Monday, June 22, 2026

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GENTLE.NEWS

In Today's Edition

"If you want to tell people the truth, make them laugh, otherwise they'll kill you."

— George Bernard Shaw

Oops, it did it again: Another small hydrothermal explosion at Biscuit Basin

Oops, it did it again: Another small hydrothermal explosion at Biscuit Basin Subscribe to receive "Caldera Chronicles" articles via email By Yellowstone Volcano Observatory June 22, 2026 Early on the morning of Saturday, June 13, 2026, a small hydrothermal explosion occurred at Biscuit Basin in Yellowstone National Park. Although smaller than the explosion that occurred in the same area in 2024, it emphasizes the dynamic and hazardous nature of hydrothermal activity in the region. Yellowstone Caldera Chronicles is a weekly column written by scientists and collaborators of the Yellowstone Volcano Observatory. This week's contribution is from Jefferson Hungerford, Park Geologist, and Kiernan Folz-Donahue, Brandon Duktig, Liam Rogers, and Margery Price, all with the Yellowstone National Park Geology Program, as well as Michael Poland, geophysicist with the U.S. Geological Survey and Scientist-in-Charge of the Yellowstone Volcano Observatory, and Jamie Farrell, associate research professor with the University of Utah Seismograph Stations and Chief Seismologist of the Yellowstone Volcano Observatory. Just after 5:09 a.m. MDT on Saturday, June 13, 2026, monitoring equipment in Biscuit Basin registered anomalous activity, including seismic energy and a low-frequency acoustic signal, called infrasound , that was coming from the general direction of Black Diamond Pool, site of a well-observed hydrothermal explosion on July 23, 2024 . As the sun rose higher into the sky, park interpretive staff noticed something odd: the Firehole River from Biscuit Basin downstream to Midway Geyser Basin, a distance of about 6 km (3.7 mi), was filled with a light-grey, milky plume. Two new runoff channels from Biscuit Basin into the river were also visible from the road throughout the day. Did Black Diamond Pool explode again? The Yellowstone National Park Geology team reviewed data from the temperature sensor that records eruptions from the pool, but those data showed only a very small heat blip, after which the temperature slowly dropped to that of the background air—nothing resembling the rapid drop that has accompanied past eruptions of Black Diamond Pool, and a sign that the pool was not the source of the morning's anomalous event. Fortunately, the Yellowstone Volcano Observatory installed a camera to monitor Black Diamond Pool in May 2025 , and it has caught numerous eruptions of varying sizes . The camera happened to be looking in the right direction to capture the activity on the morning of June 13. At 5:09:50 a.m. that morning, the camera recorded a dark-colored steam plume jetting out of the ground to the north of Black Diamond Pool—a time that coincides with the seismic and infrasound signals. Download Video Sources/Usage: Public Domain. View Media Details Yellowstone National Park geologists were on the scene the following day to assess the new activity. A few tens of meters (yards) north of Black Diamond Pool they found clear evidence that large volumes of hydrothermal water had surged into the Firehole River from three sets of newly formed vents.

Source: U.S. Geological Survey

These vents represent pathways where water at or even slightly above boiling temperatures beneath the ground suddenly found a pathway to the surface and flashed to steam, driving a hydrothermal explosion. At the time of their visit, the geologists observed that the only vent still sending water to the river was the northern-most, farthest from Black Diamond Pool, including a north-northwest-trending crack that was 18.5 meters (61 feet) long and up to 1.5 meters (5 feet) wide in places. The water was 90 °C (194 °F), which is close to the boiling temperature at that elevation—93 °C (200 °F) . The crack was surrounded by numerous rocks that had been ejected during the explosion, but none went particularly far—at most a few meters (yards)—so the explosive energy was relatively low, especially compared to that of July 23, 2024. The middle vent group, consisting of five small vents, produced short-lived water flow during the initial event. By the day after they formed, they were passively steaming but still hot, with temperatures around 85 °C (185 °F) indicating shallow subsurface boiling. More rocks were scattered about this area as well. Farther south, and closest to Black Diamond Pool, another linear vent trending to the northeast and about 15 meters (49 feet) in length had sent significant water and sediment into the river. Although the vent likely stopped flowing within a few hours after the explosion, 89 °C (192 °F) water was still present in the fractured rubble. When the Yellowstone Geology Program team returned two days later, they found something remarkable. Between Sunday evening and Tuesday morning, a new pool of vigorously boiling, gray, silty water about 6.5 × 5.3 meters (21 × 17

Source: U.S. Geological Survey

feet) in size had formed near the middle vent group. Ground that the team had walked on just two days earlier had developed into an actively boiling pool! Notable thumping, caused by steam bubbles forming and then collapsing within the pool, startled the team. The pool was not surrounded by explosion debris, indicating that it formed via collapse. On Thursday, June 18, camera observations showed that the pool experienced intermittent episodes of spouting to a height of perhaps about 6–9 meters (20–30 feet), and geologists noted that it was roiling vigorously when not showing this geyser-like behavior. Fortunately, no one was impacted by the June 13 explosion—Biscuit Basin has been closed since the 2024 event. But the recent explosion emphasizes the unstable and hazardous nature of some of Yellowstone's thermal areas. Biscuit Basin, and especially the area around Black Diamond Pool, has been a site of numerous hydrothermal explosions for more than a century . Yellowstone Volcano Observatory scientists installed temporary seismic monitoring stations in the basin to record signals related to the evolution of these newly formed vents. In addition, they will spend the next few weeks pouring over data to look for possible precursors that might have warned that an explosion was imminent. This event occurred about 100 meters (328 feet) from the new Biscuit Basin monitoring station, installed in summer 2025. If there were any seismic or infrasound precursors, there is a good chance they were recorded—no hydrothermal explosion has ever occurred this close to a monitoring station! The June 13, 2026, explosion thus offers an unprecedented opportunity to better understand this critical hazard in Yellowstone

Source: U.S. Geological Survey

National Park and perhaps learn more about their potential warning signs. Download Video Sources/Usage: Public Domain. View Media Details Related News Items per page 6 12 Label Listening for hydrothermal activity (and more!) in Yellowstone June 2, 2025 Listening for hydrothermal activity (and more!) in Yellowstone Continuous infrasound (low-frequency acoustic energy) monitoring is now established in Yellowstone. And the method is detecting activity that goes... Read Article A new view of Biscuit Basin (literally!) May 26, 2025 A new view of Biscuit Basin (literally!) YVO is pleased to announce the availability of a new static webcam that provides a current view of Black Diamond Pool in Biscuit Basin—site of a... Read Article Digging into the history of hydrothermal explosions at Biscuit Basin August 12, 2024 Digging into the history of hydrothermal explosions at Biscuit Basin In July 2024, a hydrothermal explosion at Black Diamond Pool sent muddy water and rocks hundreds of feet into the air. It's far from the first time a... Read Article The July 23, 2024, hydrothermal explosion at Biscuit Basin July 29, 2024 The July 23, 2024, hydrothermal explosion at Biscuit Basin The hydrothermal explosion at Biscuit Basin on July 23, 2024, was a spectacular event and emphatically demonstrates an underappreciated hazard in the... Read Article How hot are Yellowstone's boiling waters? Some are hotter than others July 11, 2022 How hot are Yellowstone's boiling waters? Some are hotter than others Yellowstone has numerous hot springs, but not all of them boil at the same temperature. This is because the boiling temperature depends on the... Read Article The Real Hazards of Yellowstone June 10, 2019 The Real Hazards of Yellowstone Here at YVO we receive a lot of questions related to Yellowstone supereruption "what ifs" and "whens", even though that is the least possible scenario... Read Article Hydrothermal explosions in Yellowstone National Park October 1, 2018 Hydrothermal explosions in Yellowstone National Park One of the most common questions asked of YVO is "when is the next big one?" This is an interesting question, given the multiple potential natural... Read Article Related News Items per page 6 12 Label Listening for hydrothermal activity (and more!) in Yellowstone June 2, 2025 Listening for hydrothermal activity (and more!) in Yellowstone Continuous infrasound (low-frequency acoustic energy) monitoring is now established in Yellowstone. And the method is detecting activity that goes... Read Article A new view of Biscuit Basin (literally!) May 26, 2025 A new view of Biscuit Basin (literally!) YVO is pleased to announce the availability of a new static webcam that provides a current view of Black Diamond Pool in Biscuit Basin—site of a... Read Article Digging into the history of hydrothermal explosions at Biscuit Basin August 12, 2024 Digging into the history of hydrothermal explosions at Biscuit Basin In July 2024, a hydrothermal explosion at Black Diamond Pool sent muddy water and rocks hundreds of feet into the air. It’s far from the first time a... Read Article The July 23, 2024, hydrothermal explosion at Biscuit Basin July 29, 2024 The July 23, 2024, hydrothermal explosion at Biscuit Basin The hydrothermal explosion at Biscuit Basin on July 23, 2024, was a spectacular event and emphatically demonstrates an underappreciated hazard in the... Read Article How hot are Yellowstone’s boiling waters? Some are hotter than others July 11, 2022 How hot are Yellowstone’s boiling waters? Some are hotter than others Yellowstone has numerous hot springs, but not all of them boil at the same temperature. This is because the boiling temperature depends on the... Read Article The Real Hazards of Yellowstone June 10, 2019 The Real Hazards of Yellowstone Here at YVO we receive a lot of questions related to Yellowstone supereruption "what ifs" and "whens", even though that is the least possible scenario... Read Article Hydrothermal explosions in Yellowstone National Park October 1, 2018 Hydrothermal explosions in Yellowstone National Park One of the most common questions asked of YVO is "when is the next big one?" This is an interesting question, given the multiple potential natural... Read Article

Source: U.S. Geological Survey

Hubble Glimpses Merging Galaxy Clusters

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Source: NASA

EIC Radiofrequency Controls System Passes First Real-World Test

EIC Radiofrequency Controls System Passes First Real-World Test Milestone demonstrates new approach to operating critical systems for future collider June 22, 2026 enlarge Early-career engineers (left to right) Alex Fahey, Arshdeep Singh, Michael McCooey, and Samson Mai played a central role in the first successful real-world test of the Electron-Ion Collider's (EIC) Common Platform-based low-level radiofrequency controls system — a key milestone toward future EIC operations. (Kevin Coughlin/Brookhaven National Laboratory) UPTON, N.Y. — The U.S. Department of Energy’s (DOE) Brookhaven National Laboratory has reached a key early milestone in developing radiofrequency control systems for the Electron-Ion Collider (EIC) — a next-generation research facility that will collide electrons with ions to reveal how the building blocks of matter are held together. At the heart of any particle accelerator are radiofrequency (RF) systems, which use electromagnetic waves to accelerate particle beams to near light speed and keep them tightly controlled. The system tested here — known as low-level radiofrequency (LLRF) — acts as the “brain,” precisely controlling those RF fields to ensure stable and accurate operation. This milestone marks the first successful test of the newly built EIC common platform-based LLRF electronics on a real accelerator cavity. The common platform is a shared hardware and controls system for accelerator operations, allowing teams to

Source: Brookhaven National Laboratory

use the same technology rather than create separate electronics for each system. For the first time, the system moved beyond simulations and controlled lab environments to operate as a fully integrated setup. The test demonstrated that the system can reliably maintain stable operating conditions under real-world constraints, confirming the design is on track for future EIC operations. “This was the first time we used our new hardware on a real RF cavity, with the full system — amplifiers, cavity, and controls — all working together,” said Kevin Mernick, an engineer at Brookhaven Lab and a technical lead for the common platform effort. From fragmented systems to a unified approach The milestone reflects a broader shift in how accelerator systems are designed. In earlier facilities such as the Relativistic Heavy Ion Collider (RHIC) — a DOE Office of Science user facility at Brookhaven Lab that completed operations in February 2026 — subsystems often relied on custom-built electronics. While effective, that approach led to duplicated effort and limited interoperability. The common platform was developed to unify those efforts into a shared architecture that multiple groups can use and build upon. “This platform has been in the works for more than three to four years,” said Geetha Narayan, an engineer at Brookhaven Lab and project manager for the EIC LLRF controls subsystem. “It was an effort to coordinate different groups using different hardware platforms to access the control systems.” The platform supports a wide range of EIC systems — including RF controls, beam instrumentation, and monitoring — while reducing costs and accelerating deployment. At its core is a modular

Source: Brookhaven National Laboratory

design. A central carrier board connects to the network, distributes timing signals, and coordinates data flow. Plug-in daughter cards provide specialized functionality, allowing groups to customize components while maintaining compatibility. “Each group can customize based on what they need,” Narayan said. “But what is standard is the timing, data link, system clock, and network capability that the carrier provides.” enlarge The Common Platform, developed by engineers at Brookhaven National Laboratory and Thomas Jefferson National Accelerator Facility, is more compact, more powerful, and capable of faster data transfer. It supports a wide range of systems — including radiofrequency controls, beam instrumentation, and monitoring — while reducing costs and accelerating deployment. This milestone reflects a broader shift in how accelerator systems are designed. (Kevin Coughlin/Brookhaven National Laboratory) Advancing beyond legacy systems The LLRF system plays a critical role by controlling RF cavities, which transfer energy to particle beams. It must continuously monitor conditions and make rapid adjustments to maintain precise voltage and phase. Operators send setpoints through the network to the carrier board, which relays them to daughter cards. There, field-programmable gate arrays process incoming signals and run feedback algorithms at high speed, comparing real-time conditions to desired values and making constant corrections. “They’re running continuously, updating at a very fast rate to make these little corrections,” Mernick said. “It corrects for fast fluctuations and long-term drift and keeps the cavity voltage at the set point.” This represents a significant advancement over legacy RHIC systems, which relied on larger, less integrated electronics. The common platform is more compact, more powerful, and capable of faster data transfer, with planned rates up to 8 gigabits per second. Overcoming challenges, proving the design During the test, the system ran continuously for several days, maintaining stable control of the RF cavity and accurately tracking setpoints. Results showed that performance observed in laboratory testing translated successfully to real-world operation, including improved noise performance. “It was maintaining the voltage on the cavity at the correct set point that we had requested,” Mernick said. “The controller performance that we measured in the lab carries through to running the full RF system with the controller, power amplifier, and cavity all together.” The team worked under a compressed timeline, with about two weeks to complete testing before RHIC systems were shut down and repurposed for the EIC. “It didn’t work perfectly on day one,” Mernick said. “We made a lot of progress in those two weeks, fixing bugs.” That rapid iteration helped identify issues not apparent in simulations, strengthening both hardware and control algorithms. Early career engineers take the lead The project brought together experts from multiple groups at Brookhaven Lab, along with collaborators from other institutions, including DOE’s Thomas Jefferson National Accelerator Facility. Early career engineers played a central role in implementation and testing. “I was involved with some of the firmware development, but mainly with verifying our integrated system,” said Arshdeep Singh, an associate staff electrical engineer at Brookhaven Lab.

Source: Brookhaven National Laboratory

“I developed test benches and simulation tools to evaluate our designs in the lab and ensure we were ready for testing with a real cavity.” “It was very encouraging for the early career engineers to see a reward for their efforts.” — Geetha Narayan, project manager for the EIC LLRF controls subsystem Singh said the transition to real-world testing revealed important lessons. “While we have strong simulation tools that verify major components of our design, this testing taught me about some of the smaller — but critical — details that we need to examine more thoroughly in the lab,” he said. “My main takeaway is the knowledge and experience of what can go wrong.” He also emphasized the team environment. “It was also fun working with other early career engineers,” Singh said. “It was a learning experience for all of us as we worked through and solved various problems leading up to the test.” “It’s a big collaboration,” Mernick said. “It’s pulling together people from different departments of the Lab to use the expertise that we have spread through lots of different people.” He added, “The new guys were leading this whole process. I was just there to help out.” For Narayan, that collaboration — and the opportunity for early career staff to take ownership — was a key success. “The key thing was getting the team to work together,” she said. “It was very encouraging for the early career engineers to see a reward for their efforts.” Looking ahead, the common platform is expected to serve as a foundation for many EIC subsystems, enabling coordinated system development and efficient data sharing. Its flexible architecture also opens the door to future innovations, including advanced data analysis and potential integration of artificial intelligence tools. With RHIC now shut down, opportunities for full-system testing will be limited in the near term. The team will continue refining the system in laboratory environments while preparing for future integration. “The next chance to do this work may be a year or more away, when Brookhaven and Jefferson Labs test critical EIC components before they are installed in the accelerator tunnel,” said Narayan. “That’s why this is important for us — a proof of concept to know we are on the right track.” Brookhaven National Laboratory is supported by the Office of Science of the U.S. Department of Energy. The Office of Science is the single largest supporter of basic research in the physical sciences in the United States and is working to address some of the most pressing challenges of our time. For more information, visit science.energy.gov . Follow @BrookhavenLab on social media. Find us on Instagram , LinkedIn , X , and Facebook . Tags: EIC 2026-22988 | INT/EXT | Newsroom

Source: Brookhaven National Laboratory

Forest Service invests $80M in Forest Legacy conservation

The U.S. Forest Service is investing more than $80 million from the Land and Water Conservation Fund to support 15 congressionally approved Forest Legacy projects in 2026. These projects will permanently conserve over 34,000 acres of privately owned working forests across the country. “The Forest Legacy program makes critical investments in working forests with state partnerships to provide timber supplies and other wood products, provide public access for recreation, secure drinking water, and maintain wildlife habitat in some of the most important forests across the nation,” said Forest Service Chief Tom Schultz . Privately owned forests make up the majority of all forestlands in the United States and play an essential role in the economic and cultural life of rural communities. Forest Legacy projects help landowners keep these forests working – supporting timber production, outdoor recreation, and long-term stewardship. Approximately 90% of Forest Legacy sites provide full or partial public access for outdoor recreation. While the Forest Legacy Program is designed to conserve private forestlands for their economic, ecological, and community benefits, these projects also help maintain intact, actively managed forests that are more resilient to challenges such as wildfire. Three of this year’s projects – Curley Creek Woodland and McNall Family Forest in Idaho, and Madrone Ridge in Oregon – are within ten miles of landscapes identified as being at high risk of wildfire. By conserving these

Source: U.S. Forest Service

forests now, the Forest Service and state partners help maintain continuous forest cover, support sustainable management, and reduce the long-term risks to nearby communities and infrastructure. To learn more or to view the full list of 2026 projects, visit the Forest Legacy Program webpage . About the Forest Service: The Forest Service has brought people and communities together to answer the call of conservation for more than 100 years. Grounded in world-class science and technology—and rooted in communities—the Forest Service connects people to nature and recreation opportunities. The agency manages 193 million acres of public land, supports the nation’s forest industry and energy needs, and operates the largest and most respected wildland fire and forestry research organizations in the world. By providing assistance to state and private landowners and working with Tribes and other partners, the Forest Service also helps steward an additional 900 million forested acres within the U.S.

Source: U.S. Forest Service

Strengthening Europe’s preparedness against mosquito-borne diseases

Strengthening Europe’s preparedness against mosquito-borne diseases Update 22 June 2026 A conference on mosquito-borne diseases hosted by the Cyprus Presidency of the Council of the EU, the Ministry of Health of Cyprus with support from the European Centre for Disease Prevention and Control (ECDC) focused on the growing public health impact of such diseases in Europe and and discussed challenges in mosquito control. The event brought together representatives from EU/EEA Member States, the European Commission, EU agencies, international organisations and research institutions active in multiple sectors, including public health, entomology, and animal health. With the challenges of mosquito-borne diseases increasing due to both climate and socio-economic developments, speakers highlighted the need for strong European cooperation, coordinated surveillance and response, rapid information sharing, and innovative prevention measures. Sessions covered the current situation in Europe, national preparedness and response efforts, and the importance of public awareness and community engagement. Special attention was given to surveillance and control of the invasive mosquito species, Aedes mosquitoes (e.g., Aedes albopictus , Aedes aegypti). Ongoing EU activities on prevention, research and medical countermeasures were also presented. The discussions helped to strengthen coordination and information exchange, supporting Europe’s preparedness against cross-border health threats linked to mosquito-borne diseases. Mosquito maps Mosquito factsheets Mosquito-borne diseases Share this page

Source: European Centre for Disease Prevention and Control

Activity Time - Word Search

Find the words below in the puzzle. Words go across or down only.

Words to Find:

F	K	K	N	L	E	I	G	I	B	V
W	L	O	N	I	L	O	H	A	K	C
S	L	O	I	B	B	J	F	B	Z	F
M	D	D	Q	I	W	W	H	T	Q	M
D	Y	X	P	G	V	Z	S	Q	O	Z
W	Y	Y	E	T	K	W	G	U	J	K
W	J	I	K	Y	V	Y	E	D	Q	F
Z	A	J	K	I	E	Q	N	Z	J	U
O	N	R	C	L	V	V	U	A	T	P
A	U	S	R	R	V	Y	Z	Q	Z	J
U	T	R	J	M	W	W	Y	Y	T	Z