ArcGIS API for JavaScript: Creating Custom Layers and Layer Views

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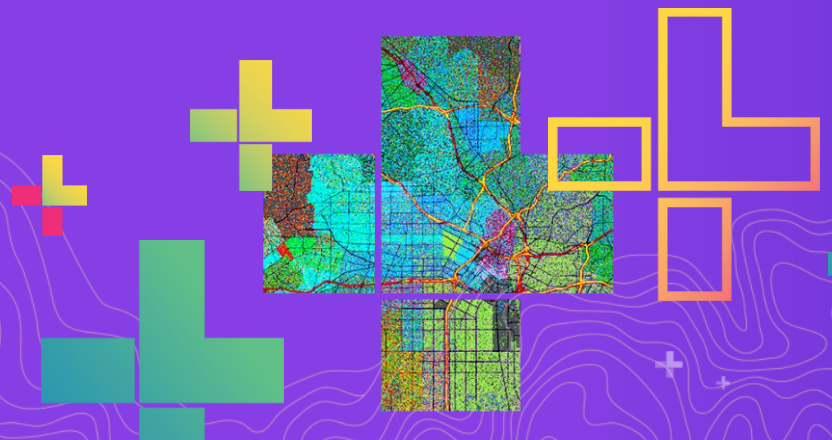
2020



Agenda

- Intro to custom Layers and LayerViews in JSAPI 4.x

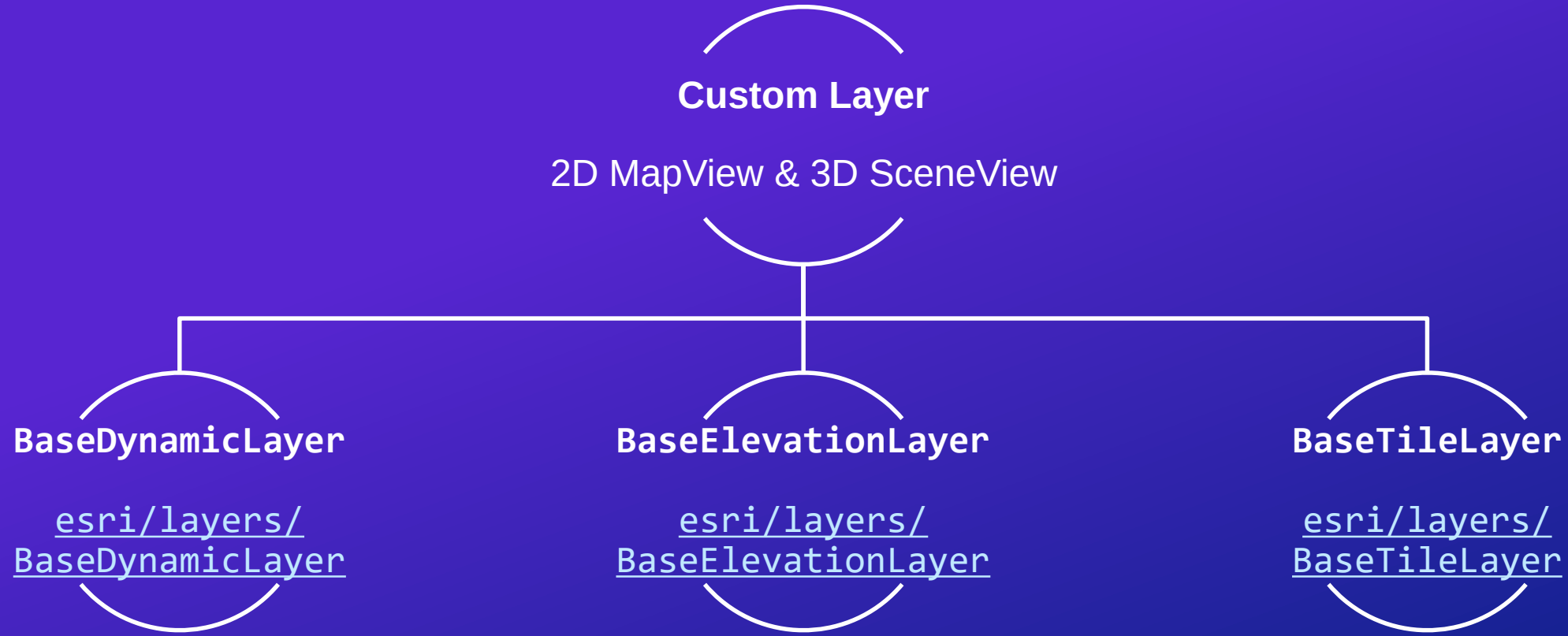
- Examples and demos

- Deep dive into a custom visualization for a 2D MapView

Finding Our Way

Where to begin making custom Layers and Layer Views

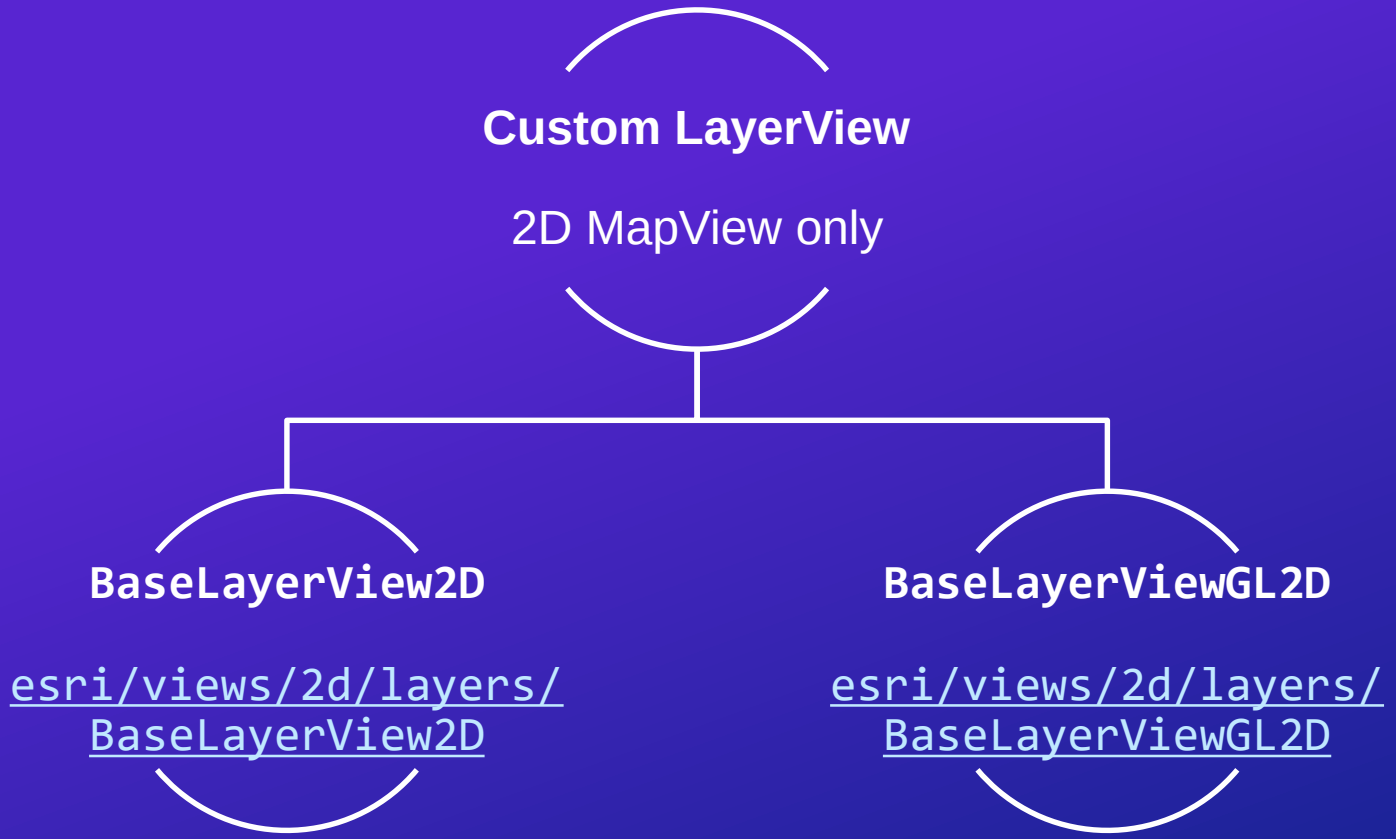
1. Extending JSAPI 4.x with a custom “Layer”



1. Extending JSAPI 4.x with a custom “Layer”

- 2D MapView or 3D SceneView
- Why create a custom layer?
  - Connect to a service not supported (yet) by the JSAPI
  - Manipulate data client-side before it is displayed in a 2D MapView or 3D SceneView
  - Mash up multiple services to create new visualizations
- Limitations
  - Suited for static content
  - No control over when it redraws
  - Limited to image formats and tiles

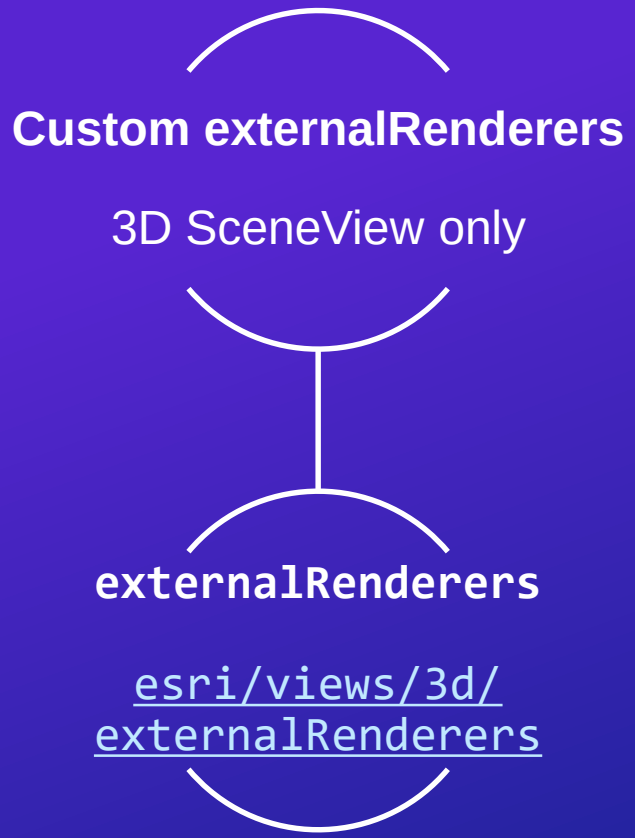
2. Extending JSAPI 4.x with a custom “LayerView”



2. Extending JSAPI 4.x with a custom “LayerView”

- 2D MapView only
- Represents the *view* of a Layer after it has been added to a Map
- Responsible for calling a Layer’s API to get data and draw it
- `Canvas API` or `WebGL API` is exposed to draw anything you want in a 2D MapView
  - Why? There are no longer HTML nodes representing your geographical features.

3. Extending JSAPI 4.x with custom “externalRenderers”



3. Extending JSAPI 4.x with custom “externalRenderers”

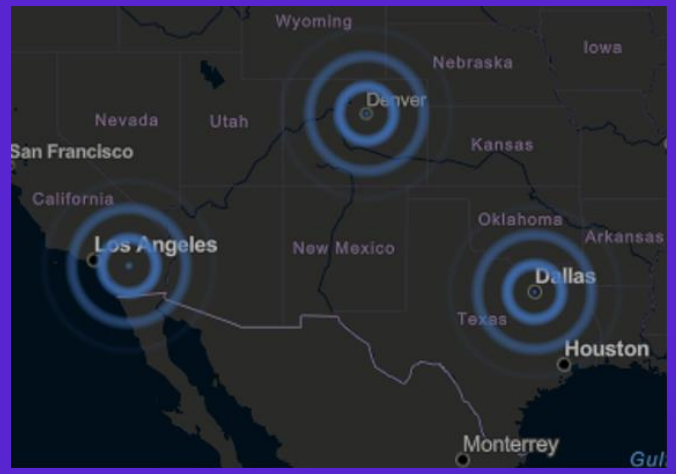
- 3D SceneView only

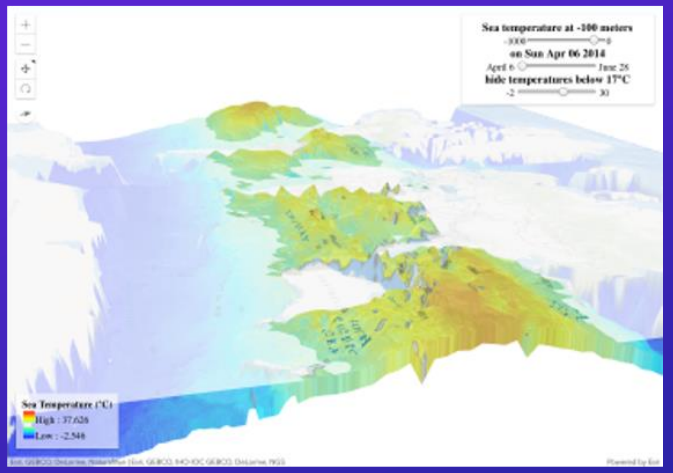
- `WebGL API` is exposed to draw anything you want in a 3D SceneView
  - Why? There are no longer HTML nodes representing your geographical features.

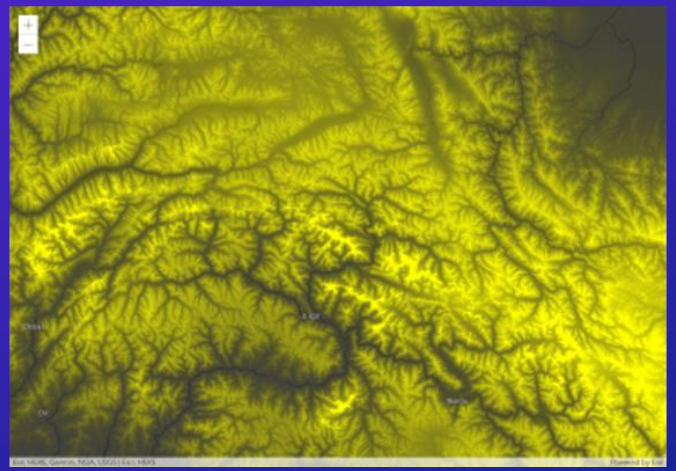
Demos & Code

Enough words, we want more pictures

Examples of what's possible: https://esriurl.com/jsCustomLayers





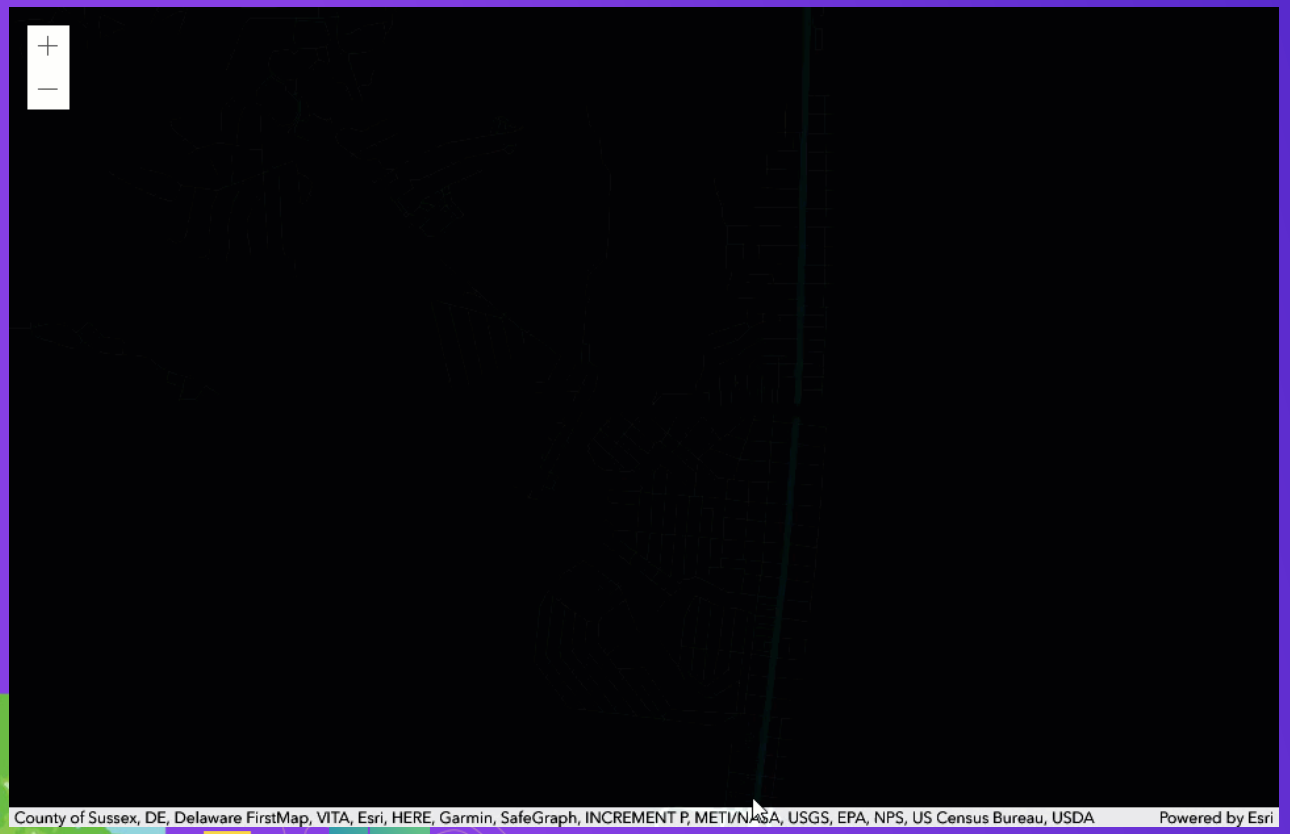


Demo

A deep dive into making a custom and animated **`BaseLayerView2D`**

1. Review a simple GraphicsLayer
2. Create a static BaseLayerView2D
3. Animate it!

https://github.com/jwasilgeo/esri-experiments

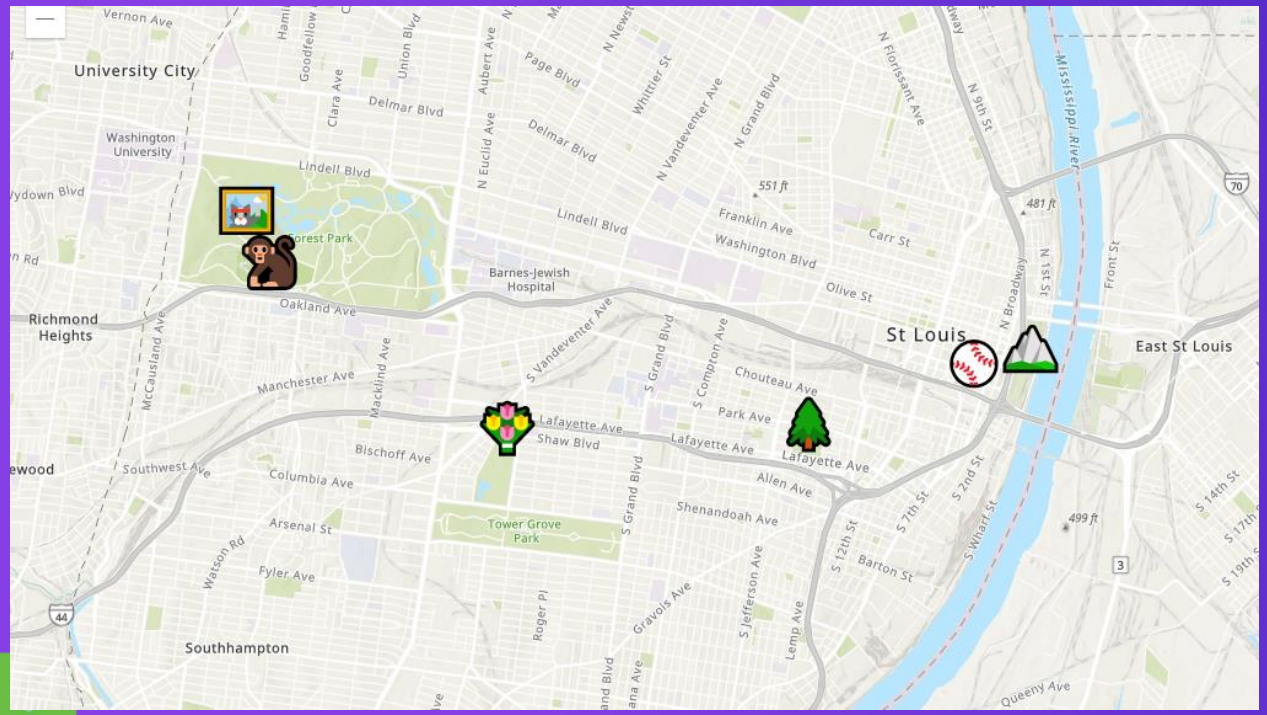


Demo

A custom **`BaseLayerView2D`** made by *Sean McGee (Esri UK)*

https://codepen.io/smcgee/pen/KKpKPxW

@HertsWestUK



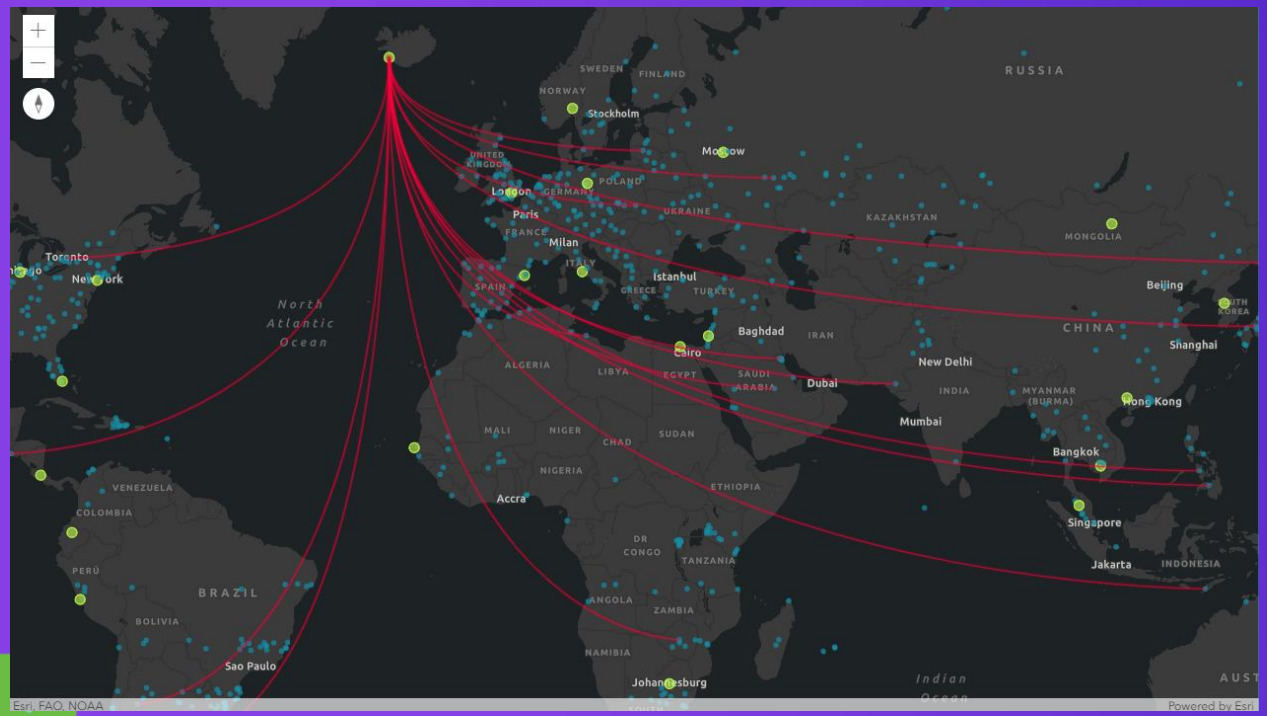
Demo

A custom **`BaseLayerView2D`** made by *Gavin Rehkemper*

https://gavinr.github.io/emoji-map-layer/

@gavinrehkemper

https://github.com/gavinr/emoji-map-layer/blob/master/EmojiLayer.js



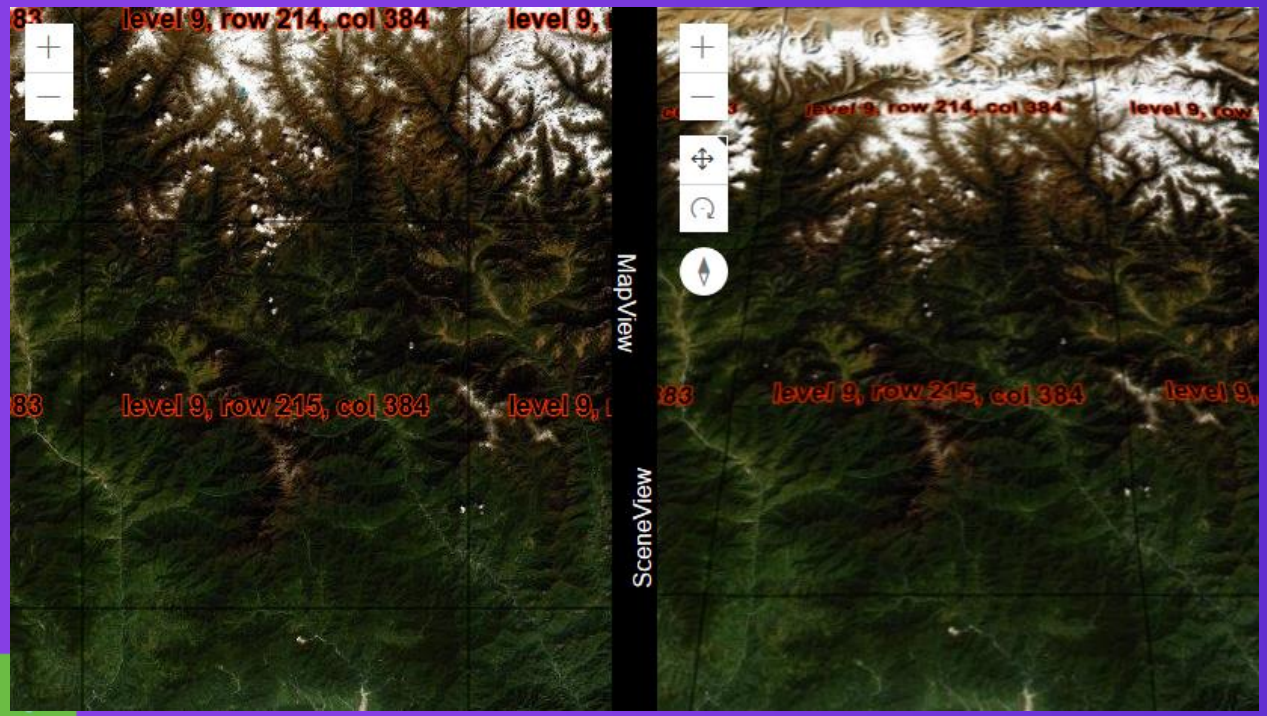
Demo

[“Canvas-Flowmap-Layer”]

A custom **`BaseLayerView2D`** made in collaboration with *Sarah Bell*

[@sarahbellmaps]

https://github.com/sarahbellum/Canvas-Flowmap-Layer



Demo

A custom `BaseTileLayer`

https://github.com/jwasilgeo/esri-experiments

Demo

"Earth at Night, Mountains of Light"

Built with a custom
`BaseElevationLayer`

https://jwasilgeo.github.io/esri-experiments/earth-at-night/

Resources

- These slides are available at
  - https://github.com/jwasilgeo/presentations
- Blog post about “Earth at Night, Mountains of Light”
  - https://petrichor.studio/2019/02/14/earth-at-night-mountains-of-light/
- Dev Summit 2019: “ArcGIS API for JavaScript: Creating Custom Layers and Layer Views”
  - https://proceedings.esri.com/library/userconf/devsummit19/papers/DevSummitPS_10.pdf
- Dev Summit 2018: “ArcGIS API for JavaScript: Creating Custom Layers”
  - https://proceedings.esri.com/library/userconf/devsummit18/papers/dev-int-018.pdf

Thank you!

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