Explorer 1
60 Years of Earth Observations

www.nasa.gov
Explorer 1
Launched Jan. 31, 1958. Explorer 1 was the first U.S. satellite and discovered the Van Allen Radiation Belts.

1950s
60 Years of Earth Observations

Vanguard 1
The second U.S. and first solar-powered satellite, Vanguard 1 tested launch capabilities and spacecraft systems.
National Aeronautics and Space Administration

**TIROS 1**
The first U.S. weather satellite, Television Infrared Observation Satellite 1, demonstrated accurate weather forecasts were possible based on data gathered from space.

**1960s**
60 Years of Earth Observations

**Echo 1**
The “satelloon” – a long-term, high-altitude balloon – was the first satellite to enable two-way, live communications by reflecting radio and radar signals.

**TIROS 3**
TIROS 3 captured the first image of a hurricane from space, Hurricane Esther, supplementing ground-based and aircraft observations.

**Nimbus 1**
The first of seven Nimbus missions that provided weather, environmental and atmospheric observations over 30 years, Nimbus 1 returned the first global images of clouds and large weather systems.

**ATS 1**
The first of six Applications Technology Satellite missions designed to test satellite technologies, ATS 1 captured the first full-disk images of Earth from geosynchronous orbit.

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GOES-1
The Geostationary Operational Environmental Satellite program began in 1975 as a joint effort of NASA and the National Oceanic and Atmospheric Administration (NOAA).

SAM 1
Conducted on the Apollo-Soyuz Test Project, the Stratospheric Aerosol Measurement experiment marked the first time atmospheric aerosol measurements were taken from space.

Seasat
Seasat was the first satellite specifically designed to test sensors to better understand Earth’s ocean.

Nimbus 7
The last of its series, Nimbus 7 marked the beginning of space-based Earth System Science—looking at the planet as an interconnected system.

1970s
60 Years of Earth Observations

Landsat-1
Landsat-1, originally designated Earth Resources Technology Satellite 1, was the first in an ongoing series of NASA/U.S. Geological Survey (USGS) satellites that have monitored Earth’s land masses for over 45 years.
ERBS
The Earth Radiation Budget Satellite investigated the Sun-Earth connection and was instrumental in determining how natural and human activities affect the planet’s radiation balance and ozone layer.

1980s
60 Years of Earth Observations

OSTA-1
The first Space Shuttle scientific payload, Office of Space and Terrestrial Applications 1, performed remote sensing of Earth’s atmosphere, oceans and land resources.

TDRS-1
The Tracking and Data Relay Satellite 1 was the first in an ongoing series of satellites that form a space-based data communications network.

www.nasa.gov
TOPEX/Poseidon
A NASA/CNES collaboration, TOPEX/Poseidon delivered the first highly accurate sea surface height measurements.

UARS
The Upper Atmosphere Research Satellite was the first satellite dedicated to stratospheric science.

SeaWiFS
The Sea-viewing Wide Field-of-view Sensor collected the first global ocean biological data, providing observations about life on Earth.

TRMM
The precipitation radar on the Tropical Rainfall Measuring Mission was the first spaceborne instrument to provide 3D maps of storm structure.

Terra
The flagship satellite of NASA’s Earth Observing System, Terra’s five instruments provide a comprehensive look at Earth System Science.
National Aeronautics and Space Administration

**A-Train**
NASA and international partners operate multiple Earth-observing satellites orbiting together in the Afternoon Constellation, including Aqua, Aura, CloudSat and CALIPSO.

**SRTM**
Flown aboard Space Shuttle *Endeavour*, the Shuttle Radar Topography Mission produced the first near-global data set of land elevations.

**ICESat**
The Ice, Cloud and land Elevation Satellite was the first mission to use laser-ranging (lidar) for continuous observations of the surface elevation of the Antarctic and Greenland ice sheets.

**GRACE**
A joint NASA/German Aerospace Centre (DLR) mission, the Gravity Recovery and Climate Experiment tracked the continuous movement of liquid water, ice and solid ground for more than 15 years.

2000s
60 Years of Earth Observations

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OCO-2
The Orbiting Carbon Observatory 2 is NASA's first spacecraft dedicated to studying atmospheric carbon dioxide. It orbits as part of the A-Train constellation.

SMAP
The Soil Moisture Active Passive mission is NASA's first to measure the amount of water in the top layer of soil and its freeze/thaw state.

GPM
The Global Precipitation Measurement mission is an international network of satellites, including the NASA/JAXA Core Observatory, that provides global observations of rain and snow.

Suomi NPP
The NASA/NOAA/DOD Suomi National PolarOrbiting Partnership satellite was developed to both collect a wide-range of land, ocean and atmospheric data and address operational weather forecasting.

Aquarius
NASA and Argentina’s space agency (CONAE) operated the first dedicated sea surface salinity satellite instrument as part of the SAC-D mission.

CYGNSS
Small spacecraft and satellites, such as the Cyclone Global Navigation Satellite System, advance scientific and human exploration, reduce cost and expand access to space.

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