17th GLOBE Annual Partner Meeting

August 12-16, 2013

FROM SPACE TO PLACE:

From Eyes on Earth to Hands on GLOBE

The Marriott Inn & Conference Center, University of Maryland University College, and the NASA Goddard Space Flight Center, Maryland

The GLOBE Program is sponsored by the National Aeronautic and Space Administration (NASA) and National Science Foundation (NSF), and supported by the National Oceanic and Atmospheric Administration (NOAA) and Department of State (DoS). It is operated by the University Corporation for Atmospheric Research (UCAR) under NASA Cooperative Agreement NNX09AF27A.

Contents

ACKNOWLEDGEMENTS

A special thanks to those from the GLOBE and NASA communities leading sessions throughout the week. We would also like to thank the following individuals for their support and work to make this meeting possible.

17th Annual Meeting Organizing Committee

Todd Toth – NASA Goddard Space Flight Center, GLOBE Training Coordinator

Dr. Nektaria Adaktylou, GLOBE Science Committee, University of Athens, Greece.
Dr. Desh Bandhu, GLOBE Regional Office Coordinator, New Delhi, India.
Mr. Bill Batyck, GLOBE Country Coordinator, Alberta, Canada.
Dr. Dixon Butler, NASA/ADNET Systems, Inc.,Washington, D.C, United States of America (U.S.A).
Dr. Lin Chambers, NASA LaRC Science Directorate, and GLOBE Partner, NASA Langley Research Center, Virginia, U.S.A.
Dr. Kevin Czajkowski, GLOBE Partner, University of Toledo, Toledo, Ohio, U.S.A.
Ms. Poonam Das, GLOBE Teacher, Indira Ideal School Sr. Sec. School, New Delhi, India.
Dr. Mikell Lynne Hedley, GLOBE Trainer, University of Toledo, Toledo, Ohio, U.S.A.
Ms. Lynne Hehr, GLOBE Partner, University of Arkansas-Fayetteville, and GIAC Member, Arkansas, U.S.A.
Ms. Charissa Jones, GLOBE Assistant Country Coordinator for Green Heritage Fund Suriname, Paramaribo, Suriname.
Mr. John McLaughlin, National Oceanic and Atmospheric Administration, Washington D.C., U.S.A.
Dr. Olakunle Oladosu, GLOBE Teacher, Federal University of Technology, Akure, Nigeria.
Ms. Sunita Ray, GLOBE Teacher, Sai International School, Bhubaneswar, India.
Ms. Stephanie Stockman, NASA Science Mission Directorate, Education & Public Outreach Lead, Washington D.C., U.S.A.
Ms. Jessica Taylor, NASA LaRC Science Directorate, and GLOBE Partner, NASA Langley Research Center, Virginia, U.S.A.
Ms. Andrea Ventoso, GLOBE Country Coordinator, Ministry of Housing, Land Planning and Environment, National Directorate of Environment, Montevideo, Uruguay.
Dr. Do-Yong Park, GLOBE Partner, Illinois State University, Normal, Illinois, U.S.A.

Financial Sponsors

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*Hats and Bottles are provided courtesy of 3M Foundation in support of The GLOBE Program Annual Meeting. They are made from 100% recycled materials and the bottles are PBA free.

NASA Goddard Space Flight Center Team

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Ms. Winnie Humberson, EOS Project Science Office, Communications Senior Task Lead
Mr. Ryan Barker, EOS Project Science Office, Warehouse Manager
Ms. Heather Hanson, EOS Project Science Office, Science Writer
Ms. Deborah McLean, EOS Project Science Office, Senior Graphic Designer
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Ms. Terri Randall, Chief, Customer Service Office
Ms. Michelle Gordon, NASA Resource Analyst

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Dr. Thomas Bogdan, President, University Corporation for Atmospheric Research
Dr. Tony Murphy, GLOBE Program Director
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Ms. Dawn Wright, Administrative Assistant
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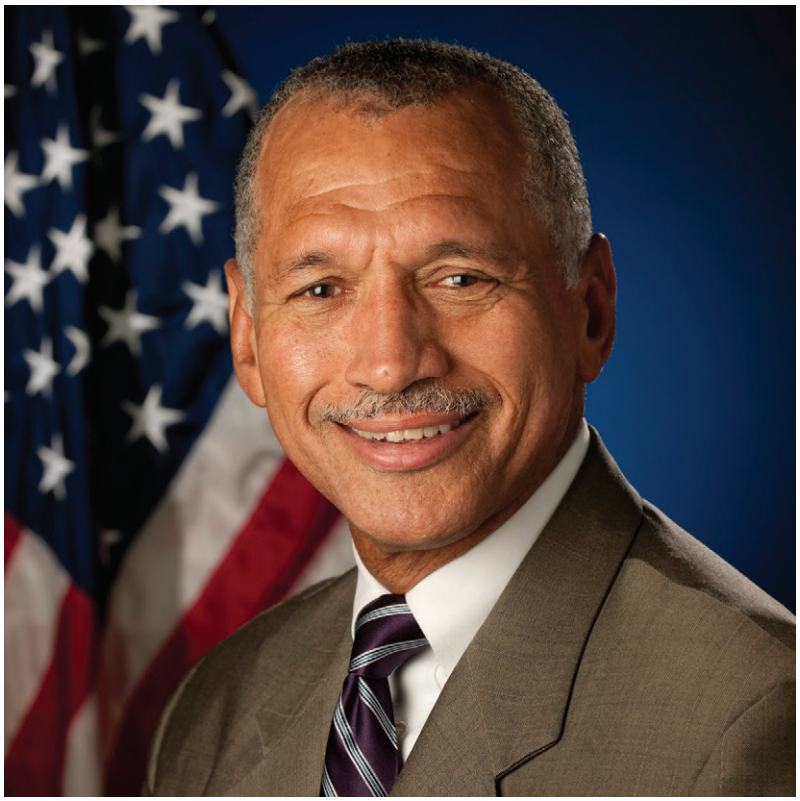
Exhibitors

Forestry Suppliers
National Aeronautics and Space Administration (NASA)
National Oceanic and Atmospheric Administration (NOAA)
National Science Foundation (NSF)
Vernier Software and Technology

FEATURED SPEAKERS

Charles F. Bolden, Jr.
NASA Administrator



Nominated by President Barack Obama and confirmed by the U.S. Senate, retired Marine Corps Maj. Gen. Charles Frank Bolden, Jr., began his duties as the 12th Administrator of the National Aeronautics and Space Administration (NASA) on 17 July 2009. As Administrator, he leads the NASA team and manages its resources to advance the agency's missions and goals.

Bolden's confirmation marks the beginning of his second stint with the nation's space agency. His 34-year career with the Marine Corps included 14 years as a member of NASA's Astronaut Office. After joining the office in 1980, he traveled to orbit four times aboard the space shuttle between 1986 and 1994, commanding two of the missions. His flights included deployment of the Hubble Space Telescope and the first joint U.S.–Russian shuttle mission.

Bolden earned a Bachelor of Science degree in electrical science in 1968 and a Master of Science degree in systems management from the University of Southern California in 1977. He was selected as an astronaut candidate in 1980. Bolden's NASA astronaut career included a wide array of technical assignments on land and in space. He was inducted into the U.S. Astronaut Hall of Fame in May 2006. In addition, his many military decorations include the Defense Superior Service Medal and the Distinguished Flying Cross.

Bolden knows the value of doing GLOBE firsthand. In 2010, he and officials from the U.S. Embassy visited the Water Classroom in Shree Yashodhara Boudha Secondary School, a GLOBE school in Lalitpur, Nepal. While there, he spoke with students whom he commended for taking steps to be the next generation of scientists and stewards of the Earth.

Dr. Joan Ferrini-Mundy

NSF Assistant Director for Education and Human Resources

Courtesy: NSF/Photo by Sandy Schaeffer

Dr. Joan Ferrini-Mundy is assistant director for the Education and Human Resources Directorate (EHR) at the National Science Foundation (NSF), a position she has held since February 2011. She serves as a member of the NSF senior management team and is involved in strategic planning and leadership for the scientific and education mission of NSF. Prior to her appointment as assistant director, she had served the foundation in a number of management capacities since 2007.

In connection with her agency-wide responsibilities, Ferrini-Mundy serves as NSF's science, technology, engineering and mathematics (STEM) workforce development goal leader for the Office of Management and Budget's Priority Goal Initiative. From 2007 through January 2010, she was a member of the National Science and Technology Council's (NSTC) Subcommittee on Education and currently serves on two task forces of the NSTC Committee on STEM Education. She is currently a member of the Mathematics Expert Group of the Programme for International Student Assessment (PISA), commissioned by the Organisation for Economic Cooperation and Development (OECD) and from 2007-2008, representing NSF, she served as an ex officio member of the president's National Mathematics Advisory Panel, and co-chaired its Instructional Practices Task Group.

Ferrini-Mundy holds an appointment at Michigan State University as a university distinguished professor of mathematics education in the departments of mathematics and teacher education. Her research interests include calculus teaching and learning, mathematics teacher learning and mathematics and science education policy at the K-12 level. Ferrini-Mundy holds a Ph.D. in mathematics education from the University of New Hampshire.

Dr. Michael Freilich

Earth Science Division Director

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Michael H. Freilich is the Director of the Earth Science Division, in the Science Mission Directorate at National Aeronautics and Space Administration (NASA) Headquarters. Prior to coming to NASA, he was a Professor and Associate Dean in the College of Oceanic and Atmospheric Sciences at Oregon State University. He received BS degrees in Physics (Honors) and Chemistry from Haverford College in 1975 and a Ph.D. in Oceanography from Scripps Institution of Oceanography (Univ. of CA., San Diego) in 1982. From 1983-1991 he was a Member of the Technical Staff at the Jet Propulsion Laboratory.

Dr. Freilich's research focuses on the determination, validation and geophysical analysis of ocean surface wind velocity measured by satellite-borne microwave radar and radiometer instruments. He has developed scatterometer and altimeter wind model functions, as well as innovative validation techniques for accurately quantifying the accuracy of space borne environmental measurements.

Dr. Freilich has served on many NASA, National Research Council (NRC) and research community advisory and steering groups, including the World Ocean Circulation Experiment (WOCE) Science Steering Committee, the NASA Earth Observing System (EOS) Science Executive Committee, the NRC Ocean Studies Board and several NASA data system review committees. He chaired the NRC committee on Earth Studies and served on the NRC Space Studies Board and the committee on NASA/National Oceanic and Atmospheric Administration (NOAA) Transition from Research to Operations.

His honors include the JPL Director's Research Achievement Award (1988), the NASA Public Service Medal (1999), and the American Meteorological Society's Verner E. Suomi Award (2004), as well as several NASA Group Achievement awards. Freilich was named a Fellow of the American Meteorological Society in 2004.

Leland Melvin

NASA Associate Administrator for Education

Leland D. Melvin, National Aeronautics and Space Administration (NASA) associate administrator for education, is responsible for the development and implementation of the agency's education programs that strengthen student involvement and public awareness about its scientific goals and missions. In this role, he leads the agency in inspiring interest in science, technology, engineering and mathematics (STEM) through NASA's unique mission, workforce, facilities, research and innovations.

Melvin currently serves on the White House National Science and Technology Council's Committee on Science, Technology, Engineering and Mathematics Education (CoSTEM). CoSTEM coordinates the STEM education activities and programs for all federal agencies, encourages the teaching of innovation and entrepreneurship as part of STEM education, reviews STEM education activities and programs to ensure they are not duplicative within the Federal government and develops and implements a five-year STEM education strategy for all federal agencies. He is the United States representative on the International Space Education Board (ISEB), a global collaboration in space education between NASA, the Canadian Space Agency, the European Space Agency, the Japan Aerospace Exploration Agency and the Centre National d'Études Spatiales. The ISEB share best practices and unites efforts to foster interest in space, science and technology among the student community worldwide.

Melvin began his NASA career in 1989 as an aerospace research engineer at the agency's Langley Research Center in Hampton, Va. He entered NASA's astronaut corps in 1998 and served as a mission specialist operating the robotic arm on two space shuttle missions to the International Space Station: STS-122 in 2008 and STS-129 in 2009.

Dr. Piers J. Sellers

NASA/GSFC Deputy Director for Science and Exploration

Dr. Piers Sellers is currently Deputy Director of the Science and Exploration Directorate at the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center (GSFC).

He was born and educated in the United Kingdom. "Since I was seven years old, I always wanted to be an astronaut," said Sellers. "I just thought the whole thing was interesting and fascinating… still do."

Educated at the University of Edinburgh and the University of Leeds along with pilot training at the Royal Air Force, Sellers came to NASA Goddard Space Flight Center in 1982 to design global climate models showing how the biosphere's living things interact with the climate system. He was involved in constructing computer models of the global climate system, satellite data interpretation and conducting large-scale field experiments in the USA, Canada, Africa and Brazil.

Sellers did not let citizenship get in the way of his dream of becoming an American astronaut. In 1991,he was officially recognized as a naturalized U.S. citizen. Soon after, he joined the NASA astronaut corps (1996) and flew to the International Space Station (ISS) in 2002, 2006 and 2010, carrying out six spacewalks and working on ISS assembly tasks: STS-112 in 2002, STS-121 in 2006 and STS-132 in 2010—one of NASA's last shuttle missions.

In 2011, Sellers returned to GSFC to serve as the deputy director of Goddard's Sciences and Exploration Directorate in order to continue his climate research.

In 2012, he accepted the coveted Order of the British Empire (OBE) medal for his service to science at an investiture ceremony at Buckingham Palace.

Christie Vilsack

USAID Senior Advisor on International Education

Christie Vilsack joined USAID as the Senior Advisor for International Education in March 2013. Christie will support USAID's Education Strategy goals to improve children's reading skills, strengthen workforce development, and provide equitable access to education in crisis and conflict settings.

Christie has committed her life to education and public service. For 25 years, she taught middle school, high school and college English and journalism. Her experience inside the classroom led to a career of community engagement as a teacher, an activist, as Iowa's First Lady, and most recently as a candidate for Congress.

Christie is a passionate and tireless advocate for education, literacy, and students around the world. In 2000, during her time as First Lady of Iowa, Christie Vilsack founded Stories

2000 (later named the Vilsack Foundation) with help from the Rotary Clubs of Iowa and raised over $1 million to mobilize resources and partnerships for children's literacy. She created a statewide reading initiative and successfully advocated for bills to promote early childhood education and funding for public libraries. She built partnerships with the Verizon Foundation and the National Center for Family Literacy to promote technology literacy for parents and their children, and served on the state and national boards of Reach Out and Read. From 2000-2007, as First Lady of Iowa, she spoke to hundreds of schools and civic organizations on the importance of reading, and visited over 500 libraries to promote their changing role in the 21st Century.

Born and raised in Mount Pleasant, Iowa, Christie is a 1972 graduate of Kirkland College in Clinton, New York, and received a master's degree in journalism from The University of Iowa in 1992. She and Tom Vilsack (Secretary of Agriculture since 2009) married in 1973, having met while students at Hamilton and Kirkland Colleges. They have two adult sons and two daughters-in-law Doug, married to Janet; and Jess, married to Kate. They also have two grandchildren.

Dr. Roger M. Wakimoto

NSF Assistant Director for Geosciences

Courtesy: NSF/Photo by Sandy Schaeffer

Dr. Roger M. Wakimoto is assistant director for the National Science Foundation's (NSF) Directorate for Geosciences (GEO). Wakimoto began his NSF appointment in February 2013.

Prior to coming to NSF, Wakimoto served as director of the National Center for Atmospheric Research (NCAR), which is sponsored by NSF. Prior to becoming NCAR director, he served as associate director for NCAR's Earth Observing Laboratory. Wakimoto is a geophysicist with expertise in tornadoes, thunderstorms and other types of severe weather.

"Roger brings to NSF significant depth and breadth of knowledge in the sciences GEO supports," said former NSF Director Subra Suresh at the time of Wakimoto's appointment. "His record of strong leadership will serve NSF and the scientific community well, given his outstanding work at NCAR and his dedication to basic research."

As the principal source of federal funding for university-based fundamental research in the geosciences, the GEO Directorate addresses the nation's need to understand, predict and respond to environmental events and changes and to use Earth's resources wisely. Basic research in the geosciences advances scientific knowledge of Earth's environment including resources such as water, energy, minerals and biological diversity. GEO-supported research also advances our ability to predict natural phenomena of economic and human significance, such as climate change, weather, earthquakes, fish-stock fluctuations and disruptive events in the solar-terrestrial environment.

Wakimoto was a professor in the Department of Atmospheric Science at the University of California, Los Angeles, where he chaired the department. He has written or co-authored more than 100 peer-reviewed papers and served on numerous committees, panels and boards for NSF, the National Academy of Sciences, the American Meteorological Society and other organizations. He has won numerous awards and honors, including a scientific and technical achievement award from the Environmental Protection Agency for observations of air pollution and the Meisinger Award from the American Meteorological Society in recognition of his contributions to understanding mesoscale weather events.

SUMMARY PROGRAM

Sunday, 11 August 2013

1:00 pm to 8:00 pm	Registration Open
8:30 am to 4:30 pm	Committee Meetings
5:30 pm to 8:00 pm	Welcome Reception, **Potomac Ballroom**

The Registration Desk will be open each day one hour before sessions begin.
Continental breakfast will be available each day one hour before sessions begin.

Monday, 12 August 2013

8:30 am to noon	Call to Order, Introductions, Welcoming Remarks, Keynote Address and Plenary Sessions, **Potomac Ballroom**
1:00 pm to 3:00 pm	Small group discussions (Session I)
1:00 pm to 3:00 pm	Student Research Presentations Session I (two parallel sessions)
3:00 pm to 3:15 pm	Refreshment Break
3:15 pm to 4:05 pm	Small group discussion (continued from Session I)
3:15 pm to 4:05 pm	Student Research Presentations Session II (continued – two parallel sessions), 3:35 p.m. Brainstorming about the upcoming 5Th GLOBE Learning Expedition (GLE)
4:10 pm to 4:25 pm	Small group discussion report out
4:25 pm to 4:45 pm	Overview of Tuesday and Thursday Training Sessions and Wednesday Parallel Sessions
5:30 pm to 8:00 pm	Student Research Exhibition and Partner Poster Presentations, **Hall of Distinction**

Tuesday, 13 August 2013

8:00 a.m. to 8:30 am	Logistics for the Day, **Potomac Ballroom**
8:30 am to 12:00 pm	Computer Labs and Hydrology Training-Marriott Conference Center
8:30 am to 9:15 am	Travel from Marriott Conference Center to Goddard Space Flight Center
9:15 am to 11:30 am	Field Training Sessions – Goddard Space Flight Center
11:30 am to 12:00 pm	Return to Conference Center
12:00 pm to 1:00 pm	Buffet Lunch
1:00 pm to 4:30 pm	Computer Labs and Hydrology Training-Marriott Conference Center
1:00 pm to 1:45 pm	Travel from Marriott Conference Center to Goddard Space Flight Center
1:45 pm to 4:00 pm	Field Training Session-Goddard Space Flight Center
4:00 pm to 4:30 pm	Return to Conference Center
5:30 pm to 8:00 pm	Student Research Exhibition and Partner Poster Presentations, **Hall of Distinction**

Wednesday, 14 August 2013

8:30 am to 8:45 am	Logistics for the Day, **Potomac Ballroom**
8:45 am to 9:45 am	Keynote Address: What Does it Take to Launch and Operate an Earth Observing Satellite?
9:45 am to 10:30 am	Education Strand Breakouts
10:30 am to 11:00 am	Refreshment Break
11:00 am to 12:00 pm	Science Strand Breakouts
12:00 pm to 1:15 pm	Buffet Lunch
1:00 pm to 4:15 pm	Special Student-Scientist Interactions
1:15 pm to 2:30 pm	Discussion Sessions by Role Breakouts

2:30 pm to 3:00 pm	Refreshment Break
3:00 pm to 4:15 pm	Discussion Sessions by Role Breakouts
5:45 pm to 7:30 pm	From Learning to Research (L2R) Working Dinner Meeting (dinner tickets available for sale ($61) at The GLOBE Program Meeting registration desk until 5:00 pm on Monday).
7:00 pm to 9:00 pm	Optional Tour of Goddard Laser Ranging Facility (prior sign up required. Board bus by 6:00 pm)
Evening	Dinner on your own. Optional Tour of Goddard Laser Ranging Facility

Thursday, 15 August 2013

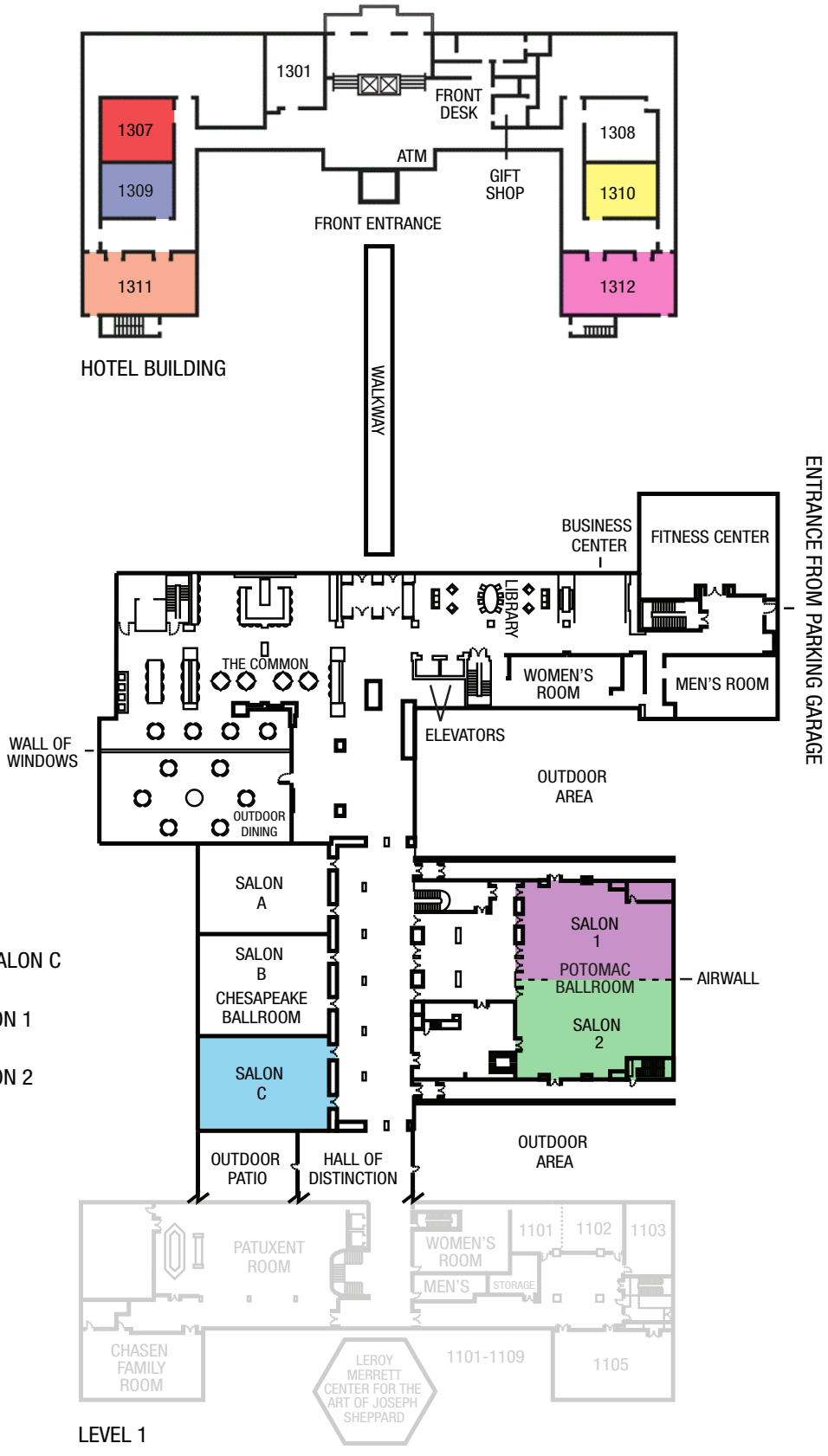
8:00 am to 8:30 am	Logistics for the Day, **Potomac Ballroom**
8:30 am to 12:00 pm	Computer Lab, and Soil Lab Training
8:30 am to 9:15 am	Travel from Marriott Conference Center to Goddard Space Flight Center
9:15 am to 11:30 am	Field Training Sessions – Goddard Space Flight Center
11:30 am to 12:00 pm	Return to Conference Center
12:00 pm to 1:00 pm	Buffet Lunch
1:00 pm to 4:30 pm	Computer Lab, Soil and Hydrology Lab Training
1:00 pm to 1:45 pm	Travel from Marriott Conference Center to Goddard Space Flight Center
1:45 pm to 4:00 pm	Field Training Session – Goddard Space Flight Center
4:00 pm to 4:30 pm	Return to Conference Center
6:30 pm to 9:00 pm	Group Dinner **Potomac Ballroom**

Friday, 16 August 2013

8:00 am to 8:30 am	Logistics for the Day, **Chesapeake Salon C**
8:30 am to 9:15 am	Travel from Marriott Conference Center to Goddard Space Flight Center
9:15 am to 11:30 am	Tour of Goddard Space Flight Center
11:30 am to 12:00 pm	Return to Conference Center
12:00 pm to 1:00 pm	Buffet Lunch
2:00 pm	Adjourn

HOTEL MAP

- ROOM 1307
- ROOM 1309
- ROOM 1310
- ROOM 1311
- ROOM 1312



- CHESAPEAKE BALLROOM SALON C
- POTOMAC BALLROOM SALON 1
- POTOMAC BALLROOM SALON 2

PROGRAM

Sunday, 11 August 2013

1:00 pm to 8:00 pm	Registration Open, **Pre-Function Area – Chesapeake Salon C**
8:30 am to 9:30 am	Combined Science and Education Advisory Committees Meetings, **Room 1311**
9:30 am to 12:00 pm	Science Advisory Committee Meeting, **Room 1311**
9:30 am to 12:00 pm	Education Advisory Committee Meeting, **Room 1307**
1:00 pm to 2:00 pm	Combined Science and Education Advisory Committees Meetings, **Room 1311**
2:30 pm to 4:30 pm	GLOBE International Advisory Committee (GIAC) Meeting, **Room 1307**
5:30 pm to 8:00 pm	Welcome Reception, **Potomac Ballroom**

Monday, 12 August 2013

7:30 am	Registration Open and Continental Breakfast Available
8:30 am to 8:50 am	Call to Order, **Potomac Ballroom** *Todd Toth, NASA Goddard Space Flight Center, Chair, Planning Committee* *Tony Murphy, GLOBE Program Director* *Tom Bogdan, UCAR President*
8:50 am to 9:10 am	Introductions and Recognition of Countries and U.S. States in Attendance *Mary Curtin, GLOBE International Coordinator* *Jen Bourgeault, GLOBE U.S. Country Coordinator*
9:10 am to 9:45 am	Welcoming Remarks *Charles F. Bolden, NASA Administrator* *Roger Wakimoto, NSF Assistant Director for Geosciences*
9:45 am to 10:15 am	Refreshment Break
10:15 am to 10:50 am	Keynote Address: From Eyes on Earth to Hands on GLOBE *Michael H. Freilich, NASA Earth Science Division Director*
10:50 am to 11:50 am	GLOBE International Advisory Committee (GIAC) Reports *Mark Brettenny, Africa Regional Help Desk Office and GIAC Chair*
11:50 am to 12:00 pm	Overview of Monday Afternoon Activities
12:00 pm to 1:00 pm	Buffet Lunch
1:00 pm to 3:00 pm	Small group discussions (Session I): -Country Coordinators, *Mary Curtin, GLOBE Program Office and Christine Bognar, International Programs Specialist, NASA,* **Room 1310** -U.S. Partners, *Jen Bourgeault, U.S. Country Coordinator,* **Room 1312** -Teachers, *Gary Randolph, GLOBE Program Office,* **Chesapeake Salon C**
1:00 pm to 3:00 pm	Student Research Oral Presentations Session I (two parallel sessions), *Jessica Mackaro, GLOBE Program Office and Dixon Butler, NASA,* **Potomac Salon 1** **Potomac Salon 2**
3:00 pm to 3:15 pm	Refreshment Break
3:15 pm to 4:05 pm	Small group discussion (continued from Session I): -Country Coordinators, *Mary Curtin, GLOBE Program Office and Christine Bognar, International Programs Specialist, NASA*, **Room 1310** -U.S. Partners, *Jen Bourgeault, U.S. Country Coordinator,* **Room 1312** -Teachers, *Gary Randolph, GLOBE Program Office,* **Chesapeake Salon C**

3:15 pm to 4:05 pm	Student Research Oral Presentations Session II (continued – two parallel sessions), *Jessica Mackaro, GLOBE Program Office and Dixon Butler, NASA,* **Potomac Salon 1** **Potomac Salon 2** 3:35 p.m. Brainstorming about the upcoming 5Th GLOBE Learning Expedition (GLE)
4:10 pm to 4:25 pm	Plenary Session, **Potomac Ballroom** Report out -Country Coordinators, *Mary Curtin, GLOBE Program Office* -U.S. Partners, *Jen Bourgeault, U.S. Country Coordinator* -Teachers, *Gary Randolph, GLOBE Program Office*
4:25 pm to 4:45 pm	Overview of Tuesday and Thursday Training Sessions and Wednesday Parallel Sessions
5:30 pm to 8:00 pm	Student Research Exhibition, **Hall of Distinction** Meet students and discuss their GLOBE Projects Light buffet will be served

Tuesday, 13 August 2013

7:00 am	Registration Open and Continental Breakfast Available
8:00 am to 8:30 am	Logistics for the Day, **Potomac Ballroom** -Review of training sessions -Introduction of session leads and trainers
8:30 am to 12:00 pm	Computer Labs D1: GLOBE Website for Partners and Trainers, *Cornell Lewis, Raytheon,* **Potomac Salon 1** D2: GLOBE Website for Social Media Capabilities, *David Overoye, Raytheon,* **Potomac Salon 2** D3: GLOBE Website Use in Teaching, *Marcy Burns, Main Street Intermediate School,* **Room 1312**
8:30 am to 12:00 pm	C1: Basic Hydrology Field Measurements, *Henry Ortiz, GLOBE California Partner,* **Hydrology Site 1, University of Maryland Pond (start in room 1310)**
8:30 am to 9:15 am	Travel from Marriott Conference Center to Goddard Space Flight Center
9:15 am to 11:30 am	Field Training Session **(All locations at Goddard Space Flight Center or Visitor Center Auditorium*. See Session Descriptions for additional detail.)** A1: Aeronet and Measurements of Aerosols, *Lin Chambers, NASA LaRC Science Directorate* **Building 33, Room E125 & Atmosphere Site 1 Building 33** A2: Air, Surface, Soil Temperature Measurements, *Bill Batycky, GLOBE Canada,* **Building 26, Room R180 & Atmosphere Site 2 Building 26** A3: GPM and the Outdoor Environmental Education Program GLOBE Project, *Karl Hetland, GLOBE Norway*, **Building 28, Room N270 the Skybox & Atmosphere Site 3 Building 28** A4: Cloudsat & Atmosphere Observations, *Todd Ellis, SUNY Oneonta*, **Building 28, Room W134 & Atmosphere Site 4 Building 28** B1: SMAP Mission and Soil Moisture & Characterization, Field, *Izolda Trakhtenberg, GLOBE Maryland Partner*, **Visitor Center Auditorium*** C3: Hydrology – Fresh Water Macroinvertebrates, *Peggy Foletta, GLOBE California Partner,* **Hydrology Site 2, Goddard Pond** E1: Investigating the Impact of Urban Development through GLOBE, *Kevin Czajkowski, GLOBE Ohio Partner, and Eric Brown De Colstoun, NASA* **Visitor Center Auditorium*** E2: Landsat 8 and Land Cover Measurements, Field, *Jennifer Bourgeault, U.S. Country Coordinator*, **Building 33, Room H120, Land Cover Site Building 33**
11:30 am to 12:00 pm	Return to Conference Center

* NASA Goddard Security Badge will not be needed to participate in sessions being held at the Visitor Center. Also, because security clearance is not needed, these sessions will begin 15 minutes earlier.

12:00 pm to 1:00 pm	Buffet Lunch
1:00 pm to 4:30 pm	Computer and Hydrology Labs C2: Advanced Hydrology Lab Measurements, *Henry Ortiz, GLOBE California Partner,* **Room 1310** D1: GLOBE Website for Partners and Trainers, *Cornell Lewis, Raytheon,* **Potomac Salon 1** D5: GLOBE Website: Student Zone, *Kristin Wegner, GLOBE Program Office,* **Potomac Salon 2** D7: Accessing Landsat Data, *Anita Davis, NASA Goddard,* **Room 1312**
1:00 pm to 1:45 pm	Travel from Marriott Conference Center to Goddard Space Flight Center
1:45 pm to 4:00 pm	Field Training Session **(All locations at Goddard Space Flight Center or Visitor Center Auditorium*. See Session Descriptions for additional detail.)** A2: Air, Surface and Soil Temperature Measurements, *Bill Batycky, GLOBE Canada,* **Building 26, Room R180 & Atmosphere site 2 Building 26** A3: GPM and the Outdoor Environmental Education Program GLOBE Project, *Karl Hetland, GLOBE Norway,* **Building 28, Room N270 the Skybox & Atmosphere Site 3 Building 28** A4: Cloudsat & Atmosphere Observations, *Todd Ellis, SUNY Oneonta,* **Building 28, Room W134 & Atmosphere Site 4 Building 28** A5: EOS Aura, Discover AQ, SAGE and GLOBE Ozone Measurements, *Jessica Taylor, NASA LaRC Science Directorate*, **Education Resource Center, 2nd Floor & Atmosphere Site 5 next to Visitor Center*** B1: SMAP Mission and Soil Moisture & Characterization – Field, *Izolda Trakhtenberg, GLOBE Maryland Partner,* **Visitor Center Auditorium*** C3: Hydrology – Fresh Water Macroinvertebrates, *Peggy Foletta, GLOBE California Partner*, **Hydrology Site 2, Goddard Pond** E1: Investigating the Impact of Urban Development through GLOBE, *Kevin Czajkowski, GLOBE Ohio Partner*, and *Eric Brown De Colstoun, NASA,* **Visitor Center Auditorium*** E2: Landsat 8 and Land Cover Measurements, *Jennifer Bourgeault, U.S. Country Coordinator,* **Building 33, Room H120, Land Cover site Building 33**
4:00 pm to 4:30 pm	Return to Conference Center
5:30 pm to 8:00 pm	Student Research Exhibition, **Hall of Distinction** Partner Activity Poster Exhibition, **Hall of Distinction** Meet students and discuss their GLOBE Projects. Light buffet will be served

Wednesday, 14 August 2013

7:30 am	Registration Open and Continental Breakfast Available
8:30 am to 8:45 am	Logistics for the Day, **Potomac Ballroom** -Review of strands and breakout sessions -Introduction of strand and session leaders
8:45 am to 9:45 am	Keynote Address: What Does it Take to Launch and Operate an Earth Observing Satellite? *Piers Sellers, NASA/GSFC Deputy Director for Science and Exploration*
9:45 am to 10:30 am	Education Strands -Earth System Science Poster Update, *Lin Chambers, NASA, LaRC Science Directorate,* **Room 1310** -International Scientist Involvement (GISN), *Jessica Mackaro, GLOBE Program Office,* **Potomac Salon 2** -GLOBE/US Science Standards Alignment, *Marcy Seavey, GLOBE Iowa Partner,* **Room 1312** -NASA Viz/iPad app and GLOBE, *Horace Mitchell, Scientific Visualization Studio NASA/GSFC,* **Potomac Salon 1** -Student Research Presentations Oral Session III, *Dixon Butler, NASA,* **Chesapeake Salon C**
10:30 am to 11:00 am	Refreshment Break

* NASA Goddard Security Badge will not be needed to participate in sessions being held at the Visitor Center.
Also, because security clearance is not needed, these sessions will begin 15 minutes earlier.

11:00 am to 12:00 pm	Science Strands -Global Precipitation Mission (GPM), *Dalia Kirschbaum, NASA/GSFC,* **Potomac Salon 1** -SERVIR Global by USAID and NASA, *Ashutosh Limaye, NASA,* **Potomac Salon 2** -Discover Air Quality, *Jim Crawford, NASA/LaRC*, **Room 1312** -Landsat, Terra and Aqua Ecosystem Research, *Karl Fred Hummrich, NASA/GSFC,* **Room 1310** -Soil Moisture Active and Passive (SMAP), *Bradley Doorn, NASA/HQ,* **Chesapeake Salon C**
12:00 pm to 1:15 pm	Buffet Lunch
1:00 pm to 4:15 pm	Special Student-Scientist Interactions, *Dixon Butler,* NASA, **Room 1312**
1:15 pm to 2:30 pm	Discussion Sessions by Role -Customizing Your GLOBE Account (All), *David Overoye, Raytheon,* **Potomac Salon 2** -Administering GLOBE Workshops on your Partnership Pages (Partners, Trainers), *Cornell Lewis, Raytheon,* **Potomac Salon 1** -Elementary GLOBE (Teachers), *Lynne Hehr, GLOBE Arkansas Partner,* **Room 1310** -How to evaluate inquiry-based learning, *Valerie Williams, GLOBE Program Office,* **Chesapeake Salon C**
2:30 pm to 3:00 pm	Refreshment Break
3:00 pm to 4:15 pm	Discussion Sessions by Role -Customizing Your GLOBE Account (All), *David Overoye, Raytheon*, **Potomac Salon 2** -Administering GLOBE Workshops on your Partnership Pages (Partners, Trainers), *Cornell Lewis, Raytheon, GLOBE Program Office,* **Potomac Salon 1** -GLOBE and Curriculum Integration (Teachers), *Julie Malmberg, GLOBE Program Office,* Panel Discussion, **Chesapeake Salon C** -Running GLOBE International Partnerships (Country Coordinators), *Karl Hetland, GLOBE Norway,* **Room 1310**
Evening 5:45 pm to 7:30 pm 7:00 pm to 9:00 pm	Dinner on your own -From Learning to Research (L2R) Working Dinner meeting open to all. Dinner tickets available for sale ($61) at The GLOBE Program meeting registration desk until 5:00 pm Monday. 5:45 pm Meeting – **Chesapeake Salon C** -Optional Tour of Goddard Laser Ranging Facility (Sign up at The GLOBE Program meeting registration desk. NASA Goddard Security Badge Required. Board bus by 6:00 pm)

Thursday, 15 August 2013

7:00 am	Registration Open and Continental Breakfast Available
8:00 am to 8:30 am	Logistics for the Day, **Potomac Ballroom** -Review of training sessions -Introduction of session leaders and trainers
8:30 am to 12:00 pm	Computer Lab and Soil Lab Training B2: SMAP Soil Moisture and Characterization Lab Measurements, *Izolda Trakhtenberg, GLOBE Maryland Partner,* **Room 1312** D3: Website Use in Teaching, *Marcy Burns, Main Street Intermediate School*, **Chesapeake Salon C** D4: Website Use in Data Access and Visualization, *Cornell Lewis, Raytheon,* **Potomac Salon 2** D6: Data Entry, *Jonathan Lang, GLOBE Program Office,* **Potomac Salon 1**
8:30 am to 12:00 pm	C1: Basic Hydrology Field Measurements, *Henry Ortiz, GLOBE California Partner,* **Hydrology Site 1, University of Maryland Pond (start in room 1310)**
8:30 am to 9:15 am	Travel from Marriott Conference Center to Goddard Space Flight Center

9:15 am to 11:30 am	Field Training Session **(All locations at Goddard Space Flight Center or Visitor Center Auditorium*. See Session Descriptions for additional detail.)** A1: Aeronet and Measurements of Aerosols, Field, *Lin Chambers, NASA LaRC Science Directorate*, **Building 33, Room A128 & Atmosphere Site 1 Building 33** A2: Air, Surface and Soil Temperature Measurements, *Bill Batycky, GLOBE Canada,* **Building 26, Room R180 & Atmosphere Site 2 Building 26** A3: GPM and the Outdoor Environmental Education GLOBE Project, *Karl Hetland, GLOBE Norway,* **Building 28, Room N270 the Skybox & Atmosphere Site 3 Building 28** A4: Cloudsat and Atmosphere Observations, *Todd Ellis, SUNY Oneonta,* **Building 28, Room W134 & Atmosphere Site 4 Building 28** C3: Hydrology – Fresh Water Macroinvertebrates, *Peggy Foletta, GLOBE California Partner,* **Hydrology Site 2, Goddard Pond** E1: Investigating the Impact of Urban Development through GLOBE, *Kevin Czajkowski, GLOBE Ohio Partner, and Eric Brown De Colstoun, NASA,* **Visitor Center Auditorium*** E2: Landsat 8 and Land Cover Measurements, *Jennifer Bourgeault, U.S. Country Coordinator,* **Building 33, Room H120, Land Cover Site Building 33**
11:30 am to 12:00 pm	Return to Conference Center
12:00 pm to 1:00 pm	Buffet Lunch
1:00 pm to 4:30 pm	Computer Lab, Soil and Hydrology Lab Training B2: SMAP Soil Moisture & Characterization Lab Measurements, *Izolda Trakhtenberg, GLOBE Maryland Partner,* **Room 1312** C2: Advanced Hydrology Lab Measurements, *Henry Ortiz, GLOBE California Partner,* **Room 1310** D4: Website Use in Data Access and Visualization, *Cornell Lewis, Raytheon*, **Potomac Salon 2** D5: Website Student Zone, *Kristin Wegner, GLOBE Program Office*, **Chesapeake Salon C** D6: Data Entry, *Jonathan Lang, GLOBE Program Office*, **Potomac Salon 1**
1:00 pm to 1:45 pm	Travel from Marriott Conference Center to Goddard Space Flight Center
1:45 pm to 4:00 pm	Field Training Session **(All locations at Goddard Space Flight Center or Visitor Center Auditorium*. See Session Descriptions for additional detail.)** A1: Aeronet and Measurement of Aerosols, Field, *Lin Chambers, NASA LaRC Science Directorate,* **Building 33, Room A128 & Atmosphere Site 1 Building 33** A2: Air, Surface and Soil Temperature Measurements Field, *Bill Batycky, GLOBE Canada*, **Building 26, Room R180 & Atmosphere Site 2 Building 26** A3: GPM and the Outdoor Environmental Education Program GLOBE Project, *Karl Hetland, GLOBE Norway,* **Building 28, Room N270 the Skybox & Atmosphere Site 3 Building 28** A5: EOS Aura, Discover AQ, SAGE and GLOBE Ozone Measurements, *Jessica Taylor, NASA Langley,* **Goddard Visitor Center, Education Resource Center, 2nd Floor & Atmosphere Site 5 Next to Visitor Center*** C3: Hydrology Fresh Water Macroinvertebrates, Field, *Peggy Foletta, GLOBE California Partner*, **Hydrology Site 2, Goddard Pond** E1: Investigating the Impact of Urban Development through GLOBE, *Kevin Czajkowski, GLOBE Ohio Partner*, *and Eric Brown De Colstoun, NASA,* **Visitor Center Auditorium*** E2: Landsat 8 and Land Cover Measurements, *Jennifer Bourgeault, U.S. Country Coordinator*, **Building 33, Room H120, Land Cover site Building 33**
4:00 pm to 4:30 pm	Return to Conference Center
6:30 pm to 9:00 pm	Group Dinner **Potomac Ballroom** Remarks from the Podium *Leland Melvin, Associate Administrator for Education, NASA* *Joan Ferrini-Mundy, NSF Assistant Director for Education and Human Resources* *Christie Vilsack, Senior Advisor for International Education, USAID*

* NASA Goddard Security Badge will not be needed to participate in sessions being held at the Visitor Center. Also, because security clearance is not needed, these sessions will begin 15 minutes earlier.

Friday, 16 August 2013

7:00 am	Registration Open and Continental Breakfast Available
8:00 am to 8:30 am	Logistics for the Day, **Chesapeake Salon C**
8:30 am to 9:15 am	Travel from Marriott Conference Center to Goddard Space Flight Center
9:15 am to 11:30 am	Tour of Goddard Space Flight Center (see description in the program)
11:30 am to 12:00 pm	Return to Conference Center
12:00 pm to 1:00 pm	Buffet Lunch
2:00 pm	Adjourn

SESSION DESCRIPTIONS FOR MONDAY

Small Group Discussions Session (I) Monday 1:00-3:00 pm

Country Coordinators (Mary Curtin, GPO International Coordinator; Christine Bognar, NASA)
GLOBE is an international community-based organization. Come participate in this facilitated discussion and share your country's perspectives and ideas for the Program. This session continues from 3:15-4:05 pm.
Location: Marriott Inn and Conference Center, Room 1310

U.S. Partners (Jen Bourgeault, GLOBE U.S. Country Coordinator)
GLOBE has over 100 active partners in the U.S.A. that contribute to the Program. Come participate in this facilitated discussion about the Program and share your perspectives about and ideas for the Program. This session continues from 3:15-4:05 pm.
Location: Marriott Inn and Conference Center, Room 1312

GLOBE Teachers (Gary Randolph, GPO Science and Education Team Lead)
GLOBE has thousands of teachers involved in the program worldwide and they play crucial role in implementing the Program. Come participate in this facilitated discussion about the Program and share your practices of using GLOBE in your classroom and school. This session continues from 3:15-4:05 pm.
Location: Marriott Inn and Conference Center, Chesapeake Salon C

Student Research Oral Presentations (I) & (II) (Jessica Mackaro, GPO Associate Scientist, Dixon Butler, NASA)
Students from around the world present their scientific research using GLOBE protocols and data. NOTE: all students will be displaying posters of their research on Monday and Tuesday evenings as well.
Location: Marriott Inn and Conference Center, Potomac Salon 1 and 2 (two parallel sessions)

Small Group Discussions Continued from Session (I) Monday 3:15-4:05 pm

Country Coordinators (Mary Curtin, GPO International Coordinator, Christine Bognar, NASA)
GLOBE is an international community-based organization. Come participate in this facilitated discussion and share your country's perspectives about and ideas for the Program. This session is a continuation from 1:00-3:00 pm.
Location: Marriott Inn and Conference Center, Room 1310

U.S. Partners (Jen Bourgeault, GLOBE U.S. Country Coordinator)
GLOBE has over 100 active partners in the U.S.A. that contribute to the Program. Come participate in this facilitated discussion about the Program and share your perspectives about and ideas for the Program. This session is a continuation from 1:00-3:00 pm.
Location: Marriott Inn and Conference Center, Room 1312

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GLOBE has thousands of teachers involved in the program worldwide and they play crucial role in implementing the Program. Come participate in this facilitated discussion about the Program and share your practices of using GLOBE in your classroom and school. This session is a continuation from 1:00-3:00 pm.
Location: Marriott Inn and Conference Center, Chesapeake Salon C

Student Research Oral Presentations (I) & (II) cont'd: GLOBE Learning Expedition (GLE) Brainstorming (Jessica Mackaro, GPO Associate Scientist, Dixon Butler, NASA)
Come listen to students from around the world present details about their scientific research using GLOBE protocols and data. NOTE: all students will be displaying posters of their research on Monday and Tuesday evenings as well. The 5th GLOBE Learning Expedition will occur during the summer of 2014. During this session, students will brainstorm and give input on possible activities for the GLE. *Location: Marriott Inn and Conference Center, Potomac Salon 1 and 2 (two parallel sessions)*

THE 2ND ANNUAL GLOBE STUDENT RESEARCH EXHIBITION

SR1: Virtual

Region: Africa
Country: Madagascar
School(s): Lycee Rabemananjara Toamasina Madagascar
Teacher(s): Doris Rabenandrasana-Tora Adonis Ricardo
Student(s):
Title: The Passing of a Possible Climate Change on the Lapse of Plants as "Terminalia catappa" and "Terminalia Mantaly"
Abstract: Is there climate change on our study site, and has climate change made an impact on plants, resulting in the disruption of their growing cycle.

SR2: Virtual

Region: Africa
Country: Madagascar
School(s): Lycee Rabemananjara Toamasina Madagascar
Teacher(s): Doris Rabenandrasana-Tora Adonis Ricardo
Student(s):
Title: The impact of temperature change on larval mosquito outbreaks
Abstract: Considering the fact that malaria is every year in our region we chose two sites of malaria in order to observe the proliferation of mosquito larvae and the factors that determine our school in order to neutralize them to protect students who work on the edge this area and participate at the same time the national fight against malaria.

SR3: Virtual

Region: Europe and Eurasia
Country: Croatia
School(s): Elementary schools from Slavonski Brod and Davor
Teacher(s): Ivica Gelemanovic, Ivan Ilisevic
Student(s): Klamentina Olic, Gabrijela Marjanovic, Marija Tankosic, Leia Smiljanić, Lea Basić, Katarina Kolaković
Title: What heats what, air soil or soil air?
Abstract: The research hypothesis is that solar radiation heats the soil first and then the soil heats the air that is above it.

SR4: Virtual

Region: Europe and Eurasia
Country: Norway
School(s): Høydalsmo skule
Teacher(s): Asbjørn Byggland
Student(s):
Title: The Tree Ring Project Report
Abstract: The question we asked ourselves, and were determined to find out, was: "Is there a connection between growth and growing conditions?"

SR5: Virtual

Region: Europe and Eurasia
Country: Norway
School(s): Vest-Telemark vgs
Teacher(s): Åse Ingebjørg Kiland, Birgit Johanne Kovajord Olsnes and Karl Torstein Hetland
Student(s): Elin Kleiv Svalastoga, Christian Homme and Ingvild Borgen Moe
Title: Tree Ring Project
Abstract: This project is about finding information about how the climate effects the growth of the trees. By taking tree samples and measuring the high of the trees, we could find information about age, negative and positive growing seasons among other things.

SR6: Virtual

Region: Europe and Eurasia
Country: Norway
School(s): Åmot skule
Teacher(s): Ivica Gelemanovic, Ivan Ilisevic
Student(s): Klamentina Olic, Gabrijela Marjanovic, Marija Tankosic, Leia Smiljanić, Lea Basić, Katarina Kolaković
Title: The relationship between tree growth and altitude
Abstract: Does altitude influence tree growth? Are there other growth conditions that affect tree growth?

SR7:

Region: Latin America and Caribbean
Country: Argentina, Peru, Uruguay
School(s): Elementary schools from Slavonski Brod and Davor
Teacher(s): Ivica Gelemanovic, Ivan Ilisevic
Student(s): Klamentina Olic, Gabrijela Marjanovic, Marija Tankosic, Leia Smiljanić, Lea Basić, Katarina Kolaković
Title: Developing Awareness About Impacts on Land Cover Produced by ENSO Phenomena and Human Activities
Abstract: This research seeks to strengthen the collaborative work between Argentina, Peru and Uruguay to analyse and understand the effects of the El Niño and La Niña events, and human activities on land covering different biomes of meadows and forests of Peru, Argentina and Uruguay.

SR8:

Region: North America
Country: United States
School(s): East Coweta Middle School
Teacher(s): Tammy Hyder
Student(s): Makayla Graham, Christina Whetstone, and Abby Lackey
Title: Climate Change and Asthma
Abstract: How are climate change and asthma related?

SR9:

Region: Near East and North Africa
Country: Saudi Arabia
School(s): The 61st Secondary Girls School at Jeddah
Teacher(s): Hussa Al-Saheel, Manal Madani
Student(s): Salha At. AL-Semery
Title: Sea surface temperature at the Red Sea Jeddah's Coast
Abstract: The purpose of this research is to clarify the impact of sea surface temperature in the Red Sea coast on other variables (density, salinity, pH) and its impact on water living organisms and the measurements were taken from 12 November 2012 to 18 March 2013.

SR10:

Region: Near East and North Africa
Country: Saudi Arabia
School(s): Shahda Intermediate and Secondary School at Sabya
Teacher(s): Mohammed Ahmed Mubajir, Mansoor Ibrahim Khawaji
Student(s): Anas al hussien Al-Nimi, Ahmed Nasir Sarhani, Najeeb Mohammed Sarhani
Title: Desertification and its effect on the plant cover in the western coast for Shahda village in the kingdom
Abstract: This research aims to study the phenomenon of the lack of vegetation in this region, especially the Coastal and desert environment.

SR11:

Region: Near East and North Africa
Country: Saudi Arabia
School(s): Somayah Bint Khayat Secondary Girls School at Al-Bahah
Teacher(s): Kheera Ali al-Zahrani, Rahma Abdullah Al-Zahrani
Student(s): Afnan Hassan Al-Zahrani, Haneen Saeed Al-Zahrani
Title: A study on the effect of water temperature on the solubility of oxygen in GAHAB spring Al-Baha area
Abstract: This study examines the effect of temperature on the solubility of oxygen in water.

SR12:

Region: Asia and Pacific
Country: Thailand
School(s): Don Chan Wittaya School
Teacher(s): Mr. Chumpon Chareesaen
Student(s): Miss Charuwan Srikhatkao and Mr. Sitinon Thepbumrung
Title: A Study of Planting Green Beans for nourishing Rubber Trees during the first year

SR13:

Region: Asia and Pacific
Country: Thailand
School(s): Princess Chulabhorn's College
Teacher(s): Mrs. Patchara Pongmanawut
Student(s): Miss Manisa Kaewsen and Miss Kornkanok Suwanpakpreak
Title: Weather affecting *Aedes* mosquitos in rubber plantation of high and low Dengue transmission risk areas in Trang, Thailand.
Abstract: This study aims at examining factors affecting Aedes mosquito larval densities between high and low dengue risk areas.

SR14:

Region: Asia and Pacific
Country: Thailand
School(s): Praphamontree II School
Teacher(s): Mrs. Betty Jane C. Lerin, M.Sc. and Mrs. Karakate Chankasem
Student(s): Miss Papavadee Vallikul and Miss Jamrell Buynay
Title: The Relationship of Climatic Factors, Soil Characteristics and Density of Fiddler Crabs (*Uca *spp*.*) in Selected Mangrove Ecosystems at Bang Pu, Samutprakarn, Thailand

SR15:

Region: Asia and Pacific
Country: Thailand
School(s): Paphayompitthayakom School
Teacher(s): Mrs. Paninee Voranetivudti
Student(s): Miss Arisa Intrasungkha and Miss Sasiwimon Thongkaeo
Title: Weather affecting amounts of latex production and percent dry rubber content of rubber trees *(Hevea brasiliensis *Müll. Arg. var. RRIM 600) in Phatthalung, Thailand

SR16:

Region: Asia and Pacific
Country: Thailand
School(s): Satit Municipal School
Teacher(s): Mrs. Kiangdeun Khotchasarn
Student(s): Mr. Manop Vajasit, Mr. Borinrak Jomchai and Mr. Panupasu Panpech
Title: Measured concentration of nitrate in water from the bulb of Wetland plant Nepenthes Bung Khong Long, Thailand
Abstract: This research aims to investigate the quality of water such as temperature, salinity, pH, turbidity, and DO that affect the amount of krill appeared in the 3 study-sites as a follow-up research in 2011-2012.

SR17:

Region: Asia and Pacific
Country: Thailand
School(s): Bung Khong Long Wittayakom School
Teacher(s): Mrs. Suttirat Srisongkram
Student(s): Mr. Kittisak Kottarin, Mr. Aitsaraphap Ouammak
Title: Measured concentration of nitrate in water from the bulb of Wetland plant Nepenthes Bung Khong Long, Thailand

SR18:

Region: Europe and Eurasia
Country: Croatia
School(s): Skola za medicinske sestre Vrapce
Teacher(s): Ira Beck, Marinela Labas
Student(s): Filip Matijašec
Title: Tree rings - are they talking about people?
Abstract: We investigated the tree rings of Pinus nigra specimens, tried to establishe if there are any significant changes written in the samples that we took, was their usual growth perhapse interrupted in some period.

SR19:

Region: Europe and Eurasia
Country: Croatia
School(s): Medicinska skola u Rijeci
Teacher(s): Tatjana Holjevic
Student(s): Megi Pavletić, Pegi Pavletić, Dina Bolkovac
Title: Water quality and revitalization potential of Mrtvi Kanal Channel

SR20:

Region: North America
Country: United States
School(s): Bowling Green State University
Teacher(s): Dr. Jodi Haney
Student(s): Nicole Winhover, Nichole Szymanski, Nicholas Buhrow
Title: Land Cover as an Indicator of Climate Change in the Bowling Green State University Area
Abstract: We set out to investigate three research questions: 1) What covers the land surrounding the BGSU Campus?, 2) How has the BGSU land cover changed over time?, and 3) Is the iPhone as accurate as two other GLOBE certified GPS devices?

SR21:

Region: North America
Country: United States
School(s): East Fairmont Junior High School
Teacher(s): Barb Pill
Student(s): Elizabeth "Libby" Hayhurst, Aidan Snodgrass, Claiborne Kunce
Title: The Effect of Albedo on Urban Climate Changes
Abstract: The purpose of the GLOBE project is to measure the surface temperature of different surfaces.

SR22:

Region: North America
Country: United States
School(s): Sodt School
Teacher(s): Connie Atkisson
Student(s): Gavin Atkisson
Title: City Critters versus Country Critters: Who has the healthiest home?
Abstract: After noticing the farm animals standing in the country rivers near my home, taking drinks and using the restroom in the water, I wondered if the country rivers would still be healthier than the city rivers with all their urban pollution the media talks about. This project attempts to determine if the water quality is healthy enough to support benthic life in both urban and rural settings.

SR23:

Region: North America
Country: United States
School(s): Roswell-Kent Middle School
Teacher(s): Mr. Steven Frantz
Student(s): Justin Rumel
Title: Snipe (Gallinago gallinago delicata), Killdeer (Charadrius vociferus), and American Woodcock (Scolopax minor) as Indicator Species on Climate Change Based on Migration.
Abstract: The motivation for this project was a study on climate change. The whole point of doing this project was to use the selected birds as a reference to climate change to see if it was actually happening.

SR24:

Region: North America
Country: United States
School(s): Palmer High School
Teacher(s): Cheryl Williams
Student(s): Kaitlyn Demoski, Mallory Obeso, Rachel Sanders, Zoie Schmauch, Sterling Stinger
Title: Weather, or Not? Comparing Two Years of GLOBE Data in Palmer, Alaska
Abstract: Palmer High Students collected phenology, frost tube and ground cover data for the past two school years. This investigation analyzes the data, evaluates the methods used, looks for conclusions, and makes recommendations for future investigations.

SR25:

Region: North America
Country: United States
School(s): Hawkins Elementary/Hawkins Middle Schools
Teacher(s): Audra Edwards
Student(s): Allyson Edwards, Hope Huges, Madison Jaco
Title: Why is soil so important?

Abstract: Our research projects have the common goal to provide insight into the sustainability of food production systems, to improve the overall movement of soil pollution prevention, and to develop and implement a student lead litter prevention program in India's school system.

SR26:

Region: North America
Country: United States
School(s): Montessori Academy of North Texas
Teacher(s): Angela Magers, Debbie Zafar
Student(s): Gerald Clark, Braden Sloan, Joshua Mager
Title: Something Fishy
Abstract: Study of the striped bass population in Lake Texoma and the effects of climate change on the population.

SR27: Virtual

Region: North America
Country: United States
School(s): Chartiers-Houston Jr./Sr. High School
Teacher(s): Gary Popiolkowski
Student(s): Ling Xue, Savannah Wheeler, Madison Simpson, Emily Lickert
Title: Lichens as bio-indicators
Abstract: Students will collect information about the types and percent lichen coverage on our campus and in their neighborhoods and compare those results to ozone data.

SR28:

Region: North America
Country: United States
School(s): Crestwood High School
Teacher(s): Diana Johns
Student(s): Ahmad Awada, Hussein Makki
Title: Correlations between vernal pool phenology and a breeding population of Bufo americanus in Dearborn Heights, Michigan
Abstract: A strong correlation between the onset of precipitation and the breeding use of this vernal pool was noted.

SR29:

Region: North America
Country: United States
School(s): Main Street Intermediate School
Teacher(s): Marcy Burns
Student(s): Jadon Magee, Ben Penrose, Mitchell Sommers
Title: Does runoff from increased precipitation affect water quality in Norwalk Creek?
Abstract: We wanted to find out if runoff from precipitation affects the quality of the water in Norwalk Creek. We hypothesized that runoff would have a negative effect on the water in the stream.

SR30:

Region: North America
Country: United States
School(s): Huntington High School
Teacher(s): Rick Sharpe
Student(s): Katherine Norman, Caressa Mainland, Amanda McCormick
Title: Climate change and sources of pollution in the Huntington, WV
Abstract: This project looks at climate change and two sources of pollution in the tri-state area.

SR31:

Region: North America
Country: United States
School(s): Berkeley Springs High School
Teacher(s): Leigh Jenkins
Student(s): Tyler Orr, Jared Levi
Title: How is tornado size affected by water temperature?
Abstract: We chose to do our report on how water temperature affects tornado size because of our interest in the formation of tornados and the extreme weather systems.

SR32:

Region: North America
Country: United States
School(s): Crenshaw Elementary & Middle School
Teacher(s): Jessie Minter
Student(s): Jacob Hinkle, Anthony Tovar, Stepanie Turbeville
Title: Habitat Habits

SR33:

Region: North America
Country: United States
School(s): Paw Paw High School
Teacher(s): Carol Coryea
Student(s): Amanda Benson, Hannah Leach, Jon Wolfe
Title: Baseline atmospheric ozone levels on the Paw Paw Schools campus in relationship to location of playground equipment and the Route 9 corridor
Abstract: Students study the atmospheric ozone levels between the Route 9 corridor and the school's playground equipment.

SR34:

Region: North America
Country: United States
School(s): Roswell-Kent Middle School
Teacher(s): Steven Frantz
Student(s): Leah Staevich
Title: North, South, East, West: A Study of Microclimate.
Abstract: This research studies surface temperature with respect to the sides of buildings to determine which side is best for gardeners to plant their crops.

Schedule of presentations

Student Research Oral Presentations Session I, Monday, August 12, 2013, 1:00- 3:00 pm*

1:00-1:10	SR32
1:10-1:20	SR18
1:20-1:30	SR26
1:30-1:40	SR27
1:40-1:50	SR13
1:50-2:00	SR9
2:00-2:10	SR31
2:10-2:20	SR22
2:20-2:30	SR14
2:30-2:40	SR21
2:40-2:50	Introduction of GLE
2:50-3:00	

Student Research Oral Presentations Session II, Monday, August 12, 2013, 1:00- 3:00 pm*

1:00-1:10	SR29
1:10-1:20	SR30
1:20-1:30	SR34
1:30-1:40	SR17
1:40-1:50	SR28
1:50-2:00	SR24
2:00-2:10	SR15
2:10-2:20	SR33
2:20-2:30	SR25
2:30-2:40	SR10
2:40-2:50	SR11
2:50-3:00	Introduction of GLE

Student Research Oral Presentations Session III, Wednesday, August 14, 2013, 9:45-10:30 am*

9:45-9:55	SR16
9:55-10:05	SR19
10:05-10:15	SR12
10:15-10:25	SR20
10:25-10:35	SR23

*To find more information on these presentations, please look under Student Research Exhibition beginning on page 20.

SESSION DESCRIPTIONS FOR WEDNESDAY

Wednesday 9:45-10:30 Education Strands

Earth System Science Poster Update (Lin Chambers, NASA Langley)
An update on the Earth System Science poster
Location: Marriott Inn and Conference Center, Room 1310

International Scientist Involvement (GISN) (Jessica Mackaro, GLOBE Program Office; Krisanedej Jaroensutasinne, GLOBE Thailand; Mullica Jaroensutasinee, GLOBE Thailand; Elena Sparrow, GLOBE Alaska Partner)
An update on the GLOBE International Scientist Network, how to get involved in it and how to involve scientists from the GISN at your schools. A case study of scientist involvement will be illustrated during the session.
Location: Marriott Inn and Conference Center, Potomac Salon 2

GLOBE/US Science Standards Alignment (Marcy Seavey, GLOBE Iowa Partner; Kristin Wegner, GLOBE Program Office)
This session will provide a brief overview of the NGSS and how GLOBE can help school districts meet NGSS. The Iowa Academy of Sciences, Wayne RESA, and GLOBE will share a sneak peak of the alignment workshop they are working on. Be a part of a working group that helps vision the final alignment product to guide the GLOBE community in NGSS alignment!
Location: Marriott Inn and Conference Center, Room 1312

NASA Visualization Explorer Stories in the Classroom Using Mobile Devices and the Web (Horace Mitchell and Helen-Nicole Kostic, Scientific Visualization Studio NASA/GSFC)
NASA Visualization Explorer (NASAViz) releases two science stories per week and makes them available on a variety of media and platforms, including: iPads, mobile devices and the web. The stories contain visually rich material (visualizations, animations, images and videos) developed in collaboration with NASA scientists. Topics include: Earth Science, Planets & Moons, Sun and the Universe. During this session, you will get a tour of the variety of the NASAViz product and tips on how to use them in the classroom. Bring your iPad, mobile device and/or laptop to follow the tour of NASAViz!
Location: Marriott Inn and Conference Center, Potomac Salon 1

Student Research Oral Presentations (III) (Dixon Butler, NASA)
Come listen to students from around the world present details about their scientific research using GLOBE protocols and data.
Location: Marriott Inn and Conference Center, Chesapeake Salon C

Wednesday 11:00-12:00 Science Strands

Global Precipitation Measurement (GPM) Mission (Dalia Kirschbaum, NASA Goddard Space Flight Center)
Building on the legacy of the Tropical Rainfall Measuring Mission (TRMM), GPM will measure rain and snow from space around the world every three hours. This mission is co-led by the Japanese Aerospace Exploration Agency (JAXA) and NASA. You will learn about the GPM science in this session and how the measurements of total rain depth and snow-water equivalent by GLOBE students can compliment the satellite observations in both space and time.
***Location:** Marriott Inn and Conference Center, Potomac Salon 1*

SERVIR Global by USAID and NASA (Ashutosh Limaye, NASA Marshall Space Flight Center)
SERVIR is a joint venture between NASA and USAID, providing data and information from satellite-based Earth observations and tools for scientific applications to help developing nations improve their environmental decision-making. In this session, you will learn about SERVIR Global and its activities at its international hubs.
Location: Marriott Inn and Conference Center, Potomac Salon 2

DISCOVER – Air Quality (Jim Crawford, NASA Langley Research Center)
It remains a challenge for Earth-observing satellites measuring air quality to distinguish between pollution high in the atmosphere and that near the surface where people live and breathe. DISCOVER-AQ, short for air quality, deploys low-flying research aircraft, balloons, and ground observing sites instrumented with sensors to help resolve the scientific challenge. In this session, you will learn about the science of DISCOVER-AQ and how the project engages local communities, educators, and students, including those from GLOBE schools, during its field campaigns.
Location: Marriott Inn and Conference Center, Room 1312

Landsat, Terra and Aqua Ecosystem Research (TBD)
The Landsat series and the Terra and Aqua satellites have enabled tremendous strides in the scientific studies of the air, land, and water (including ice) of the Earth system. This session will focus on ecosystem research on land and along the coastal regions, as well as land-cover and land-use change around the world and shed light on how GLOBE measurements of the land cover, surface temperature, and soils can complement the satellite observations.
Location: Marriott Inn and Conference Center, Room 1310

Soil Moisture Active and Passive (SMAP) Mission (Bradley Doorn, NASA Headquarters)
SMAP, scheduled to be launched in the fall of 2014, will provide global measurements of surface soil moisture and freeze-thaw state. These measurements are important to future improvements of weather prediction, and forecasts of flood, drought, agricultural productivity, and ecosystem conditions. In this session, you will learn about the science behind SMAP and how the soil temperature and moisture measurements taken by GLOBE students can contribute to the science and applied research of the SMAP mission.
Location: Marriott Inn and Conference Center, Chesapeake Salon C

Wednesday 1:00-4:15 Special Student-Scientist Interactions

Students will have the opportunity to hear from scientists about their work and to ask questions about being a scientist or engineer.
Location: Marriott Inn and Conference Center, Room 1312

Wednesday 1:15-2:30 Discussion Sessions by Role

Customizing Your GLOBE Account (David Overoye, Raytheon)
The new GLOBE website offers many ways to present yourself and your institution to the GLOBE community. This computer training session will show you how and provide help while you do it.
Location: Marriott Inn and Conference Center, Potomac Salon 2

Administering GLOBE Workshops on your Partnership Pages (Jonathan Lang, GLOBE Program Office)
The new GLOBE website provides significant support to international and in-country partners for organizing and advertising a training workshop and for documenting training records of participants in the GLOBE administrative database. This computer training session will show you how to use these tools.
Location: Marriott Inn and Conference Center, Potomac Salon 1

Elementary GLOBE (Lynne Hehr, GLOBE Arkansas Partner)
GLOBE provides resources targeted for use in primary schools. This session will present these materials and discuss their use. Participants are encouraged to bring their experiences and recommendations to this discussion.
Location: Marriott Inn and Conference Center, Room 1310

How to Evaluate Inquiry-based Learning (Valerie William, GPO; Carol Coryea, Paw Paw Schools, West Virginia; Angela Magers, Montessori Academy of North Texas, Debbie Zafar, Montessori Academy of North Texas)
GLOBE materials and learning activities can be used for inquiry-based, experiential learning in science technology, engineering, and mathematics (STEM) education. Student evaluation of such learning is often considered a challenge. This session will present and discuss how this can be and is being done.
Location: Marriott Inn and Conference Center, Chesapeake Salon C

Wednesday 3:00-4:15 pm Discussion Sessions by Role

Customizing Your GLOBE Account (David Overoye, Raytheon)
The new GLOBE website offers many ways to present yourself and your institution to the GLOBE community. This computer training session will show you how and provides help while you do it.
Location: Marriott Inn and Conference Center, Potomac Salon 2

Administering GLOBE Workshops on your Partnership Pages (Jonathan Lang, GLOBE Program Office)
The new GLOBE website provides significant support to international and in-country partners for organizing and advertising a training workshop and for documenting training records of participants in the GLOBE administrative database. This computer training session will show you how to use these tools and update your partnership records.
Location: Marriott Inn and Conference Center, Potomac Salon 1

GLOBE and Curriculum Integration (Panel Discussion, Julie Malmberg, GLOBE Program Office)
GLOBE is a rich set of material to support inquiry-based, experiential learning in science, technology, engineering, and math (STEM) education. It can be integrated in a wide variety of traditional and non-traditional classes. This session will pres- ent and discuss how this can be and is being done.

Panel: Diana Johns (Crestwood High School, Dearborn Heights, Michigan), Gary Popiolkowski (Chartiers-Houston Jr./Sr. High School, Houston, Pennsylvania), Anna Heyne-Mudrich (Gymnasium Schlol Neuhause, Paderborn Germany), Patchara Pongmanaut (Princess Chulabhorn's College, Trans, Thailand), Ira Beck (Skola Za Medicinske Sestre Vrapce, Zagreb, Croatia)
Location: Marriott Inn and Conference Center, Chesapeake Salon C

Running GLOBE International Partnerships (Karl Hetland, GLOBE Norway)
International partnership in GLOBE responds to a wide variety of specific national needs and mandates including strengthening language and communication skills, making international connections, as well as improving science, technology, engineering, and math education and improving environmental awareness and stewardship. This session will present and discuss how international partners are doing this.
Location: Marriott Inn and Conference Center, Room 1310

Wednesday 5:45 pm Evening Session

From Learning to Research (L2R) (Julie Malmberg, GPO Project Manager)
From Learning to Research teachers and students will review materials created over the course of the three-year NSF ITEST grant. Materials include teaching about STEM careers, inquiry and problem-based learning and teaching about climate change.
Location: Marriott Inn and Conference Center, Chesapeake Salon C (Meeting)
*Marriott Inn and Conference Center, Potomac Salon 1 (Dinner at 6:30 pm)**
**Only ticketed participants will be admitted for the dinner portion of this meeting. Tickets for dinner can be purchased at the Annual Meeting Registration Desk ($61USD cash or check). Please purchase tickets by 5:00 pm Monday 12 August.*

Wednesday 7:00-9:00 pm *(Board bus at 6:00 pm)*
Optional Tour of Goddard Laser Ranging Facility (GGAO)

About GGAO

The Goddard Geophysical and Astronomical Observatory (GGAO) is the home of pioneering research in many scientific areas. Scientific application of lasers, astronomy, and solar physics, are just a few examples.

The 210 acre facility is located four miles from the GSFC main site. It is home to about a dozen people working on many NASA research projects. It was originally established to provide a low background (light) level for optical instrumentation development and observation.

GGAO is one of the few locations in the world where four or more space geodesy techniques are co-located, thus providing scientists with a unique opportunity to assess system performance and perform multi-technique analysis. Other divisions within NASA use the GGAO facility for various astronomy-related activities.
Location: Goddard Space Flight Center* (*sign up for this session at the GLOBE program meeting registration)

SESSION DESCRIPTIONS FOR TUESDAY AND THURSDAY

A1: Aeronet and Measurement of Aerosols

Protocol Training: Aerosols
Clouds
Relative Humidity
Barometric Pressure

Description: Participants will learn about the importance of aerosol science and how GLOBE schools can contribute to the monitoring of aerosols. Aerosol measurements will be taken using the existing GLOBE instrument; associated measurements of clouds, relative humidity, and barometric pressure will be trained, and data will be reported on tablet computers. Potential new instruments being considered for inclusion in GLOBE aerosol protocols will be demonstrated. The Aeronet measurement program involving scientists from around the world will be presented, including a short tour to see an instrument.

Trainers: Lin Chambers, NASA Langley, lead
Mark Schoeberl, Science and Technology Corporation

Offered during the following time slots and locations:

Tuesday 9:15 a.m. Goddard Building 33, Room E125 & Atmosphere Site 1 next to Building 33
Thursday 9:15 a.m. Goddard Building 33, Room A128 & Atmosphere Site 1 next to Building 33
Thursday 1:45 p.m. Goddard Building 33, Room A128 & Atmosphere Site 1 next to Building 33

A2: Air, Surface, and Soil Temperature Measurements

Protocol Training: Digital Multi-day Max/Min/Current Air and Soil Temperature
Soil Temperature
Surface Temperature

Description: The atmosphere and soil temperature site will be located and described, and proper placement of instrument shelters and temperature probes along with thermometer calibration will be reviewed. Measurements will be taken of: max, min, and current air and soil temperatures using the Digital Multi-day Max/Min/Current Thermometer; surface temperature using an infrared thermometer; and soil temperature at 5 cm and 10 cm depths using a soil thermometer. The connections among these different temperatures will be discussed along with their role in monitoring climate. All data will be reported on tablet computers.

Trainers: Bill Batycky, GLOBE Canada, lead
Dana Votapkova, Europe and Eurasia Regional Help Desk Office
Desh Bandhu, Asia and Pacific Regional Help Desk Office

Offered during the following time slots and locations:

Tuesday 9:15 a.m. Goddard Building 26, Room R180 & Atmosphere Site 2 next to Building 26
Tuesday 1:45 p.m. Goddard Building 26, Room R180 & Atmosphere Site 2 next to Building 26
Thursday 9:15 a.m. Goddard Building 26, Room R180 & Atmosphere Site 2 next to Building 26
Thursday 1:45 p.m. Goddard Building 26, Room R180 & Atmosphere Site 2 next to Building 26

A3: GPM and the Outdoor Environmental Education Program GLOBE Project

Protocol Training: Clouds
Precipitation
Max/Min/Current Air Temperature
pH of Precipitation

Description: Participants will learn about the collaborative project between the Montgomery County (Maryland) Public Schools (MCPS) Outdoor Environmental Education Program (OEEP) and GPM. Two OEEP educators developed a two-hour module called "Survivor" for sixth grade students. In MCPS, all sixth grade students spend 2 nights and 3 days at one of the MCPS OEEP sites doing "Outdoor Education". The teachers took two GLOBE training courses last summer (hydrology and atmosphere), and selected protocols they felt would be easily accessible for students in this type of setting. "Survivor" is built around student exploration of the local environment with a focus on the four spheres: atmosphere, biosphere, geosphere, and hydrosphere. Students are asked to determine which location is best suited for human civilizations, based on accessibility of freshwater resources. We will discuss best practices and explain how this module shares GPM mission science and GLOBE measurements with the students and teachers, and provide training on the protocols used. Data from the measurements will be reported to GLOBE on tablet computers.

Trainers: Karl Hetland, GLOBE Norway, lead
Dorian Janney, GPM Education Specialist
Kate Wardle, MCPS OEEP Teacher
Brian Shilling, MCPS OEEP Educator

Offered during the following time slots and locations:

Tuesday 9:15 a.m. Goddard Building 28, Room N270 The Skybox
Tuesday 1:45 p.m. Goddard Building 28, Room N270 The Skybox
Thursday 9:15 a.m. Goddard Building 28, Room N270 The Skybox
Thursday 1:45 p.m. Goddard Building 28, Room N270 The Skybox

A4: Cloudsat & Atmosphere Observations, Field

Protocol Training: Clouds & Contrails
Temperature
Precipitation

Description: Participants will learn how GLOBE schools contribute to the monitoring of clouds and are one of the few ground-truth sources of cloud type and contrail data. An Atmosphere Site will be located and described and basic atmospheric protocols will be trained. The new Cloud and Contrail e-training module will be demonstrated. Data will be reported on tablet computers. NASA's CloudSat mission will be explained along with the role satellites and remote sensing play in understanding Earth System Science.

Trainers: CloudSat Education Team:
Todd Ellis, SUNY Oneonta
Peter Falcon JPL, Pasadena CA
Deanna TeBockhorst, Colorado State University
Natalie Tourville, Colorado State University
Sue Lini, JPL, Pasadena CA

Offered during the following time slots and locations:

Tuesday 9:15 a.m. Goddard Building 28, Room W134 & Atmosphere Site 4 next to Building 28
Tuesday 1:45 p.m. Goddard Building 28, Room W134 & Atmosphere Site 4 next to Building 28
Thursday 9:15 a.m. Goddard Building 28, Room W134 & Atmosphere Site 4 next to Building 28

A5: EOS Aura, DISCOVER-AQ, SAGE and GLOBE Ozone Measurements

Protocol Training: Ozone
Relative Humidity
Temperature

Description: Ozone is a critical part of life on Earth. In the troposphere, ozone is a major indicator of air quality. Near Earth's surface, ozone is created by reactions among hydrocarbons and nitrogen oxides in sunlight, and this leads to considerable variations in ozone concentration depending on the local sources of these compounds and wind direction. Participants will learn how GLOBE schools can contribute to the monitoring of ozone. Ozone, wind direction, temperature, and relative humidity measurements will be trained and data will be reported on tablet computers. Potential alternative measurement instruments will be demonstrated along with the role of a bio-indicator garden to observe ozone pollution. Science contributions from the Aura, DISCOVER-AQ, and SAGE missions will be highlighted along with the complementary role played by GLOBE measurements.

Trainers: Jessica Taylor, NASA/LaRC, lead
Ginger Butcher, Aura Education and Public Outreach Lead

Offered during the following time slots and locations:

Tuesday 1:30 p.m. Goddard Visitor Center, Education Resource Center, 2nd Floor & Goddard Atmosphere Site 5 next to the Visitor Center
Thursday 1:30 p.m. Goddard Visitor Center, Education Resource Center, 2nd Floor & Goddard Atmosphere Site 5 next to the Visitor Center

B1: SMAP* Mission and Soil Moisture & Characterization – Field Measurements

Protocol Training: Soil Characterization – Field Measurements
Soil Characterization – sample collection for Lab Measurements
Gravimetric Soil Moisture – sample collection

Description: Participants will characterize the horizons of an exposed soil profile and collect samples for soil moisture and characterization laboratory measurements to be performed in Session B2. Data collected will be reported.

Trainers: Izolda Trakhtenberg, GLOBE Maryland Partner
Brian Campbell, NASA/GSFC

Offered during the following time slots and locations:

Tuesday 9:00 a.m. Goddard Visitor Center Auditorium (Must also sign up for B2 Thursday morning session)
Tuesday 1:30 p.m. Goddard Visitor Center Auditorium (Must also sign up for B2 Thursday afternoon session)
*Soil Moisture Active and Passive

B2: SMAP* Mission and Soil Moisture & Characterization – Lab Measurements

Protocol Training: Soil Characterization
Soil pH
Soil Fertility
Gravimetric Soil Moisture – lab measurements

Description: Participants will learn about NASA's upcoming SMAP mission and how GLOBE schools can contribute measurements in support of it. Dried soil moisture samples will be weighed to determine water content. Soil samples collected in Session B1 will be used to train the Soil Bulk Density, pH, and Fertility Protocols. The Just Passing Through learning activity will be used to examine infiltration in different types of soil. All data will be reported.

Trainer: Izolda Trakhtenberg, GLOBE Maryland Partner
Brian Campbell, NASA/GSFC

Offered during the following times slots and locations:

Thursday 8:30 a.m. Marriott Inn and Conference Center, Room 1312
Thursday 1:00 p.m. Marriott Inn and Conference Center, Room 1312
* Soil Moisture Active and Passive

C1: Hydrology – Field Measurements

Protocol Training: Transparency
Water Temperature
Electrical Conductivity
Water pH
Dissolved Oxygen – sample collection
Alkalinity – sample collection
Nitrates – sample collection
Salinity – sample collection

Description: Participants will locate and describe a site, measure transparency, temperature, electrical conductivity, and pH of the water body and collect samples for laboratory measurements to be performed in Session C2. Data collected will be reported using tablet computers.

Trainers: Henry Ortiz, GLOBE California Partner
Krisanadej Jaroensutasinee, GLOBE Thailand

Offered during the following time slots and locations:

Tuesday 8:30 a.m. Hydrology Site 1, University of Maryland Pond (start in room 1310)
Thursday 8:30 a.m. Hydrology Site 1, University of Maryland Pond (start in room 1310)

C2: Hydrology – Lab Measurements

Protocol Training: Dissolved Oxygen – lab measurement
Alkalinity – lab measurement
Nitrates – lab measurement
Salinity – lab measurement

Description: Participants will learn about water quality measurements and their relation to air quality, soil character, and land cover/use within watersheds. Water samples collected during Session C1 will be used to complete training of Dissolved Oxygen, Alkalinity, Nitrates, and Salinity Protocols. The nature of watersheds will be discussed. All data will be reported.

Trainers: Henry Ortiz, Henry Ortiz, GLOBE California Partner
Krisanedej Jaroensutasinee, GLOBE Thailand

Offered during the following time slots and locations:

Tuesday 1:00 p.m. Marriott Inn and Conference Center, Room 1310
Thursday 1:00 p.m. Marriott Inn and Conference Center, Room 1310

C3: Hydrology – Fresh Water Macroinvertebrates

Protocol Training: Fresh Water Macroinvertebrates

Description: The presence or absence of different freshwater macroinvertebrates are indicators of water quality and the health of the water body ecosystem. Participants will locate and describe a site and sample and measure macroinvertebrates. All data will be reported on portable computers.

Trainers: Peggy Foletta, GLOBE California Partner
Mullica Jaroensutasinee, GLOBE Thailand

Offered during the following time slots and locations:

Tuesday 9:15 a.m. Hydrology Site 2, Goddard Pond
Tuesday 1:45 p.m. Hydrology Site 2, Goddard Pond
Thursday 9:15 a.m. Hydrology Site 2, Goddard Pond
Thursday 1:45 p.m. Hydrology Site 2, Goddard Pond

D1: GLOBE Website for Partners and Trainers

Website Training: Partners Management Group
Workshops & Training Sessions
Trainers Community

Description: This session will explore those areas of www.GLOBE.gov that are important for partners, country coordinators, and trainers. Each participant will have use of a computer or may connect their computer to the internet and try different functions of the website. This session will afford an opportunity to get answers to questions, training on the capabilities of the site, and experience in using the site to accomplish tasks relating to workshops and training activities. Participants will have the opportunity to provide feedback on the site and suggest changes and improvements.

Trainers: Cornell Lewis, Raytheon, lead

Offered during the following time slots and locations:

Tuesday 8:30 a.m. Marriott Inn and Conference Center, Potomac Salon 1
Tuesday 1:00 p.m. Marriott Inn and Conference Center, Potomac Salon 1

D2: GLOBE Website Social Media Capabilities

Website Training: Personal and Institutional Mypages
Community Sections
News and Events

Description: This session will explore the use of the social media capabilities of www.GLOBE.gov that offer ways to find collaborators, give and receive mentoring, keep in touch with GLOBE colleagues and institutions. Each participant will have use of a computer or may connect their computer to the internet and try different functions of the website. This session will afford an opportunity to get answers to questions, training on the capabilities of the site, and experience in using the site to accomplish tasks involving contact with other GLOBE participants, institutions, and communities. Participants will have the opportunity to provide feedback on the site and suggest changes and improvements.

Trainer: David Overoye, Raytheon, lead
Cornell Lewis, Raytheon

Offered during the following time slots and location:

Tuesday 8:30 a.m. Marriott Inn and Conference Center, Potomac Salon 2

D3: GLOBE Website Use In Teaching

Website Training: Student Zone
Data Entry
Measurement Campaigns
Student Conferences

Description: This session will explore the use of www.GLOBE.gov in the classroom to educate, inspire, and motivate students. Emphasis will be placed on accessing educational materials, including Learning Activities, as well as items for classroom use. Each participant will have use of a computer or may connect their computer to the internet and try different functions of the website. This session will afford an opportunity to get answers to questions, training on the capabilities of the site, and experience in using the site to accomplish tasks supporting preparation and implementation of teaching. Participants will have the opportunity to provide feedback on the site and suggest changes and improvements.

Trainer: Marcy Burns, Main Street Intermediate School, Ohio, lead
Steve Frantz, Roswell Kent Middle School, Ohio
Rick Sharpe, Huntington High School, West Virginia

Offered during the following time slots and locations:

Tuesday 8:30 a.m. Marriott Inn and Conference Center, Room 1312
Thursday 8:30 a.m. Marriott Inn and Conference Center, Chesapeake Salon C

D4: GLOBE Website Data Access and Visualization

Website Training: Finding GLOBE Data
Visualization Maps
Graphs & Tables
Downloading Data

Description: This session will explore use of the visualization and other data access and presentation capabilities of www.GLOBE.gov. Ways to download GLOBE data and use of other tools to look at these data will be presented. Each participant will have use of a computer or may connect their computer to the internet and try different functions of the website. This session will afford an opportunity to get answers to questions, training on the capabilities of the site, and experience in using the site to accomplish tasks involving GLOBE data. Participants will have the opportunity to provide feedback on the site and suggest changes and improvements.

Trainer: Cornell Lewis, Raytheon, lead
Dixon Butler, NASA

Offered during the following time slots and locations:

Thursday 8:30 a.m. Marriott Inn and Conference Center, Potomac Salon 2
Thursday 1:00 p.m. Marriott Inn and Conference Center, Potomac Salon 2

D5: GLOBE Website Student Zone

Protocol Training: Student Zone
Data Entry
Measurement Campaigns
Student Conferences

Description: This session will explore the use of www.GLOBE.gov by students to learn and contribute to GLOBE. Emphasis will be placed on capabilities supporting students doing research projects. Each participant will have use of a computer or may connect their computer to the internet and try different functions of the website. This session will afford an opportunity to get answers to questions, training on the capabilities of the site, and experience in using the site. Participants will have the opportunity to provide feedback on the site and suggest changes and improvements.

Trainer: Kristin Wegner, GPO, lead
Julie Malmberg, GPO

Offered during the following time slots and locations:

Tuesday 1:00 p.m. Marriott Inn and Conference Center, Potomac Salon 2
Thursday 1:00 p.m. Marriott Inn and Conference Center, Chesapeake Salon C

D6: Data Entry

Training: Data Entry Forms
Use of Mobile Devices – Tablet Computers and Smart Phones
Photo Upload
E-mail Data Entry

Description: This session will explore the reporting of data to GLOBE. Use of www.GLOBE.gov to obtain data entry forms and submit data on computers and mobile devices will be emphasized and email data entry will be covered. Each participant will have use of a computer or may connect their computer to the internet and try different functions of the website. This session will afford an opportunity to get answers to questions, training on the capabilities of the site, and experience in using the site to report data. Participants will have the opportunity to provide feedback on the site and suggest changes and improvements.

Trainer: Jonathan Lang, GPO, lead

Offered during the following time slots and locations:

Thursday 8:30 a.m. Marriott Inn and Conference Center, Potomac Salon 1
Thursday 1:00 p.m. Marriott Inn and Conference Center, Potomac Salon 1

D7: Accessing Landsat Data

Training: Obtaining Landsat Data
Multispec Use

Description: This session will explore how to obtain and use data from Landsat and the Landsat Data Continuity Mission and use these data in conjunction with GLOBE. Each participant will have use of a computer or may connect their computer to the internet and download a Landsat scene. Users may bring a flashdrive with which to save this scene for use at their home institution. This session will afford an opportunity to get answers to questions and experience in using on-line resources.

Trainer: Anita Davis, NASA GSFC, lead
Frank Niepold, NOAA

Offered during the following time slots and location:

Tuesday 1:00 p.m. Marriott Inn and Conference Center, Room 1312

E1: Investigating the Impact of Urban Development through GLOBE

Protocol Training: Surface Temperature
Land Cover

Description: Today, urban areas still represent only ~3% of Earth's land surface yet are home to over half the global population. Their impacts on hydrology, temperature, resource demand and utilization, and emissions are increasingly felt from local to regional to continental, and even global, scales. In this session we will present some of the new projects to map urbanization across the globe, and how to use existing GLOBE protocols to measure the impact of built-up in areas near GLOBE schools. Participants will use the GLOBE surface temperature and land cover protocols to measure impervious/non-impervious cover and their effect on surface temperature and will replicate the hands-on process to be used by teachers/trainers/students to participate in this project. Data will be reported on tablet computers.

Trainers: Kevin Czajkowski, GLOBE Ohio Partner
Eric Brown de Colstoun, NASA, co-lead

Offered during the following time slots and locations:

Tuesday 9:00 a.m. Goddard Visitor Center Auditorium
Tuesday 1:30 p.m. Goddard Visitor Center Auditorium
Thursday 9:00 a.m. Goddard Visitor Center Auditorium
Thursday 1:30 p.m. Goddard Visitor Center Auditorium

E2: Landsat 8 and Land Cover Measurements

Protocol Training: Land Cover

Description: Land cover is critical in determining the local environment and ecology and is strongly influenced by climate. Participants will learn how GLOBE schools can contribute to the mapping of land cover and assess the biomass present at a site. The location, categorization, and documentation of a site will be trained and data, including upload of site photos, will be reported. The LDCM mission will be explained along with the complementary role played by GLOBE measurements.

Trainers: Jennifer Bourgeault, U.S. Country Coordinator, lead
Todd Ensign, GLOBE West Virginia Partner

Offered during the following time slots and location:

Tuesday 9:15 a.m. Goddard Building 33, Room H 120
Tuesday 1:45 p.m. Goddard Building 33, Room H 120
Thursday 9:15 a.m. Goddard Building 33, Room H 120
Thursday 1:45 p.m. Goddard Building 33, Room H 120

Tour of NASA Goddard Space Flight Center

August 16, 2013, 9:00 am to 11:30 am

The Goddard Space Flight Center (GSFC) is a major NASA space research laboratory established on May 1, 1959 as NASA's first space flight center. Goddard is located approximately 6.5 miles (10.5 km) northeast of Washington, D.C. in Greenbelt, Maryland, USA. GSFC, one of ten major NASA field centers, is named in recognition of Dr. Robert H. Goddard (1882–1945), the pioneer of modern rocket propulsion in the United States.

GSFC is the largest combined organization of scientists and engineers in the United States dedicated to increasing knowledge of the Earth, the Solar System, and the Universe via observations from space. GSFC is a major U.S. laboratory for developing and operating unmanned scientific spacecraft. GSFC conducts scientific investigation, development and operation of space systems, and development of related technologies.

Integration and Test Facility
NASA Goddard Space Flight Center

GSFC also operates two spaceflight tracking and data acquisition networks (the Space Network and the Near Earth Network), develops and maintains advanced space and Earth science data information systems, and develops satellite systems for the National Oceanic and Atmospheric Administration (NOAA).

GSFC manages operations for many NASA and international missions including the Hubble Space Telescope (HST), the Explorer program, the Discovery Program, the Earth Observing System (EOS), INTEGRAL, the Solar and Heliospheric Observatory (SOHO), the Solar Dynamics Observatory (SDO), the Rossi X-ray Timing Explorer (RXTE) and Swift. Past missions managed by GSFC include the Compton Gamma Ray Observatory, SMM, COBE, IUE, and ROSAT.

Stop 1: Integration and Test Facility Walkthrough Tour (Buildings 7, 10, 15 & 29)

NO CAMERAS ALLOWED

What participants may see:

Clean Room #1:

Testing done here ensures that satellites can survive launch and then conditions in space.
This clean room filters the air and removes particles 1/300th the diameter of a human hair.
There are different levels of "clean rooms." This one and the one in building 29 are the highest level of clean.

James Webb Space Telescope (JWST) being built:

JWST – will be the largest telescope ever sent into space – larger than a tennis court.
An infrared telescope to see inside dust clouds in space

Thermal Vacuum Chambers:

These chambers mimic the space environment.
They can alternate between hot and cold. One side of the space craft will be facing the sun, heat up and expand, while the other side facing away from the sun gets cold and contracts.
Liquid nitrogen is pumped through tubes making the chamber -320°F (-195°C). Can go up to +300°F (+149°C).

Shake Tables:

Shakes at 2000 cycles per minute.
Low frequency, physically shaking the spacecraft.
This tests the spacecraft for the motion of launch.

Space Environment Simulator (Big thermal vacuum chamber):

Largest thermal test chamber on center
60 Feet total, half is below the floor (18 meters)
Only thermal chamber that simulates solar radiation. 127 solar simulator models are located in the lid.

Centrifuge:

90 feet long (27 Meters)
It spins at 33 rpm's – creating 30 G's and generates 200 mph winds when spinning full speed.

Acoustics Chamber:

The acoustics chamber simulates the sound a rocket makes during launch.
This is the world's largest sub woofer and tweeter.
The chamber is so loud the paint peels off the walls.

JWST Clean Room (Window in hallway to entry way):

This is where the new instruments for JWST are being assembled. It's the largest class 10,000 clean room in the world.

JWST Clean Room (Upstairs) Best View

The room maintains a horizontal airflow towards the right wall where the filters are located.
Watch TV monitor showing JWST video/see informational displays.

Stop 2: Goddard Visitor Center – Science on a Sphere presentation (SOS)

The SOS visualization system developed by the National Oceanic and Atmospheric Administration (NOAA) uses computers and video projectors to display animated data on the outside of a suspended, 6-foot diameter (2 meter), white sphere. Four strategically placed projectors work in unison to coat the sphere with images or videos. You will see many mesmerizing visualizations developed by NASA about the dynamic Earth, the sun through x-ray, and the planetary system.

Stop 3: Goddard Hyperwall Presentation – Bldg. 28

See one of the largest computer monitors you can imagine. It's called the hyperwall. It's a bank of HD monitors located together to create a huge viewing surface to observe and discuss scientific data and visualizations. It consists of fifteen 46-inch (116 cm) high-definition LCD screens — five across, three high — to create a combined 17-by-6 foot surface (5 by 2 meter). The visualization wall displays both high-definition movies of computer simulation results and interactive data visualizations. The wall can display a single visualization across all 15 screens or up to 15 or more different visualizations at once for comparison.

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