ARSET
Applied Remote Sensing Training

http://arset.gsfc.nasa.gov

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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

Overview of SRTM

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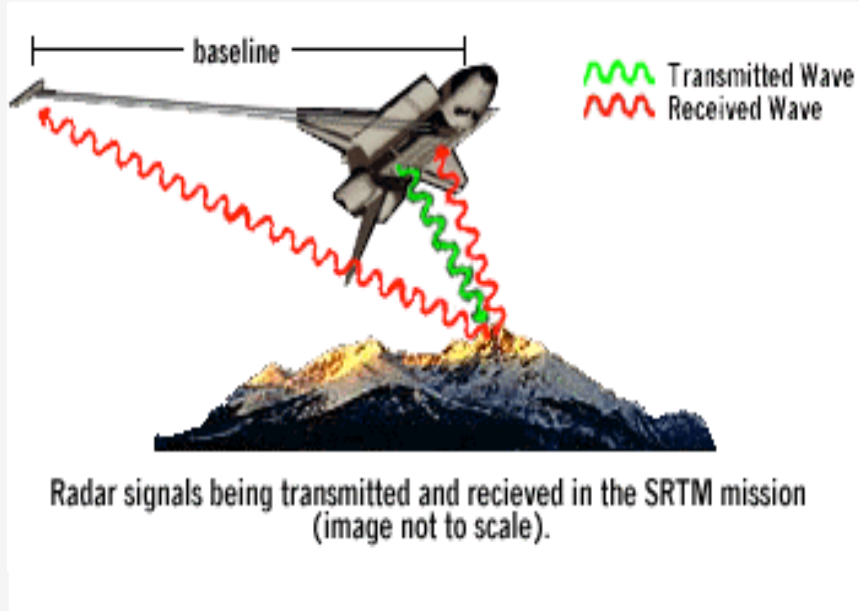Lindsey Harriman, Kelly Lemig (USGS)

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
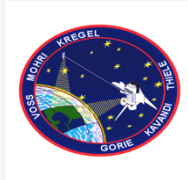
- Useful for mapping hazardous terrain

- Calculates:
  - Slope & aspect
  - Catchment area
  - Forest canopy height

- Models:
  - Runoff
  - Stream networks
  - Landslides

NASA SRTM Version 3.0 (SRTM Plus)

Radar signals being transmitted and recieved in the SRTM mission (image not to scale).

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

- 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

SRTM v3 Data Product

Tile size	1° by 1°	
Pixel size	1 arc second (~30 meters) 3 arc seconds (~90 meters)	New version released in 2014 has high resolution
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

Interactive Data Access Tools

- CGIAR-CSI
  - http://srtm.csi.cgiar.org

- 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

SRTM Data Access Using Global Data Explorer (GDEx)

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
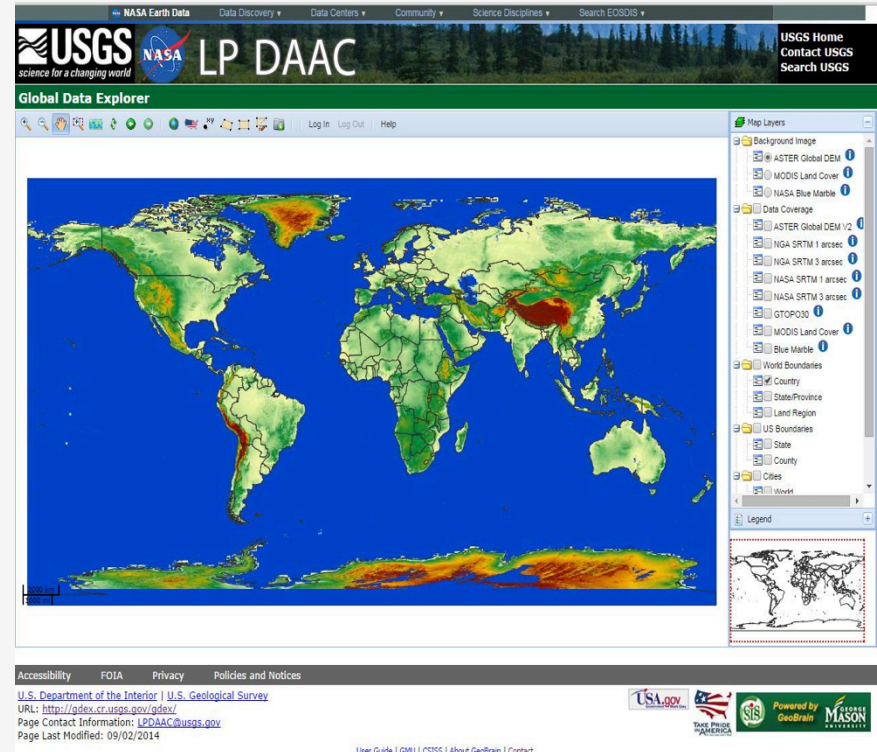
Data can be previewed before download

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
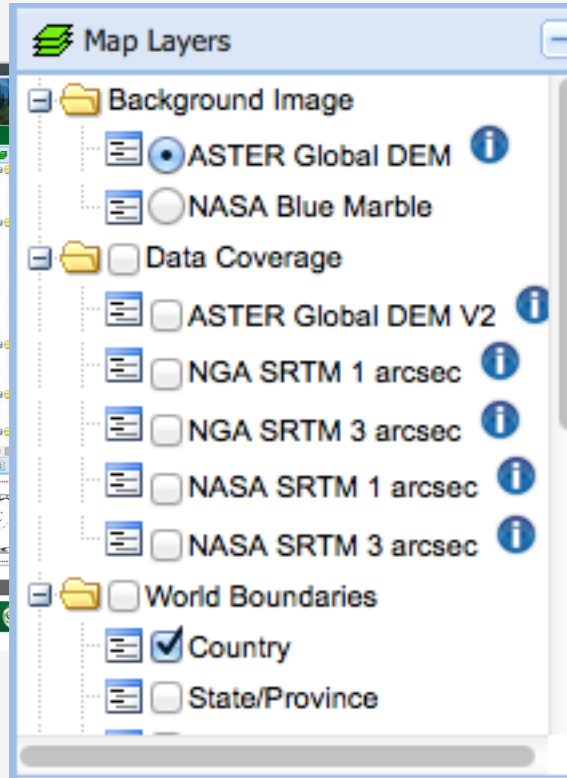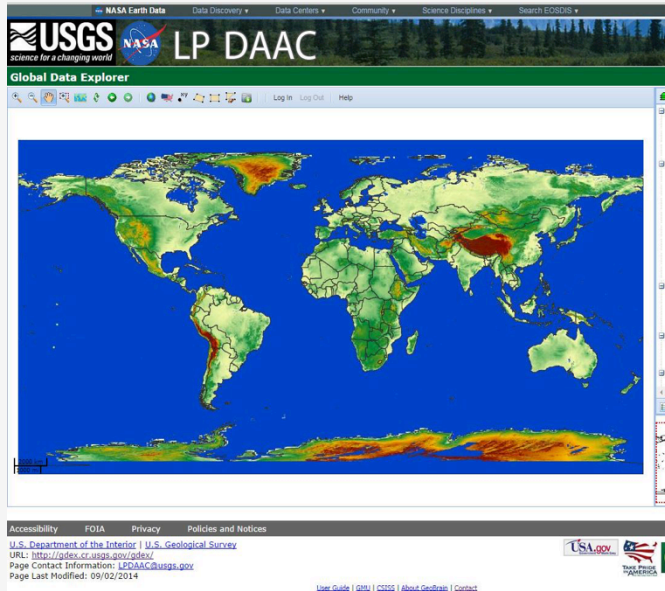
- Base Layer

- SRTM data (Void-filled)

GDEx: SRTM Data Selection

- Zoom

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

- Refresh

- Download

CGIAR-CSI

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

Consultative Group for International Agricultural Research/Consortium of Spatial Information

SRTM Data
(90 m)

CGIAR-CSI: SRTM Data Access

Click to select and download data

CGIAR-CSI: SRTM Data Selection

Spatial selection by lat-lon

or by clicking on the grid

CGIAR-CSI: SRTM Data Download

1 Items have been Found.

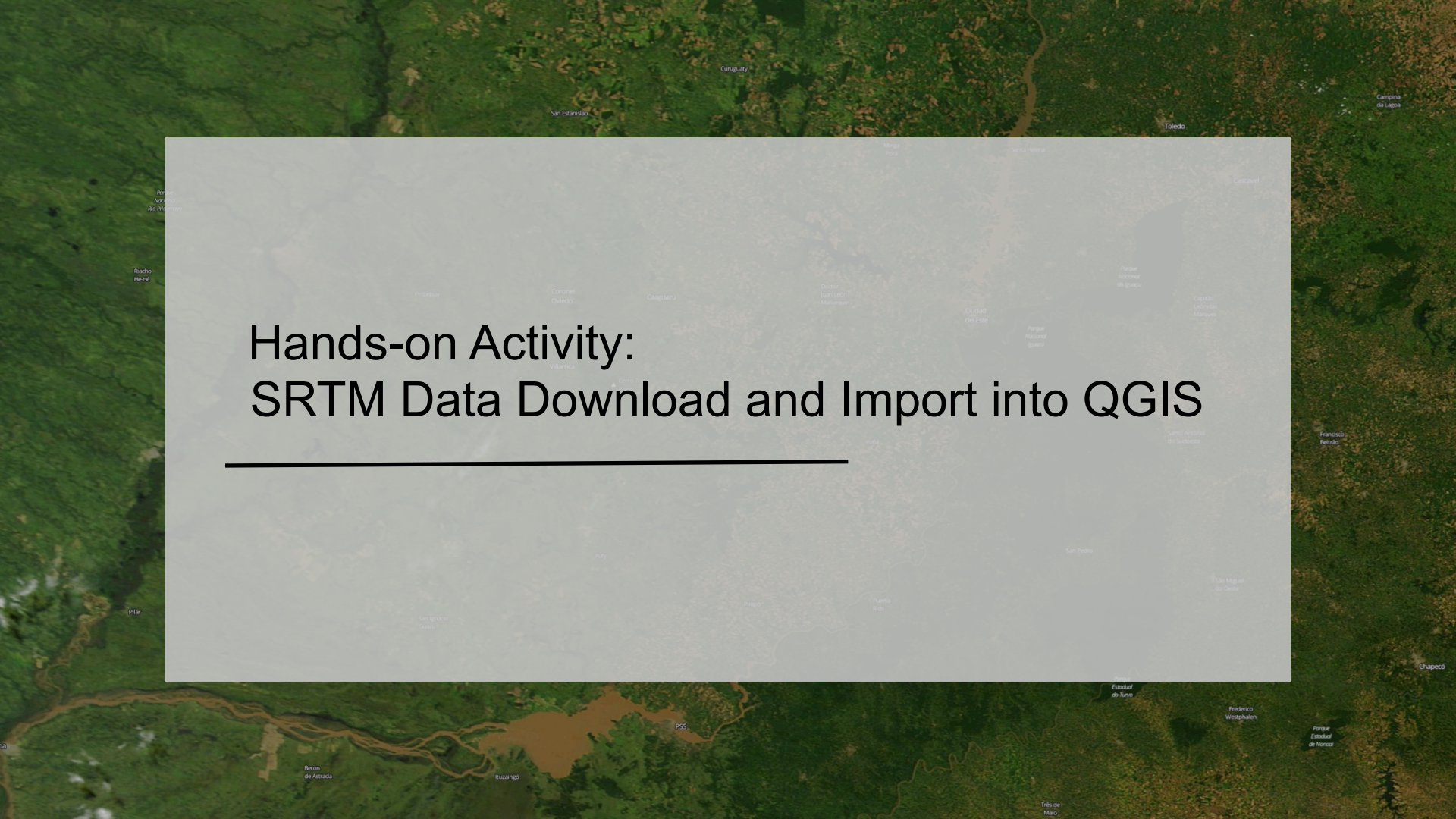| Description	Location	Image
Product : SRTM 90m DEM version 4 **Data File Name :** srtm_28_15.zip **Mask File Name:** srtm_mk_28_15.zip **Latitude min:** 15 S **max:** 10 S **Longitude min:** 45 W **max:** 40 W **Center point :** Latitude 12.50 S Longitude 42.50 W		

Our 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

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