ESRI DEV SUMMIT

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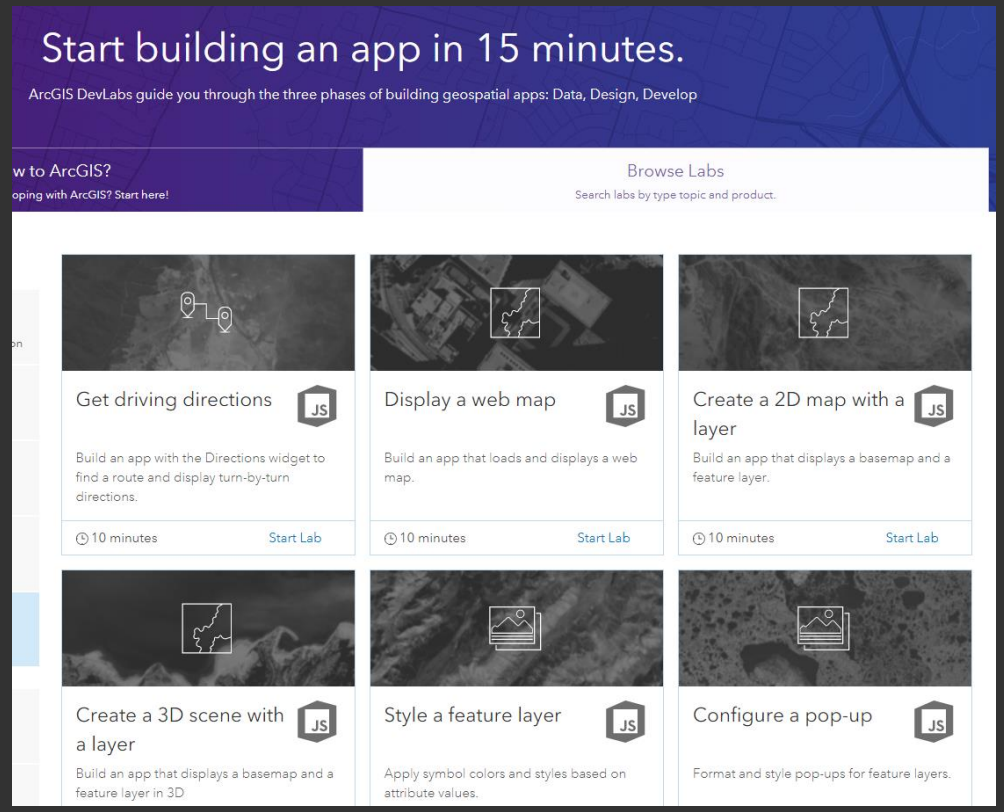
NC DOT

PLENARY SESSION

- JavaScript API

- Analytics
  - ArcGIS Insights
    - https://www.esri.com/en-us/arcgis/products/insights-for-arcgis/overview
  - Jupyter Notebooks and the ArcGIS Python API

- Developer Experience
  - ArcGIS for Developers: developers.arcgis.com
  - ArcGIS Developer Program
    - Example Apps
    - Dev Labs – 15 minutes or less (https://developers.arcgis.com/labs/)



PLENARY SESSION (CONTINUED)

The Power of Python in ArcGIS Pro

- Debugging for python in Pro
- Adding the ability to encrypt python toolboxes
- Python "Backstage" – allows you to install imports (like pip or npm)
- You can attach Visual Studio to your python process in pro for debugging

Automation for ArcGIS Enterprise

- AGOL Collaboration – adds the ability for organizations to work together as "hosts" and "participants". This can be powerful for emergency response.
- AGOL Solution Templates – you can clone these into your org

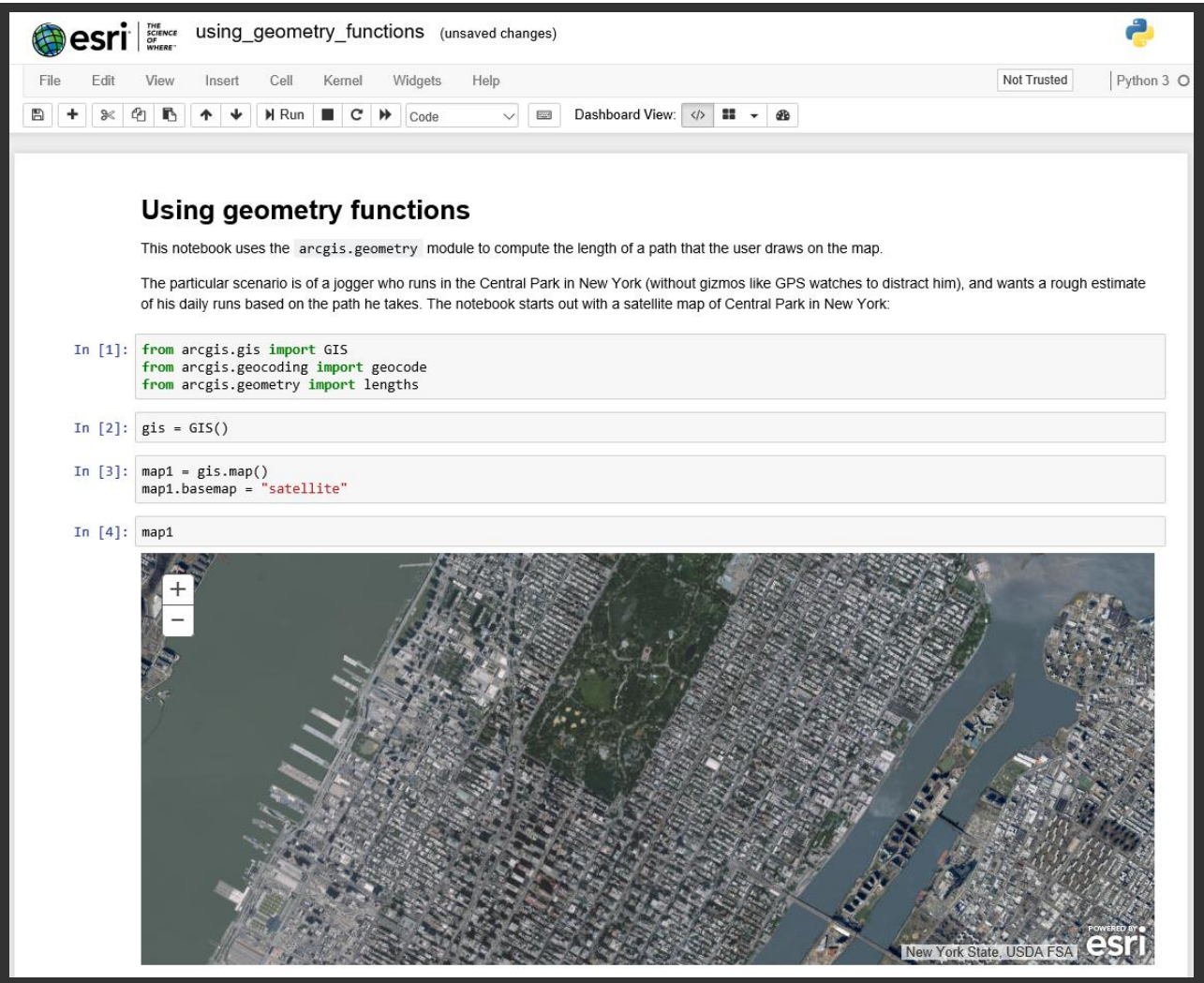
ARCGIS API FOR PYTHON

Allows you to use Python against the REST API. It contains a collection of classes that are set up to work with REST end points.

ArcGIS API	ArcPy
Script against a portal • Python 3.x	For desktop GIS • ArcMap 2.x • ArcPro 3.x
• Analysis, portal administration, content creation, Big Data Analysis	• Geoprocessing • Some map automation

JUPYTER NOTEBOOKS

NOTEBOOKS.ESRI.COM



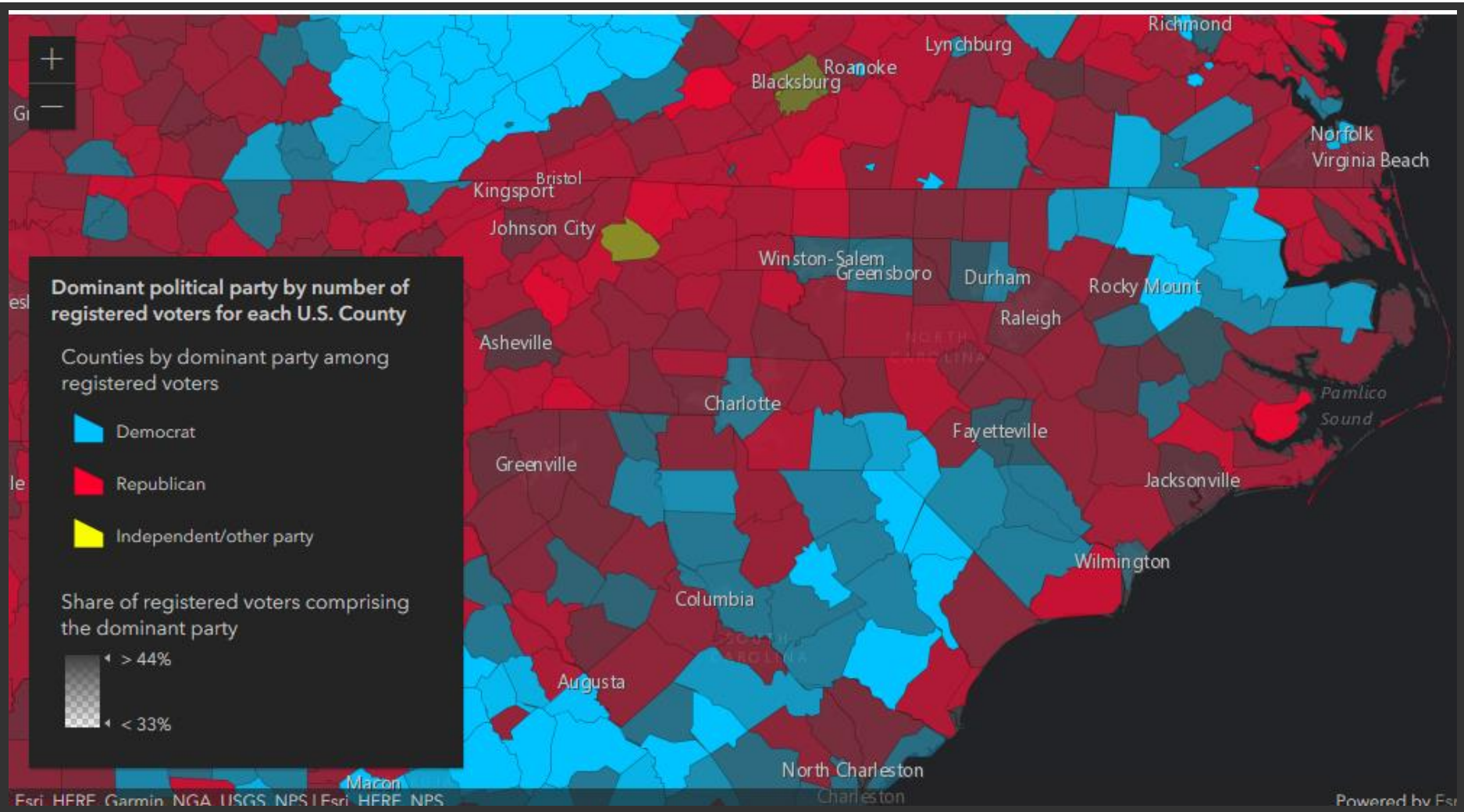
ARCADE

HTTPS://DEVELOPERS.ARCGIS.COM/ARCADE/

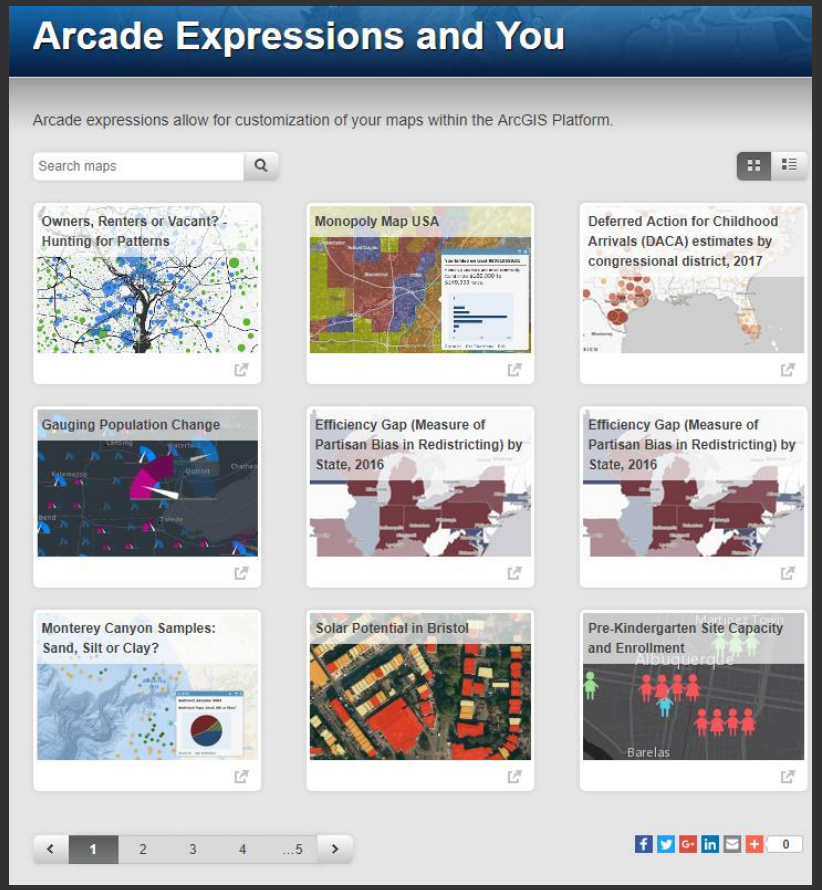
- Lightweight Scripting Language that can be used in the ArcGIS JavaScript API, ArcGIS Online, ArcGIS Runtime and ArcGIS Pro
- Can be used for dynamic labeling, rendering and pop-up content
- Includes Feature and Geometry Types

EXAMPLE:

HTTPS://DEVELOPERS.ARCGIS.COM/JAVASCRIPT/LATEST/SAMPLE-CODE/VISUALIZATION-ARCADE/INDEX.HTML



ADDITIONAL RESOURCES



- Sample Gallery
  - https://github.com/Esri/arcade-expressions
- Arcade Expressions and You
  - http://arcgis-content.maps.arcgis.com/apps/PublicGallery/index.html?appid=8951b538362b492cadadf7ede1b85c21

GEOEVENT SERVER

Real-time GIS:

- Moving objects, stationary with changing attributes, or discrete.

Six Key Capabilities

1. Ingest real time, high velocity data
2. Perform continuous analysis
3. Store observations in a *spatiotemporal big data store*
   - *Can accept 4000 events per second - 5 to 10 attributes (RDBMS capped at 300 records per second)*
4. Visualize high velocity and volume data
5. Notify about patterns of interest (real time push notifications)
6. Adjust behavior of things through automation (close a valve, activate a sprinkler system, adjust the thermostat….)

GEOEVENT SERVER (CONTINUED)

Visualizing Real Time Data

https://geoeventsample1.esri.com:6443/arcgis/rest/services

Services:

- AirportTrafficsFS (FeatureServer)
- AirportTrafficsFSHist (FeatureServer)
- AirportTrafficsFSHist (MapServer)
- AirportTrafficsFS (MapServer)
- AirportTraffics (StreamServer)
- FAAStream (StreamServer)
- LABus (StreamServer)
- NYCMonitoredVehicleJourney (StreamServer)
- PanamaAIS (StreamServer)
- PanamaTugBoatServiceLog (StreamServer)
- PanamaTugBoat (StreamServer)
- PanamaTugBuffer (StreamServer)
- SeattleBus (StreamServer)
- WashingtonMetroBuses (StreamServer)
- WorldSatellites (StreamServer)

Stream Layers

- For moving assets
- Push data directly to clients
- Does not require storage

Polling Model

- Poll to get data and write to an enterprise geodatabase or spatiotemporal big data store
- Update 6 second refresh rate

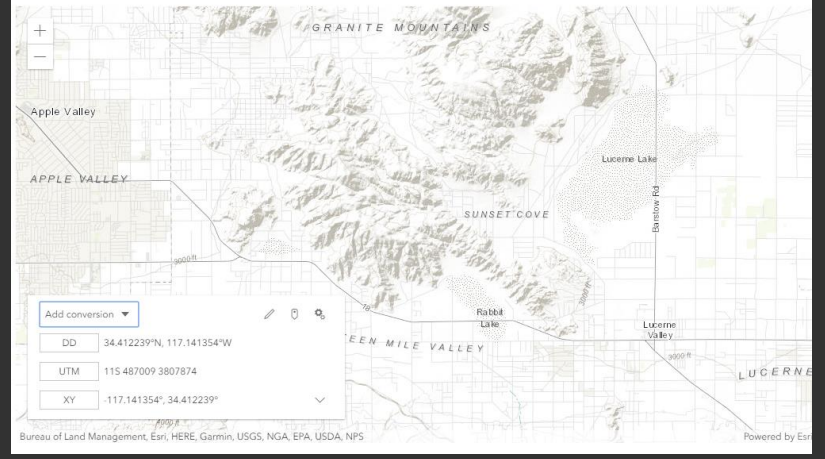
JAVASCRIPT API

Version 3.x vs 4.x

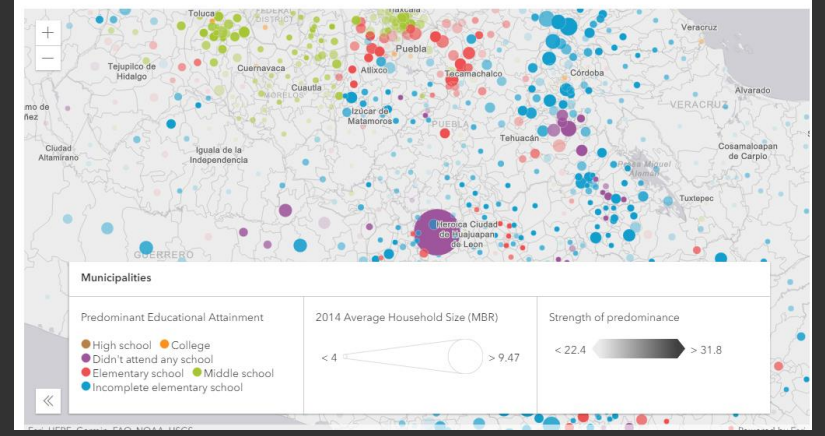
New in 4.x

- 3D
  - Direct Line Measurement Tool
  - Area measurements and perimeter (any 3D space, not just vertical)
  - Edge rendering for scene layers
- Widgets
  - Coordinate Conversion (projection engine)
  - Layer List – added panels – allows you to display the legend within the layer list
  - Legend – new card style legend with new display options
- Visualization
  - Point Clustering – quantitative and thematic
  - Smart Mapping
  - Point cloud unique values
  - Type renderer creation – generate unique value renderers

CoordinateConversion widget



Legend widget card style



JAVASCRIPT API CONTINUED

- WebGL – faster, with more feature capacity then SVG (hosted feature layer only)
  - https://www.esri.com/arcgis-blog/products/js-api-arcgis/uncategorized/featurelayer-rendering-taking-advantage-of-webgl-in-2d
- Custom Widgets
  - New widget architecture – view model that separates logic from the view.
  - Custom Widget Tutorial
    - https://developers.arcgis.com/javascript/latest/sample-code/widgets-custom-widget/index.html
- Coding Patterns (Guide – working with the API)
    - https://developers.arcgis.com/javascript/latest/guide/index.html
  - Autocasting
  - Promises
  - Loadable Pattern (Get, Set and Watch)

Before

```
require([
  "esri/Color",
  "esri/symbols/SimpleLineSymbol",
  "esri/symbols/SimpleMarkerSymbol",
  "esri/renderers/SimpleRenderer",
  "esri/layers/FeatureLayer",
], function (
  Color, SimpleLineSymbol, SimpleMarkerSymbol, SimpleRenderer, FeatureLayer
) {
```

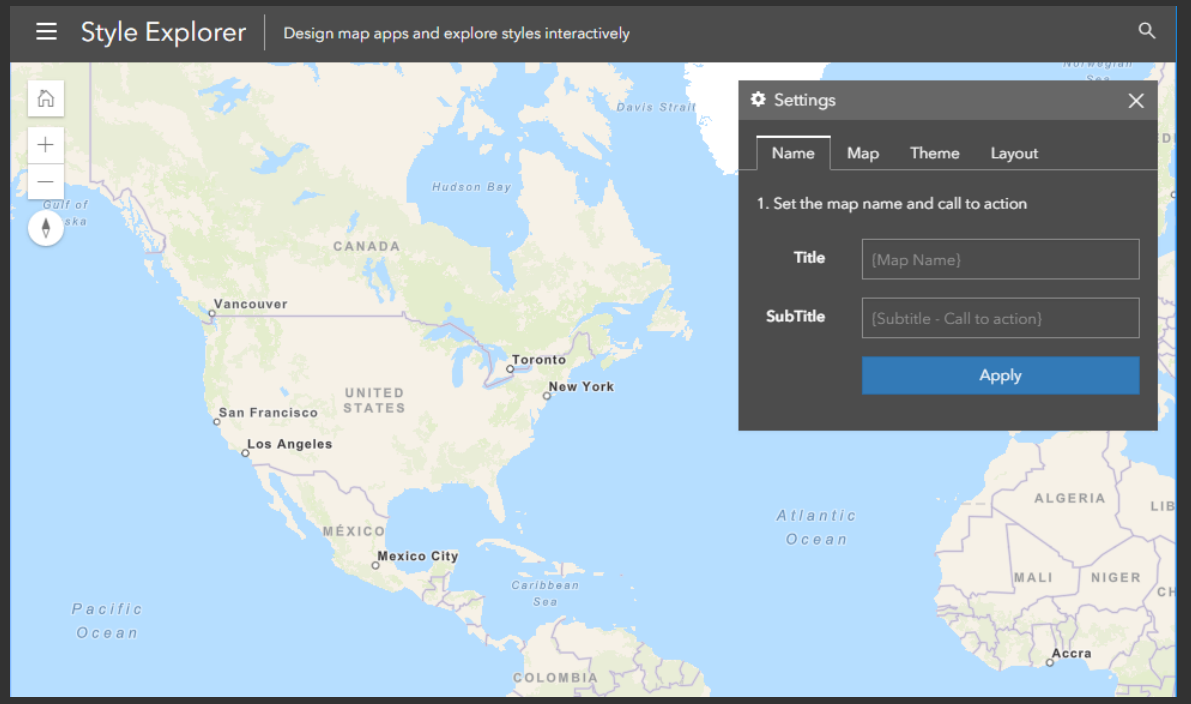
After

```
require([
  "esri/layers/FeatureLayer"
], function (
  FeatureLayer
) {
```

RESOURCES FOR BUILDING A CUSTOM WEB MAP

- Maps App for JavaScript
  - https://developers.arcgis.com/example-apps/maps-app-javascript/

- Calcite Maps (3.x, 4.x and Leaflet!)
  - https://esri.github.io/calcite-maps/samples/index.html



WHAT THE "COOL KIDS" ARE DOING

Chrome Dev Tools (https://developers.google.com/web/tools/chrome-devtools/)

- Mobile Emulator
- Break on Event listener
- Pause on caught exceptions
- Connect to a local workspace and edit your code directly

Lighthouse (https://developers.google.com/web/tools/lighthouse/)

- Audit your "progressive web app"

Visual Studio Code (https://code.visualstudio.com/)

- Free text editor with intellisense and many helpful extensions

MORE COOL STUFF

TypeScript (https://www.typescriptlang.org/)

- Typed superset of JavaScript that compiles to plain javascript
- Setting things up for ESRI: https://developers.arcgis.com/javascript/latest/guide/typescript-setup/index.html

ESRI JSAPI Resources (https://github.com/esri/jsapi-resources)

- JSHint file used by ESRI
- Resources for creating custom builds
- Webpack (https://developers.arcgis.com/javascript/latest/guide/using-webpack/index.html)

QUESTIONS?

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