USGS
science for a changing world

THE U.S. GEOLOGICAL SURVEY PLANNER

2012

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

USGS
science for a changing world

The USGS Planner is online.

Check out www.usgs.gov/calendar for an interactive USGS events calendar and more information about the programs featured in this publication.

What are those boxes?

QR *(Quick Response)* codes allow you to automatically access web content with your smart phone. Download one of the many free QR code reading apps available and try it now.

Join the conversation on Twitter.

See the hash tags *(e.g., #GSVolcano)* listed for each month? We'll be tweeting about each topic throughout the month it's being featured. Follow @USGS to learn about each subject and join in the conversation.

01.12 // Kilauea East Rift Zone

Lava flows through the Kilauea east rift zone, on the island of Hawaii, with Pu`u `O`o in the background.
Credit: Jim Kauahikaua, USGS

01.12 // Mauna Loa Northeast Rift Zone

Lava fountains erupt from the principal vents of the 1984 eruption of Mauna Loa, high on the northeast rift zone.
Credit: J.D. Griggs, USGS

02.12 // Landsat Mosaic of the Great Lakes

Landsat satellite imagery collected between 2002 and 2008 was used to develop a cloud-free mosaic view of the Great Lakes. Fluctuating water levels in the Great Lakes are the focus of current wetland research efforts.
Credit: USGS Landsat 5 and Landsat 7

02.12 // Aboard the *Kiyi*

Northland College intern Melissa Kjelvik washes a Bongo plankton net aboard the R/V *Kiyi*.
Credit: Gary Cholwek, USGS

03.12 // 2011 Spring Flood

A crew from the Missouri Water Science Center works in the upper breach area of the Birds Point-New Madrid Floodway in May 2011.
Credit: Bob Holmes, USGS

03.12 // 2011 Spring Flood

Floodwaters during the 2011 flood inundated many Louisiana hunting camps and residences. This camp, which lies flooded on the edge of the Florida Gas Canal, was built on land that is usually well above the water level and safely back from the canal's edge.
Credit: Alex Demas, USGS

04.12 // *Nature's Notebook*

A citizen scientist records her observations of Heliomeris wildflowers in Gothic, Colorado, for *Nature's Notebook,* a project of the National Phenology Network.
Credit: A. Miller-Rushing with the National Phenology Network

04.12 // Observing Shorebirds

A team from the Intercultural Center for the Study of Deserts and Oceans observes shorebirds at a barrier beach in Sonora, Mexico.
Credit: D. Rosemartin with the National Phenology Network

05.12 // Hawaii Wind Farm

A wind farm near Umkoa, Hawaii where the USGS has conducted research on avian responses to wind farms.
Credit: Alicia Burtner, National Park Service Biologist

05.12 // Insect-Eating Bats

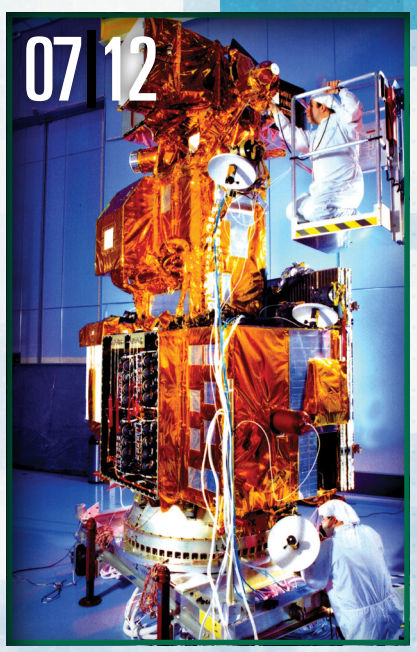
Insect-eating bats provide significant pest-control services to agriculture and natural ecosystems.
Credit: Paul Cryan, USGS

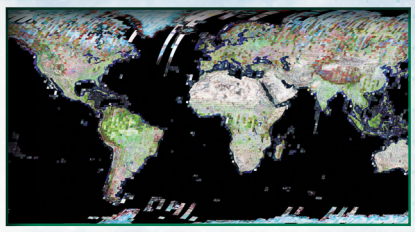
06.12 // Norton Point Beetle-Killed Conifer

A beetle-killed conifer goes up in flames during the Norton Point Fire, which began in Shoshone National Forest near Dubois, Wyoming, on July 22, 2011, and burned 23,592 acres.
Credit: Kari Greer, U.S. Forest Service

06.12 // Little Colorado River Fire

Arizona Wallow Fire flames stretch above the tree tops in the Apache-Sitgreaves National Forest on June 8, 2011.
Credit: Kari Greer; U.S. Forest Service





07.12 // Landsat 7 Prepares for Launch

Landsat 7, launched April 15, 1999, is the latest satellite of the Landsat Program. The data it collects support government, commercial, industrial, civilian, military, and educational communities across the United States and the world.
Credit: NASA

07.12 // Landsat 7 World Mosaic

Global mosaics were compiled using cloud-free imagery acquired over three consecutive years *(2000, 2001, and 2002).* These mosaics provide a snapshot of the world's land surface.
Credit: USGS Landsat, Sensor: L7 ETM+

08.12 // Everglades Mangroves

Mangrove islands dot the bay in the upper Lostman's River system in Everglades National Park, Florida. Like many places in the United States, water use in the Everglades– and in many places across the United States– must be balanced between human and ecosystem needs.
Credit: Paul Nelson, USGS

08.12 // Stream at Great Falls

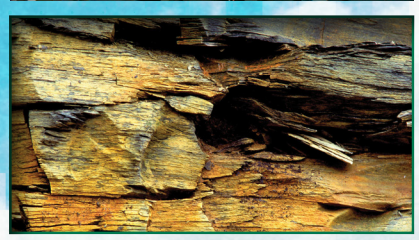
Freshwater flows through a Great Falls stream.
Credit: PK Cascio, USGS

09.12 // Denver Students

Denver public school students Rafael Gomez, Cassandra Padilla, and Joseline Marquez work with Cory Stephens and Greg Smith of the Colorado Water Science Center during a streamgaging field trip, taking measurements on Bear Creek in Evergreen, Colorado.
Credit: Jenn Lavista, USGS

09.12 // NAGT Interns

2011 NAGT interns Derrick Wagner *(University of Wisconsin)* and Amanda Cains *(University of Arkansas)* sample water on Cape Cod, Massachusetts.
Credit: Denis LeBlanc, USGS



10.12 // Colorado Rig

A rig in Colorado drills for natural gas.
Credit: Jessica Robertson, USGS

10.12 // Shale

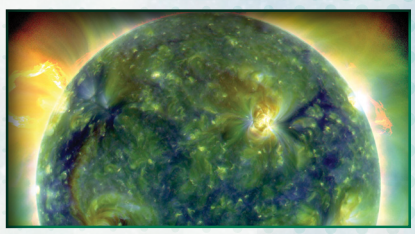
Shale is a fine-grained sedimentary rock formed through compaction, which gives it a low permeability. This keeps petroleum resources like natural gas and oil bound within the shale, instead of allowing it to form conventional deposits.
Credit: Thinkstock

11.12 // Wyoming Elk Congregate

Elk congregate at a feedground in Wyoming where brucellosis, a bacterial infection of cattle, elk and bison, can be transmitted. The USGS is investigating how the disease is spread and developing tools to protect people, domestic animals, and wildlife.
Credit: Jenny Jones, Wyoming Cooperative Fish and Wildlife Research Unit

11.12 // Rocky Mountain Elk

Elk at the camp creek feedground south of Jackson, Wyoming– ten to forty percent of the elk in this region have been exposed to brucellosis.
Credit: Paul Cross, USGS



12.12 // Auroral Lights

Auroral lights, caused by magnetic storm activity, illuminate the sky over Jökulsárlón, the largest glacier lake in Iceland.
Credit: Stéphane Vetter; Copyright image used with permission.

12.12 // The Sun

This ultraviolet image of the Sun shows its solar prominences and active regions.
Credit: NASA

USGS
science for a changing world

01|12

"The Hawaiian Volcano Observatory (HVO) helps ensure the safety and welfare of citizens of our island by forecasting potential destructive volcanic activity. Without HVO's dedicated staff our public safety agencies would not be able to mitigate loss of life and property in a timely fashion. We celebrate HVO's 100th anniversary and its continued role in protecting our island residents and advancing the science of volcanology."

Quince Mento
ADMINISTRATOR,
HAWAI'I COUNTY CIVIL
DEFENSE AGENCY

Living with Volcanoes

01.12 // Celebrate with Us.
The HVO reflects on 100 years of volcanolgy.

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

JANUARY 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 New Year's Day	2 New Year's Day Holiday	3	4	5	6	7
8	9	10	11	12	13	14
15	16 Martin Luther King, Jr., Birthday	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

science for a changing world

#GSVOLCANO | VOLCANOES.USGS.GOV

Roughly half of the nation's 169 young volcanoes pose hazards to communities within their reach. A restless volcano can endanger nearby residents with clouds of ash, toxic gases, falling blocks of rock, lava flows, hot avalanches, or debris flows. Large explosive eruptions can endanger people and property tens to hundreds of miles away and can have significant economic impacts. The **USGS Volcano Hazards Program** monitors volcanoes for signs of unrest that can lead to dangerous conditions. In January the **USGS Hawaiian Volcano Observatory (HVO)** celebrates a century of studying some of the world's most active volcanoes.

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

USGS
science for a changing world

02|12

"The scientific research performed by the USGS in the Detroit River International Wildlife Refuge is essential to understanding ecosystem processes, setting priorities, and selecting restoration and conservation actions within an adaptive management context."

JOHN H. HARTIG
REFUGE MANAGER,
DETROIT RIVER

Ecosystem Restoration

02.12 // *Kiyi* Sunrise
USGS research vessel *Kiyi* in Washburn, Wisconsin, conducts bottom trawls as part of long-term monitoring of Lake Superior's successful lake trout restoration.
Credit: Gary Cholwek, USGS

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

FEBRUARY 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	1	2	3
4	5	6	7	8	9	10

Washington's Birthday

#GSEcosystems | ecosystems.usgs.gov

Ecosystems, such as the wetlands of the **Greater Everglades**, the **Mojave and Sonoran deserts**, the **Chesapeake Bay** estuary, and the **Great Lakes**, support life through the ecosystem services they provide, including clean water, hazard protection, food and fiber, and resilience to disease and invasive species. But the value of the services provided by these vast natural areas is declining because of multiple threats including adverse land-use changes, invasive species, contaminants, and water scarcity. USGS ecosystem restoration projects aim to restore the health of ecosystems, which in turn will restore their social, ecological, and economic benefits. From the alpine tundra to the coral reefs of Florida and Hawaii, USGS ecosystem science is providing the critical research needed to understand and reverse these declines.

USGS

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS
science for a changing world

03|12

> *We're working very closely with the USGS to produce flood inundation maps, where we actually map the floodway in real time so that emergency managers and others can take action to prepare people and resources to most effectively manage the impacts of a flood.*

Tom Graziano
National Oceanic
and Atmospheric Administration

Flood Hazards

03.12 // Flood Inundation Maps
Learn about USGS flood inundation mapping science.

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

MARCH 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
26	27	28	29	1	2	3 USGS 133rd birthday
4	5	6	7	8	9	10
11 Daylight Savings Time Begins	12	13	14	15	16	17
18	19	20 First Day of Spring	21	22	23	24
25	26	27	28	29	30	31
1	2	3	4	5	6	7

#GSFLOODS | WATER.USGS.GOV

In 2011, devastating and historic floods impacted much of the United States. When floods happen, USGS crews measure streamflow and river levels, repair and install streamgages, measure water quality, and assess river changes, so that forecasters and emergency managers have the most accurate hydrologic information to issue warnings and make decisions related to flooding. The USGS is actively involved in the development of **flood inundation maps**, a powerful new tool to communicate flood hazards. These maps show the flood water extent and depth on the land surface and help emergency managers and the public see exactly what areas will be affected when waters start to rise.

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

USGS
science for a changing world

04|12

Citizen Science

"The National Phenology Network (NPN) is the primary resource in the U.S. where scientists, informal and formal science educators, families, and novice-to-expert naturalists can combine their observational skills in a collaborative and timely research effort that will contribute to the health and sustainability of our natural resources and to the ecological literacy of everyone in the United States."

Susan Mazer
professor,
University of California,
Santa Barbara

04.12 // Tweet This.
The USGS *"Did You Feel It?"* website collects web-based citizen responses of locations where people have felt an earthquake.

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

APRIL 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
Earth Day 29	30	1	2	3	4	5
6	7	8	9	10	11	12

#GSCitizenScience | USANPN.ORG | EARTHQUAKE.USGS.GOV/EARTHQUAKES/DYFI/ | PWRC.USGS.GOV/BBS/

USGS Citizen Science programs ask YOU to be the scientist. We engage the public to collect data that are used by emergency responders, scientists, and resource managers. After earthquakes or shaking events, "Did You Feel It?" collects web-based citizen responses to help provide rapid intensity assessments for earthquake science and response. The USGS is a founding sponsor of the USA National Phenology Network, whose citizen scientists monitor climate change impacts on the Nation's plants and animals. Since 1966, more than 8,000 skilled volunteer participants have contributed data used by the USGS's North American Breeding Bird Survey to monitor populations of over 420 bird species. This citizen-collected information provides quality data at more extensive scales than scientists could collect themselves, helping to identify conservation priorities and inform sound management practices.

USGS

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS
science for a changing world

05|12

> *The ability of USGS research to clarify the potential impacts of wind energy development on wildlife populations and their habitats is critical to our ability to balance future energy development with the conservation of our fish and wildlife resources.*
>
> **Ron Regan**
> EXECUTIVE DIRECTOR,
> ASSOCIATION OF FISH
> AND WILDLIFE AGENCIES

Alternative Energy and Ecosystems

05.12 // Finding Balance
Learn about bat fatalities at wind turbines.

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

MAY 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28 Memorial Day	29	30	31	1	2
3	4	5	6	7	8	9

#GSALTENERGY | ECOSYSTEMS.USGS.GOV/WTER

Worldwide, interest in alternative energy sources like wind and solar power has been growing exponentially. Yet these energy sources can have adverse effects on habitats and the wildlife that live in them, such as bats, birds, and tortoises. USGS research on ecosystems, including impacts from renewable energy, helps managers and industry make decisions that minimize conflicts between renewable energy and ecosystems. The USGS also studies rare earth elements and other critical minerals and materials, which are important components of alternative energy and other technologies.

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

USGS
science for a changing world

06|12

Wildland Fire Science

Useful and timely geospatial data provided by the USGS are critical in helping DOI make decisions that support wildland fire management across the Nation. Having access to this scientifically valid information is key to helping us successfully respond to fires that threaten the public's well-being and practicing adaptive management during fires to protect resources and enhance landscape resilience.

KIRK ROWDABAUGH
DIRECTOR,
DOI OFFICE OF WILDLAND
FIRE COORDINATION

06.12 // GeoMAC Viewer
The Geospatial MultiAgency Coordination *(GeoMAC)* Group shows you where wildland fires are burning now.

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

JUNE 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
27	28	29	30	31	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
1	2	3	4	5	6	7

First Day of Summer

science for a changing world

#GSFireScience | LANDFIRE.GOV

Wildland fires pose a threat to life and property in the United States. Their secondary effects – erosion, landslides, changes in water quality, and the introduction of invasive species – can be more disastrous than the fire itself. Yet wildland fire management can be challenging and complex. Fire is a natural and often beneficial process; fire suppression can lead to the buildup of vegetation, creating more fuel and thus more severe fires. The USGS provides tools and information to identify wildland fire risks, reduce hazards, provide real-time firefighting support, and assess the aftermath of wildland fires in order to build more resilient communities and ecosystems.

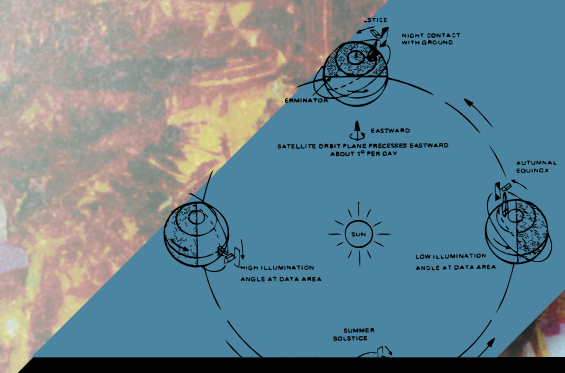
The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

USGS
science for a changing world

07|12

> *The opening of the Landsat archive to free, web-based access is like giving a library card for the world's best library of Earth conditions to everyone in the world.*
>
> **Adam Gerrand**
> **Food and Agriculture Organization of the United Nations.**

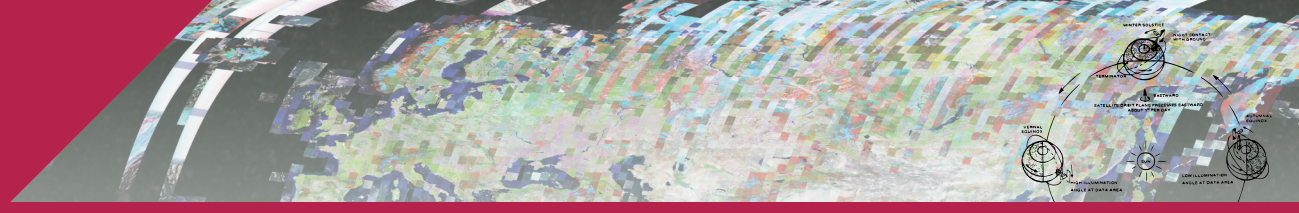


40 Years of Landsat

07.12 // Tweet This.
See Landsat through the years.

Start with Science

U.S. Department of the Interior
U.S. Geological Survey



JULY 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4 *Independence Day*	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23 *Landsat 1 launched in 1972*	24	25	26	27	28
29	30	31	1	2	3	4
5	6	7	8	9	10	11

#GSLANDSAT | LANDSAT.USGS.GOV

Systematic observation of our world from space provides impartial, objective data that we can trust — fundamental, consistent information on a regional, national, and global scale. This type of authoritative science information about the state of the earth builds the foundation for decisions by leaders and citizens around the globe on some of the most critical issues of our time, from drought and water availability, to climate and land use change, to emergency response and disaster relief. As we celebrate 40 years of recording both natural and human-made changes of the global landscape, Landsat has become vital to addressing the Nation's environmental issues and national security, providing an estimated hundreds of millions of dollars in value to the U.S. economy per year.

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

USGS
science for a changing world

08|12

> *The strategic challenge for the future is to ensure adequate quantity and quality of water to meet human and ecological needs in the face of growing competition among domestic, industrial, commercial, agricultural, and environmental uses.*
>
> National Research Council's Report
> *Confronting the Nation's Water Problems: The Role of Research.*

Water Availability

08.12 // Water Use
USGS water reports estimate United States water use amounts and trends.

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

AUGUST 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1
2	3	4	5	6	7	8

#GSWATER | WATER.USGS.GOV

Will there be sufficient freshwater resources in the future to sustain economic growth, quality of life, and ecosystems in the United States? Water managers and municipalities are looking for ways to better manage known water resources while also identifying supplemental sources of water. The USGS studies water availability and use across the United States to provide resource managers and policy makers with essential information needed for management of our Nation's water resources.

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

USGS
science for a changing world

09|12

> *"As a Mendenhall post-doctoral researcher, I have the ability to interact with leading scientists in many disciplines, genuinely interested in sharing their talents, in learning from me, and in helping me achieve my project goals. This provides, in my opinion, the greatest working environment there is."*
>
> **Jonathan Stock**
> USGS Mendenhall Fellow

Future Faces of the USGS

09.12 // Youthgo.gov
See the faces behind the future of the USGS.

Start with Science

U.S. Department of the Interior
U.S. Geological Survey

SEPTEMBER 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
26	27	28	29	30	31	1
2	3 Labor Day	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29 First Day of Autumn
30	1	2	3	4	5	6

#GSYOUTH | HTTP://BIT.LY/UNIVMAP | HTTP://BIT.LY/GSNAGT | PWRC.USGS.GOV/BBS/

The USGS has a distinguished history of engaging America's students in science, technology, engineering and mathematics (STEM). By providing hundreds of hands-on internships and research opportunities in diverse settings, the USGS enhances science literacy among students nationwide. Noteworthy USGS student programs or partnerships include: **GeoFORCE**, at University of Texas/Austin, which provides 4-year summer field experiences for minority high school students; **EDMAP**, which involves university students in U.S. geologic mapping efforts; the **USGS/National Association of Geoscience Teachers Cooperative Summer Internship Program** through which USGS scientists have mentored more than 2500 college students since 1965; and the **USGS Mendenhall Program**, which enables postdoctoral fellows to contribute current scientific expertise to USGS research projects. These and many other programs train and mentor the Nation's next generation of STEM experts.

USGS

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS
science for a changing world

10|12

Understanding the oil and gas potential of the United States and other countries is important to U.S. foreign and energy policies. USGS energy resource assessments are essential for U.S. national security and diplomacy.

David Goldwyn
President, Goldwyn Global Strategies, LLC, and former Special Envoy for International Energy Affairs at the Department of State

Fueling the Future: Unconventional Oil and Gas

10.12 // EnergyVision
Scan for a one-stop shop for energy maps and geospatial data.

Start with Science

U.S. Department of the Interior
U.S. Geological Survey

OCTOBER 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
30	1	2	3	4	5	6
7	8 Columbus Day Observed	9	10	11	12	13
14 14–20: Earth Science Week	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

#GSENERGY | ENERGY.USGS.GOV

The United States relies on oil and gas to power its economy, and unconventional oil and gas are two of the country's fastest-growing energy resources. The USGS is the authoritative, unbiased source for research and assessments of the Nation's and world's oil and gas endowment and provides reliable and impartial scientific information on energy resources, including oil, natural gas, oil shale, gas hydrates, geothermal, uranium, and more. The results of USGS research and data are used by policymakers, land and resource managers, industry, academia, environmental organizations, and the public for decisions about domestic and foreign energy resources and their potential development.

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

USGS
science for a changing world

11|12

Research by USGS scientists is critical to understanding the intricate ways human, animal, and ecosystem health are connected. Increased communication and collaboration between wildlife professionals and public health is fundamental to the success of the One Health movement.

Carol Rubin
ASSOCIATE DIRECTOR
FOR ZOONOSES AND ONE HEALTH,
CENTERS FOR DISEASE CONTROL
AND PREVENTION

The Wildlife–Human Connection

11.12 // USGS Disease Maps
See where there have been outbreaks of diseases in the U.S.

Start *with* Science

U.S. Department of the Interior
U.S. Geological Survey

NOVEMBER 2012

USGS.GOV | 1.888.ASK.USGS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
28	29	30	31	1	2	3
4 Daylight Savings Time Ends	5	6	7	8	9	10
11	12 Veterans Day Observed	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29 Thanksgiving Day	30	1
2	3	4	5	6	7	8

#GS1HEALTH | NWHC.USGS.GOV | USGS.GOV/RESOURCES_ENVIROHEALTH | HEALTH.USGS.GOV

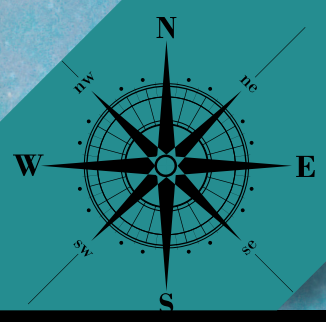
Human, wildlife, domestic animal, and environmental health are often interconnected – in fact, 7 out of 10 emerging human diseases originated in animals. But we give some of our diseases to wildlife as well – and there are many devastating wildlife diseases that don't afflict people. Climate change, impaired air and water quality, contaminants, reduced species diversity, and the ever-increasing contact between urban and wild lands increase the likelihood of disease transfer and spread. Together, these perturbations can change or create threats to wildlife, agriculture, and public heath. USGS scientists collaborate with public and animal health agencies on such diseases, playing an integral role in providing the disease identification, surveillance, and research information needed for appropriate disease-response actions.

The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

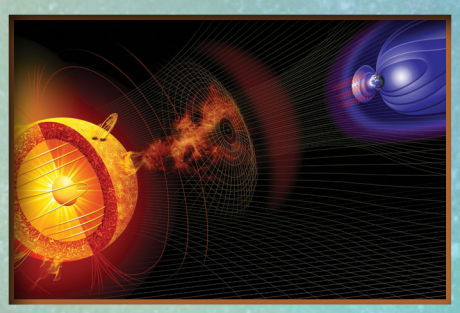
USGS
science for a changing world

12|12



Monitoring Earth's Magnetic Field

> *NOAA and the Department of Defense rely on USGS real-time ground-based magnetometer data – information that is vital to providing timely, accurate and reliable space weather warnings, observations and forecasts.*
>
> Samuel P. Williamson
> Federal Coordinator for Meteorology
> National Space Weather Program Council Chairman



12.12 // Dynamic Interaction
The dynamic interaction of Earth's magnetic field with the Sun and solar wind, depicted in this illustration, can result in geomagnetic storms.
Credit: NASA

Start with Science

U.S. Department of the Interior
U.S. Geological Survey

DECEMBER 2012

USGS.GOV | 1.888.ASK.USGS

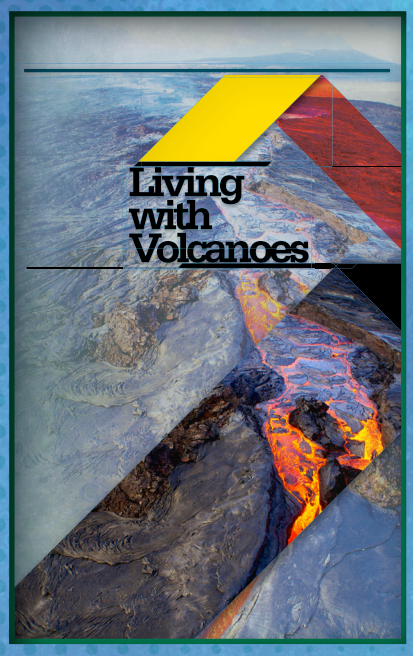
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21 First Day of Winter	22
23	24	25 Christmas Day	26	27	28	29
30	31	1	2	3	4	5

#GSGeomag | geomag.usgs.gov

Geomagnetic storms begin in space but can have serious consequences on Earth. The dynamic interaction of Earth's magnetic field with the Sun and solar wind can disrupt the infrastructure and activities of our modern, technology-based society by interrupting radio communication, reducing the accuracy of global-positioning systems, damaging satellite electronics, and even causing blackouts. The **USGS Geomagnetism Program** monitors magnetic storms to mitigate their hazardous consequences. It is an integral part of the inter-agency **National Space Weather Program**, whose space weather warnings and forecasts are important for the U.S. economy and national security.

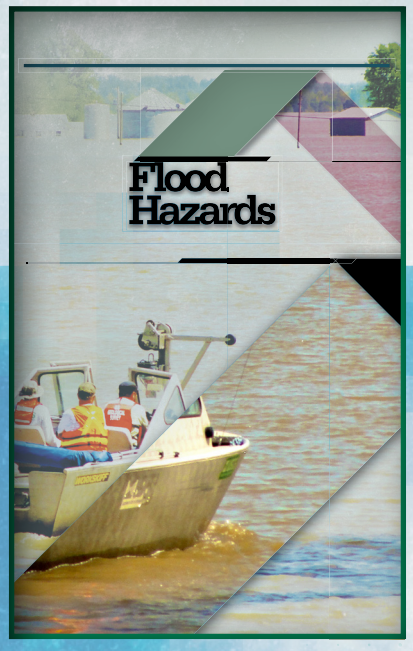
The USGS calendar is now online. Visit USGS.gov/calendar.

USGS

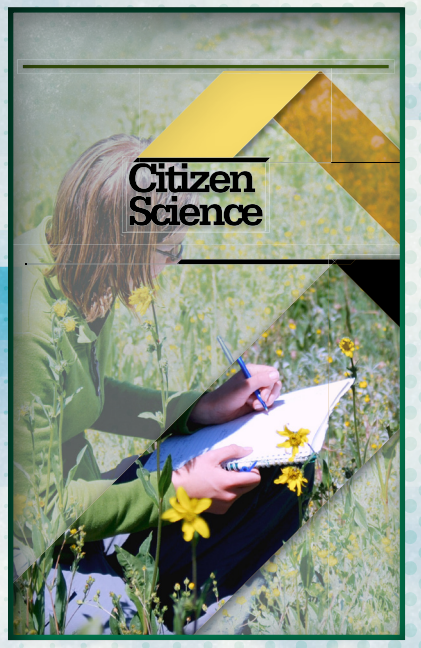


JANUARY

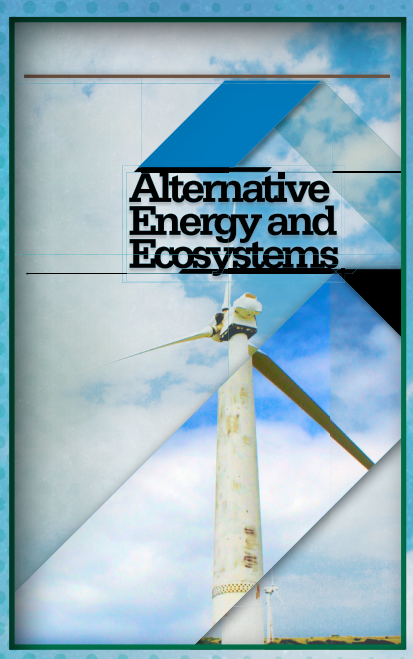
FEBRUARY



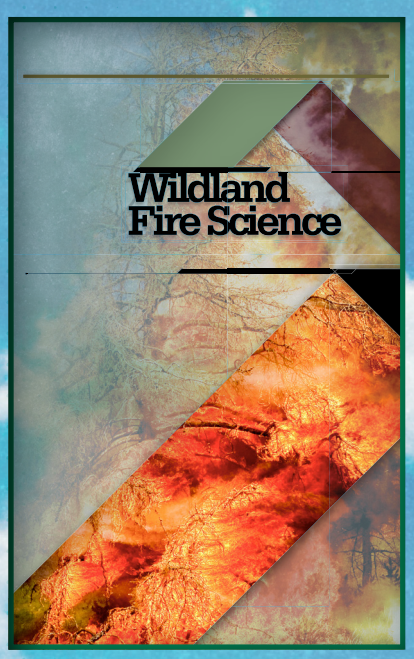
MARCH



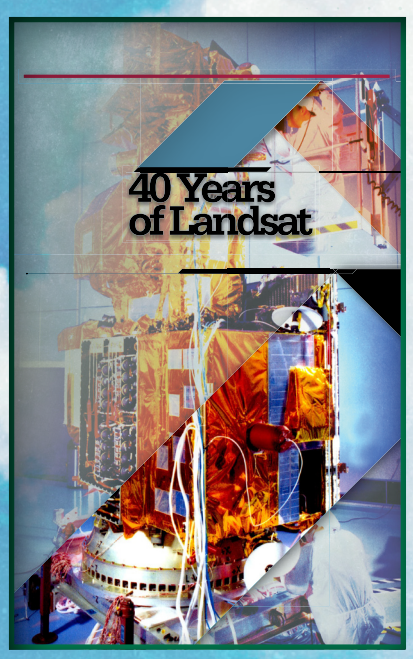
APRIL



MAY

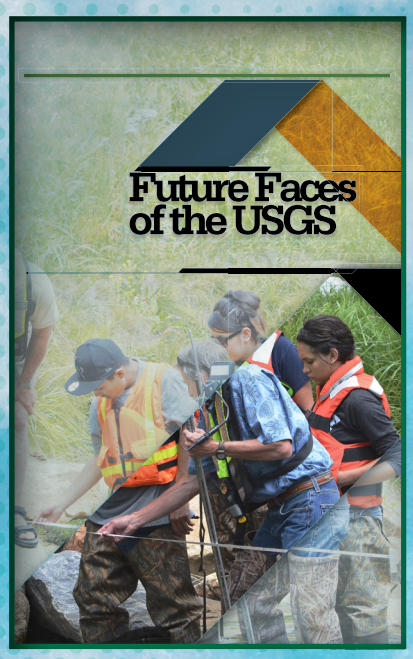


JUNE



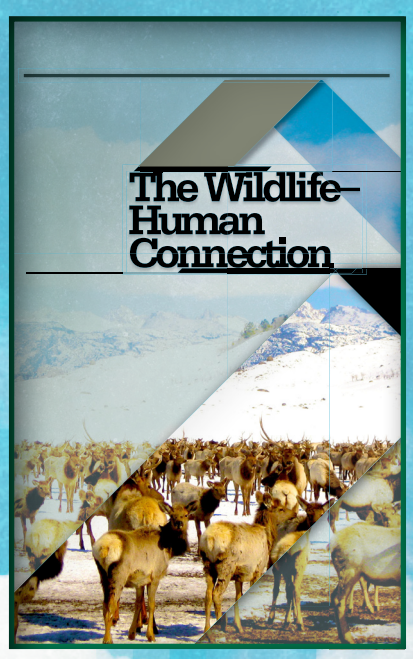
JULY

AUGUST

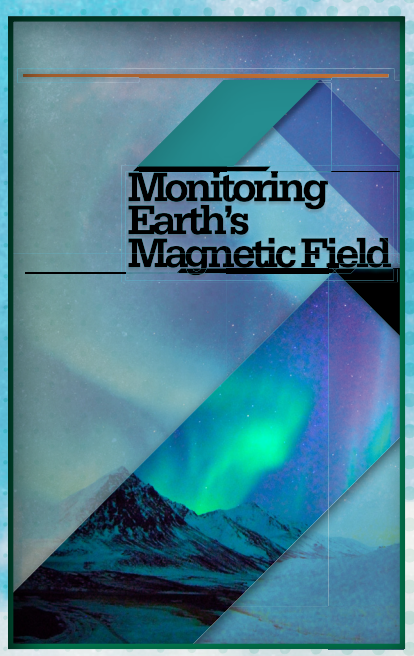


SEPTEMBER

OCTOBER



NOVEMBER



DECEMBER

What is the U.S. Geological Survey?

The USGS is a Federal science agency that provides impartial information on the health of our ecosystems and environment, the natural hazards that threaten us, the natural resources we rely on, the impacts of climate and land-use change, and the core science systems that help us provide timely, relevant and useable information.

USGS science for a changing world

EDITOR: Christina Nyquist, USGS | ASSISTANT EDITORS: Kara Capelli and Melanie Gade, USGS | LAYOUT AND DESIGN: PK Cascio, USGS