

21ST GLOBE ANNUAL MEETING

COASTAL RESILIENCE
IN URBAN ENVIRONMENTS

30 July - 3 August 2017
New Haven, Connecticut
#GLOBE21



THE GLOBE PROGRAM

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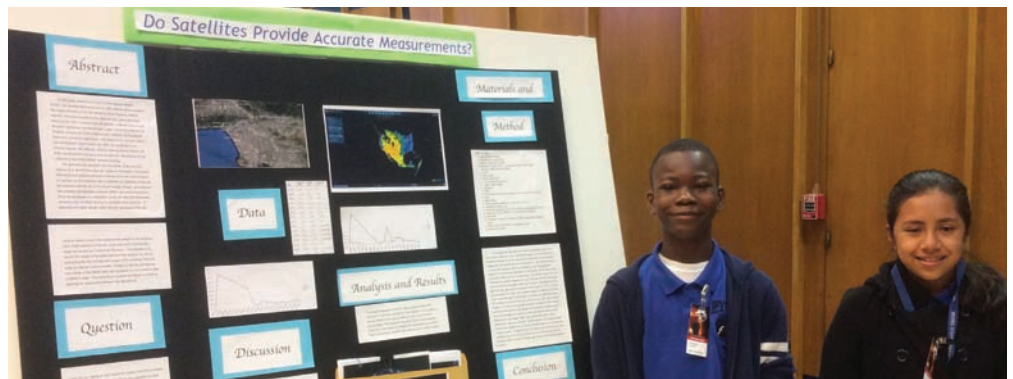
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THE **GLOBE** PROGRAM



The GLOBE Program is sponsored by the National Aeronautics and Space Administration (NASA) and supported by the National Science Foundation (NSF), the National Oceanic and Atmospheric Administration (NOAA) and the Department of State (DOS).

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ACKNOWLEDGMENTS

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

International Organizing Committee Members

Scott Graves, Organizing Committee Chair
and Host, GLOBE Partner,
Southern Connecticut State University

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Diana Garasic, Croatia

Evangeline D. Stefanakis, USA

Henry Saunders, Trinidad and Tobago

Jennifer Bourgeault, USA

John Ristvey, USA

Kevin O'Connor, Canada

Michell Klett, USA

Oluwafemi Olawale, Nigeria

Yaqoub Yousuf Ali AL-Balushi, Oman

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Brian Campbell

Rusty Low

Maria Lorraine De Ruiz-Alma

Travis Andersen

Dave Overoye

Narendra Das

Cornell Lewis

John McLaughlin

Amanda Arce

Mitch Klett

Tony Murphy

Alice Alpert

Julie Malmberg

SCSU Student Assistants: Darryl Nicholson,

Kimberly Dupuis, Jennifer Cline,

Danny Martins, Kevin Dickson, Amanda Arce,

Sarah Gifford, Peter Broadbridge,

Sharon Bostrom, Scott Thibault, Matt Connors

National Aeronautics and Space Administration

Headquarters

Washington, DC 20546-0001



June 23, 2017

Reply to Attn of:

SMD/Earth Science Division

On behalf of NASA's Earth Science Division, I am pleased to welcome you to the 21st GLOBE Annual Meeting, and to thank you for your ongoing efforts and commitment to the GLOBE Program. This past year we have seen the continuation of strong ties between GLOBE and NASA satellite missions through activities such as the ongoing ENSO campaign. In the US, NASA centers hosted two of the regional Student Research Symposia, allowing GLOBE students and NASA scientists to interact directly with each other.

This year also brought the official launch of the GLOBE Observer app, and its second protocol – Mosquito Habitat Mapper – to augment the initial clouds release and open the GLOBE program for easier participation by citizen scientists – including GLOBE alumni. We have already seen this app lead to new enthusiasm for GLOBE in South America.

Next month, on August 21st, NASA is planning for a major event: the All North American Eclipse. We are pleased to announce that the Data Information Systems team will be extending the GLOBE app to create a simple tool for reporting cloud and air temperature data at high time resolution during the eclipse. We invite anyone who is in North America on that date to download the app and contribute data to enable detailed studies of the effects of this eclipse on the atmosphere. The GLOBE Data Entry app has also gone through several cycles of improvement to better support GLOBE teachers and students, including site creation capability!

Despite changes in the US government, I am pleased to report that the budget outlook for GLOBE currently looks stable for the next 5 years or more. As your new GLOBE Program Manager, I also want to add a personal note to say how honored I am to take on this role after 15 years of involvement in various aspects of GLOBE. I hope to meet many of you whom I do not already know, and would welcome your feedback about GLOBE and your hopes for its future.

Finally, I want to thank our host Dr. Scott Graves, as well as the team who worked hard to plan the program. I hope that all of you will have a safe and informative week and leave with new GLOBE friendships.

Sincerely,

A handwritten signature in blue ink that reads "Lin Chambers".

Lin Chambers, Ph. D.

GLOBE Program Manager



National Science Foundation
Directorate for Geosciences
July 2017

Message from the Geosciences at NSF

Dr. Brandon Jones

On behalf of the Assistant Director, Dr. William Easterling, it is my honor to bring greetings and best wishes from Washington, DC, to everyone attending the 21st GLOBE Annual Meeting in New Haven, CT. We hope you enjoy your visit and make sure to grab a burger at Louis' Lunch (the hamburger was reputedly invented there)!

GLOBE is celebrating 21 years of connecting scientists, students, teachers and citizens to observe environmental processes, apply state of the art protocols, and collect standardized data to help all humanity understand how our “home” operates and open up avenues of solutions to issues and problems that impact this big blue marble. All the programs and activities associated with GLOBE provide us with a platform to gain a better understanding of our physical environment, so that we can make sustainable decisions as we move forward in our everyday lives and activities.

Given the increase in economic, environmental, social and political upheaval that the world is currently witnessing, programs like GLOBE are more important now than ever because of the programmatic focus of seeking environmental solutions using STEM-related truths. Future generations of STEM professionals, educators and citizens need to continue to interact and be trained through a sustained effort like GLOBE in order for there to be a constant pool of evidence caretakers to ensure our planet is livable for future generations.

To every student researcher, teacher, scientist, or sponsor - best wishes to you all for a successful meeting!

Brandon Jones
Program Director for GEO Education and Diversity



UNITED STATES DEPARTMENT OF COMMERCE
Office of the Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

June 22, 2017

Message from Education at the National Oceanic and Atmospheric Administration (NOAA)

Christos Michalopoulos

On behalf of the Director of NOAA Education, Louisa Koch, I wish you a successful 21st Annual GLOBE Meeting in New Haven, as well as appreciation for your work with students and educators around the world to advance their understanding of Earth science.

New Haven is known as the "Elm City". This nickname hails from the planting of Elm trees on the city green in 1686, an event that started the nation's oldest public tree planting program. In the 1930's, Dutch Elm Disease began decimating New Haven's proud trees. However, the community took action to protect its beloved canopy. Multiple groups partnered to plant disease resistant Elm trees. Today, New Haven works with community partners to plant 1,000 trees a year. New Haven's Office of Sustainability recognizes "Street trees are an important part of New Haven's tree canopy, providing not only aesthetic benefits but also saving New Haven residents and businesses over \$1.6 million annually in avoided energy costs and improving air quality".

This willingness to place value on the natural environment and take collaborative action to learn about and protect it are hallmarks of GLOBE. We at NOAA are glad to serve as a Supporting Agency working in partnership with the Sponsoring Agencies, the GLOBE Implementation Office, and you – the GLOBE Community. We are excited to work more with Dr. Lin Chambers now that she has taken the lead for GLOBE at NASA.

We at NOAA are believers in the power of science fairs to encourage and recognize student research. We offer our congratulations to the winners of this year's suite of GLOBE science fairs. We are glad to see the continued growth of science fairs within GLOBE and look forward to meeting the GLOBE students presenting their research projects this week.

GLOBE activities serve as meaningful components of a number of the projects funded through NOAA's Environmental Literacy Grants and Bay-Watershed Education and Training Programs. The latter has even called out GLOBE as an area of special interest in its funding opportunities for the Chesapeake Region.

We are excited for the opportunity to interact and share with you during what promises to be an outstanding meeting.

Sincerely,

A handwritten signature in black ink, appearing to read "Christos Michalopoulos".

Christos Michalopoulos
Deputy Director of K-12 & Informal Education





United States Department of State

*Oceans and International
Environmental and Scientific Affairs*

Washington, D.C. 20520

June 30, 2017

Message from the U.S. Department of State

Judith G. Garber

Dear GLOBE Students, Educators, and Partners:

I want to welcome you to Connecticut and thank you for another year of hard work and dedication in making GLOBE ever more successful. The U.S. Department of State has been a proud supporter of GLOBE since its launch in 1995. It is wonderful to see its continued progress, particularly in mobilizing the talents and passion of students and citizen scientists globally to work together to study, understand, and, ultimately, protect our environment.

Through its activities – science fairs, learning expeditions, and regional and annual meetings like this one – GLOBE brings science out of textbooks and into real life. GLOBE shows people around the world that science is not only about numbers and theories. Science is also about building relationships and collaborating to solve common problems. I hope the friendships you have built in the GLOBE community continue to inspire you to study the environment and apply scientific tools to the global challenges we face.

I am particularly pleased to see how the GLOBE program is growing and evolving. The new GLOBE Observer App brings GLOBE to citizen scientists. New protocols like the Mosquito Larvae Protocol harness GLOBE's power to address the challenges of today. I join my colleagues from NASA, the National Science Foundation, and the National Oceanic and Atmospheric Administration in conveying appreciation to the Globe Implementation Office for its impressive work in developing GLOBE to fit the needs of its vibrant community of today's and tomorrow's leaders.

I wish all of you a great experience this week at GLOBE Program's 21th Annual Partners Meeting. My only regret is that I will not be able to join you in the learning and fun.

Sincerely,

Judith G. Garber
Acting Assistant Secretary



Dear GLOBE Community,

It is my great honor to Welcome you all to the 21st Annual GLOBE Meeting! I am excited beyond words to be hosting you here at my home institution, Southern Connecticut State University in the historic and beautiful old New England town of New Haven, Connecticut. Our little state is big on culture, community and diversity. I hope that your experiences here along the shores of our nation's 2nd largest estuary, Long Island Sound, will be exciting, illuminating and fun. We have designed this year's program around the theme of "Coastal Resilience in Urban Environments". With this theme in mind you will have ample opportunity to engage in GLOBE data gathering in the coastal environment and shoreline habitats that we hope will stretch your investigative knowledge and skills. Data we gather using GLOBE protocols can be of value to coastal planners, local municipalities and the broader scientific community. Our theme also focuses our thinking on the important challenge of monitoring and managing coastal resources in a highly-urbanized environment, especially as we face some dramatic future predictions for our local climate and the important challenges of adapting to climate-driven sea level rise.

Our field investigation sites were chosen as they highlight important coastal ecosystems; fresh and salt water marsh systems, beaches and rocky intertidal zones, as well as coastal forest habitats. Our plan for the student research experience is a special one indeed. They will journey to Outer Island, a small offshore island nearby for an entire day filled with GLOBE data gathering activities. The Island is also an important Bird Sanctuary, so there may be opportunities to see some endangered migrating bird species. Other field sites include the Cove River Historical Site and Hammonasset State Park, where we will engage in GLOBE Hydrology protocols at fresh and salt water marsh sites, as well as practice some forest Biometry protocols. Like the students at Outer Island, at Hammonasset, we will conduct Intertidal Transects, investigating the distribution of organisms in the tidal zone. We will also be conducting a variety of other GLOBE protocols here on SCSU's campus. These include Atmosphere/Clouds, Hydrosphere and Mosquitos, and Soils/SMAP.

Our conference agenda is full of interesting sessions and you will hear from a variety of expert presenters as well as engage in panel discussions. There will be opportunities to tour SCSU's various Science Labs, the Werth Center for Coastal and Marine Science and more. We have some other fun activities planned including a "Pizza and a Movie" night for the students on Tuesday, followed by a very special treat on Wednesday evening – a Night at the Peabody Museum of Natural History. The Peabody is one of the oldest and certainly among the most famous museums of its kind anywhere in the western hemisphere. This is a must-see experience and I hope you all take advantage of this opportunity.

My experience planning this meeting has brought me ever so much closer to my colleagues in GLOBE and the leadership at my own institution. I am especially thankful for the support and assistance of the GLOBE GIO staff, my own Dean of Arts & Sciences, my President, Provost and many fellow faculty here at SCSU. I am also very thankful for the support of the National Science Foundation, NASA, NOAA and for all the offers of assistance from the GLOBE community. Please join me in welcoming all our friends and colleagues in GLOBE and give thanks to all the many volunteers, field interns and others for their invaluable assistance in making this 21st Annual GLOBE Meeting the best it can be.

In recognition of our theme this year... may we all remain *Resilient* and continue our passion for environmental science and science teaching as we celebrate GLOBE's 21st anniversary!

Thank you all for your continued dedication to GLOBE!

Very Sincerely,

A handwritten signature in blue ink, appearing to read 'Scott M. Graves', is written over a horizontal line.

Scott M. Graves
Connecticut Partner



Dannel P. Malloy
GOVERNOR
STATE OF CONNECTICUT

Dear GLOBE Members:

I am pleased to welcome you to Connecticut as you undertake this annual meeting to focus on “Coastal Resilience in Urban Environments” – a topic that is important to many of our cities and towns.

In Connecticut, we strive to preserve and protect our state’s environment. As part of this commitment, we implemented the state’s first Comprehensive Energy Strategy, which focuses on cleaner, cheaper and more reliable energy and makes major investments in solar energy and other clean energy alternatives.

Over the past few years, we have taken steps to ensure that a 1,000-acre parcel along Connecticut’s shoreline that was the last large unprotected coastal forest between New York City and Boston would be a protected and enjoyed for generations to come.

Furthermore, Connecticut is committed to addressing the issue of climate change head on – the impacts of which we have witnessed firsthand in our state. Through a \$54 million grant awarded by the National Disaster Resilience Competition, the Connecticut Institute for Resilience and Climate Adaptation is leading the development of critical infrastructure projects in communities impacted by natural disasters. Following President Trump’s withdrawal from the Paris Agreement, Connecticut joined with other states to form the United States Climate Alliance, an organization committed to reducing emissions by 26-28 percent from 2005 levels.

The goals of GLOBE resonate with those of us who care for Connecticut’s lands, waters, and air, and we thank you for helping to sustain a healthy global environment. I wish you the best for a productive and informative meeting.

Sincerely,

Dannel P. Malloy
Governor



RICHARD BLUMENTHAL
UNITED STATES SENATOR

July 30, 2017

Dear Friends,

Welcome to Global Learning and Observations to Benefit the Environment's 21st annual meeting! My sincere thanks to all in attendance for your on-going commitment to a clean, sustainable environment. I regret I cannot be in attendance.

As we fight to reduce our reliance on fossil fuels and lower carbon emissions, we must also work to make our coastal communities more resilient when extreme weather such as hurricanes, floods and blizzards strike. Most recently, Storm Sandy's impact on our beaches and coastal areas underscored the critical, vital need for better preparation and enhanced protections against storm surges and high winds. Federal programs have been crafted to provide funds and direction to coastal communities to develop storm damage mitigation programs. Money spent on these programs not only save lives and livelihoods but also future taxpayer funded disaster expenses.

By gathering today to discuss this very important issue, you are helping to minimize the grave threat weather hazards pose to us and our loved ones, as well as safeguard our economic well-being. It is my hope that you will transfer the knowledge you gather here today into action for a cleaner, safer environment for future generations.

Once again, my sincere thanks to all in attendance for your continued efforts and advocacy.

Sincerely,

A handwritten signature in blue ink, reading "Richard Blumenthal", is placed below the word "Sincerely,".

Richard Blumenthal
United States Senator



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3RD DISTRICT, CONNECTICUT

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POLICY COMMITTEE

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RANKING MEMBER

LABOR, HEALTH AND HUMAN SERVICES,
EDUCATION, AND RELATED AGENCIES
AGRICULTURE, RURAL DEVELOPMENT,
FOOD AND DRUG ADMINISTRATION,
AND RELATED AGENCIES

June 15, 2017

Southern Connecticut State University
501 Crescent Street
New Haven, Connecticut 06515

Dear Friends,

I am honored to have this opportunity to welcome you to Greater New Haven and the beautiful state of Connecticut! We are proud to host a group whose work is so vital to the health of the global environment.

As you know, supporting scientific research and sustainable practices is now more critical than ever, and GLOBE is on the front lines, educating students and nurturing collaboration among those in the scientific, education, and environmental communities. As a Member of Congress, and a member of the House Appropriations Committee, I am troubled by the direction the current Administration seems to want to take our nation in when it comes to scientific research, particularly in terms of environmental preservation, restoration, and resiliency efforts. That is one of many reasons why GLOBE and programs like it are so important.

Your time in New Haven will be well spent, as you connect with your colleagues and study coastal resilience at Southern Connecticut State University, home of the Werth Center for Coastal and Marine Studies. The research conducted at the Werth Center on such topics as water quality, sediment contamination in the harbors, plastics in the marine environment, coastal erosion and vulnerability, and the impacts of large storms, such as 2012's Hurricane Sandy, has gone a long way in helping us better understand what we, as individuals and as communities, must do to protect our shorelines and the waters we so enjoy.

I am grateful to GLOBE for the important work you do every day and for your focus in this annual meeting on an issue that directly impacts Southern Connecticut. Best wishes to you for a successful conference. With my warmest regards,

Sincerely,

ROSA L. DeLAURO
Member of Congress



CITY OF NEW HAVEN

TONI N. HARP, MAYOR

165 Church Street
New Haven, Connecticut 06510
T: 203.946.8200 F: 203.946.7683
www.CityofNewHaven.com



July 30, 2017

Dear Friends:

As a Mayor of the Elm City – the great city of New Haven – I am delighted to welcome you to Southern Connecticut for your annual meeting.

With a theme of “Coastal Resilience in Urban Environments” your meeting is well located: as you may know, New Haven’s geography and history have been shaped by three rivers – the West, the Mill, and the Quinnipiac – that all flow into Long Island Sound. Personally, I have lifelong interest in urban planning and how cities work, and with New Haven’s location on Long Island Sound, the topic of coastal resilience in urban environments is of particular concern to me.

New Haven has a commitment to protecting our environment, and, as an urban center, certainly faces environmental concerns. Through its innovative and collaborative sustainability efforts, the City has teamed up with neighborhood and environmental groups to convert environmental liabilities into sustainable assets. The New Haven Office of Sustainability provides a central point of coordination for sustainability activities, encouraging energy conservation and sustainable economic activity and offering resources to residents to live more sustainable lives while saving money.

I applaud you and GLOBE for your efforts to research and educate others on best practices in environmental stewardship and scientific endeavors. I wish you all the best in your meetings and activities over the next few days and look forward to learning about their outcomes.

Sincerely yours,


Toni N. Harp
Mayor

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www.InfoNewHaven.com





FEATURED SPEAKERS

Alexander J. Felson, PhD

Associate Professor
Yale University

Urban Design and Landscape Architecture for Coastal Resilience

Monday, 12:30 pm ~ ASC Ballroom



Dr. Felson is an Associate Professor at Yale University, an urban ecologist and a registered landscape architect. He directs the joint degree program between the School of Architecture and the School of Forestry and Environmental Studies and is the founder of the Urban Ecology and Design Lab (www.uedlab.org).

Felson focuses on ecological urban design through landscape architecture combined with green infrastructure (especially water management), coastal adaptation and constructed plant communities. He was part of Yale's core team on a federal Housing and Urban Development (HUD) Hurricane Sandy initiative, Rebuild by Design, and is currently serving as an advisor to the State of Connecticut through an Executive Order from the Governor on the "State Agencies for Resilience." He was the lead designer for the State of Connecticut's HUD National Resilience Disaster Competition. The UEDLAB worked with the Nature Conservancy on the Regional Framework for Coastal Resilience in Southern Connecticut, a USDA funded coastal resilience project in collaboration with the Southern Connecticut Regional Council of Governance and the MetroCog. Working with town representatives, the team developed near,

mid and long term coastal adaptation proposals. Felson built bioretention gardens in Bridgeport as an early example of coastal green infrastructure and developed the first Coastal Resilience Plan in Connecticut for Guilford. He is working on the Old Saybrook Coastal Resilience Plan as well as developing an economic and planning technical guide for East Haven and West Haven.

Felson is also working on projects in California including an ecological restoration and recreation design for Lake Lagunita on Stanford University's campus. He works on large national park and green infrastructure projects (e.g. the Presidio, the American River Parkway in California and projects in Baltimore, MD). His research focuses on linking urban and landscape design with applied ecological research to study, adapt, and reshape human settlements in response to pressing sustainability challenges. Felson was part of the class of 2009, Crain's New York Business, 40 Under 40 for his work at AECOM where he worked on complex urban design projects including Governors Island, Fresh Kills Landfill, and the World Trade Center Streetscapes. He also served as project director for the MillionTreesNYC Reforestation Plan and integrated amphibian research into land developments.



Mark Paine

Assistant to the
Commissioner of
Public Works,
City of West Haven,
Connecticut



James Tait, PhD

Oceanographer and
Professor in the
Department of
Environment, Geography
and Marine Sciences,
Southern Connecticut
State University



Scott Graves, PhD

Associate Professor of
Environmental
Science Education,
Department of Environment,
Geography and Marine
Science, Southern
Connecticut State University

Panel Discussion: Academic and Citizen Science Collaborations with Local Municipalities

Tuesday, 8:30 am ~ ASC Ballroom

Mr. Paine is the Department of Public Works liaison to the Harbor Management Commission, the Inland Wetlands Watercourse Agency and the West Haven Watershed Association. He has also managed the Menunkatuck Audubon Society's osprey platform project. He recently received the Outstanding Municipal Official of the Year award for New Haven County from the Southwest Connecticut Conservation District.

Mr. Paine, an alumnus of SCSU, has worked with SCSU faculty including James Tait and Scott Graves on coastal resilience monitoring projects involving SCSU students. He has also worked with local West Haven High School teachers (Kevin Dickson) and students to further study the Cove River estuary.

Dr. James Tait received a PhD in Earth Sciences, with a specialty in coastal oceanography, from the University of California at Santa Cruz. His current research focuses on the coastal impacts of large storms such as Irene and Sandy. He is co-founder and co-coordinator of

the Werth Center for Coastal and Marine Studies at SCSU. He has worked with coastal communities to develop resilience in the face of rising sea level and storm intensification. One of his most cherished accomplishments is being included in the surfing movie, *Beyond Monster Mavericks*.

Dr. Scott Michael Graves (PhD in Science/Technology Education from University of Idaho) conducts research on science teaching; teaches education and environmental science courses (undergraduate and graduate), and is coordinator for the MS Degree Program in the Science Education and Science Teacher Certification Program. Dr. Graves is a former USGS Marine Geologist/Oceanographer and has conducted field research and published on Arctic Coastal Erosion.

Dr. Graves has been an active member of the GLOBE community since its inception. While at UIdaho, and just upon completion of doctoral work, Dr. Graves conceived of the Lewis and Clark Rediscovery Project – receiving \$7.5M

from the USA Department of Education. Dr. Graves served as Co-Director of this project for 5 years and in the process helped train >52 lead teachers in 9 states in GLOBE Protocols and Activities and these went on to train many, many more teachers. Scott has been passionate about GLOBE all his professional career! Dr. Graves has designed GLOBE-centered college courses that are core to both undergraduate and graduate programs in Environmental Studies and Science Education. These courses cover GLOBE field protocols and data collection in detail in a semester long course, with links to Earth Systems Science content and activities. Field sites include the Cove River in West Haven, CT where study has been underway since 2005. Many College and High School Students have conducted GLOBE studies at Cove River, some winning Connecticut-wide science fairs and other awards. Dr. Graves has served as a state coordinator for GLOBE in Connecticut and also on the GLOBE Technology Working Group, something he is very proud of and enthusiastic about.



Dalia Kirschbaum, PhD

Research Physical Scientist
NASA Goddard Space Flight Center

Measuring Rainfall from Space in Our Backyards: How Satellites Can Be Used to Understand Disasters, Disease and More



Wednesday, 8:30 am via Skype ~ ASC Ballroom

Dr. Dalia B. Kirschbaum is a Research Physical Scientist in the Hydrological Sciences Lab at NASA Goddard Space Flight Center, Greenbelt, MD. Her research interests center on rainfall-triggered landslide modeling, focusing on applying remotely sensed surface and precipitation information to landslide hazard models at multiple spatial and temporal scales. Her current research focuses on advancing a regional landslide hazard and forecasting system with more quantitative and deterministic models to improve landslide hazard assessment. She has also developed a web-based interface for visualization of landslide hazard and remote sensing products

for improved situational awareness of landslide hazards and reported events. Dr. Kirschbaum is also the Global Precipitation Measurement (GPM) Mission Associate Deputy Project Scientist for Applications. In this role, she provides scientific support for applications research and activities. Dr. Kirschbaum received her M.S. and Ph.D. in Earth and Environmental Sciences from Columbia University with a focus in Natural Hazards and Remote Sensing. She received her A.B. in Geosciences from Princeton University. In 2017 she was awarded the Presidential Early Career Award for Scientists and Engineers (PECASE) by President Obama.



David Kozak

Senior Coastal Planner, Connecticut
Department of Energy and
Environmental Protection, Office of
Long Island Sound Program



Mark Paine

Assistant to the
Commissioner of Public Works,
City of West Haven, Connecticut



James Tait, PhD

Oceanographer and Professor in
the Department of Environment,
Geography and Marine Sciences,
Southern Connecticut
State University



Scott Graves, PhD

Associate Professor of
Environmental Science Education,
Department of Environment,
Geography and Marine Science,
Southern Connecticut
State University



Rebecca French, PhD

Director of Community
Engagement, Connecticut
Institute for Resilience and
Climate Adaptation,
University of Connecticut

***Panel Discussion: The Importance of Ongoing Environmental Monitoring;
the Value of Citizen Science and GLOBE; How Local GLOBE Students can Connect their
Data Collection to the Needs of a Local Stakeholder/Municipality***

Thursday, 12:45 pm ~ ASC Ballroom

Dave Kozak is a senior coastal planner in CT DEEP's Coastal Management Program. He has counseled coastal municipalities for over 20 years on coastal land conservation and development. Other recent responsibilities include identifying the State's most significant remaining coastal land conservation targets, overseeing Connecticut's coastal public access program and examining the potential response of Connecticut's coastal marshes and shoreline infrastructure to sea level rise. Dave received his Masters in Environmental Studies from the University of Oregon.

Dr. Rebecca French is the Director of Community Engagement for the Connecticut Institute for Resilience and Climate Adaptation (CIRCA). In this role, she develops relationships with community leaders in at risk communities, state policy makers and relevant state, local and regional organizations to translate the research products of CIRCA faculty and staff into usable information for these stakeholders and to solicit their input into the work of the Institute.

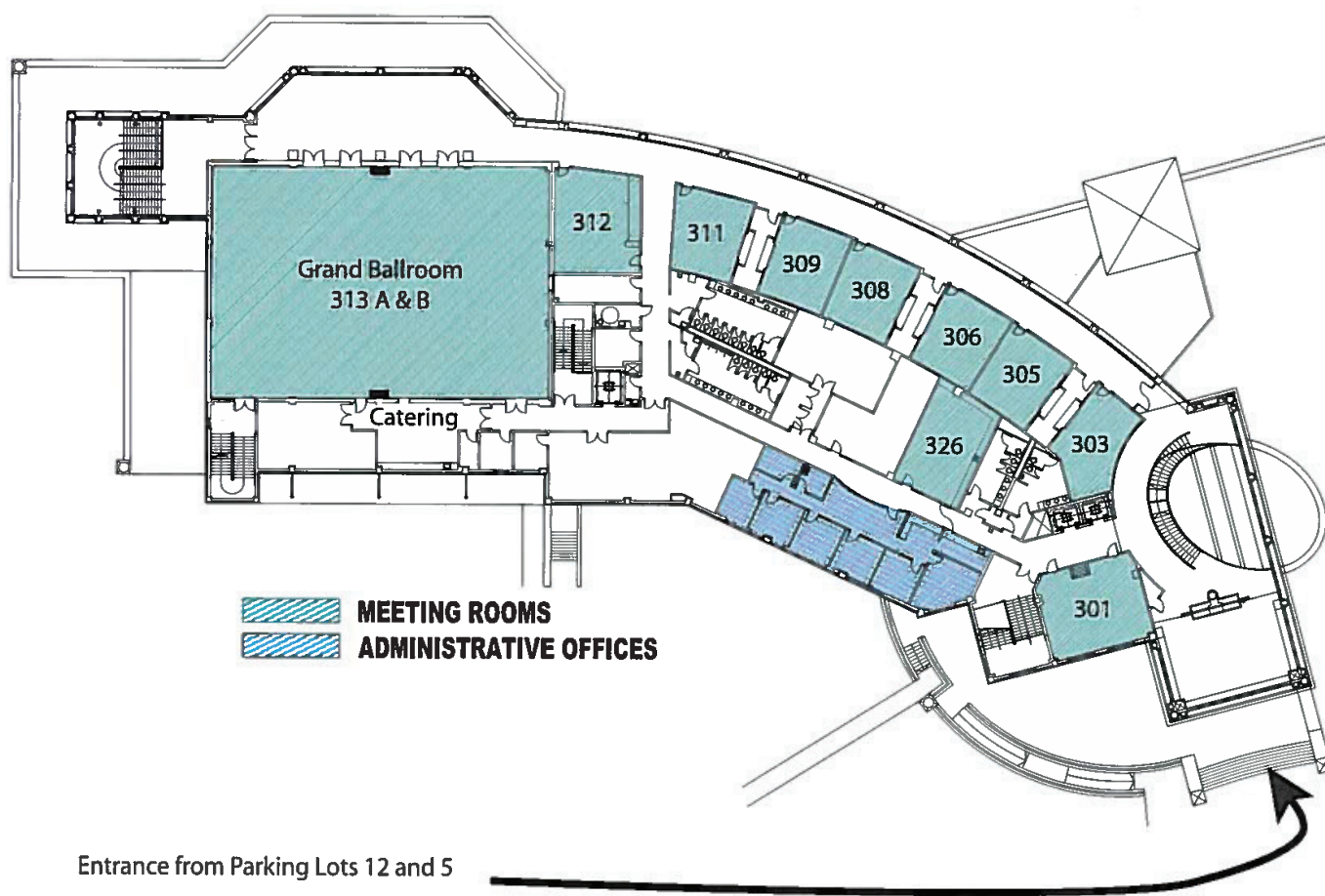
Previously Dr. French was an AAAS Science & Technology Policy Fellow with the U.S. Environmental Protection Agency in the Office of Research and

Development. Dr. French also spent a year in Congress as a Congressional Science Fellow, sponsored by the American Geophysical Union, in the Office of US Senator Bernie Sanders (I-VT). She served as a policy advisor to the Senator in the areas of energy, environment, and agriculture.

Dr. French is a proud native of northeast Connecticut. She holds a Ph.D. in geosciences from Virginia Tech and an M.S. in soil science from Cornell University. She received her B.A. from Oberlin College in chemistry and environmental studies.

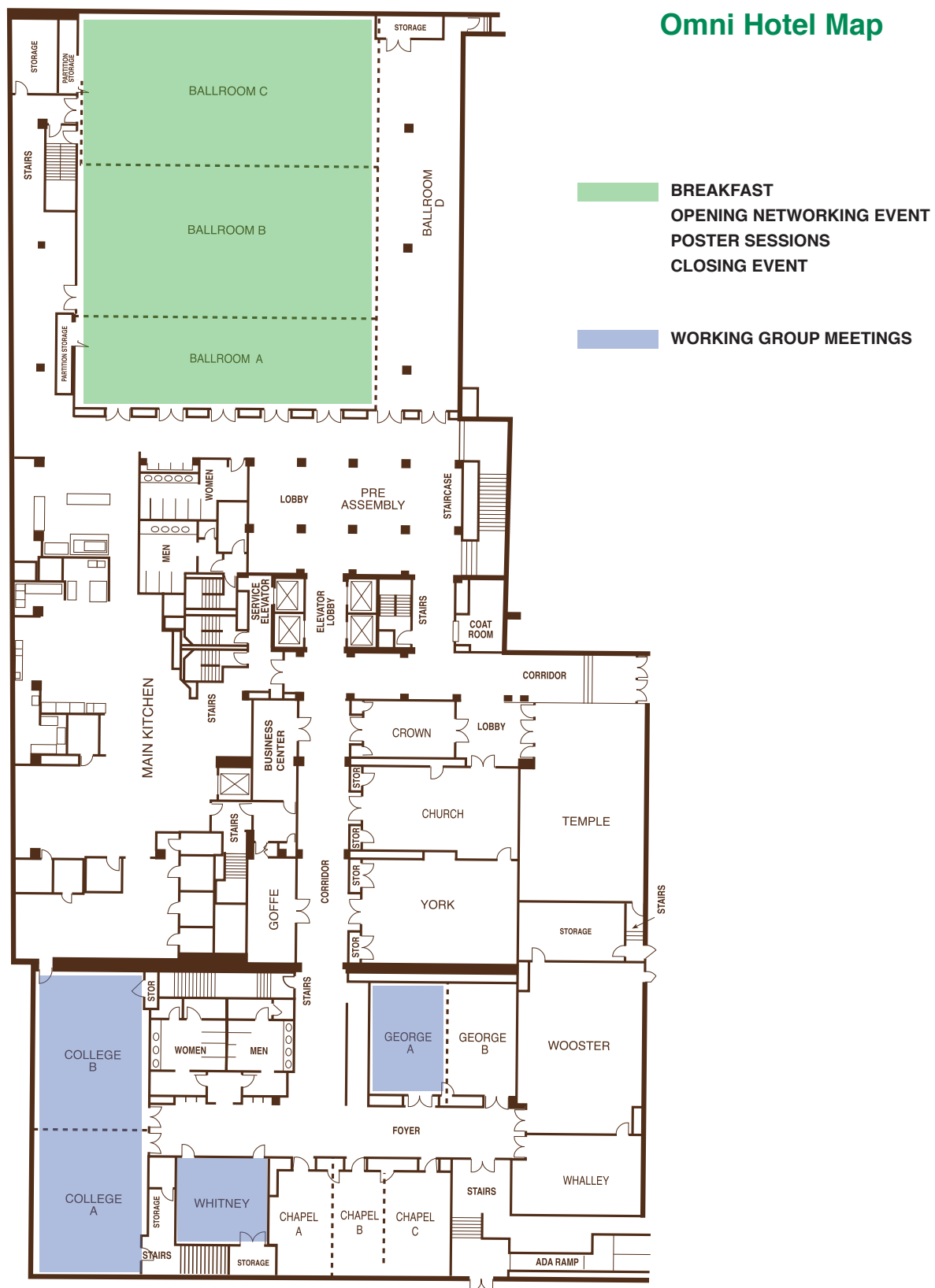


Southern Connecticut State University Adanti Student Center Map



New Haven at Yale

Omni Hotel Map





Sunday, 30 July	Monday, 31 July	Tuesday, 1 August
8:00 am Registration Open 9:00 am GLOBE Working Group Meetings	6:30 am Students Set Up Posters for Presentations 8:30 am Plenary Session: Welcome and Opening of the Meeting; Remarks from Partner Hosts, GIO Director, Sponsors and Special Guests 9:15 am The Past Year in Technology AM BREAK 10:15-10:30 10:30 am Plenary Session: Field Experience Description for Protocol Training 10:30 am Student Collaboration Opportunities and Research Alignment 11:30 am Register for Field Experience Protocol Training LUNCH 11:30-12:30 12:30 pm Keynote Address: Alexander Felson 1:15 pm Reports from GLOBE Working Groups 1:15 pm Student Field Preparations and Introduction 2:30 pm Concurrent Sessions: Country Coordinator Meeting; US Partner Meeting PM BREAK 3:30-4:00 4:00 pm Concurrent Sessions Continue 5:00 pm Students Set Up Posters for Presentations 5:45 pm Photos and Interviews with Students	8:30 am Panel Discussion: Academic and Citizen Science Collaborations with Local Municipalities — Beaches and Marshes 8:30 am Students travel to Outer Island 9:30 am Concurrent Protocol Training Sessions; Requires pre-registration: Hammonasset Beach; Cove River; SCSU Campus LUNCH 12:30-1:30 1:45 pm Concurrent Sessions: Campus Tour; GLOBE and Citizen Science; Balloon/Kite/Drones: How they Enhance our Understanding of Science and the Environment; Creative Models for Implementing GLOBE in Your Country; GLOBE Professional Development and Training PM BREAK 3:00-3:15 3:15 pm Concurrent Sessions: Website Administration; GLOBE Weather NGSS-Based Instruction Unit for Middle School; Coastal Measurements; Regional GLEs; Implementing GLOBE in Your Classroom; Educator Toolkit
5:00 pm Trainer Meeting	6:30 pm 5 th Student Research and GLOBE Community Exhibition	5:00 pm Student Working Sessions and Pizza Night 5:45 pm Free Evening for adults
6:30 pm Opening Networking Event		

Wednesday, 2 August	Thursday, 3 August
8:30 am Keynote Address: Dalia Kirschbaum 9:30 am Concurrent Protocol Training Sessions; Requires pre-registration: Hammonasset Beach; Cove River; SCSU Campus. 9:30 am Student Learning Experience Data Analysis	8:30 am Plenary Session: GLOBE Strategic Plan World Café 8:30 am Student Campus Cache
	AM BREAK 10:00-10:30
	10:30 am Student Final Preparations for Presentations 10:30 am Concurrent Sessions: Elementary GLOBE; GLOBE Alignment with NASA Resources; Present and Future Collaborations; Implementing GLOBE in a Classroom (U.S); Inclusion in the GLOBE Community STEM Equity; Technology Share-a-Thon: GLOBE Apps, Mosquitos, Phenology
LUNCH 12:30-1:30	LUNCH 12:00-12:45
1:30 pm Student Research Experience Peer Review 1:45 pm Concurrent Sessions: Campus Tour; GLOBE Weather NGSS-Based Instructional Unit for Middle School; SMAP Soil Moisture Measurements and New Instrumentation; Implementing GLOBE in a University; GLOBE Observer Mosquito Habitat Mapper	12:45 pm Panel Discussion: The Importance of Ongoing Environmental Monitoring; the Value of Citizen Science and GLOBE; How Local GLOBE Students can Connect their Data Collection to the Needs of a Local Stakeholder/ Municipality 1:45 pm Student Learning Experience Round Robin
PM BREAK 3:00-3:15	PM BREAK 3:45-4:00
3:15 pm Consecutive Sessions: Data Entry and Visualization from GLOBE Field Work; Website Clinic 3:45 pm Student College Site Exploration	4:00 pm Plenary Session: The Year Ahead
7:00 pm Night at the Yale Peabody Museum	7:00 pm Group Photo and Closing Networking Event



GLOBE Student and Community Poster Session Abstracts

Student Research Projects

☀ *Drawing Winners of the 2017 International Virtual Science Symposium
(randomly chosen from eligible participants of the 2017 IVSS).*

1A:

Country: Colombia

**School: Semillero de Investigación en Ciencias Espaciales SICE –
Semillero Kepler (ITSA)**

Presentation Title: Clouds and temperature variation in the Atlantic department

Teacher: Erquinio Alberto Taborda Martinez

Student(s): Daniela Corpas Peñuela, Daniel Beltrán Castillo, Jesús Eduardo , Taborda de la Barrera, Johan Alberto Taborda de la Barrera, Luis Padilla Castro, Selena De lima Guzmán, Jesús Serpa Pájaro, Mariana Marquez Jaramillo, Alexandra Damián Noriega.

This work develops a study of the variation of the temperature in the last 10 years, data that are extracted from the data base of the CERES-SCOOL project of the NASA that tries to look for answers to the presence of natural phenomena related to the clouds and The terrestrial radiant energy system, which has detected variations in the earth's surface, such as the increase of 0.55 ° C, in the year 2011. These effects are frequently associated with human behaviors that deteriorate the natural resources affecting the ecological balance, it is hypothesized in these investigations that temperature fluctuations of the oceans may lead to very strong climatic changes such as: The phenomenon of the Child and the Girl that originate in the Pacific Ocean.

Although this is a reality that touches all the inhabitants, it is necessary that the young students investigate the subject, take ownership of the situation and try to propose solutions from their capabilities through this work that through a statistical analysis from its base Data that began in 2006 and is still in force to date, will record information concerning the coverage and types of clouds, temperature, relative humidity, characteristics that determine the climate in the region and thus create a mathematical model that allows us to predict. In order to be prepared for a possible attack of nature, we will use tables of frequencies and graphs that allow us to know the relation of factors that determine climate change. It is expected to find a relation between the variation of the temperature during a period of time and to contrast this data with other investigations carried out by authors specialized in the subject.

Poster

1B:

Country: Croatia

School: Škola za medicinske sestre Vrapče

Presentation Title: Škola za medicinske sestre Vrapče

Teacher: Ira Beck, Marinela Labaš, Jelka Škoton

Student(s): Nikola Bušić, Philip Carek, Sara Gorički, Tin Kuzmanović, ,Karlo Ložnjak

Is the composition of aerosols changed within a day size of dispersed particles changed considering the change of climatic conditions? Are the changes of aerosol composition seasonal? Wind direction and measurement's stations location? We measured aerosols quantity; air temperature, barometric pressure and wind direction for 2 years. Data for France and Norway were taken from GLOBE base. Conclusions: the value of aerosols changes seasonally, the value of AOT Red increases by wind blowing from across the mountain, average values of AOT Green are larger in city area, for AOT Red at coast. Temperature and barometric pressure showed no significant importance.

Power Point

2A:

Country: Croatia

School: Škola za medicinske sestre Vrapče

Presentation Title: Light pollution and our sleep

Teacher: Ira Beck, Marinela Labaš, Jelka Škoton

Student(s): Nikola Bušić, Philip Carek, Sara Gorički, Tin Kuzmanović, Karlo Ložnjak

We wanted to find out light pollution's influence on sleeping. 109 students during 2 school years researched that in 10 cycles, 6270 measurements, according GLOBE at night project's calendar visibility of the stars. We collected data for: type of settlement, position of a bed related to public lightning and other sources of artificial lightning, sleeping quality and possible causes for lack of sleeping, constellation's visibility magnitudes values. All were statistically analyzed, graphically presented, further processed, compared and analyzed in Microsoft Excel program. Results and conclusions are: problem is bigger in center than in wider area and it affects sleeping quality.

Power Point



2B:

Country: France

School: Lycée Bernard Palissy

☀ Presentation Title: Global Warming and His Action in Maximal and Minimal Temperature Variations on the Continent

Teacher: Michel Pedurand

Student(s): Justine Micheletti, Clara Lanceraux

The projection of global medium temperatures on Earth in 2100 anticipates a global increase with a more important warming in northern latitude than southern.

We want to simply quantify the global warming and show that variations on minimal temperatures are higher than maximal for different stations (comparing the average of the last thirty years).

We search stations approximately all 10° in Europe with search tool GLOBE. Then we collect temperature data for the different stations (year 2016) and climatic data for the same stations. For global warming, we have 80/96 averages of 2016 (83%) upper than climatic values. The sample of weather stations is rather small (4 stations) but each time the correlation is quite strong, global warming is well noticeable and for 4 different places. For the deviations between maxima and minima, 32/48 minima deviations are higher than maxima deviations (66,6%). This is not a strong correlation but a certain trend that shows that global warming is marked by a greater increase in minimum than maxima.

Poster and PowerPoint

3A:

Country: France

School: Collège Jules Vallès – Portet sur Garonne

Presentation Title: What are the meteorological conditions that cause the formation of clouds of fine particles?

What is the part of black carbon particles in these clouds of fine particles?

And what is the health impact?

Teacher: Sandrine Larrieu-Lacoste

Student(s): Jade Avrillaud

In the winter of 2016-2017, Europe and France experienced episodes of pollution with fine particles causing the premature death of 48,000 people per year in France. These episodes seem to be more frequent in the winter. For the first time, with the atmospheric data from GLOBE, we have seen that when the atmospheric pressure is high, there is no precipitation and the temperature is low and we observe a thermal inversion. Then, we discovered that this situation is the key for the formation of fine particles clouds. Subsequently, we decided to investigate about the composition of particle clouds. For this investigation, we measured several components of air pollution as 'Aerosol Optical thickness' and concentration of 'Black Carbon'. This new measurement protocol enabled us to realize the importance of the pollution on our atmosphere.

The second part of our project was the automation of this new sensor using an arduino microcontroller.

Poster



Proud Host of the 21st GLOBE Annual Meeting: “Coastal Resilience in Urban Environments”

Southern Connecticut State University offers interdisciplinary academic training for undergraduate and graduate students, supporting career aspirations in the environment and sustainability field through the Departments of the Environment, Geography, and Marine Sciences and Earth Science. Our programs provide a diverse array of professional education options and offer students hands-on learning experiences both inside and outside the classroom. Our strength lies in student-faculty research collaborations and faculty-supervised research projects.

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Environmental Education, M.S.

Geography, B.A., B.S.

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3B:

Country: Israel

School: Ort Muqeible High School

Presentation Title: Examine the effect of water type on the growth of lentils seeds .

Teacher: Miriam Abdalla

Student(s): Tasneem Saleem , Raghad Ziadat , Jowan Saleem , Baraa Hmad

We have been very curious about the effect of water on the growth rate of lentil seeds. So we brought 12 pots and the same kind of soil, we planted lentil seeds in every pot which contains 400 gm of soil and we have 4 types of water :

1. washing water
2. salt water
3. distilled water
4. tap water

At first we assumed that washing water and salt water will have negative effects on the growth of lentil seeds, but distilled water and tap water will affect on the growth of lentil seeds positively. But after we did the experiment and saw the results, we made sure that our hypothesis was wrong. We noticed that washing water, distilled water and tap water have positive effects, but salt water has a negative effect on the growth of lentil seeds. So we advics everyone who wants to plant lentils not to use salt water because of its negative effects.

Poster

4A:

Country: Israel

School: Al Faruk Elementary School

☀Presentation Title: Checking the validity and the quality of wells' water in Jabel Al-Mukkaber area

Teacher: Samah Tawfiq

Student(s): Mina/ Dina/Dunia/ Shaden/ Shaima/ Tasneem/Sara/Sadeel/Shahd/ Nancy/Mayar/Randa/Raba'a/Sana/ Mays

Jabel Al-Mukkaber village in Jerusalem city is known with the availability of household wells were they collect the rainwater in order to use it for different purposes such as; drinking, irrigation and cooking. However, this water may be exposed to serious dangers and water pollution is the most severe one. Therefore, in this study we focused on the water pollution problem, which may affect its validity of drinking , specifically, we to chose to check the wells' water validity and quality of drinking according to the surrounded environments. Our main research question was "to what extent does the wells water in Jabel AL-Mukkaber area is considered to be valid for drinking?". Therefore, and within the GLOBE program, the six graders in AL-Farouq school in Jabel AL-Mukkaber started to collect some samples of wells' water, did some physical, biological and chemical tests using simple devices and tools. Finally, the results indicated the fact that the water in the wells which are surrounded with animals are not valid for drinking and do not meet the Israeli and WHO standards of water validity for drinking. Moreover, the wells which are not periodically cleaned and sterilized may cause diseases for its users. On the other hand, the wells which are surrounded with flagstones or asphalt and which are sterilized constantly do not have problems.

4B:

Country: Peru

School: Institucion Educative a Emblematica Teresa Gonzalez de Fanning

Presentation Title: Factors that Alter the Trophic Network of Jesus Mary's Birds

Teacher: Vicky Mery Reyes Alvino

Student(s): Fátima Tafur León, Anthonela Escobar Cantalicio, Lucia Sakiyama Torres Lucia

The variability of the temperature has affected the trophic network of the birds of Jesus Maria provoking the immigration of the Falcons and Gavilanes Acanelados, from the sierra part of Lima, generating in turn a new trophic network of the district as it feeds on the birds Slower than the Red-headed and Scarlet-fronted parrots, and becoming new resident birds of the district.

They have also observed the excessive use of agrochemicals (the sierra part of Lima), because soils are being affected by climate change making them more unproductive every year, and these agrochemicals are killing the smaller birds that feed the hawks and Gavilanes Acanelados inside its natural ecosystem.

Power Point

5A:

Country: Philippines

School: Batasan Hills National High School

Presentation Title: The Feasibility of Using Calamansi (*Citrofortunella microcarpa*) to Prevent Loss of Soil Moisture during Drought

Teacher: Joan B. Callope

Student(s): Mae Pia Flor P. Cawaling, Ivy Katrina K. Malañgen, Hazel B. Mendoza

Drought has been a big problem in these modern days most especially during summer. This research study suggests the use of alternative anti-drought method instead of using expensive commercial and chemical solutions that are harmful to the environment. One of the most promising anti-drought methods is the use of Calamansi (*Citrofortunella microcarpa*). In the study, two groups of soil were used: a control group that does not contain Calamansi and an experimental group that contains Calamansi. The two groups were exposed to artificial light generating a temperature of about 40 degrees centigrade. The study found out that the soil containing Calamansi retained its moisture while the soil that does not contain Calamansi lost its moisture.

Poster

5B:

Country: Philippines

School: Batasan Hills National High School

Presentation Title: Utilization of Jackfruit seed as Biofuel Extract

Teacher: Joan B. Callope

Student(s): Mae Joy S. Bernales

Global usage of energy has been increasing. It is therefore necessary to develop substitute fuels that can help lessen the country's dependence on imported fuels. We seek to find out whether oil from jackfruit seeds can be used as biofuel substitute. The extracted substances from the jackfruit seeds were mixed, covered and stirred. The extracted jackfruit substances were heated, stirred, and cooled to room temperature. Methoxide ($\text{NaOH} + \text{CH}_4\text{OH}$) was added and the mixture was continuously stirred to obtain esters. The researcher proved that the oil from the Jackfruit seeds can be a source of biofuel.

Poster



6A:

Country: Saudi Arabia

School: The 20th Secondary Girls School at Al-Madinah Al-Munawarah

Presentation Title: Relationship between cloud cover and temperature change through end of autumn and beginning of winter in the western area of Al-Madinah Al-Munawarah

Teacher: Majedah Zaal Aljohani

Student(s): Renad Abdul Hadi Al Dosari

Clouds are made of small and light water droplets stay the air because of their light weight and they produced as interaction between air temperature and humidity. In Al-Madinah Al-Munawarah the lower temperature rate is 18 °C in the month of January. This month considered as the coldest month of the year. Studies have indicated that Saudi Arabia affected by the phenomenon of climate change. It has been observed that in the period between 1978 and 2007, there is a linear decrease in the amount of rainfall. Another study estimated increase on temperature which could reach high as 1 °C to 2.5 °C. They also estimated a decrease in the percentage of rainfall which could reach up to 20% to 25%. In another study of Al-Madinah Al-Munawarah specifically and suggested that the rainfall will not exceed the low amount of rainfall 1%. It is likely that this phenomenon of climate change could have a direct negative impact on agriculture and water sources in the Kingdom of Saudi Arabia. In this study correlation between changes in temperature and the percentage of cloud cover over the west area of Al-Madinah Al-Munawarah is studied, to know whether the rise in temperature will affect rainfall.

Poster

6B:

Country: Saudi Arabia

School: Hawazin Secondary School at Taif.

Presentation Title: The temperature continues to drop in the air and the soil with the years

Teacher: Fahd Mahmoud Al Tuwairqi

Student(s): Abdulmohsen Fahmai Al-Nagrani

Since the era of 10 years the atmospheres were very impressive, even changed the atmosphere and then began to return therefore this difference in the evidence of the existence of a big difference between the years does this difference can show between the year of 2012 m and 2015m the most important objective of search now is proof of this great change and prove is there a difference between the years in temperatures as in the following premise (Impose that if in the summer month's high temperature in 2012 it in 2015 become temperatures are moderate.) But after the results showed it was my conclusions of the research is 1/ the presence of fluctuations in temperature in the air between 2012 and 2015 there was a difference in the arithmetic average approximately 0.03.

2/ low temperatures in the soil by 20%

- This is the big change in the Soil indicates that the drop in temperature of the air in 2015 and rainfall and therefore the soil retain the heat whenever the heavy rains there was a drop in the Temperature because the soil and water reserves - Since the low temperatures in the soil in 2015 this was evidence that the rainfall has become more this indicates to change the temperature in the air and the soil would produce a boom in life and the growth of trees and plants and rivers.

Poster



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7A:

Partnership: Taiwan

School: Taichung Municipal Taichung Girls' Senior High School

Presentation Title: The urban planning effect on Taichung city microclimate

Teacher: Cheng-Chueh, Liu

Student(s): Chia-Ping, Chen and Chiao-Hsin, Lan

The purpose of this study was to investigate the microclimate of eight stations in Taichung city through digital mapping of urban planning, which was analyzed by three aspects: the influence of water bodies on temperature, the effect of green coverage on temperature and the effect of density of buildings on wind speed. The influence of water bodies on temperature is slight or undetectable on the scale of microclimate. Green coverage has great impact on temperature difference and density of buildings affect wind speed significantly. We believe different land use can contribute to changes of local microclimate.

Poster

7B:

Partnership: Taiwan

School: Municipal Taichung Girl's Senior High School

Presentation Title: The Connection Between Taiwanese Proverbs and Weather Phenomena

Teacher: Liu, Cheng-Chueh

Student(s): Lin, Wen-Ju/Chi, Yun-Ching

The purpose of our research is to find out the connection between Taiwanese proverbs and weather phenomena. We compared the data which collected from our school and other schools in the GLOBE Program with Taiwanese proverbs. We considered the connection might have some difference after a few centuries. Moreover, we thought the temperature and atmospheric pressure also cause some changes with the connection. In the end, we hope our project can raise people's awareness about our environment and indigenous knowledge.

Poster

8A:

Country: Thailand

School: Paphayompittayakom School

Presentation Title: Types and Mosquito Larvae Density in Lankhoy Community in Paphayom District, Phatthalung, Thailand

Teacher: Mrs. Paninee Voranetivudti

Student(s): Miss Chiranan Songpia, Miss Sudarat Muadaintong, Miss Khwankhao Varanetiwudi

This study investigated the effects of different areas (touristic places, temples, households, schools) and container types on the numbers of different mosquito larvae in Paphayom District, Phatthalung, Thailand. Mosquitos were collected from different water containers from 8 tourism areas, 11 households, 2 temples and 2 schools. We observed that, numbers of different mosquito larvae were different in touristic areas and households. Containers types did not affect the numbers of different mosquito larvae. In all areas HI was more than 5%, BI was more than 20% and CI was more than 1. It indicates that, all the different areas in Paphayom District, Phatthalung, Thailand are dengue risk areas.

Poster and PowerPoint

8B:

Country: Thailand

School: Princess Chulabhorn Science High School Nakhon Si Thammarat

Presentation Title: The Effect of Climate Change on Dengue Cases in Muang Nakhon Si Thammarat

Teacher: Ms. Kanokrat Singnui

This study investigated climatic change in El Niño, Normal and La Niña group affecting dengue cases and house index in Nakhon Si Thammarat, Thailand. We randomly selected 5 households in Princess Chulabhorn Science High School, and collected mosquito larvae from indoor and outdoor water containers. We identified Aedes larvae up to species level under microscope. We compared dengue cases between El Niño, Normal and La Niña group during 2011-2016. The results showed that Dengue cases in Muang Nakhon Si Thammarat between groups were different ($F_{2,36}=9.422$, $P<0.05$). The Tukey HSD statistics showed that number of dengue incidences in El Niño range were higher than Normal and La Niña range. In El Niño range, showed highest dengue incidences in January, February and December, Normal range was showed March April and May and La Niña range showed dengue incidences lowest than other. From the mosquito larva data collected in November 2016, Princess Chulabhorn Science High School had house index of 100.00% for Ae. larvae. This indicated that Princess Chulabhorn Science High School is the dengue high risk area according to the WHO standard for dengue risk area.

Poster and PowerPoint

9A:

Country: Thailand

School: Princess Chulabhorn Science High School Trang

Presentation Title: Effects of Container Types and Water Qualities on the Density of Aedes Larvae in Trang Province, Thailand

Teacher: Mrs. Patchara Pongmanawut

Student(s): Prangnapas Kongneam, Phiramon Srisukh

This study investigated the effects of container types, and water qualities on the density of Aedes spp larvae. Mosquito larvae were collected from 9 sub-districts in Trang province in March, 2017. For this study, we focused only on Aedes spp. We observed that, containers, presence of algae in water, water odor, temperature and pH did not have any effects on the density of Aedes spp. Larval density was higher in clear water than in turbid and vegetative water. In addition, 50-75% level in the water was the most preferred level for the Aedes spp. Among 9 sub-districts, Khoklo, Banpho, and Tubthiang had the highest HI, and Tubthiang had the highest BI and CI than other sub-districts.

Poster and PowerPoint

9B:

Country: Thailand

School: Thatoomprachasermwit School

Presentation Title: The Flower Pot from Elephant Dung to Help Global Warming Reduction

Teacher: Mr. Vithiwat Raksaphakdee

Student(s): Master Akkharachai Kaewsarakhu



This invention has made pots of elephant dung. By using STEM process learning for elephant dung pots design. This pots made from elephant dung mixed with a glue made from boiled tapioca weight were then mixed with dried elephant dung. Equal ratio of starch (g): Water (liters): elephant dung dried (kg): 100: 1: 0.5, 150: 1: 0.5, 200: 1: 0.5, 250: 1: 0.5, 300: 1: 0.5, respectively. A mold containing the three types of molds made of rectangles. Pressure from hands, made of steel, rectangular and made of steel sphere. Which uses pressure from the hydraulics labor was found that the mechanical advantage 33.33 as a rule pass physical examination results. The density is strong, resistant to sun and rain over a pot made of rectangular wooden molds. The ratio is the best flour 250 g per 1 liter of water mixed with elephant dung 0.5 kg, and when the pots produced to test the crop actually compare the pots are made of plastic and clay, the pots of elephant dung to. The special feature is more strength, more moisture absorption than clay pots and this pots can be decomposed to a nutrient for the plants.

Poster and PowerPoint

10A:

Country: Thailand

School: Triamudomsuksa school

Presentation Title: The Correlation Between Climatic Factors Over Bangkok

Teacher: Thiparpa Sriwarangkul

Student(s): Nankamonporn Sirisakunngam

This study investigated the correlations between each climatic factor. Temperature and humidity data were collected using thermometer and hygrometer, respectively. Cloud cover and cloud type were measured by observing the sky over football field in Triamudomsuksa school, Bangkok at noon (+7 UTC). Air-pressure data, precipitation data and additional data were drawn from Chaloemprakit Meteorological Station. The data span from Jan 1, 2013 to Dec 31, 2016. To analyze the correlations between each factor, we use regression analysis, considering trendline, R-square and P-value in Microsoft Excel. There are three parts of analysis. In part one and two, we analyzed correlation between 1 dependent and 3 independent variables. There is some correlation between them. In part three, we analyze the correlation between 5 pairs of climatic factors separated in three Thai seasons. We found the high correlation between humidity and temperature in rainy season; air pressure and temperature in summer. Others have some but not significant correlations. These results indicate that each climatic factor affects others and can be used to further develop the regression equation to forecast one climatic factor from other climatic factors.

Poster

10B:

Country: USA

School: Alexander Dawson School

☀Presentation Title: Macro – Invertebrates and Water Chemistry in Boulder Creek

Teacher: Bill Meyers

Student(s): Lindsey Bartoletta, Breck Dunbar

This science project was done to learn more about the macroinvertebrates in the Boulder Creek, and how the numbers and species fluctuate according to alkalinity, temperature, D.O. and pH.

Before collecting data, we hypothesized that the warmer the water got, the more pollution tolerant species would be present. This is because if the water was warmer, it would mean that the atmosphere outside was warmer, which would lead to snow melt. The snow would pick up the dirt and debris it passes on its way to the creek, therefore, polluting the water. Almost every Monday, we went down to the creek and collected macroinvertebrates using the kick and pick protocol. Our conclusions were that since the stream stayed healthy and balanced, there was little change in the macroinvertebrates numbers and species. The only change was between the spike in stoneflies and drop in the mayflies during the fall.

Poster

11A:

Country: USA

School: Main Street Intermediate School

☀Presentation Title: Why doesn't grass grow on our playground?

Teacher: Marcy Burns

Student(s): Annabelle Ortner

Main Street Intermediate School is located in the uptown district of Norwalk, Ohio. Grass will not grow on a large part of the playground. This creates a problem of limited space for students to play and dirt and mud gets tracked into the school building. It also looks very bad. This project will help solve the mystery. Soil samples were taken in the area where grass grows and in the area where grass does not grow. The soil texture and nutrients were compared for each area. The soil has good nutrients and organic material to help grass grow. The problem seems to be that the soil drains very fast so the grass does not get enough moisture to grow. Additional work needs to be done to figure out what can be done to help the soil on the playground hold water longer to support a healthy crop of grass.

Poster

11B:

Country: USA

School: Ida Middle School and Dunlap Middle School

Presentation Title: Deployable Arduino Weather Stations for GLOBE

Teacher: Kevin Czajkowski

Student(s): Timothy Czajkowski and Nathan Whitney

We wanted to study the effects of humans on the environment (Terraforming). We looked at the GLOBE website to get data and found that there was very little in locations where terraforming has occurred like Utah and the United Arab Emirates. We studied where GLOBE observations have been taken in the last year for air temperature, barometric pressure, relative humidity and soil temperature. We decided that we could build weather instruments using Arduinos. Inexpensive weather stations could be deployed in locations that do not have many GLOBE observations.

Poster



Community Research Projects

12A:

Country: Netherlands

Organization: GLOBE Europe & Eurasia

Presentation Title: GrowApp: Animate Your Environment

Presenter: Matthijs Begheyn

With the new GrowApp you can make a time lapse animation of plants growing or changing over the seasons. Students all over Europe and Eurasia have used the app together with GLOBE phenology protocols to investigate how 6 species of trees are subject to their local environment. They have set up international collaboration projects to exchange their results.

Poster

12B:

Country: USA

Organization: GLOBE Implementation Office

Presentation Title: The GLOBE International Virtual Science Symposium

Presenter: Julie Malmberg, PhD

The GLOBE International Virtual Science Symposium is an annual event for GLOBE students from around the world to share their research in a completely online platform. Students are rewarded with virtual badges and the chance to be entered into a drawing for financial support to attend the GLOBE Annual Meeting. Scores and feedback to the students are provided by GLOBE International STEM Network members, other STEM professionals, alumni, and teachers. This poster will share findings from the 2016 and 2017 science symposia as well as ask for feedback for future virtual science symposia.

Poster

13A:

Country: USA

Organization: GLOBE Mission EARTH

Presentation Title: Implementing GLOBE into College/University Courses

Presenters: Kevin Czajkowski, Glenn Lipscomb, Mark Templin, Janet Struble, The University of Toledo

John Moore, Palmyra Cove Nature and Environmental Center

Caleb Farny, Peter Garik, Boston University

David Padgett, Rodney Donaldson, Tennessee State University

Most people think of GLOBE as a K-12 program, but professors are using the program in their college courses. GLOBE Mission EARTH (GME) has established two working groups: Engineering and Pre-Service, which explored and discussed using GLOBE in undergraduate and graduate education throughout this past year. As a result, GME has examples of how GLOBE is being used in engineering, science content education and pre-service education. Come and join in on our conversation!

Poster

13B:

Country: USA

Organization: GLOBE Mission EARTH, University of Toledo, Ohio

Presentation Title: GLOBE Mission EARTH: Fusing GLOBE with NASA Assets to Build Systemic Innovation in STEM Education

Presenter: Sara Mierzwiak

GLOBE Mission EARTH (GME) is a 5-year, NASA-funded (CAN #NNX16AC54A) project that is developing a systematic approach to embedding GLOBE and NASA assets into K-12 education. It brings together scientists and educators to develop K-12 “Earth as a system” curricula fusing GLOBE and NASA assets. GME supports the following NASA education goals: improving STEM education, increasing and sustaining youth and public engagement in STEM, enhancing STEM experience for undergraduates, and better serving groups historically underrepresented in STEM. Partners of GME include: The University of Toledo, Boston University, Tennessee State University, WestEd/University of California Berkeley and NASA Langley Research Center.

Poster

14A:

Country: USA

Organization: Rowan University and Palmyra Cove (NJ GLOBE Partner)

Presentation Title: Engaging in STEM Education with Big Data Analytics and Technologies: A Rowan-Cove Initiative

Presenters: Peter Dorofy, John Moore, Kristina Merola, Rouzbeh Nazari, Husam Alfergani
K-12 students are given limited opportunity in the classroom to acquire and interpret geospatial information. The next generation science standards (NGSS) include earth system and real-time data analysis; however, this is not yet fully realized in current school curricula. Under an NSF IUSE:HER grant, Rowan University and Palmyra Cove, A NJ GLOBE Partner, bring big data activities to the K-12 community. Several local teachers were recruited and trained in GLOBE protocols, GIS, and remote sensing through satellites and drones. Teachers implemented these technologies in PBL. Participating students presented their projects at the 2017 GLOBE Northeast and Mid-Atlantic Regional Science Symposium.

Poster

14B:

Country: USA

Organization: University of Southern Mississippi

Presentation Title: A Study of the Teaching Beliefs of GLOBE Teachers

Presenter: Partner Sherry S. Herron and Teacher Laila Ali

We investigated the teaching beliefs of teachers trained in GLOBE protocols using the instrument ‘Belief about the Reformed Science Teaching and Learning’ (consisting of 32 items), and their teaching practices using a survey consisting of 7 demographic items and 18 items with both forced choice and open-ended questions. 72 GLOBE-trained teachers from all regions across the U.S. participated. 93% of the teachers were found to hold constructivist rather than traditional teaching beliefs, and 90% believed that teaching with GLOBE had impacted their students’ learning. A complete summary of the results will be shared.



15A:

Country: USA

Organization: NASA ENSO Student Research Campaign Team

Presentation Title: The ENSO Student Research Campaign: Phase I, Phase II, and ENSO Campaign Data Comparisons

Presenter: Brian Campbell, Dorian Janney

The NASA GLOBE ENSO Student Research has been in full swing since March 1, 2016. Since then, there has been approximately 3 million measurements taken through the suite of six GLOBE Protocols. This poster will present information about the campaign and will highlight some comparison data during El Niño, La Niña, and La Nada.

Poster

15B:

Country: USA

Organization: NASA Wallops Flight Facility and GST, Inc.

Presentation Title: Height Matters: Citizen Science with the ICESat-2 Satellite

Presenter: Brian Campbell

Launching in 2018, the ICESat-2 satellite will measure height from space. NASA is calling on students and citizen scientists to take measurements from the ground to help validate the satellite data. Through a collaboration with the GLOBE program, these students and citizen scientists will measure heights of local trees to aid in NASA's investigations of a changing Earth.

Poster

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16A:

Country: USA

Organization: Rowan University

Presentation Title: Proactive Waste Management Through Infrared Thermography for Landfill Monitoring and Fire Warning

Presenter: Rouzbeh Nazari, Husam Alfergani

Many landfills in North America that are currently undergoing subsurface smoldering events. Landfill fires occur both on/below the ground surface at active/closed sites. Consequently, large amount of toxics and harmful chemicals released. Contaminating groundwater, soil and air. This impacts rural areas because of wider involvement of the local population in agricultural and reliance of locals on wells as a source of drinking water.

The primary objective of this project is to develop the first satellite-based landfill monitoring system (SATLAN), which will use thermal infrared observations from satellites, and UAVs to assess the thermal state of the landfill surface, identifying anomalous thermal patterns and changes in the thermal state of landfills to issue warnings of potential landfill fires. The project focus is on rural areas of South New Jersey with high landfill density, low population/income.

Poster

16B:

Country: USA

Organization: Earth Networks

Presentation Title: Lightning and Severe Weather in Florida

Presenter: Dr. Michael Stock, Ph.D and Juliet Hulse

On January 22, 2017, there was a large storm in Florida that came in from the Gulf. It traveled from West to East and produced a significant amount of severe weather. The Florida Coasts are a hot spot for lightning storms which produce hail, high winds, heavy rains and tornadoes. Because Florida is mostly coastal, radar coverage is limited. By using the lightning data we are able to see the weather farther from the coast. We will compare lightning, radar, and temperature data for this storm.

Poster

17A:

Country: USA

Organization: GLOBE Science Working Group

Presentation Title: GLOBE Science Working Group

Presenter: Mullica Jaroensutasinee

The GLOBE Science Working Group is integrated by scientist of all GLOBE regions and representatives of the GLOBE Implementation Office whose mission is to ensure that GLOBE is implemented, worldwide, with scientific integrity. The scope includes the GLOBE measurement protocols, instrumentation, student research campaigns, engagement of scientists with GLOBE, student research project competitions, etc. Main goals are prioritizing new and revised protocols, engaging scientists in GLOBE activities, writing blogs and organizing field campaigns. GLOBE field campaigns are El Niño, surface temperature, SMAP, Aerosol and etc.

Poster



17B:

Country: USA

Organization: NASA Goddard Space Flight Center

Presentation Title: Empowering Armies of Citizen Scientists to Reduce Mosquito-borne Diseases

Presenter: Dorian Janney

The recently released GLOBE Observer Mosquito Habitat Mapper has been selected to form the core of the international Global Experiment for the next year. Museums, science centers, parks, and other interested groups of citizens will learn how to use the MHM and how to access NASA data sets to conduct research to determine how certain environmental variables impact the onset of mosquito-borne diseases. This poster will describe this worldwide effort and share information about how to get groups involved in your region.

Poster

18A:

Country: USA

Organization: NASA Goddard Space Flight Center

Presentation Title: GLOBE Observer: Bridging Students, Scientists and Citizens

Presenter: Kristen Weaver

The GLOBE Program has a long history of involving students in Earth science data collection and analysis as an education-based citizen science initiative. The goal of GLOBE Observer is to expand the GLOBE Program to a wider audience that may not have a school affiliation, but is interested in the type of data collection GLOBE offers. This poster will examine lessons learned in the transition from an education audience to a broader citizen science audience while supporting the student program, as well as explore next steps, especially related to examining the evolving role of professional scientists in motivating citizen participation.

Poster

18B:

Country: USA

Organization: NASA Langley Research Center

Presentation Title: The Great American Solar Eclipse is Coming in August – Are You Ready?

Presenter: Jessica Taylor

You may have heard that the Northern Hemisphere will experience a solar eclipse on August 21st, but did you know there are GLOBE science investigations that can enhance this amazing experience? The Earth is a solar-powered planet; light from the Sun travels towards Earth where it's absorbed by the surface and reemitted in the form of heat radiation. So, what do you think would happen if you could dim or block out the Sun like you can a desk lamp? For those of you at the right place this summer, nature is providing an exciting opportunity to do just that!

Poster

19A:

Country: USA

Organization: Southern Connecticut State University

Presentation Title: Viability and Utility of μ UAS for Wetland Monitoring – Cove River

Presenter: Scott Graves

As part of ongoing research collaborations with the City of West Haven, the Cove River Historical Site site was mapped using μ UAS (micro Unmanned Aerial Systems), after considerable habitat remediation (eradication of invasive Phragmites). Our hypothesis was that native marsh grasses (Spartina and others) would recolonize the marsh top and channel margins. Unfortunately, that has not happened to the extent and/or rate anticipated. It appears the current marsh-top is deflating and some channel margins collapsing. Some of these aspects may well be documented and visualized using μ UAS overflights and employing Image Mosaics and 3D Modeling software (Pix4D Mapper).

19B:

Country: USA

Organization: NASA Langley Research Center

Presentation Title: GLOBE U.S. Air Quality Student Research Campaign

Presenters: Margaret Pippin, Angela Rizzi, Denise Magrini

The GLOBE U.S. Air Quality Student Research Campaign occurred during the 2016-17 school year with 29 schools participating in aerosol measurements. Student scientists collaborated with a NASA and university scientists as well as with other student scientists in schools in France and presented in science fairs. Teachers integrated GLOBE into existing curriculum and developed new GLOBE-focused programs.

Poster





2017 International Virtual Science Symposium Judges

We are incredibly grateful for the team of judges who helped score reports and provide feedback for the students.

Judges

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Victoria Treadaway, Narragansett, RI, USA
Vladimir Ribičić, Karlovac, Croatia
Waleska Aldana Segura, Guatemala

2017 Drawing Winners (US)

Title: **Why Doesn't Grass Grow on our Playground?**
 School: Main Street Intermediate School
 Location: Norwalk, Ohio, Teacher: Marcy Burns

Title: **How Do the Species of Macroinvertebrates in the Boulder Creek Compare with the Water Chemistry of the Stream?**
 School: Alexander Dawson School
 Location: Lafayette, Colorado, Teacher: Bill Meyers

2017 Drawing Winners (International)

Title: **Global Warming and His Actions in Maximal and Minimal Temperature Variations on the Continent**
 School: Lycée Bernard PALISSY
 Location: AGEN Aquitaine, France, Teacher: Michel Pedurand

Title: **Checking the Validity and the Quality of Wells' Water in Jabel Al-Mukkaber Area"**
 School: Al Faruk Elementary School
 Location: Jerusalem, Israel, Teachers: Nour Bakri

GLOBE Working Groups 2017

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 Binoda Chandra Sabata, India, Asia and Pacific
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International Regional Coordination Officers

(Representative/Region)

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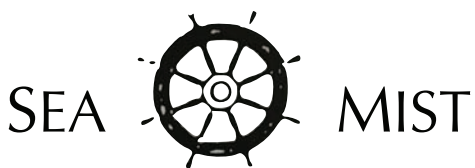
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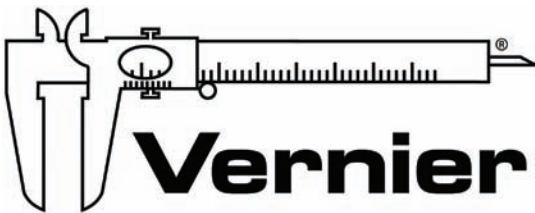


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