

UC



Getting Started with ArcGIS API for JavaScript

Kelly Hutchins

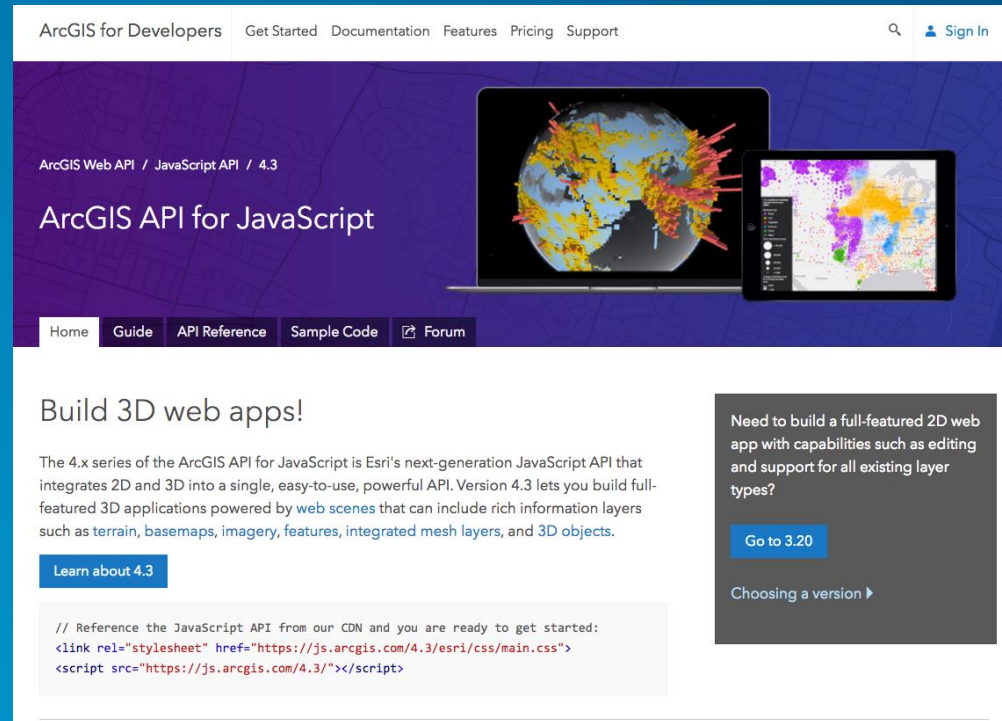
Nick Senger

Overview

- Setting up dev environment
- Debugging tips and tricks
- Tour of the SDK
- Build an app
 - Create map
 - Add layer
 - Make it interactive
 - Add widgets

- **Focusing on version 4.0 for this presentation**
- **Concepts are similar between 3.x and 4.0**
- **Version 3.x UC 2015 presentation and demos are available**
- **TODO ADD LINK TO GITHUB REPO WITH SLIDES AND DEMOS**

Where to begin?



<https://developers.arcgis.com/javascript>

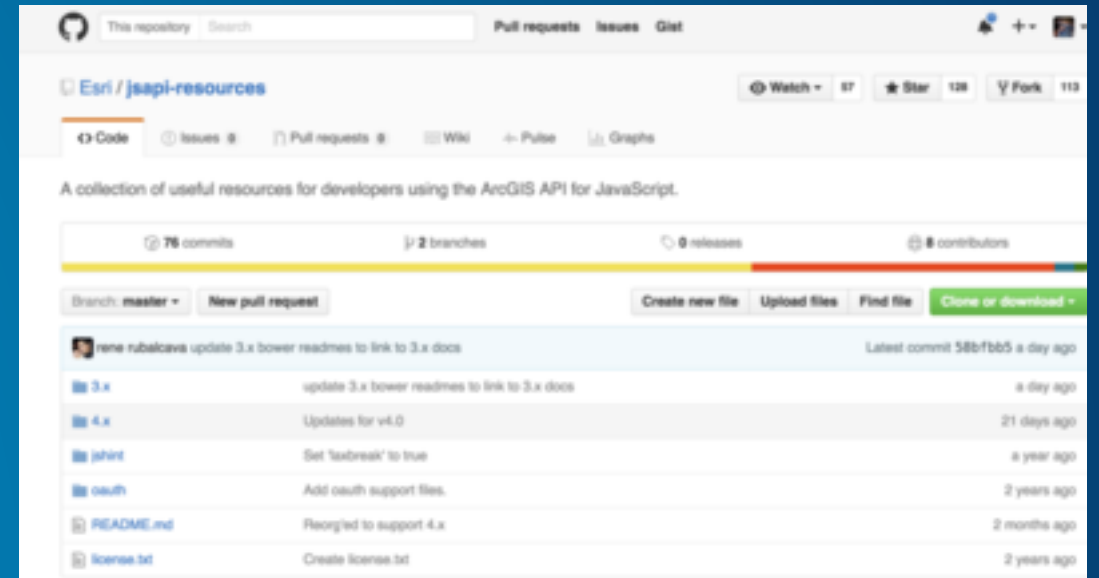
Choosing a version

Capability	3.17	4.0
3D	Not available	Released
2D	Released	Released (partial support)
Vector Tile Layer	Released	Released
Raster Tile Layer	Released	Released
Imagery Layer	Released	Released
Map Image Layer	Released	Released (dynamic layers currently not supported)
Feature Layer	Released	Released (currently supports query and visualization)
Geometry Engine	Released	Released
Web Scene	Not available	Released
Web Map	Released	Released (partial support)

<https://developers.arcgis.com/javascript/latest/guide/choose-version/index.html>

Developer Setup

- Choose an IDE
- Code assist
- Helpful tools



Get the API

- CDN
- Custom builds
- Download API

```
// Reference the JavaScript API from our CDN and you are ready to get started:  
<link rel="stylesheet" href="https://js.arcgis.com/4.3/esri/css/main.css">  
<script src="https://js.arcgis.com/4.3/"></script>
```

CSS

- Main.css
- View.css
- Custom css (SASS)

```
<link rel="stylesheet" href="https://js.arcgis.com/4.3/esri/css/main.css">
```

```
<link rel="stylesheet" href="https://js.arcgis.com/4.3/esri/css/view.css">
```


JSAPI Resources

- Collection of resources to aid development in the JSAPI
- Some of these include:
 - JSHint file
 - Helps to detect errors and potential problems in code
 - Typescript definition file
 - Provides code assist in some IDE's such as Visual Studio Code
 - Build tools, e.g. Bower for custom builds of the API
 - Callback page for popups using OAuth2 for security

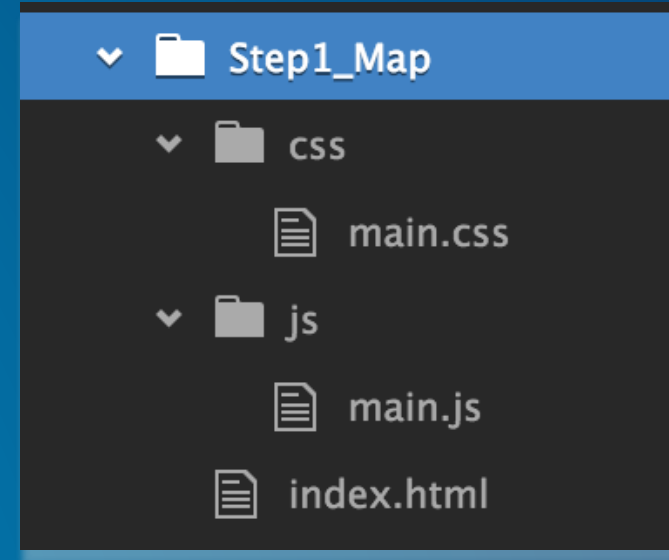
Build first app



First Steps

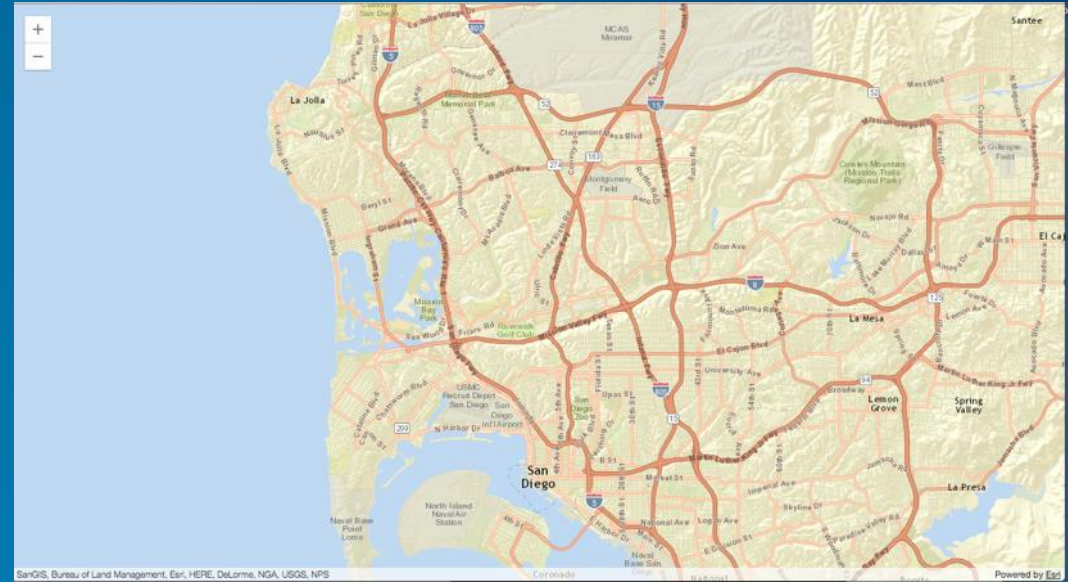
- Plan application structure
 - Demo structure
 - Separate css, html , js
 - Reference JSAPI, CSS etc.

```
<title>Step 1: Create a map</title>
<link rel="stylesheet" href="https://js.arcgis.com/4.3/esri/css/main.css">
<link rel="stylesheet" href="css/main.css">
<script src="https://js.arcgis.com/4.3/"></script>
<script src="js/main.js"></script>
```



Make a map

```
var map = new Map({  
  basemap: "streets"  
});
```



<https://developers.arcgis.com/javascript/latest/api-reference/esri-Map.html>

Debugging Tips

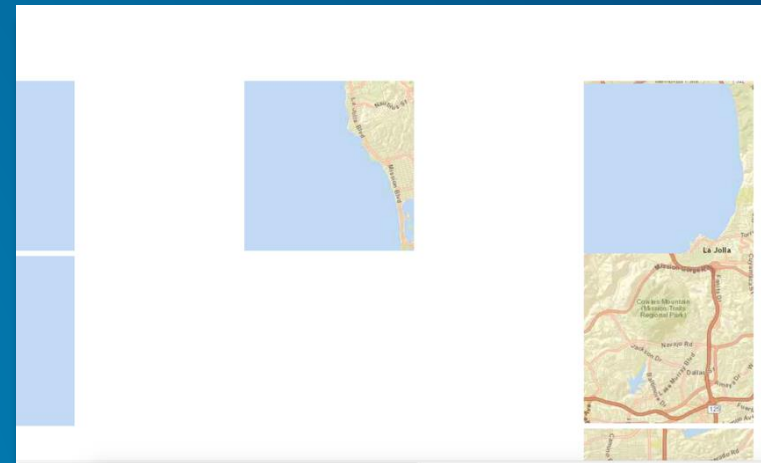
Module Order

- Order matters
- TypeScript helps

```
❶ ▶ Uncaught TypeError: Cannot read property 'move' of undefined  
    at main.js:28  
    at ca (init.js:18)  
    at init.js:18  
    at G (init.js:18)  
    at ka (init.js:18)  
    at v (init.js:20)  
    at HTMLScriptElement.<anonymous> (init.js:23)
```

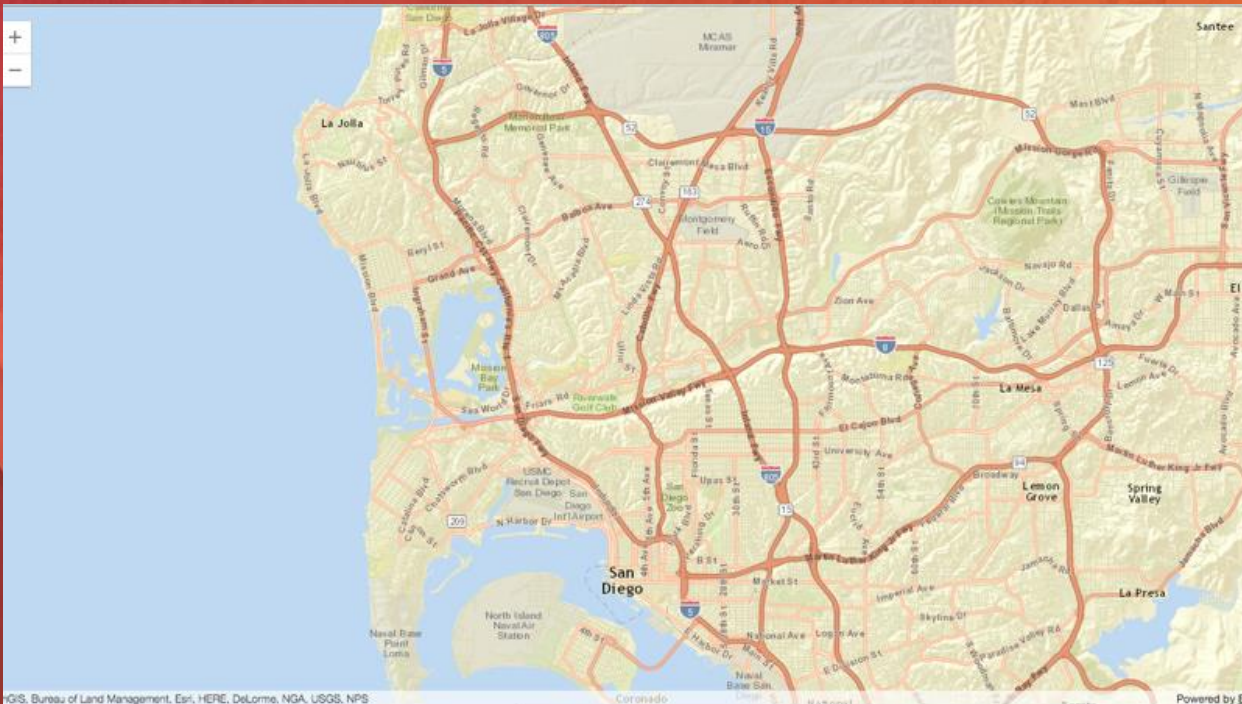
Missing CSS

- Unstyled widgets
- Scrambled tiles



Map View

```
view = new MapView({  
  container: "viewDiv",  
  map: map,  
  zoom: 12,  
  center: [-117.168, 32.776]  
});
```



Demo

Get started with map

Add data to map



Add data

- Many layer types
 - Feature layer
 - Map image layer
 - Tile Layer
 - Vector Tile Layer
 - and more



Layer coding pattern

1. Load module
2. Create layer
3. Set properties
4. Add to map (or scene)

```
require(["esri/layers/FeatureLayer"], function(FeatureLayer){  
    // points to the states layer in a service storing U.S. census  
    var f1 = new FeatureLayer({  
        url: "https://sampleserver6.arcgisonline.com/arcgis/rest/se  
    });  
    map.add(f1); // adds the layer to the map  
});
```


Working with properties

- Set properties in constructor

```
var map = new Map({  
  basemap: "topo",  
  layers: [hoods, poi, beaches]  
});
```

- Or directly on the instance

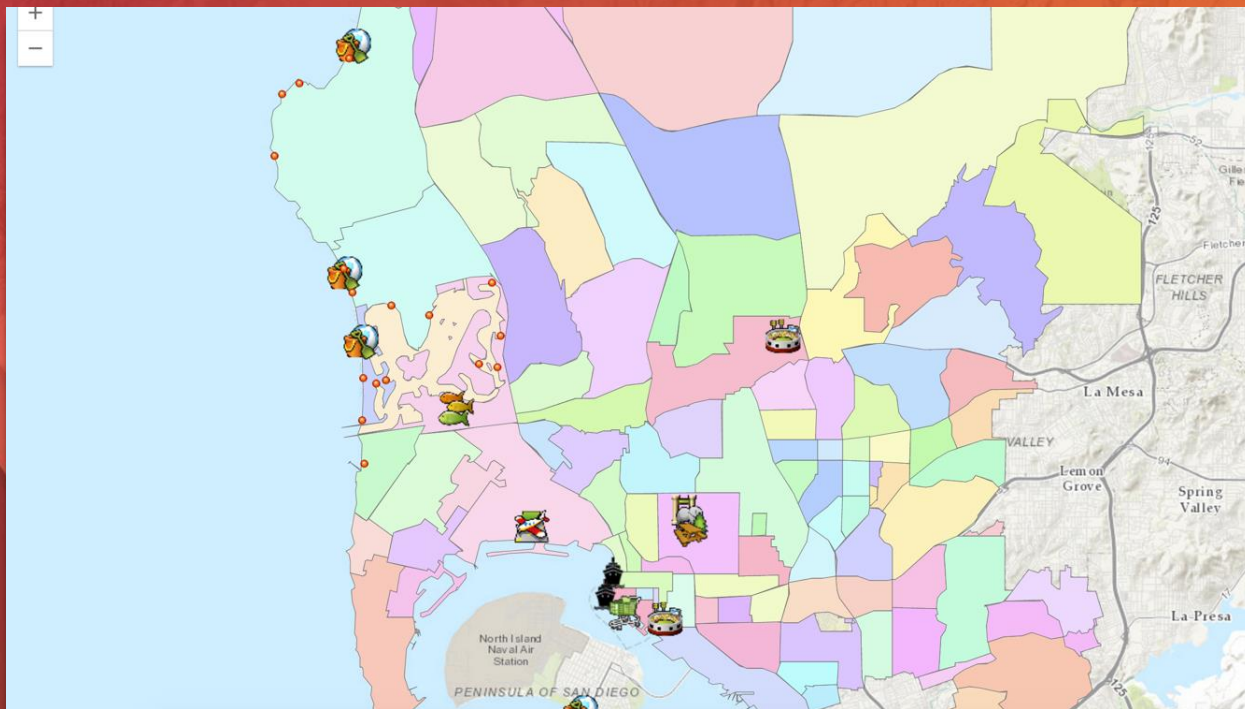
```
view.center = [ -100, 40 ];  
view.zoom = 6;  
map.basemap = 'oceans';
```

Working with properties – continued

- Watch for property changes

```
layer.watch("loadStatus", function(status) {/**/});
```

- Use esri/core/watchUtils to aid in watching property changes
 - Once
 - When false
 - When true



Demo

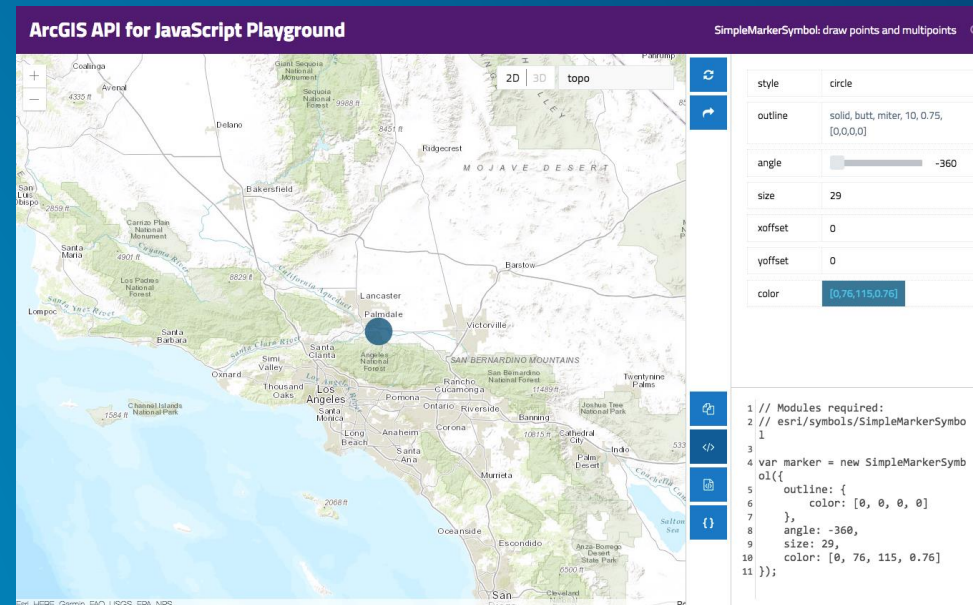
Add layer to app

Symbolize data



Symbols

- Define symbols used to represent your data
- Many types
 - SimpleMarkerSymbol
 - PictureMarkerSymbol
 - SimpleLineSymbol
 - TextSymbol
 - and more



<https://developers.arcgis.com/javascript/latest/sample-code/playground/live/index.html>

Renderers

- Define a set of symbols and rules for drawing the layer
- Apply renderer to the layer

```
var citiesRenderer = new SimpleRenderer({  
  symbol: new SimpleMarkerSymbol({  
    size: 10,  
    color: "#FF4000",  
    outline: { // autocasts as new SimpleLineSymbol()  
      color: [255, 64, 0, 0.4], // autocasts as new Color()  
      width: 7  
    }  
  }),  
  label: "Major cities" // this will appear next to the symbol in the legend  
});
```

Autocasting

- Use a property without having to import module
- Look for autocast label

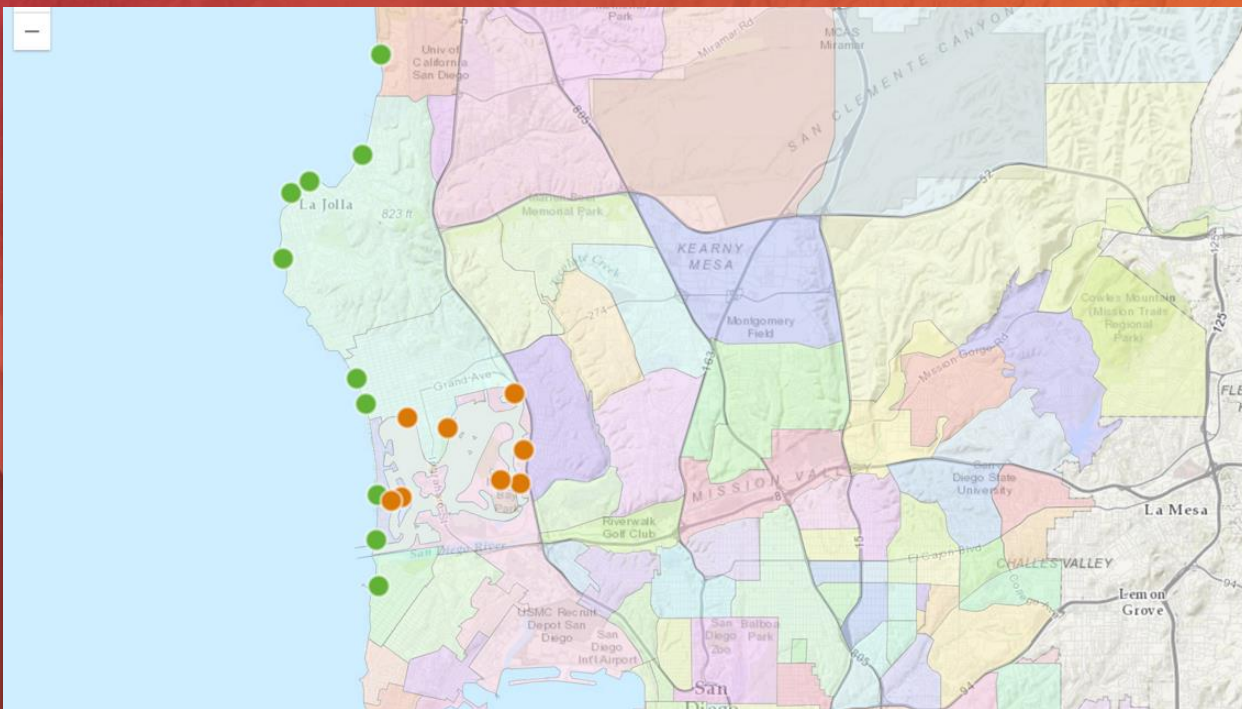
color `Color` autocast

The color of the symbol. This can be autocast with a named string; hex string; array of rgb or rgba values; an object with `r`, `g`, `b`, and `a` properties; or a `Color` object.

Default Value: `[255, 255, 255, 0.25]` - white, semitransparent

Autocast code sample

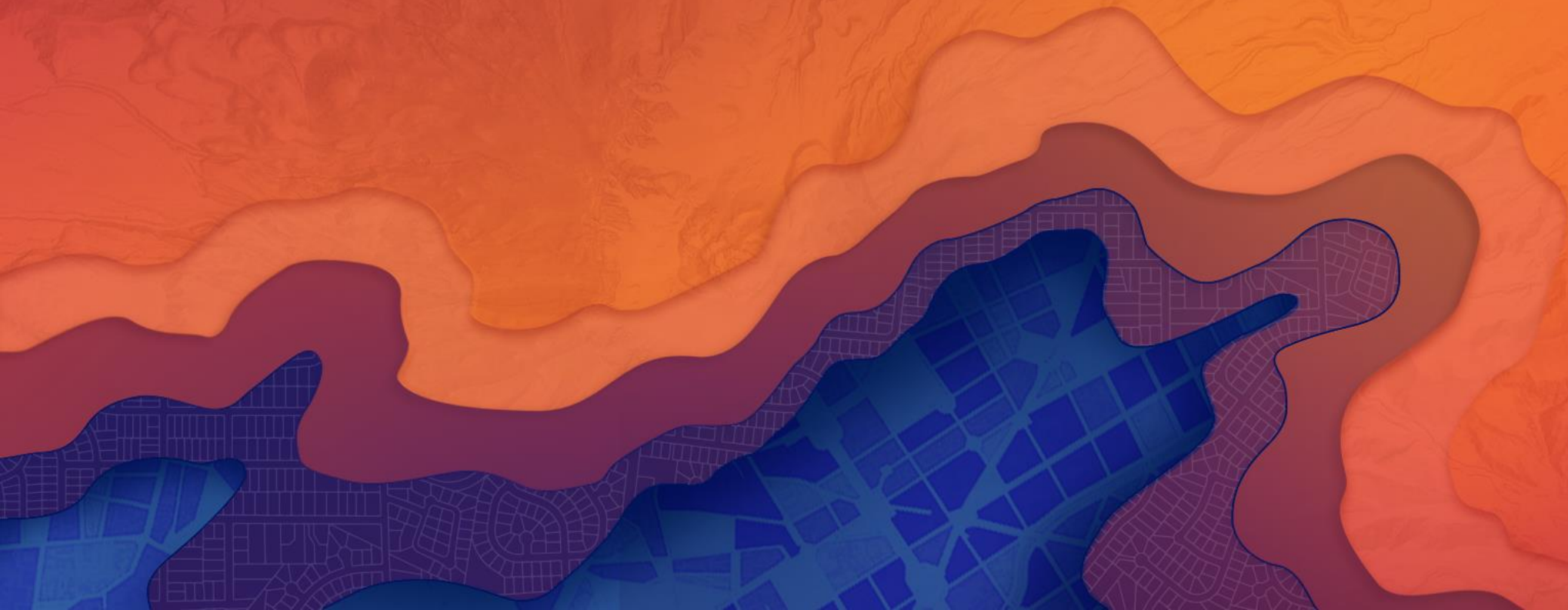
```
var sym = SimpleMarkerSymbol({  
  color: "red",  
  outline: {  
    color: [128, 128, 128, 0.5],  
    width: "0.5px"  
  }  
});
```



Demo

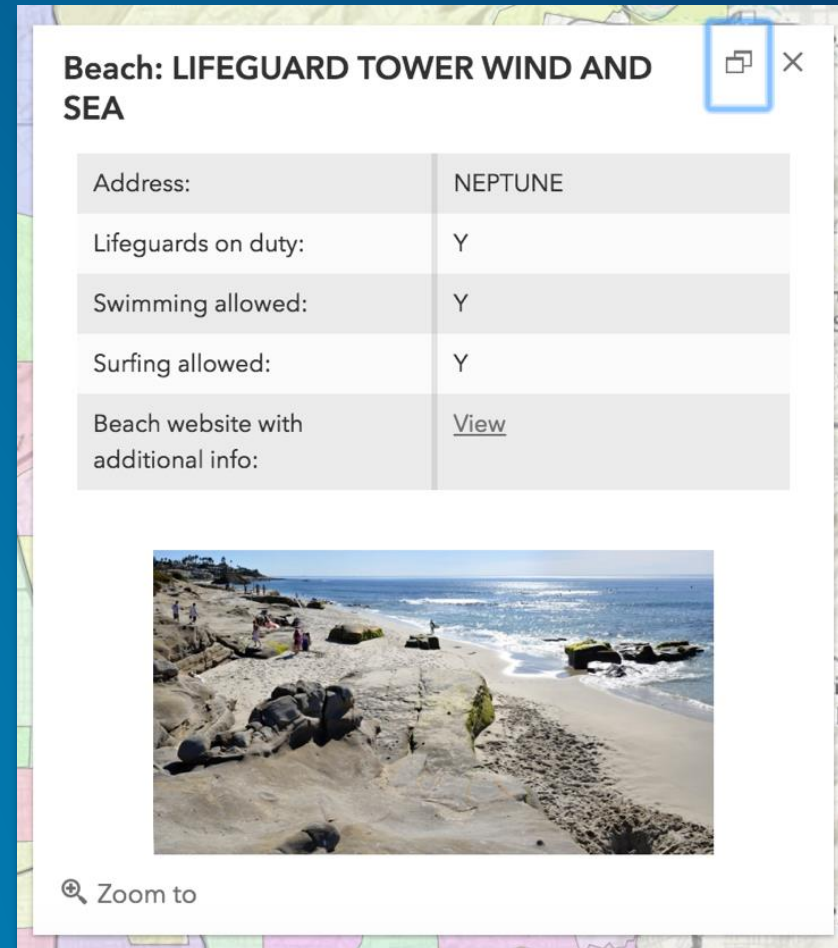
Apply renderer to layer

Make app interactive



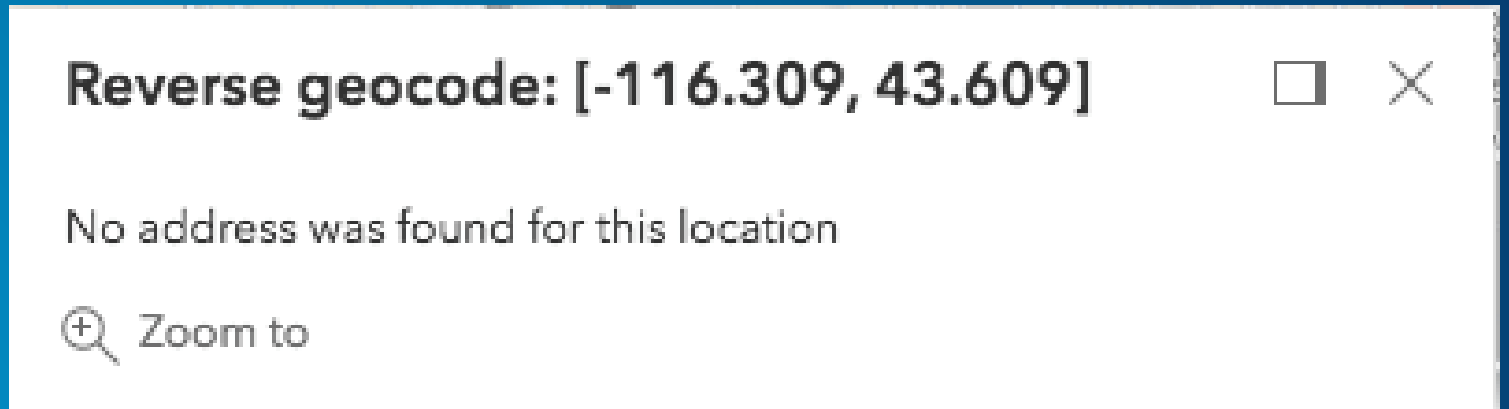
Add interactivity : Popups

- Responsive
- Details about
 - Clicked location
 - Feature
 - Search results
- Customizable



Popup components

- All views have default popup
- Define title and content
 - Popup
 - Popup Template
- Custom actions



Popup Template

- Define content in PopupTemplate
- Associate template with layer

```
var beaches = new FeatureLayer({  
  url: "<URL to featurelayer>",  
  // Step 4: Specify the outfields  
  outFields: ["*"],  
  popupTemplate: popupTemplate,  
  // set renderer  
  renderer: beachRenderer  
});
```

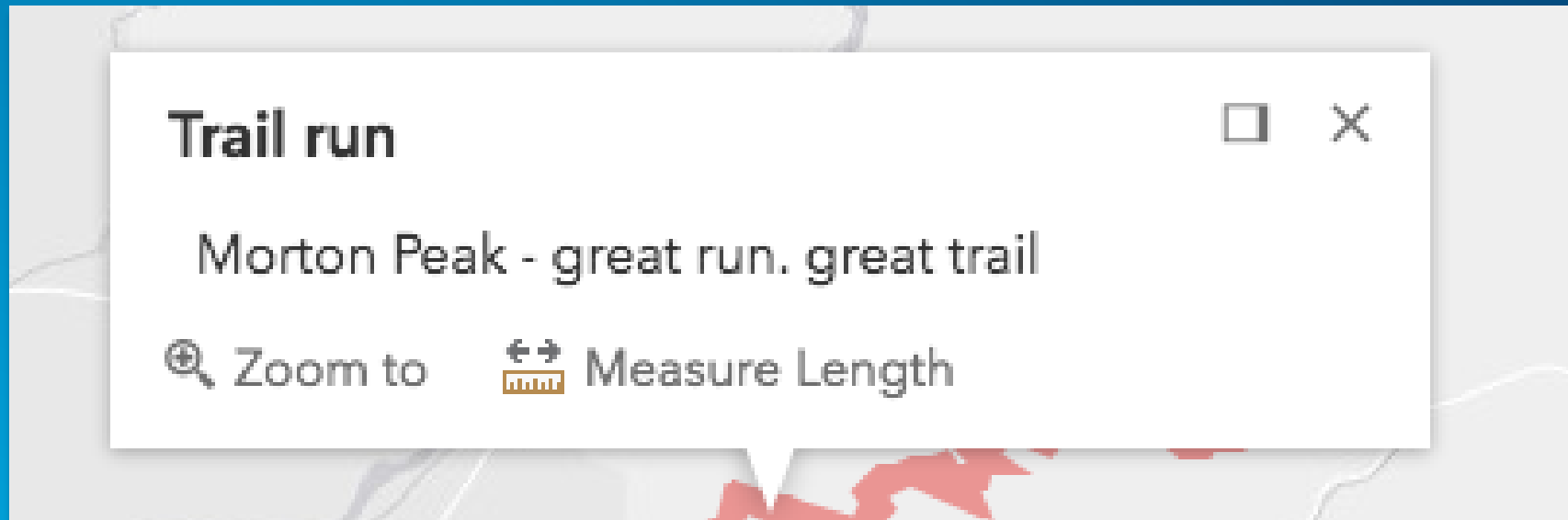
```
// Create the popupTemplate  
var popupTemplate = new PopupTemplate({  
  title: "<b>Beach: {NAME}</b>",  
  // Specify the content, first set the display fields  
  content: [{  
    type: "fields",  
    fieldInfos: [{  
      fieldName: "ADDRESS",  
      visible: true,  
      label: "Address: "  
    }, {
```

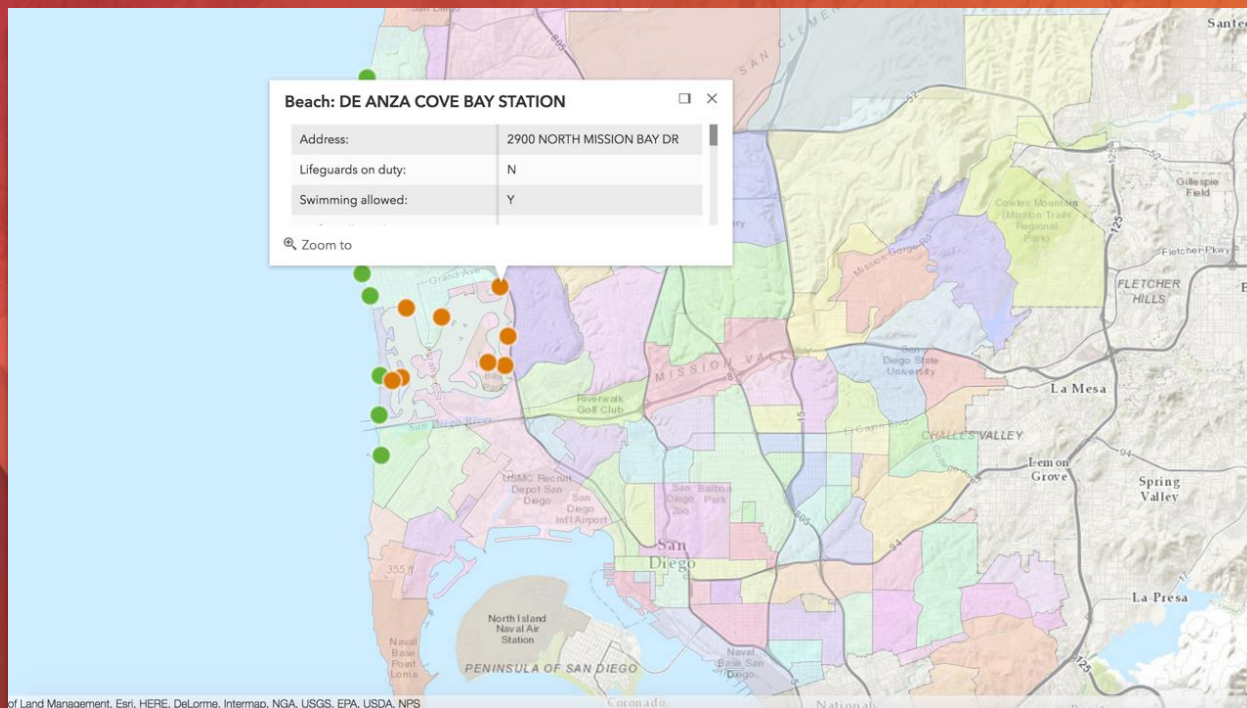

Dockable

- Define dock position
 - bottom-right
 - top-right
 - bottom-left
 - top-left
 - bottom-center
 - top-center

```
popup: {  
  dockEnabled: true,  
  dockOptions: {  
    buttonEnabled: true,  
    position: "bottom-right"  
  }  
}
```

Popup: Custom Actions





Demo

Add popups

Web maps



WebMap

- Write less code!
- Use ArcGIS Online/Portal Map Viewer to:
 - Specify basemap and extent
 - Define symbology
 - Create popup content
 - Add layers

```
var map = new WebMap({  
  portalItem: {  
    id: "12843e71a82446d89a1df878312d6749"  
  }  
});
```

The image shows a web map interface. The main map displays the San Diego area with various colored regions and labels like 'La Jolla', 'San Diego', 'Mission Valley', and 'Peninsula of San Diego'. A sidebar on the right is titled 'DE ANZA COVE BAY STATION' and contains a table with details about the station. Below the table is a photograph of a sunset over water. At the bottom of the sidebar is a 'Zoom to' button with a magnifying glass icon.

DE ANZA COVE BAY STATION	
ADDRESS	2900 NORTH MISSION BAY D
Lifeguards	N
Surfing	N
Swimming	Y
URL	View

Zoom to

Demo

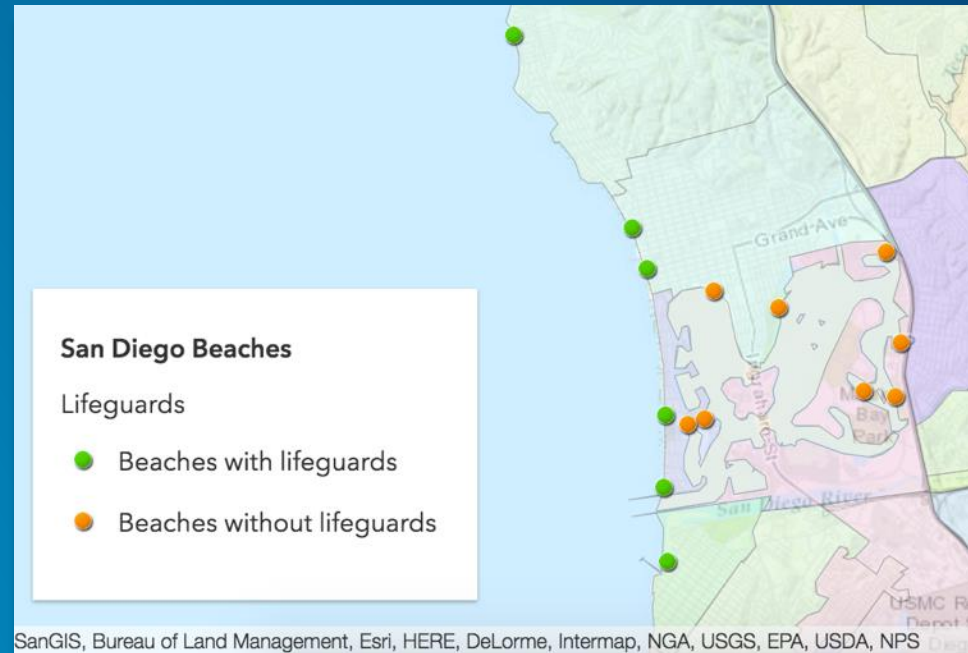
Use WebMap

Widgets



Widgets

- Basemap
- Compass
- Home
- Legend
- Search
- Expand
- Locate
- and more



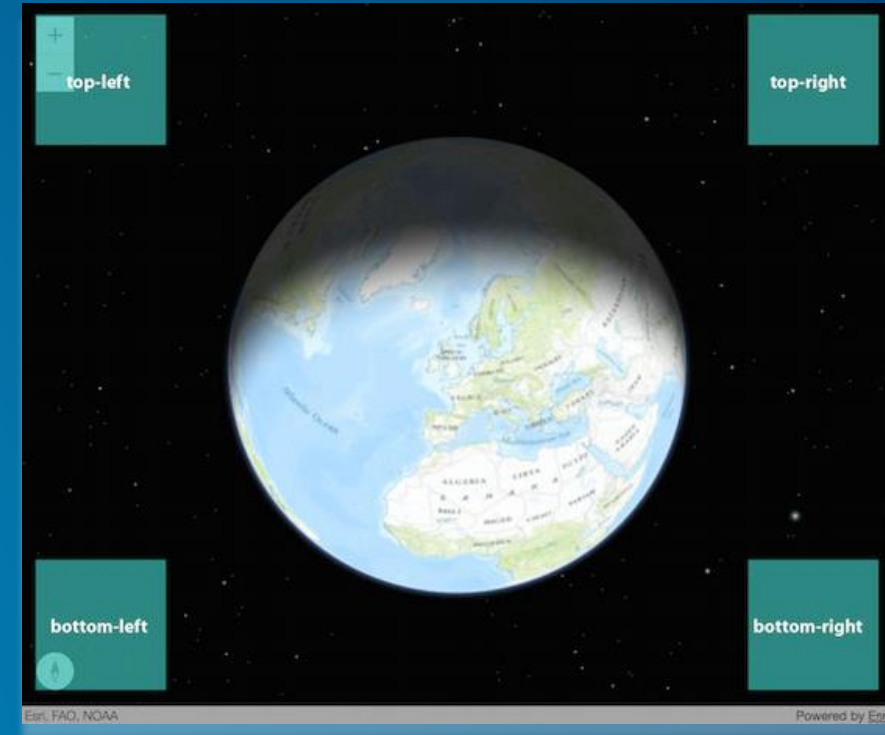
Widget coding pattern

- Load module
- Create widget
- Set properties
- Add to View's UI

```
view.then(function() {  
    var beaches = map.layers.getItemAt(1);  
    // Step 1: Create the widget  
    var legend = new Legend({  
        // Step 2: Specify any additional properties  
        // we are just setting the view to  
        view: view,  
        layerInfos: [{  
            layer: beaches,  
            title: "San Diego beaches"  
        }]  
    });  
    // Step 3: Add the widget to the view's UI  
    view.ui.add(legend, "bottom-left");  
});
```

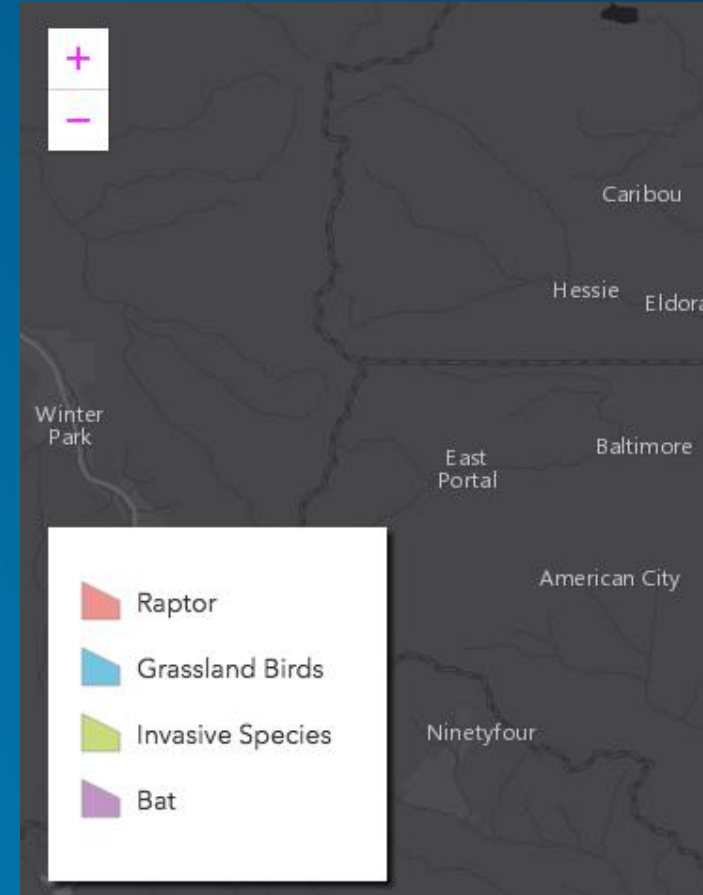
View UI

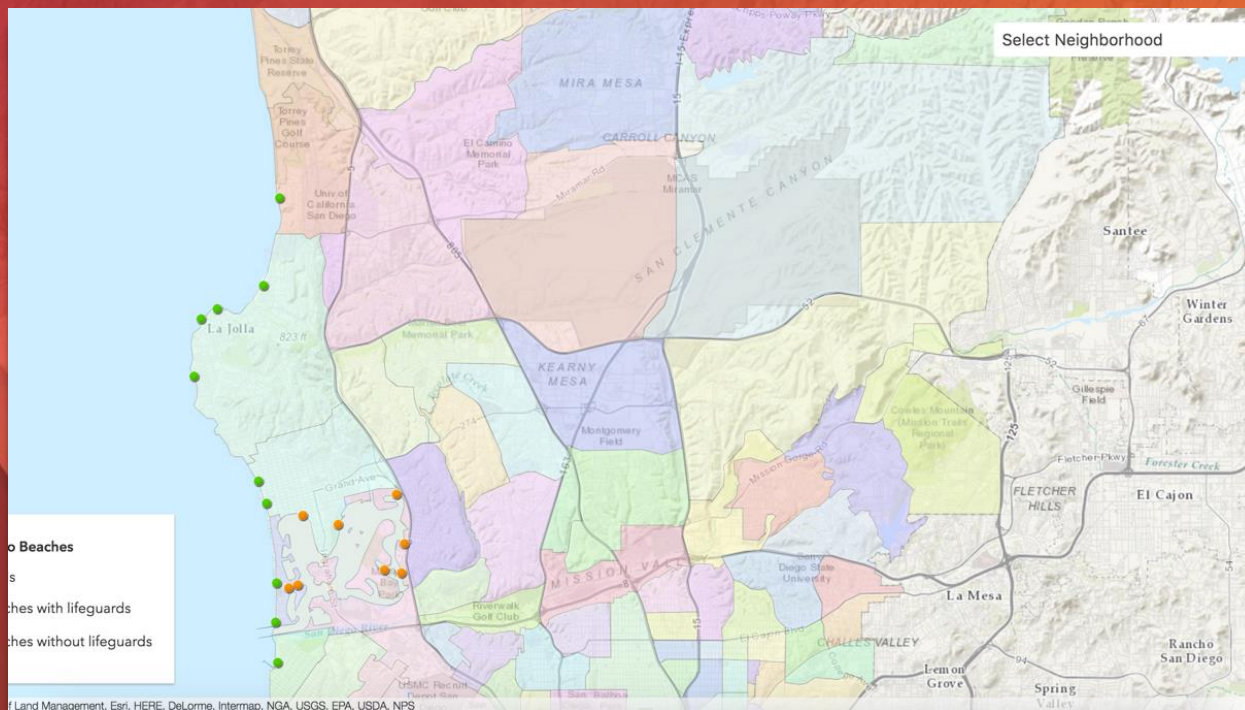
- Simple process of placing widgets in app



Customize widget appearance

- CSS
- SASS





Demo

Add widget to app



esri

THE
SCIENCE
OF
WHERE

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Avenir Next

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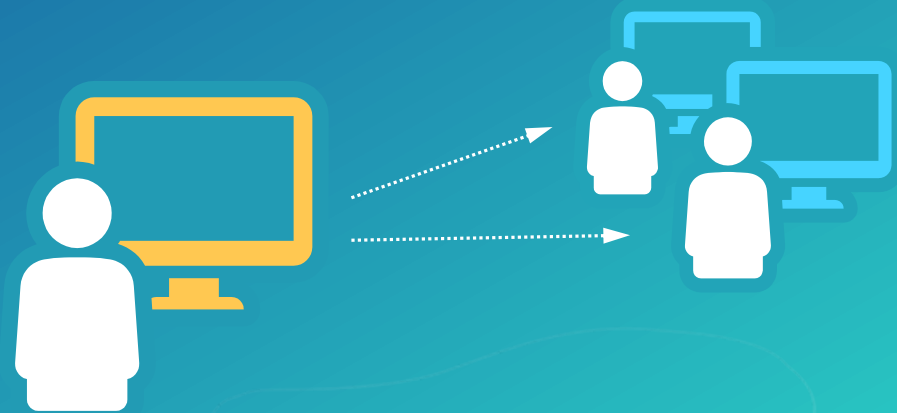
Sole Presenter

Single computer used for presentation

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Use Arial if...

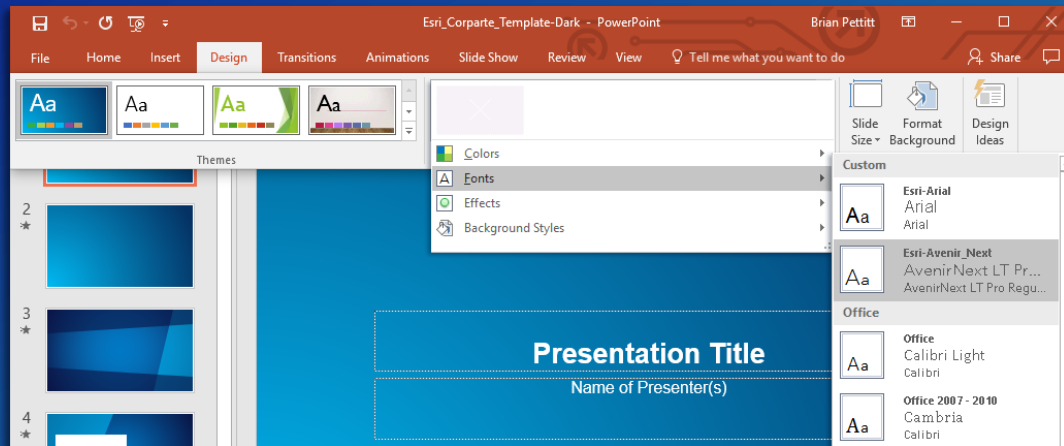
Multiple Users / Presentation Distributed to others

Presentation used on multiple computers

How to Change Your Theme Fonts to Avenir Next

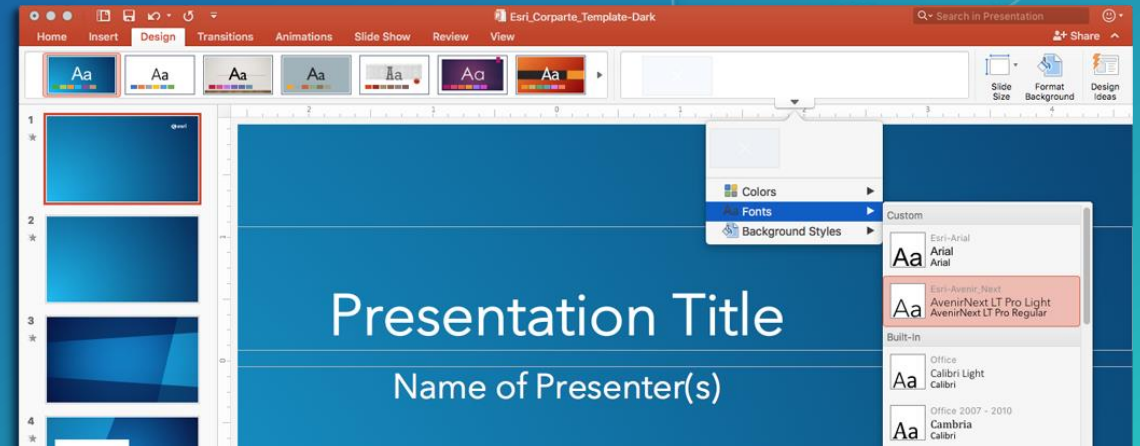
Windows

Select: Design
Variants (arrow)
Fonts > Esri-Avenir Next

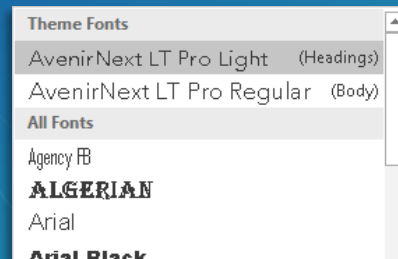


Mac

Select: Design
Variants (arrow)
Fonts > Esri-Avenir Next



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*If the text boxes on your slides are not using
(Heading) or (Body) fonts from the Theme Fonts
section, they will not update correctly.
You will have to replace them manually.*

How to Test if you're using Avenir Next

If you have Avenir Next installed, the two Qs will match.



Picture



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<https://compass.esri.com/resources/presentations/Pages/Main.aspx>

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Aspect Ratio Test



If this shape does not appear as
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ratio of your display until it does.

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