



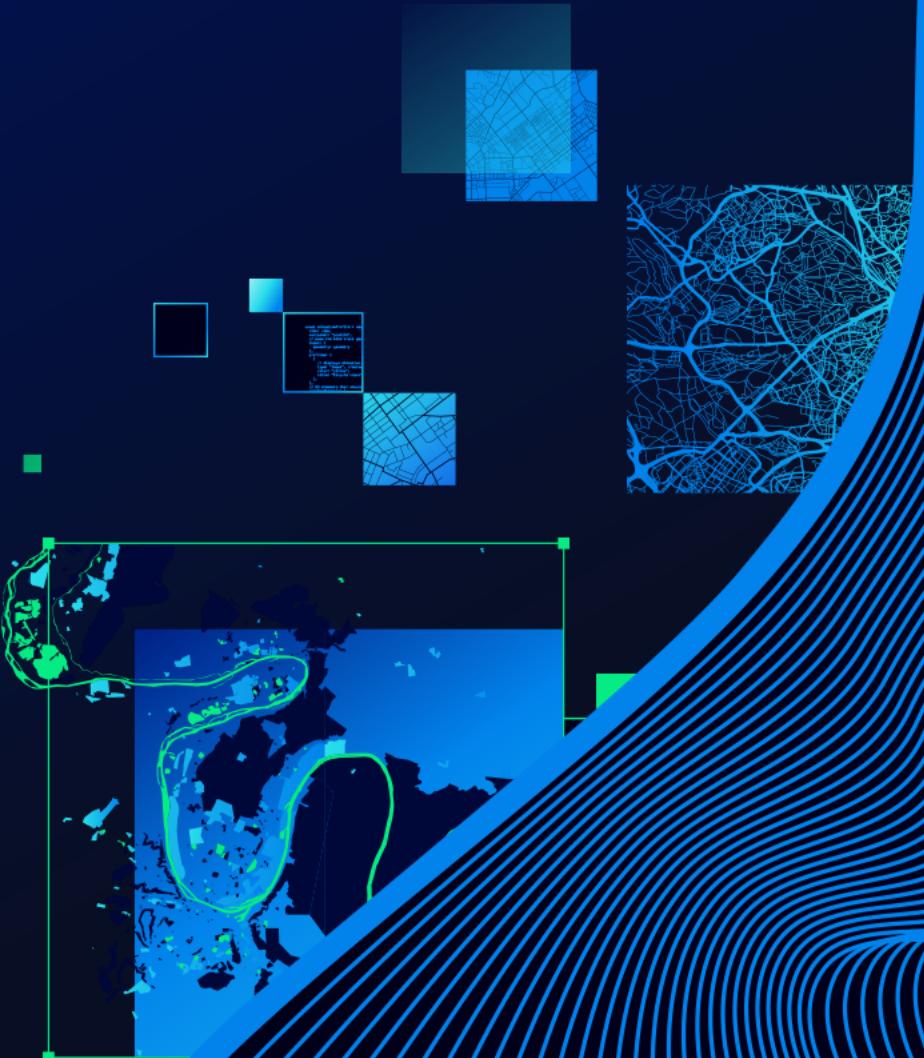
ArcGIS API for JavaScript: Building Web Apps Using Data from Anywhere

Jose Banuelos and Lauren Boyd

2022 ESRI DEVELOPER SUMMIT



Demos and slides
available at [Github Repo](#)



Agenda

Using external data sources
with the ArcGIS API
for JavaScript

GeoJSON

CSV

OGC



External Data Sources

- Different subclasses of Layer based on the data type
- List of external data source layer types

```
// typical programming pattern for working with external data
const layer = new Layer({
  url: "url to your external data",
})
```



Recently Added Capabilities

	2021		
	GeoJSON	CSV	OGC
Faster smart mapping	X	X	X
Refresh Layer from Data Source	X	X	
Custom Parameter Support	X	X	
Feature Effect Support	X	X	X
Control Feature Drawing Order	X	X	X
FeatureTable Support	X	X	X (WFSLayer only)
Editor Feature Snapping	X	X	X (WFSLayer only)



GeoJSON

Lauren Boyd



```
// live  
by  
the  
code;
```

GeoJSON Data

- Format for encoding geographic data structures
- RFC7964 Specification requires:
 - Geometry, a feature, or a collection of features.
 - World Geodetic System 1984 (WGS84) datum

```
1  {
2      "type": "FeatureCollection",
3      "name": "FH_Perimeter",
4      "crs": {
5          "type": "name",
6          "properties": {
7              "name": "urn:ogc:def:crs:OGC:1.3:CRS84"
8          }
9      },
10     "features": [
11         {
12             "type": "Feature",
13             "properties": {
14                 "OBJECTID": 14680,
15                 "poly_IncidentName": "Muck Farm",
16                 "poly_FeatureCategory": "Wildfire Daily Fire Perimeter",
17                 "poly_MapMethod": "Phone/Tablet",
18                 "poly_GISAcres": 2.9902640601488399,
19                 "poly_CreateDate": "2022-01-06T13:21:06Z",
20                 "poly_DateCurrent": "2022-01-06T16:21:06Z",
21                 "poly_PolygonDateTime": null,
22                 "poly_Acres_AutoCalc": 2.99025142073934,
23                 "poly_GlobalID": "{4308A734-2330-49B2-BBDB-6A2274DF76C9}",
24                 "poly_Source": "2022 NIFS",
25                 "irwin_ABCDMisc": null
26             }
27         }
28     ]
29 }
```

GeoJSONLayer

- Create layer based on GeoJSON
- Each layer will only accept:
 - One geometry type
 - One schema of the properties

GeoJSON Geometry Object	API Geometry Type
Point	Point
MultiPoint	Multipoint
LineString/MultiLineString	Polyline
Polygon/MultiPolygon	Polygon

GeoJSONLayer

Load GeoJSON Data

- Via GeoJSON URL

```
1 // points to the states layer in a service storing U.S. census data
2 const geojsonlayer = new GeoJSONLayer({
3   url: "https://earthquake.usgs.gov/earthquakes/feed/v1.0/summary/all_month.geojson",
4   copyright: "USGS Earthquakes"
5 });
```

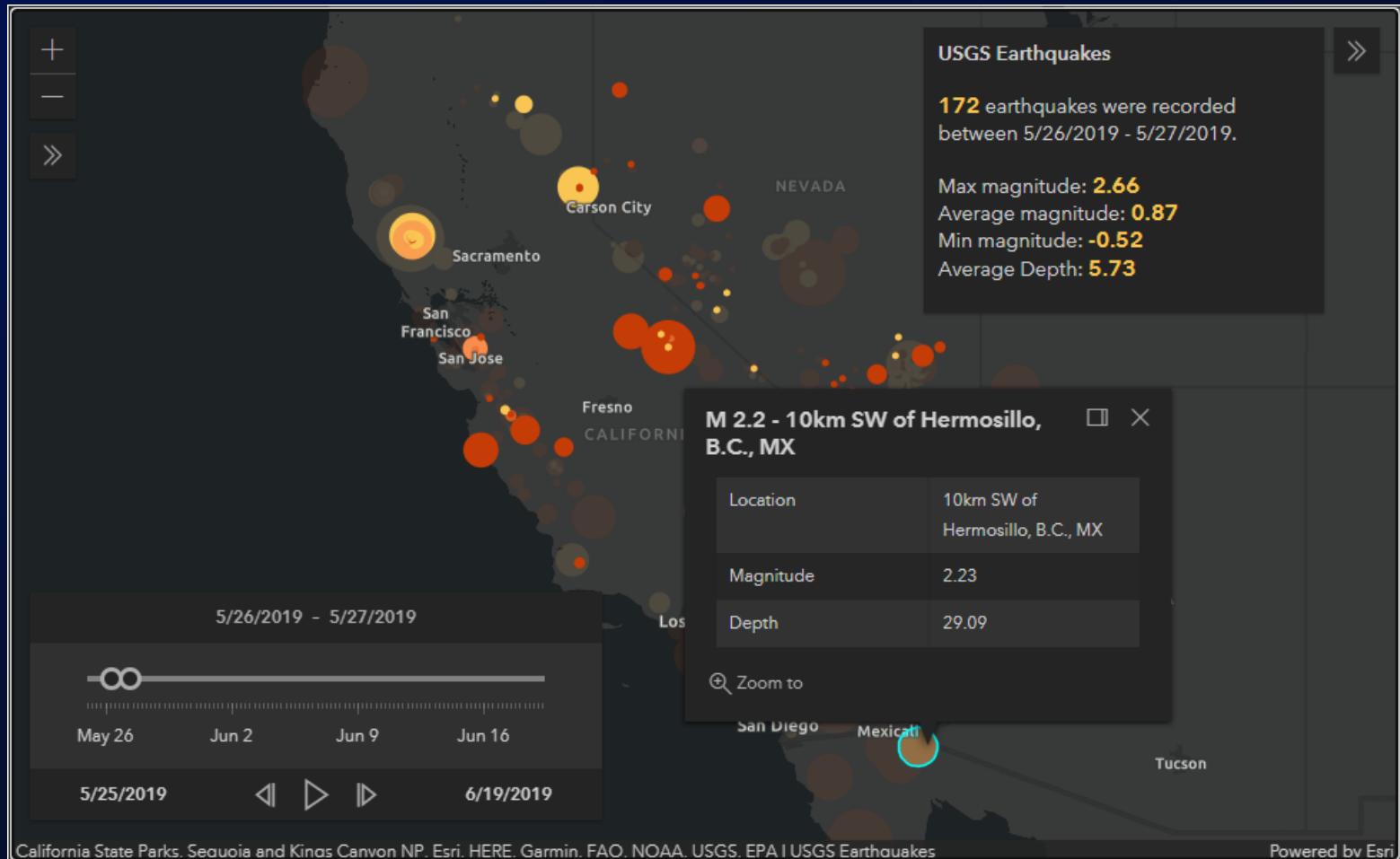
- Via blob URL for in memory data:

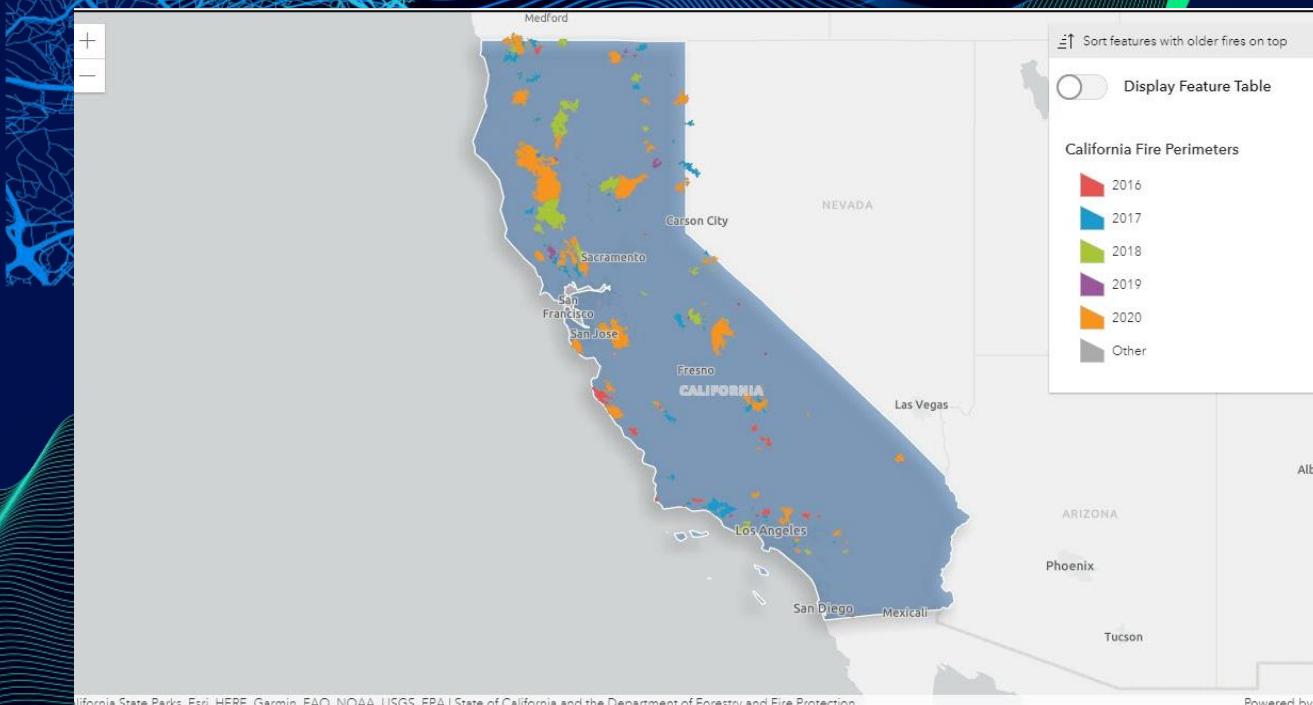
```
1 // create a new blob from geojson featurecollection
2 const blob = new Blob([JSON.stringify(geojson)], { type: "application/json" });
3
4 // URL reference to the blob
5 const url = URL.createObjectURL(blob);
6 // create new geojson layer using the blob url
7 const layer = new GeoJSONLayer({ url });
```

GeoJSONLayer

Capabilities

- Supports:
 - Clustering
 - Layer Blending
 - Custom parameters
 - Layer and Feature Effects
 - Widgets
 - Time
 - ... etc!





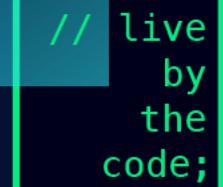
GeoJSONLayer

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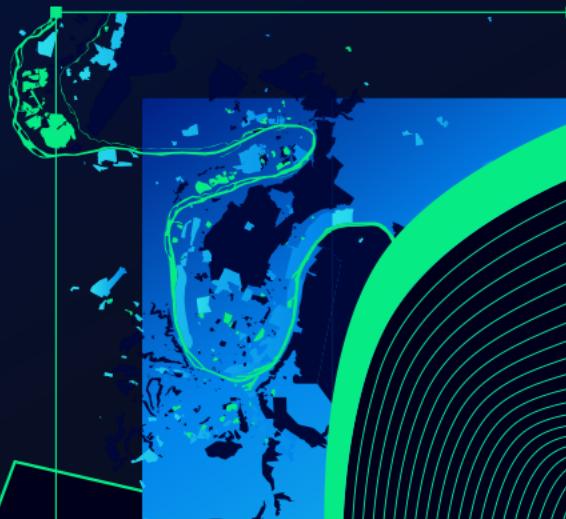
California Department of Forestry and Fire Protection - Large Fire Parameters

OGC

Lauren Boyd & Jose Banuelos



// live
by
the
code;



OGC Services and OGC Layer Types

- JS API supports the following services:

Service Type	API Layer Type
OGC API Features	<u>OGCFeatureLayer</u>
WFS (Web Feature Service)	<u>WFSLayer</u>
WMS (Web Map Service)	<u>WMSLayer</u>
WMTS (Web Map Tile Service)	<u>WMTSLayer</u>
WCS (Web Coverage Service)	<u>WCSLayer</u>

WFSLayer

Load WFS service data

- Create layer based on OGC Web Feature Service (WFS)

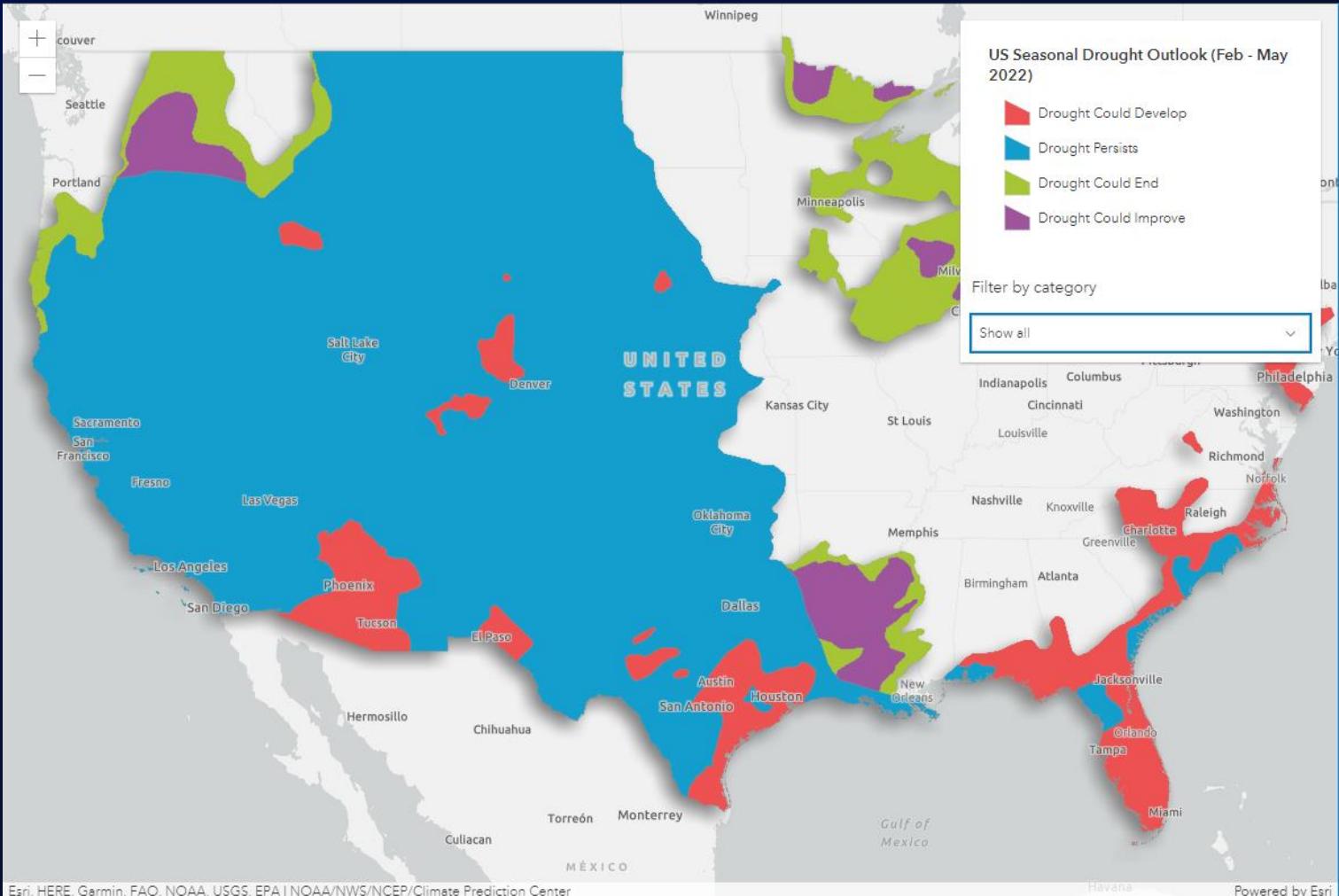
```
1 // Create a layer with features from Massachusetts 1990 census
2 const censusData = new WFSLayer({
3   url: "https://giswebservices.massgis.state.ma.us/geoserver/wfs",
4   name: "GISDATA.CENSUS1990BLOCKGROUPS_POLY"
5 });
```

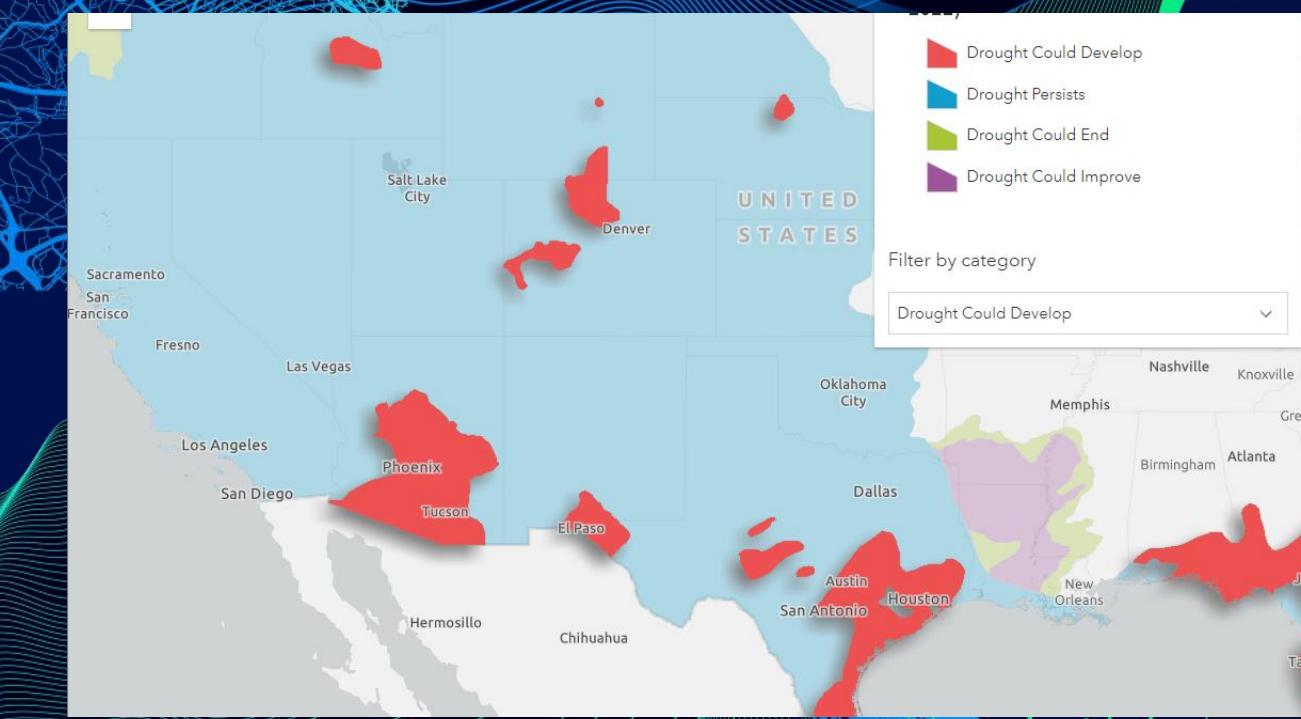
Properties Specified	Layer Load Behavior
None	First layer in the service
name	First layer with the name
name and namespaceUri	Layer with the name and namespace specified

WFSLayer

Capabilities

- Supports:
 - Clustering
 - Layer Blending
 - Custom parameters
 - Layer and Feature Effects
 - Smart mapping
 - Widgets
 - ... etc!





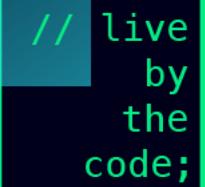
WFSLayer

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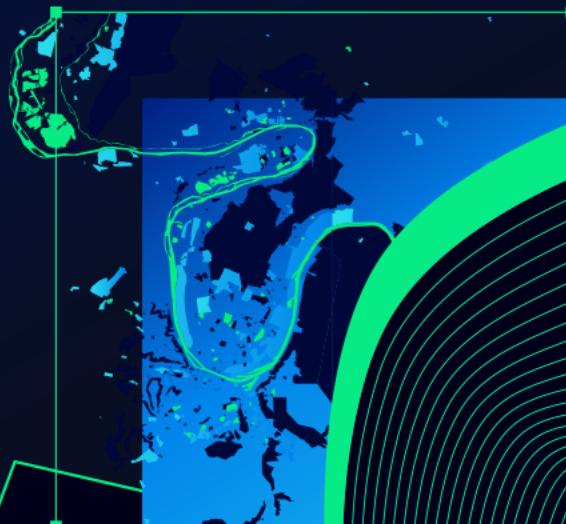
US Seasonal Drought Outlook (NOAA)

CSV

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// live
by
the
code;



CSV Data

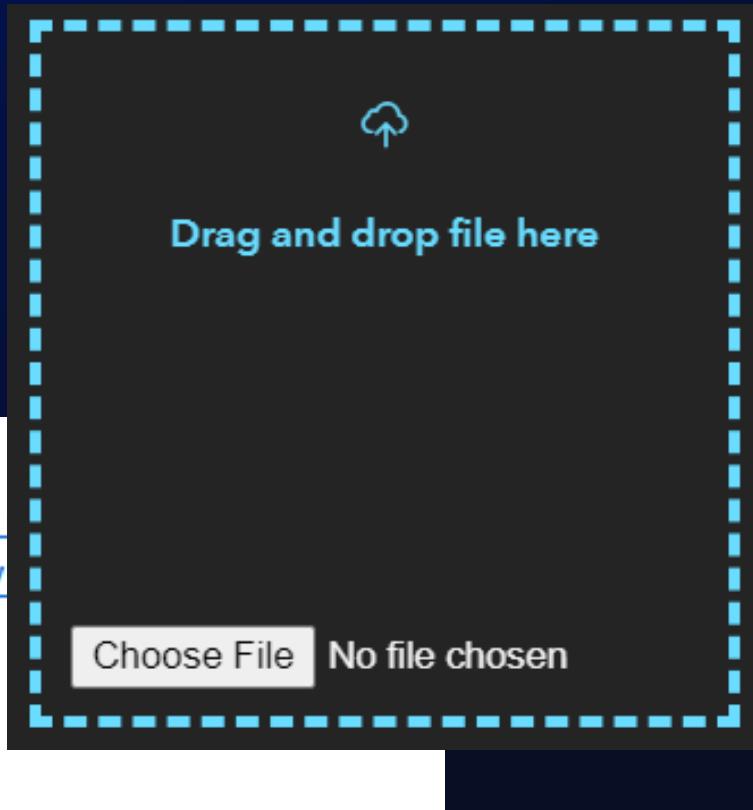
The screenshot shows a Microsoft Excel spreadsheet titled "wind_data_2_18_full". The data consists of 19 rows of weather observations. The columns are labeled as follows:

	A	B	C	D	E	F	G	H	I	J	
1	raw_text	station_id	observation_tin	latitude	longitude	temp_c	dewpoint	wind_dir	wind_speed	wind_gust	visib
2	PAKX 1900 PAKX	2022-02-19T00::		60.2	-154.32	1	0	230	4		
3	KY51 1900 KY51	2022-02-19T00::		43.58	-90.9	-2.8	-9.4	280	16	25	
4	KXSA 1900 KXSA	2022-02-19T00::		37.87	-76.9	3.4	-6.1	340	7		
5	KW96 1900 KW96	2022-02-19T00::		37.5	-77.12	4.5	-5.9	10	6		
6	KW81 1900 KW81	2022-02-19T00::		37.18	-78.1	5.2	-10.4	300	7		
7	KW75 1900 KW75	2022-02-19T00::		37.6	-76.45			360	16	19	
8	KW31 1900 KW31	2022-02-19T00::		36.95	-78.18	5.1	-4.4	280	4		
9	KVNW 1900 KVNW	2022-02-19T00::		40.87	-84.62	-3	-8	210	13	20	
10	KVER 1900 KVER	2022-02-19T00::		38.95	-92.68	2.7	-10.8	230	6		
11	KVDF 1900 KVDF	2022-02-19T00::		28.02	-82.33	23	21	0	0		
12	KVBW 1900 KVBW	2022-02-19T00::		38.37	-78.97	-0.2	-8.9	300	3		
13	KUNU 1900 KUNU	2022-02-19T00::		43.42	-88.7	0.5	-6	200	20	26	
14	KTGI 1900 KTGI	2022-02-19T00::		37.82	-75.98	5.4	-2.1	340	18	21	
15	KSXK 1900 KSXK	2022-02-19T00::		42.98	-96.17	-4	-20	320	43	53	
16	KSVC 1900 KSVC	2022-02-19T00::		32.63	-108.15	10.5	-11.8	150	5		
17	KSUT 1900 KSUT	2022-02-19T00::		33.93	-78.08	15.6	8.1	10	10		
18	KSPA 1900 KSPA	2022-02-19T00::		34.92	-81.95	7	-1	360	7		
19	KSNK 1900 KSNK	2022-02-19T00::		32.7	-100.95	10.9	-5.3	130	5		

CSVLayer

- Lat / Long automatic detection
 - CSVLayer.latitudeField
 - CSVLayer.longitudeField

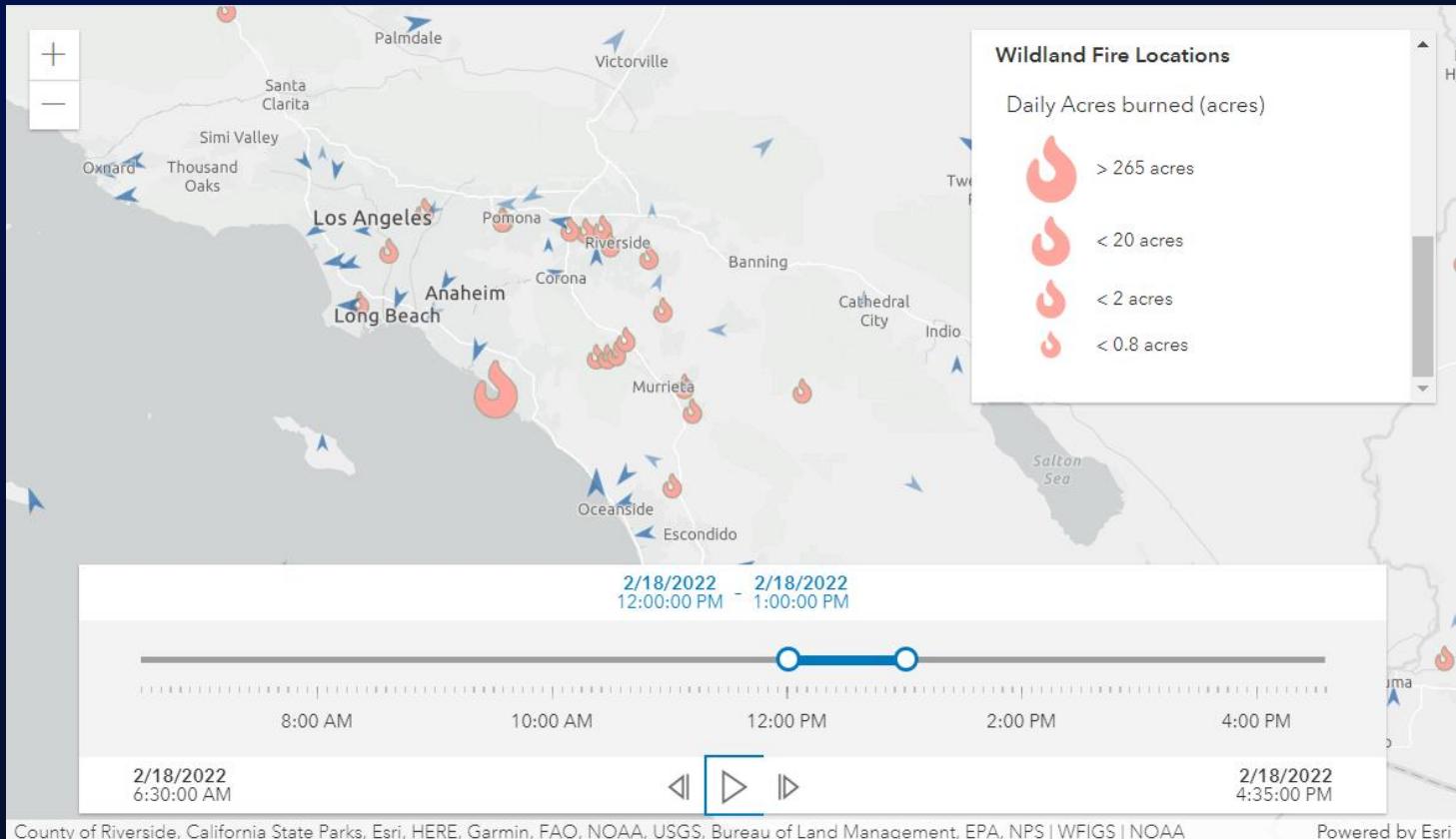
```
const csvLayer = new CSVLayer({  
  url: "https://developers.arcgis.  
  /latest/sample-code/layers-csv  
  /earthquakes.csv",  
  copyright: "USGS Earthquakes"  
});
```

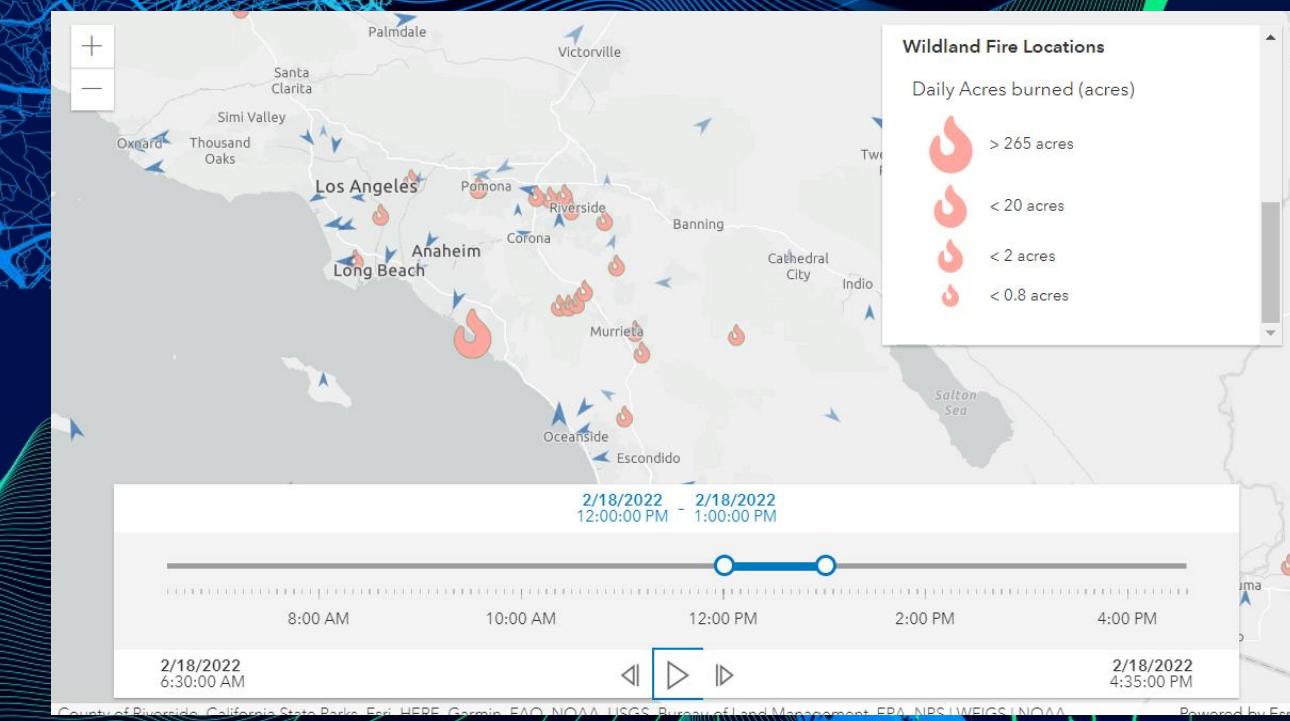


CSVLayer

Capabilities (same as geojson)

- Supports:
 - RefreshInterval
 - Clustering
 - Layer Blending
 - Custom parameters
 - Layer and Feature Effects
 - Widgets
 - Time
 - ... etc!



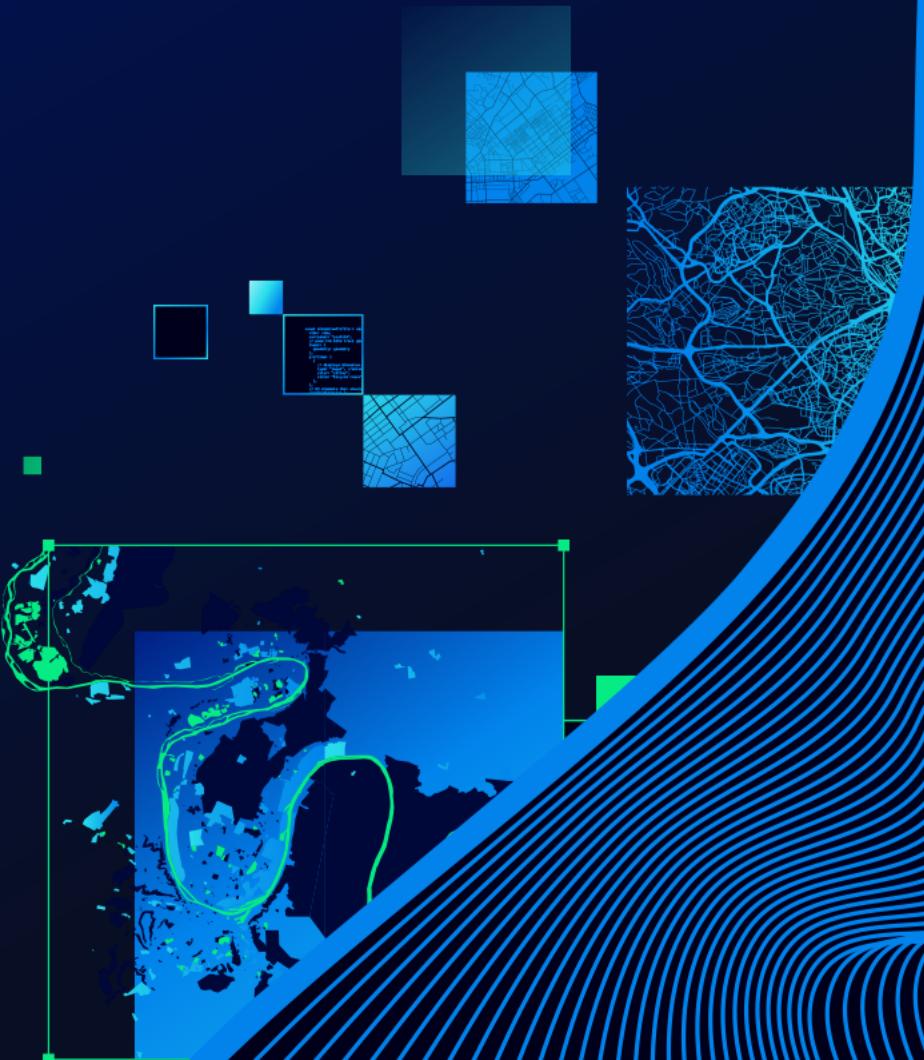


CSVLayer

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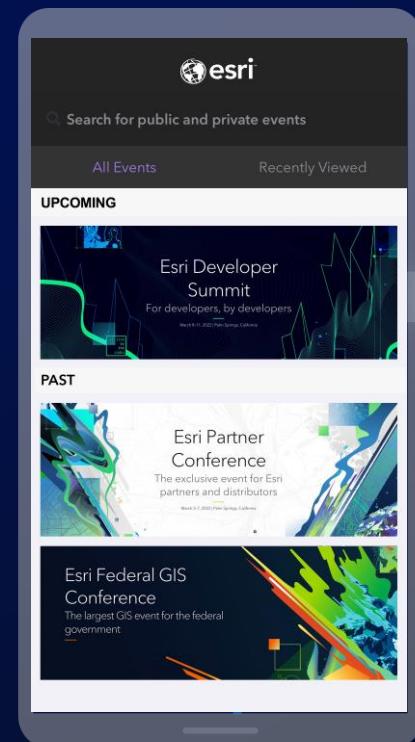
WFIGS - 2021 Wildland Fire Locations to Date
METAR station data from NOAA

Demos & Slides
available at [Github Repo](#)

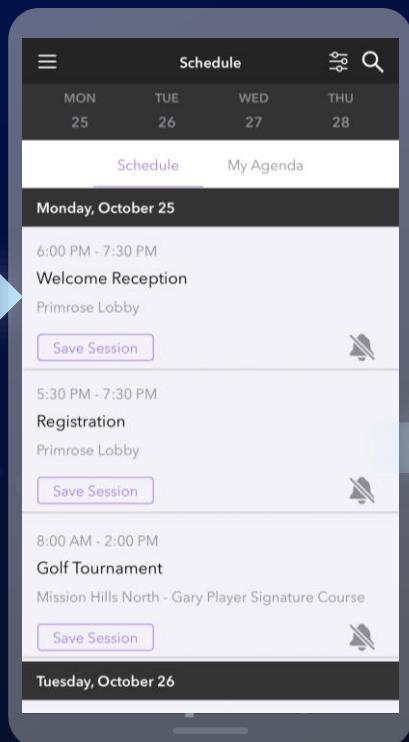


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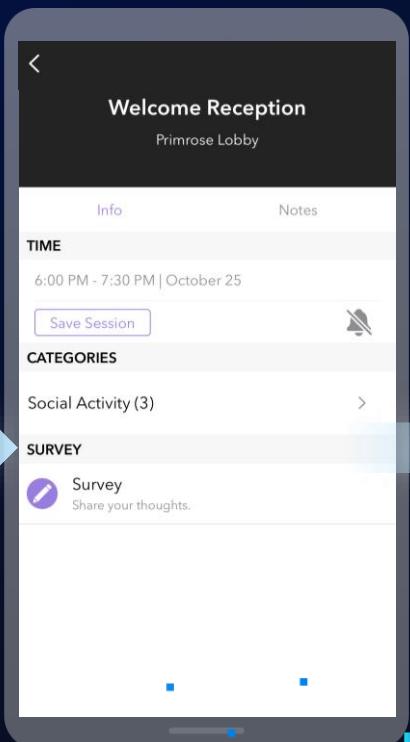
Download the Esri Events app and find your event



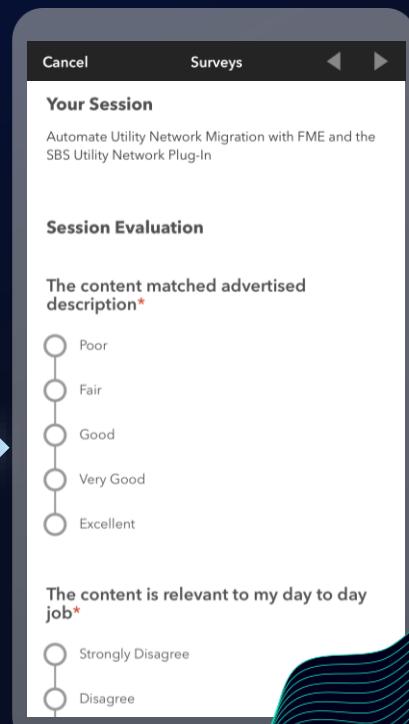
Select the session you attended



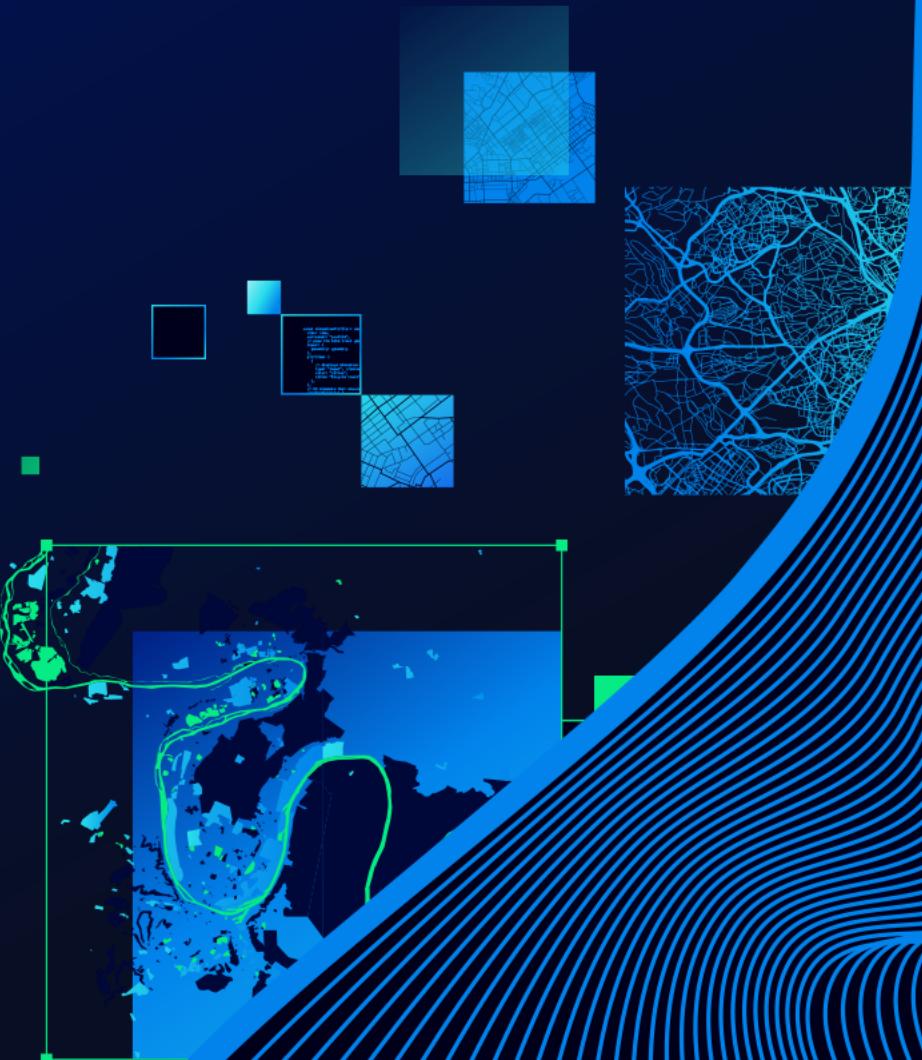
Scroll down to "Survey"



Log in to access the survey



Questions?





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