



Working with Elevation Services in ArcGIS Online

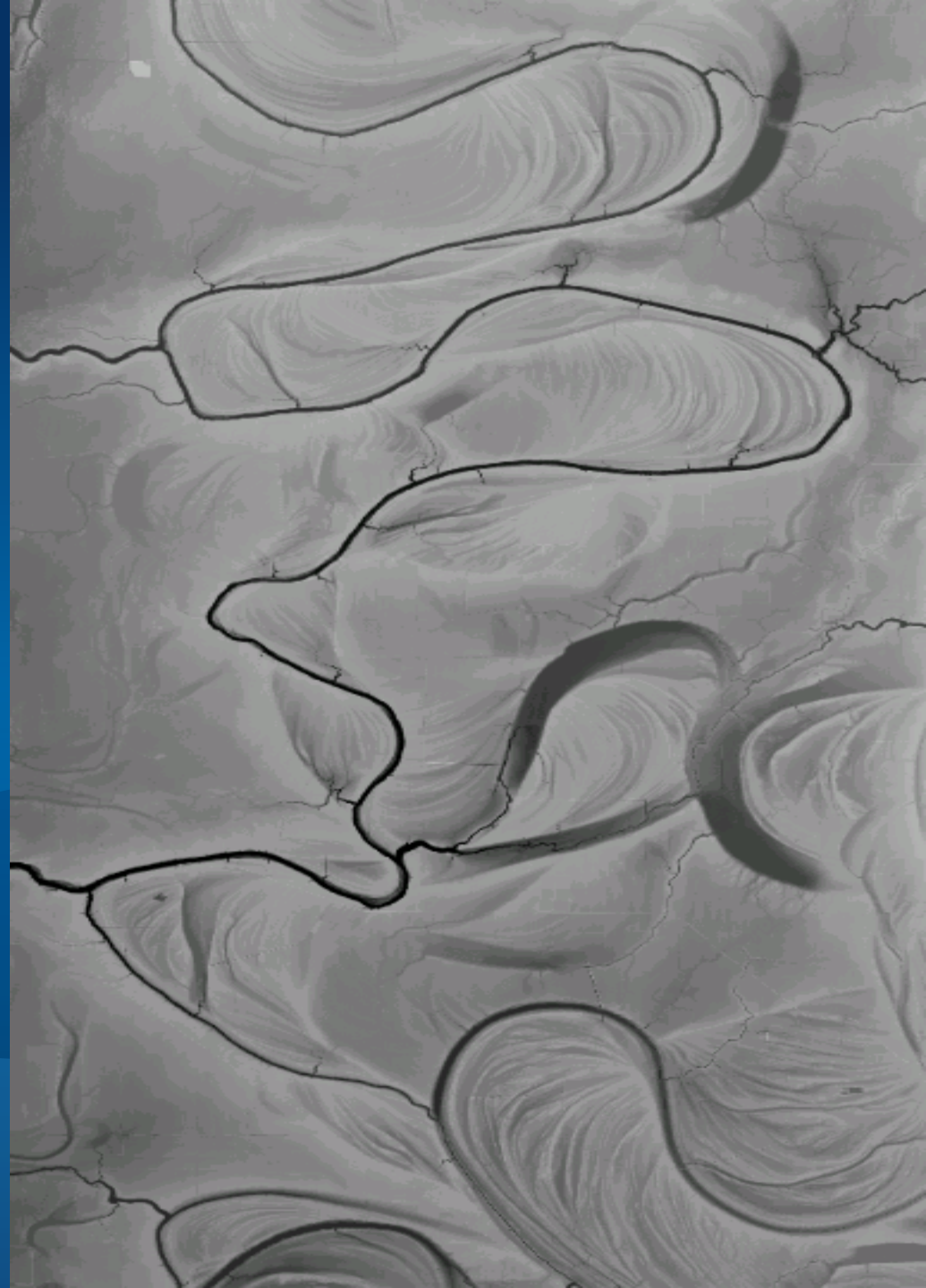
Cody A. Benkelman

Technical Workshop

Outline

- **What is included?**
 - **Data and Tools**
- **How can I use it?**
 - **Modes of use**
 - **Client Applications**
- **What are the details?**
 - **Technical and Legal**

World Elevation: Contents



World Elevation Services - Data Sources

Public domain elevation data – **1.6 TB** (LZW compressed TIF)

1 km Bathymetry

250m GMTED

90 m SRTM & EarthEnv-DEM90

60 m NED (AK)

50 m OS (UK)

30 m NED (North America)

10 m (USA & Norway)

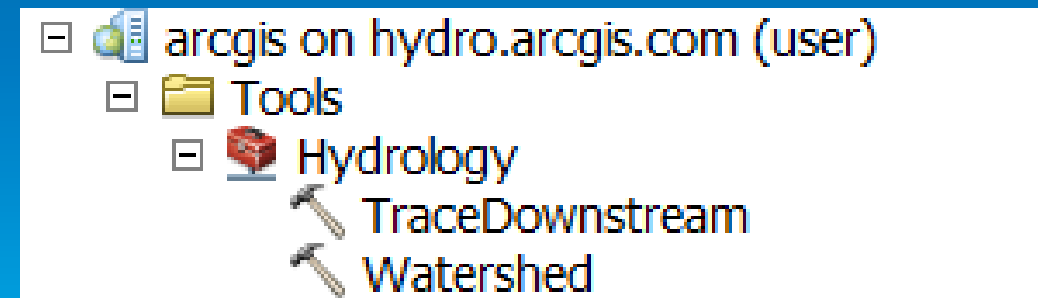
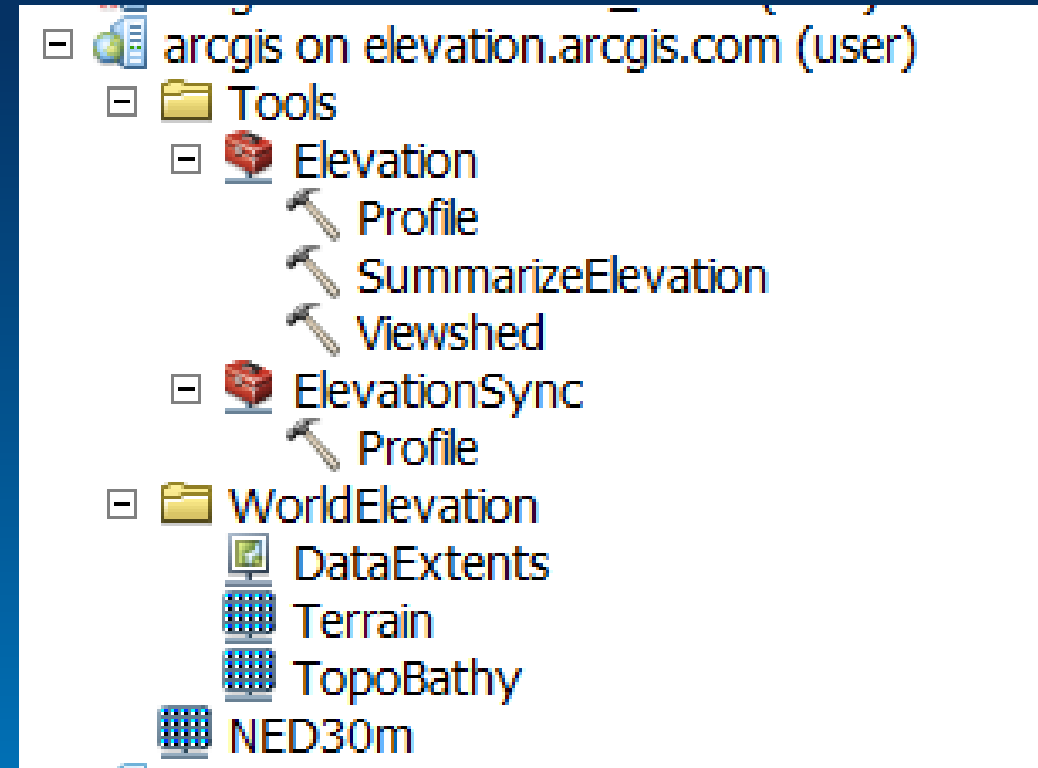
3 m (partial USA, Denmark, Finland)

Coming: Community contributions



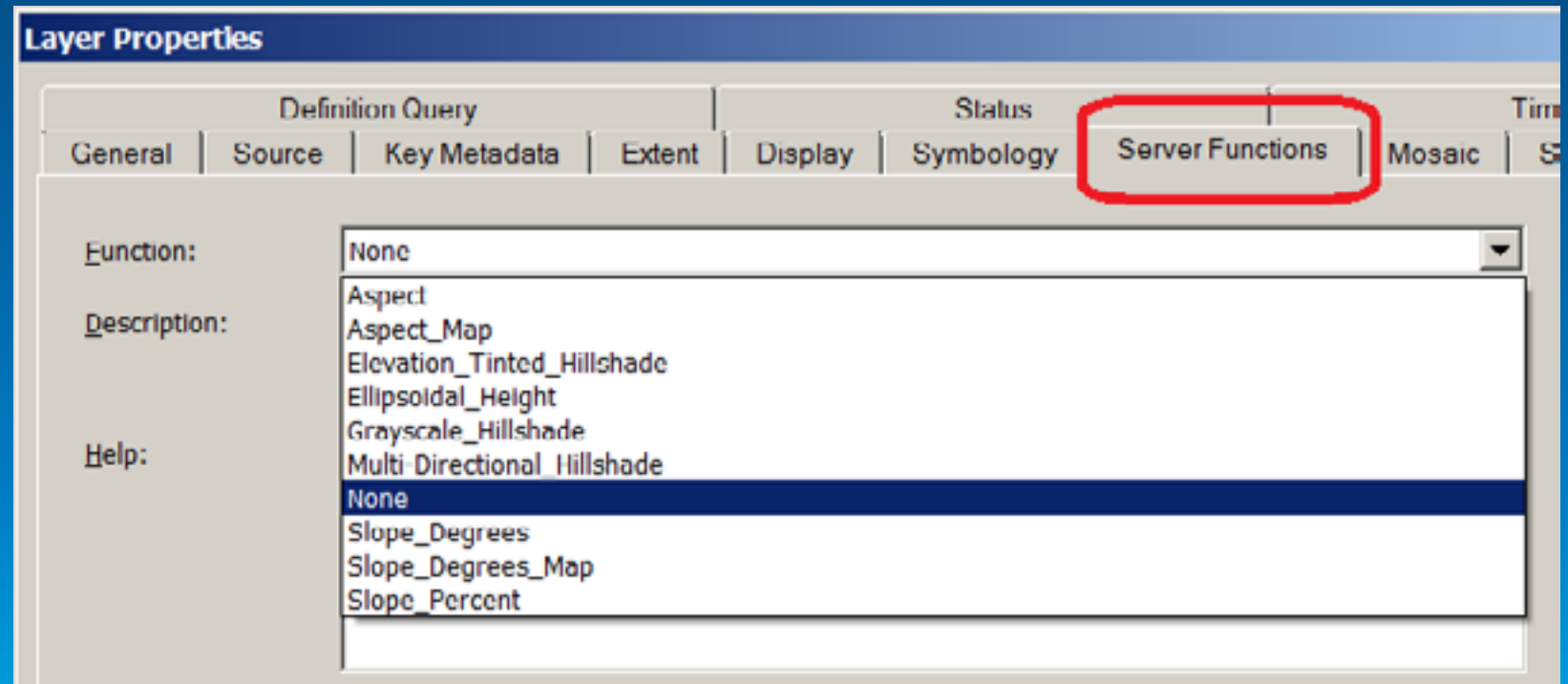
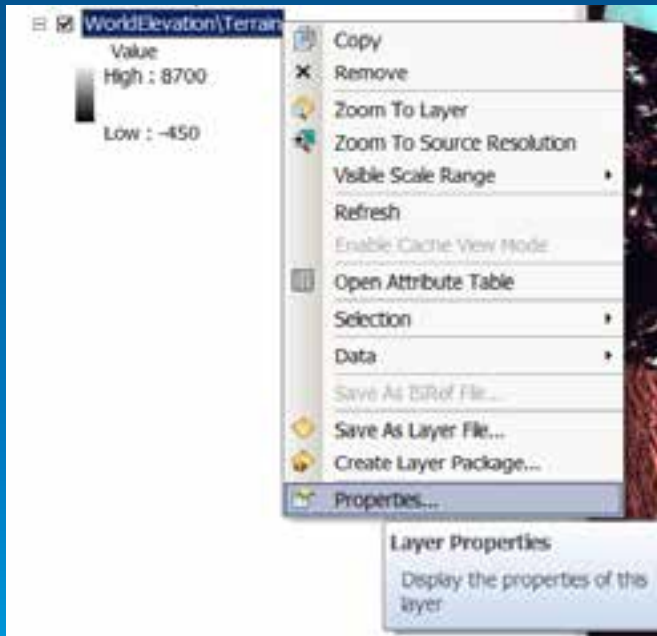
Services

- **Image service: elevation values**
 - Terrain
 - TopoBathy
 - **Dedicated NED 30m (USA)**
- **Server-side Geoprocessing (GP) services**
 - Profile
 - Summary Statistics
 - Viewshed
 - Watershed (Hydro)
 - Trace Downstream (Hydro)

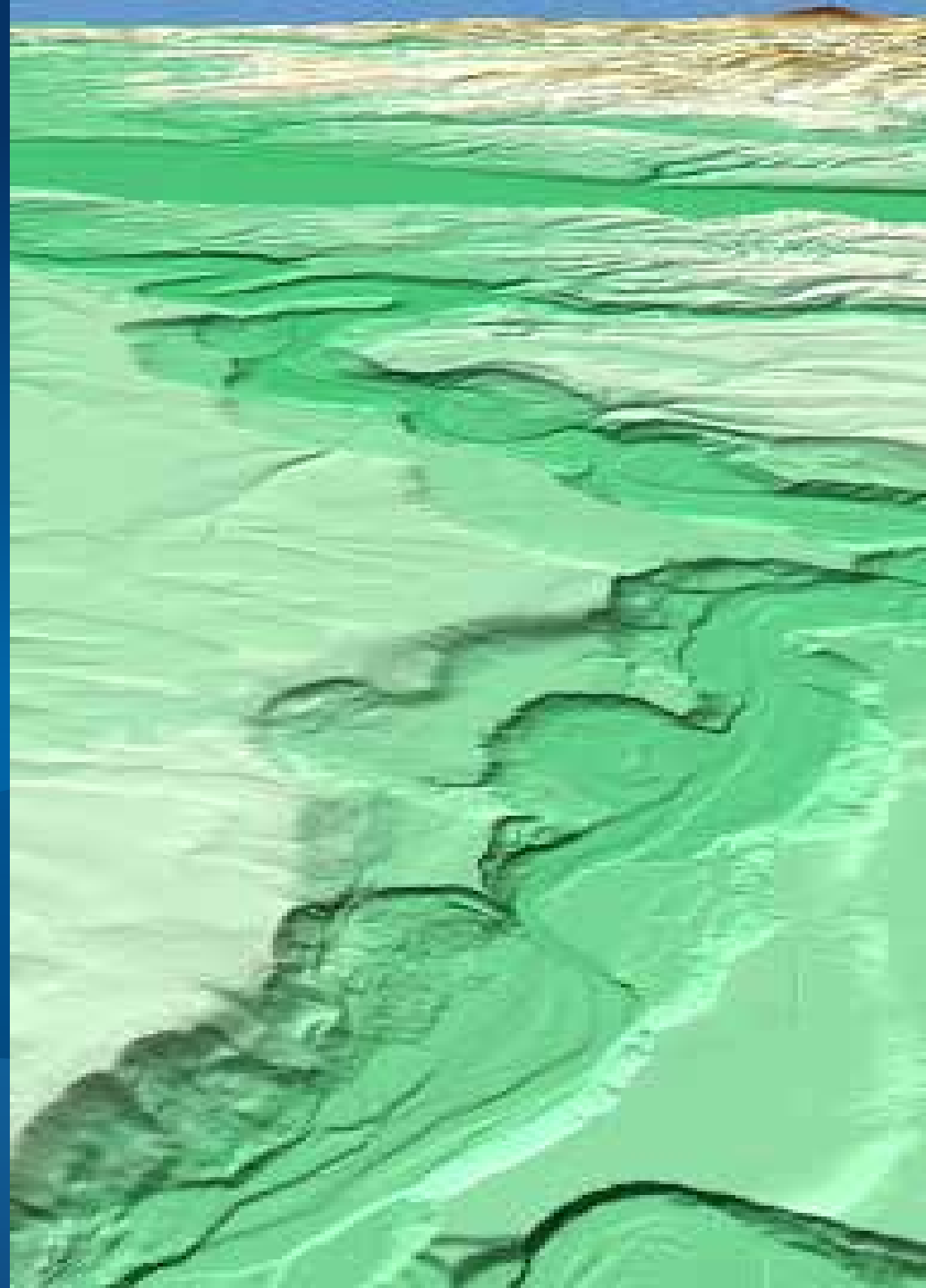


Contents – “Terrain” Image Service

- Default “Terrain” (orthometric height)
- 9 Functions to create on-the-fly products



World Elevation: Modes of Use

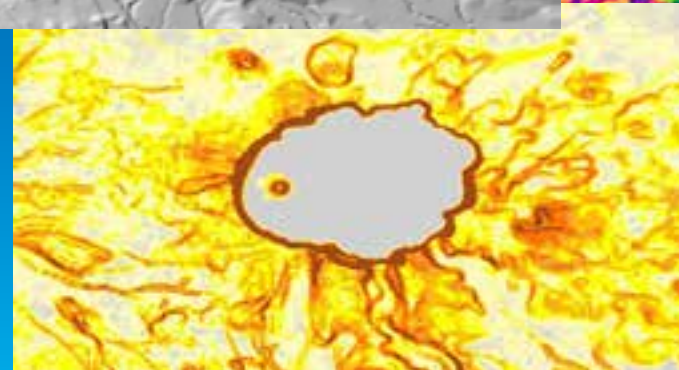
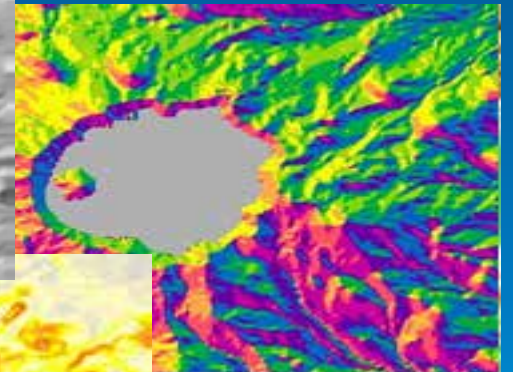
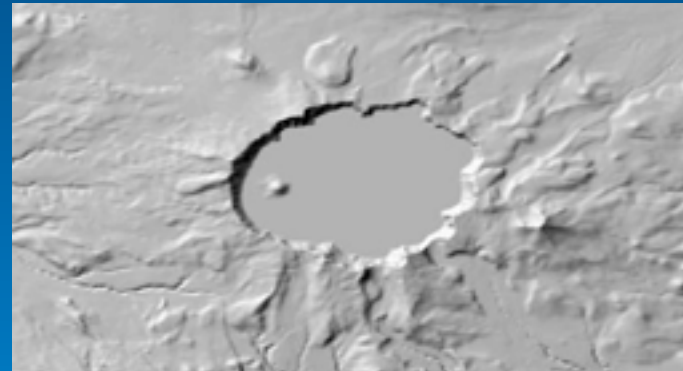


“How can I use these services?”

- **Usage Modes**
 - **Visualization**
 - **Data Values**
 - **Geoprocessing**
- **Client Applications**
- **End Users vs. Developers**

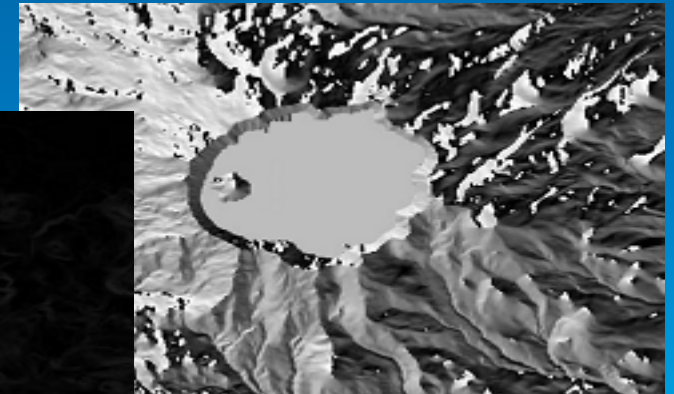
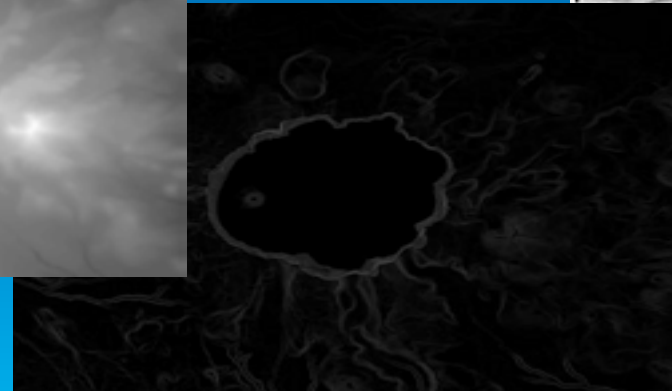
Usage Modes

- **Visualization**
 - **Hillshade (Grayscale, Elevation Tinted)**
 - **Slope Map & Aspect Map**



Usage Modes

- **Visualization**
 - **Hillshade (Grayscale, Elevation Tinted)**
 - **Slope Map & Aspect Map**
- **Data Values**
 - **Orthometric & Ellipsoidal Height - for Orthorectification, Local Analysis...**
 - **Slope & Aspect**



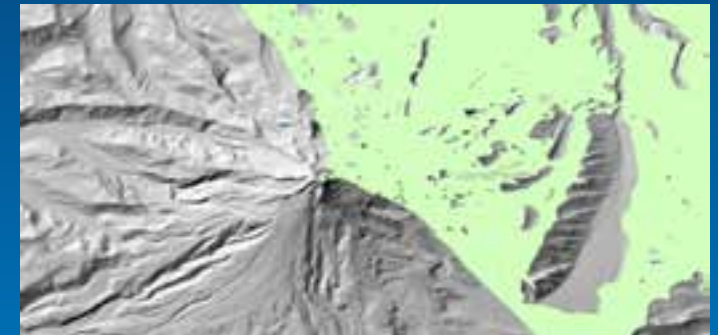
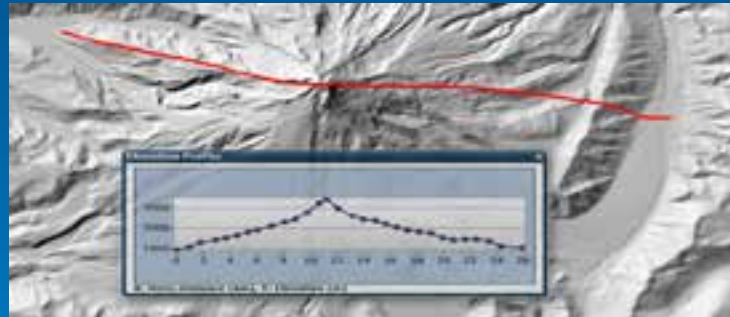
Usage Modes

- **Visualization**

- **Hillshade (Grayscale, Elevation Tinted)**
- **Slope Map & Aspect Map**

- **Data Values**

- **Height**
- **Slope & Aspect**



- **Server-side Geoprocessing Services**

- **Viewshed, Profile, Statistics, Watershed, Trace Downstream**

Client Applications

- **ArcGIS Desktop 10.1 & 10.2**

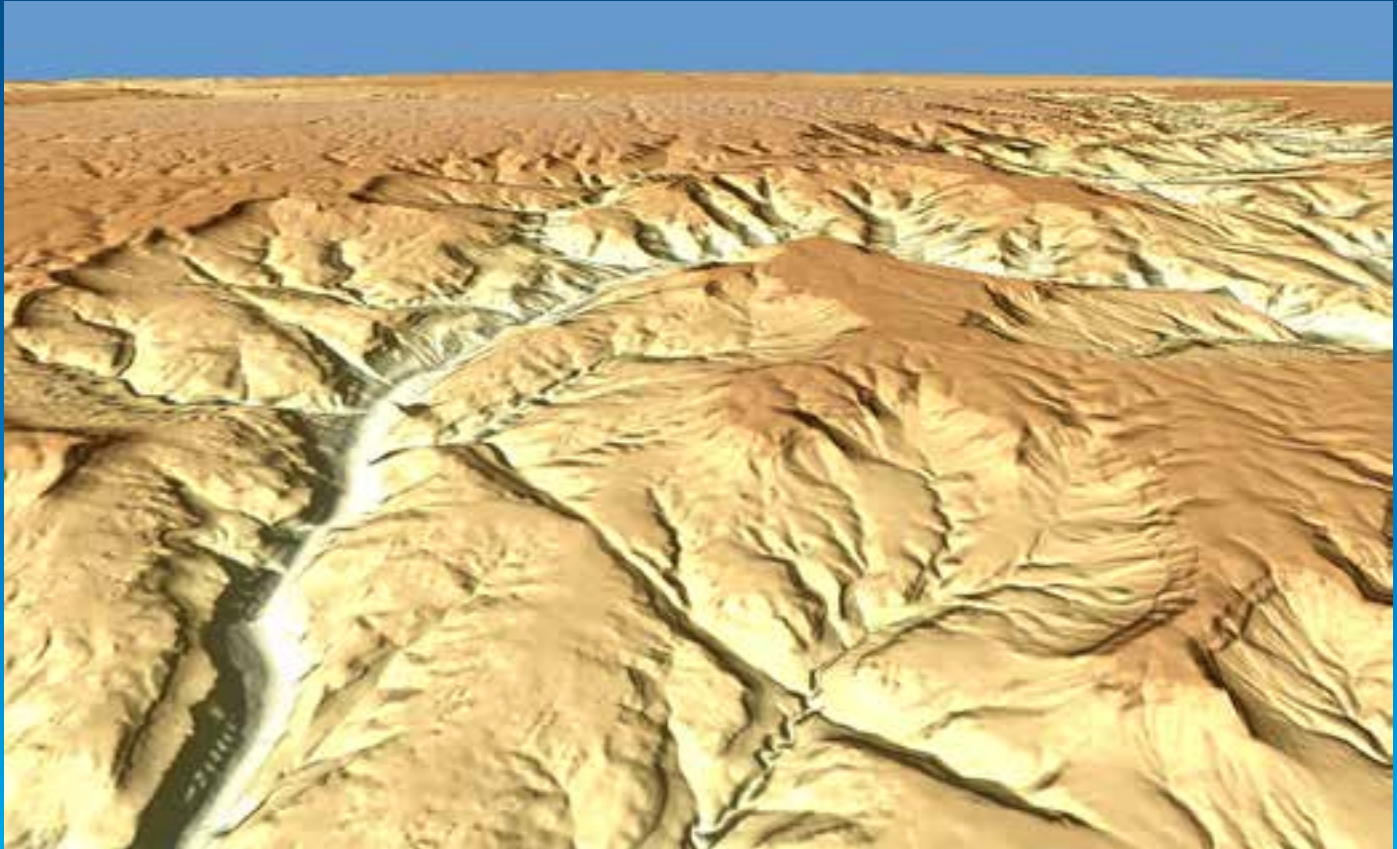
World Elevation: Demo - ArcMap



Client Applications

- ArcGIS Desktop 10.1 & 10.2
- ArcGlobe

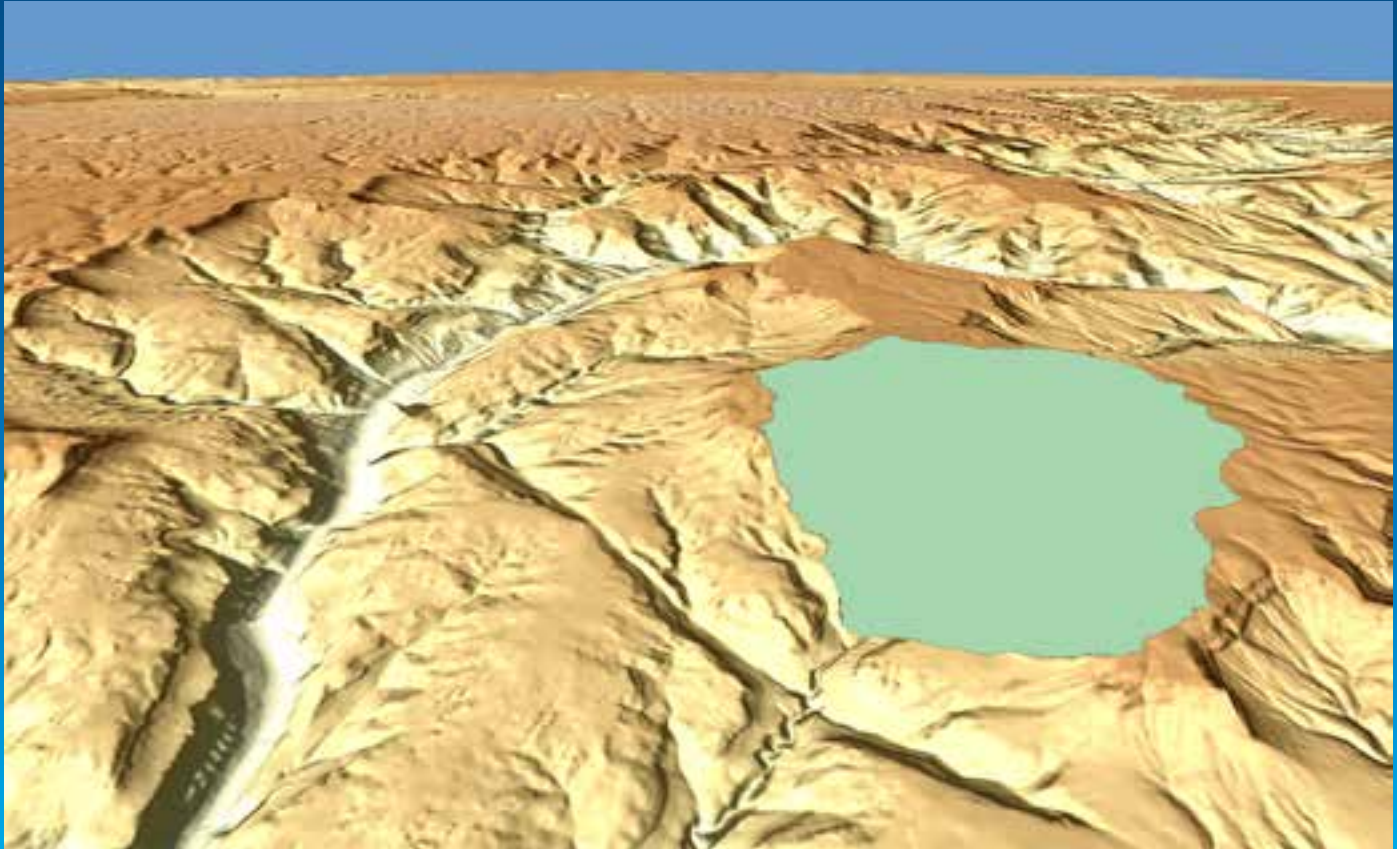
AGOL Terrain as elevation source, with *Elevation Tinted Hillshade* loaded via LZR file



Client Applications

- ArcGIS Desktop 10.1.1 & 10.2
- ArcGlobe

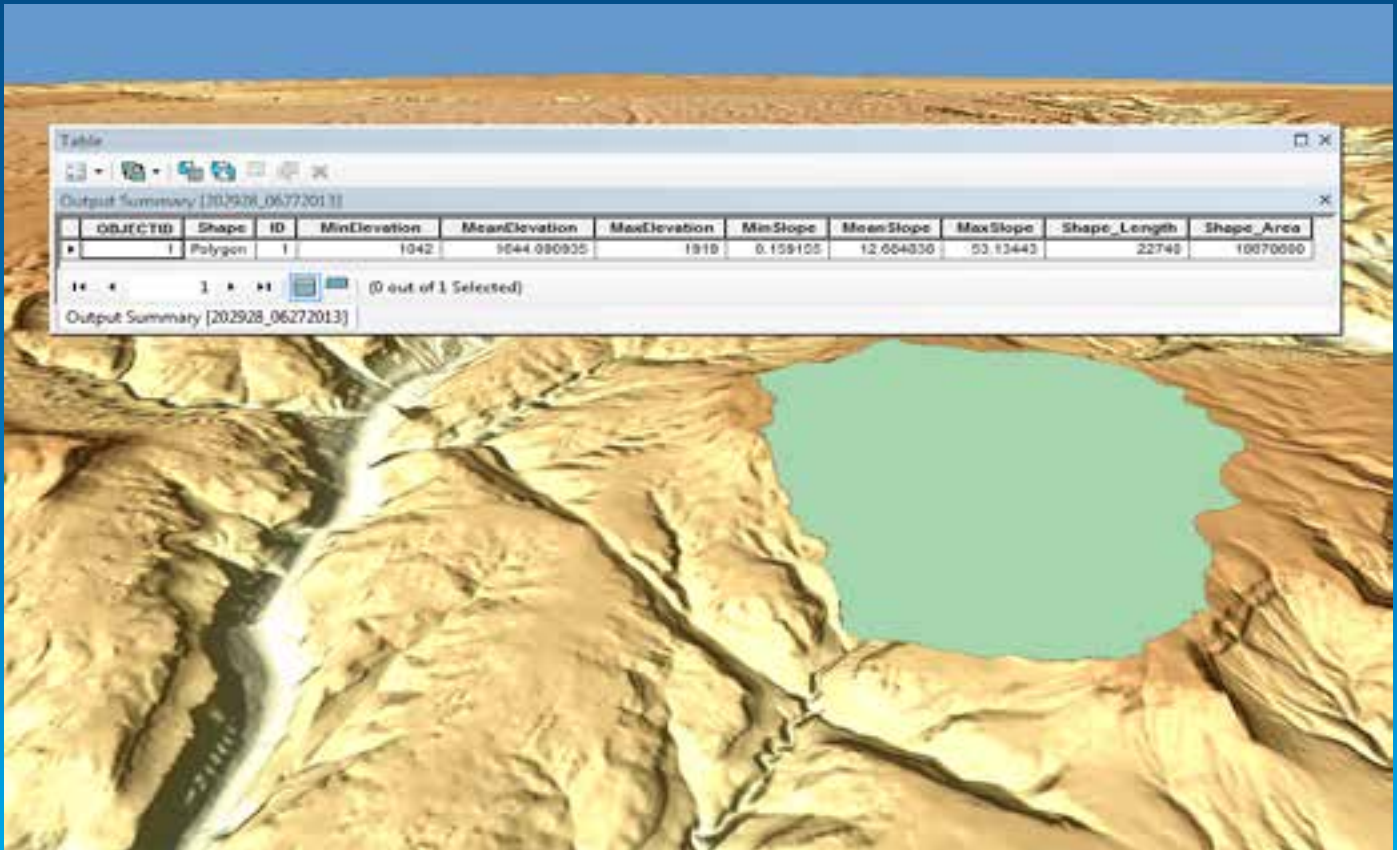
Watershed GP tool result



Client Applications

- ArcGIS Desktop 10.1.1 & 10.2
- ArcGlobe

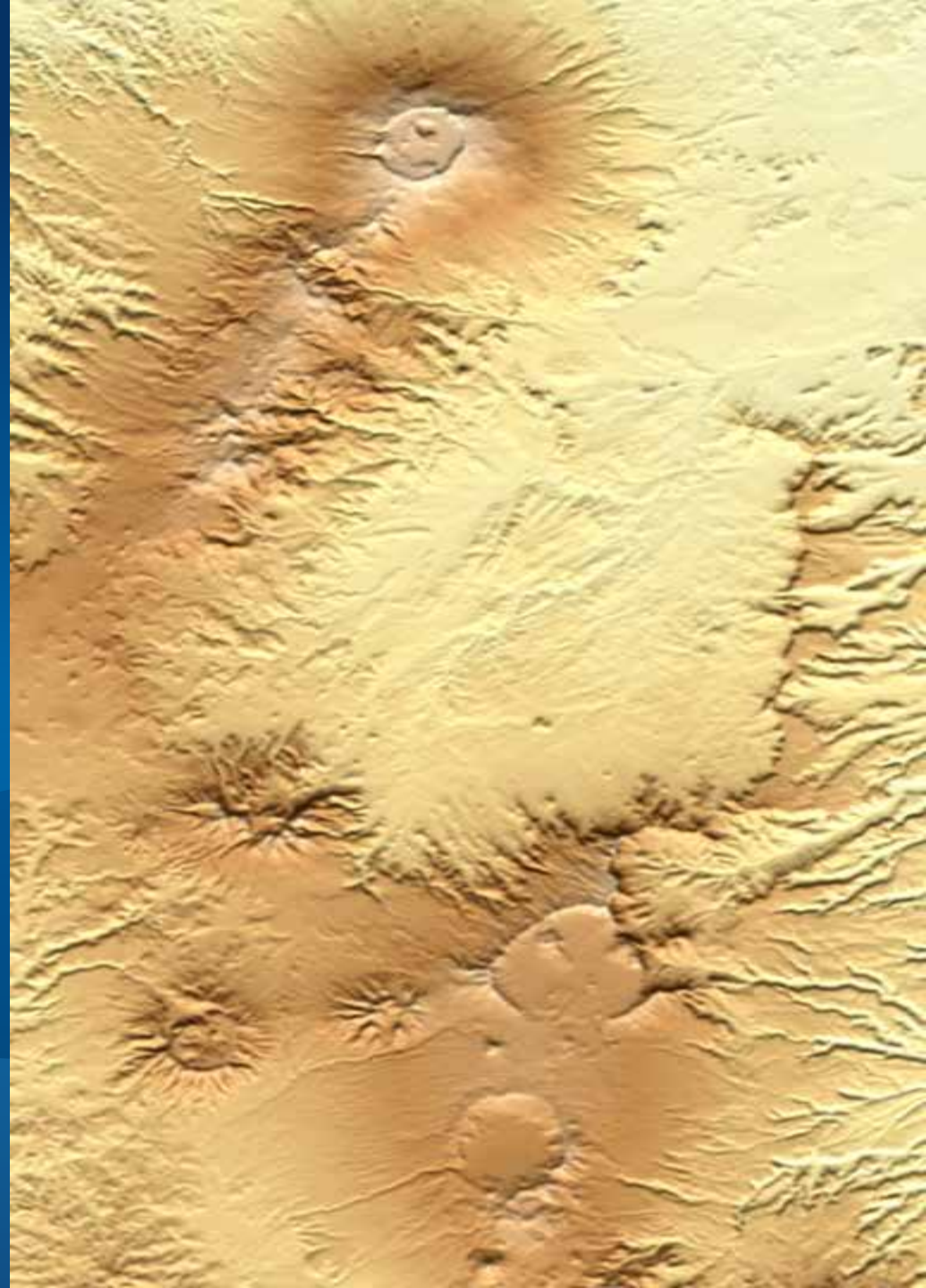
SummarizeElevation results using watershed polygon as input feature class



Client Applications

- **ArcGIS Desktop 10.1 & 10.2**
- **ArcGlobe**
- **ArcGIS Online web map**
 - **Image services only**
 - **Geoprocessing services supported in the future**

World Elevation: Demo – ArcGIS Online



Client Applications

- **ArcGIS Desktop 10.1 & 10.2**
- **ArcGlobe**
- **ArcGIS Online web map**
- **Custom web applications**
 - **Cartography**
 - **Data for elevation analysis**
 - **Custom geoprocessing**


Terms of Use

- **ArcGIS Online Subscription account**
- **No cost in terms of Service Credits**
- **Future offerings may require Credit consumption**
 - **Geoprocessing tools**
 - **Premium content**


Connecting and Using

- AGOL Group: “Elevation Layers:
 - Shortcut: <http://esriurl.com/6548>
 - Multiresolution service is “Terrain”
 - Select Raster Function
- Authentication
 - ArcGIS, ArcGlobe, AGOL map
 - ArcGIS Online Subscription Account
 - Custom REST-based apps
 - Acquire token
 - Pass token in REST request


Elevation Layers

- 

Terrain
A multi-resolution layer providing access to elevation values for use in aspect, and hillshade.
Imagery by esri
Last Modified: June 26, 2014
★★★★☆ (7 ratings, 3 comments, 41,370 views)

[Open](#) ▾ [Details](#)
- 

Terrain: Elevation Tinted Hillshade
This layer provides access to a tinted hillshade for use as a base map.
Imagery by esri
Last Modified: June 26, 2014
★★★★☆ (1 rating, 0 comments, 11,887 views)

[Open](#) ▾ [Details](#)
- 

Watershed [Beta]
Watershed determines the contributing area above each input point elevation data.
Geoprocessing Service by esri
Last Modified: June 26, 2014
★★★★☆ (1 rating, 1 comment, 4,202 views)

[Details](#) ▾ [Details](#)

That's not exactly what I wanted...

For organization with other requirements

- **In-house data collections**
 - **Proprietary data**
 - **Lidar with DSM**
 - **Bathymetric data**
- **Offline use/Behind your firewall**
- ***“Best Practices for Managing Elevation Data”***
 - **Imagery Demo Theater Thursday 10:00 a.m.**

Thank you...

- **Please fill out the session survey:**

Offering ID: 887 / 1831

Online – www.esri.com/ucsessionsurveys

Paper – pick up and put in drop box



Understanding our world.