

**Esri Developer Summit**

March 8–11, 2016 | Palm Springs, CA



# DECLARATIVE MAPPING APPLICATIONS WITH ANGULARJS

---

Tom Wayson [@tomwayson](#)

Jacob Wasilkowski [@jwasilgeo](#)



# Production Ready

ArcGIS JavaScript API 3.x + Angular 1.x

# Road Ahead

**Angular 1.x & JSAPI 4**

**Angular 2.x & JSAPI 3 & 4**

**ArcGIS API for JavaScript and AngularJS:**

**What's New, What's Next**

**Today 5:30PM Mesquite B**





<declarative />

**{{data-binding}}**

dependency injection

test-all-the-things



A close-up, top-down view of a large, dense pile of white plastic Stormtrooper figurines. The figurines are packed closely together, filling the entire frame. They are in various orientations, some facing forward, some turned away, and some at angles. The lighting is soft, highlighting the smooth, glossy texture of the plastic. The background is dark, making the white figurines stand out. A semi-transparent dark horizontal band runs across the middle of the image, serving as a background for the text.

super popular



angularjs

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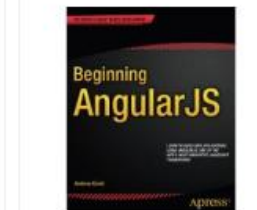
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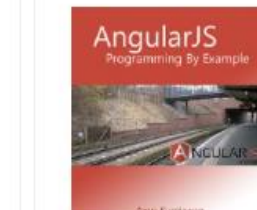
- 

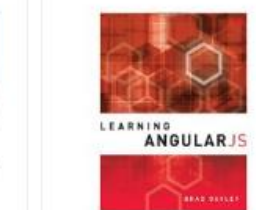
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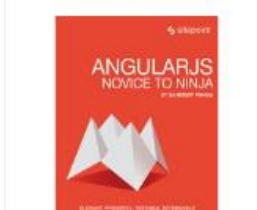
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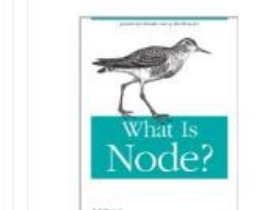
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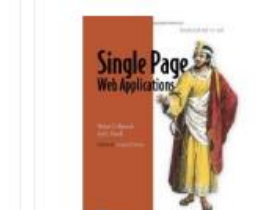
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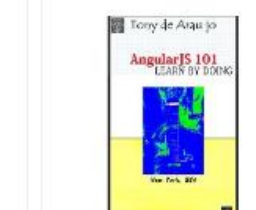
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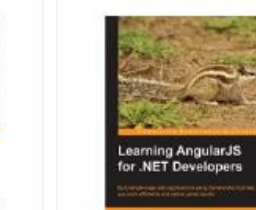
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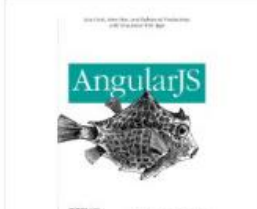
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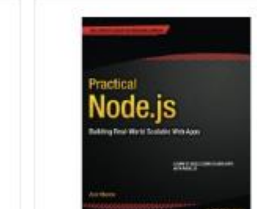
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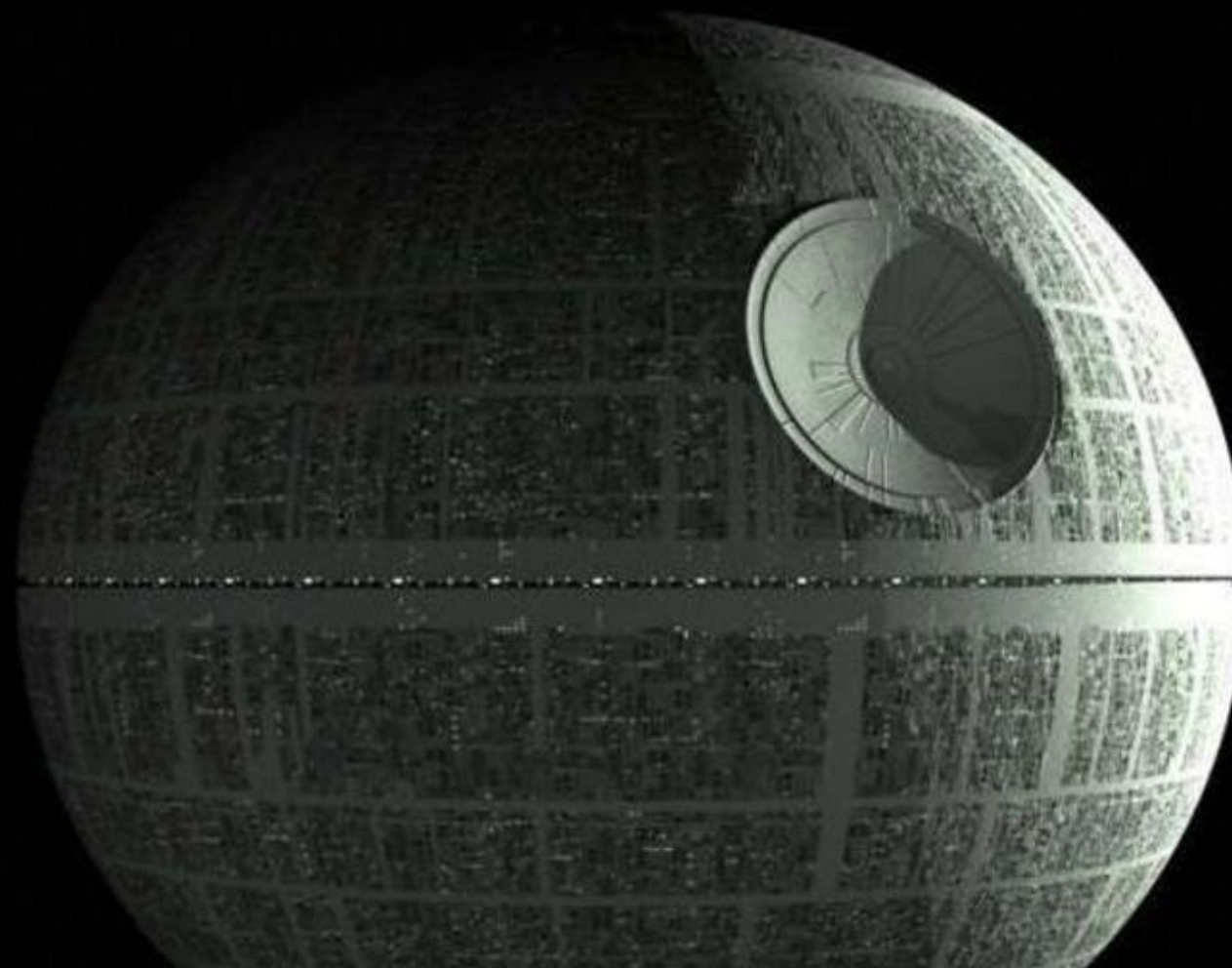
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big ecosystem







“enterprise”

Basic Details

Job Details

Payment Details

Pay Rates

Tax Details

First Name(s)

Duck

Surname or Contractor \*

Ranger

Person ID

duck

Address

12 The Esplanade  
Wellington

Email Address

duckranger@duckranger.com

Phone Number

Gender \*


Male

Date of Birth

dd/mm/yyyy

# Forms over data

Cancel

 Save Person





# WebGIS Spatial Economical Clusters in Argentina Development Version - Province of Santa Fe

Experimental Geographic Information System (on behalf of [Fundación "Observatorios PyME Regionales"](#)) - [more info](#)

## LEGEND [close](#)

### ADMINISTRATIVE BOUNDARIES

- ☒ National Boundary
- ☒ Province of Santa Fe

### ZOOM TO LOCATION

ROSARIO

### COMPANIES - LOCAL UNITS

#### Search Parameters

ISIC CODE (first 2 digits ...) [all](#)

specific Isic code [info](#)

#### Employment classes' range

From 0 to 8

#### Search for Company Name

[info](#)

#### Territorial scope of the search

☒ In the current view

☐ All the territory

Province of [all provinces ...](#)

Location of [all locations ...](#)

Marker dim multiply 1 [info](#)

Max Results per query: 500

(better not more than 1500 ...) [info](#)

#### Results Ordered by

employees' class [desc](#)

Add on the Map Clean ...

### CONTENT MANAGEMENT SYSTEM

[Access Data Front End - CMS](#)

#### ISIC decodes (first 2 digits)

- 15 Manufacture of food products and beverages
- 16 Manufacture of tobacco products
- 17 Manufacture of textiles
- 18 Manufacture of wearing apparel; dressing and dyeing of fur
- 19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
- 20 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- 21 Manufacture of paper and paper products
- 22 Publishing, printing and reproduction of recorded media
- 23 Manufacture of coke, refined petroleum products and nuclear fuel
- 24 Manufacture of chemicals and chemical products
- 25 Manufacture of rubber and plastics products
- 26 Manufacture of other non-metallic mineral

id= 5391

Company name

**ANTUNA JOSE MARIA INGARAMO**

28110 - Manufacture of fabricated metal products, except machinery and equipment

SAN NICOLAS 965

Province: SANTA FE

Class: from 11 to 20 employees

(Geocoding accuracy: Address level)

# Not so much

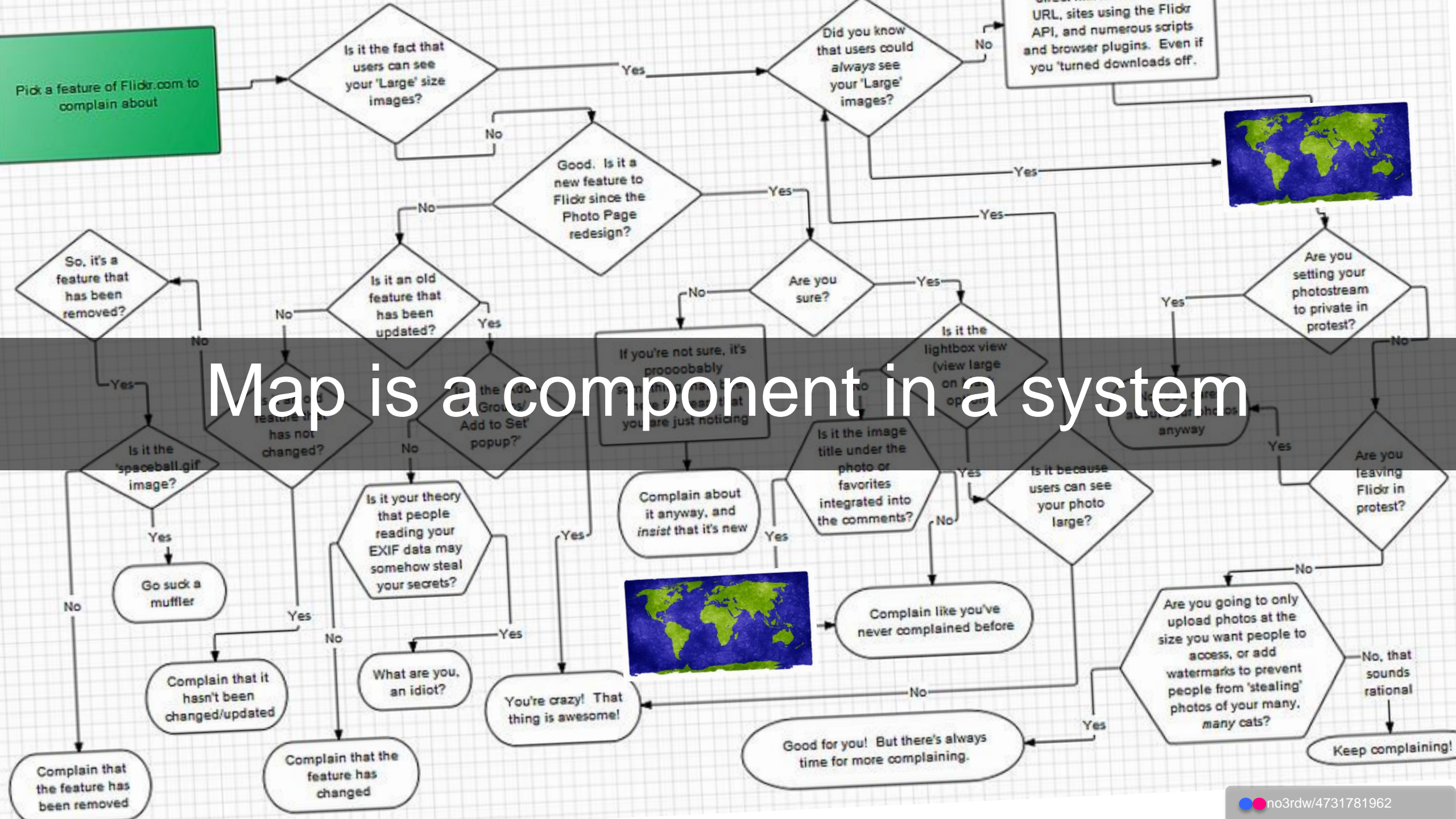
## SEARCH RESULTS ON THE MAP

TOTAL RESULTS ON THE MAP: 500

LAST SEARCH RESULTS: 500 [info](#)

- FALCONE BODETTO S A**  
Isic: 33200 - Manufacture of medical, precision and optical instruments, watches and clocks  
Location: ROSARIO  
(from 251 to 500 employees ...)
- SIPAR ACEROS S.A.**  
Isic: 27100 - Manufacture of basic metals  
Location: PEREZ  
(from 251 to 500 employees ...)
- DANA ARGENTINA S A**  
Isic: 34300 - Manufacture of motor vehicles, trailers and semi-trailers  
Location: ROSARIO  
(from 251 to 500 employees ...)
- MATTIEVICH S A**  
Isic: 15111 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- SOLIDO S R L**  
Isic: 18110 - Manufacture of wearing apparel; dressing and dyeing of fur  
Location: ROSARIO  
(from 251 to 500 employees ...)
- CAFES LA VIRGINIA S A**  
Isic: 15491 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- CAFES LA VIRGINIA S A**  
Isic: 15491 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- LAVADERO VIRASORO S A**  
Isic: 17120 - Manufacture of textiles  
Location: ROSARIO  
(from 101 to 250 employees ...)
- AMERICANO SA**  
Isic: 17120 - Manufacture of textiles  
Location: ROSARIO  
(from 101 to 250 employees ...)
- EDITORIAL DIARIO LA CAPITAL S A**  
Isic: 22120 - Publishing, printing and reproduction of recorded media  
Location: ROSARIO  
(from 101 to 250 employees ...)
- FRECICAR S R L**  
Isic: 25201 - Manufacture of rubber and plastics products  
Location: ROSARIO





# Map is a component in a system





`<directive>`

dojo  
toolkit

<widget>



dōjō  
toolkit

Who's in charge?





esri



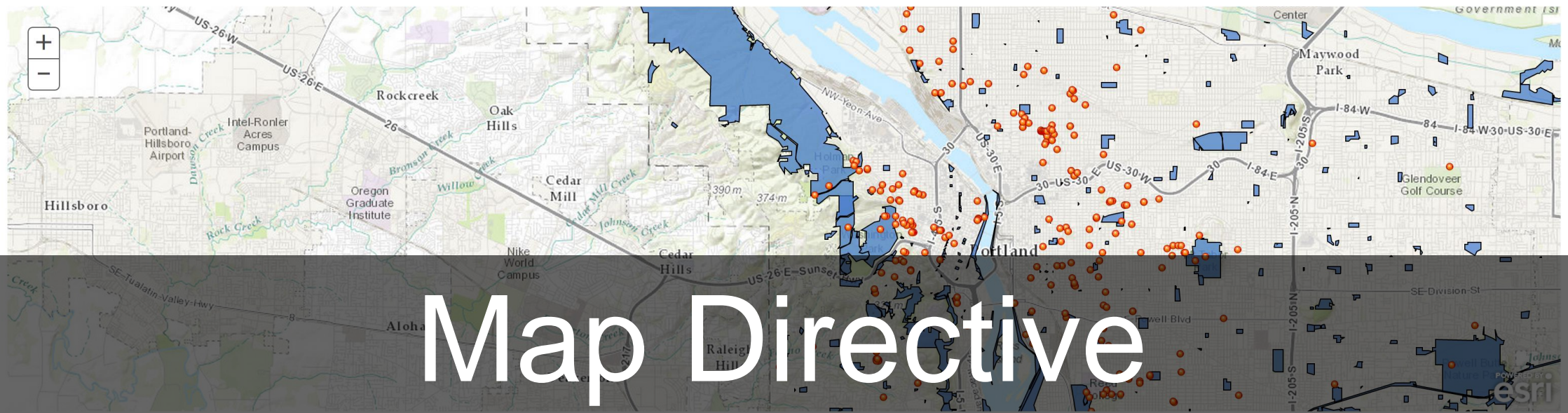
Don't Wrap Angular in Dojo



Make JSAPI work in Angular



```
<esri-map id="map" center="map.center" zoom="map.zoom" basemap="topo">  
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/0" />  
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/1" />  
</esri-map>
```







Let's go further...

```
<esri-map id="map" center="map.center" zoom="map.zoom" basemap="topo">
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/0" />
  <esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/1">
    <renderer field="area" type="class-breaks">
      <break min="0" max="50">
        <symbol linecolor="#ff0044" fillcolor="#ff0044">
      </break>
      <break min="51" max="150">
        <symbol linecolor="#cc0044" fillcolor="#cc0044">
      </break>
      <break min="151" max="500">
        <symbol linecolor="#aa0044" fillcolor="#aa0044">
      </break>
    </renderer></esri-feature-layer>
  </esri-map>
```

```
<esri-map id="map" center="map.center" zoom="map.zoom" basemap="topo">
```

```
<esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/0" />
```

```
<esri-feature-layer url="http://services.arcgis.com/.../FeatureServer/1">
```

```
<renderer field="area" type="class-breaks">
```

```
<break min="0" max="50">
```

```
<symbol linecolor="#ff0044" fillcolor="#ff0044">
```

```
</break>
```

```
<break min="51" max="150">
```

```
<symbol linecolor="#cc0044" fillcolor="#cc0044">
```

```
</break>
```

```
<break min="151" max="500">
```

```
<symbol linecolor="#aa0044" fillcolor="#aa0044">
```

```
</break>
```

```
</renderer></esri-feature-layer>
```

```
</esri-map>
```

25 types of layers

10 renderers

9 types of symbols

100s of events

A close-up shot of a man's face, showing a look of confusion or uncertainty. He has a furrowed brow and a slightly open mouth. The background is a blurred landscape with green fields and distant hills under a cloudy sky.

It's... It's... ArcXML??!



Directives exposing the entire  
Esri JS API?

No.

Directives exposing the entire  
Esri Leaflet API?

No.

A few directives to cover  
common use cases?

Yes!

Facilitate creating custom  
directives?

Yes!





# angular-esri-map

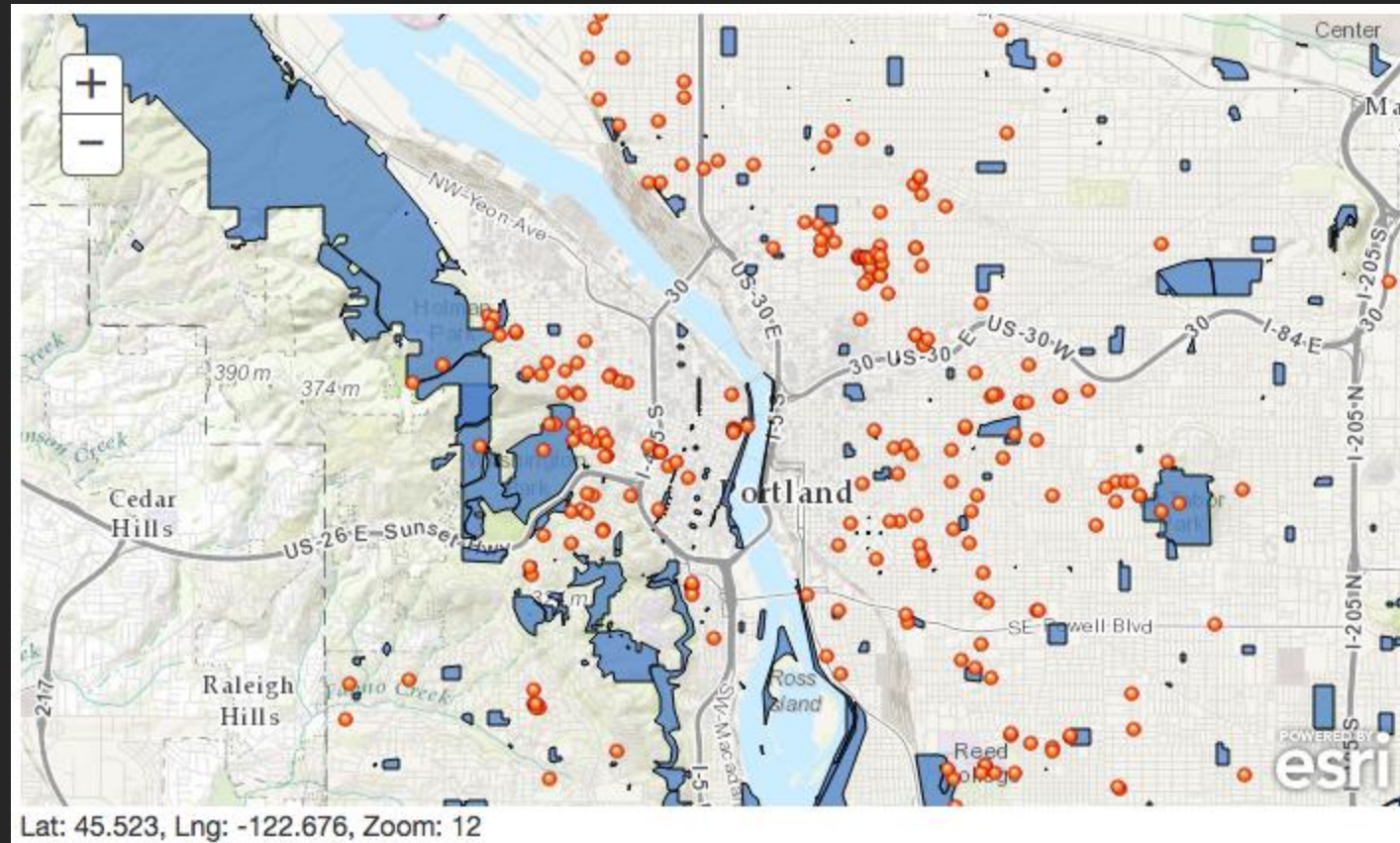
<https://github.com/esri/angular-esri-map>



# Demo

Quick Start & Brief Tour

## Demo: Quick Start



## Demo: Quick Start

```
<!-- load Esri JSAPI -->
<script src="//js.arcgis.com/3.16compact"></script>
<!-- load AngularJS -->
<script src="//ajax.googleapis.com/ajax/libs/angularjs/1.5.0/angular.js"></script>
<!-- load angular-esri-map -->
<script src="//npmcdn.com/angular-esri-map@1"></script>

<script type="text/javascript">
    angular.module('app', ['esri.map']);
</script>
```

See the [Quick Start](#)



## Demo: Brief Tour – Set Basemap



## Demo: Brief Tour – Web Map with Legend

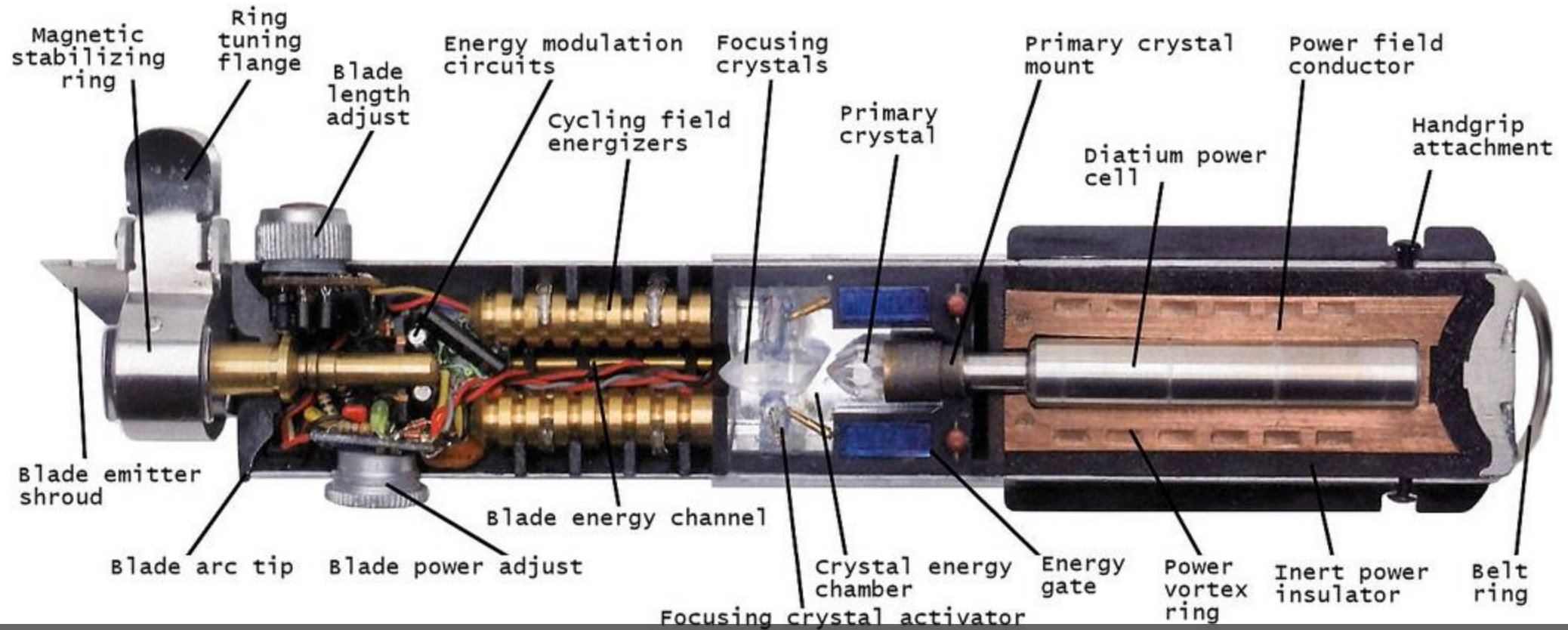




angular-esri-map

DevSummit 2015





# A reference implementation





Create your own map directives



# <parcel-map id="1919377001" />

## Parcel Map

Parcel ID:

1919377001

Select

Clear

### Parcel Details

5415 Provincial Dr  
Bloomfield Hills, MI 48302

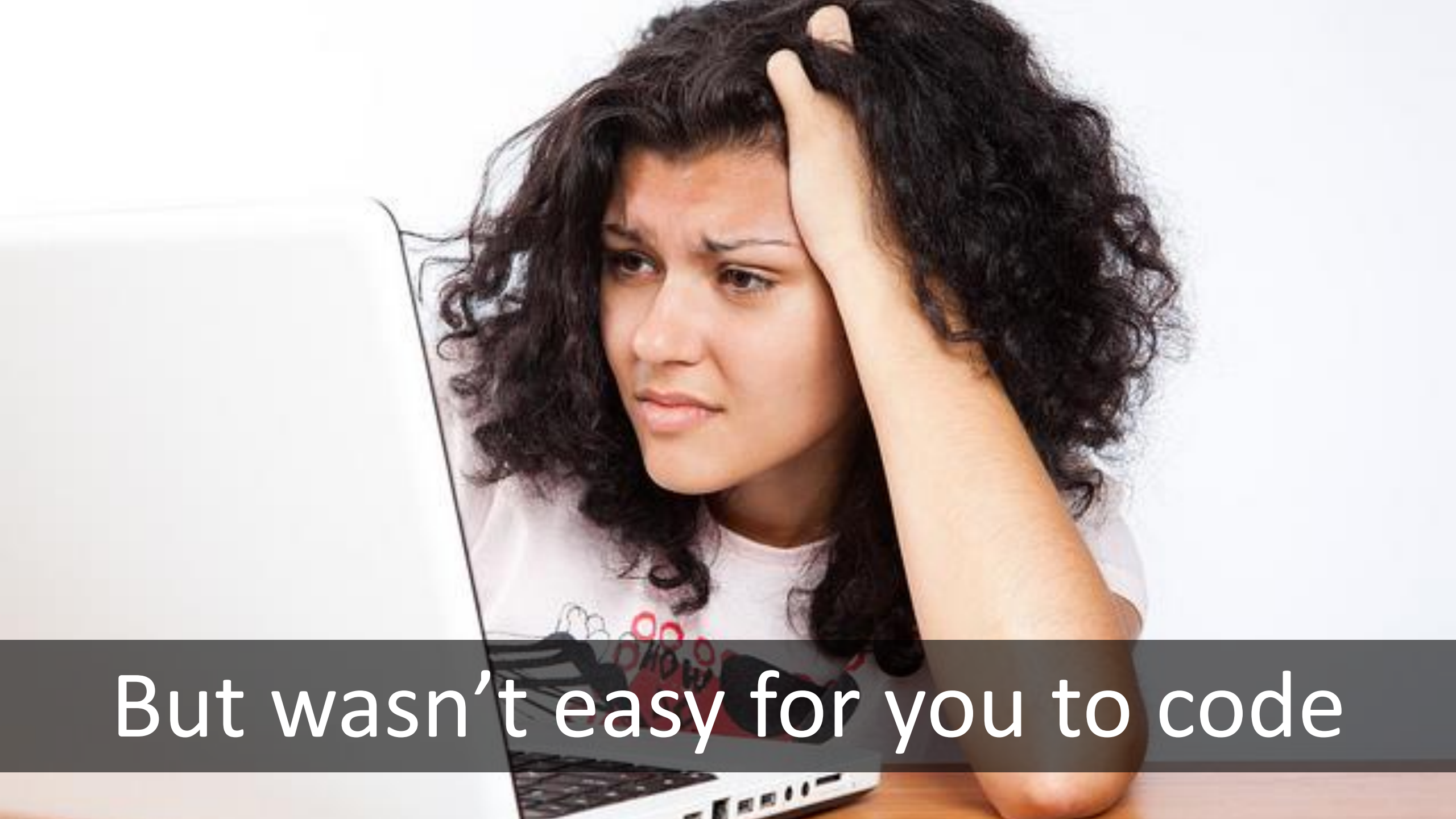
T2N, R10E, SEC 19 BLOOMFIELD  
SQUARE SUB NO 4 LOT 111

Type: Ranch

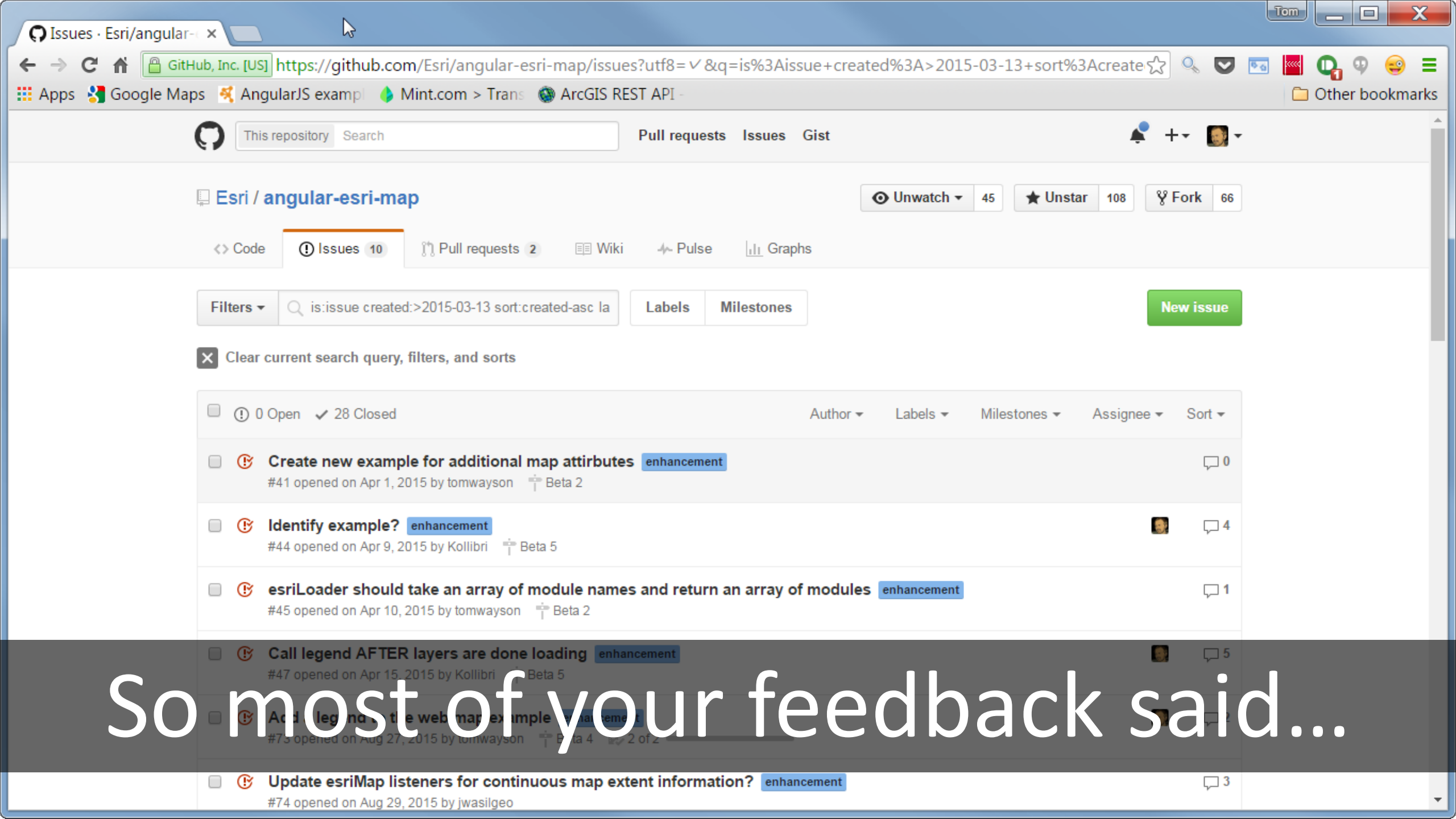
Built: 1974



# Easy for non-GeoDevs to use



But wasn't easy for you to code



So most of your feedback said...





“More re-usable directives!”







OK, Let's work together



1) A few more directives & attributes





2) Help you extend & meet your needs

# What's New

Since last we talked

# Added New Layer Types

- `<esri-dynamic-map-service-layer />`
- `<esri-vector-tile-layer />`



# Additional Layer Attributes

- **Visibility**
- **Opacity**
- **Definition Expression (Feature only)**
- **Constructor options**

# Added support for

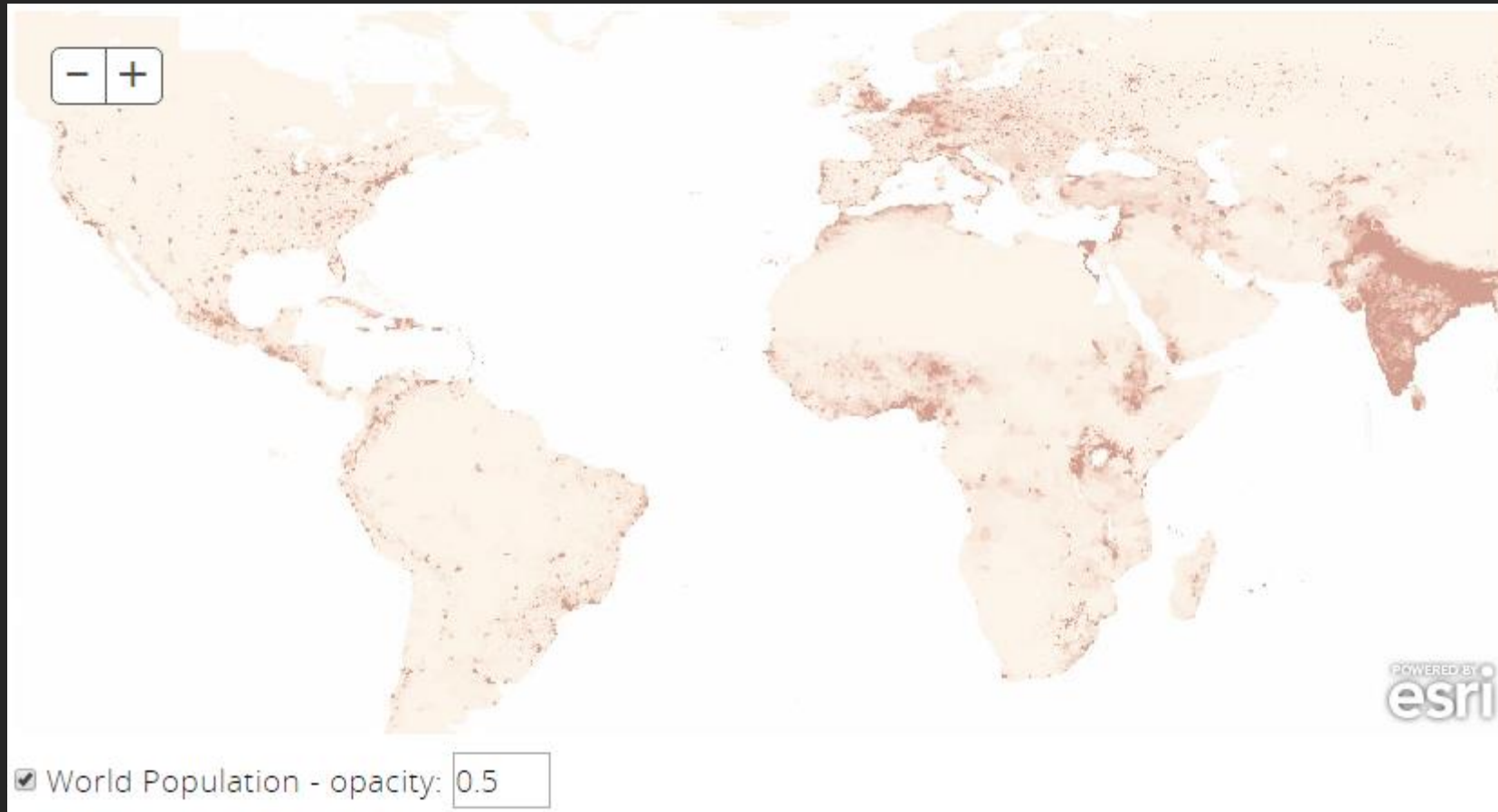
- Info templates
- Typed map constructor options (Extent, etc)
- Add/remove layers after map init



# Demo

**New Directives and Attributes**

## Demo: What's New – Dynamic Map Service Layer



## Demo: What's New – Vector Tile Layer







angular-esri-map

DevSummit 2016



Thank you!

Mostly driven by your contributions



2<sup>nd</sup> Goal: Make it easy to extend

# esriLoader Improvements

- Load multiple Esri modules at once
- Promise and callback signatures
- Lazy load ArcGIS JavaScript API



# Refactor out “core” code

- Refactored shared code into services
- Moved services into `esri.core` module
- Ideal for writing your own directives

# A library you can count on

- Unit tests for services
- e2e tests for directives
- Documented public methods/attributes

# Patterns Pages

- Handling map and layer events
- Loading additional Esri classes
- Creating own custom directives



# Demo

**Patterns: Extend by example**



# Patterns

- ➡ • **Straightforward mapping needs?**
  - Use directive property bindings in **esri.map** Angular module

<esri-map>

<esri-legend>

<esri-feature-layer>

<esri-info-template>

<esri-dynamic-map-service-layer>

<esri-vector-tile-layer>

# Patterns

- Straightforward mapping needs?



- Need a little more control?
  - Use callback `load` event binding with map (and layer) directives
  - And `esriLoader.require()` to get other JSAPI modules

```
<esri-map load="onMapLoad" ...></esri-map>
<script>
    // in the controller, start once the map is loaded
    this.onMapLoad = function(map) {
        // load Esri modules using the esriLoader
        esriLoader.require([
            'esri/toolbars/draw',
            ...
        ])
    }
</script>
```

# Patterns

- Straightforward mapping needs?
- ➔ • Need a little more control?
  - Use callback `load` event binding with map (and layer) directives
  - And `esriLoader.require()` to get other JSAPI modules

Demo: [Other Esri Modules](#) example

# Patterns

- Straightforward mapping needs?
- Need a little more control?
- ➔ • Need even more power?
  - Roll your own map and layer directives
  - Use **esri.core** Angular utilities module with **esriLoader.require()**

```
<parcel-map pin="ABC123"></parcel-map>
```

```
<lot-layout-map lot="93920-A-23"></lot-layout-map>
```

```
<workorder-map order="10-31-14-002"></workorder-map>
```



# Patterns

- Straightforward mapping needs?
- Need a little more control?
- ➔ • Need even more power?
  - Roll your own map and layer directives
  - Use **esri.core** Angular utilities module with **esriLoader.require()**

```
<housing-map basemap="gray" show-layer="true"></housing-map>
```

```
<esri-point-renderers-map  
  heatmap-renderer-params="heatmapRendererParams"  
  cluster-tolerance="clusterTolerance"  
  renderer-active="{{rendererActive}}">  
</esri-point-renderers-map>
```

# Patterns


- Straightforward mapping needs?
- Need a little more control?
- ➔ • Need even more power AND want to share mapping state?
  - Use **esriRegistry** to get map reference among controllers

```
<esri-map id="map" register-as="myMap" basemap="topo" ... ></esri-map>
```

```
esriRegistry.get('myMap').then(function(map){  
    map.on('click', function(e) { // do something with click handler }  
    ...  
})
```

See the [Registry Pattern](#) example

# Patterns

- Straightforward mapping needs?
- Need a little more control?
-  • Need even more power AND want to share mapping state?
  - Suggestion: Todd Motto's [Rethinking AngularJS Controllers](#)
  - Focus on sharing a custom map's state, rather than making reusable directives
  - Make use of your own factory that can be injected among directives, controllers
    - Anything from JSAPI could live in the factory: a map, layers, graphics, etc.
    - Any other directive can then ask the factory for reference



# WebGIS Spatial Economical Clusters in Argentina Development Version - Province of Santa Fe

Experimental Geographic Information System (on behalf of [Fundación "Observatorios PyME Regionales"](#)) - [more info](#)

## LEGEND

### ADMINISTRATIVE BOUNDARIES

- ☒ National Boundary
- ☒ Province of Santa Fe

### ZOOM TO LOCATION

ROSARIO

### COMPANIES - LOCAL UNITS

#### Search Parameters

ISIC CODE (first 2 digits ...) **all**

specific Isic code  [info](#)

#### Employment classes' range

From **0** to **8**

#### Search for Company Name

[info](#)

#### Territorial scope of the search

☒ In the current view

☐ All the territory

Province of **all provinces ...**

Location of **all locations ...**

Marker dim multiply **1** [info](#)

Max Results per query: **500**

(better not more than 1500 ...) [info](#)

#### Results Ordered by

employees' class **desc**

Add on the Map Clean ...

### CONTENT MANAGEMENT SYSTEM

[Access Data Front End - CMS](#)

#### ISIC decodes (first 2 digits)

- 15 Manufacture of food products and beverages
- 16 Manufacture of tobacco products
- 17 Manufacture of textiles
- 18 Manufacture of wearing apparel; dressing and dyeing of fur
- 19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
- 20 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- 21 Manufacture of paper and paper products
- 22 Publishing, printing and reproduction of recorded media
- 23 Manufacture of coke, refined petroleum products and nuclear fuel
- 24 Manufacture of chemicals and chemical products
- 25 Manufacture of rubber and plastics products
- 26 Manufacture of other non-metallic mineral

Info Location

id= 5391

Company name

**ANTUNA JOSE MARIA INGARAMO**

28110 - Manufacture of fabricated metal products, except machinery and equipment

SAN NICOLAS 965

Province: SANTA FE

Class: from 11 to 20 employees

(Geocoding accuracy: Address level)

You can build this, but...

## SEARCH RESULTS ON THE MAP

TOTAL RESULTS ON THE MAP: 500

LAST SEARCH RESULTS: 500 [info](#)

- FALCONE BODETTO S A**  
Isic: 33200 - Manufacture of medical, precision and optical instruments, watches and clocks  
Location: ROSARIO  
(from 251 to 500 employees ...)
- SIPAR ACEROS S.A.**  
Isic: 27100 - Manufacture of basic metals  
Location: PEREZ  
(from 251 to 500 employees ...)
- DANA ARGENTINA S A**  
Isic: 34300 - Manufacture of motor vehicles, trailers and semi-trailers  
Location: ROSARIO  
(from 251 to 500 employees ...)
- MATTIEVICH S A**  
Isic: 15111 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- SOLIDO S R L**  
Isic: 18110 - Manufacture of wearing apparel; dressing and dyeing of fur  
Location: ROSARIO  
(from 251 to 500 employees ...)
- CAFES LA VIRGINIA S A**  
Isic: 15491 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- CAFES LA VIRGINIA S A**  
Isic: 15491 - Manufacture of food products and beverages  
Location: ROSARIO  
(from 251 to 500 employees ...)
- LAVADERO VIRASORO S A**  
Isic: 17120 - Manufacture of textiles  
Location: ROSARIO  
(from 101 to 250 employees ...)
- AMERICANO SA**  
Isic: 17120 - Manufacture of textiles  
Location: ROSARIO  
(from 101 to 250 employees ...)
- EDITORIAL DIARIO LA CAPITAL S A**  
Isic: 22120 - Publishing, printing and reproduction of recorded media  
Location: ROSARIO  
(from 101 to 250 employees ...)
- FRECICAR S R L**  
Isic: 25201 - Manufacture of rubber and plastics products  
Location: ROSARIO



Basic Details

Job Details

Payment Details

Pay Rates

Tax Details

First Name(s)

Duck

Surname or Contractor \*

Ranger

Person ID

duck

Address

12 The Esplanade  
Wellington

Email Address

duckranger@duckranger.com

Phone Number

Gender \*

Male

Date of Birth

dd/mm/yyyy



Still the “sweet spot”

Cancel

Save Person

What's the migration path to  $4x/2x$ ?





angular-esri-map

For use w/ Angular 1.x only

# Version Compatibility

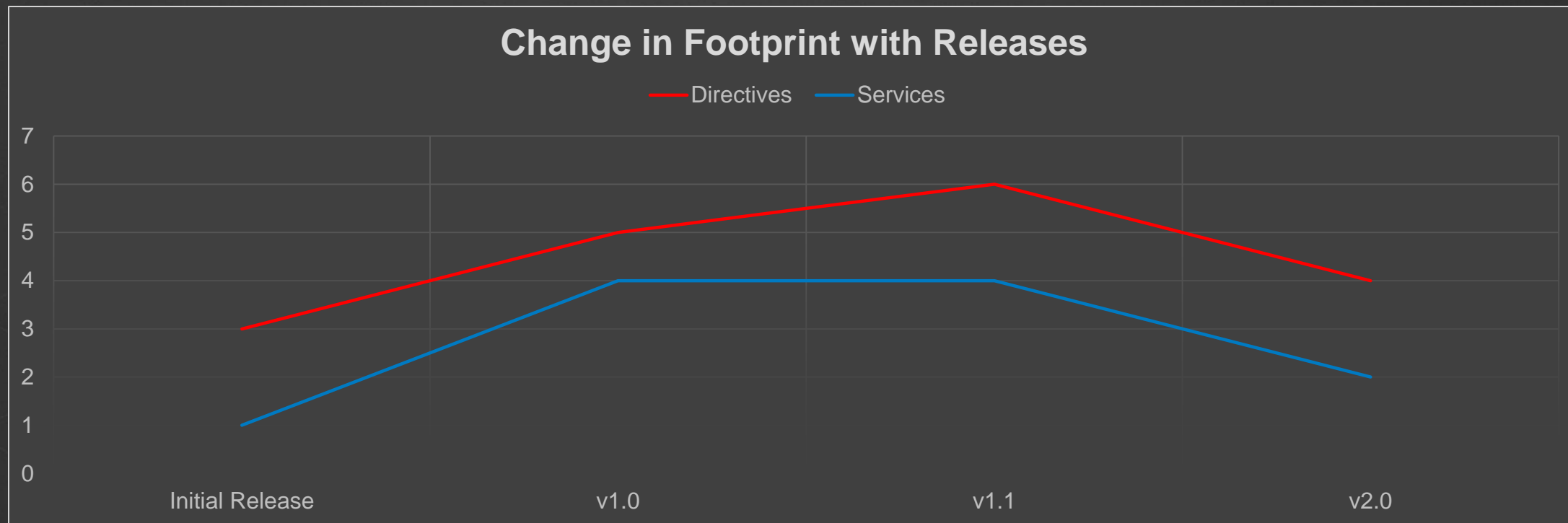
angular-esri-map

angular-esri-map	Angular	ArcGIS API for JavaScript
v1.0	v1.3+	<u>v3.12+</u>
v1.1	v1.3+	<u>v3.15+</u>
v2.xbeta	v1.3+	<u>v4.0beta3+</u>



# Decreasing Footprint of angular-esri-map

As Angular and ArcGIS API for JavaScript become more compatible



# JSAPI 4.x with Angular 1.x

- JSAPI 4.x has breaking changes
- angular-esri-map 2.x has breaking changes

# The Good News

- Services are unchanged
- Patterns are unchanged, and become more important

# The Not So Good News

- Directives are completely different
- Only include directives for objects that have a UI footprint



# A Better Dev Experience

- No need learn new declarative API
- Write code in a familiar style



What about Angular 2?

# Even Smaller Surface

- May not need reusable components
- Still figuring out the patterns

# Follow Along at Home

## Angular 2 Integration Patters

- [odoe/esrijs4-vm-angular2](#)  
JSAPI 4 + Angular 2: Focus on view models
- [tomwayson/angular2-esri-example](#)  
Example Angular 2 app using JSAPI 3
- [jwasilgeo/angular2-esri-playground](#)  
Deeper dive into JSAPI 4 + Angular 2



# Road Ahead

**Angular 1.x & JSAPI 4**

**Angular 2.x & JSAPI 3 & 4**

**ArcGIS API for JavaScript and AngularJS:**

**What's New, What's Next**

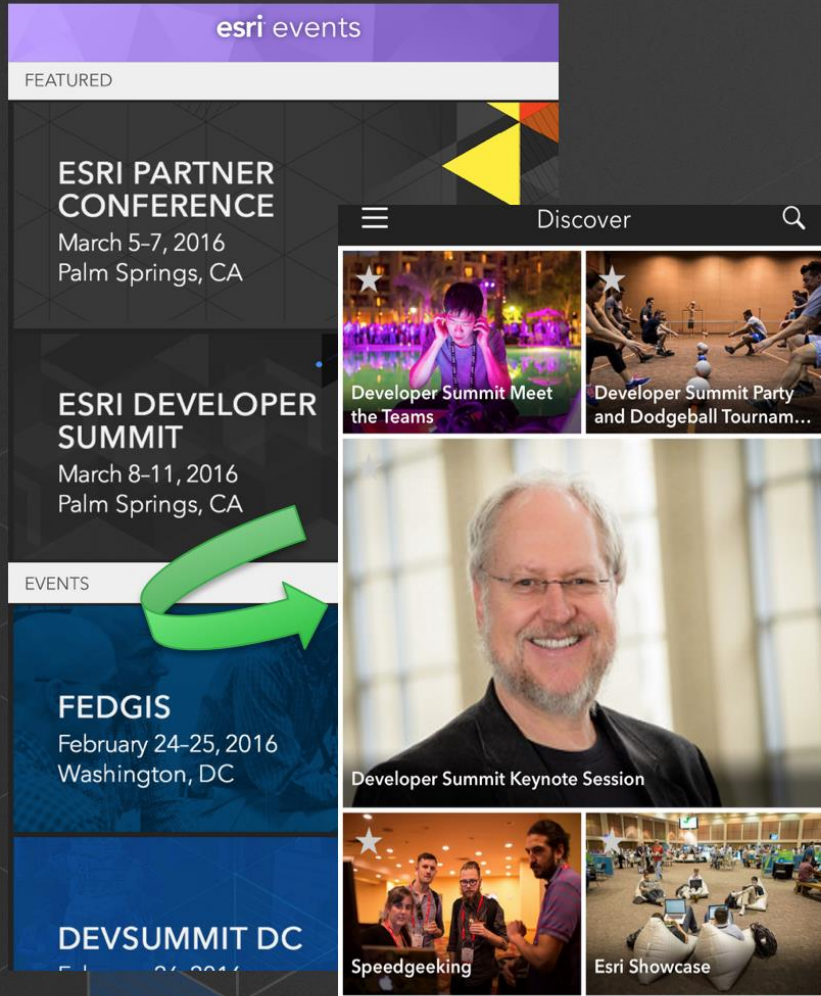
**Today 5:30PM Mesquite B**

# Thank You

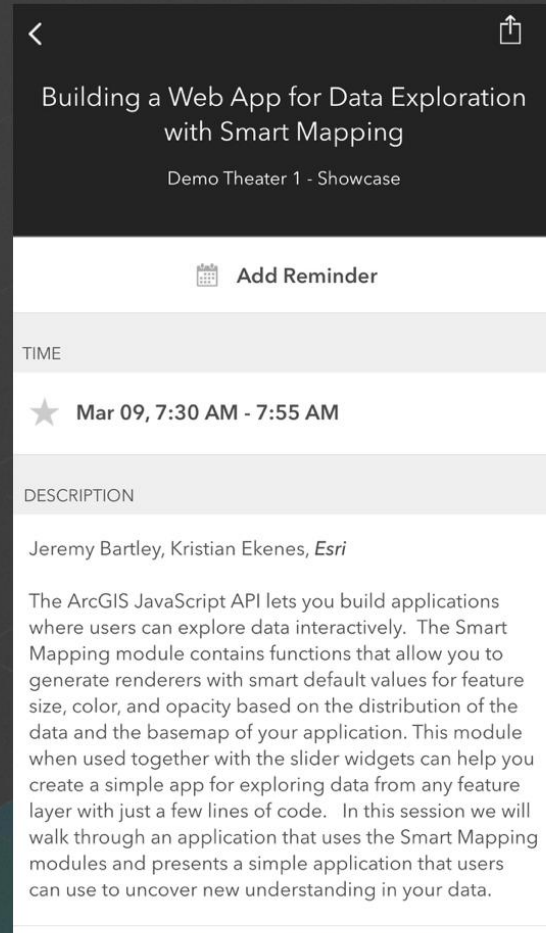
Tom Wayson [@tomwayson](#) | Jacob Wasilkowski [@jwasilgeo](#)

# Please Take Our Survey!

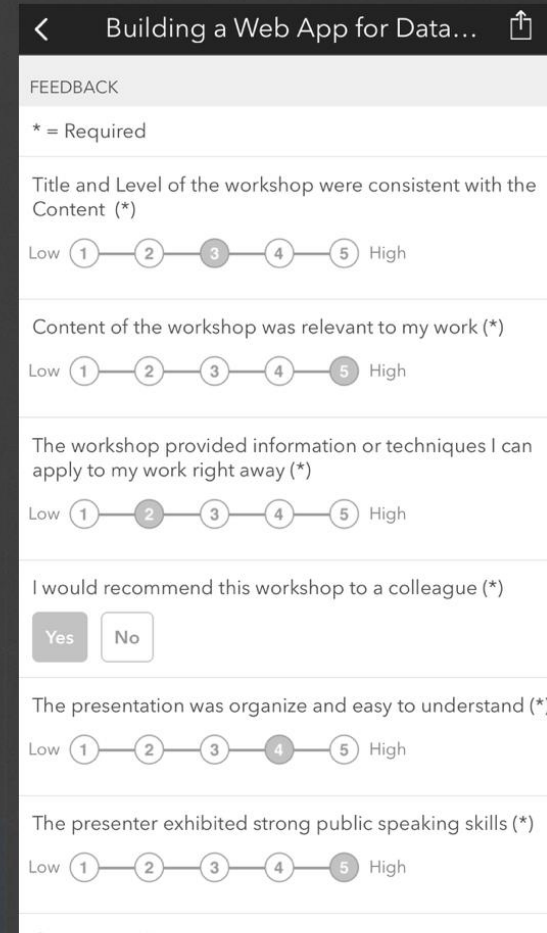
Download the Esri Events app  
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Select the session you  
attended



Scroll down to the  
“Feedback” section



Complete Answers,  
add a Comment,  
and Select “Submit”

