Land Cover Layer and Manning's n Values

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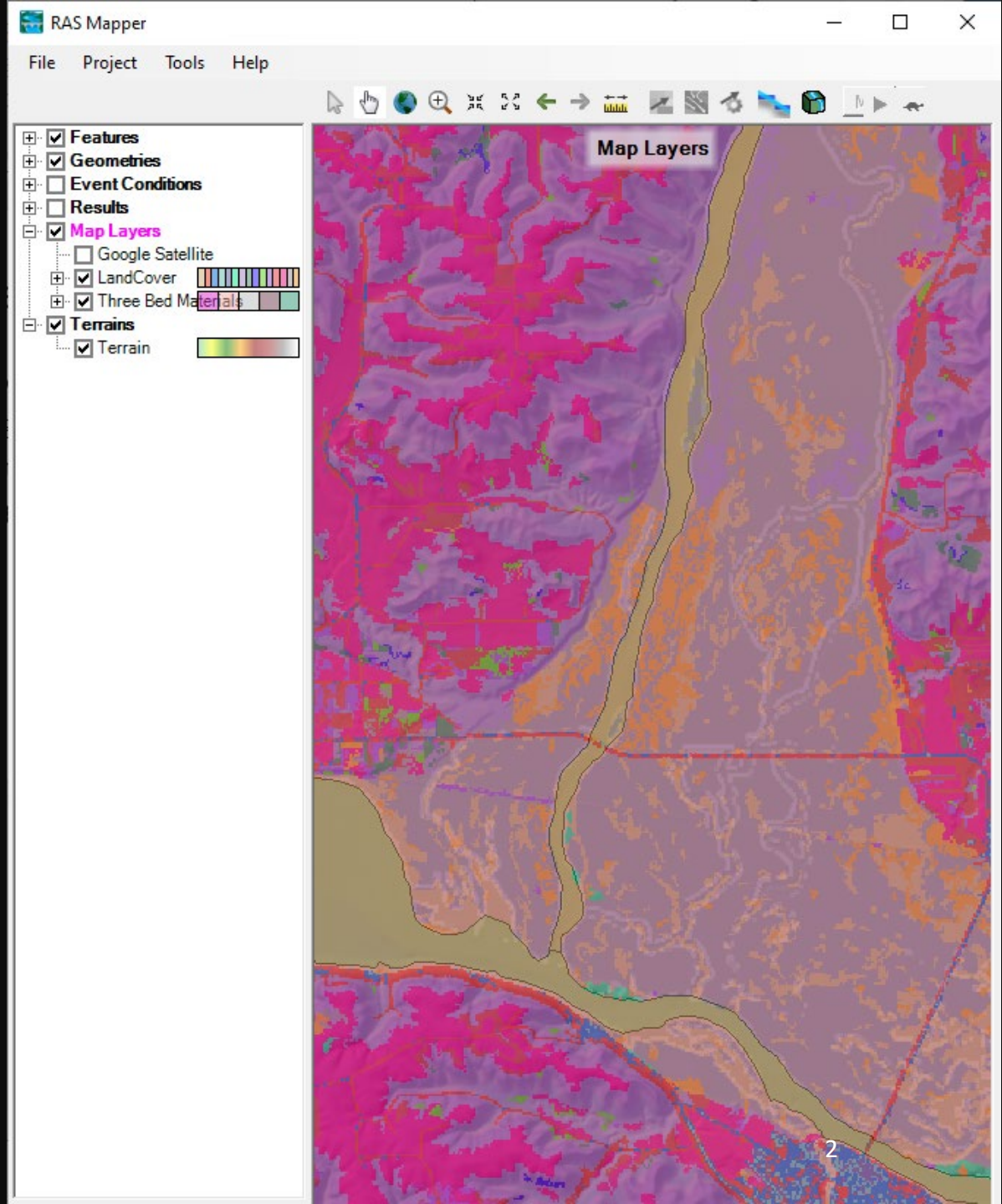
US Army Corps of Engineers

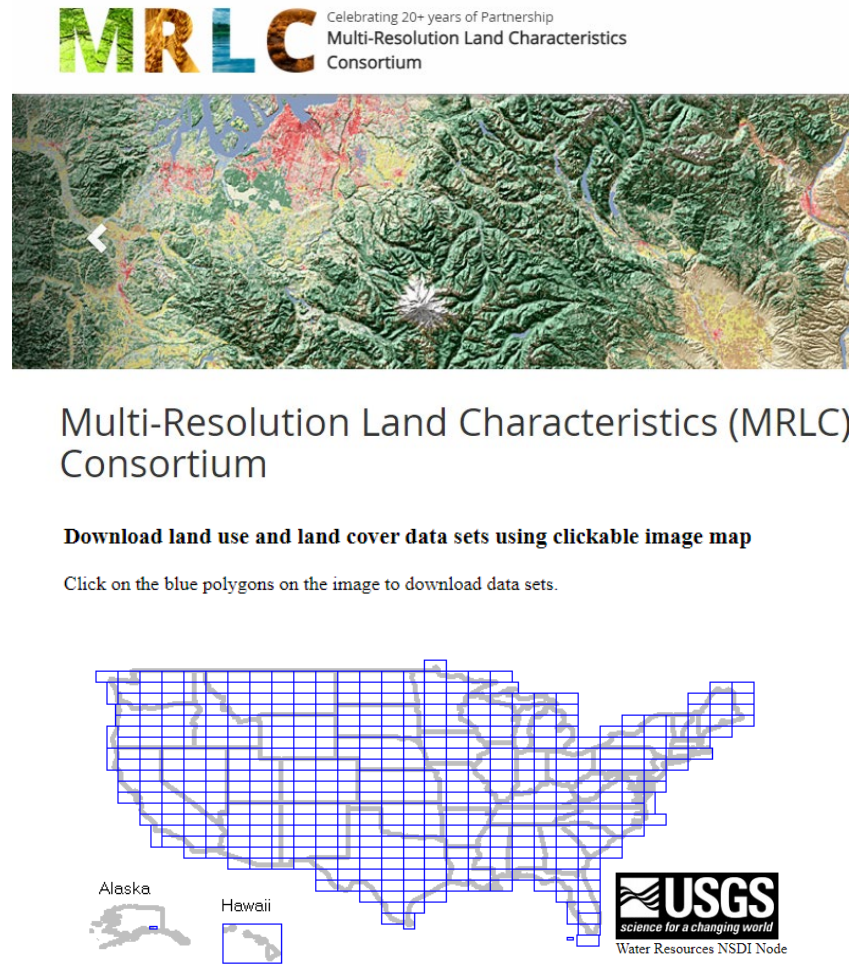
Overview

1. Land Cover Data Sources
2. Importing Land Cover Data
3. Associating Manning's n Values
4. Modifying Land Cover Data



Land Cover Data Sources

- Support use of Land Cover data for estimating Manning's n values
  - Raster and Shapefile polygon datasets
- NLCD 2016
  - http://www.mrlc.gov
    (30-m raster)
- USGS LULC
  - http://water.usgs.gov/GIS/dsdl/ds240/index.html
    (vector or raster)



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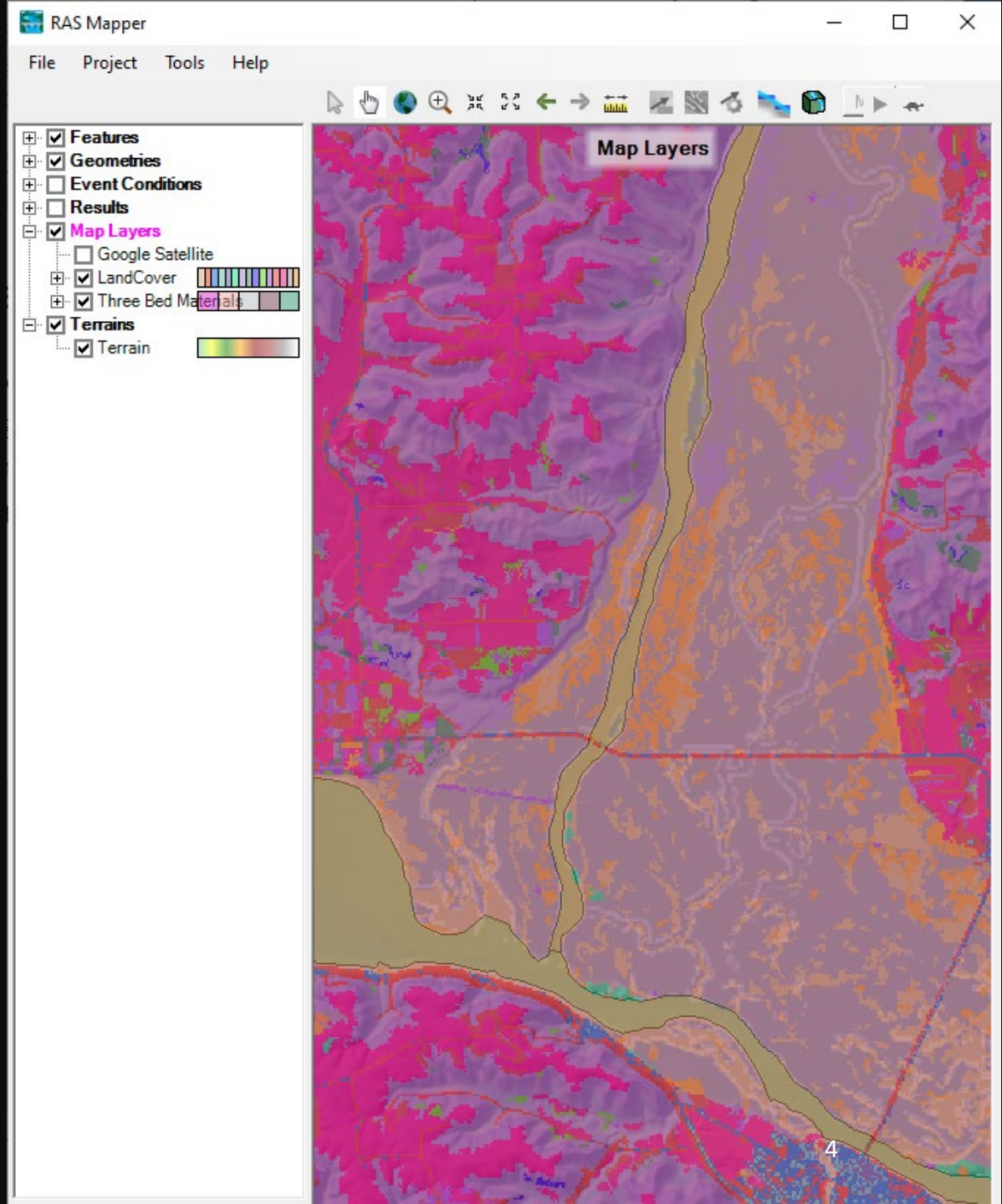

Overview

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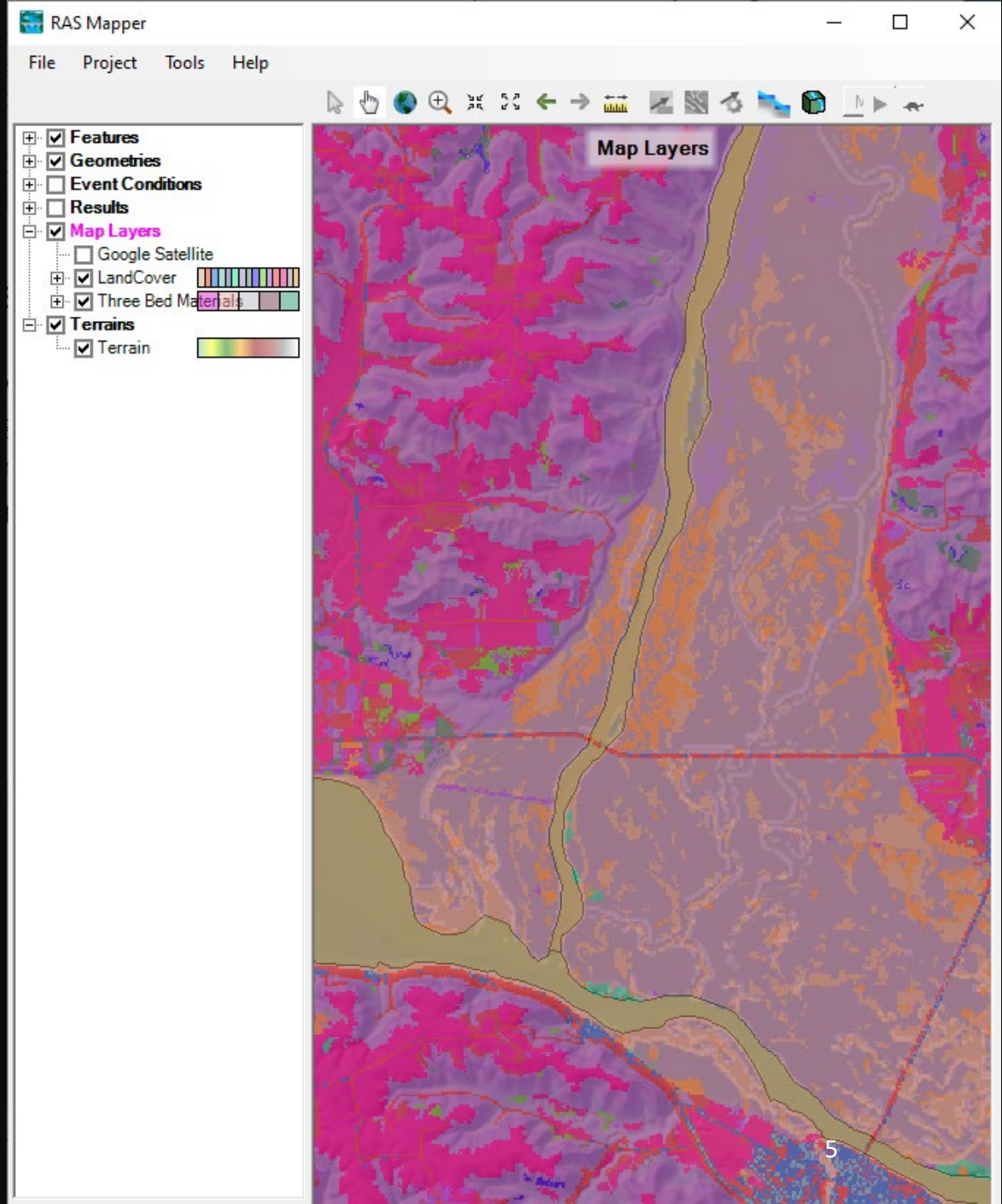
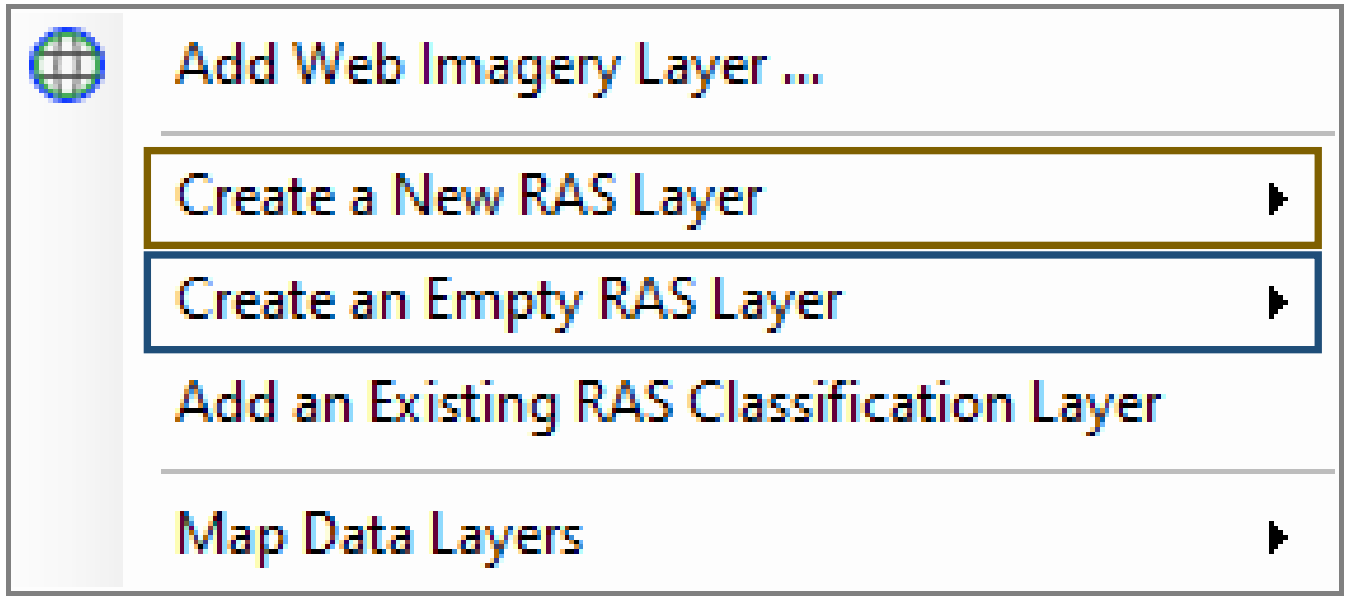
Creating

2. ~~Importing~~ Land Cover Data

3. Associating Manning's n Values

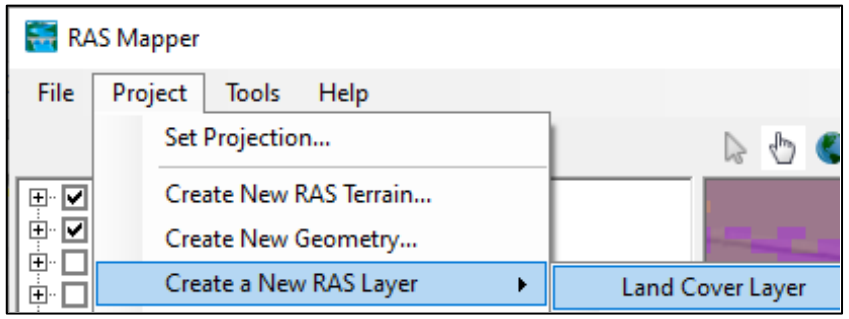
4. Modifying Land Cover Data





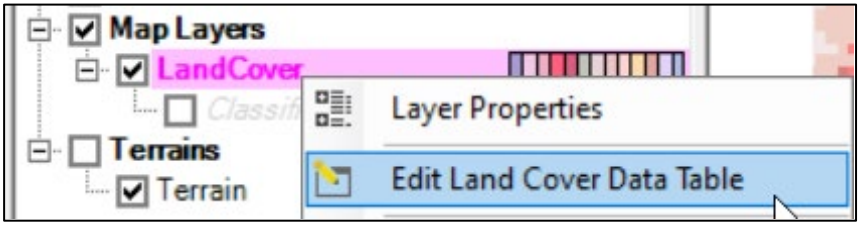
Create = Import
(from GIS file)

Create Empty =
Draw It



Create Land Cover Layer

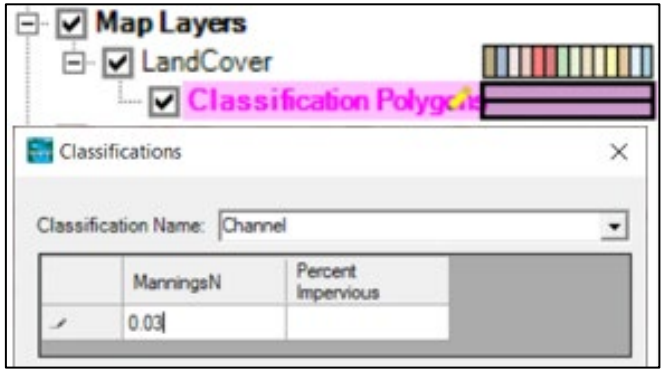
Import Land Cover Data

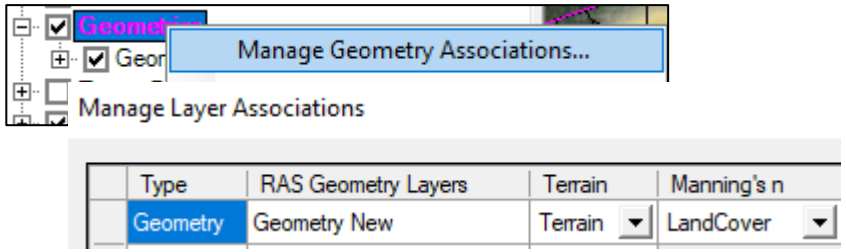


Define Base n Values

Optional

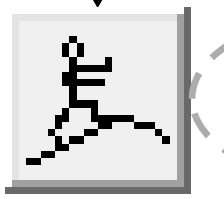
Land Classification Polygons



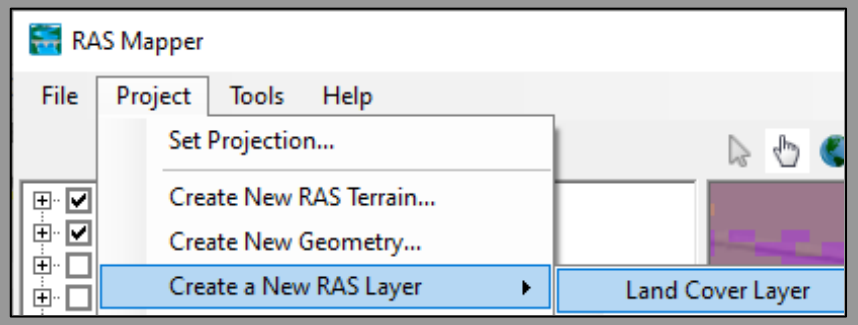


Associate Land Cover with Geometry

Optional

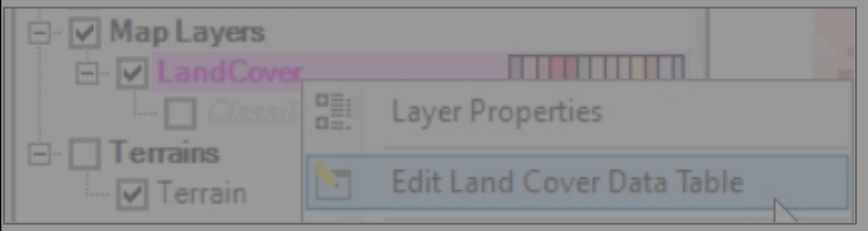


Calibration Regions



Create Land Cover Layer

Import Land Cover Data



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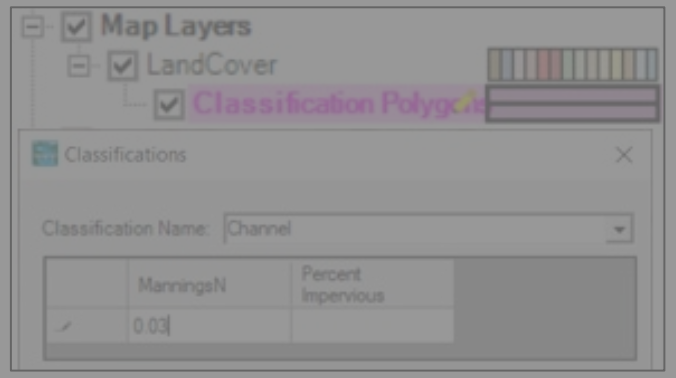

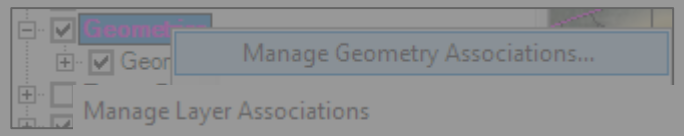

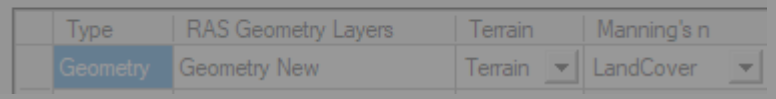

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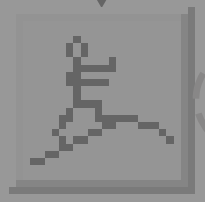

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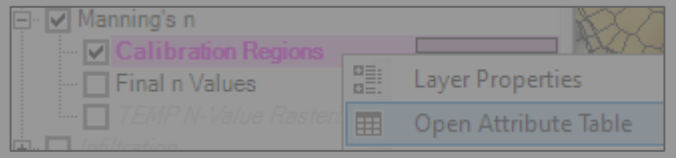
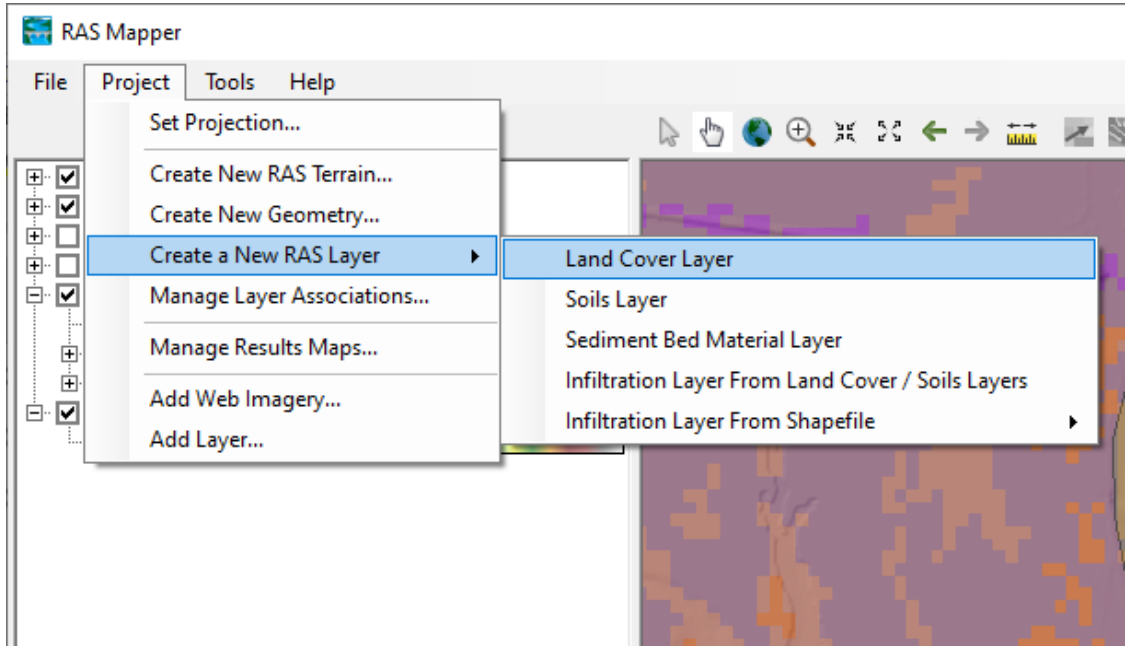
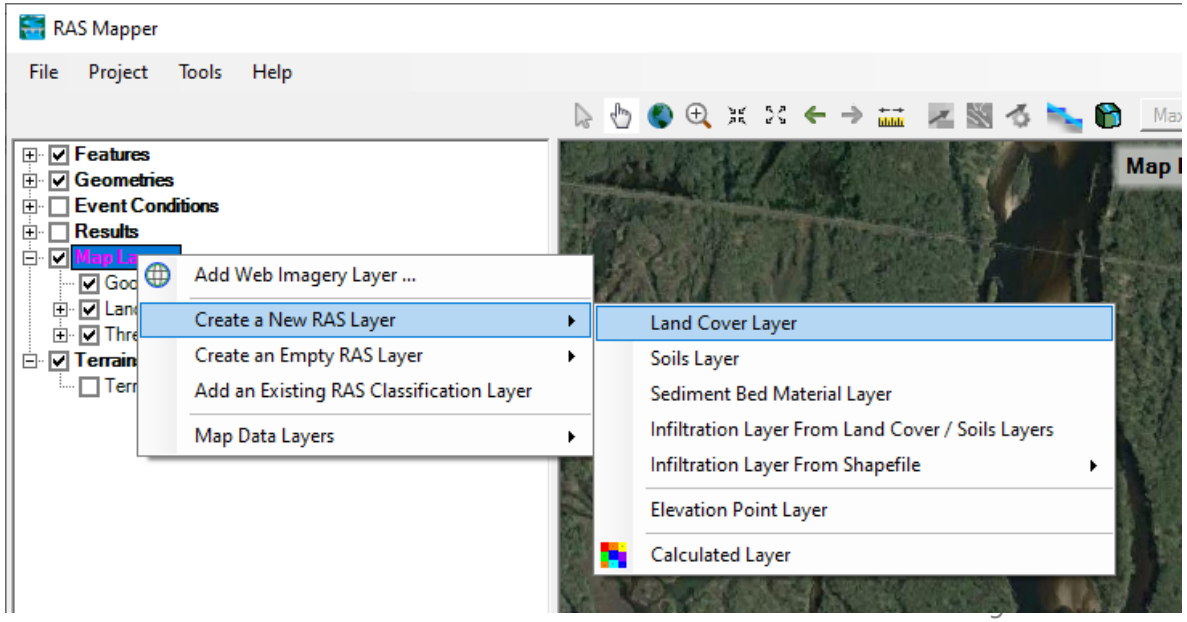


Importing Land Cover Data

- Define the project domain
  - Terrain model
  - River model construct
- Create a New Land Cover Layer

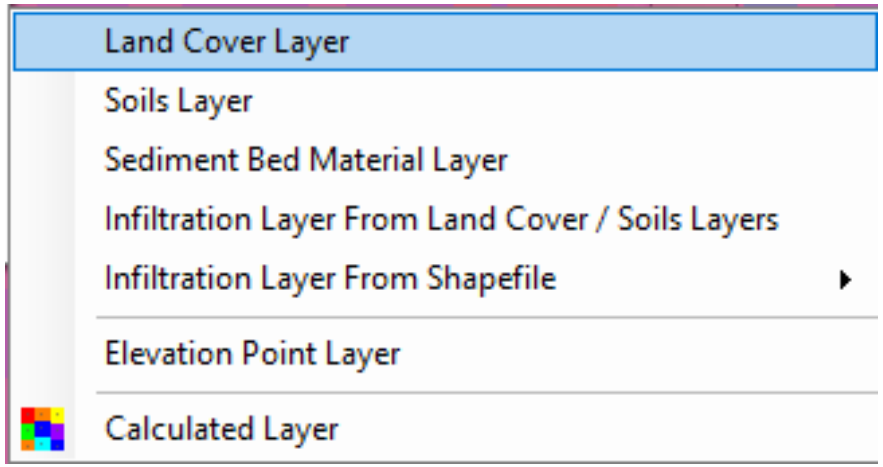


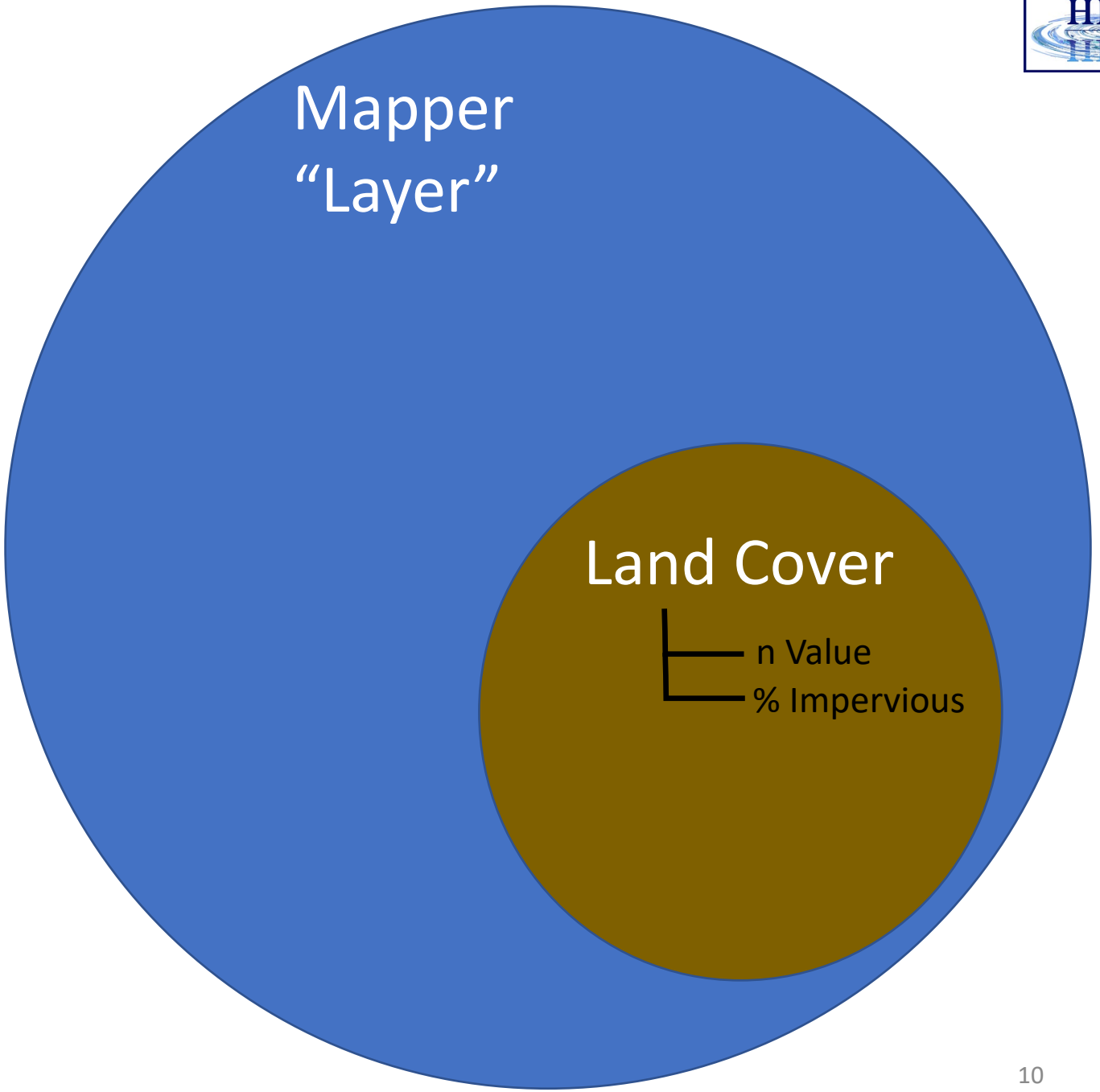


A Ven Diagram of Important Terms

Note: None of these terms is "n-Value"

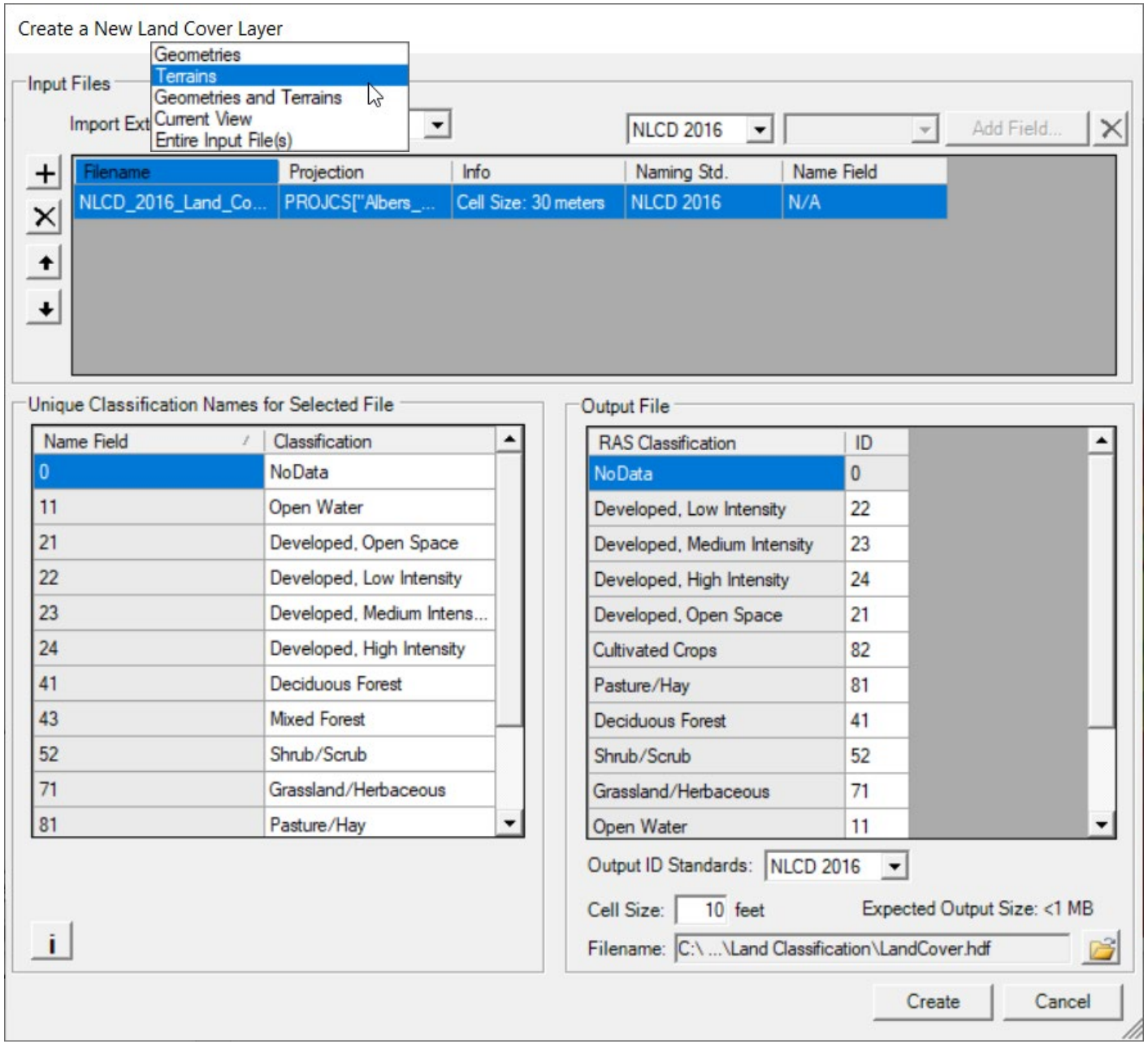
Types of Mapper Layers





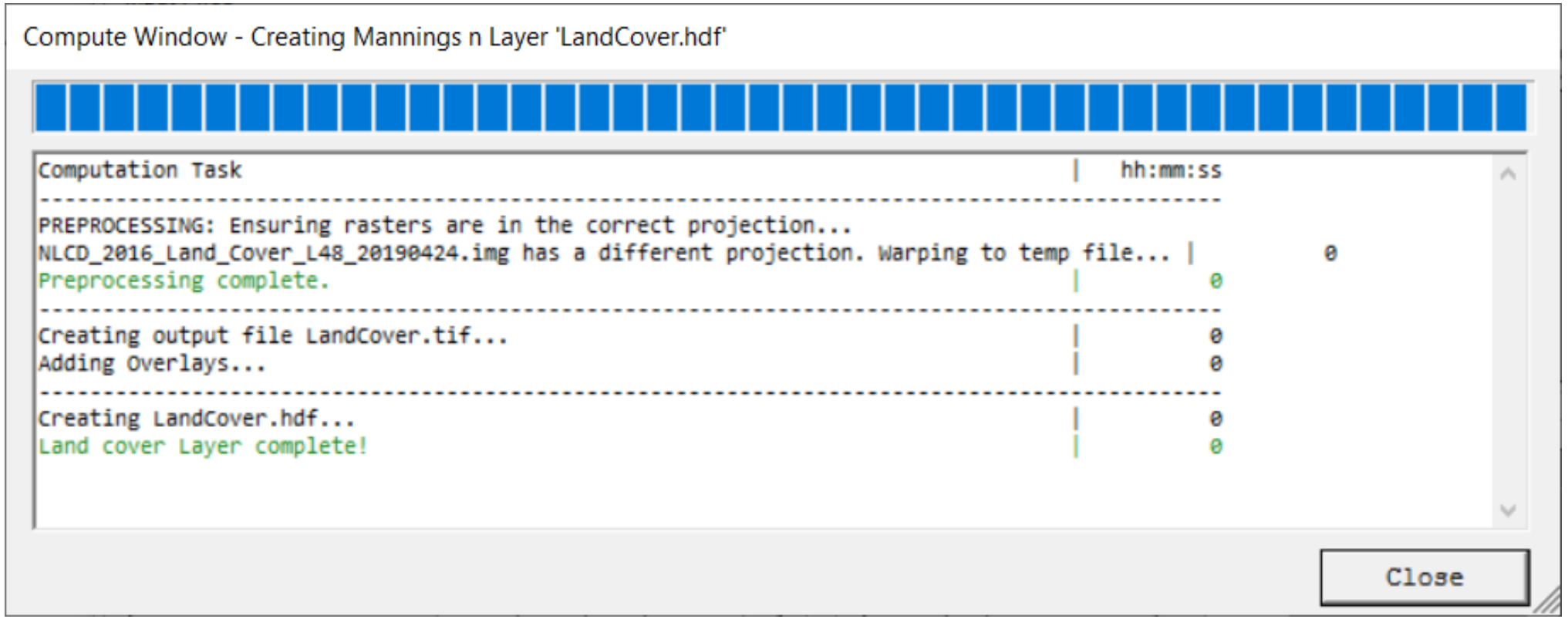
New Land Cover Layer

- Set Extents
- Add Files
- Reclassify
- Set Cell Size
- Provide Filename
- Create

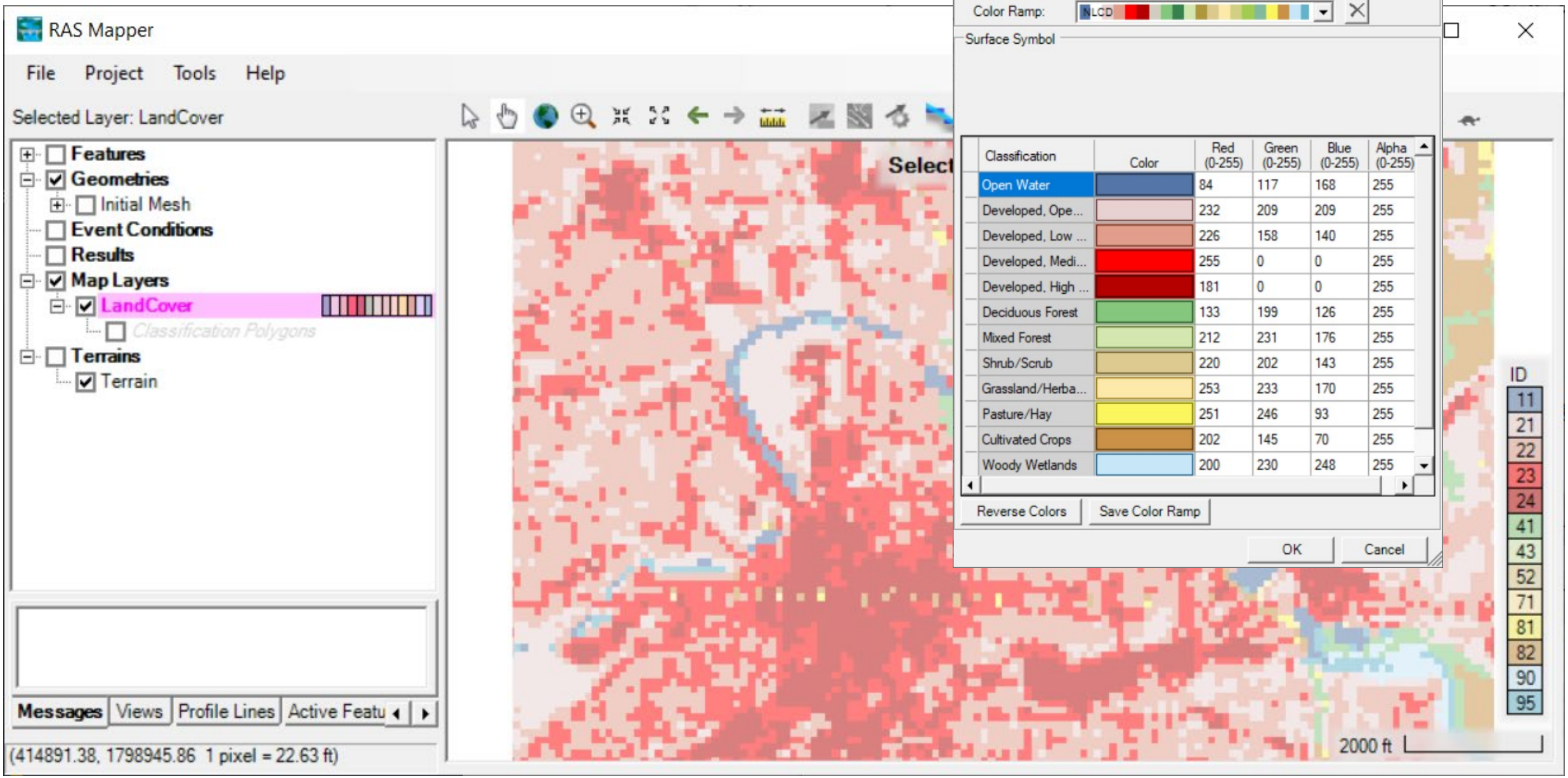


Land Cover Import

- New Raster is created (LandCover.tif and LandCover.hdf)
- Reprojected into coordinate system



Land Cover Layer



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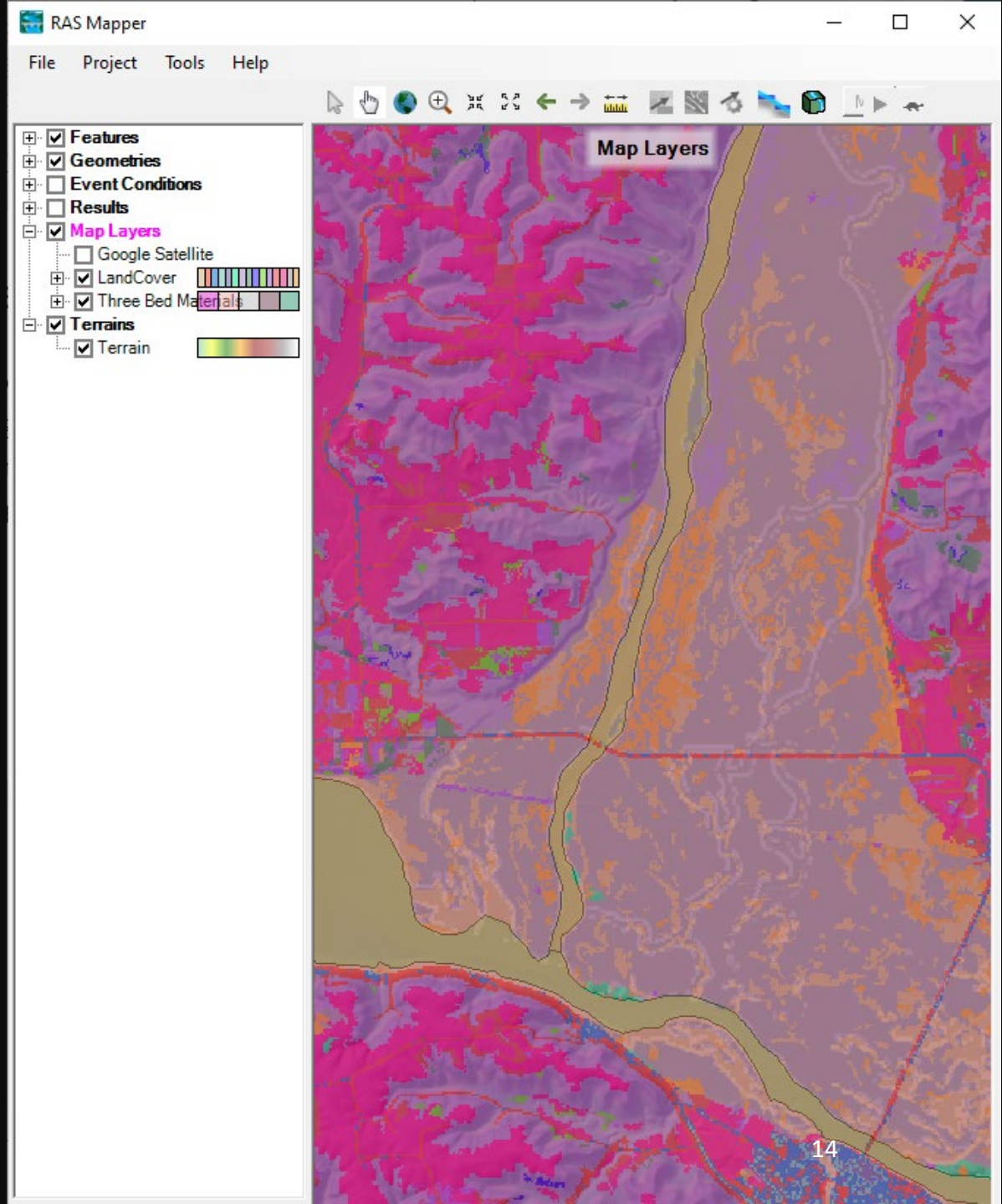
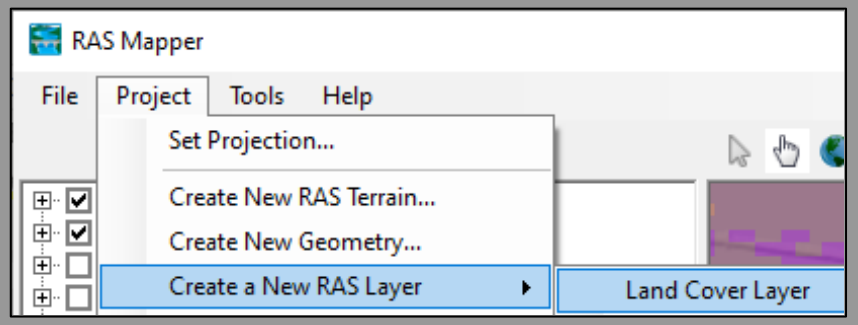
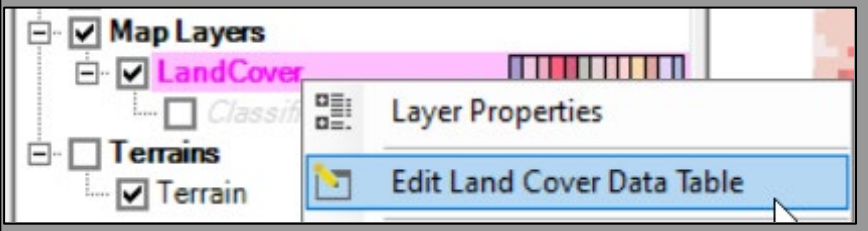




Create Land Cover Layer

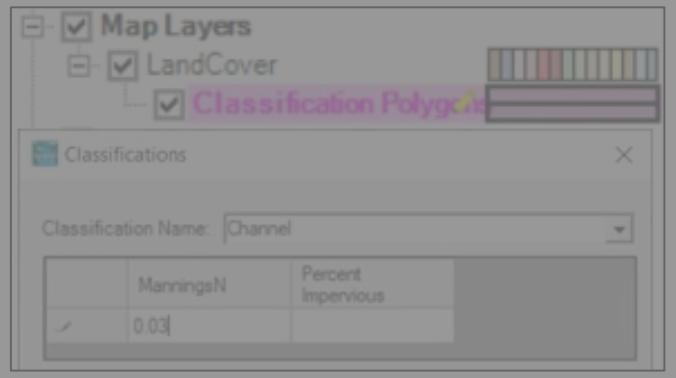
Import Land Cover Data

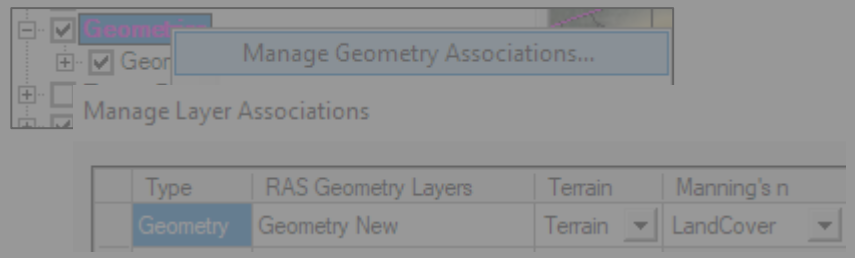


Define Base n Values

Optional

Land Classification Polygons





Associate Land Cover with Geometry

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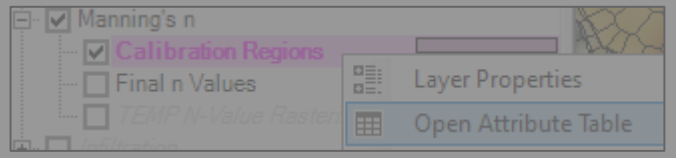
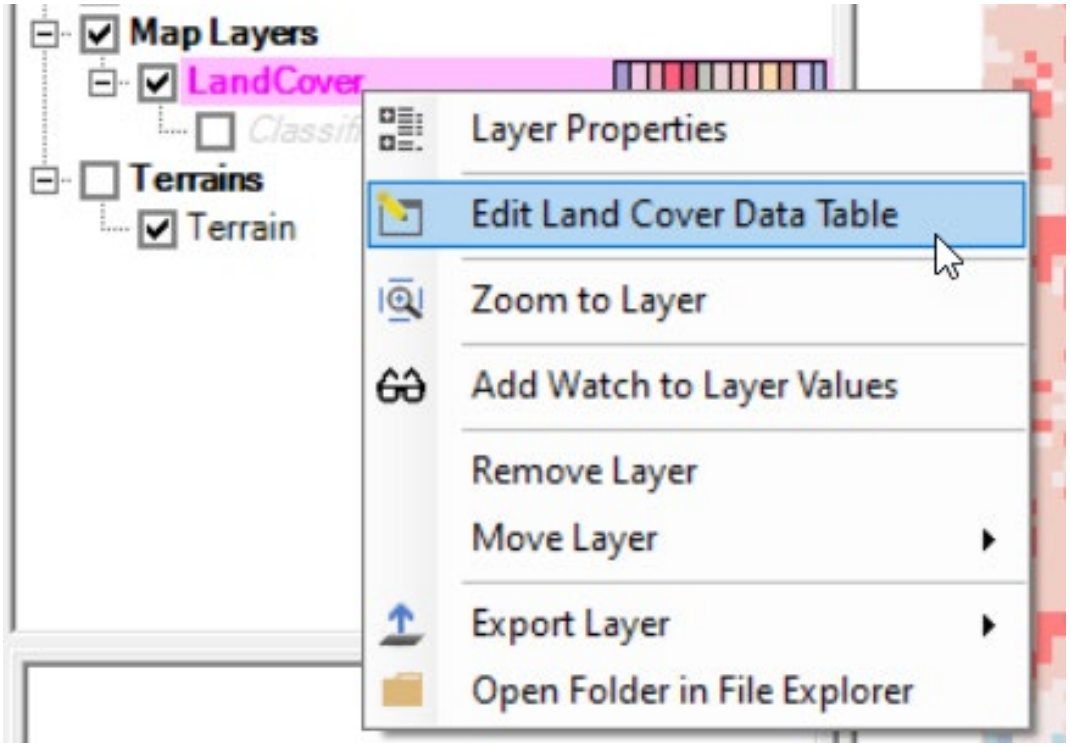


Manning's n Values

- Provide base Manning's n values



This is the first time you will actually see "Manning n"

Classification Parameters

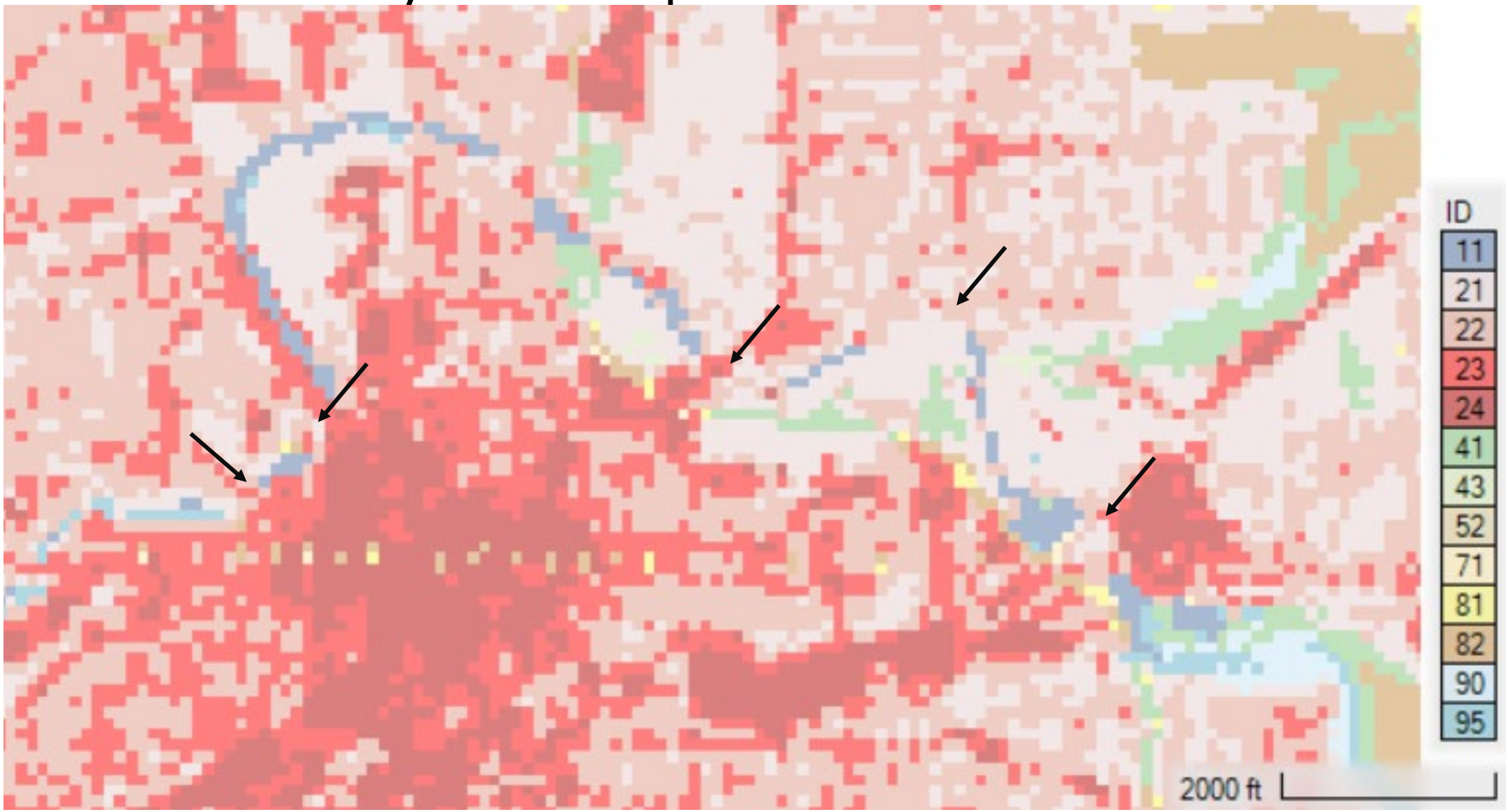
Selected Area Edits

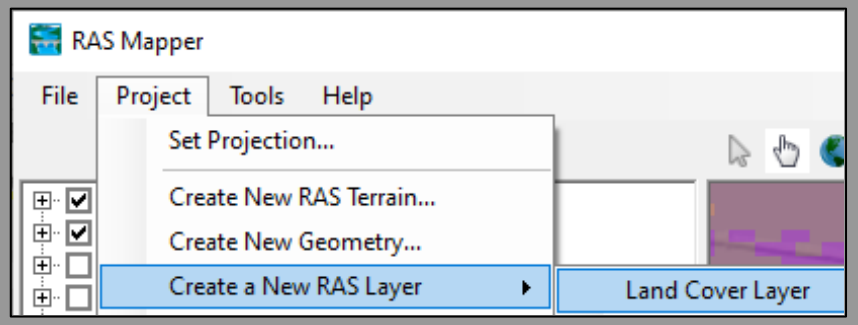
Parameter: ManningsN

ID	Name	ManningsN
0	NoData	0.066
11	Open Water	0.035
21	Developed, Open Space	0.04
22	Developed, Low Intensity	0.06
23	Developed, Medium Intensity	0.08
24	Developed, High Intensity	0.1
41	Deciduous Forest	0.16
43	Mixed Forest	0.14
52	Shrub/Scrub	0.04
71	Grassland/Herbaceous	0.055
81	Pasture/Hay	0.04
82	Cultivated Crops	0.05
90	Woody Wetlands	0.09
95	Emergent Herbaceous Wetlan...	0.65

OK Cancel

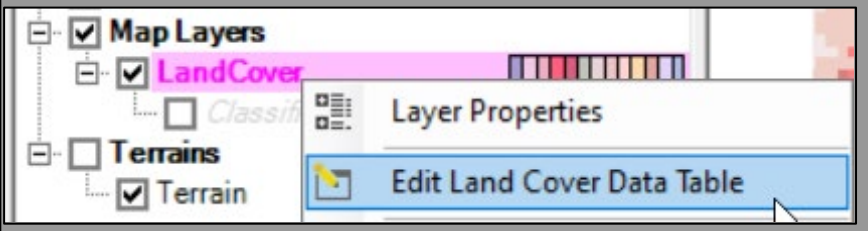
Land Cover Layer – Imperfect Data





Create Land Cover Layer

Import Land Cover Data



Define Base n Values

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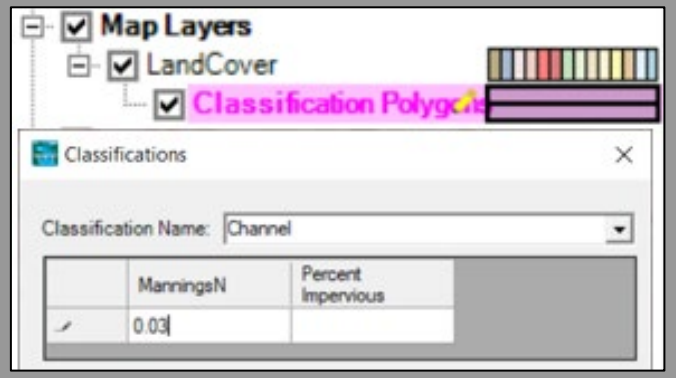
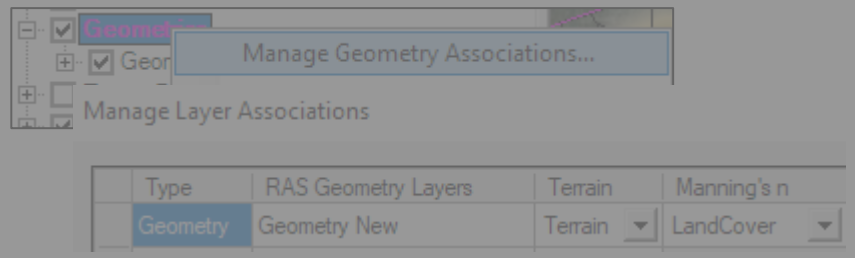
Land Classification Polygons

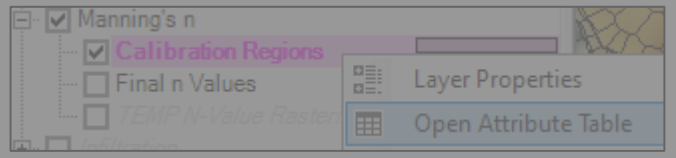




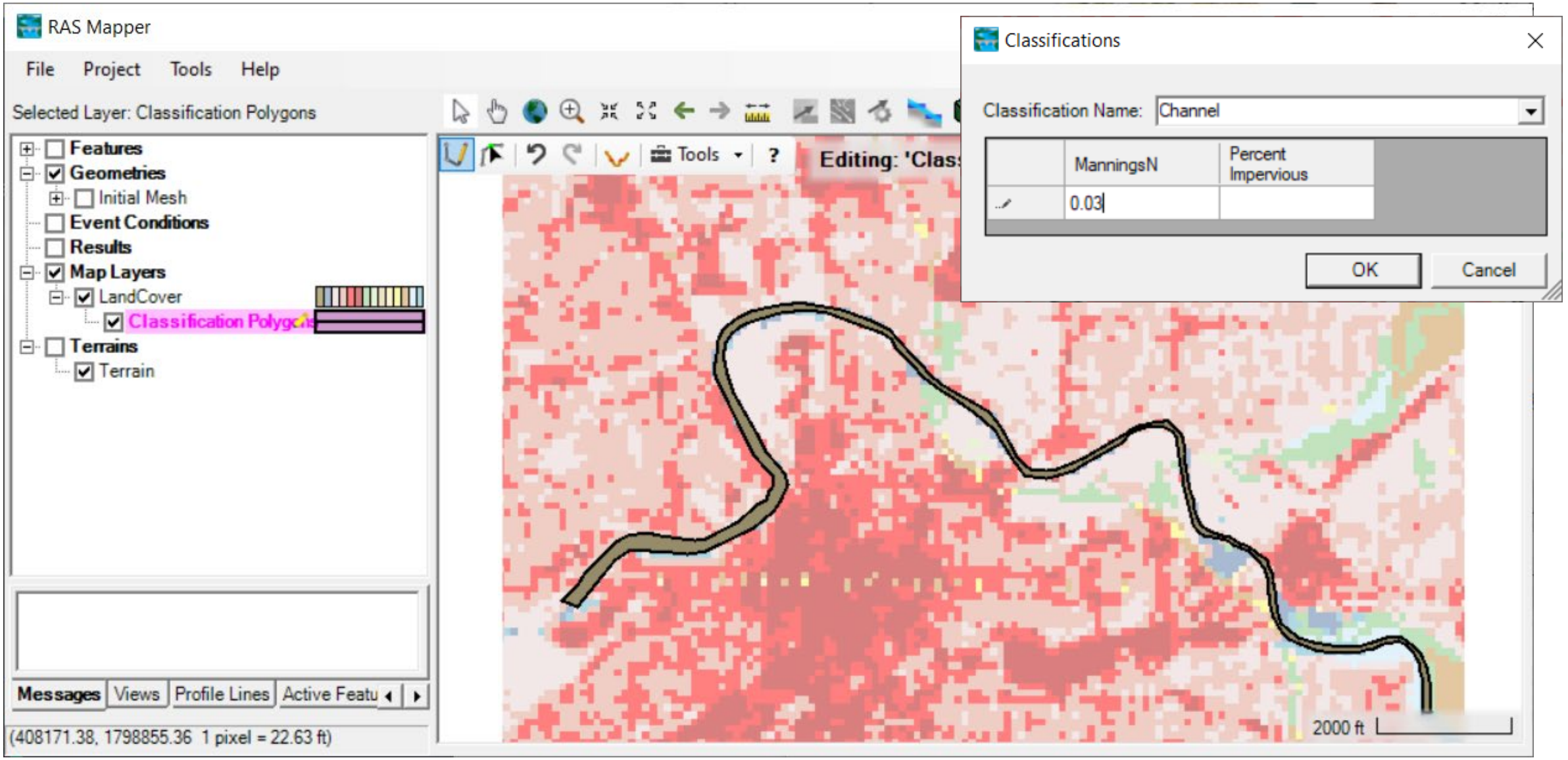
Associate Land Cover with Geometry

Optional

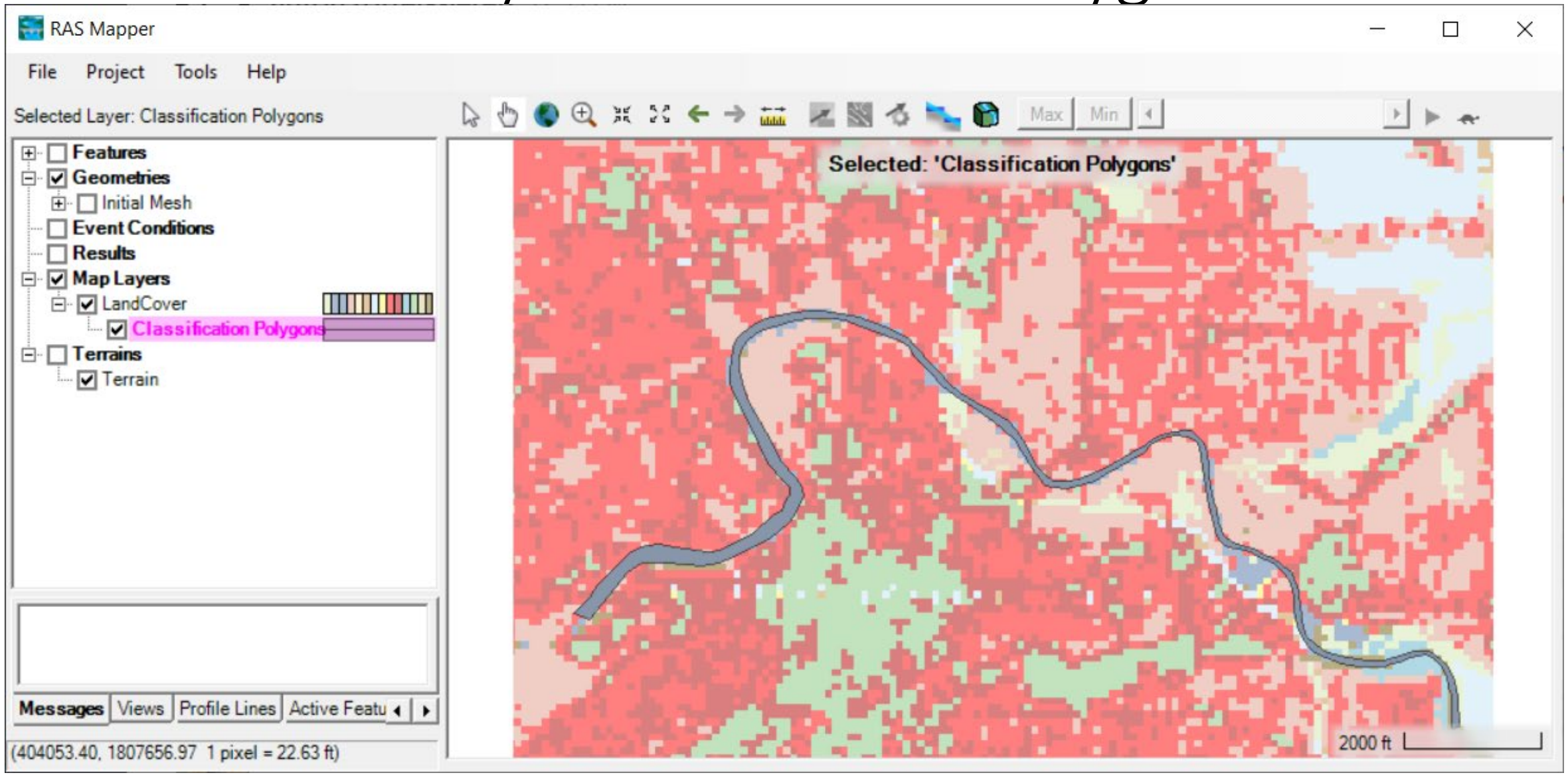
Calibration Regions

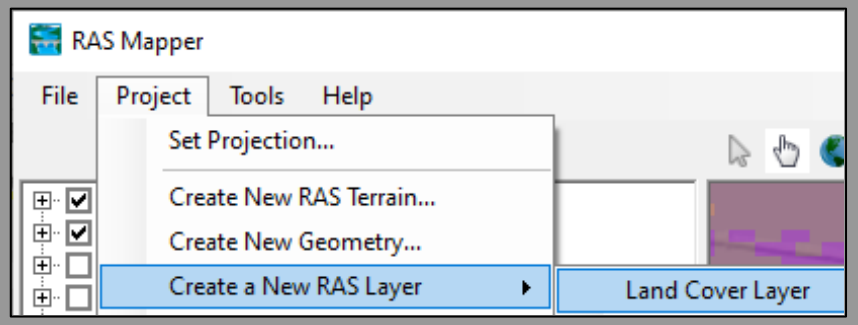


Land Cover Classification



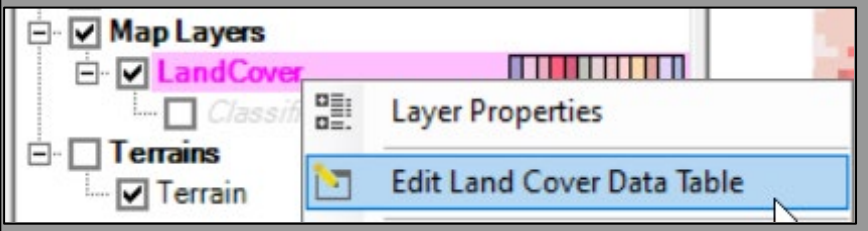
Land Cover Layer with Vector Polygons





Create Land Cover Layer

Import Land Cover Data



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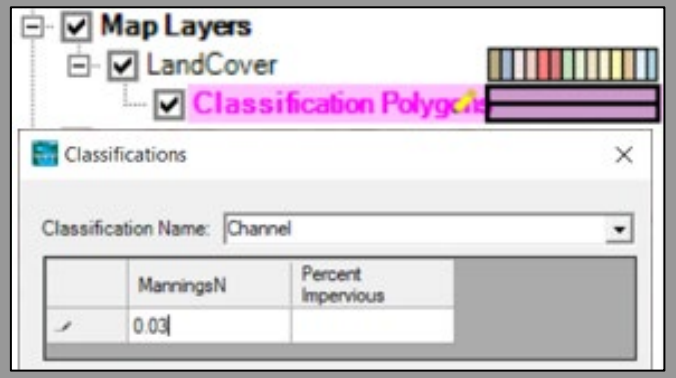
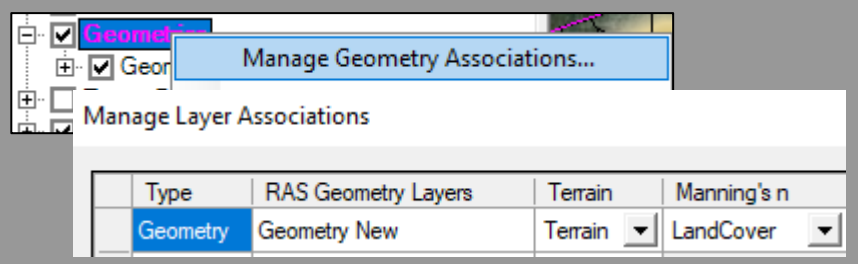
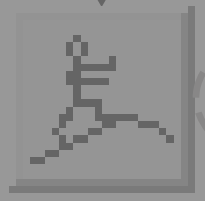




Associate Land Cover with Geometry

Optional



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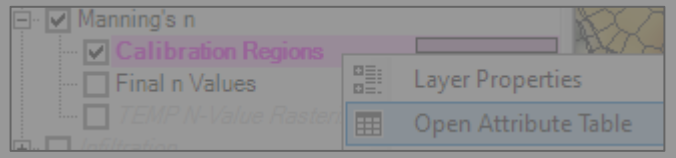

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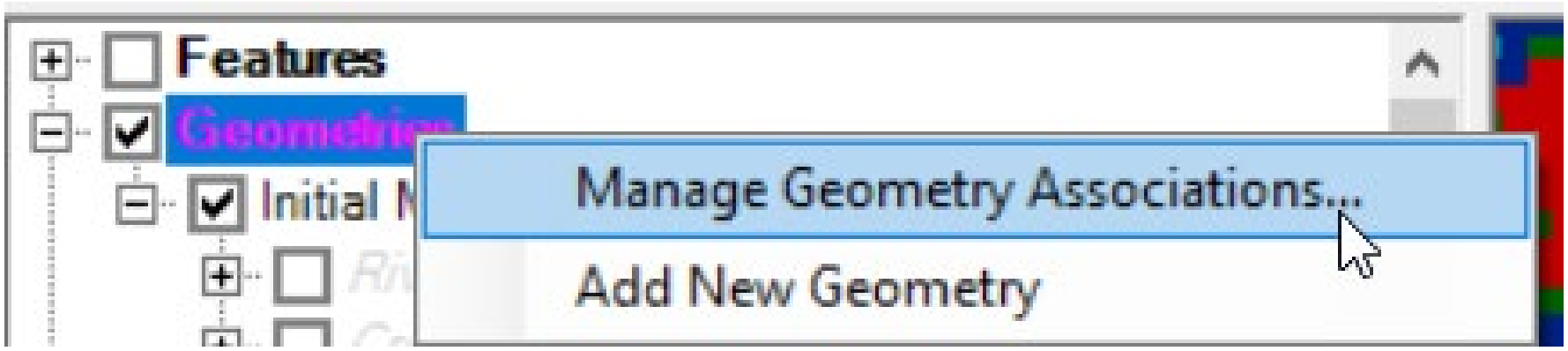
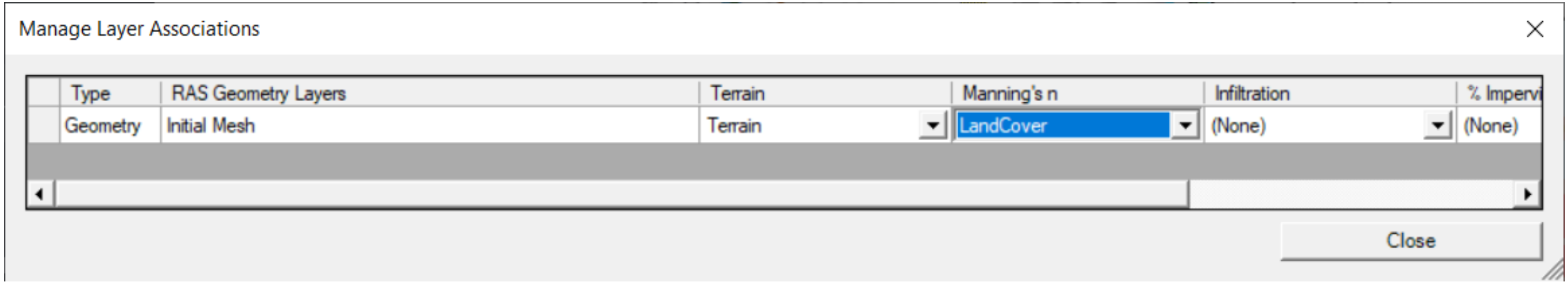
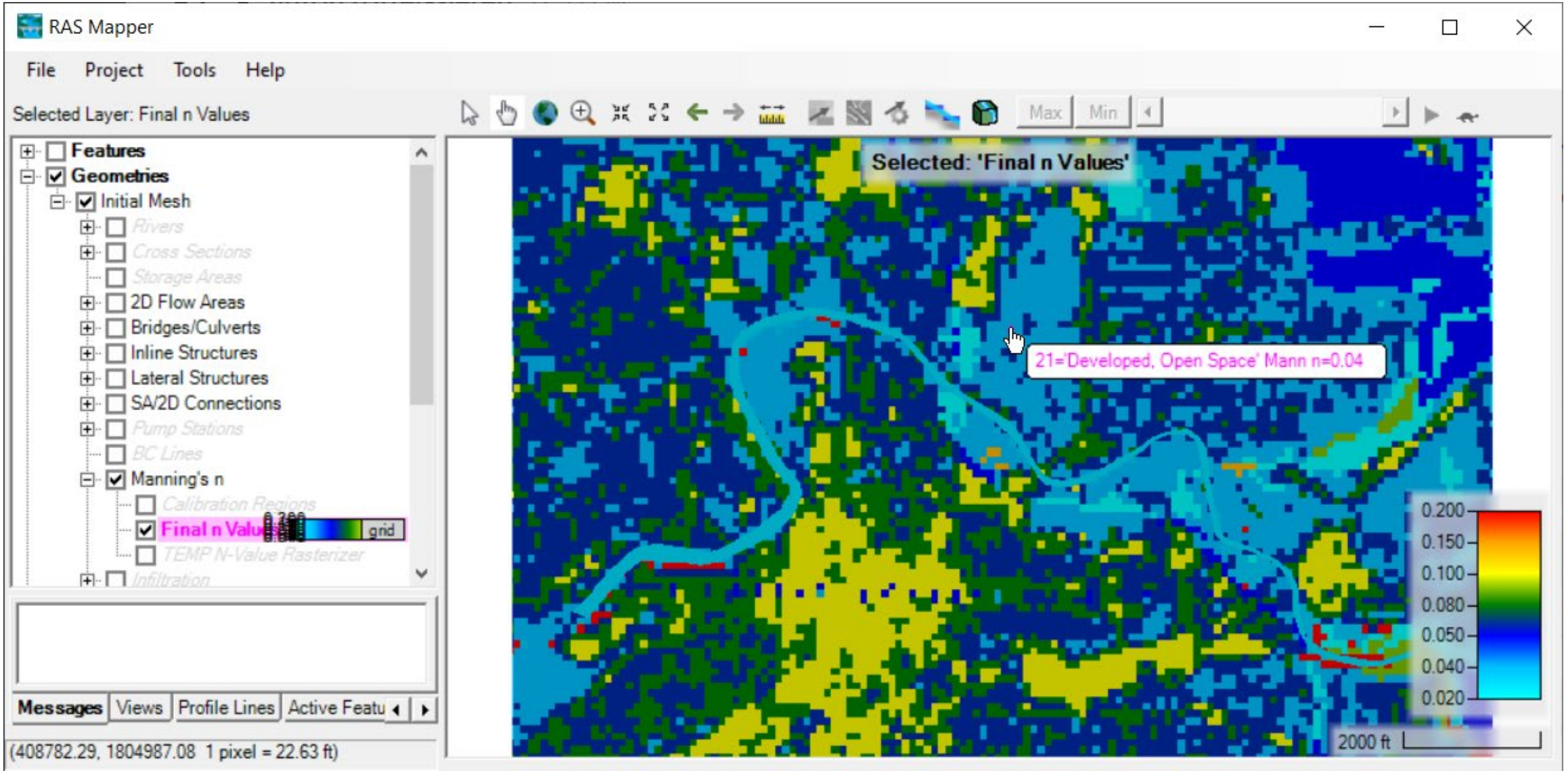


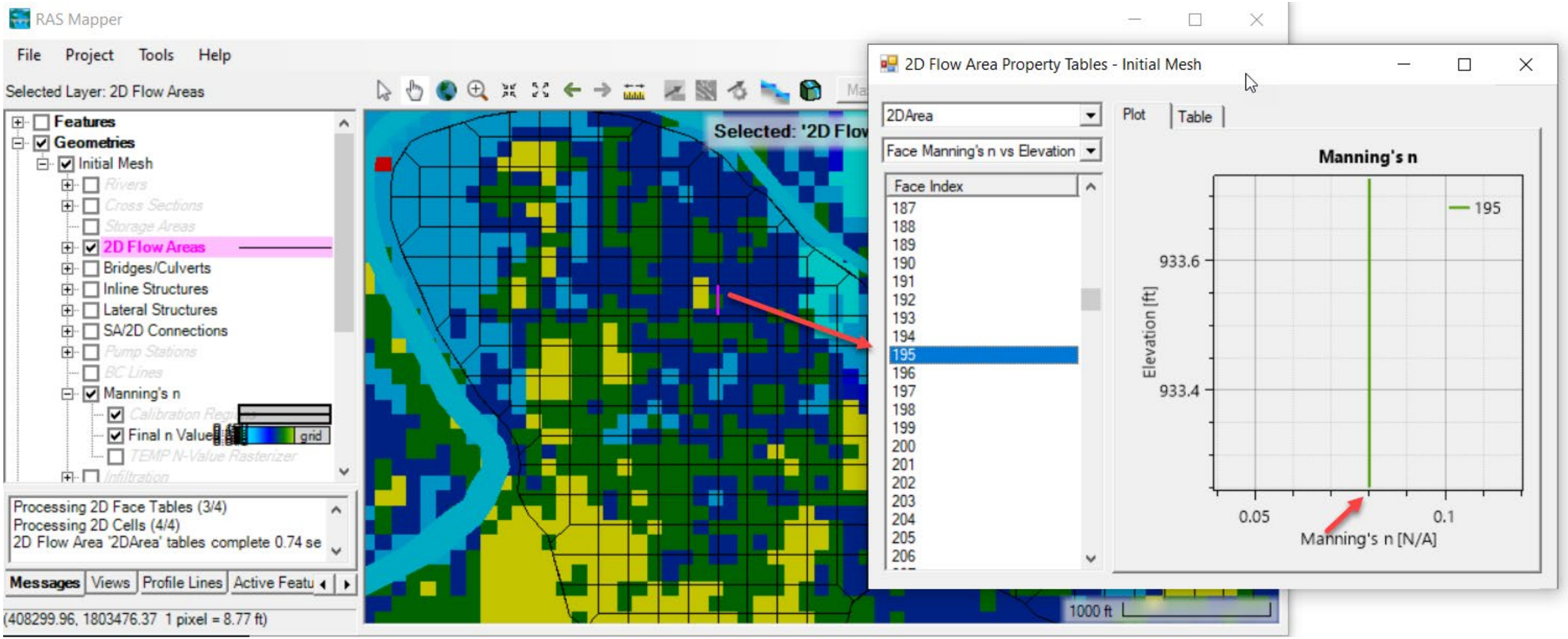


This is a commonly overlooked step for new users.

Final Manning's n Values

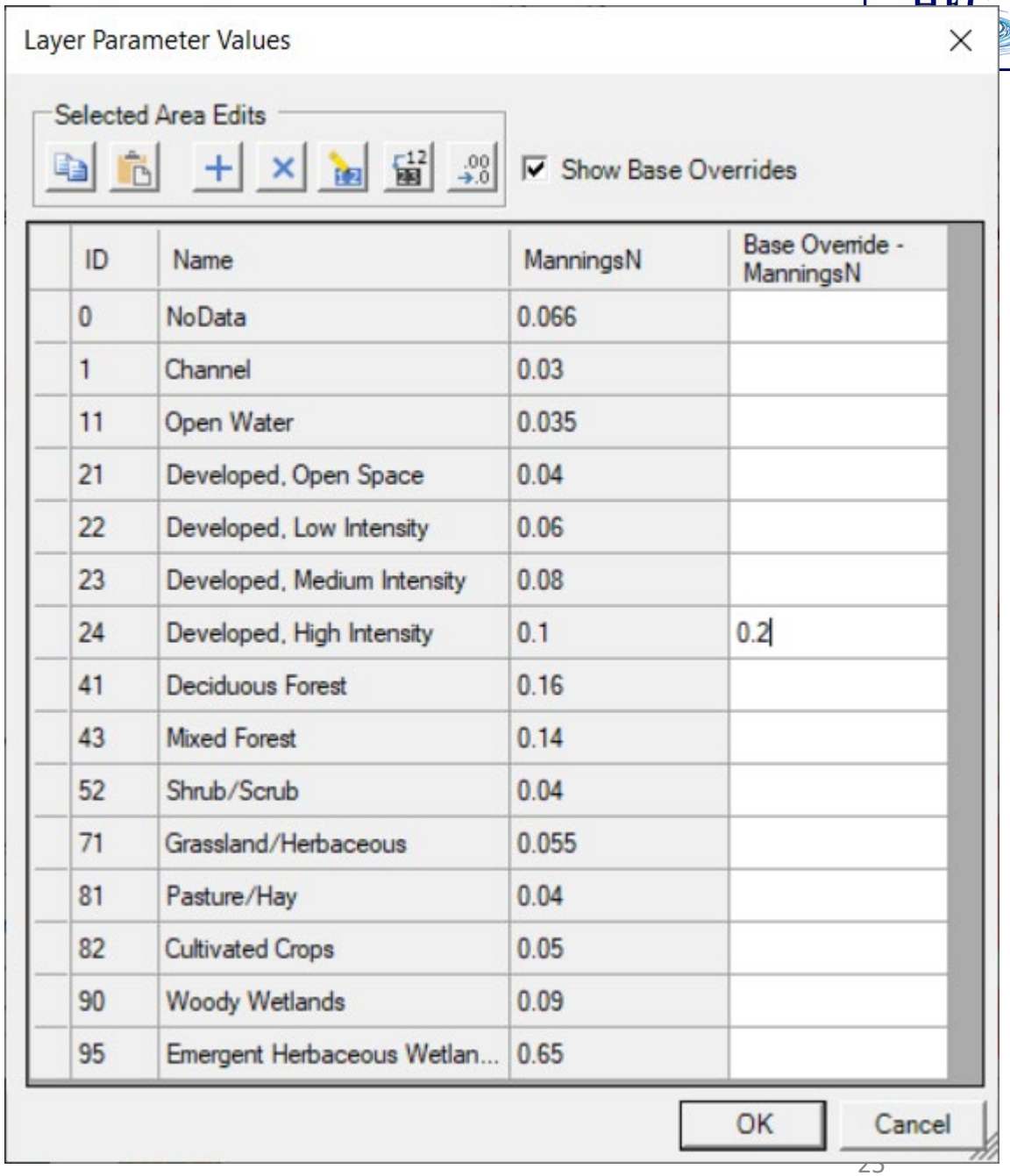


Inspection of Hydraulic Properties



Base Overrides

- Global replacement of values from the Land Cover Layer



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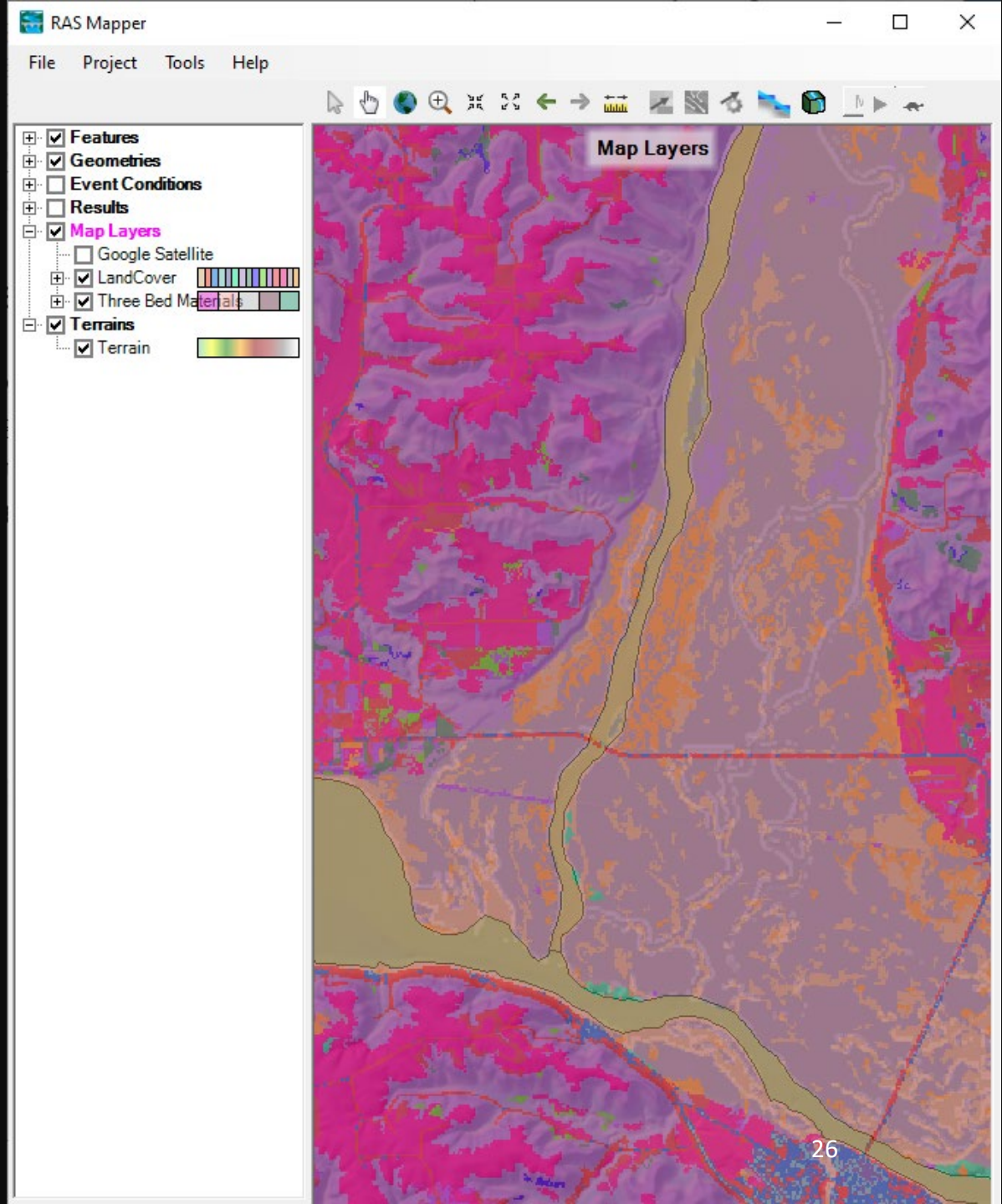
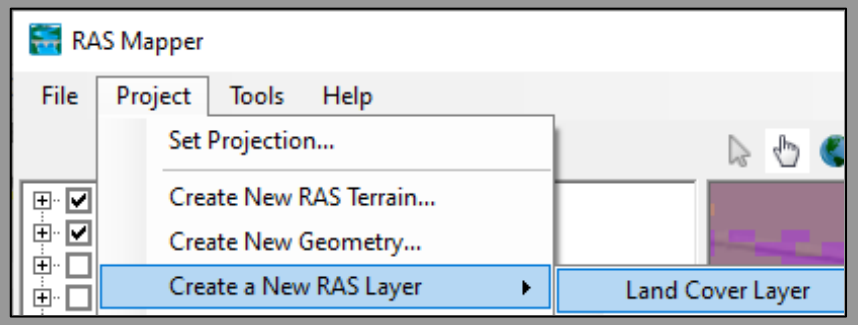
22	Developed, Low Intensity	0.06	
23	Developed, Medium Intensity	0.08	
24	Developed, High Intensity	0.1	0.2
41	Deciduous Forest	0.16	
43	Mixed Forest	0.14	
52	Shrub/Scrub	0.04	
71	Grassland/Herbaceous	0.055	
81	Pasture/Hay	0.04	
82	Cultivated Crops	0.05	
90	Woody Wetlands	0.09	
95	Emergent Herbaceous Wetlan...	0.65	

Overview

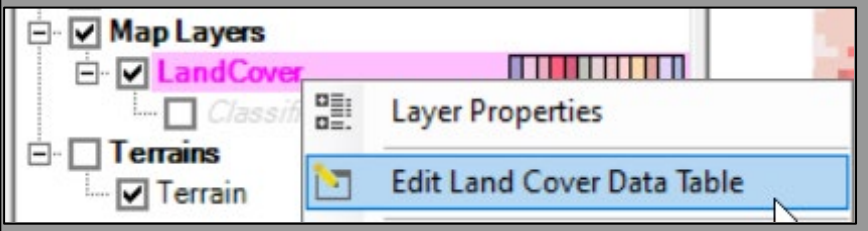
1. Land Cover Data Sources
2. Importing Land Cover Data
3. Associating Manning's n Values
4. Modifying Land Cover Data





Create Land Cover Layer

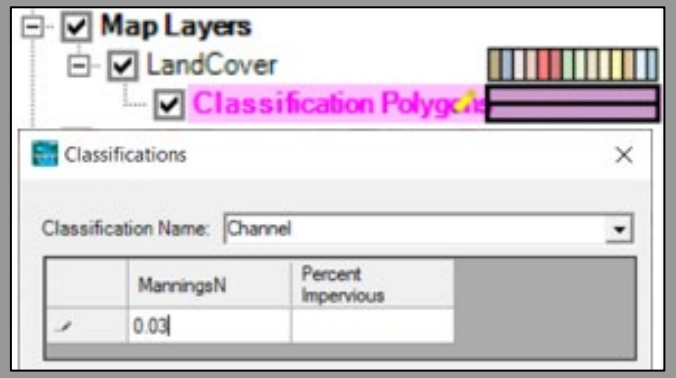
Import Land Cover Data

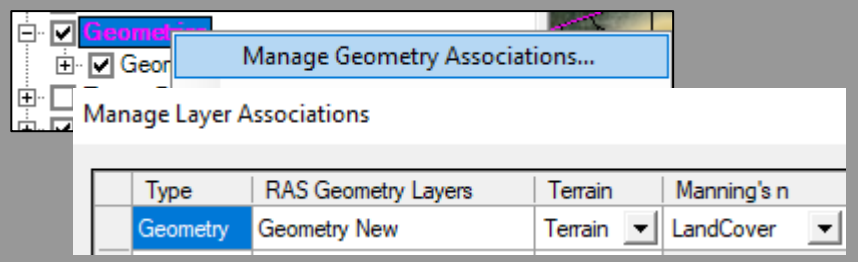


Define Base n Values

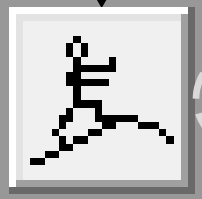
Optional

Land Classification Polygons



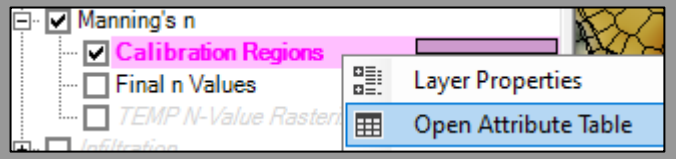


Associate Land Cover with Geometry

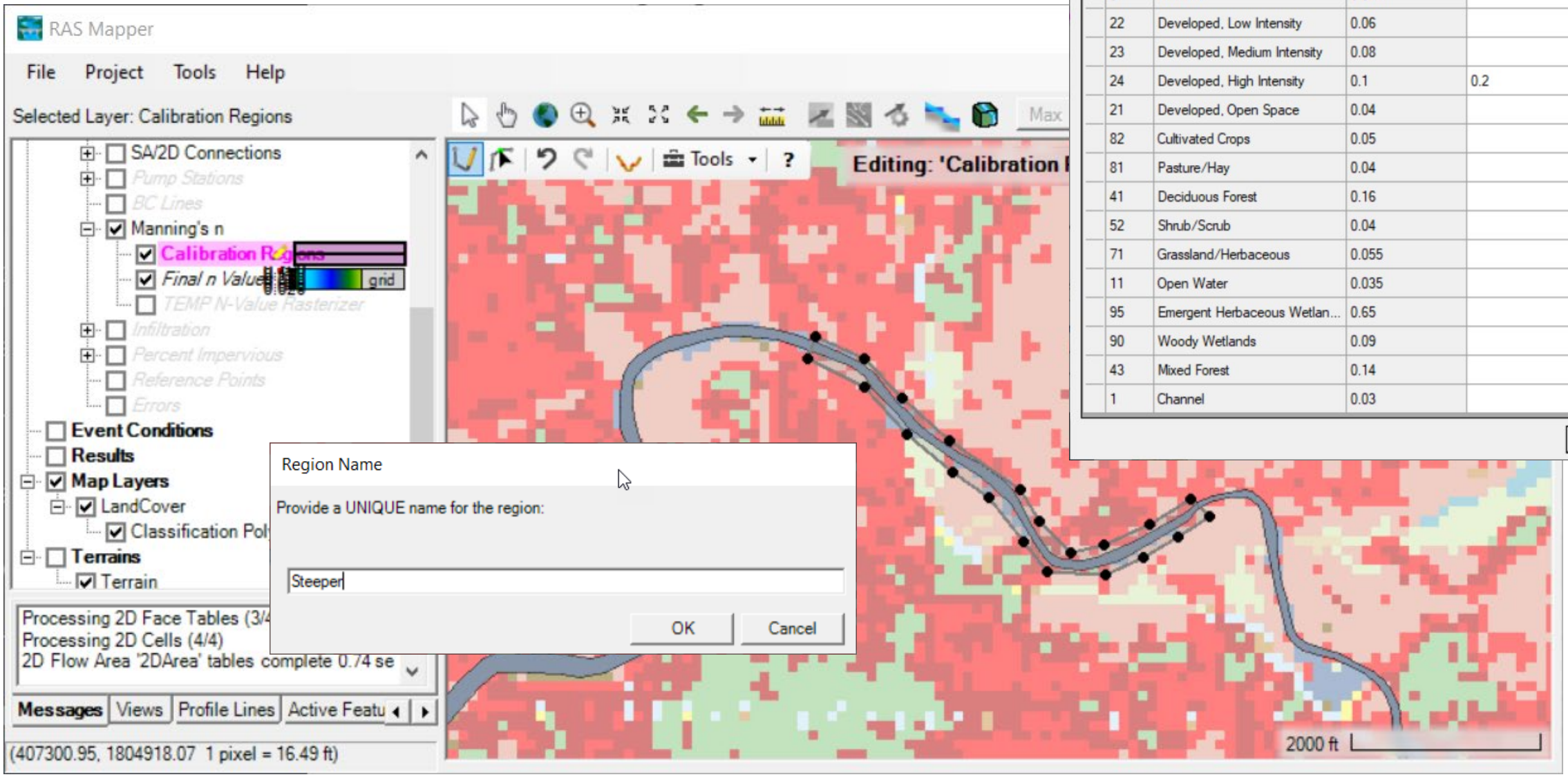


Optional

Calibration Regions



Calibration Regions



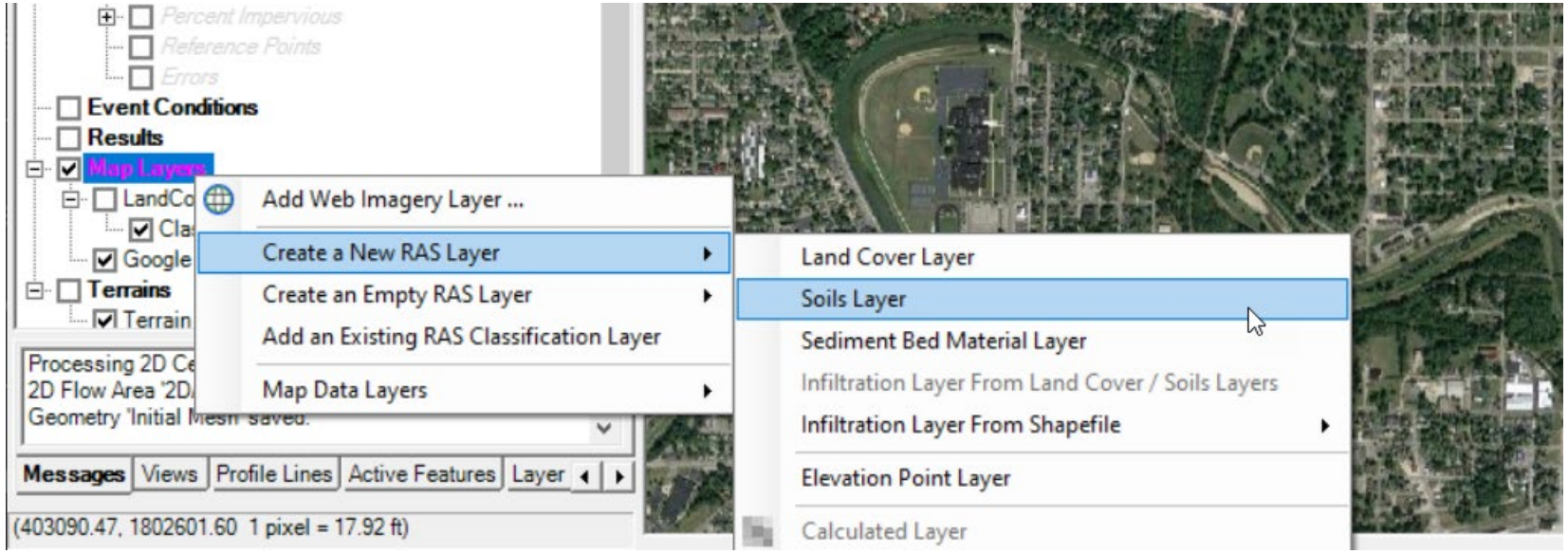
Layer Parameter Values

Selected Area Edits

Show Base Overrides

ID	Name	ManningsN	Base Override - ManningsN	Steeper - ManningsN
0	NoData	0.066		
22	Developed, Low Intensity	0.06		0.075
23	Developed, Medium Intensity	0.08		0.1
24	Developed, High Intensity	0.1	0.2	0.125
21	Developed, Open Space	0.04		0.05
82	Cultivated Crops	0.05		0.0625
81	Pasture/Hay	0.04		0.05
41	Deciduous Forest	0.16		0.2
52	Shrub/Scrub	0.04		0.05
71	Grassland/Herbaceous	0.055		0.06875
11	Open Water	0.035		0.04375
95	Emergent Herbaceous Wetlan...	0.65		0.8125
90	Woody Wetlands	0.09		0.1125
43	Mixed Forest	0.14		0.175
1	Channel	0.03		0.0375

OK Cancel

Land Cover Data – I Don’t Have Any!

- If you don’t have land cover data, you can create an Empty land cover dataset.
- Create Classification Polygons for each area using the RAS Mapper Editing Tools and Web Imagery