Workshop agenda

• Defining data quality
• What is ArcGIS Data Reviewer?
• Automated review
• Semi-automated review
• Managing errors
• Summary/resources
Defining data quality
Defining quality
A technical perspective

- Spatial Accuracy
- Thematic Accuracy
- Completeness
- Logical Consistency
- Temporal Quality
- Usability

Lake feature has been shifted

ISO-19157:2013 Geographic information – Data quality
Defining quality
A technical perspective

- Spatial Accuracy
- Thematic Accuracy
- Completeness
- Logical Consistency
- Temporal Quality
- Usability

Swimming pool captured as wetland

ISO-19157:2013 Geographic information – Data quality
Defining quality
A technical perspective

Spatial Accuracy
Thematic Accuracy
Completeness
Logical Consistency
Temporal Quality
Usability

Neighborhood with missing building footprint

ISO-19157:2013 Geographic information – Data quality

ArcGIS Data Reviewer: An Introduction
Defining quality
A technical perspective

- Spatial Accuracy
- Thematic Accuracy
- Completeness
- Logical Consistency
- Temporal Quality
- Usability

ISO-19157:2013 Geographic information – Data quality

Highway with road surface type gravel
Defining quality
A technical perspective

Spatial Accuracy
Thematic Accuracy
Completeness
Logical Consistency
Temporal Quality
Usability

Outdated chart showing open runway
Updated chart should show closed runway

ISO-19157:2013 Geographic information – Data quality
Defining quality
A technical perspective

Spatial Accuracy
Thematic Accuracy
Completeness
Logical Consistency
Temporal Quality
Usability

Used to map National Parks
Used to route emergency vehicles

ISO-19157:2013 Geographic information – Data quality

ArcGIS Data Reviewer: An Introduction
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
- Quality assurance plan
- Training and experience
Data quality management
Capabilities of the ArcGIS platform

Geodatabase integrity
- Schema constraints
- Attribute rules
- Versioning

Advanced data types
- Topologies
- Parcel fabric
- Geometric/Utility network

ArcGIS Data Reviewer
- Automated review
- Semi-automated review
- Error management
- Quality reporting
What is ArcGIS Data Reviewer?
Data quality management in the ArcGIS platform

- Data Reviewer for Desktop
  - ArcGIS Pro
  - ArcMap

- Data Reviewer for Server
  - ArcGIS Server (standard or higher)

- Data Reviewer API
  - JavaScript
  - ArcGIS Pro SDK for Microsoft .NET

- Web AppBuilder for ArcGIS
Managing quality control

Quality control processes

Automated review

Semi-automated review

Quality reporting

ArcGIS Data Reviewer: An Introduction
Automated review
Managing quality control

Quality control processes

Automated review

Semi-automated review

Quality reporting

ArcGIS Data Reviewer: An Introduction
Types of quality control

- Automated review
  - Fast
  - Consistent and repeatable
  - Objective
  - 100% coverage
Implementing quality requirements

- 40+ configurable checks

- Feature integrity
  - Collection rules

- Attribution
  - Feature and table values

- Spatial
  - Spatial relationships

Automating data validation

http://esriurl.com/12379

ArcGIS Data Reviewer Checks

Database Validation Checks

- Consistency Rules
- Geodatabase rules
- Feature values
- Feature and table values
- Spatial
  - Spatial relationships

Default Checks

- Valid Geometry
- Feature value
- Feature code
- Feature category
- Feature attributes
- Feature classification
- Feature digitization
- Feature integer
- Feature label
- Feature name
- Feature number
- Feature value
- Feature category
- Feature relationships
- Feature table
- Feature values
- Feature attribute
- Feature code
- Feature category
- Feature relationships
Implementing data quality rules

Rule implementation workflow

Authoring workflow
- Identify and document requirements
- Identify relevant validation methods in ArcGIS
- Implement data quality rules

Industry standards / specifications

Subject matter experts

Training and experience

Quality assurance plans

ArcGIS Data Reviewer Checks

ArcGIS Data Reviewer: An Introduction
Where to start
Leveraging templates

• Data Reviewer templates
  - Local government
  - Topographic mapping
  - Utilities
    - Electric
    - Gas
    - Water
  - Water resources
• Based on Esri industry models
• Use as starting point
Authoring data quality rules
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

- ✔ Future data quality requirements are integrated into existing data management workflows
- ❏ Existing and new features should comply with new quality requirements
- ❏ Features should be accurately positioned
- ❏ All errors are corrected and verified
Automating feature validation
Methods for executing data validation

Validating features using Reviewer Rules

Validation in ArcGIS Pro

• Run Reviewer Rules
Methods for executing data validation
Validating features using Reviewer Batch Jobs

Validation in ArcGIS Pro
• Run Reviewer Rules
• Geoprocessing
Validating Features
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

✓ Future data quality requirements are integrated into existing data management workflows
✓ Existing and new features should comply with new quality requirements
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❑ All errors are corrected and verified

ArcGIS Data Reviewer: An Introduction
Semi-automated review
Managing quality control

Quality control processes

Automated review

Semi-automated review

Quality reporting

ArcGIS Data Reviewer: An Introduction
Types of quality control

**Automated review**
- Fast
- Consistent and repeatable
- Objective
- 100% coverage

**Semi-automated review**
- Guided Workflows
- Streamlined processes
- Subjective
- Sampling
Value of performing visual review

- Discover patterns
- Find missing features
- Compare against trusted sources
Semi-automated review
Leveraging ArcGIS Desktop

Tools supporting semi-automated review
- Redlining missing features
- Flagging existing features in error
- Random sampling
Visual data review
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

✓ Future data quality requirements are integrated into existing data management workflows
✓ Existing and new features should comply with new quality requirements
✓ Features should be accurately positioned
☐ All errors are corrected and verified
Managing errors
Managing quality control
QC lifecycle management

Review
Find and record errors

Correct
Perform edits
or
Note exceptions

Verify
Acceptable
or
Unacceptable

ArcGIS Data Reviewer: An Introduction
Managing Errors
Workshop scenario

My organization needs to address data quality issues that impact future requirements from stakeholders.

Success criteria

✓ Future data quality requirements are integrated into existing data management workflows
✓ Existing and new features should comply with new quality requirements
✓ Features should be accurately positioned
✓ All errors are corrected and verified
Workshop review

• Defining data quality

• Forms of data quality control
  - Automated review
  - Semi-automated review

• ArcGIS Data Reviewer
  - Automated validation checks
  - Semi-automated tools
  - Error management
## See Us Here

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<td>• ArcGIS Data Reviewer: Deploying Data Quality Web Services</td>
<td>• Demo Theater 5</td>
<td>• Tuesday 11:15 – 12:00</td>
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<td>• ArcGIS Data Reviewer: An Introduction (Offering #2)</td>
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<td>• ArcGIS Data Reviewer: Leveraging Geoprocessing for data validation</td>
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<td>• Wednesday 2:30 – 3:30</td>
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Want to learn more?

- Documentation
  - Desktop

desktop.arcgis.com
Want to learn more?

- Documentation
  - Desktop
  - Server

ArcGIS Data Reviewer: An Introduction
enterprise.arcgis.com
Want to learn more?

- **Documentation**
  - Desktop
  - Server

- **Training** *(training.esri.com)*
  - Free - Assessing Data Quality using ArcGIS Data Reviewer *(Seminar)*
  - Free - Evaluating Positional Accuracy Using ArcGIS Data Reviewer for Desktop *(Seminar)*
  - Data QC with ArcGIS: Automating Validation *(Web Course)*
  - Data QC with ArcGIS: Visual Review *(Web Course)*
  - Quality Control Using ArcGIS Data Reviewer for Desktop *(Instructor-Led)*
Want to learn more?

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  - Desktop
  - Server

• Training
  - Assessing Data Quality using ArcGIS Data Reviewer
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  - Data QC with ArcGIS: Visual Review
  - Quality Control Using ArcGIS Data Reviewer for Desktop

• GeoNet (community.esri.com)
  - Data Reviewer place
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