

Tutorial

Getting Seamless USGS Elevation Data into Fractal Terrains

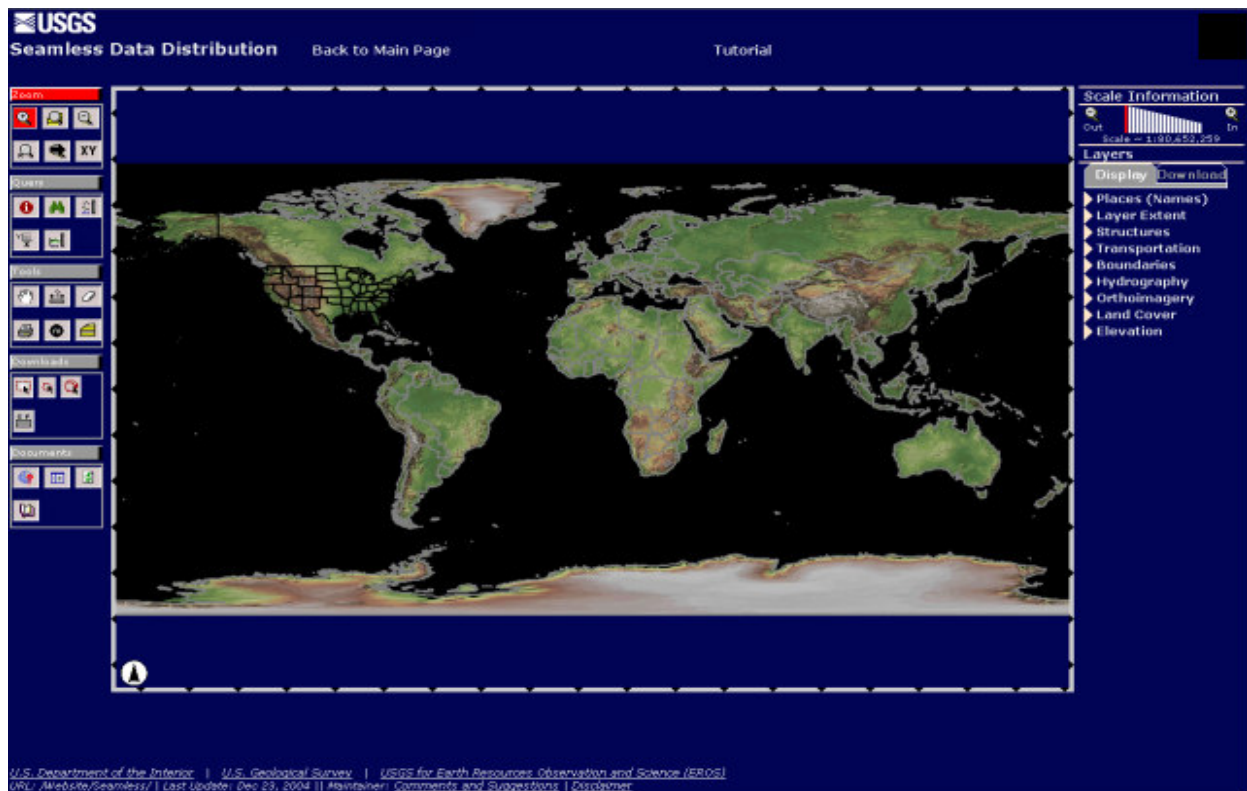
Sometimes we want to map regions of our good old Earth instead of realms of our imagination. This creates the unique challenge that we need to adhere to existing facts to be believable – we can't simply label any old map “Northern Germany” and expect people to accept it, if it shows no resemblance to the real thing.

The solution is of course to base the maps on real world data, but that can be difficult. Earth tends to be much more detailed and complex than any imagined world can be. But there is hope, at least for some details. The United States Geological Survey (USGS) provides free access to a lot of satellite data of our planet, and with Fractal Terrains you can translate some of this into Campaign Cartographer maps. In this tutorial I want to show you how.

Step 1 – Getting the Data

The creation of this tutorial was prompted by the fact that USGS has been providing access to seamless data via a web interface for a while, which makes obtaining specific data both more convenient but also a little less obvious.

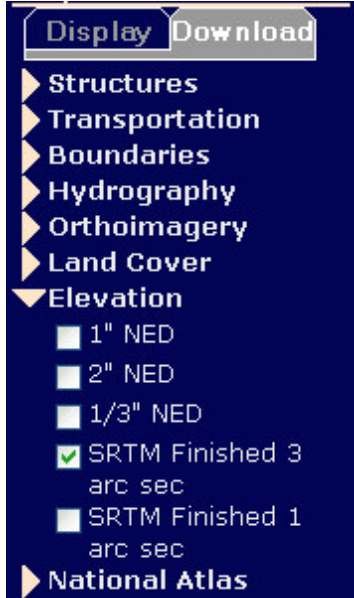
Navigate to the USGS'website <http://seamless.usgs.gov/> and follow the **View and Download International Data** link. Be prepared to wait a while since loading might take some time. But eventually you should get to the Seamless Data Distribution interface:



With the zoom tool on the left of the screen, navigate to the rough area you want to get the data from. As my example I will get the elevation data of Puget Sound and Vancouver Island, so I zoom to the northwestern United States and western Canada. If you want to speed up loading of the page, you can disable what data to show under **Display** on the right of the page.



Now it is time to define the data we actually want to download, as we can only use a portion of the various data sets offered by the USGS.



Switch to the **Download** tab in the right-hand menu, and open the **Elevation** list. Uncheck the **1" NED** entry and check **SRTM Finished 3 arc sec** as shown in the image on the left.

While we could also use the **SRTM Finished 1 arc sec** data set – which is more detailed – it is unfortunately only available for the United States and not for Canada.

Now click on the **Define Download Area** button on the left (left-most button under **Downloads**). This will let us define the area we want the data for. Alternatively, if you already know the longitude and latitude extensions of the area you need, you can also use the **Define Area By Coordinates** button.



Click and drag a window around the area you want the data for. A new window will pop-up, showing you the download options you have.

Most likely your download will be separated into several chunks, since USGS limits data to download to 100MB per piece by default. You can change that to 250MB (see below), but that's the upper limit you'll have to live with, as Fractal Terrains can only read one file of data at a time.

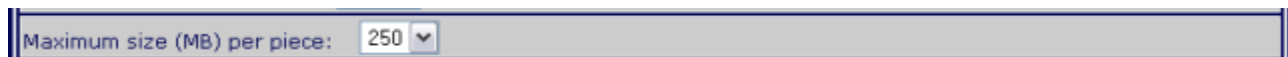
Click on the **Modify Data Request** link at the top of the page; we need to make some adjustments. The following page contains a list of the available data and its format. Since we checked only the **SRTM Finished 3 arc sec** set, only the following line should be activated:






We need to change the data format to **BIL** instead of **ArcGRID**, since that is the format Fractal Terrains can read. Simply select **BIL** from the drop down list. **ZIP** as the archive format is fine, but also change the Metadata format to **TXT**. That way Fractal Terrains can also read the metadata and we don't have to enter it by hand.



Scroll down to the bottom of the page and set the Maximum **Size (MB) per piece** to 250 MB.



Click **Save Changes and Return to Summary** to get back to the data download page. It should look something like this now:

Data Extraction Request Pieces:			
Area	Output Parameters	Size (MB)	Download Links
SRTM 3 arc sec - Shuttle Radar Topography Mission [Finished]			
(WGS 84) N: 51.18301 W: -128.78905  S: 46.68452 E: -122.08114	Output Format: BIL WGS 1984 Geographic X cell Size: 00.00083 Degrees Y cell Size: 00.00083 Degrees	87	 

Now it is important that you note down the coordinates shown in the left-most cell, as we will need them for import into Fractal Terrains. In the example above they are:

N: 51.18391
W: -128.78905
S: 46.68452
E: -122.08114

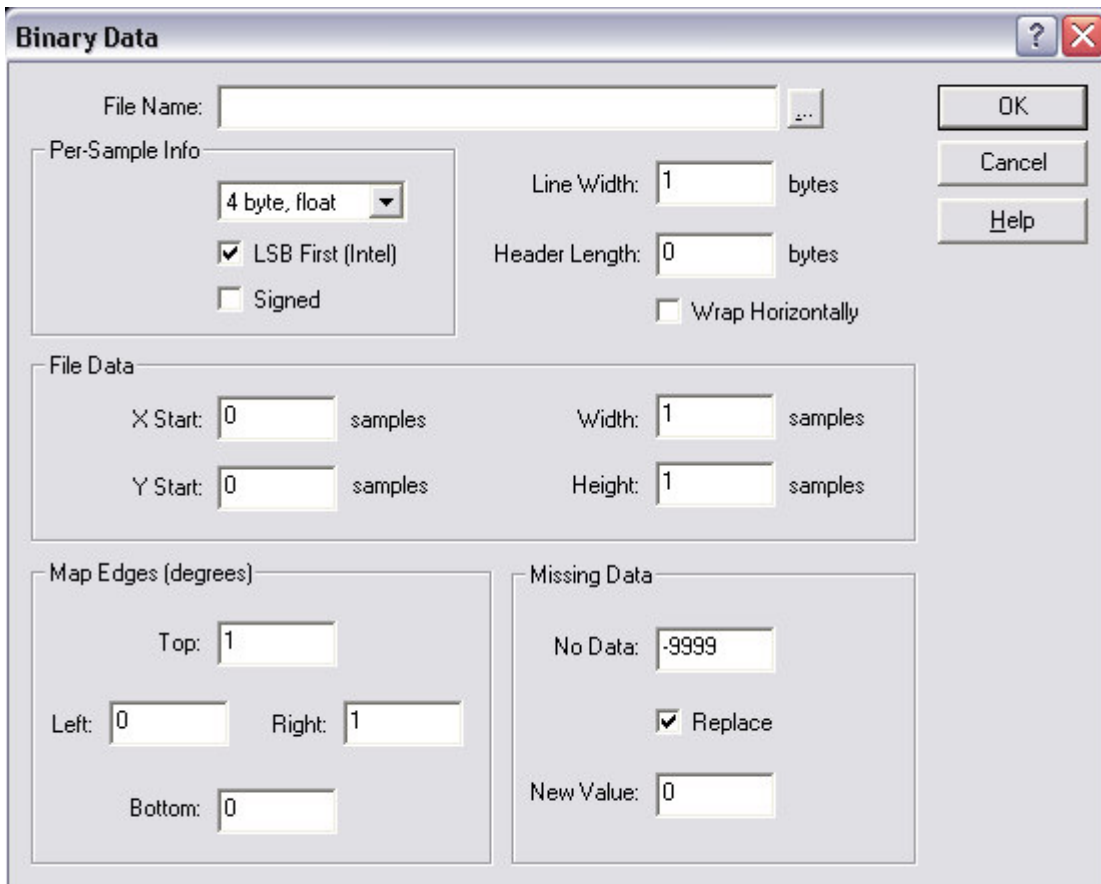
It is time to hit the **Download** button! Yet another pop-up window will appear and tell you what the current order status is. The operative sentence here is "Please wait for the data to be returned." Go make a coffee, read a book, do some shopping or whatever. This will take a little while...

Well, okay, perhaps a minute or so, depending on the size of the area you selected. After a while a dialog will pop-up, prompting you to save the data to your disk. Do so in a convenient location. Now go brew a coffee while the data downloads...

Step 2 – Getting the Data into Fractal Terrains

When the download is finished, open the zip file you saved and extract it to a convenient folder.

Now fire up Fractal Terrains and start a new world (File -> New). Select **Binary File** for the type of world to generate and click on the **Choose Elevation File** button. The **Binary Data** dialog comes up:



Binary Data

File Name:

Per-Sample Info

LSB First (Intel)
 Signed

Line Width: bytes
 Header Length: bytes
 Wrap Horizontally

File Data


X Start: samples Width: samples
 Y Start: samples Height: samples

Map Edges (degrees)

Top:
 Left: Right:
 Bottom:

Missing Data

No Data:
 Replace
 New Value:

Click the file selection button  next the the **File Name** field and navigate to the folder you extract the zip file to. Double click on the file with the extension *.bil.

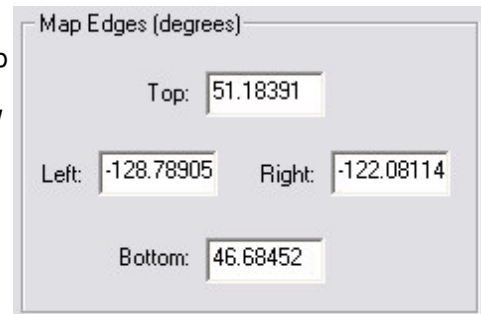
Answer “Yes” when Fractal Terrains asks you whether you want to use the info file found along with the data file.

This info file sets most of the options in the **Binary Data** dialog for you. The only thing you need to enter are the coordinates of the map area which we noted down just before downloading the data. Enter the data into the Map Edges fields with the N coordinate into Top, W into Left, E into Right and S into Bottom.

Click **Ok**, **Next** and then **Finish** to finally import the data into Fractal Terrains.

Your area will probably be a tiny speck of green or black on the world map. Use the zoom tools to get a better look at your import.

This is what I get:



Map Edges (degrees)	
Top:	51.18391
Left:	-128.78905
Right:	-122.08114
Bottom:	46.68452



Now you can go ahead, play with the colors, the projection and export your results to CC3. Enjoy!