The Sweet Spot for Spatial Analysis: Using Online Content

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Why do Spatial Analysis with Online Services?

- **Never download data** again
  - No pre-processing
  - Reduced risk of processing errors
  - Increased productivity
- Large selection of **Ready-To-Use** layers
- Use the most current data
  - Real-time or near-real-time services
  - Historical data available in many cases too

What You Will Learn

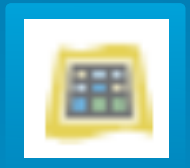
- Types of online content
- The Living Atlas. What’s there, why it’s different from ArcGIS Online Content
- How to perform analysis with online content

What We Mean When We Say: “Analysis”

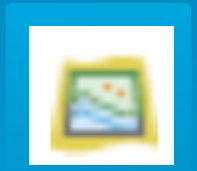
- No local data required

- Output can be to a desktop computer or your online account.

Online Content as Inputs to Analysis

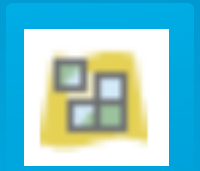


Imagery Layer – Image service – raster data – **probably good for analysis**



Map Image Layers - possibly good for analysis

- Cached – analysis is not possible
- Dynamic – **possibly good for analysis**
  - Single layer – worth a try (depends on how it was served)
  - Group layers – not possible



Tile Layers – Map service – Cached – **not for analysis**

Feature Layers – Map service, feature access enabled – vector data – **good for analysis**

- Designed for editing, draws slower than a dynamic map service

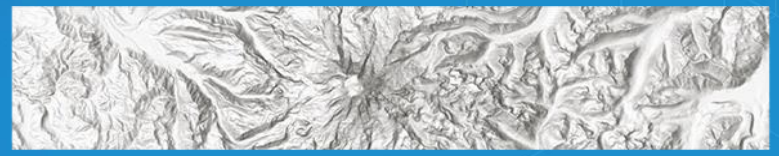
Other Online Analysis Concepts

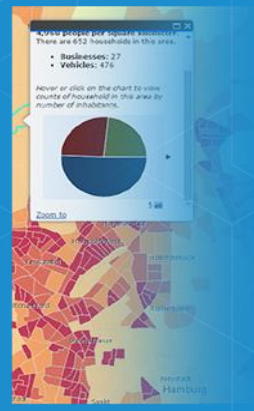
- Online Analysis Options
  - Built-in Analysis Tools
    - Enrichment
    - Proximity
  - Geoprocessing Services
- Geocoding Services
- 3d
- Time Series

ArcGIS Online and The Living Atlas

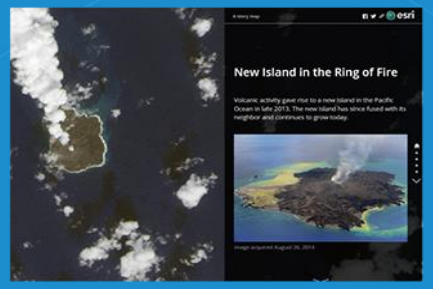
The Living Atlas is the BEST of ArcGIS Online

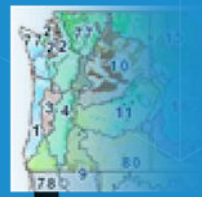
- **Curated by Esri Employees**
- **Ready to use across the Platform**

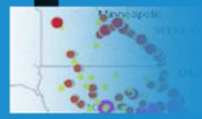




The Collection is growing and changing on a daily basis…

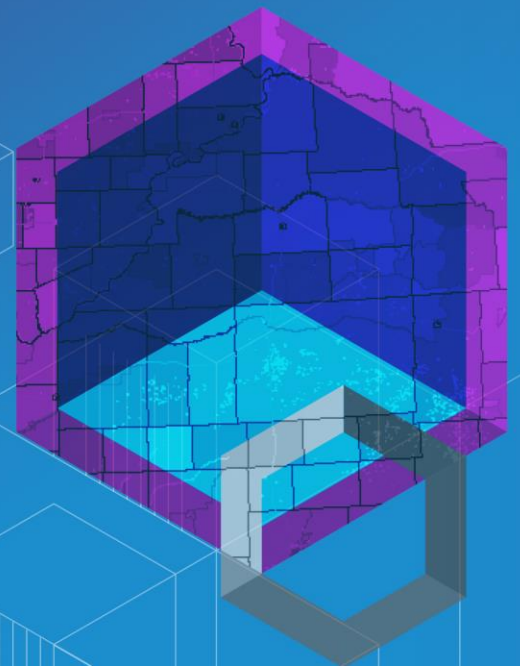






Network Analysis

Charlie Frye



Enrichment

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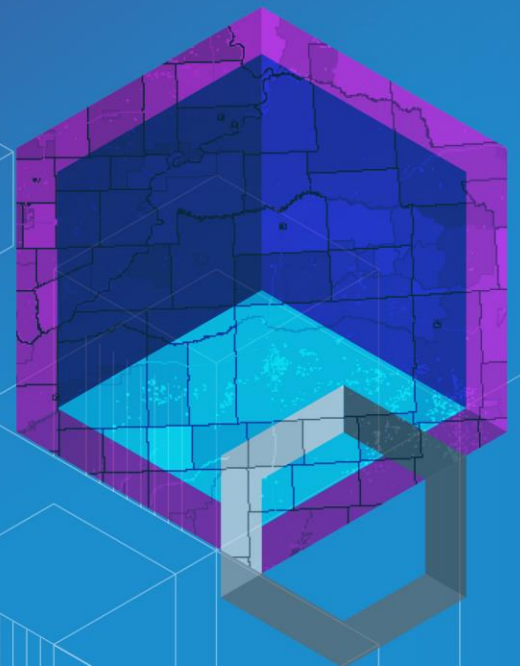
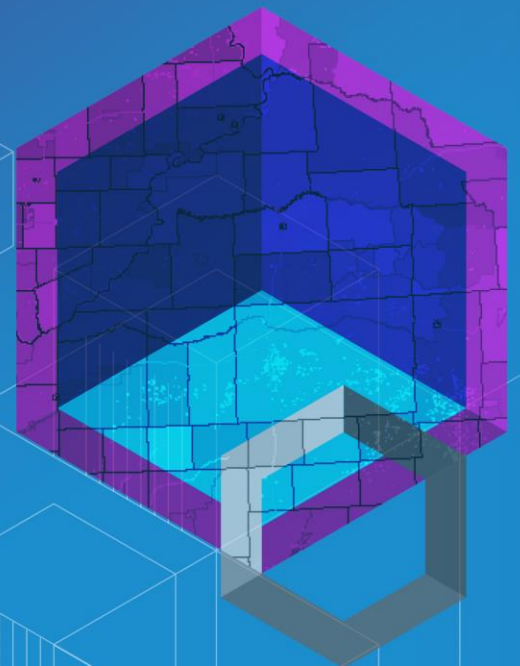


Time-Enabled Services

Michael Dangermond

Analysis With Near Real-Time Data

Caitlin Scopel



NAIP Imagery Services

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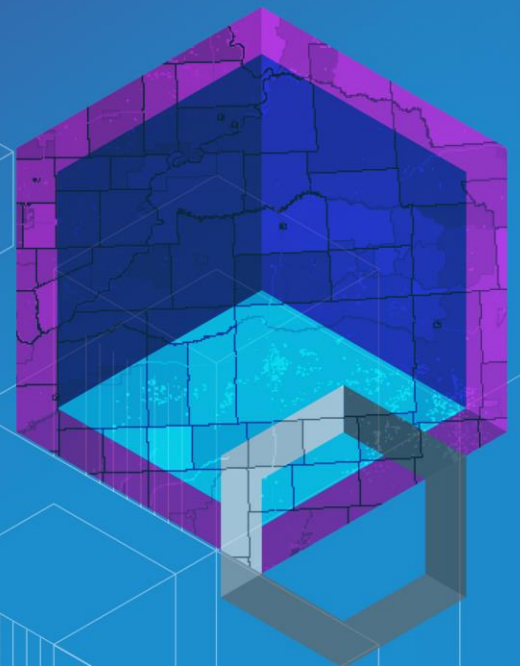

Elevation Services

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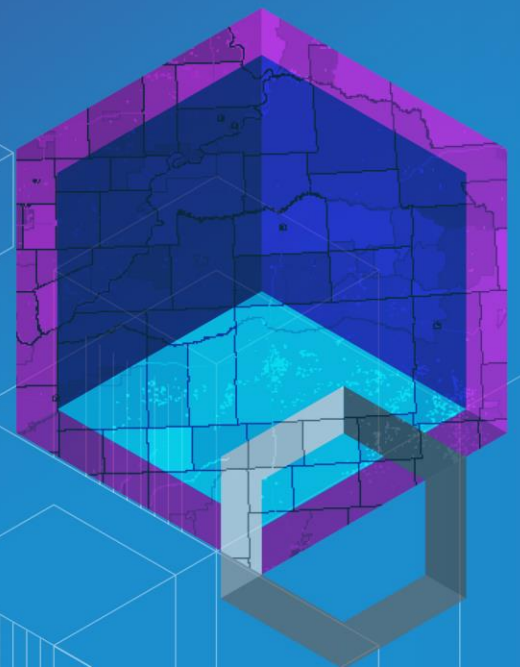

Working with an image service in python

Connect to online rasters, use them in python

- Set your destination environment.
  - projection
  - Snap raster
- Create a connection file which can be used to connect to a GIS server.
- Use the connection file to make an image server layer.
- Optional: Copy raster from the image server layer

Extracting your own raster from an image service

Example: Retrieving a piece of the landforms service from the landscape server for local analysis

```
sr = arcpy.SpatialReference(54009)

arcpy.env.outputCoordinateSystem = sr

arcpy.mapping.CreateGISServerConnectionFile("USE_GIS_SERVICES",
scratchFolder, service, serviceUrl, "ARCGIS_SERVER", '', '',
userName, passWord, "SAVE_USERNAME")

arcpy.management.MakeImageServerLayer(Url, imageLayer,
extentLayer,"#","#","#","#","#",cellsize)
```

CreateGISServerConnectionFile

Parameters

```
out_folder_path = tempfile.mkdtemp(prefix="agd_")
out_name = "landscape7.ags"
server_url= "http://landscape7.arcgis.com/arcgis/rest/services"
arcpy.mapping.CreateGISServerConnectionFile("USE_GIS_SERVICES",
out_folder_path, out_name, server_url, "ARCGIS_SERVER", '', '',
userName, passWord, "SAVE_USERNAME")
```

MakeImageServerLayer

Parameters

- In_image_service = os.path.join(tempFolder, "landscape7", "World_Landforms_Improved_Hammond_Method" + ".ImageServer")
- out_imageserver_layer = "Landforms"
- template = str(ext.XMin) + " " + str(ext.YMin) + " " + str(ext.XMax) + " " + str(ext.YMax)
- arcpy.management.MakeImageServerLayer(in_image_service, out_imageserver_layer, template,"#","#","#","#","#",cellsize)

Summary of service types with analysis context

Service Type	ArcGIS Online	ArcGIS Desktop	ArcGIS Pro	Apps
Imagery Layer	No	Yes*	Yes*	Yes*
Map Image Layer (Dynamic)	Yes**	No	No	Yes**
Feature Layer	Yes	Yes	Yes	Yes

* Web Mercator Projection must be managed

** For single layer dynamic map services

Thinking about web-based analysis

- Think about how to use online content first rather than last.
- Online analysis is just as powerful, and sometimes more powerful than desktop analysis.

After the Conference…

- Download this presentation from Proceedings.esri.com or
- http://esriurl.com/Sweetspot4Analysis

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- **Tuesday**
  - 3:15-4:15: Rethinking How You Style Your Online Maps
  - 3:15-4:30: Working with Feature Layers
- **Wednesday**
  - 9:30-10:15: Working with Elevation Services
  - 10:15-11:30: Understanding Earth: Spatial Analysis with Online Raster Content
  - 1:30-2:45: Story Maps: Great Story Maps and How To Emulate Them
  - 3:15-4:30: Participating in the Living Atlas of the World
  - 3:30-4:15: Configure and Manage an ArcGIS Online Organization
- **Thursday**
  - 10:15-11:30: Understanding Earth: Spatial Analysis with Online Raster Content
  - 10:15-11:30: ArcGIS Online Content: Living Atlas of the World
  - 10:15-11:30: ArcGIS Online: Data Exploration with Smart Mapping

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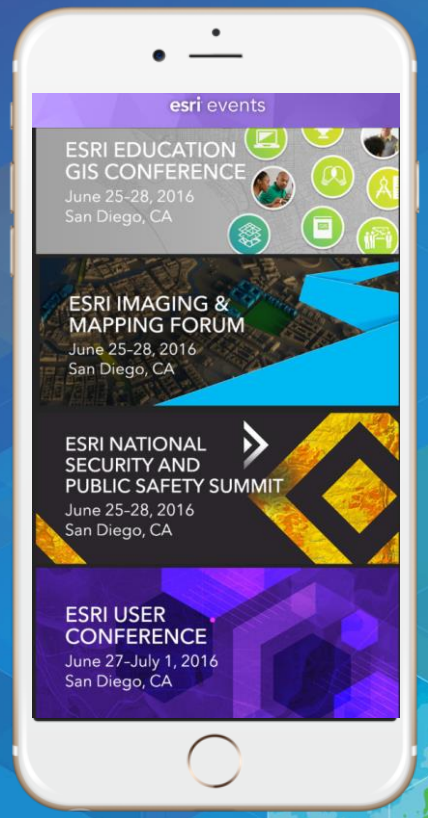

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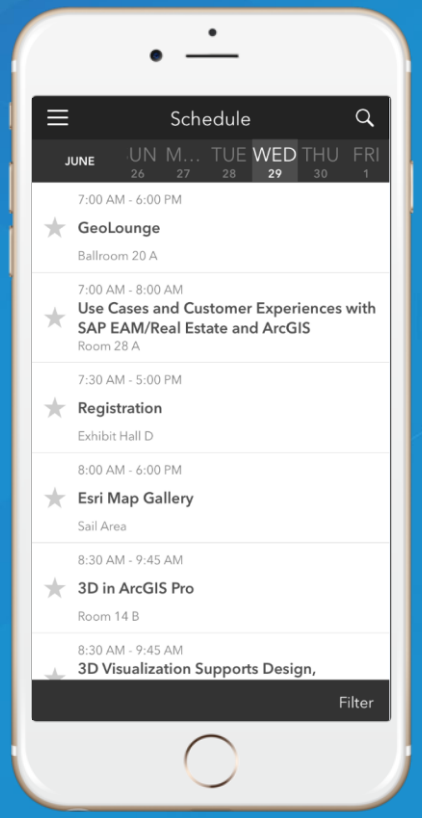

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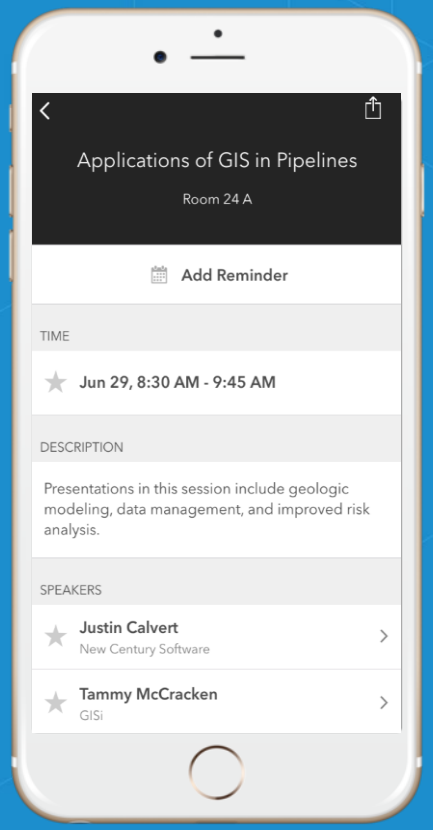

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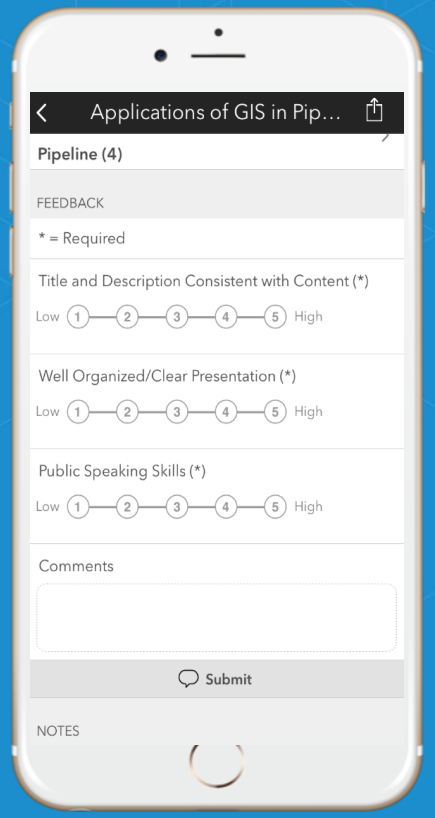

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Understanding our world.