ArcGIS Data Reviewer: An Introduction

Jay Cary and Chandan Banerjee
Workshop Agenda

• Importance of Data Quality
• What is ArcGIS Data Reviewer
• Automated Review
• Visual Review
• Managing Errors and Reporting Data Quality
• Summary/Resources
Importance of data quality
Defining quality
A business perspective

• Executive
  - Confidently make decisions
  - Reduce financial risk
  - Optimize organizational performance
Defining quality
A business perspective

• Executive
  - Confidently make decisions
  - Reduce financial risk
  - Optimize organizational performance

• Manager
  - Effective data stewardship
  - Drive increased usage
  - Maximize productivity
Defining quality
A business perspective

• Executive
  - Confidently make decisions
  - Reduce financial risk
  - Optimize organizational performance

• Manager
  - Effective data stewardship
  - Drive increased usage
  - Maximize productivity

• Knowledge worker
  - Increased efficiencies
  - Confidence in GIS
Defining Quality
A Technical Perspective

Spatial Accuracy
Thematic Accuracy
Completeness
Logical Consistency
Temporal Quality
Usability

ISO-19157:2013 Geographic Information – Data Quality
What is ArcGIS Data Reviewer?
Data Quality Management for ArcGIS

• Provides
  - Rule-based validation
  - Interactive tools
  - Track errors

• For individuals and enterprise
  - Saves time/money
  - Less rework

• For multiple domains
  - Configurable
  - Extendable
Managing Quality Control

Quality Control Processes

Automated Review

Visual Review

Reviewer Results

Quality Reporting
Types of quality control

Automated review

- Fast
- Consistent and repeatable
- Objective
- 100% coverage
Types of quality control

Automated review

- Fast
- Consistent and repeatable
- Objective
- 100% coverage

Visual review

- As subjective as needed
- Better for finding patterns and missing elements
Automated Review
Managing Quality Control
Quality Control Processes

- Visual Review
- Automated Review
- Reviewer Results
- Quality Reporting
Defining Quality

Sources of data quality requirements

Industry standards / Specifications
Defining Quality

Sources of data quality requirements

- Industry standards / Specifications
- Subject matter experts
Defining Quality
Sources of data quality requirements

- Industry standards / Specifications
- Subject matter experts
- Training and experience
Defining Quality
Sources of data quality requirements

- Industry standards / Specifications
- Subject matter experts
- Training and experience
- Quality assurance plans
Automating Data Validation

- Implementing quality requirements
  - 40+ configurable checks
  - Attribute
    - Feature and table values
  - Spatial
    - Spatial relationships
  - Feature integrity
    - Collection rules
  - Metadata
    - Completeness/Content

www.esri.com/datareviewer
Demo:

Getting Started with Automated Review
Demo Scenario

- Department plans to use student interns with field data collection devices to map road-related features (signs, street furniture).

- Business Requirement
  - Features should be positionally accurate based on siting criteria
  - Key attributes are populated and have the correct values
  - All features should be collected within the survey area
Authoring Data Quality Rules
Batch Validation
Implementing Cumulative Review

• Reviewer Batch Jobs
  - Encapsulate QC model
  - Designed once and executed many times
  - Complete specification check
ArcGIS Resource Center
Leveraging Templates for QC Requirements

• **Data Reviewer Templates for**
  - Address Management
  - Electrical Utilities
  - Roads & Highways
  - Tax Parcel Editing
  - Water Utilities

• **Based on Esri industry models**

• **Use as Starting point**
Demo:
Authoring Data Quality Rules
Authoring Batch Jobs
Tips and Tricks

• When authoring new checks
  - Configure and execute from Reviewer Toolbar
  - Leverage Mini-Browser to quickly assess results
  - Try validating a pilot area first where known issues are located
Executing Automated Validation
Methods for executing data validation

Execute data validation using

- ArcMap
Methods for executing data validation

Execute data validation using

- ArcMap
- ArcGIS Pro
Methods for executing data validation

Execute data validation using

- ArcMap
- ArcGIS Pro
- Model/Python script
Methods for executing data validation

Execute data validation using

- ArcMap
- ArcGIS Pro
- Model/Python script
- ArcGIS Workflow Manager
Methods for executing data validation

Execute data validation using

- ArcMap
- ArcGIS Pro
- Model/Python script
- ArcGIS Workflow Manager
- ArcGIS for Server
Demo:
Executing Automated Validation
Batch Validation

A Workflow Perspective

• Before data loading

• During editing

• Prior to publishing services/maps

• Prior to rolling-out new applications
Visual Review
Managing Quality Control

Quality Control Processes

- Automated Review
- Visual Review
- Reviewer Results
- Quality Reporting
Automated vs visual review

- Limitations of automated review
  - Data must exist
  - Not possible to detect all types of errors
Value of Performing Visual Review

- Discover Patterns
- Find missing features
- Compare to trusted sources
Visual Review
Leveraging ArcGIS for Desktop

Tools supporting
- Selecting/browsing features
- Redlining missing features
- Flagging features in error
- Generating random samples
- Assessing positional accuracy
- Comparing GDB versions
Visual Review
Leveraging ArcGIS for Server

• Extending quality control workflows into other communities
  - QC review across ArcGIS platform
  - Simple to use tools for error identification
  - Manual QC workflow “automation”
Demo:
Visual Data Review
Reporting Quality
Data Quality Reporting
ArcGIS for Desktop

- Automated reporting of quality control results
- Available Reports
  - Automated Check (Origin Table, Subtype, Check Group)
  - Total Record Count
  - Sampling
Data Quality Reporting
ArcGIS for Server

Enabling transparency in data quality
- Better decision making by communicating data quality across stakeholders
- Open quality reporting
- Shared across ArcGIS system
- Tools and methods to communicate quality
Demo:

Reporting Quality
Scenario

- As a GIS manager, I need to manage the quality of the GIS database to ensure that it can support existing and new staff operations.

- Business Requirements
  - Features should be positionally accurate based on siting criteria (95% accuracy)
  - Key attributes are populated and have the correct values (95% accuracy)
Managing Quality Results
Managing Quality Control
QC lifecycle management

REVIEW
Find & Record Errors

CORRECT
Perform Edits or Note Exceptions

VERIFY
Acceptable or Unacceptable
Demo:
Managing Quality Results
Workshop Review

- Importance of data quality
- Components of data quality
- Forms of data quality control
  - Automated review
  - Visual/Manual review
- ArcGIS Data Reviewer
  - Automated validation
  - Visual QC tools
  - Reporting
  - Error lifecycle management
Resources

Product page
- www.esri.com/datarReviewer

Resource Center
- http://resources.arcgis.com/

Training
- www.esri.com/training

Questions & comments
- dataReviewer@esri.com
# Other Data Reviewer Sessions

<table>
<thead>
<tr>
<th>Day and Description</th>
<th>Type</th>
<th>Time</th>
<th>Location</th>
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<tbody>
<tr>
<td><strong>Tuesday July 15</strong></td>
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<tr>
<td>ArcGIS Data Reviewer: Extending the Validation Framework</td>
<td>Demo Theater</td>
<td>9:30 – 10:00am</td>
<td>Geodata Mgmt Theater</td>
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<tr>
<td>ArcGIS Data Reviewer: Leveraging Geoprocessing for Data Validation</td>
<td>Demo Theater</td>
<td>10:30 – 11:00am</td>
<td>Geodata Mgmt Theater</td>
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<tr>
<td>ArcGIS Data Reviewer: Assessing Positional Accuracy</td>
<td>Demo Theater</td>
<td>1:00 – 1:30pm</td>
<td>Geodata Mgmt Theater</td>
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<td>ArcGIS Data Reviewer: Plans for Quality Assessment of Raster Datasets</td>
<td>Demo Theater</td>
<td>5:30 – 6:00pm</td>
<td>Geodata Mgmt Theater</td>
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<tr>
<td><strong>Wednesday July 16</strong></td>
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<tr>
<td>ArcGIS Data Reviewer: An Introduction</td>
<td>Technical Workshop</td>
<td>8:30 – 9:45am</td>
<td>Room 14A</td>
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<td>ArcGIS Data Reviewer: Integrating ArcGIS Data Reviewer and ArcGIS Workflow Manager to Automate Data Quality Control Workflows</td>
<td>Demo Theater</td>
<td>11:30 – 12:00am</td>
<td>Geodata Mgmt Theater</td>
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<td>ArcGIS Data Reviewer: Special Interest Group Meeting</td>
<td>SIG</td>
<td>12:00 – 1:00pm</td>
<td>Room 15B</td>
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<tr>
<td>ArcGIS Data Reviewer: Planning and Deploying Data Quality Services</td>
<td>Technical Workshop</td>
<td>3:15 – 4:30pm</td>
<td>Room 15B</td>
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<tr>
<td><strong>Thursday July 17</strong></td>
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<td>ArcGIS Data Reviewer: Integrating Data Validation Capabilities Into Web Applications</td>
<td>Demo Theater</td>
<td>9:30 – 10:00am</td>
<td>Web &amp; Server Theater</td>
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<tr>
<td>ArcGIS Data Reviewer: Implementing Data Quality Reporting in Web Clients</td>
<td>Demo Theater</td>
<td>10:30 – 11:00am</td>
<td>Web &amp; Server Theater</td>
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Thank you...

• Please fill out the session survey:

Offering ID: 1169

Online – www.esri.com/ucsessionsurveys
Paper – pick up and put in drop box
Thank you…

• Please fill out the session survey:

Offering ID: 1287

Online – www.esri.com/ucsessionssurveys
Paper – pick up and put in drop box