Downloading Digital Elevation Models from USGS:
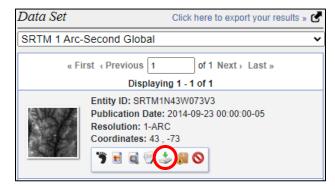
a. Go to https://earthexplorer.usgs.gov

b. Create an account for yourself

c. Under *Enter Search Criteria*, for *State*, choose your state of interest (**New Hampshire**)

d. For *Feature Type*, choose level of geography (BOROUGH*CIVIL*COUNTY*MINICIPIO*PARISH*TOWN*TOWNSHIP)

e. Click on the *Show* button

f. Scroll down the drop-down list, click on your area of interest (e.g.; **TOWN OF HANOVER**)

g. Click on the *Data Sets* button at the bottom left

h. Navigate to **Digital Elevation** and expand its heading. There are lots of different sources for DEMs, labeled by the name of the satellite/aircraft mission that collected data. Feel free to Google what the acronyms mean and what resolution each DEM source has. A standard DEM with global coverage is **SRTM** (bottom of list). Click on **SRTM 1 Arc-Second Global** and check the box.

i. Click the *Results* button.

j. Click on the Download Icon (marked by the red circle in the screenshot below)

k. Choose to download the file in the *GeoTIFF* format.

l. Copy the downloaded tif file to your working folder.

3.2.2 Project the DEM

a. Load the tif file into ArcGIS. You do not have to build pyramids or calculate statistics.

b. Project your DEM to your project coordinate system, using the tool in *Toolboxes -> Projections and Transformations -> Raster -> Project Raster*. It may take a few minutes to run.

There are lots of different calculations or analyses you can do with DEMs. You might calculate Slope, create a Hillshade, generate contour lines, etc. Check this web page for more information:

Calculating Slope:

a. If using ArcGIS Pro, check if the **Spatial Analyst** Extension is turned on.

b. Go to *Toolboxes -> Spatial Analyst Tools -> Surface -> Slope*, using your DEM as the input. Find out the meaning of different parameters of the Slope tool by clicking the blue question mark.

Note: The vertical and horizontal units of a projected DEM are in meters, so we are comparing apples to apples when we calculate the slope. However, it is important to check DEMs when you get them from different sources to confirm the vertical and horizonal units before doing surface analyses because your answers could turn out quite wrong if your units are mixed (using feet for vertical units or decimal degrees for horizontal are common mistakes).

You could also create a map of slope gradient: In the *Symbology* panel, explore different classification methods by pressing the **Classify** button.