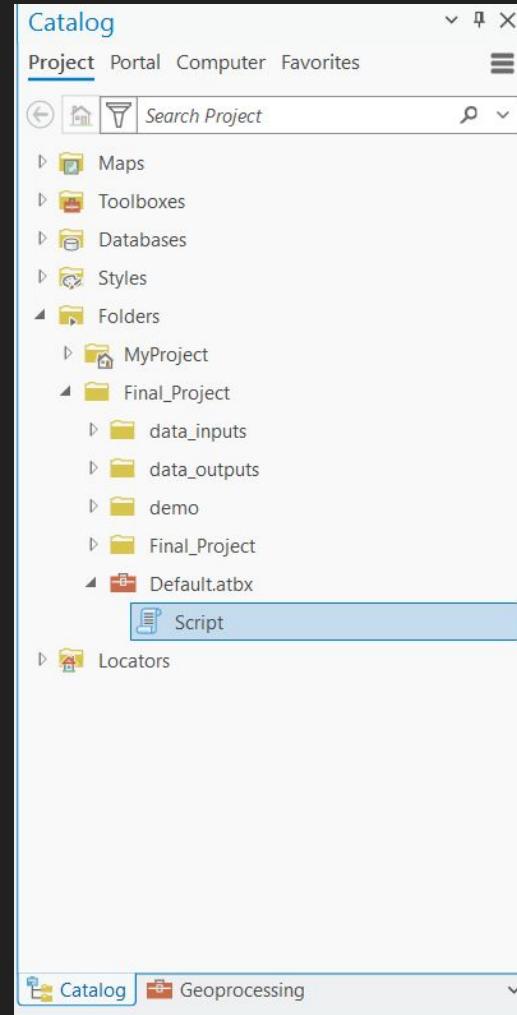


Elevation Tool

Demonstration with images

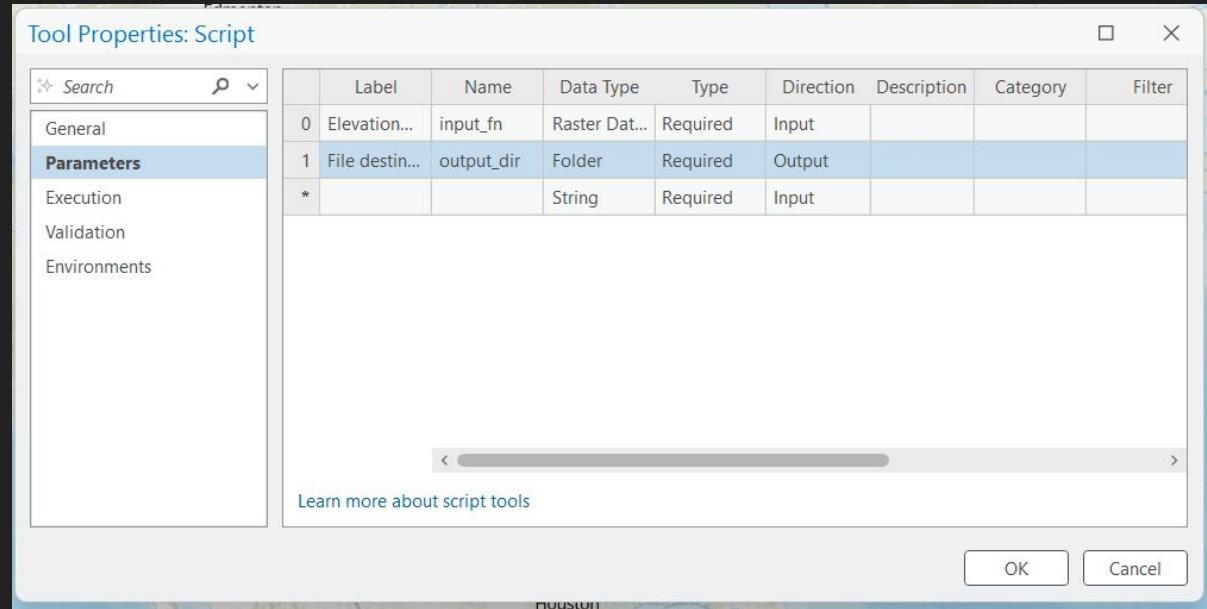
Setup

- Create a new project or open an existing one that has a map.
- Download and connect the folder that contains the toolbox to your project.



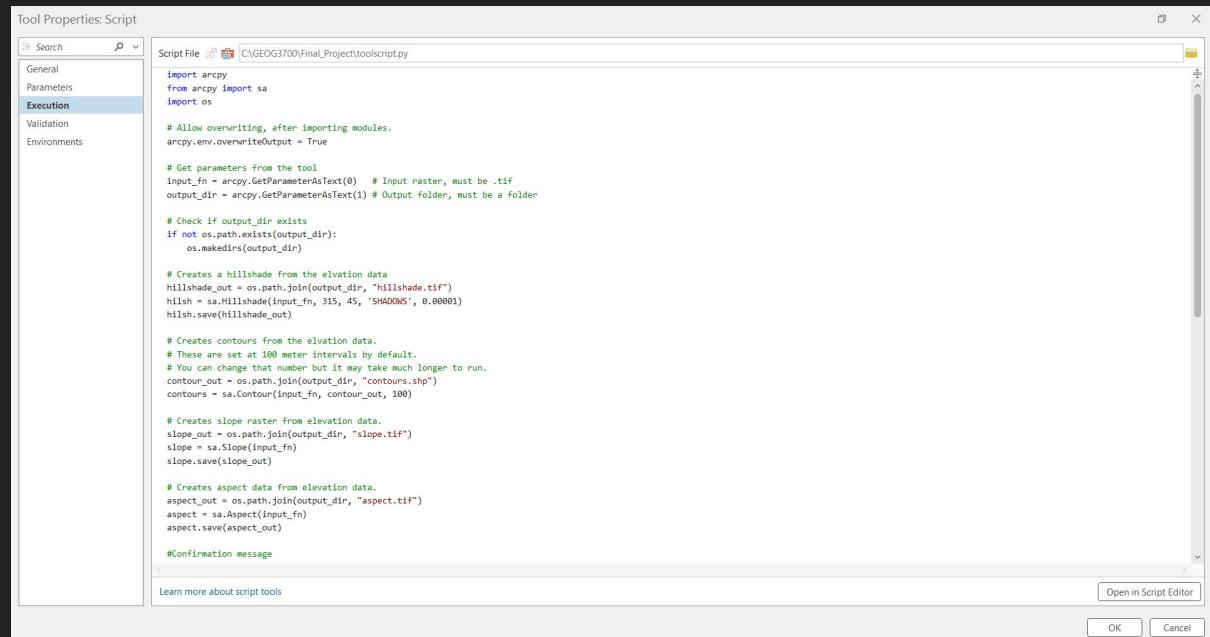
The Tool Itself

- If you right click on Script, and then choose Properties, you will get something like this.
- Under Execution, you can update or change the script.
- The tool will only accept Raster Data as in input, and only a folder as an output.



The Tool Itself: Execution

- This is the script. Here you can change how the tool works, and the default tool values are the same as the ArcPro tool defaults.
- The “100” in the Contour section denotes 100 meters between each contour line. You may change this, but may result in longer processing times.



Tool Properties: Script

Script File: C:\GEOG3700\Final_Project\toolscript.py

```
import arcpy
from arcpy import sa
import os

# Allow overwriting, after importing modules.
arcpy.env.overwriteOutput = True

# Get parameters from the tool
input_fn = arcpy.GetParameterAsText(0) # Input raster, must be .tif
output_dir = arcpy.GetParameterAsText(1) # Output folder, must be a folder

# Check if output_dir exists
if not os.path.exists(output_dir):
    os.makedirs(output_dir)

# Creates a hillshade from the elevation data
hillshade_out = os.path.join(output_dir, "hillshade.tif")
hillsh = sa.Hillshade(input_fn, 315, 45, "SHADOWS", 0.00001)
hillsh.save(hillshade_out)

# Creates contours from the elevation data
# These are set at 100 meter intervals by default.
# You can change that number but it may take much longer to run.
contour_out = os.path.join(output_dir, "contours.shp")
contours = sa.Contour(input_fn, contour_out, 100)

# Creates slope raster from elevation data.
slope_out = os.path.join(output_dir, "slope.tif")
slope = sa.Slope(input_fn)
slope.save(slope_out)

# Creates aspect data from elevation data.
aspect_out = os.path.join(output_dir, "aspect.tif")
aspect = sa.Aspect(input_fn)
aspect.save(aspect_out)

#Confirmation message

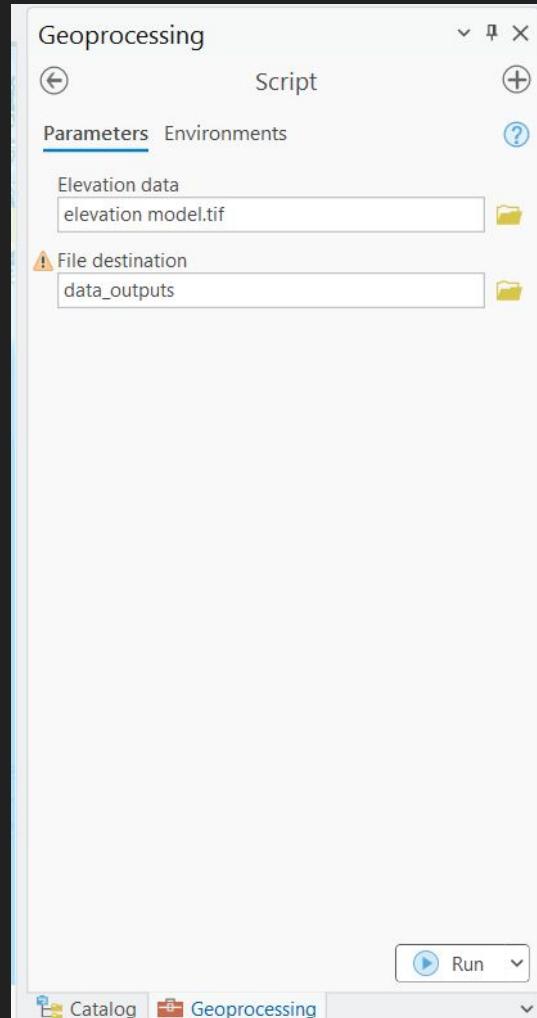
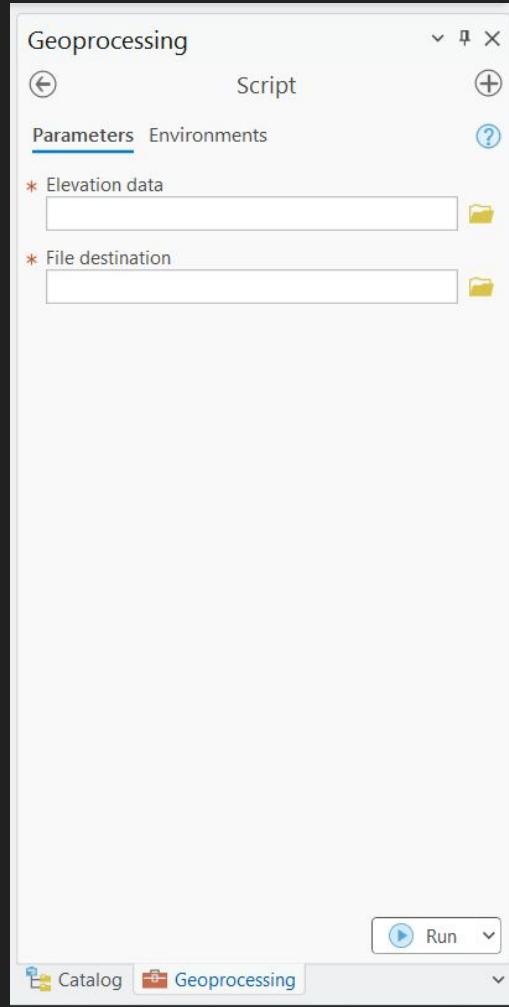
```

Learn more about script tools

OK Cancel Open in Script Editor

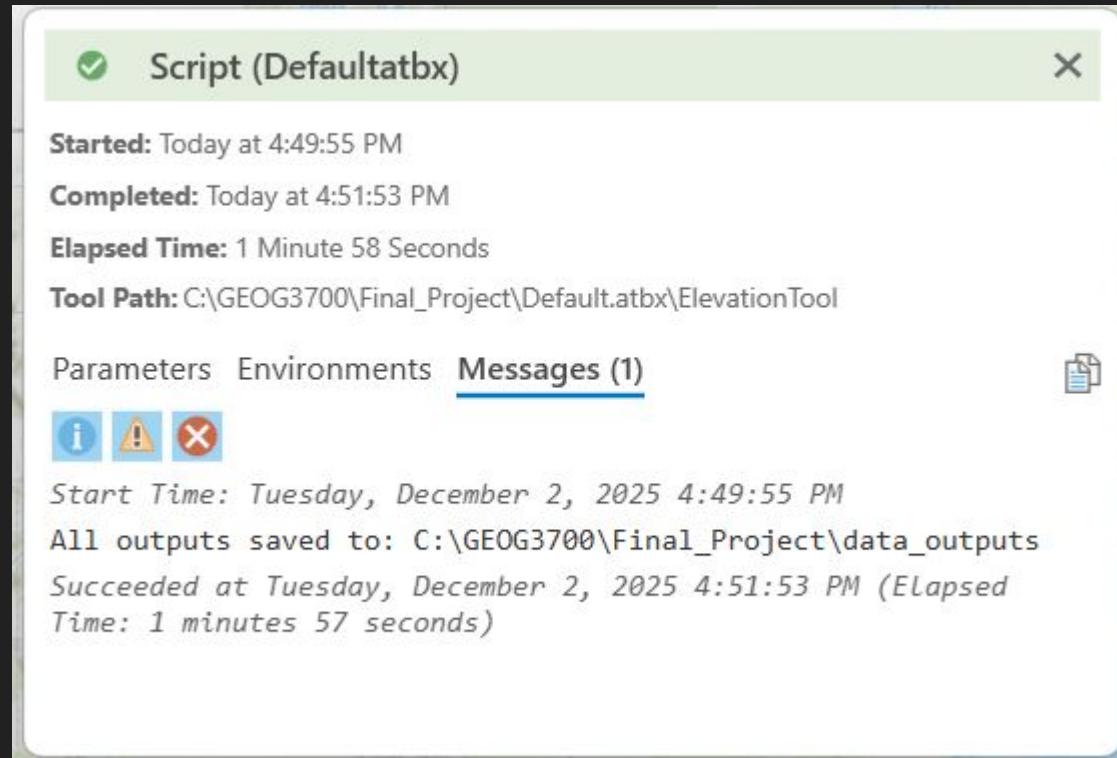
Using the Tool

- Double click on “script” in the catalog. The left image shows what should pull up.
- Determine your inputs and outputs. Mine are shown on the right.
 - My input, under “Elevation data” is a simple 10 meter DEM of the Wasatch Front. Any elevation raster will do.
 - My output (“File destination”) is an empty folder called data_outputs.
 - The input data and output file are included in the “Final_Project” folder along with this demonstration.
- If you have already run the tool, running it again will overwrite previous outputs, but may take longer as a result.



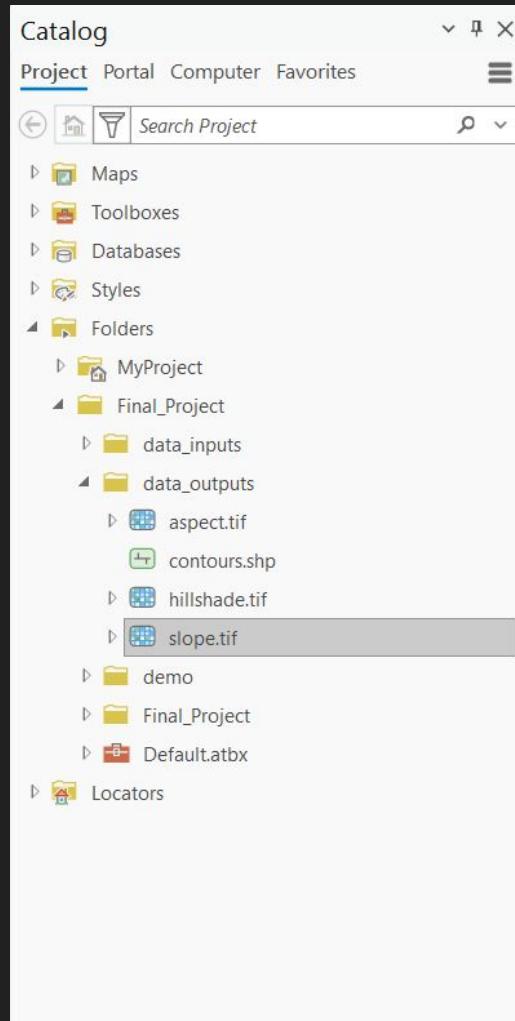
Running the Tool

- Hit “Run” once you have the proper parameters set.
- Depending on your machine, it may take a few minutes to complete processing.
 - My laptop took just under 2 minutes to complete while running on battery, hence the reason for this slideshow instead of a video.
- When it is done, you’ll get a message like the one pictured, which confirms the location your new files are saved to.



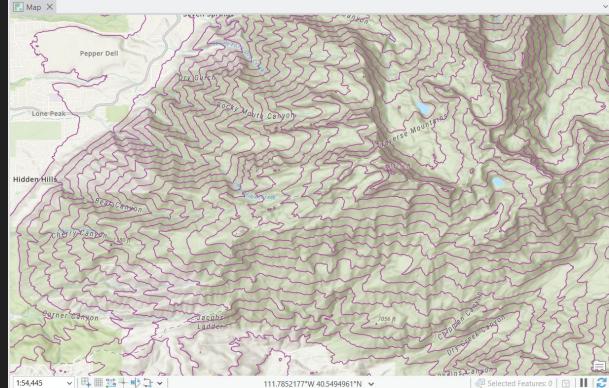
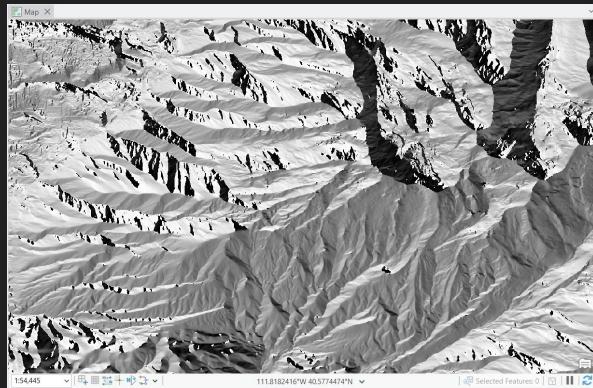
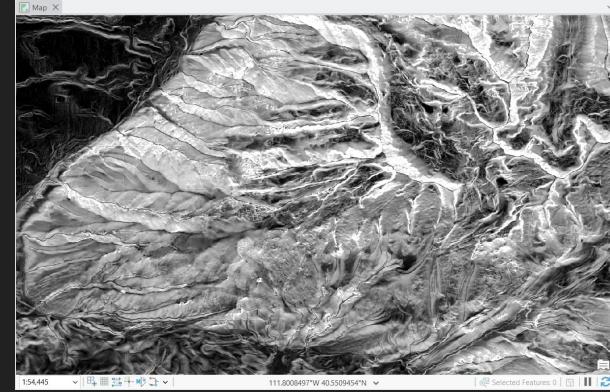
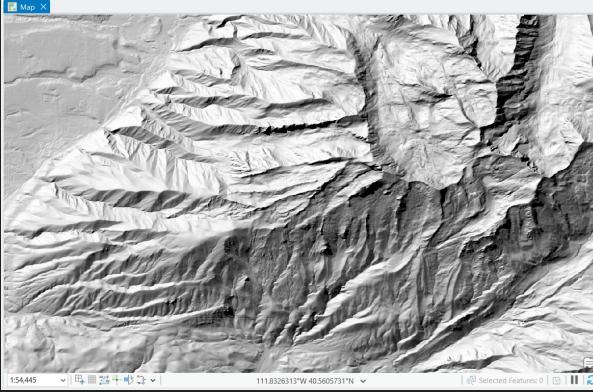
Using the Results

- Refresh your files and you'll find several .tif files and one .shp (contour) file.
- The image shows what the results look like in my catalog.
- From here, you can put them into your project, and change the symbology as needed.
- More results will show up in your output folder than applicable in ArcPro.



Example Results

- These results show the same area near Lone Peak in Draper, UT.
- From left to right, top to bottom they are hillshade, slope, aspect, and 100m contour.
 - Note: the hillshade comes out in rainbow colors. I was unable to get the code to stop doing this but evidently that can be changed quickly by opening Symbology for that layer.



Summary

- This tool will save a bit of time when working with elevation data.
 - I once worked on a project where I had to use a number of elevation rasters, and much of my time was spent doing spatial analysis on them to get slope, contours, etc.
 - This allows you to get everything* out of your elevation raster in one single tool.
 - *By everything, I mean that this tool performs pretty much every geoprocessing operation in one go. There were no other elevation-related operations in the ESRI documentation that were relevant to this project.
- Make sure your outputs are valid and be patient when waiting for it to run, as it may take a minute.