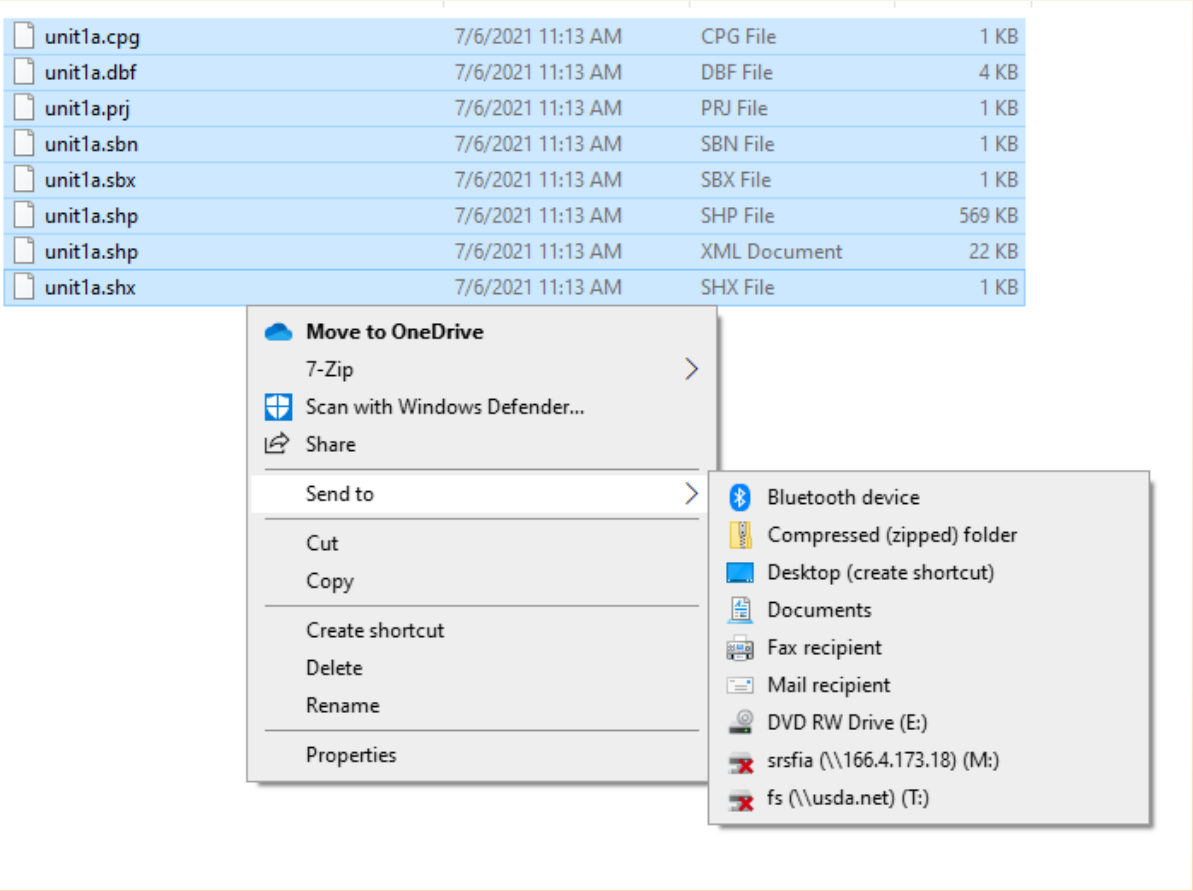
USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

THE UNIVERSITY OF TENNESSEE KNOXVILLE

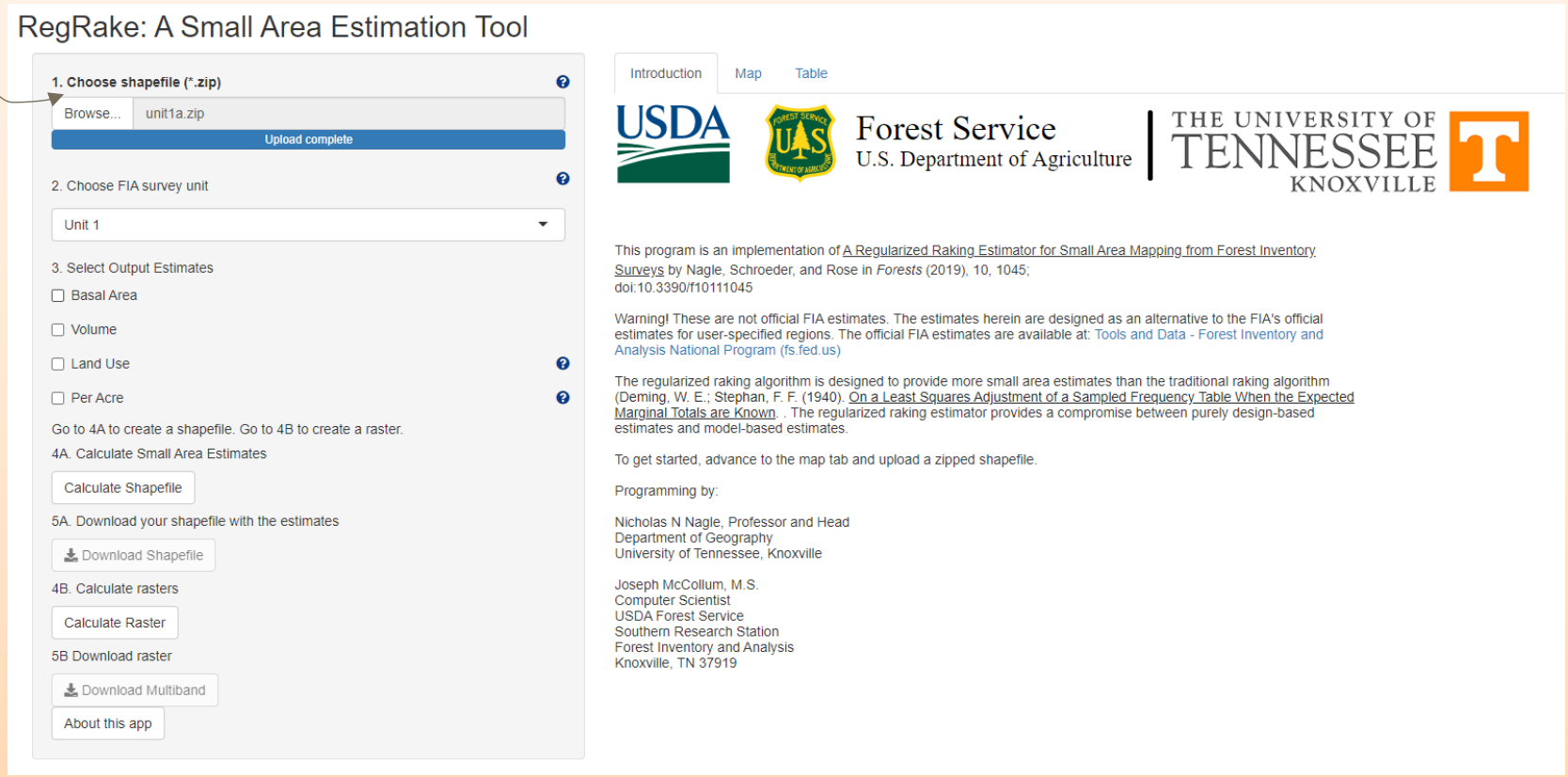
RegRake User Guide

Version: 14 September, 2021

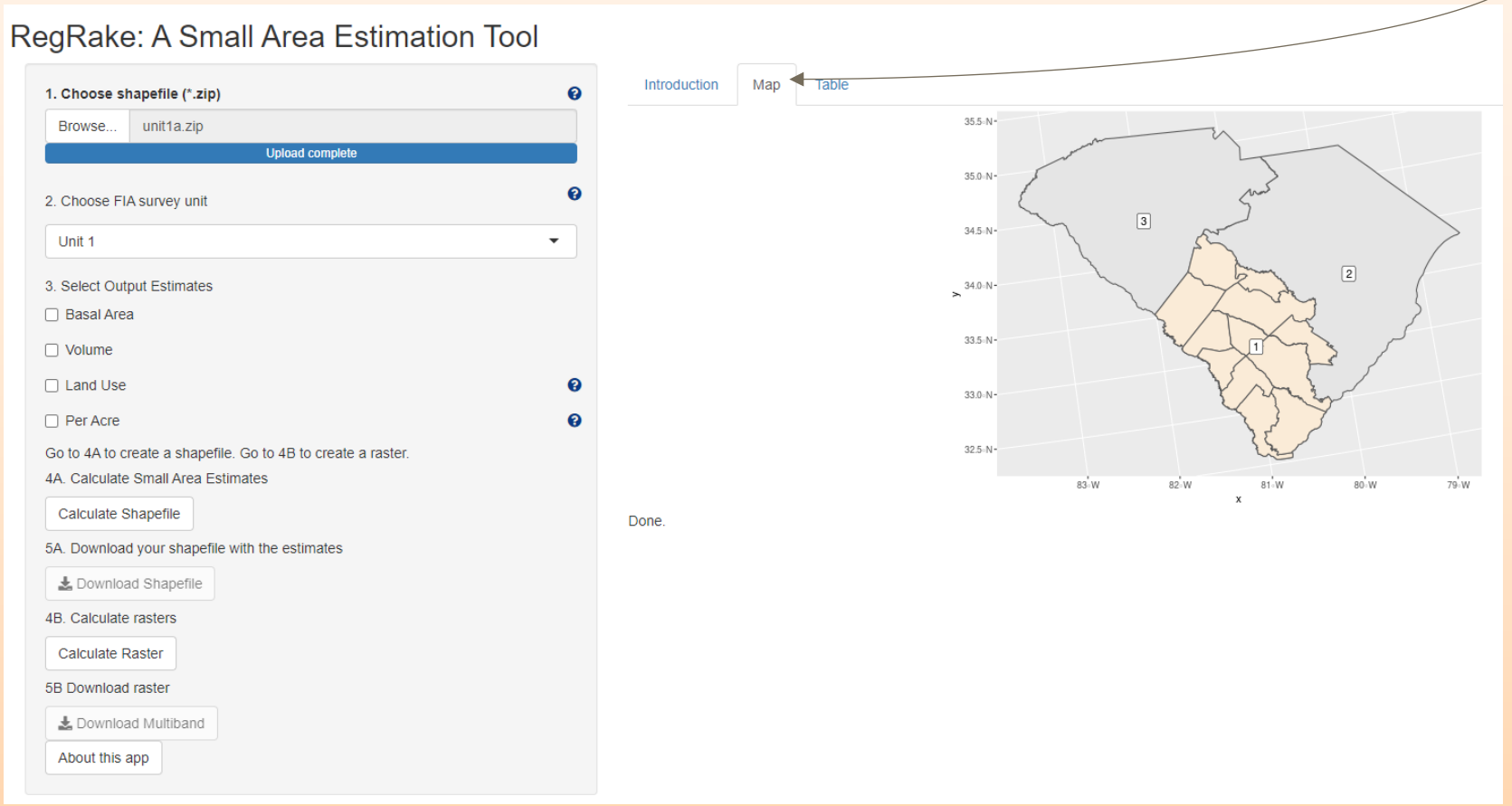
Step 1: Put your polygon shapefile in a zipped folder



Step 2a: Upload your shapefile



Step 2b: Advance to the “Map” tab



Step 3: Choose survey unit

RegRake: A Small Area Estimation Tool

1. Choose shapefile (*.zip)

Browse... unit1a.zip

Upload complete

2. Choose FIA survey unit

Unit 1

3. Select Output Estimates

- [ ] Basal Area
- [ ] Volume
- [ ] Land Use
- [ ] Per Acre

Go to 4A to create a shapefile. Go to 4B to create a raster.

4A. Calculate Small Area Estimates

Calculate Shapefile

5A. Download your shapefile with the estimates

Download Shapefile

4B. Calculate rasters

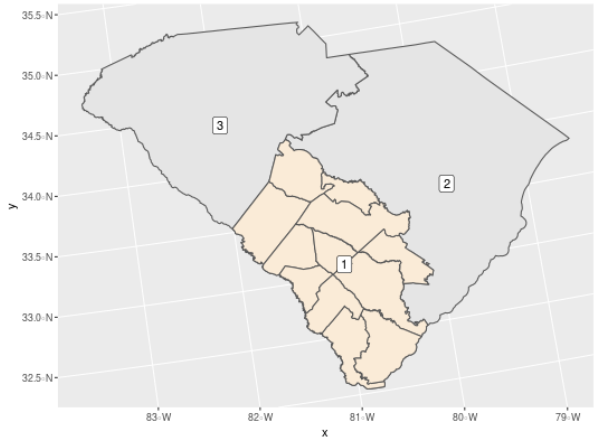
Calculate Raster

5B Download raster

Download Multiband

About this app

Introduction | Map | Table



Done.

Step 4: Choose output estimates (any or all)

RegRake: A Small Area Estimation Tool

1. Choose shapefile (*.zip)

Browse... unit1a.zip

Upload complete

2. Choose FIA survey unit

Unit 1

3. Select Output Estimates

- [x] Basal Area
- [x] Volume
- [x] Land Use
- [x] Per Acre

Go to 4A to create a shapefile. Go to 4B to create a raster.

4A. Calculate Small Area Estimates

Calculate Shapefile

5A. Download your shapefile with the estimates

Download Shapefile

4B. Calculate rasters

Calculate Raster

5B Download raster

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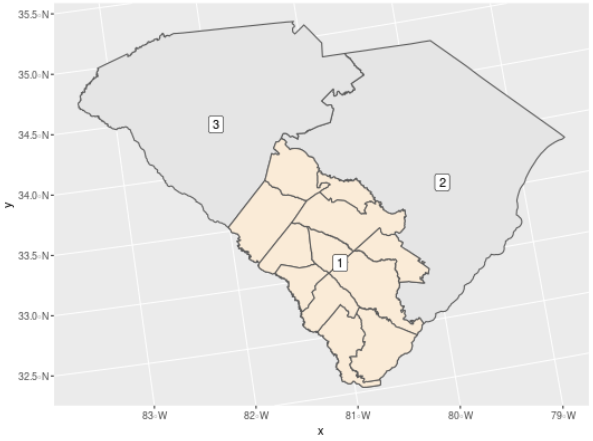

Done.

Land use is generalized

LAND_USE_SRS	Meaning
1	Timberland
2	Other forest land
10	Agricultural
11	Cropland
12	Pasture
13	Idle farmland
14	Orchard
15	Christmas tree plantation
16	Maintained wildlife opening
17	Windbreak/Shelterbelt
20	Rangeland
30	Developed
31	Cultural
32	Rights of way
33	Recreation
34	Mining
40	Other
41	Nonvegetated
42	Wetland
43	Beach
91	Census Water
92	Noncensus Water

RegRake categories are:

Forest
Agricultural
Developed
Other

Surface water will not appear in the output

NLCD Land Class 11 approximates Census Water

NLCD Land Class 31:
-- is small (very few plots land in it)
-- doesn't fit easily into FIA land use
(It could be idle farmland, mining, nonvegetated, beach, etc.)

NLCD Land Cover

11 Open Water
21 Open Developed
22 Low Density Developed
23 Medium Density Developed
24 High Density Developed
31 Barren Land
41 Deciduous Forest
42 Evergreen Forest
43 Mixed Forest
52 Shrub/Scrub
71 Grassland/Herbaceous
81 Pasture/Hay
82 Cultivated Crops
90 Woody Wetlands
95 Emergent Herbaceous Wetlands

Step 5: Calculate shapefile

RegRake: A Small Area Estimation Tool

1. Choose shapefile (*.zip)

Browse... unit1a.zip

Upload complete

2. Choose FIA survey unit

Unit 1

3. Select Output Estimates

- [x] Basal Area
- [x] Volume
- [x] Land Use
- [x] Per Acre

Go to 4A to create a shapefile. Go to 4B to create a raster.

4A. Calculate Small Area Estimates

Calculate Shapefile

5A. Download your shapefile with the estimates

Download Shapefile

4B. Calculate rasters

Calculate Raster

5B Download raster

Download Multiband

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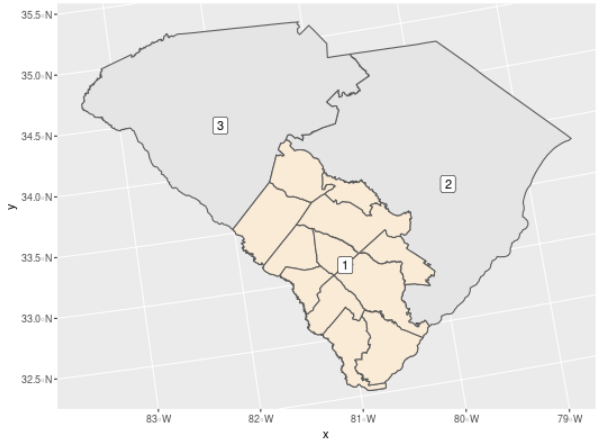
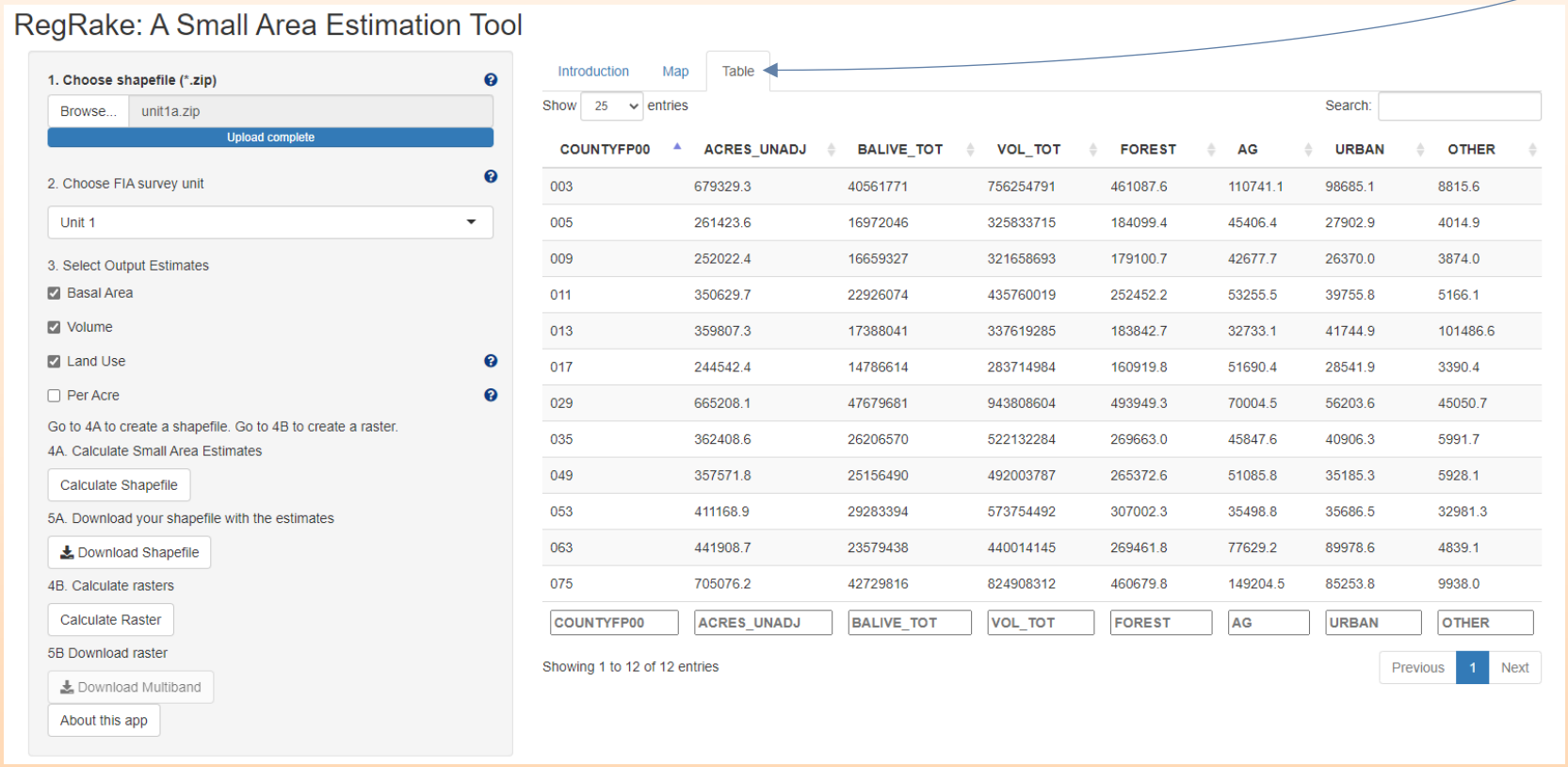


Done.

Step 6: Output will be on the "Table" tab



Basal area is about 5% low compared to Evalidator

	Land class	
Unit code	**Total**	**Accessible forest**
Total	1,280,802,001	1,280,802,001
4501 South Carolina: Southern Coastal Plain	340,362,222	340,362,222
4502 South Carolina: Northern Coastal Plain	479,241,980	479,241,980
4503 South Carolina: Piedmont	461,197,799	461,197,799

Net cubic foot volume is about 6.5% low compared to Evalidator

	Land class	
Unit code	**Total**	**Accessible forest**
Total	24,123,167,701	24,123,167,701
4501 South Carolina: Southern Coastal Plain	6,698,486,198	6,698,486,198
4502 South Carolina: Northern Coastal Plain	8,605,945,454	8,605,945,454
4503 South Carolina: Piedmont	8,818,736,049	8,818,736,049

Shapefiles along a unit boundary can spill into the next unit

RegRake: A Small Area Estimation Tool

1. Choose shapefile (*.zip)

Browse... unit1b.zip

Upload complete

2. Choose FIA survey unit

Unit 2

3. Select Output Estimates

- [x] Basal Area
- [x] Volume
- [x] Land Use
- [x] Per Acre

Go to 4A to create a shapefile. Go to 4B to create a raster.

4A. Calculate Small Area Estimates

Calculate Shapefile

5A. Download your shapefile with the estimates

Download Shapefile

4B. Calculate rasters

Calculate Raster

5B Download raster

Download Multiband

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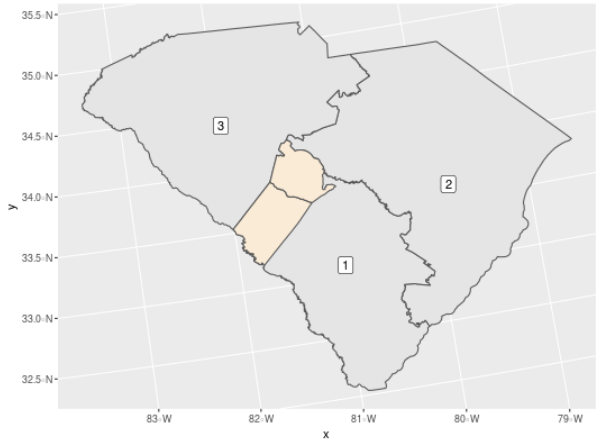
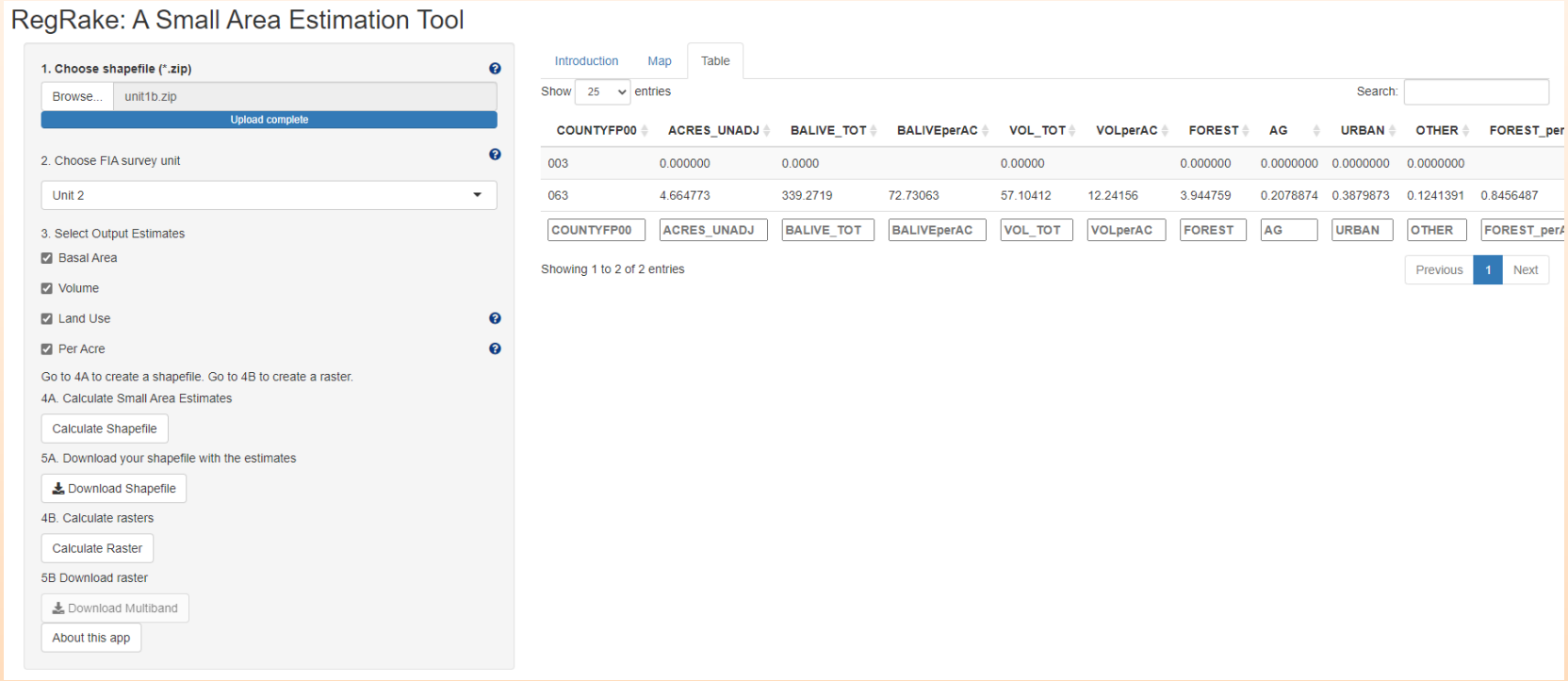
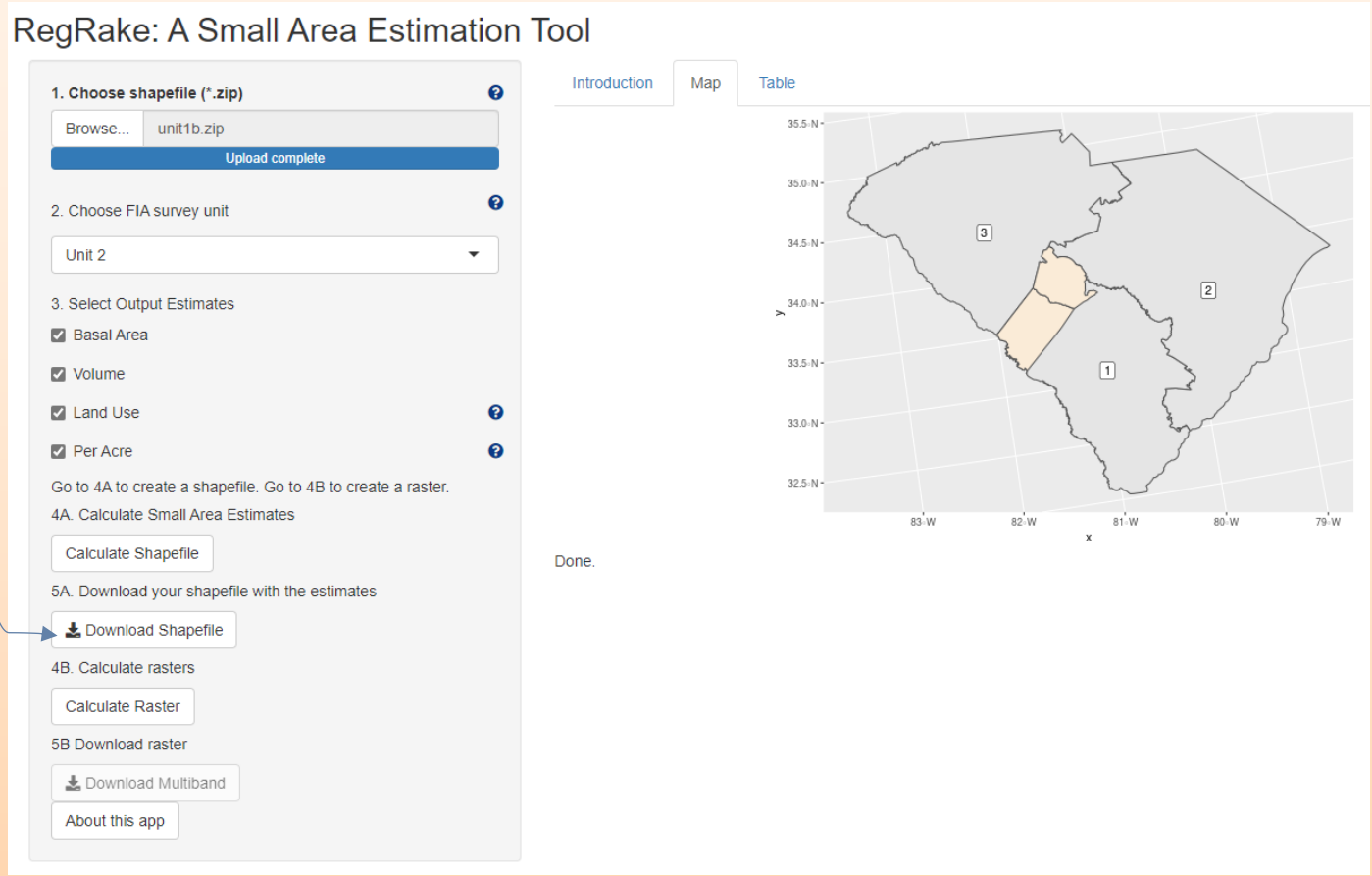


Done.

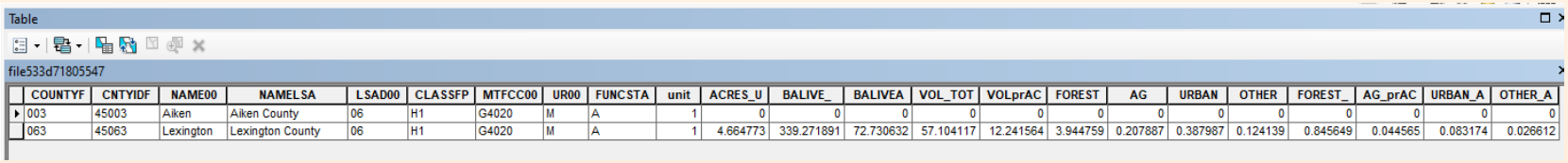
Shapefiles along a unit boundary can spill into the next unit



Step 7: Download shapefile (if desired)



Downloaded shapefile will have fields attached



Table

file533d71805547

	COUNTYF	CNTYIDF	NAME00	NAMELSA	LSAD00	CLASSFP	MTFCC00	UR00	FUNCSTA	unit	ACRES_U	BALIVE_	BALIVEA	VOL_TOT	VOLprAC	FOREST	AG	URBAN	OTHER	FOREST_	AG_prAC	URBAN_A	OTHER_A
▸	003	45003	Aiken	Aiken County	06	H1	G4020	M	A	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	063	45063	Lexington	Lexington County	06	H1	G4020	M	A	1	4.664773	339.271891	72.730632	57.104117	12.241564	3.944759	0.207887	0.387987	0.124139	0.845649	0.044565	0.083174	0.026612

Step 8: Calculate raster

RegRake: A Small Area Estimation Tool

1. Choose shapefile (*.zip)

Browse... unit1a.zip

Upload complete

2. Choose FIA survey unit

Unit 1

3. Select Output Estimates

- [x] Basal Area
- [x] Volume
- [x] Land Use
- [x] Per Acre

Go to 4A to create a shapefile. Go to 4B to create a raster.

4A. Calculate Small Area Estimates

Calculate Shapefile

5A. Download your shapefile with the estimates

Download Shapefile

4B. Calculate rasters

Calculate Raster

5B Download raster

Download Multiband

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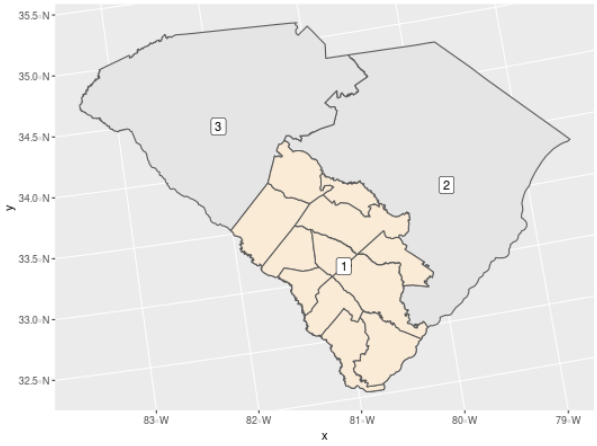
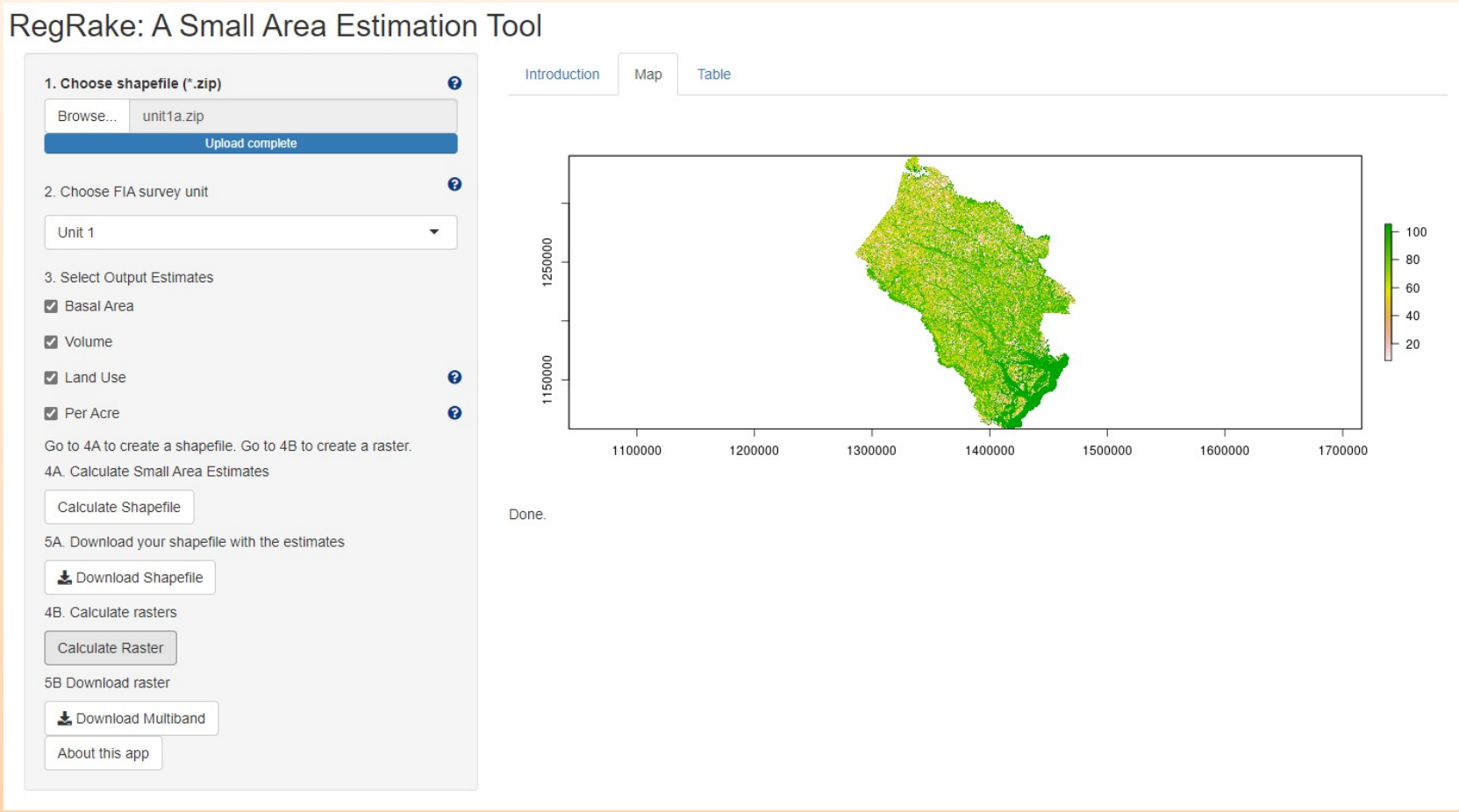
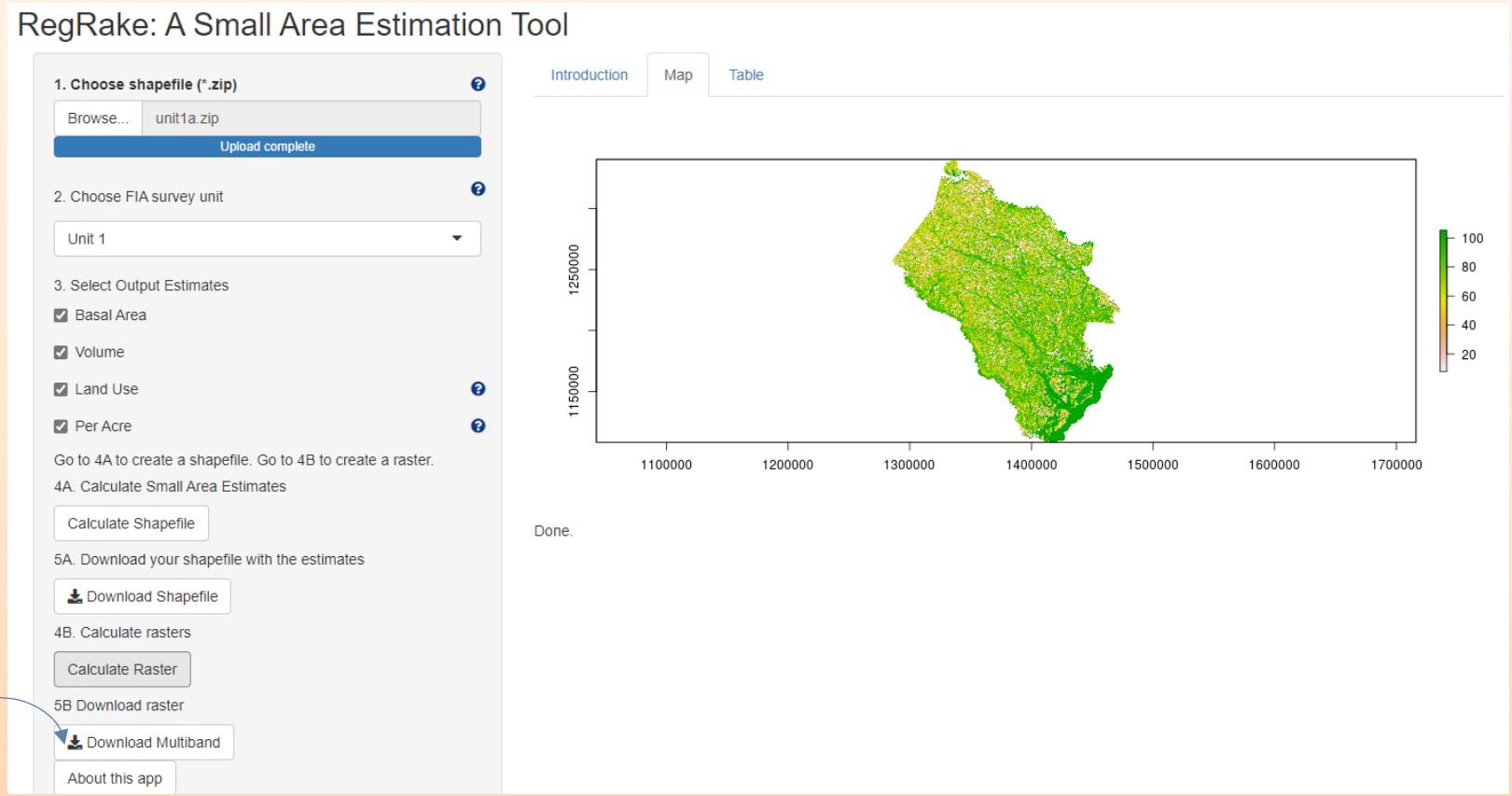


Done.

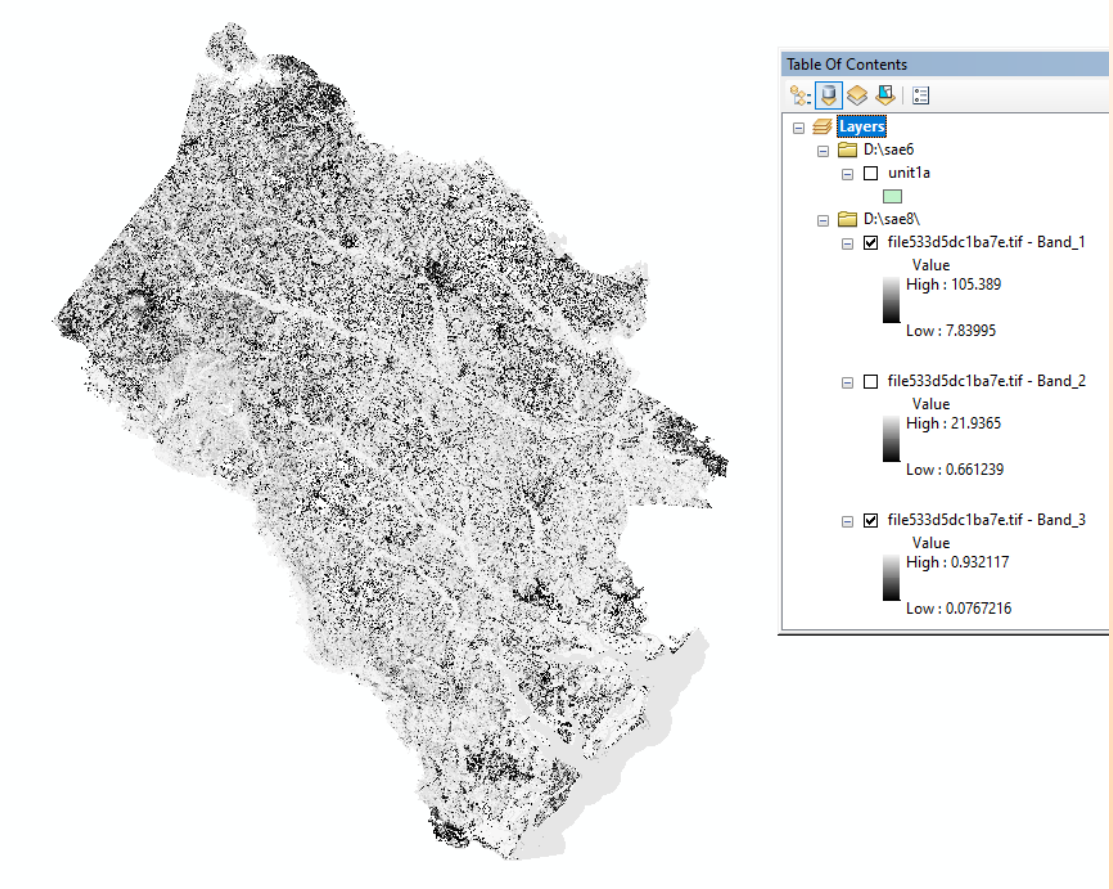
Output will be displayed on the “Map” tab



Step 9: Download raster (if desired)



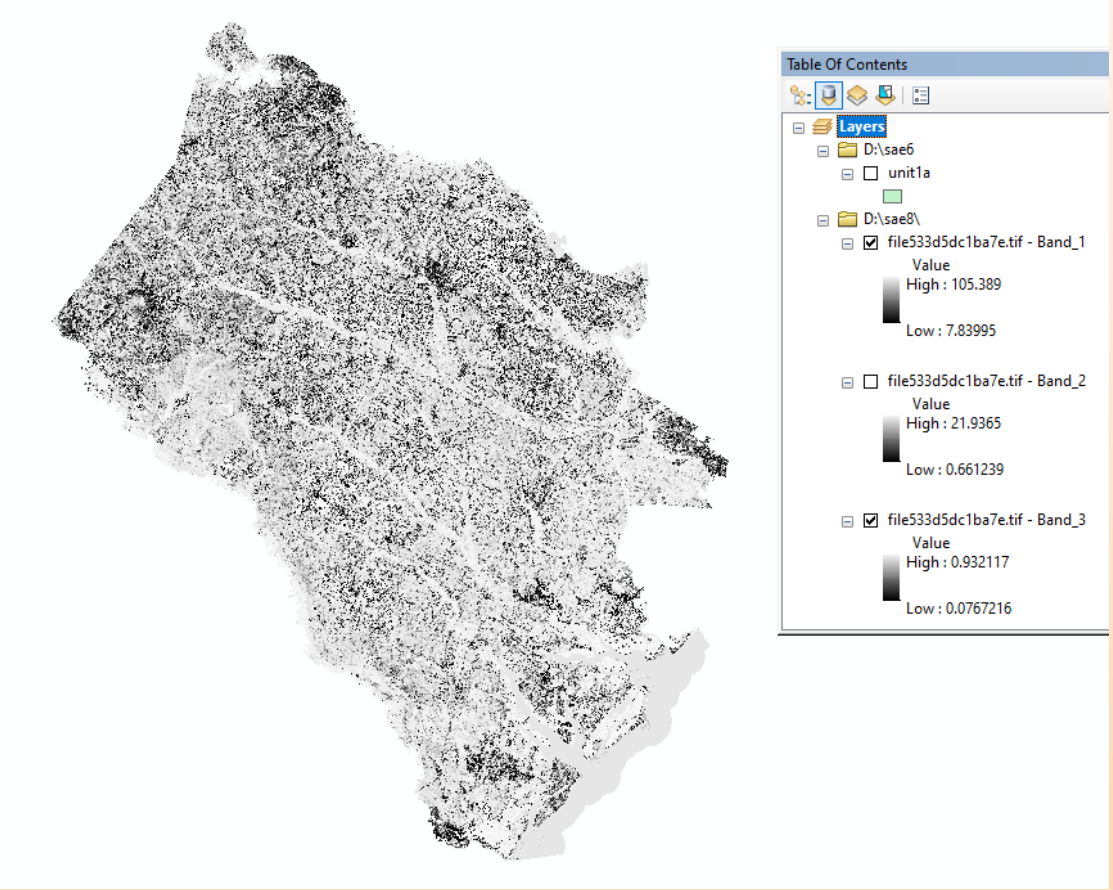
If requested, Basal area will be the lowest numbered band.



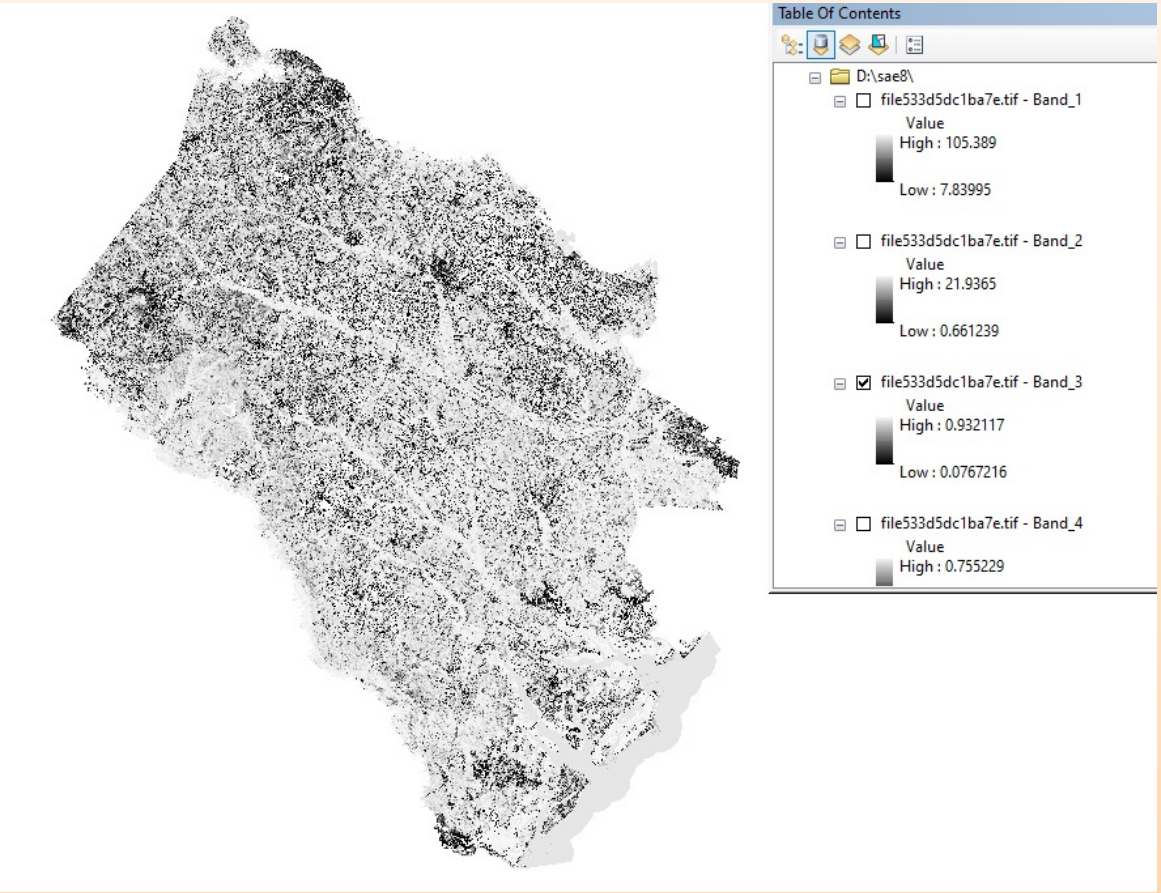
The sum of the pixels will be equal to the tabular output.

```
#####################################
library(tiff)
x = readTIFF("d:\\sae_1\\band_1.tif")
# change the above line for each band
p = matrix(data=0,nrow=nrow(x)*ncol(x),ncol=1)
k = 1
s = 0
for (iin 1:nrow(x))
for (j in 1:ncol(x))
    {if ((x[i,j] >= 0) && (x[i,j] <= 9999))
       {p[k] = x[i,j]
        k = k + 1
       s = s + x[i,j]
       }
    }

#####################################

sum(s)

##################
```

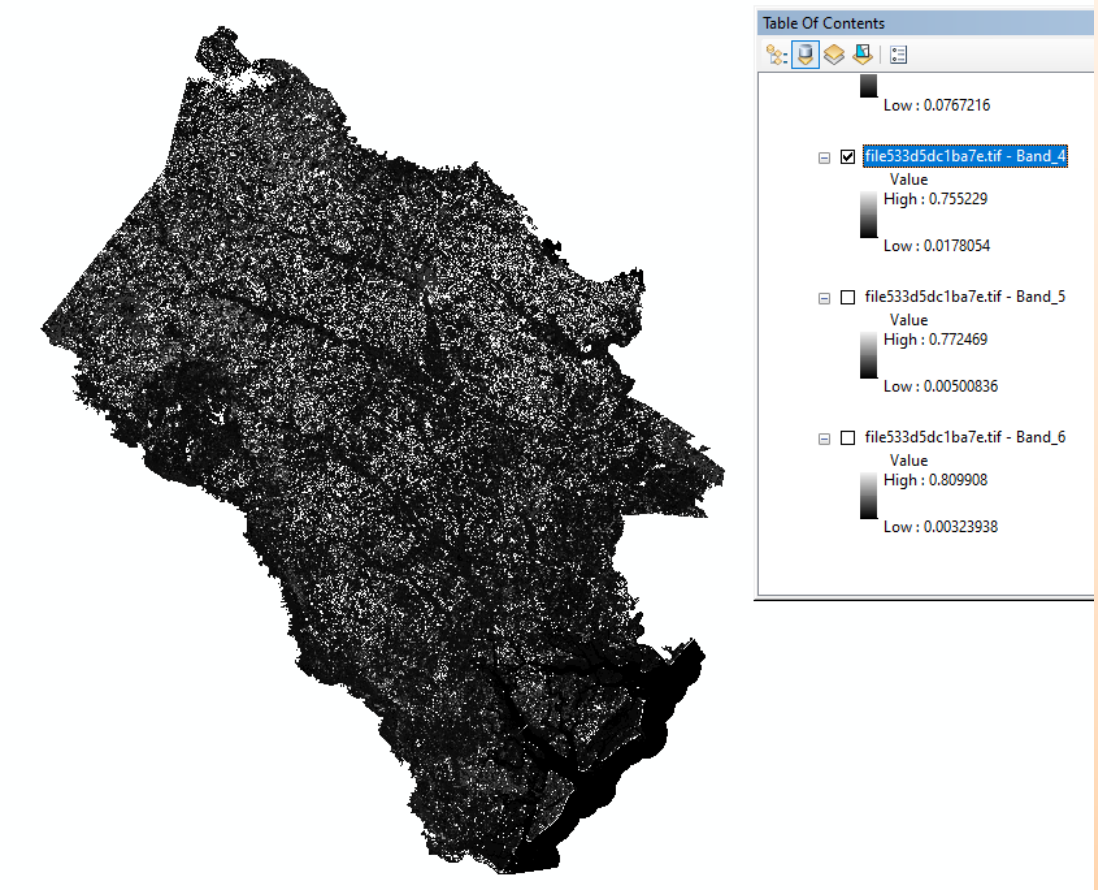
Volume will be the next band.



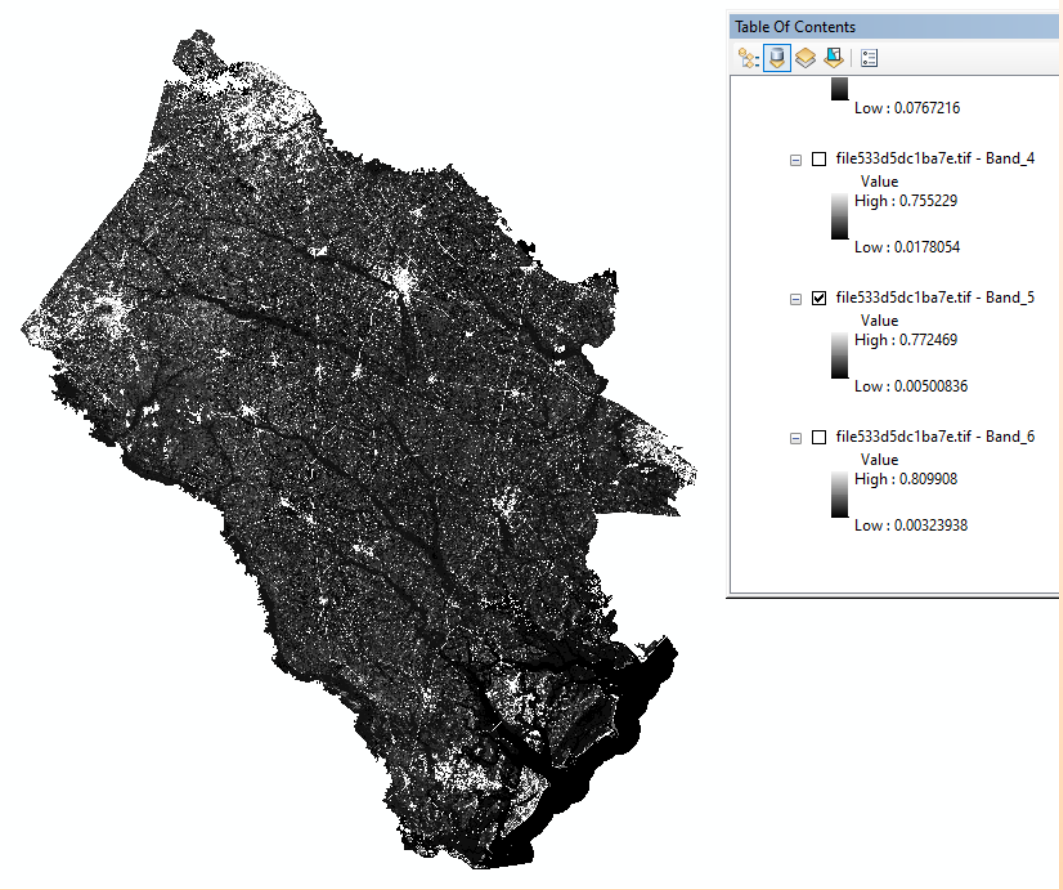
Forest is the next band band (pixels sum to acres)



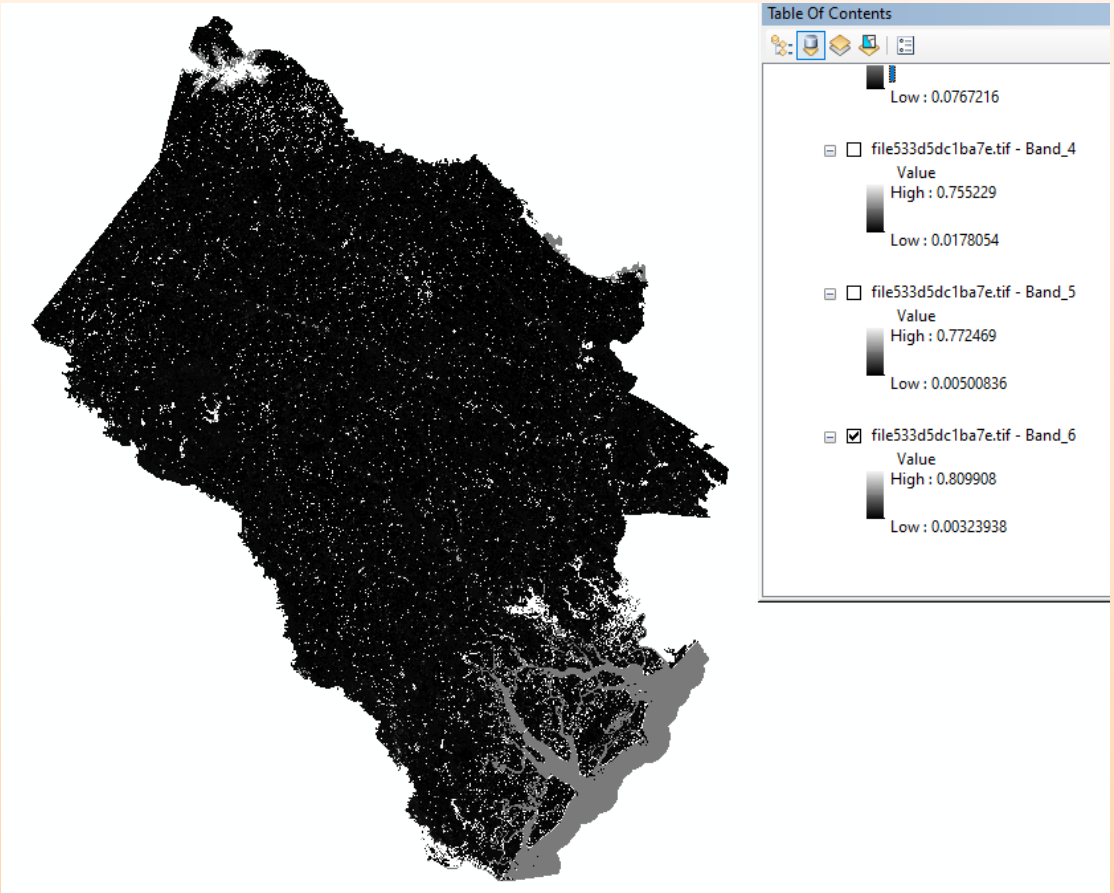
Percent agriculture is the next band.



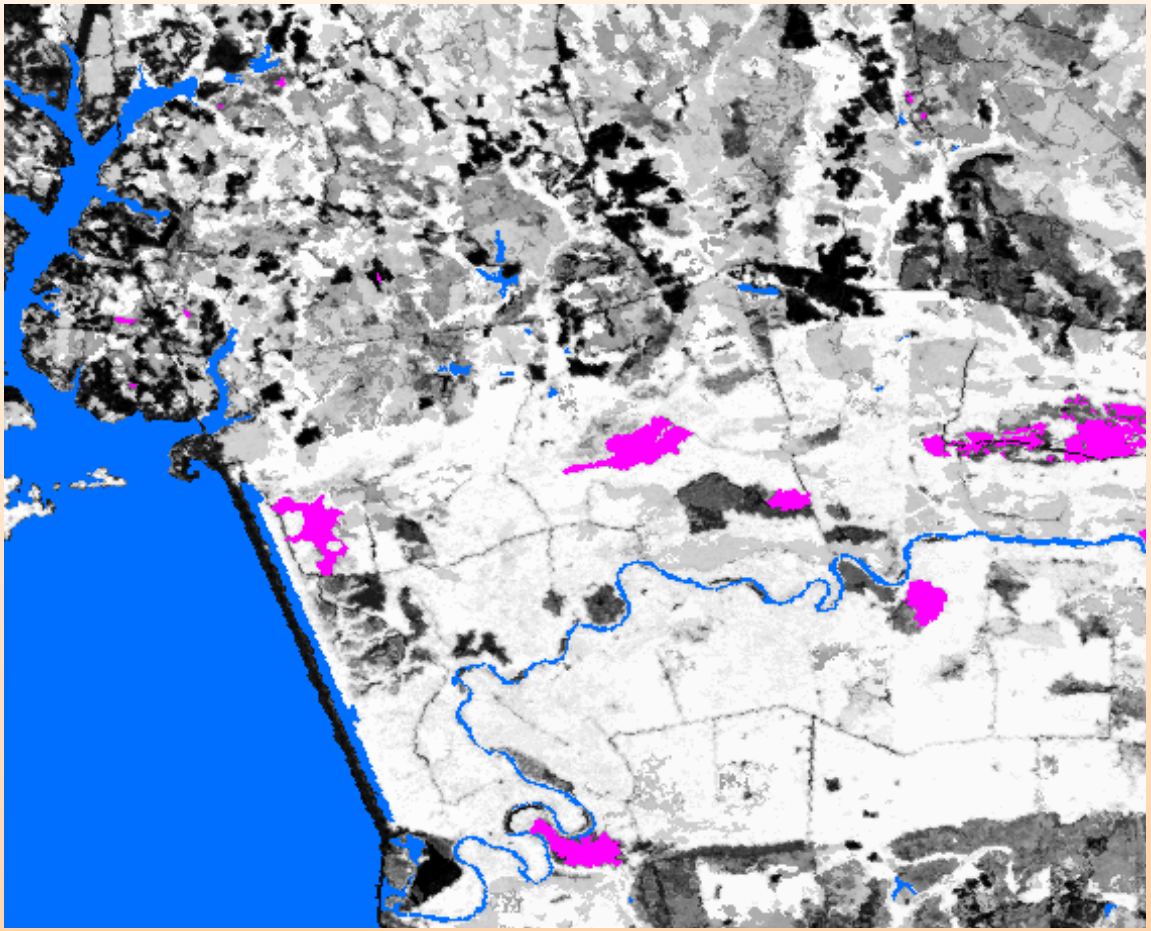
Percent developed is the next band.



Percent other is the next band.



Gaps in the raster



NLCD Land Class 11

NLCD Land Class 31

Gaps in the raster

Users should be aware that the land cover data used to develop the small area patches was pre-processed to remove the classes barren (NLCD class 31) and open water (NLCD class 11) most likely to be devoid of vegetation. As a result, the raster-based small area estimates produced by RegRake will not have predicted values in these areas (see example). In some instances, this also results in missing data in other land cover types, due to the merging that occurs during the development of the small area patches. The holes in the raster outputs are mostly confined to barren and water, although occasionally the missing data occurs in other land cover classes. The missing predictions in the other land cover classes are relatively minor and should not impact the landscape-level estimates produced by RegRake.