



NOAA Knows...

Earth-Observing Satellites

For more than 50 years, NOAA has operated earth-observing satellites and collected, processed, and distributed the data from these satellites to provide life-saving weather forecasts, measure ocean temperatures, and monitor hazards worldwide — helping to protect lives and improve livelihoods.

NOAA satellites are the backbone of weather forecasts, climate research, and environmental assessments that result in public awareness and preparedness. NOAA satellites scan the globe day and night, sending back an endless stream of information about the atmosphere, ocean, land, and space such as temperatures, cloud formations, wind patterns, and sea currents. Accurate forecasts and severe weather alerts on television and radio, on web pages, and smart phone “apps” all rely on NOAA satellite data.

A Weather-Ready Nation

NOAA satellites collect vital information for short-term and long-term weather forecasting, atmospheric and oceanic research, and guard the nation from unexpected severe weather such as hurricanes, winter storms, and even solar storms. They also are critical to monitoring and predicting environmental events such as El Niño and La Niña, coral bleaching, ocean acidification, and algal blooms.

These satellite data are an important part of building a “Weather-Ready Nation” — where communities, businesses, and individuals become resilient to the increasing vulnerabilities to extreme weather.

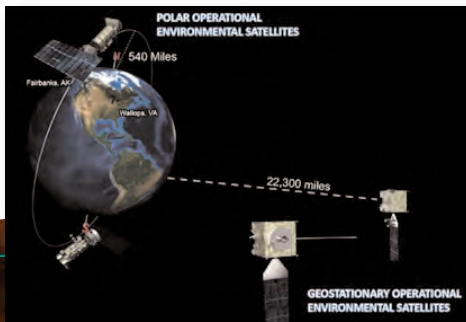
Sentinels in the Sky

To help us become weather-ready, NOAA operates two types of satellites that provide real-time data around the clock while orbiting the Earth: *geostationary* and *polar-orbiting* satellites.

Geostationary Operational Environmental Satellites (GOES) provide continuous monitoring from a fixed position more than 22,300 miles above the Earth. These satellites, orbiting together at the same rate as the Earth’s rotation, beam down images and other measurements of air, land, water, and ice across the Western Hemisphere — allowing scientists to constantly monitor for severe weather such as tornadoes, heavy rainfall, and tropical storms.



Artist's rendering of polar-orbiting satellite.

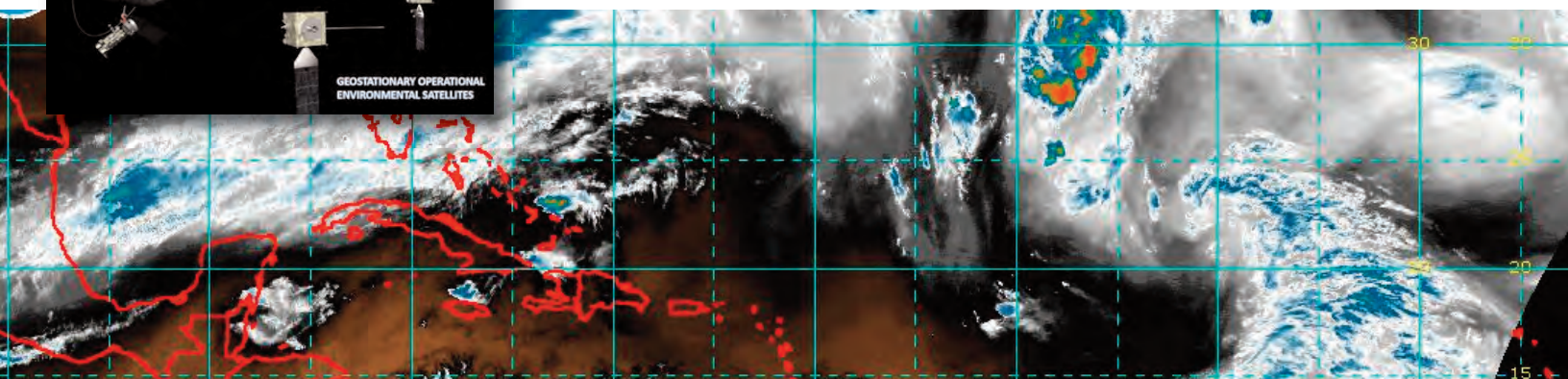


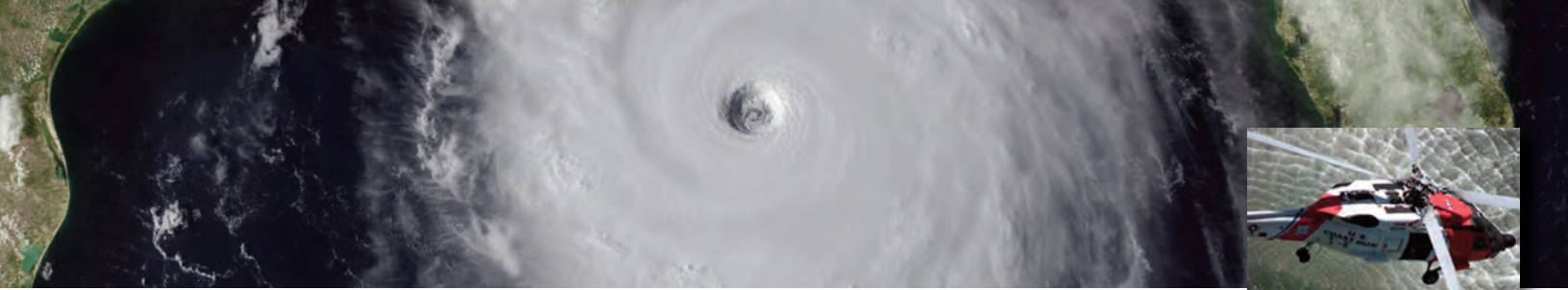
POES and GOES satellites.

“We all want a government that lives within its means, but there are still things we need to pay for as a country — things like... weather satellites...”

President Barack Obama (July 2011)

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Polar Operational Environmental Satellites (POES) operate 540 miles above Earth, much closer than geostationary orbits. Because the Earth rotates while these satellites travel from the North Pole to the South



Pole, they can collect land, ocean, and atmospheric data from across the entire globe. It's these satellites that are the main sources of observational data used to initiate weather prediction models that are essential for accurate weather forecasts.

To ensure that these “space sentinels” are always protecting our nation, next-generation satellite systems, such as the **Joint Polar Satellite System (JPSS)** and **GOES-R**, must be built, launched into space, and fully operating before an aging satellite reaches the end of its expected lifespan.

Economic Value

NOAA satellites provide many life-saving and economic benefits to the nation:

- ▶ Accurate weather analysis and forecasting from minutes to days in advance.
- ▶ Hurricane formation, detection, and track/intensity prediction.
- ▶ Efficient air traffic management support
- ▶ Volcanic eruption monitoring and ash cloud dispersion, especially for aviation safety.
- ▶ Water resource managers receive alerts to extreme precipitation to manage river flow and reservoir levels.
- ▶ Faster detection of wildfires provides firefighters critical time to respond.
- ▶ Research advances in climate and ocean dynamics.

- ▶ Solar storm detection and warnings (guarding against power grid disruptions, GPS outages, and hazardous radiation exposure to airplanes flying over the poles).
- ▶ Emergency locators for search and rescue operations.



Fast Facts

- ▶ Satellite data have contributed to improved weather forecasts — today's 3-day forecasts are as accurate as 2-day forecasts were 10 years ago.
- ▶ A recent study by NOAA's National Weather Service showed forecasts for the 2010 East Coast “Snowmageddon” storm would have under-predicted snowfall totals in the mid-Atlantic region by more than 10 inches and the predicted location of the heaviest snowfall would have been off by up to 250 miles without the POES satellite data.
- ▶ Since 1982, more than 6,500 lives have been saved in the United States using NOAA satellites in search and rescue efforts.
- ▶ NOAA satellites play a key role in fire weather forecasting, particularly in early detection of rapidly growing fires in remote areas.

To learn more about how NOAA is helping to build a Weather-Ready Nation, watch [NOAA's National Weather Service: Building A Weather-Ready Nation](#) video or read the [National Weather Service's 2011 Strategic Plan](#).

For more information about NOAA's Earth Observation Satellites, visit: <http://www.nesdis.noaa.gov>.

To learn more about NOAA, visit www.noaa.gov.

“Through the work of NOAA and other scientists who utilize polar-orbiting satellites to develop weather forecasts, the American Red Cross is able to make accurate and informed response decisions based on those forecasts.”

Neil Denton
American Red Cross (2011)



How do NOAA satellites affect your life?

Scan the QR-Code with your mobile phone to find out.