

ArcGIS API for JavaScript: An Introduction

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[@Bjorn_Svensson](#)



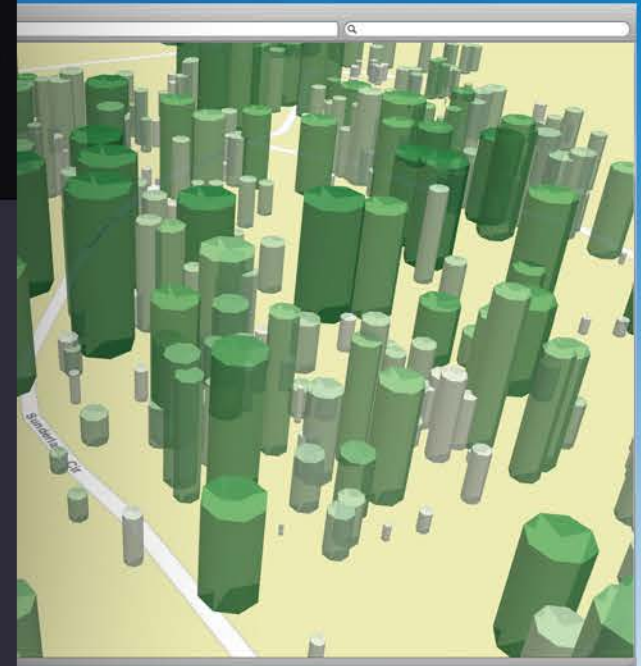
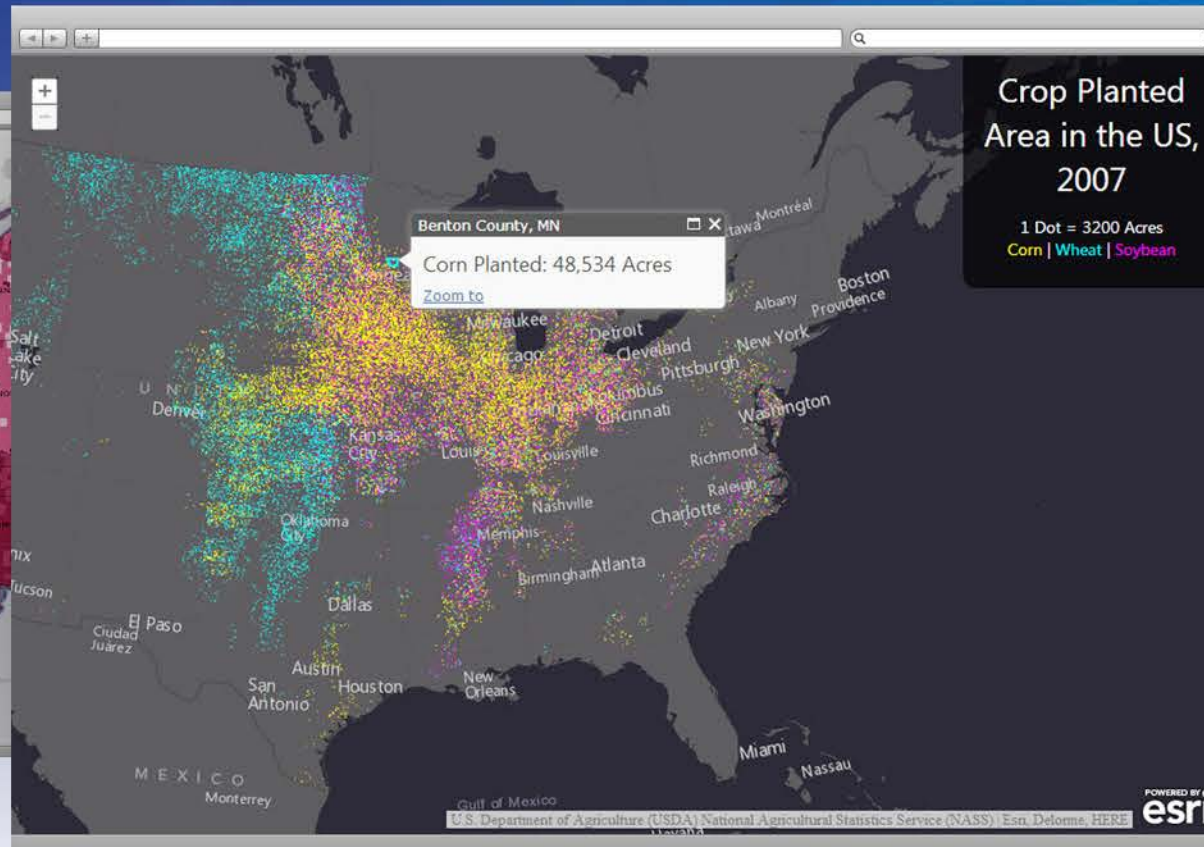
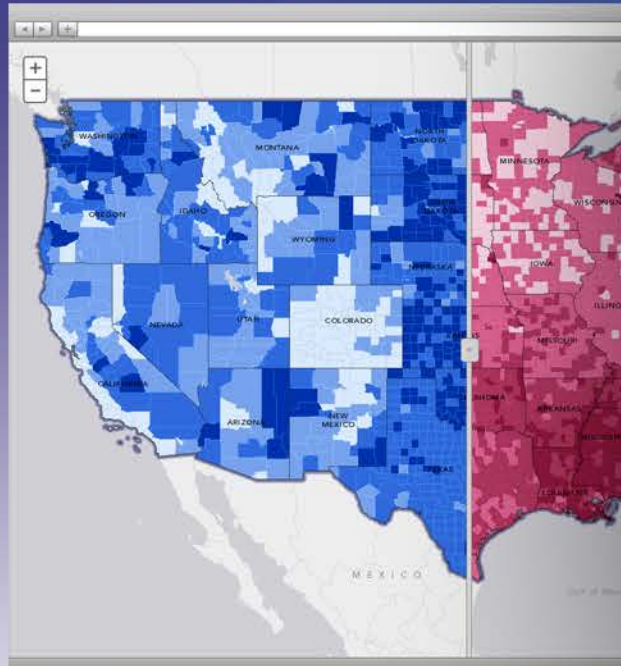
[@hgonzago](#)

Overview

- JavaScript API and the ArcGIS platform
 - Web maps
 - Hosted services
- Getting started with the API – resources to know
- JS functionality:
 - Adding layers/web maps, popups, rendering
 - 10.3 updates
 - Widgets
- Developer resources

ArcGIS API

FOR JAVASCRIPT



Take advantage of the ArcGIS platform

- Web maps
- Hosted feature services
- Configure map/layer(s)
- Restrict content if applicable

“The web map templates have certainly give me new perspective on rapid app deployment, especially if you're used to coding from scratch with the Javascript API.

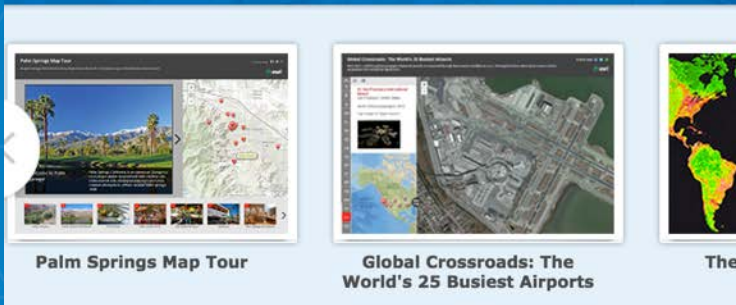
The web map templates have almost everything you need and with some customisation and redeployable code you can minimize your coding time a lot....”

- fcbassongis (via GeoNet)

ArcGIS



Demo: Web Maps



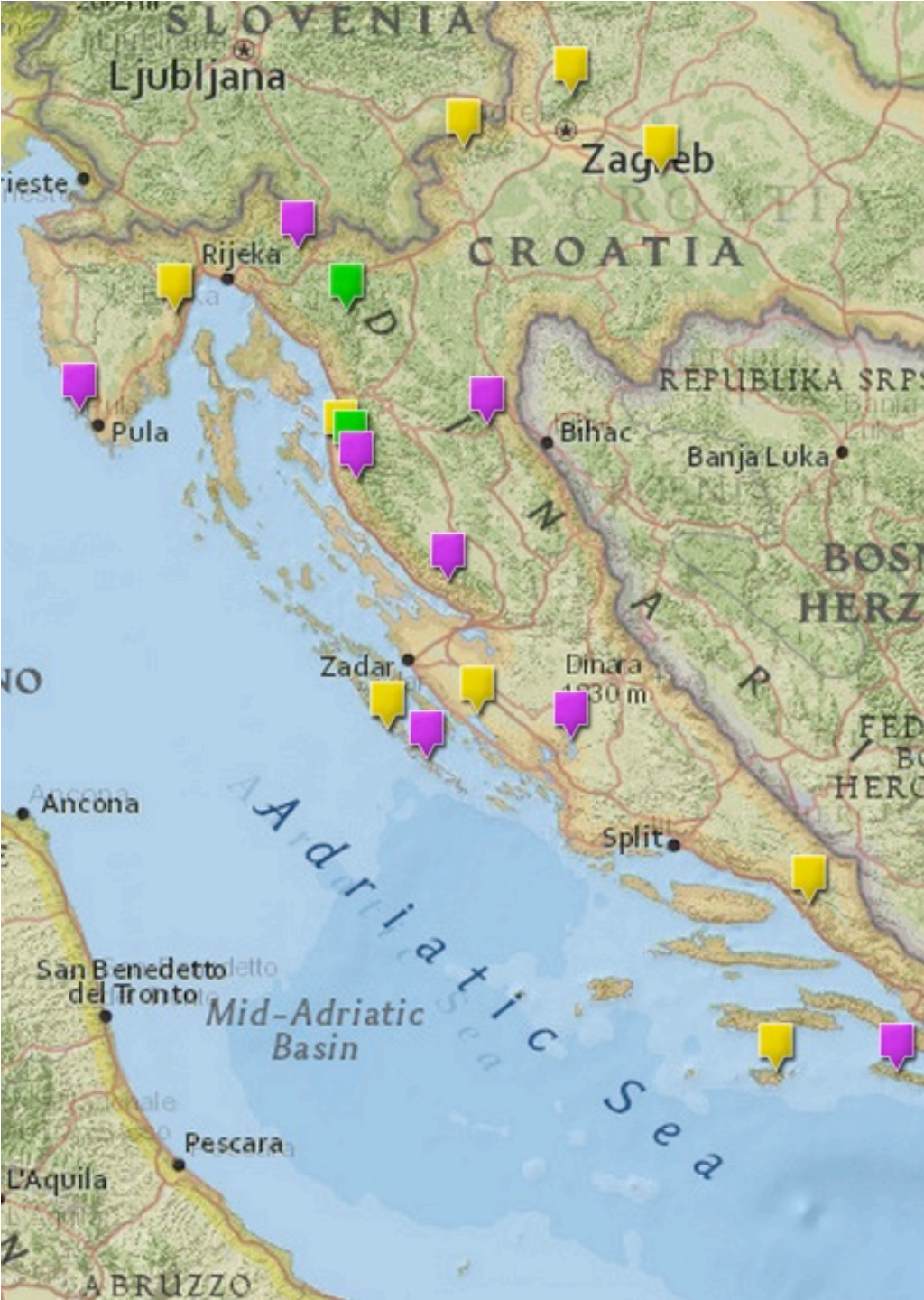
Details | Add | Edit | Basemap | Save | Share | Print | Directions

About | Content | Legend

Contents

- Ecological Footprint
 - Greater than 10
 - 8 - 9
 - 7 - 7.9
 - 6 - 6.9
 - 5 - 5.9
 - 4 - 4.9
 - 3 - 3.9
 - 2 - 2.9
 - 1 - 1.9
 - Lower than 1
- Topographic

Zoom to | Transparency | Set Visibility Range | Move up | Move down | Rename | Remove | Copy | Hide in Legend | Remove Pop-up | Configure Pop-up | Change Symbols | Create Labels | Disable Editing



Working with the API

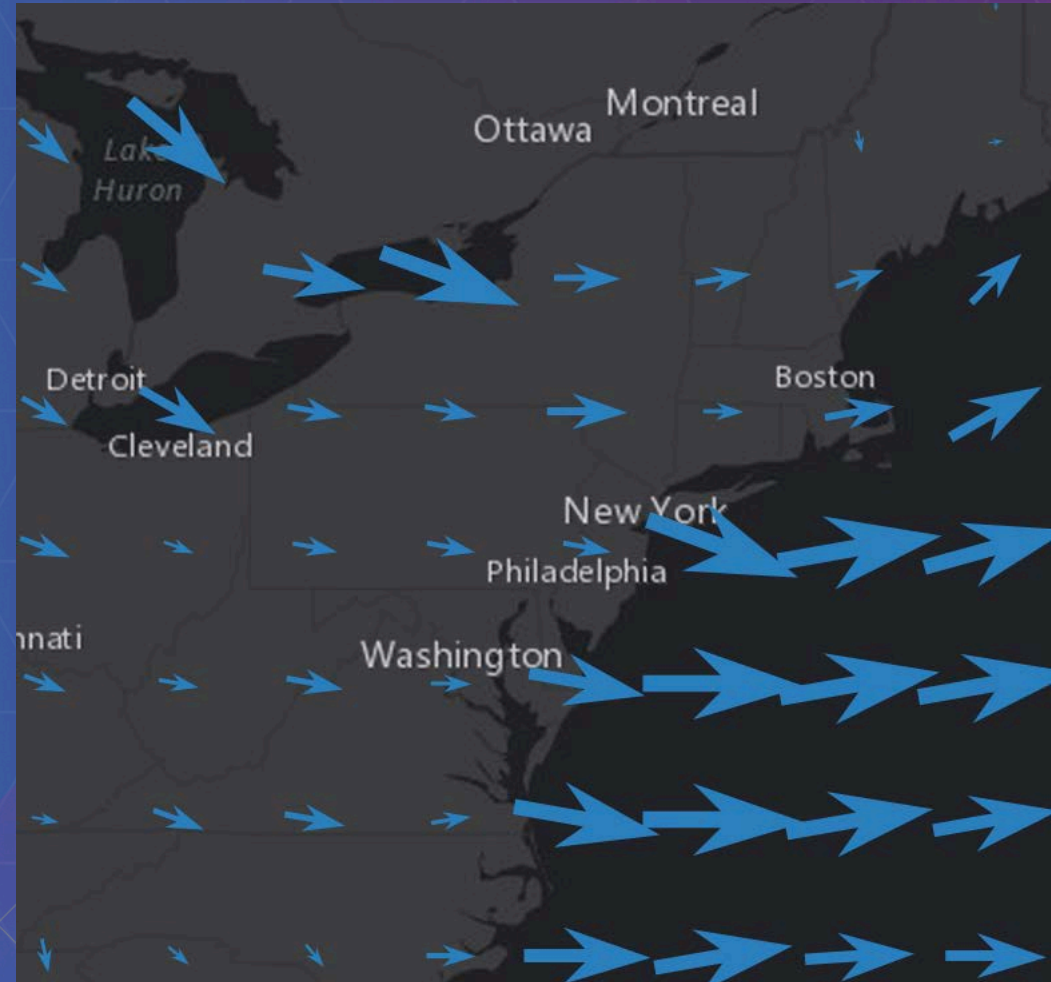
Get started with the API

- Provides more granular control over the application
- Where to begin?
 - <http://developers.arcgis.com/en/javascript>
- How do I?
 - https://developers.arcgis.com/javascript/jshelp/intro_accessapi.html
 - https://developers.arcgis.com/javascript/jsapi/api_devenv
- Get familiarized with the doc
 - API Reference, Samples, and conceptual topics
- User communities, e.g. GeoNet

Working with layers

- Tiled Layers
- Feature Layers
- Dynamic Map Layers
- CSV
- KML
- GeoRSS
- Image Layers
- Streaming features
- WMS, WMTS
- Web Tiled Layer

ArcGISImageServiceVectorLayer



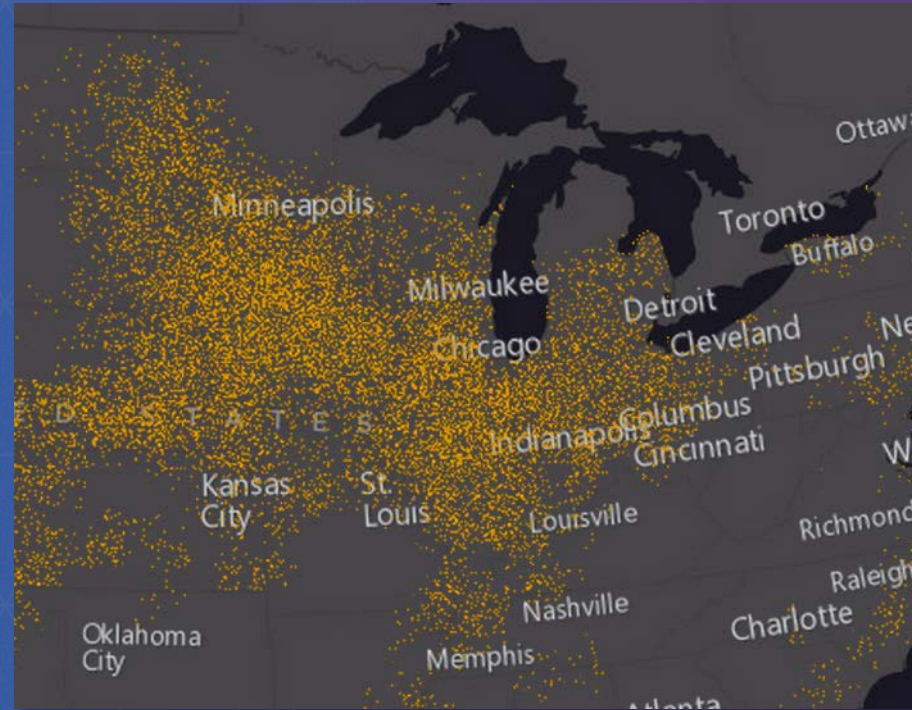
Layer coding pattern

- Create layer
- Set layer specific properties
- Add to map

```
var params = new ImageServiceParameters();
params.noData = 0;
var layerUrl = "http://sampleserver6.arcgisonline.com/arcgis/rest/services/Toronto/ImageServer";
var imageServiceLayer = new ArcGISImageServiceLayer(layerUrl, {
    imageServiceParameters: params,
    opacity: 0.75
});
map.addLayer(imageServiceLayer);
```

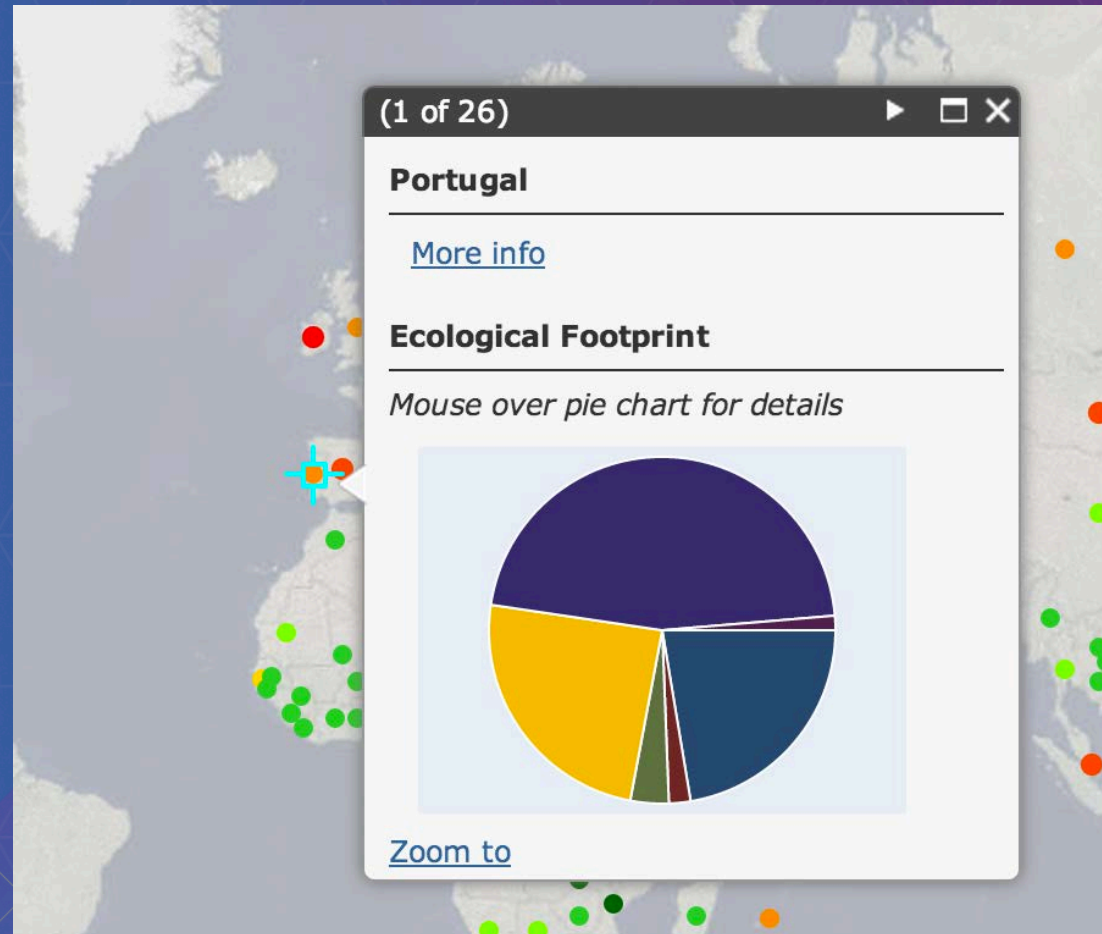
Feature layers

- **Versatile**
- **Various modes**
- **Editing**
- **Rendering**
 - **HeatmapRenderer**
 - **DotDensityRenderer**
 - **TemporalRenderer**
 - **VectorFieldRenderer**



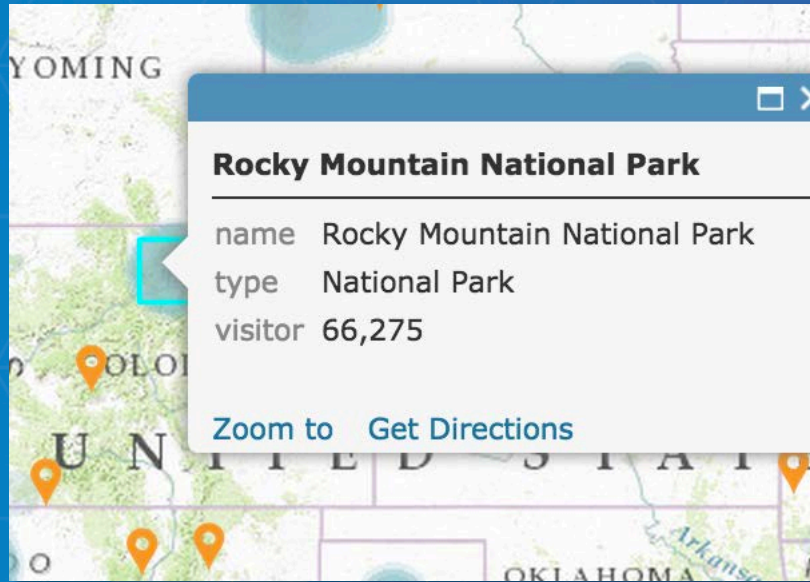
Simplify code by adding web maps

- `esri/arcgis/utils`
 - `createMap`

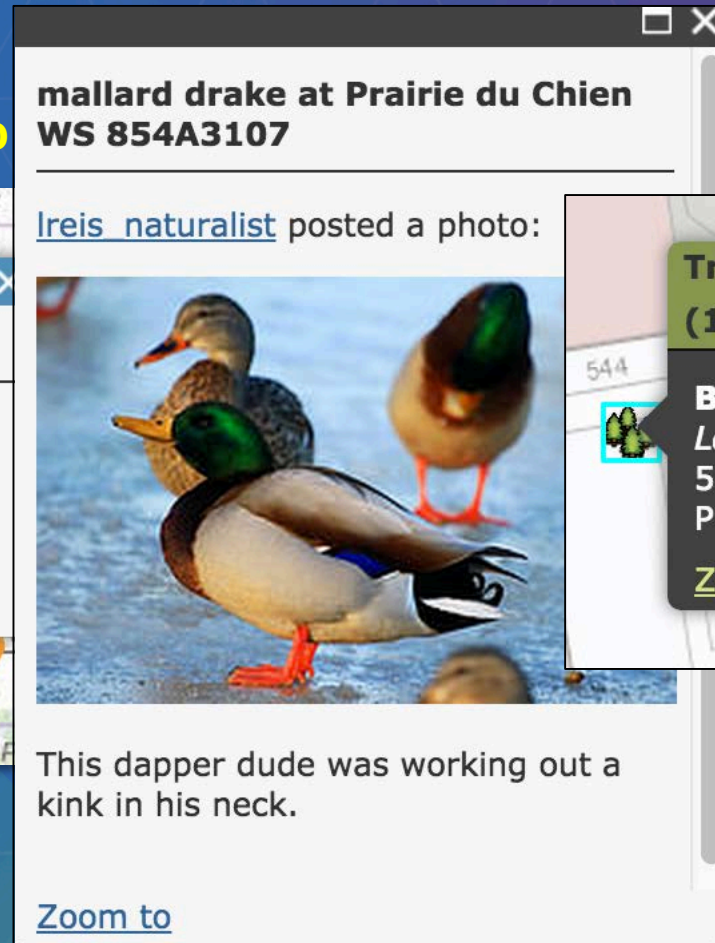


Creating a Popup

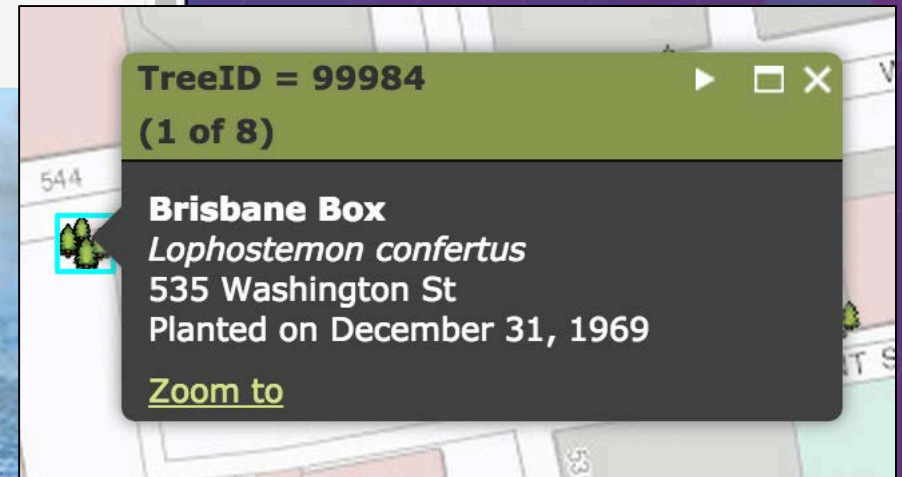
Popup carried over from web map



Popup with formatted content



Popup with customized UI



Demo

Visualizing your data

- SimpleMarkerSymbol 

- PictureMarkerSymbol 

- SimpleLineSymbol 

- CartographicLineSymbol 

- SimpleFillSymbol 

- PictureFillSymbol 

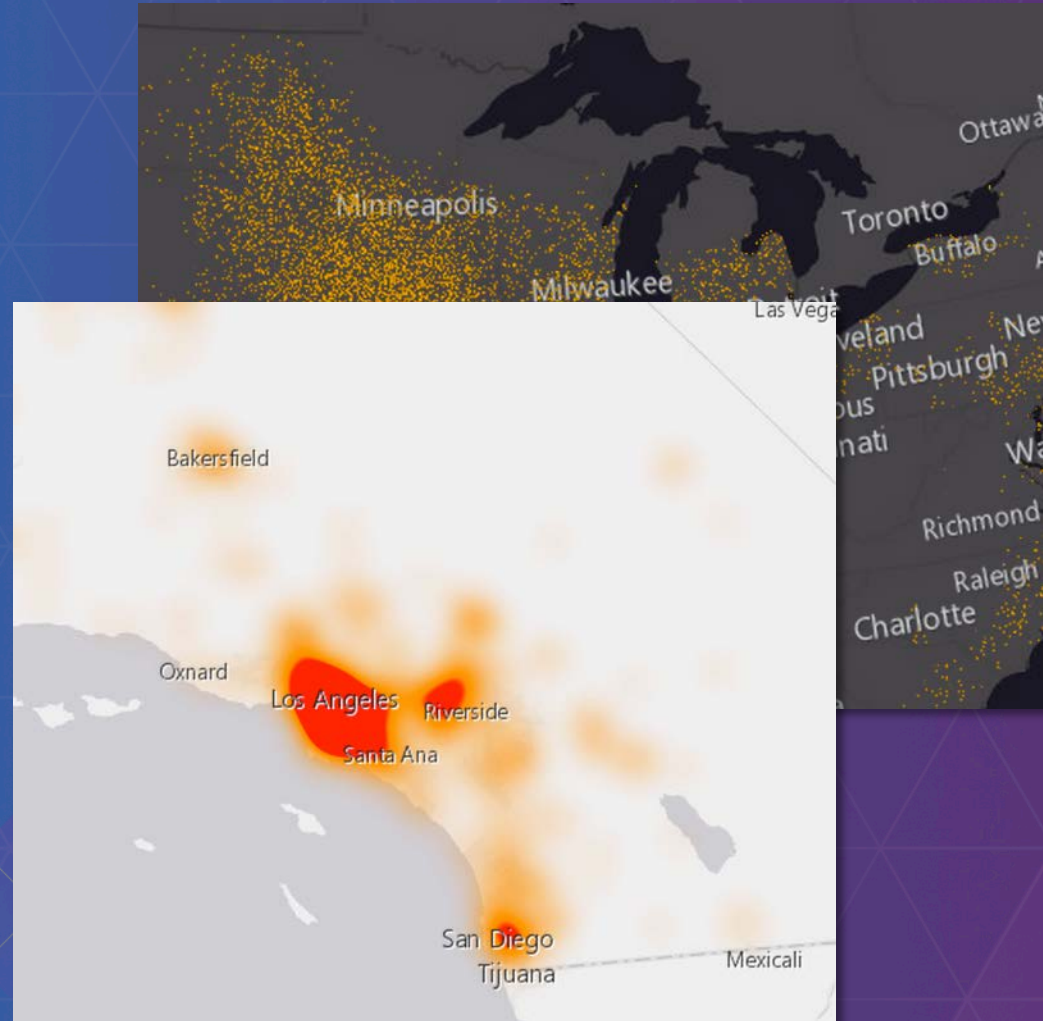
Symbols are used to display points, lines, and polygons on the graphics layer.

Symbol is the base symbol class and has no constructor. Instead, use the following:

- **Points:** SimpleMarkerSymbol, PictureMarkerSymbol
- **Lines:** SimpleLineSymbol, CartographicLineSymbol
- **Polygons:** SimpleFillSymbol, PictureFillSymbol
- **Text:** TextSymbol, Font

Visualizing your data

- SimpleRenderer
- ClassBreaksRenderer
- UniqueValueRenderer
- ScaleDependentRenderer
- **DotDensityRenderer**
- HeatMapRenderer
- TemporalRenderer



Labeling data

- **LabelLayer class**
- **showLabels**
- **constructor option for map**
 - Uses **labelingInfo** off of the **featurelayer**
 - since 3.7

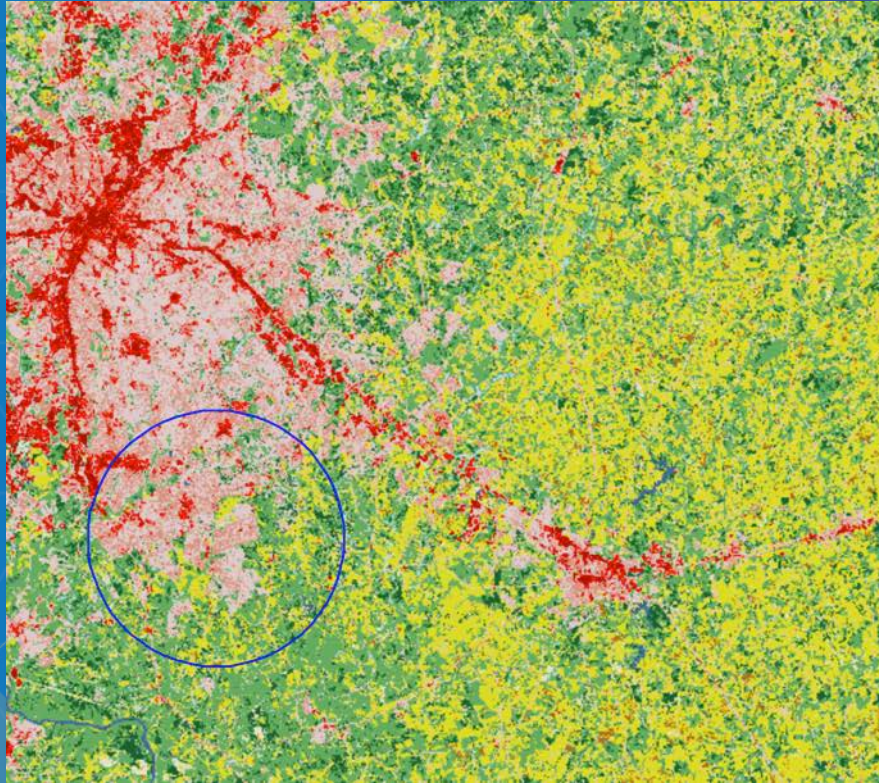


10.3 Functionality – Streaming features

- StreamLayer class
 - Works with stream services from 10.3 ArcGIS Server

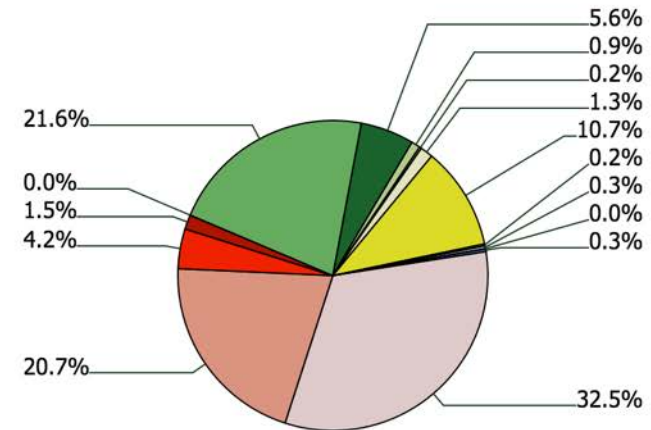


10.3 Functionality – Advanced Image Server



Land Cover Composition in 5 Miles Radius

This app dynamically generates land cover composition within a 5 mile radius. Hold the ALT key and hover the cursor on the map using the mouse. Move the mouse around while holding the ALT key to get live updates. Release the ALT key to go back to navigation mode.



Working with the API: 40+ Widgets

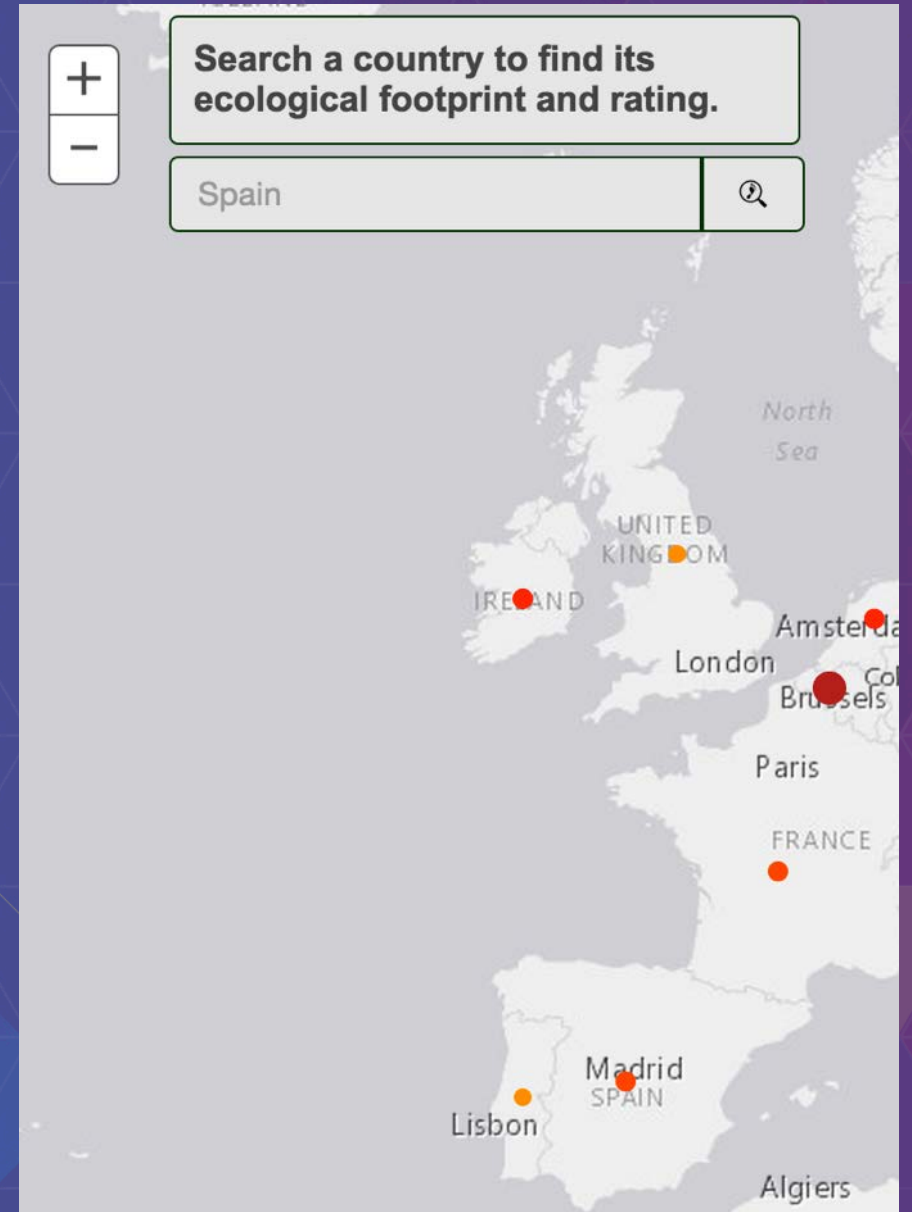
The image displays a web application interface with three main components:

- Search Widget:** A search bar with a plus/minus icon and a magnifying glass. The text "Search a country to find its ecological footprint and rating." is above the input field, which contains "Spain".
- Map Widget:** A map showing a route from Miami, Florida (Point A) to Boca Raton, Florida (Point B). The route is highlighted in blue. The map includes labels for various cities and highways in the Miami area.
- Directions Widget:** A panel showing the route details: "72.36 kilometers · 54 minutes". It includes options for "BY CAR", "BY TRUCK", and "WALKING", and a "GET DIRECTIONS" button. The directions are listed as follows:
 1. Start at Miami, Florida, United States
 2. Go south on N Miami Ave toward W Flagler St / E Flagler St
0.15 km 1 minute
 3. Bear right onto ramp to I-95
0.13 km
 4. At fork keep right on I-95 N
2.33 km 2 minutes
 5. At exit 4A take ramp on the right toward Miami Beach (I-195 E)
13.89 km 11 minutes
- Table Widget:** A table titled "Trees (1146 features, 0 selected)". The table has columns for Status, Spp_Code, Cmn_Name, Sci_Name, and Native. The data rows are as follows:

Status	Spp_Code	Cmn_Name	Sci_Name	Native
P	SABA	Weeping willow	Salix x sepulcralis simonk	NO
P	HACA	Snowdrop tree	Halesia carolina	YES
P	AMAR	Downy serviceberry	Amelanchier arborea	YES
I	PIST	Eastern white	Pinus strobus	YES

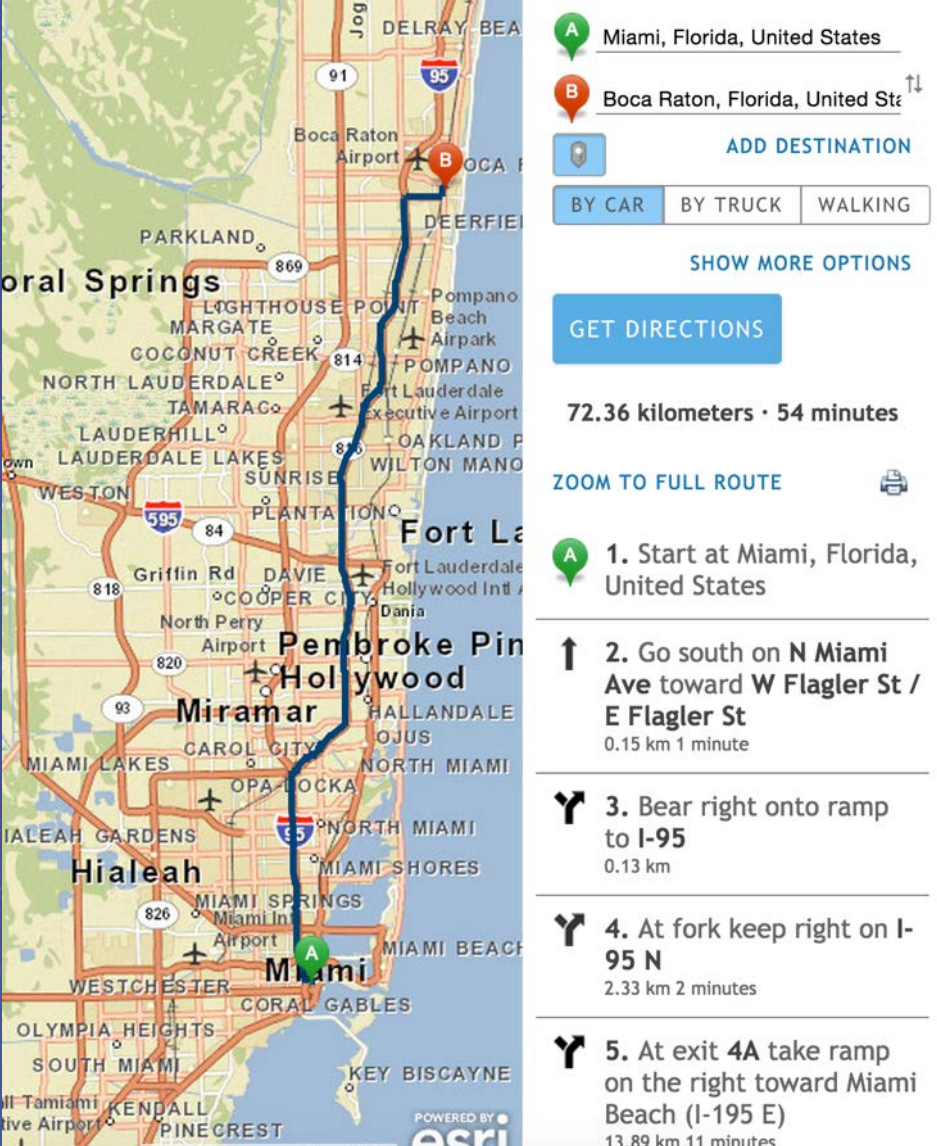
Widgets: Search

- Search geocode locators and/or feature layers
- You set the source for the search
- New at version 3.13
- Geocoder widget and then some!!!!



Widgets: Directions

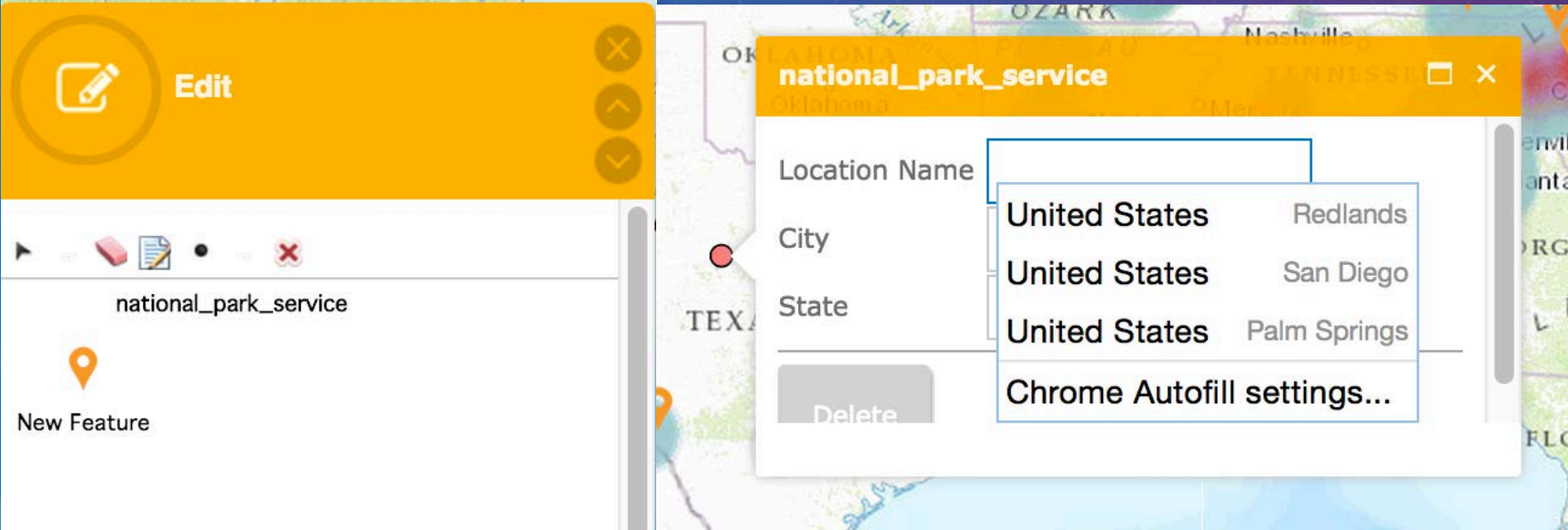
- Locate me
- Click on the map for from/to locations
- Works with traffic



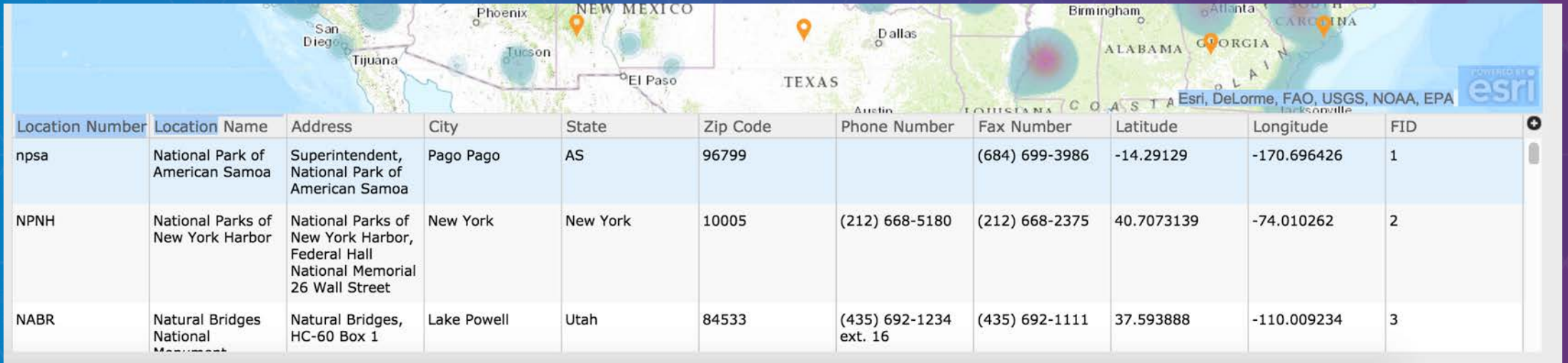
The screenshot displays a Google Maps interface with a directions widget. The map shows a route from Miami, Florida (Point A) to Boca Raton, Florida (Point B). The route is highlighted in blue and follows major roads like I-95 and I-195. The widget on the right provides the following information:

- Origin:** Miami, Florida, United States (Point A)
- Destination:** Boca Raton, Florida, United States (Point B)
- Mode:** BY CAR (selected), BY TRUCK, WALKING
- Distance and Time:** 72.36 kilometers · 54 minutes
- Buttons:** GET DIRECTIONS, ZOOM TO FULL ROUTE, SHOW MORE OPTIONS
- Directions List:**
 1. Start at Miami, Florida, United States
 2. Go south on N Miami Ave toward W Flagler St / E Flagler St
0.15 km 1 minute
 3. Bear right onto ramp to I-95
0.13 km
 4. At fork keep right on I-95 N
2.33 km 2 minutes
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13.89 km 11 minutes

Widgets: Editor



Widgets: FeatureTable (beta)



The screenshot displays a map of the United States with three orange location pins. Below the map is a table with 11 columns: Location Number, Location Name, Address, City, State, Zip Code, Phone Number, Fax Number, Latitude, Longitude, and FID. The table contains three rows of data.

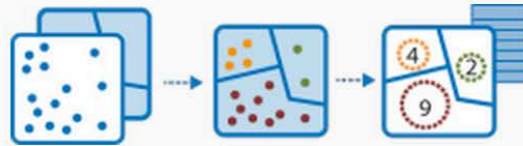
Location Number	Location Name	Address	City	State	Zip Code	Phone Number	Fax Number	Latitude	Longitude	FID
npsa	National Park of American Samoa	Superintendent, National Park of American Samoa	Pago Pago	AS	96799		(684) 699-3986	-14.29129	-170.696426	1
NPNH	National Parks of New York Harbor	National Parks of New York Harbor, Federal Hall National Memorial 26 Wall Street	New York	New York	10005	(212) 668-5180	(212) 668-2375	40.7073139	-74.010262	2
NABR	Natural Bridges National Monument	Natural Bridges, HC-60 Box 1	Lake Powell	Utah	84533	(435) 692-1234 ext. 16	(435) 692-1111	37.593888	-110.009234	3

Analysis widgets

AggregatePoints

[[JavaScript API](#) | [REST API](#)]

(added at v3.6)



Aggregate points into polygons where the points are located.

- **pointLayer:** point
- **polygonLayer:** polygon

CalculateDensity

[[JavaScript API](#) | [REST API](#)]

(added at v3.12)



Create a density map from point or line features by spreading known quantities of some phenomenon (represented as attributes of the points or lines) across the map.

- **inputLayer:** any geometry
- **boundingPolygonLayers:** polygon
- **radiusUnits:** polygon
- **areaUnits:** polygon

- Calculate drivetime
- Viewshed analysis

- Watershed analysis
- Hot spot analysis

Additional Resources

- Esri course: Building Applications with the ArcGIS API for JavaScript
- Esri webinar: Data visualization and time saving tips

- Dojo documentation
- JavaScript online training classes: free and fee-based

Additional presentations

- **JavaScript: What have you done for me lately?**
 - Tuesday 3/10, 2:30 – 3:30 Oasis 4
- **ArcGIS for JavaScript: Building Apps that Consume Web Maps**
 - Tuesday 3/10, 6:00 – 6:30 Demo Theater 2 – Oasis 1
- **ArcGIS Online and Portal: Developing Custom JavaScript Applications**
 - Wednesday 3/11, 1:00 – 2:00 Primrose C/D
- **ArcGIS for JavaScript: Data Visualization**
 - Thursday 3/12, 9:00 – 10:00 Pasadena/Sierra/Ventura
- **ArcGIS for JavaScript: Tips and Trips for Developing and Debugging ...**
 - Thursday 3/12, 2:30 – 3:30 Primrose B
- **ArcGIS API for JavaScript: The Road Ahead**
 - Thursday 3/12, 5:30 – 6:30 Primrose B

Questions?

js.arcgis.com