EARTH SCIENCE WEEK

October 8–14
www.earthsciweek.org

Geoscience Innovating for Earth and People

Earth Science Week 2023

Earth Science Week Poster produced by

AGI american geosciences institute
connecting earth, science, and people

You're Invited

"Geoscience Innovating for Earth and People," the theme of Earth Science Week 2023 (October 8–14), emphasizes the many ways that innovations in the geosciences are helping communities create healthier and increasingly sustainable lives, while accelerating environmental problem-solving around the world. While there are many innovations in the geosciences, this year's Earth Science Week poster features how some of our Earth Science Week partners are utilizing aerial drones to conduct geoscience work. Other innovative technologies related to aerial drones and products created with data collected by drones are also explored.

You are invited to join in the celebration of Earth Science Week 2023. Play your part by learning about and raising awareness of how innovations in your community are helping solve problems and improving sustainability. Innovations can include technology, careers, relationships, and more!

Get Involved

We encourage you to participate in Earth Science Week by attending, planning, and/or hosting events; entering the Earth Science Week Contests; and more! Scan the QR code to visit the 2023 Earth Science Week website to learn how to:

- **Plan** an Earth Science Week event
- **Participate** in Earth Science Week contests
- **Watch** the Earth Science Week webinar series
- **Participate** in focus days
- **Browse** a collection of classroom activities

Earth Science Week Future Dates

- October 13–19, 2024
- October 12–18, 2025
- October 11–17, 2026
- October 10–16, 2027

Scan this QR code for more information about how to get involved in Earth Science Week 2023.

Earth Science Week 2022 Visual Arts Contest winning entry by Evelyn MacMichael.

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AMS American Meteorological Society
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SEG SOCIETY OF EXPLORATION GEOPHYSICISTS
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Learning Activities

Innovations, and specifically drones, can be used to collect data in the geosciences while also working toward sustainability. The United Nations' Sustainable Development Goals (SDGs) highlight specific targets for sustainability such as accessing clean water, locating mineral and energy resources, assessing natural hazards, and analyzing and applying data about the Earth. Examine the images on the front of the poster and decide which phrase best describes each use of a drone. Visit https://sdgs.un.org/goals to learn more about the SDGs. List additional ways that the use of drones could assist in working toward one of these goals.

- Think about a problem in your community where having a drone might be beneficial. How could the drone help solve this problem?
- Imagine you had access to a drone and endless amounts of funding. What scientific question might you want to research? Where would you fly your drone and how would you utilize it? Write up a scientific proposal explaining your ideas.
- Read more about how drones and other innovations have been used in geoscience at https://bit.ly/ESW-2023.

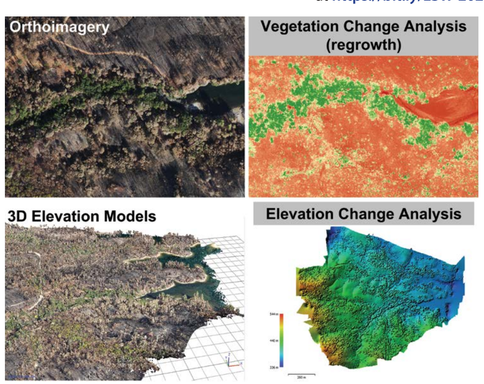
Drone flight paths are typically planned prior to takeoff to ensure that they can collect the needed data. Here, the drone flight paths (yellow lines) used to collect imagery data for structure from motion (SfM) modeling and lidar data comparison at Zion National Park are displayed.
Credit: Utah Geological Survey

Collecting Data to Answer Geoscience Questions

The poster front displays different situations where aerial drones are capturing images and data. Geoscientists then use these images and data to create maps and other visualizations to help answer questions and solve problems. However, a drone is not the only way to collect data. Below are two innovative uses of smart phones:

Photogrammetry: Three-dimensional models can be created from a large number of overlapping photographs collected using a drone or personal camera. Explore photogrammetry models created by the National Park Service (https://bit.ly/3U40RAw) and University of Utah Geohazards program (https://bit.ly/3TTVR1e).

Digital Crack Extensometers: Engineers can monitor bridges and natural structures with sensors to collect data. If there are disturbances above a certain level, notifications can be sent directly to a smart phone. Scientists at the National Park Service and the University of Utah are monitoring Rainbow Bridge, a natural sandstone arch — read more about it at https://bit.ly/ESW-2023.

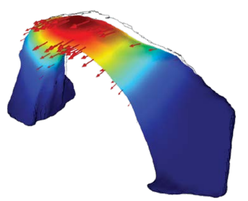


Drone images are collected with high-resolution sensors and used to identify changes in topography and cultural sites, as well as estimate debris flow risk and measure vegetation recovery following wildfires.
Credit: USGS
Disclaimer: This information is preliminary and subject to revision.

Find Out More

See the Earth Science Week 2023 Toolkit (www.earthsciweek.org/materials) and website (https://www.earthsciweek.org/) for instructional resources, newsletters, local events, and classroom activities. Have a great Earth Science Week!

Images and models of Rainbow Bridge, one of the world's largest natural bridges located in southern Utah. Geoscientists used photogrammetry to create a 3-dimensional model, and collected vibration data using seismometers to determine the arch's natural, or resonance, modes. Comparisons of vibration properties from different times can shed light on changes in the structural stability of the bridge.
Rainbow Bridge credits: Jeff Moore, University of Utah; Jack Wood, NPS



Read more about these innovations and others from our Earth Science Week partners at https://bit.ly/ESW-2023.

Earth Science Week Program Partners

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North American Commission on Stratigraphic Nomenclature
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SEPM (Society for Sedimentary Geology)
Society for Mining, Metallurgy & Exploration
Society of Economic Geologists
Society of Exploration Geophysicists
Society of Independent Professional Earth Scientists
Society of Mineral Museum Professionals
Society of Vertebrate Paleontology
Soil Science Society of America
United States Permafrost Association

Acknowledgements

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