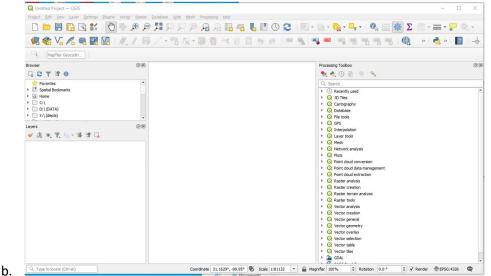
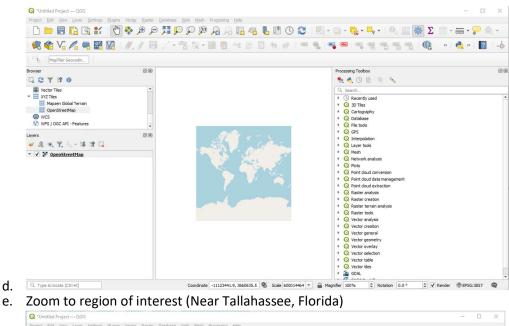
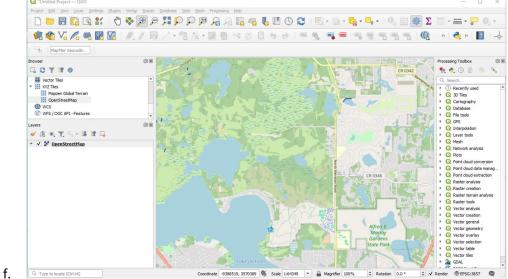
QGIS Workflow for Florida Watershed Example

- 1. Install QGIS 3.34.x (most current is 3.34.8) or some equivalent:
 - a. ArcGIS
 - b. Equator Studios
 - c. Mapline
 - d. Grass GIS
 - e. Post GIS
 - f. Maptitude
 - g. OpenLayers
 - h. SuperGIS
 - i. MapWindows GIS
 - j. DIY using R (programming language) + various packages (Non crybaby option)
 - k. DIY using Python (programming language) + various packages (Non crybaby option)
- 2. Install/activate plugins:
 - a. SRTM downloader (used to get NASA provided global DEM on 30x30 m pixels)
 - b. SAGA System for Automated Geoscientific Analyses (want Next GEN)
 - c. Coordinate Capture
- 3. Start QGIS:
 - a. Open existing project or create a new one



c. Load Open Street Map (from XYZ Tiles or Data Source Manager)

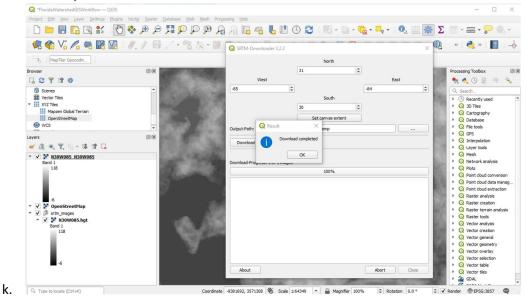




- g. SAVE the project at this point. You should be able to return to this zoom level if things get cluttered. Make note of the CRS WGS-84 Pseudo Mercator EPSG 3857. When you get DEM data you have to re-project into this CRS for the other tools to work.
- h. Obtain SRTM data using SRTM downloader. Set the search area to Canvas Extent (it's the button in the middle of the dialog)

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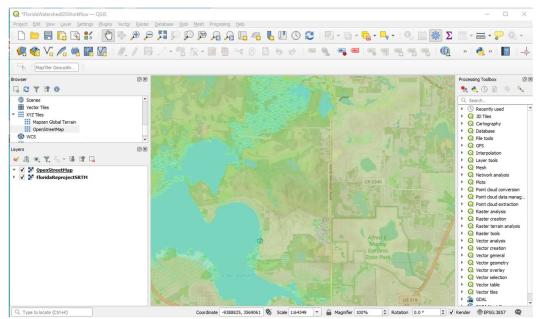


- I. Notice the background changes to show the DEM data (you can fix it so the street map overlays the DEM). Click OK; then save the project.
- m. Re-project the DEM target CRS is 3857 Raster/Projections/Warp

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o. We now remove the SRTM layers, and save the remaining project. Can mess with the DEM rendering and OpenStreetMap to get something like:

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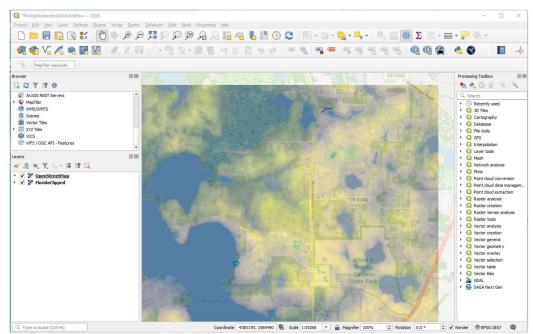


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s. After clipping and some rendering/symbology adjustments.

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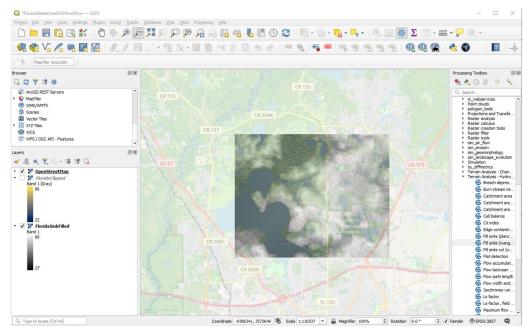


4. Now use SAGA to make a sink-filled file.

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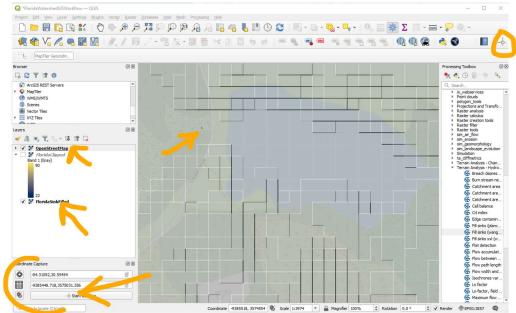
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b. This process takes a long time and uses a lot of RAM, so that's partly why we clipped the area. 16GB seems to be enough RAM; My 8GB laptop is too small for the algorithm to work. Figure is sink filled, and zoomed out a little to show effect of clipping.



d. Now find the outlet.

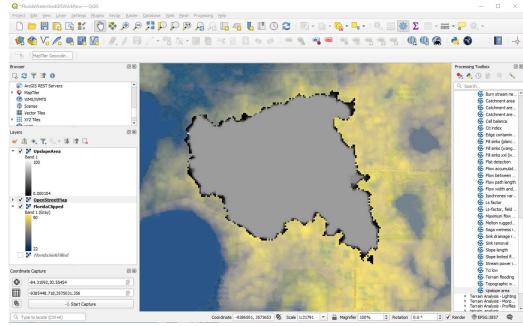
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5. Use hillshade to help find locations, notice the coordinate capture tool leaves a small red dot. Next use SAGA upslope area to find all the cells upstream of the coordinate

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b. The output is a raster of the watershed

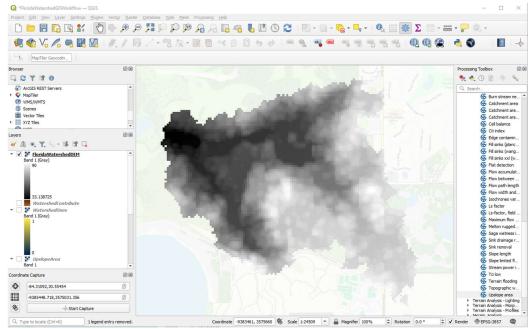


- c. We will then process this to get more information about the watershed. This is a good time to save work so far.
- 6. To make a better render.
 - a. Use Raster calculator to extract Ones. (UpslopeArea < 50 => WatershedOnes)
 - b. Use Raster Conversion to vectorise WatershedOnes => WatershedContribute.

c. Use this WatershedContribute vector to mask the fill layer Raster/Extract/by Mask, and produce a DEM of just the watershed.

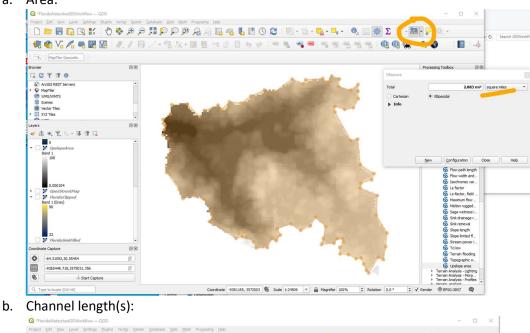
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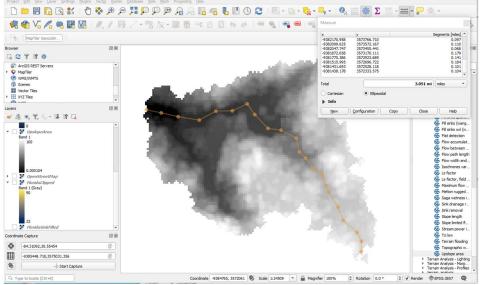
d. Now render the final DEM



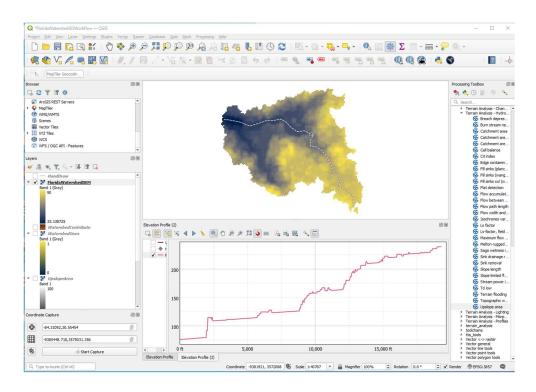
7. Now we can use measuring tools to get areas., and lengths.

a. Area:





c. Profile(s): Designate DEM as elevation data. Then use profile view to render profile along a path.



- d. Change scales/units as needed using the tools, or the grid scale and offset features.
- 8. Summarize in a Table (for typical homework)

Item	Value	Units	Remarks
Area	2.83	Square Miles	GIS Area Tool
Main Channel	3.05	Miles	GIS Line Tool
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Elevation	222	Feet	Read from
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Slope (MCS)			