

20th GLOBE Annual Meeting

ESTES PARK, COLORADO, USA

16-21 JULY 2016

DETAILED PROGRAM

Saturday, 16 July 2016

- 8:00 am – 8:00 pm **Registration Open – Lobby/Lounge**
- 9:00 am – 4:30 pm **Working Group Committee Meeting – Ballroom**
- 6:30 pm – 8:00 pm **Opening Networking Event – Aspen Courtyard (outside venue)**

Beginning on Sunday, 17 July, registration will open at 7:00 am each day and will remain open until the conclusion of the last session each day.

Beginning Sunday, 17 July, continental breakfast will be served each morning from 7:00 to 8:00 am in the Aspen Courtyard (outside venue).

Social Media – Use #GLOBEInCO2016 when posting to your accounts.

Tech Support Schedule – Ballroom A

Technology Support will be available each day to assist with technology needs, work on website profiles, and informal meetings and networking sessions requiring technology.

Sunday	12:15 pm – 6:00 pm
Monday	10:00 am – 6:00 pm
Tuesday	8:30 am – 6:00 pm
Wednesday	8:30 am – 5:00 pm

Informal Meetings and Networking – Prefunction Area and Meeting Rooms as Assigned

Participants will be encouraged to use this space for meetings around emerging questions and issues. Informal conversations and networking is often the most valuable part of any conference. We are intentionally planning time and space for these meetings each day.

Exhibit Hall Schedule – Trail Ridge/Lake Estes

Sunday	12:15 pm – 6:00 pm
Monday	10:00 am – 6:00 pm
Tuesday	8:30 am – 6:00 pm
Wednesday	8:30 am – 5:00 pm
All exhibits must be removed by 10:30 am on Thursday	

Sunday, 17 July 2016

- 8:30 am – 10:00 am **Welcome and Opening of the Meeting Plenary – Ballroom**
Presenters: Deanna TeBockhorst, John Ristvey, Bill Kuo, Ming-Ying Wei, Brandon Jones, Christos Michalopoulos, Tony Murphy
Welcome to the 20th GLOBE Annual Partner Meeting and 4th Student Research Exhibition from local GLOBE Partners and Hosts, Director of UCAR Community Programs, NASA Program Manager, NSF Program Manager, NOAA Education Deputy Director and GIO Director.
- 10:00 am – 10:30 am **Break**
- 10:30 am – 11:30 noon **Report from GLOBE Working Groups – Ballroom**
Presenters: Tony Murphy, Nektaria Adaktilou, Kevin Czajkowski, Scott Graves
Moderator: Tony Murphy
Chairs of each of the four constituted Working Groups (Education, Evaluation, Science, Technology) report out on their work over the last year.
- 10:30 am – 12:00 noon **Students set up poster presentations – Lobby**
- 11:30 am – 12:15 pm **Keynote Address – Vector Borne Diseases – Ballroom**
Presenter: Mary Hayden, PhD, Research Applications Laboratory, NCAR
Vector-borne diseases (VBDs) continue to increase in scale and intensity worldwide. Despite concerted efforts to reduce VBDs, they still represent a heavy burden in developing countries and an emerging threat in developed countries. This presentation will focus on the threat posed by *Aedes aegypti*, the primary dengue and Zika virus vector in the Americas. Factors contributing to the risk of Zika virus emergence in the U.S. will be highlighted, and information on the current range of *Aedes aegypti* in the U.S. will be provided.
- 12:15 pm – 1:00 pm **Lunch – Aspen Courtyard**
- 1:00 pm – 1:30 pm **Students Meet and Greet – Columbine**
Presenters: Deanna TeBockhorst, John Ristvey
- 1:30 pm – 3:00 pm **Concurrent Sessions**
- Collaborating Satellite Missions & Campaigns – Panel Discussion – Ballroom**
Panelists: CloudSat, Peter Falcon; GPM, Dorian Janney; GOES-R, John Moore; SMAP, ICESat-2, AREN, El Niño & SMAP Brian Campbell; CALIPSO and CERES, Jessica Taylor
Moderator: Annie Richardson
Each of these panelists brings a NASA satellite mission to the GLOBE community through field

campaigns and data collection efforts focused on a better understanding of our planet. Panelists will discuss details about their satellites & missions with an opportunity for participant questions. Please note: If you would like to learn more about the specific protocols each of these supports see the **Protocol Demonstrations** session on Sunday 3:30 – 5:00 pm in the Ballroom and check the posted schedule for presenters at their exhibit tables in Trail Ridge.

Share-a-Thon with Elementary GLOBE – Blue Spruce/Big Horn

Presenters: Lynne Hehr, Becca Hatheway, Lisa Gardiner, Lin Chambers

Description: Have ideas about using and adapting Elementary GLOBE? Need ideas about using and adapting Elementary GLOBE? Join this interactive, fun share-a-thon. Showcase how you have been incorporating K-5 education resources into workshops for educators and learn how others are sharing Elementary GLOBE.

Results of the 2015-2016 GLOBE Teacher Survey – Columbine

Presenters: The Evaluation Working Group

In 2015, the Evaluation Working Group (WG) developed a survey for GLOBE teachers to determine how they implement and assess GLOBE in their classrooms. Working with the GIO to translate the survey into four languages, the survey was distributed via SurveyMonkey®. Evaluation WG members have analyzed the results and will present the analysis at this session. Learn how GLOBE teachers around the world use GLOBE and its learning resources in their classrooms.

3:00 pm – 3:30 pm **Break**

3:30 pm – 5:00 pm **Concurrent Sessions**

Protocol Demonstrations (CALIPSO, CERES, CloudSat, GPM, GOES-R, SMAP, Frost Tube) – Ballroom

Presenters: CloudSat, Peter Falcon; GPM, Dorian Janney; GOES-R, John Moore; SMAP, Brian Campbell (El Niño & ICESat-2); CERES and CALIPSO, Jessica Taylor

Facilitators: Deanna TeBockhorst, Annie Richardson

Each of the mission specialists will discuss and demonstrate the GLOBE Protocol that is associated with their mission.

SciGirls and GLOBE – Ballroom F

Presenters: Julie Malmberg, Sarah McCrea

SciGirls is an Emmy-award winning PBS Kids television series and educational resources that seek to change how kids think about science, technology, engineering, and math. This session will demonstrate how to integrate inquiry-based STEM instruction with a commitment to gender equity. Come learn about the latest research for engaging underrepresented populations in STEM; experience hands-on STEM activities; and learn how to incorporate research-based gender-equity strategies into your GLOBE resources including the SciGirls episode all about S'COOL!

Implementing Elementary GLOBE Aerosols – Blue Spruce and Big Horn

Presenters: Lynne Hehr, Becca Hatheway, Lisa Gardiner, Lin Chambers

Join this session to learn about aerosols educational resources including the newest Elementary

GLOBE storybook, *What's Up in the Atmosphere? Exploring Colors in the Sky*. Hands-on activities and aerosols data collection strategies for young learners will be the major focus. Also be a part of the discussion of how trainers have been bringing these new resources to teachers over the past year through professional development workshops.

6:30 pm – 8:00 pm **Student Research and GLOBE Community Exhibition – Lobby**
Stroll around and absorb information from the student research posters, learn how partners are implementing GLOBE in various countries. *Light refreshments will be served during this session.*

Monday, 18 July 2016

8:00 am – 9:00 am **Announcements, Informal Meeting Topics and Locations – Ballroom**

Welcome from the City of Estes Park

Presenter: Todd Jirsa, Mayor, Estes Park, Colorado

Appreciating the Critical Role of Science as We Celebrate the National Park Service Centennial

Presenter: Therese Johnson

The U.S. National Park Service (NPS) protects some of the most cherished resources and beloved places in the United States. As the NPS enters its second century, science will play an increasingly important role in improving our understanding of complex ecosystem and social changes, as well as informing management decisions. At the same time, improving the science literacy of citizens, including students and park visitors, is increasingly critical. Citizen science provides an exciting opportunity to bring research and education together to enhance resource stewardship. This talk will share on-going park research, including citizen science efforts, and explore links to broader landscapes and global interconnectedness.

9:00 am – 12:00 noon **STUDENTS/TEACHERS/CHAPERONES: Student Research Orientation, Schedule, Expectations, Protocols, Presentation Requirements – Blue Spruce**

Presenters: Deanna TeBockhorst, John Ristvey, Melinda Merrill

In the morning session students will be introduced to the student leaders, adult leaders and each other. You will learn about some of the current research going on at Rocky Mountain National Park. You will also learn about the Thursday morning presentation format.

9:00 am – 10:00 am **Plenary Sessions
What's New with Technology – Ballroom**

Presenter: David Overoye, Cornell Lewis

Learn about recently developed new features on the GLOBE website including eTraining and the new Data Access Tool. See new capabilities

which have been added to the GLOBE Visualization system. Learn about the new Citizen Science GLOBE Observer app and how to enter data. Finally hear about proposed new capabilities for the upcoming year, and provide your input and feedback.

eTraining – Certify in GLOBE Protocols Anytime, Anywhere – Ballroom

Presenter: Russanne Low

GLOBE's new eTraining Program was launched Earth Day, 22 April 2016. While designed for use by individual teachers seeking protocol certification so they can participate in GLOBE research with their classrooms; country coordinators, partners, and trainers are welcome to use these resources in their own GLOBE workshops and training events. In this session, we will host an information session and open discussion on the use of these resources and how interested GLOBE trainers and scientists can collaborate on future development of eTraining resources.

Undergraduate Research Project Findings – Ballroom

Presenter: Jodi Haney

Soil Moisture: From Within & Above Bowling Green State University
By: Bonnie Altstaetter, Logan Bretz, Emma Constance, Janelle Mangen, Kim Wheatley, & Beth Zeno. Six undergraduate students from Bowling Green State University investigated soil moisture collected in nine testing sites over an eight-week period. Volumetric soil moistures were compared to the NASA SMAP Satellite data and GLOBE soil oven and “bucket” drying methods were also compared. Findings revealed a similar trend between the local and satellite data and the GLOBE “bucket” drying method is an appropriate alternative.

10:00 am – 10:30 am **Break**

10:30 am – 12:15 pm **Concurrent Sessions**

Country Coordinator Discussion on International Developments and Collaboration – Ballroom

Presenters: Lyn Wigbels, Elise Nelson

Country Coordinators have an opportunity to learn about international developments in the Program and discuss topics such as implementation ideas, collaboration within and among regions, GLOBE Stars and STEM features, advertising events, and connecting with the regional coordinators.

US Partner Meeting – Columbine

Moderator: Jen Bourgeault

Jennifer Bourgeault, U.S. Country Coordinator, will provide a year-in-review and future plans which include: the regional science fairs, Eco-Schools, Elementary GLOBE and NARM. During this session, participants will begin a discussion on partner-driven initiatives and provide an opportunity to make arrangements for groups to meet during the Annual Meeting and beyond.

12:15 pm – 1:00 pm **Lunch** – Aspen Courtyard

1:00 pm – 3:00 pm **STUDENTS/TEACHERS/CHAPERONES: Student Research Orientation Continued. Team Building with Student Leaders – Blue Spruce**

Moderators: Deanna TeBockhorst, John Ristvey, Melinda Merrill

In the early afternoon, students will see a presentation of skulls, bones, and hides from fauna within Rocky Mountain National Park as well as complete an introductory activity using GLOBE data exploration and changes in elevation. Students analyze temperature data from two GLOBE sites in Germany as a way of observing how temperature changes with altitude. They learn that temperatures cool as a function of elevation, which is the scientific concept called lapse rate.

1:30 pm – 3:00 pm **Concurrent Sessions**

Integrating GLOBE and NASA Resources – Columbine

Presenters: David Bydlowski, AEROKATS and ROVER Education Network (AREN) (video presentation); Kevin Czajkowski, Mission Earth; Elena Sparrow, STEM Integration of NASA and GLOBE for Climate Change Education Learning; Holli Riebeek Kohl, Lin Chambers and Jessica Taylor, Citizen Science

Moderator: Tony Murphy

A number of GLOBE partners received NASA funding to increase the connections between GLOBE and NASA resources. The Principal Investigators of the teams will share an overview of their proposed work and outline the goals and objectives for their projects. Learn about how you can become involved in some of these projects.

GLOBE Science Fairs: A Discussion of the International Virtual Science Fair and Regional US Science Fairs – Ballroom

Presenters: Julie Malmberg, Matt Silberglitt, Peter Falcon

Join a panel discussion about the GLOBE International Virtual Science Fair including a review of the 2016 science fair, a discussion of the upcoming 2017 science fair, and how to tie in regional science fairs to the International Virtual Science Fair. Additionally, two representatives from the US Regional Science Fairs will discuss what worked and lessons learned for hosting a regional science fair.

Implementing GLOBE in your Classroom – Ballroom F

Presenters: Bill Meyers, USA; Thip-arpa Srivarangkul, Thailand; Vithiwat Raksaphakdee, Thailand; Paninee Voranetivudti, Thailand; Maria Auxiliadora Portuguese Campos, Costa Rica

Facilitator: Kristin Wegner

Implementing GLOBE in the classroom requires some planning and management of the learning situation. It can also involve a number of different strategies to increase student learning. This session will show how teachers from different countries are using GLOBE to meet their educational goals and standards.

3:00 pm – 3:30 pm **Break**

3:15 pm – 5:15 pm **STUDENTS/TEACHERS/CHAPERONES: GLOBE Data Activity:
Altitude – Blue Spruce**

Moderators: John Ristvey, Lisa Gardiner

In the late afternoon session students will learn about their investigations in Rocky Mountain National park including protocols and equipment. Group assignments will be made.

3:30 pm – 5:00 pm **Concurrent Sessions**

e-Training – Ballroom A

Presenters: Jodi Haney, Todd Toth, Doug Schnurrenberger

Moderator: Russanne Low

GLOBE's new eTraining Program was launched Earth Day, 22 April 2016. While designed for use by individual teachers seeking protocol certification so they can participate in GLOBE research with their classrooms; country coordinators, partners, and trainers are welcome to use these resources in their own GLOBE workshops and training events. In this session, we will host an information session and open discussion on the use of these resources and how interested GLOBE trainers and scientists can collaborate on future development of eTraining resources.

GLOBE in Your Country Panel – Ballroom F

Presenter/Country/Region: Charles Mwangi (Kenya) Africa, Pay-Liam (Taiwan) Asia/Pacific, Anne Lewis and Jen Bourgeault (US) North America

Moderator: Lyn Wigbels

Implementing GLOBE in Your Country: When a country joins The GLOBE Program, it decides how to implement the Program. In this session, Country Coordinators present how the Program is implemented differently in their countries. Come learn how the Program is individualized in different countries to meet its needs.

Equity and STEM – Columbine

Presenter: Janelle Johnson

Fostering an interest in STEM subjects among all students is something that GLOBE has been focused on for two decades. GLOBE's integrative, hands-on approach to learning about the natural world provides an anecdote to the growing crisis in education: the declining interest in, and mastery of, science and mathematics during the formative years. Studies show that students, irrespective of gender or race, lose interest in science at the elementary and middle school grades. By the time students enter high school, over 50 percent have lost an interest in STEM. Recent studies point to possibilities for improvement that can be made by facilitators.

6:30 pm – 8:00 pm **Free Evening with Optional Activities**

EcoChains Card Game – Ballroom

Players are environmental stewards of a sea within the Arctic Ocean. Players respond to forces of nature and humankind, and control the migration of species within their sea, aiming to create a diverse ecosystem. The goal is to sustain as many species as possible to preserve the valuable sea ice reserves necessary to support Arctic marine life.

Tuesday, 19 July 2016

- 7:45 am **Vans load for departure to Rocky Mountain National Park (PRIOR SIGN UP REQUIRED) – Main Parking Lot**
See investigation descriptions below (Activity 1,2,3 vans will depart at 8:00 am – Activity 4 will meet in Big Horn before loading into van and departing for the park.)
- 8:00 am **Students load baggage into vans and depart for Rocky Mountain National Park – Meet in Aspen Courtyard**
Students will return to the conference hotel at 4:00 pm on Wednesday.
- 8:00 am – 8:30 am **Announcements, Informal Meeting Topics and Locations – Ballroom**
- 8:00 am – 11:45 am **Investigations in Rocky Mountain National Park**
Prior Sign Up Required. Van transportation provided.

Activity 1: Freshwater Macroinvertebrates Protocol – Rocky Mountain National Park

Trainer: Mark De Gregorio and Park Rangers

GLOBE Master Trainer: Henry Ortiz

Participants will be guided by Rocky Mountain National Park education staff through the protocols of collecting macroinvertebrates. They will be guided in collecting, sorting, identifying and counting the macroinvertebrates at the field site.

Activity 2: Soil Characterization Protocol – Rocky Mountain National Park

Trainer: Mark De Gregorio and Park Rangers

GLOBE Master Trainer: Scott Graves

Participants will characterize the physical and chemical properties for each horizon in a soil profile. For each horizon, describe the structure, color, consistency, and texture.

Activity 3: Exploring the Effects of Wildfire on a Sub-Alpine Watershed Using GLOBE Protocols – Rocky Mountain National Park

Trainer: Cortney Butler

GLOBE Master Trainer: Andrew Warnock

In 2012, a lightning strike started the Fern Lake fire in Forest Canyon of Rocky Mountain National Park that lasted for three months. All of the area along the Cub Lake Trail was burned. Today, the average park visitor will not notice any signs of fire. In this session, we will use GLOBE protocols to look for lasting effects on the Forest Canyon and Moraine Park watersheds. The goal of this session will be to demonstrate how GLOBE protocols can be used to study local issues when field time with students is severely limited. Links to cultural relevance will also be discussed. The protocols we will use are: Water Transparency, Soil Characterization (Texture, Color, and Infiltration), Electrical Conductivity, and Dissolved Oxygen. Data will be analyzed and interpreted in the field. We will begin at the Cub Lake Trailhead and hike a total of two miles over easy to moderate terrain with frequent stops for measurements. We will follow park “leave no trace” guidelines. Sturdy hiking shoes, sunscreen, sun hat, sun glasses, light weight rain jacket, and water bottle are highly recommended.

Activity 4: When Plants Can't Breathe: Seeing Ozone Damage in Nature – Meet in Big Horn (then will board van and depart for Park at approximately 8:45 am)

Trainer: Danica Lombardozi, Kateryna Lapina, Becca Hatheway

Ground-level (“bad”) ozone is a serious pollution problem, negatively impacting human health and damaging plants. We planted gardens containing ozone sensitive plants in Boulder, CO. As ozone levels rise throughout the summer, the plants show visible signs of damage, providing a great learning opportunity for students to understand how the atmosphere is connected to biology. In this workshop you will learn how to identify ozone damage on plants. You will also learn how to collect data from an ozone garden, and tips on how to plant your own ozone garden at your school.

Mosquito Protocol (Half Day Session) – Blue Spruce

GLOBE Master Trainers: Mullica Jaroensutasinee, Elena Sparrow

Participants will walk to a nearby lake to learn about implementation of the new Mosquito Protocol. Concerns all over the world about mosquitos have increased alarmingly. The GLOBE mosquito protocol is one of the responses of the GLOBE community to such important issues while maintaining the safety of students when conducting this investigation. It is STEM in design and tested heavily in Thailand and many other places. Results of the student research using the protocol are also publishable in scientific journals and can be used in raising community awareness about the insects, and hence, the related diseases, which is very important in preventing the spreading of mosquito-borne diseases. Moreover, this protocol is also conducted in collaboration with many other climate-change related GLOBE protocols and missions, such as Atmosphere protocol, SMAP and GPM missions and many others. In this training, GLOBE master trainers will focus on the designs, the implementations of the protocol and related successful examples of student research investigations.

8:30 am – 10:00 am **Concurrent Sessions**

Equity and STEM – Ballroom F

Trainer: Janelle Johnson

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GLOBE Science School in the Netherlands – Columbine

Presenter: Matthijs Begheyn

In 2015 GLOBE Netherlands had set up a new system to intensify participation of GLOBE schools: the GLOBE Science School. Participating schools develop a GLOBE learning trajectory in which students do at least one GLOBE research project every year. In every school the trajectory is developed by a group of teachers from the subjects of science, physics, chemistry, biology and geography. During five sessions over a time span of one year GLOBE helps the school to develop this cross-curricular learning trajectory. Schools are willing to pay a fair price for the GLOBE support because it really helps them to improve scientific capabilities of students and professionalize teachers in the field of science. They get certified as a GLOBE science school at the end of the process.

10:00 am – 10:30 am **Break**

10:30 am – 12:00 noon **Concurrent Sessions**

African Expeditions Session – Kilimanjaro & Lake Victoria – Columbine

Presenter: Mark Brettenny

Kilimanjaro The Expedition is a collection of GLOBE students, alumni and scientists on a GLOBE Africa trek to the summit of Mt. Kilimanjaro, the tallest mountain in all of Africa, and the highest free standing mountain in the world. Students on the Expedition observe first-hand the shifting biomes and shrinking glaciers of Mt. Kilimanjaro. The Expedition contributes scientific measurements to compare with previous research on the mountain and will serve as a comparative baseline for future studies. GLOBE students assist scientists with their research while introducing the work being done to students around the world in real time, creating an authentic global classroom.

Lake Victoria is today seriously threatened due to receding water levels, soil and waste pollution, over-fishing, and a growing decline in the health of its ecosystems. As a result, the livelihoods and well-being of over 30 million people who live around its basin are at risk. Learners on the Expedition would be involved in taking measurements to ascertain water quality. Since there are a number of rivers that drain into the Lake Victoria basin it would be ideal to test the water from the various rivers. The plan would be to follow a selected river taking samples at different points and to see the effect that reclamation of swampy areas has on the lake in terms of water quality draining into it. The selection of the river to be followed will depend on the country hosting the expedition. This is because Lake Victoria is shared by a number of countries. This would provide an opportunity to rotate the expedition from one country to the other as the rivers are investigated.

Implementing GLOBE in your Classroom – Ballroom F

Presenters: Rueda Bataina, Jordan; Sandrine Larrieu-Lacoste, France; Eric Agrall, France; Marina Pavlic, Croatia; Charles Mwangi, Kenya

Facilitator: Julie Malmberg

Implementing GLOBE in the classroom requires some planning and management of the learning situation. It can also involve a number of different strategies to increase student learning. This session will show how teachers from different countries are using GLOBE to meet their educational goals and standards.

What’s New on the GLOBE Website – Ballroom A

Presenters: David Overoye, Cornell Lewis

Over the past year new tools and improvements became available to the GLOBE website, from data and visualization tools, to management pages. Learn what’s available through the website and get a brief tour on using them.

12:00 noon – 1:00 pm **Lunch – Aspen Courtyard**

12:45 pm **Vans load for departure to Rocky Mountain National Park (PRIOR SIGN UP REQUIRED) – Main Parking Lot**
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1:00 pm – 5:00 pm **Investigations in Rocky Mountain National Park**
Prior Sign Up Required. Van transportation provided.

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Trainer: Mark De Gregorio and Park Rangers

GLOBE Master Trainer: Henry Ortiz

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Participants will characterize the physical and chemical properties for each horizon in a soil profile. For each horizon, describe the structure, color, consistency, and texture.

Activity 3: Exploring the Effects of Wildfire on a Sub-Alpine Watershed Using GLOBE Protocols – Rocky Mountain National Park

Trainer: Cortney Butler

GLOBE Master Trainer: Andrew Warnock

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Activity 4: When Plants Can’t Breathe: Seeing Ozone Damage in Nature - Meet in Big Horn (then will depart for Park at approximately 1:45 pm)

Trainer: Danica Lombardozi, Kateryna Lapina, Becca Hatheway

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1:30 pm – 3:00 pm **Concurrent Sessions**

NASA Web Resources Presentations – Ballroom

Presenters: Peter Falcon, Annie Richardson

Earth Science Education and Communication Specialists, Annie Richardson and Peter Falcon of NASA’s Jet Propulsion Laboratory will showcase some of NASA's online resources geared towards students in K-12. NASA web resources and mobile apps will highlight NASA visualizations, global image data, educational activities, and augmented reality.

GLOBE Data Explorations – Columbine

Presenter: Lisa Gardiner

In this hands-on session we will explore a new suite of GLOBE Learning Activities that helps students explore GLOBE data as they build skills with analysis and interpretation of data and how to test a hypothesis using GLOBE data. These Learning Activities are adaptable for different levels of instruction – from upper elementary to high school learners. They are a way for students to start understanding what GLOBE data can tell them about the world. The activities were developed this year by the UCAR Center for Science Education, a GLOBE Partner, with input from science educators, GIO staff, and field test teachers.

GLOBE in University/Community College Setting – Ballroom F

Panelists: Kevin Czajkowski, Mike Jabot, Karl Schneider, Claudia Caro Vera, Russanne Low

Moderator: John Hehr

While GLOBE is seen mainly as a K-12 environmental education resource, universities and community colleges are also an extremely important part of The GLOBE Program. Join this panel of university researchers and professors as they discuss how they combine 1) research, 2) undergraduate and graduate education programs, 3) GLOBE partnerships, and/or 4) science training within the *higher* education realm of GLOBE. Open discussion will follow the panel presentation.

GLOBE International STEM Network (GISN) Presentation – Blue Spruce

Facilitator: Kristin Wegner

The GLOBE International STEM Network (GISN) has doubled in size over the past few years. In this session we will share results of a recent GISN member questionnaire, explore how GISN members and the GLOBE Community benefits from the network, and engage in an interactive discussion about how we can collaboratively move the GISN forward.

3:00 pm **Free Afternoon and Evening**

3:30 pm **Optional Trail Ridge to Alpine Guided Tour (Limited Seating – Van will load at 3:30 pm at Rocky Mountain Park Inn, main parking lot.)**

Presenters: Offered by Estes Park Shuttle at \$59 per person (Call 970-586-5151 to reserve a seat. Space is limited.)

Four-hour tour of Rocky Mountain National Park

6:30 pm – 8:00 pm **Optional Evening Activities**
The Martian movie – **Columbine**
Jeopardy Game – **Ballroom**
“Jeopardy!” is a classic game show – with a twist. The answers are given first, and the contestants supply the questions. Three contestants compete in six categories using clues about the GLOBE Program!

Wednesday, 20 July 2016

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Prior Sign Up Required. Van transportation provided.

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Trainer: Mark De Gregorio and Park Rangers

GLOBE Master Trainer: Claudia Caro

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Activity 2: Soil Characterization Protocol – Rocky Mountain National Park

Trainer: Mark De Gregorio and Park Rangers

GLOBE Master Trainer: Marta Kingsland

Participants will characterize the physical and chemical properties for each horizon in a soil profile. For each horizon, describe the structure, color, consistency, and texture.

Activity 3: Exploring the Effects of Wildfire on a Sub-Alpine Watershed Using GLOBE Protocols

Trainer: Cortney Butler

GLOBE Master Trainer: Andrew Warnock

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Activity 4: When Plants Can’t Breathe: Seeing Ozone Damage in Nature – Meet in Big Horn (then will board for Park at approximately 8:45 am)

Trainer: Danica Lombardozi, Kateryna Lapina, Becca Hatheway

Ground-level (“bad”) ozone is a serious pollution problem, negatively impacting human health and damaging plants. We planted gardens containing ozone sensitive plants in Boulder, CO. As ozone levels rise throughout the summer, the plants show visible signs of damage, providing a great learning opportunity for students to understand how the atmosphere is connected to biology. In this workshop you will learn how to identify ozone damage on plants. You will also learn how to collect data from an ozone garden, and tips on how to plant your own ozone garden at your school.

Mosquito Protocol (Half Day Session) – Blue Spruce

GLOBE Master Trainers: Mullica Jaroensutasinee, Elena Sparrow

Participants will walk to a nearby lake to learn about implementation of the new Mosquito Protocol. Concerns all over the world about mosquitos have increased alarmingly. GLOBE mosquito protocol is one of the responses of the GLOBE community to such important issues while maintaining the safety of students when conducting this investigation. It is STEM in design and tested heavily in Thailand and many other places. Results of the student research using the protocol are also publishable in scientific journals and can be used in raising community awareness about the insects, and hence, the related diseases, which is very important in preventing the spreading of mosquito-borne diseases. Moreover, this protocol is also conducted in collaboration with many other climate-change related GLOBE protocols and missions, such as Atmosphere protocol, SMAP and GPM missions and many others. In this training, GLOBE master trainers will focus on the designs, the implementations of the protocol and related successful examples of student research investigations.

8:30 am – 10:00 am **Concurrent Sessions**

Alternative Funding – Ballroom F

Panelists: Steven Frantz, Desh Bandhu, Dixon Butler, Mark Brettenny

Facilitator: Julie Malmberg

Join panelists to learn about interesting and innovative ways to find funding to run GLOBE activities. These panelists will share tips on finding funding including places to find funding and suggestions on what to include in proposals. Additionally, the panelists will share what they have learned after providing funding and reviewing proposals. A time for group discussion and brainstorming will be held at the end of the meeting time.

Phenology Campaign – Columbine

Presenter: Matthijs Begheyn

GLOBE Europe is preparing a phenology campaign that all GLOBE schools in the world can join. One of the parts of the campaign is that we are developing a new app that makes it possible to add phenology data to the GLOBE database and next to that make beautiful time lapse movies of plants that grow. So you will see the green-up and green-down as a real movie. The campaign will start in

the spring of 2017, but of course we want to prepare country coordinators and teachers already in Colorado! We have funding from the European Union and Dutch ministry of environment to develop this.

10:00 am – 10:30 am **Break**

10:30 am – 12:00 noon **Concurrent Sessions**

GLOBE Data Explorations – Columbine

Presenter: Lisa Gardiner

In this hands-on session we will explore a new suite of GLOBE Learning Activities that helps students explore GLOBE data as they build skills with analysis and interpretation of data and how to test a hypothesis using GLOBE data. These Learning Activities are adaptable for different levels of instruction – from upper elementary to high school learners. They are a way for students to start understanding what GLOBE data can tell them about the world. The activities were developed this year by the UCAR Center for Science Education, a GLOBE Partner, with input from science educators, GIO staff, and field test teachers.

Reflection on Adult Rocky Mountain National Park Experience – Ballroom F

Facilitator: John Ristvey, Deanna TeBockhorst

In this informal session, participants will reflect on the field investigations in Rocky Mountain National Park and discuss how the examples and lessons learned can be implemented in local settings.

12:00 noon – 1:00 pm **Lunch – Aspen Courtyard**

12:30 pm – 1:30 pm **The GLOBE Community Celebrates GLOBE @ 20 – Ballroom**

A sampling of videos made in all regions, throughout GLOBE’s anniversary year will be shown. Please enter and leave the ballroom quietly during this hour.

12:45 pm

Vans load for departure to Rocky Mountain National Park (PRIOR SIGN UP REQUIRED) – Main Parking Lot
See investigation descriptions below (Activity 1,2,3 vans will depart at 1:00 pm – Activity 4 will meet in Big Horn before loading into van and departing for the park.)

1:00 pm – 5:00 pm

Investigations in Rocky Mountain National Park
Prior Sign Up Required. Van transportation provided

Activity 1: Freshwater Macroinvertebrates Protocol – Rocky Mountain National Park

Trainer: Mark DeGregorio and Park Rangers

GLOBE Master Trainer: Claudia Caro

Participants will be guided by Rocky Mountain National Park education staff through the protocols of collecting macroinvertebrates. They will be guided in collecting, sorting, identifying and counting the macroinvertebrates at the field site.

Activity 2: Soil Characterization Protocol – Rocky Mountain National Park

Trainer: Mark DeGregorio and Park Rangers

GLOBE Master Trainer: Marta Kingsland

Participants will characterize the physical and chemical properties for each horizon in a soil profile. For each horizon, describe the structure, color, consistency, and texture.

Activity 3: When Plants Can't Breathe: Seeing Ozone Damage in Nature – Meet in Big Horn (then will depart for Park at approximately 1:45 pm)

Trainer: Danica Lombardozzi, Kateryna Lapina, Becca Hatheway

Ground-level (“bad”) ozone is a serious pollution problem, negatively impacting human health and damaging plants. We planted gardens containing ozone sensitive plants in Boulder, CO. As ozone levels rise throughout the summer, the plants show visible signs of damage, providing a great learning opportunity for students to understand how the atmosphere is connected to biology. In this workshop you will learn how to identify ozone damage on plants. You will also learn how to collect data from an ozone garden, and tips on how to plant your own ozone garden at your school.

1:30 pm – 3:00 pm **Concurrent Sessions**

Citizen Science Panel – Ballroom

Panelists: Holli Riebeek Kohl, Lisa Gardiner, Noah Newman, Sheri Potter

Moderator: Todd Toth

Panelists will discuss the GLOBE Program venturing further into the world of Citizen Science. Topics include the work to be done, discussions to have, and the greater outcomes to be had. The panelists bring a wide variety of background in Citizen Science to this discussion and have some interesting views on the path GLOBE should pursue to engage the Citizen Science community.

MY NASA DATA – Columbine

Presenters: Sarah McCrea, Jessica Taylor

Join us for a session on how to add satellite data comparisons to your current GLOBE protocol data collection. The MY NASA DATA project has paired NASA satellite data with the GLOBE protocols so you can take data collection and understanding to the next level. In this session, you will learn to use the live access server to produce custom data visualizations, and make data comparisons with the data that you are already collecting. Participants will leave with the materials and information needed to go back and start looking at their data right next to satellite data.

Reflection on Adult Rocky Mountain National Park Experience – Blue Spruce

Moderator: John Ristvey, Deanna TeBockhorst

In this informal session, participants will reflect on the field investigations in Rocky Mountain National Park and discuss how the examples and lessons learned can be implemented in local settings.

3:00 pm – 3:30 pm **Break**

3:30 pm – 5:00 pm **Concurrent Sessions**

GLOBE Observer: Opening GLOBE to Non-Student Citizen Scientists – Ballroom

Presenter: Holli Riebeek Kohl

In 2016, NASA expanded the GLOBE Program to accept environmental observations from non-student citizen scientists. The new citizen science component of GLOBE, called GLOBE Observer, allows anyone to submit GLOBE observations through an easy-to-use smart phone app. GLOBE Observer aims to build and strengthen the overall GLOBE community by: increasing the density of GLOBE data available for student and science research; improving access to GLOBE data for students and scientists; developing a strong community of GLOBE supporters outside the traditional education realm; and increasing science literacy among participants. This session will provide an overview of the expansion and will include a discussion of how partners might use GLOBE Observer to build GLOBE in their local communities.

Online Training Panel Presentation – Ballroom F

Panelists: Todd Toth, Dave Bydlowski (video presentation), Sheri Potter, Jennifer Hammonds

Facilitator: Kristin Wegner

Models for Online Training: What works, lessons learned and how you can do it. In this presentation, GLOBE Partners and Affiliates will share the various online GLOBE training models they have developed and implemented, such as a yearlong webinar series, Google Hangout videos, and incorporating GLOBE e-Training modules in an organizational Learning Management System (LMS). Presenters will share the “nuts and bolts” of their trainings, as well as some of their lessons learned and tips for setting up and implementing online training programs.

New GLOBE Cloud Protocol Matching Satellite Data – Columbine

Presenters: Sarah McCrea, Ann Martin

The NASA CERES Student Cloud Observations On-Line (S’COOL) Project has integrated with the GLOBE Cloud Protocol, creating a new Clouds Protocol for the GLOBE community! Session attendees will walk through the new and improved protocol, review complimentary learning activities, and explore the value of corresponding NASA satellite data. Attendees will experience the new hardcopy materials and reflect on content and implementation ideas. Be one of the first in the community to review this new protocol. We are excited to hear your input!

6:00 pm – 6:30 pm **Group Photo – Aspen Courtyard**

6:30 pm – 8:00 pm **Dinner and Keynote Address – Beyond the Globe: Turning Questions Into Discovery – Ballroom**

Presenter: Allison Barto, Ball Aerospace

Explore how science and engineering come together to envision and build the tools we need to enable future discovery.

Thursday, 21 July 2016

8:00 am – 8:30 am **Plenary Sessions – Ballroom
Announcements**

- 8:30 am – 10:00 am **Student Presentations - Ballroom**
Moderator: John Ristvey
 Round-Robin presentations in an exhibit format for adults to engage with students through conversations and descriptions and findings from investigations. A questioning guide for adults will be adapted to facilitate conversations.
- 10:00 am – 10:30 am **Break**
- 10:30 am – 12:00 noon **The Year Ahead with GLOBE – Ballroom**
Presenters: Tony Murphy, Ming-Ying Wei
- 12:00 noon **Box Lunch and Depart – Aspen Courtyard**
- 1:00 pm – 4:30 pm **Continuation of Working Group Meetings – Trail Ridge**
- 1:30 pm **Optional Trail Ridge to Alpine Guided Tour (Limited Seating – Van will load at 1:30 pm at Rocky Mountain Park Inn, main parking lot)**
Presenters: Offered by Estes Park Shuttle at \$59 per person (Call 970-586-5151 to reserve a seat. Space is limited.)
 Four-hour tour of Rocky Mountain National Park

