VECTOR TILES:
STYLING YOUR OWN BASE MAPS

Andrew Green

René Rubalcava

Andy Skinner

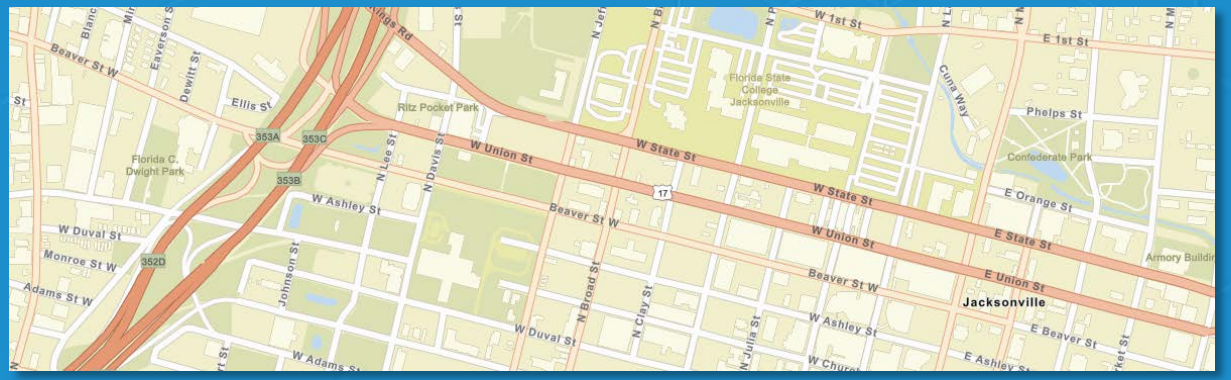
Introducing Vector Tiles

Andrew Green

What are Esri Vector Tile Basemaps?

Introduction

- Basemaps cached and delivered as vector tiles (PBF format)
- Rendered client-side
- Based on resource files delivered with vector tiles
  - styles, sprites, fonts, info



What are Esri Vector Tile Basemaps?

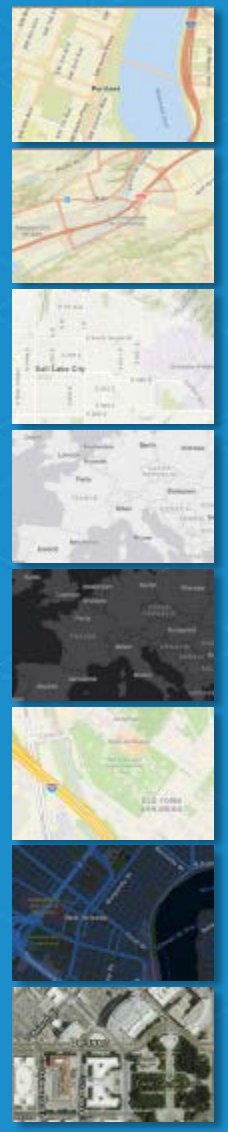
Introduction (continued)

- Esri generating with early versions of ArcGIS Pro
- Vector basemaps display in most current desktop web browsers
- Future plans… display in various desktop and mobile apps

What are Esri Vector Tile Basemaps?

Introduction (continued)

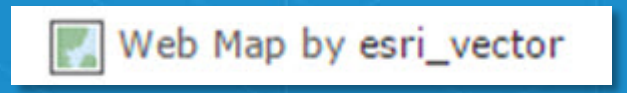
- Initial set includes eight different map styles
- All built from a single vector tile service
- Some styles closely resemble existing Esri basemaps
  - Streets (with / without relief)
  - Topographic
  - Light Gray Canvas
  - Dark Gray Canvas
- Other styles are new
  - Navigation
  - Streets at Night
  - Imagery Hybrid



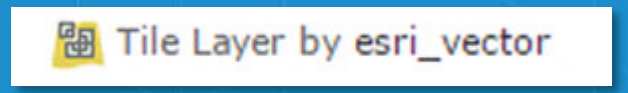
What are Esri Vector Tile Basemaps?

Introduction (continued)

- Availability
  - **Web maps**
    - Use as basemap for adding other layers



  - **Tile layers**
    - Add to existing maps either as basemap or overlay layer

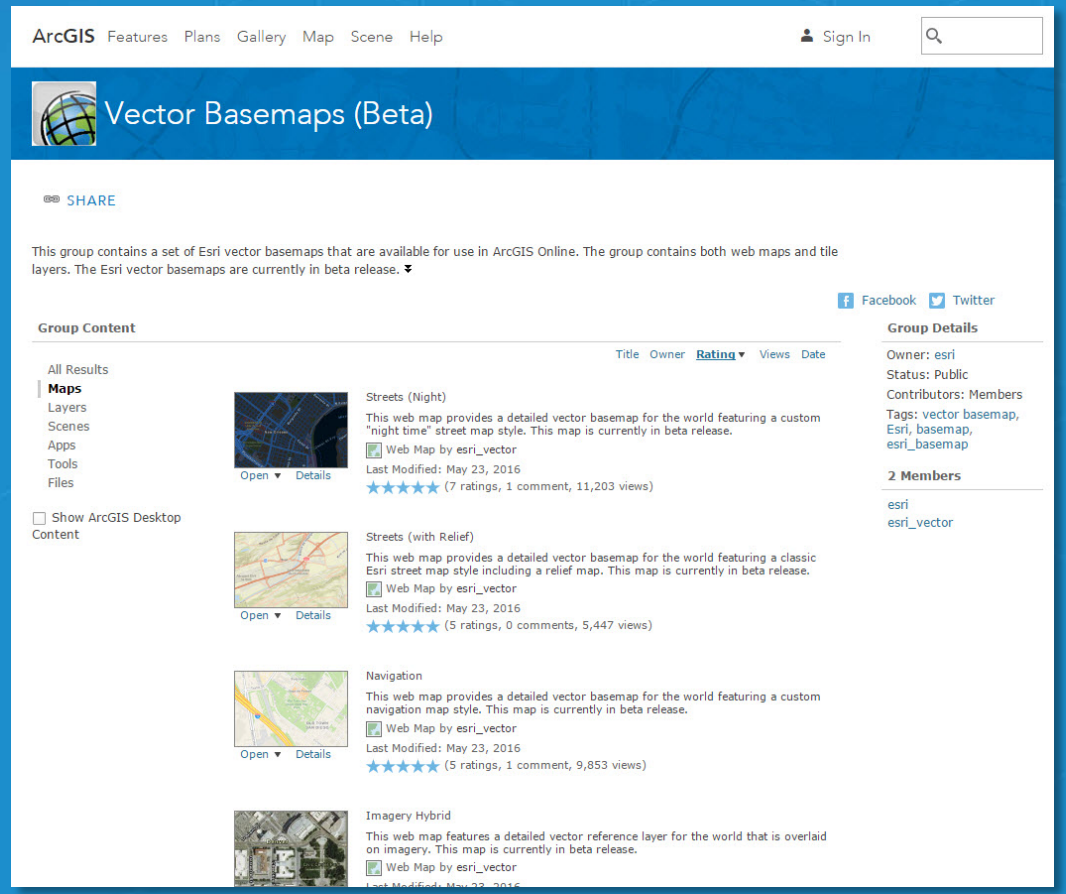


Where can I find Esri Vector Tile Basemaps?

ArcGIS Online

- **Vector Basemaps (Beta)** group
  - Web maps & Tile layers
  - Review online items & descriptions
  - *Bookmark it!*

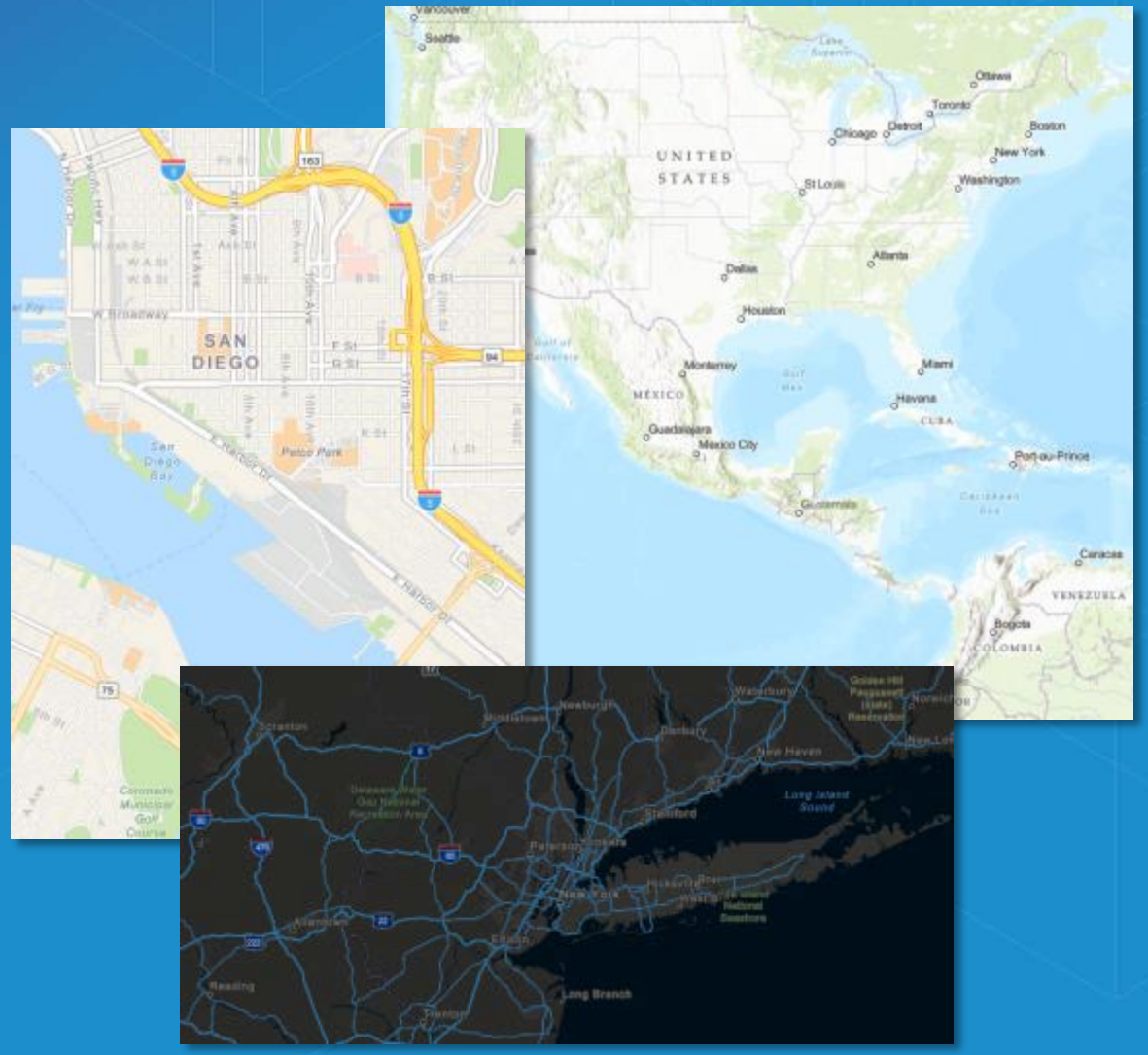
- **Search in ArcGIS Online**
  - Owner:esri_vector



Esri Vector Tile Basemaps

Timeline

- **Initial showing at U.C. 2015**
- **Beta 1 release November 2015**
- **Beta 2 release May 2016**
  - New tile set & URL
  - Updated root.json syntax
  - New data features added
  - Updated data & new communities added



Esri Vector Tile Basemaps

Timeline (continued)

- **Beta 2.x releases throughout 2016**
  - Continue data updates
  - Settings file refinements
  - Style improvements & more data features
  - Update Esri basemap tile layers & web maps
- **Exiting Beta**
  - Planned for later in 2016
  - As more Esri clients utilize the vector tile format
    - Survey123, Collector, Workforce, Explorer for ArcGIS, Pro 1.3

Benefits of using Esri Vector Tile Basemaps

- Updated Data
- Create Custom Styles
- Better display on High-res devices

Updated Data in the Esri Vector Tile Basemaps

Benefit

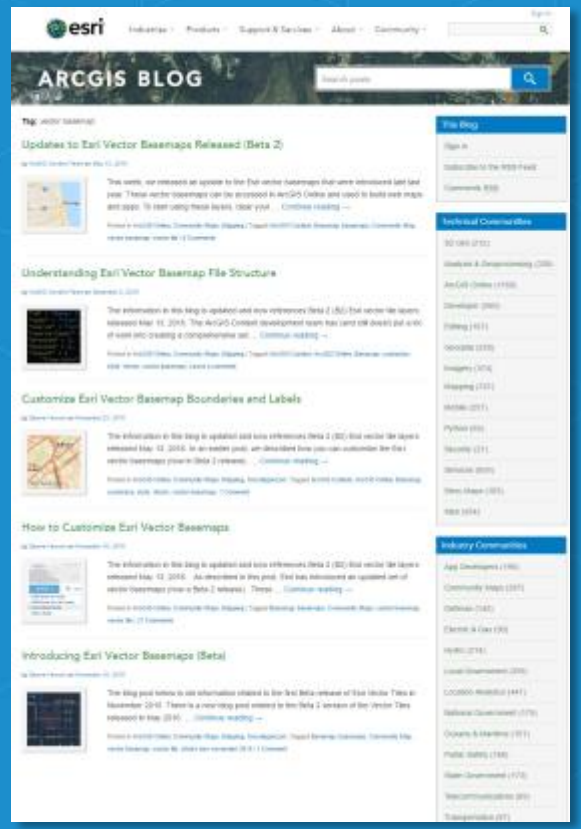
- Commercial data updates
- Esri Community Maps data
  - More than 400 contributors… *and growing!*
  - Country-level to campus detail

- Data cooked into single vector tile set & available in all styles

Create Custom Styles from Esri Vector Tile Basemaps

Benefit

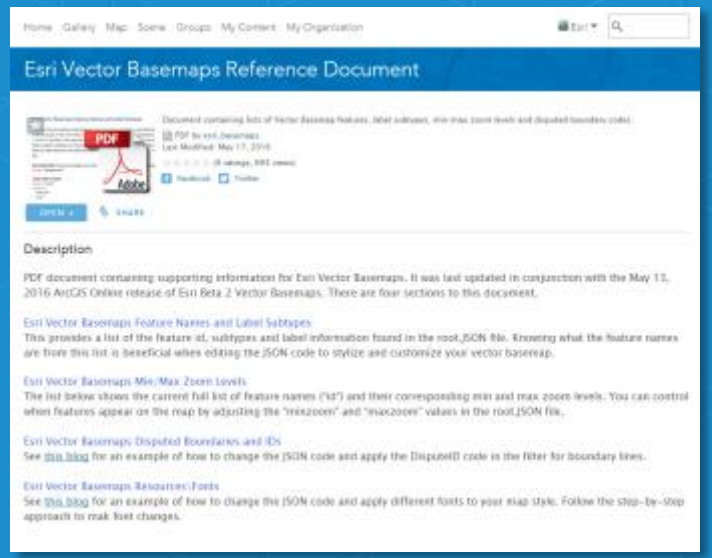
- *Updates to Esri Vector Basemaps Released (Beta 2)*
- *Understanding Esri Vector Basemap File Structure*
- *Customize Esri Vector Basemap Boundaries and Labels*
- *How to Customize Esri Vector Basemaps*
- *Introducing Esri Vector Basemaps (Beta)*
  - Blogs.esri.com
  - Tag: vector-basemap



Create Custom Styles from Esri Vector Tile Basemaps

Benefit (continued)

- *Esri Vector Basemap Reference Document*
  - PDF document available at ArcGIS.com
  - Layer detail, min/max zoom levels, fonts, & more…



Esri Vector Basemaps Feature Names and Label Subtypes

INLAND HYDROGRAPHY (Inland water feature and labels)
name : "Water area" *largest local scale
symbols :
"Dam or weir"
"Lake, river or bay"
"Inundated area"
"Playa"
"Lake or river intermittent"
"Ice mass"
"Swamp or marsh"
labels :
"Dam or weir"
"Playa"
"Small island"
"Large island"
"Canal or ditch"
"Bay or inlet"
"Small lake or reservoir"
"Large lake or reservoir"
"Large river"
"Small river"

SYMBOL ID (Feature layer name)	minzoom	maxzoom
Background	(displays at all zoom levels)	
Land/Not ice	0	
Land/Ice	0	
Bathymetry/depth 2 (shallow water)		11
Bathymetry/depth 3		11
Bathymetry/depth 4		11
Bathymetry/depth 5		11
Bathymetry/depth 6		11
Bathymetry/depth 7 (deep water)		11
Water area/Dam or weir	12	
Water area/Lake, river or bay	11	
Water area/Inundated area	12	

Create Custom Styles from Esri Vector Tile Basemaps

Benefit (continued)

- Serving a single vector tile set
- Multiple styles available as starting point for customization
- Copy vector tile layer into your own ArcGIS Online account
- Different ways to re-style & customize the maps
  - Styling apps, direct json editing, or with JavaScript API

ArcGIS API for JavaScript

René Rubalcava

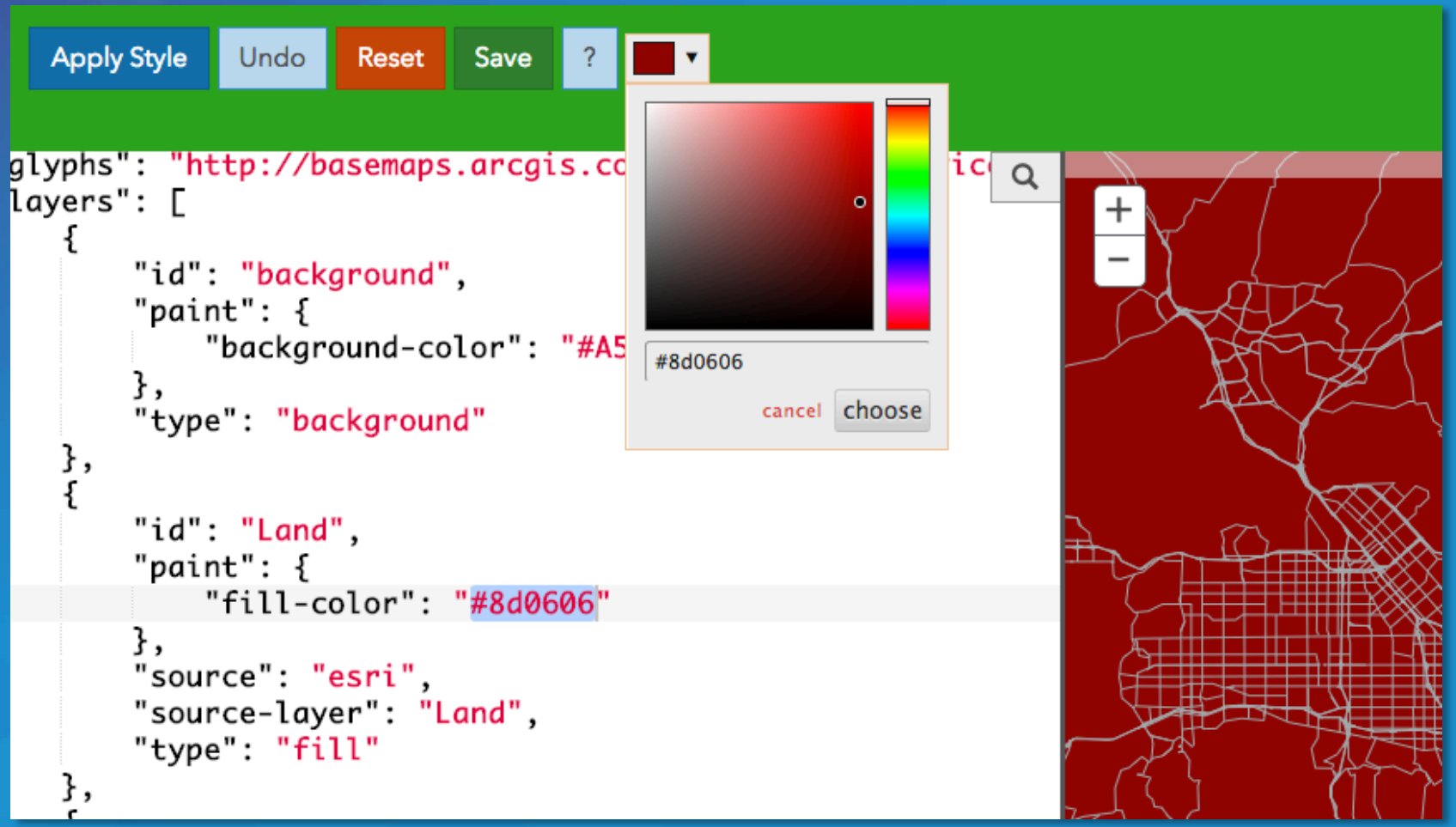
Esri Vector Tiles in the ArcGIS API for JavsScript

Using in Web Apps

- 3.17 & 4.0
- Utilize WebGL (supported in modern browsers)
- In 4.0 available in 2D only… *for now*.
- Can be styled in a web application.
- APIs allow updating of styles client-side.
- 4.0 – `vectorTileLayer.loadStyle(<URL or Style Object>);`
- 3.17 – `vectorTileLayer.setStyle(<URL or Style Object>);`

Esri Vector Tiles in the ArcGIS API for JavsScript

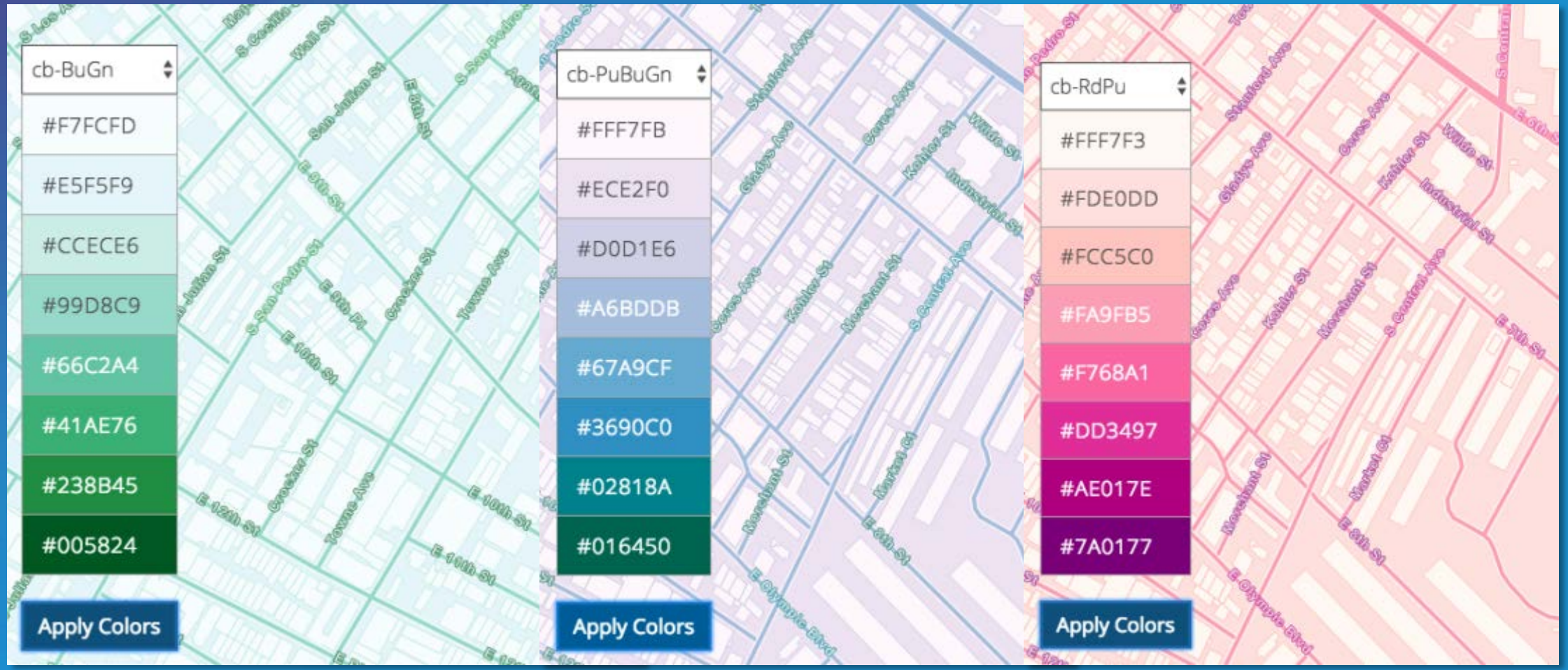
Using in Web Apps



Vector Tiles: Styling Your Own Base Maps

Esri Vector Tiles in the ArcGIS API for JavsScript

Using in Web Apps



Choosing your Basemap

Andy Skinner

Which Basemap?

… and now with vector basemaps?

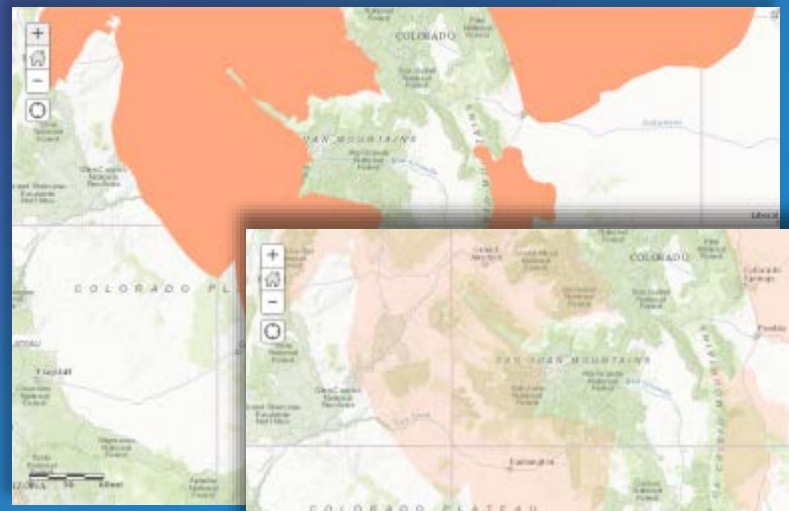
- What is your subject?
- What kind of data are you using (Point/Line/Polygon)?
- What is the geographic extent of your data?
- What scales are most appropriate for your data?

- Are you trying to find a basemap to use with an existing map?...
- … or are you building a new map on top of your preferred basemap?

Vector Tiles: Styling Your Own Base Maps

Transparency

Maximise the effectiveness of your basemap

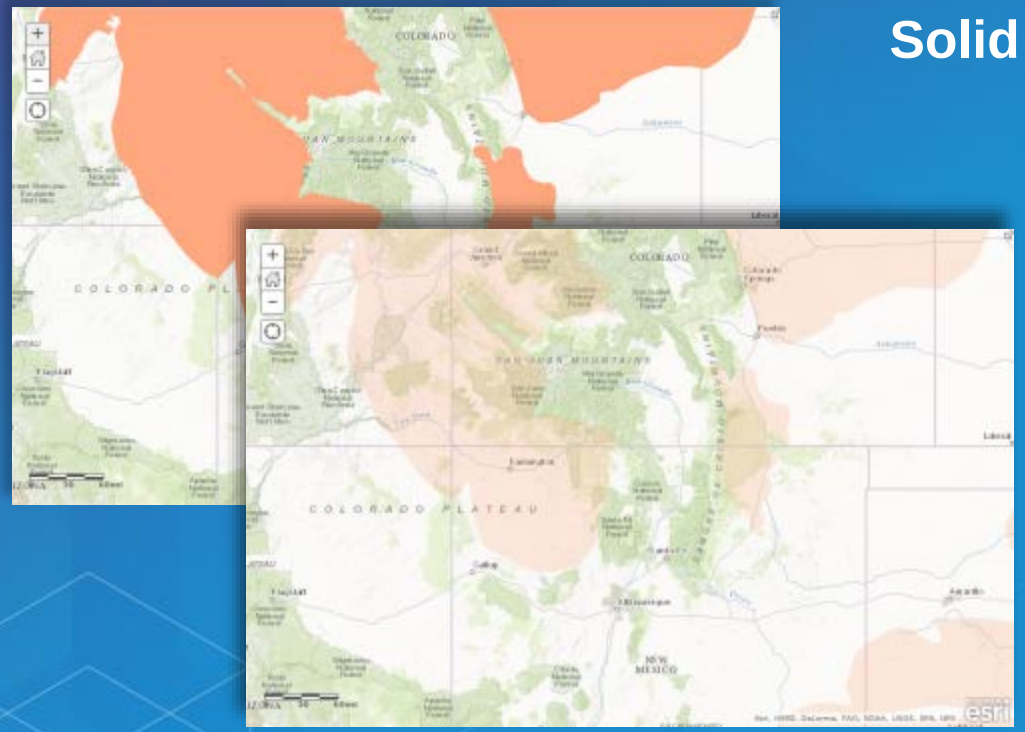


Solid fill

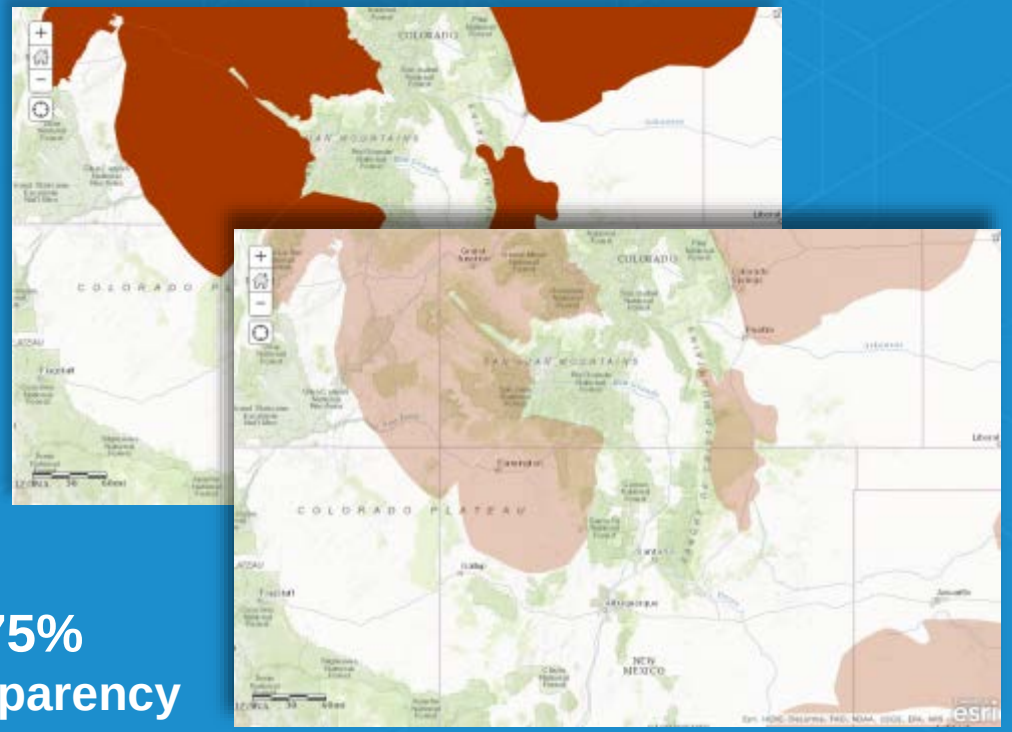
75% transparency

Transparency

Darken your colors to compensate for the transparency



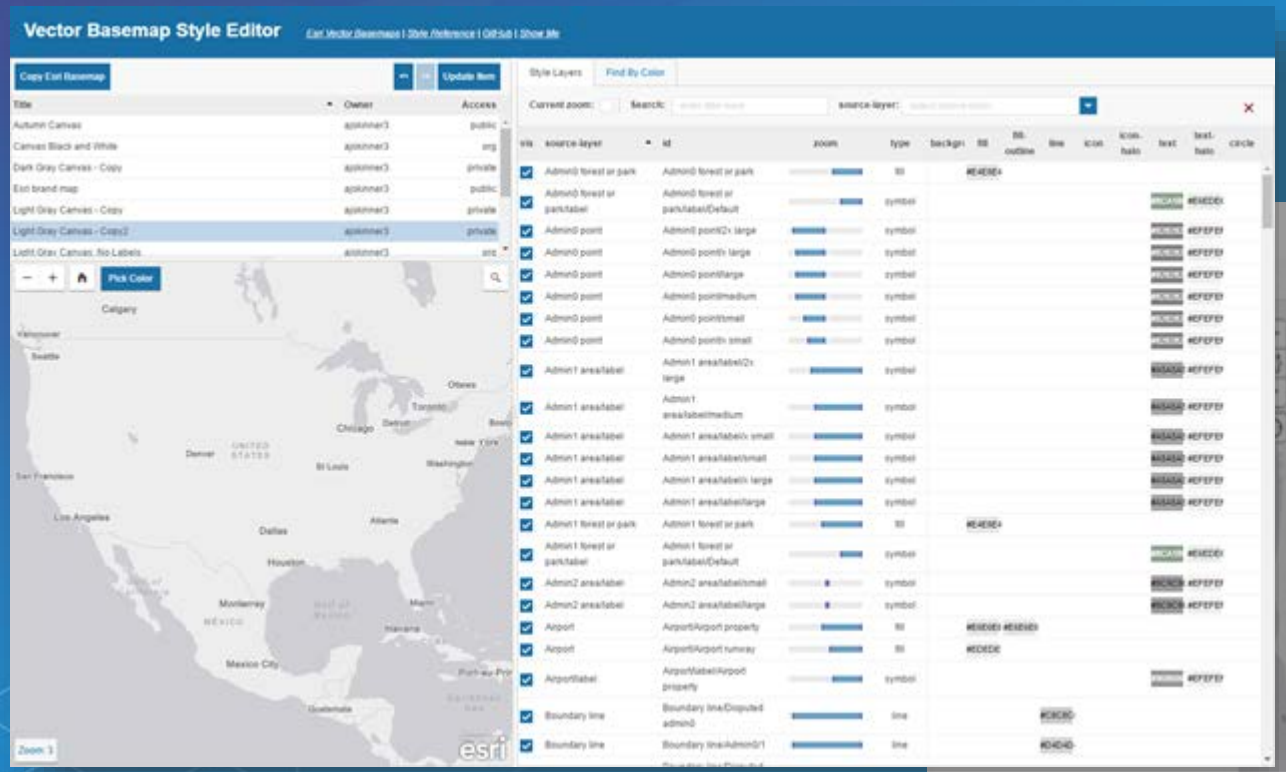
Solid fill



75% transparency

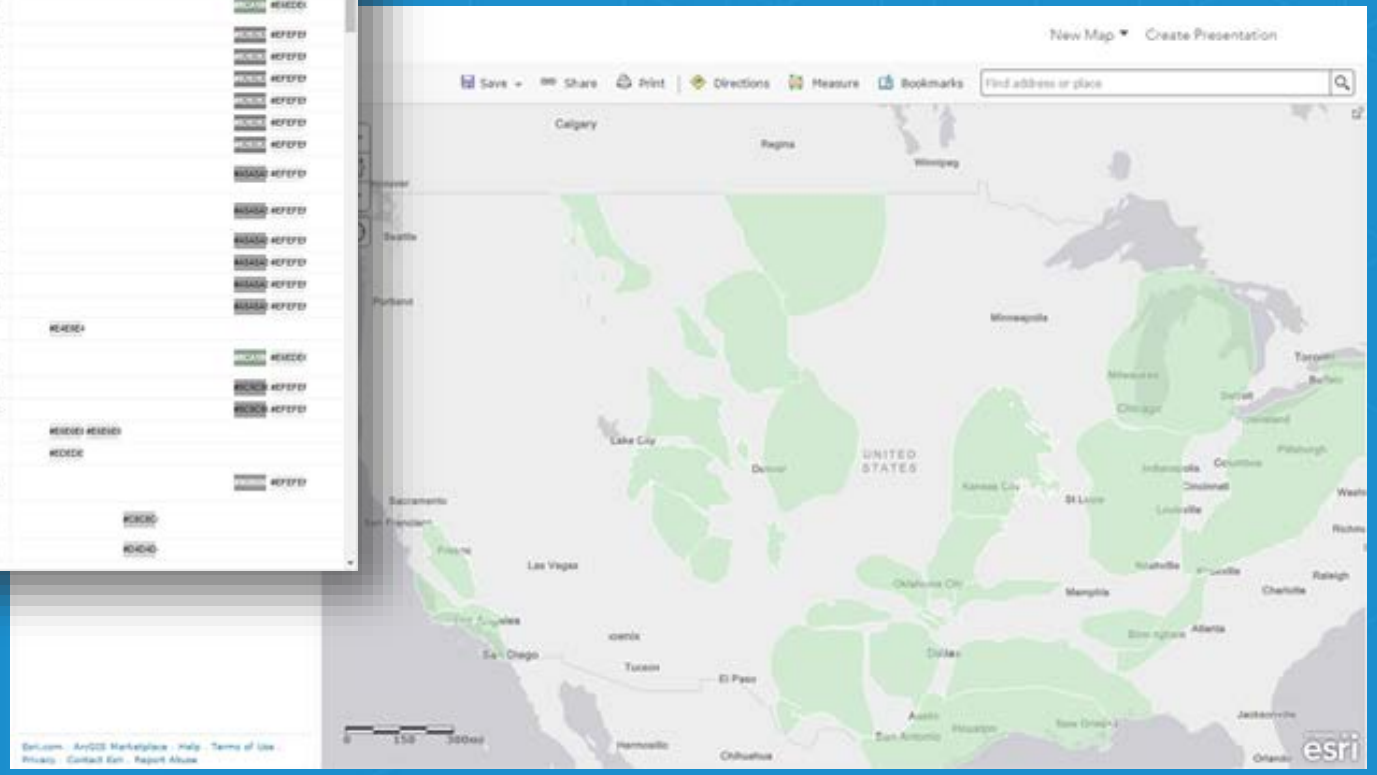
Styling your Basemap

Working online: An alternative editing app



Grayson Basemap Editing App

- Web map on ArcGIS.com



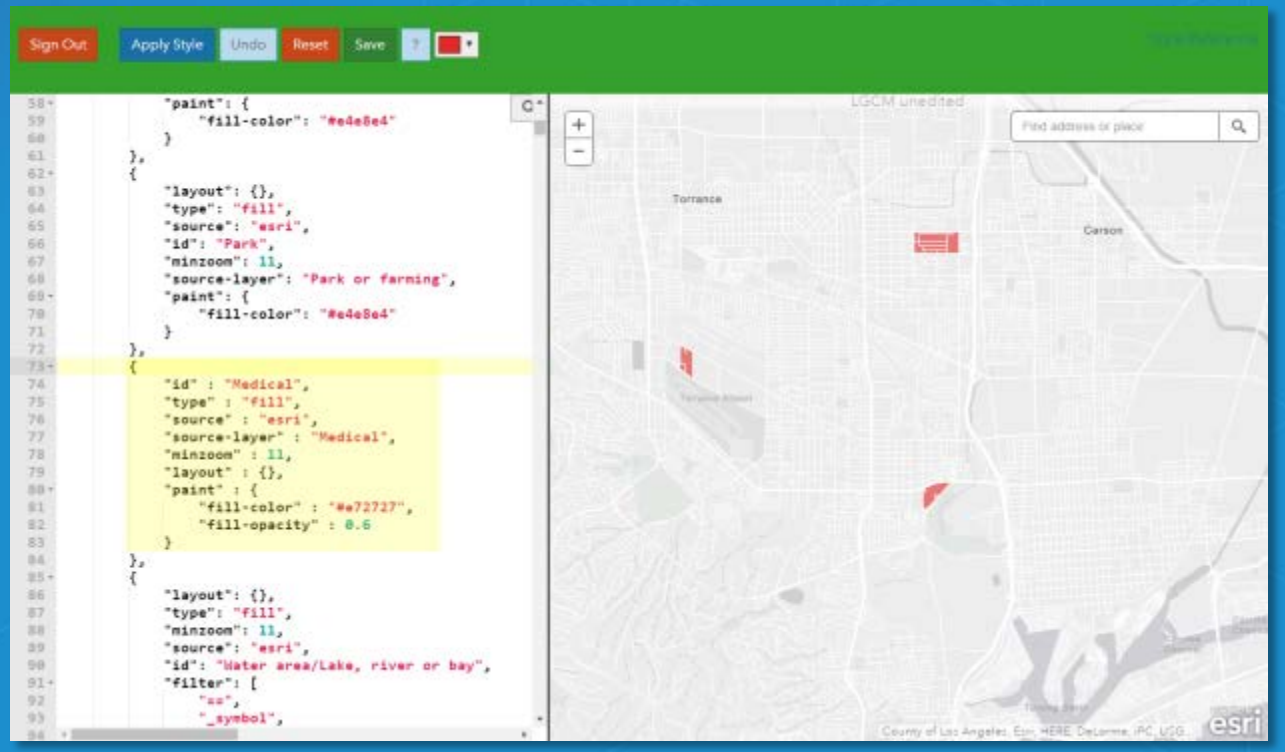
Vector Tiles: Styling Your Own Base Maps

Styling your Basemap

Adding content

Insert the relevant code into the style:

- It must be a feature that is available in the original build.
- It will only work at scales defined within the original build.



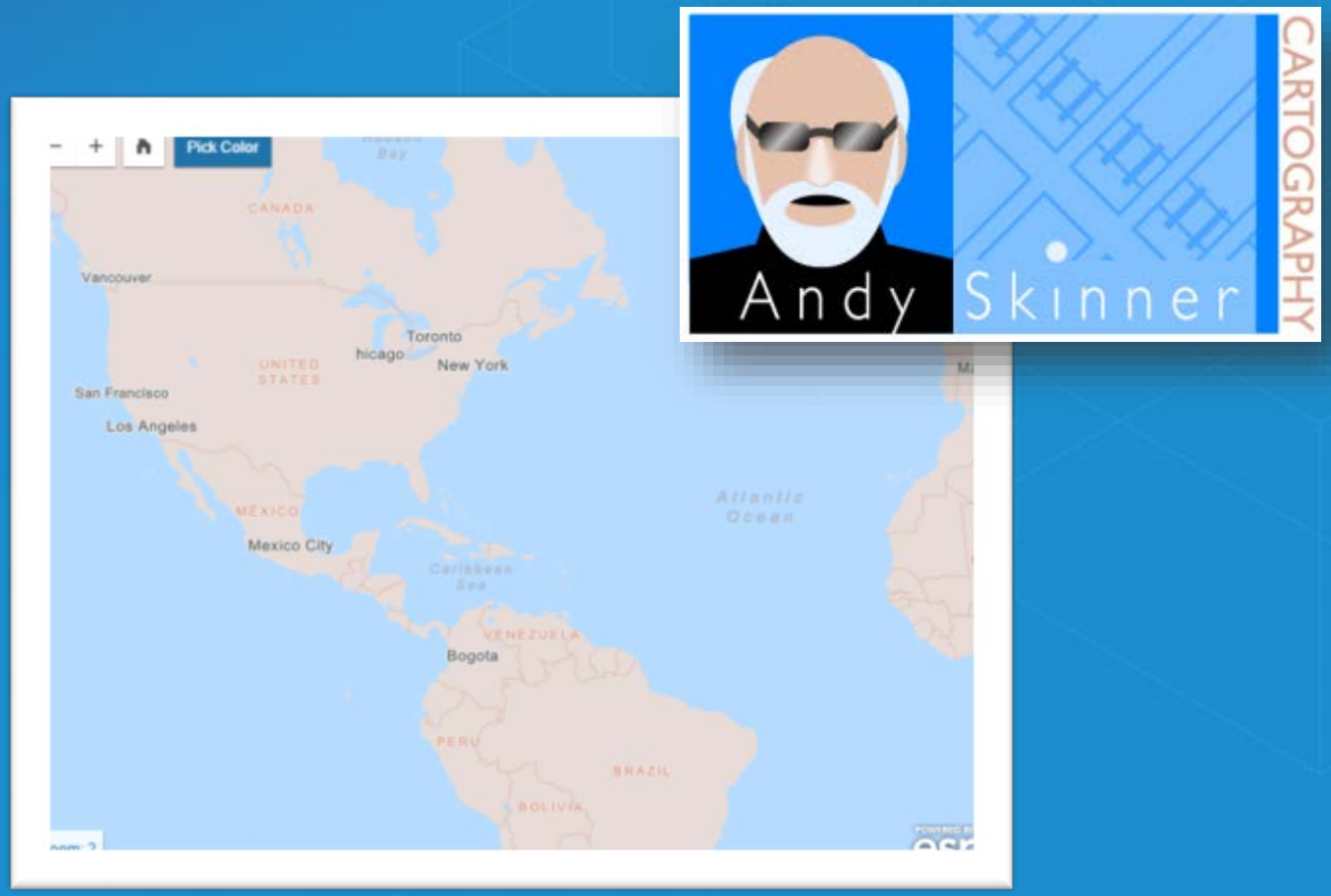
Styling your Basemap

Andy Skinner

Styling your Basemap

Simple color changes: Creating a ‘branded’ look

- Pick colors from your ‘Brand’
- Remember it’s a basemap. Don’t overpower the subject!
- Lighten colors so that they are complimentary… but balanced, and in the background.



Vector Tiles: Styling Your Own Base Maps

Styling your Basemap

Enhancing specific symbols

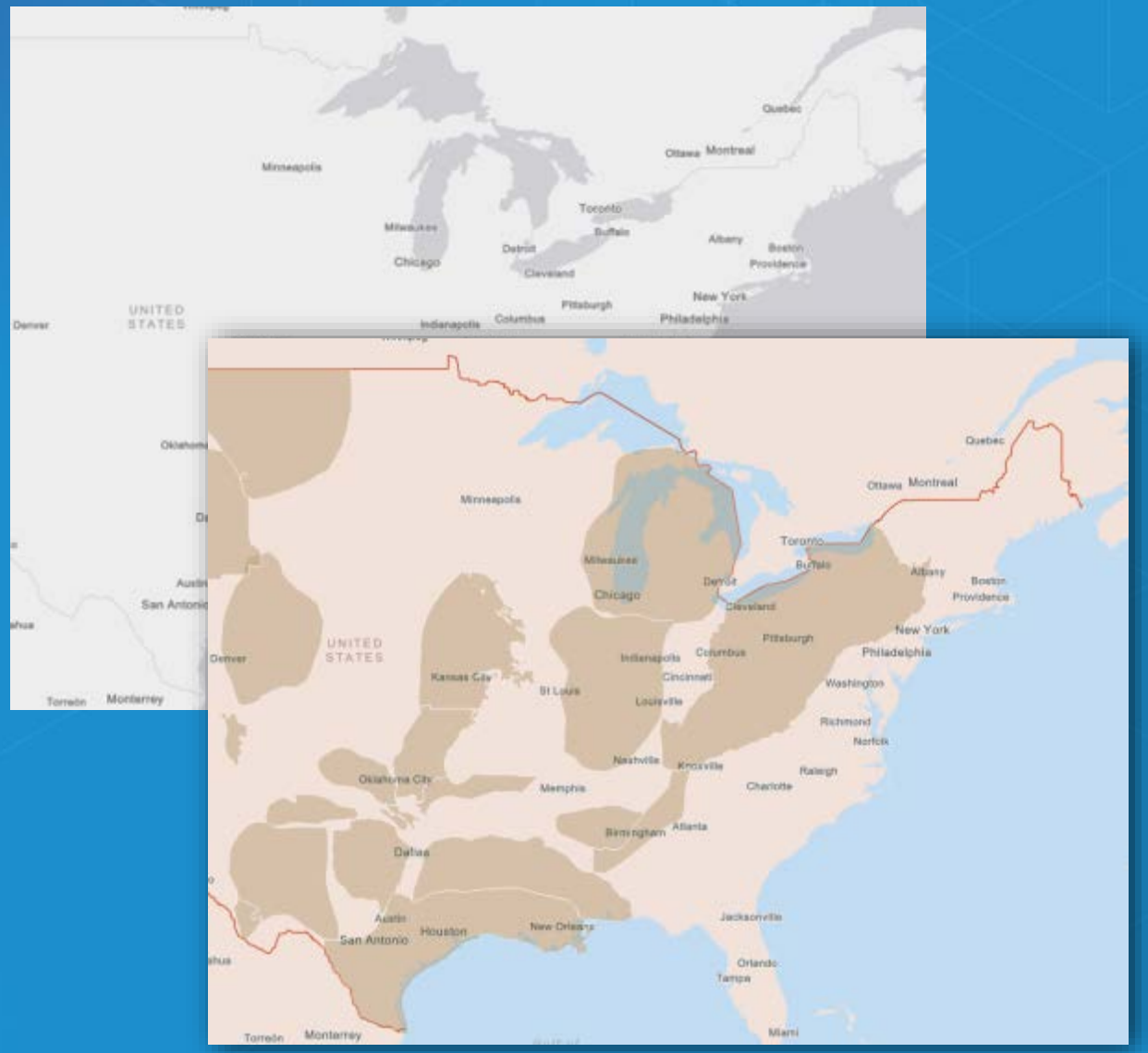
- Pick a symbol from the basemap
- Adjust the color and/or the stroke value to make it more visible…
- … but don't make it stronger than the subject.
- Remember to check it at all scales.

Vector Tiles: Styling Your Own Base Maps

Styling your Basemap

Starting with a vector basemap:

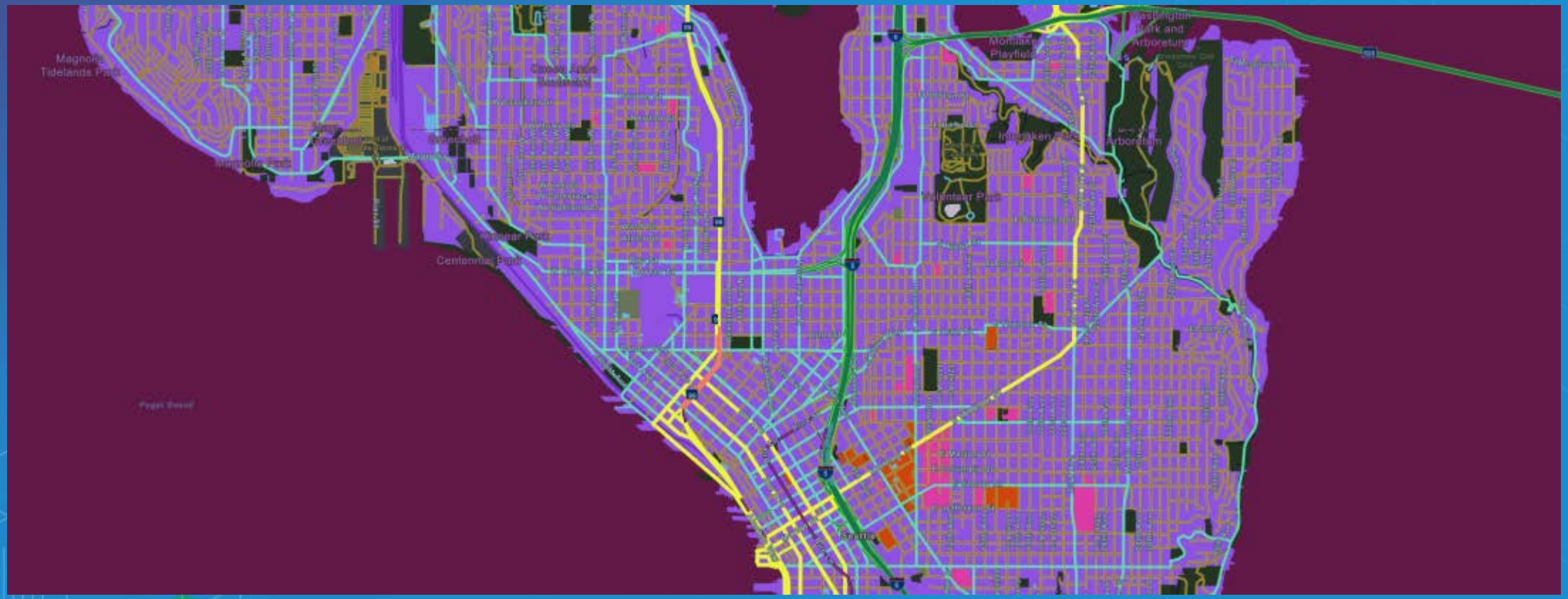
- We can subtract information from the basemap
- Within limits, we can add information to the basemap.
- We can make subtle adjustments to the appearance of the basemap.
- We can elevate the visual importance of selected features…
- …to the point where they become part of the subject.



Vector Tiles: Styling Your Own Base Maps

What? …

‘Kate’s Hideous Vector Layer’



With thanks to Katy Leroux

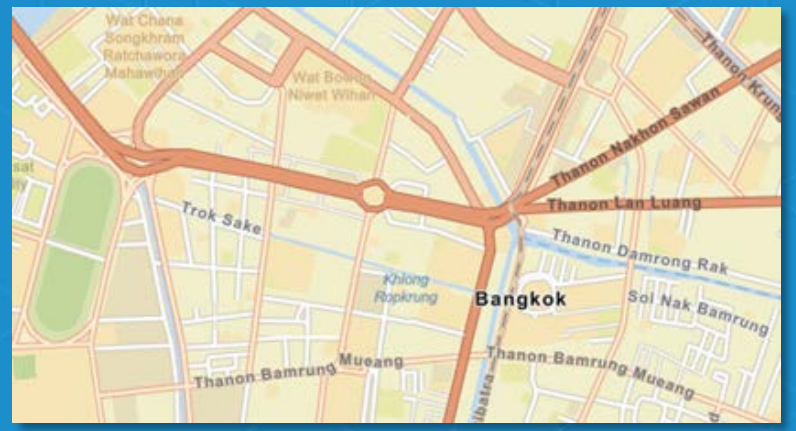
Advanced Customization

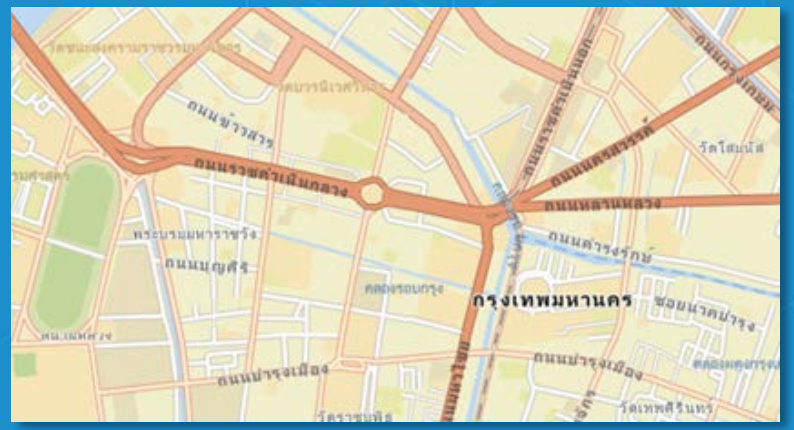
Andrew Green

Languages & Fonts

Advanced Customization

- Global view presents English labels
  - Translated/Transliterated
- Local languages cooked into the tile set
  - Edit root.json style file
  - Change from “name_global” to “name_local”
  - May need to change font to display
    - Thai, Georgian, etc.
    - Arial Unicode MS Regular





Languages & Fonts

Advanced Customization (continued)

- *Customize Esri Vector Basemap Boundaries and Labels*
  - Blogs.esri.com

- *Esri Vector Basemap Reference Document*
  - PDF document available at ArcGIS.com
  - Layer details & min/max zoom levels
  - List of fonts supported in the resources folder
  - Additional fonts to be added during beta period

International Boundary Disputes

Advanced Customization

- Users can customize international boundaries for a specific point of view
  - Esri displays disputed boundaries
  - Users edit root.json to change non-disputed

- *Customize Esri Vector Basemap Boundaries and Labels*
  - Blogs.esri.com

- *Esri Vector Basemap Reference Document*
  - PDF document lists disputed boundary codes

Future Enhancements

Esri Vector Tile Basemaps

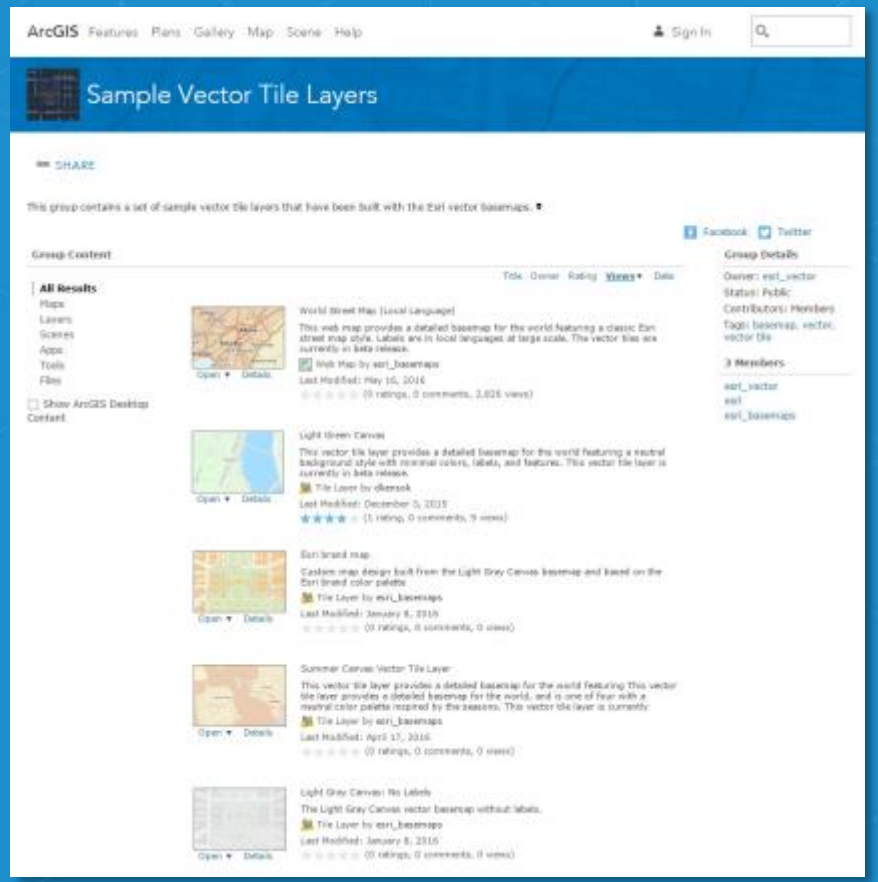
- Additional contributor data & commercial content from HERE
  - Better mapping content updated on a more frequent cycle

- More data features
  - Spot elevations
  - Landform labels
  - Contours
  - Community sourced roads
  - User customization choices
  - *… and more to come*

Future Enhancements

Esri Vector Tile Basemaps (continued)

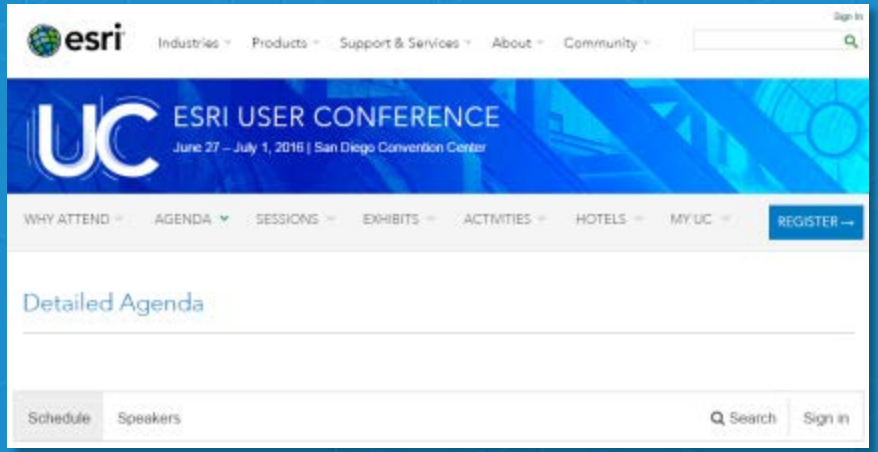
- More Esri default styles
- More Esri creative styles
  - **Sample Vector Tile Layers** group
- More Fonts
- Tools to download & upload Resources
  - User fonts, sprites, root.json style files



Additional Vector Tile-related Presentations this Week

Consult *uc.schedule.esri.com* or the *Esri Events* app for more detail

- Designing Esri's Vector Tile Basemaps
  - Wednesday & Thursday
- Styling Vector Tiles
  - Thursday
- Leveraging Vector Tile Layers in Web Apps
  - Wednesday & Thursday
- Desktop Mapping: Creating Vector Tiles
  - Thursday
- Best Practices for Caching Maps and Vector Tile Layers
  - Wednesday & Thursday



Vector Tile Styling & Customization Tools

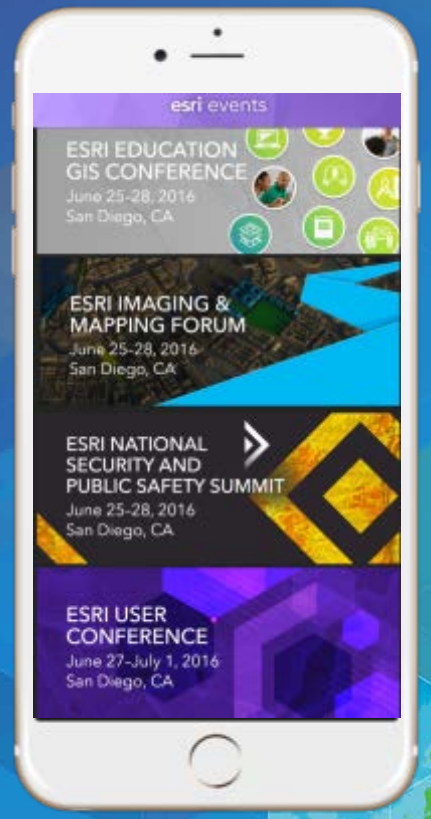
Esri Vector Tile Basemaps

- **Vector Style JSON Editor** http://esri.github.io/arcgis-vectortile-style-editor
- **Vector Basemap Style Editor** https://github.com/jgrayson-apl/VectorBasemapStyleEditor
- **Vector Tile Brew Master** https://github.com/odoe/esrijs4-vt-palette
  - Demo http://odoe.github.io/esrijs4-vt-palette/
- **ArcGIS API for JavaScript** https://developers.arcgis.com/javascript/
- Adobe Brackets (json editor)

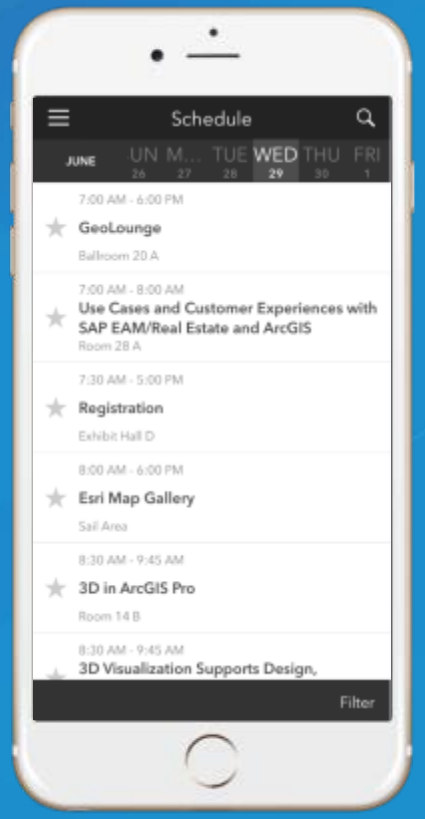
Please take our Survey: Vector Tile Styling & Customization Tools

Your feedback allows us to help maintain high standards and to help presenters

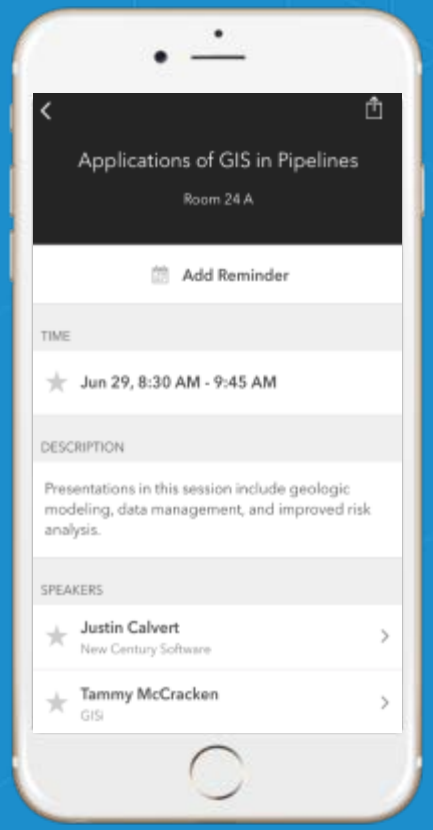
Find your event in the Esri Events App



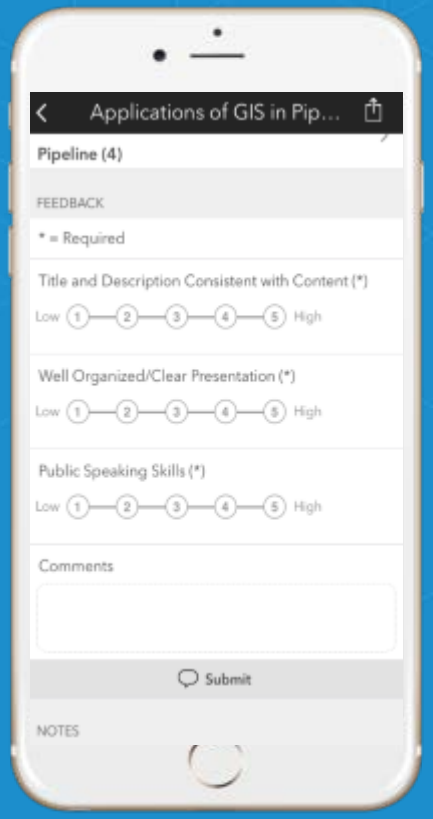
Find the session you want to review



Scroll down to the bottom of the session



Answer survey questions and submit



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Thank you!