

A MERGED GLOBAL DIGITAL TOPOGRAPHIC DATA SET

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In 2000 the Shuttle Radar Topography Mission (SRTM) [1] used radar interferometry to map the Earth's topography between $\pm 60^\circ$ latitude - representing 80% of the land surface. The resulting digital elevation models bettered existing topographic data sets (including restricted military data) in accuracy, areal coverage and uniformity by several orders of magnitude, and have found broad application in most of the geosciences, civil and military operations, even Google Earth. [2]

Despite their popularity the SRTM data have several limitations, including lack of coverage in polar regions and occasional small voids, or areas of no data in regions of high slope or low radar backscatter. Fortunately additional data sets have become available that, although lacking SRTM's data quality, are sufficient to mitigate many of these limitations. Primary among these is the Global Digital Elevation Model (GDEM) produced from ASTER stereo pairs.

NASA'S MEASURES ([Making Earth Science Data Records for Use in Research Environments](#)) program is sponsoring an effort to merge these sets to produce and distribute an improved collection of data records that will optimize the topographic data, as well as make available additional non-topographic data products from the SRTM mission. [3] There are four main areas of effort:

- A systematic program to combine SRTM elevation data with those from other sensors, principally GDEM but also including SPOT stereo, the USGS's National Elevation Data Set and others, to fill voids in the DEMs according to a prioritized plan, as well as extend the coverage beyond the current 60° latitude limit.
- Combine the topographic data records with ICESat laser altimeter topography profiles to produce and distribute data records with enhanced ground control.
- Document the existing SRTM radar image and ancillary data records, as well as generate image mosaics at multiple scales and distribute them via the world wide web.
- Generate, document and distribute a standard and representative set of SRTM raw radar echo data, along with the appropriate ancillary tracking and pointing data necessary to process the echoes into DEMS using improved algorithms or techniques.

In addition, a number of new data types have been identified for distribution based on the SRTM data set:

- A correlation data product will be generate and distributed, allowing the derivation of biomass measurements through various radar scattering models.
- Height accuracy data will be distributed based on the Terrain Height Error Data (THED) data files generate dunder a proprietary agreement between NASA and the NGA.
- The SRTM Water Body Data (SWBD), currently available only as vector shapefiles, will be rasterized and distributed through standard channels

REFERENCES

- [1] Farr, T. G., et al, "The Shuttle Radar Topography Mission," *Reviews of Geophysics*, 45, RG2004, 2007.
- [2] Kobrick, M., "On the Toes of Giants – How SRTM Was Born," *Photogrammetric Engineering and Remote Sensing*, pp. 206-210, 2006.
- [3] Kobrick, M., Farr, T., and Crippen, R., "Optimized Global Digital Elevation Data Records," *Fall AGU Meeting*, abstract IN41B-01, 2009.