

Geoff Camphire<sup>1</sup>

## Abstract

Earth Science Week 2015 (11–17 October) will engage millions of people in all 50 states and around the world in learning about the many ways scientists monitor and represent information about earth systems, including land, water, air, and living things. Through the “Visualizing Earth Systems” theme of this year’s celebration, science educators, students, and others will explore what it means to see our planet through eyes informed by the geosciences. Each year, the American Geosciences Institute promotes better understanding of earth science and stewardship of the planet through Earth Science Week. A major addition to the 2015 celebration will be the launch of a new “Visualizing Earth Systems” Web page, linking educators to online visualizations that they can use in instruction. Additional new components of the program include a visualization online competition, stakeholder events linked to citywide celebrations, a video promoting the program, posters on the national parks, and an in-depth publication on the topic of geologic heritage produced in partnership with the National Park Service. Earth Science Week provides a wide variety of ways for geoscience professionals, such as exploration geophysicists, to become involved, share their expertise, strengthen the field, and celebrate earth science.

## Introduction

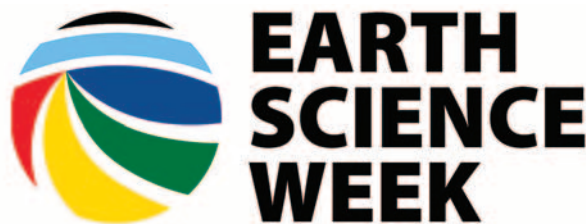
Was someone in your educational experience special to you — perhaps a high school teacher, college professor, or career mentor who sparked your fascination with the geosciences? Today’s science students need educators and mentors of their own. During Earth Science Week 2015, which takes place 11–17 October, you can be that person.

You are invited to help a young person envision the possibilities. It is not so hard; geoscientists like you are adept at using visualizations, after all. In addition to using words and numbers, geoscientists often communicate ideas and information with visual presentations. Visualizations — graphic representations of data — provide a powerful means of illuminating the interactions of earth systems.

It is no coincidence that Earth Science Week 2015 will focus on the theme of “Visualizing Earth Systems.” During the 18th annual Earth Science Week, millions of people in all 50 states and around the globe will learn about the many ways scientists monitor and represent information about earth systems including land, water, air, and living things (Camphire, 2013).

The Society of Exploration Geophysicists (SEG) once again will play a major role in promoting Earth Science Week by featuring the program poster in *The Leading Edge*. In addition, the Earth Science Week 2015 Toolkit will include SEG’s Student and Early Career Brochure, designed to help young people visualize themselves in geosciences studies and careers.

Through the “Visualizing Earth Systems” theme of this year’s celebration, science teachers and students will explore what it means to see our planet through eyes informed by the



geosciences. Earth scientists are finding innovative ways to not only examine natural phenomena but also present that information to professional, educational, and other audiences. In addition to using tools such as telescopes and microscopes, we also view and map changes in natural systems through new technologies, such as computer software, smartphone applications, and online videos.

Each year, the American Geosciences Institute (AGI) promotes better understanding of earth science and stewardship of the planet through Earth Science Week. A major addition to the 2015 celebration will be the launch of a new “Visualizing Earth Systems” Web page, linking educators to online visualizations they can use in instruction. You are invited to submit the URLs for your favorite online geosciences visualizations. Look for the debut of the new page on the Earth Science Week Web site this fall.

## Envisioning education

Earth Science Week originated in 1998 as a celebration to mark AGI’s 50th anniversary. Major partners initially included the U. S. Geological Survey, the AAPG Foundation, the Joint Oceanographic Institutions, and the U. S. Department of Agriculture’s Forest Service. AGI member societies and state geological surveys also promoted the program. AGI staff members assembled educational kits consisting of about 20 items, including posters, flyers, and bookmarks. The Earth Science Week Web site, which served as a hub of participant engagement throughout the year, also was a major component from the start.

Following the success of the first celebration, AGI determined to make Earth Science Week an annual celebration. Program partners multiplied, the Web site and other online offerings were updated and expanded, new materials were added to the kit, and innovative program components, from “Focus Days” to “Citywide Celebrations,” proliferated.

Today, AGI reaches more than 50 million people a year with educational resources, news, information, events, and activities through the Earth Science Week campaign (Camphire, 2013). The program is supported by many organizations, including the U. S. Geological Survey; the AAPG Foundation; the National Park Service; NASA; Esri; National Geographic; the Society for Mining, Metallurgy, and Exploration; the Geological Society of America; the American Geophysical Union; the Association of American State Geologists; and the Archeological Institute of America.

<sup>1</sup>American Geosciences Institute.

During Earth Science Week 2015, science teachers and students across the country and around the world will view and create visualizations, conduct classroom activities, prepare competition projects, and visit parks, museums, and science centers. Exploration geophysicists, among others, are invited to join the celebration.

### All week long

Looking for your special niche within Earth Science Week? Take part in activities emphasizing different areas of the geosciences on Focus Days during Earth Science Week 2015.

- Sunday, 11 October: EarthCachers take part in geocaching “treasure hunts” for International EarthCache Day, hosted by the Geological Society of America. EarthCache events are being held around the world. Participants can use GPS, find a location of geoscientific significance, and learn about earth science.
- Monday, 12 October: Earth Science Literacy Day focuses on videos illustrating the field’s “big ideas” and related activities. The brief video clips bring to life the big ideas of earth science — the nine core concepts that everyone should know.
- Tuesday, 13 October: No Child Left Inside Day invites young people to go outdoors, feel the soil under their feet, and learn about earth science firsthand. A free online guide provides everything needed to start planning an event, including activities designed specifically for elementary, middle, and high school students.
- Wednesday, 14 October: The National Park Service and AGI are collaborating to conduct the sixth annual National Fossil Day. Celebrate the scientific and educational value of fossils, paleontology, and the importance of preserving fossils for future generations. Look for fossil-themed activities and materials in the Earth Science Week 2015 Toolkit.
- Thursday, 15 October: The Association for Women Geoscientists and other groups urge you to share the excitement of geoscience careers with young women, underrepresented minorities, and others on Geoscience for Everyone Day. If you are a geoscientist, visit a school or volunteer at a science center. Organize a Scout event, lead a field trip, or hold a special Take Your Child to Work Day.
- Friday, 16 October: Hosted by a consortium of geoscience organizations, Geologic Map Day promotes awareness of the importance of geologic mapping for education, science, business, and public policy. A poster, featured in this year’s toolkit as well as online, provides a geologic map plus step-by-step instructions for a related classroom activity.
- Saturday, 17 October: Program partner Archaeological Institute of America brings Earth Science Week to an eventful climax with International Archaeology Day. Whether it is a family-friendly archaeology fair, a guided tour of an archaeological site, a simulated dig, or a classroom visit from an archaeologist, this hands-on event offers the chance to indulge your inner Indiana Jones (Camphire, 2013).

For more information on Focus Days, including a wealth of teaching and learning resources, see Earth Science Week online.

### Cities in the spotlight

Another major new component of the program is the introduction of Citywide Celebrations, city-specific events that serve as centers of public-awareness activities during Earth Science Week. Leading the charge, Earth Science Week Houston and Earth Science Week Denver will extend and deepen the reach of the campaign with special activities, educational materials, online resources, and activities in schools and other settings.

In Houston, major partners include the Houston Geological Society, the Houston Museum of Natural Science, and the Consumer Energy Alliance. In the Denver area, partners include the Colorado Scientific Society, the Colorado School of Mines, and the Society for Mining, Metallurgy, and Exploration.

To support these celebrations, AGI is donating hundreds of Earth Science Week Toolkits to schools in the Houston Independent School District and Denver Public Schools. Each kit contains dozens of materials for earth-science education, which school officials are working with teachers to use in inspiring activities in the classroom.

In addition, AGI recently launched a Citywide Celebrations Web site to provide educators, students, and families with links to additional educational resources as well as other offerings in participating cities. Why not partner with local geoscience organizations to launch a Citywide Celebration in your area? If you are hosting an event for the public during Earth Science Week, let people know about it by posting your event details on the “Events in your Area” page of the program Web site. This page provides information on events taking place through program partners in each state.

### Spotting opportunities

If you’re wondering what Earth Science Week can offer teachers and students in your area, visit the program Web site for ideas, activities, and instructional resources.

The “Big Ideas of Earth Science” videos, for example, are brief clips covering nine key concepts of the geosciences. The Earth Science Literacy Initiative, funded by the National Science Foundation, has codified these underlying understandings of earth science. Online links provide related activities that students can conduct to further explore these ideas.

Students and others also can enter AGI’s Earth Science Week contests in photography, visual arts, and essay writing. The photo contest, open to all ages, focuses on “Earth Systems Interacting.” Students in kindergarten through fifth grade may enter the visual arts contest, “Picturing Earth Systems.” In addition, students in sixth through ninth grades can enter the essay contest, which highlights “Earth Science Visualization Today.” Essays of a maximum of 300 words should describe how geoscientists are using cutting-edge visualizations to advance earth science today. The first-place prize for each contest is \$300 and a copy of AGI’s *The Geoscience Handbook*. Information on rules and prizes is online.

Earth Science Week Web site visitors can discover more than 70 instructional resources available in Spanish as well as English, peruse new links for information on geologic mapping, check out events taking place in their areas, and explore a nationwide map and database of geoscience agencies, companies, and other organizations offering earth-science expertise.

Teachers and others can search an online collection of more than 120 learning activities — most of them contributed by the leading geoscience agencies and groups that are Earth Science Week partners — which support the Next Generation Science Standards. To find the perfect activity for a lesson, click on “Search classroom activities.” Instructors can search, by grade level and science-education standard, among 24 categories of earth-science topics, from energy and environment to plate tectonics and weathering. This database-driven resource is ideal not only for supplementing a prepared curriculum but also for generating activities that address in-the-news events such as fossil discoveries and volcanic eruptions.

The Earth Science Week 2015 Toolkit includes dozens of items, such as the Earth Science Activity Calendar, an attractive wall calendar that features an activity for each month of the school year, information on important dates in geoscience history, and other fun facts. The calendar provides a great way for teachers and students to explore the celebration theme of “Visualizing Earth Systems” throughout the 2015–2016 school year and beyond.

### Visiting geoscientists make impact

Are you an exploration geophysicist or other geoscientist who wants to help educate young people about the field, but you are not sure how to start? Check out *Visiting Geoscientists: An Outreach Guide for Geoscience Professionals*, a handbook coproduced by AGI and the American Association of Petroleum Geologists Youth Education Activities Committee.

Professional geoscientists such as geophysicists and geologists who visit schools and lead field trips, especially at the K-12 level, provide unique enrichment opportunities based on their education, experience, and firsthand knowledge of the workplace. Whether you work in a resource or environmental company, a research institute, a state or federal agency, or a college or university, you can make a difference.

Plan now for a school visit this school year, perhaps during Earth Science Week. The handbook offers strategies and resources. Various sections discuss how students learn science best, issues in earth-science education, recommendations for volunteers, sample activities, and more.

### Network with geoscience peers

Do you want to organize a field trip or a classroom presentation during Earth Science Week? Start preparing by networking with other local scientists, professors, employers, nonprofit representatives, environmental educators, and government leaders in the geosciences.

To facilitate partnerships between educators and others in the earth-science community, AGI has launched the Earth Science Organizations (ESO) database. ESO’s national map pinpoints local contacts for AGI member societies, state geological surveys, agencies such as USGS and NASA, universities offering geology programs, parks, museums, and other earth-science groups.

Now is the time to reach out to potential partners and invite them to collaborate during Earth Science Week 2015. Use the Earth Science Week Web site to identify potential geoscience partners near you, access relevant information, and network with colleagues. To recommend an organization (or have one removed), contact AGI.

### Be a citizen scientist

Young people want to take part in the scientific process. Often they just need to be shown the way. A new educational resource of the Earth Science Week Web site, the “Be a Citizen Scientist” Web page, features information and links for recommended citizen-science programs focusing on earth science.

Citizen-science initiatives invite ordinary citizens to participate in scientific research by making observations and contributing to large data sets. Such projects offer great ways for children and others to become actively involved in the scientific process.

The “Be a citizen scientist” Web page spotlights initiatives inviting students and others to participate in research on earthquakes, coastal erosion, flooding, landslides, and other geoscientific phenomena. The page is supported by the U. S. Geological Survey, a longtime Earth Science Week partner, which sponsors or has partnerships with many citizen-science programs.

### Honoring earth-science educators

Earth Science Week would not be so successful without the efforts of amazing earth-science teachers. That is why AGI annually celebrates the profession of earth-science teaching with the Edward C. Roy Jr. Award — and you are invited to make a nomination.

Do you know a great earth-science teacher? John Russell, a teacher at Columbia Secondary School for Math, Science, and Engineering in New York City, for example, was named the 2015 recipient of the Edward C. Roy Jr. Award for Excellence in K-8 Earth Science Teaching. Russell has spent his career challenging students in eighth through twelfth grade by integrating research into authentic experiences for students in earth sciences.

Russell was presented with the award at the National Earth Science Teachers Association’s Friends of Earth Science Reception during the National Science Teachers Association (NSTA) 2015 National Conference in Chicago earlier this year. Two other finalists also were recognized.

Given annually, AGI’s Edward C. Roy Jr. Award recognizes one classroom teacher from kindergarten through eighth grade for leadership and innovation in earth-science education. The winner receives a \$2,500 prize and a travel grant of \$1,000 to attend the NSTA conference. This award is named in honor of Edward C. Roy Jr., who was a strong and dedicated supporter of earth-science education. To learn more, please see <http://www.americangeosciences.org/education/awards/roy>.

### Videos make it visual

You can help students see the excitement of the geosciences — right on their own computer screens. AGI’s “Why Earth Science” video is now available for free viewing online on YouTube and TeacherTube. For a thrilling introduction to the geosciences, you can do no better than this six-minute clip, which features eye-popping cinematography and computer-animation highlights from AGI’s “Faces of Earth” miniseries on the Science Channel.

The video, which won a Silver Telly Award, is ideal for illustrating the importance of earth science not only to students but also to local education decision makers who might be weighing the subject’s place in the your curriculum. To

view the clip on YouTube, go to <http://www.youtube.com/watch?v=jxbIJH4fTYo>, or on TeacherTube, go to [http://www.teachertube.com/viewVideo.php?video\\_id=47669](http://www.teachertube.com/viewVideo.php?video_id=47669).

In addition, AGI now offers award-winning videos and related classroom activities to help students, educators, and others explore the big ideas of earth science during Earth Science Week and all year long. Recently added are dozens of additional activities selected specifically to help educators teach about core concepts of earth science.

"Big Ideas of Earth Science" videos are brief clips that bring to life the underlying understandings of earth science.

The Earth Science Week Web site provides related resources. You can find more than 100 classroom activities online to help students build understanding of the big ideas (<http://www.earthsciweek.org/big-ideas>).

### Discovering success

Earth Science Week invites you to take part in a campaign with a long, solid track record of results. Each year, AGI commissions an independent external evaluation of Earth Science Week, including a survey of program participants, by PS International.

Although the 2015 program is yet to be evaluated, the results for 2014 show that the program continues its record of success. Comparing participation last year and plans for next year, 88% of survey respondents said they anticipated either increasing or maintaining level participation. That figure was up from 84% the previous year.


A large majority of participants (88%) once again said Earth Science Week offered opportunities for teaching and promoting earth science that they would not have had otherwise. Participants commented on the "useful annual topics to focus on" and the way the "theme provides opportunities to explore new aspects of earth science."

Similarly, 91% said program resources and activities were "very" or "somewhat" important to educating students and others about earth science. This figure was up from 86% last year. "Teachers really appreciate all the materials," remarked one participant.

Seventy-seven percent rated the program's overall usefulness as "excellent" or "good." When respondents were asked to rate 20 key items from the Earth Science Week 2014 Toolkit and the program Web site, all were rated "very useful" or "useful" by strong majorities of participants.

The program Web site received more than 200,000 hits in 2014. New partners joined the effort, and new resources were introduced. Outlets ranging from *Discover Magazine*, *Smithsonian Science News*, and *The Huffington Post* to NBC, ABC, and the BBC carried news of the event.

Help to continue this proud tradition this year. Throughout the week, take advantage of opportunities available for anyone connected to teaching and learning about geoscience. In addition to teachers, scientists can use the program Web site as a gateway to information and resources, such as webcasts, links to nearby partner organizations, and special events during Earth Science Week.

Visit a classroom. Conduct a hands-on activity with students. Lead a field trip. Show students how to get involved in a citizen-science project in which they can help collect data contributing to nationwide or global research. Sign up for the program's monthly e-newsletter for information on upcoming opportunities. Follow Earth Science Week on Facebook and Twitter. Search for events in your area and participate in this year's celebration. Have a great Earth Science Week! 

Corresponding author: [gac@agiweb.org](mailto:gac@agiweb.org)

### Reference

Camphire, G., 2013, Mapping Earth Science Week 2013: Eos, Transactions, American Geophysical Union, **94**, no. 38, 331.