

# Using GIS Technology for Social Impact

University of Southern California

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Noah Sager

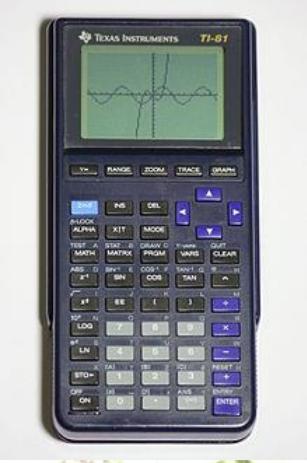
Product Engineer | ArcGIS API for JavaScript | Esri

@noashx

nsager@esri.com

# Agenda

- 1. Who am I?**
- 2. What are we talking about?**
- 3. GIS apps**
- 4. A tad o' data**
- 5. Career Opportunities**



**Bring On the Papers!**  
Esri UC Call for Papers Closes October 26

Do you have a GIS story to change the world? Can your insights

"Go for it! You have everything to





What is...  
**Geography?**



Everything is related.

Things that are closer  
are more related than  
things that are farther  
away.



# What is...

Geography?  
**GIS?**



Geographic Information System (GIS) lets us visualize, question, analyze, and interpret data to understand relationships, patterns, and trends. GIS benefits organizations of all sizes and in almost every industry.



GIS is a  
tool/science/technology  
that collects, analyzes,  
and visualizes spatial  
relationships on a  
computer\*.



# What is...

Geography?  
GIS?  
**ArcGIS?**



ArcGIS is an Esri GIS solution.

Desktop (Windows, Mac, Linux)  
Mobile (Android, iOS, Windows)  
Web (Chrome, IE, Opera, etc.)  
Embedded (Car, Fridge, etc.)

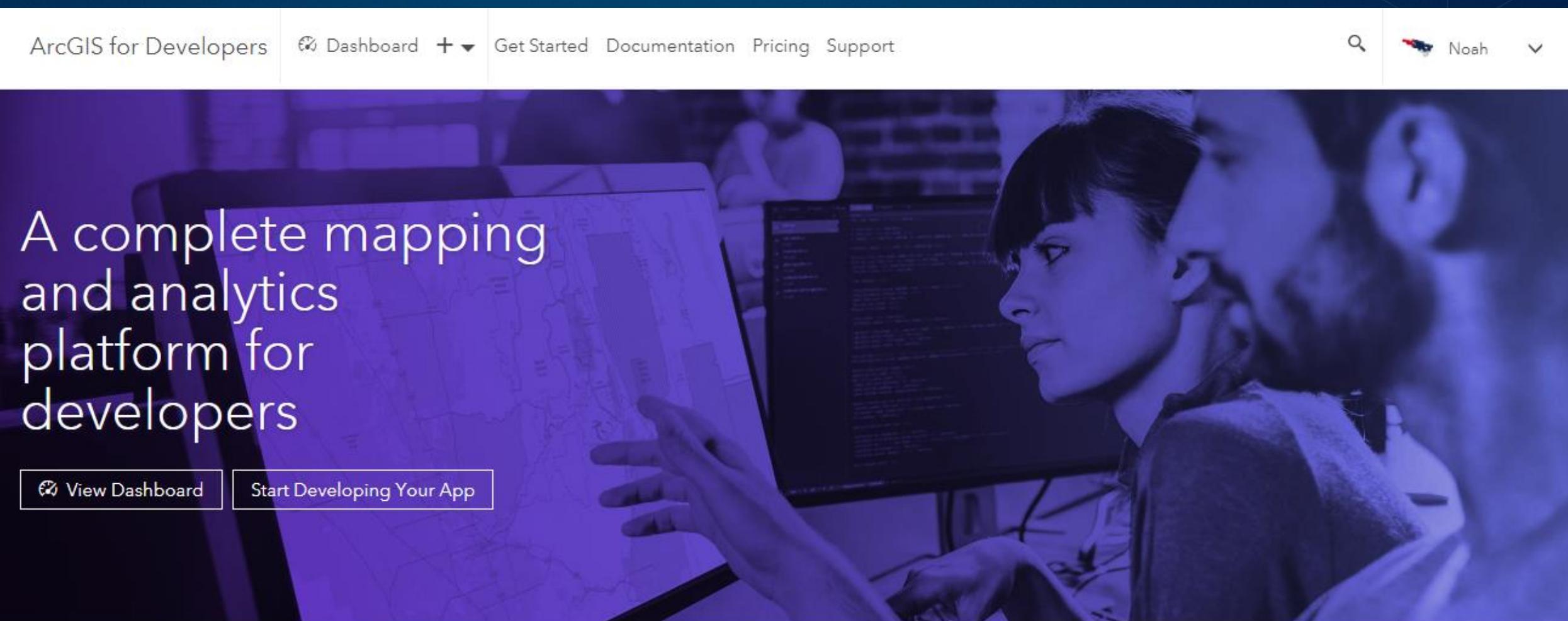


# What is...

Geography?  
GIS?  
ArcGIS?  
**GIS Programming?**



GIS Programming is a kickbutt way to solve geospatial problems and forward social causes in a creative and totally relevant/unique workflow.



A complete mapping and analytics platform for developers

[View Dashboard](#) [Start Developing Your App](#)

JS  iOS  .NET  Qt  REST  Python 

# ArcGIS for Developers

2D & 3D  
Maps



Search &  
Geocoding



Directions &  
Routing



Location  
Datasets



Spatial  
Analysis



Data  
Hosting

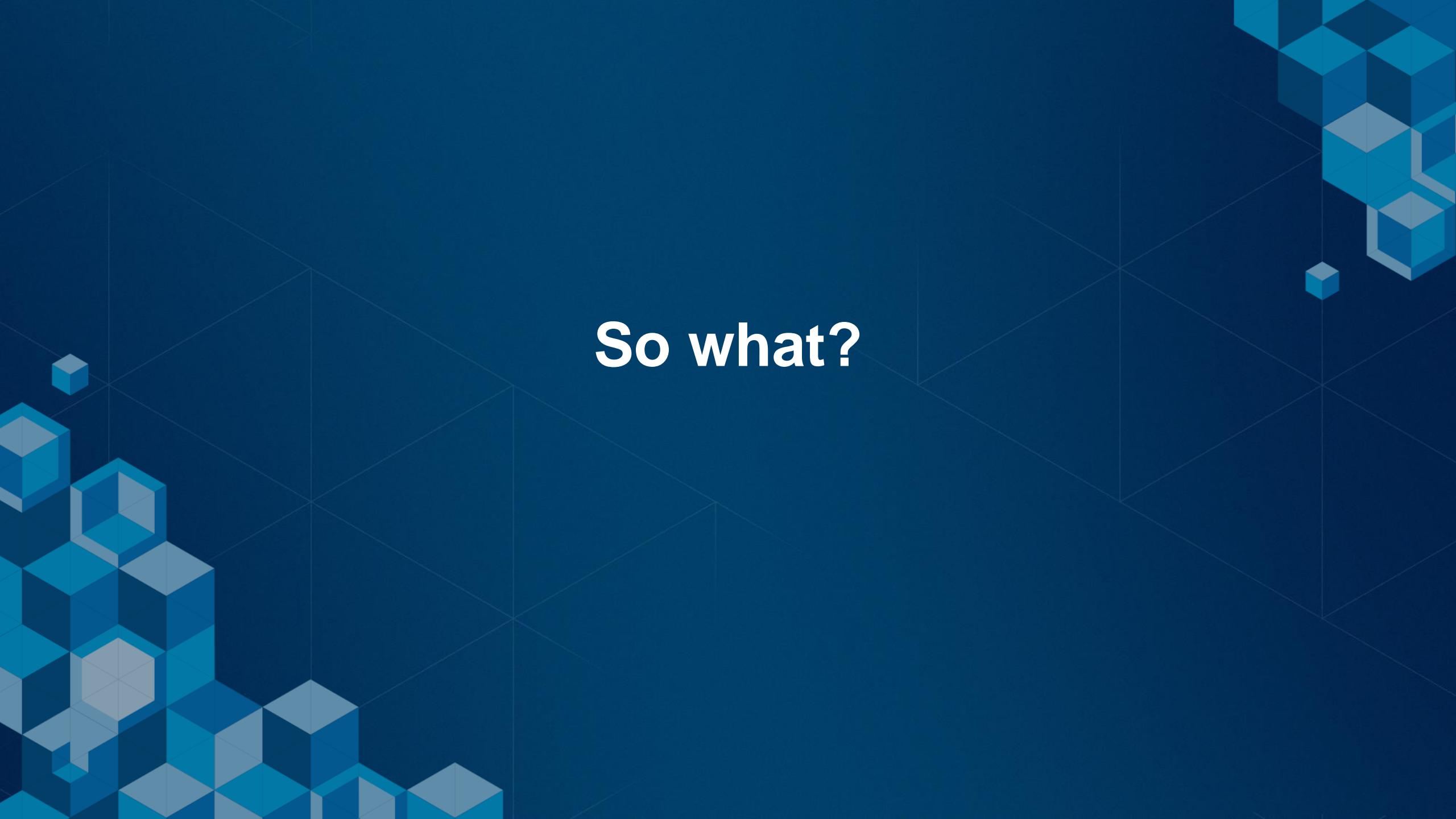


via

Our APIs & SDKs +  
ArcGIS Online

# APIs & SDKs



The background features a dark blue gradient with a subtle grid pattern. In the bottom left corner, there is a cluster of blue cubes of various sizes and shades, some with hexagonal faces. In the top right corner, there is another group of similar cubes, also in shades of blue.

**So what?**

# Faulty trail app leaves tourist stranded overnight on a cliff face

North Shore News

By **Brent Richter** - October 9, 2018

 Share on Facebook

 Tweet on Twitter

 G+

 P

North Shore Rescue says a tourist using a faulty trail map app on his phone was led astray into danger Monday evening.

The hiker, a 37-year-old man who was visiting from the U.K., was using the Maps.me app to navigate his way off Crown Mountain.

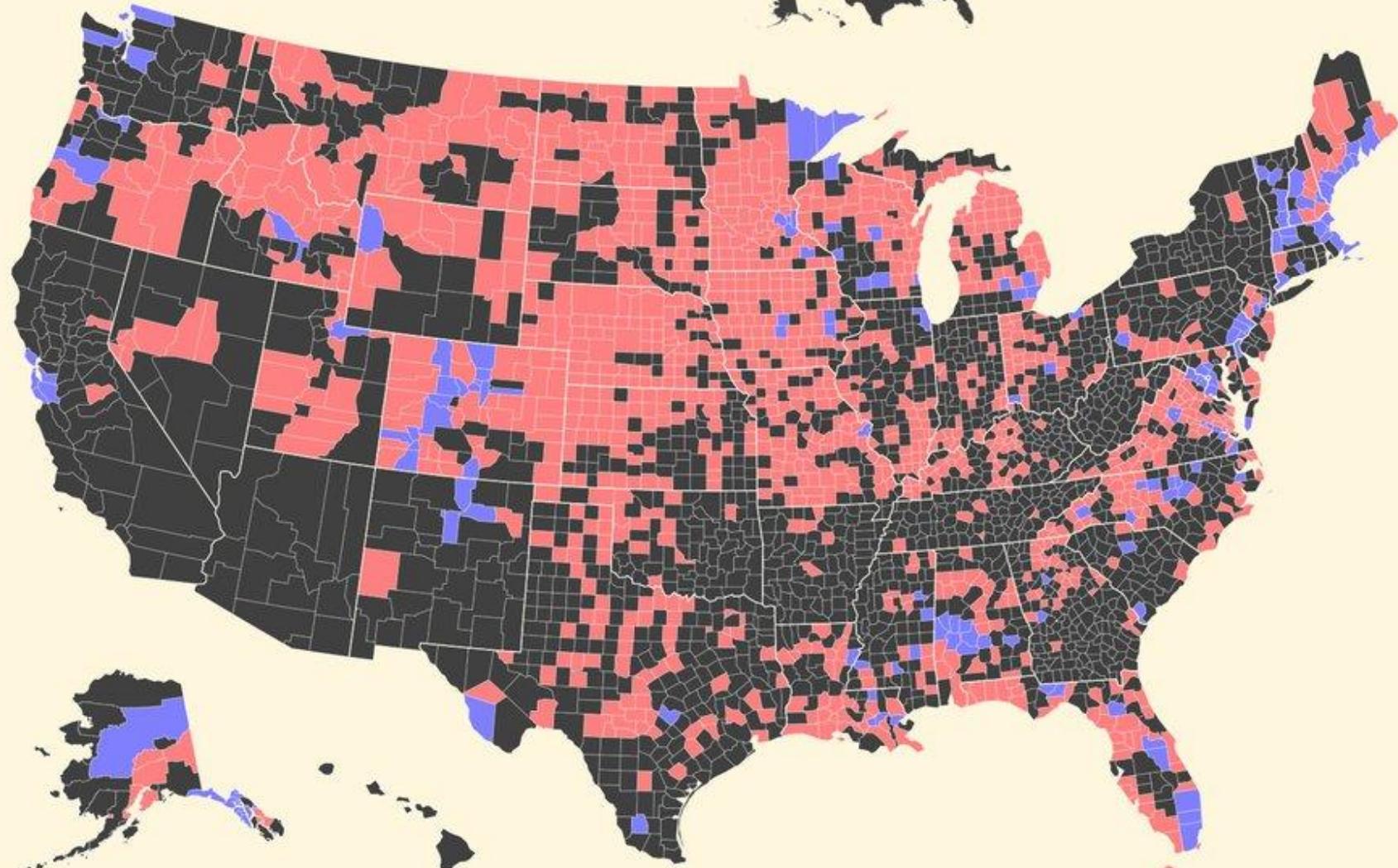


# United States of Apathy

2016 US Presidential Election results if abstention from voting was counted as a vote for "Nobody"



- Donald Trump - 21 electoral votes
- Hillary Clinton - 72 electoral votes
- "Nobody" - 445 electoral votes, winner





GATOR

Find address or place



### Legend

- Sub-Tropical Depression
- Sub-Tropical Storm
- Tropical Depression
- Tropical Storm
- Hurricane

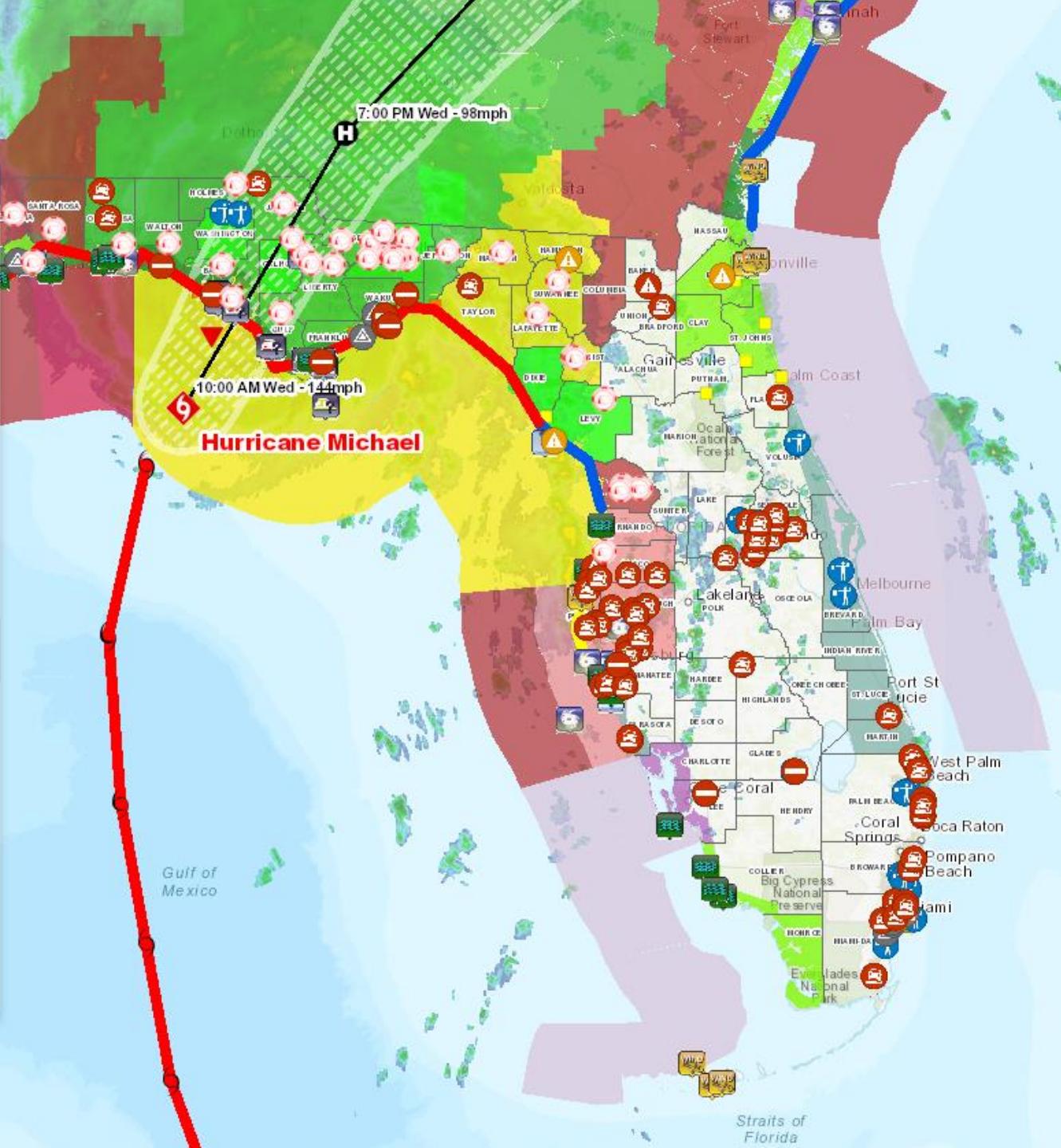
### Past Track

- Post-Tropical Cyclone
- Wave
- Disturbance
- Low
- Sub-Tropical Depression
- Sub-Tropical Storm
- Tropical Depression
- Tropical Storm
- Hurricane

### River Conditions

#### Currently Flooding (Florida)

- Major Flooding
- Moderate Flooding
- Minor Flooding
- Near Flood Stage
- Normal
- Low Threshold



+ Find address or location -

Map tools: Location, Draw, Measure, Print, Fullscreen

Map controls: Zoom, Pan, Home, Rotation

Map view: Satellite, Map, Hybrid

Map scale: 400km, 300mi

Map coordinates: 52.467 -96.574 Degrees

Map source: Esri, DigitalGlobe

### About this application

About the map

Map legend

#### News Observations

- Active fire report
- Active perimeter

#### NWS Watches Warnings - Severe Events

- 911 Telephone Outage
- Administrative Message
- Air Quality Alert
- Air Stagnation Advisory
- Arroyo and Small Stream Flood Advisory
- Ashfall Advisory
- Ashfall Warning
- Avalanche Advisory



@ NewYears #Resolutions

Mapping consensus opinion data from Twitter, Dec. 31 - Jan. 1

#Resolution Tweets

0 100 200 300 400 500 600

Love

Exercise

Quit Drinking

Earn More Money

Education

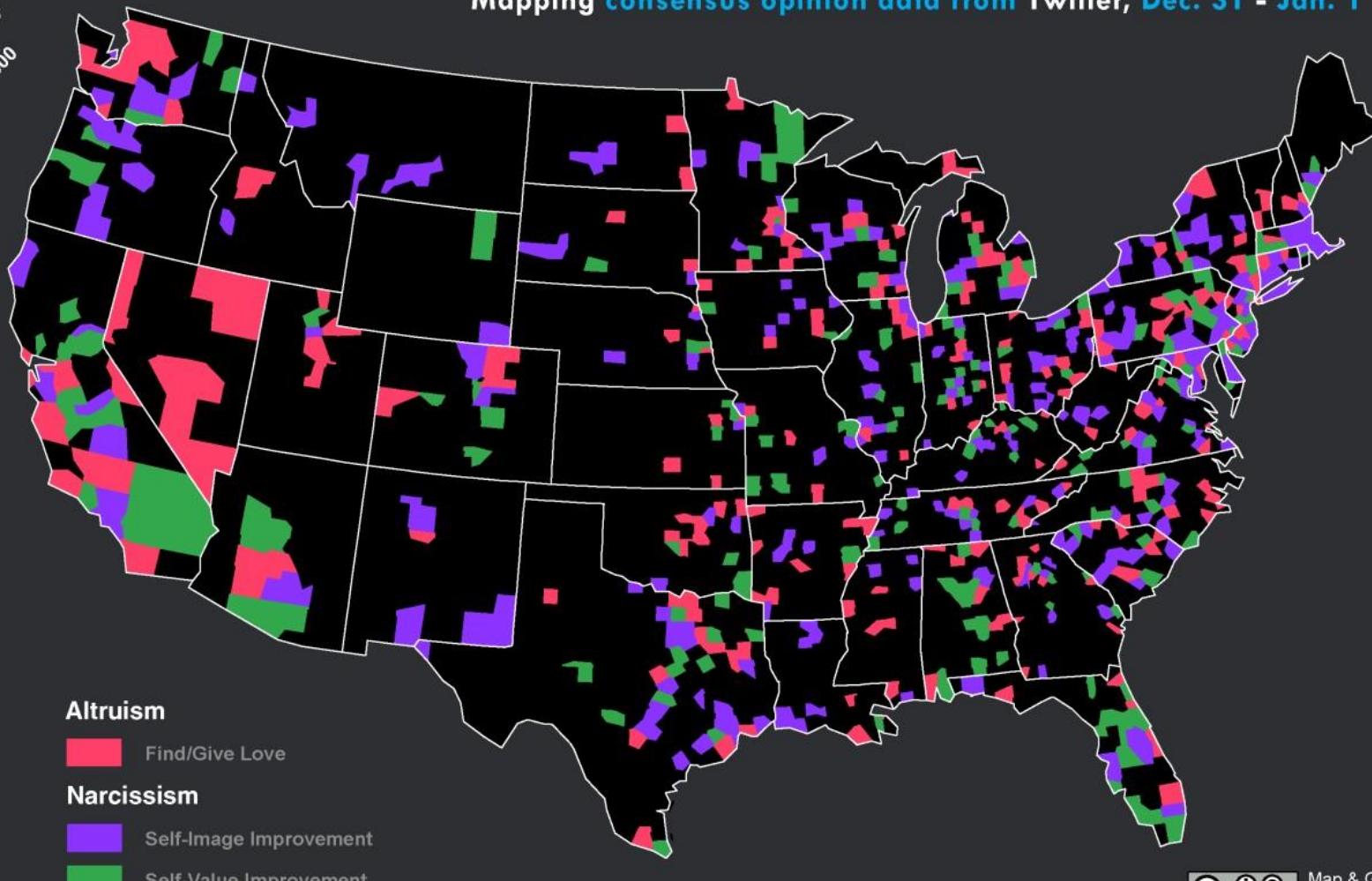
Family

Quit Smoking

Vacation

Volunteer/Donate

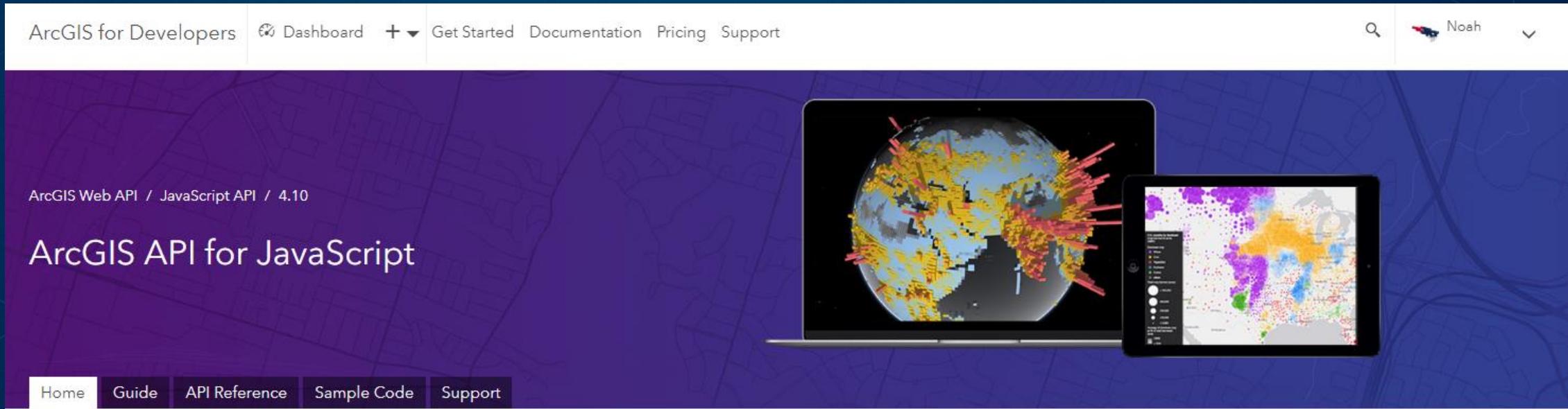
God/Jesus Pray



Map & Graphics  
By Chris Cantey  
[mywebspace.wisc.edu/ccantey/web/](http://mywebspace.wisc.edu/ccantey/web/)

# ArcGIS API for JavaScript

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



ArcGIS for Developers Dashboard Get Started Documentation Pricing Support Noah

ArcGIS Web API / JavaScript API / 4.10

## ArcGIS API for JavaScript

Home Guide API Reference Sample Code Support

### Build 2D and 3D web apps!

The 4.x series of the ArcGIS API for JavaScript integrates 2D and 3D into a single, easy-to-use, powerful mapping API. Create 3D maps as easily as 2D maps, seamlessly integrate your web GIS and build influential data-driven visualizations.

[Learn about 4.10](#)

```
// Reference the JavaScript API from our CDN and you are ready to get started:  
<link rel="stylesheet" href="https://js.arcgis.com/4.10/esri/css/main.css">  
<script src="https://js.arcgis.com/4.10/"></script>
```

Need to build a full-featured 2D web app with capabilities such as editing and support for all existing layer types?

[Go to 3.27](#)

Choosing a version ▶

Get the API | Release notes | FAQ | System requirements

# Get Started with the ArcGIS DevLabs

Use the ArcGIS DevLabs tutorials to learn how to build mapping apps with ArcGIS APIs and SDKs.



## What is ArcGIS?

Explore key components of the ArcGIS Platform and learn how to leverage them in your apps.

[Learn More](#)

## Graphics and Data

Learn how to display points, lines, and polygons, configure popups, and import and style your data in ArcGIS.

[Start Labs](#)

## Search and Directions

Learn how to leverage premium ArcGIS services to search for places and addresses, find routes and get directions.

[Start Labs](#)

## Explore all the ArcGIS DevLabs

Find a DevLab tutorial for the exact project, task and API you need.

All Products						All Topics				

# Update FeatureLayer using applyEdits()

The map displays a dense cluster of incident locations in Riverside, California, marked by various icons such as red flags, green trees, orange cones, and blue question marks. The locations are scattered across several neighborhoods, including Redlands, Cypress Park, and Citrus Hill. A callout box titled "Report Incidents" contains the following information:

- Click Add incident button
- Click on the map to create the incident
- Change the incident type

**Add incident**

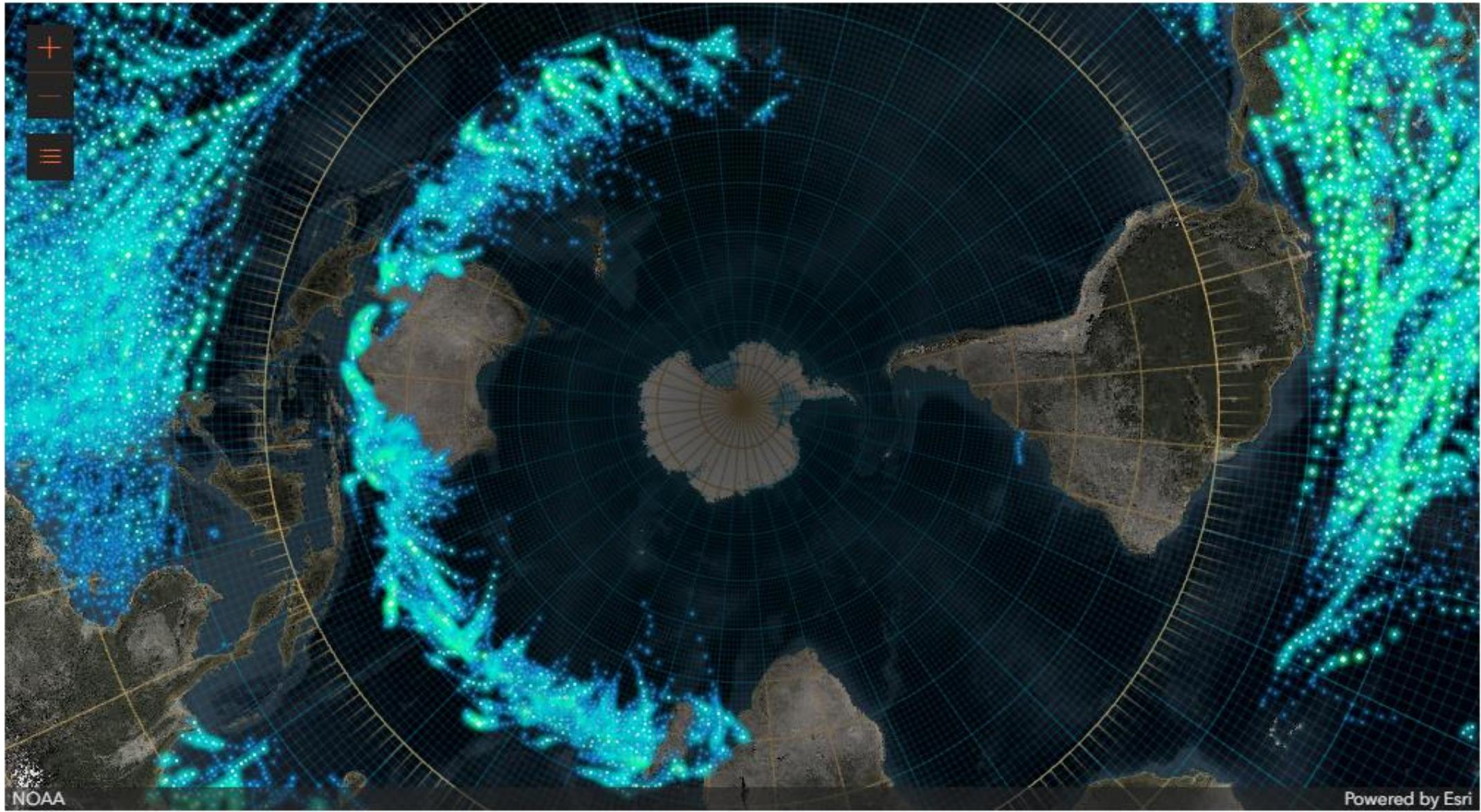
Or

Select an incident to edit or delete.

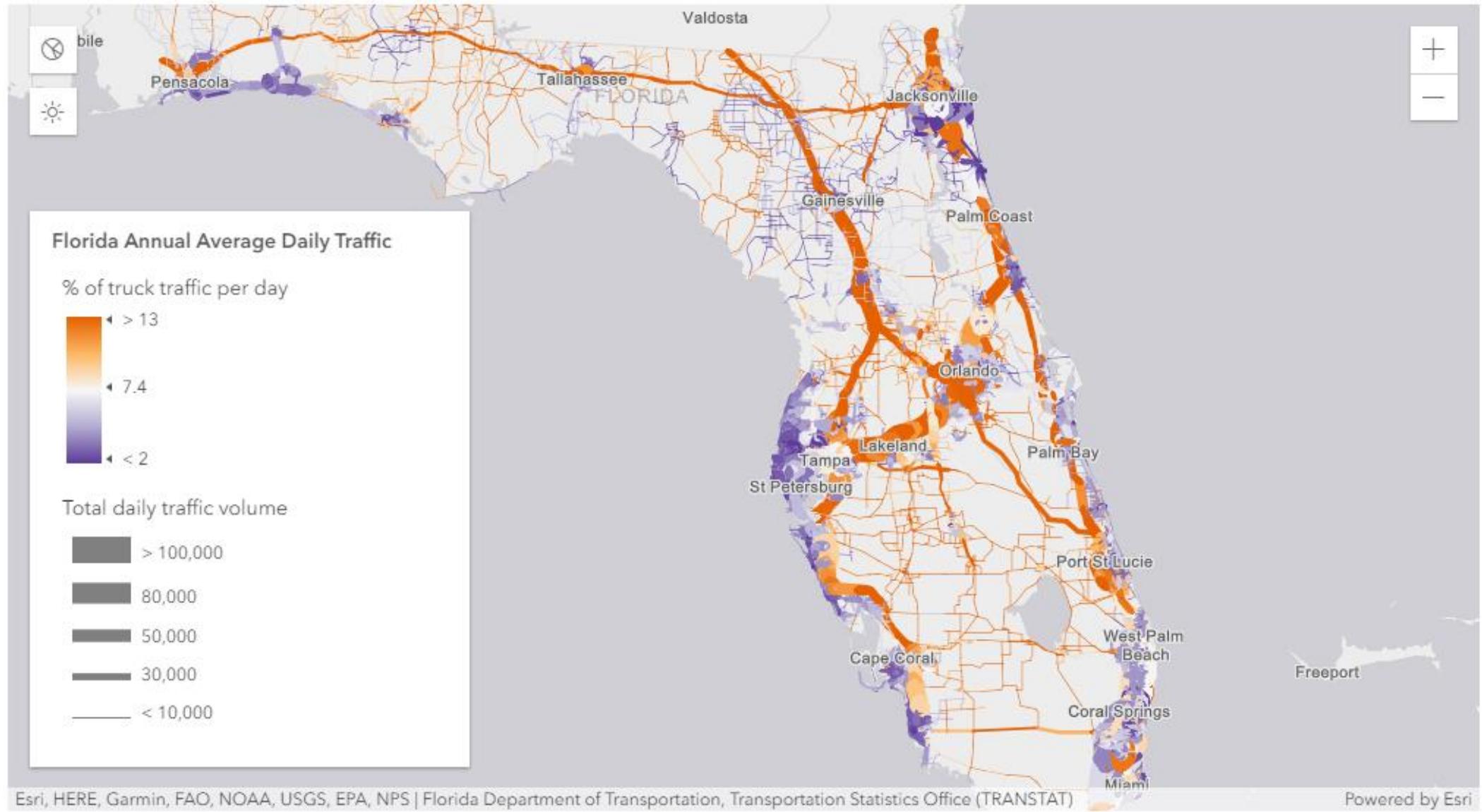
City of Riverside, County of Riverside, Esri, HERE, Garmin, INCREMENT P, NGA, USGS | Esri, HERE

Powered by Esri

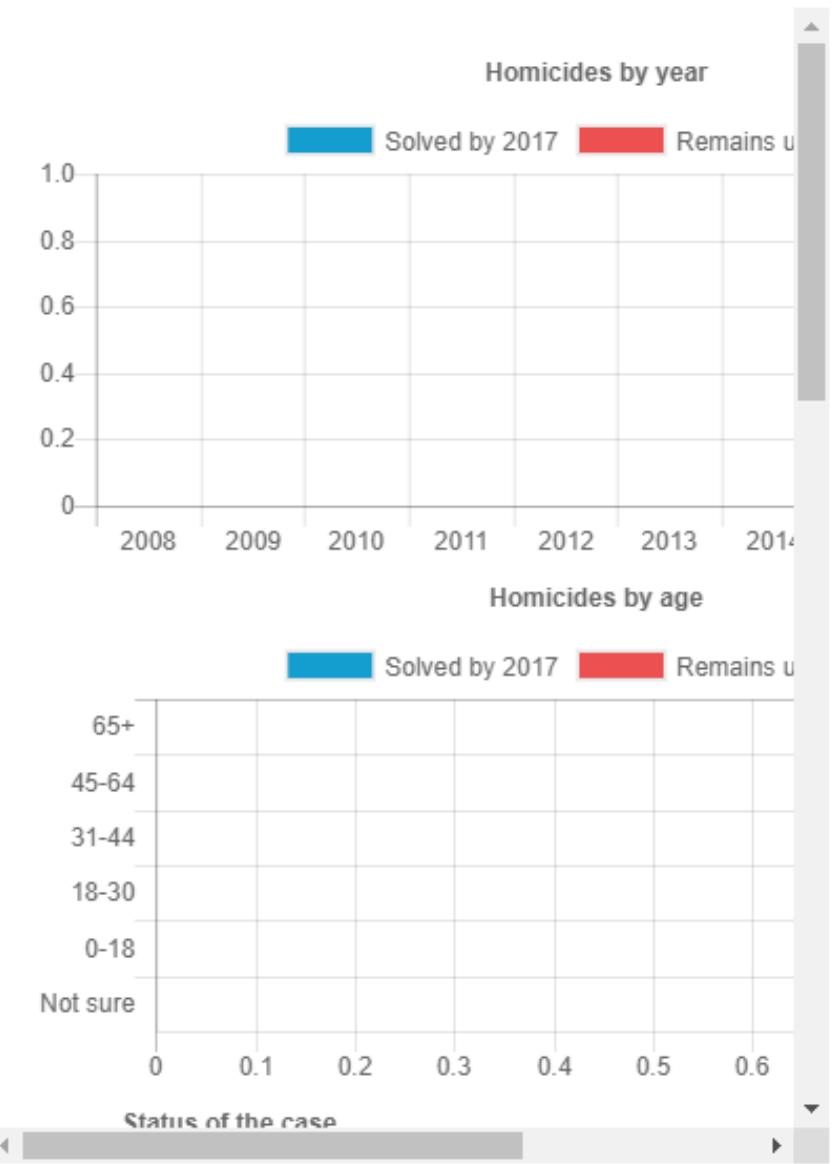
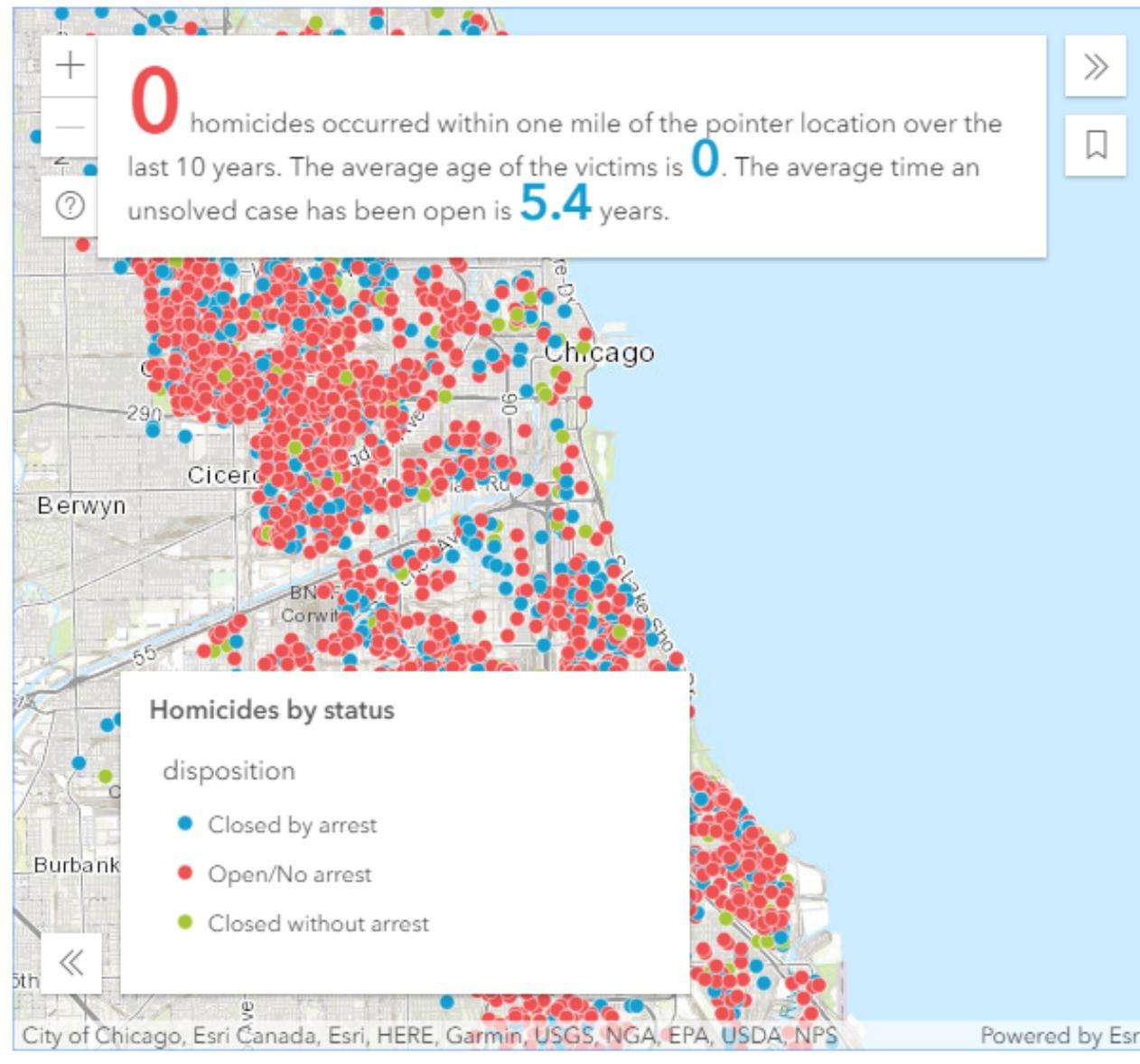
# CSVLayer - Project points on the fly

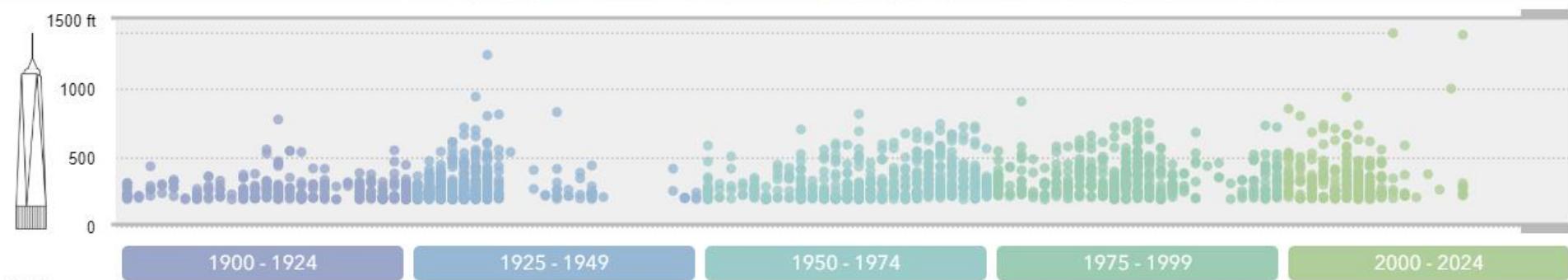


# Multivariate data exploration



# Query statistics client-side by distance

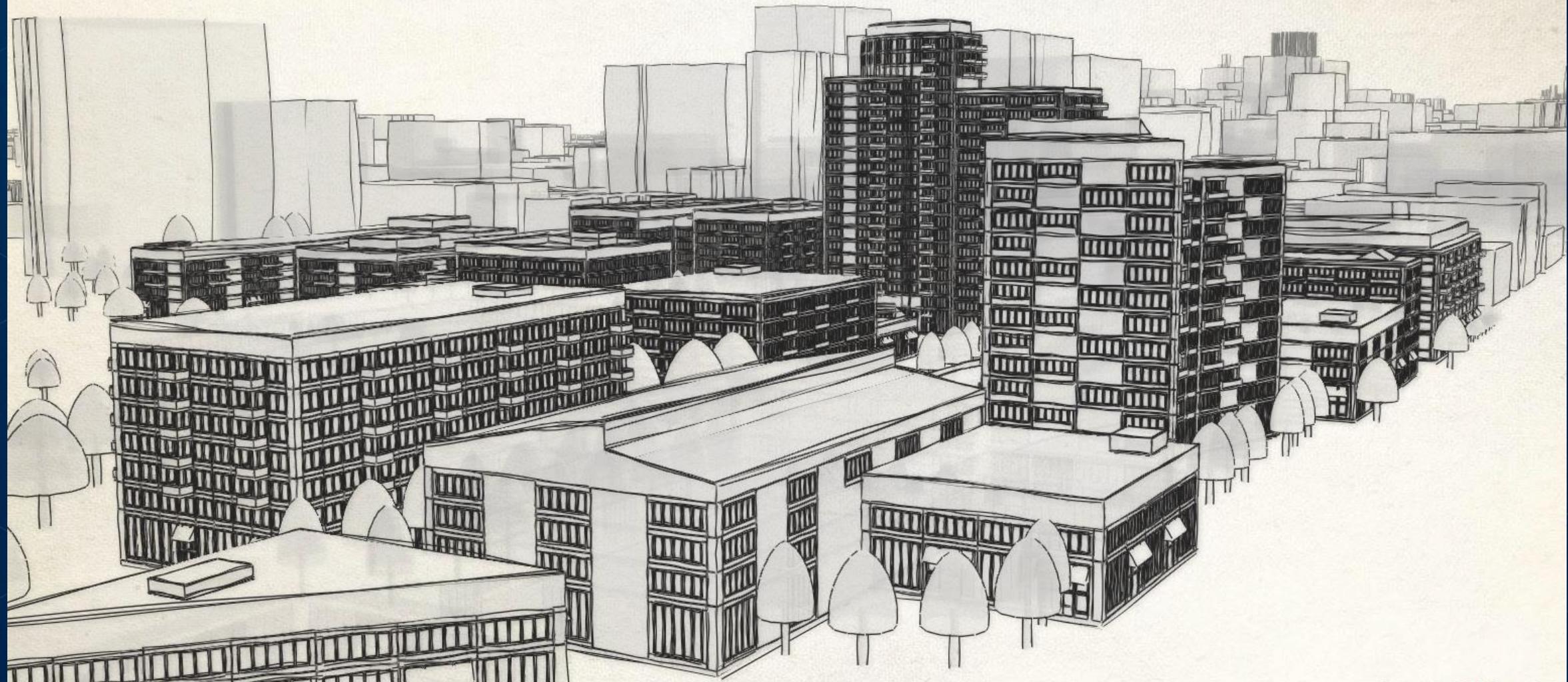




App credit: Raluca Nicola - @nicolaraluk

San Francisco   New York - Manhattan   Paris   Berlin   Washington D.C.

Chalk



Made with ArcGIS API for JavaScript  
Powered by Esri

App credit: Raluca Nicola - @nicolaraluk

# Esri Leaflet

A lightweight set of tools for using ArcGIS services with [Leaflet](#).

[Examples](#)[API Reference](#)[Download](#)[Terms](#)

# Web AppBuilder for ArcGIS (Developer Edition)

[Download SDK](#)

Version 2.11 · January 2019

[Home](#) [Guide](#) [API Reference](#) [Sample Code](#) [Support](#)

## Create custom widgets and themes for Web AppBuilder.

Get Web AppBuilder for ArcGIS (Developer Edition) to create custom widgets and themes. Boost your productivity by extending the framework. Build powerful GIS apps that run on desktops, tablets, and smartphones.

[What's New](#) | [License](#) | [Key Features](#) | [Developer's Overview](#)



GATOR

Find address or place



### Legend

- Sub-Tropical Depression
- Sub-Tropical Storm
- Tropical Depression
- Tropical Storm
- Hurricane

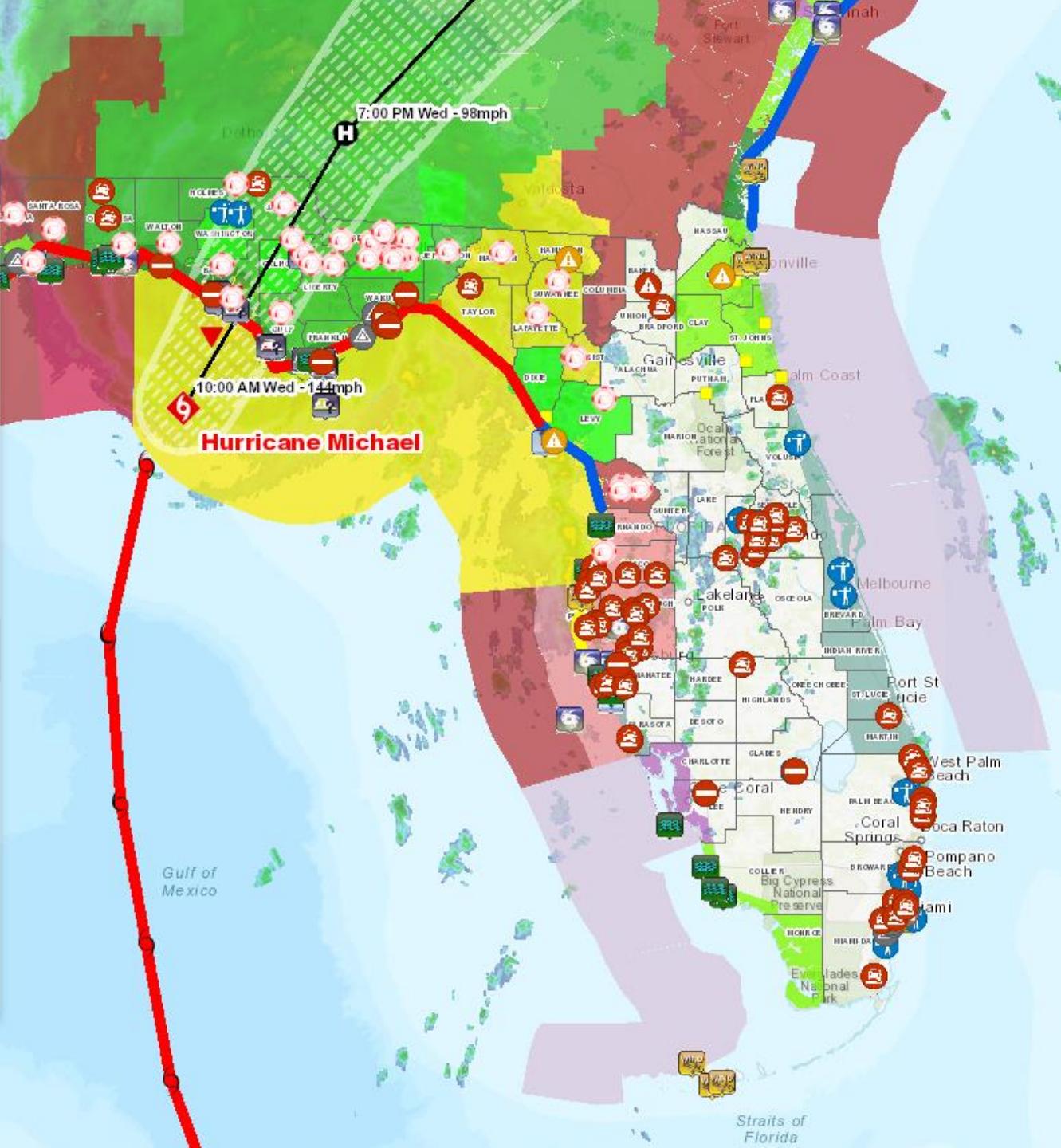
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- Hurricane

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- Low Threshold



# Configurable Apps & Templates

# ArcGIS Online

Configurable Apps  
App Templates  
Story Maps

## Create a web app

What do you want to do?

Show All

Build a Story Map

Collect/Edit Data

Compare Maps/Layers

Explore/Summarize Data

Interpret Imagery

Map Social Media

Provide Local Information

Route/Get Directions

Showcase a Map

Select a configurable app. ?



Basic Viewer



Compare



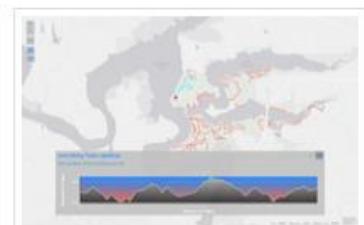
Crowdsouce Polling



Directions



Edit



Elevation Profile



Cancel

# Create a web app



What do you want to do?

Select a configurable app. [?](#)

Search

Show All

**Build a Story Map**

Collect/Edit Data

Compare Maps/Layers

Explore/Summarize Data

Interpret Imagery

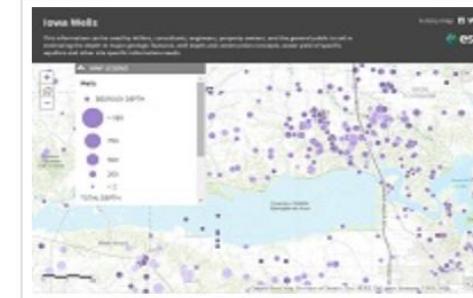
Map Social Media

Provide Local Information

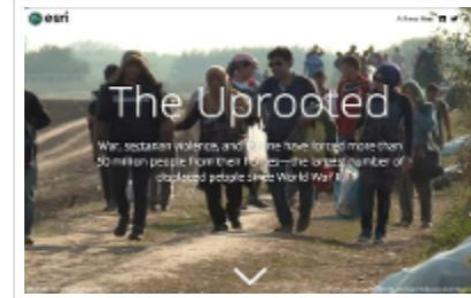
Route/Get Directions

Showcase a Map

Combine maps with narrative text, images, and multimedia content to tell your story



Story Map Basic



Story Map Cascade



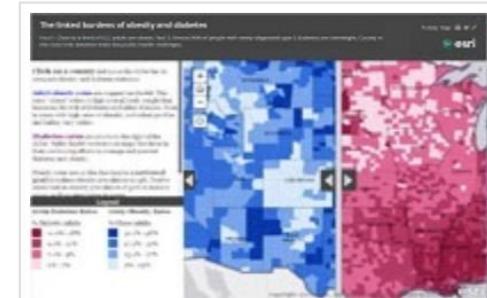
Story Map Journal



Story Map Series



Story Map Shortlist



Story Map Swipe and Spyglass

# Data

# What can you add to ArcGIS Online?

If you have [privileges](#) to create content, you can add many different types of content as items to ArcGIS Online. You can add most item types through **Content > My Content > Add Item**. Other types of items, such as a web map item, are automatically added to ArcGIS Online when you create and save them through a related app or workflow—for example, creating a map in Map Viewer.

You can upload files up to 200 GB to **My Content** through a web browser.



Datasets    Topics ▾    Groups    About ▾    State Portals    Civic Engagement    Documentation ▾

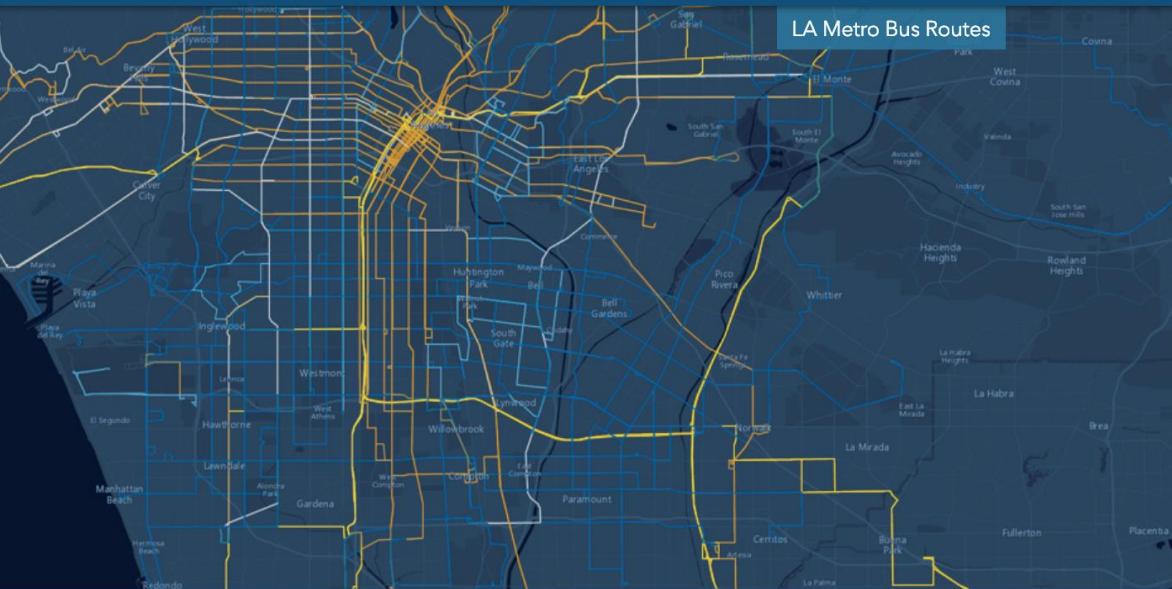
## Welcome to California Open Data

search

California believes in the power of unlocking government data. We invite all to search and explore our open data portal and engage with our data to create innovative solutions. We believe the California open data portal will bring government closer to citizens and start a new shared conversation for growth and progress in our great state.

<https://data.ca.gov/>

# Los Angeles GeoHub



The GeoHub is the City's new public platform for exploring, visualizing, and downloading location-based Open Data. You can also analyze and combine Open Data layers using maps, as well as develop new web and mobile applications. Let's make our great City even better, together!

## Find Data

Search for data



<https://geohub.lacity.org/>



Sign In



ArcGIS Living Atlas of the World

Home

Browse

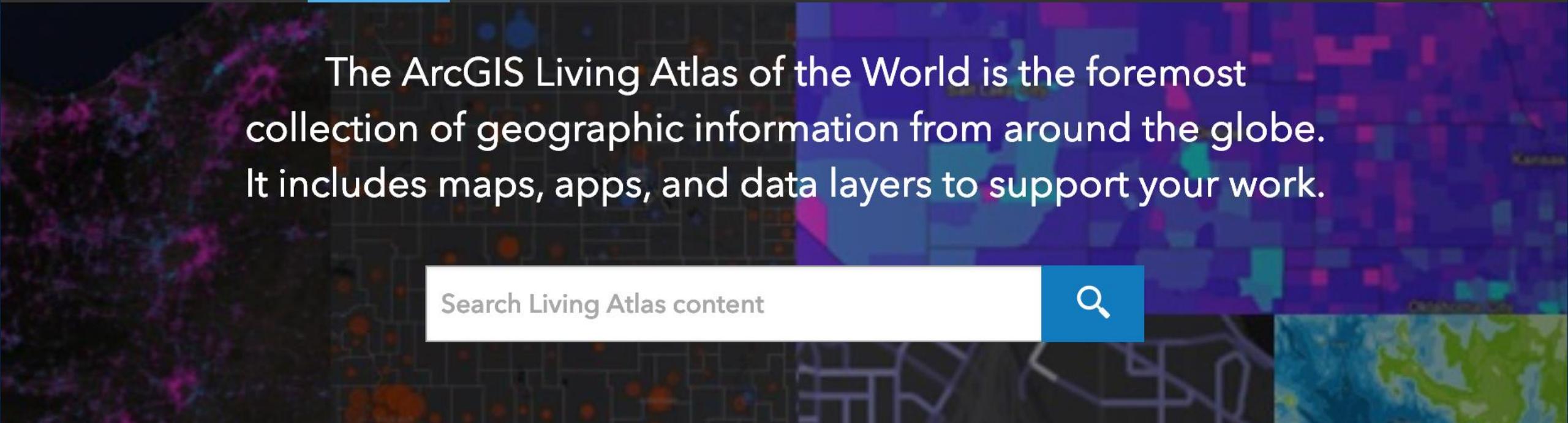
Benefits

Apps

Blog

My Contributions

My Favorites



The ArcGIS Living Atlas of the World is the foremost collection of geographic information from around the globe. It includes maps, apps, and data layers to support your work.

Search Living Atlas content



<https://livingatlas.arcgis.com/en/>

# Career Opportunities



# STUDENTS AT ESRI

INNOVATION, COLLABORATION, PROFESSIONAL AND  
PERSONAL GROWTH

Whether you are looking to gain hands-on experience to add to your résumé or you're ready to launch your career, you'll find this and much more at Esri.

New Grads

Internship Program

Student Assistantship Program

**30 POSITIONS**

Job Category

---

CAREERS HOME

---

JOB SEARCH

---

RECRUITING EVENTS

---

STUDENTS & GRADS

---

BENEFITS



<https://community.esri.com/community/esri-young-professionals-network>



Products

Industries

About

Support



Sign In

# GeoNet

The Esri Community

Home

My News

Browse GeoNet ▾

Communities ▾

ArcGIS Ideas

GeoNet Resource Hub

Log in



All Places >

## Esri Young Professionals Network

Actions ▾



Overview

Esri UC

FedGIS

Regional Events

Activity

Content

People

Subspaces

Calendar

<https://community.esri.com/groups/geodev>

The screenshot shows the Esri Geo Developers group page. At the top, there's a banner image of a group of people in a conference room. Below the banner, the group name "Geo Developers" is displayed, along with navigation links for "Activity", "Content", "People", and "Calendar". On the right side of the header, there are "Actions" and an information icon.

The main content area features a purple circular profile picture of the Earth. To its right are three smaller map images: a world map, a San Francisco crime map, and a map of New York City. Below these are the group's statistics: 1,999 tweets, 1,877 following, 4,438 followers, 1,123 likes, and 3 lists.

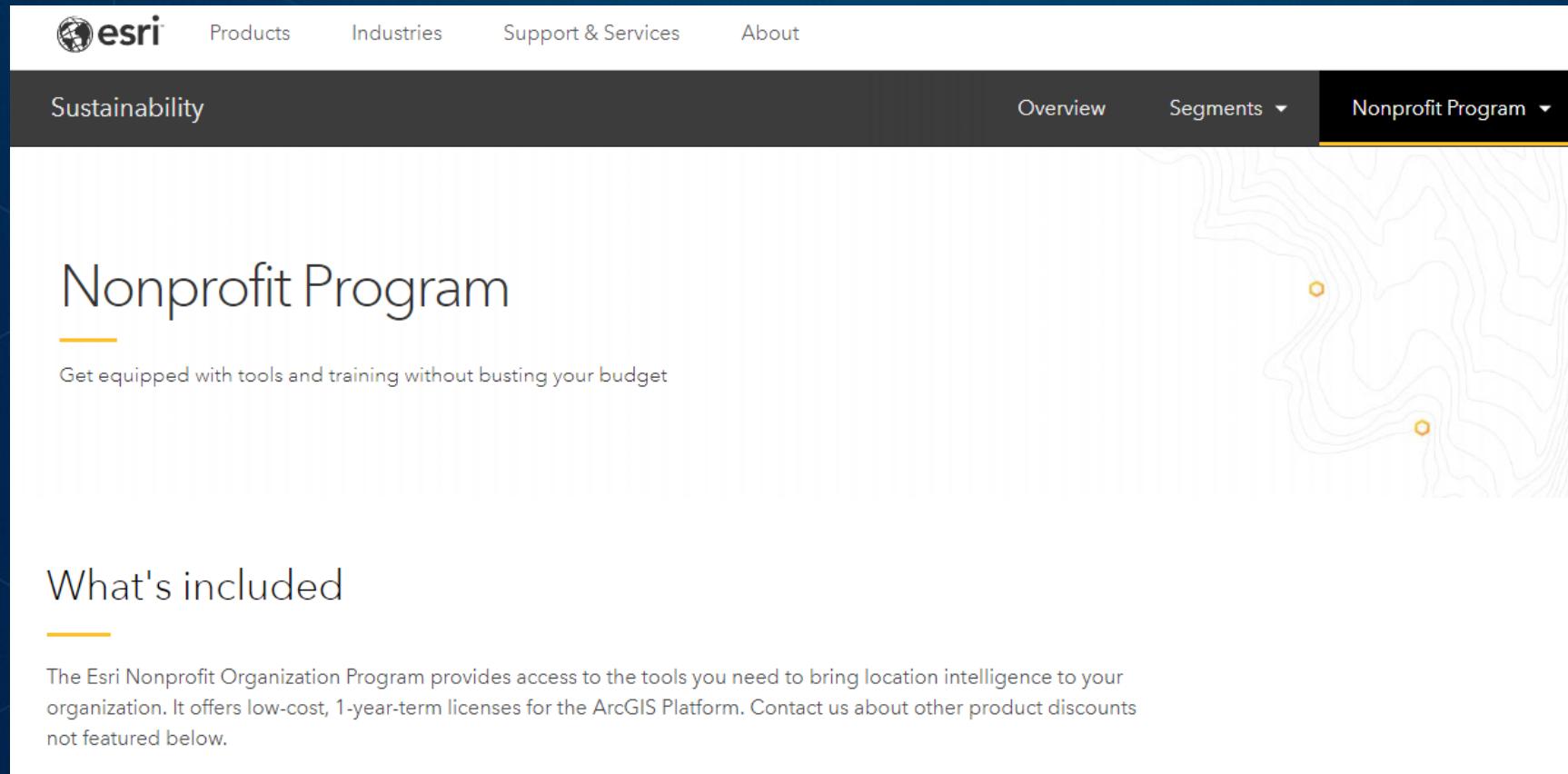
The left sidebar contains the group's bio: "For our unique GeoDev friends, a special Twitter account. We hope to meet you at a #GeoDev Meetup, tech conference, hackathon or the #DevSummit." It also lists the location as Redlands, CA, the website as developers.arcgis.com, and the joining date as August 2010. There are "Tweet to" and "Message" buttons at the bottom of this sidebar.

The central part of the page has tabs for "Tweets", "Tweets & replies", and "Media". Under "Tweets", there's a recent post from "Esri GeoDev" (@EsriGeoDev) about a presentation at a meetup. Below the tweet are two small images: one of a person at a podium and another of a group of people seated around a table.

The right sidebar is titled "Who to follow" and lists three accounts: "ArcGIS Enterprise" (@ArcGl...), "Amy Niessen" (@AmyNiessen), and "Esri Globe" (@EsriGlobe). Each account has a "Follow" button next to it.

@EsriGeoDev

<https://www.esri.com/en-us/industries/sustainability/nonprofit-program/overview>



esri Products Industries Support & Services About

Sustainability Overview Segments Nonprofit Program

## Nonprofit Program

Get equipped with tools and training without busting your budget

### What's included

The Esri Nonprofit Organization Program provides access to the tools you need to bring location intelligence to your organization. It offers low-cost, 1-year-term licenses for the ArcGIS Platform. Contact us about other product discounts not featured below.



esri & THE SCIENCE OF WHERE

**Sustainable Development**  
@Esri\_Nonprofit Follows you

Nonprofits worldwide are using Esri technology to address the world's most pressing environmental and humanitarian challenges.

Redlands, CA  
[esri.com/nonprofit](http://esri.com/nonprofit)  
Joined July 2015

[Tweet to](#) [Message](#)

@Esri\_Nonprofit



# Support

Contact Support

USA +1-888-377-4575

Search Esri Support



Products ▾

Knowledge Base

Downloads

Other Resources ▾

Manage Cases

Request Case

Start Chat

## Desktop

ArcGIS Desktop

Industry Focused Extensions

Data and Workflows Extensions

## Enterprise

ArcGIS Server

Server Components

Portal for ArcGIS

and more...

## Online

ArcGIS Online

## Developers

Web APIs

Native Runtime SDKs

ArcGIS Engine

and more...

## Apps

Web Apps

Mobile Apps

Plug-in Apps

and more...

## More Products

Business Analyst

Esri CityEngine

Content

and more...



## Contact Tech Support

Please select a country/region

United States

### Esri Headquarters

380 New York Street  
Redlands, CA 92373-8100

Email [support@esri.com](mailto:support@esri.com)

Phone +1-909-793-3774

Toll-free +1-888-377-4575

Fax +1-909-792-0960

Website <http://support.esri.com>

Support Web Form <http://support.esri.com/en/webform>

## Developers

### Web APIs

[ArcGIS API for JavaScript](#)

### Native Runtime SDKs

[ArcGIS Runtime SDK for .NET](#)

[ArcGIS Runtime SDK for Android](#)

[ArcGIS Runtime SDK for iOS](#)

[ArcGIS Runtime SDK for Java](#)

[ArcGIS Runtime SDK for macOS](#)

[ArcGIS Runtime SDK for Qt](#)

[ArcGIS Runtime SDK for Windows Mobile](#)

### ArcGIS Engine

[ArcGIS Engine](#)

[ArcGIS Engine for Linux](#)

### Desktop SDKs

[ArcGIS Explorer SDK \(.NET\)](#)

[ArcGIS Pro SDK \(.NET\)](#)

[ArcObjects SDK \(.NET\)](#)

[ArcObjects SDK \(C++\)](#)

[ArcObjects SDK \(Java\)](#)

### Web AppBuilder for ArcGIS (Developer Edition)

[Web AppBuilder for ArcGIS \(Developer Edition\)](#)

### Scripting and Automation

[ArcGIS Python API](#)



# Hackathons



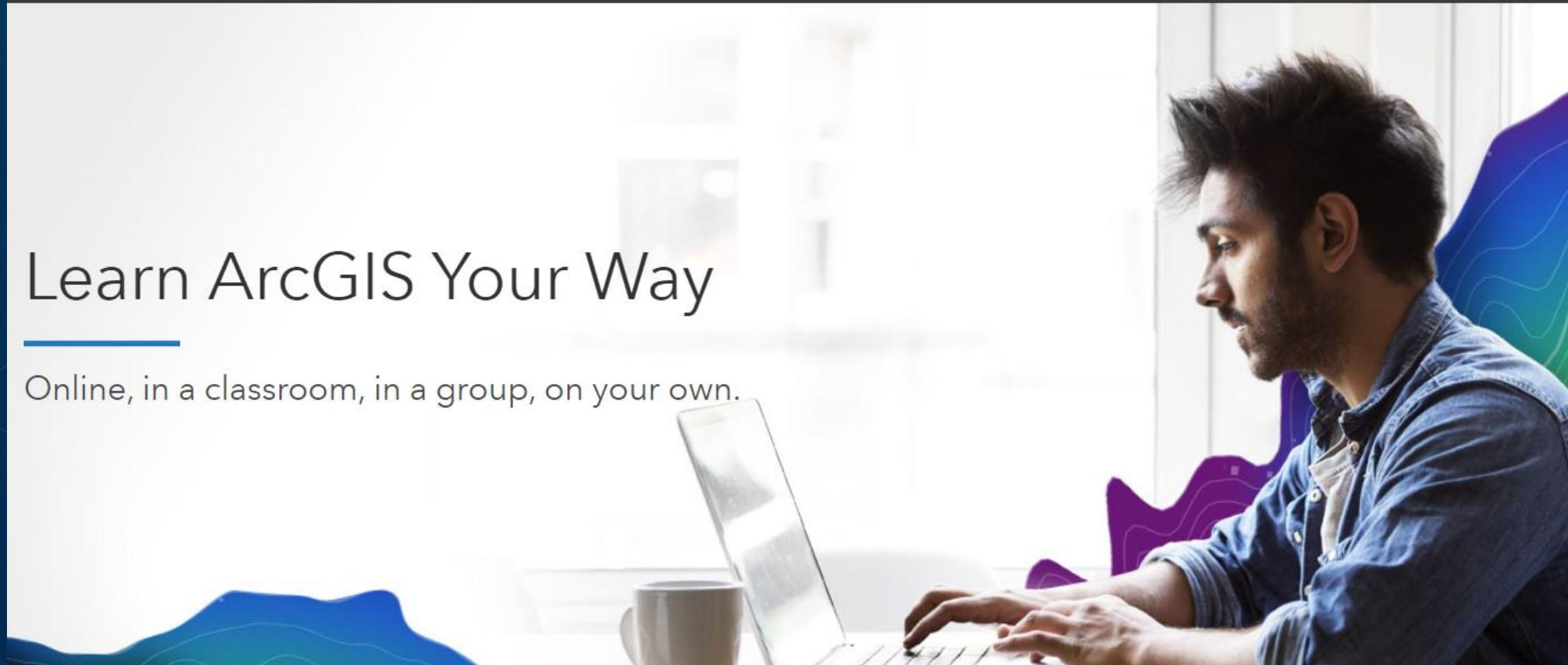
# Outreach





# Learn ArcGIS Your Way

Online, in a classroom, in a group, on your own.



Search Courses



My Dashboard



Learning Plans



Class Schedule



About Us

<https://www.esri.com/training/>



Search All Videos



## The Science of Where - Unlock Data's Full Potential

We believe digital transformation is leading business, government, and society into a new technological frontier. As the global market leader in geographic information...

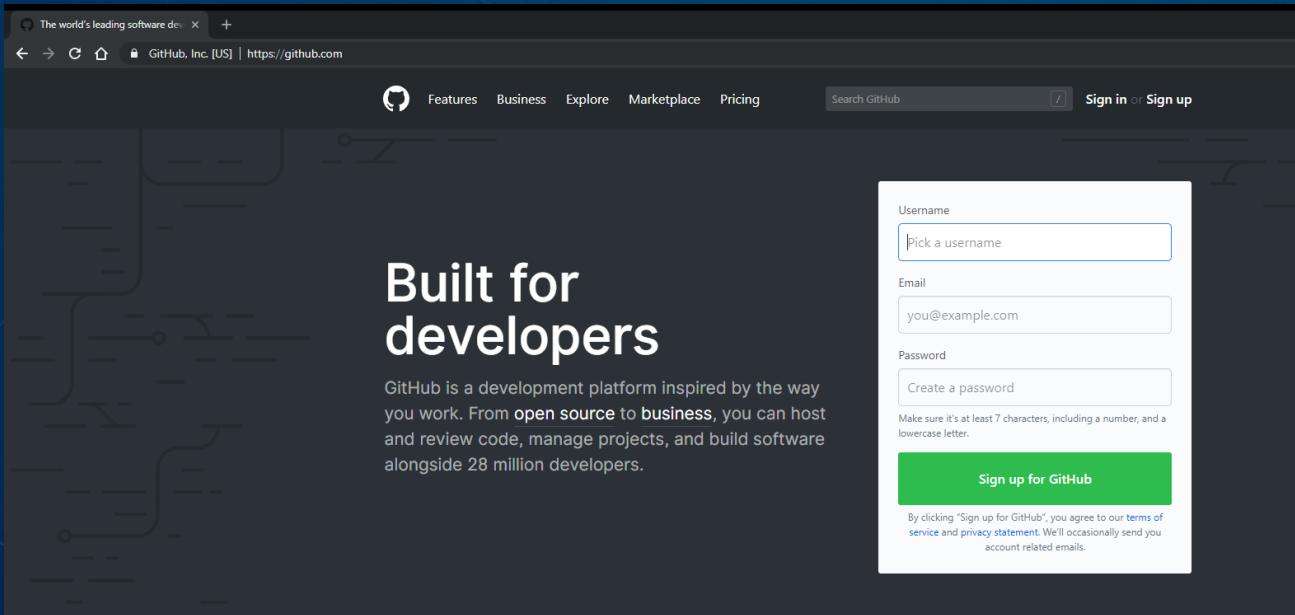
[Watch Now →](#)

THE  
SCIENCE  
OF  
WHERE

<https://www.esri.com/videos>

# Unsolicited Advice

The world's leading software dev + GitHub, Inc. [US] | https://github.com



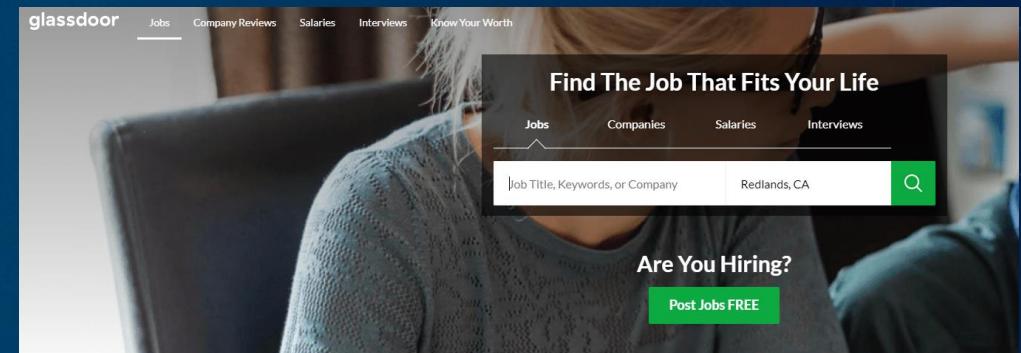
The GitHub homepage features a dark background with a faint circuit board pattern. On the left, there's a large white text area with the heading "Built for developers". Below it, a paragraph explains GitHub as a development platform. On the right, there's a sign-up form for GitHub.

Built for developers

GitHub is a development platform inspired by the way you work. From **open source to business**, you can host and review code, manage projects, and build software alongside 28 million developers.

Sign up for GitHub

By clicking "Sign up for GitHub", you agree to our [terms of service](#) and [privacy statement](#). We'll occasionally send you account related emails.



The Glassdoor homepage has a blue header with the company logo and navigation links: Jobs, Company Reviews, Salaries, Interviews, and Know Your Worth. A large banner features a woman in a blue top. To the right, there's a search bar and a "Post Jobs FREE" button.

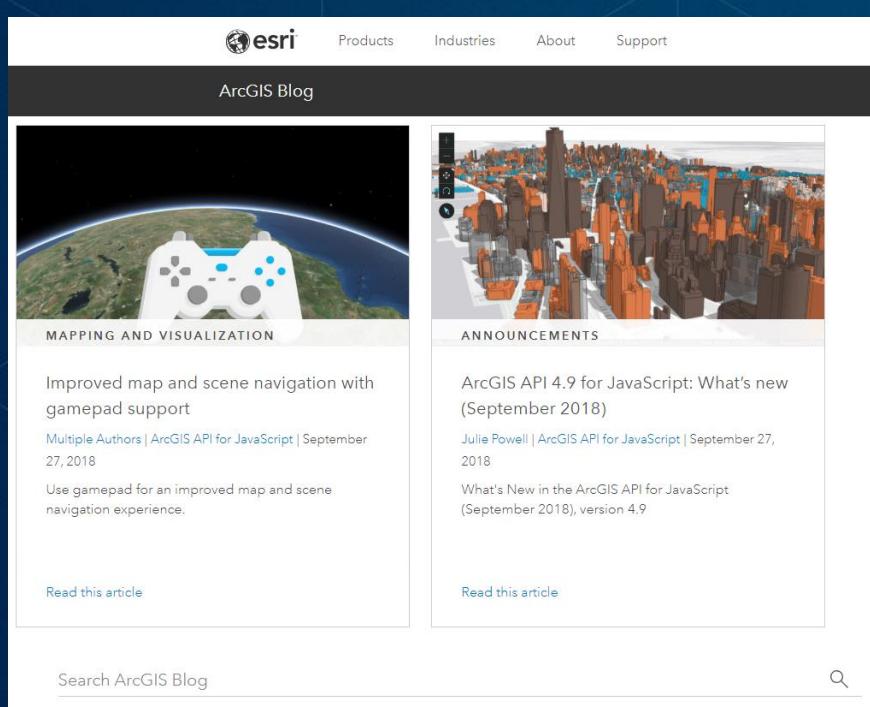
Find The Job That Fits Your Life

Jobs Companies Salaries Interviews

Job Title, Keywords, or Company Redlands, CA

Are You Hiring?

Post Jobs FREE



The ArcGIS Blog homepage features a dark header with the Esri logo and navigation links: Products, Industries, About, and Support. Below the header, there are two main sections: "MAPPING AND VISUALIZATION" and "ANNOUNCEMENTS".

**MAPPING AND VISUALIZATION**

Improved map and scene navigation with gamepad support  
Multiple Authors | ArcGIS API for JavaScript | September 27, 2018  
Use gamepad for an improved map and scene navigation experience.

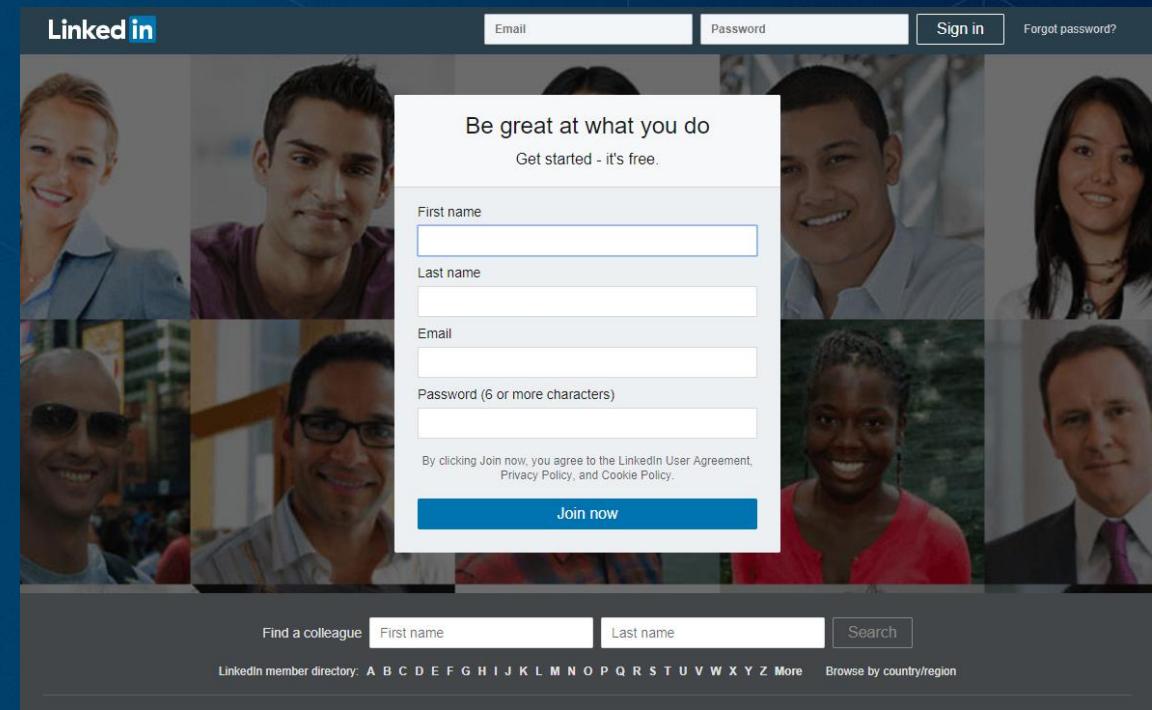
[Read this article](#)

**ANNOUNCEMENTS**

ArcGIS API 4.9 for JavaScript: What's new (September 2018)  
Julie Powell | ArcGIS API for JavaScript | September 27, 2018  
What's New in the ArcGIS API for JavaScript (September 2018), version 4.9

[Read this article](#)

Search ArcGIS Blog



The LinkedIn homepage features a dark header with the LinkedIn logo and navigation links: Email, Password, Sign in, and Forgot password?. A large banner shows several diverse people smiling. To the right, there's a sign-up form for LinkedIn.

LinkedIn

Email Password Sign in Forgot password?

Be great at what you do  
Get started - it's free.

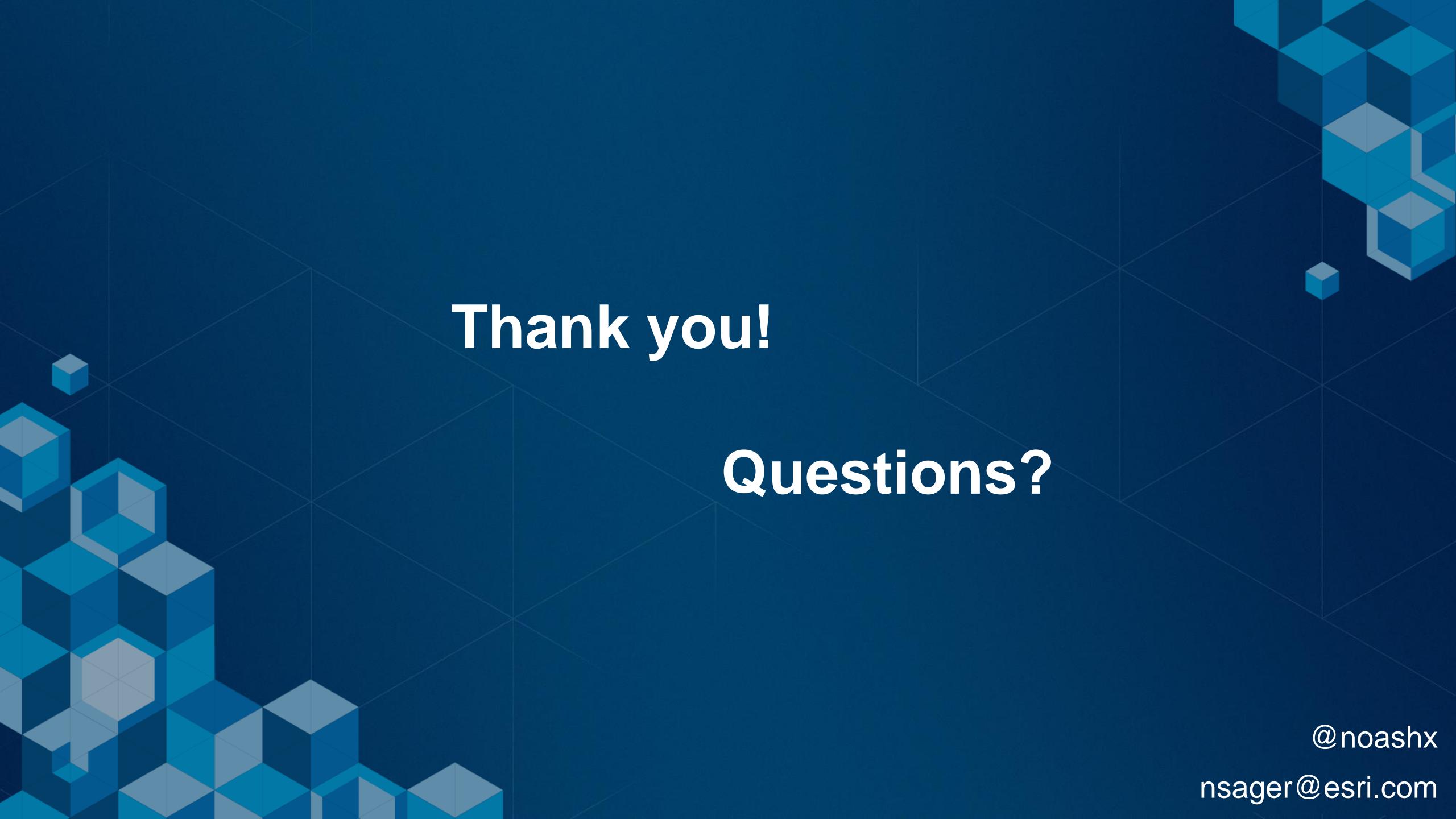
First name  
Last name  
Email  
Password (6 or more characters)

By clicking Join now, you agree to the LinkedIn User Agreement, Privacy Policy, and Cookie Policy.

Join now

Find a colleague First name Last name Search

LinkedIn member directory: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z More Browse by country/region



Thank you!

Questions?

@noashx

nsager@esri.com