National Aeronautics and Space Administration

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NASA and Japan Release Most Complete Topographic Map of Earth

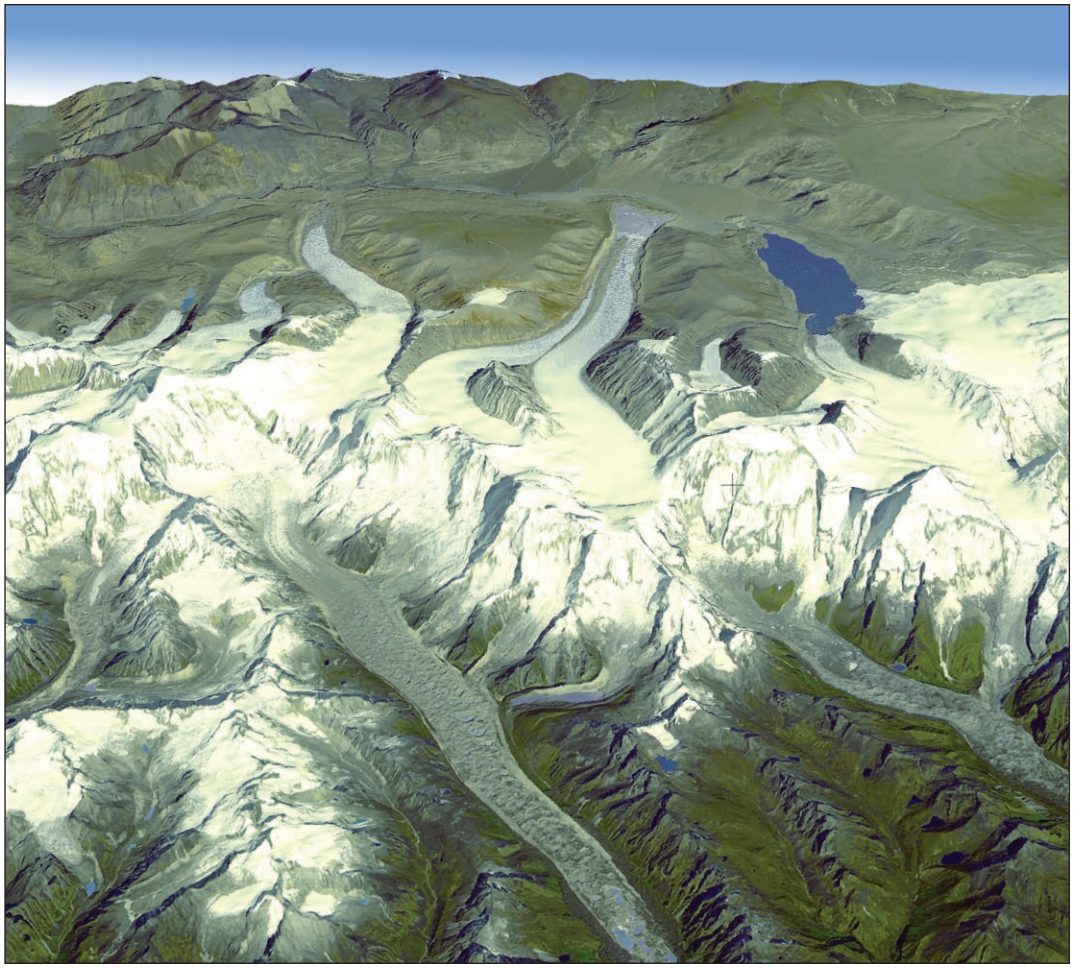
NASA and Japan released a new digital topographic map of Earth Monday that covers more of our planet than ever before. The map was produced with detailed measurements from NASA's Terra spacecraft.

The new global digital elevation model of Earth was created from nearly 1.3 million individual stereo-pair images collected by the Japanese Advanced Spaceborne Thermal Emission and Reflection Radiometer, or ASTER, instrument aboard Terra. NASA and Japan's Ministry of Economy, Trade and Industry, known as METI, developed the data set. It is available online to users everywhere at no cost.

"This is the most complete, consistent global digital elevation data yet made available to the world," said Woody Turner, ASTER program scientist at NASA Headquarters in Washington. "This unique global set of data will serve users and researchers from a wide array of disciplines that need elevation and terrain information."

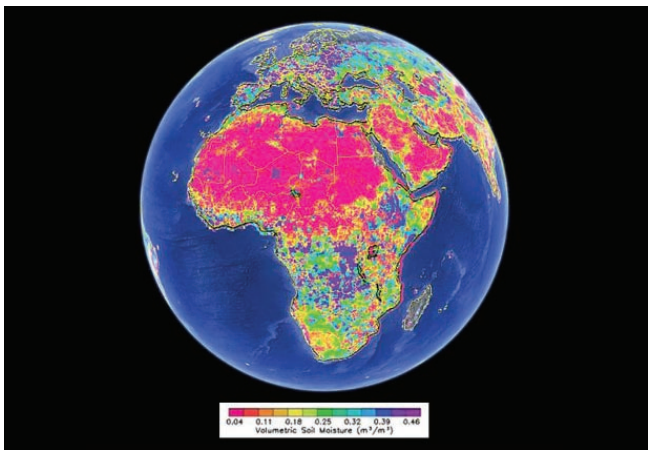
According to Mike Abrams, ASTER science team leader at NASA's Jet Propulsion Laboratory in Pasadena, Calif., the new topographic information will be of value throughout the Earth sciences and has many practical applications. "ASTER's accurate topographic data will be used for engineering, energy exploration, conserving natural resources, environmental management, public works design, firefighting, recreation, geology and city planning, to name just a few areas," Abrams said.

—Jet Propulsion Laboratory, June 29



This view of Himalayan glaciers in Bhutan, looking toward the northwest, was created by draping an ASTER simulated natural color image over digital topography from the ASTER Global Digital Elevation Model (GDEM) data set. The ASTER scene was acquired November 20, 2001. Credit: NASA

NASA Satellite to Unearth Innovation in Crop Forecasting



The AMSR-E satellite instrument captured data over Africa on April 7, 2004 from which this image of global root-zone soil moisture was produced. The data overlays a Google Earth map of the entire continent, with warmer colors of pink, orange, and yellow depicting lower levels of moisture and cooler colors of green, blue, and purple indicating higher levels of moisture in the soil. Credit: NASA and Google Earth

Soil moisture is essential for seeds to germinate and for crops to grow. But record droughts and scorching temperatures in certain parts of the globe in recent years have caused soil to dry up, crippling crop production. The falling food supply in some regions has forced prices upward, pushing staple foods out of reach for millions of poor people.

NASA researcher John Bolten, and his colleagues, are using satellite data to deliver a kind of space-based humanitarian assistance. They are cultivating the most accurate estimates of soil moisture—the main determinant of crop yield changes—and improving global forecasts of how well food will grow at a time when the world is confronting shortages.

—Goddard Space Flight Center, May 26

NASA Satellite Detects Red Glow to Map Global Ocean Plant Health

Researchers have conducted the first global analysis of the health and productivity of ocean plants, as revealed by a unique signal detected by a NASA satellite. Ocean scientists can now remotely measure the amount of fluorescent red light emitted by ocean phytoplankton and assess how efficiently the microscopic plants are turning sunlight and nutrients into food through photosynthesis. They can also study how changes in the global environment alter these processes, which are at the center of the ocean food web.

—NASA Headquarters, May 28

Satellites Guide Relief to Earthquake Victims

On May 28, 2009, at 2:24 a.m. local time, a deadly earthquake rocked Honduras, killing seven people and injuring several others, demolishing homes, damaging scores of other buildings, and sending terrified residents running through the streets.

"I woke up immediately, and all I could do was hug my youngest son and pray," says Dalia Martinez of San Pedro Sula, Honduras. Fortunately for Martinez and other shaken residents, disaster officials knew exactly where to send help. A state-of-the-art Earth observation system called SERVIR directed them to the hardest hit areas.

Meaning "to serve" in Spanish, SERVIR is a joint effort between NASA and other partners that uses satellite imagery to zero in on places where a flood, fire, hurricane, or earthquake has left destruction in its wake.

—Marshall Space Flight Center, June 25

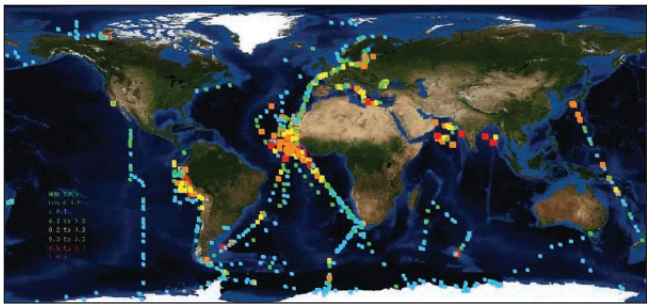
Climate Adds Fuel to Asian Wildfire Emissions

In the last decade, Asian farmers have cleared tens of thousands of square miles of forests to accommodate the world's growing demand for palm oil, an increasingly popular food ingredient. Ancient peatlands have been drained and lush tropical forests have been cut down. As a result, the landscape of equatorial Asia now lies vulnerable to fires, which are growing more frequent and having a serious impact on the air as well as the land.

A team of NASA-sponsored researchers have used satellites to make the first series of estimates of carbon dioxide (CO_2) emitted from these fires—both wildfires and fires started by people—in Malaysia, Indonesia, Borneo, and Papua New Guinea. They are now working to understand how climate influences the spread and intensity of the fires.

—Goddard Space Flight Center, April 30

Aerosol Sensors Help Fill Crucial Data Gap Over Oceans



Scientists contributing to the Maritime Aerosol Network use portable instruments to measure aerosols levels during research cruises. This map shows the trajectories of the 50 cruises conducted so far. Credit: NASA

Since NASA researchers began assembling the Aerosol Robotic Network (AERONET) in the 1990s, the worldwide network of ground-based aerosol sensors has grown to 400 sites across seven continents. The trouble is that two-thirds of the planet is covered by ocean. And aerosols—the tiny atmospheric particles that can have an outsized impact on the climate—are just as likely to be found in the air above the oceans as they are over land.

Yet aerosols are scarcely measured over the oceans. Alexander Smirnov, an AERONET project scientist at NASA's Goddard Space Flight Center, Greenbelt, Md., hopes to change that. Smirnov is leading a new effort called the Maritime Aerosol Network (MAN), which will send researchers with portable photometers on oceanographic research cruises. The handheld devices can detect the presence of aerosols in air by measuring how light scatters as it strikes the particles.

—Goddard Space Flight Center, May 25