

Lands of Landsat

Since 1972, Landsat satellites have provided us with a unique view of our planet's ecosystems and changes in land cover.

Parks

More than 50 wildfires hit Yellowstone National Park during the summer of 1988. Lightning started most of these, but humans started nine of the fires. Short-wave infrared data from Landsat helped reveal where and how much of the forest was damaged. These images helped firefighters monitor affected areas as the fires spread and helped park rangers and scientists monitor the recovery afterwards.



Disaster Recovery
Landsat images of Yellowstone recovery after the 1988 wildfires. The red shows the fire-damaged areas and lighter green shows new forest growth and recovery.

Forests

Landsat images can reveal both natural and human impacts on ecosystems such as forests. Patches of forest infested by pine beetles are visible from space because entire ridges and valleys turned brown when the trees died. Satellite images also can show impacts from human activity such as logging.



Cities

Views from space show how cities have interesting patterns and shapes on the Earth's surface. Many cities are designed on a grid with the roads and highways creating rectangular shapes. Large parks and golf courses stand out as green spaces between the roads and buildings.

City Planning
A closer look at the image shows Sun City's circular neighborhoods and green spaces. City planners designed this retirement community so that each neighborhood has its own community buildings, green spaces, and recreation areas.



Islands

This Landsat image shows the coral reef surrounding the island of Vanua Levu in Fiji. New technology on the Landsat 8 satellite allows for observations of shortwave ultra-blue, making it easier for scientists to spot coral reefs, quantify their area and depth, and even monitor their health.



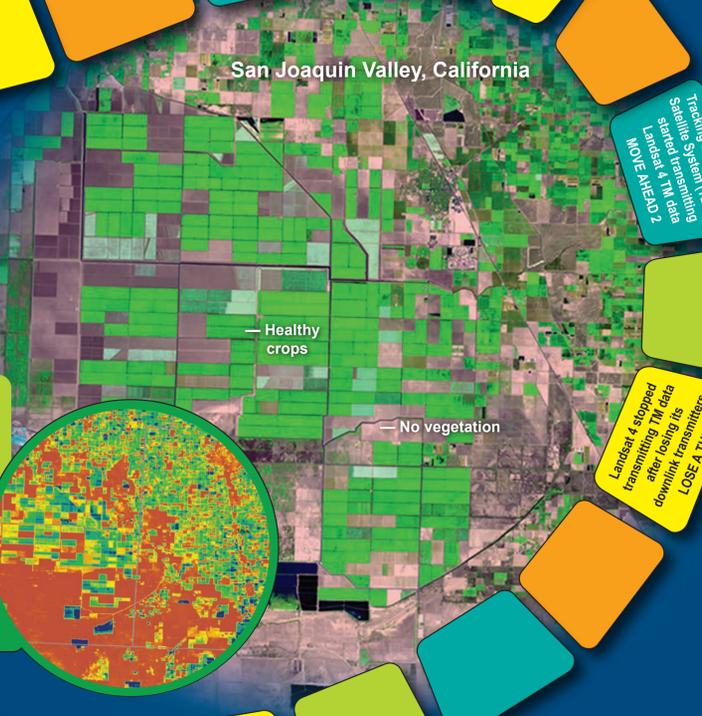
Coastline Change
With more than 45 years of observations, Landsat images can reveal slow changes in coastlines. The growth of the Atchafalaya and Wax Lake Outlet deltas show new marshlands are being created at a rate of 2.8 square kilometers (1 square mile) per year.



Farms

Satellites can also sense light beyond the visible part of the electromagnetic spectrum. Near-infrared light is used to study plants because chlorophyll in healthy leaves reflects a large amount of this energy. This image displays infrared light as green so that the healthy crops look bright green.

Water Monitoring
The San Joaquin valley gets only about 16 inches of rain a year. This valley is one of the world's most productive agricultural regions but has to depend on irrigation for its water. It is critical to monitor water use in this region. By combining measurements from other parts of the electromagnetic spectrum, Landsat data can help farmers calculate the amount of water lost to evaporation from the soil and water loss from plant transpiration—evapotranspiration.



FINISH

Landsat 9—a partnership between NASA and the U.S. Geological Survey—will continue the Landsat program's critical role in monitoring, understanding and managing the land resources needed to sustain human life. Watch for Landsat 9 to launch in 2020!



START

How to Play
Use any small objects for playing pieces and place them at the START. Flip two coins to move forward 1, 2, or 3 spaces. Follow any instructions on spaces to MOVE AHEAD or GO AGAIN. If you land on a shortcut by exact count, follow the short cut spaces on your next turn.

- Flip two coins to move forward
- heads + tails = Move ahead 1 space
 - heads + heads = Move ahead 2 spaces
 - tails + tails = Move ahead 3 spaces

The Landsat Satellite

Land cover and land use around the globe are changing faster than ever before. This has sweeping consequences. Managing our land and water resources in a sustainable way is important for life on Earth—and if you want to manage something well, you need to be able to map it well. Landsat collects data at the scale of human interactions with the land and with the frequency necessary to detect, monitor, and understand changes in land use and land cover—allowing us to map a better future. Learn more at <https://landsat.gsfc.nasa.gov> and <https://landsat.usgs.gov>.

Landsat 8's instruments include the Operational Land Imager (OLI), which improves on past Landsat sensors and collects data in the visible, near-infrared, and short wave infrared. The Thermal Infrared Sensor (TIRS) collects data in the thermal region of the electromagnetic spectrum.

Benefits to Society

Landsat data, used in combination with today's advanced geographic information systems, image processing software, and cloud computing, enable individual users to process as many scenes as needed for land analysis. Users of Landsat data can easily see changes in land-cover or land-use conditions across an entire State or region. Landsat imagery is used in natural resource management, agriculture, disaster management, industry, forestry, human health, climate, energy, urban growth, and ecosystems and biodiversity.

AmericaView

AmericaView (www.americaview.org) is a group of scientists, researchers, educators, and students that, with funding from the U.S. Geological Survey Land Remote Sensing Program, use remote sensing data and technology to study phenomena on the surface of the Earth and share knowledge and information to help people better understand the world they live in.

Earth Observation Day

AmericaView Earth Observation Day (EOD) (<http://bit.ly/avearthod>) is an education and outreach event that celebrates remote sensing and Earth science. EOD events are held across the United States and involve educational activities such as demonstrations of remote sensing technology, lectures and discussions, student projects, and mapathons.

