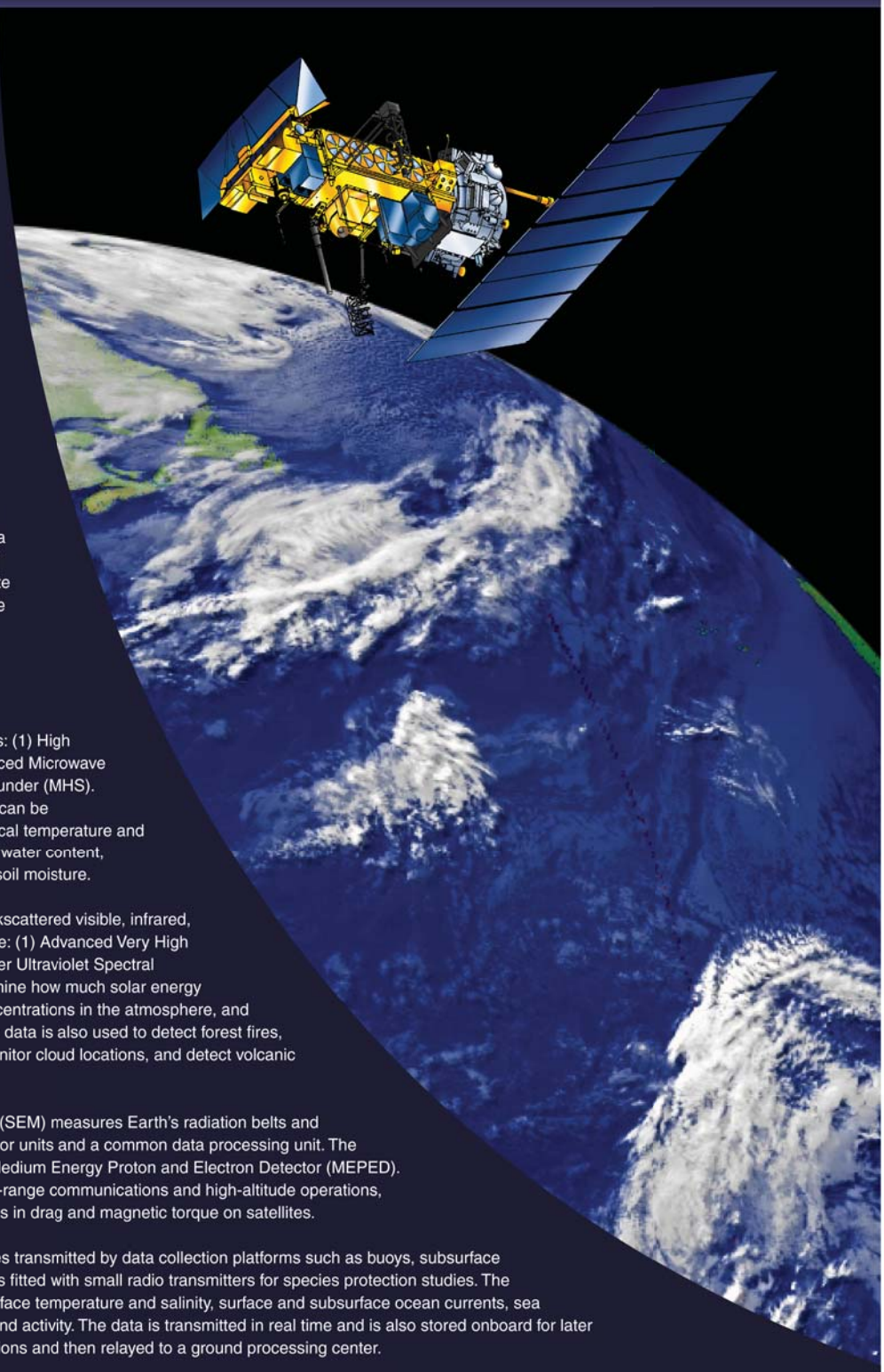
NOAA-N Prime



NOAA-N Prime is the last in the Television Infrared Observation Satellite (TIROS) series of National Oceanic and Atmospheric Administration (NOAA) satellites that observe Earth's weather and the environment. These satellites have served the nation well since 1960, when the world's first weather satellite was launched by the National Aeronautics and Space Administration (NASA). This observation system consists of a pair of polar-orbiting satellites. Every part of Earth is observed at least twice every 12 hours. The satellites provide global coverage of numerous atmospheric and surface parameters, furnishing measurements for input to global atmospheric and surface forecast models. Data from these satellites has helped scientists to more accurately and consistently predict potentially catastrophic environmental events, allowing emergency managers to activate plans to save life and property.

In addition, this continuous overlapping source of satellite data has provided the foundation for extensive climate and research programs. In many parts of the world, satellite data is the only source of quantitative information on the state of the atmosphere and of Earth's surface. This up-to-the-minute data is invaluable in forecasting weather and is critical to the safety of those in these remote areas.

To provide this vital data, NOAA-N Prime carries a suite of instruments.

Sounders: The satellite carries three sounding instruments: (1) High Resolution Infrared Radiation Sounder (HIRS/4), (2) Advanced Microwave Sounding Units (AMSU-A), and (3) Microwave Humidity Sounder (MHS). These instruments obtain measurements of (or from which can be calculated) total atmospheric ozone, the atmosphere's vertical temperature and humidity profiles, cloud height, cloud coverage, cloud liquid water content, precipitation rates, snow cover, sea ice concentration, and soil moisture.

Radiometers: Two instruments measure reflected and backscattered visible, infrared, and ultraviolet light from land, seas, clouds, and atmosphere: (1) Advanced Very High Resolution Radiometer (AVHRR/3) and (2) Solar Backscatter Ultraviolet Spectral Radiometer (SBUV/2). From this data, scientists can determine how much solar energy actually reaches the surface over the long term, ozone concentrations in the atmosphere, and the influence of "trace" constituents on the ozone layer. This data is also used to detect forest fires, measure sea surface temperatures, monitor vegetation, monitor cloud locations, and detect volcanic plumes.

Space Weather Monitor: The Space Environment Monitor (SEM) measures Earth's radiation belts and charged particles at satellite altitude. It consists of two sensor units and a common data processing unit. The sensor units are the Total Energy Detector (TED) and the Medium Energy Proton and Electron Detector (MEPED). The SEM helps to warn of solar winds that may impair long-range communications and high-altitude operations, damage satellite circuits and solar panels, or cause changes in drag and magnetic torque on satellites.

Advanced Data Collection System: Collects the messages transmitted by data collection platforms such as buoys, subsurface floats, remote weather stations, fishing vessels, and animals fitted with small radio transmitters for species protection studies. The platforms relay data such as atmospheric pressure, sea surface temperature and salinity, surface and subsurface ocean currents, sea and river levels, vessel positions, and animal temperature and activity. The data is transmitted in real time and is also stored onboard for later transmission to NOAA Command and Data Acquisition stations and then relayed to a ground processing center.

Digital Data Recorder: Records and stores selected sensor data during each orbit for later downloading to the NOAA Command and Data Acquisition stations at Wallops Island, VA, Fairbanks, AK, and the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)-controlled station in Svalbard, Norway.

The Final TIROS Mission

NOAA-N Prime

NOAA-N Prime Search and Rescue:

Like its predecessors, NOAA-N Prime is part of the international COSPAS-SARSAT Search and Rescue system. Search and Rescue instruments on NOAA-N Prime receive emergency signals transmitted from aircraft, marine vessels, or individual emergency locator transmitters and relay them to a mission control center, from which rescue efforts can be dispatched. As of August 15, 2008, over 24,500 people have been rescued worldwide since 1982, of which 5,949 were in the United States.

NOAA-N night launch, May 20, 2005

Launch:

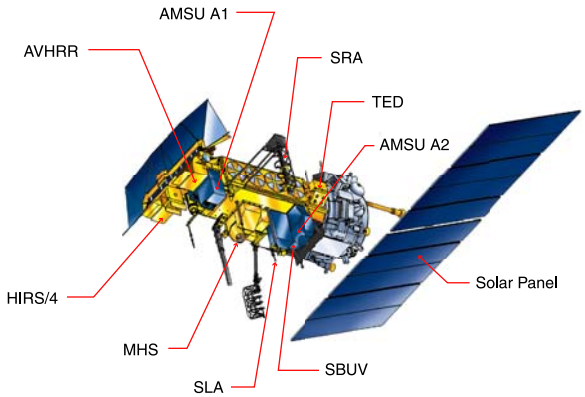
Launch Location:	Vandenberg AFB, CA
Launch Vehicle:	Delta II 7320-10
Launch Services:	NASA Kennedy Space Center through United Launch Alliance (ULA)
Planned launch date:	February 4, 2009

Orbit:

Orbit apogee altitude:	870 km (470 nmi)
Orbit Perigee altitude:	870 km (470 nmi)
Minutes per orbit:	102.14
Degrees inclination:	98.730

Spacecraft Definitions:

AMSU:	Advanced Microwave Sounding Unit
AVHRR:	Advanced Very High Resolution Radiometer
HIRS/4:	High Resolution Infrared Radiation Sounder
MHS:	Microwave Humidity Sounder
SBUV:	Solar Backscatter Ultraviolet Spectral Radiometer
SLA:	Search and Rescue Transmitting Antenna
SRA:	Search and Rescue Receiving Antenna
TED:	Total Energy Detector



NOAA and NASA Partnership:

NOAA manages and operates the Polar-orbiting Operational Environmental Satellite (POES) program, of which NOAA-N Prime is part. NOAA establishes requirements, provides funding and distributes environmental satellite data for the United States. NASA's Goddard Space Flight Center in Greenbelt, Maryland, procures and manages the acquisition of POES for NOAA.

A diverse integrated government and industry team contributes to this mission and the decades of previous Earth weather, climate, and environment monitoring satellites. International partners include France, Canada, and EUMETSAT.

NOAA and the U.S. Department of Defense are collaborating on the replacement system, dubbed the National Polar-orbiting Operational Environmental Satellite System.