



Rethinking How You Style Your Maps

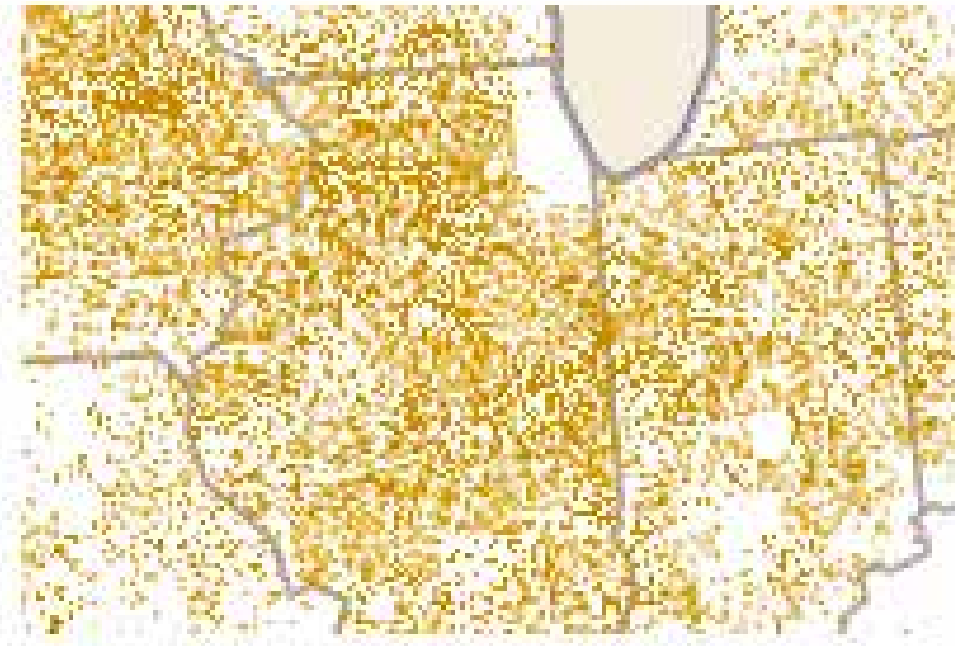
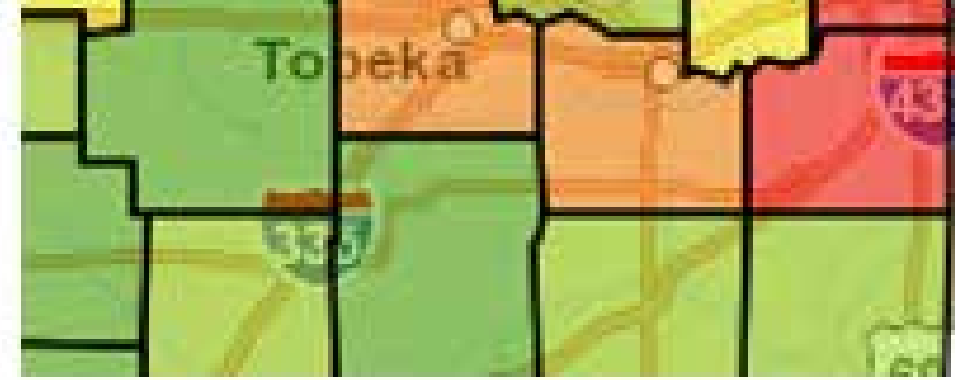
Jeremy Bartley

Jim Herries

Technical Workshop

Enhancements to support better vector mapping

Jeremy Bartley



ArcGIS API for JavaScript

Search the JavaScript API

Tutorials

Concepts

API Reference

Samples

Forum

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ArcGIS JavaScript API Overview

What's New in Version 3.8

▸ About the API

▸ Getting Started

▸ Working with the API

▸ Mobile

▸ Recommendations

▸ Application Layouts

▸ ArcGIS Server Services

▾ What's New archive

Migrating to 3.0

Migrating to 2.0

What's New in Version 3.7

What's New in Version 3.6

What's New in Version 3.5

What's New in Version 3.4

What's New in Version 3.3

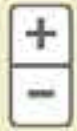
What's new in Version 3.7

Better vector maps with new rendering functionality



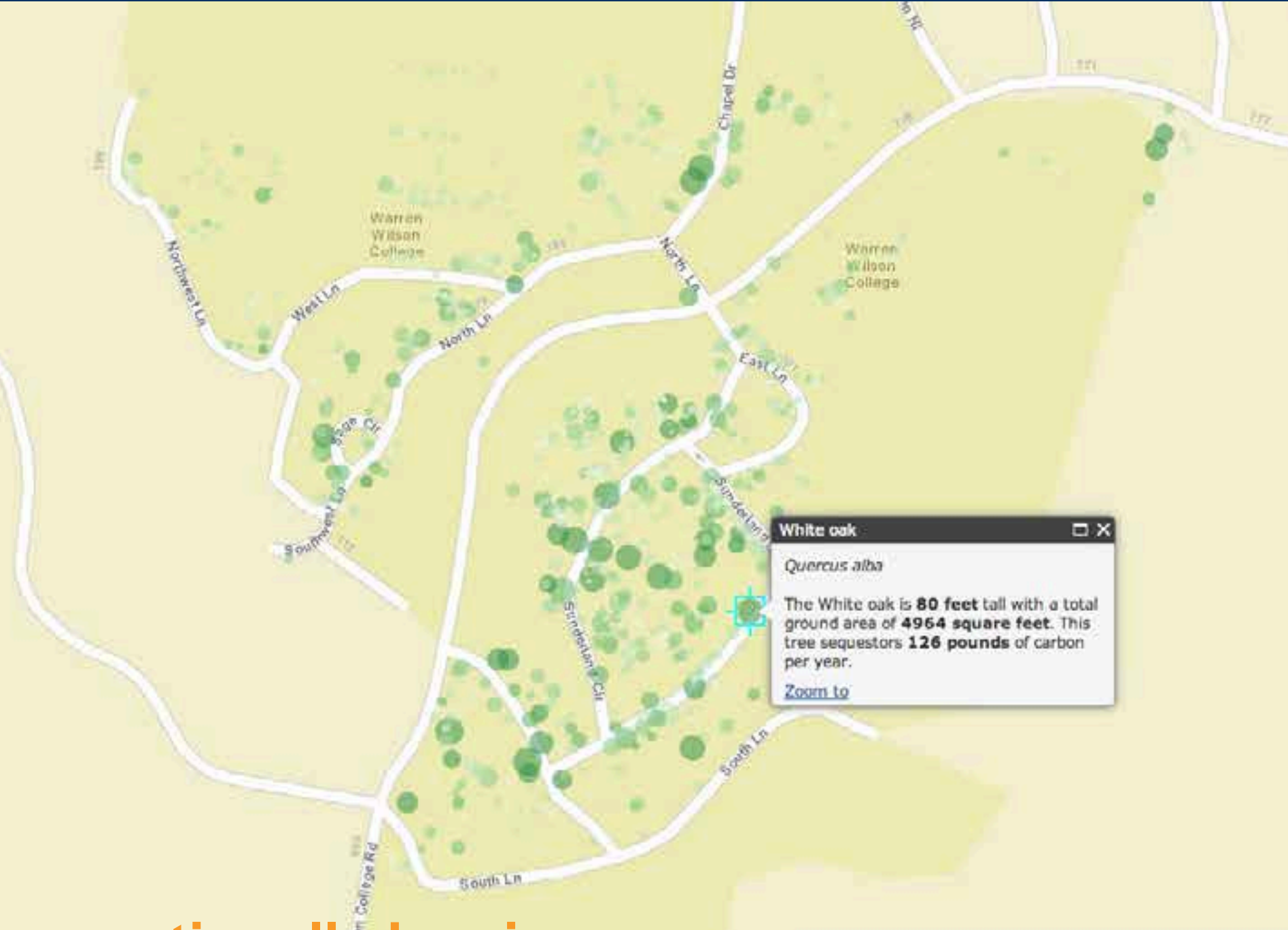
Better Vector Mapping -- FeatureLayer

- FeatureLayer is a key component of **vector mapping** that represents the Data on the client side
- Simple, Fast, Smart, Powerful
- Leverages the key **characteristics of the Web**
 - SVG, Canvas, CSS, HTTP Caching, Workers
- Simple way to **visualize your data** on the client



Warren Wilson Center Campus [Tree Study](#)

Map depicts tree canopy size and yearly carbon sequestration. Darker green trees sequester more carbon. Touch a tree for more information.



White oak ✕

Quercus alba

The White oak is **80 feet** tall with a total ground area of **4964 square feet**. This tree sequesters **126 pounds** of carbon per year.

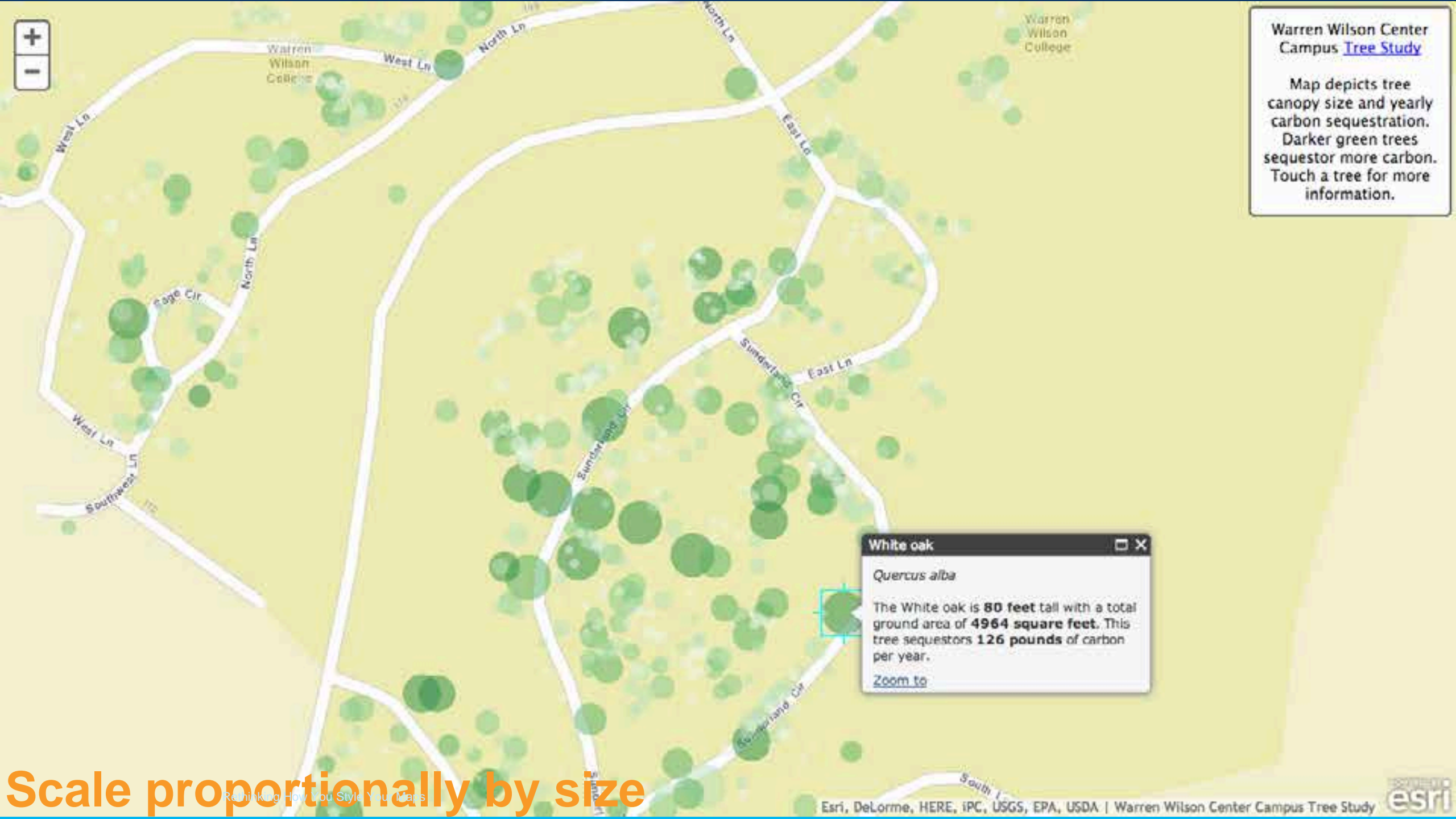
[Zoom to](#)

Scale proportionally by size



Warren Wilson Center Campus [Tree Study](#)

Map depicts tree canopy size and yearly carbon sequestration. Darker green trees sequester more carbon. Touch a tree for more information.



White oak □ ✕

Quercus alba

The White oak is **80 feet** tall with a total ground area of **4964 square feet**. This tree sequesters **126 pounds** of carbon per year.

[Zoom to](#)

Scale proportionally by size

Reinventing How You Style Your Maps

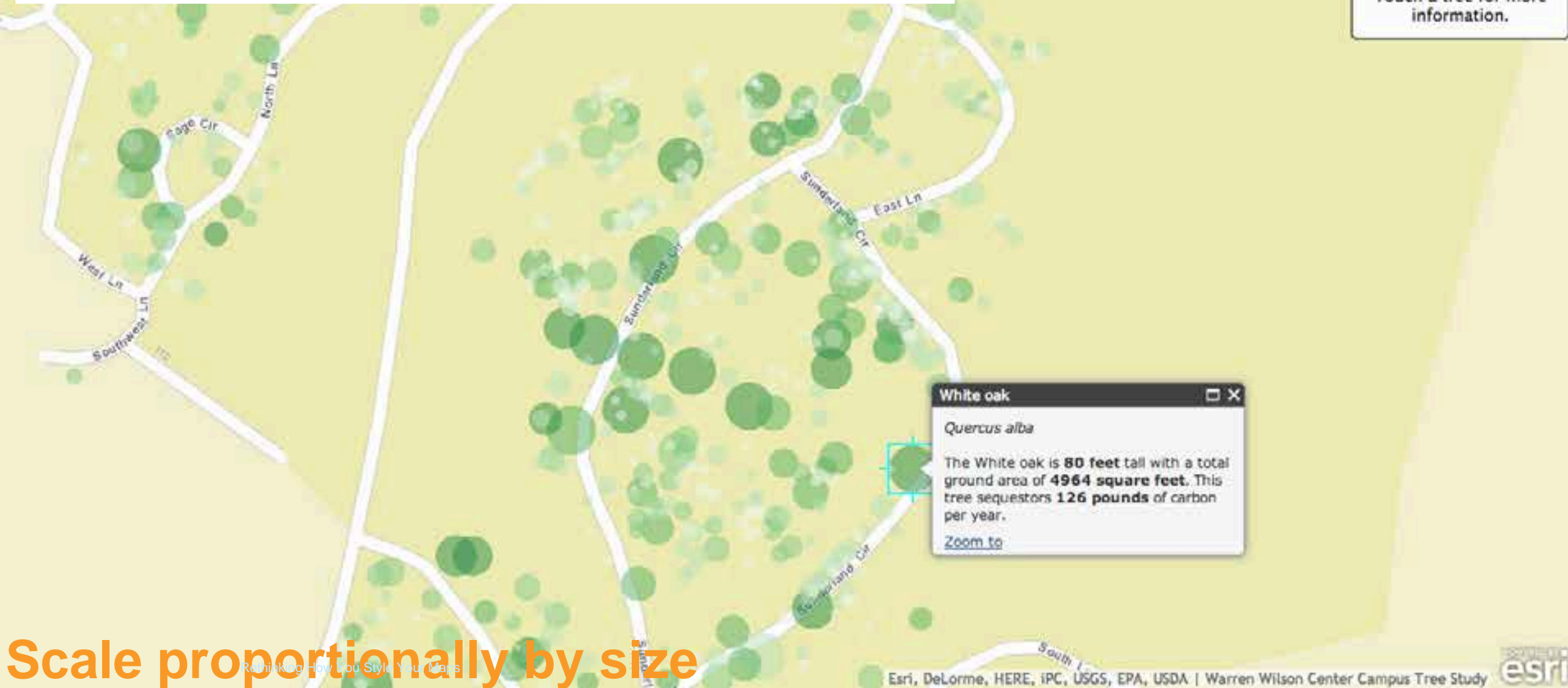


```
var proportionalSymbolInfo = {  
  field:"GroundArea",  
  valueUnit:"feet",  
  valueRepresentation:"area"  
};
```

```
featureLayer.renderer.setProportionalSymbolInfo(proportionalSymbolInfo);
```

Warren Wilson Center
Campus [Tree Study](#)

Map depicts tree canopy size and yearly carbon sequestration. Darker green trees sequester more carbon. Touch a tree for more information.

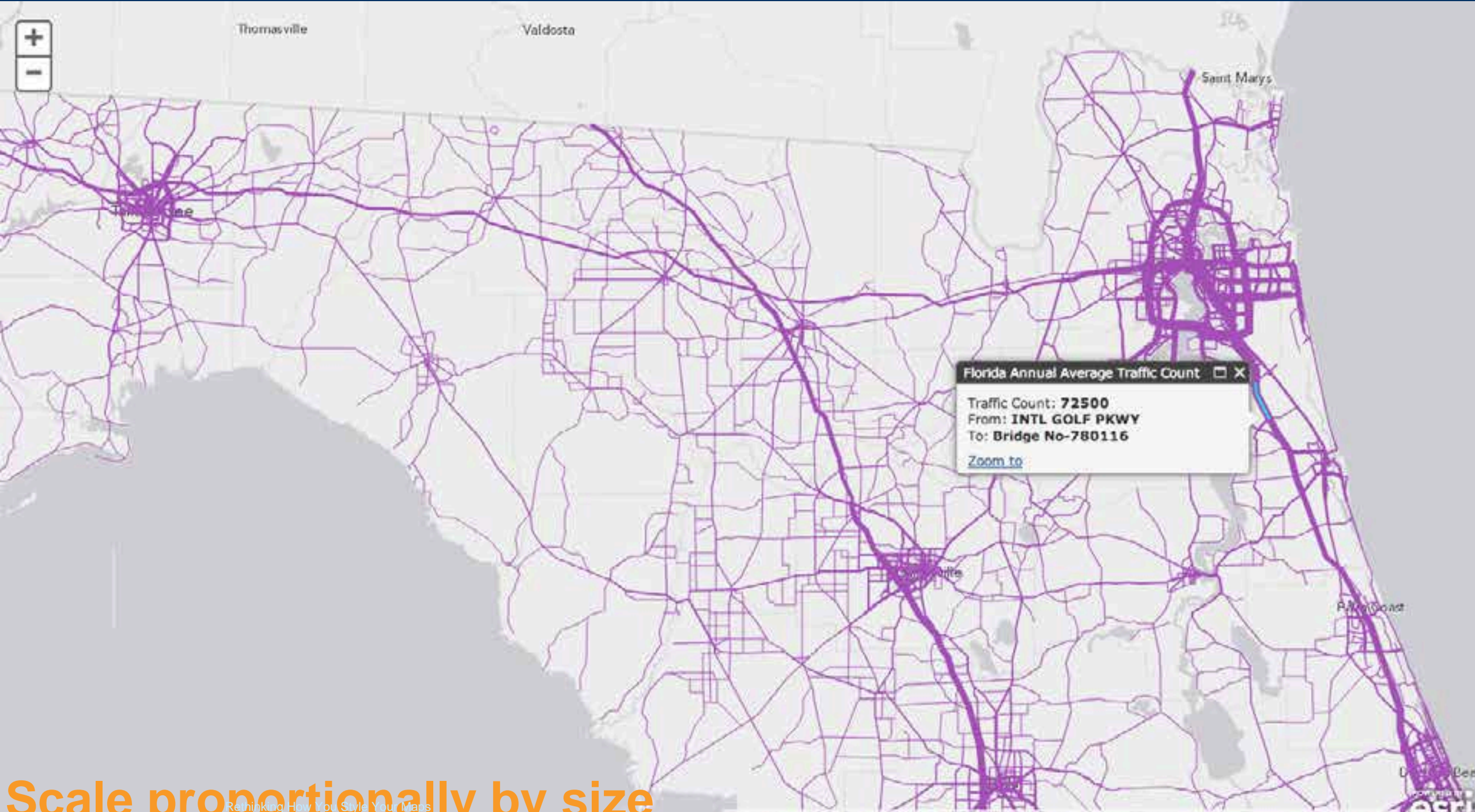


White oak
Quercus alba
The White oak is **80 feet** tall with a total ground area of **4964 square feet**. This tree sequesters **126 pounds** of carbon per year.
[Zoom to](#)

Scale proportionally by size

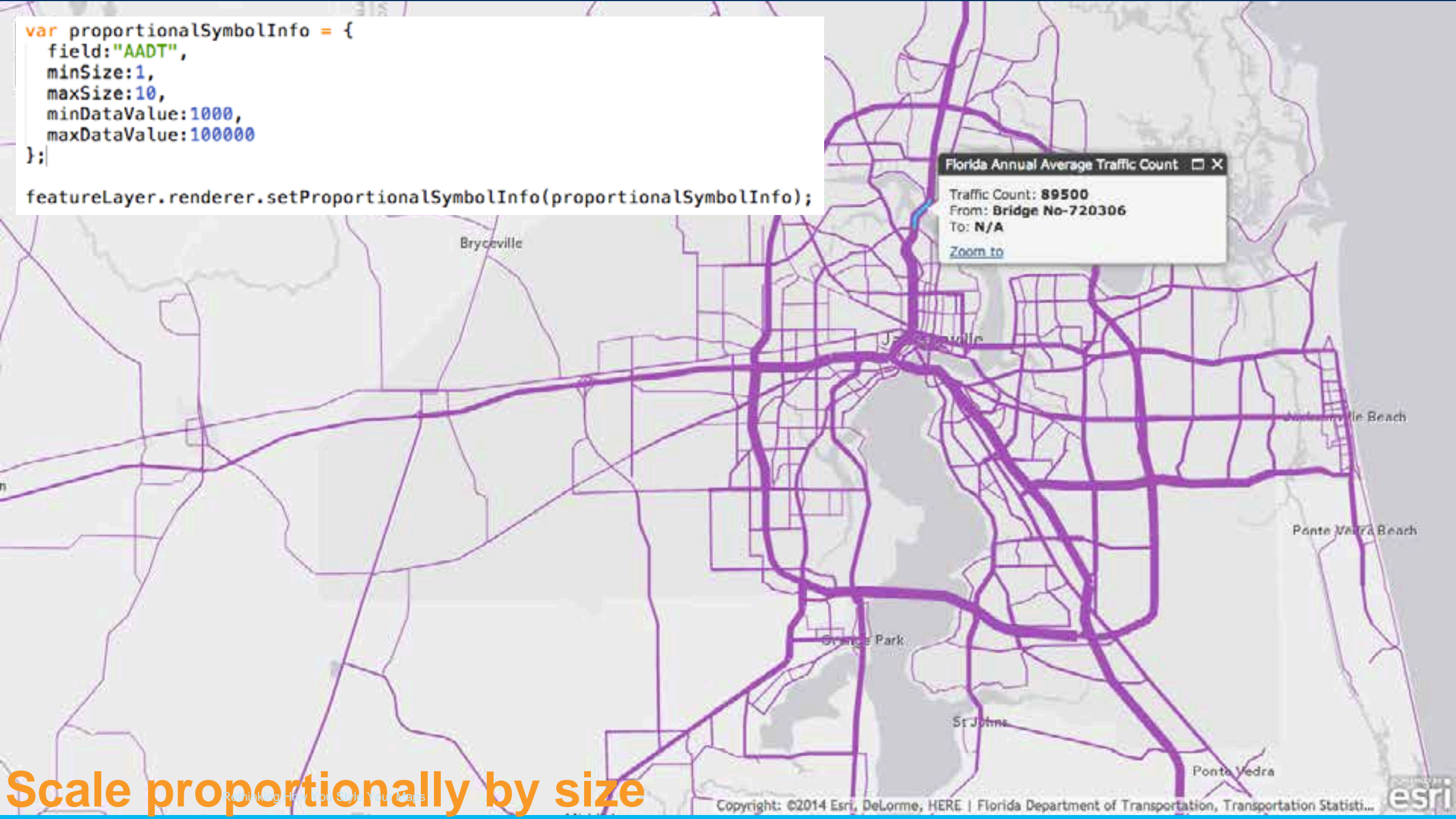
Re-thinking How You Style Your Maps





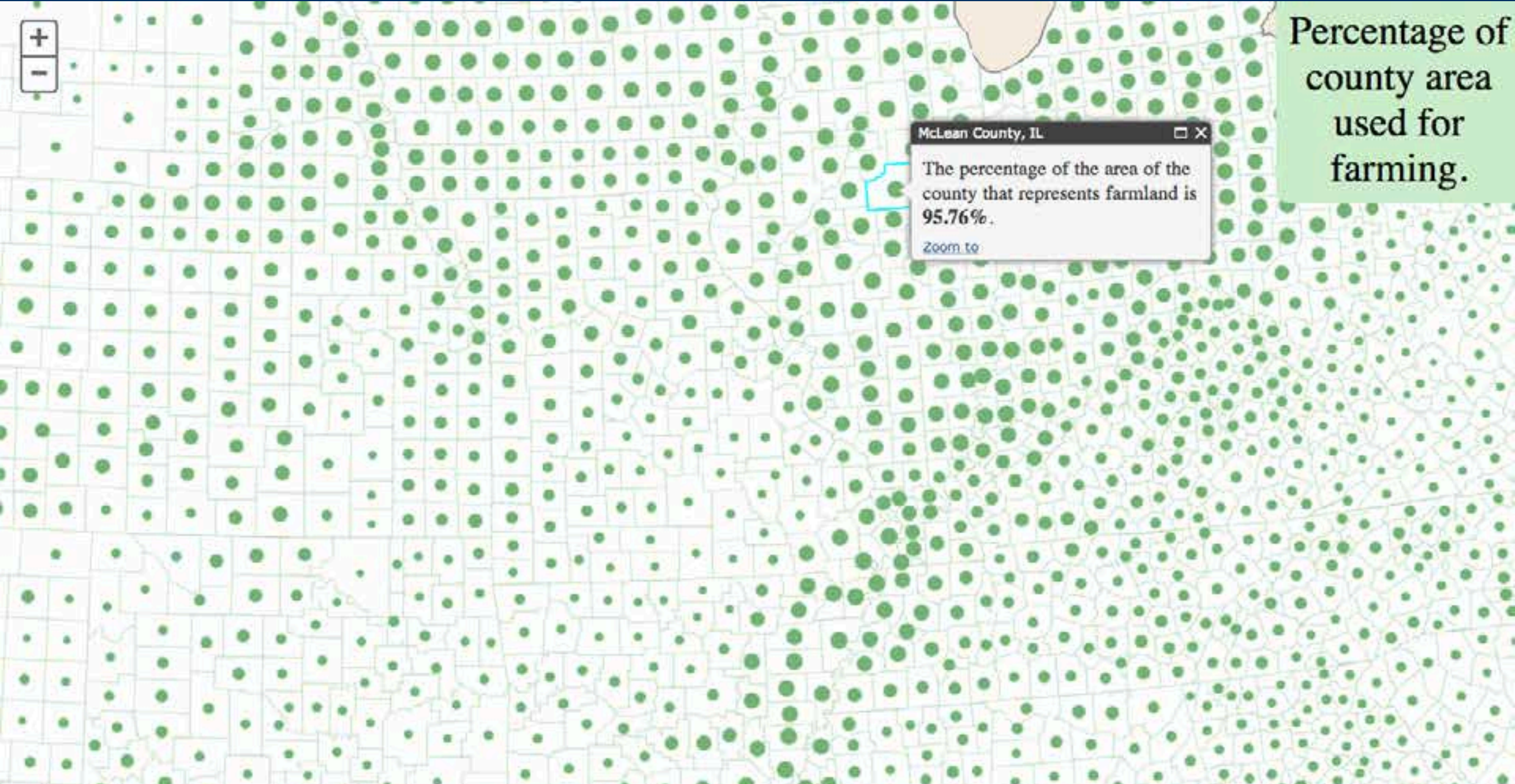

```
var proportionalSymbolInfo = {  
  field:"AADT",  
  minSize:1,  
  maxSize:10,  
  minDataValue:1000,  
  maxDataValue:100000  
};
```

```
featureLayer.renderer.setProportionalSymbolInfo(proportionalSymbolInfo);
```



Scale proportionally by size

Re-thinking How to Style Your Maps



Percentage of county area used for farming.

McLean County, IL

The percentage of the area of the county that represents farmland is 95.76%.

Zoom to

Continuous Size – Center of Polygon

Reimagining How You Style Your Maps

Department of Agriculture (USDA) National Agricultural Statistics Service (NASS)

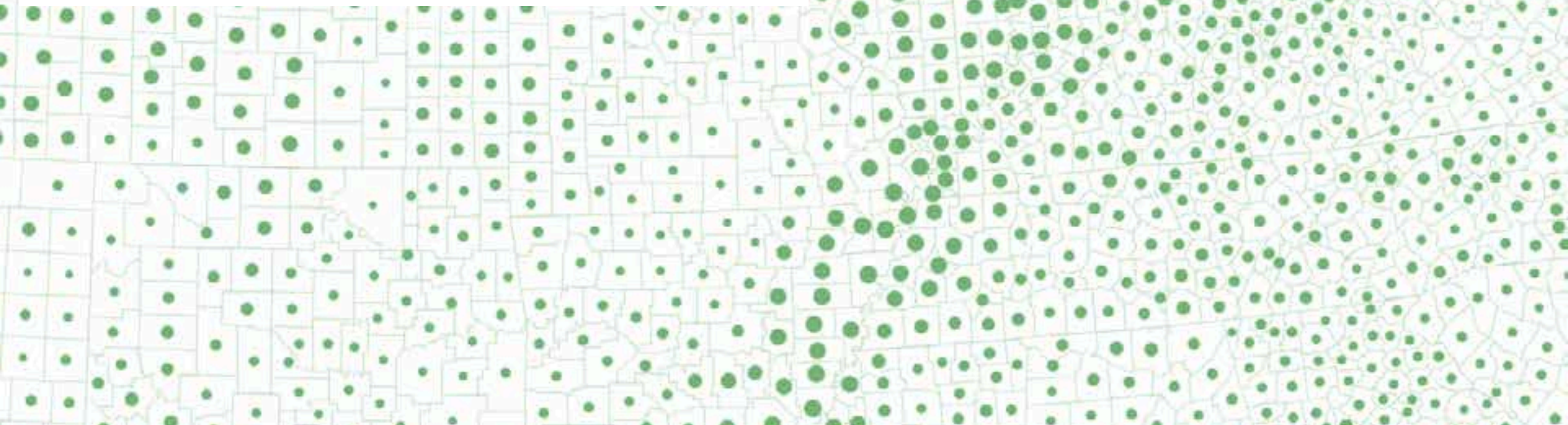


```
var renderer = new SimpleRenderer(markerSym);
var proportionalSymbolInfo = {
  field:"M086_07",
  minSize:1,
  maxSize:10,
  minDataValue:0,
  maxDataValue:100,
  valueUnit: "unknown",
  legendOptions: { customValues: [1, 25, 50, 75, 100] }
};

renderer.setProportionalSymbolInfo(proportionalSymbolInfo);

var fillSym = new SimpleFillSymbol().setColor(null);
fillSym.setColor(new Color("#FFFFFF"));
fillSym.setOutline(fillSym.outline.setColor(new Color([133,197,133,.25])));

renderer.backgroundFillSymbol = fillSym;
featureLayer.setRenderer(renderer);
```



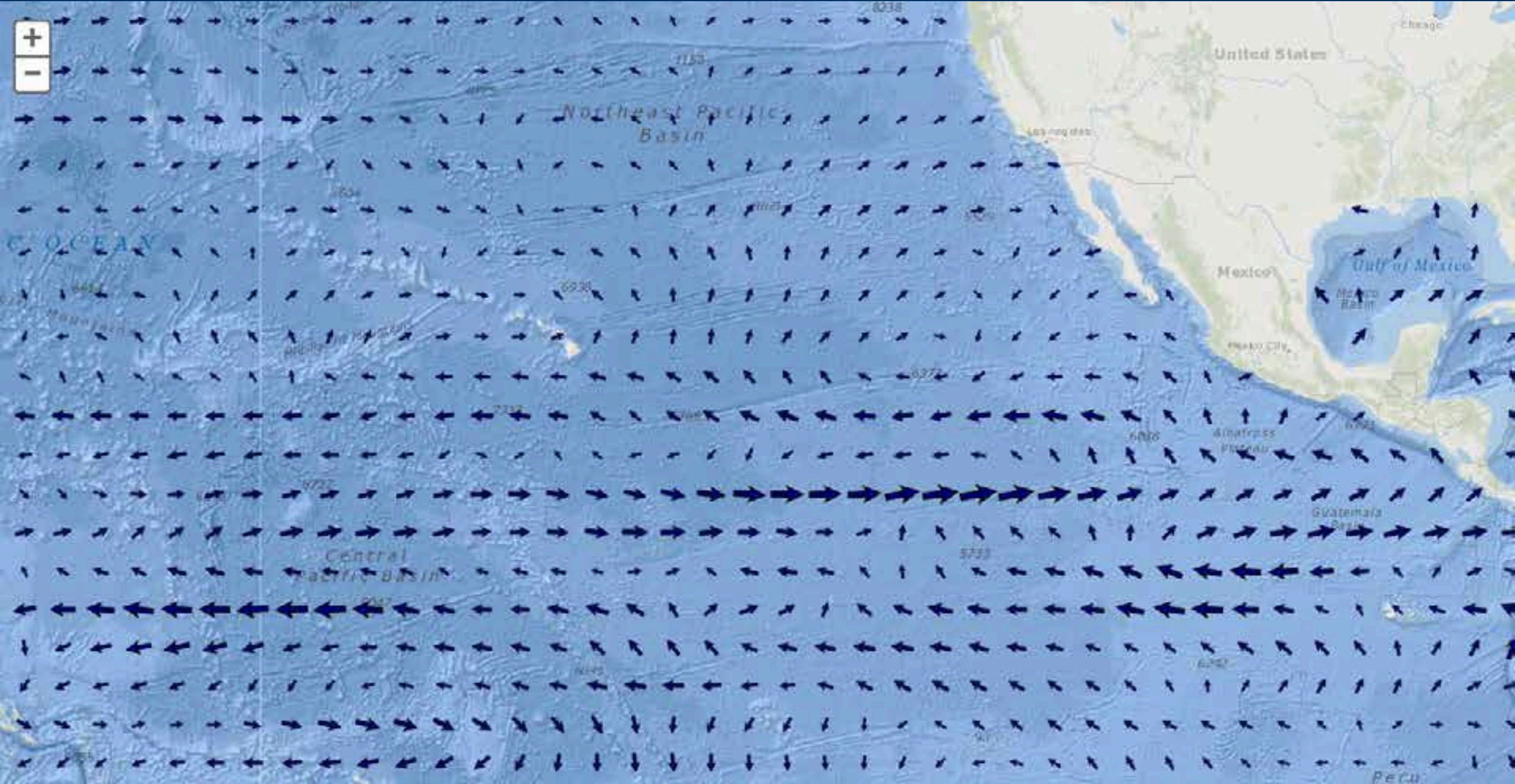
Percentage of
county area
used for
farming.

McLean County, IL

The percentage of the area of the
county that represents farmland is
95.76%.

Zoom to

Continuous Size – Center of Polygon



Scale proportionally by size + Rotation

Rethinking How You Style Your Maps

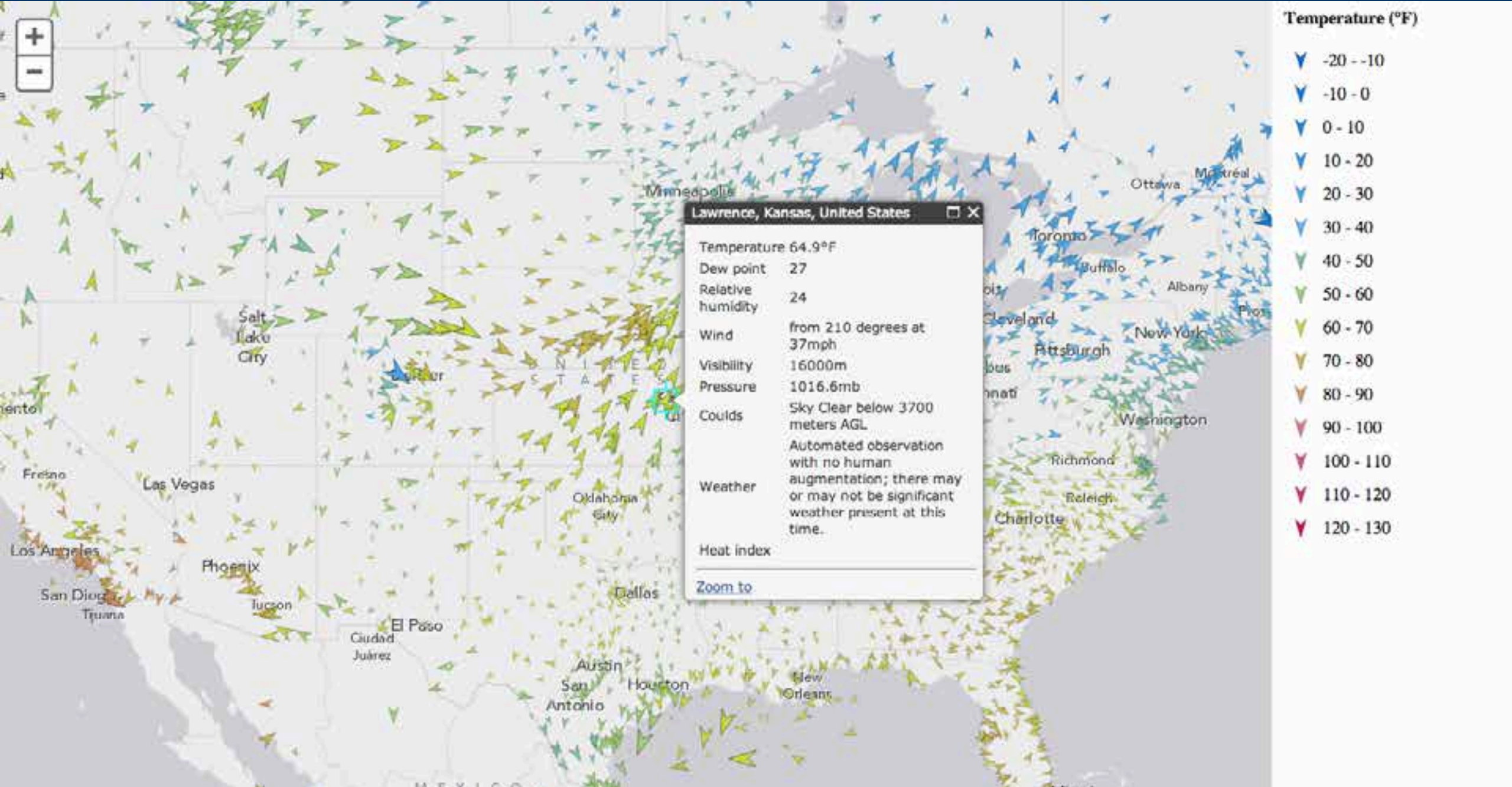
POWERED BY esri
GEBCO, IHO-IOC, GEBCO, NGS, DeLorme

```
var marker = new SimpleMarkerSymbol().setPath("M0,-15 7.5,0 2.5,-2.5 2.5,15 -2.5,15  
-2.5,-2.5 -7.5,0z").setColor(new Color([0, 0, 127]));  
  
var renderer = new SimpleRenderer(marker);  
  
renderer.setProportionalSymbolInfo({  
  field: "velocity",  
  minSize: 10,  
  maxSize: 50,  
  minDataValue: 0.01,  
  maxDataValue: 0.75  
});  
  
renderer.setRotationInfo({  
  field: "direction",  
  type: "arithmetic"  
});  
  
featureLayer.setRenderer(renderer);
```



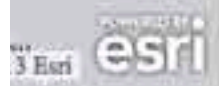
Scale proportionally by size + Rotation

Rethinking How You Style Your Maps



Scale proportionally by size + Rotation + Color

Rethinking How You Style Your Maps

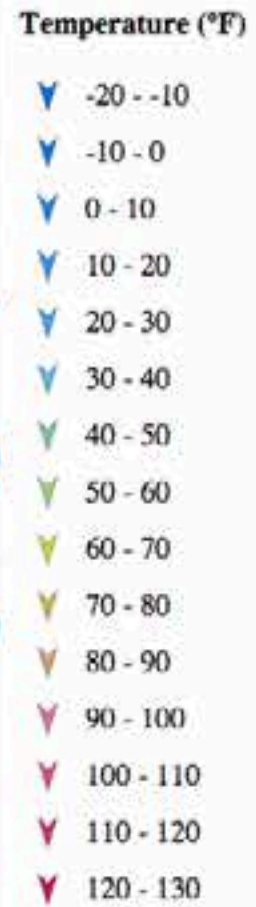


```
var markerJson = new SimpleMarkerSymbol().setPath("M14.5,29 23.5,0 14.5,9 5.5,0z").setOutline(new SimpleLineSymbol().setWidth(0.5)).toJson();
var renderer = new ClassBreaksRenderer(null, "TEMP");
renderer.addBreak(-20, -10, new SimpleMarkerSymbol(markerJson).setColor(new Color([0,104,214])));
renderer.addBreak(-10, 0, new SimpleMarkerSymbol(markerJson).setColor(new Color([20,120,220])));
...
renderer.addBreak(110, 120, new SimpleMarkerSymbol(markerJson).setColor(new Color([211,53,106])));
renderer.addBreak(120, 130, new SimpleMarkerSymbol(markerJson).setColor(new Color([206,19,97])));

renderer.setRotationInfo({
  field: "WIND_DIRECT",
  type: "geographic"
});

renderer.setProportionalSymbolInfo({
  field: "WIND_SPEED",
  minSize: 6,
  maxSize: 25,
  minDataValue: 5,
  maxDataValue: 50
});

layer.setRenderer(renderer);
```

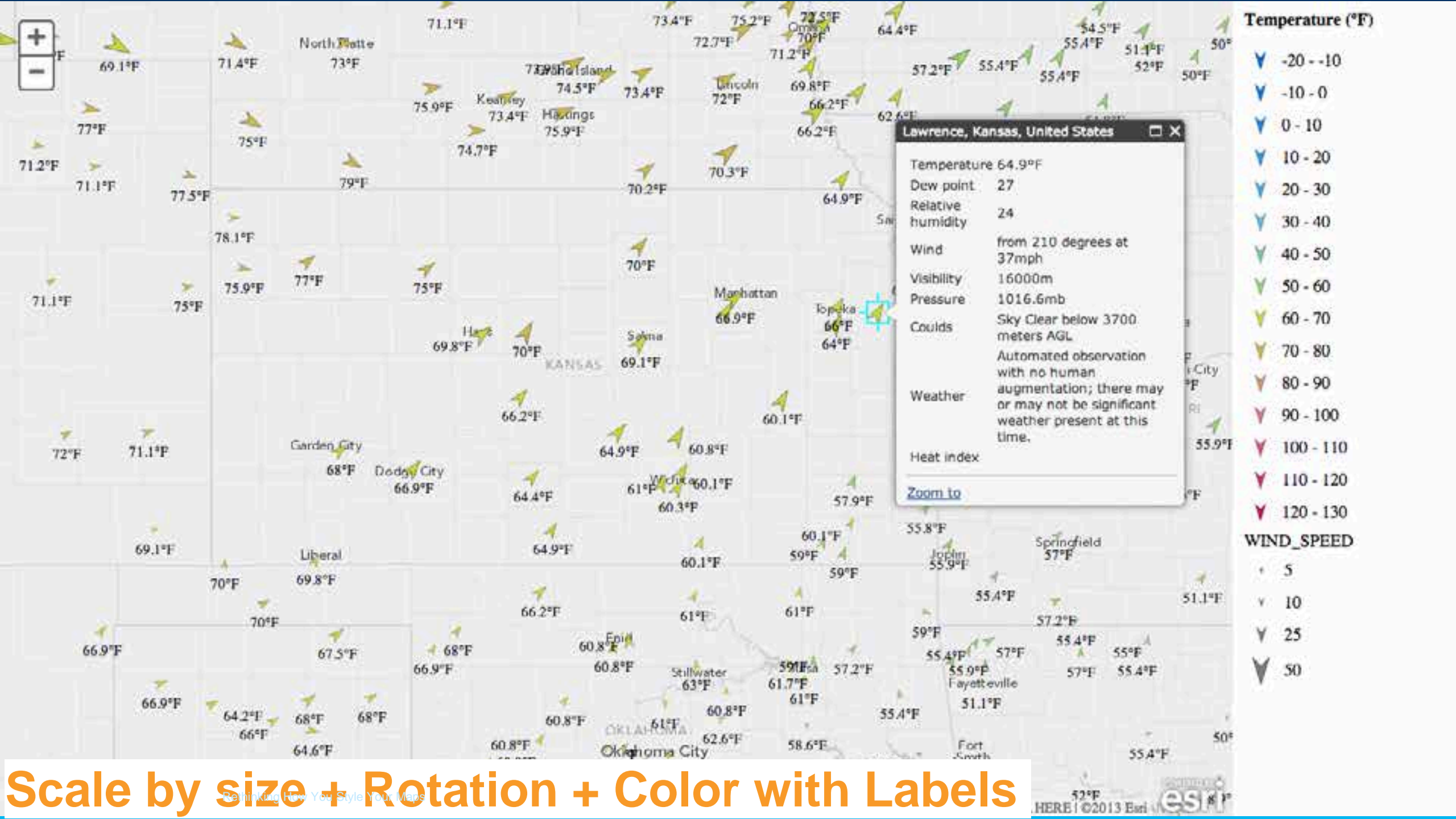


Lawrence, Kansas, United States

| | |
|-------------------|---|
| Temperature | 64.9°F |
| Dew point | 27 |
| Relative humidity | 24 |
| Wind | from 210 degrees at 37mph |
| Visibility | 16000m |
| Pressure | 1016.6mb |
| Clouds | Sky Clear below 3700 meters AGL |
| Weather | Automated observation with no human augmentation; there may or may not be significant weather present at this time. |
| Heat index | |

Zoom to

Scale proportionally by size + Rotation + Color



Scale by size + Rotation + Color with Labels

Re-thinking How You Style Your Maps


```
var font = new Font().setFamily("Segoe UI");
var textSymbol = new TextSymbol().setFont(font).setOffset(0,-12);
var labelLayer = new LabelLayer();
labelLayer.addFeatureLayer(layer, new SimpleRenderer(textSymbol), "${TEMP}°F",{
  pointPriorities: 'BelowCenter'
});
```

```
map.addLayer(labelLayer);
```



Lawrence, Kansas, United States

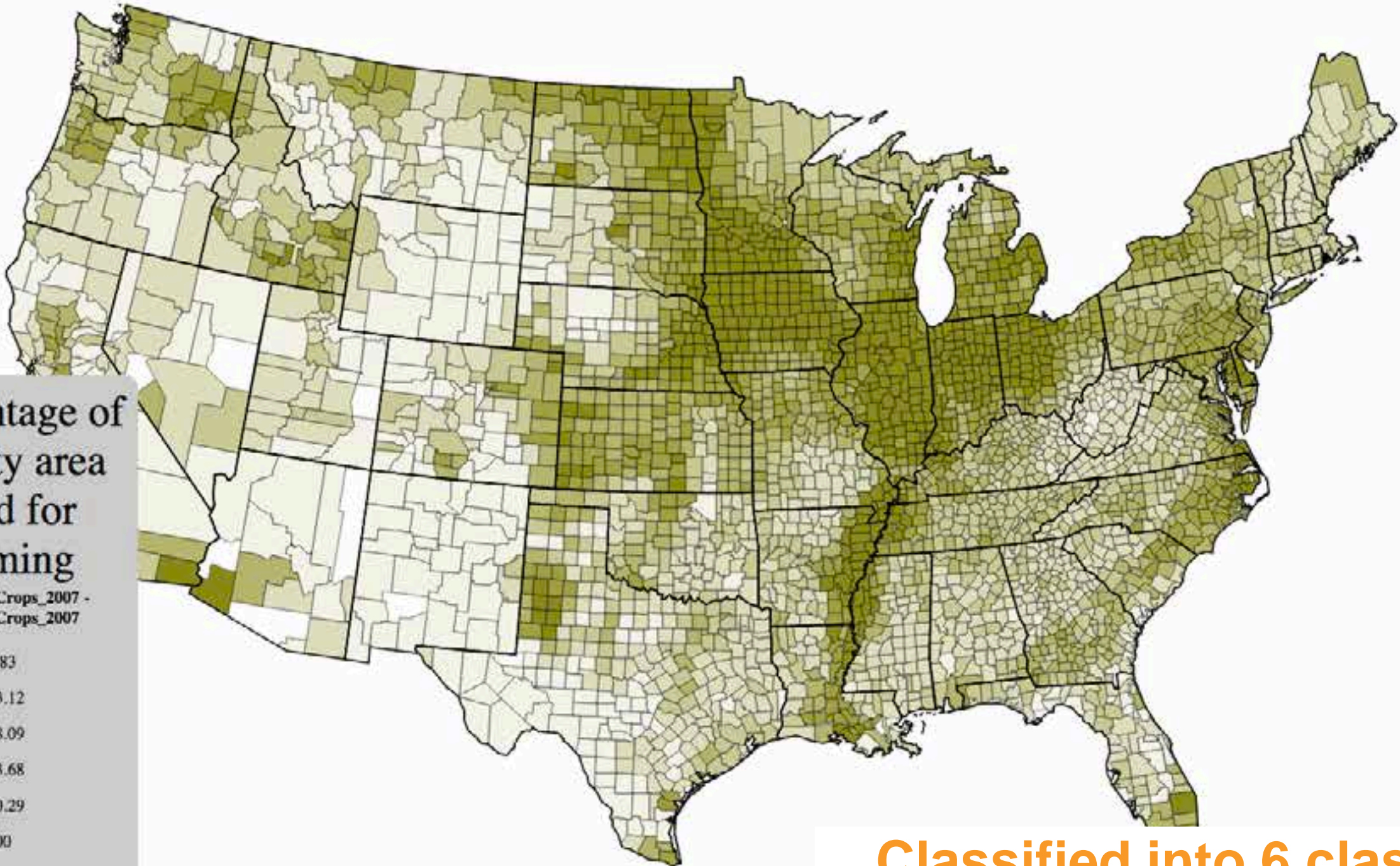
Temperature 64.9°F
 Dew point 27
 Relative humidity 24
 Wind from 210 degrees at 37mph
 Visibility 16000m
 Pressure 1016.6mb
 Clouds Sky Clear below 3700 meters AGL
 Weather Automated observation with no human augmentation; there may or may not be significant weather present at this time.
 Heat index

[Zoom to](#)

- Temperature (°F)**
- ▼ -20 - -10
 - ▼ -10 - 0
 - ▼ 0 - 10
 - ▼ 10 - 20
 - ▼ 20 - 30
 - ▼ 30 - 40
 - ▼ 40 - 50
 - ▼ 50 - 60
 - ▼ 60 - 70
 - ▼ 70 - 80
 - ▼ 80 - 90
 - ▼ 90 - 100
 - ▼ 100 - 110
 - ▼ 110 - 120
 - ▼ 120 - 130
- WIND_SPEED**
- ▼ 5
 - ▼ 10
 - ▼ 25
 - ▼ 50

Scale by size + Rotation + Color with Labels

Re-thinking How You Style Your Maps

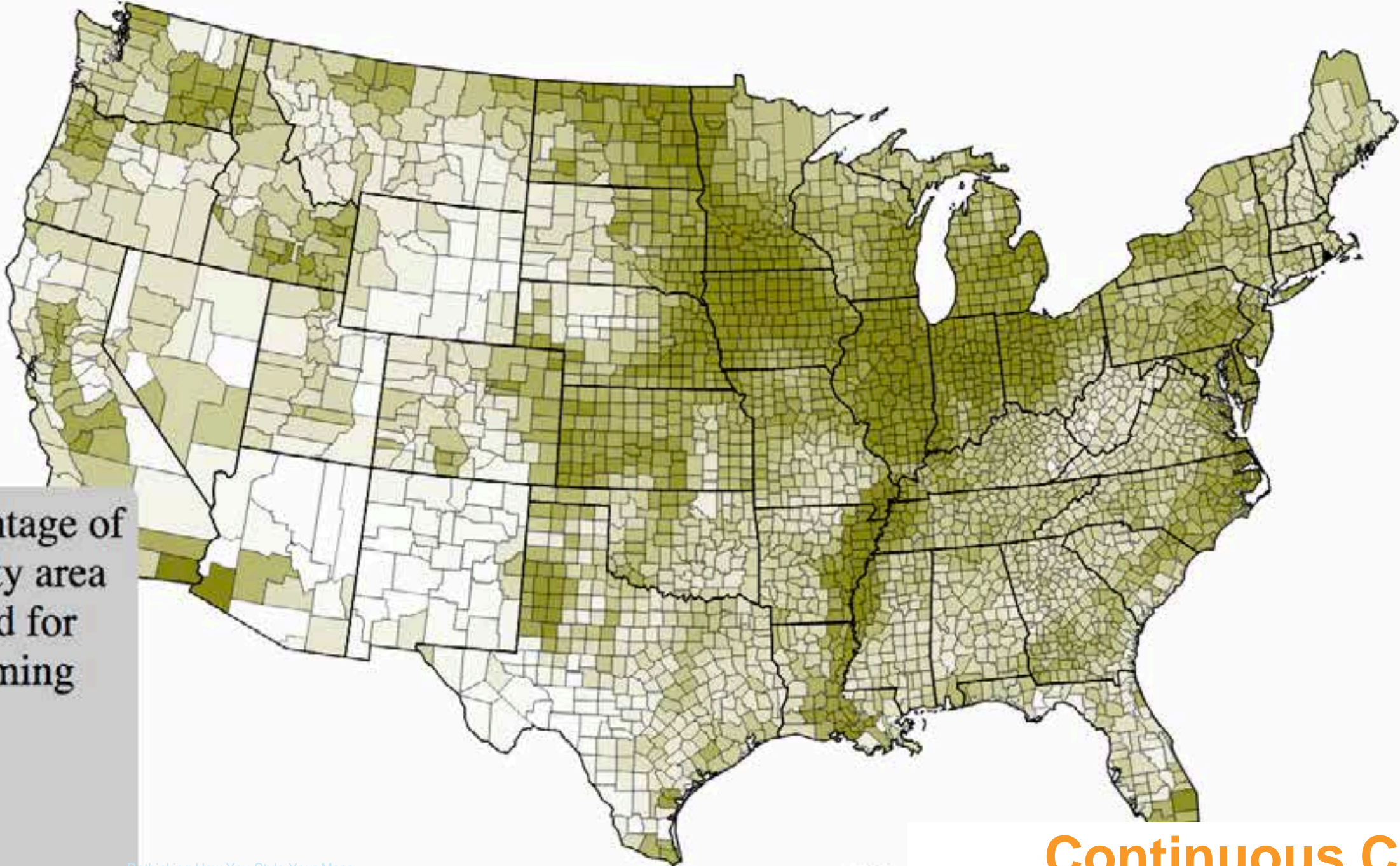


Percentage of county area used for farming

USA_County_Crops_2007 - USA_County_Crops_2007

- 0.04 - 16.83
- 16.83 - 33.12
- 33.12 - 48.09
- 48.09 - 63.68
- 63.68 - 80.29
- 80.29 - 100

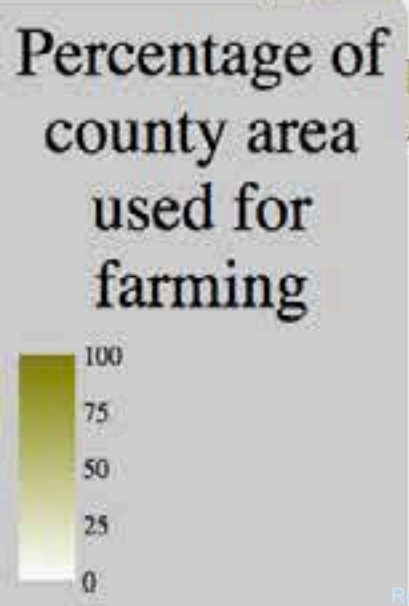
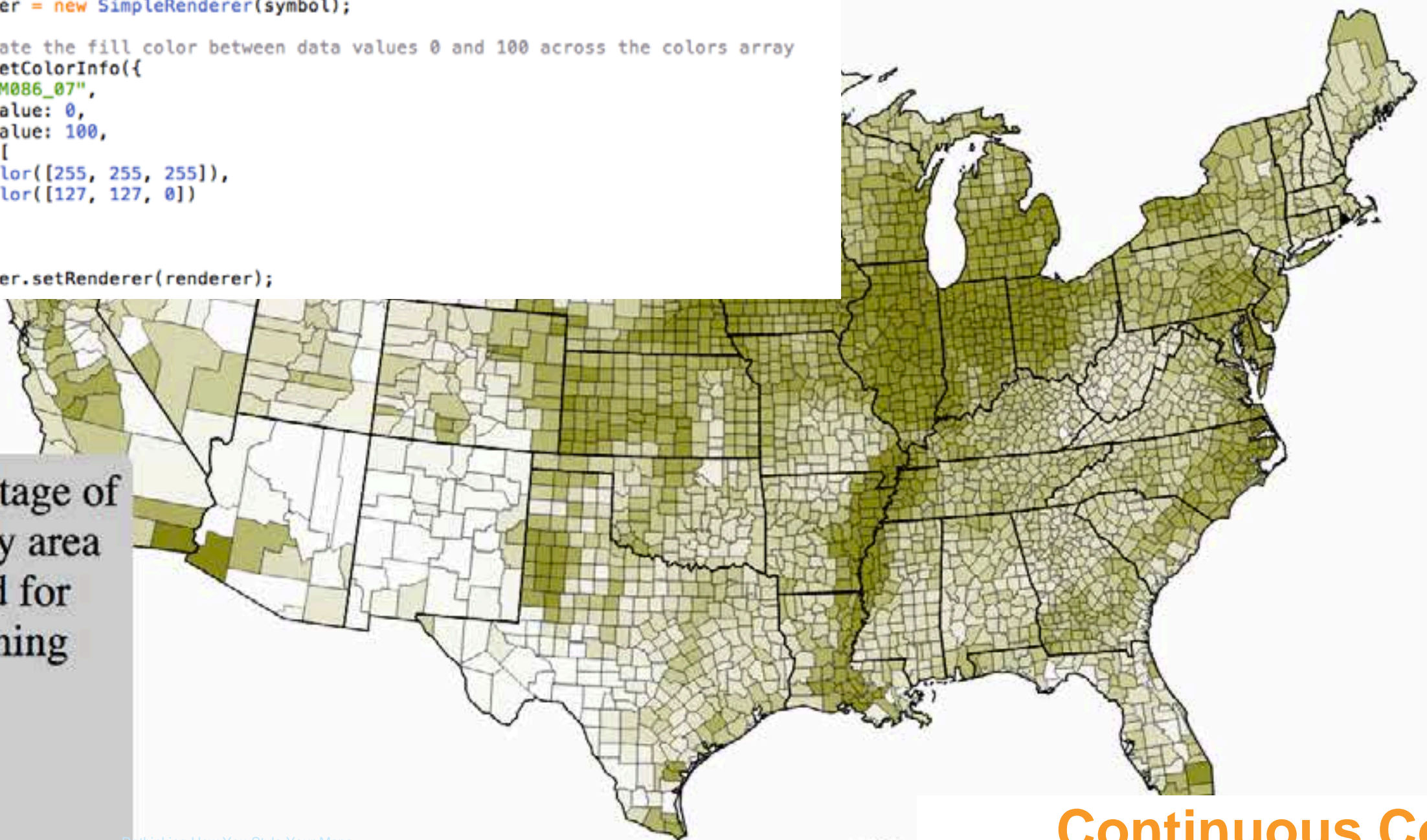
Classified into 6 classes



Percentage of
county area
used for
farming



```
var symbol = new SimpleFillSymbol().setOutline(new SimpleLineSymbol().setWidth(0.5));  
var renderer = new SimpleRenderer(symbol);  
  
//interpolate the fill color between data values 0 and 100 across the colors array  
renderer.setColorInfo({  
  field: "M086_07",  
  minDataValue: 0,  
  maxDataValue: 100,  
  colors: [  
    new Color([255, 255, 255]),  
    new Color([127, 127, 0])  
  ]  
});  
  
featureLayer.setRenderer(renderer);
```

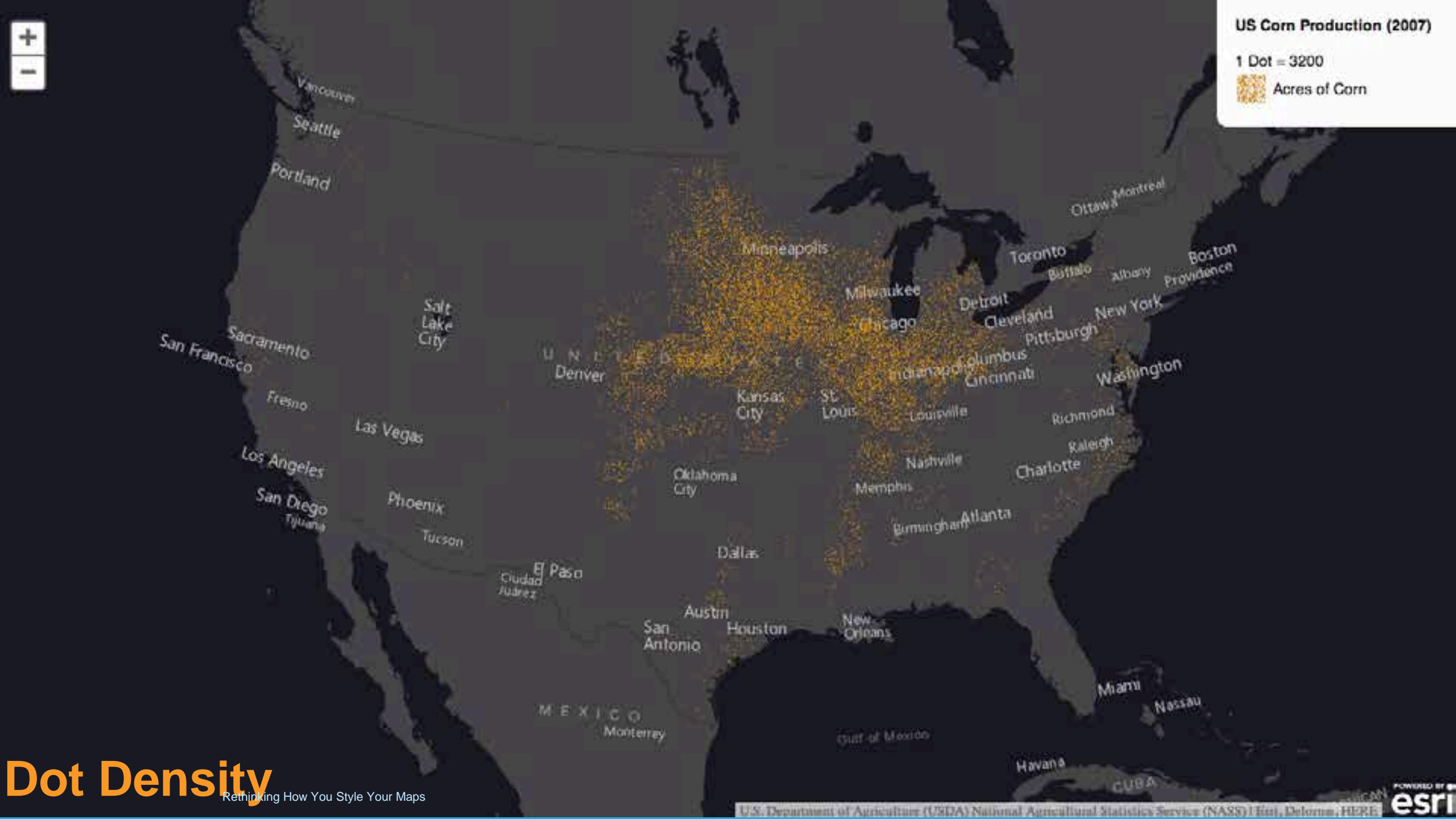


Continuous Color

US Corn Production (2007)

1 Dot = 3200

Acres of Corn



Dot Density

Rethinking How You Style Your Maps

```
var renderer = new DotDensityRenderer({
  fields: [{
    name: "M163_07",
    color: new Color("#CC8800")
  }],
  dotValue: 1600,
  dotSize: 1
});
layer.setRenderer(renderer);
```

US Corn Production (2007)

1 Dot = 1600

 Acres of Corn

Dot Density

Rethinking How You Style Your Maps

Style for value

Jim Herries

Counts and rates are valuable attributes to have

Layer Properties

General Source Selection Display Symbology Fields Definition Query Labels Joins & Relates Time HTML Popup

Show:

Features

Categories

Quantities

- Graduated colors
- Graduated symbols
- Proportional symbols
- Dot density

Charts

Multiple Attributes

Draw quantities using color to show values. Import...

Fields Value: Ind:Watch on TV: bskball (I...)

Classification Manual Classify...

Normalization: none

Color Ramp:

| Symbol | Range | Field |
|-------------|-------|--|
| Dark Red | 149 - | Watch on TV: bskball (college) |
| Brown | 135 - | Ind:Watch on TV: bskball (college) |
| Olive Green | 101 - | Watch on TV: bskball (NCAA toumamnt) |
| Green | 67 - | Ind:Watch on TV: bskball (NCAA toumamnt) |
| Light Green | 67 - | Watch on TV: bskball (NBA reg season) |
| Blue | 54 - | Ind:Watch on TV: bskball (NBA reg season) |
| Dark Blue | 38 - | Watch on TV: bskball (NBA playoffs/finals) |
| Dark Blue | 38 - | Ind:Watch on TV: bskball (NBA playoffs/finals) |
| Dark Blue | 38 - | Watch on TV: bskball (WNBA) |
| Dark Blue | 38 - | Ind:Watch on TV: bskball (WNBA) |
| Dark Blue | 38 - | Shape_Length |
| Dark Blue | 38 - | Shape_Area |

Show class r... Advanced

Watches NCAA Men's Basketball on TV (click map to view)



Watch basketball on TV

- Watch on TV: bskball (college)
- 100,000
- 50,000
- 25,000
- 10,000
- 5,000

```
layer.on("load", function() {  
  var renderer = new SimpleRenderer(new SimpleMarkerSymbol(  
    field: "MP33055a_B",  
    minSize: 2,  
    minDataValue: 5000,  
    maxSize: 20,  
    maxDataValue: 100000,  
    valueUnit: "unknown"  
  ));  
});
```

Rethinking How You Style Your Maps

Watches NBA on TV (click map to view)



Watch basketball on TV

- Watch on TV: bskball (NBA reg season)
- 100,000
- 50,000
- 25,000
- 10,000
- 5,000

```
layer.on("load", function() {  
  var renderer = new SimpleRenderer(new SimpleMarkerSymbol().  
    field: "MP33057a_B",  
    minSize: 2,  
    minDataValue: 5000,  
    maxSize: 20,  
    maxDataValue: 100000,  
    valueUnit: "unknown"  
  });  
  layer.setRenderer(renderer);  
  legend.startup();  
});
```

Rethinking How We Style Our Maps

Watches WNBA on TV (click map to view)

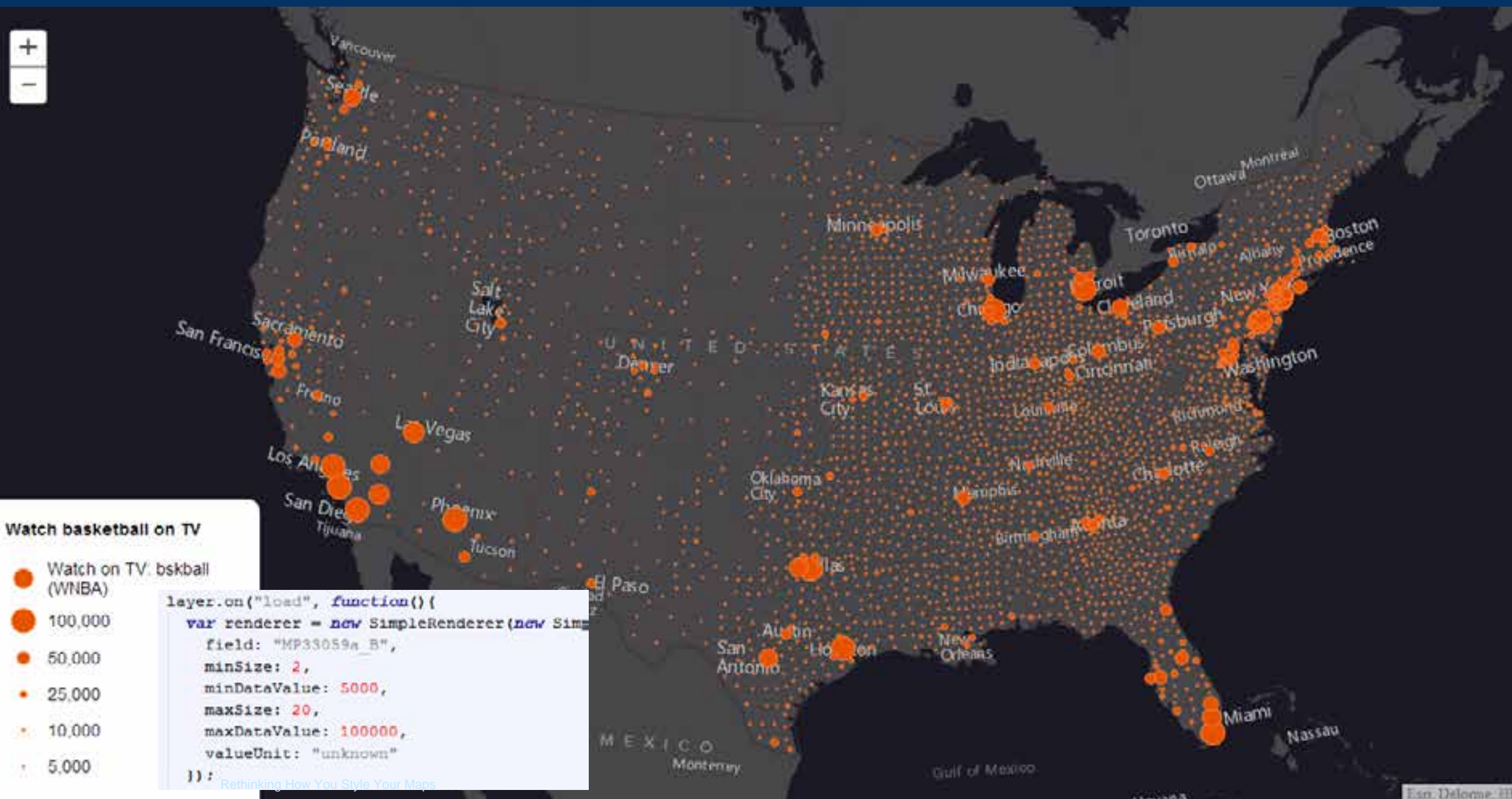


Watch basketball on TV

- Watch on TV: bskball (WNBA)
- 100,000
- 50,000
- 25,000
- 10,000
- 5,000

```
layer.on("load", function() {  
  var renderer = new SimpleRenderer(new SimpleRenderer({  
    field: "MP33059a_B",  
    minSize: 2,  
    minDataValue: 5000,  
    maxSize: 20,  
    maxDataValue: 100000,  
    valueUnit: "unknown"  
  }));  
});
```

[Rethinking How You Style Your Maps](#)



NCAA v. WNBA on TV (click map to view)

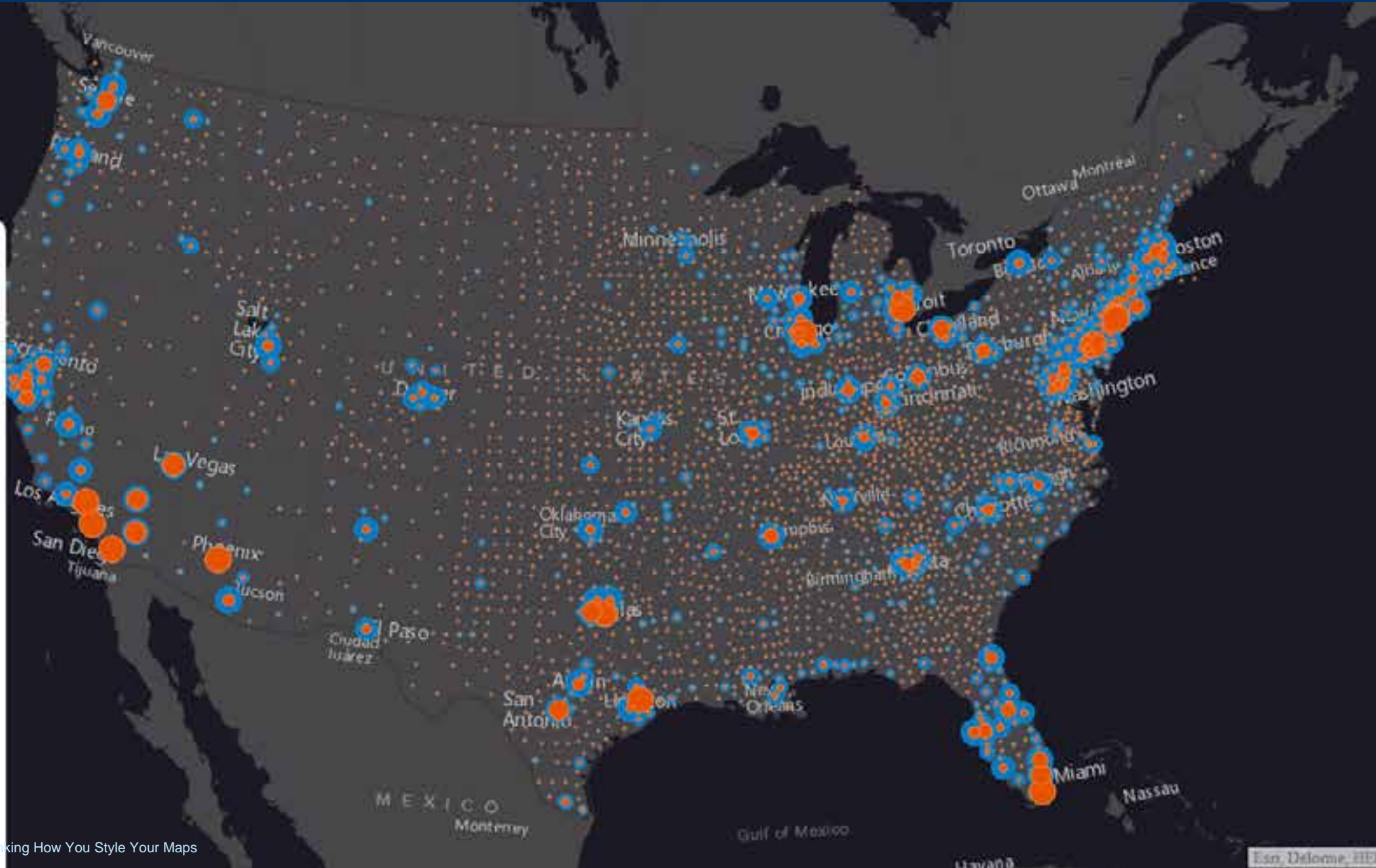


WNBA

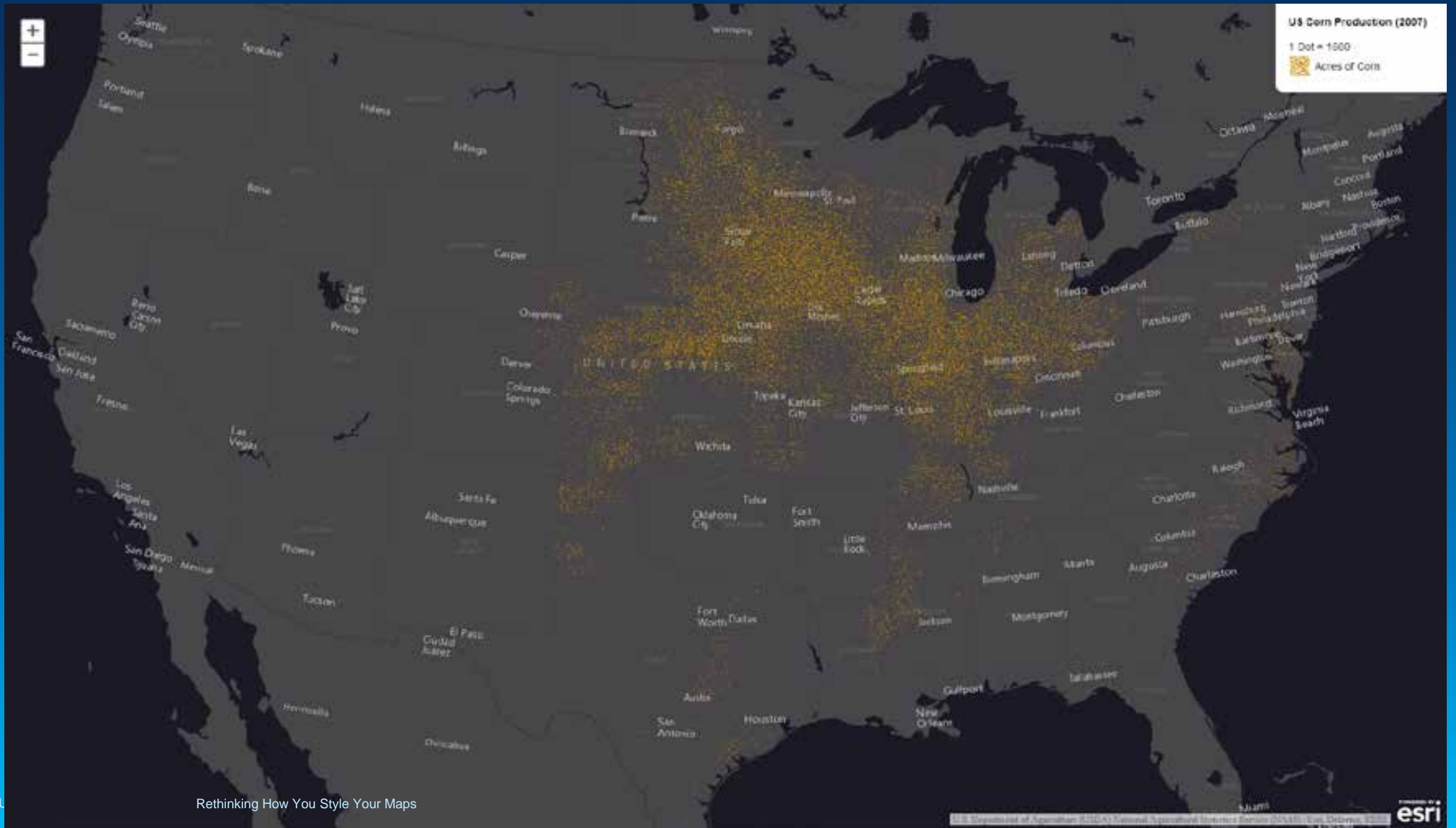
- Watch on TV: bskball (WNBA)
- 100,000
- 50,000
- 25,000
- 10,000
- 5,000

NCAA

- Watch on TV: bskball (college)
- 100,000
- 50,000
- 25,000
- 10,000
- 5,000



Corn Production (click map to view)



Watches Basketball on TV (click map to view)



UNITED STATES




Dallas, TX

College: 290,048
NBA (Regular): 392,739
WNBA: 102,764

[Zoom to](#)

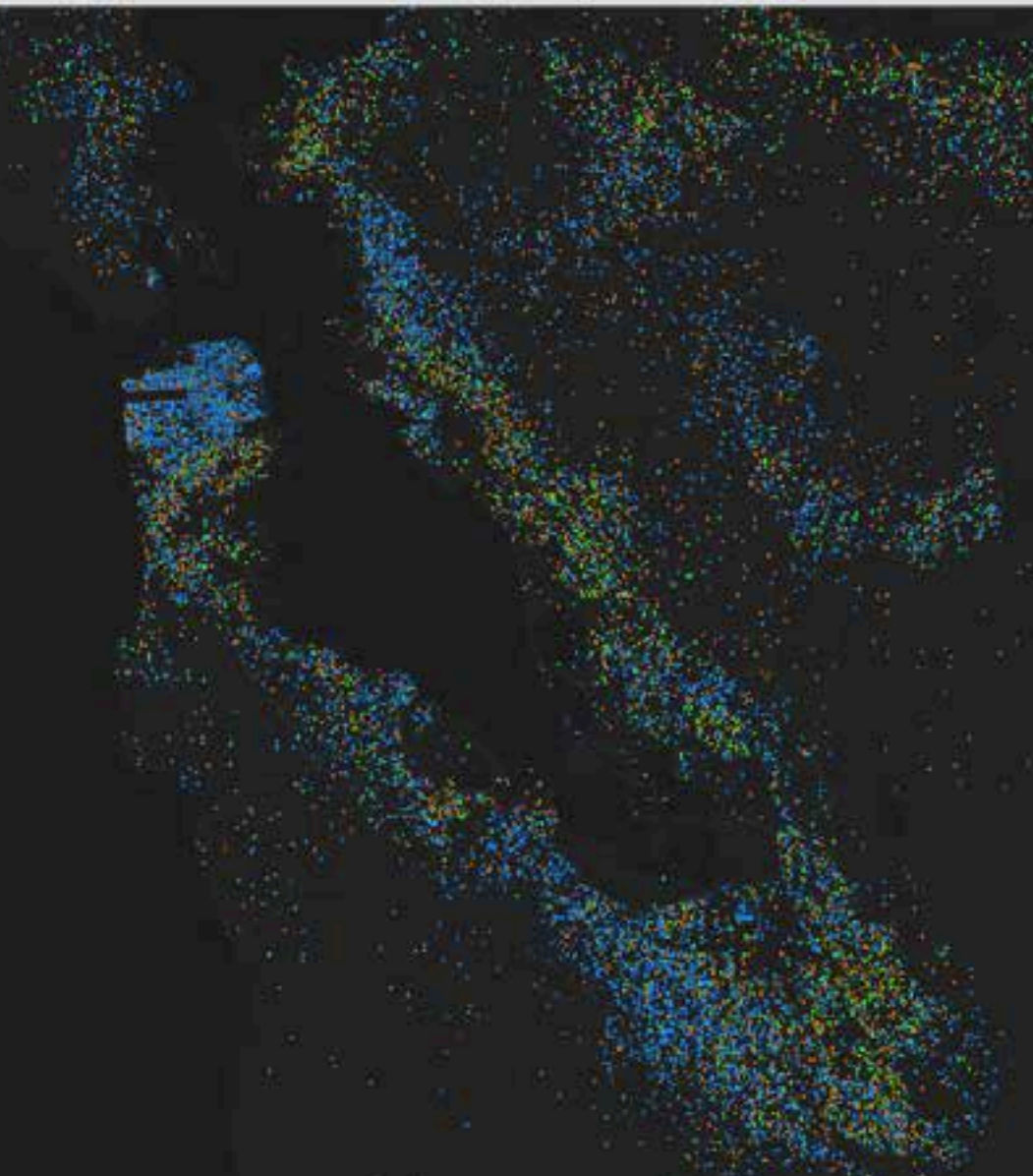
Watch basketball on TV

1 Dot = 1500

-  Watch on TV: bskball (WNBA)
-  Watch on TV: bskball (college)
-  Watch on TV: bskball (NBA reg season)

Working Classes in Bay Area (click map to view)

← → ↻ jyang/samples/better-map/renderer_dot_density_multiple_classes/ ☆ ☰



[Toggle/expand information pane]

Working Classes in Bay Area


DotDensityRenderer provides a way to display multiple attributes for polygon features. A quantitative attribute is represented by dots randomly placed within a polygon.

The symbols on this map are scale-dependent. As you zoom in, the sizes of symbols are enlarged accordingly.

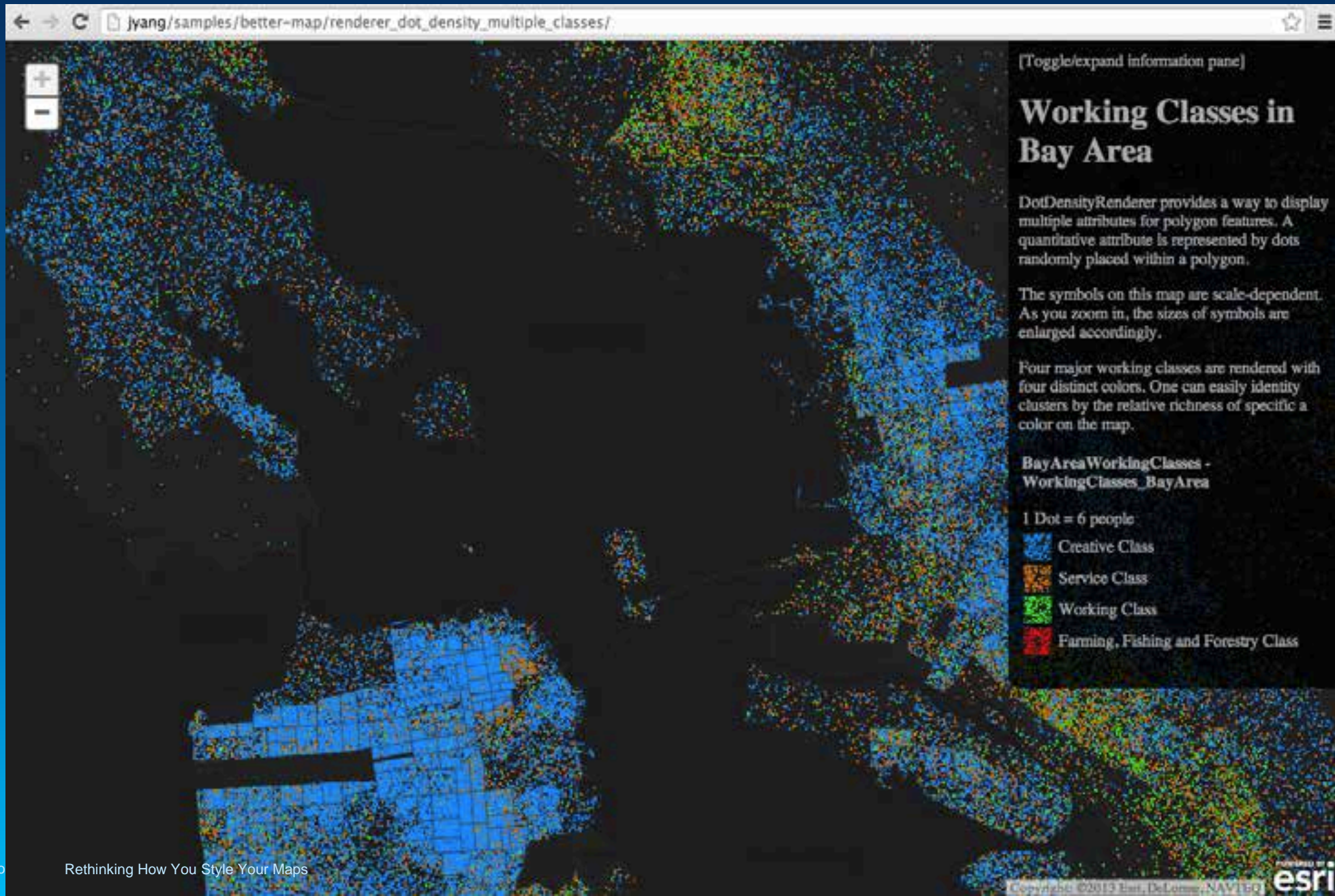
Four major working classes are rendered with four distinct colors. One can easily identify clusters by the relative richness of specific a color on the map.

BayAreaWorkingClasses - WorkingClasses_BayArea

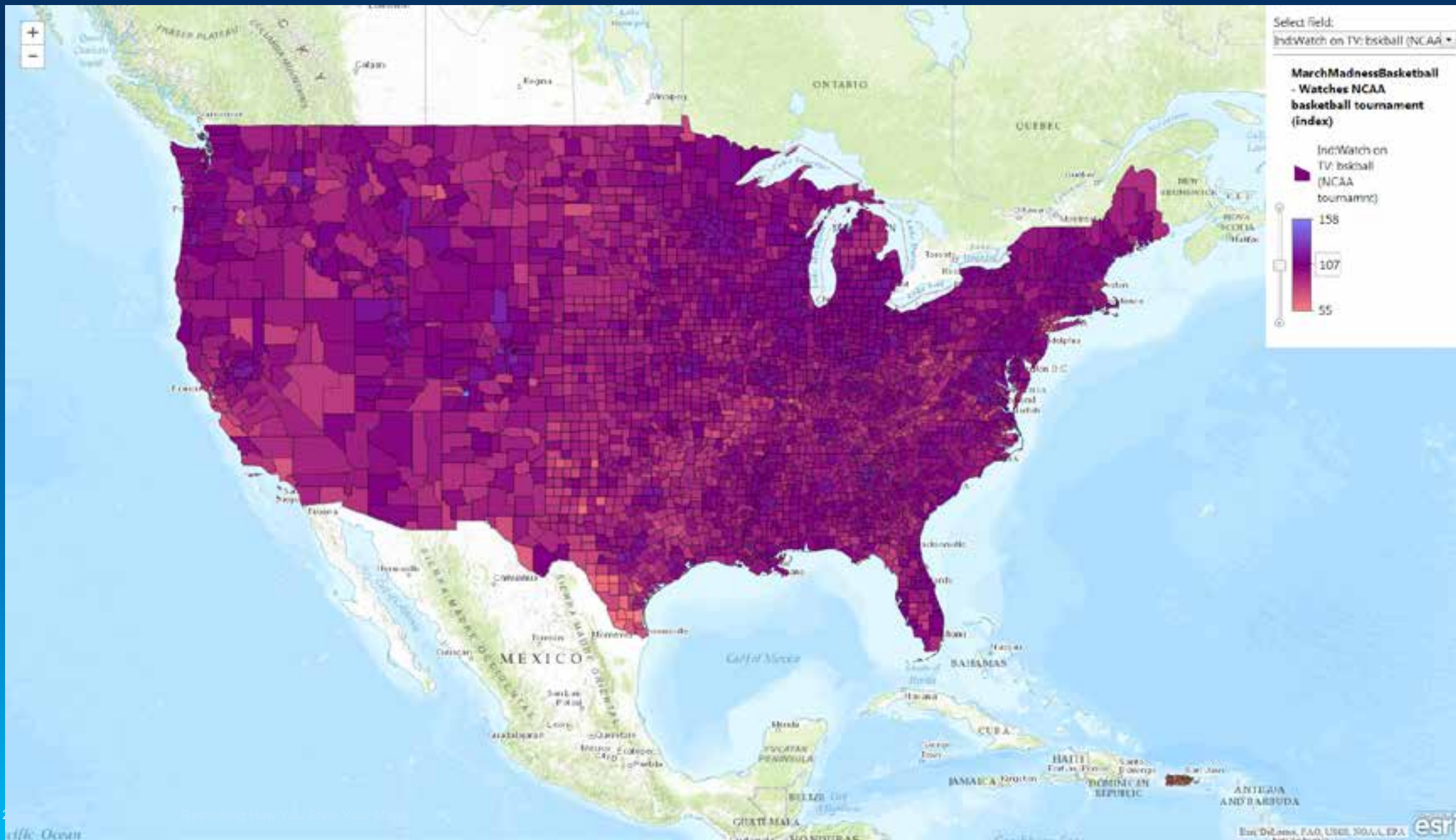
1 Dot = 100 people

-  Creative Class
-  Service Class
-  Working Class
-  Farming, Fishing and Forestry Class

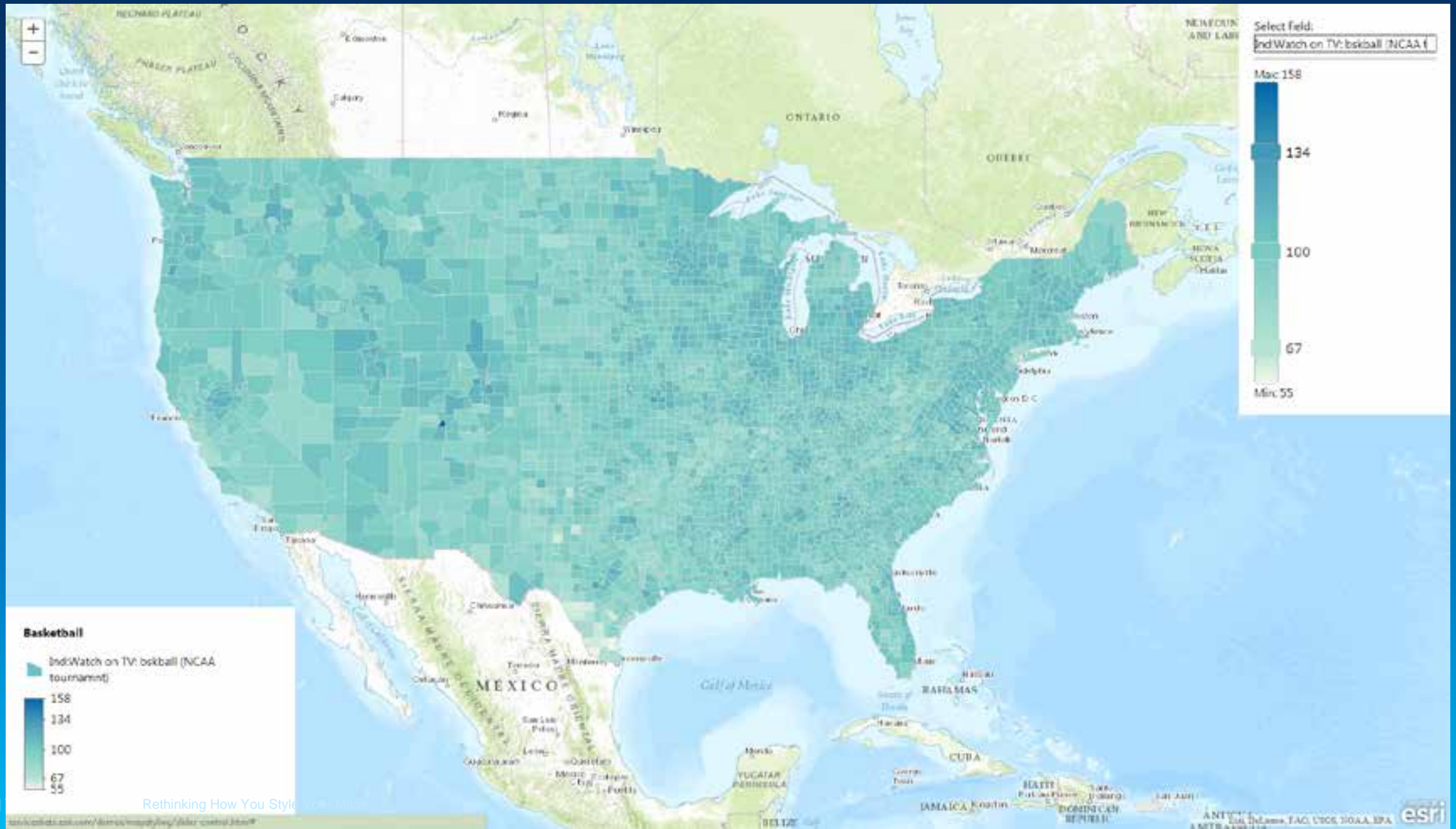
Working Classes in Bay Area (click map to view)



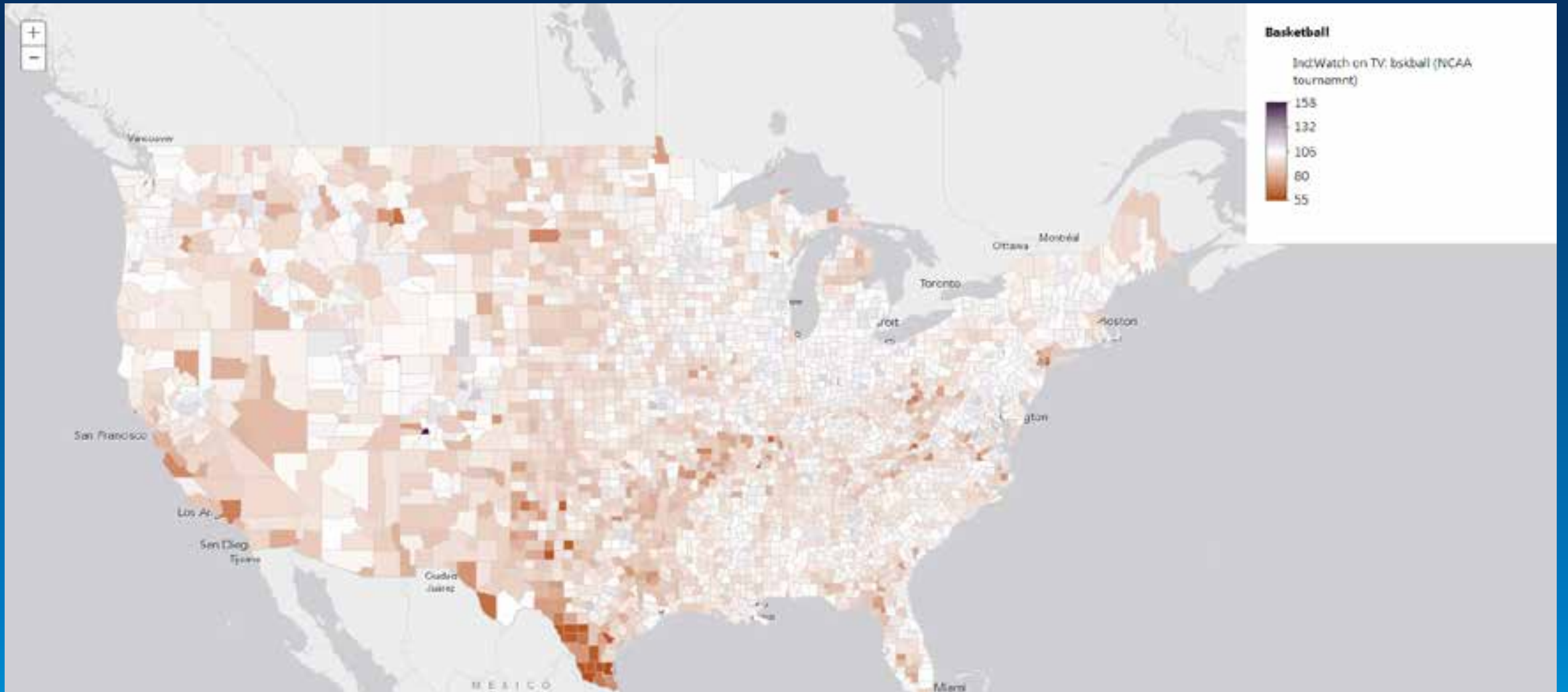
Watches NCAA Tournament on TV (click map to view)



Watches NCAA Men's Basketball on TV (click map to view)

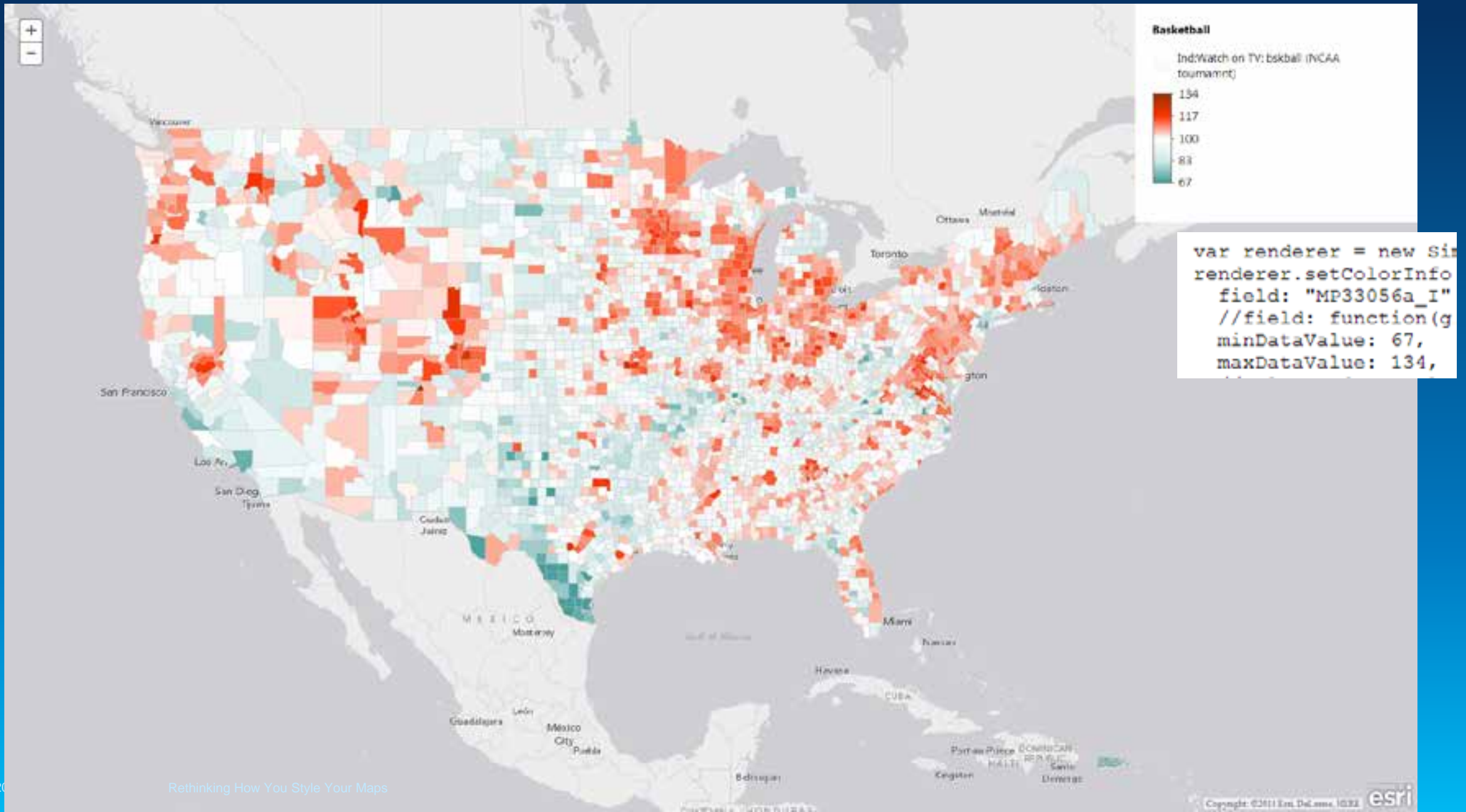


Watches NCAA Men's Basketball on TV (click map to view)

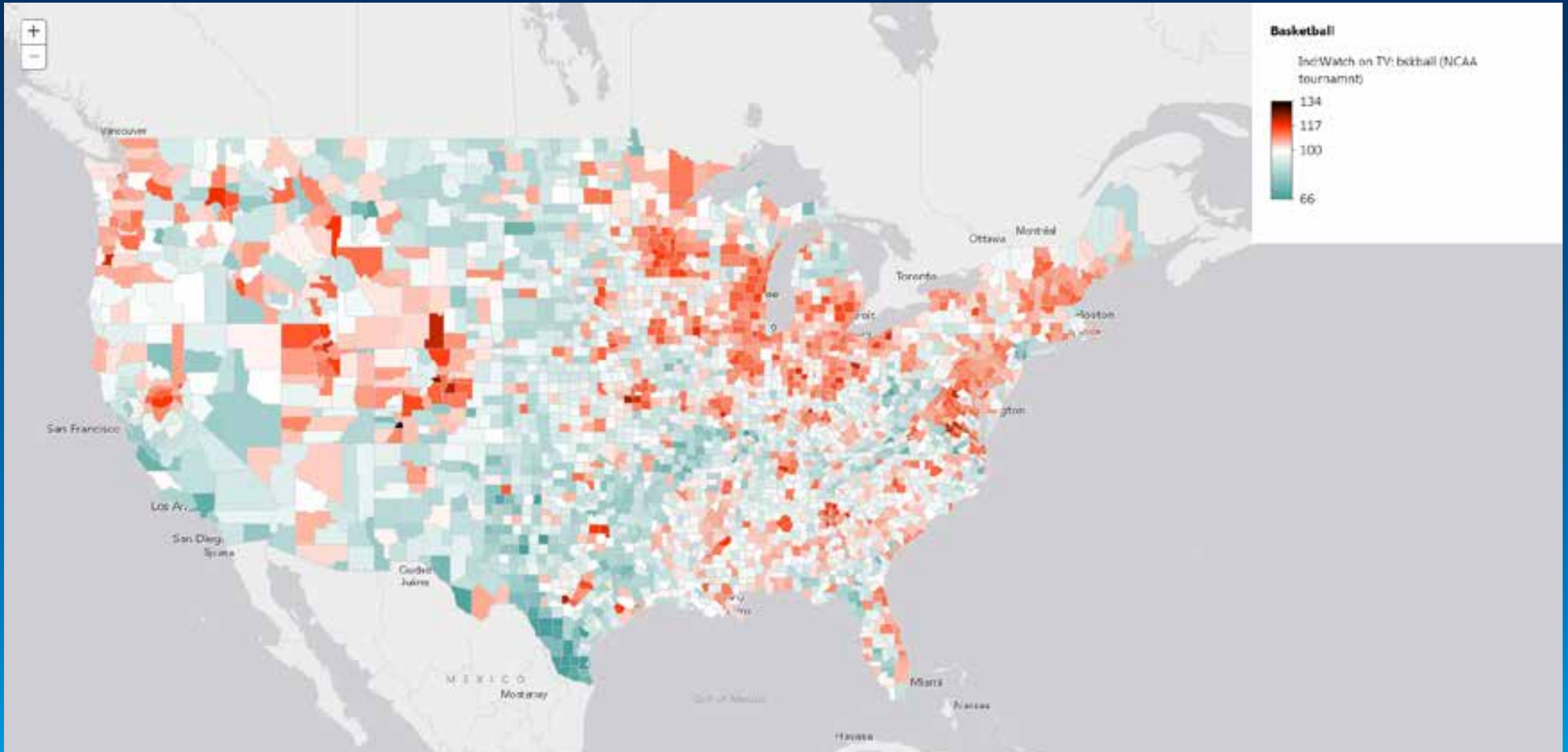


```
renderer.setColorInfo({  
  field: "MP33056a_I",  
  //field: function(graphic) { return graphic.attributes.MP33039a_I - 100 },  
  minDataValue: 55,  
  maxDataValue: 158,  
  colors: [new Color("#b74913"), new Color("#c16335"), new Color("#d69778"), new  
Color("#eacbbc"), new Color("#f5e5dd"), new Color("#ffffff"), new Color("#e4dfe4"), new  
Color("#c8bec9"), new Color("#927e93"), new Color("#5b3d5d"), new Color("#401d42")]
```

Watches NCAA Men's Basketball on TV (click map to view)

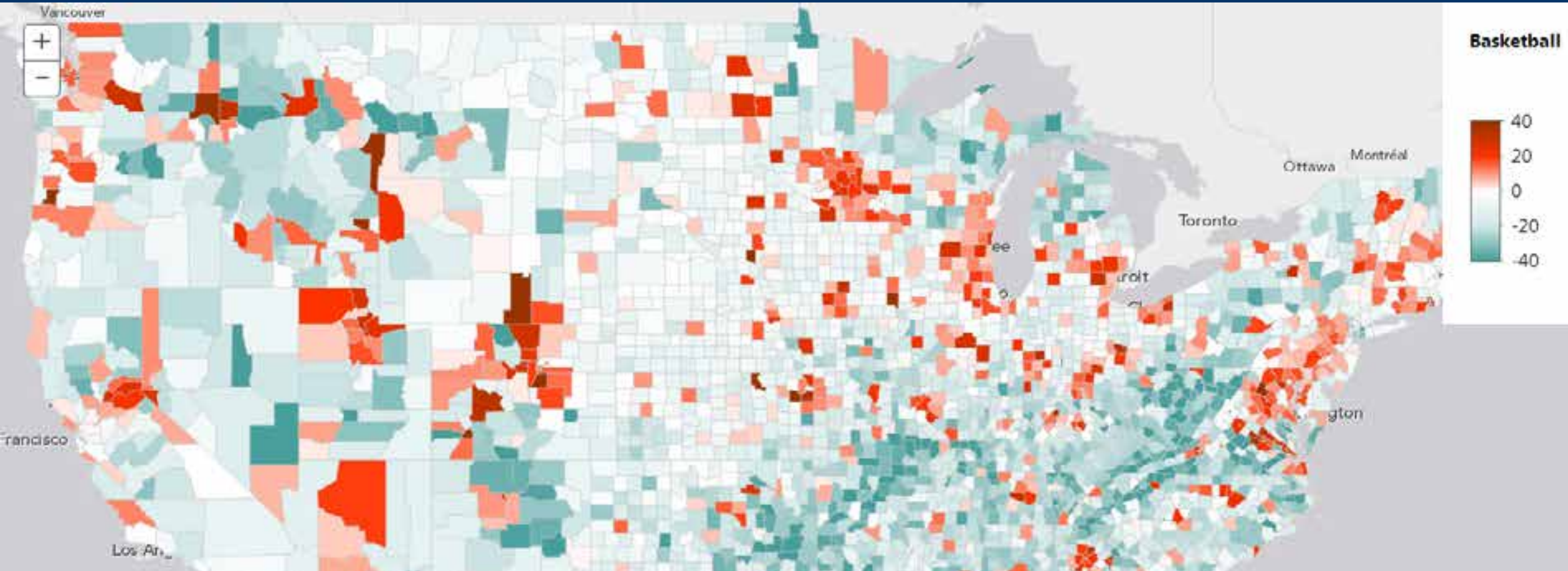


Watches NCAA Men's Basketball on TV (click map to view)



```
//These stops define a color for each specific value. The API will ramp the color from  
stop to stop, giving you fine-grain control over the ramp  
stops: [{value:66, color: new Color("#489f9c")}, {value:100, color: new Color("white")},  
{value:117, color: new Color("#ff3300")}, {value:134, color: new Color("black")}]
```

Watches NCAA Men's Basketball on TV (click map to view)



```
var renderer = new SimpleRenderer(new SimpleFillSymbol().setOutline(new SimpleLineSymbol()).setColorInfo({
  //field: "MP33039a_I",
  field: function(graphic){ return graphic.attributes.MP33039a_I - 100 },
  minDataValue: -40,
  maxDataValue: 40,
  //colors: [new Color("#b74913"), new Color("#c16335"), new Color("#d69778"), new Color("#ead1c0"), new Color("#f4919c")],
  //colors: [new Color("#423313"), new Color("#5d5035"), new Color("#938a78"), new Color("#c9c08a"), new Color("#d2e8e8")],
  stops: [(value:-40, color: new Color("#48919c")), (value:-20, color: new Color("#d2e8e8")),
```

Resources

- <http://developers.arcgis.com>
- <http://blogs.esri.com/esri/arcgis/>
- [**http://www.arcgis.com**](http://www.arcgis.com)

Thank you...

- **Please fill out the session survey:**

First Offering ID: 946 / 1357

Second Offering ID: 946 / 1244

Online – www.esri.com/ucsessionsurveys

Paper – pick up and put in drop box



Understanding our world.

Notes to presenters:

- **Please include the following slide at the end of your presentation encouraging the audience to fill out the session surveys and how to do so.**
- **These slides should be included for:**
 - **75 minute Technical Workshops**
 - **30 minute Technical Workshops**
 - **Demo theaters (paper only)**