

Environment and organisms - Task #207

Produce global fused DEM layer

04/14/2011 11:50 AM - Jim Regetz

Status:	In Progress	Start date:	04/11/2011
Priority:	Normal	Due date:	05/31/2011
Assignee:	Natalie Robinson	% Done:	100%
Category:	Terrain	Estimated time:	180.00 hours
Target version:			
Activity type:	Other		
Description			
This is the top-level ticket associated with creation of a global fused DEM layer, with subtasks to flesh out specific component issues and activities. Also see the Terrain wiki page for standing links and general notes.			
Product specs			
<ul style="list-style-type: none">• Resolution: 1 km<ul style="list-style-type: none">◦ <i>Note that we may require finer resolution DEM (up to 90m) to produce derived terrain layers</i>• Extent: Global to +/- 83 degrees latitude• Format: Probably BIL, but we can easily translate as needed• CRS: WGS84 geographic (EPSG:4326)• Also include detailed FGDC metadata			
Proposed sources			
<ul style="list-style-type: none">• SRTM 90m where available (56 deg S to 60 deg N)• ASTER elsewhere• Existing work on fused DEMs?			
Anticipated issues			
<ul style="list-style-type: none">• Getting the smoothing right at the SRTM/ASTER boundary• Dealing with e.g. missing pixels and other quality control issues in the fused layer			
Related issues:			
Related to Task #212: Validate fused DEM at SRTM/ASTER boundary	Closed	04/19/2011	06/15/2011
Blocks Task #209: Produce global slope layer	New	04/14/2011	05/31/2011
Blocks Task #210: Produce global aspect layer	New	04/14/2011	05/31/2011
Blocks Task #211: Produce global flow accumulation layer	New	04/14/2011	05/31/2011

History

#1 - 04/20/2011 09:43 AM - Rick Reeves

I have downloaded the complete set (872 files) of CGIAR / SRTM 90 meter data tiles and most if not all (2780) available ASTER GDEM 30 meter files onto Jupiter. After creating a set of small (~ 12 - 16 map tiles) terrain map mosaics at 90 meter and 1 kilometer spatial resolutions, I have launched the first 'production scale' script that will create a terrain map mosaic of the continental United States at 1 kilometer resolution, comprised entirely of CGIAR SRTM data.

#2 - 04/20/2011 09:47 AM - Jim Regetz

- Due date set to 05/31/2011

- Status changed from New to In Progress

- Start date set to 04/11/2011

#3 - 04/20/2011 02:10 PM - Rick Reeves

(continuing from previous update)

Digital Terrain File data sources:

CGIAR / SRTM 90 meter Digital Elevation Database Ver 4.1 obtained from the 'bulk download' and interactive links on this page:

<http://www.cgiar-csi.org/data/elevation/item/45-srtm-90m-digital-elevation-database-v41>

The 'bulk' download ZIP file contained 872 image tiles, in separate ZIP files; each ZIP file containing one tile in ESRI .ASC (ASCII) format. All the ZIP files require a total of 14.1 GB disk space.

I converted the ASC images to GeoTiff format using the command:

```
gdal_translate -ot Int16 -of GTiff $iName $iNewName
```

The 872 GeoTIFF images require 60 GB disk space, which is approximately one-third the amount required by the unzipped .ASC files.

Note: At least one of the bulk download files was defective (srtm_25_13.zip), and I replaced it by ordering from the GoogleMaps interface found on the above link. Note that individual tile downloads are available as GeoTIFF OR ASC format.

ASTER Global Digital Elevation Model (GDEM): from NASA WIST Portal:

<https://wist.echo.nasa.gov/api/> (account required to download data)

I intended to download complete ASTER GDEM coverage for the Northern Hemisphere North of 60 degrees Latitude. To do so, I submitted approximately eight 'Lat/Long' bounding box search requests, which together covered the Northern Hemisphere. Over the next 24 hours I received emails with links to the search results on the WIST server.

I downloaded 2779 .ZIP format image files; the zip files consume 155 GB of disk storage. Each Zip file contains two GeoTIFF format images: the Terrain Elevation file (.dem) and the Quality Assessment file (.num) - and an XML format statistics summary (.aux). The .dem and .num files are of equal size, and each (2779 member) set consumes 70 GB of disk space.

Creating fused terrain (mosaic) images:

After acquiring the required input data, I have begun to assemble fused mosaics containing multiple input data tiles. I have created Unix shell scripts based

upon the GDAL utility program 'gdalwarp'. This is a powerful utility with many command options that specify input and output file characteristics. Refer to: http://www.gdal.org/gdal_utilities.html for detailed command summaries of gdalwarp, gdal_translate, and other utilities.

The gdalwarp command line used to create initial image mosaics

```
gdalwarp -of GTiff -ot Int16 -r near -tr .0090436 .0090436 -srcnodata -9999 -dstnodata -9999 \ <list of input and output files.....>
```

```
gdalwarp -of GTiff -ot Float32 -r bilinear -tr .0090436 .0090436 -srcnodata -9999 -dstnodata -9999 \ <list of input and output files.....>
```

Note that since both SRTM and ASTER data sets use geographic coordinate space, there is no need to specify projection parameters for either data set.

Note on output image pixel size: The ASTER GDEM data has a pixel size of 30 meters (or 0.000277777777778 degrees); the SRTM GDEM data has a pixel size of 90 meters (or 0.000833333333333 degrees). I am creating the initial output mosaics with one kilometer pixels, using a pixel size of .009043 degrees, based on the calculations

at the site: <http://www.digitalmobilemap.com/index.php?slug=latitude-and-longitude-getting-started> - which has a good discussion of the topic.

Using these calculations, I obtain slightly different pixel sizes for 30 and 90 meters:

30 meters: .00027131
90 meters: .00081393

....different from the values in the incoming data.

We need to select a 'standard' pixel size for the 90 meter and 1 kilometer output data layers.

To date, I have created two mosaics: A small test area covering the interface between the ASTER and SRTM data in central Canada (90 meter resolution), and an 'SRTM-only' mosaic covering the Western Hemisphere (North and South America) at 1 kilometer resolution. Next will be a more extensive ASTER/SRTM mosaic, at 1 kilometer resolution.

#4 - 04/20/2011 03:48 PM - Jim Regetz

Thanks Rick. Regarding pixel sizes (cell resolution), what we've been calling "1km" is just shorthand for 30 arcseconds. So for the unprojected (geographic) data layers that will ultimately be produced under this project, this means cell resolutions of 30/(60*60), or 0.000833333333333. Similarly the "30m" ASTER product is really 1 arcsecond (0.000277777... degrees), and the "90m" SRTM product is really 3 arcsecond (0.000833333... degrees).

That said, I don't think you should be generating resampled 1km rasters (fused or otherwise) yet, particular as I thought we were leaning toward producing the derived terrain layers (slope, aspect, etc) at 90m (3 arcseconds), and then aggregating. This means the DEM fusion has to happen at 90m, not 1km, and moreover validation and further post-processing should happen at the finer resolution too -- unless, I suppose, you can definitively show that artifacts and e.g. boundary anomalies evident at that resolution "disappear" when scaling up, not only for the DEM itself but also for all

derived terrain layers.

#5 - 04/20/2011 04:05 PM - Jim Regetz

Also, when you're simply combining tiles, you can get big efficiency gains by using the VRT format with GDAL, rather than using gdalwarp to combine the separate tif tiles into a big merged tif. For example, this builds a VRT file that "combines" all SRTM tiles in the working directory (assuming consistent naming):

```
gdalbuildVRT srtm_merged.vrt srtm_*.tif
```

This can yield two big benefits. First, this VRT file really just stores info **about** the input tiles and **how** they should be combined. It's a "lazy" format, which means it doesn't actually do the merging until it needs to (i.e., until you try to use it at some later point). So this way we don't have to store a large amount of what is essentially duplicated data (unmerged tiles and merged raster). Then you can still use other GDAL commands on this vrt file as though it were the real combined raster, including e.g. producing a GeoTIFF that really does contain all the data:

```
gdal_translate -of GTiff -ot Int16 srtm_merged.vrt srtm_merged.tif
```

The second benefit is that, in my experience, this can be **considerably** faster than using gdalwarp.

#6 - 04/21/2011 10:59 AM - Rick Reeves

I see your point re: cell resolution, if we stay in the realm of arc-seconds. Yes, we are in agreement about producing the derived layers from 90 m data and then aggregating. We wouldn't want to use the fused 1 KM DEM layer for the derived layer calculations. And the VRT format will be useful for creating the derived layers.

#7 - 04/27/2011 10:14 PM - Rick Reeves

- Activity type changed from Coding/analysis to Other

The first set of ASTER GDEM data search results for the Northern Hemisphere that I downloaded using the NASA WIST data portal:

(<https://wist.echo.nasa.gov/~wist/api/imswelcome/>)

did not include data tiles for parts of Alaska, Canada, Greenland, and Iceland. For example, I received no ASTER data for portions of the region bounded by -136 to -90 deg West longitude, 64 to 74 deg North latitude.

The reason may be that the WIST search sessions failed to locate suitable data sets before 'timing out' at the specified 2 clock-hours. The initial search areas were quite large (10 - 15 degrees in longitude, 8 degrees latitude).

Today I submitted four WIST searches that are more tightly focused on the missing areas, and with a 600 minute time limit:

-136 to -90 deg West longitude, 64 to 74 deg North latitude. (Arctic Canada)

-90 to -10 deg West longitude, 58 to 83 deg North latitude. (Greenland)

-166 to -146 deg West longitude, 58 to 62 deg North latitude. (South Alaska)

I should have the search results on Thursday morning, and will report them here.

I have also noticed gaps in the ASTER coverage for the North Eastern Hemisphere; on Thursday I will review these gaps and submit new searches for the missing area.

It is possible that ASTER GDEM data does not completely cover the Northern Hemisphere; if so we will need to discuss the best alternative(s) for providing terrain coverage for the 'gap' areas.

#8 - 04/27/2011 10:42 PM - Rick Reeves

- File ReevesSpatialSoftwareStack.txt added

Mark, Jim, and I met today to review progress on the tasks related to Fused Terrain Layer construction and to discuss our participation in the biweekly progress report call with the IPLANT scientists/Terrain Analysis team.

During the meeting, we discussed computer resource requirements, and Mark asked me to list the software tools that I have been using to work with the digital terrain data sets and plan for construction of the fused terrain layer and related products.

I have attached the list..

#9 - 04/28/2011 04:33 PM - Mark Schildhauer

I have moved the "ReevesSpatialSoftwareStack.txt" file to the "Documents" section of Redmine, where it will be more obvious and accessible than buried within this Issue. Please make future edits/additions to the file under the new document structure in the Documents section. Rick-- could you remove it from here so that we don't get mixed up about which is the current version. Thanks!

#10 - 05/06/2011 08:55 AM - Rick Reeves

Here, for the team's comment and feedback, is my proposed plan for producing the global Fused 1 Km Terrain layer.

Comprehensive Plan: Develop Global Fused 1 Km Terrain Layer

Delivery Date: June 3, 2011

Step one: Acquire incoming DEM Data Files

CGIAR / SRTM

ASTER GDEM

CANADA DEM (boundary edge issue resolution and verification)

Inventory of files: Determine completeness of global coverage / determine 'no coverage' areas
comprehensive file list / GIS display

Status: 95% complete for Western Hemisphere

Step Two: Initial Data Review and exploration

Objectives:

Gain experience with all DEM data types used in project AND software tools

Develop, test, refine batch jobs that use GDAL tools for processing large

numbers of DEM files into image mosaics

Focus: British Columbia / 60 Degree North Latitude mosaic boundary

Observe and measure magnitude of boundary artifact

Evaluate Quality Assurance validation methods: Example: ASTER GDEM '.num' files

Report results to project scientists

Status: 95% complete

Step Three: Production planning

Objective: Organize large volume of DEM mosaic development task into manageable, monitor reproducible segments

Subdivide global study area into four quadrants

Proposed (based on experience in Steps One and Two):

Western Hemisphere North and South

North America pilot study area: develop/evaluate/test Derived Data Product production

Eastern Hemisphere North and South

Create Image Mosaic production Batch Job that uses GDAL commands to generate DEM mosaic images

Includes 'standard set' of GDAL / gdalwarp command parameters used for production of all four quadrants

Command parameters will be adapted in response to lessons learned, production changes.

Create one batch job per production quadrant + North America 'pilot study' area - including appropriate DEM tile file names.

Status: 10% complete

Step Four: Production Pilot using North America 'pilot region'.

Objective: Create fused DEM terrain layer AND subset of Derived Data Products

Proposed: Slope, Aspect, Terrain Wetness Index *** (Suggestions from scientists desired)

Develop derived data product production scripts

Identify and resolve fused artifacts in DEM terrain layer that affect quality of derived data products

Evaluate Disk Storage and CPU requirement issues in anticipation of Production (Step Five)

Generate North America DEM 1 KM terrain layer

Generate 90 meter (3 arcsecond) terrain layer

Generate selected derived data products

*** Work with Jim R, Mark, and scientific team members to refine methods for generating derived product

s

***** Baseline/Starting Point: AML Scripts and methods created by Dr. Gallant and Ming

Develop, test, document Quality Assurance validation methods

Candidate 'collateral data': ASTER GDEM .num files

Continue to monitor and record production time parameters

Distribute pilot study data files to project scientists for evaluation
Incorporate their comments and results into adapted production process

Status: Not begun

Step Five: Production of complete Fused 1 Km Terrain Layer

Objective: Produce the complete global data set by promised deadline

In sequence, execute the production batch jobs, monitor and evaluate results, adjust process as necessary
Provide examples to project scientists for evaluation and testing

Status: Not begun

Notice: The 'implementation details' of this plan will be encapsulated into the directory file structure,
file lists for the global quadrants, and batch job commands.

Looking forward to timely discussion and implementation of this plan

--Rick

#11 - 05/09/2011 05:20 PM - Rick Reeves

- File NasaAsterListNorthOf58.txt added

- File NasaAsterListNorthOf58.txt added

- File MissingAsterFilesNorthOf58.txt added

Using a subset of the ASTER 'master tile list' (supplied by Bob Crippen at JPL) containing only the image tile file names for Latitude ≥ 58 degrees North ASTER GDEM2 file list, and listing of the names of ASTER GDEM1 image tiles downloaded to date, I used Unix 'diff' command to get the names of the 'missing' ASTER image tiles that we still need to download.

Summary: 646 'missing' Aster image tiles North of 58 Degrees North Latitude still need to be obtained (if available).

How I calculated this number:

- 1) Converted the Word document-format ASTER GDEM2 file list to a unix-compatible text file.
- 2) used the unix 'sort' command to confirm that records in this list were already sorted in order of increasing Latitude and Longitude.
- 3) Opened the result of 2) using the vi text editor.
- 4) Used text substitution to convert the file name strings to match the naming convention used in the file containing the downloaded ASTER files.
- 5) Filtered the NASA file list to include ONLY files for latitudes north of 58 degrees.(inclusive).
- 6) Accumulated a list of ALL ASTER GDEM1 files downloaded to /Jupiter server
- 7) Created a SORTED list of UNIQUE downloaded ASTER file names (Ming and I had downloaded 821 of the same files).
- 8) I used vi text substitution to make the file names in the 'downloaded' and 'NASA' lists identical.
- 9) Filtered the sorted unique ASTER file list to include ONLY files for latitudes north of 58 degrees (inclusive).

```
wc -l NasaAsterListNorthOf58.txt  
5298 NasaAsterListNorthOf58.txt
```

```
wc -l uniqueSortedNorthHemiAsterFileRootsNorthOf58.txt  
4652 uniqueSortedNorthHemiAsterFileRootsNorthOf58.txt 646 less than NASA list.
```

- 10) Used Unix 'diff' command to identify ASTER files 'missing' from the download; e.g, files that do not appear in the NASA sorted list, and write them to an output file.

```
diff uniqueSortedNorthHemiAsterFileRootsNorthOf58.txt NasaAsterListNorthOf58.txt |  
grep ">" > MissingAsterFilesNorthOf58.txt
```

```
wc -l MissingAsterFilesNorthOf58.txt  
646 MissingAsterFilesNorthOf58.txt
```

MissingAsterFilesNorthOf58.txt: These are the files that we still need to acquire

Next step: Acquire the missing files from either the WIST or Japanese
ASTER data portal, or determine the reason that these files are not obtainable.

#12 - 05/13/2011 10:56 AM - Rick Reeves

Here is an example of the workflows that generate fused digital terrain data layers
for one of the four Earth 'quadrants' (Northwest,Southwest,Northeast,Southeast)

Workflow consists of three shell scripts. Each script consists of one 'gdalwarp' command and a collection of image files (.tif or .IMG). Here are the scripts, residing on /Jupiter:

```
/data/project/organisms/rcr/OutProducts/WestHemi/NorthWest/
```

- 1) mosaicNwHemiAster30ArcSecBL.sh - generates mosaic of ASTER GDEM tiles, Northwest Quadrant
- 2) mosaicNwHemiCgiar30ArcSecBL.sh - " " CGIAR SRTM " "
- 3) mosaicNwHemiAsterCgiar30ArcSecBL.sh - makes Northwest quadrant mosaic from 1), 2) results

The core of the script is the gdalwarp command. Here is an example from 3)

```
gdalwarp -of HFA -ot Int16 -te -168.5 15.0 -24.5 85.0 -ts 17280 8400 -r bilinear -srcnodata -9999 -dstnodata -9999 \
```

Flags:

-of HFA : Specify .img output file format. the most generic file format that supports image sizes > 2 GB (needed for our large mosaic sizes)

-ot Int16 : Output word size signed 16 bit - supports elevation values -10000 - 10000 meters

-te '-168.5 15.0 -24.5 85.0': Specify the bounding coordinates of the grid into which all of the input image 'tiles' will be resampled.

-ts 17280 8400: number of columns (X) and rows (Y) in the output grid: In combination with the grid definition (-te), determines the size of image pixels (in this case, 30 arcsecond @ 3600 arc seconds in one degree):

Columns (X):

```
-168.5 - (-24.5) = 144 degrees  
144 degrees / 17280 = 0.00833333 degree pixel size (30 arcseconds or ~ 90 meters)
```

Rows (Y):

```
85 - 15 = 70 degrees  
70 / 8400 = 0.08333333 degree pixel size
```

-r bilinear: select bilinear resampling

-srcnodata -9999 -dstnodata -9999 : specify values for 'no data' in the input and output images

To execute the workflow: run scripts 1) through 3) sequentially.

File format note: The Tif file format only supports maximum image size of 2 GB (some platforms support 4 GB). Our image mosaics will exceed this limit, so we will use .IMG format for the mosaiced images.

5/13 Note: Due to system load, I have not yet re-tested this workflow since changing to the .img format. I will, ASAP. But this workflow has been successfully tested using .tif files, so it is a good example of the workflows to be used.
5/13 Note: I will most likely be replacing scripts 1) and 2) with virtual image tables, created using the GDAL 'gdalbuildvrt' utility. Using VRTs to represent the sub-mosaics is more efficient as it eliminates the need for physical sub-mosaic files.

I am currently testing the VRT approach to make sure that it will work with the large mosaic file sizes encountered here.

#13 - 05/17/2011 10:47 AM - Rick Reeves

- Priority changed from High to Normal

- % Done changed from 20 to 0

- Estimated time set to 24.00 h

Today I received an email from Rob G regarding progress on data layer construction; among the items in the email was a question about our plans to include FGDC metadata in the data layer. This of course was no surprise to me; but it does remind me that we need to begin assembling a list of attributes that these layers must incorporate. So my response to Rob included in inquiry: has the group assembled such a list?

If they have not, I should begin to assemble one and begin implementing it in the terrain layers soon to be produced.

I can include the complete text of Rob's letter (and my reply) if desired.

#14 - 05/20/2011 04:45 PM - Rick Reeves

- % Done changed from 0 to 10

Progress during week of 5/16:

- 1) Located and downloaded most if not all ASTER GDEM data tiles for Northern Hemisphere
- 2) On Vulcan server, established file directories and transferred CDEM, ASTER, and SRTM

files so that production can begin on that machine. Transferred

- 3) When we resolve the issue: Which SRTM version to use, I will generate the fused data

data layer for the Southern Hemisphere (which uses SRTM data only)

#15 - 06/08/2011 05:41 PM - Rick Reeves

- % Done changed from 10 to 70

- Estimated time changed from 24.00 h to 180.00 h

Steps:

- 1) Identify base DEM data sources
- 2) Define regions for which each base data type are required
- 3) Download base data files from selected sources
 - 3a) Verify that downloaded file groups contain all of the files requested
 - 3b) Re-order missing files from same or alternate data portal as necessary

- 4) Preprocess base data files- One or more of these steps may be required:

-Extract from compressed archive format (e.g., Zip files)

-Convert the files obtained into a different file format (e.g., from GeoTiff format ESRI ASCII Grid format). Reason to do this: To retain a single format within the collection of the same data type (e.g., ASTER GDEM)

-Repair image file 'header' (metadata) damage

- 5) Create an appropriate file folder hierarchy to contain the source and resultant data products. Aggregate all same-type DEM files obtained from different sources (e.g, ASTER GDEM) into a single file folder within the hierarchy.

- 6) Validate that coverage is complete; e.g., that the collection of data file 'tiles' completely covers the study area (e.g., all global land masses north of 60 Deg South Latitude). Alternative methods are:

-Compare the collection of file (names) in each data folder with 'master' list obtained from data source.

-Create a (low-resolution or virtual) mosaic containing all the data and view the mosaic(s) using GIS software.

- 7) Correct any gaps or deficiencies in the source data by repeating (parts of) steps 3) through 5) until complete and error-free coverage of entire study area by each base data layer exists.

8) Back up the complete set of base data layers on a DEDICATED backup tape. Reason: To make it fast and easy for Systems Administrator (or you) to restore all (or, more importantly, PART of) the base data set to your computer system.

The following entry for this task ([#207](#)) describes the application of these steps to the IPlant project fused terrain layer data set.

#16 - 06/29/2011 07:30 PM - Rick Reeves

When creating the ASTER GDEM image mosaics for the northeastern hemisphere, I noticed that the (sub) mosaics extended beyond the longitude boundaries implied by the set of ASTER image tiles selected for the mosaic. This is easy to spot; the mosaic included a large area of solid grey, with a single 1 degree ASTER image tile embedded in the grey area (usually at the outer boundary).

Note that the dimensions and boundaries of these mosaics are defined by the aggregate dimensions of the ASTER GDEM tiles included in the .vrt file for the mosaic.

I checked the file list used to construct the .vrt for the 'oversized' mosaic; the latitude/longitude coordinates embedded within each filename were consistent with the intended mosaic boundaries.

Then, I checked the **actual** boundaries of each GDEM tile using gdalinfo. I discovered that five GDEM files actually covered areas (based on internal metadata) DIFFERENT than the areas implied by the file names:

Examples of the mismatch:

ASTGTM_N60E076_dem.tif ACTUALLY covers area centered on 91.5 long, 64.5 lat
ASTGTM_N61E075_dem.tif ACTUALLY covers area centered on 97.5 long, 65.5 lat
ASTGTM_N80E080_dem.tif ACTUALLY covers area centered on 91.5 long, 81.5 lat

This situation appears to occur in ASTER images for other parts of the Eastern Hemisphere; this problem delayed me in creating the baseline and derived data layer products that I had promised by June 4.

I need to determine which of the two ASTER data portals (NASA or JAPAN) supplied the erroneous ASTER files. If I can isolate the problem to one portal, then it will be easy to identify and replace the defective images with 'clean' images from the error-free repository. However, if BOTH data portals contain incorrectly tagged data tiles, then we will have to add an additional two steps to the mosaic production process: 1) obtain the image metadata for each tile with gdalinfo utility. 2) review the metadata for all ASTER images, 3) identify 'mistagged' ASTER images 4) replace the images, if possible with correct image tiles.

It is possible that no replacements are available for the mistagged files, and that the mosaics will contain some gaps.

Next step: Attempt to fix these problems within my two test mosaic areas.

#17 - 07/01/2011 11:06 AM - Rick Reeves

- % Done changed from 70 to 90

I downloaded these tiles, which were mislabeled/defective in the previous (May) delivery:

ASTGTM_N60E076_dem.tif
ASTGTM_N60E079_dem.tif

ASTGTM_N61E073_dem.tif
ASTGTM_N61E075_dem.tif
ASTGTM_N80E080_dem.tif

from the ASTER Japan AND WIST portals.

All tiles from BOTH portals are error-free.

I can not positively trace the mislabeled tiles to either one of the portals; I surmise that the defective tiles were replaced sometime between late May and now.

Note: I am reviewing the large Eastern Asia mosaic component, which appears to include may defective and/or 'misplaced' tiles. So I expect to make more replacements.

#18 - 07/01/2011 12:20 PM - Rick Reeves

Reviewing the 'NorthWestEast' ASTER GDEM component of the terrain mosaic, I encountered one more mislabeled tile:

ASTGTM_N63E061_dem.tif

I replaced it with a 'correct' version from ASTER Japan portal, and recreated the image mosaic.

#19 - 07/05/2011 11:55 AM - Rick Reeves

When I inspected the ASTER GDEM component of the North Eastern Hemisphere mosaic component, I detected a series of defects in the image corresponding to a series of ASTER image tiles. These appear as square or rectangular discontinuities extending throughout the lower half of the image.

Reviewing the metadata for the tiles corresponding to the 'dropout' locations, I note that many of them have location metadata that does not match the locations in the filenames. Others have correct metadata, but do not match their surroundings.

To resolve it, I downloaded ~130 replacement files from the Aster Japan portal. These are stored on /jupiter in the folder /data/organisms\rcr\ReplaceDefectiveTilesJuly2011/AsterDataJuly4.

I copied the replacement files to /home/reeves/EandO/asterGdem AFTER I copied the files being replaced to the (vulcan) subfolder ./IncorrectTilesJuly2011/repalcedJuly4.

Am re-running the mosaic building script, will review the modified image when it is done.

#20 - 04/24/2012 12:54 PM - Jim Regetz

- Assignee changed from Rick Reeves to Natalie Robinson

#21 - 05/16/2012 12:01 PM - Natalie Robinson

A global 90m product is now available, though the individual pieces have not been mosaiced together due to file size. Metadata that is correct for end-use distribution has not yet been prepared.

Persisting issues:

- Data were not pre-processed other than to shift the grids (SRTM and ASTER GDEM2) to align properly. No smoothing has been performed, and we are working on figuring out how to do this.
- Striping is apparent in the ASTER GDEM2 portion of the dataset (above N60), especially over Russia. We are discussing possible null pixel-filling procedures
- There is definite noise in the dataset, with pixel values as low as -200 (and probably lower). Perhaps smoothing the dataset will help, though more steps might need to be taken to fix the issue.

#22 - 10/10/2012 05:15 PM - Natalie Robinson

- % Done changed from 90 to 100

A fully fused and void-filled global 90m DEM was finally finished in Sept. 2012.

The final steps to making this DEM available to the public are: 1) smooth the DEM (probably for N60 and above, as SRTM has already undergone smoothing), 2) properly document everything in metadata. Part 1 is in the works, we are trying to work with John Gallant in using his multiscale smoothing algorithm. Part 2 is also in the works, with initial documentation steps having begun.

Files

ReevesSpatialSoftwareStack.txt	955 Bytes	04/28/2011	Rick Reeves
NasaAsterListNorthOf58.txt	77.6 KB	05/10/2011	Rick Reeves
NasaAsterListNorthOf58.txt	77.6 KB	05/10/2011	Rick Reeves
MissingAsterFilesNorthOf58.txt	10.7 KB	05/10/2011	Rick Reeves