

Creating an Inundation Extent Raster for the Austin District

Prepared by David R. Maidment, 12/30/2022

Input: Inundation Depth Raster for one of the five exercise modules prepared using HAND

Output: Inundation Extent Raster with Value = 1 for each inundated cell.

Project and Model are at: <https://utexas.box.com/s/3ny52zrgikkoy5o54qyb3769iqs3k2t6>

Results are at: <https://utexas.box.com/s/2nlfx491j838791n0mnez3pekawq8mg>

(1) Get the Data

Inundation Depth Rasters are at: <https://utexas.box.com/s/exy2jco1zge84r0psmg51jy8aku904r7> These files total ~ 10GB so take a while to download

TxDOT Maintenance Section Boundaries are at: <https://gis-txdot.opendata.arcgis.com/>

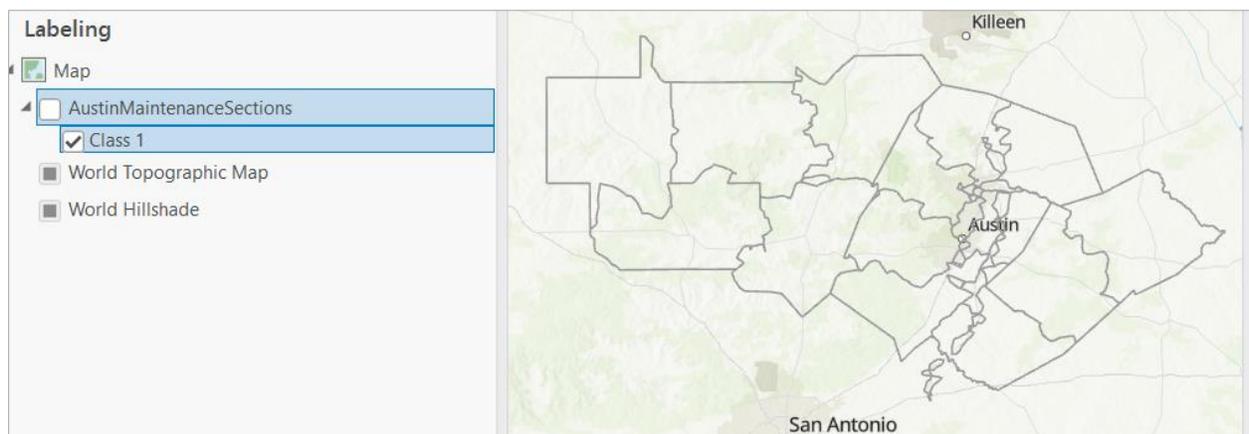
HUC12 Watershed boundary file is part of the Watershed Boundary Dataset at: https://prd-tnm.s3.amazonaws.com/StagedProducts/Hydrography/WBD/National/GDB/WBD_National_GDB.zip

NHD Medium Resolution https://edap-ow-data-commons.s3.amazonaws.com/NHDPlusV21/Data/NationalData/NHDPlusV21_NationalData_Seamless_Geodatabase_Lower48_07.7z

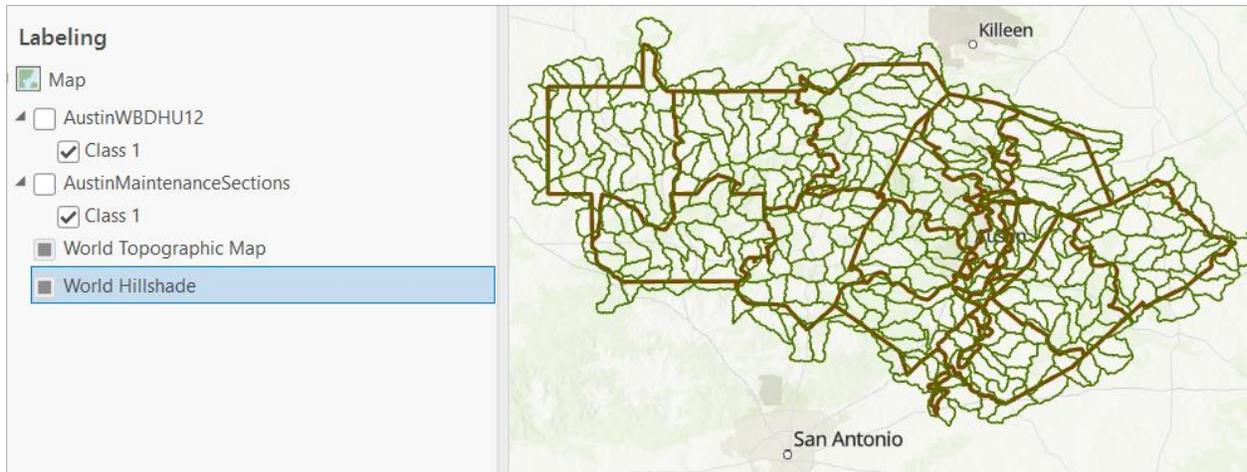
(2) Define the Analysis Domain

Open a new folder in Windows Explorer, **InundationRaster** and established a new ArcGIS Pro project in that location called **AustinInundationRaster**

Add the Maintenance Section Boundaries to an ArcGIS Pro Project. Select by Attributes for **DIST_NM = Austin** and export the resulting selected features to a new feature class **AustinMaintenanceSections**



Add the WDBHU12 feature class to the project, Select by Location for HU12 units that intersect the AustinMaintenanceSections and export these to a new feature class **AustinWDBHU12**.



Dissolve out the internal boundaries of this HU12 feature class to get an **AustinHU12Boundary**. This is the analysis extent needed for the inundation raster even though the input raster inundation depth data cover a larger area comprising all HU8 watersheds that intersect the Austin District.



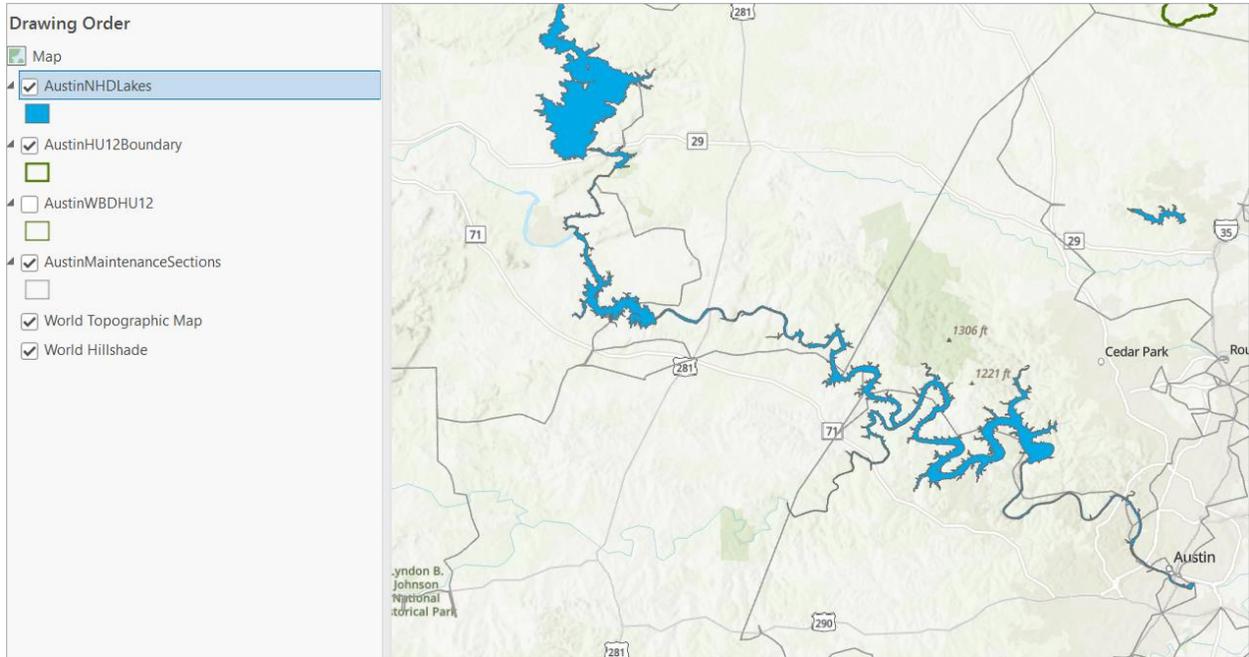
(3) Inundation Raster for Lakes

Add the **NHD Waterbody** feature class to the map and select all the lakes large enough to be in the Highland Lake chain. This includes Lake Buchanan to Lady Bird Lake, the most downstream one in the City of Austin.

Note: It would be better to use the NWM Lakes feature class for this step.

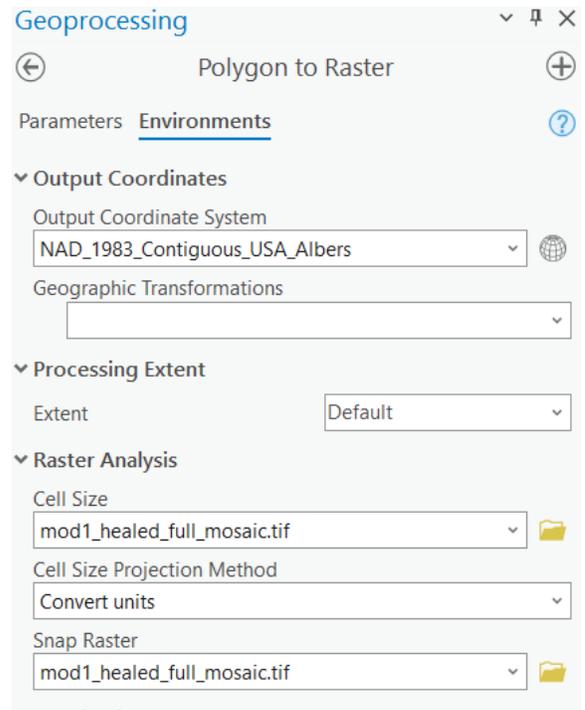
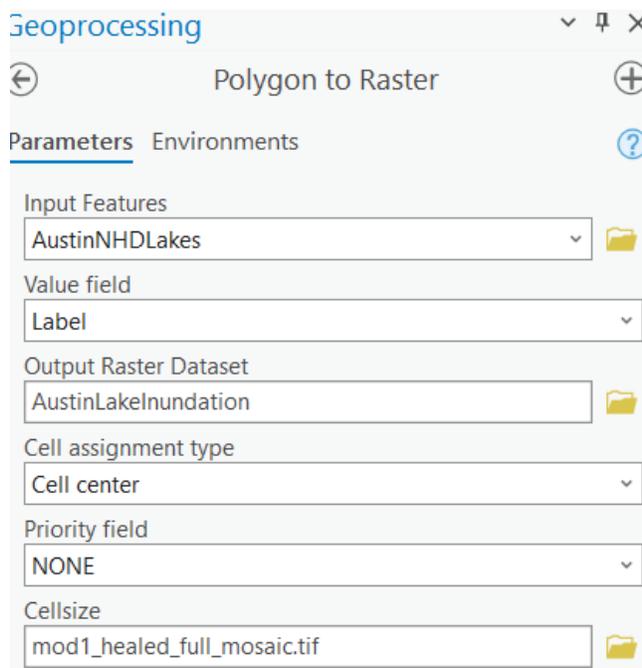
Add a field called Label lake features and calculate Label = 1.

Add the first module inundation depth raster to the map display (it takes forever to building pyramids and statistics for this raster).

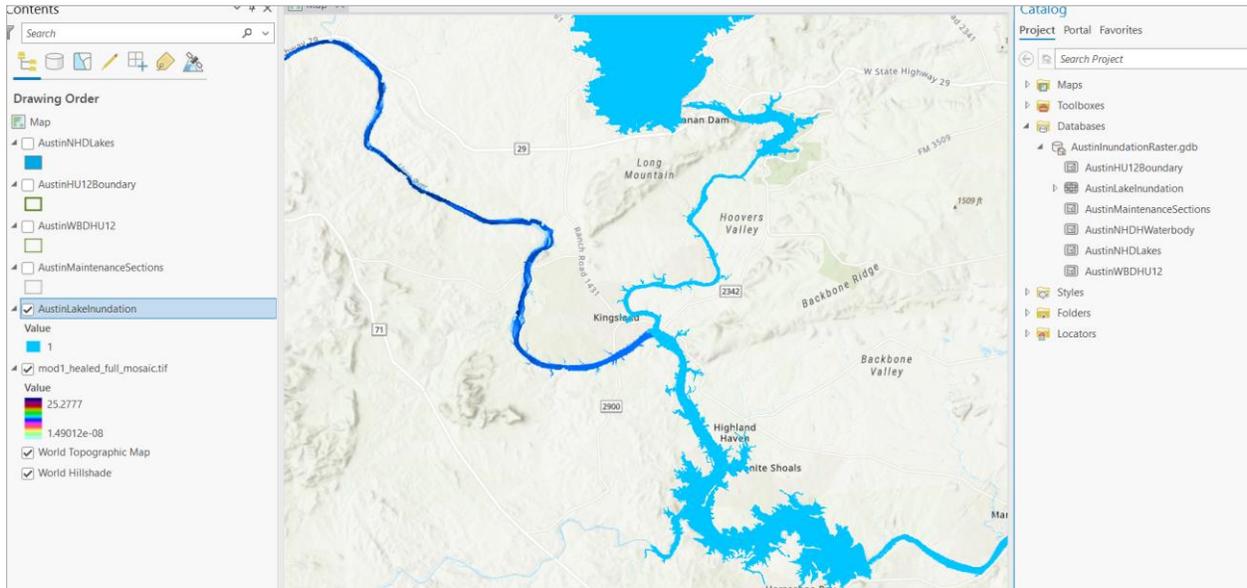


Add the first module inundation depth raster to the map display (it takes forever to building pyramids and statistics for this raster).

User **Polygon to Raster** to convert the lakes feature class to a raster **AustinLakeInundation** with values equal to 1 by using the Label = 1 as the field to become raster values. Use the **mod1_healed_full_mosaic.tif** as the **output coordinate system, cell size and snap raster**.



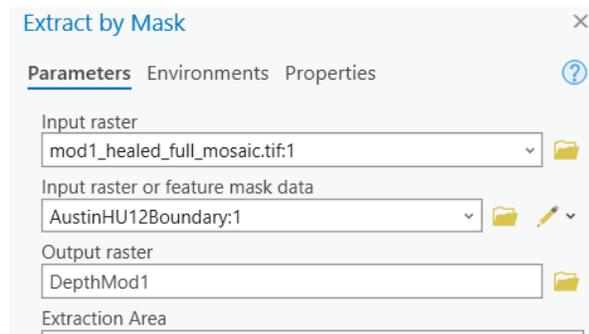
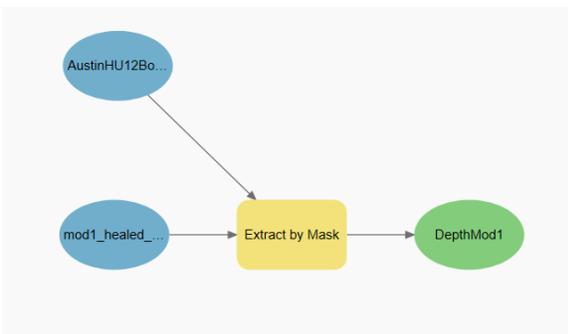
This produces a raster with values = 1 for the lakes and no data elsewhere that connects to the inundation depth raster on the rivers, as shown below for the Llano River and Lake LBJ near Kingsland.



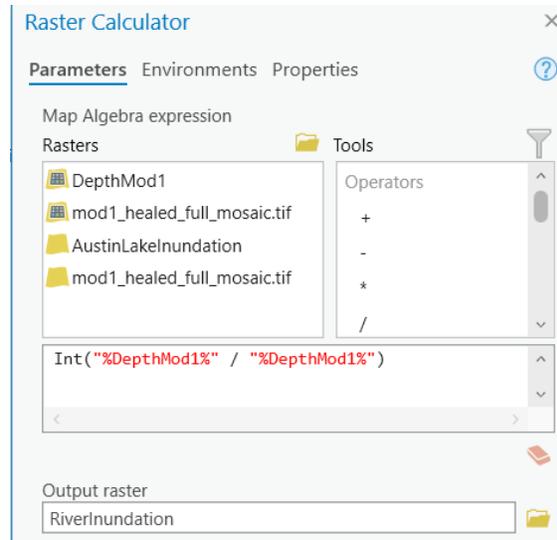
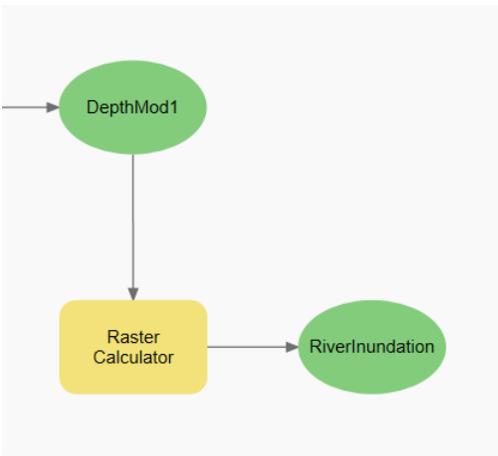
(4) Inundation Raster for Rivers

This process has to be repeated five times, one for each of the exercise modules. It is useful to use Model Builder to automate the processing sequence for this. Call the model **InundationRaster**.

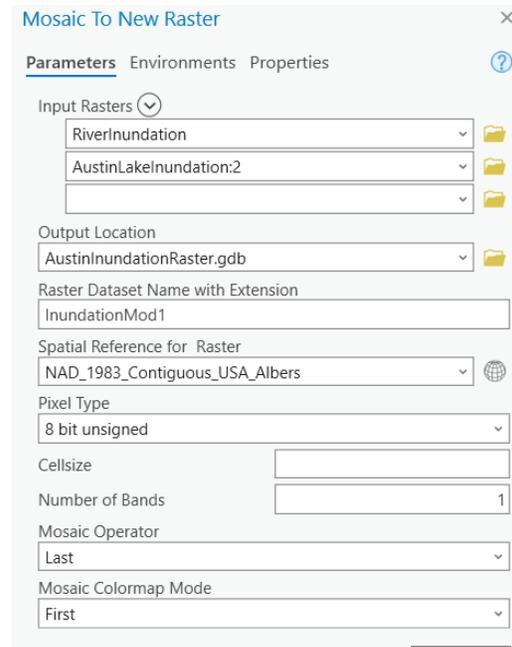
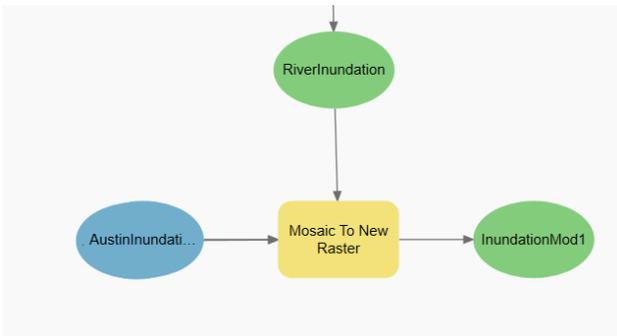
Step 1: Extract by Mask the portion of the Inundation Depth raster that is within the analysis domain, the AustinHU12 boundary. Use the mod1_healed_full_mosaic.tif to set the raster parameters as in Inundation Raster for Lakes.



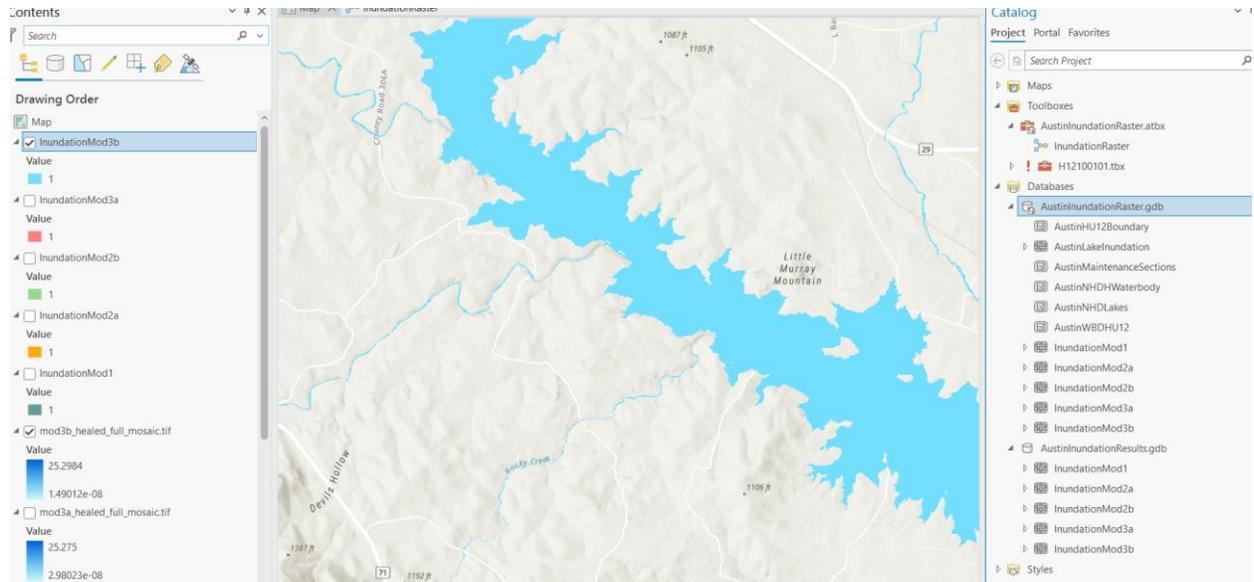
Step 2: Use Raster Calculator to divide the depth raster by itself and convert the resulting values to Integer. This produces an Integer raster with values = 1 in all river inundated cells.



Step 3: Use Mosaic to New Raster to merge the lake and river inundation rasters. Continue to use the first inundation depth raster for the spatial reference, pixel type is 8 bit unsigned, number of bands =1. The output raster is InundationMod1



Step 4: Use Delete to delete the intermediate raster products DepthMod1 and RiverInundation that are no longer needed. Use InundationMod1 as the Precondition for this action. Mark the



(5) Project and Results

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