

# GENTLE.NEWS

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## In Today's Edition

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New England WSC Products in the Second Quarter of 2026

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Word Search Puzzle

*"Life, he realize, was much like a song. In the beginning there is mystery, in the end there is confirmation, but it's in the middle where all the emotion resides to make the whole thing worthwhile."*

— Nicholas Sparks

### New England WSC Products in the Second Quarter of 2026

New England WSC Products in the Second Quarter of 2026 By New England Water Science Center June 25, 2026 List of products from the New England Water Science Center released in the second quarter of 2026. Related Science Data Publications Web Tools Software News Items per page 6 12 Label May 27, 2026 Thermal Imaging to Detect Cold-Water Habitat for Atlantic Salmon and Brook Trout at Katahdin Woods and Waters National Monument The U.S. Geological Survey (USGS), in cooperation with the National Park Service (NPS), is using airborne thermal infrared remote sensing to characterize cold-water habitat for the federally designated endangered species Atlantic salmon ( *Salmo salar*) and wild brook trout ( *Salvelinus fontinalis*) in the East Branch of the Penobscot River system within Katahdin Woods and Waters National Monument... By New England Water Science Center Thermal Imaging to Detect Cold-Water Habitat for Atlantic Salmon and Brook Trout at Katahdin Woods and Waters National Monument May 27, 2026 Thermal Imaging to Detect Cold-Water Habitat for Atlantic Salmon and Brook Trout at Katahdin Woods and Waters National Monument The U.S. Geological Survey (USGS), in cooperation with the National Park Service (NPS), is using airborne thermal infrared remote sensing to characterize cold-water habitat for the federally designated endangered species Atlantic salmon ( *Salmo salar*) and wild brook trout ( *Salvelinus fontinalis*) in the East Branch of

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### **Expedition 73 Crew Reflects on Science, Teamwork, and Life in Orbit**

The Expedition 73 crew attends a debrief and awards ceremony at Space Center Houston's IMAX theater on June 16, 2026. NASA/Luna Posadas Nava On June 16, astronauts and cosmonauts gathered at Space Center Houston to share stories from their missions aboard the International Space Station and recognize the teamwork and people on the ground that made their missions possible. The Expedition 73 Welcome Home Ceremony brought together members of NASA's SpaceX Crew-10, Soyuz MS-27, and NASA's SpaceX Crew-11 missions. During the event, the crews reflected on the science, partnerships, and international collaboration that defined their time in orbit. Remarks were delivered by NASA's Johnson Space Center Director Vanessa Wyche, Low Earth Orbit Program's Deputy Manager for the International Space Station Dina Contella, Richard Jones with NASA's commercial crew office, Flight Operations Director Norm Knight, Johnson Employee Relations Lead David Kelley, and Space Center Houston Chief Operating and Strategy Officer Keesha Bullock. Together, they recognized the accomplishments of the crews and the team members who helped make the expedition a success. NASA's Johnson Space Center Director Vanessa Wyche gives opening remarks at the crew debrief and awards ceremony. NASA/Luna Posadas Nava Wyche welcomed the crews home and reflected on the accomplishments of Expedition 73. "Together, these crews exemplified professionalism,

resilience, and the spirit of international cooperation,” Wyche said. “Their work ensured the continued success of the International Space Station Program and demonstrated the strength of our multi-vehicle crew transportation strategy.” During the expedition, all available docking ports were occupied simultaneously for the first time, with eight spacecraft attached to the station. The crew also supported visiting missions, including Axiom Mission 4 , and multiple cargo deliveries while maintaining a full schedule of scientific investigations. Crew members completed three spacewalks, installing hardware that supports future solar array upgrades and maintenance activities critical to station operations. NASA astronaut Anne McClain is photographed near one of the International Space Station’s main solar arrays during a spacewalk to upgrade the orbital outpost’s power generation system and relocate a communications antenna on May 1, 2026. NASA The ceremony also recognized the workforce whose dedication supported every aspect of Expedition 73, from mission planning and operations to research, training, and crew safety. “You learned each other’s languages, and often, when we didn’t know the right answers, you partnered with us, and you would come up with the answers and help,” said International Space Station Program Deputy Manager Dina Contella. “You really helped make us successful.” She noted that collaboration extended well beyond the crew in orbit, with teams across the program matching that dedication throughout the expedition. Contella shared that Expedition 73 included six cargo missions, the inaugural flight of JAXA’s (Japan Aerospace Exploration Agency) HTV-X1 cargo spacecraft, and

more than 37,000 pounds of supplies, equipment, and scientific investigations delivered to the space station. She also thanked the Commercial Crew Program and Flight Operations teams for helping safely transport crews to and from the station and support mission operations. More than 1,000 employees representing 40 teams received NASA Group Achievement Awards, while 23 individuals were honored with Superior Achievement Awards for their contributions to the mission. NASA astronaut Zena Cardman and JAXA (Japan Aerospace Exploration Agency) astronaut Kimiya Yui receive the NASA Exceptional Bravery Honors at the crew debrief. From left: NASA astronaut Zena Cardman, Johnson Director Vanessa Wyche, Richard Jones with NASA's commercial crew office, International Space Station Deputy Manager Dina Contella, and JAXA astronaut Kimiya Yui. NASA/Luna Posadas Nava NASA astronaut Zena Cardman and JAXA astronaut Kimiya Yui received NASA Exceptional Bravery Honors for demonstrating exceptional courage, leadership, and composure during a medical event. Flight Operations Director Norm Knight thanked the teams that supported Expedition 73 from the ground while recognizing the crews' contributions throughout their missions. "You represent an astronaut corps that is the best of the best, epitomizing courage and teamwork," Knight told the crew. "Every opportunity or challenge that came your way, you met with confidence and creativity." NASA astronaut Jonny Kim conducts an investigation to assess the effects of microgravity on bone marrow stem cells, including their ability to secrete proteins that form and dissolve bone. NASA Crew members

reflected on the station's legacy as a platform for discovery, innovation, and international partnership after more than 25 years of continuous human presence in orbit . Research conducted during Expedition 73 included investigations in human physiology, biology, materials science, pharmaceutical development, and technologies designed to benefit life on Earth and future exploration missions. The crews also discussed research aboard the station that will help prepare NASA for future missions to the Moon and Mars, including advanced life-support systems and water recovery technologies. NASA astronaut Nichole Ayers holds space botany hardware that supports the low Earth orbit Integrated Flori-culture Experiment (LIFE) investigation as she floats inside the space station's cupola. The study examines how radiation and microgravity affect plant growth to support future exploration and improve crop production on Earth. NASA Beyond science and operations, the crew built strong bonds during their months in orbit. They marked birthdays, holidays, and mission milestones together, often creating elaborate cakes from the limited ingredients available aboard the station. NASA astronaut Anne McClain celebrates her birthday with a cake, gifts, and cards aboard the space station's Unity module. NASA Many crew members said their strongest memories centered on the people around them, and that trust and teamwork remained essential to mission success. Viewing Earth from orbit provided the crew with a powerful reminder of humanity's shared connection. "When you look back at Earth, what we have in common is so much more important than what makes us different," said McClain. "We're all

on this one planet. We're all on the same crew." Awardees pose for a group photo from the Expedition 73 crew debrief and awards ceremony. NASA/Luna Posadas Nava The evening concluded with the crew expressing gratitude to all those who supported their missions from launch through landing. "It was overwhelming in the most wonderful way to step off that aircraft and see so many team members who had supported us and see family and friends for the first time," said Cardman. "We are so grateful." View the list of award recipients here . Watch the full Expedition 73 crew debrief and awards ceremony below. Explore More 3 min read A Turquoise Tint for the Black Sea Phytoplankton added a milky blue hue to the waters of the Black Sea and nearby... Article 1 day ago 5 min read NASA at the Ion: Orion Lessons from Artemis II Shape NASA's Moon to Mars Path Article 1 day ago 2 min read Astronaut Jessica Meir Assists With Hardware Updates for NASA's Cold Atom Lab Description NASA astronaut Jessica Meir inspects optical fibers while installing hardware updates to the agency's... Article 1 week ago

### **Team finds way to reverse ovarian cancer's chemo resistance**

Researchers have identified how ovarian cancer cells become resistant to chemotherapy and discovered a protein, that, when blocked, can restore the drug's effectiveness. The findings in Cell Reports center on cisplatin, a widely used chemotherapy drug that is still considered among the gold standard for treating ovarian and other cancers. It's been long understood that cisplatin works by damaging cancer cells' DNA, but this study shows that it also disrupts microtubules, which are the internal scaffolding cells rely on to survive. "We have learned how cancer cells adapt to chemotherapy by altering their internal structure," says Sachi Horibata, assistant professor in the Precision Health Program and pharmacology and toxicology department at the Michigan State University College of Human Medicine and one of the lead researchers on the study. "This enables them to survive and ultimately resist treatment." At the center of that process is a protein called tubulin polymerization promoting protein 3, or TPPP3. The researchers found that cancer cells with higher levels of TPPP3 were better able to stabilize their internal scaffolding and withstand the effects of cisplatin or carboplatin that tries to destroy that internal scaffold. In contrast, patients with lower levels of TPPP3 lived longer and responded better to treatment. In laboratory models, removing the protein significantly restored cancer cells' sensitivity to cisplatin, suggesting a new approach to overcoming resistance. "TPPP3 acts like a protective shield

for cancer cells,” Horibata says. “When we remove it, we weaken the cell’s defenses and allow chemotherapy to work more effectively.” The discovery also helps explain why some patients are told they are cancer-free, only to see the disease return. After her grandmother was diagnosed with ovarian cancer, Horibata made it her life’s work to understand that pattern—why tumors initially respond to treatment but later come back stronger. This research shows progress in her quest. Rather than simply repairing DNA damage, cancer cells can reprogram what scientists call the “tubulin code”—a set of structural changes that help stabilize microtubules and support survival under stress. By shifting focus beyond DNA to the physical structure of cancer cells, researchers say the findings could open the door to improving existing treatments rather than replacing them. Researchers are now working to translate these findings into new treatment strategies, including developing drugs that target TP53 and testing whether the protein can be used as a biomarker to identify patients at risk of developing resistance. Future studies will also examine how this mechanism affects current chemotherapy combinations and whether it plays a role in fighting other cancer types. “This is about staying one step ahead of cancer,” Horibata says. “If scientists can understand how tumors adapt to survive treatment, we can start to block that process—making existing therapies more effective, more durable and ultimately more personalized for each patient.” The findings may also have broader implications. Because microtubules are essential in many healthy cells, this research could help scientists better understand some of chemother-

apy's most common side effects, including nerve damage, hair loss and hearing loss. Additional researchers from MSU; the National Institute of Neurological Disorders and Stroke at the National Institutes of Health; the Center for Cancer Research, National Cancer Institute at the National Institutes of Health; and the Center for Biomedical Informatics & Information Technology, National Cancer Institute at the National Institutes of Health contributed to the work. This work is funded by MSU, the Japan Society for the Promotion of Science, the Intramural Research Program of the National Cancer Institute, the National Institute of Neurological Disorders and Stroke, the National Heart and Lung Institute, and the Intramural Research Program of the National Institutes of Health. Source: Michigan State University The post Team finds way to reverse ovarian cancer's chemo resistance appeared first on Futurity .

## Technology & Innovation

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### Visit Brookhaven Lab for Family Fun on Sunday, 6/28

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at Brookhaven Lab Tour Brookhaven Lab's firehouse and see real fire-fighting gear while learning how the Laboratory Protection Division helps keep our community safe. Location: Brookhaven Lab Firehouse Environmental Protection Division Demonstrations and activities presented by the Environmental Protection Division. Location: Chemistry Building Machine Learning, AI, and Robots Robot demonstration and hands-on activities. Location: Berkner Hall Scheduled Activities Talk: "Powering Progress: Early Histories at the Brookhaven National Laboratory site" This talk is about the history of the Brookhaven Lab site from the time of the American Revolution to today and is recommended for those age 8 and older. Presented by Allison McGovern, Environmental Protection Division 11:30 a.m. • 1 p.m. • 2:30 p.m. (45 minutes) Location: Berkner Hall Auditorium Doors open 15 minutes before showtime. Arrive early. Seating is first come, first served. AI and Robots Science Learning Center Brookhaven Lab Firehouse June 28 Family Fun Featuring The Science Learning Center, Brookhaven Lab's Firehouse, and the Environmental Protection Division See Details July 19 Dazzling Discoveries Featuring The National Synchrotron Light Source II, the Environmental Science & Technologies Department, and Instrumentation Division Details Coming Soon August 2 Fascinating Physics Featuring The future Electron-Ion Collider, the Nuclear & Particle Physics Directorate, and the Tandem Van de Graaff Facility Details Coming Soon Each day, you're invited to historical Lab talks and curated displays as we commemorate the 250th anniversary of American independence. Free, no reservations needed •

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### **Tagged and Tracked: Mapping the Journeys of Pacific Cod in the Bering Sea**

Pacific cod support Alaska's second largest groundfish fishery and play a critical role in the Bering Sea ecosystem. In recent decades—particularly from 2017 to 2019—the Bering Sea experienced unusually warm temperatures and minimal sea ice. These conditions appear to have shifted Pacific cod distributions farther north compared to colder years, raising questions about long-term changes in population distribution and demographic structure. Understanding a Shifting Species In response to industry concerns and scientific data needs to support management, a research team launched a satellite tagging study in 2019 . Led by Dr. Susanne McDermott—the Gulf of Alaska bottom trawl survey lead—the team included fisheries biologists Julie Nielsen, Kimberly Rand, and many others. McDermott recalled, “There was tremendous anxiety over what’s going on. Why are these fish in different places? Is this something that's changing on a population level? Is this just the same population moving into different areas?” The summertime distribution of Bering Sea Pacific cod is usually centered in the southeastern portion of the region. Cod distribution typically varies with the extent of sea ice in the Bering Sea during the previous winter. It shifts northward in warm years and southward in cold years. However, beginning in 2017, the Bering Sea experienced unprecedented warming that resulted in greatly reduced sea

ice. In conjunction with warming waters, the summertime distribution of Pacific cod shifted dramatically northward into the northern Bering Sea. This study aimed to determine whether cod observed in the northern Bering Sea during the summers of 2017 and 2018 were a separate population from the southeastern Bering Sea. Or were they migrants? Tagging fish can be a critical tool for understanding how and when fish cross regulatory boundaries. “When fish move across management boundaries, it really affects our management of that species because fishermen usually get assigned a certain quota in a certain management area. So, if fish move from one management area to another, they may not be able to catch them anymore,” explained McDermott. “That has a huge impact on the commercial fleet.”

Satellite Tagging for Management Insight To answer these questions, the team deployed pop-up satellite archival tags to track the movements of Pacific cod. These tags collected high-resolution data on depth, temperature, light levels, and acceleration, providing a dynamic view of both fish behavior and their surrounding environments. Light data allowed estimates of latitude and longitude based on time of sunrise, sunset, and local noon. Researchers used information on depth, longitude, and sometimes latitude to estimate daily locations of tagged cod using a geolocation model. Simultaneously being able to understand what time of day, season, environmental habitat, or region a fish is actively swimming in has provided critical insight into their behavior. The tags detach from the fish after a programmed length of time, such as 30, 90, or 300 days. They float to the surface and transmit their data to the Argos satellite

network . The number of tag transmissions were limited by battery life and summarized for transmission. Tags that were physically recovered—mailed back by fishers or beach combers—provided the full suite of data collected by the tags. Nielsen was the team’s tag and modeling expert: “When you get the tag back,” Nielsen remarked, “you get data every second if it’s programmed for 90 days, every three seconds if it is out for 6 months or less, or every 5 seconds if it’s out for a year or longer.” Rand assisted the team by processing the satellite tag models, communicating results, and writing manuscripts. “It’s really exciting when we dive into the data to find new and exciting patterns—things we haven’t seen before,” Rand shared eagerly. “We also collect genetics and otoliths for ages. It’s part of this comprehensive ecological picture.” Rand has witnessed the evolution of tagging research technology, including early catch-and-release studies with conventional “spaghetti” tags. Those conventional tags only provided information on release and recovery locations. Detecting seasonal movements was very difficult if tagged fish moved away after tagging but returned prior to recapture. In contrast, pop-up satellite archival tags provided a detailed understanding of seasonal movements even if the tagged fish is not recaptured. Data That Drive Discovery For this study, Pacific cod were tagged in both the summer and winter to track their movements year-round. Nielsen developed models that use the satellite tag data to reconstruct individual movement paths for the fish, and to deduce behavior. These contribute to a clearer understanding of cod life history. In the Bering Sea, the results indicated behavioral

trends : August–November: Foraging December–January: Transition period February–April: Spawning May–July: Return migration Pacific cod tagged in summer in the northern Bering Sea left the area in November ahead of oncoming sea ice. Many went to traditional spawning areas in the eastern Bering Sea. However, some fish moved to Russian waters or the Gulf of Alaska during the winter, suggesting greater seasonal connectivity than expected. This demonstrated movement across international and management boundaries. Supporting Resilient Fisheries The team works with stock assessors to determine how these data and insights can be applied to stock and ecosystem assessments mandated under the Magnuson-Stevens Act . The team strategizes with the assessors to prioritize where they should release tags next to fill knowledge gaps. The effort helps to develop and support a framework for multi-area stock assessment models that incorporate fish movement across management zones. “We’ve all worked together for a long time,” Rand shared, and “really care about the fishery.” This research advances our understanding of how Pacific cod—and marine species more broadly—may adapt to climate-driven shifts in their environment. As the oceans continue to warm, these efforts will be useful for maintaining sustainable fisheries and resilient marine ecosystems. As scientists continue to evolve tagging methods, these advancements will help sustain healthy fish populations and support the broader marine ecosystem.

## Activity Time - Word Search

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

### Words to Find:

