

Natural Hazards Monitoring from the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) on NASA's Terra Spacecraft

Michael Abrams^a

^aJet Propulsion Laboratory/California Institute of Technology, Pasadena CA,
mike@lithos.jpl.nasa.gov

ABSTRACT:

The Advanced Spaceborne Thermal Emission and Reflection Radiometer, ASTER, is an international project: the instrument was supplied by Japan's Ministry of Economy Trade and Industry and is flying on NASA's Terra satellite. A joint US/Japan science team developed the science data products, and is validating instrument performance and data products. With its 14 bands, extremely high spatial resolution, and 15 meter along-track stereo capability, ASTER is the zoom lens for the other Terra instruments. The primary mission goals are to characterize the Earth's surface; and to monitor dynamic events and processes that influence habitability at human scales. ASTER was launched in December 1999, and since then has acquired over 600,000 images of the land surface. The data are first processed in Japan, then they are archived and distributed in both Japan, and in the US through the EROS Data Center Distributed Active Archive Center. Data are available as Level 1 images, geometrically and radiometrically corrected, and on-demand higher level, geophysical data products.

ASTER data are being used to monitor many types of natural hazards and disasters. Examples of applications will be shown to illustrate how the data are being used, and demonstrate the emergency processing and delivery system. As part of the Wildfire Response Team, data have been acquired for ongoing forest fires, and delivered to the US Forest Service in near real time. The USFS uses these data to locate hot spots, plan logistics of fire fighting, and assess severity of burns. Observations of volcanoes have been used to alert volcanological agencies of renewed activity; systematic study of active volcanoes are used to assess eruption state, measure SO₂, and determine fragility of domes. ASTER data are being used to look at naturally occurring and man-induced oil seeps and spills in areas such as Lake Maracaibo and off of the California coast.