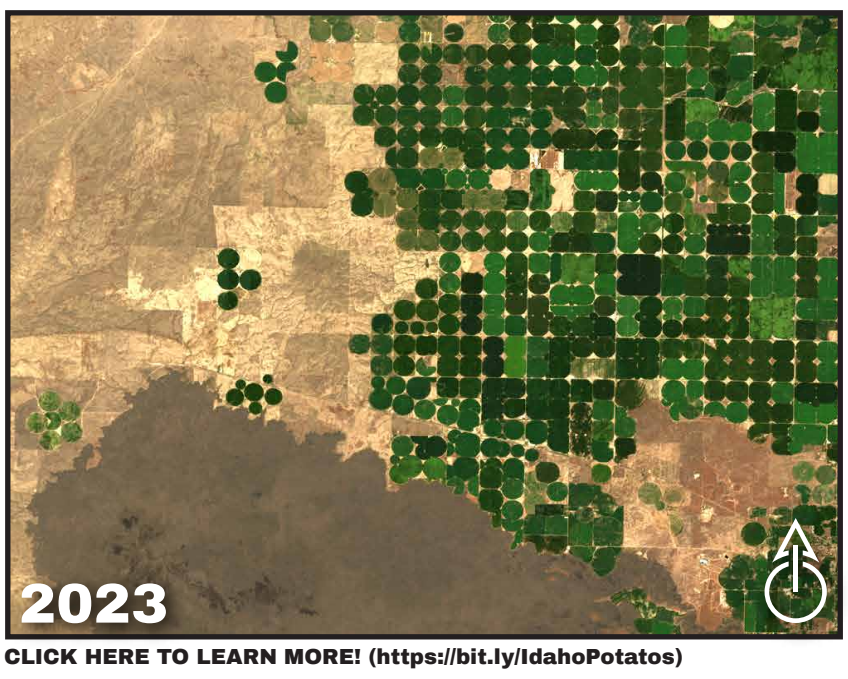
EOD_2024_ESW_Back_20241014.pdf 1 10/14/2024 8:04:13 PM

EXPLORING EARTH SCIENCE THROUGH REMOTE SENSING



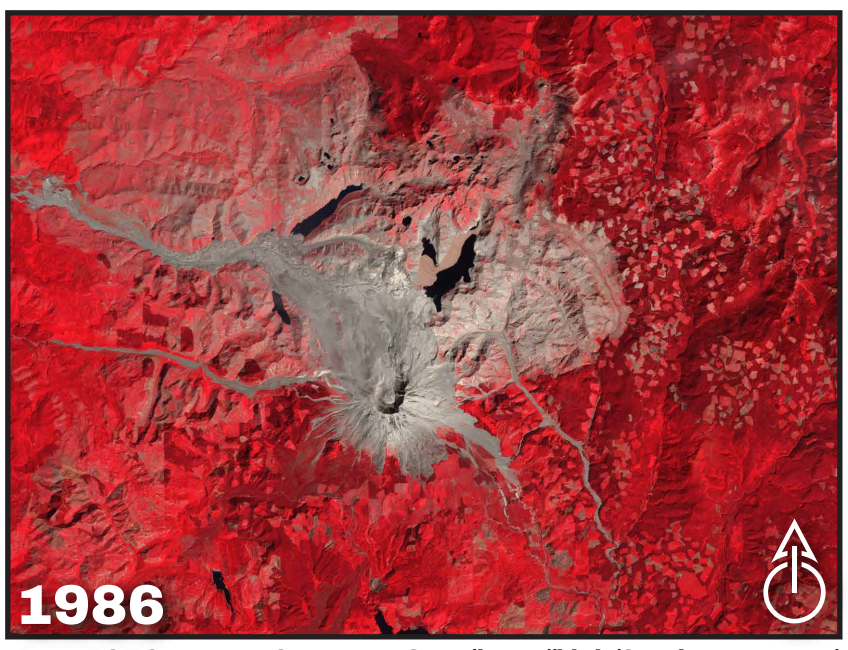
CLICK HERE TO LEARN MORE! (https://bit.ly/IdahoPotatos)

AGRICULTURE

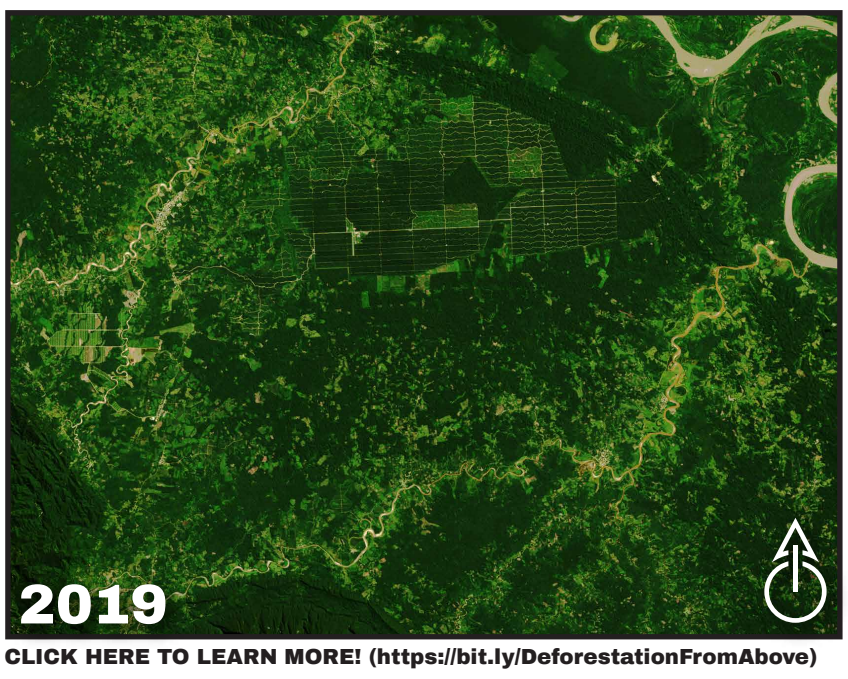
Nearly one-third of the potatoes in the United States are grown in Idaho's Snake River Plain. This natural-color image, captured on July 22, 2023, by the Operational Land Imager-2 on Landsat 9, provides a detailed view of the basaltic lava fields with sparse vegetation and the surrounding farm fields near Idaho Falls. Although the soils in the Snake River Plain are fertile, the region receives very little precipitation annually. Central-pivot irrigation systems, visible as green crop circles, are essential for supporting the growth of potatoes, which are particularly sensitive to drought. These circular patterns stand out against the barren landscape, highlighting the importance of irrigation in this arid region.

DISASTER

On May 18, 1980, Mount St. Helens erupted, causing widespread devastation across the surrounding landscape. This infrared, false-color image, captured on August 26, 1986, by the Thematic Mapper sensor on Landsat 5, vividly illustrates the aftermath of the eruption. The image reveals the extensive damage caused by the eruption, including the vast areas of barren land and the destruction of dense forests. Disaster mapping plays a crucial role in understanding the long-term environmental impact of natural and human-made disasters. It also aids in monitoring the gradual process of environmental recovery, as new vegetation begins to reclaim the once devastated areas.



CLICK HERE TO LEARN MORE! (https://bit.ly/StHelensRecovery)



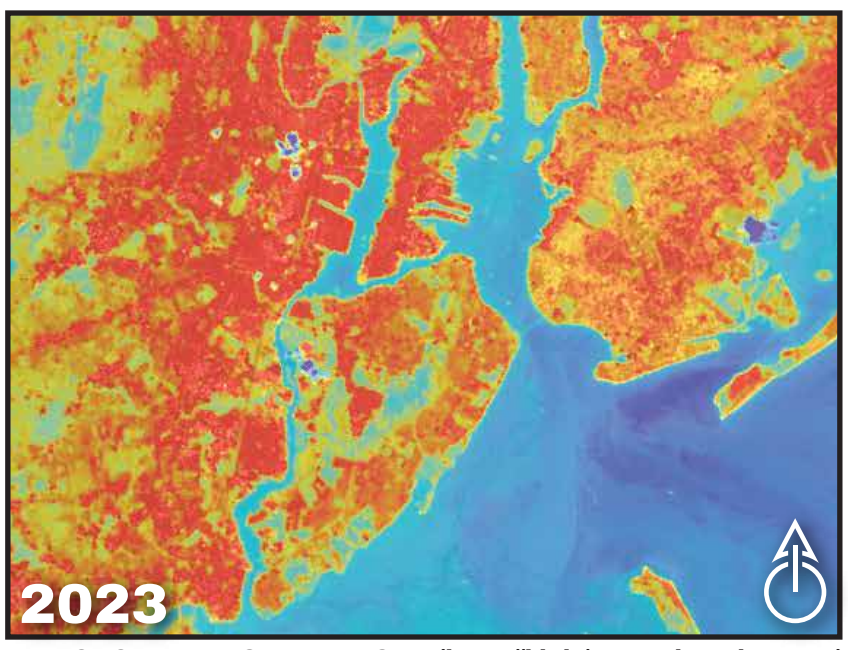
CLICK HERE TO LEARN MORE! (https://bit.ly/DeforestationFromAbove)

FORESTRY

This Landsat image shows deforestation near Yurimaguas, Peru; a palm oil plantation has replaced tropical rainforest. Such plantations divert water resources from local communities. Deforestation elsewhere in the Amazon rainforest is done for multiple purposes includng agriculture, grazing, and mining. Scientists have been tracking Amazonian rainforest deforestation for several decades, helping in establishing monitoring systems, in raising public awareness, and in slowing deforestation. Newer satellite systems including radar will enable even more productive monitoring.

URBAN USE

This Landsat image depicts land surface temperatures (LSTs). LSTs represent how hot the surface of the Earth would feel to the touch and can sometimes be significantly hotter or cooler than air temperatures. Urban areas, like the red and orange regions shown in New York City, often experience a phenomenon known as the urban heat island effect, where buildings and pavement absorb and retain heat, making them warmer than the surrounding areas. The suburbs appear slightly cooler in orange, while the ocean water is even cooler, as shown in blue hues. However, the clouds to the west of New York City, which are colder due to their altitude and composition, show the coolest temperatures in the image.



CLICK HERE TO LEARN MORE! (https://bit.ly/MeasuringUrbanHeat)

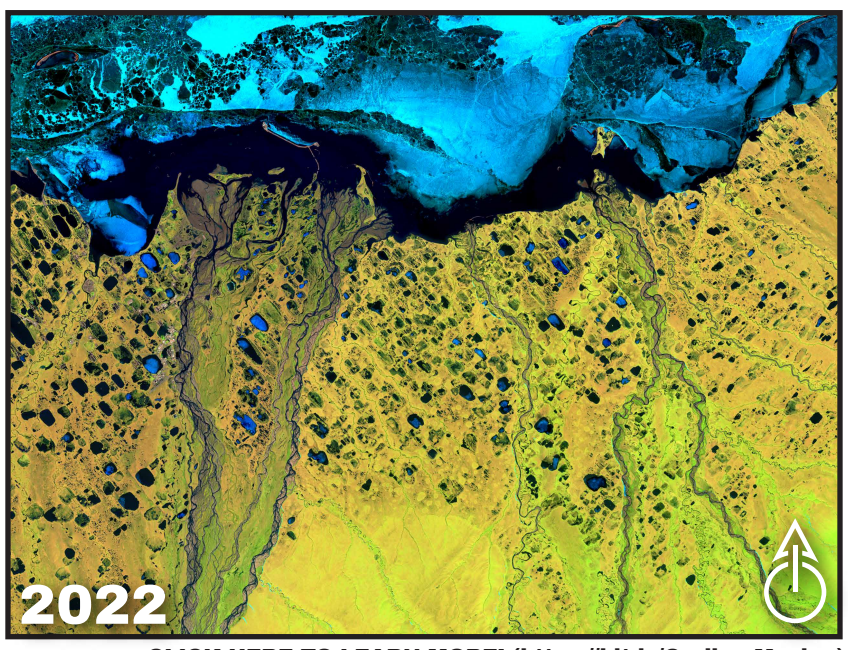
CLICK HERE TO LEARN MORE! (https://bit.ly/ShrinkingAralSea)

WATER

In the 1960s, water from the rivers feeding the Aral Sea was diverted for agriculture, leading to the lake's dramatic shrinkage. Once the fourth largest lake in the world, the Aral Sea began to dry up, and satellite imagery, such as this Landsat Thematic Mapper image from Landsat 5 in 1986, has been crucial in tracking these changes. The 1986 image shows the Aral Sea still full of water, before it began to split into smaller bodies and suffer from increased salinity, pollution, and dust storms. Remote sensing remains vital for understanding the environmental impacts of water management and the ongoing changes to water bodies like the Aral Sea.

WILDLIFE

Caribou herds in northern Alaska and Canada migrate hundreds of miles each spring to the northern coast, where they give birth. The timing of this migration—when they leave their winter ranges and arrive at calving grounds—is still not fully understood. Scientists are studying the caribou's movements and the factors that may influence these migrations. This Landsat 9 image shows the Arctic coastal plain in Alaska and part of the Arctic National Wildlife Refuge, which is a key calving ground for the Porcupine caribou herd. Satellite imagery provides crucial insights into the vast ranges these herds travel and the habitat factors that affect the timing and location of their movements.



CLICK HERE TO LEARN MORE! (https://bit.ly/CaribouMoving)

LESSONS AND RESOURCES

To explore freely available lessons, curriculum, and resources associated with these topics, scan the QR code with your mobile device or visit https://bit.ly/EOD2024Resources.

To learn more about the Landsat Program and how it has kept an eye on Earth for more than 50 years, visit https://www.usgs.gov/landsat-missions. Follow this link for USGS educational resources: https://bit.ly/usgseudout

AmericaView is a nationwide non-profit network of educators, researchers, and partners dedicated to empowering Earth observation (EO) education and advancing remote sensing (RS) and EO through education, outreach, and workforce development. Earth Observation Day (EOD), a STEM initiative sponsored by AmericaView and USGS, highlights the importance of RS/EO and the Landsat program—a collaborative, 50+ year effort by USGS and NASA to monitor the Earth from space. EOD engages students with RS and EO science tools and technology, providing an interactive experience to explore satellite imagery and its role in addressing critical environmental challenges. Visit the AmericaView EOD website (https://bit.ly/AVEarthObservationDay) for freely available resources and educational activities.