

Impervious Surface Spatial Integrity Estimation

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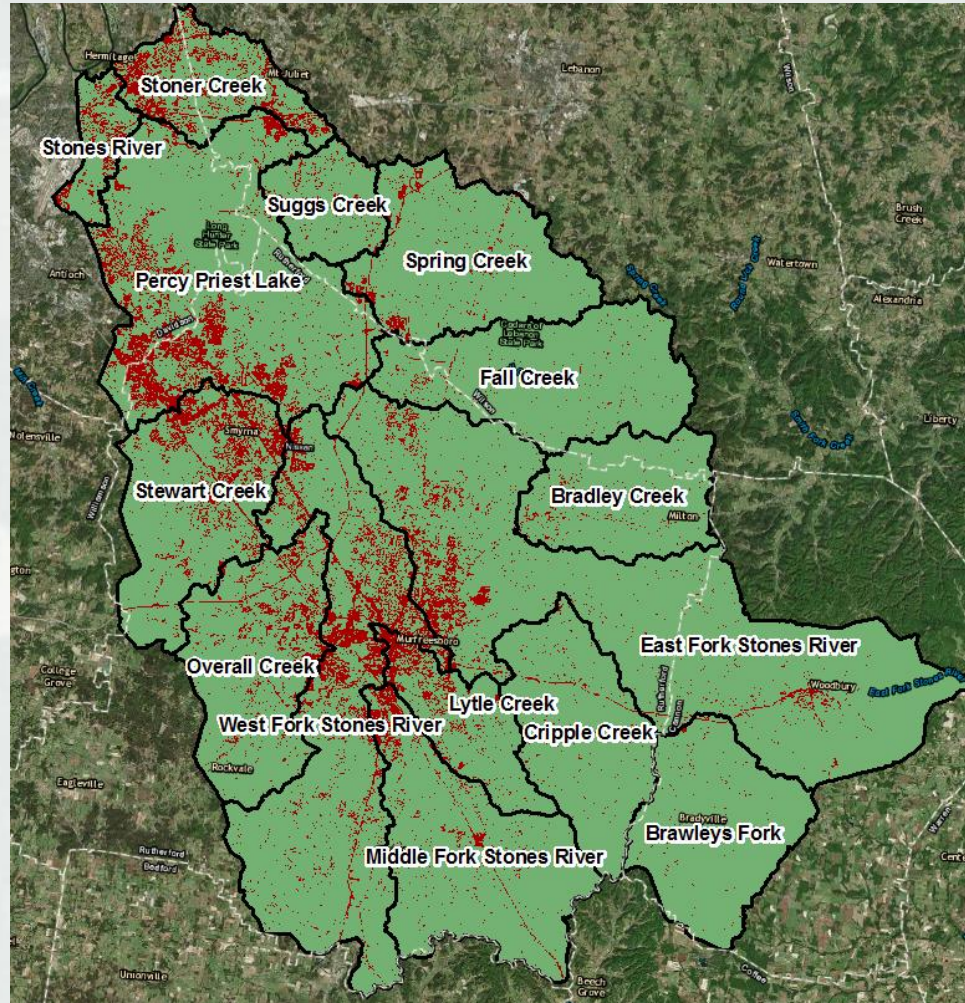
Presenter Title: Geographer

Duty Location: Nashville

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Impervious Surface Spatial Integrity Estimation



Background

As a result of the May 2010 Flood in Middle Tennessee, many studies were and are being conducted.

The Stone's River watershed shown was a study conducted in 2011.

The question came up we have the impervious percent but how is it distributed?

The data used was Landsat 5 and 7 and for the years 1989, 1999, 2007 and 2010

For the presentation 2010 data was used.

The Extent or Spatial Distribution of Impervious Areas

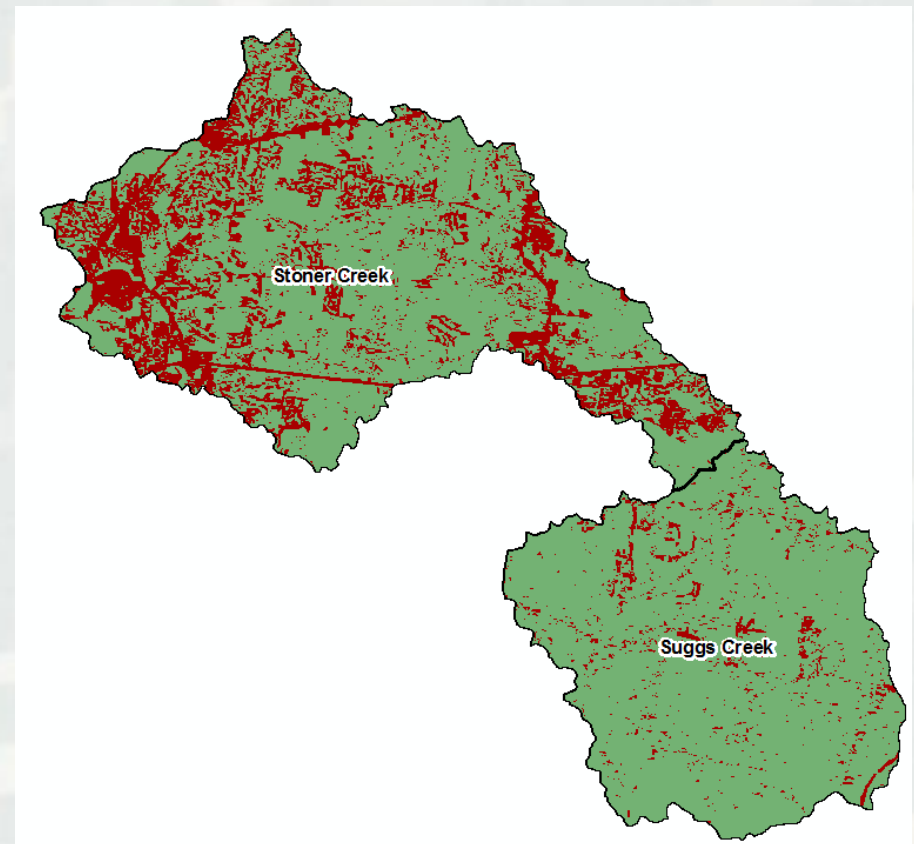
The Question?

We all have estimated the impervious areas of a watershed, but how are the impervious areas distributed throughout the Watershed?

Is there one big area?

Are the impervious areas all one size?

Is the area more heterogeneous or homogeneous?

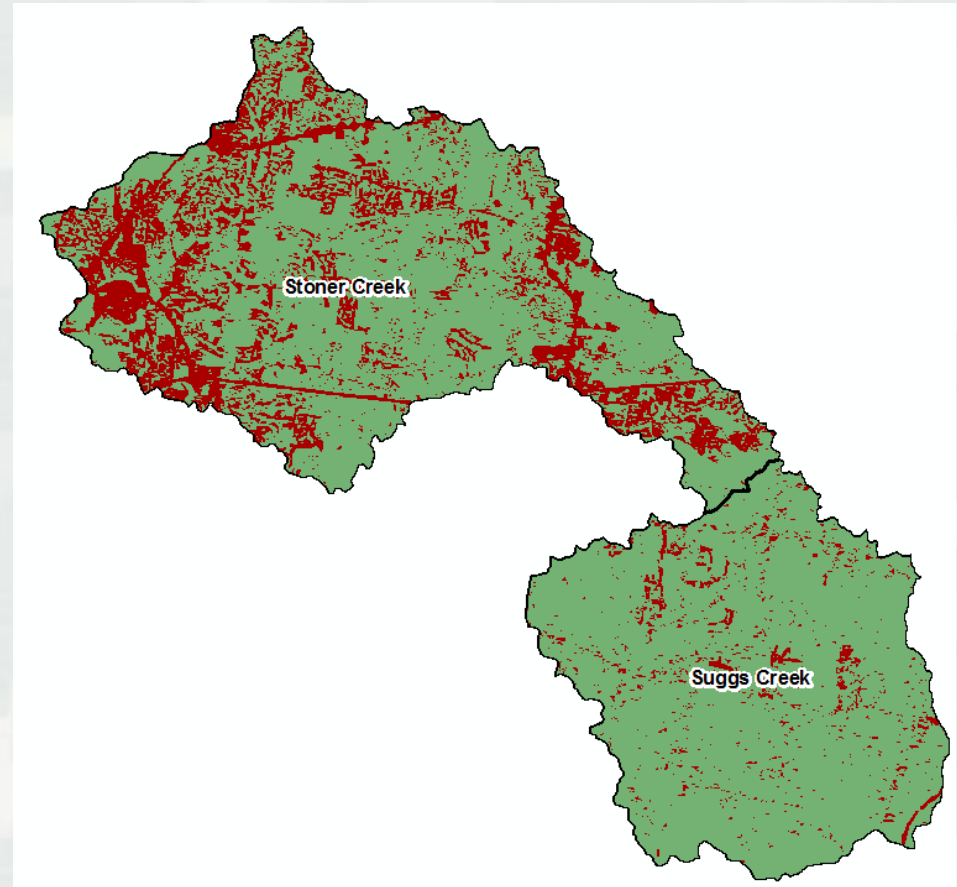


Percent Impervious, Average Fragment Size and Euler Number

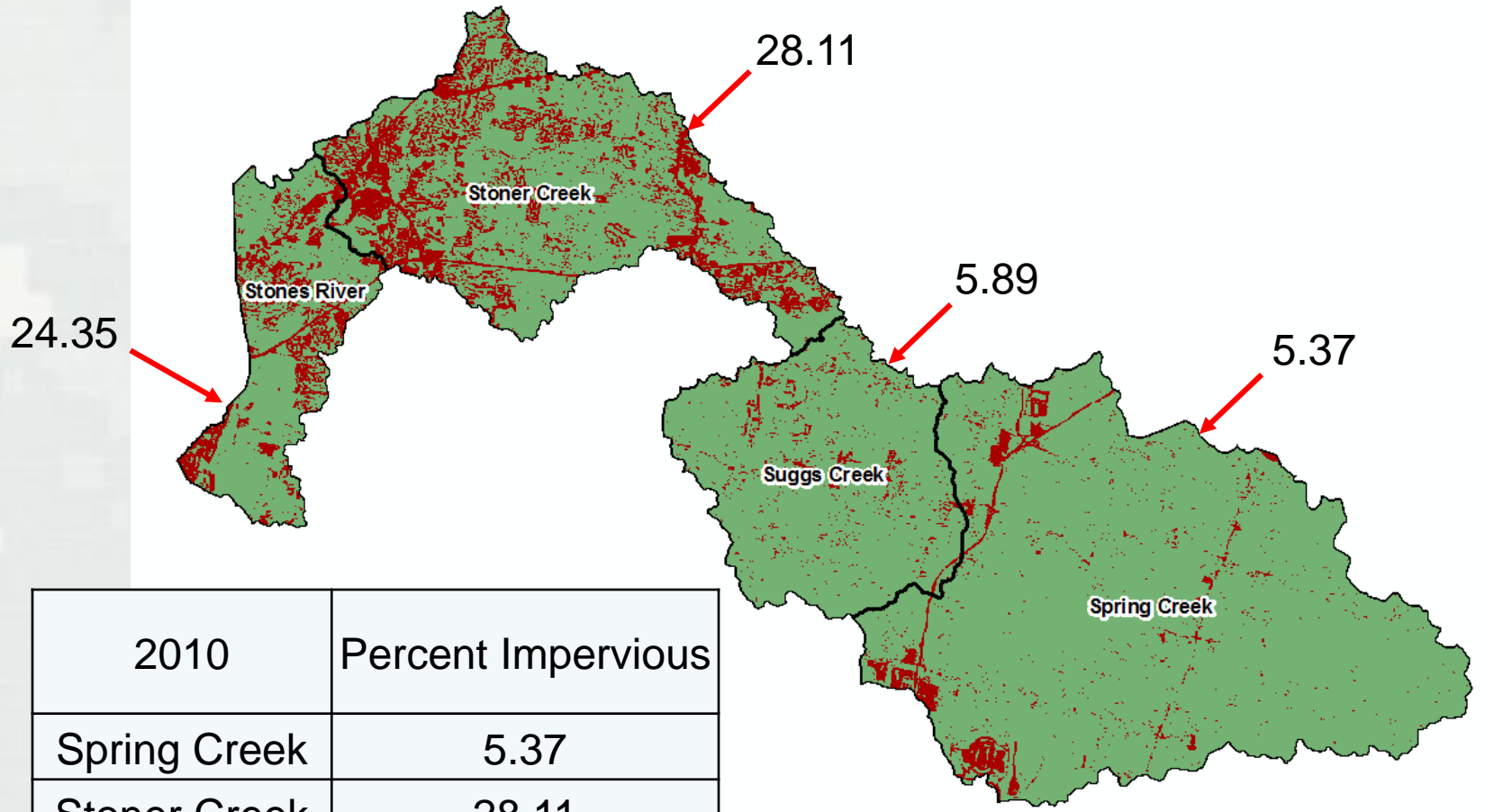
Approach

The factors are defined as follows:

- The percent impervious of each watershed
- The average impervious fragment size for each watershed
- The euler number is the (non-impervious fragments) – (impervious fragments – 1)

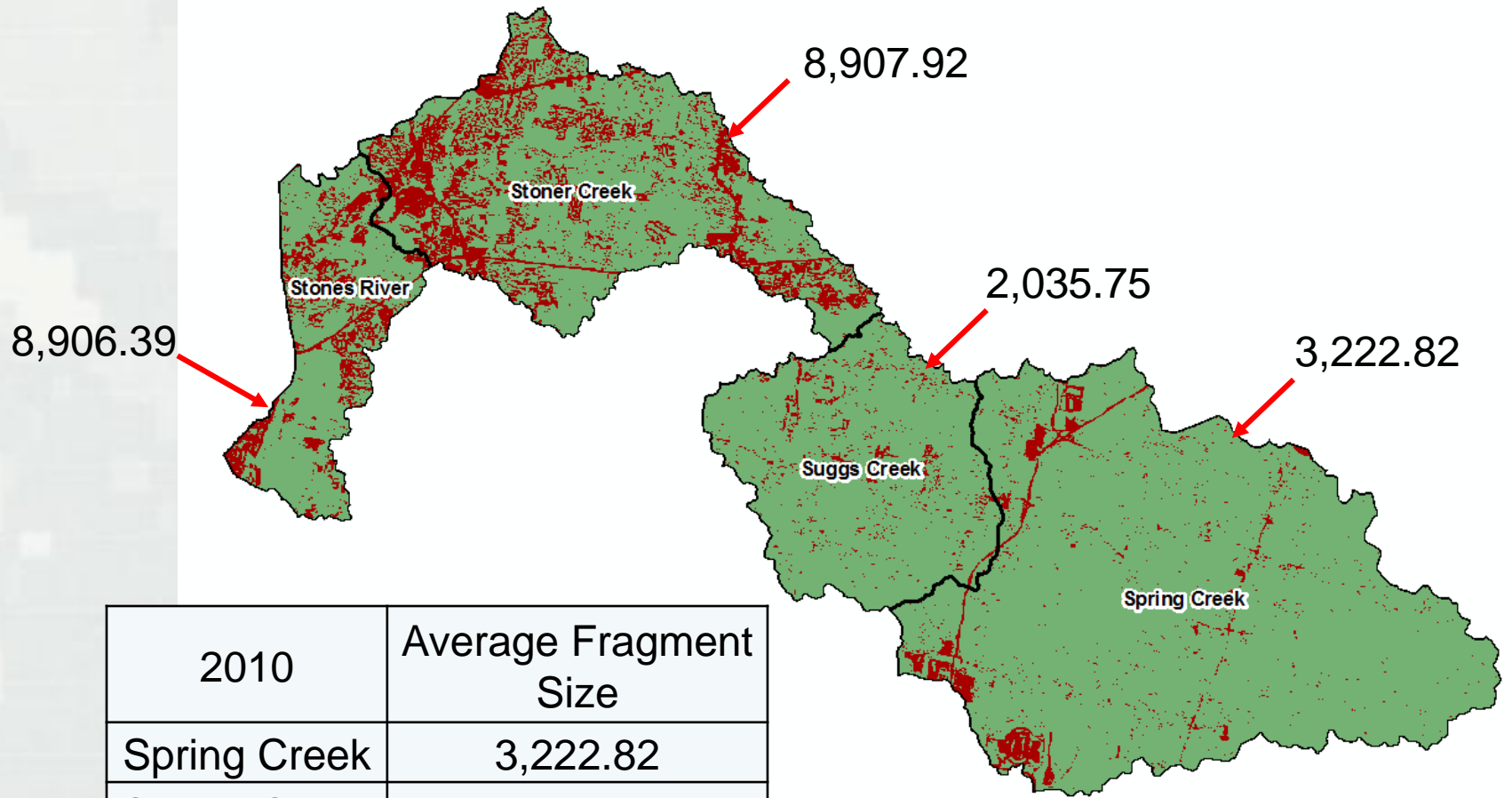


Percent Impervious



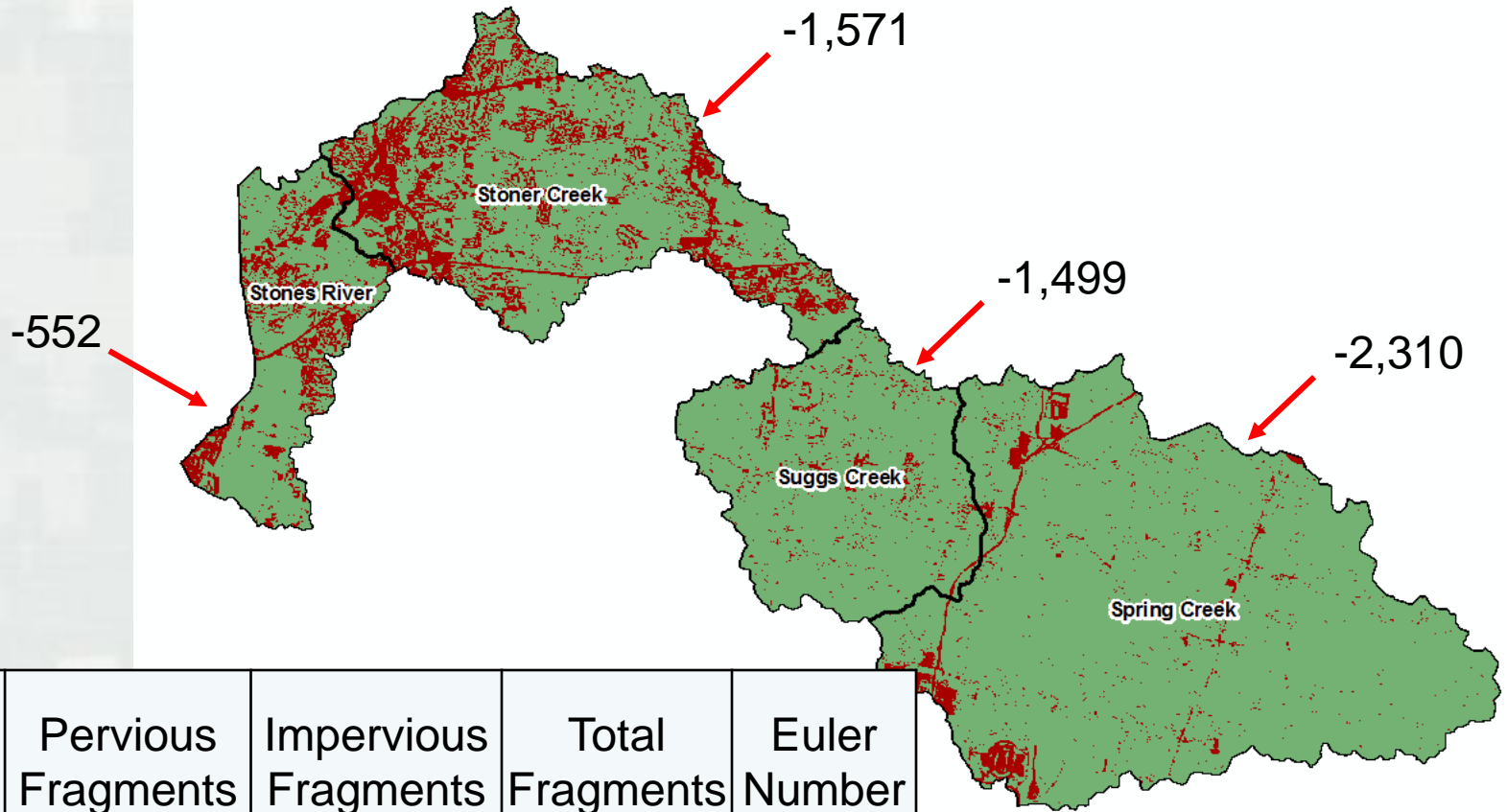
2010	Percent Impervious
Spring Creek	5.37
Stoner Creek	28.11
Stones River	24.35
Suggs Creek	5.89

Average Fragment Size



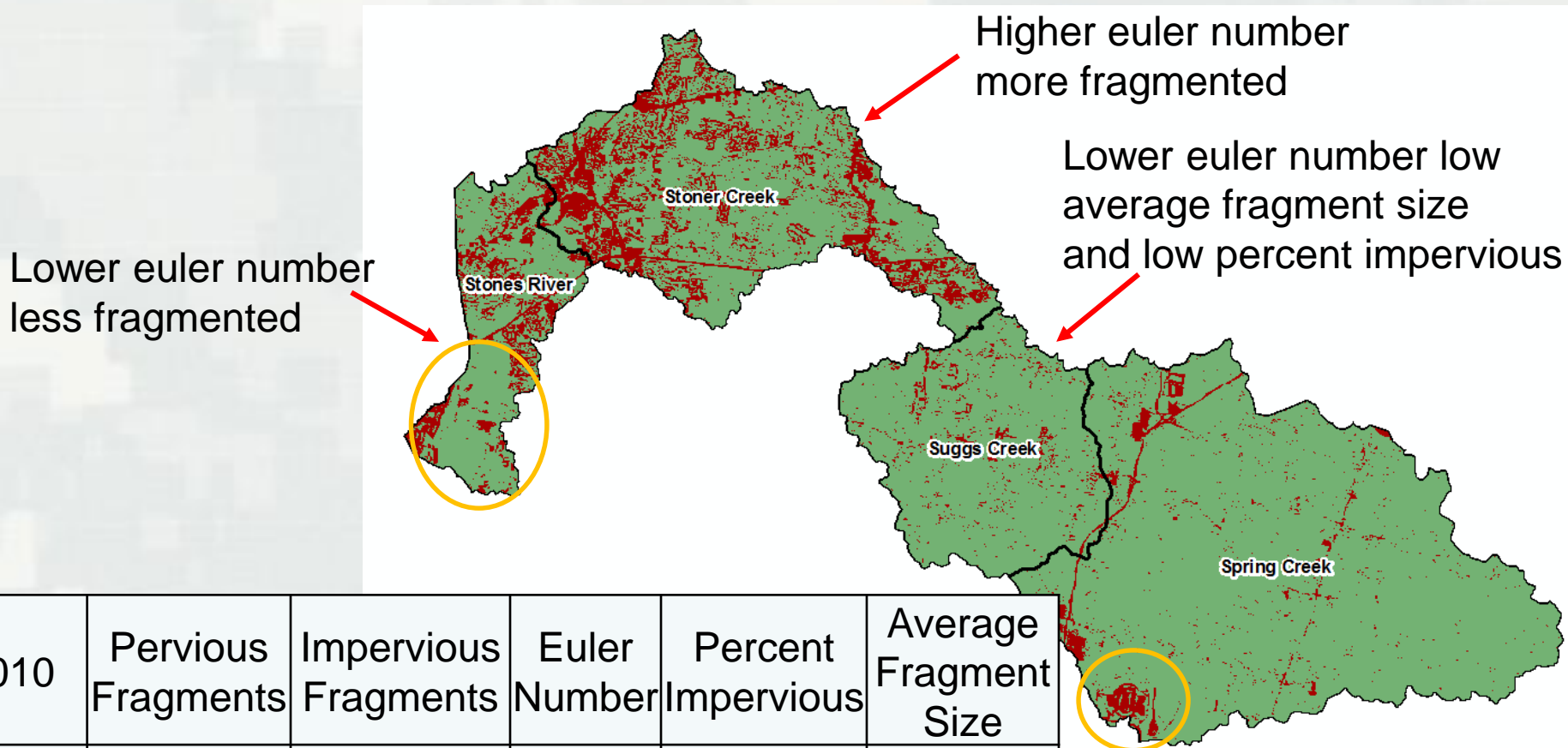
2010	Average Fragment Size
Spring Creek	3,222.82
Stoner Creek	8,907.92
Stones River	8,906.39
Suggs Creek	2,035.75

Euler Number



2010	Pervious Fragments	Impervious Fragments	Total Fragments	Euler Number
Spring Creek	132	2,441	2,573	-2,310
Stoner Creek	862	2,432	3,294	-1,571
Stones River	333	884	1,217	-552
Suggests Creek	54	1,552	1,606	-1,499

Combined



2010	Pervious Fragments	Impervious Fragments	Euler Number	Percent Impervious	Average Fragment Size
Spring Creek	132	2,441	-2,310	5.37	3,222.82
Stoner Creek	862	2,432	-1,571	28.11	8,907.92
Stones River	333	884	-552	24.35	8,906.39
Suggs Creek	54	1552	-1,499	5.89	2,035.75

Larger average fragment size, high euler and low percent impervious

Conclusion

Using percent impervious, average fragment size or euler number can describe impervious surface.

Using all three factors together gives a better idea of the heterogeneous or homogeneous state of a land area.

Is there one big area? No

Are the areas all one size? No

Is the area more heterogeneous or homogeneous? What scale are we talking about? And what part of the watershed are we talking about? So it depends on the state of the area.

This can be applied to any continuous data type i.e., forest, wetlands...

Questions???

Contact Info

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