



# Best Practices with ArcGIS Basemaps

*Styles, Static Basemap Tiles, and Static Maps*

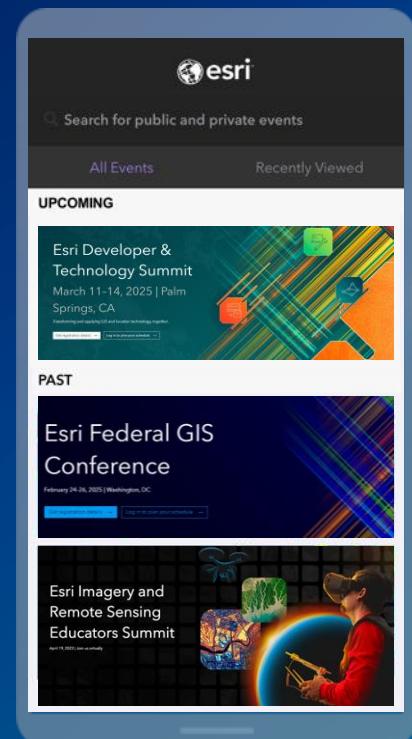
Courtney Yatteau, George Owen

2025 ESRI DEVELOPER & TECHNOLOGY SUMMIT

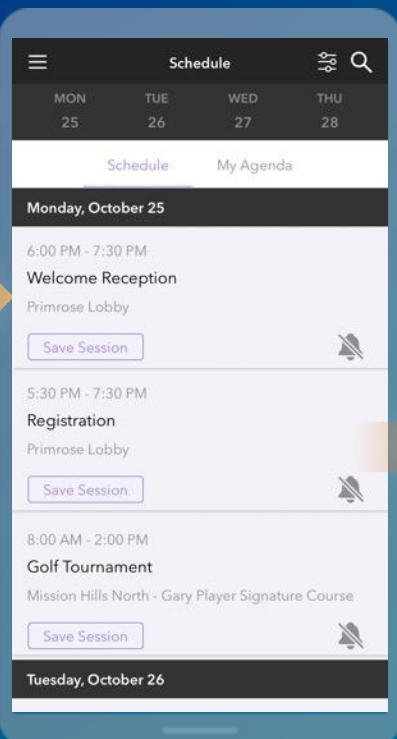


# Please share your feedback in the app

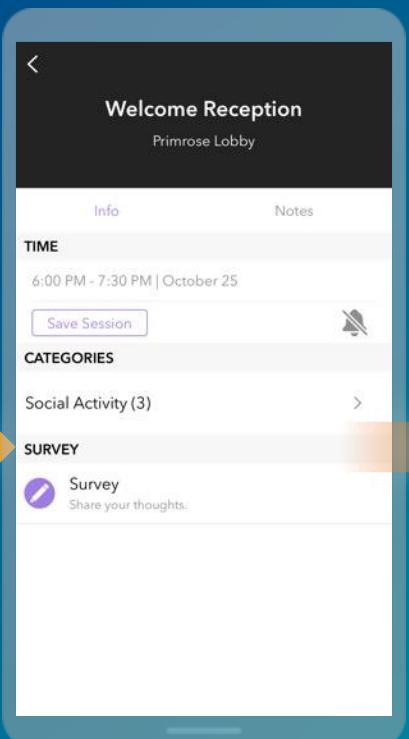
Download the Esri Events app and find your event



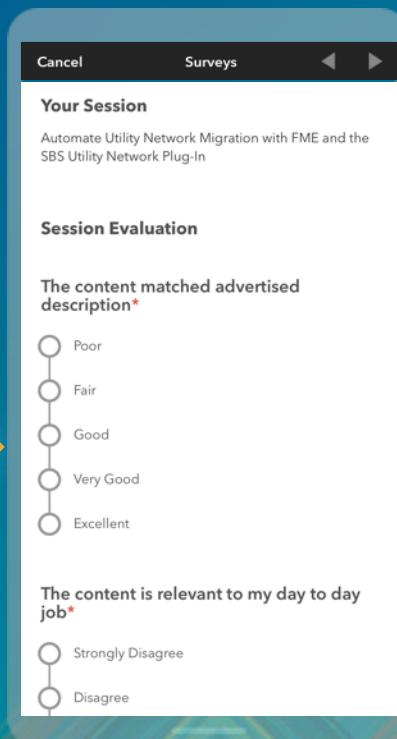
Select the session that you attended



Scroll down to "Survey"



Log in to access the survey



# Agenda

What we'll cover

- Basemap fundamentals
- Basemap styles service
- Vector tile style editor
- Static basemap tiles
- Static maps
- Q&A



# Courtney Yatteau

Developer Advocate, Esri

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 [cyatteau.bsky.social](#)



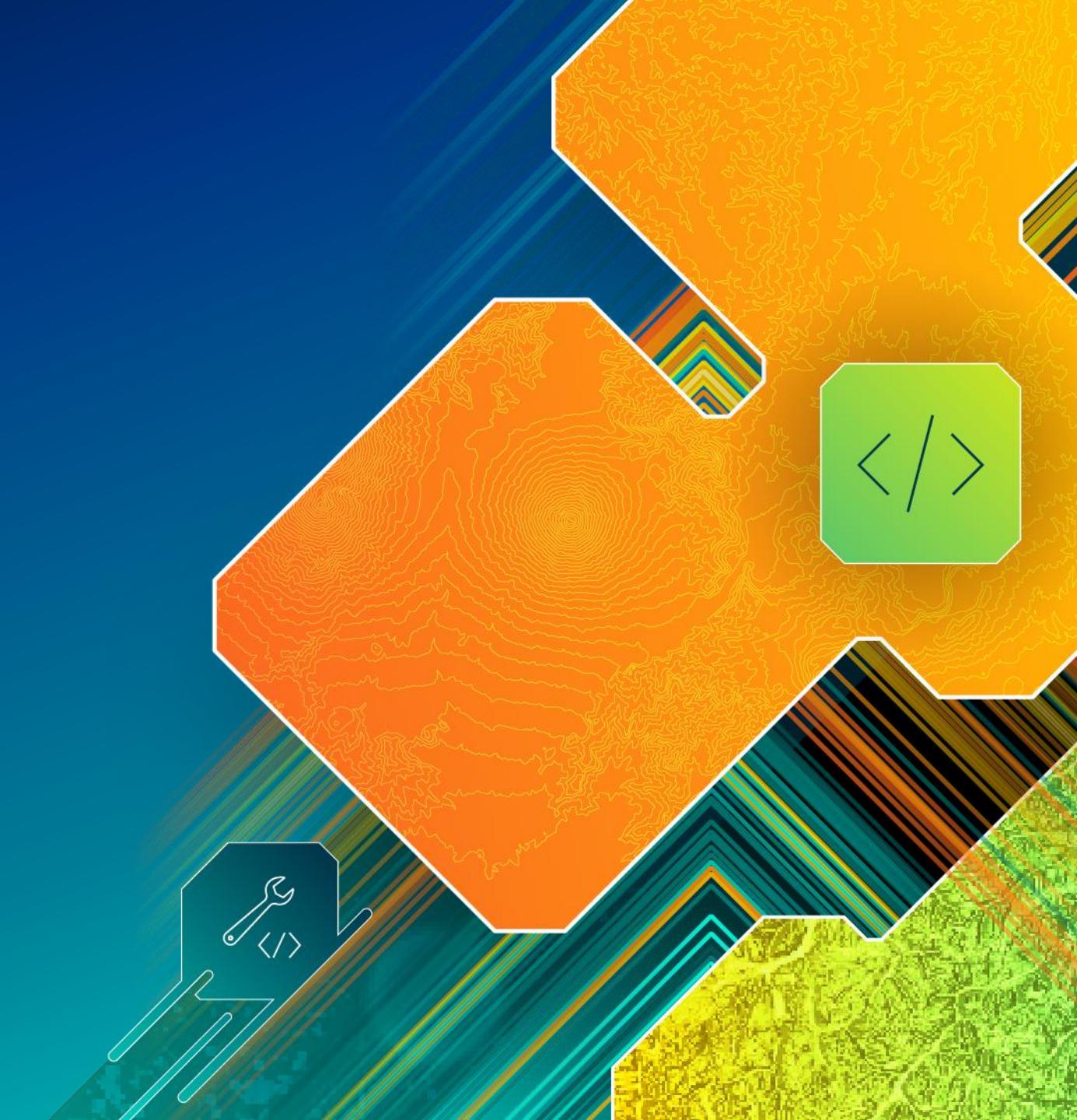
# George Owen

Product Engineer, Esri

 [gowin20](#)

 [go-wen](#)

# Basemap Fundamentals



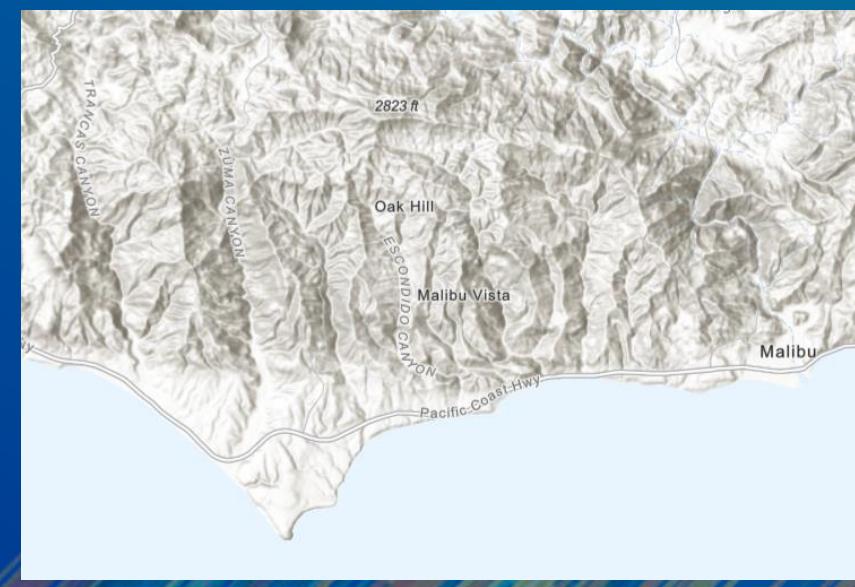
# What is a basemap?

- A basemap is a map
- Provides visual context
- Typically worldwide extent
- Styled

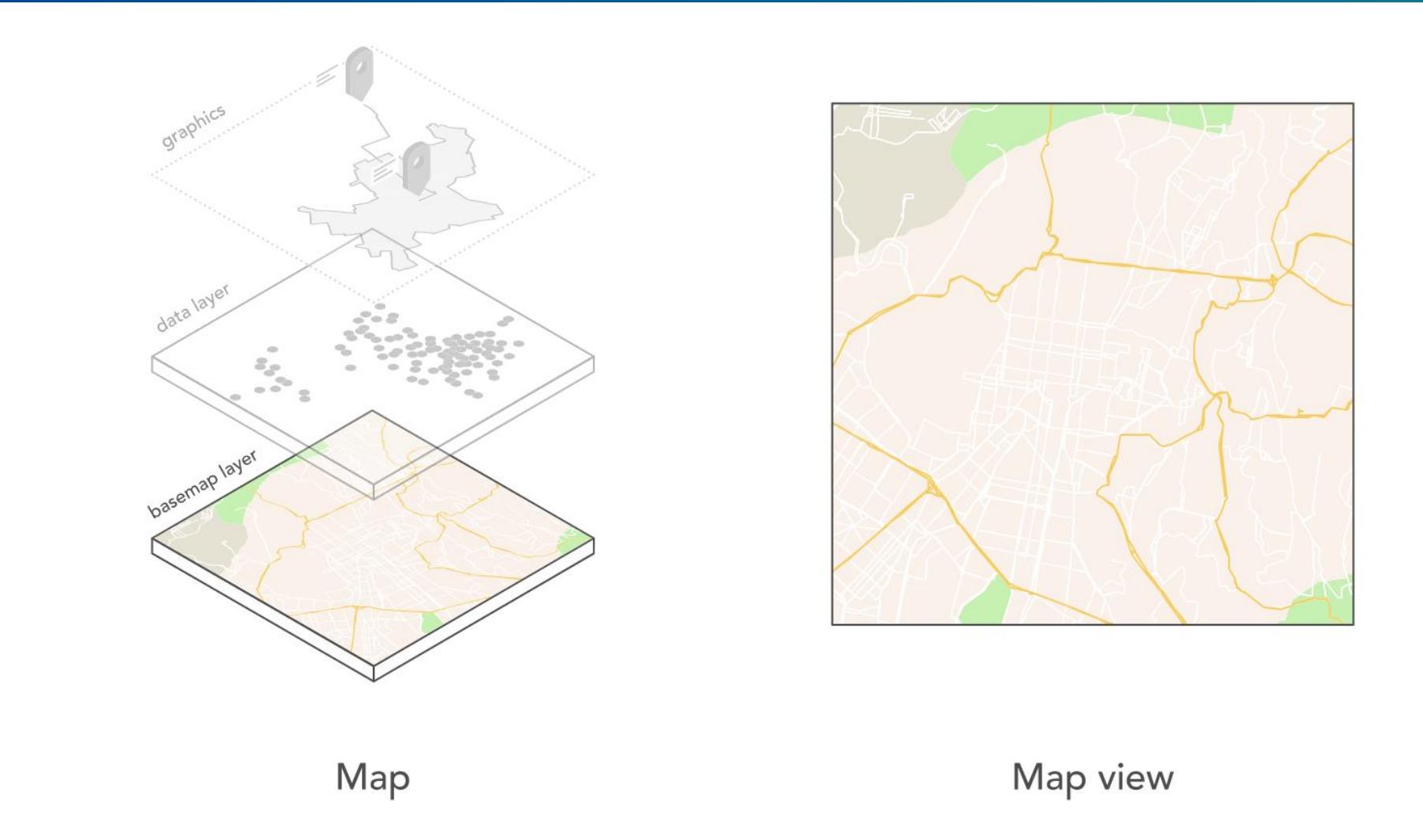


# Basemap components

- Geographic features
  - Political boundaries
  - Country, city, street labels
  - Places of interest
- 
- Building footprints
  - Imagery
  - Topography



# The foundation of your custom application



# Build powerful apps

Dining and Drinking X ▼

< Venice Farmers Market

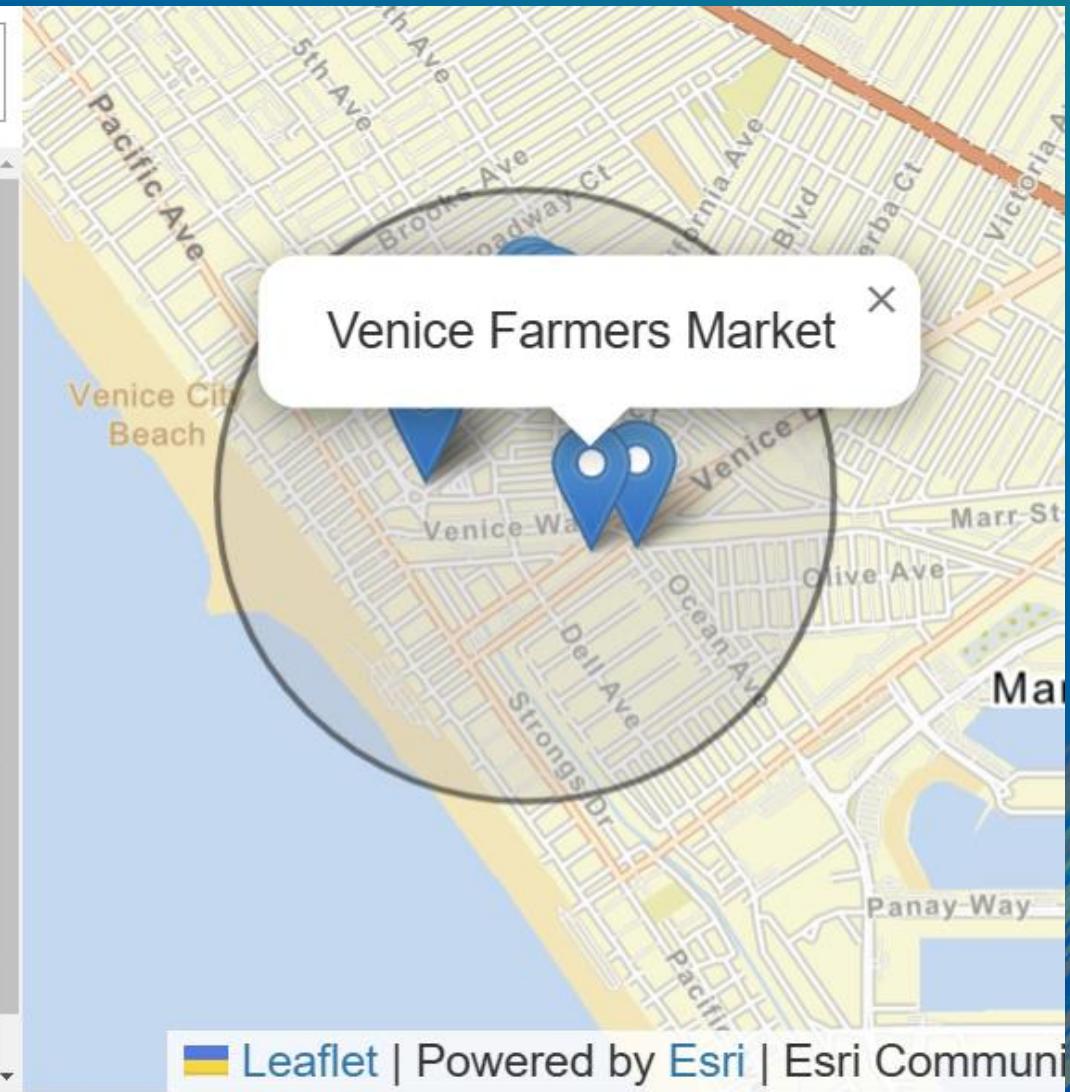
Farmers Market

Address  
500-516 N Venice Blvd

Phone  
(310) 399-6690

Email  
bellissimovenice@hotmail.com

Website  
[venicefarmersmarket.com](http://venicefarmersmarket.com)



# Basemap services

Request basemap tiles from these URLs

- ArcGIS Basemap Styles service
- ArcGIS Static Basemap Tiles service
- ArcGIS Static Maps service (beta)

# Access basemap services

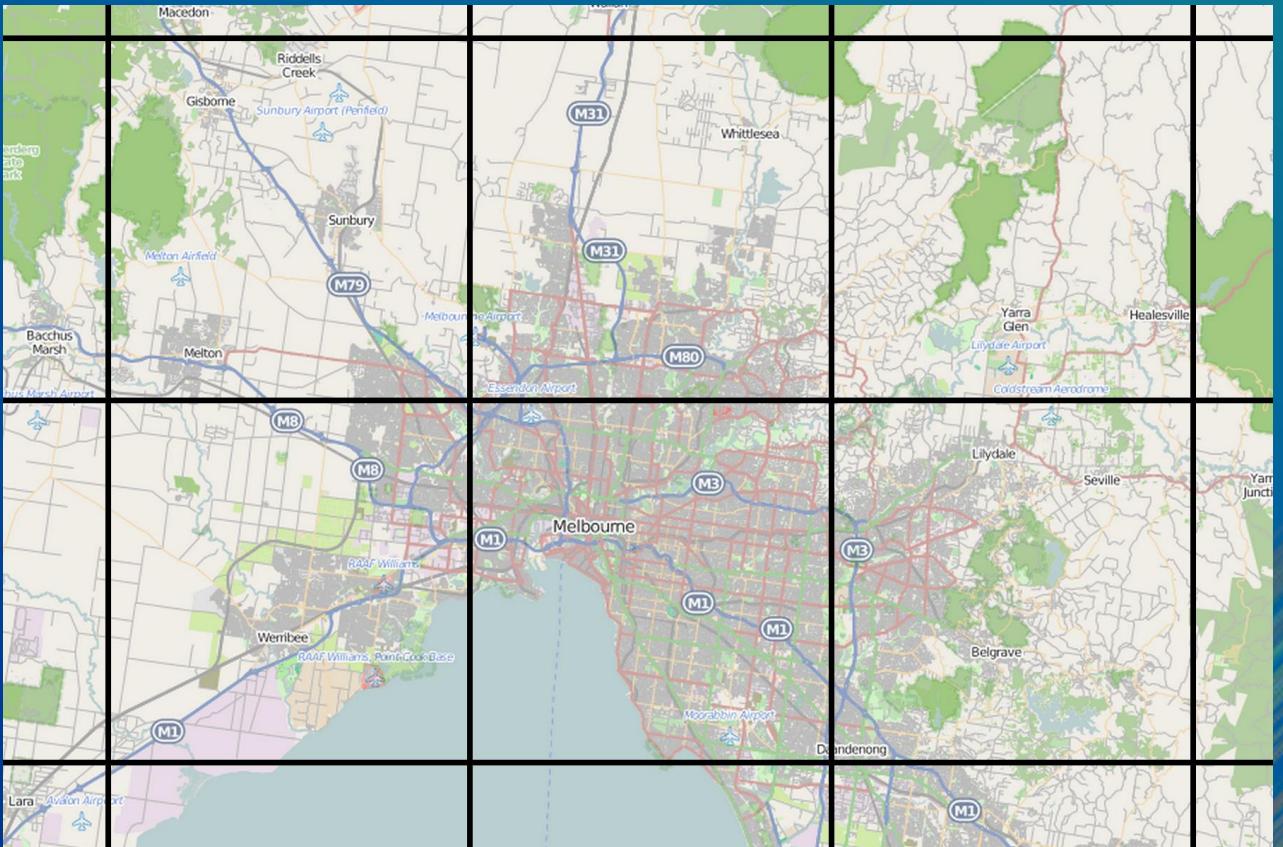
1. Pick a service
2. Pick a style, add style enumeration
3. Add optional parameters
4. Include an access token

- Style enumerations: /arcgis/<style>
- E.g. /arcgis/navigation, /arcgis/imagery, etc

```
GET  
  
https://basemapstyles-api.arcgis.com/arcgis/rest/services/styles/v2/styles/arcgis/navigation
```

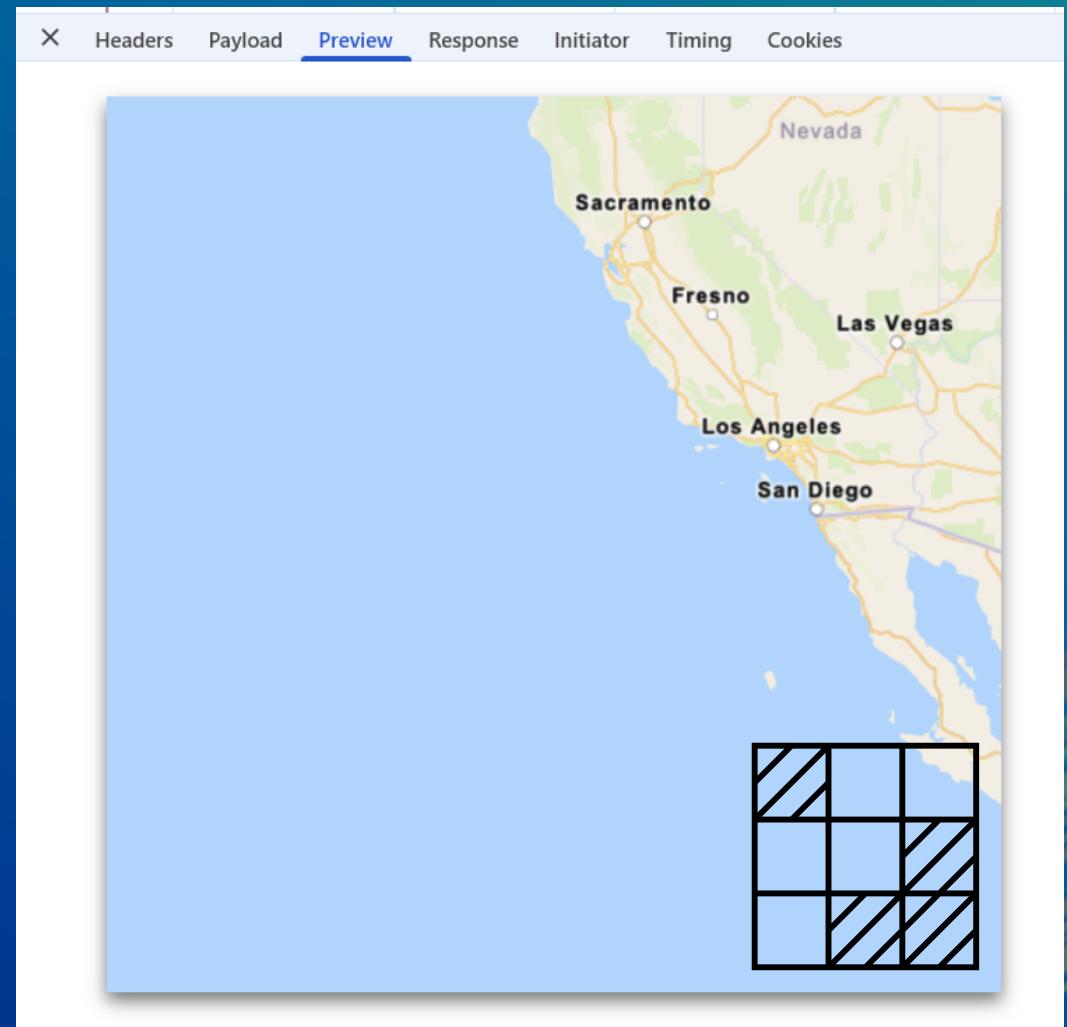
# Basemap data types

- Basemaps use *tile data*
- Map tiles
- Vector tiles
- Tiles are loaded as you pan and zoom



# Map tiles

- AKA “raster tiles”, “image tiles”
- Tiled PNG images
- Traditional way of making interactive maps
- No longer best practice
- Still required in some use cases



# Vector tiles

- Tile data served as PBF
- Smaller files, more efficient
- Works similarly to map tiles
- Defined in Mapbox's [vector-tile-spec](#)
- “Newer” format (2014)
- Widely supported



The screenshot shows a web browser window with the URL [basemaps-api.arcgis.com/arcgis/rest/services/World\\_Basemap...](http://basemaps-api.arcgis.com/arcgis/rest/services/World_Basemap...). The page content is a JSON object with "Pretty-print" checked. The JSON describes a vector tile map with various properties like current version, name, copyright text, capabilities, and a large array of tile definitions. To the right of the browser, there is a diagram of a 4x4 grid of squares. Some squares are empty, while others contain smaller squares, representing a hierarchical tree structure of vector tiles.

```
{"currentVersion":10.81,"name":"World_Basemap_v2","copyrightText":"Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community","capabilities":"TilesOnly,Tilemap","type":"indexedVector","tileMap":"tilemap","defaultStyles":"resources/styles","tiles":[{"tile/{z}/{y}/{x}.pbf"],"exportTilesAllowed":true,"initialExtent":{"xmin":-2.00375070671618E7,"ymin":-2.00375070671618E7,"xmax":2.00375070671618E7,"ymax":2.00375070671618E7,"spatialReference":{"wkid":102100,"latestWkid":3857}},{"fullExtent":{"xmin":-2.00375070671618E7,"ymin":-2.00375070671618E7,"xmax":2.00375070671618E7,"ymax":2.00375070671618E7,"spatialReference":{"wkid":102100,"latestWkid":3857}},"minScale":0.0,"maxScale":0.0,"tileInfo":{"rows":512,"cols":512,"dpi":96,"format":"pbf","origin":{"x":-2.0037508342787E7,"y":2.0037508342787E7}),"spatialReference":{"wkid":102100,"latestWkid":3857}},{"lods":[{"level":0,"resolution":78271.516964,"scale":2.958287637957775E8}, {"level":1,"resolution":39135.75848199995,"scale":1.479143818978885E8}, {"level":2,"resolution":19567.87924100005,"scale":7.39571909489445E7}, {"level":3,"resolution":9783.93962049995,"scale":3.6978595474472E7}, {"level":4,"resolution":4891.96981024998,"scale":1.8489297737236E7}, {"level":5,"resolution":2445.98490512499,"scale":9244648.868618}, {"level":6,"resolution":1222.992452562495,"scale":4622324.434309}, {"level":7,"resolution":611.496226281245,"scale":2311162.2171545}, {"level":8,"resolution":305.74811314069,"scale":1155581.1085775}, {"level":9,"resolution":152.874056570279,"scale":577790.5542885}, {"level":10,"resolution":76.4370282852055,"scale":288895.2771445}, {"level":11,"resolution":38.2185141425366,"scale":144447.638572}, {"level":12,"resolution":19.1092570712683,"scale":72223.819286}, {"level":13,"resolution":9.55462853563415,"scale":36111.909643}, {"level":14,"resolution":4.777314267817075,"scale":18055.9548215}]}]
```



# Demo: Visualizing tiles

# ArcGIS Basemap Styles service



# ArcGIS Basemap Styles service

- Basemap styles served primarily as **vector tiles**
- Also supports web map format
- The primary ArcGIS basemap service
- Compatible with all ArcGIS Maps SDKs, some open source libraries

## Service URL

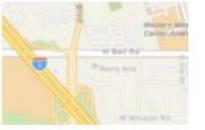
```
https://basemapstyles-api.arcgis.com/arcgis/rest/services/styles/v2
```



# Available styles

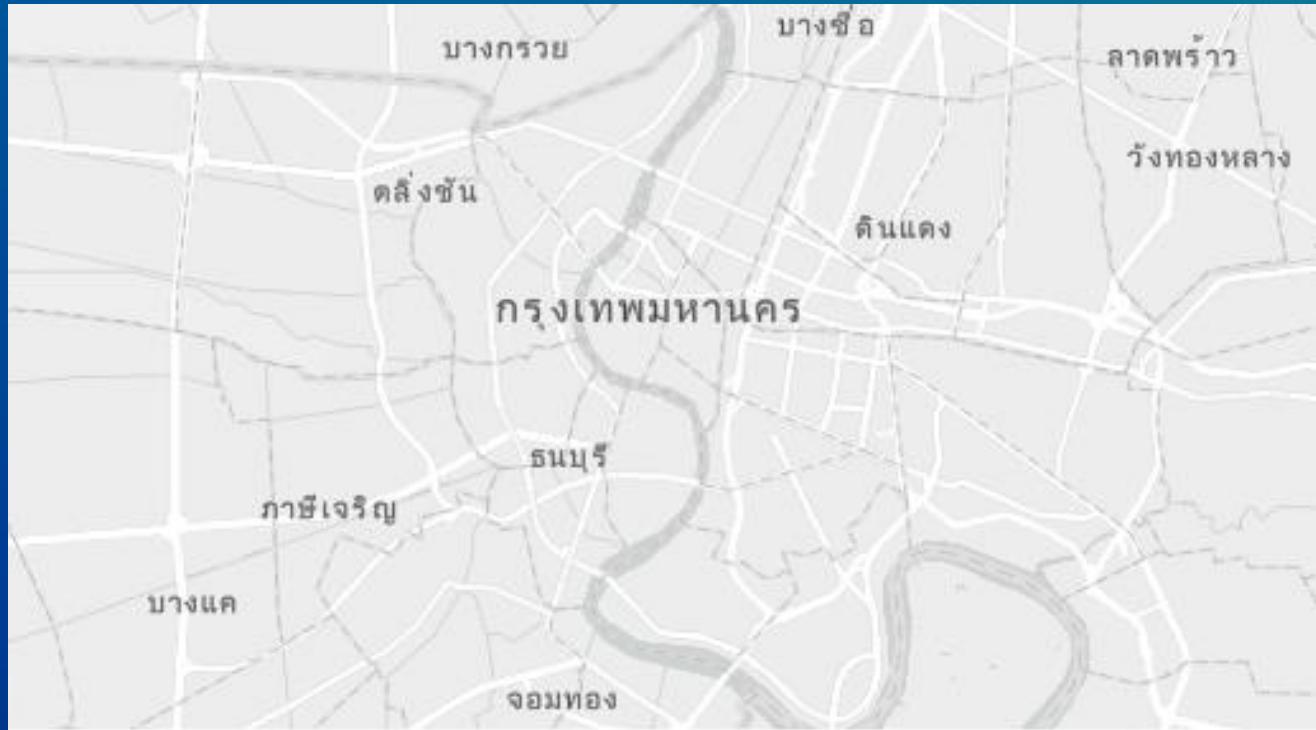
- 40+ ArcGIS basemap styles
- OSM styles
- Supports custom basemap styles created with VTSE

<https://developers.arcgis.com/rest/basemap-styles/>

Streets and navigation			
Topography and imagery			
Reference			
Creative			
	<b>Name</b>	<b>Description</b>	
	<a href="#">/styles/arcgis/navigation</a> <a href="#">/webmaps/arcgis/navigation</a>	 Navigation	
	<a href="#">/styles/arcgis/navigation-night</a> <a href="#">/webmaps/arcgis/navigation-night</a>	 Navigation night	
	<a href="#">/styles/arcgis/streets</a> <a href="#">/webmaps/arcgis/streets</a>	 Streets	
	<a href="#">/styles/arcgis/streets-relief</a> <a href="#">/webmaps/arcgis/streets-relief</a>	 Streets relief	
	<a href="#">/styles/arcgis/streets-relief-base</a> <a href="#">/webmaps/arcgis/streets-relief-base</a>	 Streets relief-base	

# Parameters: Language

- Language localization
- `language=<code>`



- <https://developers.arcgis.com/rest/basemap-styles/languages/>

## Parameters: Worldview

- Adjust map to accommodate boundary disputes
  - **worldview=<code>**
  - New `unitedStatesOfAmerica` option
- 
- <https://developers.arcgis.com/rest/basemap-styles/worldview/>

# Parameters: Places of interest

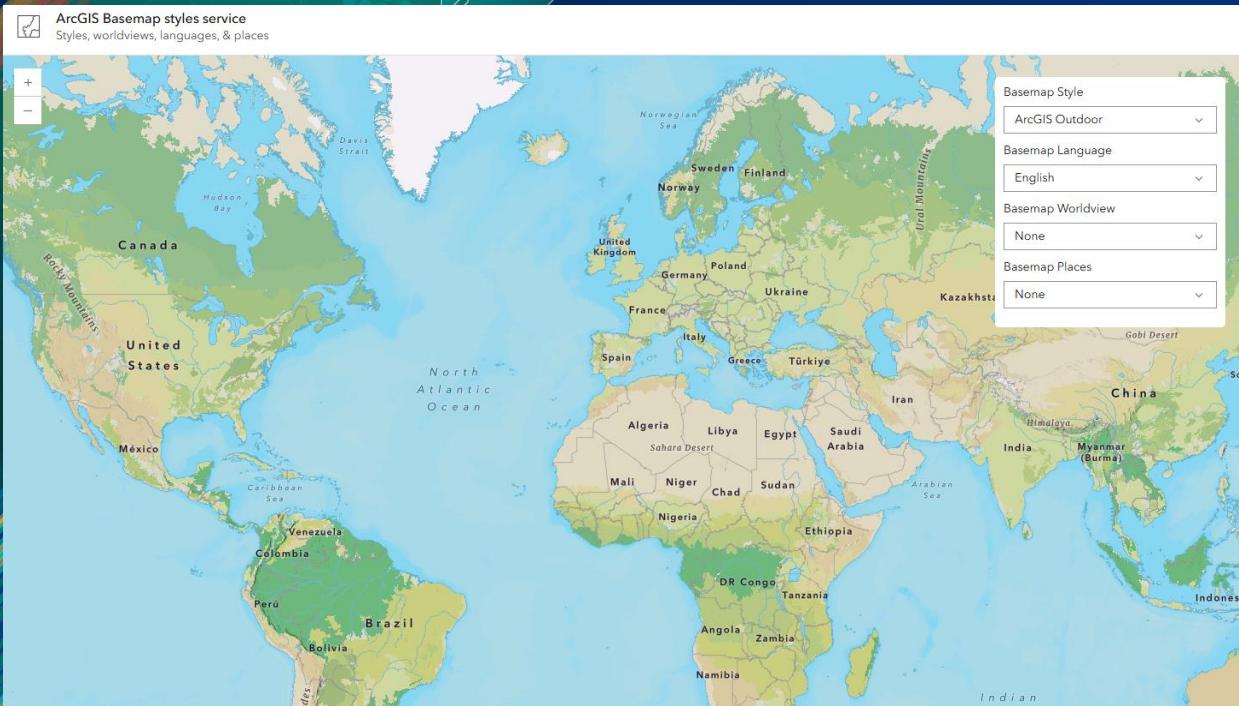
## Basemap places

- Display places of interest on your map
- Gives place IDs that are usable with the ArcGIS Places service
- **places=all**

- Basemap places documentation



# Demo: Display a basemap



# ArcGIS Vector Tile Style Editor (VTSE)



# ArcGIS Vector Tile Style Editor

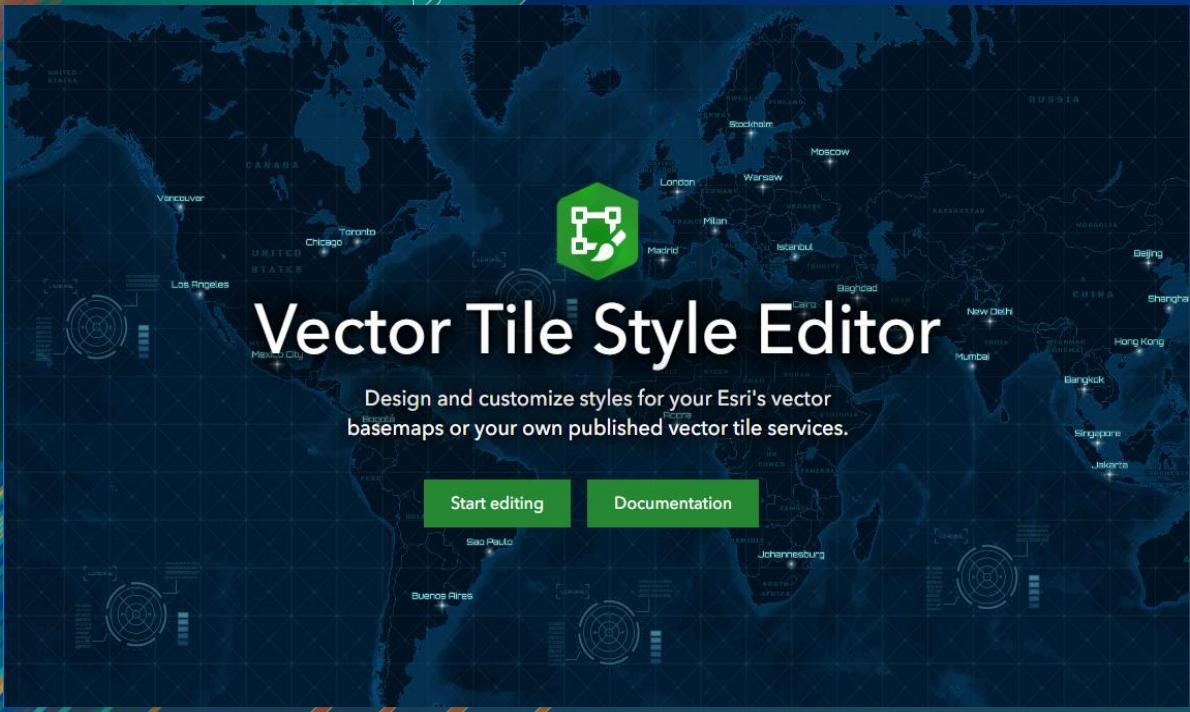
- Dynamic vector tile services
- High-performance rendering
- Part of the ArcGIS system



# VTSE: More details

- Seamless integration
- Scalable & customizable
- Real-time styling
- Optimized for all devices

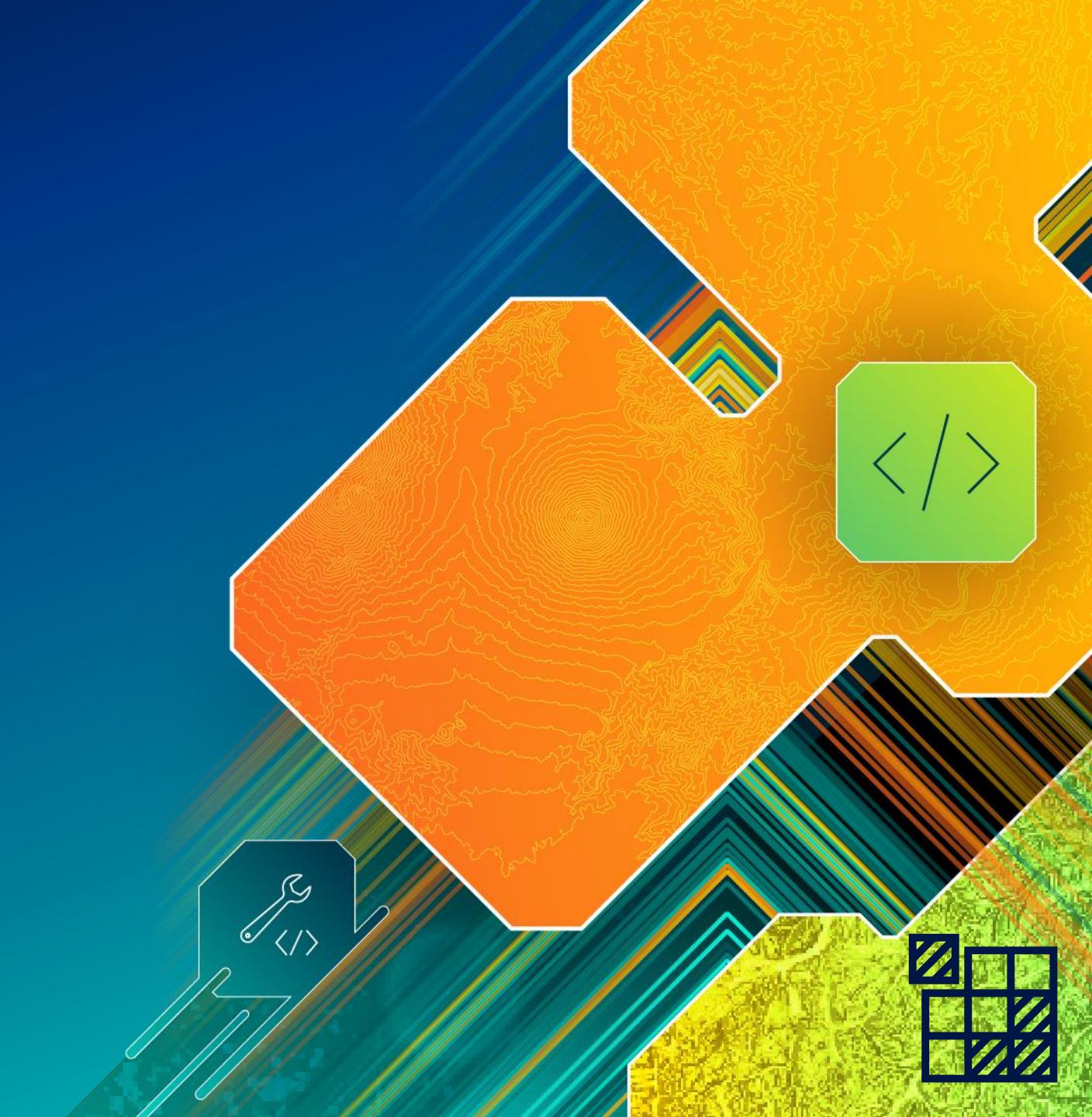




# Demo: Custom basemap style



# ArcGIS Static Basemap Tiles service

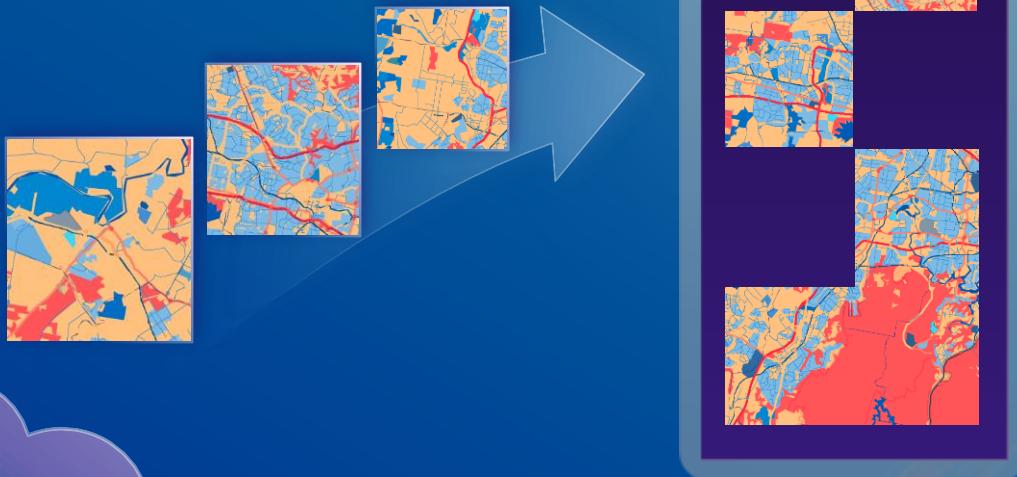


**new**

# Static Basemap Tiles Service

Provides On-Demand Generation of Map Tiles

- Documentation:  
[https://developers.arcgis.com/rest  
/static-basemap-tiles/](https://developers.arcgis.com/rest/static-basemap-tiles/)
- Raster form of vector basemaps
- Always up-to-date



*Bringing the Power of Vector Tiles to Map Tiles*



# What the service contains

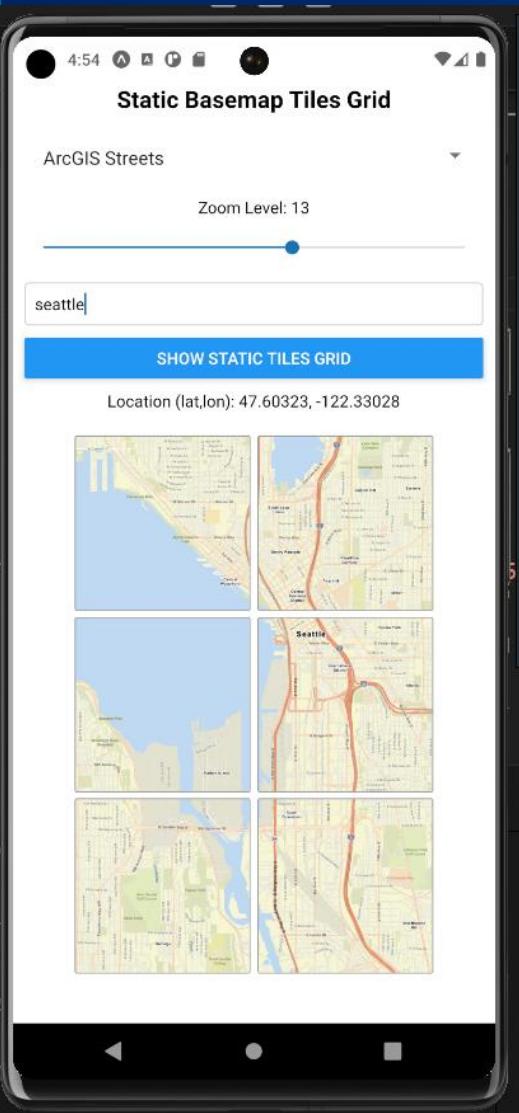
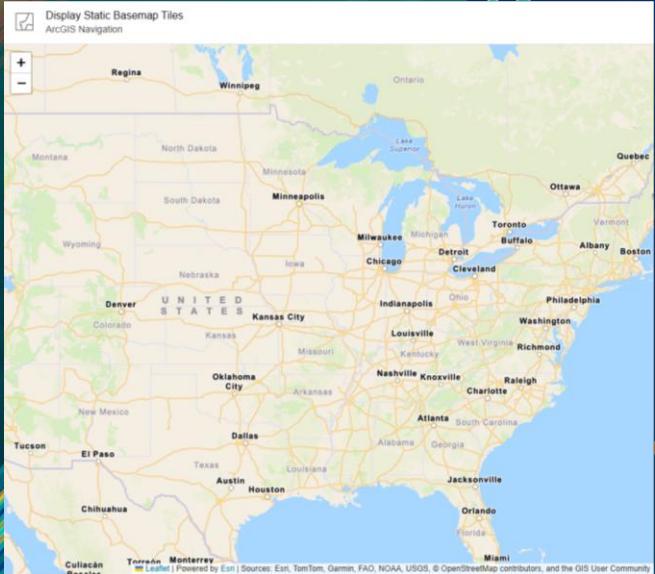
- Supports most of the same styles as the Basemap Styles Service
- Can be used with ArcGIS Maps SDKs and open source libraries
- No satellite imagery on this endpoint
- Some limitations re: language, worldview



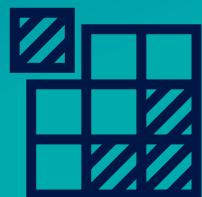
# When should you use this?

- Ideal for
  - Lightweight applications
  - No vector tile rendering engine
  - Older devices
  - Developer preference



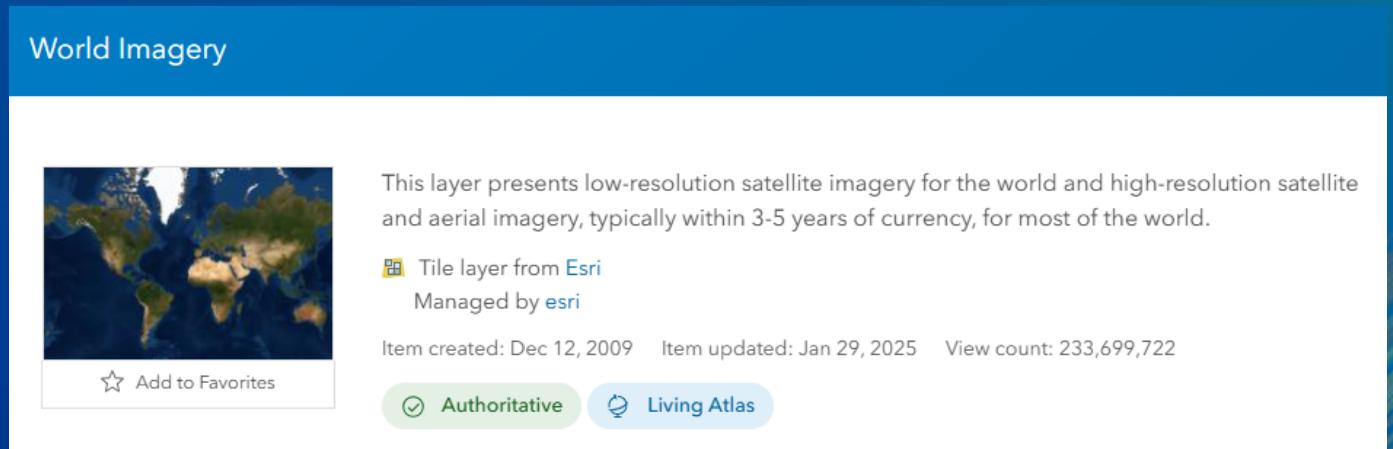


# Demos: Static basemap tiles



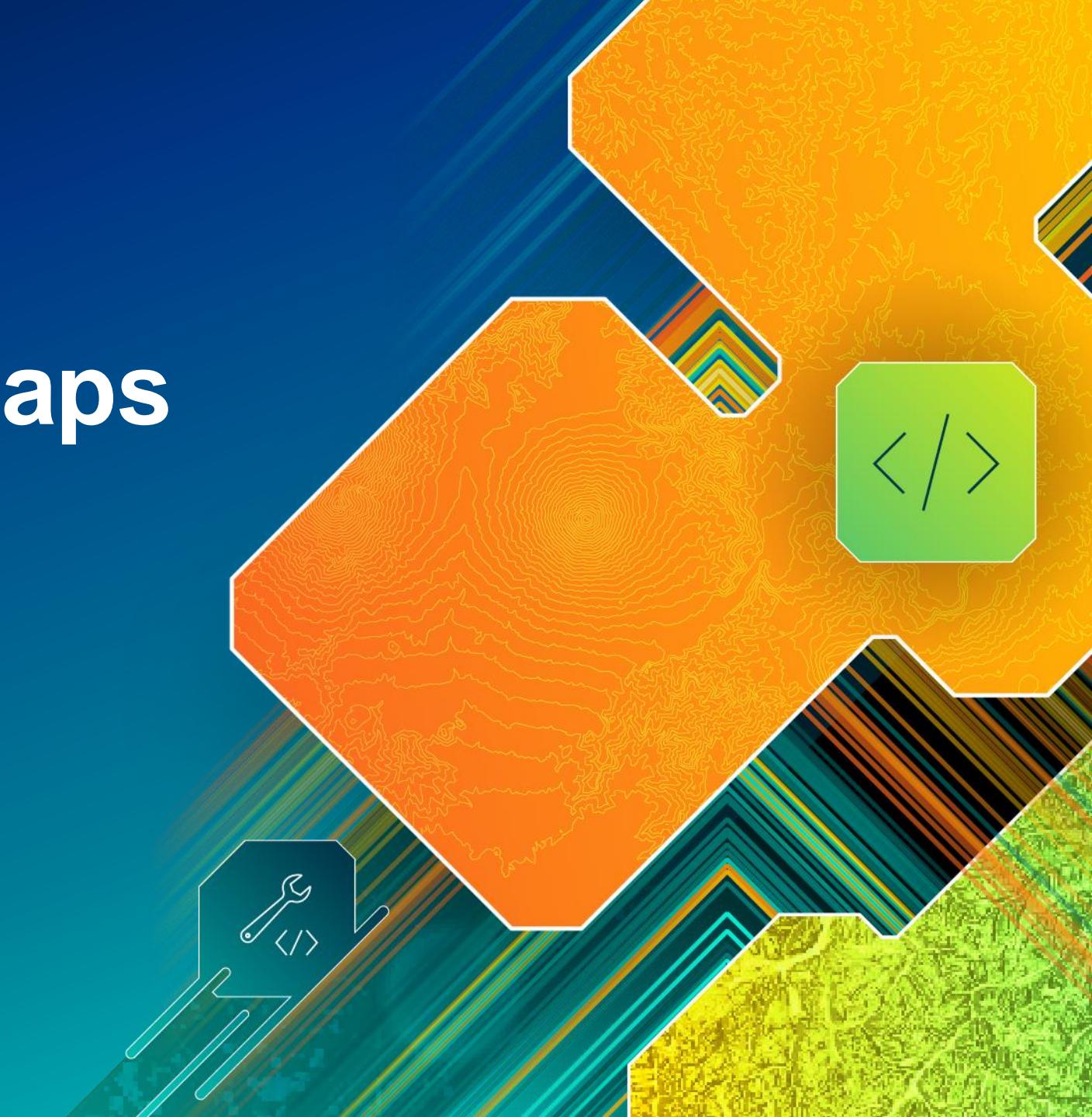
# Map service alternatives for basemaps

- Access map tiles from MapServer urls
- [ibasemapsapi.arcgis.com](https://ibasemapsapi.arcgis.com/arcgis/rest/services) urls
- Satellite imagery, oceans, terrain
- ArcGIS Living Atlas



- [https://ibasemaps-api.arcgis.com/arcgis/rest/services/World\\_Imagery/MapServer/](https://ibasemaps-api.arcgis.com/arcgis/rest/services/World_Imagery/MapServer/)

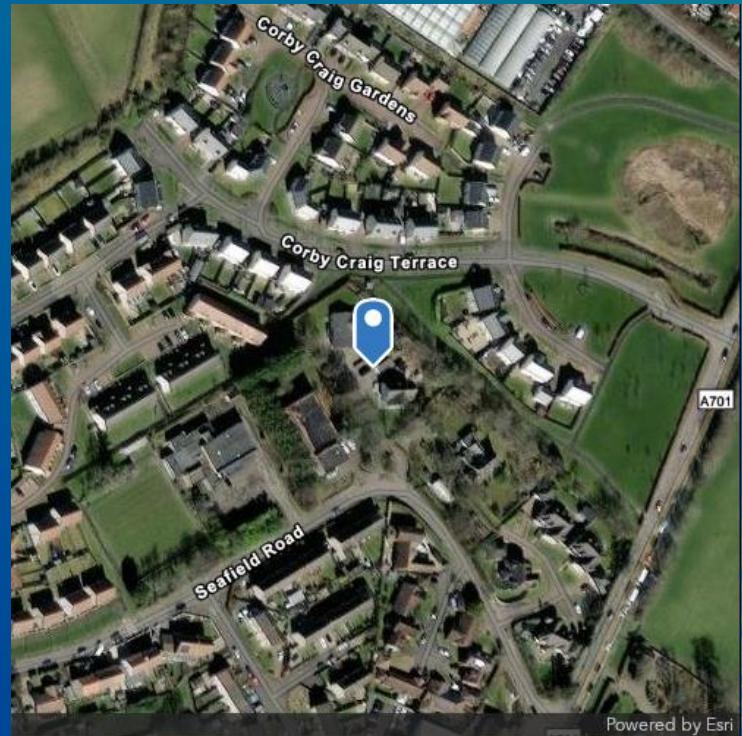
# ArcGIS Static Maps service



# ArcGIS Static Maps service (Beta)

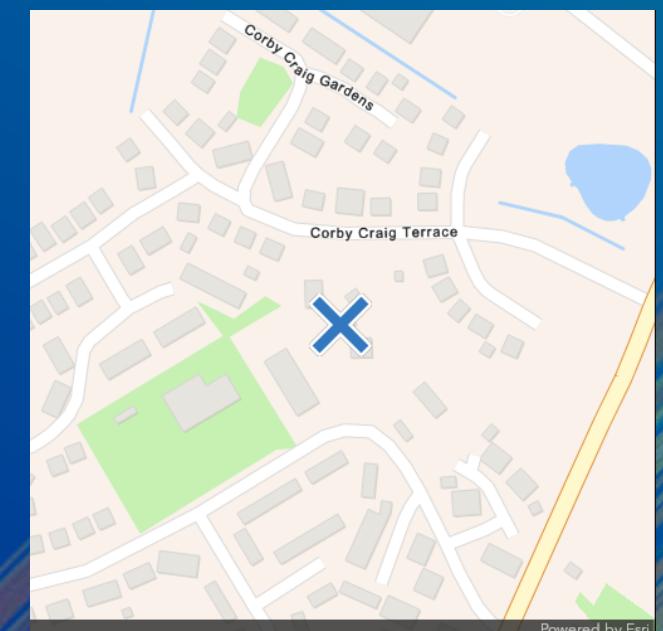
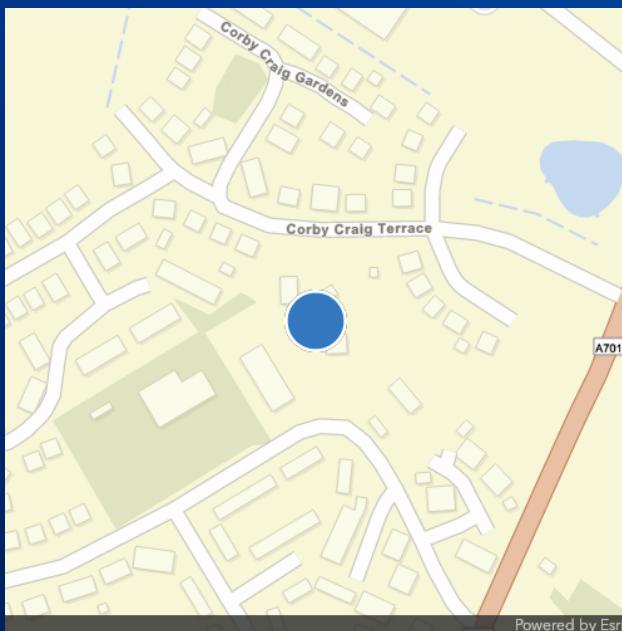
new

- Use basemap data to generate **still images of maps**
- Output is a single PNG/JPG/WEBP image, *not tiles*
  
- Service in beta, limited styles and params
- Documentation: <https://developers.arcgis.com/rest/static-maps/>



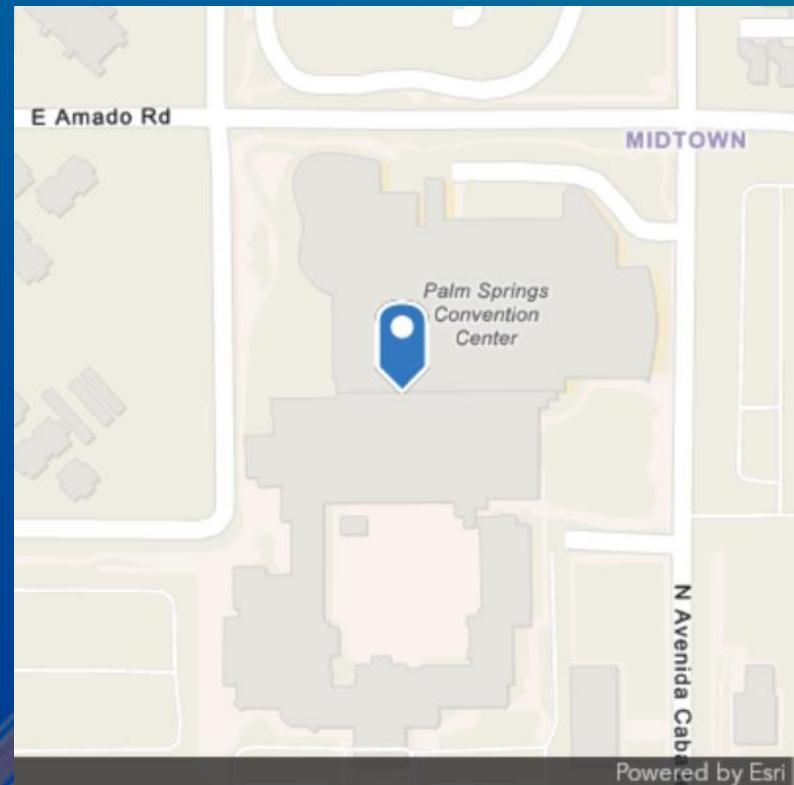
# Static maps: Customization options

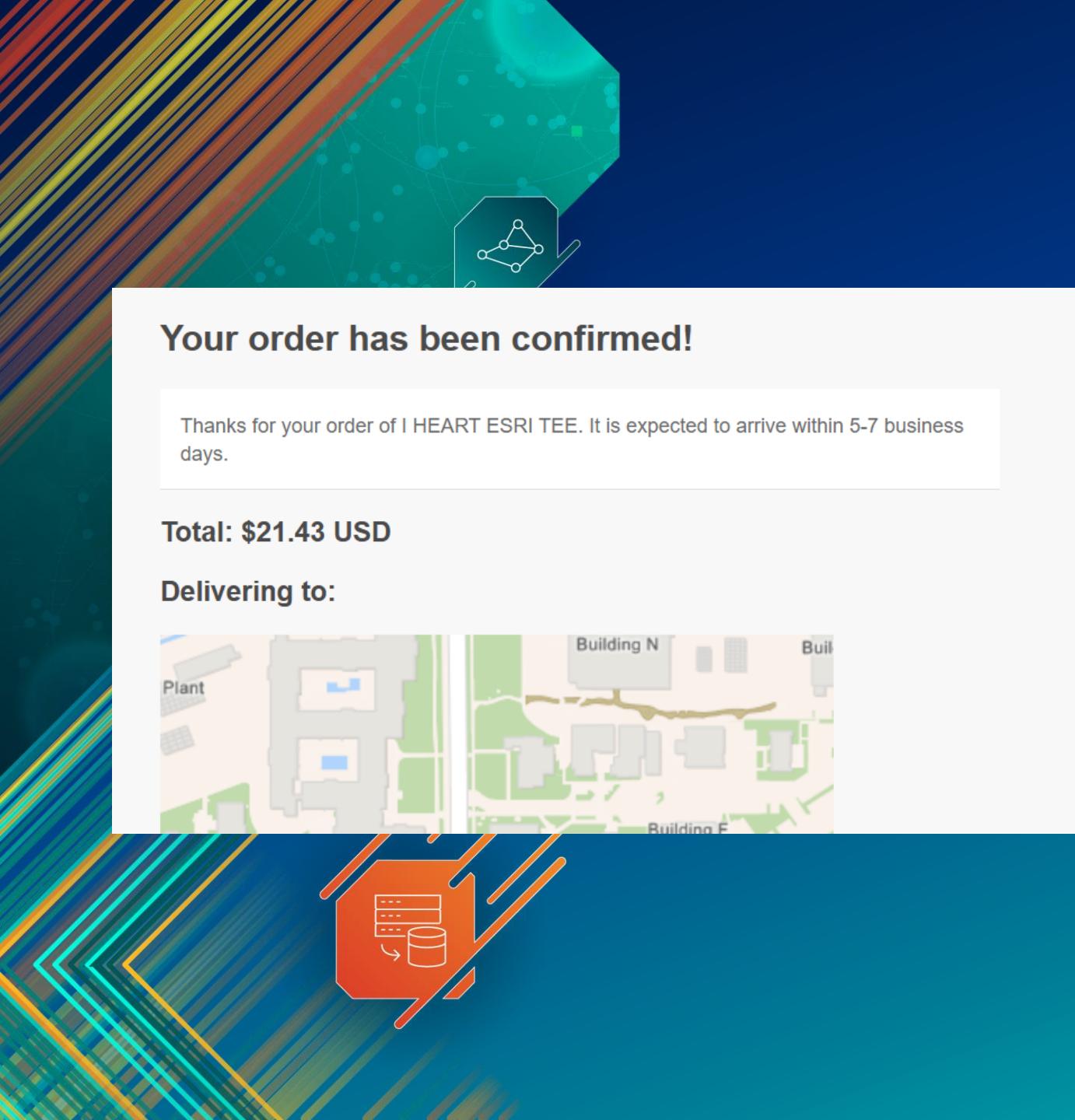
- Basemap style (navigation, streets, imagery)
- Marker style (pin, x, circle, square, etc)
- Output format (png, jpg, webp)
- Image dimensions



# Static maps: Use cases?

- Any situation where the map does not need to be interactive
- Show a map without building a fully-fledged application
- E-commerce
- Address books, sensor locations



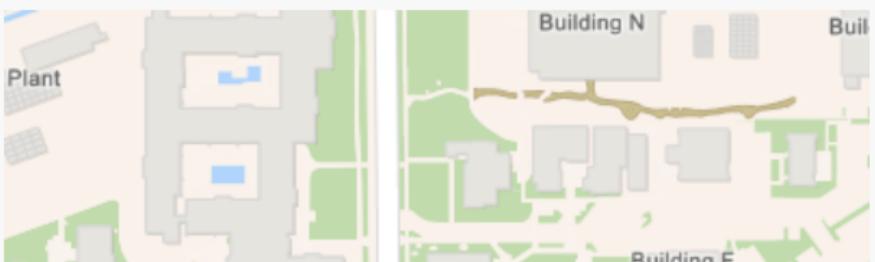


## Your order has been confirmed!

Thanks for your order of I HEART ESRI TEE. It is expected to arrive within 5-7 business days.

Total: \$21.43 USD

Delivering to:



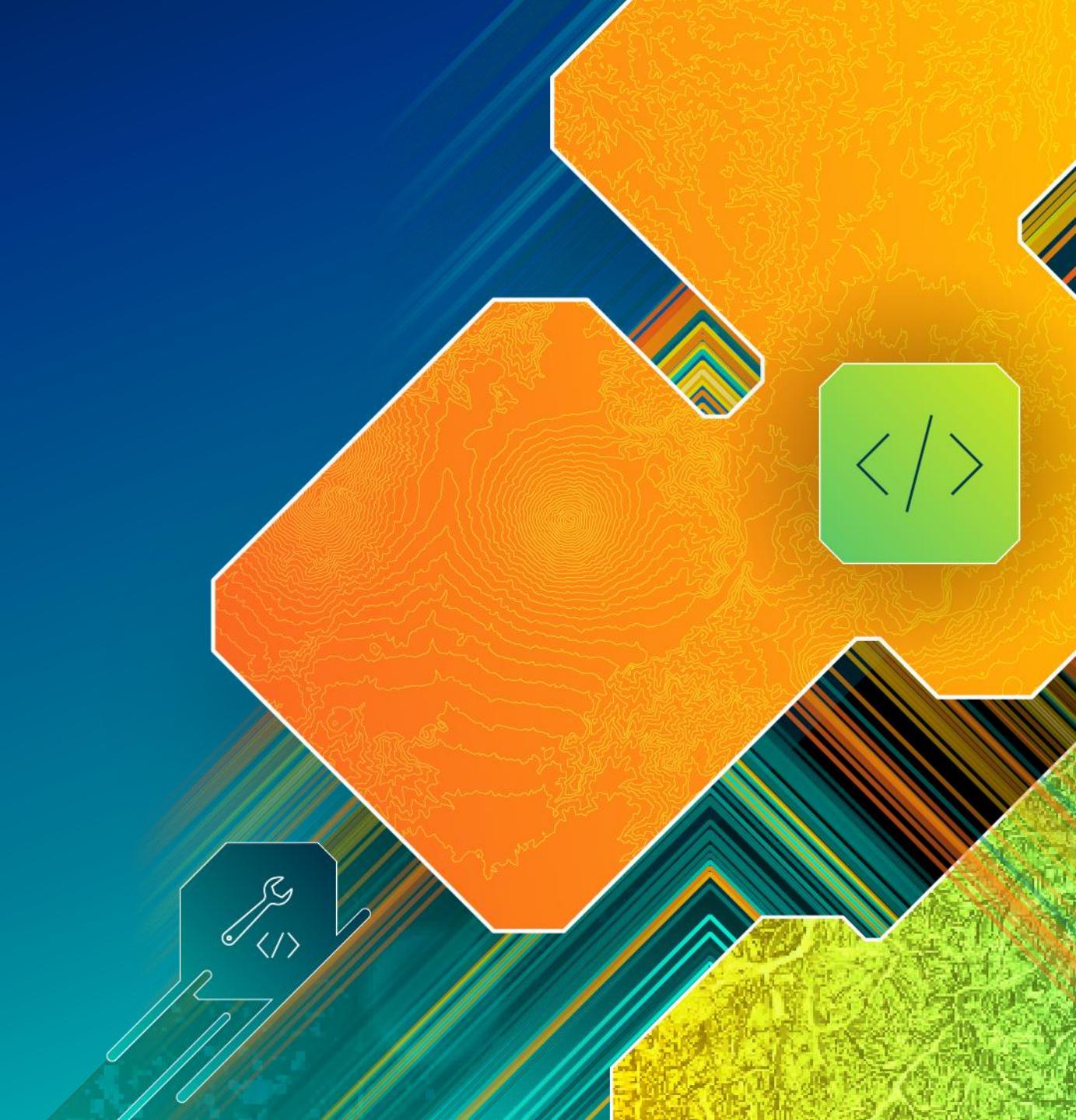
# Demo: Static maps for email receipts

React app by George Owen

# Resources

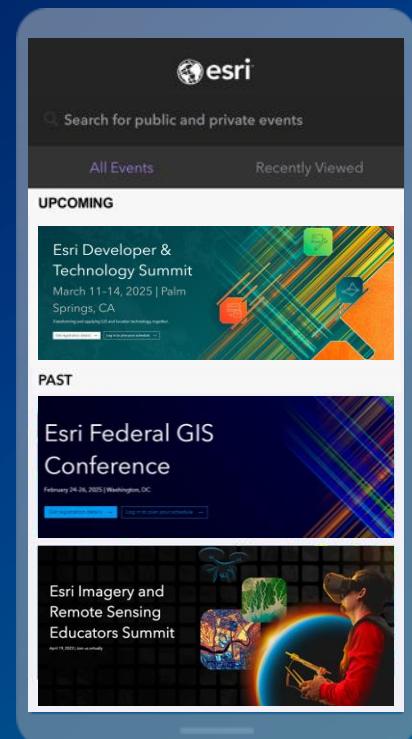
- [ArcGIS Basemap Styles service](#)
- [Vector Tile Style Editor](#)
- [ArcGIS Map Viewer](#)
- [ArcGIS Static Basemap Tiles service](#)
- [ArcGIS Static Maps service](#)
- [ArcGIS Living Atlas basemaps](#)

# Questions

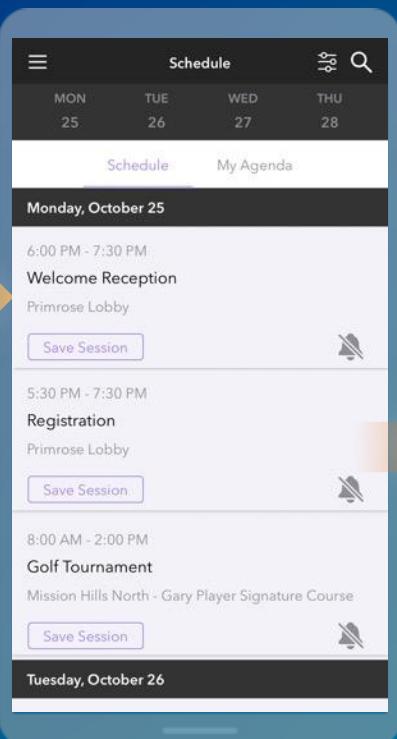


# Please share your feedback in the app

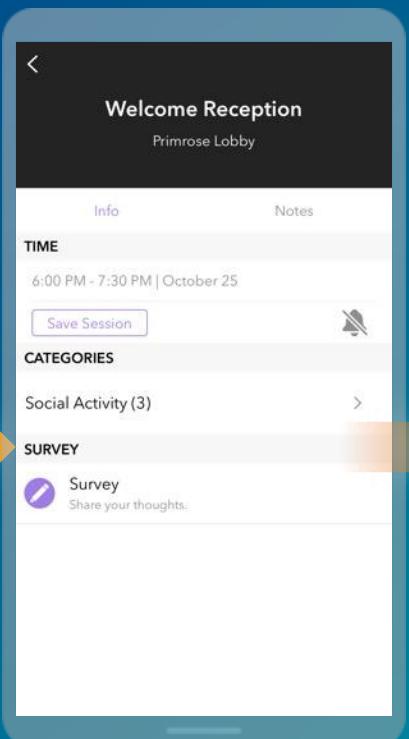
Download the Esri Events app and find your event



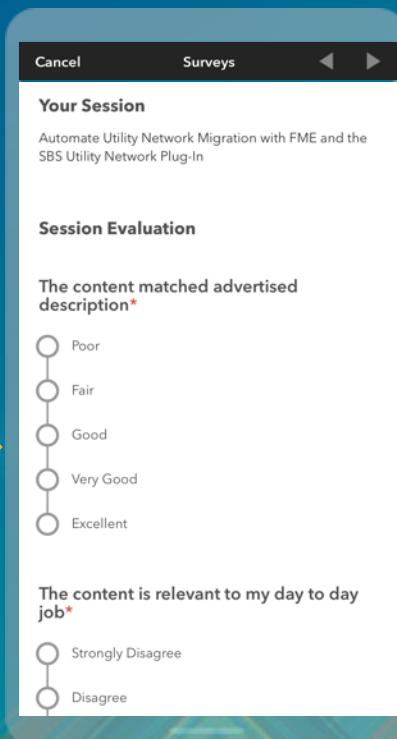
Select the session that you attended



Scroll down to "Survey"



Log in to access the survey



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 [x.com/EsriDevEvents](https://x.com/EsriDevEvents)

 [youtube.com/@EsriDevs](https://youtube.com/@EsriDevs)

 [links.esri.com/DevVideos](https://links.esri.com/DevVideos)

 [github.com/Esri](https://github.com/Esri)

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