

# How to Pull the Water Surface Elevation (WSE) from an A zone H & H model



# When is it appropriate to pull the WSE from the model?

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- In an approximate A zone where no BFE has been provided
- When the cross section is at least 500 ft. upstream or downstream from a hydraulic structure
  - Culvert, bridge, railroad crossing, etc.
- Not at the confluence of a major river
  - Backwater impacts



# How Can Effective Approximate A-Zone Models be Obtained?

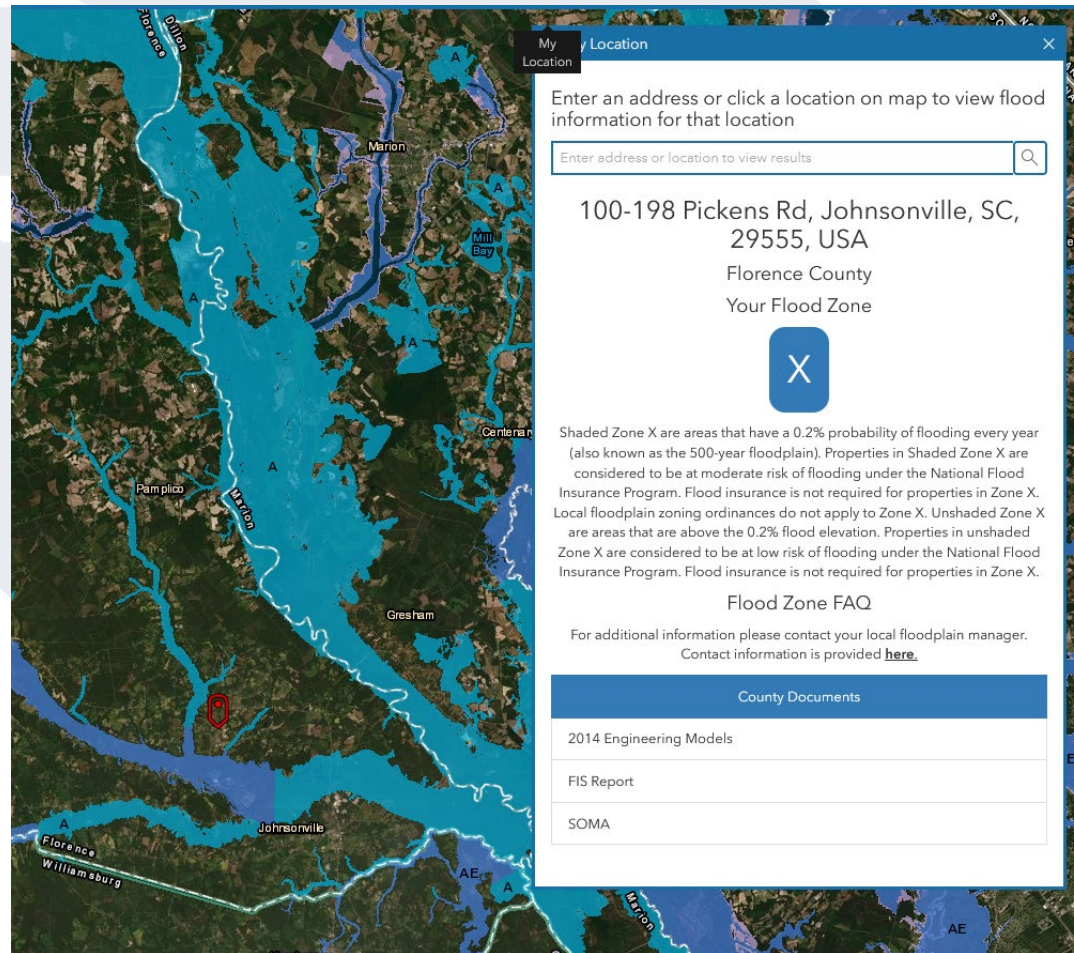
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- SC Flood IMPACT website – only a registered community floodplain manager will have access to the models
  - Only models that SC has produced
- FEMA Library using the Data Request form
  - Older models, anything older than HEC-RAS (HEC 1 or 2)



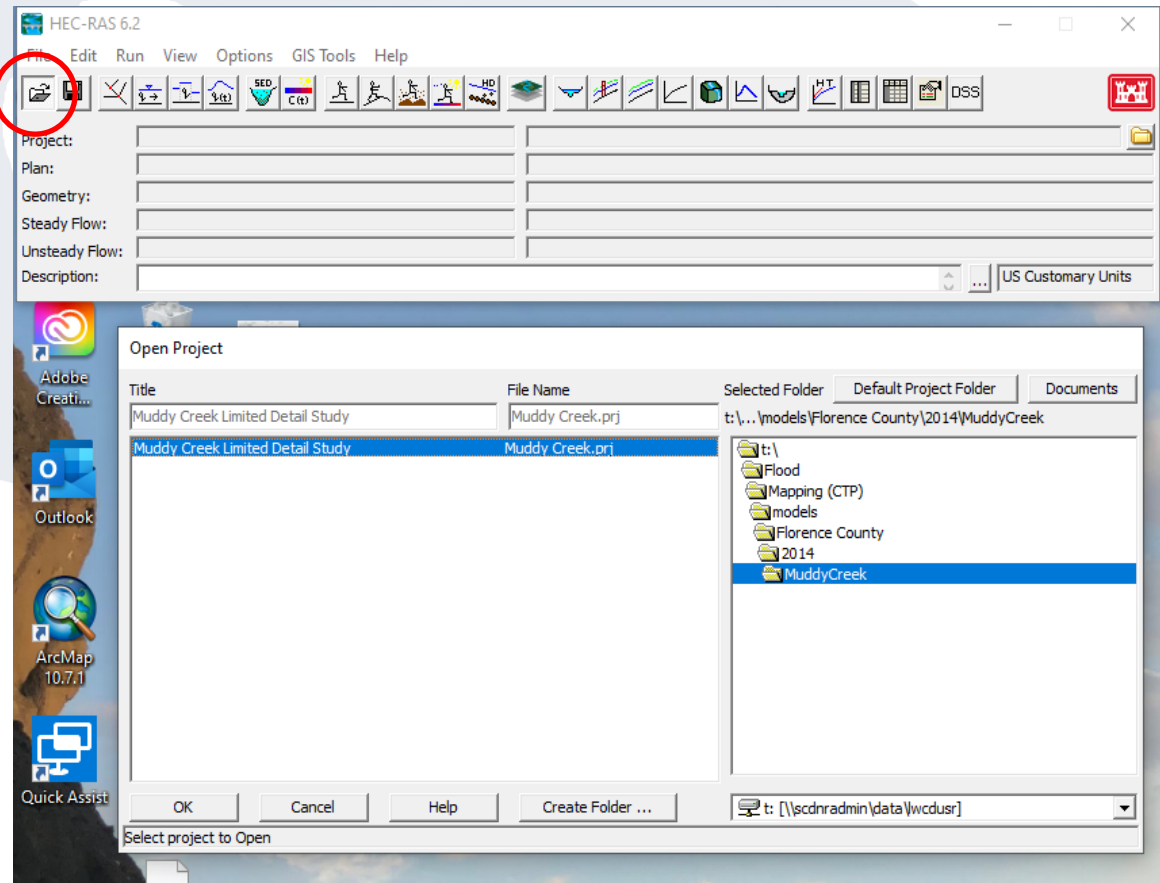
# WSE from Model – Step 1

- Download the model from SC Flood IMPACT website
- Save the model to a known location on your computer
- Download the latest version of HEC-RAS <https://www.hec.usace.army.mil/software/hecras/download.aspx>
- Download the projection file (link on website) and save it to a known location



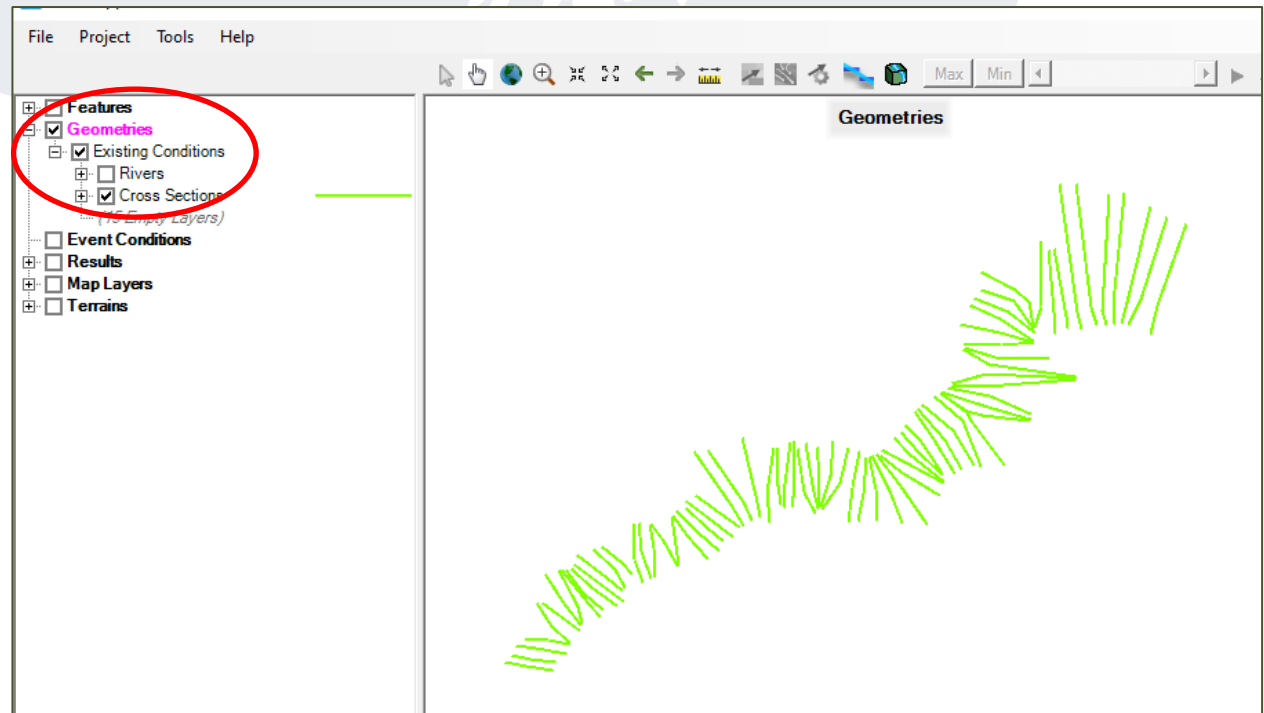
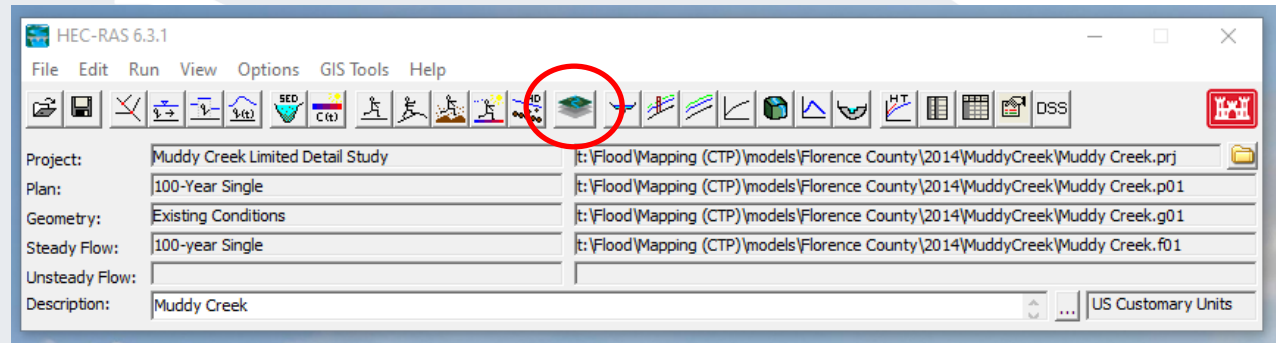
# WSE from Model – Step 2

- Open HEC-RAS
- Click the “Open Project” icon
- Navigate to the folder that the model is saved in
- Click once on the project name and make sure it is highlighted in blue
- Click OK



# WSE from Model – Step 3

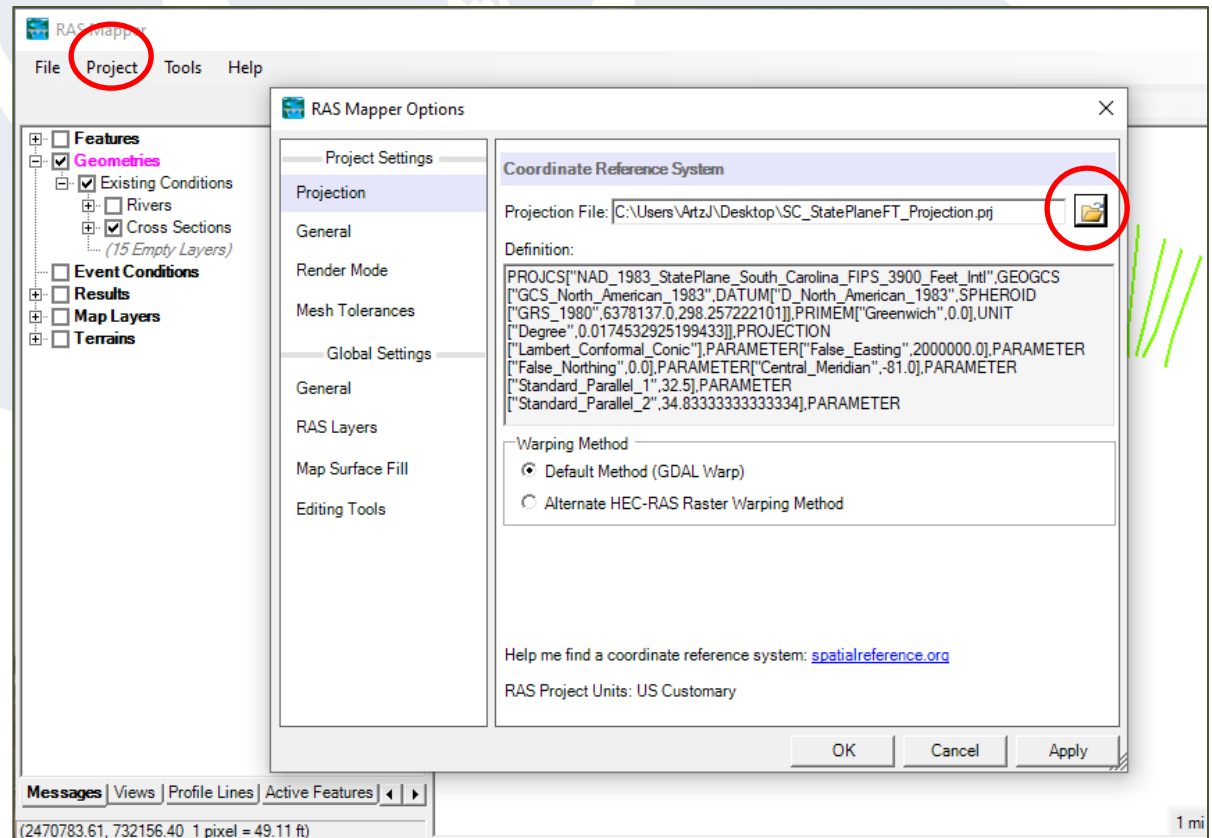
- Click on the RAS-Mapper icon
- Once the next screen pops up, click on “Geometries” and “Existing Conditions”
- Check the “Cross Sections” box



# WSE from Model – Step 4

*The models may not be geo referenced so you will set the projection using the projection file downloaded in Step 1.*

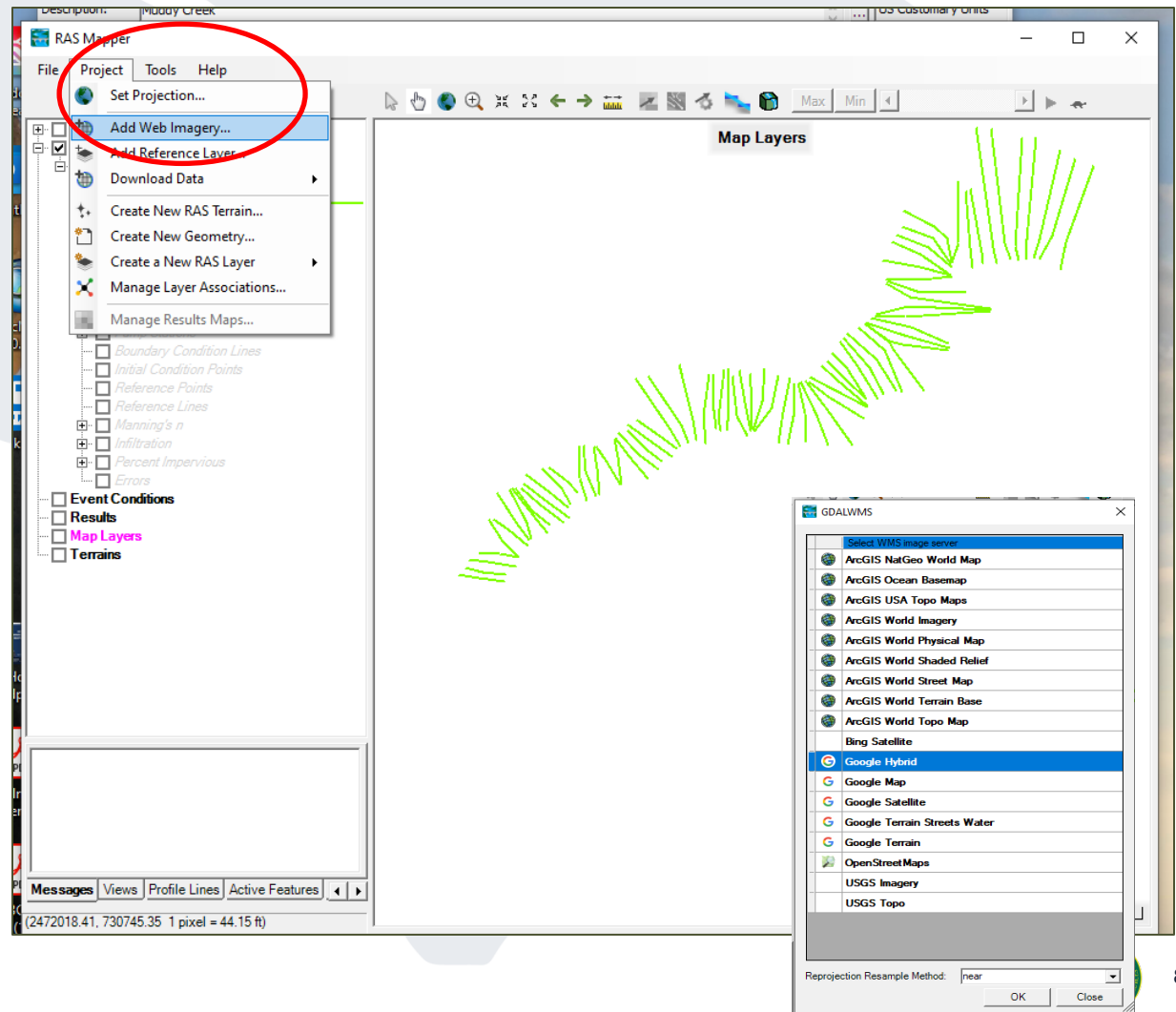
- Go to “Project”
- Click “Set Projection”
- Open Folder and find the projection file that you downloaded with Step 1
- Click “OK”



# WSE from Model – Step 5

- Select “Project” and “Add Web Imagery”
- Choose a base map

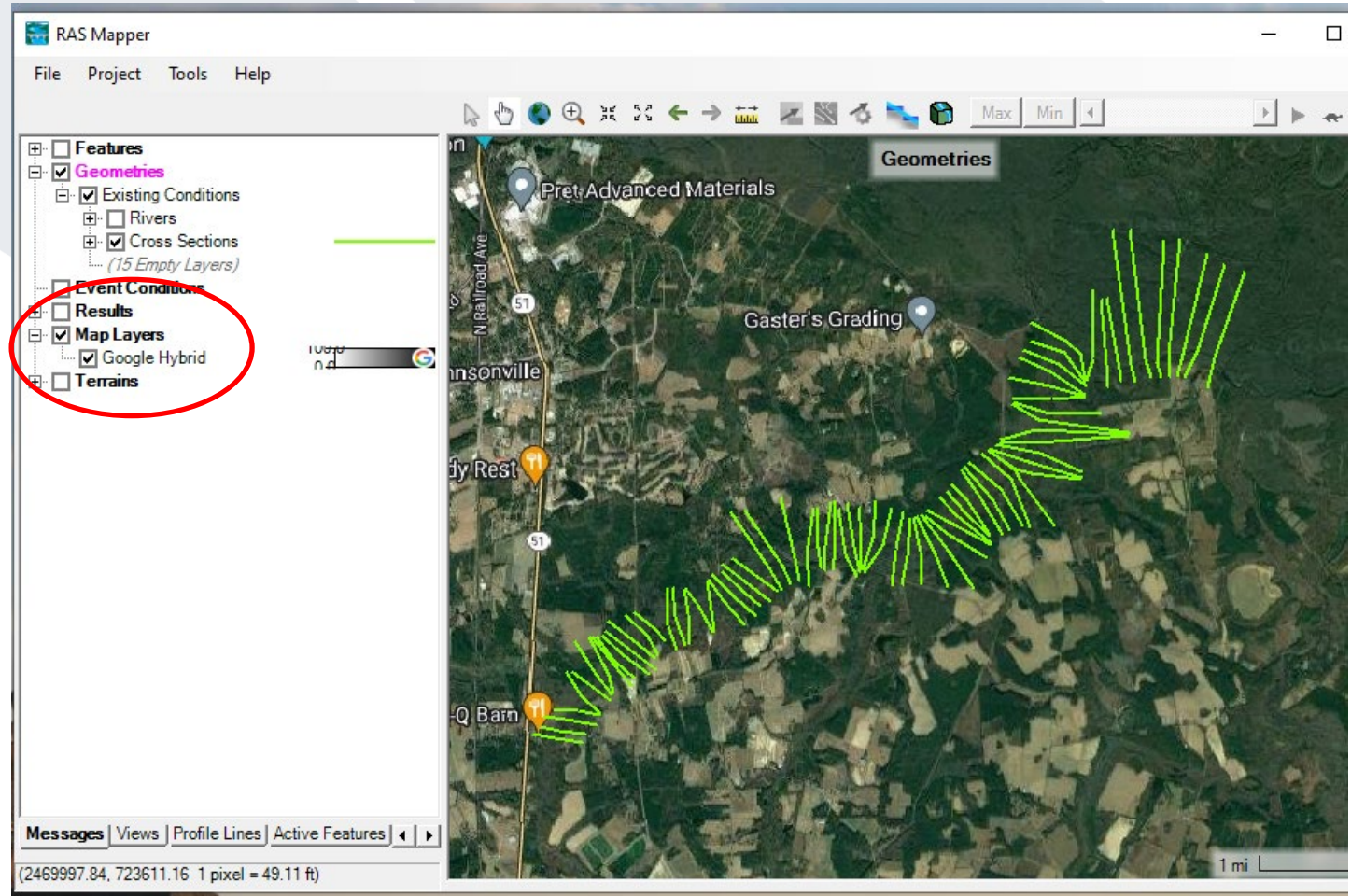
*\*Shapefiles can be added using the “Add Reference Layer” under “Project”*





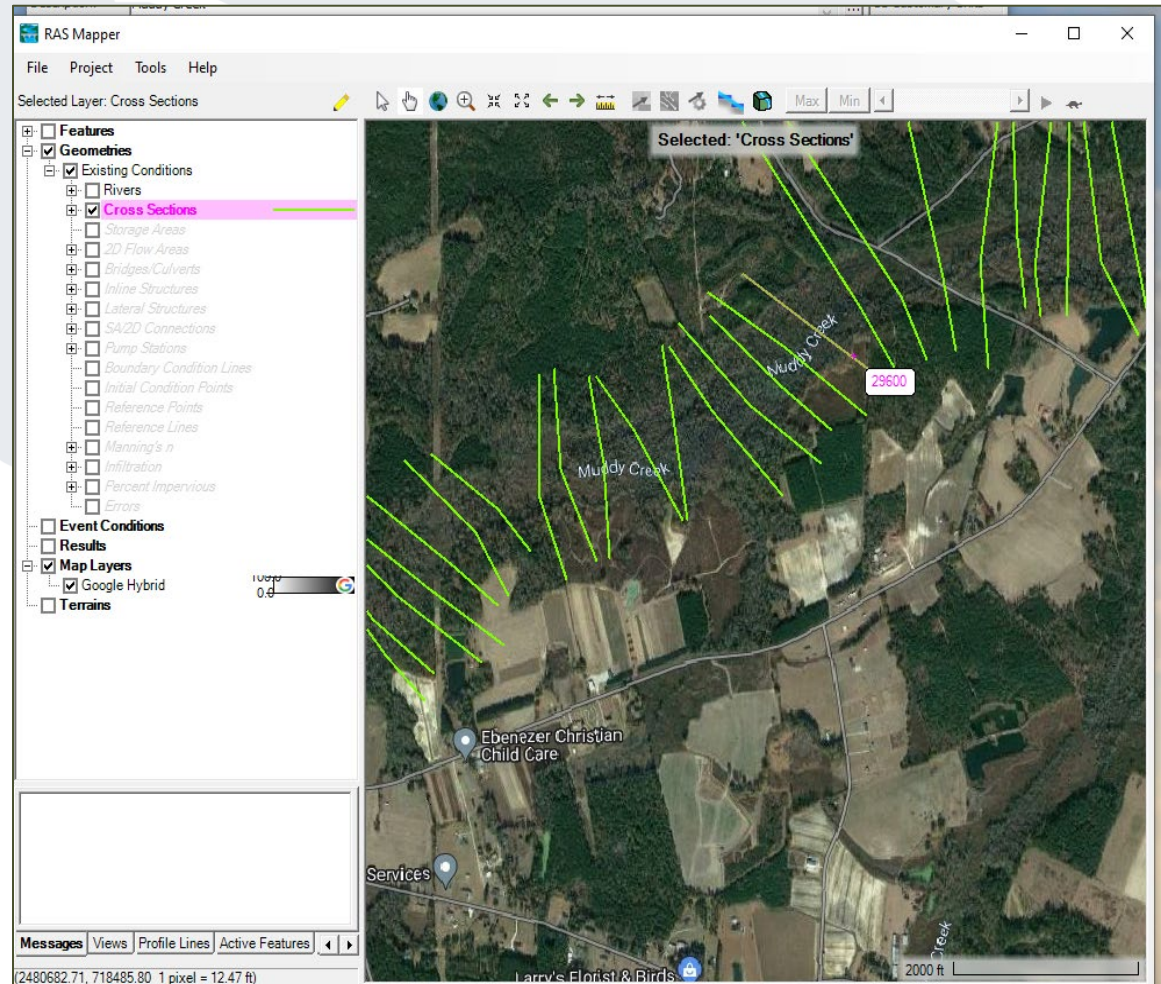
# WSE from Model – Step 6

- Check the “Map Layers” box
- Check the box of the base map you selected



# WSE from Model – Step 7

- Click on “Cross Sections” box to highlight
- Hover over cross section line
- The River Station number will appear



# WSE from Model – Step 8

- Click on “Profile Output Table”
- Find corresponding River Station number
- Find W.S. Elev

HEC-RAS 6.3.1

File Edit Run View Options GIS Tools Help

Project: Muddy Creek Limited Detail Study  
 Plan: 100-Year Single  
 Geometry: Existing Conditions  
 Steady Flow: 100-year Single  
 Unsteady Flow:  
 Description: Muddy Creek

Profile Output Table - Standard Table 1

File Options Std. Tables Locations Help

HEC-RAS Plan: 100Year River: Muddy Creek Reach: Reach-1 Profile: 100-year

Reach	River Sta	Profile	Q Total (cfs)	Min Chl Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude #	Chl
Reach-1	36000	100-year	2142.00	21.11	28.52		28.54	0.000347	1.99	3730.99	854.27	0.13	
Reach-1	35500	100-year	2142.00	20.52	28.35		28.37	0.000329	2.01	3904.28	943.78	0.13	
Reach-1	35030	100-year	2142.00	20.61	28.21		28.22	0.000296	1.87	3952.01	866.30	0.12	
Reach-1	34480	100-year	2142.00	20.58	28.05		28.07	0.000267	1.75	4401.22	1033.66	0.11	
Reach-1	34000	100-year	2142.00	20.31	27.92		27.93	0.000297	1.87	4153.33	986.10	0.12	
Reach-1	33520	100-year	2142.00	20.37	27.75		27.76	0.000405	2.14	3624.84	909.34	0.14	
Reach-1	33000	100-year	2761.00	19.77	27.52		27.55	0.000431	2.31	3982.93	875.61	0.15	
Reach-1	32500	100-year	2761.00	19.56	27.34		27.36	0.000332	2.04	4573.46	973.46	0.13	
Reach-1	32000	100-year	2761.00	19.66	27.18		27.19	0.000317	1.94	5149.58	1241.43	0.13	
Reach-1	31500	100-year	2761.00	19.93	27.00		27.01	0.000405	2.11	4701.24	1203.56	0.14	
Reach-1	31000	100-year	2761.00	20.11	26.77		26.79	0.000484	2.22	4239.28	1048.68	0.15	
Reach-1	30500	100-year	2761.00	20.13	26.53		26.55	0.000484	2.16	4058.30	918.72	0.15	
Reach-1	29600	100-year	2761.00	19.67	26.08		26.10	0.000514	2.23	4098.95	1002.52	0.16	
Reach-1	29000	100-year	2761.00	19.27	25.72		25.75	0.000690	2.59	4024.84	1266.69	0.18	
Reach-1	28500	100-year	2761.00	18.91	25.28		25.33	0.001015	3.11	3264.59	1077.92	0.22	
Reach-1	28000	100-year	2761.00	17.93	24.87		24.91	0.000703	2.74	3781.23	1246.95	0.18	
Reach-1	27500	100-year	2761.00	17.74	24.60		24.62	0.000460	2.20	4679.24	1356.32	0.15	
Reach-1	27000	100-year	2761.00	17.58	24.39		24.41	0.000393	2.03	5023.61	1354.92	0.14	
Reach-1	26500	100-year	2761.00	17.51	24.20		24.21	0.000387	1.99	5067.82	1360.31	0.14	
Reach-1	26100	100-year	2761.00	17.41	24.03		24.04	0.000459	2.15	4640.30	1250.65	0.15	



# Using the WSE as the BFE

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- This WSE can be used as best available data to determine a BFE if it meets the criteria in Slide 2
- If the WSE is determined by the community and used on an Elevation Certificate, the source will be “community determined”
- If the WSE is determined by a surveyor or engineer and used on the Elevation Certificate, the source will be “other” and should be explained in the comments AND the BFE must be verified by the community

