On September 27, The National Atmospheric and Space Administration (NASA) successfully launched the Landsat 9 satellite from Vandenberg Space Force Base in California. A joint mission with the U.S. Geological Survey (USGS), Landsat 9 will continue to provide earth observations, including data from a thermal infrared sensor (TIRS-2) that many western states and water managers are using to measure and monitor evapotranspiration from vegetation and calculate consumptive water use. With nearly 80 percent of the fresh water in the Western U.S. being used to irrigate crops, TIRS is an invaluable tool for managing water consumption and contributes to the archive of data gathered by Landsat 5, 7 and 8. The WSWC was instrumental in ensuring TIRS was added back on to Landsat 8 after it was dropped from development plans due to its cost and weight.

"Today's successful launch is a major milestone in the nearly 50-year joint partnership…to collect valuable scientific information and use that data to shape policy with the utmost scientific integrity," said Secretary of the Interior Deb Haaland, attending in person. "As the impacts of the climate crisis intensify in the United States and across the globe, Landsat 9 will provide data and imagery to help make science-based decisions on key issues including water use, wildfire impacts, coral reef degradation, glacier and ice-shelf retreat, and tropical deforestation."

Also invited to witness the launch were: Tanya Trujillo, Assistant Secretary of the Interior for Water and Science; Jon Niermann, WSWC Vice-Chair and Chairman of the Texas Commission on Environmental Quality; and WSWC Executive Director Tony Willardson.

The first Landsat satellite launched in 1972, and since then, NASA has always kept a Landsat in orbit to collect images of our planet's surface and changes to land and water use. TIRS data has been available since 1982. Landsat images also allow water and land managers and researchers to monitor agricultural productivity, forest health, water quality, and harmful algal blooms.

"The Landsat mission is like no other,' said Karen St. Germain, NASA Earth Science Division Director in Washington. "For nearly 50 years, Landsat satellites have observed our home planet, providing an unparalleled record of how its surface has changed over timescales from days to decades. Through this partnership with USGS, we've been able to provide continuous and timely data for users ranging from farmers to resource managers and scientists. This data can help us understand, predict, and plan for the future in a changing climate."

Landsat 9 joins Landsat 8 in orbit and working in tandem, the two satellites will collect images spanning the entire planet every eight days. Landsat 7 is still orbiting the earth but with degraded sensor capabilities after 22 years in space.

"Landsat 9 will be our new eyes in the sky when it comes to observing our changing planet," said Thomas Zurbuchen, NASA Associate Administrator, Science Mission Directorate. "Working in tandem with the other Landsat satellites, as well as our European Space Agency partners who operate the Sentintel-2 satellites, we are getting a more comprehensive look at Earth than ever before. With these satellites working together in orbit, we'll have observations of any given place on our planet every two days. This is incredibly important for tracking things like crop growth and helping decision makers monitor the overall health of Earth and its natural resources."

The instruments aboard Landsat 9 - the Operational Land Imager 2 (OLI-2) and TIRS-2 will measure 11 wavelengths of light reflected or radiated off Earth's surface, in the visible spectrum as well as other wavelengths beyond what our eyes can detect. As the satellite orbits, these instruments will capture scenes across a swath of 115 miles (185 kilometers). Each pixel in these images represents an area about 98 feet (30 meters) across, about the size of a baseball infield - providing high resolution data for resource managers who will be able to identify most crop fields in the United States.

"Launches are always exciting, and today was no exception," said Jeff Masek, NASA Landsat 9 project scientist. "But the best part for me, as a scientist, will be when the satellite starts delivering the data that people are waiting for, adding to Landsat's legendary reputation in the data user community."

The USGS Earth Resources Observation and Science (EROS) Center in Sioux Falls, South Dakota, processes and stores data from the instruments, continuously adding that information to the five decades of data from all of the Landsat satellites. All Landsat images and the embedded data are free and publicly available, a policy that has resulted in more than 100 million downloads since its inception in 2008.

Teams from NASA's Goddard Space Flight Center in Greenbelt, Maryland, built and tested the TIRS-2 instrument. NASA's Launch Services Program, based at the agency's Kennedy Space Center in Florida managed the launch of the mission. EROS will operate the mission and manage the ground system, including maintaining the Landsat archive. Ball Aerospace in Boulder, Colorado, built and tested the OLI-2 instrument. United Launch Alliance provided the rocket for Landsat 9's launch. Northrop Grumman in Gilbert, Arizona, built the Landsat 9 spacecraft, integrated it with instruments, and tested it. (*NASA Press Release*, 9/27/2021)