



ArcGIS Data Reviewer: Plans for Quality Assessment of Raster Datasets

Pete Aniello

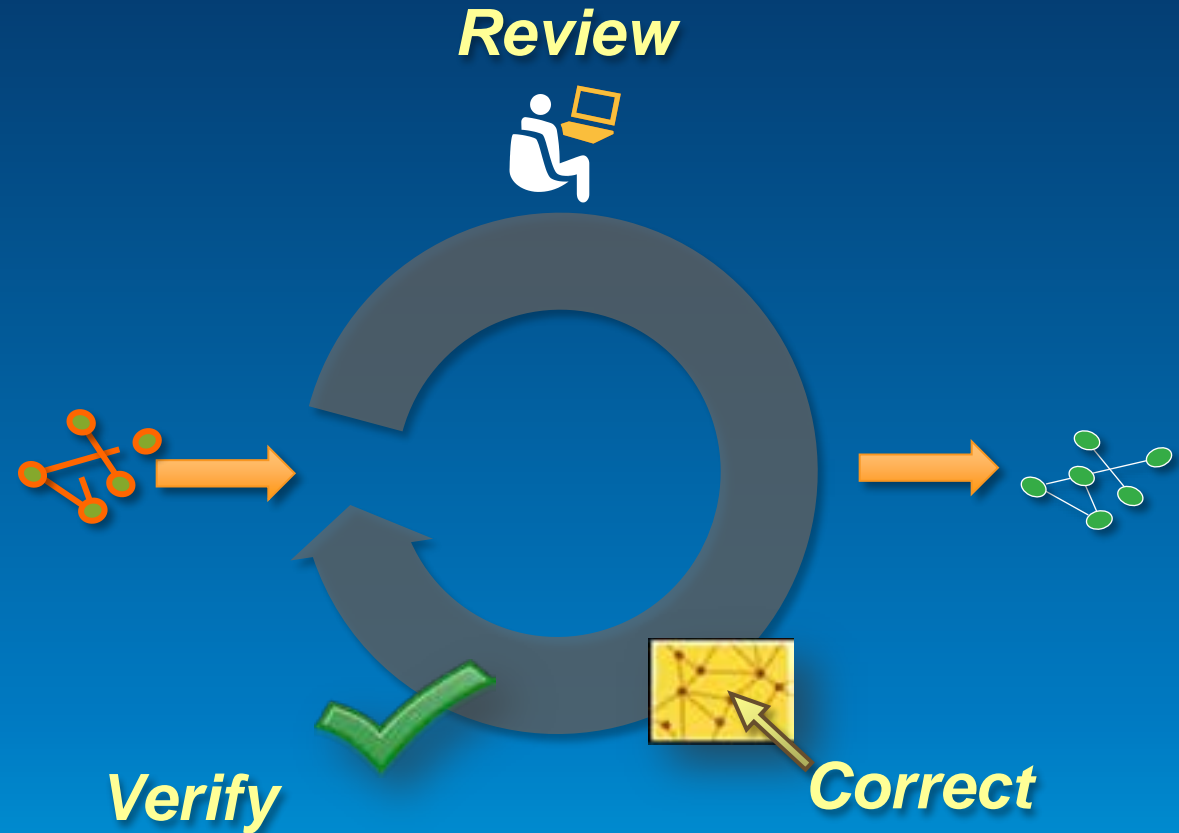
Andrew Leason

Demo Theater

What is ArcGIS Data Reviewer?

Data quality management for ArcGIS

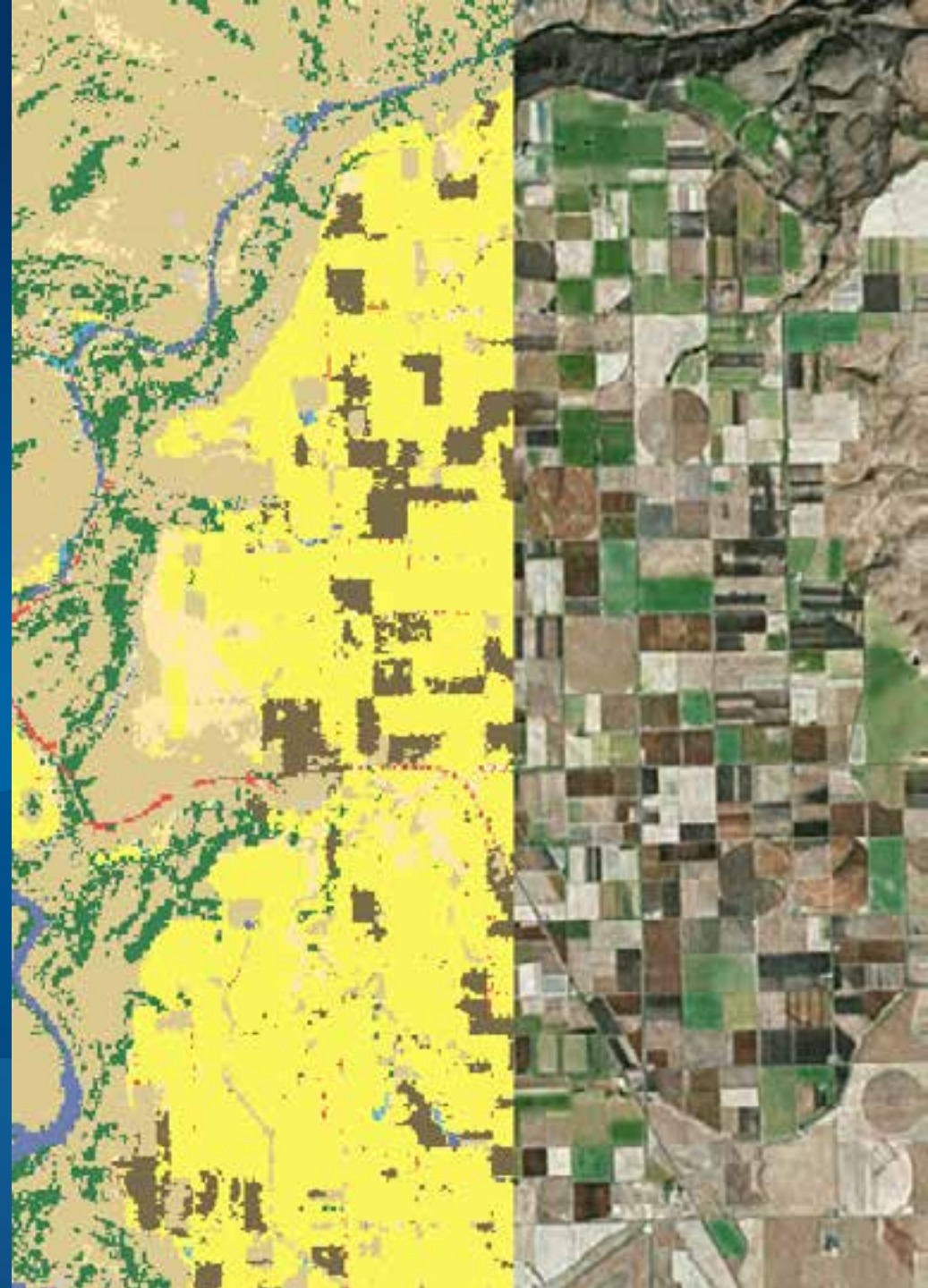
- Provides
 - Rule based workflows
 - Interactive tools
 - Track errors
- For individuals and enterprise
 - Saves time/money
 - Less rework
- Standard extension
 - ArcGIS for Desktop
 - ArcGIS for Server



Trusted data through improved quality management

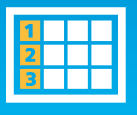
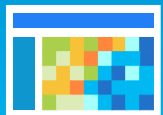
Thematic Accuracy Tools

Pete Aniello



Geospatial Data Accuracy

- **Spatial (positional, geometric)**
- **Spectral (band depth)**
- **Thematic (classification)**
- **Temporal (appropriate date)**
- **Radiometric (capture piece of electromagnetic spectrum)**
- **Attributional (types of attributes for intended purpose, correctness of attributes)**



Thematic Accuracy

- **How closely a classification conforms to a reference source (“truth”)**
- **No classification is perfect (80 percent is excellent)**
- **Products may need to conform to a specification**
- **Usually scale-dependent to some degree**
- **How to quantify?**
- **Error table: Overall Accuracy and Kappa Value**

Thematic Accuracy Tools

- **Part of Spatial Analyst Multivariate Toolbox**
 - **Same toolbox with classification tools**
- **Created with requirements gathered from NGA through the Esri's CRADA with NGA**
- **Quantitative accuracy value for a classified raster**

Accuracy Reporting

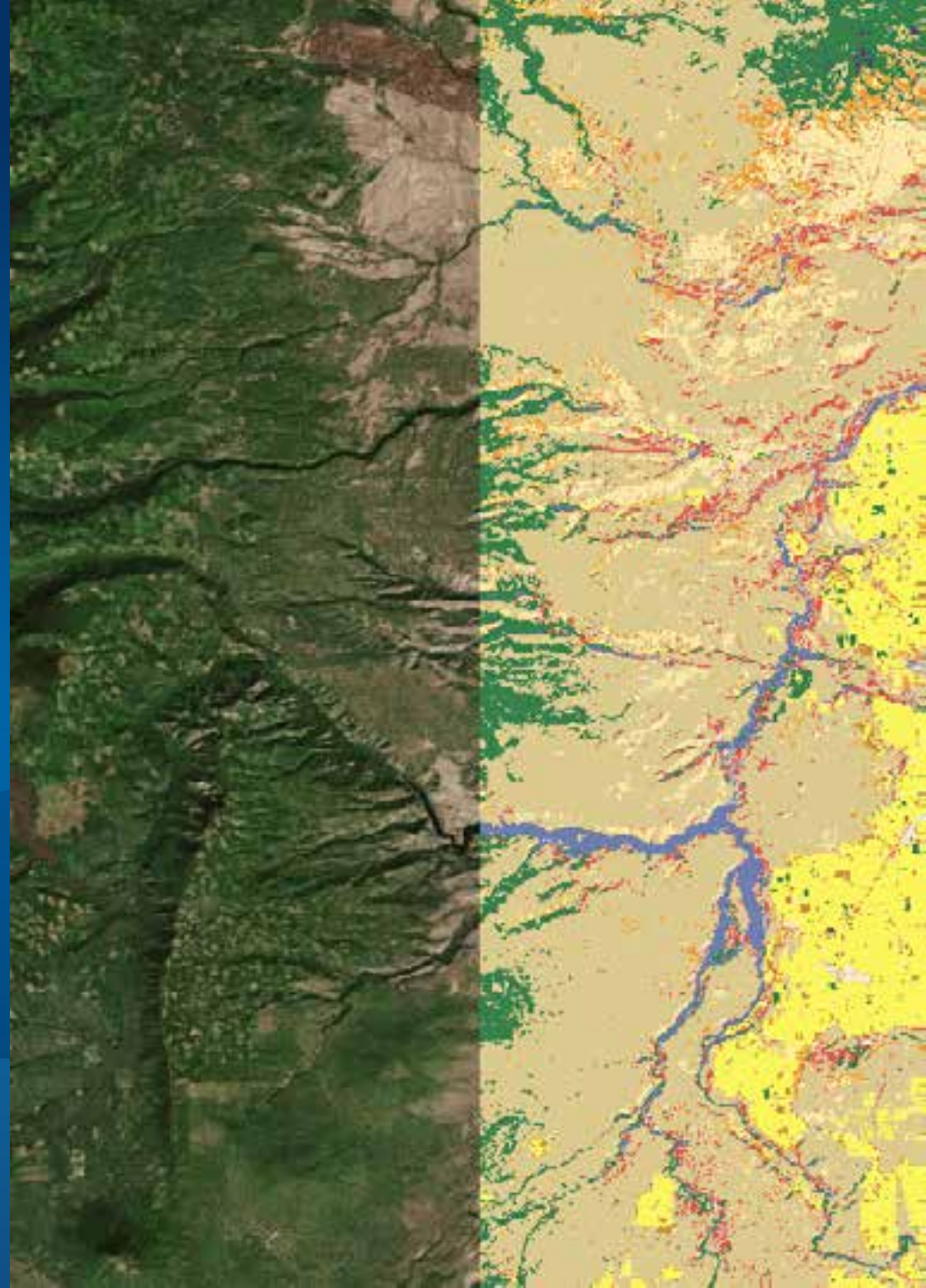
- Error matrix
 - Standard output for classification accuracy
 - In text report
 - In table for use in GP model
- Overall accuracy value
- Kappa value
 - Overall accuracy minus random chance

```
[[ 0 42 51 33 81 82 71 92 23 43 85 11 91 41 31 12 32 0]
 [ 42 447 16 3 0 0 5 0 0 2 0 0 0 4 5 0 0 482]
 [ 51 43 195 0 4 0 6 0 0 0 0 0 0 0 0 0 0 248]
 [ 33 45 4 18 0 0 7 0 0 1 0 0 0 1 2 0 0 78]
 [ 81 6 3 0 42 0 3 0 0 0 0 0 0 0 0 0 0 54]
 [ 82 0 1 0 6 0 0 0 0 0 0 0 0 0 0 0 0 7]
 [ 71 0 20 0 2 0 3 0 0 0 0 0 0 0 1 0 0 26]
 [ 92 10 1 1 0 0 0 0 0 2 0 0 0 0 0 0 0 14]
 [ 23 4 7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 11]
 [ 43 25 1 0 0 0 1 0 0 3 0 0 0 2 0 0 0 32]
 [ 85 2 9 0 1 0 0 0 0 0 0 0 0 0 0 0 0 12]
 [ 11 3 3 0 0 0 0 0 0 0 0 6 0 0 0 0 0 12]
 [ 91 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1]
 [ 41 7 0 1 0 0 2 0 0 1 0 0 0 0 0 0 0 11]
 [ 31 0 0 0 0 0 1 0 0 0 0 1 0 0 1 2 0 5]
 [ 12 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 2]
 [ 32 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 1]
 [ 0 593 260 23 55 0 28 0 0 9 0 7 0 7 11 3 0 996]]

accuracy = 71.9%
kappa = 0.561
```

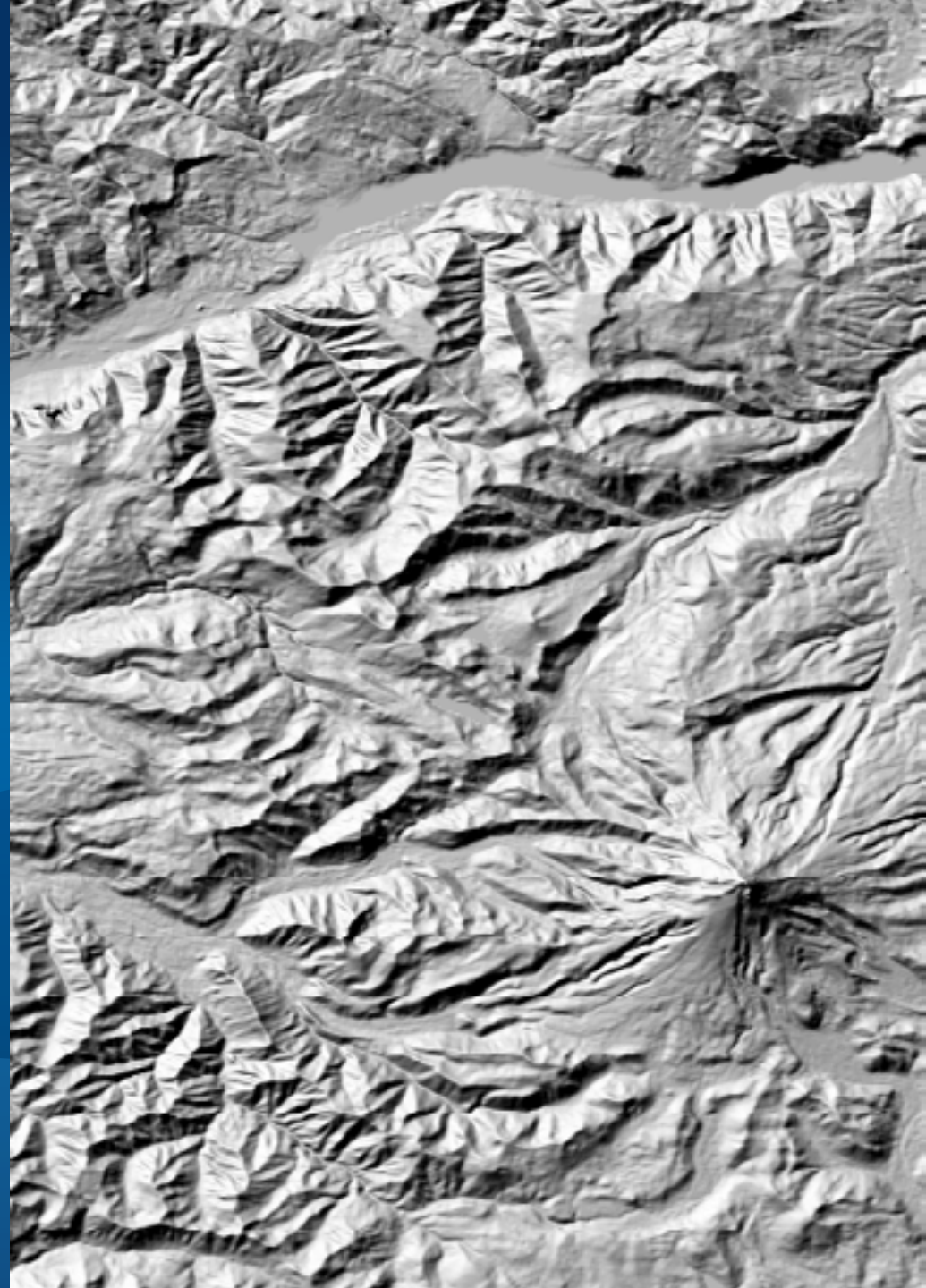
Demo

Thematic Accuracy Assessment



Elevation QA tools

Andrew Leason



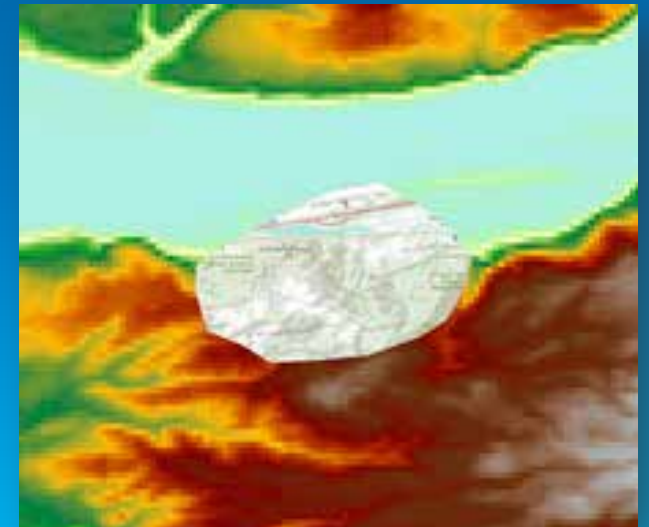
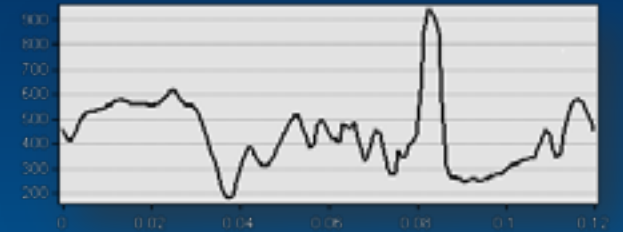
Elevation QA tools

Background

- **Developed for internal use**
 - **Community portion of World Elevation Service**
- **Developed as GeoProcessing tools**
- **Results can be written directly to Data Reviewer tables**
 - **Allows for centralized management and reporting**
- **Currently in beta version**

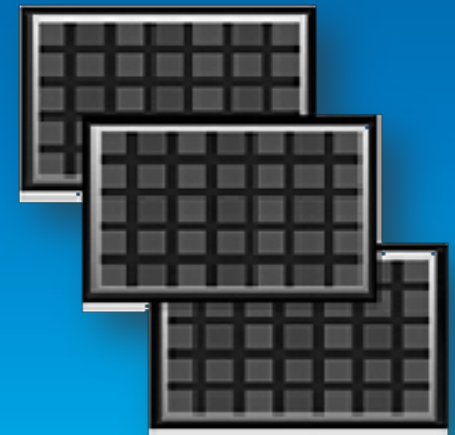
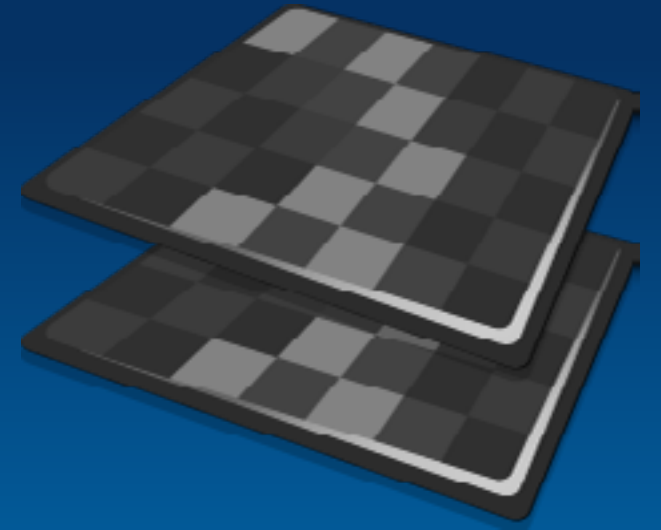
Elevation QA tools

- **Slope tool**
 - Check for slopes in elevation raster that are greater than a user specified value
- **No Data check**
 - Find areas of NoData pixels
 - Optionally find NoData pixels around the perimeter of the imagery



Elevation QA tools

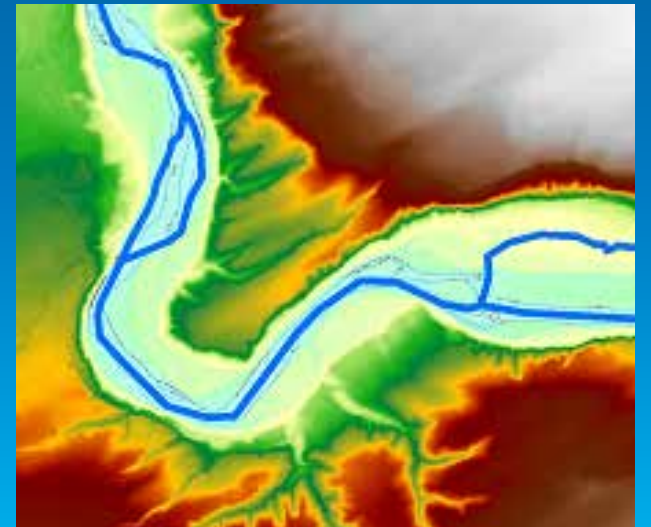
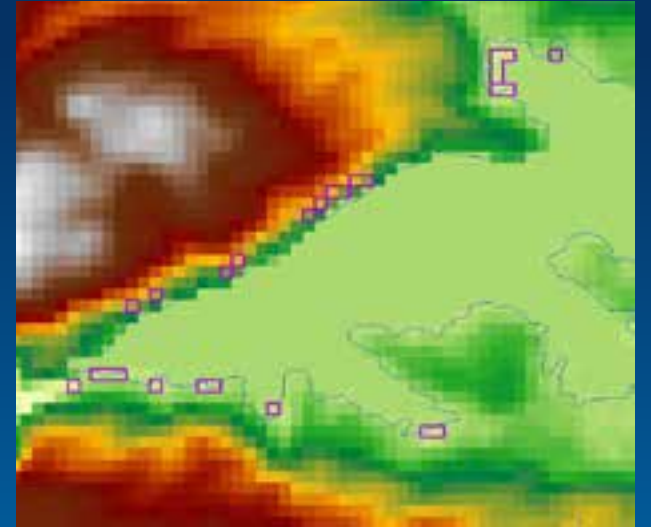
- **Reference DEM**
 - Compare DEM against a reference DEM
- **Mosaic Dataset Overlaps**
 - Compare values in all overlapping DEMs within a single mosaic dataset



Elevation QA tools

- **Water Bodies**
 - Check for flatness
 - Check for displacements at water edge

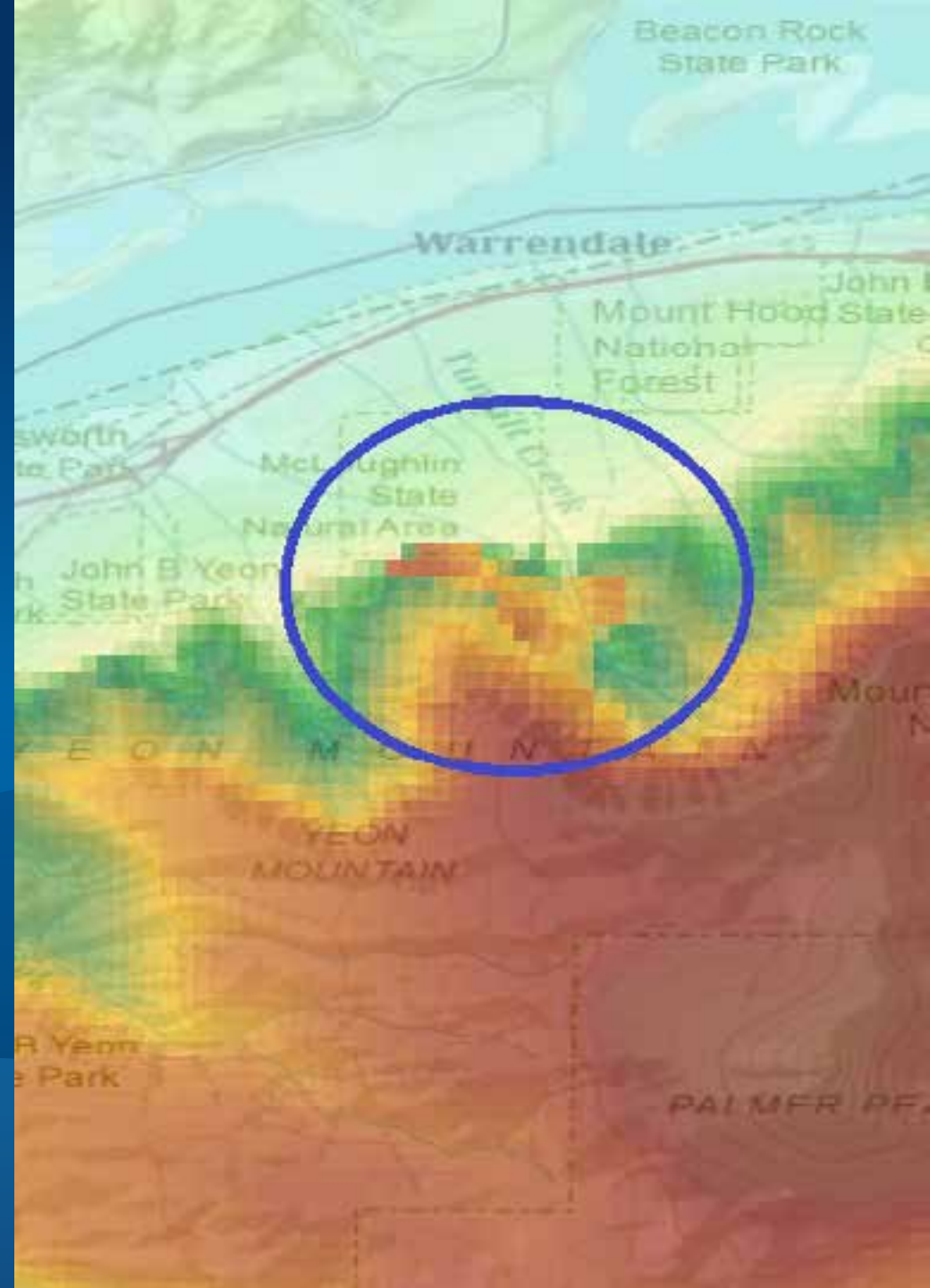
- **Rivers**
 - Check for monotonicity
 - Check for displacements at water edge



Demo

Check Slope tool

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Resources

- **Product page**
 - www.esri.com/datareviewer
- **Resource Center**
 - <http://resources.arcgis.com/>
- **Training**
 - www.esri.com/training
- **Questions & comments**
 - datareviewer@esri.com
- **Questions?**

The screenshot shows the ArcGIS Resources website for Data Reviewer. The page features a navigation bar with links for Home, Communities, Help, Blog, Forums, and Videos. A search bar is located in the top right corner. The main content area is titled "Data Reviewer" and includes a "Communities" section with a sub-header "Automate, simplify, and improve data quality control management across multiple platforms - desktop, server, mobile, and online". Below this is a featured article titled "Importance of Quality Control" with a "Read more..." link. To the right of the article is a map showing "Orphan Water Service Points" and "Arroyohead Park" with a "Severity distribution" pie chart and an "Error Count by Feature Class" table. The table lists feature classes and their counts: "w-Casing" (47/267), "urban" (139/21,404), "w-Intersective" (229/13,618), and "w-Correlative" (81/24,284). A "Quick Links" section on the right provides links for Desktop, Server, and Server APIs. The "Gallery" section at the bottom displays five thumbnails for various tutorials and guides.

Importance of Quality Control
It's important for your GIS data to adhere to a standard for quality because poor data quality impacts decision making and is often expensive to fix.

Orphan Water Service Points
Service points should always connect to pipes. Disconnected service points will affect service outage notifications.

Severity distribution

Error Count by Feature Class

Feature Class	Count
w-Casing	47/267
urban	139/21,404
w-Intersective	229/13,618
w-Correlative	81/24,284

Quick Links

- Desktop**
 - What's new at 10.11 | Install guide
 - Help: 10.1 | 10.1 | 9.3 | 10.1
- Server**
 - Concepts | Install guide
- Server APIs**
 - Flex | JavaScript | REST | Download
- Resources**
 - Data Reviewer cheats poster
 - Forum | Blog | White papers
 - Support
 - Training
 - Webinars

Gallery

- ArcGIS Data Reviewer 10 Tutorial
- Write to the Reviewer Table using ArcGIS Data Reviewer 10
- Data Reviewer for Water Utilities (ArcGIS 10)
- Managing Data Reviewer Records (ArcGIS 10)
- Data Reviewer for Water Utilities (ArcGIS 10.1)

Thank you...

- Please fill out the session survey:

First Offering ID: 1550

Online – www.esri.com/ucsessionsurveys



Understanding our world.