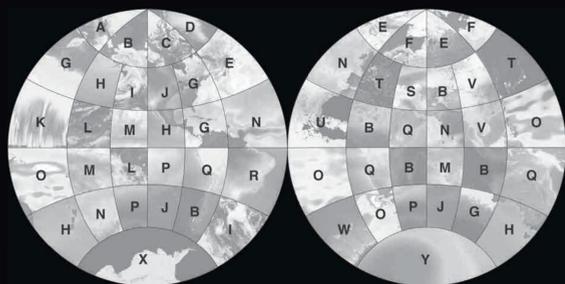


Mapping Our World



NASA satellites have been mapping Earth for over 40 years. These global observations of the atmosphere, biosphere, land surface, solid Earth, and ocean enable an improved understanding of the Earth as an integrated system. The images above feature data from over a dozen Earth observation missions.

A Forest Fires

Terra/MODIS • The MODIS instrument has revolutionized the way scientists can detect fires the world over and map the extent and temperature of these fires and the resulting burn scars. This true-color image shows the detection of dozens of fires burning in eastern Siberia.

B Blue Marble—Next Generation

Terra/MODIS • A year's worth of monthly data allows scientists to create cloud-free images that reveal seasonal changes to the land surface: the green-up and dying back of plants in temperate regions, dry and wet seasons in the tropics, and advancing and retreating snow cover in the Northern Hemisphere.

C Northwest Passage

Aqua/MODIS • This rare cloud-free view of the Canadian Arctic Archipelago in August 2009 reveals a partially ice-free Northwest Passage.

D Ice Elevation (m)

ICESat/GLAS • Monitoring the elevation of Earth's polar regions, such as the Greenland ice sheet, helps scientists determine whether polar ice is growing or shrinking. These measurements are an important variable for understanding climate change.

E Sea Surface Temperature Anomaly (°C)

Aqua/AMSR-E • Temperature anomalies on July 14, 2003 show a greater warming (red colors) occurring at higher latitudes, such as around the Arctic circle.

F Sea Ice Concentration (%)

GCOM-W1/AMSR2 • Sea ice minimum extent in September 2012 (East Siberian Sea) and the maximum extent in April 2012 (Norwegian Sea).

G Sea Surface Temperature (°C)

Aqua/AMSR-E • In general, but not everywhere, sea surface temperatures tend to be colder at higher latitudes. The Gulf Stream can be seen by the flow of warm water from the Gulf of Mexico north along the east coast of North America.

H Vegetation (NDVI)

OrbView-2/SeaWiFS • Observations of Earth's biosphere.

I Pacific Storm

Terra/MODIS • A large storm system swirls off the west coast of the United States in this true-color image.

J Outgoing Longwave Radiation (W/m²)

Aqua/CERES • Observations of outgoing longwave radiation show low values in locations with clouds. Clouds associated with a cold front are draped across central North America in these August 2006 data.

K Radar Reflectivity (dB)

CloudSat • Radar data showing the storm structure (height and shape) of Typhoon Choi-wan, a Category 4 super typhoon, on September 15, 2009.

L Clouds

Suomi NPP/VIIRS • True-color images of clouds over the Pacific Ocean as captured by the Visible Infrared Imaging Radiometer Suite. Along with clouds, VIIRS monitors ocean color and forest fires, and measures sea and land surface temperatures and ice motion and temperature—all critical for understanding climate change.

M Total Rainfall (mm)

TRMM • Total monthly rainfall for February 2013, showing a pattern of higher rain amounts in the tropics. TRMM data can be used to understand how precipitation is changing around the world at daily, monthly and yearly time scales.

N Sea Surface Salinity (g/kg)

Aquarius • This map shows an extensive region of low salinity water (in blue) where the Amazon River flowed into the Atlantic Ocean.

O Sea Surface Height Anomaly (mm)

Jason-2 • Variations in sea surface height can reveal seasonal patterns such as El Niño/La Niña cycles.

P Mid-Tropospheric Temperature (°F)

Aqua/AIRS • Observations of average daytime temperatures in the mid-troposphere (approximately 3,000 meters in altitude) for May 2009 show relatively warm air near the equator and cooler air closer to the poles.

Q Land Surface Temperature (°C)

Aqua/MODIS • Desert areas in Africa, South America, and the Australian Outback absorb and radiate more heat than forested areas, such as Papua New Guinea.

R Seasonal Terrestrial Water Storage Changes (mm)

GRACE • Over the course of one year, seasonal gravity changes reflect the large amount of water cycled through the Amazon River Basin, which has Earth's largest seasonal gravity variations.

S Long-Term Terrestrial Water Storage Changes (mm)

GRACE • From 2003 to 2009, the Tigris and Euphrates river basins in the Middle East lost 144 cubic kilometers of total stored freshwater—almost the amount of water in the Dead Sea.

T Lights at Night

Suomi NPP/VIIRS • Observations from a new low-light sensor detect dim light down to the scale of an isolated highway lamp or fishing boat, providing unprecedented views of Earth at night.

U Aerosol Optical Thickness

Terra/MODIS • Aerosols, tiny particles floating in the atmosphere—such as windblown dust, sea salts, volcanic ash, smoke from wildfires, and pollution from factories—can impact cloud formation and type, weather, and climate. This image shows average monthly aerosol concentration.

V Nitrogen Dioxide (10¹⁵ molecules/cm³)

Aura/OMI • NO₂ is a pollutant produced from burning fuel for energy. High levels are observed around cities and industrialized areas.

W Aerosol and Cloud Attenuated Backscatter (Mm/sr)

CALIPSO • Vertical profiles of aerosols and clouds from the Copahue volcano in South America.

X Landsat Mosaic of Antarctica

Landsat • The first high-resolution satellite view of Earth from the sun's harmful ultraviolet rays. A hole in the ozone layer has been monitored by NASA for over 30 years.

Y Stratospheric Ozone (Dobson Units)

Aura/OMI • Ozone in the stratosphere protects life on Earth from the sun's harmful ultraviolet rays. A hole in the ozone layer has been monitored by NASA for over 30 years.