

# Shuttle Radar Topography Mission (SRTM) Technical Guide

## Global Land Cover Facility

University of Maryland Institute for Advanced Computer Studies  
University of Maryland Department of Geography

### Introduction

The Shuttle Radar Topography Mission (SRTM) obtained elevation data on a near-global scale to generate the most complete high-resolution digital topographic database of Earth. SRTM consisted of a specially modified radar system that flew onboard the Space Shuttle Endeavour during an 11-day mission in February of 2000. SRTM is an international project spearheaded by the National Geospatial-Intelligence Agency (NGA) and the National Aeronautics and Space Administration (NASA).

### Data Set Overview

The Global Land Cover Facility provides SRTM data at three resolutions:

- 1 arc-second/30-meter DEM of the United States
- 3 arc-second/90-meter DEM of the world
- 30 arc-second/1km SRTM-GTOPO30 product corrected by GTOPO30 30 arc-second DEM

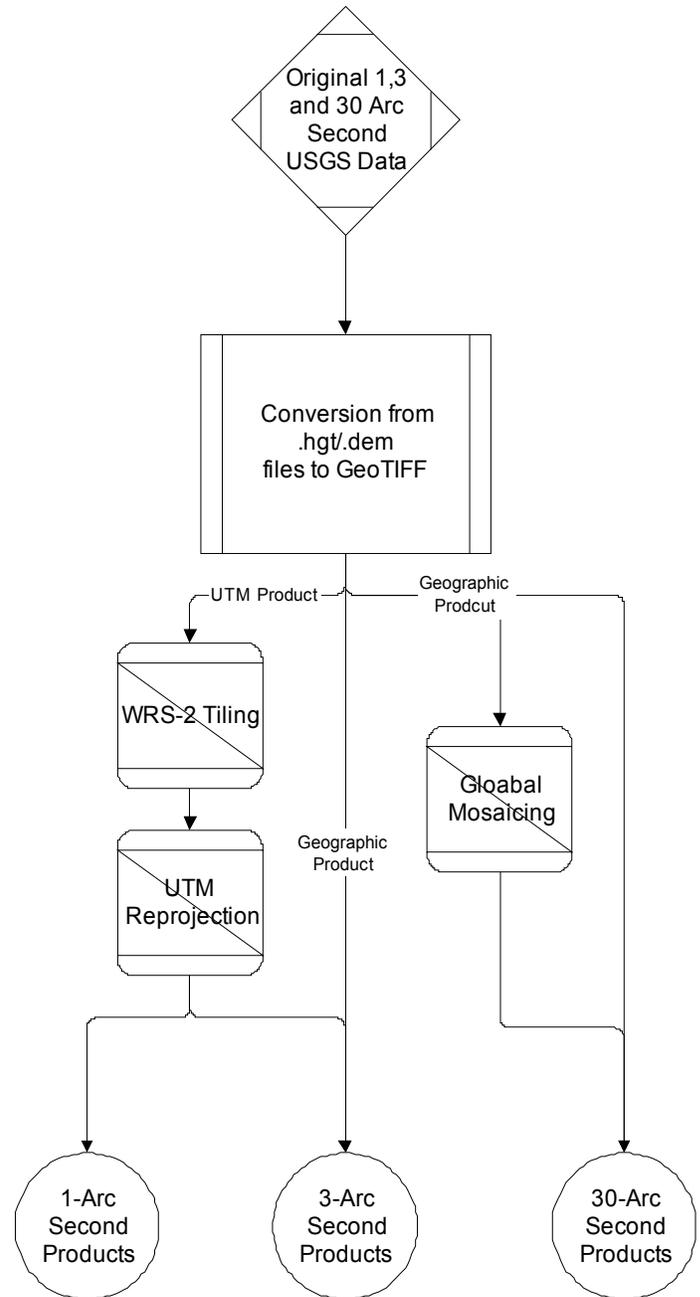
These comprise the initial edition of the SRTM data set, per the USGS standard. USGS plans to process the data to a higher level to account for missing land values and negative values in water bodies. This “finished” SRTM product is anticipated in Fall 2004, whereupon GLCF will update its holdings accordingly.

### Processing Characteristics

The Global Land Cover Facility editions of SRTM data are available in six layers (Table 1). The processing for each of the editions is diagrammed in Figure 1.

**Table 1: GLCF SRTM Editions**

Resolution	Projection	Coverage
1 arc-second/ 30-meter	Geographic	Native USGS Tiles
	UTM	WRS-2 Path/Row
3 arc-second/ 90-meter	Geographic	Native USGS Tiles
	UTM	WRS-2 Path/Row
1 Kilometer	Geographic	Native USGS Tiles
	Geographic	Global



**Figure 1: Processing Conducted for Each Edition of the GLCF SRTM Data Sets**

Per Figure 1, all editions were initially converted to GeoTIFF. The 1 and 3 arc-second editions were then made available in their native USGS format and were also tiled to the Landsat WRS-2 reference schema (and reprojected to UTM). The global 30 arc-second product was the result of mosaicing the USGS native

tiles, which are also available from GLCF. The last step in the processing will really occur in Fall 2004 when the same procedure is conducted with the “Finished” USGS product.

#### **Data Properties (Geographic Coordinates):**

All elevations are in meters referenced to the [WGS84 EGM96 geoid](#) and the horizontally georeferenced to the WGS84 ellipsoid using a geographic projection. The naming scheme is tied with the geographic coordinates of the data content. For example, the coordinates of the lower-left corner of tile N40W118.tif are 40 degrees north latitude and 118 degrees west longitude. The output GeoTIFF files for the 3 arc-second product are 1201\*1201 in size, and those of the 1 arc-second product are 3601\*3601 in size. All GeoTIFF files are 16-bit GeoTIFFs.

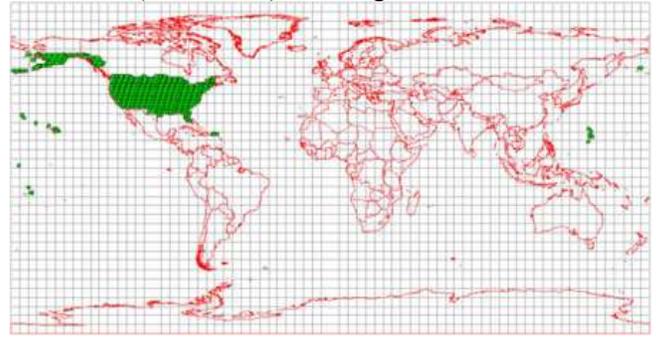
#### **Data Properties (UTM Coordinates):**

The elevation data of the UTM datasets are referenced to the WGS84 EGM96 geoid, and horizontally georeferenced to the WGS-84 ellipsoid using a UTM projection. The center longitude of each file decides which UTM zone it should be in. And the center latitude of each file decides the North/South UTM zoning. The naming scheme is tied with the WRS-2 system. For example, p15r33\_utm.tif contains the data for Path 15, Row 33 of the WRS-2 system, which is the Washington-Baltimore region. This WRS-2 conversion for SRTM data is meant to support data synthesis with the Landsat GeoCover dataset also available from the GLCF website. The GeoCover dataset is also in the WRS-2 convention, however, due to satellite mechanics, the Landsat imagery actually taken may have a shift up to 5 kilometers. Therefore, GLCF SRTM-UTM dataset was generated with a 7.5-km data-buffer around the WRS2 tile.

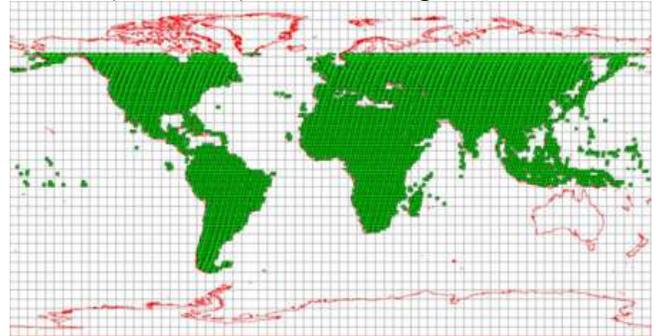
#### **Data Coverage**

The respective coverages for each of the data products is outlined in the below three diagrams (Figures 1,2,3).

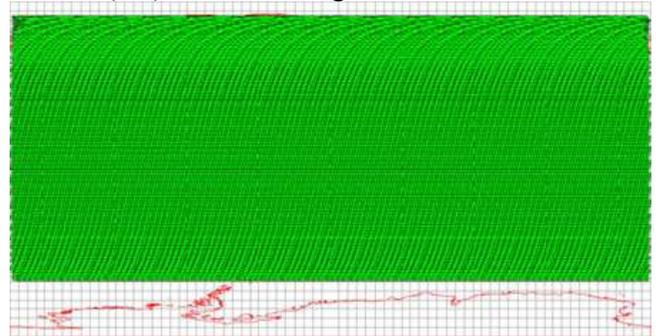
US 30-m (UTM, LL) coverage:



Global (LL, UTM) 90-m coverage:



Global (LL) 1-km coverage:



**Figures 2,3,4: GLCF SRTM Product Coverages.**

Please email [glcf@umiacs.umd.edu](mailto:glcf@umiacs.umd.edu) with all questions concerning the derived SRTM products. All questions concerning the SRTM sensor itself should be directed to the NASA SRTM project (see the below link).

#### **Primary Links**

- National Aeronautics and Space Administration Jet Propulsion Laboratory SRTM Project: <http://www2.jpl.nasa.gov/srtm/>
- United States Geological Survey SRTM Project: <http://srtm.usgs.gov/>
- Landsat 7 WRS-2 Web Site: <http://landsat.gsfc.nasa.gov/documentation/wrs.html>