

The GLOBE Program



UNITED STATES  
**GLOBE**  
PARTNER YEARBOOK

**2023**

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# ABOUT THE GLOBE PROGRAM

## **GLOBE History**

Announced in 1994 and launched in 1995, the Global Learning and Observations to Benefit the Environment (GLOBE) Program has been a leader as an international science and education program that creates a network of youth, educators and scientists to better understand, sustain and improve Earth's environment at local, regional and global scales.

More than 248 million measurements have been contributed to the GLOBE science database, creating useful, standardized, research-quality data that support informal and professional scientific exploration.

Generations of youth and educators in 127 countries have moved through and beyond the GLOBE program. Widely available information technology and tools have enabled citizen scientists to participate in GLOBE anywhere and anytime. By motivating and supporting citizen science with authentic learning of Earth Systems Science, GLOBE serves learners of all ages who are enthusiastic about scientific discovery locally and globally.

## **The GLOBE Vision**

*A worldwide community of students, teachers, scientists and citizens working together to better understand, sustain and improve Earth's environment at local, regional and global scales.*

## **The GLOBE Mission**

*To increase awareness of individuals throughout the world about the global environment, contribute to increased scientific understanding of the Earth and support improved student achievement in science and mathematics.*

For more information, we invite you to visit [www.globe.gov](http://www.globe.gov).

## **GLOBE Partnerships**

GLOBE Partnerships make GLOBE happen throughout the United States. Partners recruit, train and mentor new GLOBE educators and facilitators to promote the teaching and learning of science, enhance environmental literacy and stewardship and promote scientific discovery.

Each U.S. GLOBE Partnership must have a formal affiliation with an institution of higher education, a school district, a state department of education or a recognized informal education organization (501c3) such as STEM learning centers, museums and foundations that can sustain the implementation of GLOBE in their communities.

New and prospective GLOBE Partners must demonstrate the capacity to recruit, train and mentor educators in their service area. Their efforts must focus on capacity-building, program sustainability and youth inquiry and research.

View a list of [current U.S. GLOBE Partners](#). If you would like information about becoming a GLOBE Partner, please contact the Community Support Team at [globehelp@ucar.edu](mailto:globehelp@ucar.edu).



Students and educators attended the 2023 GLOBE Pacific Regional Student Research Symposium in Watsonville, California

## The GLOBE U.S. Coordination Office

The GLOBE U.S. Coordination Office (“U.S. GLOBE” or “The Office”) is supported through a sub-award from the GLOBE Implementation Office. Headquartered at the Leitzel Center at the University of New Hampshire, U.S. GLOBE is managed by Jennifer Bourgeault, U.S. Country Coordinator; Haley Wicklein, U.S. Assistant Country Coordinator; Alicia Carlson, Outreach Lead; Jodi Haney, Trainer/Mentor Trainer & Partner Sustainability Lead; and Eleanor Jaffee, Outside Evaluator.

U.S. GLOBE supports a diverse group of 99 experienced and committed GLOBE Partnerships to create a strong, self-sustainable framework for training and responsive support for every GLOBE learner in the country. The Office works with the U.S. Partner Forum to contact and provide support for every Partner in the country on a personal basis and through a regional model.

## U.S. GLOBE Program Highlights

- U.S. GLOBE hosts regular webinars—called Watercoolers—that model the idea that informal gatherings around watercoolers at work can lead to valuable exchanges of information and new collaborations. Read more on page 4.
- U.S. GLOBE coordinates six annual in-person Student Research Symposia ([SRS](#)) for teacher/student teams, supported with funding from NASA (grant 80NSSC18K0135) and Youth Learning as Citizen Environmental Scientists ([YLACES](#)).
- The Office publishes stories about U.S. GLOBE students, teachers, Partners, and organizational accomplishments. Stories are featured on the GLOBE website and U.S. GLOBE social media accounts ([Twitter](#) and [Facebook](#)). Read more on page 6.
- The Office helps strengthen the local scientist network and GLOBE alumni on a regional level and engages these groups in GLOBE events.

GLOBE is sponsored by the U.S. National Aeronautics and Space Administration (NASA) and supported by the National Science Foundation (NSF), National Oceanic and Atmospheric Administration (NOAA) and the United States Department of State. The GLOBE Implementation Office is supported under the NASA Grant and Cooperative Agreement NNX17AD75A awarded to the University Corporation for Atmospheric Research.





*U.S. GLOBE Partners attended the U.S. GLOBE Retreat in Kensington, New Hampshire*

## 2023 U.S. GLOBE ACTIVITIES

### STUDENT RESEARCH SYMPOSIA

Four GLOBE U.S. Regional Student Research Symposia (SRS) took place in April and May 2023, where 218 students presented their research posters in 86 projects to their peers and STEM professional reviewers. Also attending were 45 educators, 20 U.S. GLOBE Partners from 10 Partnerships, and 54 others as reviewers, scientists, and event support. Read more about [the 2023 SRS](#).

### NORTH AMERICA PHENOLOGY CAMPAIGN

The GLOBE U.S. Coordination Office initiated its first [Phenology Campaign](#) season in Fall 2023. The campaign is based largely on the successful European GLOBE Phenology Campaign. During the fall, educators, students and citizen scientists measured leaf green-down using the GLOBE Color Guide and GLOBE Observer app and entered 415 measurements into the GLOBE database.

The campaign was enhanced with weekly emails to share resources, mini-tutorial videos for GLOBE protocols, short scientist interview videos, webinars, and collaboration opportunities.

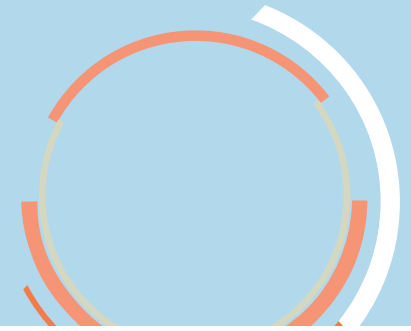
### NEW U.S. GLOBE PARTNERSHIPS

The GLOBE U.S. Coordination Office welcomed two new GLOBE Partnerships in 2023: Science Systems and Applications, Inc (SSAI) in Hampton, Virginia, and West Virginia University Department of Geology and Geography in Morgantown, West Virginia. We look forward to working with them to expand GLOBE's reach in the U.S.!

### U.S. GLOBE RETREAT

The U.S. GLOBE Retreat held from September 25 to 27, 2023, in Kensington, NH, brought together key stakeholders with a primary focus on aligning and committing to the goals for U.S. GLOBE (2023-2025). Participants included fourteen U.S. GLOBE Partners, GLOBE U.S. Coordination and Implementation Office staff, and the NASA GLOBE Program Manager.

The retreat provided valuable insights, identified barriers, and proposed solutions to enhance the GLOBE Program's presence and impact in the United States. These recommendations and insights will guide the future efforts of the U.S. GLOBE community in achieving their goals.



*Students and educators attended the 2023 GLOBE Northwest Regional Student Research Symposium in Fairbanks, Alaska*

## 2023 U.S. GLOBE ACTIVITIES continued

### U.S. GLOBE PARTNER MINI-GRANTS

Beginning in July 2023, the GLOBE U.S. Coordination Office began soliciting proposals from U.S. GLOBE Partners through a mini-grant program. [Seven mini-grants were awarded in 2023](#) with a diverse range of topics, including:

- An afterschool program that focuses on learners conducting local research using GLOBE measurements.
- A GLOBE Atmosphere Focus Group and helping educators to support students in entering the International Virtual Science Symposium.
- A STEM professional learning community and facilitating GLOBE training.
- A crosswalk of GLOBE with state standards and purchasing tablets for on-site GLOBE data entry.
- Project-Based Learning curriculum development projects.
- Training science specialists to move through the trainer/mentor trainer process.
- Engaging camps and classroom teachers in GLOBE through professional learning.

### U.S. GLOBE WATERCOOLERS

The [U.S. GLOBE Watercoolers](#) – virtual learning, discussion and networking opportunities for GLOBE educators and Partners – continued with presentations by U.S. GLOBE community members. The U.S. GLOBE Office hosted 19 Watercoolers with 99 unique attendees. Presentations covered a wide range of topics including soils and carbon, AI and GLOBE, Eclipse and My NASA Data, GLOBE Caching, Fresh Eyes on Ice, GLOBE Weather Pathways.

### 2023 NORTH AMERICAN REGIONAL MEETING

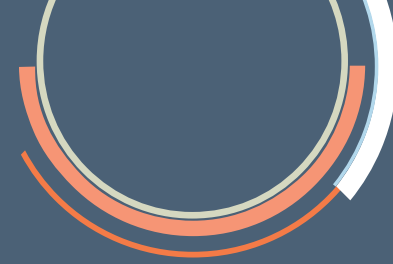
The 2023 GLOBE North American Regional Meeting (NARM) began with a virtual meeting from 1-3 November and continues in the winter and spring of 2024 with four in-person professional development workshops between February and May. This hybrid model of virtual and in-person options was chosen to reach the widest North American GLOBE community audience possible and include a variety of topics to learn about from U.S. GLOBE Partners.

In a keynote session during the virtual meeting, Dr. Matt Marone of Mercer University and educators from the Georgia Academy for the Blind discussed adapting resources for students to engage in GLOBE weather measurements through devices that read aloud temperature and humidity.

U.S. GLOBE Partners shared their work in lightning talks, including presentations on collaborating with international GLOBE audiences, STEM camps in support of neurodiversity, engaging educators and students through the solar eclipses, and much more.



U.S. GLOBE Partners practicing cloud measurements at the U.S. GLOBE Retreat



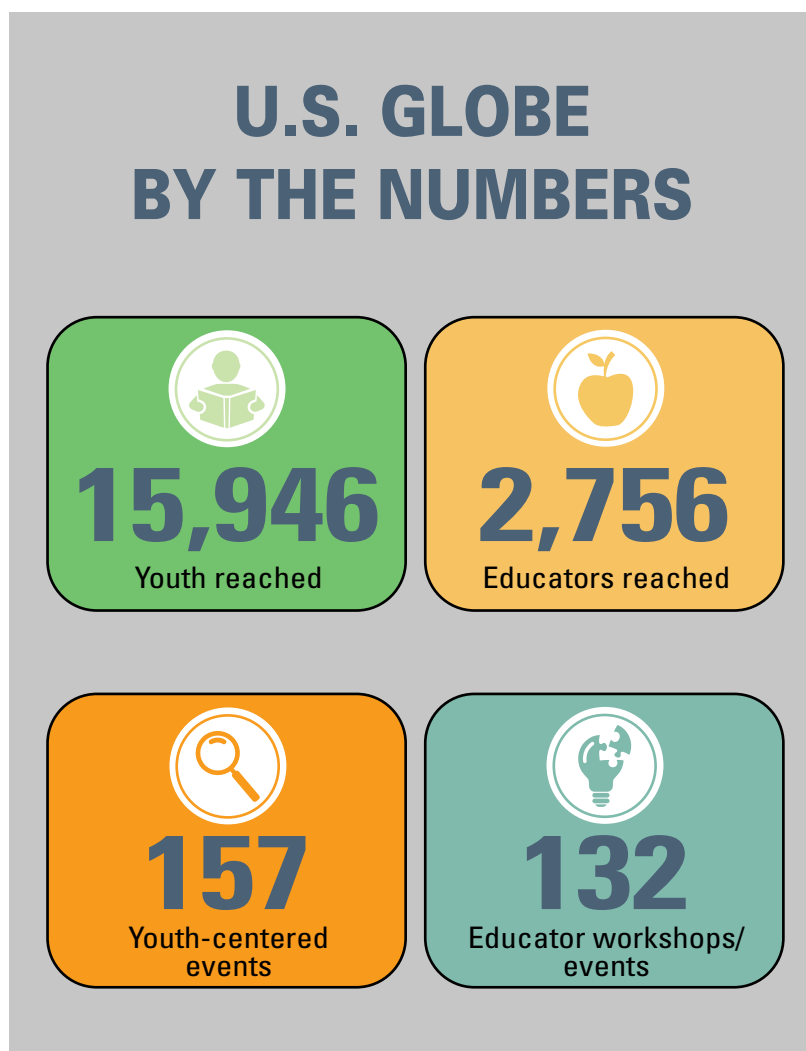
## U.S. GLOBE PARTNERSHIP ACTIVITIES: BY THE NUMBERS

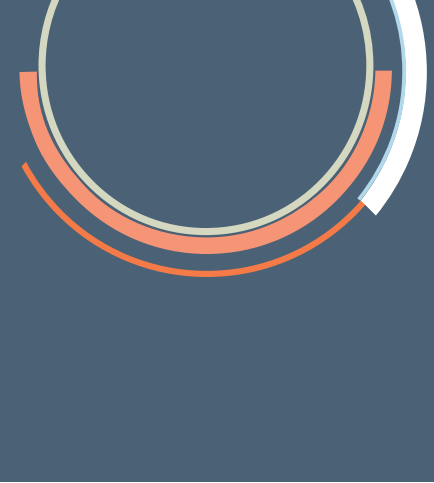
U.S. GLOBE Partners reach a wide audience through their events and activities. This year, we asked them to report the numbers, including:

- Youth reached
- Youth-centered events
- Educators reached
- Educator-centered events

This graphic shows the cumulative reports of the 19 Partnerships that reported on at least one of the categories. To highlight some accomplishments:

- Seven Partnerships reached more than 1,000 youth: University of Alaska Fairbanks, Arkansas Partnership for STEM Education, Elkhorn Slough National Estuarine Research Reserve, Science Action Club, WestEd/UC Berkeley, Leitzel Center at the University of New Hampshire, and University of Toledo.
- Three Partnerships reached more than 300 educators: University of Alaska Fairbanks, NASA Goddard, and Institute for Research in Science Teaching.





## U.S. GLOBE NEWS HIGHLIGHTS

The following stories are highlights from some of the U.S. GLOBE Partnerships that were posted on the [U.S. GLOBE news page](#) in 2023. The full stories are available from the linked titles. The complete list of news stories for 2023 can be found in the Appendix on page 37.

[Educators and Students Weather the Storm in Support of NASA's IMPACTS Mission](#): In January and February 2023, educators and their students from 11 sites in five states and one Canadian province collected measurements of snow (or rainfall) accumulations. They were participating in Mission SnowGLOBE, a GLOBE intensive observation period in support of the [NASA IMPACTS mission](#). IMPACTS (Investigation of Microphysics and Precipitation for Atlantic Coast-Threatening Snowstorms) was a three-year mission to study the processes that produce snowbands; 2023 was the last year of data collection.



[GLOBE Goes to Camp Supports Its First GLOBE IOP](#): The NASA Goddard GLOBE Goes to Camp Project supported its first GLOBE Intensive Observation Period (IOP) this summer during the months of June and July with campers, their communities, and other members of the GLOBE community. Throughout the summer they collected and compared air temperature, soil temperature, surface temperature, water temperature, and cloud observations as they examined microclimates where they live and learned about others from camps across the United States.





[Students Learn about Prairie Soil at the Soil and Solar Festival](#): On 15 June, roughly 175 participants engaged in hands-on science at the Waterville Primary School Soil and Solar Festival led by Xcite Learning. Students in grades K-4 and their family members attended the event that included five Soil Tent Activities to learn about the school prairie's soil: soil layering in take-home tubes; comparing sand vs. silt vs. clay; building a model soil profile; conducting a soil texture ribbon test; and creating a 10 x 4 foot soil mural out of multi-colored construction paper.



[Soil Health Buckets: Meet GLOBE](#): The Soil Health Educators Guide is a series of lessons developed by the NRCS to support educators in teaching soil health. The lessons have been disseminated throughout the soil education community since 2014. The Soil Quality Test Bucket is an equipment and supplies list for labs and field studies featured in the guide; the term Soil Health Bucket is often used as a catchall to mean both the lessons and materials.

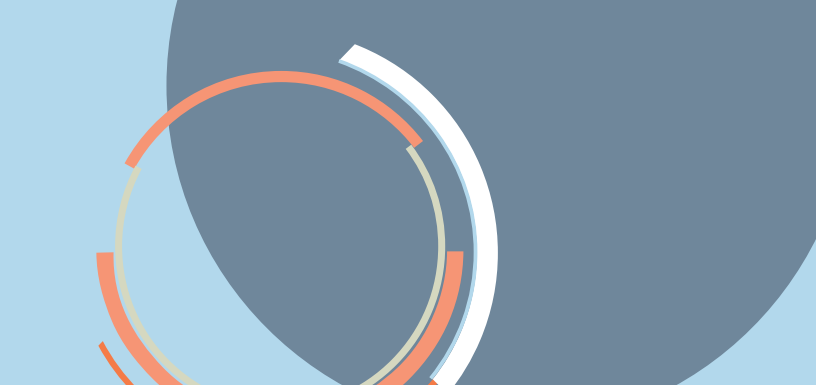


[GLOBE Mission Earth West Trained 43 Los Angeles-Area Camp Counselors](#): Los Angeles Unified School District (LAUSD) hosted an 8-hour hydrosphere training for 43 camp naturalists and counselors from three LAUSD outdoor education camps: Canyon Creek, Clear Creek and Point Fermin. The LAUSD camps mission is to help students create an emotional connection to learning and the outdoors. GLOBE Mission Earth West led the training.



[El Paso Community College Shares GLOBE in Classrooms and at Community Events](#): The GLOBE Program was highlighted during Tornillo Elementary's Career Day in February 2023. GLOBE Observer protocols were introduced to highlight how students and teachers of every grade level can utilize the app and learn about the environment. Teachers were shown how to incorporate the app and other GLOBE and NASA resources into their classrooms.





Students collected and observed macroinvertebrates in Rochester, New Hampshire

## UNITED STATES GLOBE AUDIENCES SERVED

We asked Partnerships to report on the audiences they served. Partnerships that contributed have an icon on their page for each category they reported on.



Pre-school age youth



Graduate students



Elementary school age youth



Pre-service educators



Middle school age youth



PreK-12 educators



High school age youth



Life-long learners



Undergraduate students



# UNIVERSITY OF ALASKA FAIRBANKS



## [University of Alaska Fairbanks Partnership Page \(GLOBE\)](#)

**About the Partnership:** The University of Alaska Partnership engages in culturally sustaining climate change education focusing on issues important to and selected by local communities. It financially supports diverse Alaska schools, teams, and projects, providing GLOBE supplies or equipment and travel support for symposia and conferences as well as educator professional development. We connect students with scientists and Indigenous knowledge holders, matching expertise with the subject matter focus of student projects and helping students make sense of the data.

### 2023 Highlights:

- Engaged 642 informal and formal educators and community members in professional development workshops.
- Approximately 2,009 youth engaged in climate change learning using Arctic and Earth STEM Integrating GLOBE and NASA (SIGNs) activities and GLOBE methodologies and NASA assets.
- GLOBE Alaska and GLOBE Grandma helped educators and students participate in GLOBE's North America Fall Phenology Campaign and Year of Climate and Carbon Campaign.
- Hosted the GLOBE Northwest Student Research Symposium (SRS) in Fairbanks on Earth Day, April 24 and 25.
- Arctic and Earth SIGNs Learning Framework has been expanded to undergraduate and graduate students.
- Co-developed and co-hosted a culturally sustaining GLOBE training in Southeast Alaska with Sealaska Heritage Institute, a Native non-profit organization.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers, GLOBE in undergraduate classrooms, Education research, Science research, Citizen science, Informal science, Other: Indigenous Knowledges

**Cooperating Organizations:** University of Alaska Fairbanks (UAF); Association of Interior Native Educators; NASA Science Activation Science Mission Directorate; NASA Citizen Science; NASA Minority University Research and Education Project (MUREP) for American Indian and Alaska Native Science, Technology, Engineering and Mathematics (STEM) Engagement; National Weather Service; Sealaska Heritage Institute; U.S. Fish and Wildlife Service. Key Organizations at UAF: International Arctic Research Center; Bonanza Creek Long Term Ecological Research Project; Water and Environmental Research Center; 4-H - Alaska and Florida; Alaska Satellite Facility; Alaska Climate Research Center.

**Funding:** NASA Cooperative Agreement Award NNX16AC52A; Bonanza Creek Long Term Ecological Research Project NSF DEB -1636476; Winterberry Project NSF Award 1713156; Fresh Eyes on Ice National Science Foundation Award 1836523 and NASA Cooperative Agreement Award 180NSSC21K0858

### [Publications](#)

### [News Stories: \(Arctic and Earth SIGNs news & GLOBECaching StoryMap\)](#)

**Student Research Support:** Two projects support students in entering their research in the GLOBE International Virtual Science Symposium and SRS: Arctic and Earth SIGNs and Fresh Eyes on Ice. These projects have a yearly workshop with educators plus a monthly professional development opportunity.

### Audiences served:



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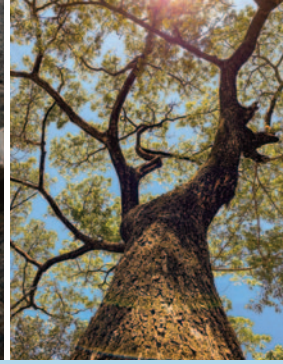
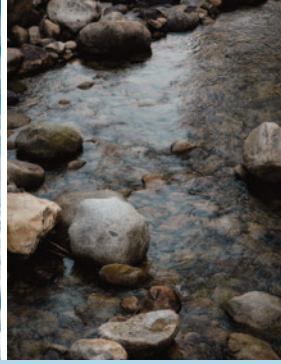
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# ARKANSAS

## IMPACT



# ARKANSAS PARTNERSHIP FOR STEM EDUCATION



## [University of Arkansas STEM Education Center](#)

**About the Partnership:** Our Partnership provides STEM career and outreach opportunities to middle and high school students and teachers, including student STEM competitions, research projects, and teacher professional development.

**Areas of Expertise:** In-service professional development, Elementary GLOBE, Pre-service teachers, Informal science

**Student Research Support:** Fulfill requests for student research mentors; encourage participation in and presentation of pre-college, undergraduate and graduate-level scientific research.

**Audiences served:**



### **Coordinator**

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## UNIVERSITY OF ARKANSAS, FAYETTEVILLE

### Center for Math and Science Education

**About the Partnership:** The Arkansas GLOBE Partnership at the University of Arkansas, Fayetteville through the STEM Center for Math and Science Education has been continuously active since its creation in 1996.



### 2023 Highlights:

- Citizen science and lifelong learners have been a key focus this past year and the GLOBE Observer (GO) app has been a very useful tool for enhancing interest in data collection.
- Lynne Hehr gave GLOBE Observer presentations on Cloud protocols, GO data collection opportunities, and the solar eclipse tools to the Arkansas Environmental Education Association/Arkansas Master Naturalists annual meeting in June, to the Northwest Arkansas Master Naturalist chapter meeting in September, and the Osher Lifelong Learning Institute in October.
- Lynne Hehr was an invited participant in the Near East and North Africa GLOBE Region Mentor Trainer workshop held in Sharjah, United Arab Emirates in May.
- Lynne Hehr attended the GLOBE annual meeting and gave two presentations dealing with the Education Working Group and the Trainer/Mentor Trainer Process.
- GLOBE Mentor Trainer Lynne Hehr was active in the Education Working Group as 2023 Chair.
- GLOBE Trainer John Hehr has continued to be active with atmosphere presentations to the Northwest Arkansas Master Naturalists chapter, a group of over 400 members.
- The Arkansas GLOBE Partnership continued its community outreach efforts through citizen science with lifelong learners and the K–5 education community (school team support, educator workshops, equipment and material loans, and teacher mentoring) as it works with GLOBE U.S. and international partners.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers, Engineering, Education research, Science research, Citizen science, Informal science

**Audiences served:**   

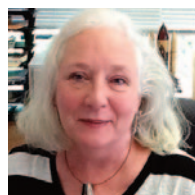
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## IMPACT



# CALIFORNIA ACADEMY OF SCIENCES/ SCIENCE ACTION CLUB



## [Science Action Club](#)

## [California Academy of Sciences/ Science Action Club \(GLOBE\)](#)

**About the Partnership:** Designed for students in grades 5 to 8, Science Action Club (SAC) is a global out-of-school-time program that inspires youth to explore and connect with nature while achieving essential science, technology, engineering, and math (STEM) learning goals. Through dynamic curricula that integrate high-energy games and hands-on activities with citizen and community science investigations, the program ignites curiosity, fosters workforce development skills, and builds STEM identity among the next generation of environmental stewards.

SAC's Cloud Quest unit explores the impact of clouds on weather and climate. Through games and projects, youth investigate local sky conditions, document their discoveries with GLOBE Observer, explore environmental issues, and design strategies to protect our planet. More than 80,000 youth and educators have participated since 2011.

SAC features staff training and science kits that make it easy for out-of-school educators to lead science experiences with confidence and skill. Each kit includes twelve activities and bonus resources; science tools and supplies; interactive, self-paced online training for program staff members; and options for customized training.

**2023 Highlights:** In 2023, Science Action Club shared the Cloud Quest with national audiences while exhibiting at the National Afterschool Association conference, the American Camp Association Spring Leadership Conference, and the Best of Out-of-School Time Conference.

Additionally, we presented the lasting impact of the Cloud Quest unit on our educators and youth during the [poster session](#) at the Annual Conference of the Citizen Science Association in Phoenix, Arizona, in May.

**Areas of Expertise:** In-service professional development, Programming for students, Citizen science, Informal science

**Cooperating Organization:** California School-Age Consortium

**Funding:** Pisces Foundation, Simons Foundation

**News Story:** [Sharing Tools, Expanding Knowledge](#) (American Alliance of Museums)

**Audiences served:** 

### Coordinator

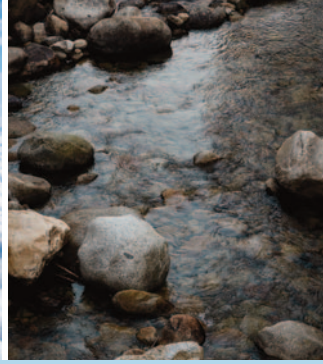
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# CENTRAL SAN JOAQUIN VALLEY PARTNERSHIP

## [Central San Joaquin Valley Partnership Page \(GLOBE\)](#)

**About the Partnership:** This partnership serves schools and informal education centers around the Central Valley of California. We can offer GLOBE information on training and other events going on around the state, country, and the world.

**2023 Highlights:** Our 2022-2023 school year was a great success. Three students from Kingsburg High School attended the GLOBE Pacific Regional SRS in Moss Landing in May. Their project studying “The Effects of PM10 on Rainwater pH in Kingsburg, CA Over 2022-2023” received recognition for Community Impact. The students enjoyed meeting other students from the Pacific region and networking with scientists and GLOBE partners.

**Areas of Expertise:** Citizen science

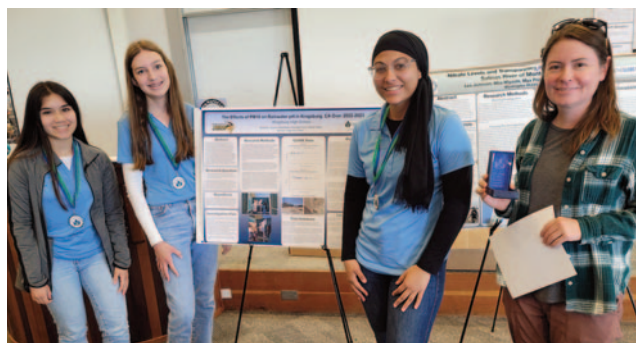
**Publication:** [The Effects of PM10 on Rainwater pH in Kingsburg, California Over 2022-2023](#) (Student Research Symposium report)

**Audiences served:**



### **Coordinator**

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## IMPACT



# ELKHORN SLOUGH NATIONAL ESTUARINE RESEARCH RESERVE

## Elkhorn Slough NERR

**About the Partnership:** We support conservation at Elkhorn Slough and beyond through research, stewardship, education, professional training, and community engagement. Students come to explore our wetlands and oak woodlands, learn about nature, and discover the tiny life found in a drop of water. At the Elkhorn Slough Reserve, we are committed to preparing tomorrow's environmental leaders by providing them with opportunities to explore the wonderful connectedness of the world they inhabit.

In addition to field trip explorations for students, teachers are invited to participate in a variety of teacher workshops, including GLOBE teacher workshops. Self-guided lessons are also available to enhance Reserve visits and provide alternatives for those who can't join us in person. Our field trip offerings include GLOBE hydrosphere water quality testing of slough water, GLOBE landcover canopy cover/ground cover, and GLOBE carbon in forest trees.

### 2023 Highlights:

- We conduct 2 GLOBE teacher workshops per year, one Kindergarten to grade 6 (atmosphere, biosphere, pedosphere) the other grade 6 to college (atmosphere, biosphere, hydrosphere, pedosphere).
- We ran the Pacific Region GLOBE Student Research Symposium in 2023. Participants were at the Reserve on the first day, and at Moss Landing Marine Labs and MBARI on the second day.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers, Science research, Citizen science, Informal science

**Cooperating Organizations:** Monterey Bay Aquarium, Moss Landing Marine Labs, MBARI

**Funding:** California Department of Fish and Wildlife (CDFW) & National Oceanic and Atmospheric Administration (NOAA)

## Publications

**Student Research Support:** Elkhorn Slough Reserve conducts GLOBE trainings for teachers and informal educators and encourages teachers trained in our partnership to contact us for assistance if they are interested in having their students conduct projects for the SRS or IVSS. Reserve education staff conduct virtual meetings with interested teachers, and sometimes with their team of students, to discuss potential project ideas. We offer to come visit their schools to see their sites and provide feedback to questions about potential project ideas and sometimes go with the teams on one of their data-collecting field trips. We loan equipment to teams so they are able to conduct projects. We encourage teachers to contact us about any issues they are having about their students' projects.

**Audiences served:**

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# WESTED/UNIV OF CALIFORNIA BERKELEY

## WestEd/UC Berkeley (GLOBE)

**About the Partnership:** The WestEd/UC Berkeley GLOBE partnership works directly with formal and informal educators interested in inspiring their learners to engage with their communities and the environment around them. We provide professional learning opportunities for educators and work with learners directly in and out of the classroom. We hope we can support tomorrow’s STEM professionals by providing thoughtful GLOBE integration into K-12 content.

**2023 Highlights:** One highlight of our year has been the collaboration with the California Strong Earth System Science Team. The CA Strong Team consists of Kay Ferrari – Solar System Ambassador Director at NASA Jet Propulsion Laboratory (JPL), Peter Falcon – Earth System Science Outreach Coordinator at NASA JPL, Gerry Salazar – Administration of Los Angeles Unified School District (LAUSD) Outdoor Office of Environmental Education, Dr. Matt Ferner – Director of Research and Monitoring Programs at the San Francisco Bay National Estuarine Research Reserve, Peggy Foletta – Education Specialist at Elkhorn Slough National Estuarine Research Reserve, Svetlana Darche – Senior Research Associate at [WestEd.org](http://WestEd.org) and Tracy Ostrom – GLOBE Program Coordinator UC Berkeley Department of Chemistry, Atmospheric Sciences.

Together we have provided GLOBE training to more than 40 camp counselors associated with the LAUSD Office of Outdoor Environmental Education. We have provided a GLOBE webinar series to more than 30 Solar System Ambassadors across the country, created a collaboration handbook for international school connections, and hosted the Pacific Region GLOBE Student Research Symposium.

In addition to these highlights, UC Berkeley and San Francisco Bay National Estuarine Research Reserve are collaborating with GLOBE Italia and Deakin University in Australia to create a microplastics workshop in hopes of adding a microplastics investigation in surface waters as a GLOBE protocol.

The WestEd/UC Berkeley GLOBE Partnership continues to support K-12 educators across Northern California in the integration of GLOBE learning activities and protocols into K-12 curriculum. As a member of the GLOBE Mission Earth Science Activation Team, we continue to provide resources and materials to the educators we work with and the GLOBE community as a whole.

**Areas of Expertise:** In-service professional development, Education research, Citizen science

**Cooperating Organizations:** The WestEd/UC Berkeley partnership works with a number of organizations throughout the CA Strong Collaborative and GLOBE Mission Earth. We also work with informal institutions such as American River Conservancy and Chabot Space and Science Center.

**Funding:** The WestEd/UC Berkeley GLOBE partnership's primary funding is through NASA's Science Activation grant for GLOBE Mission Earth (#NNX.16A654A).

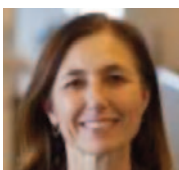
**Publication:** [Monitoring Microplastics in Surface Water—A Pacing Guide for Grades 5–12](#)

**Student Research Support :** The WestEd/UC Berkeley Partnership has collaborated to host or co-host the Student Research Symposia (SRS) since 2016. Every year we have educators whom we work with take a group of learners to present their research posters. We also train the STEM professionals every year for feedback with the participants. We have developed a community of practice for educators who want to guide their learners into developing research questions and GLOBE investigations in preparation for the SRS.

**Audiences served:**   

### Coordinators

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### Team Members

Jon Boxerman, Matt Silbergliitt, Melissa Rego, Nico Janik, & Robin Montoya



## IMPACT



# CIRES EDUCATION OUTREACH

## [CIRES Education Outreach/GLOBE](#)

### [The Future of Forests](#)

**About the Partnership:** As a GLOBE Partner, CIRES Education Outreach provides outreach and engagement opportunities for formal and informal education audiences and community organizations. GLOBE investigations are built into many of our projects, curricula, and professional development workshops.

**2023 Highlights:** In 2023, the CIRES Education and Outreach connected with a Title 1 school in the Denver/Metro area to engage students with the GLOBE Land Cover protocol in the context of a larger curriculum called “The Future of Forests.” In the classroom, students engaged with the curriculum to explore shifting post-fire succession patterns that are taking place in a warmer, drier world before embarking on a field trip to Rocky Mountain National Park to measure and observe these patterns in real life. As part of the field trip, students had the option to use the GLOBE Land Cover protocol to document these patterns by recording observations and capturing images.

**Areas of Expertise:** In-service professional development, Education research, Science research, Other: Curriculum development

**Cooperating Organization:** Rocky Mountain National Park

**Funding:** University of Colorado Boulder Office for Outreach & Engagement

**News Story:** [A day in Rocky Mountain National Park helps students see forest recovery in real-time](#)

**Audiences served:**  

### **Coordinator**

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### **Team Member**

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## IMPACT



# UNIVERSITY OF SOUTH FLORIDA



[University of South Florida \(GLOBE\)](#)

[USF College of Marine Science](#)

**About the Partnership:** We focus on training teachers, graduate students, and young scholars how to use science tools to take atmospheric and hydrology data. Each summer we use GLOBE protocols to take atmospheric and hydrology data during our 3-week program called the Oceanography Camp for Girls.

**2023 Highlights:** In 2023, we had two graduate student liaisons visit local elementary schools 21 times throughout the year. They connected with and trained over 255 teachers and students in Elementary GLOBE atmospheric data collections. The elementary students collected 136 cloud observations and 68 surface temperature measurements.

Our 30 Oceanography Camp for Girls campers and 15 mentors learned how to collect atmospheric and hydrology data from Tampa Bay, Florida. They collected data on nutrients, salinity, oxygen, pH, water and air temperature, clouds, and wind speed.

Dr. Teresa Greely reconnected with GLOBE leadership while meeting many new members to creatively brainstorm and inform future developments during the 2023 U.S. GLOBE retreat in New Hampshire.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Citizen science, Informal science

**Funding:** NOAA

**Audiences served:**

### Coordinator

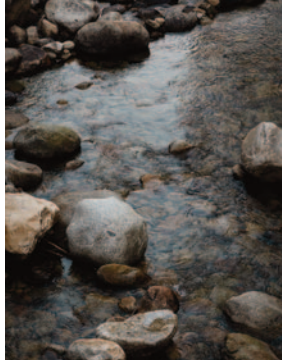
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### Team Member

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## FORT HAYS STATE UNIVERSITY

### Fort Hays State University

**About the Partnership:** FHSU serves the needs of K-12 classrooms. Assistance is provided in incorporating GLOBE into your classroom curriculum.

### **2023 Highlights:**

- We sponsored a solar eclipse workshop with a focus on using the GLOBE Observer app for citizen science sponsored by the Kansas NASA Space Grant.
- Provided training on atmospheric protocols as part of a Wind Energy workshop sponsored by the Kansas NASA Space Grant.
- Participated in the Hays Science Cafe solar eclipse presentation introducing the audience to the GLOBE Observer app.

**Areas of Expertise:** In-service professional development, Elementary GLOBE, Pre-service teachers, Citizen science, Informal science

**Audiences served:**



### **Coordinator**

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## IMPACT



# NASA GODDARD SPACE FLIGHT CENTER

## NASA Goddard (GLOBE)

**About the Partnership:** The NASA Goddard GLOBE Partnership provides resources to schools, educators and citizen scientists in our 11-state region. We offer program support to integrate GLOBE into school curricula, webinars to provide additional training, answers to specific problems via telecons and telephone calls, and, if possible, face-to-face in-school support. We offer an equipment loan program for new GLOBE schools and students preparing for the Student Research Symposia (SRS).

**2023 Highlights:** 2023 saw the NASA Goddard GLOBE Partnership travel overseas to the country of Bhutan. As part of a GLOBE Mentor training team, we provided training to GLOBE Mentor Trainer and Trainer candidates. This new GLOBE country has worked to integrate GLOBE protocols and activities into schools and government institutions nationwide.

Our team members played an integral part in updating the GLOBE Observer app to include data entry in Atmosphere, Biosphere and Hydrosphere areas. Those same team members also took part in the 2023 Annular Eclipse to bring a great educational experience to the general public across the southwestern states.

Brian Campbell was honored in November 2023 with the installation of a permanent sign at the inaugural ceremony of the new STEAM Innovation Lab in Cañadas de Obregón, Jalisco, Mexico. Brian has been working with collaborators in Mexico through his work with NASA Earth Science, ICESat-2 Mission, and The GLOBE Program.

Our Partnership was chosen to develop a tent for the Earth Around Us Project sponsored by the GLOBE U.S. Coordination Office, with support from the USDA Forest Service, Eastern Region.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers, GLOBE in undergraduate classrooms, Engineering, Education research, Science research, Citizen science, Informal science

**Cooperating Organizations:** NASA, NOAA, U.S. Department of State, Fizzee Labs and the University of Maryland

**Funding:** NASA

**Audiences served:** PreK Elem MS HS UG Grad PreEd Educ LLL

### Coordinator

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## IMPACT



# BOSTON UNIVERSITY

## [Boston University Partnership Page \(GLOBE\)](#)

**About the Partnership:** The GLOBE Partnership at Boston University’s Wheelock College of Education and Human Development promotes GLOBE activities to support science education in Massachusetts and Rhode Island.

BU GLOBE Mission Earth is a member of the GLOBE Mission Earth consortium supported by NASA Science Activation 2.0. We work with teachers in grades K-12 to engage students in GLOBE outdoor investigations of their environment and in the use of GLOBE and NASA online data resources.

The BU GLOBE Partnership invites teachers, youth-serving organizations, or school districts to contact us. We offer GLOBE training and support year-round and integration into the network of GLOBE schools and teachers.

**2023 Highlights:** Each summer we offer GLOBE workshops to introduce teachers to GLOBE and for veterans to share their GLOBE practices to satisfy NGSS standards. In 2023 the workshop was hybrid with a focus on figuring out ways for GLOBE and Mission Earth activities to fit into classrooms with shifts in district science curriculum.

During the school year we provide professional development sessions focused on students’ research projects and support of teachers’ implementation of GLOBE activities.

We are partnering with Providence, Rhode Island, schools and the Boston Public Schools to support outdoor classrooms and to provide phenological gardens.

**Areas of Expertise:** In-service professional development, Elementary GLOBE, GLOBE in undergraduate classrooms, Informal science

**Funding:** NASA Science Activation 2.0 through a subcontract to the University of Toledo’s GLOBE Mission Earth project.

**Audiences served:**    

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## IMPACT



# GLOBAL STEM EDUCATION CENTER



## Global STEM Education Center (GLOBE)

**About the Partnership:** As a small 501(c)(3) nonprofit, we are committed to equity, STEM careers, global citizenship, diversity and inclusion, environmental science diplomacy and assisting schools beyond the greater Boston area from underserved and underrepresented groups.

### 2023 Highlights:

- Organized and moderated 3 GLOBE sessions at the UN General Assembly Science Summit in September 2023
- Represented GLOBE Observer at NASA STEM Red Sox event in Boston
- Served on the GLOBE Lifelong Learners Advisory group
- Presented a GLOBE Watercooler
- Contributed to the Artificial Intelligence Session at the GLOBE Annual Meeting
- Served on 2023 GLOBE North American Regional Meeting Organizing Committee
- Actively participated in GLOBE International STEM Network
- Recruited new GLOBE educators and students in Massachusetts, UK, South Africa, Scotland, Nigeria
- Continued to work with the UNITAR, UNESCO and other UN agencies
- Served as a Judge at IVSS
- Continued to work with Shrewsbury Senior Center
- Continued to work with YCAN (Youth Climate Action NOW)
- Continued to work with Zonta International (Women Leadership in STEM)
- Successfully running a GLOBE collaboration with Whitinsville Christian K-12 School in Massachusetts, Finham Park 2 School in the UK, Calling Academy School in South Africa and SUNY Fredonia (including providing virtual PD)
- GLOBE protocols used included atmosphere (air temperature, precipitation, clouds and contrails, relative humidity, surface temperature) and biosphere (biometry, trees).

**Areas of Expertise:** In-service professional development, Programming for students, Pre-service teachers, Citizen science, Informal science

**Cooperating Organizations:** UNESCO, UNITAR, Zonta International, YCAN (Youth Climate Action NOW), Stellenbosch University (South Africa), University of the Western Cape (South Africa), SUNY Fredonia, University of the West of Scotland, Nigerian Society of Engineers, Hugenote Kollege (South Africa)

**News Story:** [NASA at Fenway \(2018\)](#)

**Audiences served:**



### Coordinator

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### Team Member

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## IMPACT



# GRAND VALLEY STATE UNIVERSITY

## Grand Valley State University (GLOBE)

**About the Partnership:** GLOBE at GVSU focuses on three primary audiences: K-12 students, in-service educators, and pre-service teachers. K-12 students are immersed in place-based education field trips that use GLOBE protocols to help them gather information about their place. Pre-service and in-service teachers are trained as GLOBE educators.

**2023 Highlights:** A course for pre-service teachers at GVSU offered training in several protocols including air temperature, surface temperature, clouds, relative humidity, precipitation-rain, precipitation-snow.

Hundreds of students used GLOBE protocols to explore the connection between land and water in educational programming. Student favorites included surface temperature, clouds, and tree height. Students especially enjoyed building their own clinometers to measure tree heights.

**Areas of Expertise:** Programming for students, Pre-service teachers, GLOBE in undergraduate classrooms, Citizen science, Informal science

**Audiences served:** Elem MS HS UG Grad Educ LLL

### Coordinator

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### Team Members

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## WAYNE RESA

### Wayne RESA (GLOBE)

**About the Partnership:** The focus of the Wayne RESA GLOBE Partnership work is to integrate the AREN Project with the GLOBE Program and the Rouge Education Project with educators and their students. Our primary focus is to work in Wayne County, Michigan, although some of the work goes beyond the boundaries of Wayne County.

### 2023 Highlights:

Wayne RESA coordinated online eTraining with multiple university partners: Madonna University, Wayne State University, Tennessee State University, and the University of Michigan-Dearborn.

We have worked on integrating the AREN Project and the GLOBE program within the Rouge Education Project. AREN tools used were AEROPDS and AquaROVER. We focused on the GLOBE hydrosphere protocols. There were 13 schools involved in this work.

We have provided AREN support to our AREN goals and objectives through:

- AREN professional development program
- AREN Project follow-up training meetings
- Wayne RESA maker space event
- AREN professional development on TerraROVER and AEROKATS
- AREN summer institute
- Wayne County Master Science Teaching Fellowship cohort

**Areas of Expertise:** In-service professional development, Programming for students, pre-service teachers, GLOBE in undergraduate classrooms, Citizen science, Informal science

**Cooperating Organizations:** Friends of the Rouge/Rouge Education Project; Metropolitan Detroit Science Teachers Association; Tennessee State University; Wayne State University; Madonna University; University of Michigan-Dearborn; Mission Earth-University of Toledo

**Funding:** NASA Science Mission Directorate Science Activation Program (Solicitation: NNH15ZDA004C)

**Publication:** [Podcast: GLOBE Observer-Clouds](#)

**Student Research Support:** Students representing the Wayne RESA GLOBE Partnership shared research at the GLOBE Midwest Science Symposium and the GLOBE International Virtual Science Symposium. Wayne RESA provides support in terms of expertise and equipment needed for projects. Examples of projects included:

- Comparing Select Atmospheric Parameters Between Disparate Geographic Locations Using Collaboration Between Two GLOBE Schools
- TerraRover 2 Augmented to Detect a Suite of Atmospheric Parameters Using Arduino Related Technology
- Analysis of Precipitation and Select Water Quality Parameters on Crayfish Activity in the Rouge Rivers

**Audiences served:**

### Coordinator

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### Team Member

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# NEW HAMPSHIRE

## IMPACT



# LEITZEL CENTER AT THE UNIVERSITY OF NEW HAMPSHIRE

## [Leitzel Center Partnership Page \(GLOBE\)](#)

**About the Partnership:** The Leitzel Center New Hampshire GLOBE Partnership works to build a training team of GLOBE teachers and university scientists and graduate students. We work primarily with schools and teachers in New Hampshire, but training and support are available to schools in Vermont and Maine as well.

### 2023 Highlights:

- [The Soil Tent program](#) reached 1,647 PreK–12 students, eight educators (during professional development), and 845 members of the general public.
- The New Hampshire GLOBE Team, STEM professionals, and a USDA Forest Service representative led water quality activities with three educators and 40 students from Maple Street Magnet School, Rochester, N.H., in April and June as part of the development of activities and mural panels for a Water Tent.
- Jennifer Bourgeault and Haley Wicklein led a GLOBE training at a professional learning opportunity for educators as part of the STEM-Language Arts Teaching/Learning Ecosystem (SLATE) program funded by the U.S. Department of Education.
- Beth Young joined the New Hampshire GLOBE Team as the Earth Around Us Tent program coordinator.
- Beth Young presented as part of the [GLOBE Exchange](#) at the GLOBE North American Regional Meeting in November.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Education research, Citizen science

**Cooperating Organizations:** USDA Forest Service; University of New Hampshire Cooperative Extension

**News Story:** [New Hampshire GLOBE Partnership Developing Water Tent with Maple Street School Students](#)

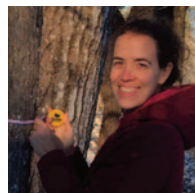
**Audiences served:**     

### Coordinator

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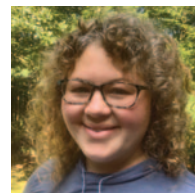


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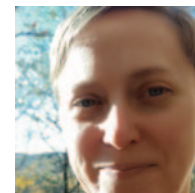


### Team Members

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# INSTITUTE FOR RESEARCH IN SCIENCE TEACHING

## Institute for Research in Science Teaching (GLOBE)

**About the Partnership:** The Institute's focus has been the infusion of GLOBE into classrooms across our region through our ongoing partnerships, which grows from the use of GLOBE in our pre-service teacher education program and having the trained pre-service teachers serve as ambassadors of GLOBE in classrooms.

### 2023 Highlights:

- We expanded the work that we are doing in building pre-service teachers' understanding of the role of GLOBE in developing content knowledge and their knowledge of how to engage young scientists in their classrooms as they seek to help meet the NGSS in their classrooms. The most impactful expansion has been a focus on connecting cooperating teachers that are hosting the pre-service teachers in their classrooms. This has been an incredible way of supporting both the pre-service teachers, but also to help teachers see the connections that GLOBE allows them to make in meeting New York State Science Learning Standards and NGSS.
- The content course that the pre-service teachers take, The Earth as a System, has been expanded to be a general education course. So the impact that GLOBE has is now extended to other majors and content areas as we link the understanding of science to helping to meet the UN Sustainable Development Goals.
- With Larisa Schelkin of the Global STEM Education Center, we have expanded our offering of sessions for the UNITAR Science Diplomacy Program as well as taking part in the UN General Assembly Science Forum. The expansion now includes classroom-based partnerships with teachers and their students around the globe.
- We continue to expand our regional network of schools around GLOBE. This includes atmospheric data collection (including snow and frost-tube protocols) and now because of our outreach with the Soil Tent, we are adding soil protocols.
- Our work with seven NOAA B-WET grant programs continues to expand. This is becoming a very important long-term data set and has been referenced by localities and agencies looking at monitoring water quality.
- We will be hosting a local SRS in January 2024 with a number of schools planning on also submitting to the IVSS as well as the Regional SRS in Spring 2024.
- We continue to partner with GLOBE Mission Earth on the integration of GLOBE to both pre-service education and engineering.

Collaborators: GLOBE Mission Earth, AREN Project, GLOBE Teams Project, GLOBE Satellites and Education Team, NOAA B-WET, New York State Department of Environmental Conservation, US Forest Service, National Science Foundation.

**Areas of Expertise:** In-service professional development, Elementary GLOBE, Pre-service teachers, GLOBE in undergraduate classrooms, Engineering, Education research, Science research, Citizen science

**Cooperating Organizations:** State University of New York at Fredonia

## Publications

**Audiences served:**        

### Coordinator

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# ELIZABETH CITY STATE UNIVERSITY

## Elizabeth City State University

**About the Partnership:** The ECSU site has chosen to focus activities on enhanced learning of hydrology and atmospheric protocols while assisting pre-service and in-service teachers in understanding these protocols. ECSU assists teachers to become certified as GLOBE-trained teachers through e-protocol training and in-person training.

### 2023 Highlights:

- Three new teachers participated in the ECSU summer 2023 program. Each completed hydrology and atmosphere GLOBE protocol certification.
- The United States GLOBE Office, GLOBE Implementation Office, and the NASA GLOBE Program Office hosted a GLOBE Partner Retreat in September to discuss how to expand the reach and elevate the presence of the GLOBE Program in the United States, and strengthen and sustain the GLOBE Partnership network and its members. Lonisha Whidbee represented the ECSU Partnership at the retreat.
- ECSU STEM Program provided Hydrology supplies for 6th Grade Science students at River Road Middle School and high school students at Northeastern High School.
- One high school and one middle school teacher received the ECSU Dr. Maurice Powers GLOBE Teachers Award which included a \$1,000 honorarium.

**Areas of Expertise:** In-service professional development, Elementary GLOBE, Pre-service teachers

**Cooperating Organizations:** IEEE-Geoscience and Remote Sensing Society (GRSS) Chapter #03191; ECSU STEM Operations Program (Dr. Sheryl Bradford, manager)

**Funding:** ECSU Center of Excellence in Remote Sensing Education and Research (CERSER)

### Publications:

- Hayden, Linda Bailey, GLOBE Data Entry App Version 1.3 Now Available to GLOBE Community! Create and Edit Sites Without Active Internet Connection! GRSM-2017-00032
- Hayden, Linda Bailey, GLOBE: Connecting You to an International Community of Observers and Directly to NASA Satellites, IEEE Geoscience and Remote Sensing Society Magazine, Fall 2017, GRSM-2018-00079

**Audiences served:**       

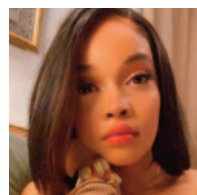
### Coordinator

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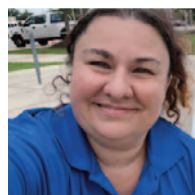


### Team Members

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# UNIVERSITY OF TOLEDO

## [University of Toledo Partnership Page \(GLOBE\)](#)

## [GLOBE Mission EARTH](#)

**About the Partnership:** The University of Toledo (UT) leads the efforts of [GLOBE Mission EARTH \(GME\)](#), a collaborative whose mission is to increase involvement in GLOBE. We offer training and support for all levels of formal and informal educators and incorporate multiple interdisciplinary collaborations in our work. Dr. Kevin Czajkowski, Geography Professor at UT and Principal Investigator of GME, also serves as lead scientist on the [GLOBE Urban Heat Island Effect \(UHIE\) Surface Temperature Intensive Observation Period](#).

### 2023 Highlights:

**Professional Development:** In 2023, UT hosted two professional development opportunities:

- [Earth Heart Farms PD](#), an 80-acre former farm undergoing native restoration in northwest Ohio.
- [Solar Eclipse PD](#), in coordination with Jodi Haney of [Xcite Learning](#).

**Student Outreach:** GME engages students in GLOBE data collection and analysis.

- UT actively works with NASA SEES high school virtual internship program ([UHIE group](#) and [Air Quality Initiative group](#)) and [Upward Bound high school training program](#) to engage directly with K-12 students.
- The [GLOBE Kids Club](#) is a virtual program for students in grades 3-5. Students produce a Science Notebook of their observations.
- UT engages students in studying the UHIE via our [UHIE for Students google site](#).
- Over 600 students witnessed the [CubeSat High-altitude Balloon Launch](#) and were engaged in weather monitoring at Defiance Elementary School.

### Student Symposia

- Over 60 K-college students presented their research at the [Students And Teachers Exploring Local Landscapes to Interpret The Earth from Space \(SATELLITES\) Student Research Conference](#).
- UT worked with the University of Wisconsin Madison to coordinate the [GLOBE Midwest Student Research Symposium \(SRS\)](#). Students presented their research projects and participated in educational activities.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers, GLOBE in undergraduate classrooms, Engineering, Education research, Science research, Citizen science, Informal science

**Cooperating Organizations:** NASA Langley Research Center (LaRC); AREN Project; Arctic and EARTH Signs Project; Palmyra Research Cove; WestEd/UC Berkeley; Tennessee State University; Boston University; among many others. Our other cooperating organizations can be viewed on [our collaborations page](#).

**Funding:** NASA Cooperative Agreement Notice (CAN) #: NNX16AC54A

### [Publications](#)

### [News Stories](#)

**Student Research Support:** UT offers ongoing support to teachers and students in preparing and submitting student research projects to the GLOBE IVSS, SRS and GLE. Teachers upload student projects to the GME Student Research webpage; GME staff review the projects and provide suggestions for edits.

**Audiences served:**        

### Coordinator

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# XCITE LEARNING/NWO @ BGSU/TOLEDO ZOO

## [Xcite Learning/NWO @BGSU/Toledo Zoo Partnership Page \(GLOBE\)](#)



**About the Partnership:** Our collaborative Partnership engages in teacher professional development, K-12 student programming, pre-service teacher training, and collaborative federal grant activities to promote GLOBE in the region.

**2023 Highlights:** We trained teachers from four school districts at BGSU’s federally funded Project IMPACT: GLOBE in the Prairie summer and academic year professional learning program. This program aimed to assist teachers in using GLOBE protocols and the iNaturalist tool to conduct student research in school prairies. Teachers were encouraged to bring students to the local student research symposium (SRS).

We also led a four-week STEM Summer Camp Program for students in grades K-4 at Waterville Primary School. We led students through a project-based learning (PBL) experience to answer “How can we make our school prairie better for the animals and plants that live there and for the people visiting the prairie?” GLOBE atmosphere and soil protocols were used, and a purple air device was installed to investigate air quality. We kicked off our Earth Beneath Our Feet GLOBE soil tent program at the STEM Camp and constructed a mosaic soil mural.

In May, 83 students in grades 3-8 presented research at our second annual Local GLOBE in the Prairie SRS held at the Toledo Zoo and Aquarium. These students represented three area schools: Hull Prairie Intermediate (Perrysburg, Ohio), Marshall STEMM Academy (Toledo, Ohio), and Waterville Primary School (Waterville, Ohio).

BGSU pre-service teachers assisted students in grade 5 in collecting data at the third annual Bioblitz program in September 2023. This year, we offered two different events with 207 students from Kenwood Elementary School in Bowling Green and Washington Junior High in Toledo participating. Each event included GLOBE data collection (soil, air, and surface temperature protocols), an iNaturalist Bioblitz, and a take-home monarch attracting seed drop-making activity.

Another cohort of Project IMPACT teachers received GLOBE in the Prairie Training during the fall semester. Again, the teachers received stipends and GLOBE equipment needed for student research projects and are invited to bring students to the local SRS in May 2024.

**Areas of Expertise:** In-service and pre-service professional development, Student programs, Citizen science, Informal science

**Cooperating Organizations:** Xcite Learning; The Toledo Zoo & Aquarium; Wintergarden City Park; NWO STEM Center of Excellence at BGSU; Waterville Primary School, Toledo Public Schools

**Funding:** YLACES, The Toledo Zoo and Aquarium, and Bowling Green State University’s Northwest Ohio Center for Excellence in STEM Education (NWO) sponsored our Bioblitz BG and GLOBE in the Prairie Local SRS.

**Student Research Support:** We had funding from university grant, the Toledo Zoo, and local schools to support teachers in a professional development series on GLOBE in the Prairie student research. Participating schools received GLOBE equipment and supplies, and the teachers received stipends. We held follow-up meetings and visited schools to provide the support needed for student research success.

**Audiences served:** Elem MS HS UG Grad PreEd Educ LLL

### Coordinator

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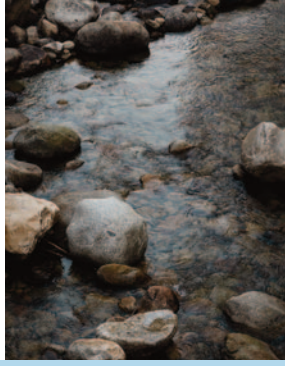
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# UNIVERSITY OF TENNESSEE AT CHATTANOOGA

## University of Tennessee at Chattanooga (GLOBE)

**About the Partnership:** Our Partnership provides teacher professional development for STEM content and pedagogy.

**Areas of Expertise:** In-service professional development, Elementary GLOBE, Pre-service teachers, Education research, Citizen science, Informal science

**Funding:** Tennessee Space Grant Consortium

**Audiences served:**  

### **Coordinator**

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### **Team Members**

Peggy Moyer  
Dot Finch



## IMPACT



# EL PASO COMMUNITY COLLEGE

## El Paso Community College (GLOBE)

**About the Partnership:** Our Partnership provides GLOBE teacher training, continuing education and public outreach related to GLOBE events and activities. We also provide curriculum support in the Earth sciences to all levels of academia.

### 2023 Highlights:

- Initiated new [outreach with Tornillo Elementary School](#)
- Co-coordinated the [October 2023 Annular eclipse event](#) for our international audience
- Co-authored a [learning module](#) using NASA GLOBE products and database for K-12 and early college

**Areas of Expertise:** In-service professional development, Programming for students, Pre-service teachers, GLOBE in undergraduate classrooms, Education research, Science research, Citizen science, Informal science

**Cooperating Organizations:** El Paso Community College Service Learning Program; University of Texas at El Paso; Tornillo Elementary School

### Publications and Presentations:

- [GLOBE and My NASA Data Collection, Visualization and Analysis through Concept Mapping](#)
- [Solar eclipse 2023: Educational and public outreach opportunities with NASA GLOBE partnerships and national and international academic institutions](#) (American Geophysical Union 2023)
- [GLOBE Observer Cloud data quality](#) (U.S. GLOBE Watercooler)

**News Story:** [EPCC hosts interactive solar eclipse viewing party](#) (KVIA)

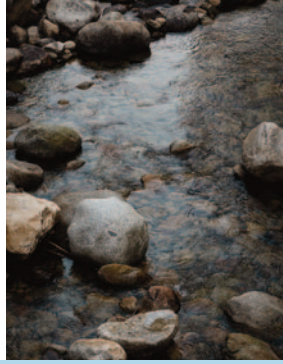
**Audiences served:**

### Coordinator

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# TEXAS STEM COALITION



## Texas STEM Coalition

**About the Partnership:** The Texas STEM Coalition GLOBE Partnership provides a venue for recruiting, training, follow-up and dissemination of the GLOBE Program across Texas. Specifically, the annual Texas STEM conference includes a GLOBE focused strand to promote GLOBE and student environmental research. The coalition also provides GLOBE teachers with a venue to present their GLOBE activities during the conference.

**2023 Highlights:** The virtual 16th Annual Texas STEM Conference had opportunities for teachers to learn about GLOBE. The two sessions are cited below. Teachers were introduced to GLOBE, Elementary GLOBE and the GLOBE Observer app. Teachers received sample materials they could use in their classrooms and were introduced to the 2023 Southwest Student Research Symposium opportunity.

TSTEM also promoted the GLOBE Observer Annular Eclipse by providing eclipse glasses to over 1,000 school children. We are also preparing for the 2024 Total Eclipse that will be visible in Texas.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Citizen science, Informal science

**Cooperating Organization:** UT Tyler GLOBE Partnership

### Publications and Presentations:

- Odell, M.R.L. and Kennedy, T.J. (2023). The GLOBE Student Research Symposium (SRS). Texas STEM Conference (Virtual).
- Odell, M.R.L. and Kennedy, T.J. (2023). The Elementary GLOBE Program. Texas STEM Conference (Virtual).

**Student Research Support:** TSTEM helped subsidize the 2023 SRS

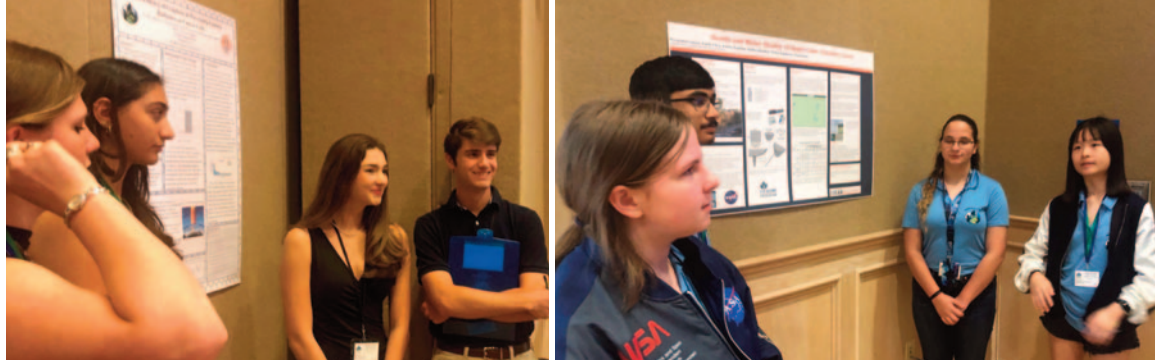
**Audiences served:**   

### Coordinator

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### Team Members

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# UNIVERSITY OF TEXAS AT TYLER

## [University of Texas at Tyler](#)

**About the Partnership:** The University of Texas at Tyler is responsible for recruiting, training and mentoring teachers in GLOBE activities and facilitating student research in schools across East Texas. Students take GLOBE measurements at their schools on the UT Tyler campus. The Partnership focuses on training pre-service and in-service teachers and facilitating student research at the UT Tyler University Academy Lab Schools in Tyler, Palestine, and Longview.

### 2023 Highlights:

- Trained pre-service teachers enrolled in elementary and secondary science methods classes.
- Hosted the 2023 Southwest Student Research Symposium (SRS).
- Incorporated GLOBE in an undergraduate STEM Research Methods course that supports future STEM teachers.
- Applied for a 100K Strong Grant with the Argentina to create a Climate Action Project using GLOBE with a focus on the Year of Climate and Carbon.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers, GLOBE in undergraduate classrooms, Education research, Informal science

**Cooperating Organization:** The Texas STEM Coalition Partnership

### Publications and Presentations:

- Odell, M.R.L., Dyer, K. and Klett, M. (2023). [Collaboration and Communication in Science and Technology Education \(Chapter 20\)](#). In B. Akpan & T.J. Kennedy (Eds.) Contemporary Issues in Science and Technology Education; Springer, Switzerland.
- Kennedy, T.J. and Odell, M.R.L. (2023). [STEM Education as a Meta-discipline \(Chapter 4\)](#). In B. Akpan & T.J. Kennedy (Eds.) Contemporary Issues in Science and Technology Education; Springer, Switzerland.
- Odell, M.R.L. and Kennedy, T.J. (2023). The GLOBE Student Research Symposium (SRS). Texas STEM Conference (Virtual).
- Odell, M.R.L. and Kennedy, T.J. (2023). The Elementary GLOBE Program. Texas STEM Conference (Virtual).
- Odell, M.R.L. and Kennedy, T.J. (2023). Texas and Argentina: GLOBE Climate Exchange Program. GLOBE North American Regional Meeting (Virtual).

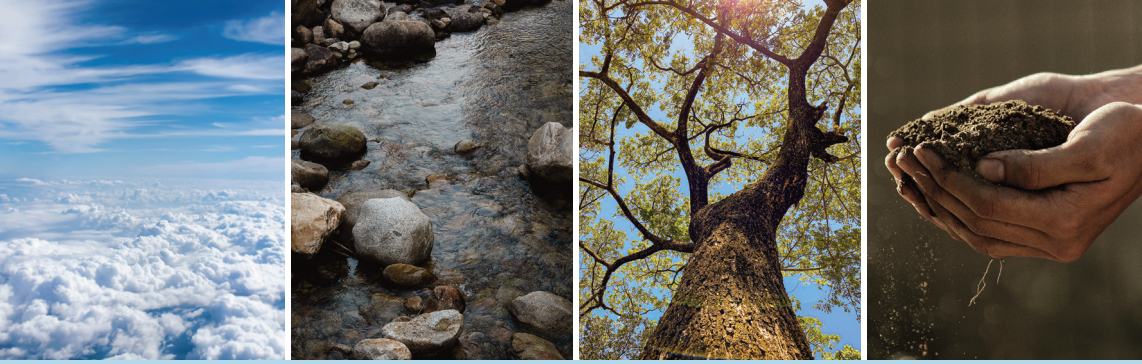
**Student Research Support:** Assist University Academy students in Tyler, Longview, and Palestine to prepare for GLOBE SRS.

**Audiences served:**    

### Coordinators

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# INSTITUTE FOR GLOBAL ENVIRONMENTAL STRATEGIES (IGES)

[Institute for Global Environmental Strategies](#)

[Institute for Global Environmental Strategies Partnership Page \(GLOBE\)](#)

**About the Partnership:** Our Partnership centers on supporting GLOBE Observer outreach and participation within the GLOBE Community, with a focus on GLOBE Observer Mosquito Habitat Mapper and GLOBE Observer Land Cover. We do this through supporting monthly community webinars, creating educational resources for use by GLOBE teachers, maintaining a [campaign website](#), and providing two-way conversation through our Mighty Network Space (GLOBE Mission Mosquito and Student Research).

## 2023 Highlights:

- 3 peer-reviewed publications
- 12+ webinar presentations to the community
- Supported NASA SEES high school internship
- Engaged 46 high school students resulting in 11 International Virtual Science Symposium (IVSS) projects

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, GLOBE in undergraduate classrooms, Science research, Citizen science, Other: Life-long Learning

**Cooperating Organizations:** University of South Florida; GLOBE Africa; GLOBE Kenya; GLOBE Ghana; GLOBE Madagascar; GLOBE Brazil; Other programs in South Dakota and Hawaii; Harris County, Precinct 4 Biologic Control Initiative, TX.

**Funding:** NESEC

**Student Research Support:** In 2023, 46 students submitted 11 projects to the IVSS and 11 abstracts/posters to AGU Bright STaRS. Two of our SEES Earth System Explorers were in the top 400 in the 2024 Regeneration competition, and one was selected to compete in the top 40.

**Audiences served:**       

## Coordinator

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## NASA LANGLEY RESEARCH CENTER

### NASA Langley (GLOBE)

**About the Partnership:** We create pathways for all to engage in NASA science and GLOBE.

#### 2023 Highlights:

- Completed 2022-2023 ENGAGE teacher cohort with focus on GLOBE Nature Notes.
- Started 2023-2024 ENGAGE teacher cohort.
- Hosted GLOBE Clouds Workshop series.
- Mentored National Institute of Aerospace (NIA) helping them become GLOBE Trainers.
- Collaborated with NIA for GLOBE Workshops with regional educators, all Media Specialists in Richmond, and all 3rd grade teachers in Hampton.
- Hosted a GLOBE Teacher Intern summer 2023.
- Developed new Eclipse resources.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers

**Cooperating Organizations:** GLOBE Mission Earth and the NASA Earth Science Education Collaborative

**Funding:** NASA

#### Student Research Support:

- Supporting GLOBE Nature Notes and other student research with our teacher cohort.
- GLOBE Clouds Student Project Support.

**Audiences served:**         

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# KATHERINE JOHNSON NASA IV&V EDUCATION RESOURCE CENTER

## [NASA IV&V ERC \(GLOBE\)](#)

### [Fairmont State University Katherine Johnson IV&V ERC](#)

**About the Partnership:** NASA's Independent Verification & Validation Program's Education Resource Center conducts educator trainings across West Virginia. Each training certifies users to borrow classroom kits containing GLOBE equipment to perform data collection for The GLOBE Program. Check out an updated listed of loanable kits in the [ERC's Loan & Learn Catalog](#) and [request a GLOBE educator training](#).

### 2023 Highlights:

- Utilized GLOBE mini-grant award to prepare four new GLOBE mentors on a suite of Atmosphere protocols and certify them to borrow the ERC's loanable Atmosphere kit to implement GLOBE at their new Atmosphere sites. Each mentor is working with their students to submit data science projects to both their local science fair and the 2024 International Virtual Science Symposium (IVSS).
- Partnering with Fairmont State University, the graduate course Elementary Earth & Space Science Literacy enabled 30 of West Virginia's K-5 teachers to receive certification on GLOBE: Atmosphere and Heating Things Up! kits. Teachers immersed science and literacy by including picture books in the design of their lessons, which were implemented in their classes in the 2023-24 academic year. Kindergarten teachers selected the books "Clouds" (Anne Rockwell & Frane Lessac) and "Air is All Around You" (Franklyn Branley & John O'Brien); third grade teachers selected the books "What Will the Weather Be?" (Lynda Dewitt & Carolyn Croll) and "Sunshine Makes the Seasons" (Franklyn Branley & Michael Rex).
- Hosted a GLOBE: Clouds webinar and presented climate lessons designed specifically for West Virginia classrooms at the West Virginia Science Teachers Association Annual Conference. Teachers engaged in West Virginia Mass Concentration studies using data from the NASA GRACE missions, which was then contrasted with precipitation data from My NASA Data.

**Areas of Expertise:** In-service professional development, Elementary GLOBE, Pre-service teachers, Citizen science

**Cooperating Organizations:** Fairmont State University; Katherine Johnson NASA IV&V Education Resource Center

**Funding:** NASA West Virginia Space Grant Consortium, The GLOBE Implementation Office, and Fairmont State University; Katherine Johnson NASA IV&V Education Resource Center

### News Stories:

- [Fairmont State receives NASA Grant to support elementary science teachers](#)
- [Fairmont State University awarded GLOBE grant for science education](#)

**Audiences served:**



### Coordinators

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### Team Member

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# UNIVERSITY OF WISCONSIN - MADISON

## University of Wisconsin – Madison (GLOBE)

**About the Partnership:** Our GLOBE Partnership offers teacher professional development workshops, youth STEM camps, student research symposia (SRS) opportunities, internships, and K-12 class activities.

**2023 Highlights:** We led multiple youth efforts throughout 2023 in support of climate education, youth citizen science, and diversity, equity, and inclusivity.

- Autistic middle and high school-aged students are encouraged to pursue STEM degrees and careers through hands-on, nature-based learning activities at The Sky's The Limit STEM Camp at the Welty Environmental Center in Beloit and Nature's Navigators STEM camp at Upham Woods Outdoor Learning Center in the Wisconsin Dells. The camps strive to celebrate neurodiversity through a safe, personalized, and interactive learning environment. Many of the camp activities apply or extend GLOBE protocols related to the atmosphere, hydrosphere, biosphere and pedosphere.
- Through the SnowGLOBE Youth Citizen Science Collaborative, K-12 schools across Wisconsin and the broader Midwest region are collecting snowfall observations and snowflake photos to categorize crystal type.
- CCR is supporting the Girls in STEM: Muddy Water STEMInist Camp, co-organized by our partner the Welty Environmental Center and Hendricks CareerTek. This aquatic science camp empowers middle and high school-aged girls to investigate the many facets of STEM through the lens of water science.

Many of these youth activities, including STEM camps, internships, hands-on learning activities, teacher professional development workshops, and student symposia, fit under the umbrella of the Wisconsin Educational Leadership for Community Outreach and Mentoring for the Environment, or the WELCOME initiative.

**Areas of Expertise:** In-service professional development, Programming for students, Elementary GLOBE, Pre-service teachers, GLOBE in undergraduate classrooms, Science research, Citizen science

**Cooperating Organizations:** Welty Environmental Center; School District of Beloit; Beloit College; Achieving Collaborative Treatment; Ridges Sanctuary; Taking Autism to the Sky

**Funding:** National Science Foundation GEOPATHs Program; University of Wisconsin-Madison Wisconsin Idea Collaborative Grant; Wisconsin Sea Grant

### Publications and Presentations:

- [2023 Sky's the Limit STEM Camp Recap](#)
- [2023 Nature's Navigators STEM Camp Recap](#)

### News Stories:

- [Learning without Limits](#)
- [The Sky's the Limit: Autistic youth explore science on their terms at STEM camp](#)
- [A "SRS" Success](#)
- [A look into the camp welcoming autistic youth into nature and STEM](#)
- [Hoping for snow: Wisconsin snow data project captures snowflake images and students' attention](#)

**Student Research Support:** Our GLOBE Partnership hosted the 2023 Midwest GLOBE SRS at the University of Wisconsin-Madison for three days. SRS activities included student poster sessions, a boat trip on Lake Mendota and limnology activities, a tour of the Cave of the Mounds, and a tour of the atmospheric science building and radiosonde launch. Our grants provide equipment and training to K-12 schools, free of cost.

**Audiences served:**      

### Coordinator

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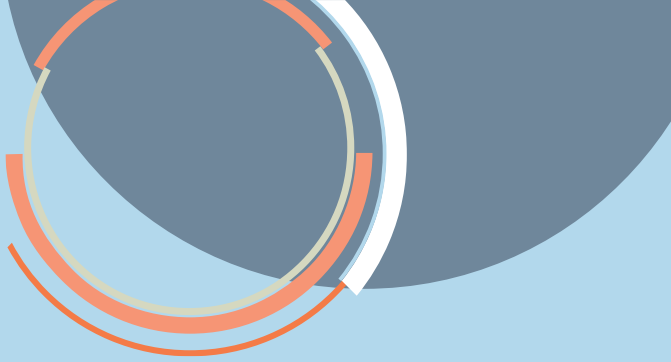
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*Students in Ohio make cloud measurements during Mission SnowGLOBE*

## U.S. GLOBE 2023 NEWS ROUND-UP

These articles were posted on the [U.S. GLOBE news page in 2023](#). The full stories are available from the linked titles

### JANUARY TO MARCH

- [Celebrate Earth Day with GLOBE!](#)
- [March 2023 Updates from GLOBE Mission Earth – University of Toledo](#)
- [U.S. Partner Forum Updates](#)

### APRIL TO JUNE

- [Educators and Students Weather the Storm in Support of NASA's IMPACTS Mission](#)
- [2023 GLOBE Midwest Student Research Symposium](#)
- [Student Researchers from Alaska, Montana and Washington Present and Learn at the Northwest GLOBE Student Research Symposium](#)
- [In-Person 2023 GLOBE Pacific Region SRS is a Success](#)
- [Three GLOBE Regions Send Students to the University of Texas at Tyler for Student Research Symposium](#)
- [More than 200 U.S. GLOBE Students Attend the 2023 Regional Student Research Symposia](#)
- [News from GLOBE Mission EARTH – June 2023](#)
- [GLOBE in the Prairie Hosts a 2023 Local Student Research Symposium](#)
- [GLOBE Goes to Camp Supports Its First GLOBE IOP](#)
- [New Hampshire GLOBE Partnership Developing Water Tent with Maple Street School Students](#)
- [Soil Health Buckets: Meet GLOBE](#)

### JULY TO SEPTEMBER

- [U.S. GLOBE Partners and Educators: Join our Weekly Watercoolers](#)
- [GLOBE and Natural Inquirer Crosswalk Project: Stipends are Available for U.S. Educators and Pre-Service Teachers](#)
- [Students Learn about Prairie Soil at the Soil and Solar Festival](#)
- [GLOBE Mission Earth West Trained 43 Los Angeles-Area Camp Counselors](#)
- [U.S. GLOBE Midwest Regional Updates – September 2023](#)
- [U.S. Partner Forum Welcomes New Members](#)

### OCTOBER TO DECEMBER

- [El Paso Community College Shares GLOBE in Classrooms and at Community Events](#)
- [GLOBE U.S. Sophomores and Juniors: Apply for the STEM Enhancement in Earth Science \(SEES\) 2024 Summer Internship Program](#)
- [Students in Ireland and USA Share Green-Down Data and Culture in Virtual Meeting](#)
- [SEES Internship Piqued STEM Interest for GLOBE Student Tyree Gillespie-Williams](#)



U.S. GLOBE Partners share their ideas at the U.S. GLOBE Retreat

# PARTNERSHIP AREAS OF EXPERTISE



Partnership	State	In-service PD	Programming for students	Elementary GLOBE	Pre-service teachers	GLOBE in undergraduate classrooms	Engineering	Education research	Science research	Citizen science	Informal science	Other
University of Alaska Fairbanks - IARC	Alaska	X	X	X	X	X		X	X	X	X	Indigenous knowledges
Arkansas Partnership for STEM Education	Arkansas	X		X	X						X	
University of Arkansas Fayetteville	Arkansas	X	X	X	X		X	X	X	X	X	
California Academy of Sciences/ Science Action Club	California	X	X							X	X	
Central San Joaquin Valley Partnership	California									X		
Elkhorn Slough National Estuarine Research Reserve	California	X	X	X	X				X	X	X	
WestEd/UC Berkeley	California	X						X		X		
CIRES Education Outreach	Colorado	X						X	X			Curriculum development
University of South Florida	Florida	X	X	X						X	X	
Fort Hays State University	Kansas	X		X	X					X	X	
NASA Goddard Space Flight Center	Maryland	X	X	X	X	X	X	X	X	X	X	
Boston University School of Education	Massachusetts	X		X		X					X	
Global STEM Education Center	Massachusetts	X	X		X					X	X	
Grand Valley State University	Michigan		X		X	X				X	X	
Wayne RESA	Michigan	X	X		X	X				X	X	
Leitzel Center at the University of New Hampshire	New Hampshire	X	X	X				X		X		
Institute for Research in Science Teaching- SUNY Fredonia	New York	X		X	X	X	X	X	X	X		
Elizabeth City State University	North Carolina	X		X	X							
University of Toledo	Ohio	X	X	X	X	X	X	X	X	X	X	
Xcite Learning/NWO @BGSU/Toledo Zoo	Ohio	X	X	X	X	X				X	X	
University of Tennessee at Chattanooga	Tennessee	X		X	X			X		X	X	
El Paso Community College	Texas	X	X		X	X		X	X	X	X	
Texas STEM Coalition	Texas	X	X	X						X	X	
University of Texas at Tyler	Texas	X	X	X	X	X		X			X	
Institute for Global Environmental Strategies (IGES)	Virginia	X	X	X		X			X	X		Life-long learning
NASA Langley	Virginia	X	X	X	X							
Katherine Johnson NASA IV&V Facility	West Virginia	X		X	X					X		
University of Wisconsin - Madison	Wisconsin	X	X	X	X	X			X	X		



# 2023 CURRENT U.S. GLOBE PARTNERSHIPS

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[NASA Goddard Space Flight Center](#) (pg. 19)

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## 2023 CURRENT U.S. GLOBE PARTNERSHIPS continued

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