Why Do ArcGIS Users Need GI Tools?

Sensors

Access a much larger number of satellite sensors in ArcGIS 10

Accuracy

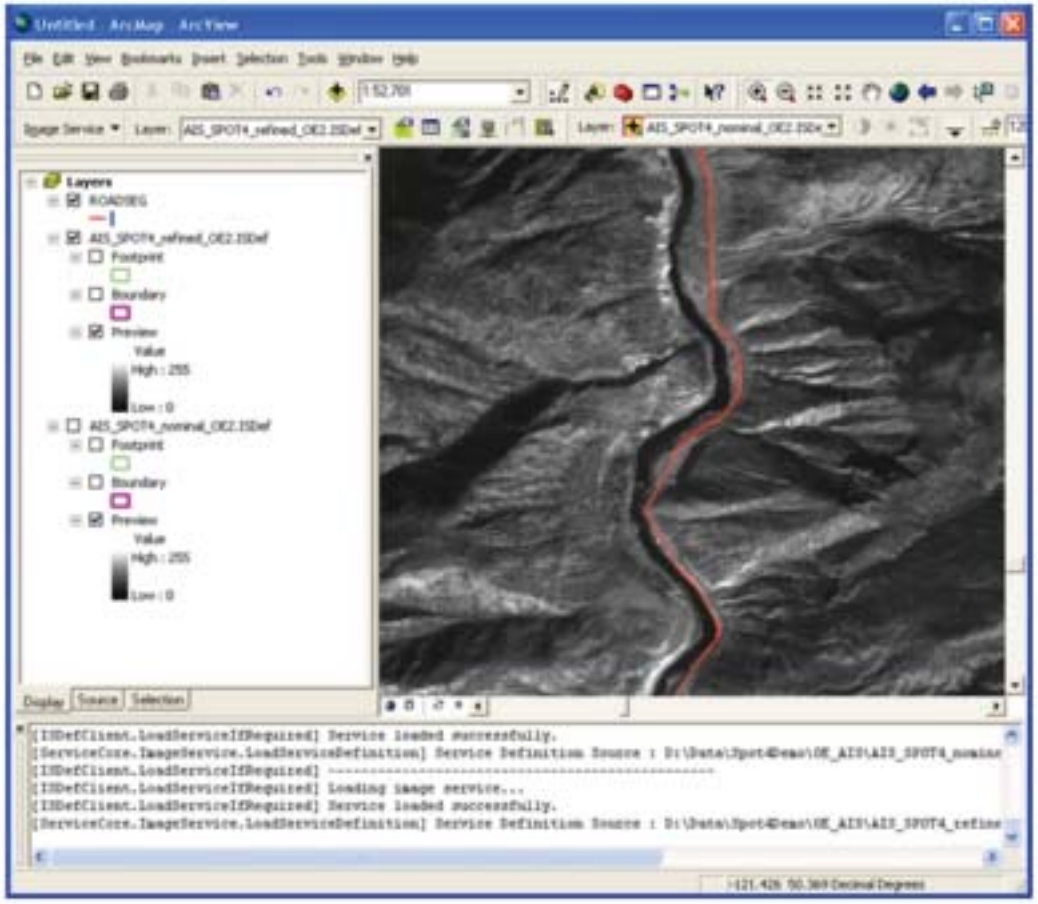
High precision image correction for alignment and processing

Simplicity

ArcGIS 10 extension, automated identification of imagery types

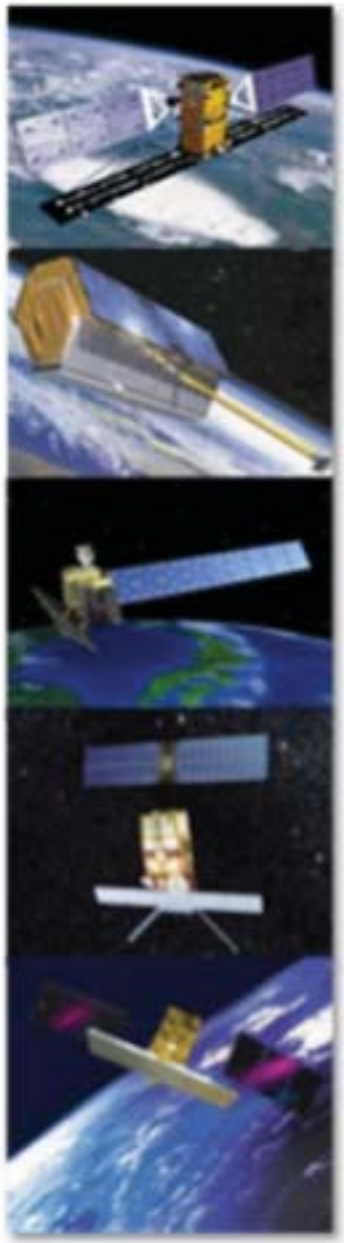
Savings

Georeference your imagery in ArcGIS in minutes, not hours



GI Tools Brings More Sensors to ArcGIS

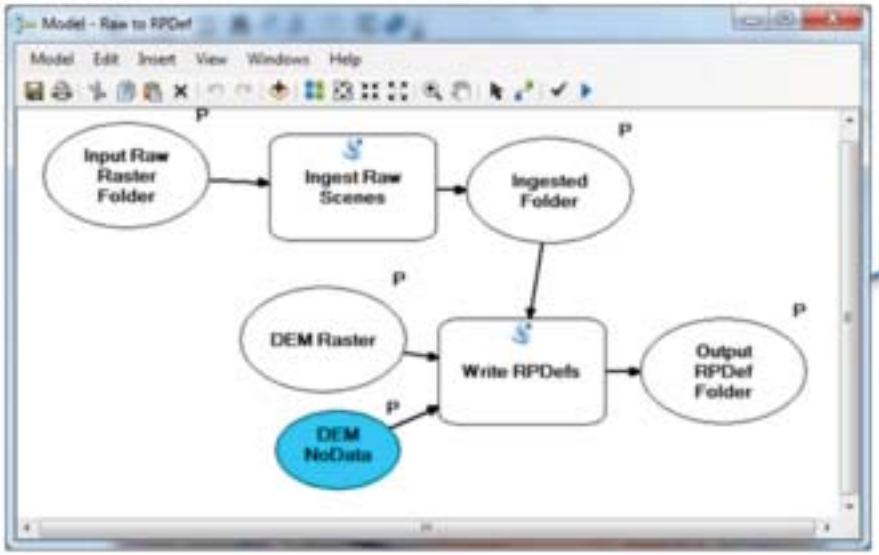
SATELLITE IMAGERY PRODUCTS	
Name	**Level**
Optical Sensors	
ALOS AVNIR-2	1A, 1B1, 1B2R
ALOS PRISM	JAXA 1A, 1B1, 1B2R
ASTER	1A, 1B HDF
CARTOSAT-1	1, 2, 3,4,5,6
GeoEye-1 (TIFF, NITF)	Mono, Stereo
HJ	1A, 1B
IKONOS GEO	Geo Product GeoTIFF or HDF
IRS Super Structure	0, 1
IRS (EOSAT)	IRS full scene, ORBIT-ORIENTED, MAP-ORIENTED
Kompsat-2	1A (1R) Tiff
LANDSAT 5 (Brazilian)	Full scene level 4, 5
LANDSAT 5 (EOSAT)	Full scene, ORBIT-ORIENTED, MAP-ORIENTED
LANDSAT 5/7 (LSGOWG) Canadian CDs	Full scene, Sub-scene, Level 4, 5
LANDSAT 5/7 (LSGOWG) ESA CDs	5 full or quad scene
LANDSAT 5 (NLAPS, TIFF)	Full scene level 8, TIFF full scene
LANDSAT 7 (HDF, TIFF, FAST, NLAPS)	Full scene 1G
Quickbird	Basic and Ortho Ready GeoTIFF or NITF
SPOT 4 (SPOTIMAGE)	0, 1A, 1B
SPOT 5	1A Dimap format
WorldView-1	GeoTIFF, NITF
WorldView-2	GeoTIFF, NITF
Radar Sensors	
ASAR	1B
RADARSAT-1	SGC, SGF, SGX, SLC, SCN, SCW
RADARSAT-2	SLC, SGF, SGX, SGC, SSG, SPG
TerraSAR-X (TIFF)	MGD

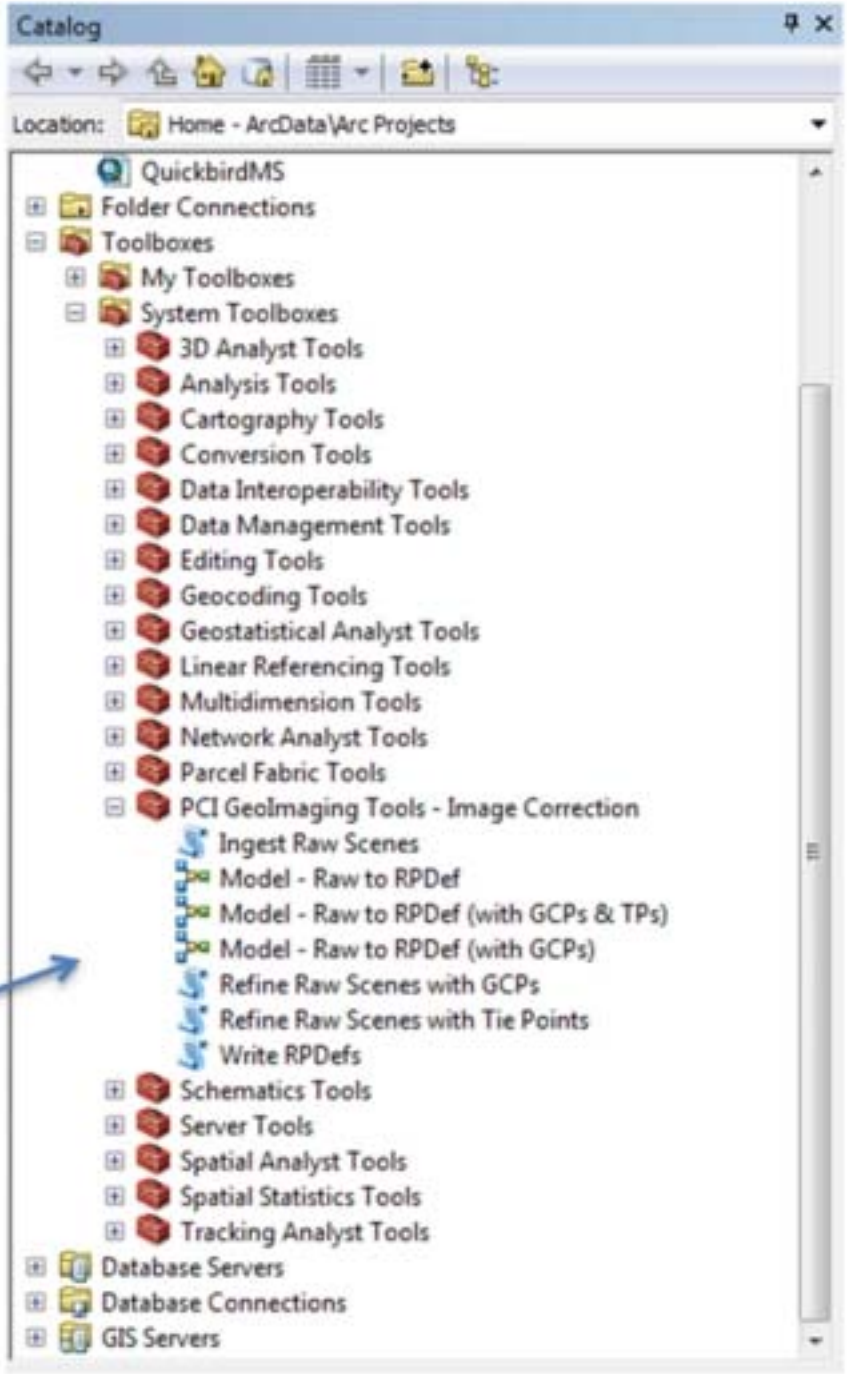


GI Tools Provides Rigorous Correction of Imagery Products

GI Tools Uses a Simple ArcGIS Interface

- **GI Tools interface enables:**
  - Automated importing of raw satellite scenes – we find/identify the files and sensor types
  - Geo-correcting raw scenes by automatically finding control points
  - Formatting the corrected imagery for processing in ArcGIS 10
- **Models for ArcGIS are included**





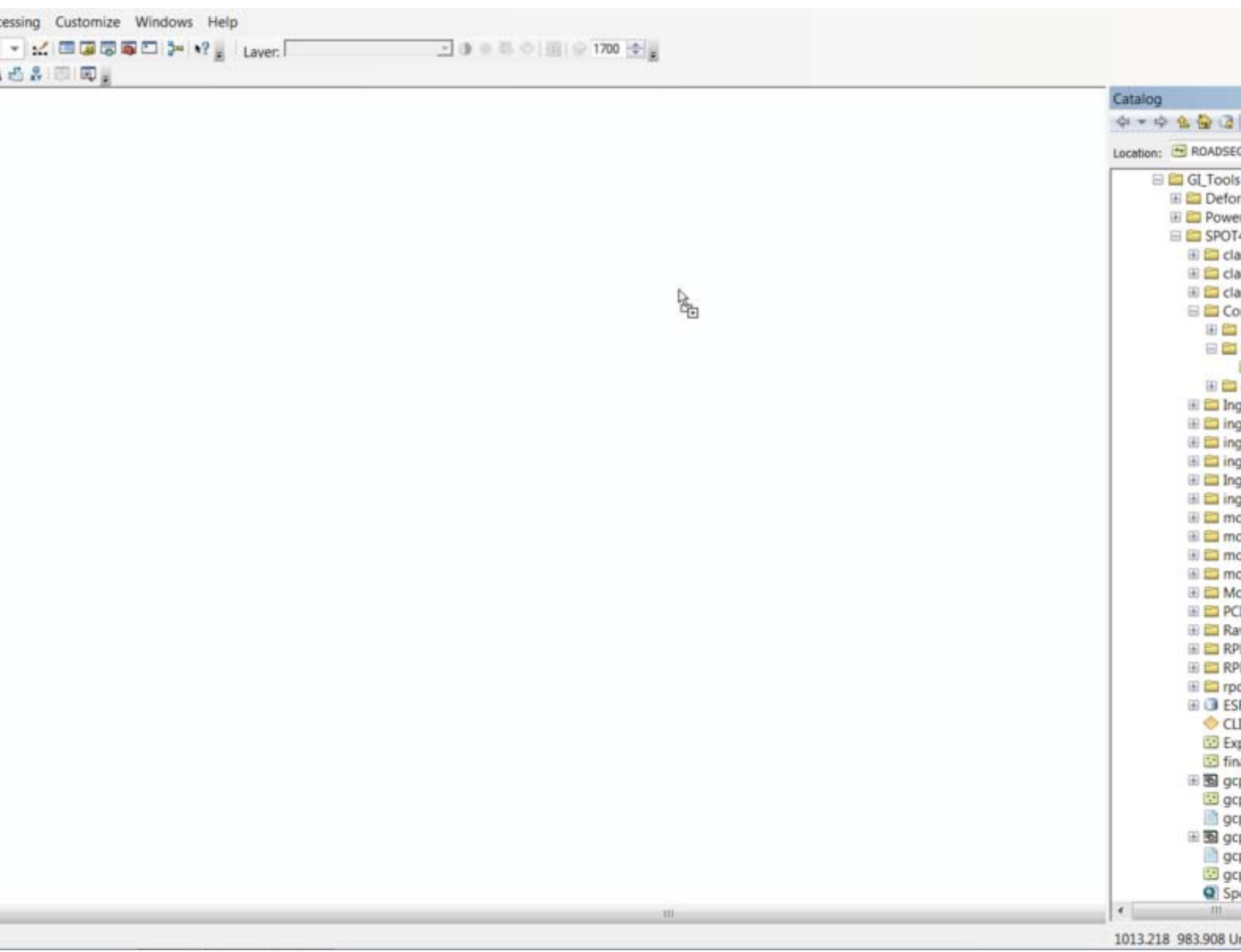
GI Tools Demo Scenario

Correct Spot 4 Imagery Using Reference Vector Data

- You are an ArcGIS 10 user working a HADR project mapping fire boundaries
- You have been given Spot 4 imagery that has useful content, but it is not spatially accurate
- You have 20 minutes to align the Spot 4 imagery with an accurate road vector dataset that you have downloaded
- Accuracy counts in fire applications and you've never done this before – feels bad
- Luckily you have PCI's GI Tools extension installed… and you were awake for most of our demo…You can do this!

GI Tools Demo Details

- **Spot 4 Imagery**
  - 10 images collected over Kelowna, BC
  - Total coverage = 36,000 km^2
- **Corrections**
  - Spot 4 Images are corrected using the high accuracy road vector reference
  - We can also correct Spot 4 to our LandSat 7 reference imagery (Plan B if we didn't have accurate vector data)
- **Processing Steps**
  - Read in imagery
  - Automatically generate controls
  - Correct the imagery
  - Send to ArcGIS 10 mosaic dataset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GI_Tools
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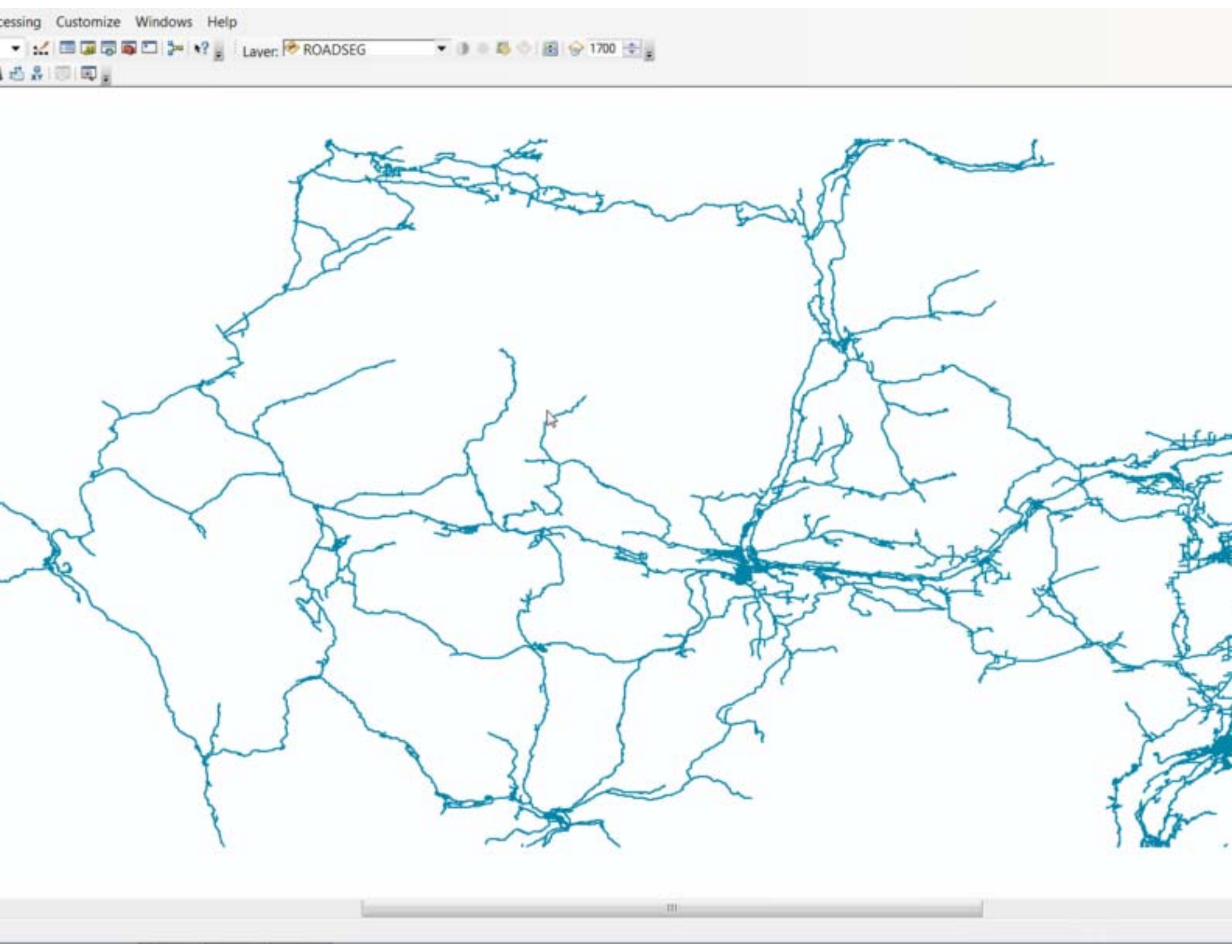
SPOT4
1013.218 983.908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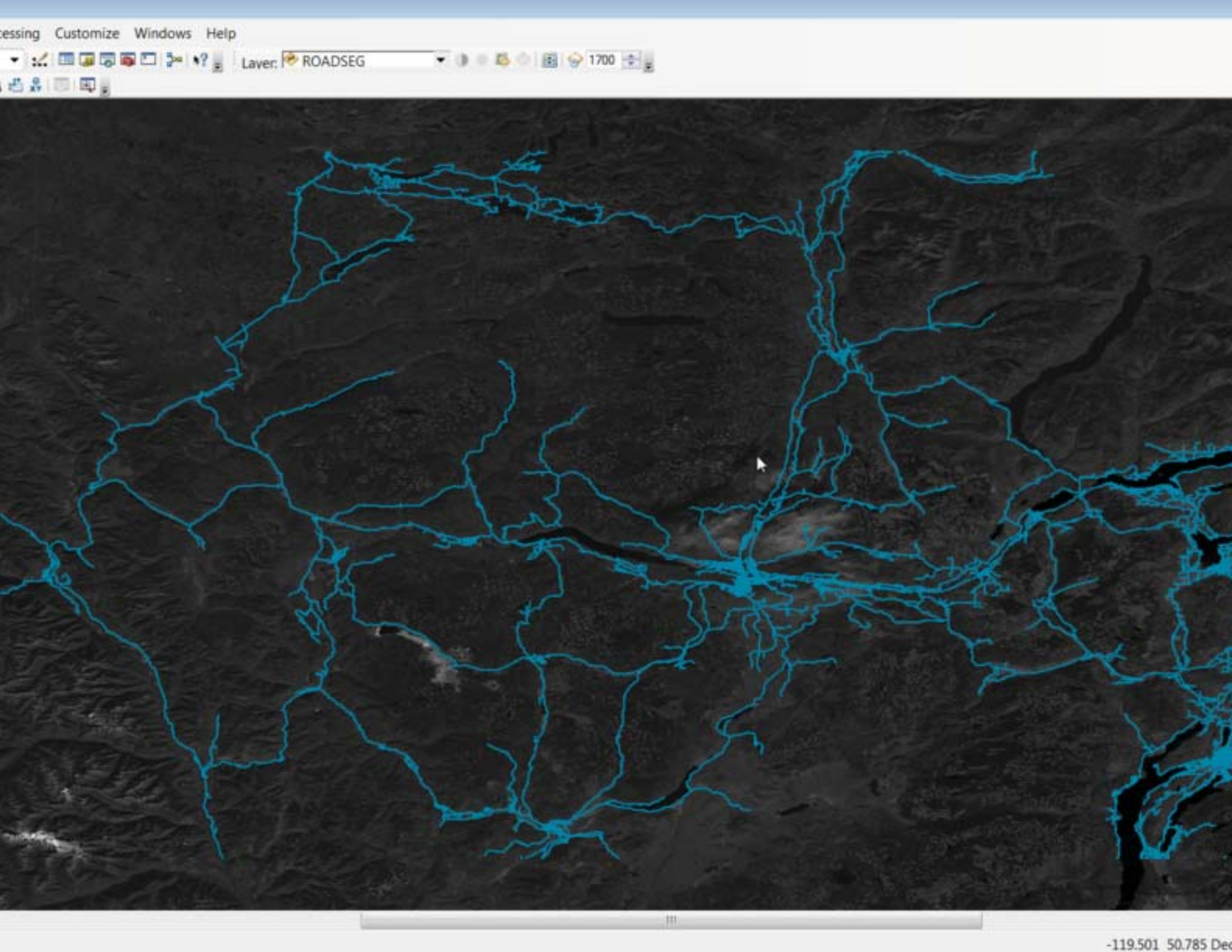
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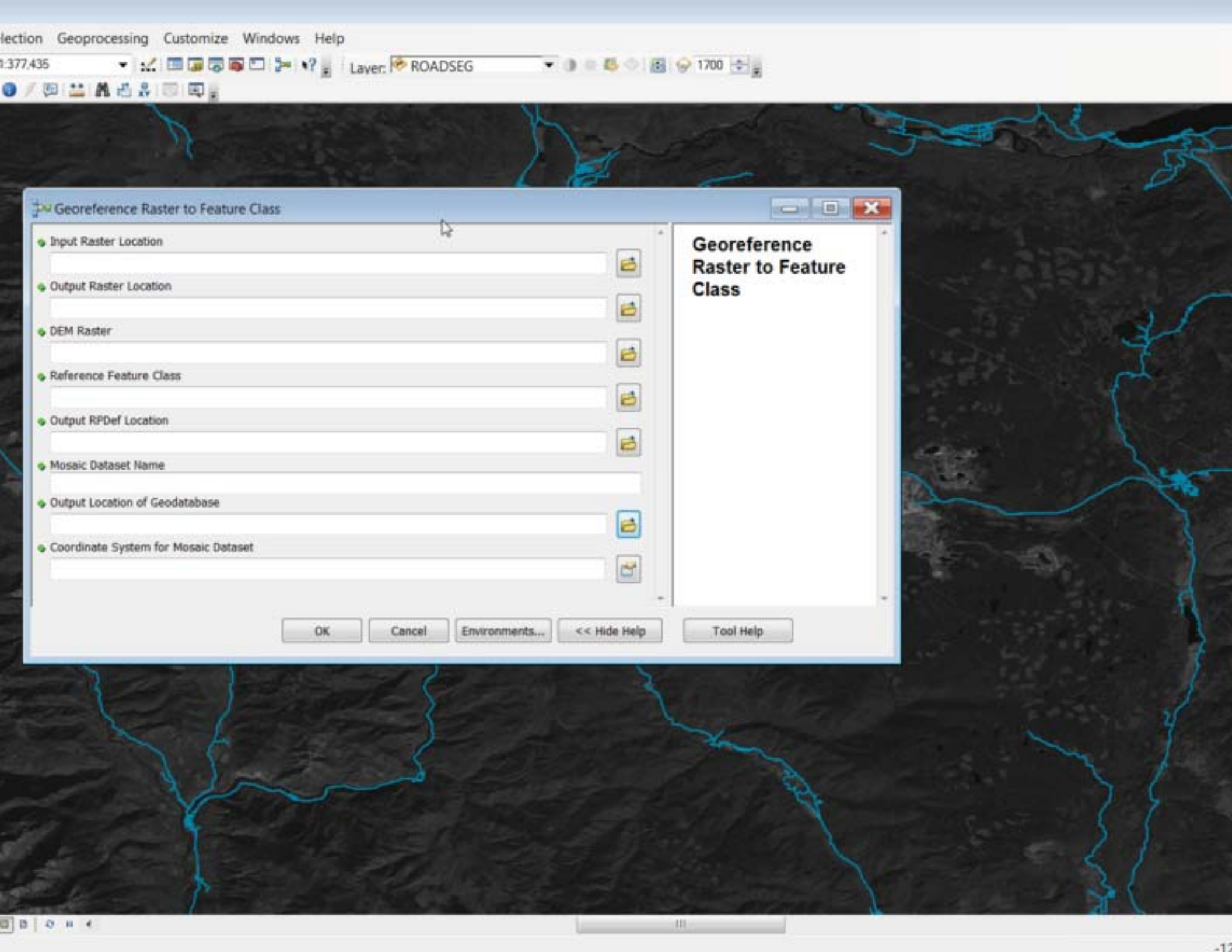
-119.501 50.785 Dec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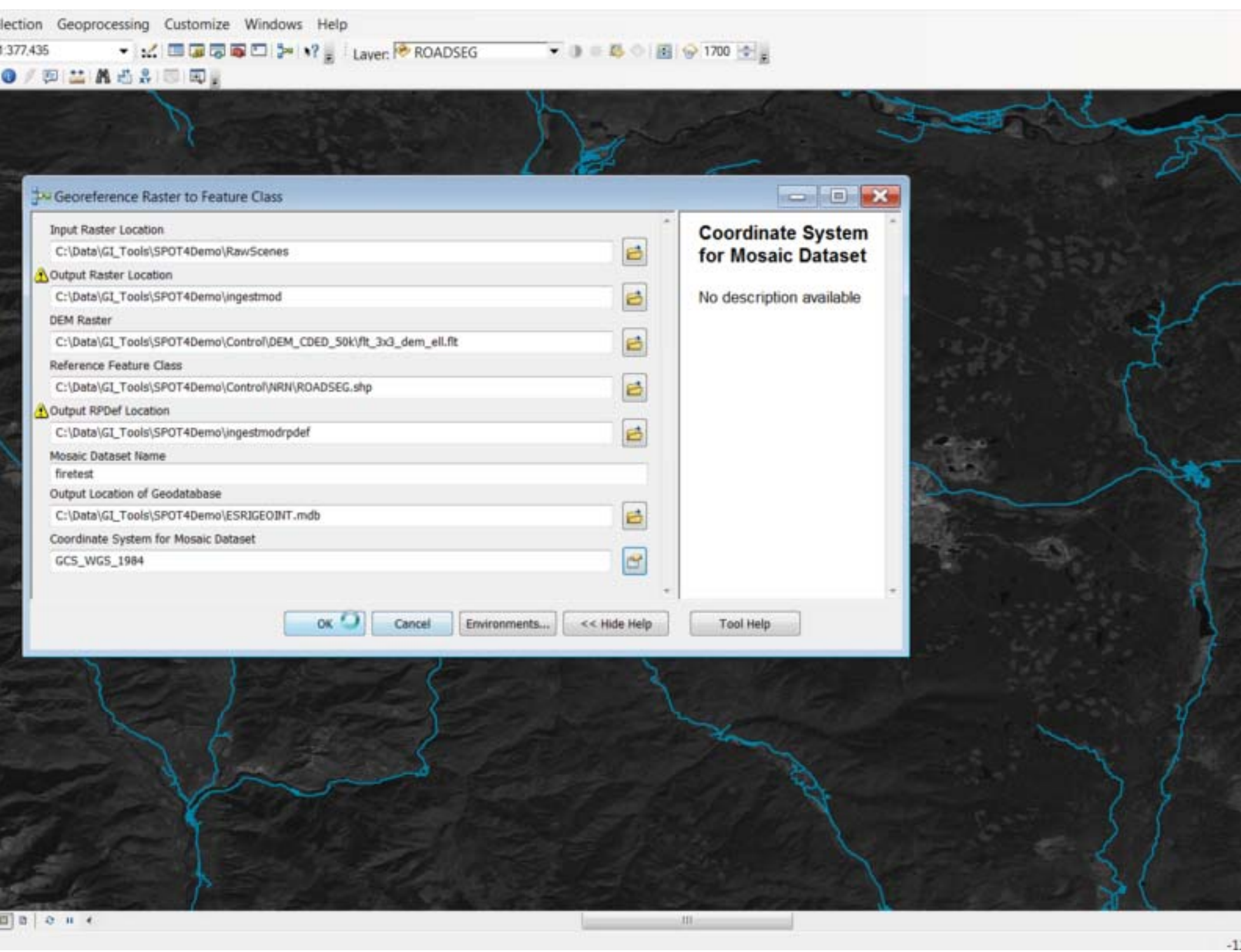
Georeference Raster to Feature Class
Input Raster Location
Output Raster Location
DEM Raster
Reference Feature Class
Output RPDef Location
Mosaic Dataset Name
Output Location of Geodatabase
Coordinate System for Mosaic Dataset
Georeference Raster to Feature Class
OK
Cancel
Environments...
<< Hide Help
Tool Help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Georeference Raster to Feature Class
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Output Raster Location
C:\Data\GI_Tools\SPOT4Demo\ingestmod
DEM Raster
C:\Data\GI_Tools\SPOT4Demo\Control\DEM_CDED_50k\flt_3x3_dem_ell.flt
Reference Feature Class
C:\Data\GI_Tools\SPOT4Demo\Control\NRN\ROADSEG.shp
Output RPDef Location
C:\Data\GI_Tools\SPOT4Demo\ingestmodrpdef
Mosaic Dataset Name
firetest
Output Location of Geodatabase
C:\Data\GI_Tools\SPOT4Demo\ESRIGEOINT.mdb
Coordinate System for Mosaic Dataset
GCS_WGS_1984
Coordinate System for Mosaic Dataset
No description available
OK
Cancel
Environments...
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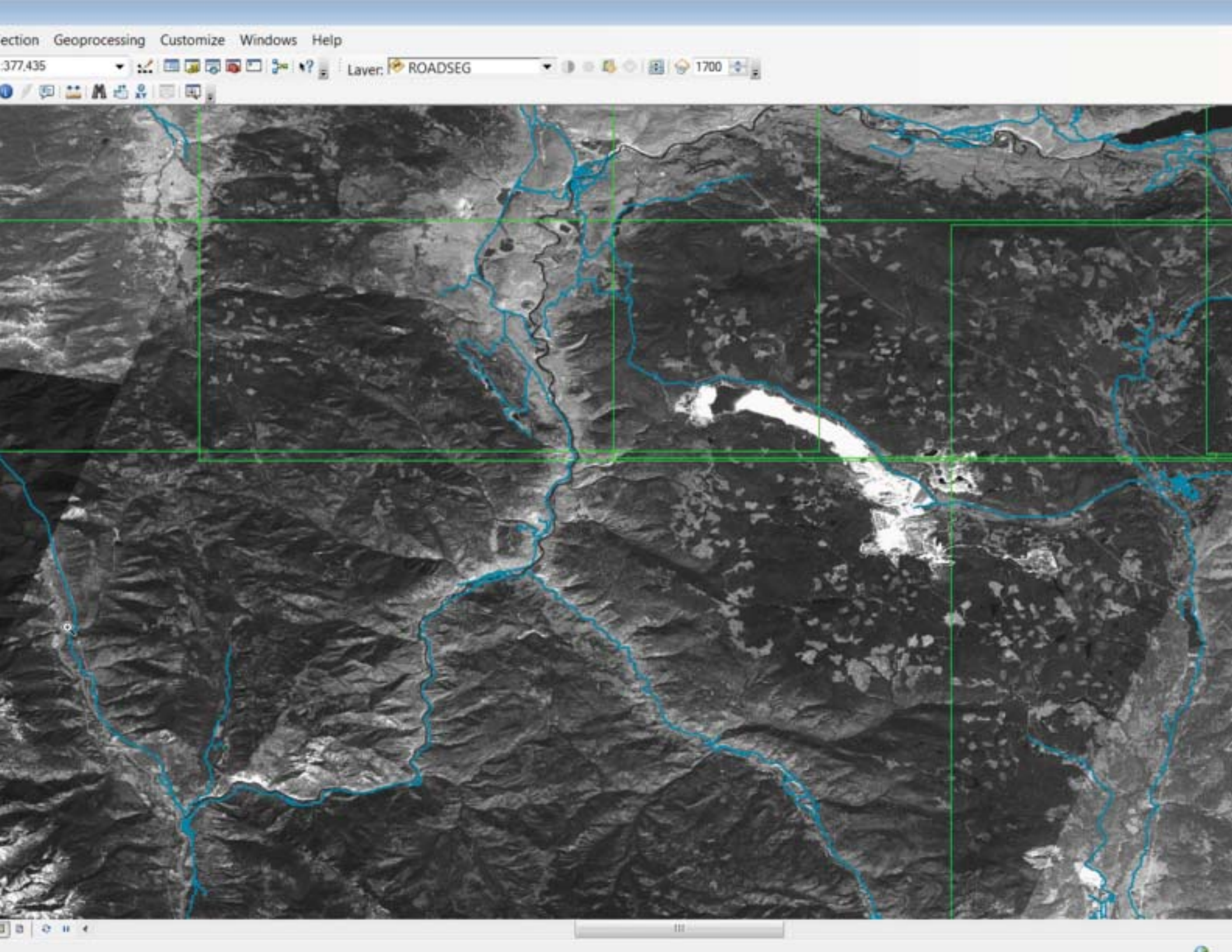
Tool Help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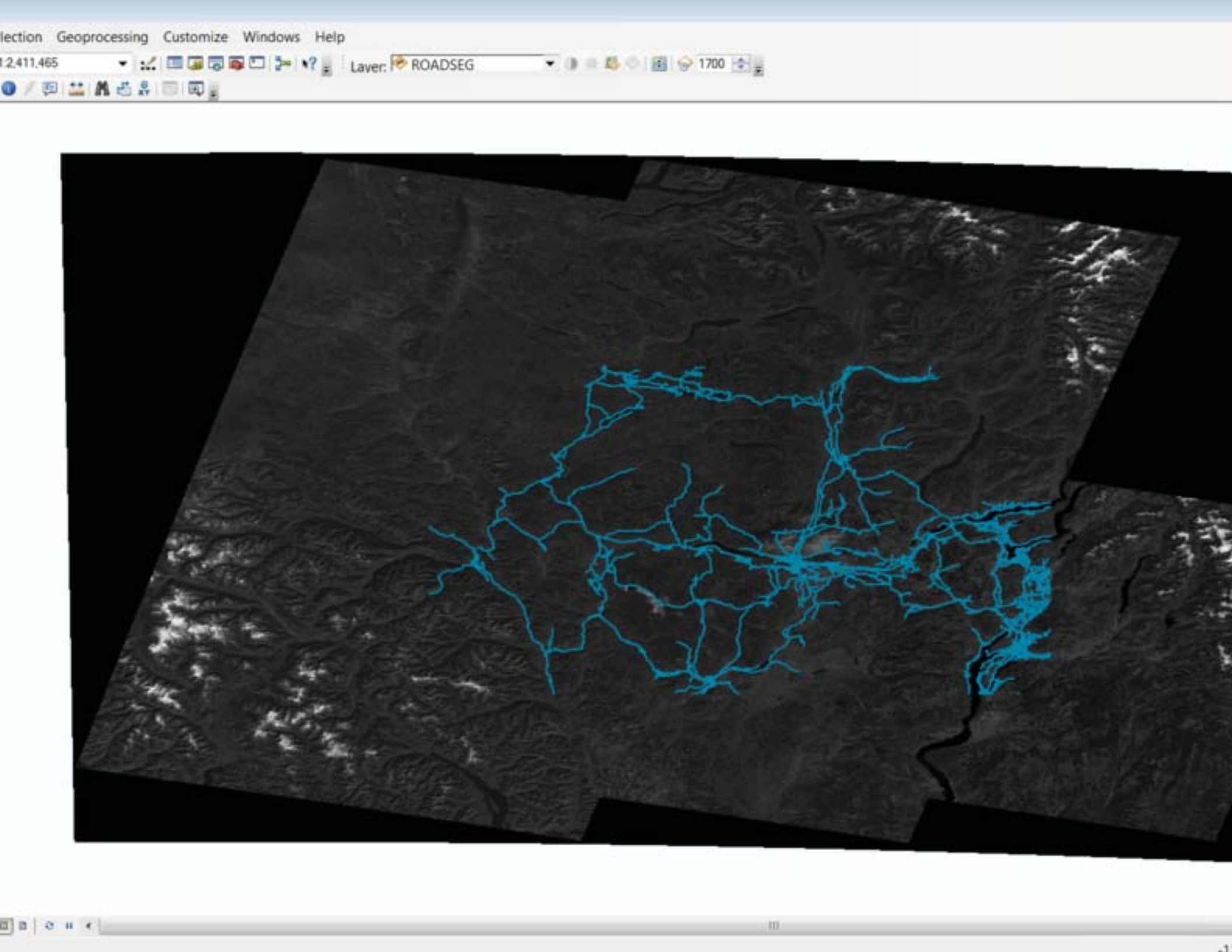
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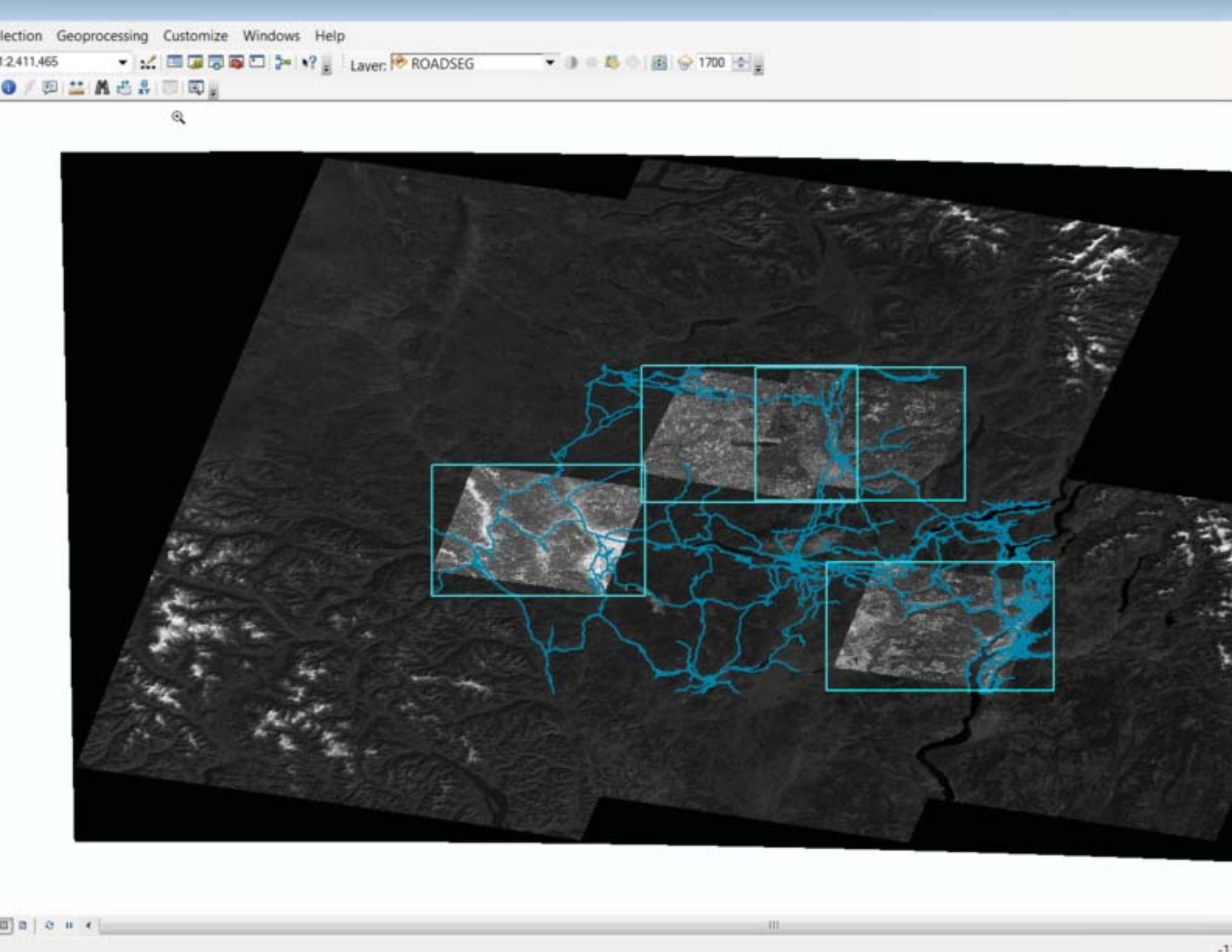
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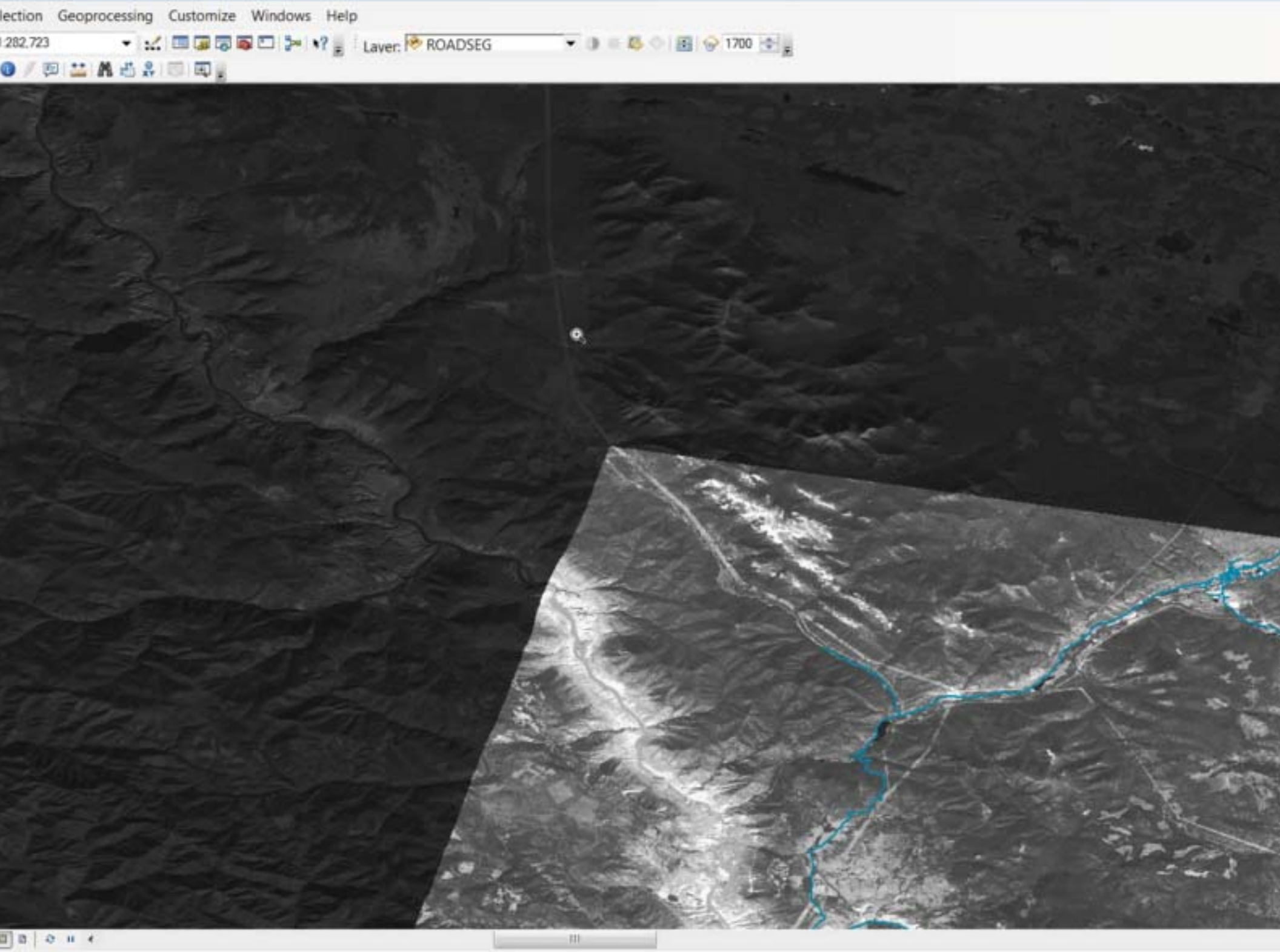
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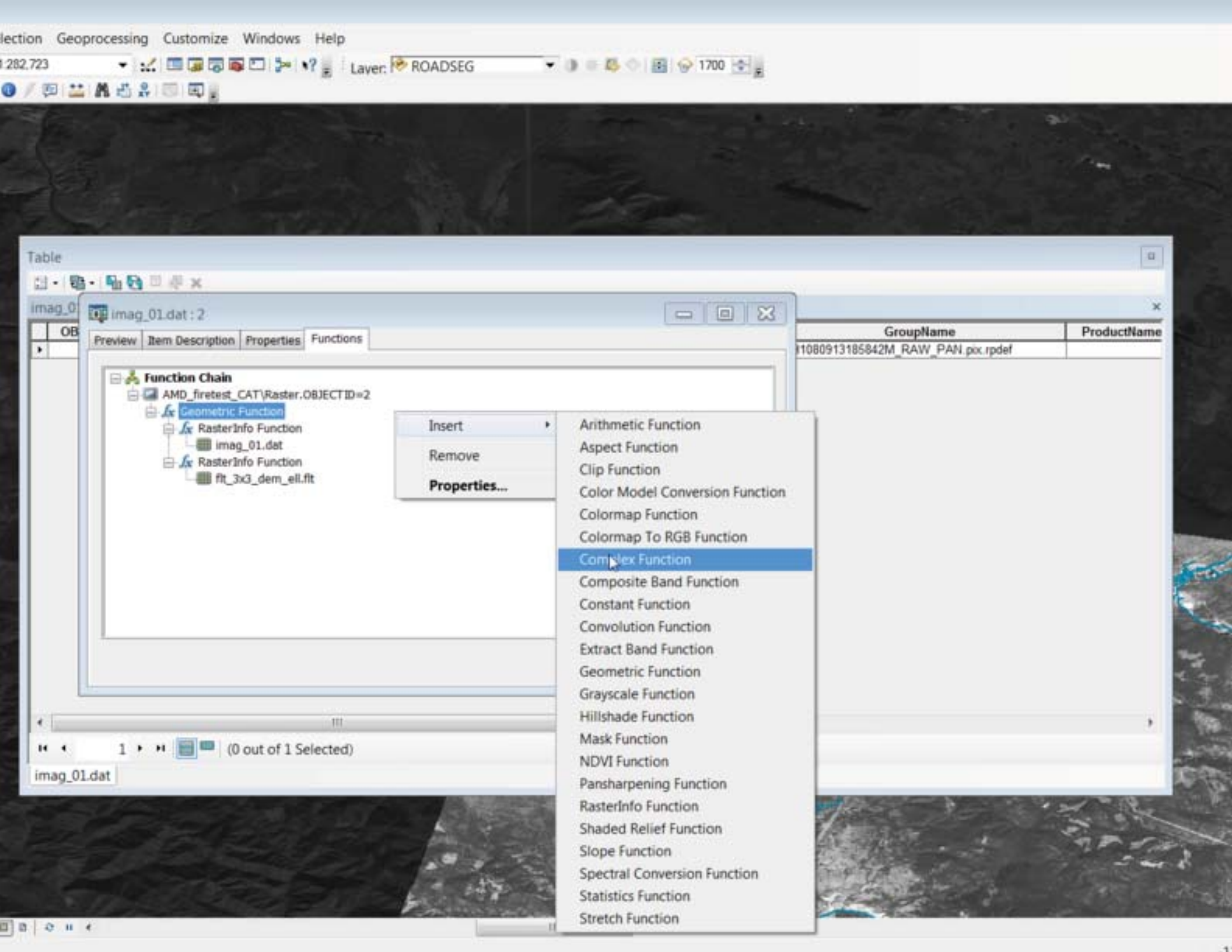
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Constant Function
Convolution Function
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Geometric Function
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Mask Function
NDVI Function
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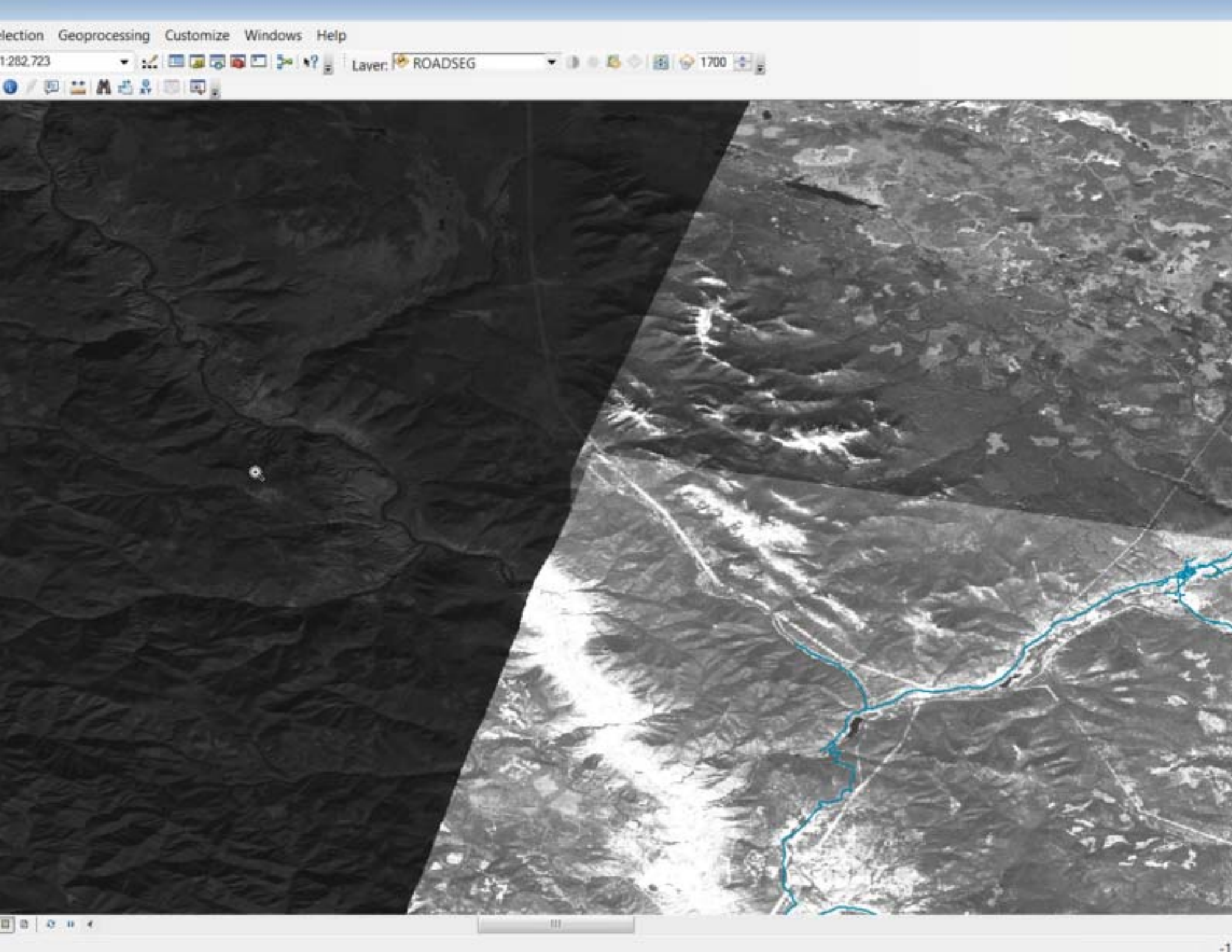
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Summary

- GI Tools imported Spot 4 which is not supported by ArcGIS 10
- GI Tools was easy to use as an ArcGIS 10 extension
- Quickly created over 60 control points in 2 minutes saving hours over the manual approach
- Accurate results – imagery aligned with both reference image and reference vectors

lection Geoprocessing Customize Windows Help

282.723 Layer: ROADSEG 1700

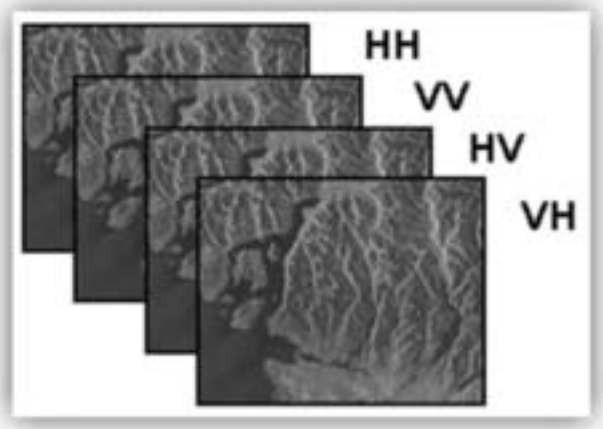
stics for Y values
points: 65; Mean: 14.280730
dard deviation(n): 0.688280
12.951891 at point# 29; Max 17.011024 at point# 57
stics for Weights
points: 65; Mean: 20.123804
dard deviation(n): 6.993101
6.759943 at point# 38; Max 39.081657 at point# 52

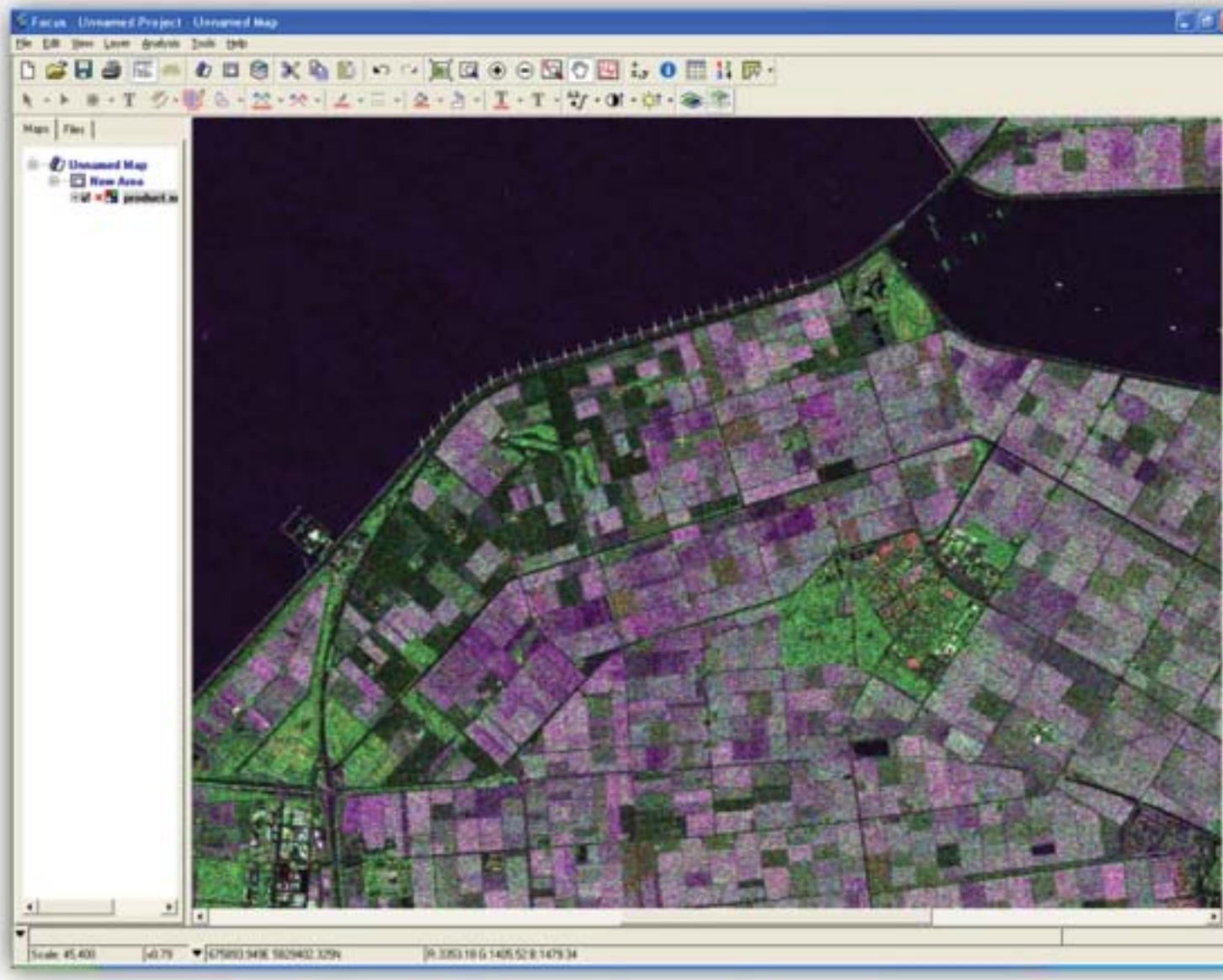
	GCP ID	Pixel	Line	Ground Y	Ground X	ShiftY	ShiftX	Weight	Pts
1	V_02496_00250	2513.90	264.76	51.08971119	-121.57788700	17.90	14.76	16.78	292
1	V_04064_00250	4083.45	264.30	51.05847604	-121.35387127	19.45	14.30	21.87	86
1	V_03808_00384	3824.32	397.63	51.05203841	-121.39577561	16.32	13.63	38.17	132
1	V_02208_00432	2225.99	447.03	51.07957812	-121.62560390	17.99	15.03	14.70	46
1	V_02624_00544	2646.34	558.86	51.06154486	-121.56965874	22.34	14.86	22.55	68
1	V_03600_00592	3618.74	606.50	51.03814430	-121.43315791	18.74	14.50	33.59	125
1	V_02832_00752	2854.71	769.31	51.03936065	-121.54755761	22.71	17.31	17.99	41
1	V_03552_00800	3571.73	813.97	51.02102217	-121.44751916	19.73	13.97	20.82	94
1	V_03472_01056	3491.81	1070.39	51.00035837	-121.46814265	19.81	14.39	6.76	75
1	V_01264_01136	1289.09	1150.64	51.03683302	-121.78538978	25.09	14.64	33.39	56
1	V_01344_01216	1363.47	1231.10	51.02845043	-121.77775599	19.47	15.10	23.47	55
1	V_01760_01168	1782.52	1183.36	51.02437067	-121.71587178	22.52	15.36	20.47	55
1	V_03152_01264	3170.89	1278.29	50.98865902	-121.52140182	18.89	14.29	18.90	54
1	V_03600_01280	3619.40	1294.49	50.97840783	-121.45846422	19.40	14.49	18.85	114
1	V_01408_01408	1428.93	1423.21	51.01050097	-121.77548357	20.93	15.21	33.00	94
1	V_03728_01456	3748.73	1471.01	50.96056416	-121.44664611	20.73	15.01	12.14	102
1	V_01376_01648	1398.94	1663.00	50.99020478	-121.78831835	22.94	15.00	15.10	105
1	V_01488_01904	1502.37	1918.79	50.96575693	-121.78153766	14.37	14.79	26.05	75
1	V_04144_01920	4162.16	1934.27	50.91202509	-121.40491480	18.16	14.27	14.02	76
1	V_04064_02256	4081.34	2270.22	50.88444833	-121.42866403	17.34	14.22	21.25	57
1	V_04192_02224	4210.42	2238.18	50.88467709	-121.40934559	18.42	14.18	22.47	73
1	V_03616_02368	3636.58	2382.21	50.88355233	-121.49581999	20.58	14.21	10.98	62
1	V_05600_02400	5619.20	2413.61	50.84113486	-121.21633030	19.20	13.61	35.58	76
1	V_05756_02368	5775.11	2381.31	50.84077744	-121.19317052	19.11	13.31	15.92	71
1	V_01408_02576	1424.27	2590.62	50.90899523	-121.81783811	16.27	14.62	13.00	63
1	V_05392_02624	5409.53	2638.01	50.82592723	-121.25433264	17.53	14.01	15.23	76
1	V_01824_02672	1849.39	2685.92	50.89251105	-121.76196958	25.39	13.92	5.78	56

PCI Core Capabilities for SAR Primary Processing support

- Ingest
- Orthorectification
- Mosaic (color balancing)
- Filtering
- Texture Analysis

PCI Core Capabilities for SAR Advanced Analysis modules





Polarimetric Analysis

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