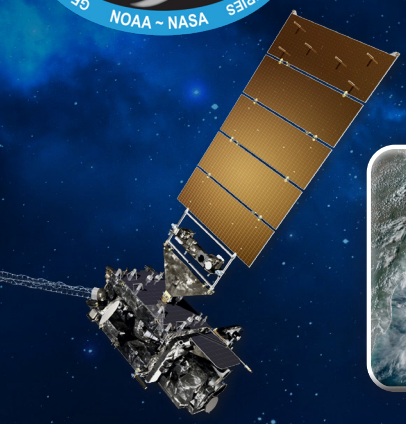
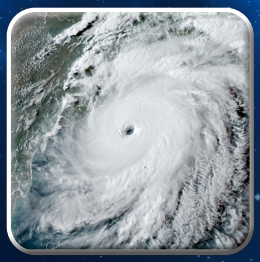
Advanced Baseline Imager

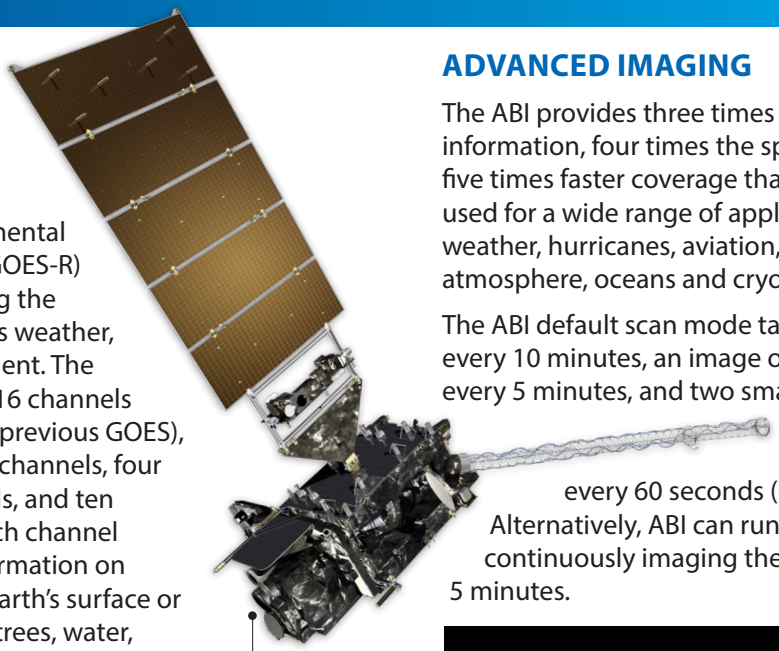
GOES-R Series





FACT SHEET

The Advanced Baseline Imager (ABI) is the primary instrument on the Geostationary Operational Environmental Satellites – R Series (GOES-R) spacecraft for imaging the Western Hemisphere's weather, oceans and environment. The ABI views Earth with 16 channels (compared to five on previous GOES), including two visible channels, four near-infrared channels, and ten infrared channels. Each channel provides specific information on various elements of Earth's surface or atmosphere, such as trees, water, clouds, moisture, and smoke.



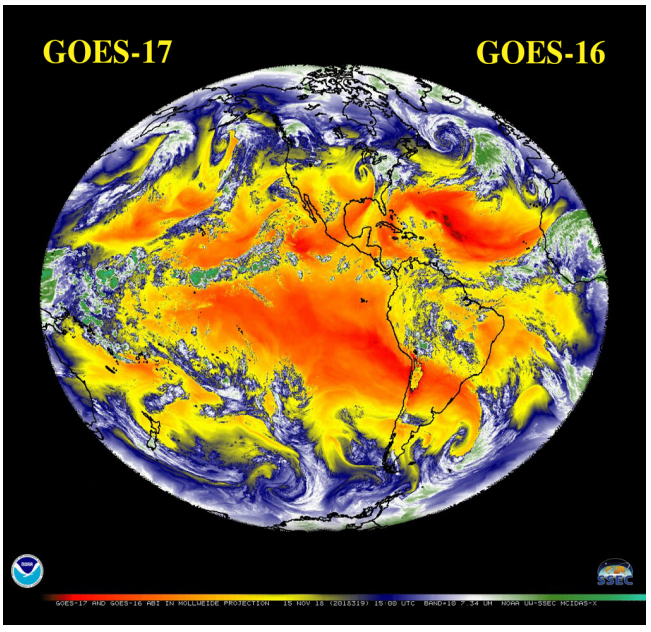
Advanced Baseline Imager (ABI)

ADVANCED IMAGING

The ABI provides three times more spectral information, four times the spatial resolution, and five times faster coverage than previous GOES. ABI is used for a wide range of applications related to severe weather, hurricanes, aviation, natural hazards, the atmosphere, oceans and cryosphere.

The ABI default scan mode takes a full disk image every 10 minutes, an image of the contiguous U.S. every 5 minutes, and two smaller, more detailed images of areas where storm activity is present, every 60 seconds (or one every 30 seconds). Alternatively, ABI can run in full disk mode, continuously imaging the full disk every 5 minutes.

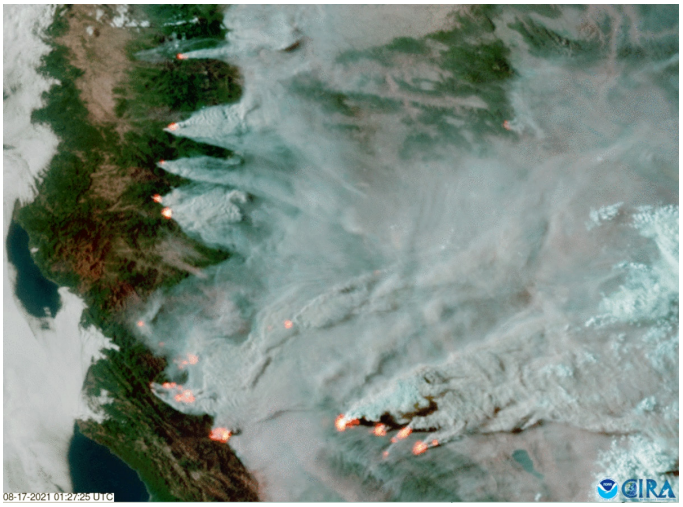
Installation of the GOES-R ABI onto the spacecraft. Credit: Lockheed Martin



This view of the Western Hemisphere combines full-disk water vapor images from GOES-16 and GOES-17 in a Mollweide map projection. Infrared water vapor imagery helps identify areas of high moisture content and precipitable water vapor in the lower to mid-levels of Earth's atmosphere. Credit: NOAA/CIMSS

WIDE-RANGING APPLICATIONS

ABI tracks and monitors cloud formation, atmospheric motion, severe storm development, land and sea surface temperatures, ocean dynamics, flow of water, fire, smoke, volcanic ash, aerosols and air quality, and vegetative health. Data from ABI helps meteorologists pinpoint and track an area of developing storms in much greater detail. Knowing how rapidly storm clouds are forming leads to earlier warnings. Better data quality and faster scan speed contribute to fewer weather-related flight delays as well as earlier preparation for tropical storms and hurricanes. ABI is also very useful for providing real-time data during radar outages or in areas where radar coverage is sparse.

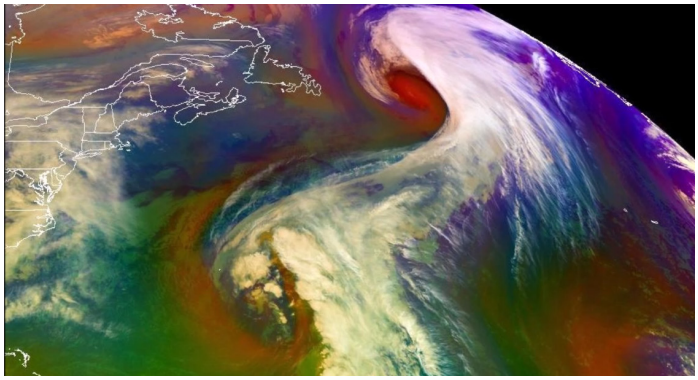


GOES-17 imagery of numerous fires burning in California on Aug. 17, 2021, combines GeoColor imagery with the fire temperature data product to highlight both the fires' hotspots and smoke plumes. Credit: NOAA/CIRA

MULTISPECTRAL IMAGERY CHANGES THE GAME

The ABI provides an extraordinary amount of data. To help meteorologists quickly discern the information they need to issue timely forecasts and warnings, scientists are working on new ways to enhance meteorological features of interest. The result is a variety of red-green-blue or "RGB" composite imagery.

RGB imagery merges information from multiple ABI channels to highlight the presence and evolution of important meteorological phenomena. When combined in a specific "recipe," a single, easy-to-interpret image results. The final product highlights atmospheric and surface features that are difficult or more time-consuming to distinguish with single-channel images alone. This "value added" imagery conveys complex environmental information from large satellite datasets to forecasters, analysts, researchers, and the public alike.



This GOES-16 air mass RGB imagery shows a pair of mid-latitude cyclones in the North Atlantic on Jan. 23, 2020. This type of imagery combines water vapor and infrared imagery and is used to monitor the evolution of cyclones and jet streaks. Credit: NOAA/CIRA

BENEFITS

By delivering a better and larger suite of weather, climate and environmental products, ABI has ushered in a new era in weather forecasting, benefitting public safety, protection of life and property, and our nation's economic health and prosperity.

- **Hurricane track and intensity forecasts**
- **Early warning of severe storms**
- **Fire detection, monitoring, and intensity estimation**
- **Monitoring of smoke and dust**
- **Data for air quality warnings and alerts**
- **Detection of low clouds and fog**
- **Data for aviation route planning and reducing weather-related flight delays**
- **Detection of heavy rainfall and flash flood risks**
- **Detection of volcanic eruptions**
- **Monitoring of ash and sulfur dioxide**
- **Sea surface temperature data for monitoring fisheries and marine life**
- **Monitoring of vegetative health**
- **Data for long-term climate variability studies**