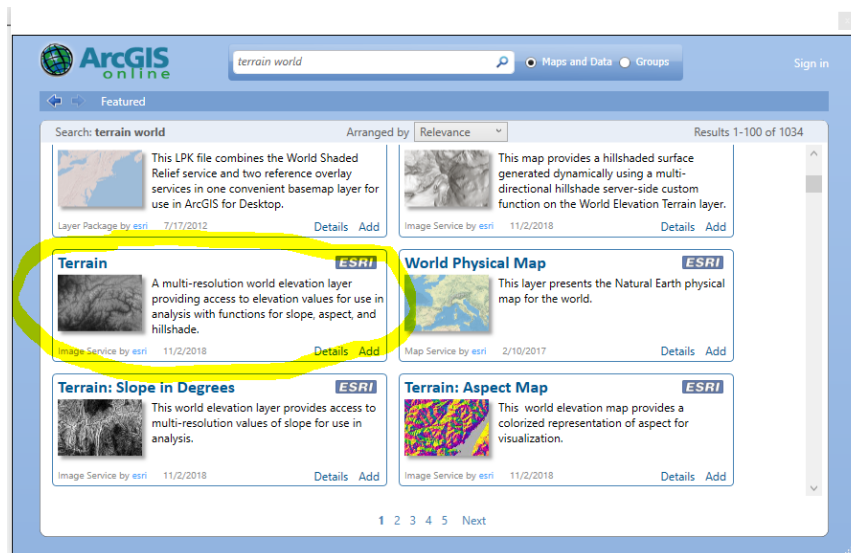# Creating contours on DEM layers
—by Cici Xiao

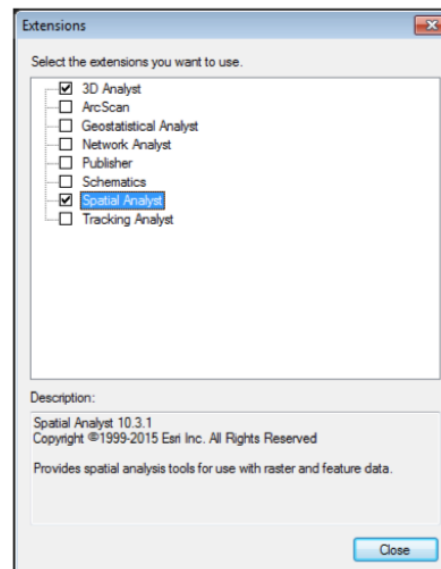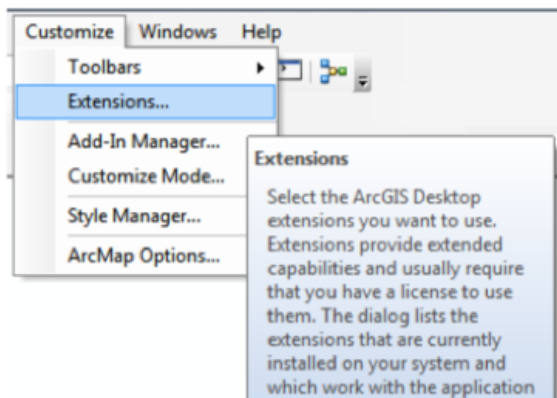## Load DEM data
1. In ArcMap, sign in to ArcGIS Online [File -> Sign in]
2. Add data from ArcGIS Online
   a. Look up "Terrain world" or "DEM"
   b. Scroll down and you will see a black and white world DEM data –"Terrain"
   c. Click "Add" on the right hand side

3. Set up
   A. Customize -> Extension -> check 3D analyst and Spatial Analyst
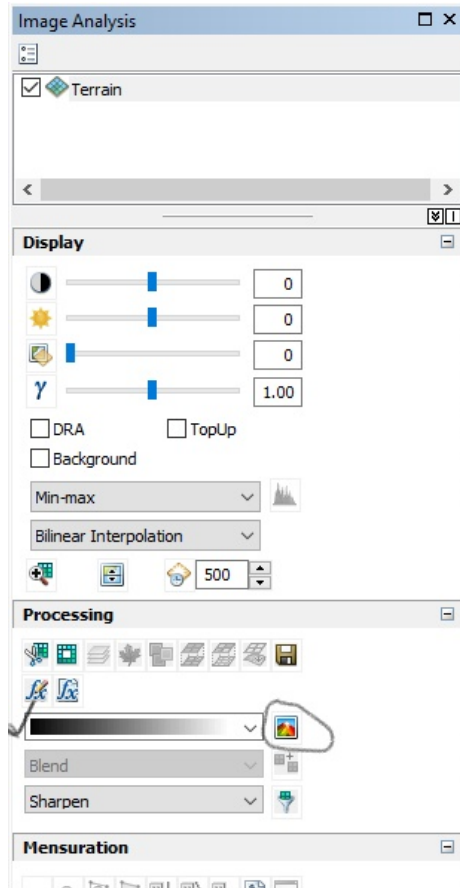   B. File -> Map Document Properties -> Pathnames: check store Relative Pathnames

Create Hillshade in Image Analysis
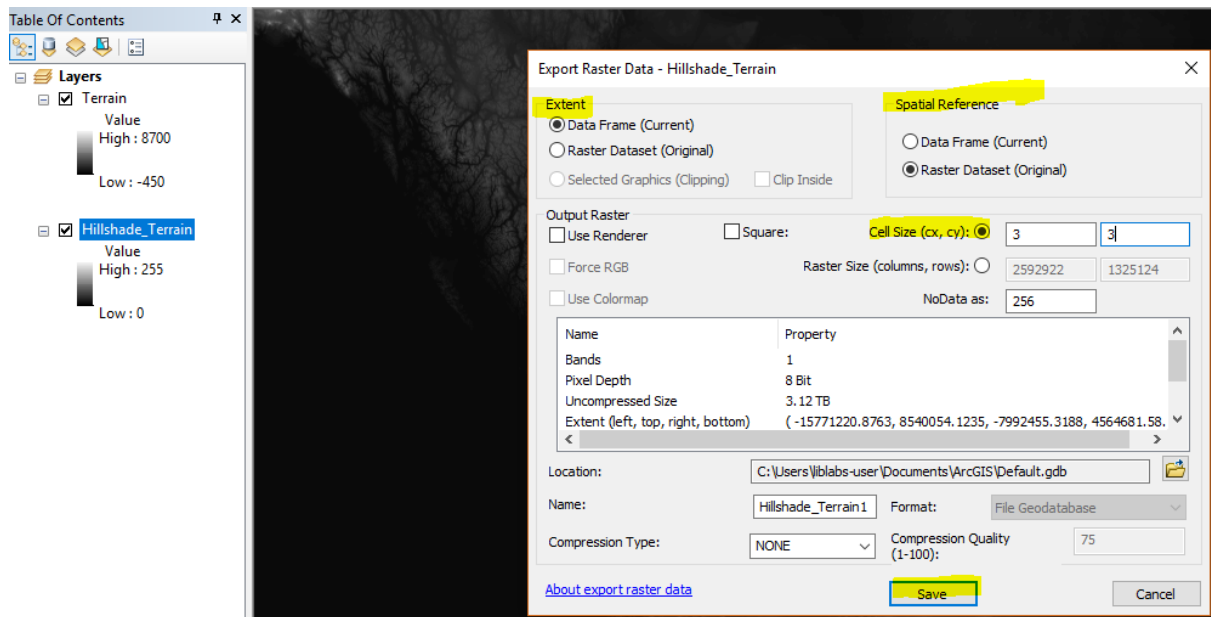
1. Windows -> Image Analysis Toolbar

| File | Edit | View | Bookmarks | Insert | Selection | Geoprocessing | Customize | Windows | Help |

2. Select Terrain
3. Under Processing, click drop down bar and click the <u>Black To White Ramp</u> to create hillshade
4. Click the colorful mountain behind the ramp

Extract by Data Frame Extent

1. Under Layer, drag the new layer (Hillshade_terrain) above the Terrain layer
2. Zoom to your area of interest (Adding a basemap is recommended)
3. Right click the Terrain layer in your table of contents -> Data -> Export Data
4. Under Extent -> check Data Frame (Current)
   a. Under Spatial Reference -> check Image Service (Original)
   b. Format -> Grid
5. Click the [Browse (folder)] icon
   a. Navigate and select your output workspace
   b. Click [Add]
6. Leave the cell size as 3, 3 (unit: meter)
(the export window will populate the cell size of the export to match that of the original raw raster dataset)

On the new layer, redo the steps in Image Analysis to create Hillshade for the selected layer
* The world DEM data took lots of memory spaces, therefore we create a new layer that contains only areas of our interest

Contour
Click the toolbox to search Contour (Control + F)
Choose the first option
Fields highlighted with green dots are required
Contour interval: [2, 20] of your choice
Base Contour: (optional)