (Arctic and Earth SIGNs) – This venture seeks to connect youth and adults to climate issues and Earth science learning through inquiry-based GLOBE investigations and community stewardship projects.

Mission EARTH: Fusing GLOBE with NASA Assets to Build Systematic Innovation in STEM Education

GLOBE Mission EARTH is a collaborative of multiple institutions across the United States formed to increase involvement in The GLOBE Program with the goal of connecting students to scientists in the common pursuit of real-world science.

Stay tuned and see how these innovative projects will enhance your GLOBE experience – and expand our GLOBE community!

An International Expedition of Learning on Shores of Lake Victoria, Africa

In September 2016, the GLOBE Africa Regional Coordination Office (led by Mark Brettenny), YLACES (Youth Learning As Citizen Environmental Scientists), GLOBE Kenya, and the GIO successfully undertook an expedition to train, equip, support, and evaluate schools on the shores of Lake Victoria in water monitoring – and to engage schools around the world in learning about the lake and in comparing measurements with data from sites in three Lake Victoria basin GLOBE countries: Tanzania, Kenya, and Uganda.

Following the expedition, scientists from the National Center for Atmospheric Research (NCAR, located in Boulder, Colorado, USA) and GIO held a week-long training in Nairobi covering revolutionary 3D-printed weather stations. Now GLOBE students, and other citizen scientists in the region, will be able to contribute scientifically through data collection and research on the lake – an effort that is sure to evolve during the course of the future expeditions.

Section II – The GLOBE Implementation Office

The GIO is deeply informed by ongoing interactions with the scientists, educators, students, U.S. Partners, and Country Coordinators who make up the worldwide GLOBE community. GIO is committed to collaborating with community members — listening to their suggestions and responding to their needs, which is the key to enduring success.

This section includes highlights from the 2016-2017 year, demonstrating GIO's determination to enhance the understanding of the varying needs, interests, capacities, and expectations of the members of the GLOBE community, and to manage its activities in an effective and coherent fashion that promotes the further development and expansion of the program.

2017 GLOBE International Virtual Science Symposium

In 2017, GLOBE held its second GLOBE International Virtual Science Symposium (IVSS). GLOBE students (K-16) were invited to show the world what they are learning through the scientific, experiential, hands-on journey that is GLOBE! The 2017 IVSS served as a showcase for this dedicated work.

This completely virtual science symposium allowed GLOBE students to use the GLOBE data that they entered into the database and to collaborate with GISN members – and to apply their work to a real-world problem. GISN members and GLOBE community members from all six GLOBE regions stepped up to volunteer to help mentor students and help score the submitted projects.

As in 2016, students had the opportunity to earn virtual badges for the IVSS. These badges were Collaboration, Community Impact, Connections to a STEM Professional, Engineering Solution, Interscholastic Connections, and new for 2017, Exploring STEM Careers.

In May 2017, four eligible projects (two from the U.S. and two international projects) were awarded with stipends to help offset the costs of attending the 2017 GLOBE Annual Meeting in New Haven, Connecticut:

United States

- "Why Doesn't Grass Grow on our Playground?"
  School: Main Street Intermediate School (Norwalk, Ohio)
- "How Do the Species of Macroinvertebrates in the Boulder Creek Compare with the Water Chemistry of the Stream?"
  School: Alexander Dawson School (Lafayette, Colorado)

International

- "Global Warming and His Actions in Maximal and Minimal Temperature Variations on the Continent"
  School: Lycée Bernard Pallissy (Agen Aquitaine, France)
- "Checking the Validity and the Quality of Wells' Water in Jabel Al-Mukkaber Area"
  School: Al Faruk Elementary School (Jerusalem, Israel)

In all, 147 projects were submitted from all six GLOBE regions (up from the 105 projects from five GLOBE regions in 2016). There were 50 mentors (up from 37 in 2016) and 62 judges (up from 24 in 2016).

The IVSS truly exemplifies the power of GLOBE. Students, teachers, scientists (and other STEM professionals), and alumni work together to help the students succeed. Stay tuned for the 2018 International Virtual Science Symposium!

Data Quality Challenge – Location, Location, Location!

GLOBE would like to thank everyone who participated in the "2016 Data Quality Challenge!" The goal was to have community members check the GPS coordinates they use for their data collection sites to help us ensure that these coordinates are correct. This campaign recognized 80 schools from 12 countries that confirmed the location accuracy of nearly 200 sites. Remember – data collection is the foundation of The GLOBE Program. It takes a world to contribute the scientific and environmental measurements that help GLOBE fulfill its vision of a worldwide community working together to better understand, sustain, and improve Earth's environment at local, regional, and global scales.

Do You Know Your MUC? Distinguished Educator Offers New Activity

The GLOBE Distinguished Educator Fellowship had another successful year with the creation of a new land cover activity called “Do You Know Your MUC?” Mr. Gary Popiolkowski (a middle school science teacher from Pennsylvania, USA) developed the activity, which helps students to determine and produce a land cover map of plant life at a site.

GLOBE Collaborates for Expanded Learning

The GLOBE Program continues to collaborate with other organizations to enhance scientific understanding and student learning. Collaborating organizations include:

The National Wildlife Federation's Eco-Schools USA

GLOBE and Eco-Schools USA (a part of the global Eco-Schools network, the oldest and largest green schools organization in the world) are working to integrate school sustainability and Earth system's observations, and data collection. Currently, GLOBE is working toward a goal of having 120 schools join as GLOBE schools from the Eco Schools network, and supporting the development of "The NWF/ Eco-Schools USA: Online GLOBE/Eco-Schools USA Training Model." In addition, in 2016, a pilot face-to-face training program "NWF/Eco-Schools USA Training Proposal: Eco-Schools USA and The GLOBE Program" was hosted by NWF regional offices.

SciGirls

In the U.S., GLOBE continues its educational partnership with SciGirls – an NSF-funded public television STEM education production that draws on cutting-edge research about what engages girls in STEM, learning, and careers. The effort has reached over 14 million girls, educators, and families, making it the most widely accessed girls' STEM program in the United States. Currently, GLOBE is working on initiatives that include introducing the SciGirls Seven (research based strategies to encourage girls and minorities in STEM) to the GLOBE community, representing GLOBE at national workshops about STEM education and gender-equity research, and collaborating on proposals. In 2016, GLOBE was invited to help lead "SciGirls Reflect," a two-day workshop for STEM educators from across the United States that discussed gender-equitable teaching strategies. Once these activities are piloted, they will be available for the GLOBE community.

GLOBE Offers Nine New Learning Activities

In 2016-2017, nine new GLOBE Data Exploration Learning Activities were created for the GLOBE community. These learning activities (available on GLOBE Teacher's Guide section of the website), are designed to help students learn how to analyze GLOBE environmental data while also learning atmospheric science concepts and geography:

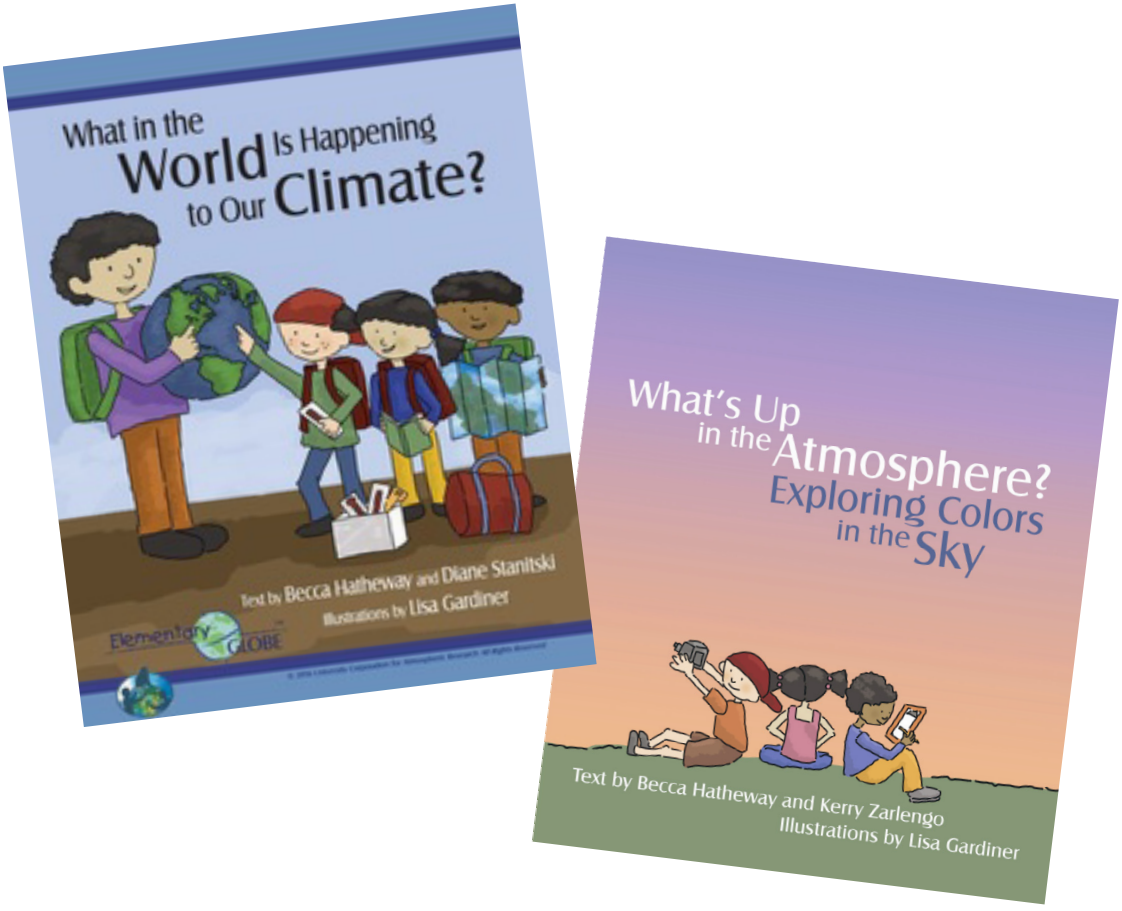
- Rainfall in the GLOBE Africa Region: A GLOBE Data Exploration
- An Alaskan Spring Mystery: A GLOBE Data Exploration
- Data at Altitude: A GLOBE Data Exploration
- Climate and Latitude: A GLOBE Data Exploration
- Making a Climograph: A GLOBE Data Exploration
- Comparing Croatia Climates: A GLOBE Data Exploration
- Monsoons and Health: A GLOBE Data Exploration
- Iowa's Highs and Lows: A GLOBE Data Exploration
- Weather Tourists: A GLOBE Data Exploration

New Elementary GLOBE Storybooks Reach Higher

Two new Elementary GLOBE books have been released:

- *What in the World is Happening to Our Climate?*
- *What's Up in the Atmosphere? Exploring Colors in the Sky*

These colorful and informative visual explorations (available on the GLOBE website, under "Do GLOBE") are designed to introduce primary (K-4) students to the study of Earth system science. Each book offers a complete instructional unit, including science-based storybooks designed to introduce students to key concepts in water, soil, clouds, seasons, aerosols, and Earth system studies; and classroom learning activities complementing the science content covered in each storybook.



GLOBE Materials Now Offered in 11 Languages

In order to support GLOBE's vibrant international community, GLOBE materials have been translated into multiple languages – and placed in one easy-to-find spot on the website (under "Do GLOBE"). Languages that some GLOBE materials have been translated into include Arabic, Chinese, French, German, Greek, Korean, Mongolian, Portuguese, Russian, Spanish, and Vietnamese! (If you are interested in translating GLOBE materials, please send an email to at help@globe.gov.)

Enhanced GLOBE Cloud Protocol Goes Live

Now that the enhanced GLOBE Cloud Protocol is live, it's time to join the NASA and GLOBE science teams in taking a new look at clouds – from the ground and from space! New observation and data analysis skills have been added for you to explore and master (as an optional enhancement to the work you are currently doing). Thanks to the newly enhanced protocol, you can now provide additional information that scientists and the GLOBE community can use to compare with satellite data! Visit the GLOBE Teacher's Guide section of the website and download the protocol – then touch the clouds!

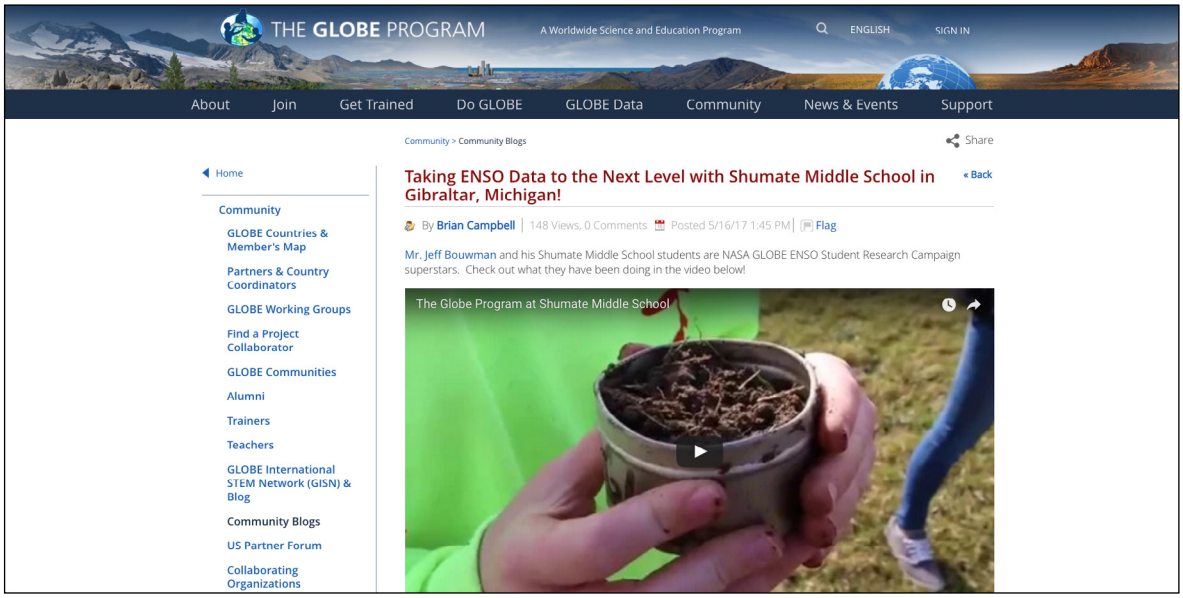
New "Events to Campaigns" Checklist – Ready to Go?

Thanks to input from the GLOBE community, the Working Groups, and NASA, the GIO is offering a new "GLOBE Events to Campaigns Spreadsheet." This document provides guidance and streamlines requirements for community-led efforts and ensures that community members know the processes involved in requesting and performing events, projects, and campaigns. (You can find this spreadsheet in many places on the website, but an easy place to remember to look is under "Events.")

Share Your GLOBE Story Via New Community Blog

In the ever-evolving use of the GLOBE website, and as a means to encourage more communication within the community, you, as a GLOBE member, are now invited to blog on the GLOBE website. Respectfully voice your opinion, ask questions, share tips and tidbits – and make meaningful connections with members of the community today! (The GLOBE Community Support Team has even recorded a demonstration video on how to create a blog post.)

In addition, GLOBE partners and Country Coordinators are now encouraged to share their local and national news and events with the region and possibly the larger community. It is hoped that this new system will inform more people of the incredibly valuable work that all the community does for, and with, GLOBE.



Section III – Community Highlights

As always, GLOBE would like to thank all of the members of our vibrant – and varied – worldwide community for helping us continue to develop and expand our scientific, educational, and experiential boundaries. The following are but a few of our community and regional highlights.

2016 Annual Meeting and Student Research Experience Highlights

In July 2016, more than 200 participants from 31 countries climbed to new heights to help celebrate the GLOBE community in Estes Park, Colorado, USA, for the 20th GLOBE Annual Meeting and 4th Student Research Exhibition (during which the students engaged in a natural and scientific journey across the high-mountain landscape of the Estes Park Environmental Center in Rocky Mountain National Park). The theme of the 2016 Annual Meeting was “Celebrating the GLOBE Community.”

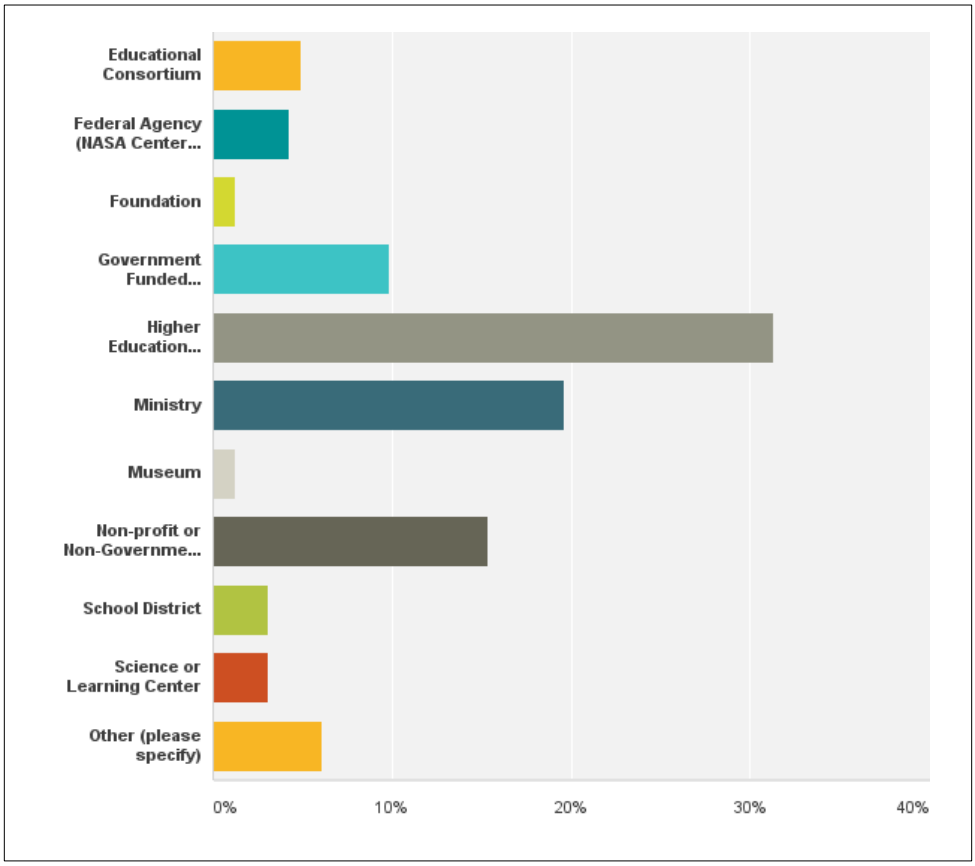
GLOBE/Peace Corps

In late 2016, NASA Administrator Charles Bolden and Peace Corps Director Carrie Hessler-Radelet signed a Letter of Intent for The GLOBE Program at NASA Headquarters in Washington, D.C. The Letter of Intent strengthens the collaboration between NASA and the Peace Corps through GLOBE – and makes GLOBE resources accessible to Peace Corps volunteers, connects GLOBE Country Coordinators with Peace Corps staff, and highlights projects that leverage GLOBE.

The GLOBE Annual Survey

The Annual Survey, distributed each year, is one of GLOBE's primary data-collection tools – providing invaluable input from community members. In June 2016, the Summary of the 2015 GLOBE Annual Survey was issued online. Here are a few highlights:

- Approximately one-third (32.9 percent) of respondents described their partnership as "Higher Education" (university or college).



- Respondents most frequently reported working with public schools (93 percent), and secondary grade levels (grades 7-9).

- Similar to previous years, respondents who completed the survey indicated that the highest priority for them is providing training or training new teachers.

- Among the protocols, atmosphere protocols were used "almost all of the time" by over 50 percent of the survey respondents.

- Close to 60 percent of survey respondents reported being involved in a collaborative GLOBE-related project, with the majority of collaborations with other GLOBE partners.

- Over 75 percent of survey respondents reported that they participated in at least one GLOBE event last year. The most popular among GLOBE events were the regional meetings, receiving 46 percent of the responses. GLOBE webinars and the GLOBE Annual Meeting were also popular events, each receiving over one-third of the responses.

In 2017, discussions will occur about possible alignment of the Annual Survey with the new GLOBE Strategic Plan.

Africa Region Highlights

2017 REGIONAL MEETING

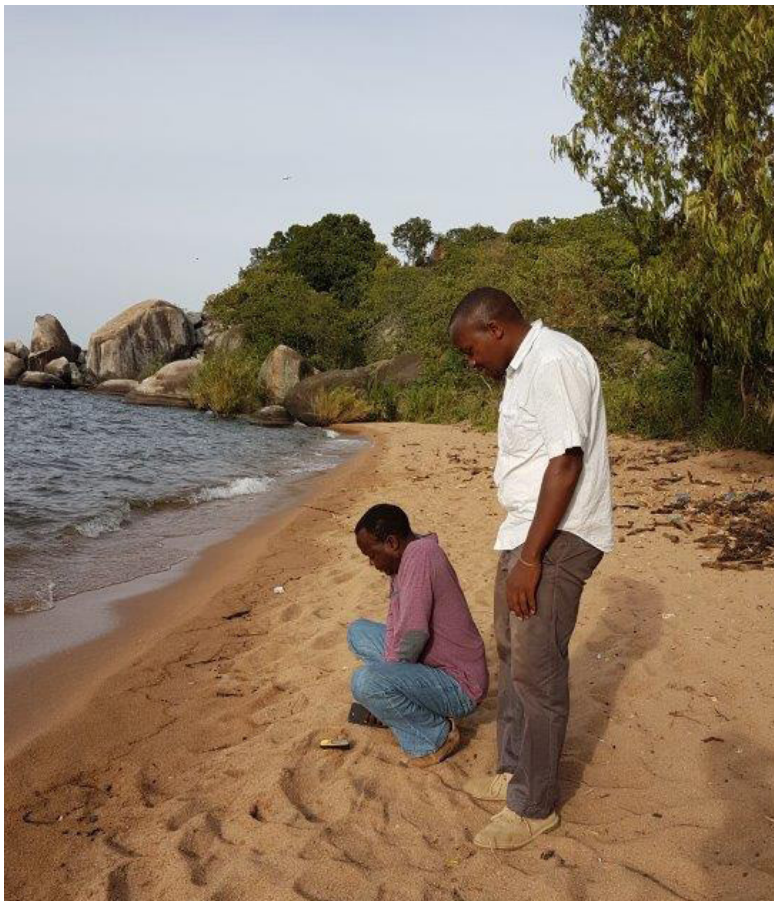
In February, the 2017 Africa Regional Meeting, followed by a teacher's training workshop, was held in Cotonou, Benin. Participants from six countries (Senegal, Niger, Nigeria, Togo, Benin, and South Africa) attended the event. The objective of this meeting was to work towards greater participation, cooperation, collaboration, and innovation to strengthen The GLOBE program in the Africa region.
In addition to GIO Director Dr. Tony Murphy, RCO Director Mark Brettenny, and the Regional Alumni Representative Ylliass Destin Lawani (Benin), most of the West African Country Coordinators attended this event. The meeting started with a welcome to participants, and greetings and opening remarks from Mark Brettenny, who pointed out the presence of participants from Niger (after a long absence) and TAHMO (Trans-African Hydro-Meteorological Observatory), who will later train teachers in Benin regarding the automated weather stations.

After the regional meeting, a three-days GLOBE/TAHMO Workshop was held at the SOS Children's Village and the University of Abomey Calavi. Participants from 21 schools and university laboratories attended this workshop. During this time, participants visited various faculties at the local university and also met with two GLOBE alumni (now lecturers and researchers at universities and institutes).

SCIENCE

Lake Victoria Learning Expedition

Teachers, students, and scientists travelled and visited the water bodies in the Great Rift Valley, where they – and participants from local schools – were trained in various GLOBE protocols. The emphasis was on hydrology and the quality of the water bodies.



EDUCATION

School Visits

During the year, Mark Brettenny visited the three GLOBE countries that boarder Lake Victoria: Uganda, Tanzania, and Kenya. During these visits, he trained teachers from the various schools. At these trainings, teachers and students were also supplied with the LabQuest Probeware (thanks to the sponsorship of YLACES). The hydrology equipment was given to the Country Coordinators who, in turn, distributed them to the schools.

COMMUNITY

School Visits

During the expedition to Lake Victoria, the team visited various schools in the region. All of the schools were boarding communities that housed between 1,200 and 1,500 students. Scientists encouraged the headmasters, students, and teachers to pursue their education. Participants indicated that GLOBE "opened their eyes" to their paths of study and to their potential careers.

GLOBE ALUMNI NETWORK

Corps of Volunteers

The GLOBE Alumni Network (established in 2005) is a corps of volunteers who support and assist GLOBE partners in their country, and in their region, to further engage GLOBE students in inquiry-based research opportunities. GLOBE alumni have proven to be self-sustaining groups in several GLOBE countries within the regions. A number of projects organized, or co-organized, by GLOBE alumni raised awareness of the alumni community and of The GLOBE Program in general. It is a key component in the revitalization and sustainability of The GLOBE Program in the region.

In February 2017, the GLOBE Alumni Center was established in Cotonou, Benin. This was a key step in the sustainability of the alumni organization in the world. It aims to create and sustain (in each of the 23 GLOBE countries in Africa) an expanding alumni organization, and to serve the Africa RCO in an advisory capacity.

Asia and Pacific Region Highlights

2016 REGIONAL MEETING

In January, the 2016 Asia and Pacific Regional Meeting was held in Chiang-Rai, Thailand. The event was attended by 27 participants from 12 countries (India, Thailand, Taiwan, Philippines, Republic of Korea, Palau, Micronesia, Nepal, Magnolia, Vietnam, Maldives, and Sri Lanka).

The main topics discussed during the meeting included a GLOBE program overview and updates, GLOBE national events (and how to encourage students and teachers to join the program), field campaigns (GPM, SMAP, ENSO), the new mosquito protocol, and trainings for GLOBE Country Coordinators. Strategies designed to strengthen alumni and scientist participation in the region were discussed at length.

SCIENCE

GLOBE Science Festival for Asia Pacific Region

In November (08-10) 2016, the Republic of Korea hosted the GLOBE Science Festival for the Asia Pacific Region in Seoul. The event was organized along with the Annual Conference of Korea Foundation for the Advancement of Science and Creativity (KOFAC), which is implementing The GLOBE Program in the Republic of Korea. The U.S. Ambassador in Korea, along with other dignitaries, addressed the KOFAC Conference.

The Science Counselor in Korea addressed the participants at the science festival. Dr. Tony Murphy gave a video address, which was appreciated by all. Participants included students and teachers from Nepal, Philippines, Thailand, Mongolia, India, and Korea. The event was attended by 130 participants. The teachers gave PowerPoint presentations, and students gave poster presentations. Based on a vote, selected posters were awarded prizes. The event was supported by KOFAC and the U.S. American Embassy.

EDUCATION

ISTEM Conference

In October 2016, the ISTEM Conference – hosted by GLOBE Thailand – was held in Bangkok. Along with this event, GLOBE Thailand organized the GLOBE Student Exchange Program. Participants from 12 schools in Thailand (80 students and teachers), three schools in Taiwan (12 students and teachers), and four schools in India (18 participants, including RCO participation) attended the event. Dr. B.C. Sabat, a GLOBE Education Working Group Member, also attended the event. There were 18 projects (posters) displayed, and there were a large number of visitors present to discuss the projects with the students, including participants from the conference (which was attended by nearly 700 participants).

GLOBE Teacher's Training in Magnolia

In May 2017, a training was conducted in Ulaanbaatar, Magnolia. The event was attended by teachers from different schools in Ulaanbaatar. The training materials were translated in the Mongolian language. GLOBE instruments were distributed during the training, including such items as pH meters, TDS meters, soil color charts, cloud charts, and soil charts. This was the first GLOBE event held in Mongolia. The RCO provided two trainers for this workshop.

GLOBE Teacher's Training in South Korea

In May 2017, a training was conducted in Seoul, South Korea. Teachers from different schools in Seoul attended the event. The training materials were translated in the Korean language. GLOBE instruments were distributed during the training, including such items as pH meters, TDS meters, soil color charts, cloud charts, and soil charts. Field activities were also conducted.

GLOBE Teacher's Training in Vietnam

In May-June, 2017, a workshop was conducted in Hanoi, Vietnam. Teachers from different schools in Hanoi attended the event. Training materials were translated in the Vietnamese language. GLOBE instruments were distributed during the training, including such items as pH meters, TDS meters, soil color charts, cloud charts, and soil charts. This was the first event held in Vietnam, and was a great success.

COMMUNITY

GLOBE Students Science Research Exchange and World Wetlands Day

The GLOBE RCO for the Asia Pacific Region organized the GLOBE Students Science Research Exchange and World Wetlands Day (held from 31 January through 04 February 2017) in Bhubaneswar/Chilika. Eleven students and teachers from Thailand, 15 students and teachers from GLOBE Partner Taiwan, and 20 participants from India, attended the event. Dr. B.C. Sabat, a GLOBE Education Working Group Member, also attended the event. Research posters were displayed, and there were discussions held about the research with the students. Participants also collected data on hydrology at Chilika Lake. A few cultural visits were also part of the event.

Europe and Eurasia Region Highlights

2016 REGIONAL MEETING

In September, the 2016 Europe and Eurasia Regional Meeting was held at the University of Cologne, in Cologne, Germany. The event was attended by more than 30 Country Coordinators, teachers, trainers, and scientists from 18 European countries (Estonia, Croatia, Netherlands, Greece, France, Israel, Norway, Latvia, Macedonia, Ukraine, Finland, Kyrgyzstan, Switzerland, Poland, Belgium, Malta, Germany, Czech Republic, and Portugal).

Vice-Rector of the University of Cologne, Professor Herzig, and a representative from the U.S. Embassy, Darlene R. Ketten, welcomed the participants. GIO Director, Dr. Tony Murphy, presented highlights of the program and offered updates from the GIO. After that, Country Coordinators gave presentations on a variety of "good practices" of the program in their country.

Highlights from countries reflected the diversity of program implementation in the region. Country Coordinators also discussed their priorities for future development of the program in the coming year. Several topics resonated with the participants: citizen science, international school-to-school collaboration, implementation of GLOBE in school curricula, and the Phenology Campaign of 2016-2017.

Teachers, university students, and other members of the GLOBE community joined the group on the second day of the meeting for the presentation panel and for workshops focused on inquiry-based learning. Participants interacted with one another at the poster session and during the GLOBE trainings (which included atmosphere and climate, phenology, soils, the ENSO Campaign, and website training) and during the "Motivate and Attract Students to Science" workshops.

Sharing experiences, discussing ideas for GLOBE implementation, and planning collaboration were the core essentials of the meeting. The 2016 GLOBE Europe and Eurasia Regional Meeting motivated teachers to use GLOBE activities and other inquiry-based learning approaches in their schools.

SCIENCE

Student Phenology Campaign "Cherry Ukraine 2016"

The campaign gathered 448 students and 60 teachers from 60 educational institutions in 17 regions of Ukraine. (The observation period lasted from 01 April through 20 May.) In accordance with GLOBE protocols, students observed budburst and measured the length of leaves twice a week. At the same time, they collected data daily on solar noon air temperatures. Finally, students and teachers entered data to the GLOBE website.

Many participants noted that in 2016 the buds developed faster than they had the previous year due to the fairly warm April. Campaign "Cherry Ukraine" is important not only because students collect data that can help scientists to build possible climate models, but because it raises the awareness of the younger generation about climate change and its consequences for flora, fauna, and humanity.

2017 European Phenology Campaign

The European Phenology Campaign began in March 2017. It introduced a new smartphone application (GrowApp) designed to track the green wave of vegetation during the spring from the southwest (Spain) to the northeast (Russia) of Europe. It is also designed to observe plants changing over seasons, to make time-lapse videos, and to help students learn how plants react to climatic changes.

During the campaign, which continues throughout 2017 (until the leaves have fallen from the trees) students are encouraged to investigate six species that are common in Europe: beech, birch, hazel, oak, lime, and sour cherry. Along with taking pictures with the GrowApp, students follow the GLOBE protocols to monitor the greening-up and greening-down of the selected trees, as well as temperature and other characteristics. Teachers are able to attract students to phenology observations through learning activities that were developed in various countries and then made available in English for the community. The campaign is organized by GLOBE Netherlands, the GLOBE Program Europe and Eurasia Regional Coordination Office, and leading scientists, including Arnold van Vliet from the University in Wageningen. Phenology scientists involved in the campaign (from Netherlands, Croatia, and Czech Republic) will provide regular feedback to the schools about the seasonal changes that take place. GLOBE coordinators in 16 European countries will be contributing to the campaign.

EDUCATION

Aerosols in Europe Project – Final Workshop at Svalbard

Towards the end of October 2016, the project "Aerosols in Europe" culminated in a final workshop that was organized in Svalbard (Norway). Teachers and scientists from Norway, Croatia, Czech Republic, and Germany (altogether 35 participants) gathered to share their results from student research projects, to exchange experiences and benefits of cooperating with various schools from different countries, and to learn new information from the scientists.

The two-year project "Aerosols in Europe" was initiated, led, and supported by Karl Torstein Hetland, the GLOBE Country Coordinator of Norway. The students (ranging from 16 to 18 years old) from Norway and six other countries from the region established collaboration in the field of aerosols, climate, or air pollution. Scientists from the research center CICERO (in Oslo) provided the guidance for the student research projects.

Germany and Ghana Cooperation

In November 2016, the new weather station for Westphalian Senior High School (Oyoko, Ghana) was donated by the Gymnasium School Neuhaus in Paderborn, Germany. The weather station was installed on the rooftop of the new school, and various GLOBE teacher trainings were organized at the Oyoko school by Ylliass Lawani (Country Coordinator for West Africa from Benin), Emmanuel Adjei-Boadi, GLOBE alumni from Ghana, and Anna Heyne-Mudrich (Organizer for German GLOBE Schools and Environmental Education Organizations). The first data were collected during the training by participants and were reported to the GLOBE database. The hope is that the high school will soon be part of the Ghana weather net. "The African-European group plans to start the cooperation in 2017 and wants to bring together the students from different parts of Africa and from Europe," said Anna Heyne-Mudrich.

Learning Science with GLOBE in Ukraine

June 2016 was a busy month for GLOBE in Ukraine. Altogether, 60 students and teachers from all parts of Ukraine participated in the first-ever GLOBE Games in Ukraine. The event took place on the grounds of the National Ecology and Nature Center in the capital city of Kiev. During the three-day event, students, teachers, and scientists worked together in workshops (covering hydrology, botany, meteorology, water chemistry, astronomy, and other topics), science games, and other inspiring activities. Students presented the results of their GLOBE work during the year and, with the help of scientists, they learned about research fieldwork. After the workshop with scientists, student teams were able to test their knowledge in a fun science quest, while teachers learned about new tools and methods of environmental education. Students not only learned how to conduct practical research and present their research, but also experienced what it means to be a leader and what skills a modern scientist should acquire.

Teachers from 10 regions of Ukraine came to the Sumy Annual GLOBE Meeting. The event was organized by the National Ecology and Nature Center and the Sumy Regional Non-formal Education Center in the format of a conference – combined with GLOBE training. Teachers presented their work, shared experiences, and discussed ideas for GLOBE implementation. Teachers were trained in soil pH, freshwater macroinvertebrates, and biometry protocols. The scientists from Sumy National Agriculture University, Sumy State University, and Desniansko-Starohytskyi National Park accompanied the teachers; the event was supported by the Regional Department of Ministry of Education and Science of Ukraine.

COMMUNITY

Finland's Utajärvi Upper Secondary School Celebrates 20 Years with GLOBE

From 1996 through 2016, Finland's Utajärvi Upper Secondary School has been involved in The GLOBE Program – and has earned the rare distinction of having taken and reported environmental data, without fail, for twenty straight years. Using data from the school's Davis Automated Weather Station (Vantage Pro model), students and teachers take the automated data and enter the data manually into the GLOBE database and the school database. Daily, they record precipitation, temperature, pressure, wind, snow depth, and UV, with crews gathering the data even on weekends, holidays, and during summer vacation! This is a spectacular achievement. Very soon the school is set to achieve an astonishing milestone: 50,000 measurements!

On Friday, 26 May 2016, 50 students and 15 teachers and partners of Utajärvi Upper Secondary School gathered in UNESCO Rokua Geopark, Finland, to celebrate the remarkable achievement of 20 years of continuous participation in The GLOBE Program – and 20 years of continuous data collection. The celebration day proved to the community how the GLOBE vision has come true in Utajärvi. The students, teachers, and scientists have connected to observe and investigate the unique UNESCO Rokua Geopark area. Especially gratifying to the school community was the high level of enthusiastic experts who participated in the event, including the Deputy Chief of Mission, Mrs. Susan Elbow from the U.S. Embassy in Helsinki, and the GLOBE Finland Country Coordinator, Mrs. Taina Ruuskanen.

U.S. Ambassador to Switzerland Visits a GLOBE School at Uzwil, St.Gallen

On 05 December 2016, U.S. Ambassador Suzan LeVine (and her husband Eric LeVine) graced a GLOBE class and its highly active teacher, Markus Eugster, with a visit! They received an overview of The GLOBE Program from Juliette Vogel (the Switzerland Country Coordinator) and Ursula Frischknecht (Co-President, GLOBE Switzerland). During the visit, students presented on phenology research projects they had been working on during the previous growing season. Following this, Markus Eugster took everyone through a short introduction lesson on GLOBE weather and atmosphere.

The Ambassador was very impressed by all of the GLOBE activities, as well as with the student participation, especially in activities that concerned environmental studies linked to STEM. In this context, Juliette Vogel remarked: “We could perfectly show how GLOBE mission is adapted to this need.” Towards the end of the visit, the Ambassador gave a very interesting and dynamic speech on her career, her professional development, her responsibilities, and her activities as an Ambassador to Switzerland.

2017 GLOBE Europe and Eurasia Annual Photo Competition

During this competition, more than 600 pictures were sent by students from nine Europe and Eurasia Region countries. In these pictures, students captured their best moments with GLOBE, showing GLOBE study sites (along with the local environment). The 2017 GLOBE At My School Calendar presents winning pictures and provides an overview of the year’s GLOBE activities and International days related to environmental protection. The calendar was distributed to the regional Country Coordinators, who will pass it along to the awarded schools.

2016 GLOBE Games in the Czech Republic

The 2016 GLOBE Games, which took place in Czech Republic from 02-04 June, hosted 250 students, teachers, and scientists from the Czech Republic, Norway, Latvia, Poland, Slovakia, and Croatia. The event was organized by the TEREZA Educational Center in close cooperation with two GLOBE schools from the city of Karvina: Delnicka Elementary School and Technical High School of Karvina.

The student conference was opened with a video speech from GIO Director Dr. Tony Murphy. After the opening, student teams presented outcomes of their research projects in six parallel sessions (out of which, three were international). They were evaluated by STEM professionals and an audience consisting of other school teams. The feedback, and the discussion of results, was an important input to their yearlong work in The GLOBE program. Students from Latvia introduced their common project with an Estonian school regarding phenology observations, Polish teams addressed the audience with research based on hydrology observations. Teams from Norway and Croatia presented projects on measuring aerosols in Europe. After the conference, students attended workshops lead by scientists, where they conducted experiments and worked with special devices. On the last day, students enjoyed being outdoors during the field games, which took place in a former coal mining area. Students investigated the impact of mining on the landscape and ecosystems, as well as the process of recent revitalization.

GLOBE Estonia Celebrates 20 Years at Summer Learning Expedition

In August 2016, GLOBE Estonia celebrated 20 years of GLOBE! Approximately 130 participants from all over Estonia gathered at the annual Summer Learning Expedition (held in Voore, Estonia from 08-10 August).
This year's main focus was on the natural diversity of the area. U.S. Ambassador Brian Melville greeted the participants with kind words, recognizing the years of dedicated work that has been put into sustaining GLOBE activities in Estonian schools. During the three days, students learned about the local environment under the guidance of scientists. They learned how to follow GLOBE protocols and, after that, they ventured out for a field excursion into the surrounding natural area to gather data for their research projects on eight different topics: plant coverage, water life, water chemistry, water plants, landscape, geology, carbon, and soil. Participants analyzed the data and put together a short presentation on what they had learned, which was presented at the very end of the event.

Latin America and Caribbean Region Highlights

2016 REGIONAL MEETING

In September, the 2016 Latin America and Caribbean (LAC) Regional Meeting was held in San Jose, Costa Rica. The event was attended by Country Coordinators, teachers, trainers, and scientists from 14 countries (Argentina, Bahamas, Bermuda, Brazil, Chile, Costa Rica, Dominican Republic, Guatemala, Mexico, Panama, Peru, Suriname, Trinidad and Tobago, and Uruguay). In addition, Julio C. Durand and Amalia Aubone from the LAC Regional Coordination Office (RCO) attended, as did GIO Director Dr. Tony Murphy and Cornell Lewis from SSAI (Science Systems and Applications, Inc.).

The meeting was hosted by the Omar Dengo Foundation (a non-governmental organization) and Virginia Aguilar, the Country Coordinator. Local authorities attended the opening, including: Ana Viria Hernandez (Deputy Country Coordinator) and Natalia Zamora (Director of Education, National Program of Educational Informatics MEP-FOD), who provided the opening address for the meeting. Sharon Thommas (U.S. Embassy) and Melania Odio (the National Academy of Arts), and Julio C. Durand and Amalia Aubone (LAC RCO) welcomed attendants. All of the Country Coordinators made presentations covering GLOBE activities conducted since the previous regional meeting (in Paramaribo, Suriname, in September, 2015). During the meeting, it was discussed that several countries have increased the number of GLOBE schools, including Bermuda, Brazil, Peru, Suriname, and Uruguay – thanks to local training.

Dr. Murphy provided a very complete presentation of The GLOBE Program, covering all of the work done in 2016 as well as updates of future work. He also highlighted his recent visit to South America, including Argentina, where he visited a GLOBE school, and Paraguay, where he announced a new Country Coordinator for that country. While in Costa Rica, he explained that he had visited a GLOBE school in Alajuela and that he'd had a chat with GLOBE students, as well as with Trainer Maria Auxiliadora Portuguez. In addition, Cornell Lewis (from SSAI) gave a session on how to ender data and on the new GLOBE Observer.

A preview of the Mosquito Larvae Protocol was performed by Master Trainers Marta Kingsland (Argentina), Claudia Caro (Peru), and Andrea Ventoso (Uruguay). It was conducted in Spanish, and Maria Lorraine Ruiz-Alma (Dominican Republic) did the live translation to English. The training ended with a dance on how to collect larvae. A visit to the Poas Volcano, whose crater is the largest in the world, was included, and soil experts helped in measuring the different types of earth layers.

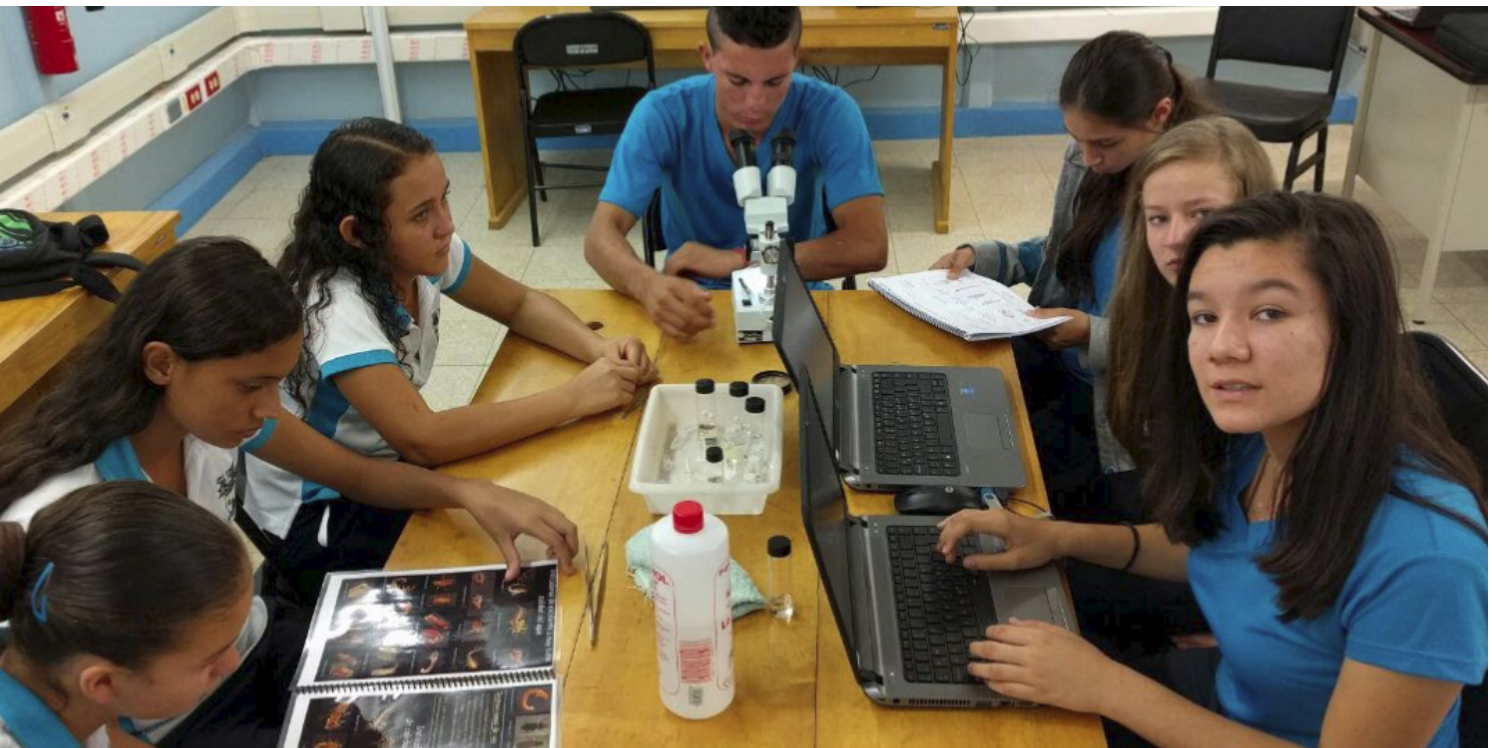
Several students and teachers from GLOBE schools attended the regional meeting. Students from the Liceo del Paraiso (San Jose) participated in national and international science fairs (and some have become local authorities, helping make decisions about the local environment). Participants from the Liceo San Rafael (Alajuela) presented about their main GLOBE activities, including learning about recycling to protect the environment. They also offered recommendations on water pollution levels of nearby rivers.

SCIENCE

Training Workshop at Universidad Latina, San Pedro

During this training, a local Science and Society Fair was conducted. On 31 August, Julio Durand (LAC RCO) also contributed with a presentation on social and education responsibilty. At the same time, a one-day workshop was conducted. Twenty-five teachers participated, and training on atmosphere and hydrology protocols were presented. There was also a Mosquito Larvae Protocol preview, with field work on the university campus.
Additional science-related highlights include:

- Argentina: CEI San Ignacio, Junin de los Andes, Northern Patagonia, offered a School Science Club, where students were able to work at a school lab.
- Chile: Academia Lincoln students built a photometer in Santiago. The purchase of instruments for the Coronel Eleuterio Ramirez School was supported by the Chilean Aeronautical Agency.
- Costa Rica: A GLOBE schools meeting was conducted in South Costa Rica
- Dominican Republic: A number of science fair research reports from Notre Dame School students (grades 06-11) were presented related to the topic “What does the concentration of nitrogen in fertilizer run-off show about the potential contamination of water sources?”



EDUCATION

Education-related highlights include:

- Argentina: A presentation on The GLOBE Program was presented at the Universidad Austral in March 2016. A two-day "train the trainer" workshop took place at the Colegio Marin (Province of Buenos Aires) in April 2016.
- Peru: An Atmosphere and Soil Training Workshop for teachers was held in Lima; it was conducted by Argentine Master Trainers Marta Kingsland and Oscar Busch in May 2016.
- Costa Rica: A workshop was held at the Universidad Latina covering atmosphere and hydrology protocols; it was conducted by Master Trainers Claudia Caro (Peru), Andrea Ventoso (Uruguay), Virginia Aguilar (Costa Rica), and Marta Kingsland (Argentina) in August 2016.
- Brazil: Two workshops for teachers and scientists of the Brasilia area were organized by the Brazilian Space Agency. Atmosphere and hydrology protocols were conducted by LAC Master Trainers Marta Kingsland (Argentina) and Claudia Caro (Peru) in June and November 2016.

COMMUNITY

Community-related highlights include:

- Costa Rica: Environmental education activities were conducted in Paraiso, Cartago; these were coordinated by Master Trainers Rocio and Vera Brenes Corrales from the Liceo de Paraiso School.
- Suriname: A workshop for children was held in the Brownsweg, Paramaribo urban area during the holidays, where a special summer atmosphere protocol training was conducted by GLOBE teachers.

Near East and North Africa Region Highlights

2016 REGIONAL MEETING

In November, the 2016 Near East and North America (NENA) Regional Meeting was held in Jordan at the Dead Sea. The event was attended by 50 participants, including Country Coordinators, teachers, trainers, and scientists from six countries (Lebanon, Bahrain, Saudi Arabia, Oman, Pakistan, and Jordan).

The ceremony for the event began when Her Royal Highness Princess Basmah Bint Ali arrived and welcomed participants. Salma Alzubi, the Regional Coordinator from the NENA Region, gave a welcome speech, as well as a brief overview of the event. A short film of the region's achievements was also played.

GIO Director Dr. Tony Murphy gave a short welcome to the attendants and Her Royal Highness. He offered a presentation of The GLOBE Program, and provided a short film that explained new protocols. U.S. Ambassador Tobias Bradford welcomed the attendants and discussed the role of the American Embassy in Amman, and the U.S. Department of State in supporting and encouraging The GLOBE Program.

Certificates were presented to all participating teachers and students (with the support of Ajyal Organization, and under the patronage of Her Royal Highness Princess Basmah Bint Ali). In addition, Mr. Abu Alsundos from the Royal Association for Red Sea Protection, gave a presentation about Eco-Schools in relation to The GLOBE program. Mrs. Israa Alturk talked about the law regarding environmental legislation and education. There was also a lively discussion regarding the program and how to incorporate GLOBE protocols into the curriculum. A meeting was also held for the attending Country Coordinators, where each gave an overview of their country's role and achievements in The GLOBE Program, as well as their future requests (including the desire for more science fairs, additional meetings with other Country Coordinators, and a newsletter that would be published every three months). There were also discussions regarding the Working Groups, as well as regarding the regional meeting in February.

SCIENCE

Student Conference

The NENA Regional Office organized a GLOBE student conference during which a regional research project competition was held. The research was of a high caliber; the teams used posters, PowerPoint presentations, and even interactive presentations to explain their projects. A panel of judges used well-defined rubrics to evaluate the work, and to select the top research displays. Eleven teams from four countries participated; the winners were given trophies for their efforts. Everyone received a Participation Medal as a form of encouragement.

Additional science-related highlights include:

- Jordan: In June 2016, a number of schools demonstrated their activities and work to celebrate the visit of Former NASA Administrator Charles Bolden to the country.
- Oman: In April, “Citizen Science” was the slogan used to describe the regional science fair and camp, which included five countries. During the event, students displayed their research projects and then completed trainings in various GLOBE protocols. Students also made videos to demonstrate their knowledge of GLOBE protocols.
- United Arab Emirates (UAE): During the visit of the Regional Coordinator of the UAE (on 08 February 2017), students from GLOBE schools worked through different GLOBE protocols in an outdoor gathering of students, teachers, and coordinators.
- Bahrain: A GLOBE science fair (“Future Scientists”) was conducted (under the patronage of the Minister of Education); it covered technology, engineering, and the environment.
- Saudi Arabia: GLOBE Saudi Arabia celebrated Earth Day by broadcasting different videos on the GLOBE website; the videos represented their work throughout the year.

EDUCATION

Education-related highlights include:

- NENA RCO: The NENA RCO conducted a number of training workshops for different groups throughout the year, including:
- a three-day workshop in Amman covering the five GLOBE study areas and data entry for the employees of the U.S. Consulate in Jerusalem;
- a training for Jordanian schools (in preparation for the NASA visit), which included all GLOBE protocols;
- a special training for a small group of schools covering hydrology for a joint project;
- a new protocol training for “Mosquito” and “Fire Fuel” given at a workshop during the regional GLOBE meeting; and
- a training covering data entry and the soil protocol for the participants of the first GLOBE student conference in the region.
- Oman: A training session was held for the students of the South Province during the celebration of Earth Day.
- Morocco: A teacher training workshop was held at the University of Mohammad covering a number of GLOBE protocols.

COMMUNITY

Community-related highlights include:

- Jordan: A parade was organized by local schools to celebrate Earth Day. This included environmental awareness activities and the distribution of GLOBE pins to students and governmental officials.
- Oman: Junior GLOBE students organized a GLOBE exhibition at the Batinah Governerate; they also met with the Governor.

North America Region Highlights

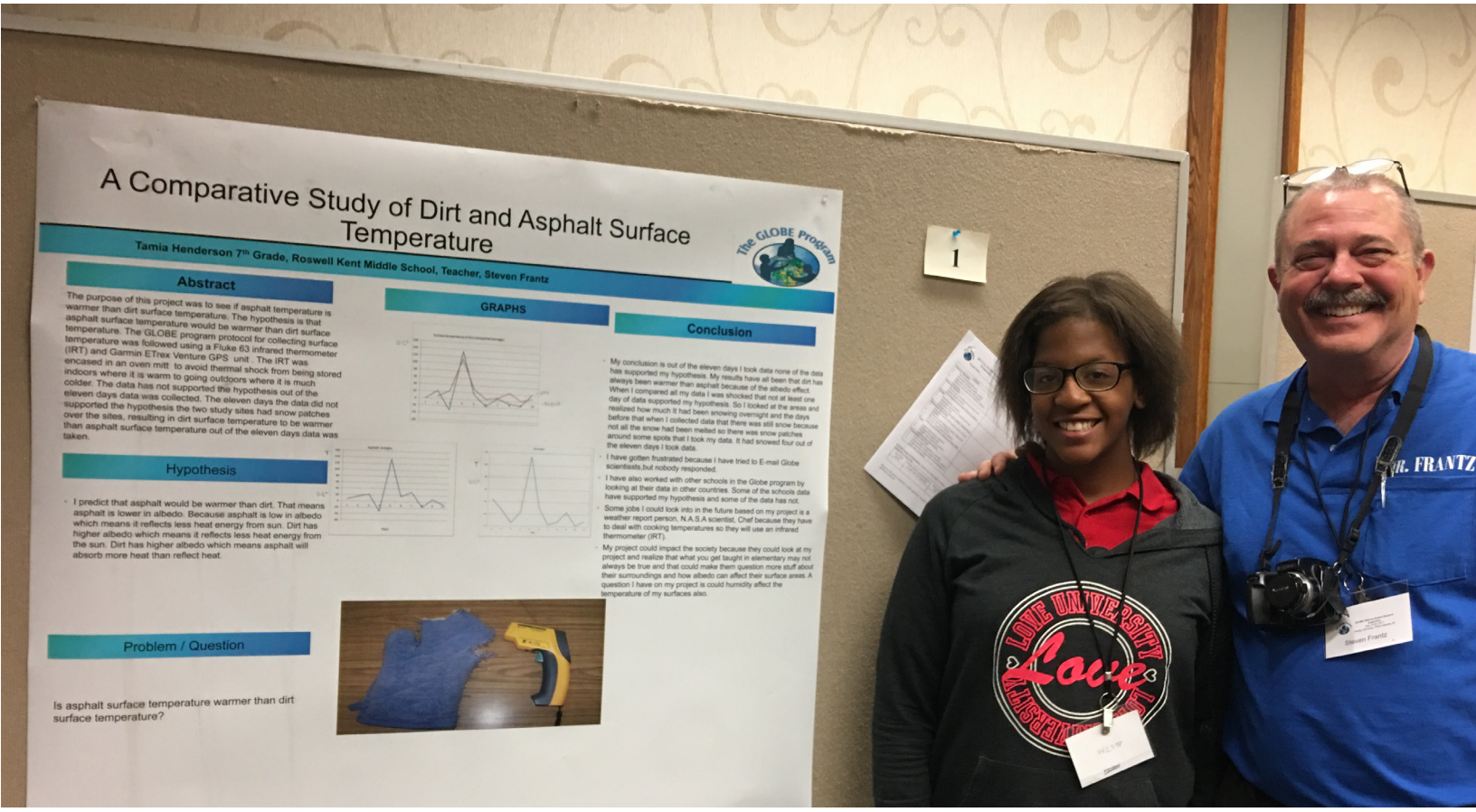
2017 REGIONAL MEETING

In January 2017, the North American Regional Meeting (NARM) and the annual Train-the-Trainer (TTT) took place in Fayetteville, Arkansas, USA. The event was attended by 43 U.S. GLOBE community members, representing 27 partnerships from 19 different states. Other participants included people from the GIO, SSAI, NASA Headquarters, and NOAA (National Oceanic and Atmospheric Administration).

The week started with the TTT: Biosphere and Earth Systems Science Using Field Investigations Workshop. During this event, there was a review of some of the biosphere protocol as well as two learning activities on the carbon cycle. The 33 participants from the TTT were joined by 10 additional U.S. partners for the NARM. Welcoming remarks were offered by the host, Lynne Hehr. After that, Dr. Lin Chambers (NASA Program Manager), John McLaughlin (NOAA), Dr. Tony Murphy, and Jen Bourgeault shared the current status of GLOBE – programmatically, internationally, and nationally.

The meeting used a technique called “Lightning Talks,” where participants were given six minutes to share a topic. There was then discussion time, where participants could attend and learn more from the presenters. Topics included: GLOBE Measurements and the Solar Eclipse (Steve Edberg); Learning Expedition Model (Anne Lewis); GLOBE Teacher Outcomes (Sherry Herron); Remotely-sensed Data and Geospatial Technologies (Mike Jabot and John Moore); Weather and Climate Modules (Lynne Hehr); GLOBE in 21st Century Community Learning Centers (Tina Harte); The ARENS Project (Dave Bydlowski); Zoom for Student Collaboration (Kevin Czajkowski and Mission Earth); NOAA Resources (John McLaughlin); and Global Data Math Activity (Teresa Ellis-Stevenson).

Participants were also trained in the expanded cloud protocol; they also learned about STEM equity and inclusion, mosquitoes, and new enhancements to the website. The U.S. Partner Forum (representatives from each of the six U.S. geographic areas) also met briefly to discuss the Student Research Symposia happening in their areas.



Science Fair	Location	Date (2016)	Projects	Students	Partners	States
Northeast & Mid-Atlantic	NASA Goddard, Greenbelt, MD	March 10-11	12	30	8	7
Pacific	NASA Jet Propulsion Lab, Pasadena, CA	April 29-30	7	16	5	2
Southeast	Museum of Natural Science, Jackson, MS	May 5-6	6	20	4	3
Midwest	University of Toledo, Toledo, OH	May 13-14	23	37	4	3
Northwest	World Forestry Center, Portland, OR	May 20-21	8	20	4	3
Southwest	University of Texas – Tyler, Houston Engineering Center, Houston, TX	May 20-21	11	36	2	2

EDUCATION

Student Research Symposium

U.S. GLOBE held a series of six regional face-to-face science symposia in 2016. Over 160 students from around the country submitted 70 projects. There were three videos produced by GLOBE, featuring the student research demonstrated. In addition, many photographs and updates were posted to the GLOBE Facebook page.

COMMUNITY

Intensive GLOBE Partner Trainings

In an effort to help GLOBE partners focus on increasing diversity within the STEM fields, the NSF funded three (two in 2016 and one in 2017) five-day intensive GLOBE partner training workshops. In 2016, the workshops were held in Charlotte, North Carolina, USA, and Santa Fe, New Mexico, USA – with almost 50 participants from new and existing partners. The 2017 workshop was held in Boulder, Colorado, USA. Bootcamp sessions focused on STEM-equity, diversity, and inclusion, as well as on discussions regarding innovative ways to reach underrepresented and underserved communities. The Bootcamps also covered science protocol trainings, and served to assist new GLOBE partners in becoming familiar with The GLOBE Program and with the GLOBE website.

CANADA HIGHLIGHTS

Regional Workshops

In Canada, eight GLOBE-related workshops were conducted in 2016-2017 in Alberta, Yukon, British Columbia, and Montreal. Nearly 400 participants attended these events, including teachers, student teachers, school administrators, and K-12 students.

GLOBE Program Strategic Plan

In 2016, NASA conducted an independent review of The GLOBE Program. One of the recommendations of this external review panel was to revise the 2012-2017 GLOBE strategic plan. Based on this recommendation, the GLOBE Implementation Office (GIO) worked closely with the NASA GLOBE Program Office to identify a process for revising the strategic plan to guide GLOBE for the next five years. The following describes the process that was conducted to revise the strategic plan.

The GIO director convened a Strategic Planning Leadership Group to lead the process for conducting the revision. This group was composed of the GLOBE evaluator who has extensive experience in strategic planning and was involved in the development of the 2012-2017 plan. In addition, a senior advisor to the GIO director with experience in strategic planning, science education, who is also the director of the UCAR Center for Science Education, and a GLOBE Partner, was part of the group. This planning group outlined a revision process to be undertaken by key representatives of the GLOBE Community.

Next, representatives of the GLOBE community (Regional Coordination Office staff as well as Working Group Chairs) were invited to join the Strategic Planning Leadership Group to become the all-inclusive GLOBE *Community* Strategic Planning Team. In preparation for a face-to-face three-day meeting that would bring all these stakeholders together, the participants were asked to carefully consider the 2012-2017 strategic plan, and to come prepared to discuss the goals from that plan in light of where GLOBE should be in the next five years.

The Strategic Planning Meeting was held in Chantilly, Virginia on 4-6 April 2017 and three days of exhaustive discussions and guided activities ensued, resulting in a list of recommended goals and strategies for the future in the main programmatic areas: Education, Science, Community, Technology, and Communications.

Following the meeting, staff from L'evations, the selected facilitation company, compiled the voluminous notes from the meetings. The original Strategic Planning Leadership Group along with the GLOBE International Coordinator, GIO Communications Coordinator, US Country Coordinator, and the NASA GLOBE Program Manager reviewed the recommendations and feedback and shared that information with L'evations who then made further revisions.

Finally, the GLOBE evaluator streamlined the goals, strategies, and activities for consistency in language and the Strategic Planning Leadership Group prepared the final draft for NASA. The NASA GLOBE Program Office reviewed this document to ensure that the goals and strategies were consistent with strategic priorities. To solicit further feedback from the GLOBE Community Strategic Planning Team, a survey was distributed to the group focusing on the activities that align with the strategies, as well as with questions to identify responsible parties for the activities outside of GIO.

The DRAFT plan will be shared with the larger GLOBE community during the GLOBE annual meeting in New Haven Connecticut in July/August, 2017. After the annual meeting, performance metrics will be identified, finalized and the complete Strategic Plan will be posted to the GLOBE website.

Thanks to our GLOBE Partners around the world...

- Argentina
- Australia
- Austria
- Bahamas
- Bahrain
- Bangladesh
- Belgium
- Benin
- Bermuda
- Bolivia
- Brazil
- Bulgaria
- Burkina Faso
- Cameroon
- Canada
- Cape Verde
- Chad
- Chile
- Colombia
- Republic of the Congo
- Costa Rica
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Dominican Republic
- Ecuador
- Egypt
- El Salvador
- Estonia
- Ethiopia
- Fiji
- Finland
- France
- Gabon
- Gambia
- Germany
- Ghana
- Greece
- Guatemala
- Guinea
- Honduras
- Hungary
- Iceland
- India
- Ireland
- Israel
- Italy
- Japan
- Jordan
- Kazakhstan
- Kenya
- Republic of Korea
- Kuwait
- Kyrgyz Republic
- Latvia
- Lebanon
- Liechtenstein
- Lithuania
- Luxembourg
- Macedonia
- Madagascar
- Maldives
- Mali
- Malta
- Marshall Islands
- Mauritania
- Mauritius
- Mexico
- Micronesia
- Moldova
- Monaco
- Mongolia
- Montenegro
- Morocco
- Namibia
- Nepal
- Netherlands
- New Zealand
- Niger
- Nigeria
- Norway
- Oman
- Pakistan
- Palau
- Panama
- Paraguay
- Peru
- Philippines
- Poland
- Portugal
- Qatar
- Romania
- Russia
- Rwanda
- Saudi Arabia
- Senegal
- Serbia
- South Africa
- Spain
- Sri Lanka
- Suriname
- Sweden
- Switzerland
- Taiwan Partnership
- Tanzania
- Thailand
- Trinidad and Tobago
- Tunisia
- Turkey
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States of America
- Uruguay
- Vietnam

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