



Land Remote Sensing

Ghana Watershed Prototype Products

Introduction/Background

A number of satellite data sets are available through the U.S. Geological Survey (USGS) for monitoring land surface features. Representative data sets include Landsat, Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER), and Shuttle Radar Topography Mission (SRTM). The Ghana Watershed Prototype Products cover an area within southern Ghana, Africa, and include examples of the aforementioned data sets along with sample SRTM derivative data sets.

Landsat Products

Landsat products include recently acquired Landsat 7 (<http://landsat.usgs.gov>) satellite data as well as data from the Tri-Decadal Global Landsat Orthorectified (http://eros.usgs.gov/products/satellite/landsat_ortho_overview.html) data collection (fig. 1).

Landsat 7 developed problems with the sensor's scan line corrector, a system designed to collect data while compensating for the forward motion of the satellite. Gaps in the resulting images were "filled" for the Ghana Watershed products by special processing using data values from previously acquired images over the area. For more information, please see the Landsat 7 SLC-off Gap-filled product description (http://landsat.usgs.gov/data_products/slc_off_data_products/l1g_products/gap-filled_l1g.php).

The Tri-Decadal Global Landsat Orthorectified data collection consists of approximately 7,500 Landsat 1–5 Multispectral Scanner (MSS) images, 7,461 Landsat 4–5 Thematic Mapper (TM) images, and approximately 8,500 Landsat 7 Enhanced Thematic Mapper Plus (ETM+) images, which were selected to provide full sets of global coverage over three time periods: circa 1975, circa 1990, and circa 2000. All selected images are either cloud-free or contain minimal cloud cover and have a high quality ranking with regard to the possible presence of errors such as missing scans or saturated bands.

Landsat MSS, TM, and ETM+ data were orthorectified by using geodetic and elevation control data to ensure positional accuracy and correct for relief displacement.

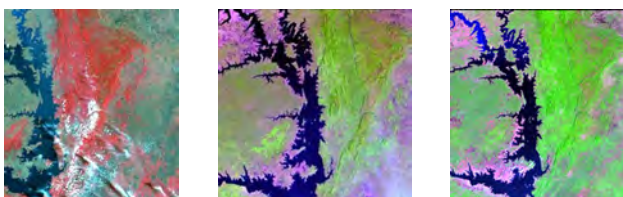


Figure 1. Tri-Decadal data for southern Ghana from 1970, 1990, and 2000.

ASTER Products

The processed ASTER radiometrically and geometrically corrected (Level-1B) product contains co-registered data for the acquired channels of the three different telescopes of unprocessed (Level-1A) data (fig. 2).

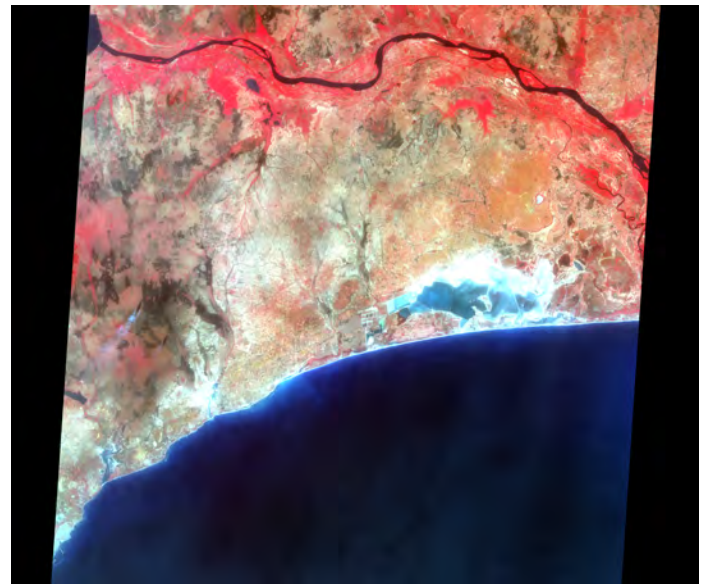


Figure 2. ASTER image of southern Ghana.

SRTM 90-Meter Products

Digital topographic data were acquired by the Shuttle Radar Topography Mission (SRTM) over 80 percent of the Earth's land surface (all land areas between 60 degrees north and 56 degrees south latitude). From that data, SRTM Digital Terrain Elevation Data (DTED) were processed to represent elevation values indexed to specific points on the ground (fig. 3).

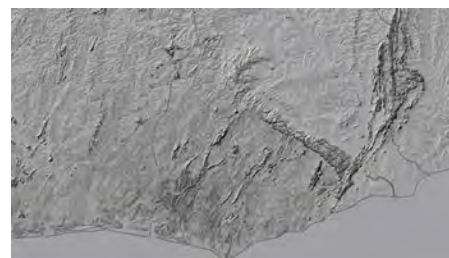
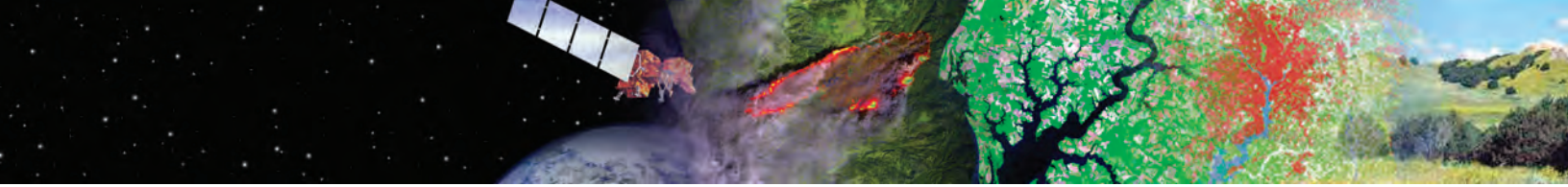


Figure 3. SRTM 90-meter data for southern Ghana.



SRTM 30-Meter Derivative Products

SRTM data at 1 arc-second (30 meters) are currently available for the United States and its territories. SRTM data at 3 arc-second (90 meters) are currently available for global coverage between 60 degrees north and 56 degrees south latitude. The

data are expressed in geographic coordinates (latitude/longitude) and are horizontally and vertically referenced to the Earth Gravitational Model 1996 (EGM96) geoid. Several 30-meter derivative products (fig. 4), made available through an arrangement with a USGS science project, are produced from the SRTM 30-meter data set.

For More Information

For additional information on Ghana Watershed Prototype Products and ordering procedures, visit <http://gisdata.usgs.gov/gwpp/>.

Landsat Products

<http://landsat.usgs.gov>
http://landsat.usgs.gov/data_products/slc_off_data_products/l1g_products/gap-filled_l1g.php

Tri-Decadal Global Landsat Orthorectified

http://eros.usgs.gov/products/satellite/landsat_ortho_overview.html

ASTER

<http://LPDAAC.usgs.gov>

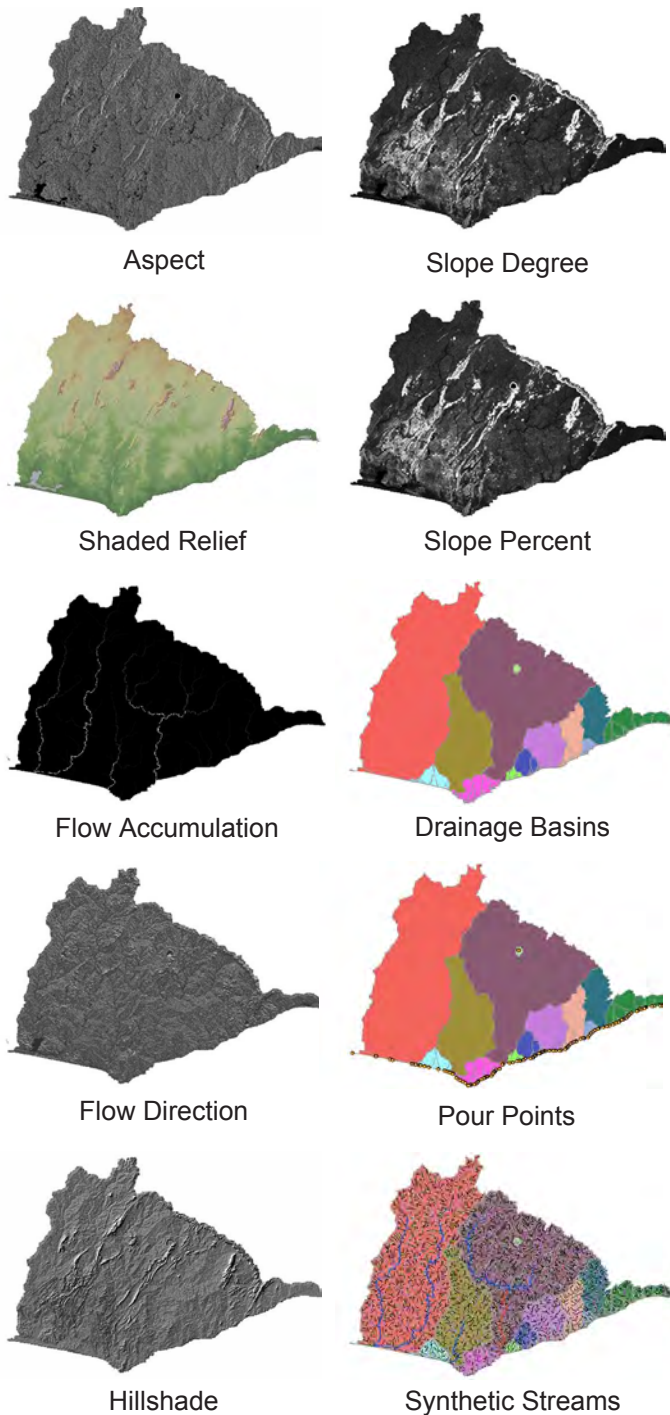


Figure 4. SRTM 30-meter derivative data for southern Ghana.

For additional information on USGS Center for Earth Resources Observation and Science (EROS) products and ordering procedures, visit <http://eros.usgs.gov/> or contact USGS EROS at:

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