

ARSET

Applied Remote Sensing Training

<http://arset.gsfc.nasa.gov>




@NASAARSET

Shuttle Radar Topography Mission (SRTM) Data Access and Application

Outline

- Overview of SRTM Data
- SRTM Data Access Using Global Data Explorer (GDEx) and Consultative Group for International Agricultural Research (CGIAR)
- Hands-on Activity: SRTM Data Download and Import into QGIS

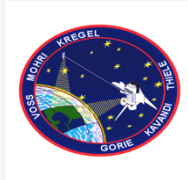
An aerial photograph of a lush, green forested landscape with a winding river. A semi-transparent white rectangular box is overlaid on the center of the image, containing text. The text is in a clean, sans-serif font. A horizontal line is positioned below the title. The background image shows various geographical features like rivers, trails, and small settlements, with some labels visible around the edges of the white box.

Overview of SRTM

Courtesy of:
Cynthia Schmidt, Kyle Peterson (NASA-ARSET);
Lindsey Harriman, Kelly Lemig (USGS)

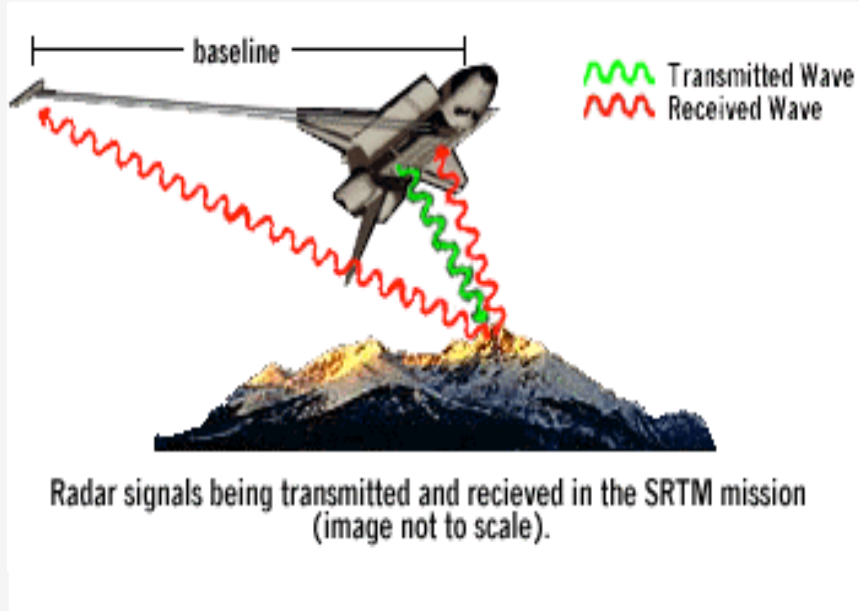
What is SRTM?

- A radar mission, carried by NASA Space Shuttle Endeavour, completed Feb 2000
- Consisted of 176 orbits around Earth in 11 days
- Acquired Digital Elevation Model (DEM) of all land between 60°N and 56°S latitude, ~80% of Earth's total land mass



- Useful for mapping hazardous terrain
- Calculates:
 - Slope & aspect
 - Catchment area
 - Forest canopy height
- Models:
 - Runoff
 - Stream networks
 - Landslides


NASA SRTM Version 3.0 (SRTM Plus)



- Eliminated voids in SRTM data by filling with:
 - ASTER GDEM2
 - USGS GMTED2010
 - USGS National Elevation Dataset (NED)
- Collected at 1 arc second; resampled to 3 arc seconds
- Nov 2013: U.S. territories 1 arc sec, global 3 arc sec
- Oct 2014: Africa 1 arc sec

<http://srtm.usgs.gov/data/interferometry.php>

SRTM v3 Data Product

Tile size		1° by 1°	New version released in 2014 has high resolution
Pixel size	1 arc second (~30 meters) 3 arc seconds (~90 meters)		
Geographic coordinates	Geographic latitude and longitude		
Output format	DEMS: .HGT, 16-bit signed integer, in units of vertical meters Number: .NUM		
Geoid reference	WGS84/EGM96		
Special DN values	N/A - No voids in v3		
Coverage	60°N to 56°S latitude U.S. and Territories Africa		

How to Access SRTM v3 Terrain data

- Reverb

- <http://reverb.echo.nasa.gov/reverb>

- GDEx

- <http://gdex.cr.usgs.gov/gdex>

- CGIAR-CSI

- <http://srtm.csi.cgiar.org>

Interactive Data Access Tools

- Data Pool and DAAC2Disk

- https://lpdaac.usgs.gov/data_access/data_pool

- More information: SRTM v3 User Guide

- https://lpdaac.usgs.gov/sites/default/files/public/measures/docs/NASA_SRTM_V3.pdf

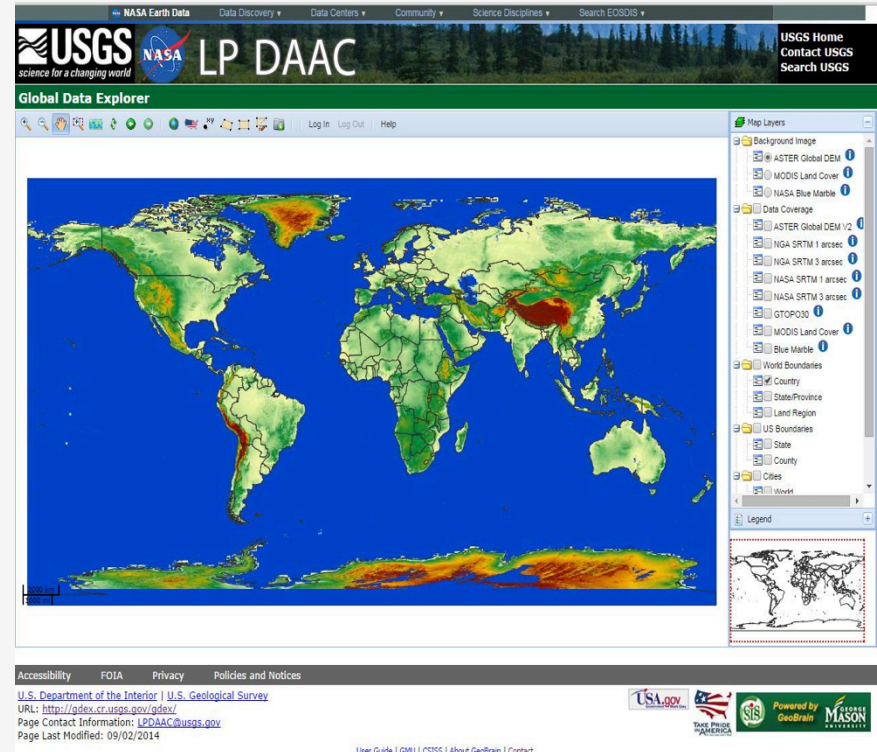
The background is an aerial photograph of a lush, green forested area with a winding river. Overlaid on this is a semi-transparent map of a region, likely in Brazil, showing various towns and geographical features. The map overlay is centered and covers most of the image. The title text is positioned in the center of the map overlay.

SRTM Data Access Using Global Data Explorer (GDEx)

GDEx

<http://gdex.cr.usgs.gov/gdex>

- A seamless data viewer providing access to multiple sources of digital elevation data sets
- Users can subset and download data by area of interest in multiple formats and projections



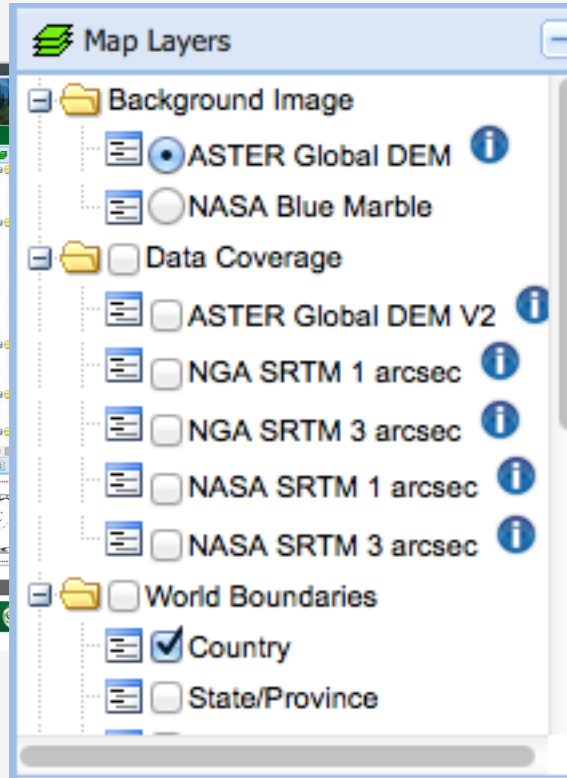
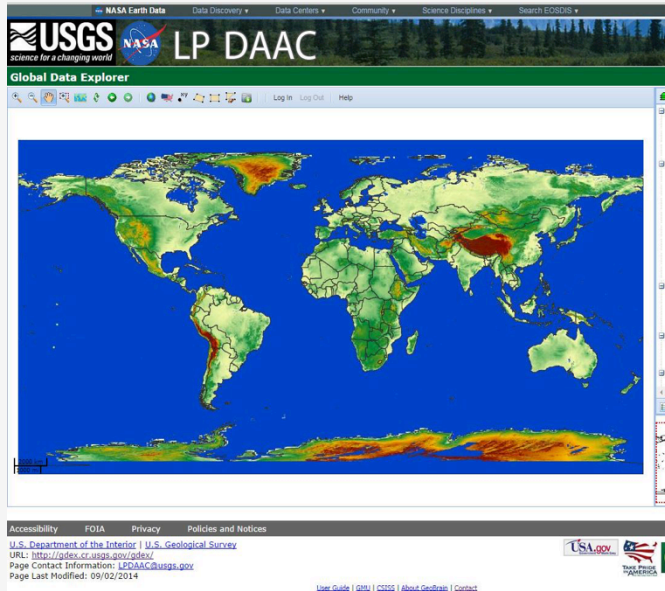
Data can be previewed before download

GDEx

<http://gdex.cr.usgs.gov/gdex>

- NASA ECHO/Reverb user account required to download data – can register through GDEx
- Square or polygonal area of interest
- Pre-defined areas of interest (state, country)
 - Advanced, on-the-fly processing
 - Mosaic tile coverage clipped to area of interest
 - Reformat to GeoTIFF, ArcASCII, or JPEG
 - Universal transverse Mercator (UTM) or LAT/LON projection

GDEx: SRTM Data Access



- ← • Base Layer
- ← • SRTM data (Void-filled)

GDEx: SRTM Data Selection

• Zoom

• Define region of interest by bounding box, by state, country, or lat/lon)

• Refresh

• Download

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USA.gov

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CGIAR-CSI

http://csi.cgiar.org/WhtisCGIAR_CSI.asp

Consultative Group for International Agricultural Research/Consortium of Spatial Information

SRTM Data
(90 m)



The CGIAR Consortium for Spatial Information (CGIAR-CSI)

Applying GeoSpatial Science for a Sustainable Future...

CGIAR-CSI HOME

Home > What is CGIAR-CSI ?

What is CGIAR-CSI ?

The fifteen CGIAR International Research Centers have pioneered the application of Geographic Information Systems (GIS) and Remote Sensing (RS) for sustainable agricultural development for more than a decade. In May 1999, they formed the Consortium for Spatial Information (CGIAR-CSI) which links the all of the CGIAR's GIS/RS laboratories, and the many geospatial scientists and researchers within the CGIAR system, with scientists and institutions from around the world. Together, these laboratories, scientists and researchers constitute a formidable assemblage of technical ingenuity, scientific expertise, and practical experience in spatial analysis.

They have already developed important collections of data on population, poverty, climate, soils, crops, livestock, transportation, and biodiversity and other geospatial Global Public Goods. The CGIAR-CSI researchers are continuing to break new ground in the integration of biophysical and socio-economic data to better target agricultural technologies and resources to farmers' needs, to assess global needs, develop strategies to alleviate poverty, and to better adapt to a changing global environment.

These powerful spatial technologies have become an integral part of interdisciplinary research within the CGIAR. Through linking geo-referenced data to digital maps, a whole new range of opportunities for integrating and presenting diverse information has opened to a diverse set of users to harness these technologies. Users can more readily see and understand interrelationships between, for example, urban and rural areas, markets, crop production, deforestation, and soil erosion.

They can develop more realistic models, and identify and monitor change more accurately. Ultimately, the improved understanding of the landscape strengthens strategies and activities in natural resource management, agricultural development, land change analysis, biodiversity conservation, and ecological studies.

CGIAR-CSI Content

- What's New ?
- What is CGIAR-CSI ?
- CGIAR-CSI Members
- CGIAR-CSI Geonetwork Nodes
- Geonetwork Support
- GeoLinks-Directory
- CGIAR GeoSpatial Sites and Web Map Servers
- GeoSpatial Toolkit
- SRTM 90m DATABASE
- CRU Climate DATABASE
- Global PET / Aridity DATABASE
- MENRIS Portal

csi.cgiar.org/Members.asp

CGIAR-CSI: SRTM Data Access

Click to select
and download
data



The CGIAR Consortium for Spatial Information (CGIAR-CSI)

Applying GeoSpatial Science
for a Sustainable Future...

CGIAR-CSI HOME ■ SRTM 90m DATABASE HOME ■ DISCLAIMER ■ HELP

CGIAR-CSI Content

- What is CGIAR-CSI ?
- CGIAR-CSI Members
- What's New ?
- CRU Climate Data

SRTM Content

- **SRTM Data Search and Download**
- SRTM Data Processing Methodology
- SRTM FAQ
- SRTM Quality Assessment (PDF File - 2.55 Mb)
- About SRTM Imagery
- CIAT Landuse Project
- How to Search for Data?
- Disclaimer
- Contact Us

SRTM 90m Digital Elevation Data



new Resampled SRTM data to 250m resolutions for the entire globe are available <https://hc.box.net/shared/fyidaheouv> (Password: ThanksCSII)

UPDATE - VERSION 4: THE SRTM DATA NOW AVAILABLE FROM THIS SITE HAS BEEN UPGRADED TO VERSION 4. THIS LATEST VERSION REPRESENTS A SIGNIFICANT IMPROVEMENT FROM PREVIOUS VERSIONS, USING NEW INTERPOLATION ALGORITHMS AND BETTER AUXILIARY DEMs. WE ARE CONFIDENT THIS IS NOW THE HIGHEST QUALITY SRTM DATASET AVAILABLE

CGIAR-CSI

CGIAR

CGIAR

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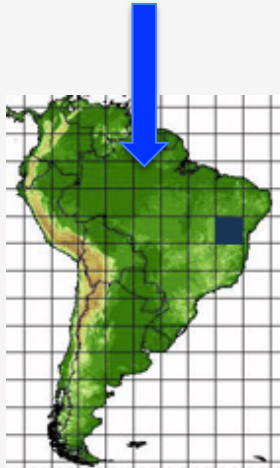
il

CGIAR-CSI: SRTM Data Selection

Spatial selection by
lat-lon



or by clicking on the
grid



SRTM Data Selection Options

Chinese users : [中国用户可通过中国科学院镜像站点下载](#)

1. Select Server: ☒ CGIAR-CSI (USA) ☐ HarvestChoice (USA) ☐ JRC (IT) ☐ King's College (UK) ☐ TerraScience (USA)

2. Data selection method: ☒ Multiple Selection ☐ Enable Mouse Drag ☐ Input Coordinates

Many tiles can be selected at random locations. These selected tiles are listed in the results page for download.

☐ Decimal Degrees (ie 34.5, -100.5) ☒ Degrees: Minutes: Seconds (ie 34 30 00 N, 100 30 00 W)

Longitude - min: max: Longitude - min: East max: East

Latitude - min: max: Latitude - min: North max: North

Longitude: 100.00 Latitude: 100.0 Tile X: 10 Tile Y: 10

3. Select File Format: ☒ GeoTiff ☐ ArcInfo ASCII

CGIAR-CSI: SRTM Data Download

1 Items have been Found.

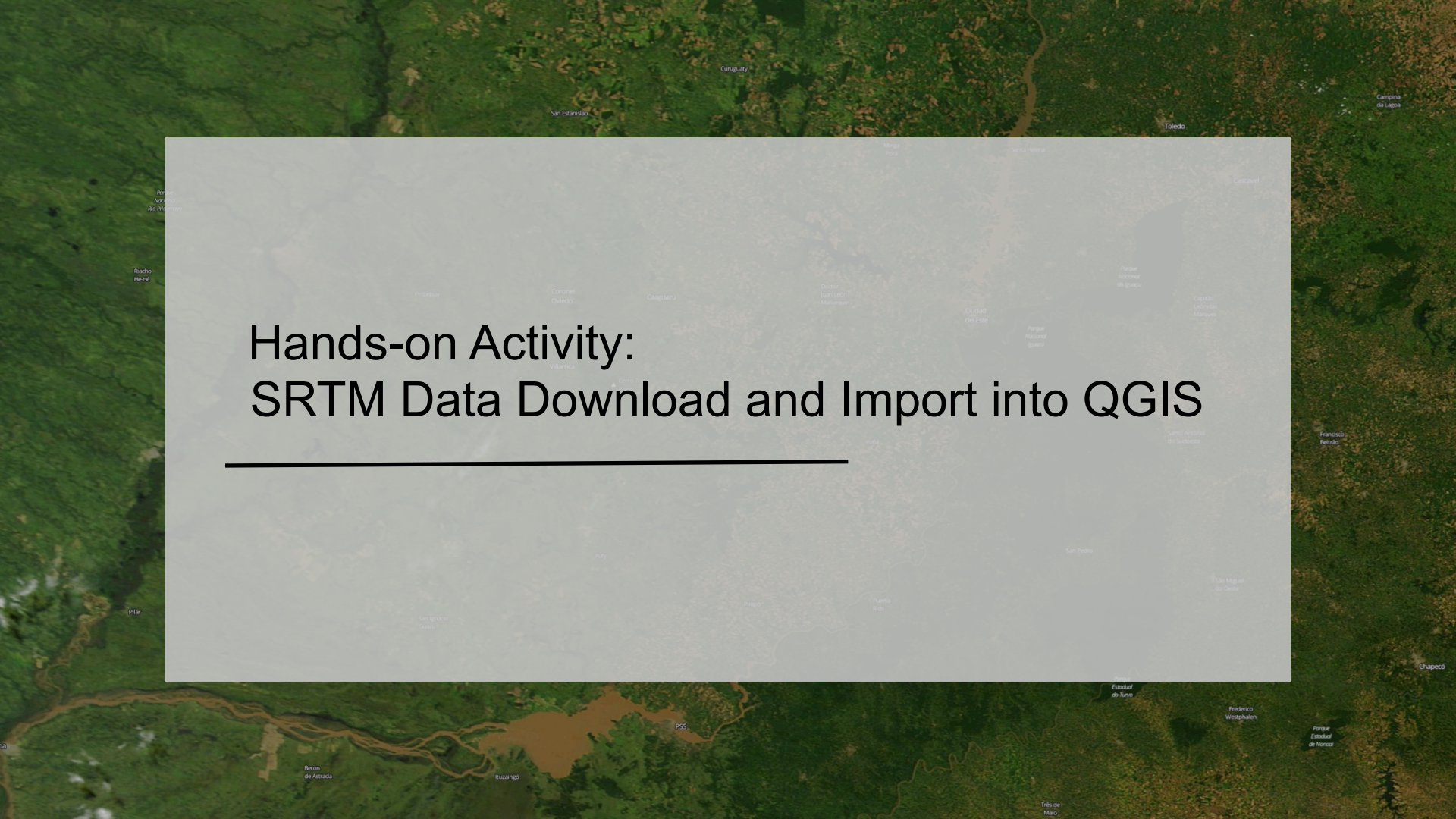
Description	Location	Image
<p>Product : SRTM 90m DEM version 4</p> <p>Data File Name : srtm_28_15.zip</p> <p>Mask File Name: srtm_mk_28_15.zip</p> <p>Latitude min: 15 S max: 10 S</p> <p>Longitude min: 45 W max: 40 W</p> <p>Center point : Latitude 12.50 S Longitude 42.50 W</p>		

Click Server :  Data Download (FTP)  Data Download (HTTP)  Data Mask Download (FTP)  Data Mask Download (HTTP) [^TOP^](#)

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Image

- Download options
- Digital elevation data can be downloaded as GeoTIFF

An aerial photograph of a lush green forested area with a brown river winding through it. A semi-transparent map overlay is centered on the image, showing a network of roads and geographical features. The map overlay is a light gray color, allowing the underlying landscape to be visible. The text 'Hands-on Activity: SRTM Data Download and Import into QGIS' is written in a large, black, sans-serif font across the center of the map overlay. A horizontal black line is positioned below the text.

Hands-on Activity: SRTM Data Download and Import into QGIS
