The Importance of Data Quality Within Your Organization

Sherry Fagin and Andy Ommen

Workshop Agenda

- Perspectives of Data Quality
- What is ArcGIS Data Reviewer?
- Quality Control Processes
- Reporting Data Quality
- Data Reviewer Users: Timmons Group
- Summary

Data Quality: An Overview

Why Data Quality?

Executive

Confidently make decisions

Manager

Effective data stewardship

User

Confidence in data

Data Quality

A Technical Perspective

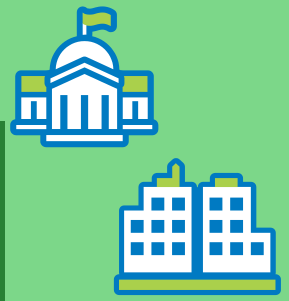
- Spatial Accuracy
- Thematic Accuracy
- Completeness
- Logical Consistency
- Temporal Quality
- Usability

ISO-19157:2013 Geographic Information – Data Quality

Defining Data Quality

Source requirements

Industry standards / Specifications



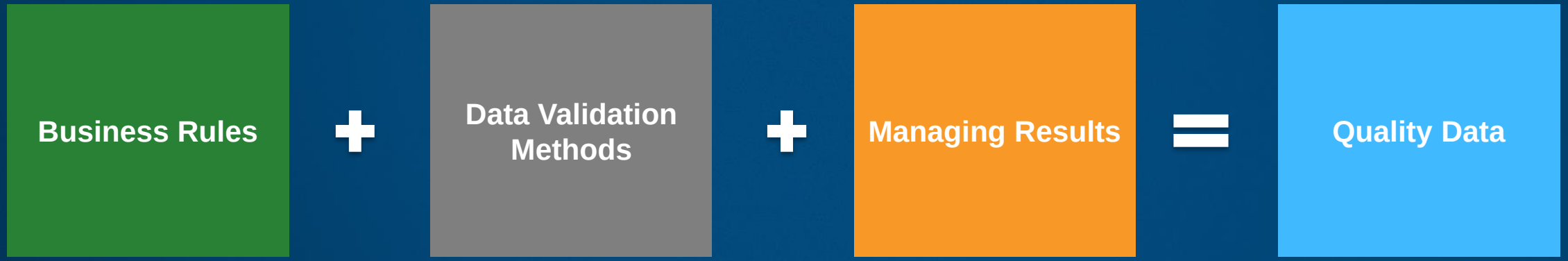
Subject matter experts

Training and experience

Quality assurance plans

The Data Quality Model

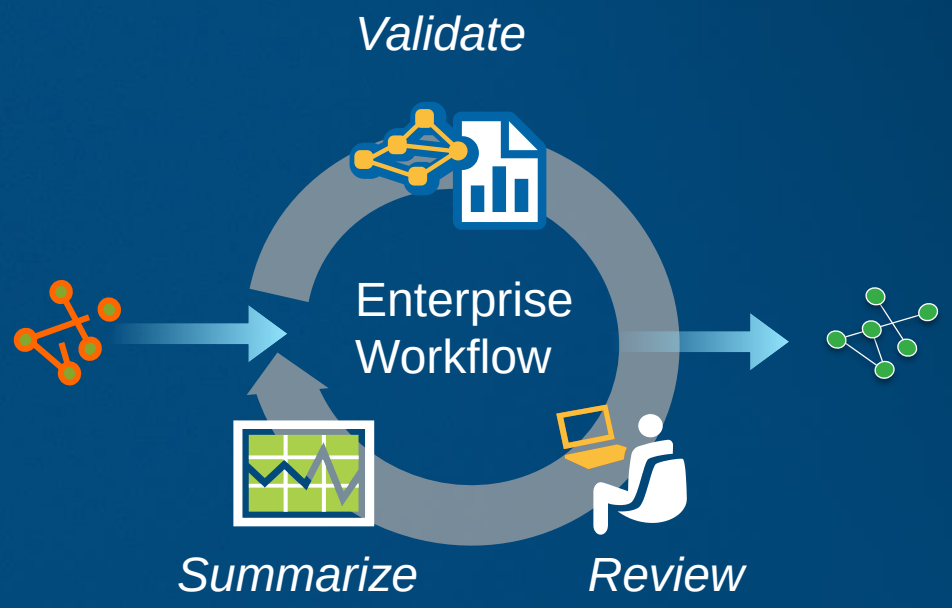
Achieving Data Quality



What is ArcGIS Data Reviewer?

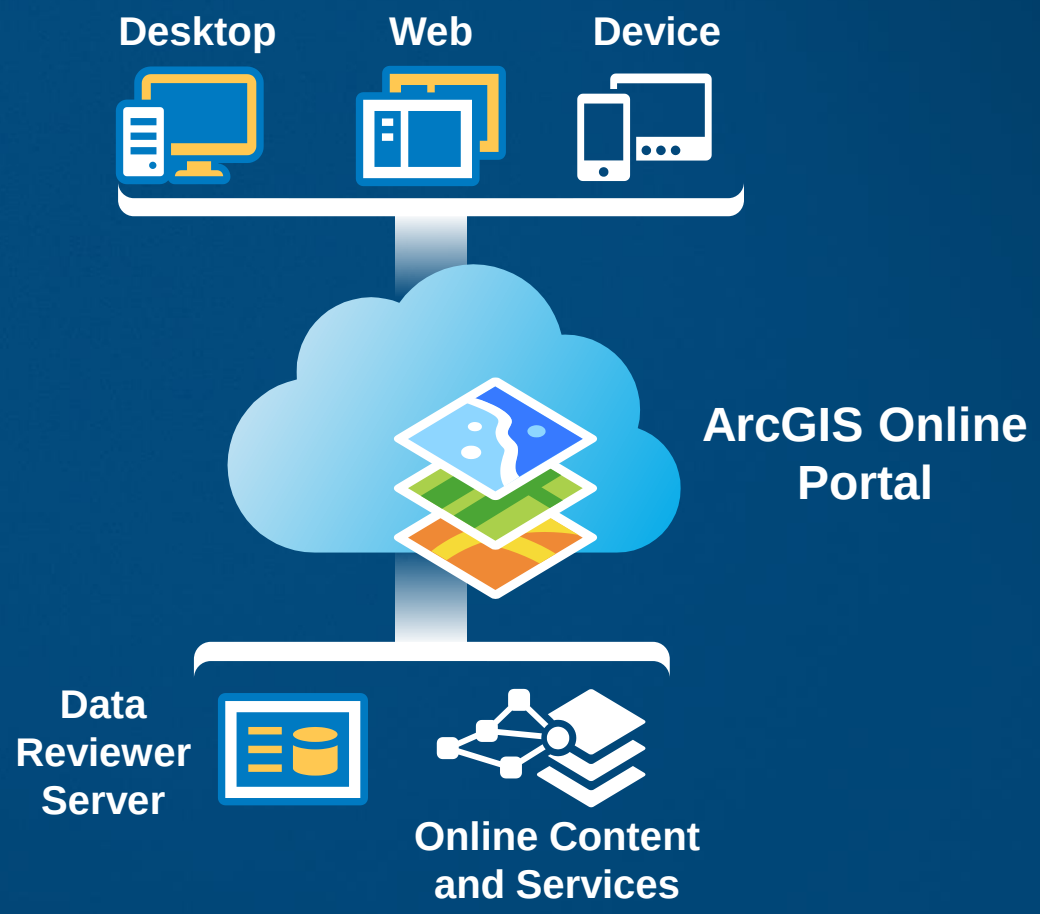
Data Quality Management for ArcGIS

- **Provides**
  - Configurable rule-based validation
  - Interactive tools
  - Error tracking and reporting
  - Automated and visual review methods
- **Benefits**
  - Saves time and money
  - Less rework
- **For multiple domains**
  - Defense
  - Utilities
  - Land Management



ArcGIS Platform Support for Data Reviewer

- **ArcGIS for Desktop**
  - ArcGIS Pro
  - ArcMap
- **ArcGIS for Server**
  - JavaScript Viewer
  - APIs for JavaScript and REST
  - Map Service Capability
  - Samples (ex. BVM)



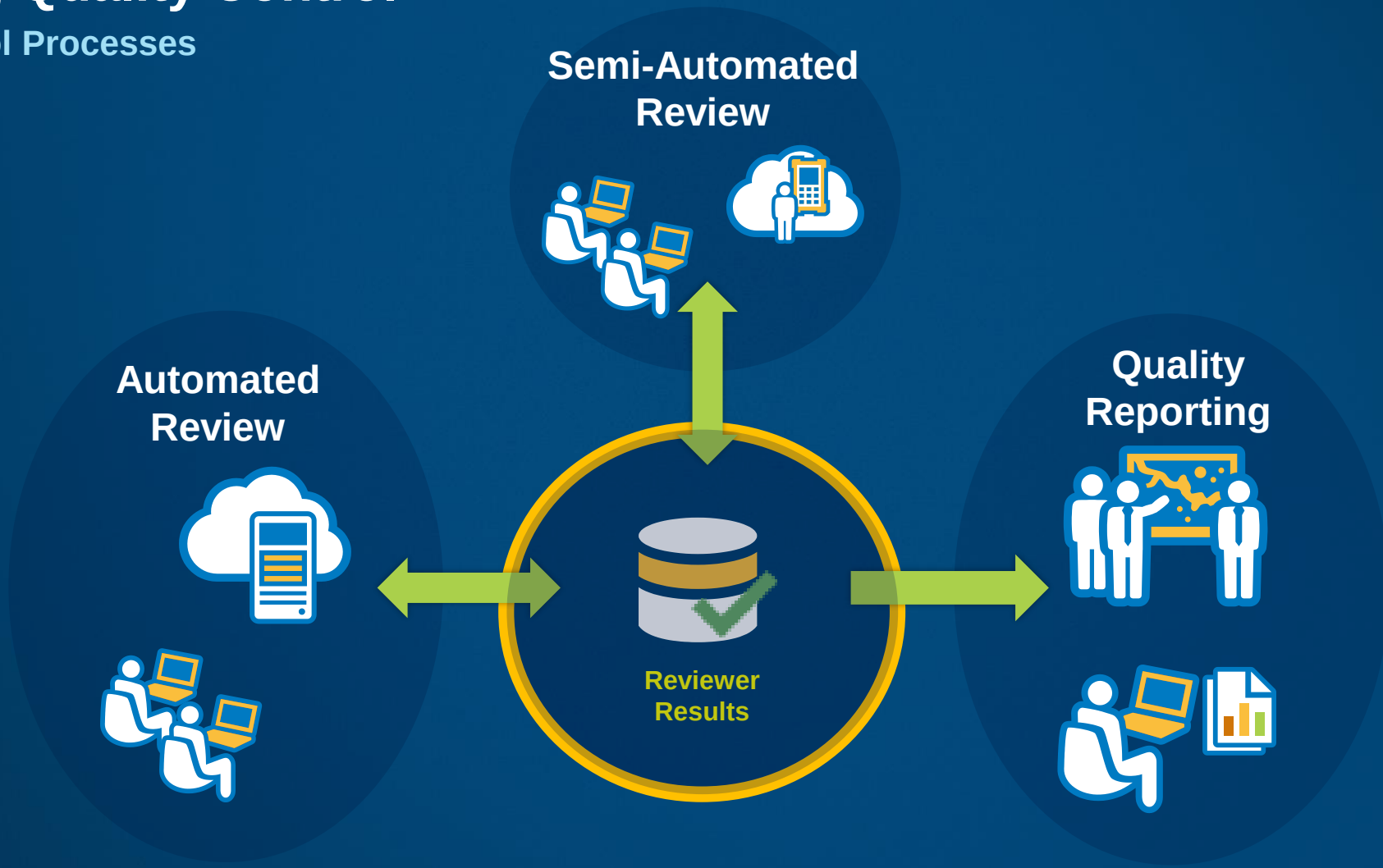
Data Reviewer: Managing Results within a Workflow

- Holistic method for storing different results
  - Data quality checks
  - Visual review workflow
  - Reporting
- What is a result?
  - Rule violation
  - Missing features

Data Reviewer and the Quality Control Processes

Managing Quality Control

Quality Control Processes



Automated Validation Workflow

Implementing Cumulative Review

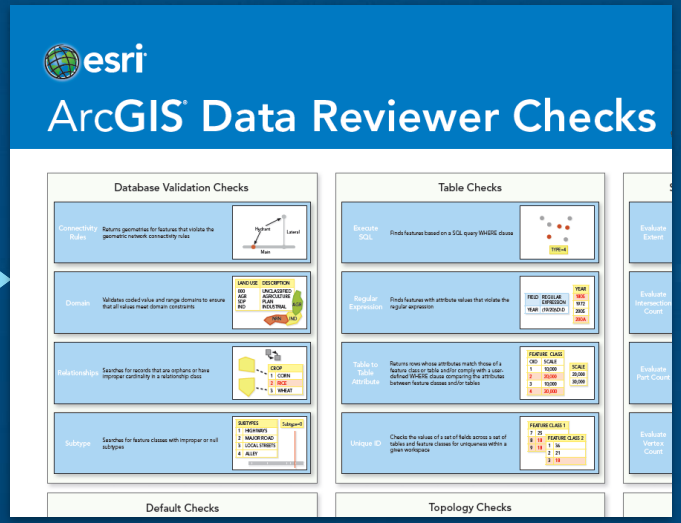
- **Encapsulate quality rules**
- **Configured from 40+ automated checks**
- **Designed once and executed many times**

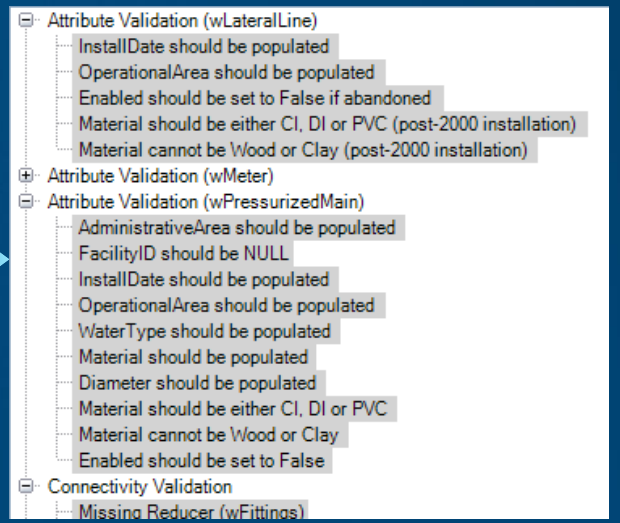
Industry standards / Specifications

Subject matter experts

Training and experience

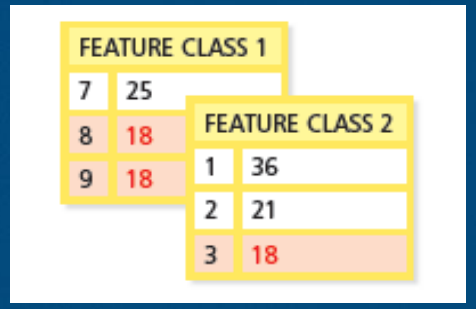
Quality assurance plans

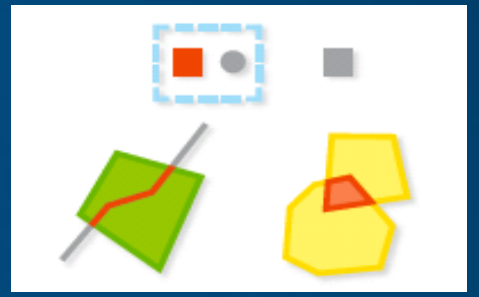


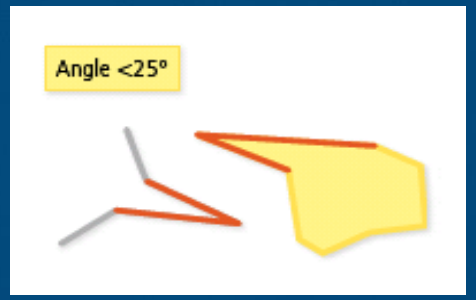


Automating Data Validation

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





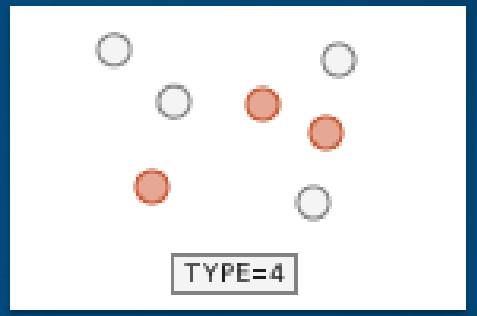


Automated Review

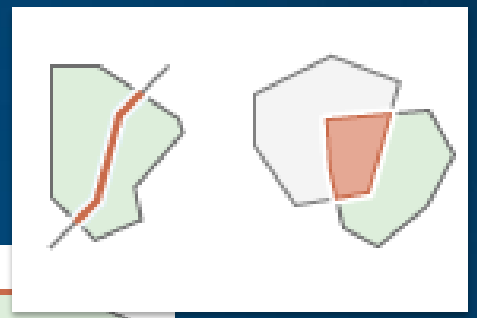
Authoring Reviewer Rules in ArcGIS® Pro

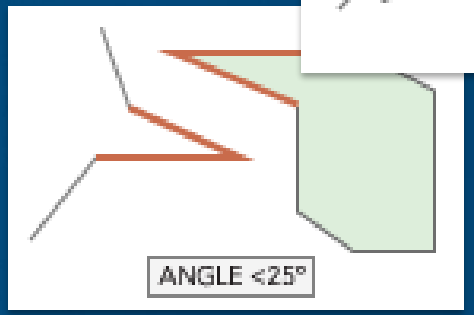
- **Define quality requirements**
- **Author Reviewer rules**
- **Share as a project / layer or map package**

Query Attributes



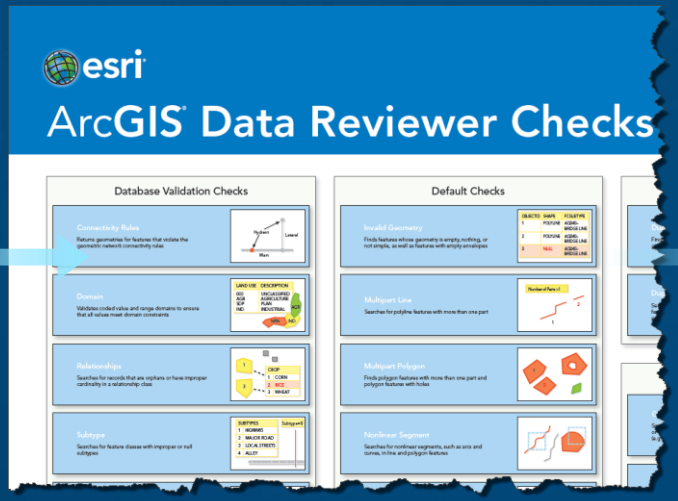
Feature on Feature





Cutbacks

Industry Standards/ Specifications	Subject matter experts
QA Plans/SOW/SOP	Training and Experience



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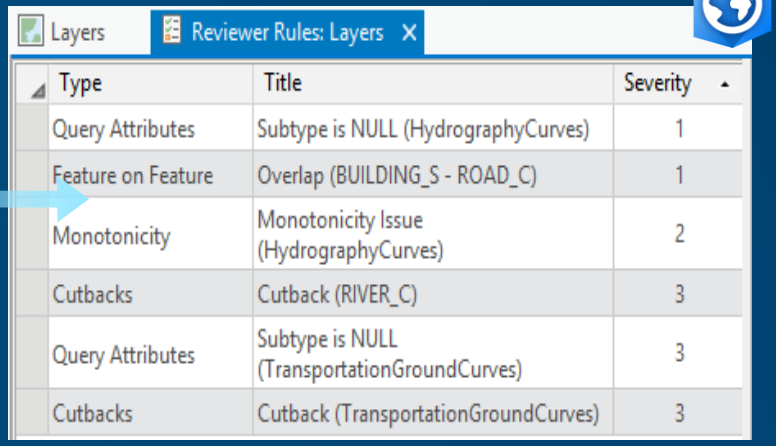
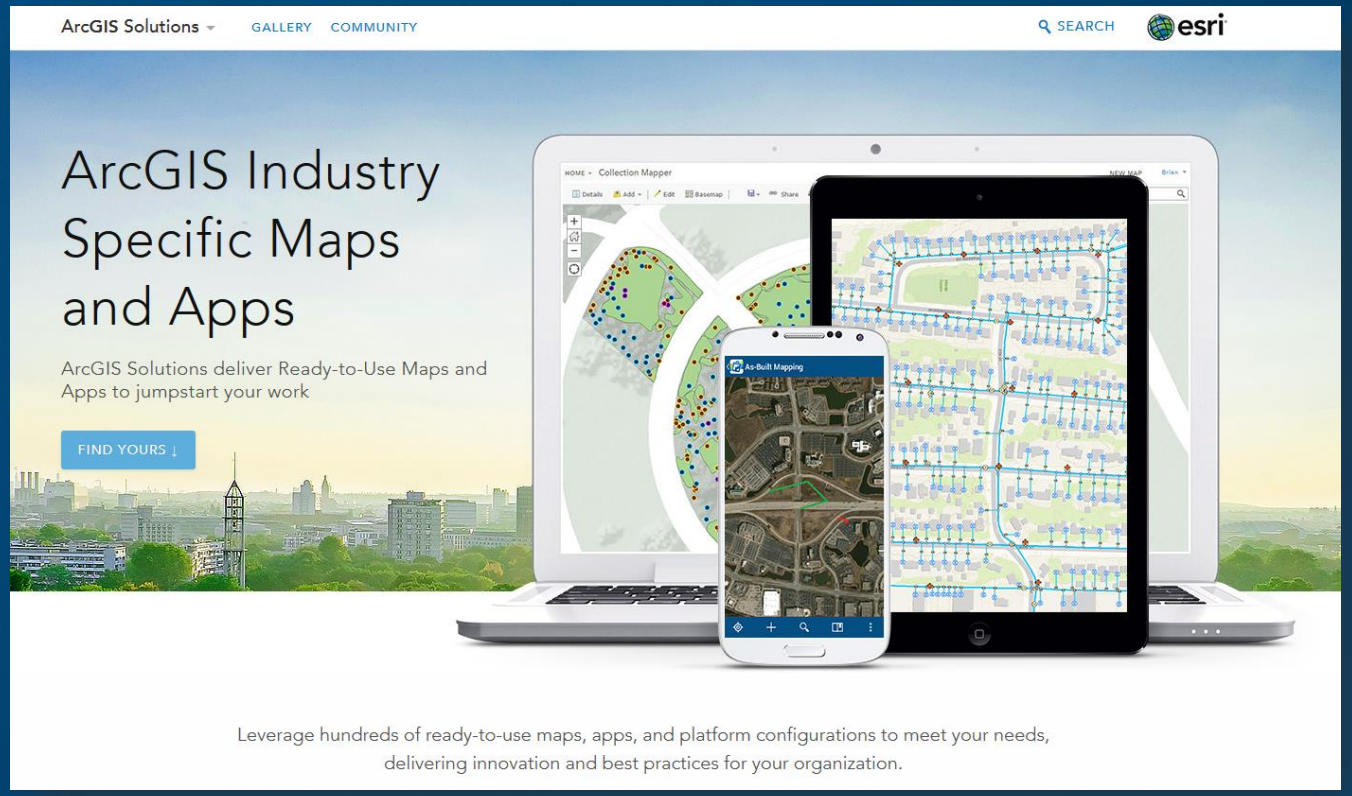


Type	Title	Severity
Query Attributes	Subtype is NULL (HydrographyCurves)	1
Feature on Feature	Overlap (BUILDING_S - ROAD_C)	1
Monotonicity	Monotonicity Issue (HydrographyCurves)	2
Cutbacks	Cutback (RIVER_C)	3
Query Attributes	Subtype is NULL (TransportationGroundCurves)	3
Cutbacks	Cutback (TransportationGroundCurves)	3

Where to start

Leveraging templates

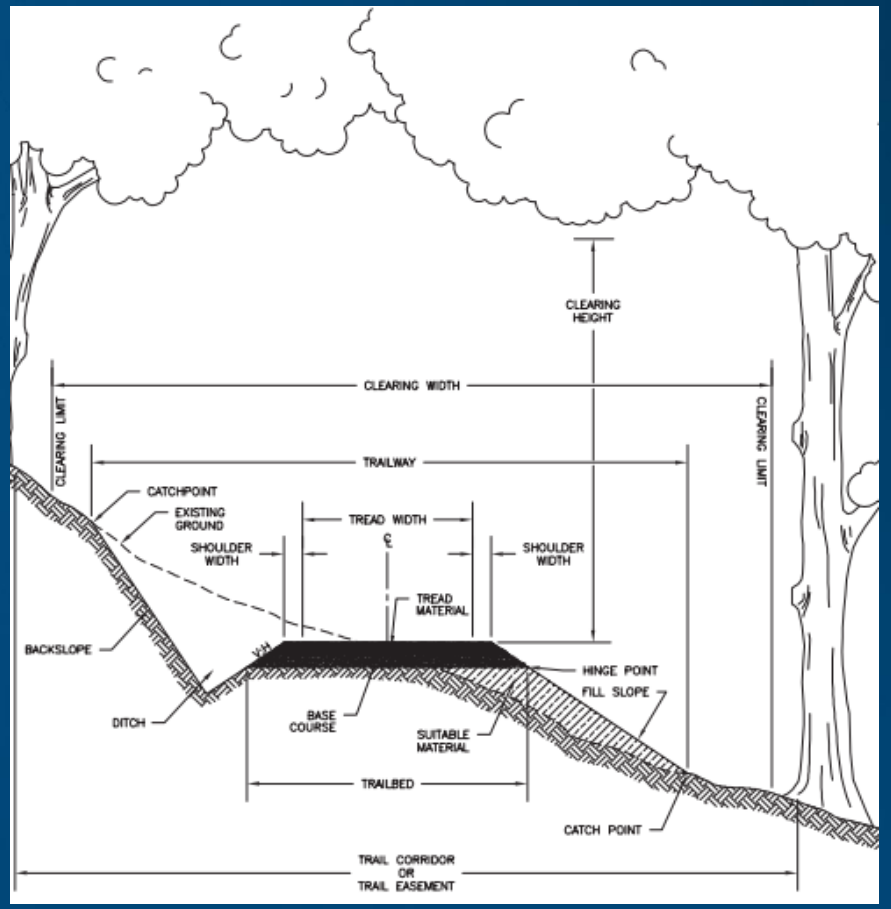
- **Data Reviewer Templates**
  - **Electrical utilities**
  - **Gas utilities**
  - **Local government**
  - **Water resources**
  - **Water utilities**
- **Based on Esri industry models**
- **Use as starting point**

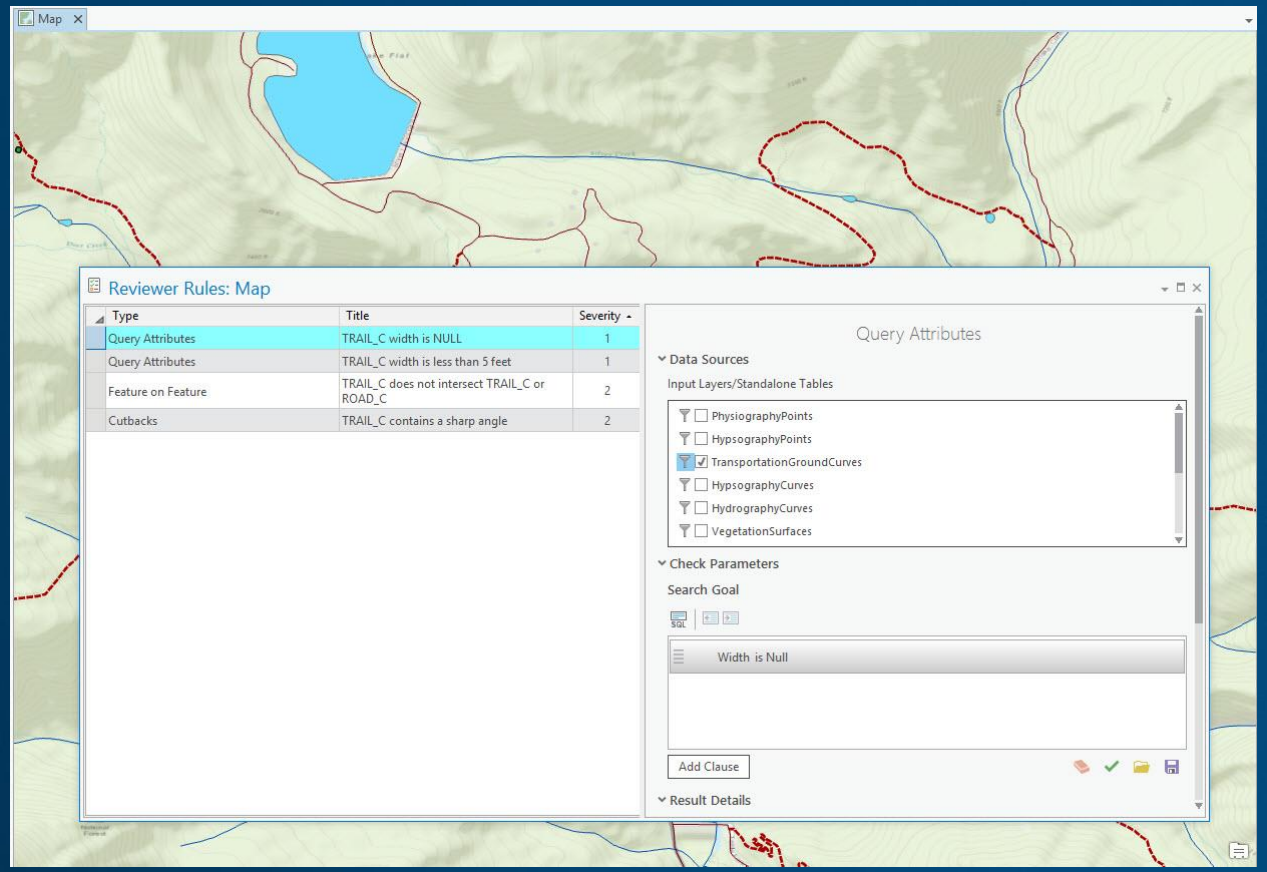


Demo Scenario

- **Project: Updating trails data to support cartography**

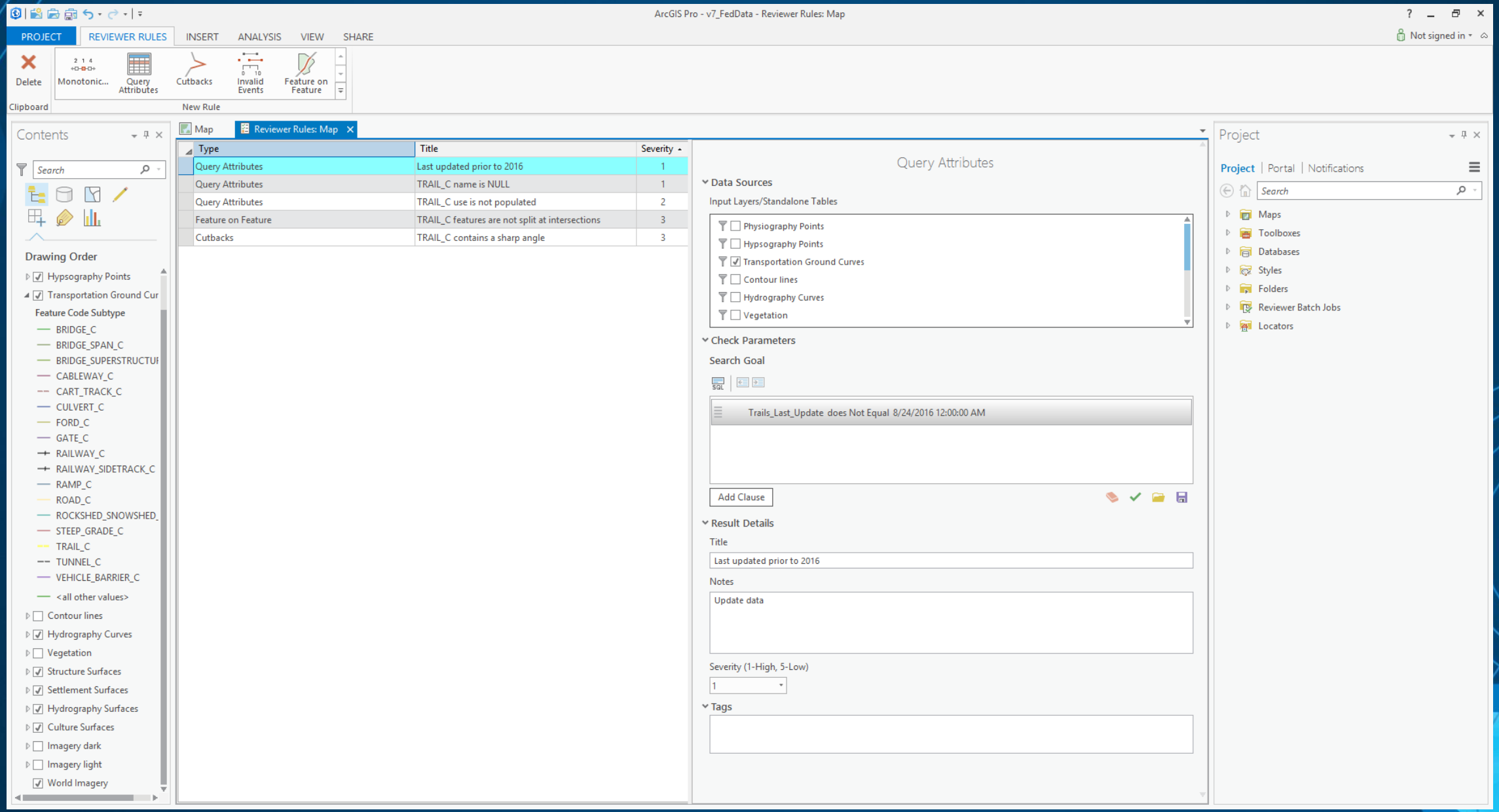
- **Goals:**
  - **Key attributes are populated and have correct values**
  - **Valid trails network**
  - **Trails have been recently updated in authoritative database**

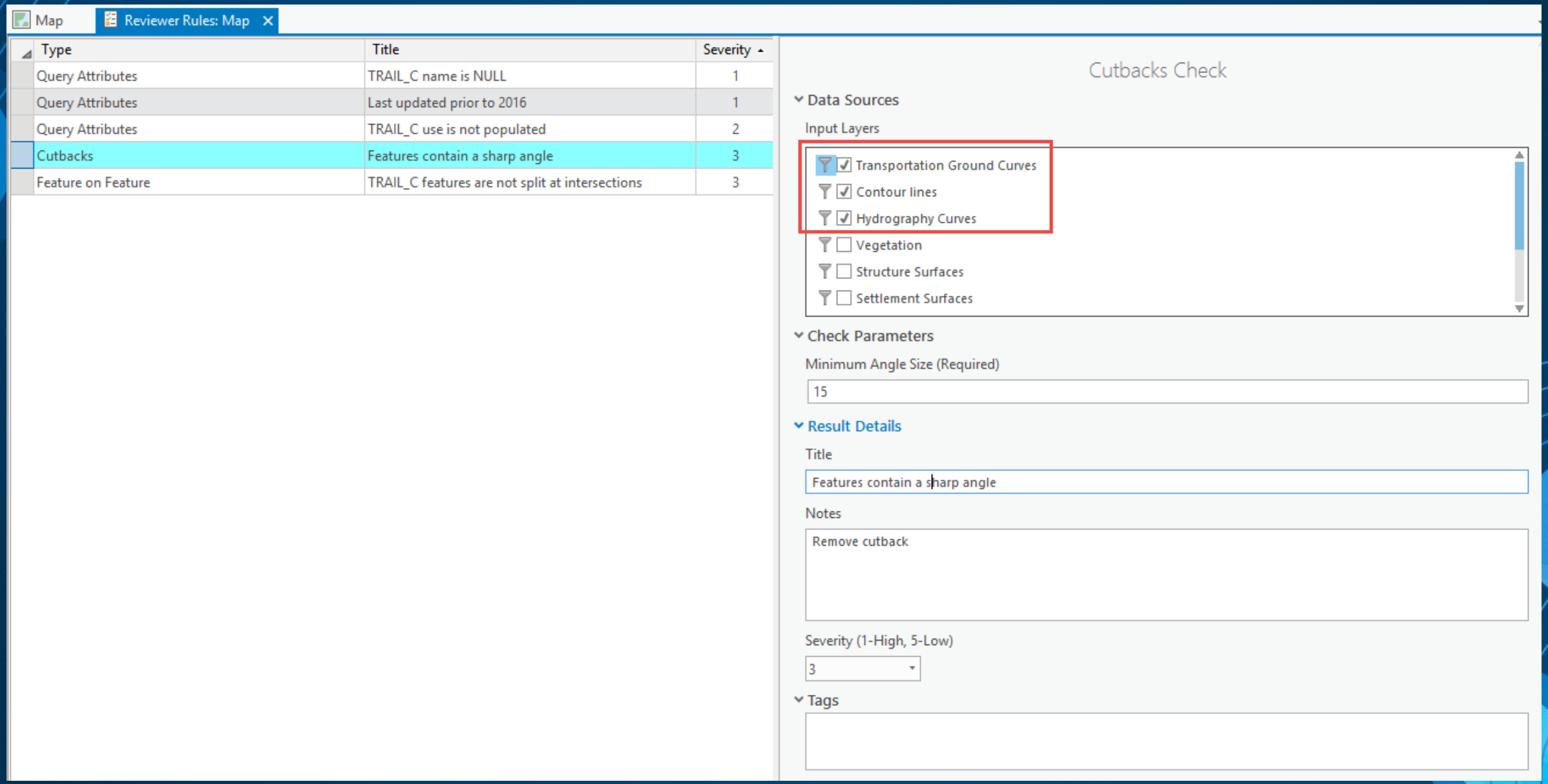




Configure and Share Reviewer Rules using ArcGIS Pro

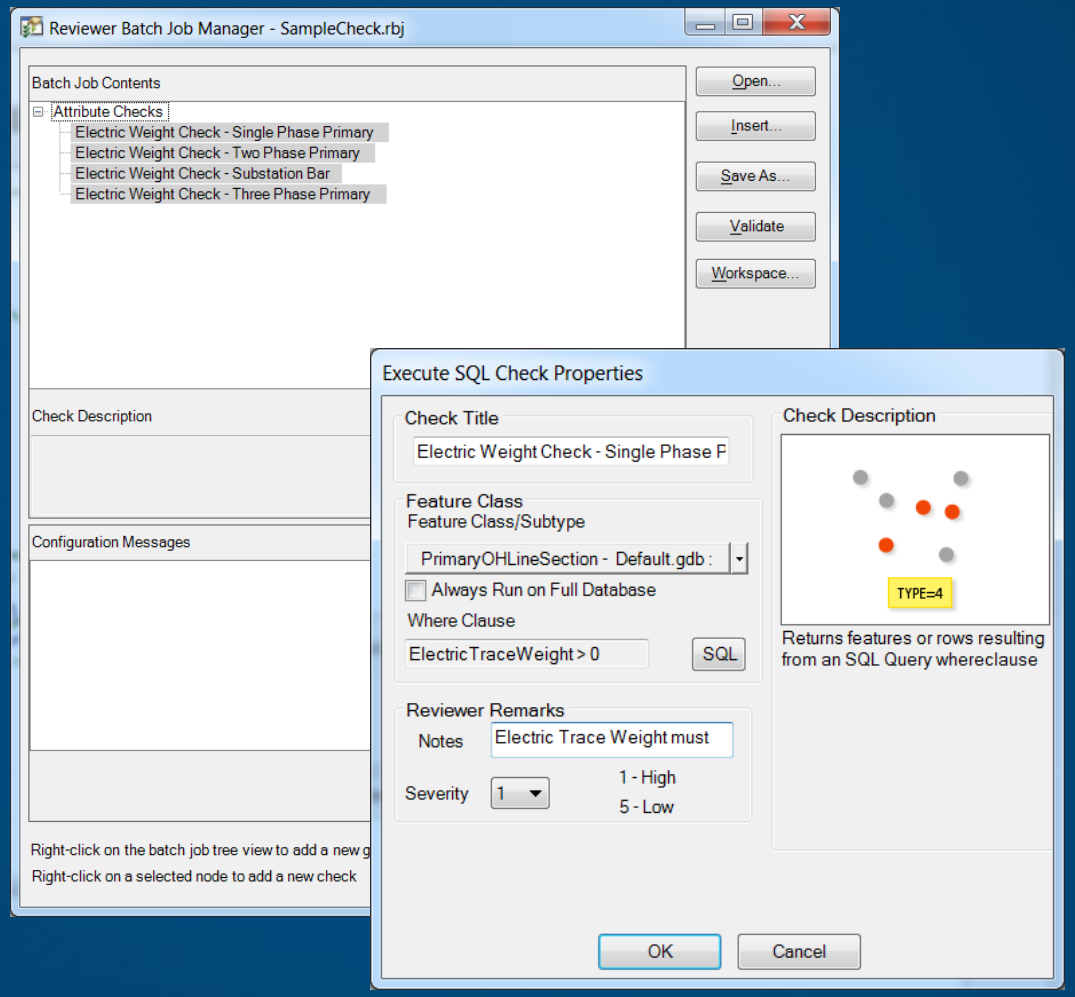
Sherry Fagin


ArcGIS Pro - v7_FedData - Reviewer Rules: Map
PROJECT
REVIEWER RULES
INSERT
ANALYSIS
VIEW
SHARE
Not signed in
Delete
Clipboard
Monotonic...
Query Attributes
Cutbacks
Invalid Events
Feature on Feature
New Rule
Contents
Search
Drawing Order
Hypsography Points
Transportation Ground Cur
Feature Code Subtype
BRIDGE_C
BRIDGE_SPAN_C
BRIDGE_SUPERSTRUCTUI
CABLEWAY_C
CART_TRACK_C
CULVERT_C
FORD_C
GATE_C
RAILWAY_C
RAILWAY_SIDETRACK_C
RAMP_C
ROAD_C
ROCKSHED_SNOWSHED_
STEEP_GRADE_C
TRAIL_C
TUNNEL_C
VEHICLE_BARRIER_C
<all other values>
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Hydrography Surfaces
Culture Surfaces
Imagery dark
Imagery light
World Imagery
Map
Reviewer Rules: Map
Type
Title
Severity
Query Attributes
Last updated prior to 2016
1
Query Attributes
TRAIL_C name is NULL
1
Query Attributes
TRAIL_C use is not populated
2
Feature on Feature
TRAIL_C features are not split at intersections
3
Cutbacks
TRAIL_C contains a sharp angle
3
Query Attributes
Data Sources
Input Layers/Standalone Tables
Physiography Points
Hypsography Points
Transportation Ground Curves
Contour lines
Hydrography Curves
Vegetation
Check Parameters
Search Goal
Trails_Last_Update does Not Equal 8/24/2016 12:00:00 AM
Add Clause
Result Details
Title
Last updated prior to 2016
Notes
Update data
Severity (1-High, 5-Low)
1
Tags
Project
Project
Portal
Notifications
Search
Maps
Toolboxes
Databases
Styles
Folders
Reviewer Batch Jobs
Locators


Map
Reviewer Rules: Map
Type
Title
Severity
Query Attributes
TRAIL_C name is NULL
1
Query Attributes
Last updated prior to 2016
1
Query Attributes
TRAIL_C use is not populated
2
Cutbacks
Features contain a sharp angle
3
Feature on Feature
TRAIL_C features are not split at intersections
3
Cutbacks Check
Data Sources
Input Layers
Transportation Ground Curves
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Check Parameters
Minimum Angle Size (Required)
15
Result Details
Title
Features contain a sharp angle
Notes
Remove cutback
Severity (1-High, 5-Low)
3
Tags

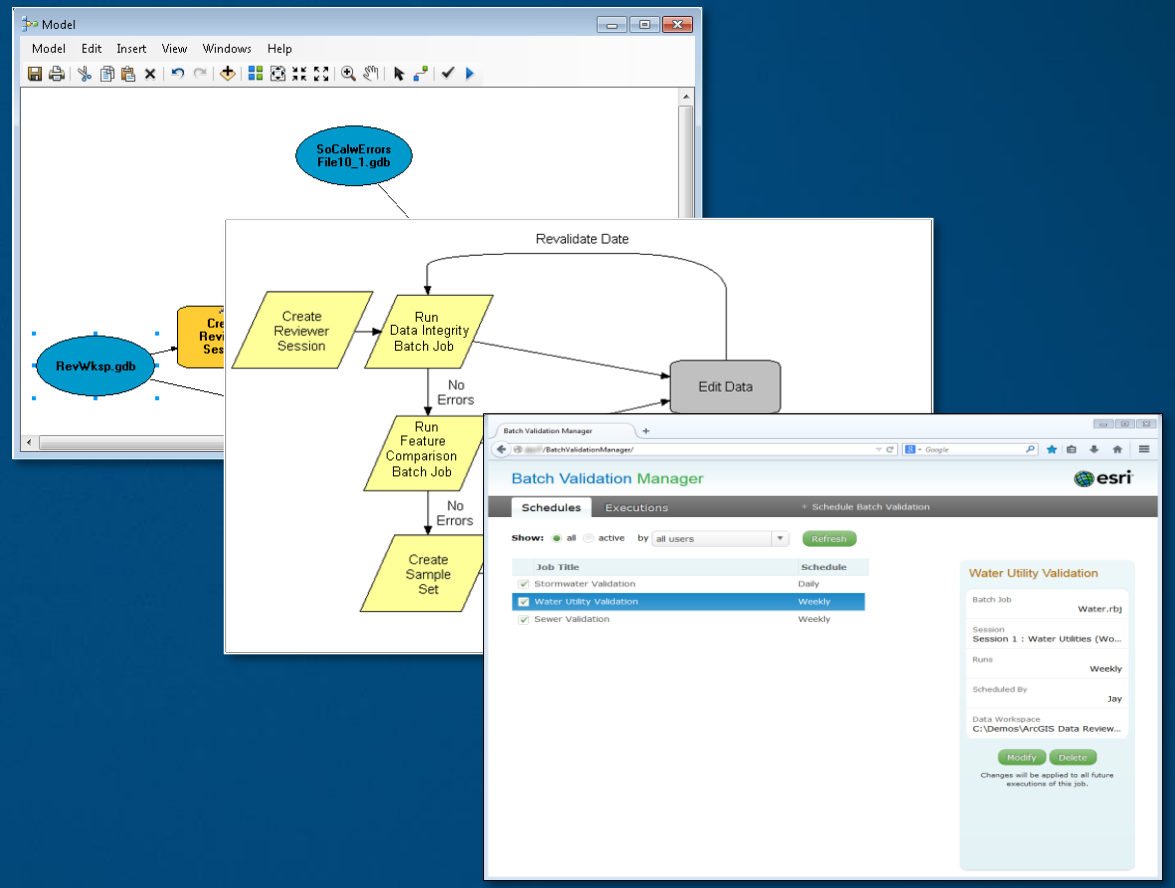
Authoring Rules in ArcMap

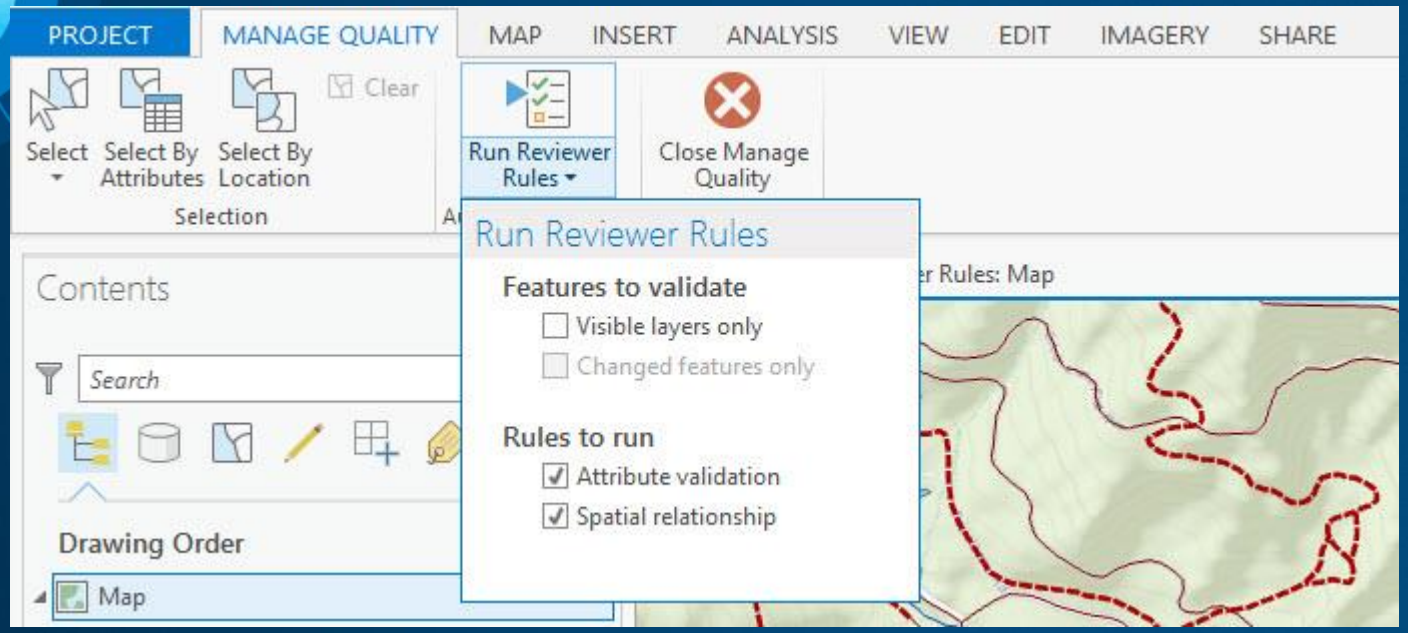
- Create One Check
  - Configure and run as needed
  - Used for testing
- Reviewer Batch Job Manager
  - Accessed in ArcMap
  - Configure all 43 checks
  - Combine existing batch jobs



Additional Methods for executing data validation

- Automated Geoprocessing
  - Model Builder
  - Python Script
- Workflow Manager
- ArcGIS Server
  - Batch Validation Manager





Executing rules and batch jobs in ArcGIS Pro

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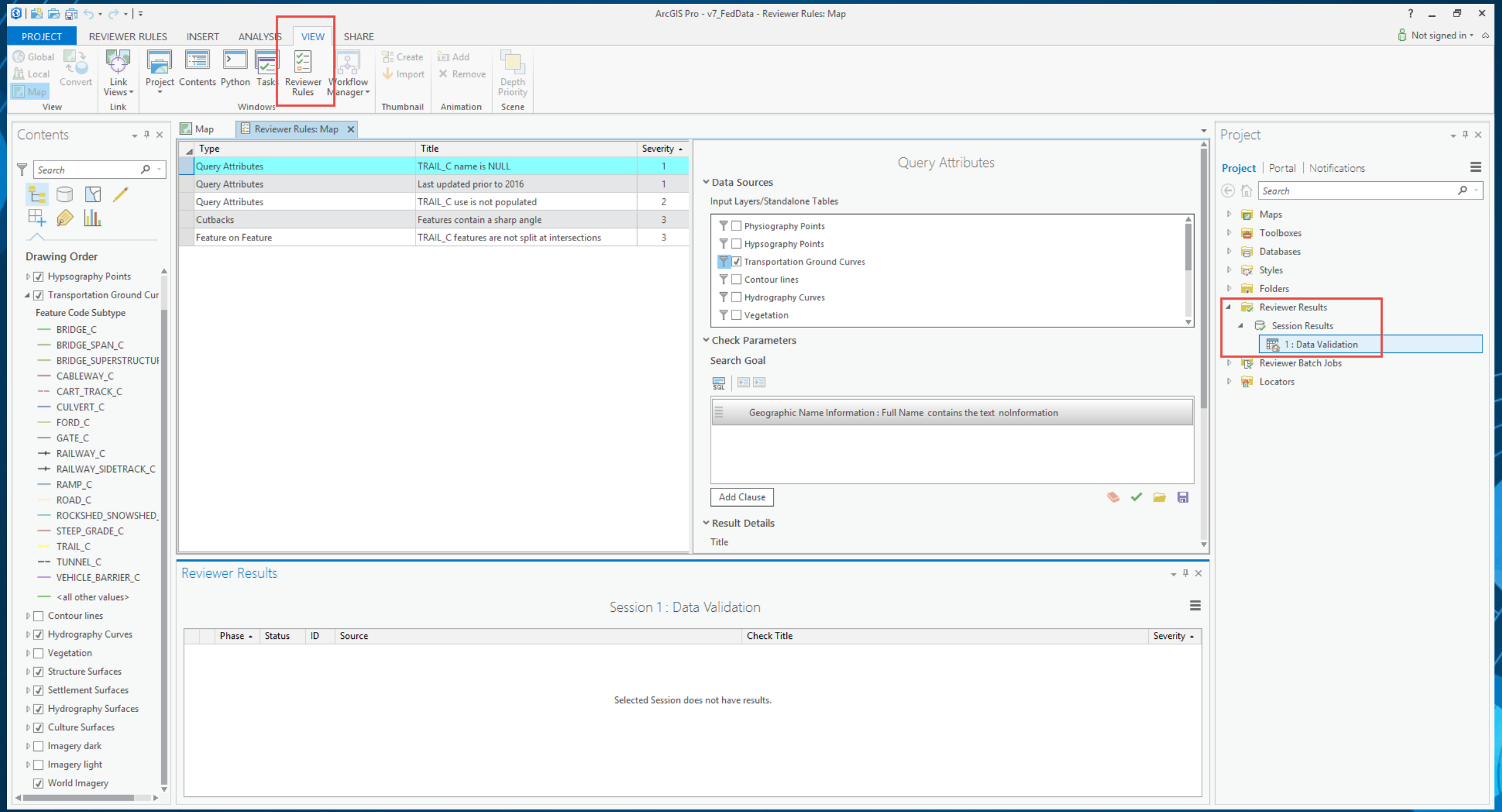
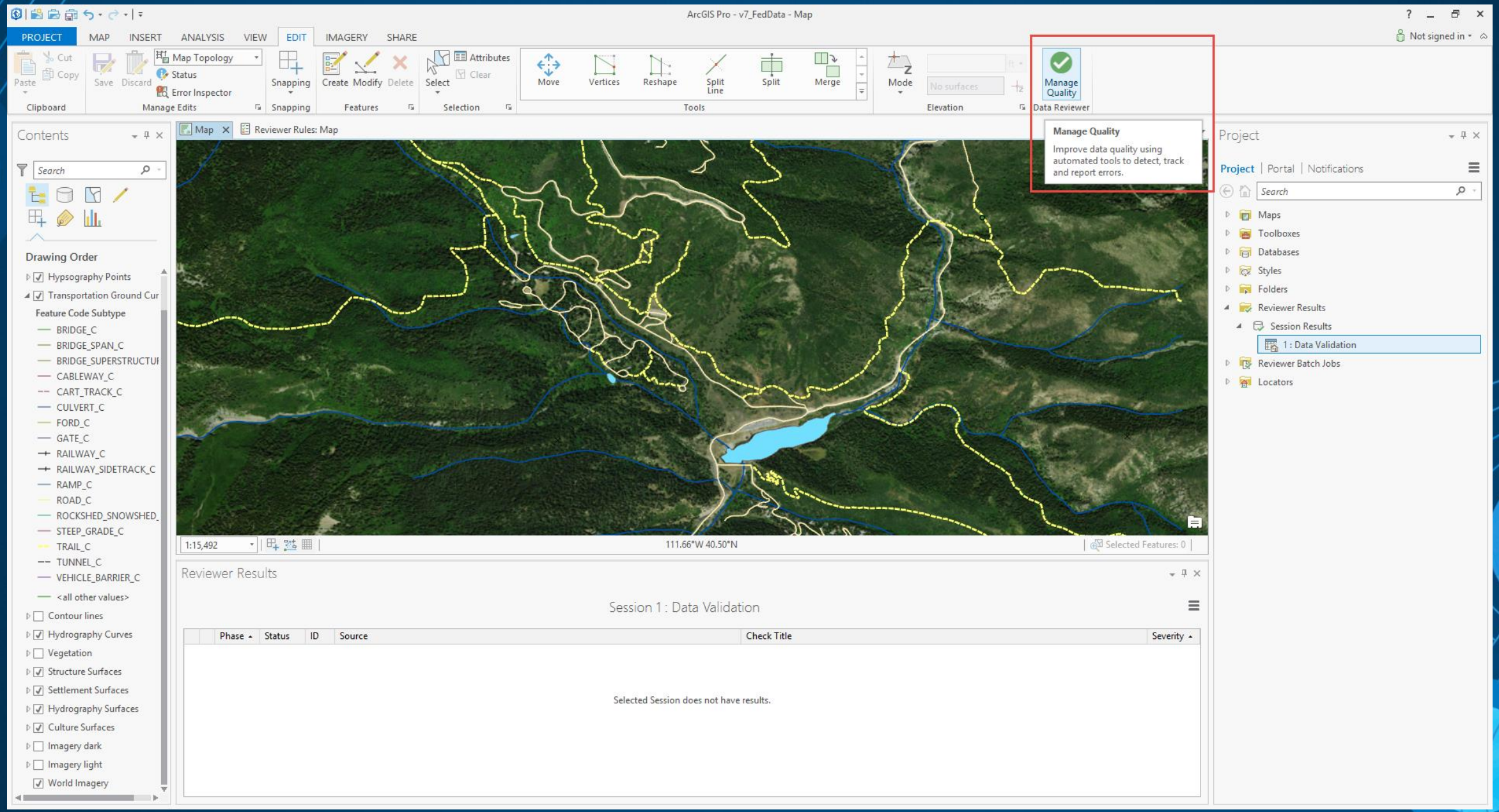
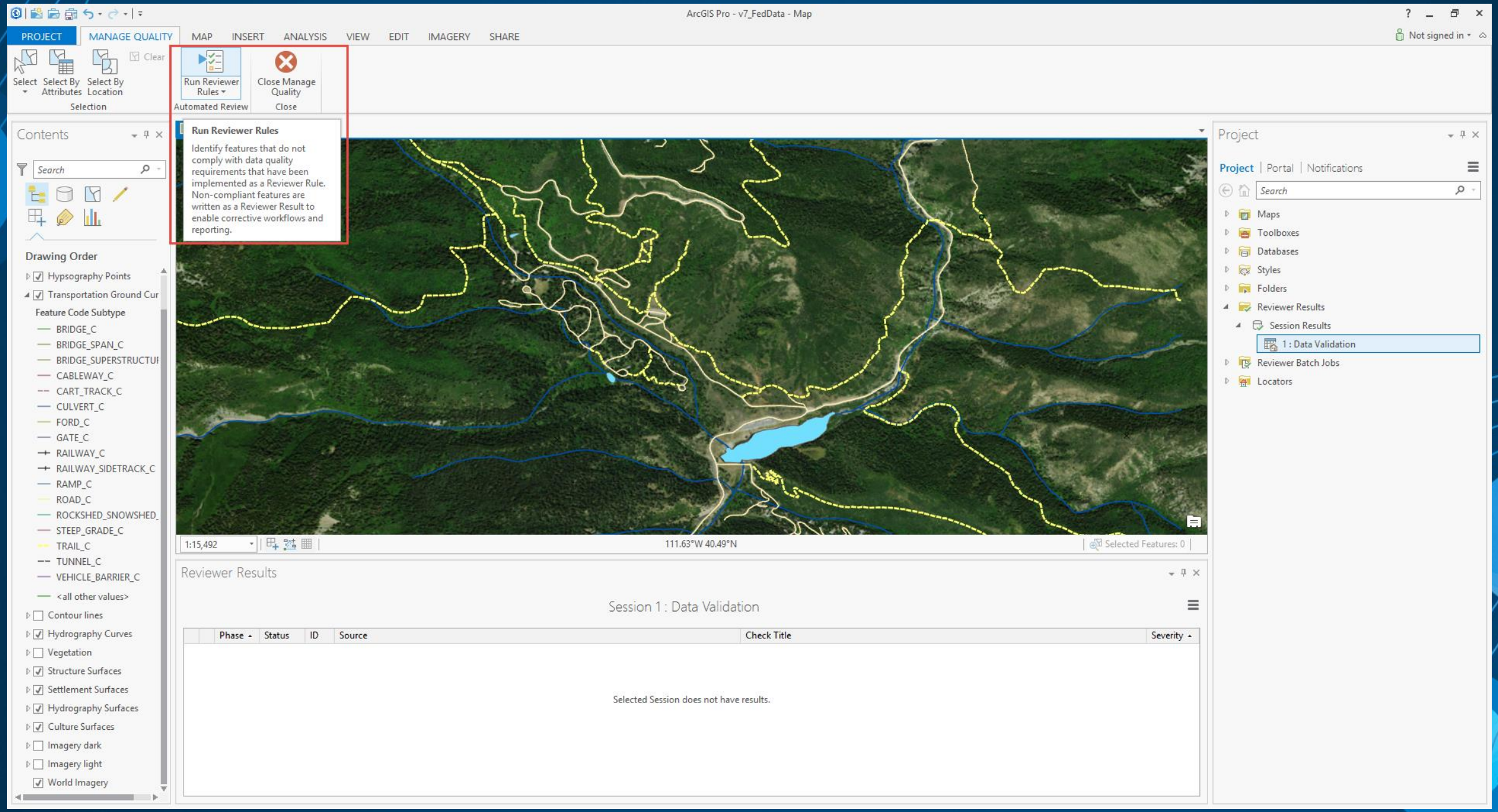
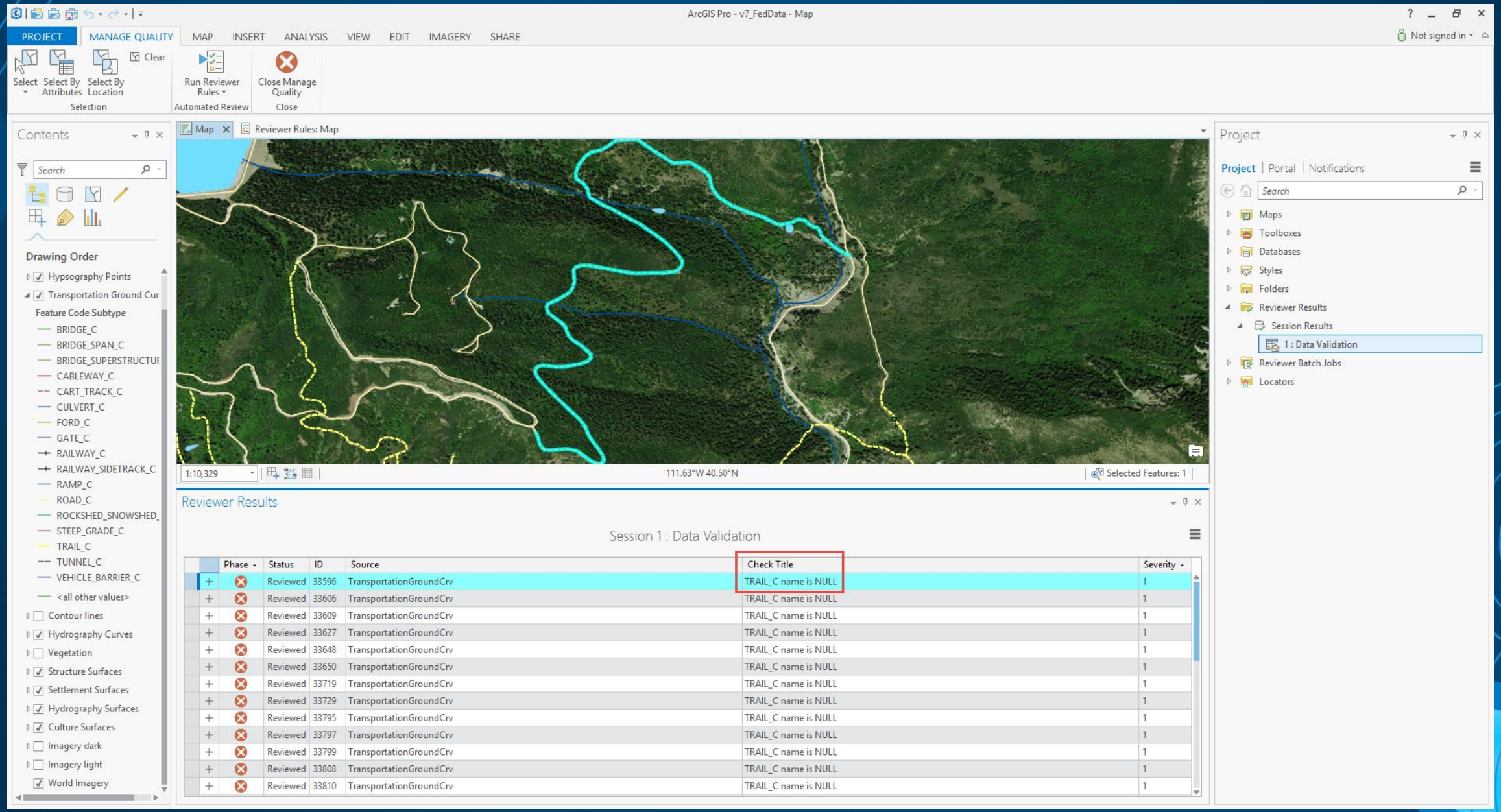
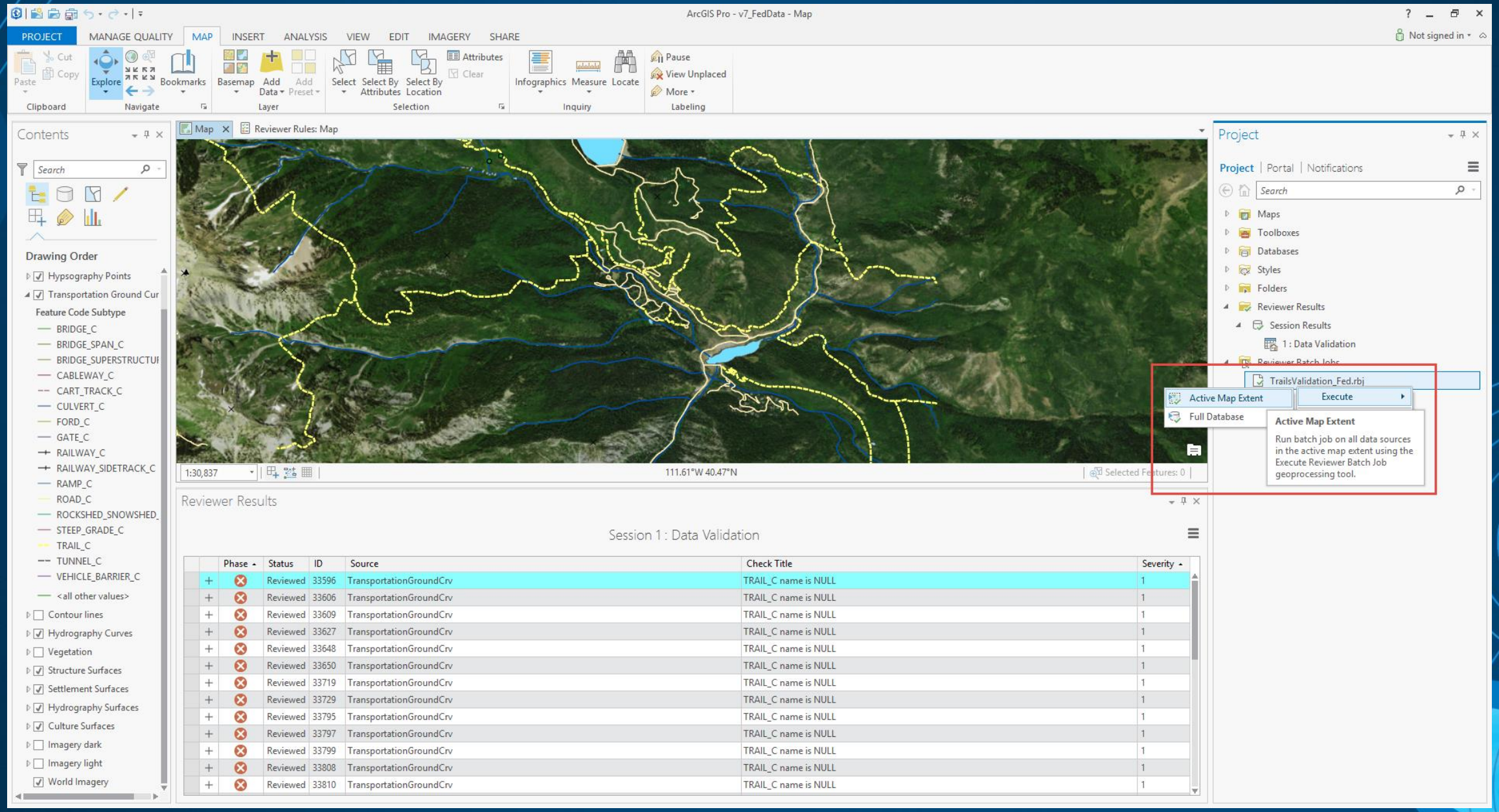
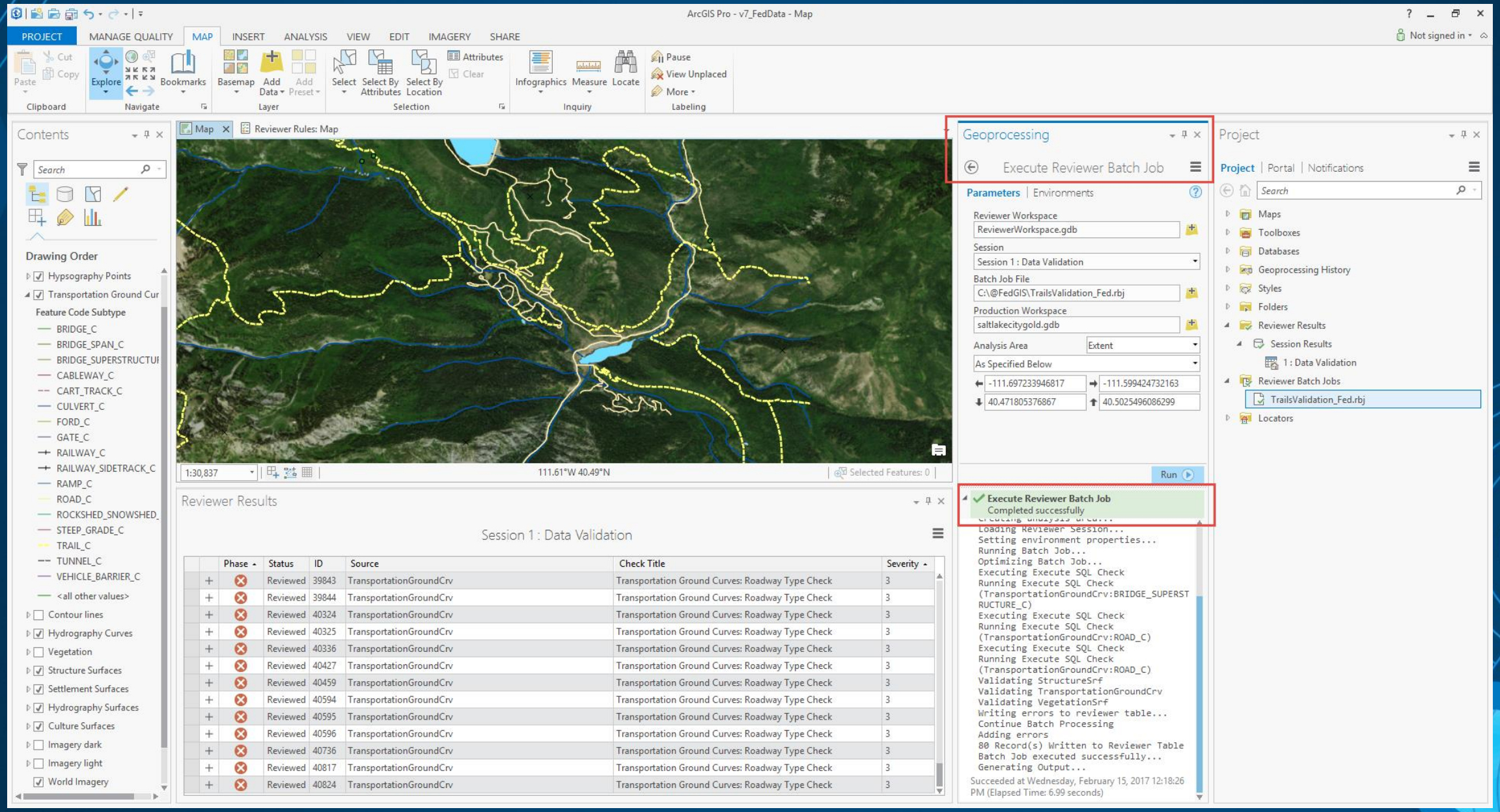

ArcGIS Pro - v7_FedData - Reviewer Rules: Map
PROJECT
REVIEWER RULES
INSERT
ANALYSIS
VIEW
SHARE
Not signed in
Global
Local
Map
Convert
View
Link Views
Link
Project
Contents
Python
Task
Reviewer Rules
Workflow Manager
Windows
Create
Import
Thumbnail
Add
Remove
Animation
Depth Priority
Scene
Contents
Search
Drawing Order
Hypsography Points
Transportation Ground Cur
Feature Code Subtype
BRIDGE_C
BRIDGE_SPAN_C
BRIDGE_SUPERSTRUCTUI
CABLEWAY_C
CART_TRACK_C
CULVERT_C
FORD_C
GATE_C
RAILWAY_C
RAILWAY_SIDETRACK_C
RAMP_C
ROAD_C
ROCKSHED_SNOWSHED_
STEEP_GRADE_C
TRAIL_C
TUNNEL_C
VEHICLE_BARRIER_C
<all other values>
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Hydrography Surfaces
Culture Surfaces
Imagery dark
Imagery light
World Imagery
Map
Reviewer Rules: Map
Type
Title
Severity
Query Attributes
TRAIL_C name is NULL
1
Query Attributes
Last updated prior to 2016
1
Query Attributes
TRAIL_C use is not populated
2
Cutbacks
Features contain a sharp angle
3
Feature on Feature
TRAIL_C features are not split at intersections
3
Query Attributes
Data Sources
Input Layers/Standalone Tables
Physiography Points
Hypsography Points
Transportation Ground Curves
Contour lines
Hydrography Curves
Vegetation
Check Parameters
Search Goal
Geographic Name Information : Full Name contains the text noInformation
Add Clause
Result Details
Title
Reviewer Results
Session 1 : Data Validation
Phase
Status
ID
Source
Check Title
Severity
Selected Session does not have results.
Project
Project
Portal
Notifications
Search
Maps
Toolboxes
Databases
Styles
Folders
Reviewer Results
Session Results
1 : Data Validation
Reviewer Batch Jobs
Locators


ArcGIS Pro - v7_FedData - Map
PROJECT
MAP
INSERT
ANALYSIS
VIEW
EDIT
IMAGERY
SHARE
Not signed in
Cut
Copy
Paste
Clipboard
Save
Discard
Map Topology
Status
Error Inspector
Manage Edits
Snapping
Snapping
Create
Modify
Delete
Features
Select
Attributes
Clear
Selection
Move
Vertices
Reshape
Split Line
Split
Merge
Tools
Mode
No surfaces
Elevation
Manage Quality
Data Reviewer
Manage Quality
Improve data quality using automated tools to detect, track and report errors.
Contents
Search
Drawing Order
Hypsography Points
Transportation Ground Cur
Feature Code Subtype
BRIDGE_C
BRIDGE_SPAN_C
BRIDGE_SUPERSTRUCTUI
CABLEWAY_C
CART_TRACK_C
CULVERT_C
FORD_C
GATE_C
RAILWAY_C
RAILWAY_SIDETRACK_C
RAMP_C
ROAD_C
ROCKSHED_SNOWSHED_
STEEP_GRADE_C
TRAIL_C
TUNNEL_C
VEHICLE_BARRIER_C
<all other values>
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Hydrography Surfaces
Culture Surfaces
Imagery dark
Imagery light
World Imagery
Map
Reviewer Rules: Map
1:15,492
111.66°W 40.50°N
Selected Features: 0
Reviewer Results
Session 1 : Data Validation
Phase
Status
ID
Source
Check Title
Severity
Selected Session does not have results.
Project
Project
Portal
Notifications
Search
Maps
Toolboxes
Databases
Styles
Folders
Reviewer Results
Session Results
1 : Data Validation
Reviewer Batch Jobs
Locators


ArcGIS Pro - v7_FedData - Map
PROJECT
MANAGE QUALITY
MAP
INSERT
ANALYSIS
VIEW
EDIT
IMAGERY
SHARE
Not signed in
Select
Select By Attributes
Select By Location
Clear
Selection
Run Reviewer Rules
Automated Review
Close Manage Quality
Close
Run Reviewer Rules
Identify features that do not comply with data quality requirements that have been implemented as a Reviewer Rule. Non-compliant features are written as a Reviewer Result to enable corrective workflows and reporting.
Contents
Search
Drawing Order
Hypsography Points
Transportation Ground Cur
Feature Code Subtype
BRIDGE_C
BRIDGE_SPAN_C
BRIDGE_SUPERSTRUCTUI
CABLEWAY_C
CART_TRACK_C
CULVERT_C
FORD_C
GATE_C
RAILWAY_C
RAILWAY_SIDETRACK_C
RAMP_C
ROAD_C
ROCKSHED_SNOWSHED_
STEEP_GRADE_C
TRAIL_C
TUNNEL_C
VEHICLE_BARRIER_C
<all other values>
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Hydrography Surfaces
Culture Surfaces
Imagery dark
Imagery light
World Imagery
1:15,492
111.63°W 40.49°N
Selected Features: 0
Reviewer Results
Session 1 : Data Validation
Phase
Status
ID
Source
Check Title
Severity
Selected Session does not have results.
Project
Project
Portal
Notifications
Search
Maps
Toolboxes
Databases
Styles
Folders
Reviewer Results
Session Results
1 : Data Validation
Reviewer Batch Jobs
Locators

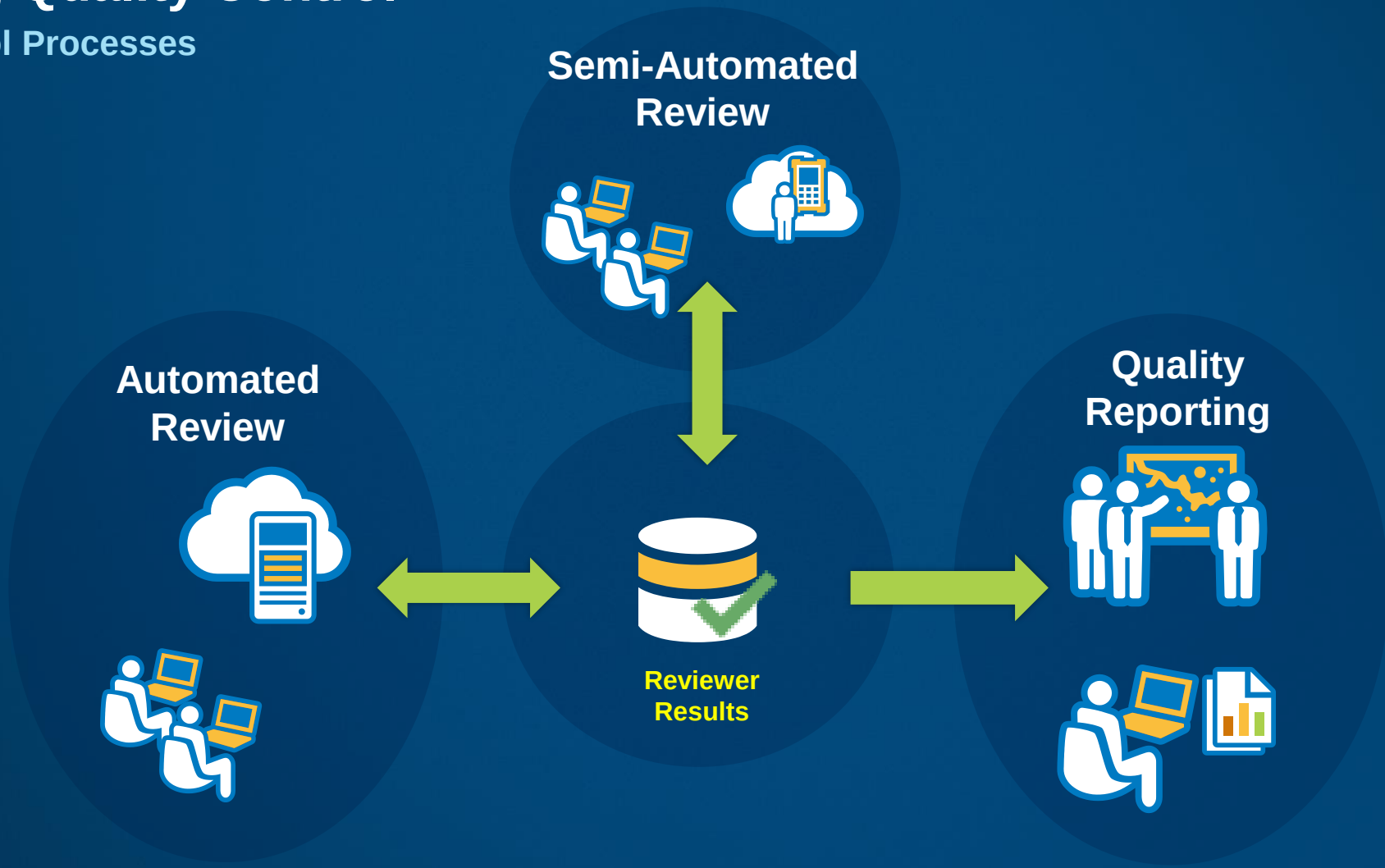

ArcGIS Pro - v7_FedData - Map
PROJECT
MANAGE QUALITY
MAP
INSERT
ANALYSIS
VIEW
EDIT
IMAGERY
SHARE
Not signed in
Select
Select By Attributes
Select By Location
Clear
Selection
Run Reviewer Rules
Automated Review
Close Manage Quality
Close
Contents
Search
Drawing Order
Hypsography Points
Transportation Ground Cur
Feature Code Subtype
BRIDGE_C
BRIDGE_SPAN_C
BRIDGE_SUPERSTRUCTUI
CABLEWAY_C
CART_TRACK_C
CULVERT_C
FORD_C
GATE_C
RAILWAY_C
RAILWAY_SIDETRACK_C
RAMP_C
ROAD_C
ROCKSHED_SNOWSHED_
STEEP_GRADE_C
TRAIL_C
TUNNEL_C
VEHICLE_BARRIER_C
<all other values>
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Hydrography Surfaces
Culture Surfaces
Imagery dark
Imagery light
World Imagery
Map
Reviewer Rules: Map
1:10,329
111.63°W 40.50°N
Selected Features: 1
Reviewer Results
Session 1 : Data Validation
Phase
Status
ID
Source
Check Title
Severity
Reviewed 33596 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33606 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33609 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33627 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33648 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33650 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33719 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33729 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33795 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33797 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33799 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33808 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33810 TransportationGroundCrv TRAIL_C name is NULL 1
Project
Project | Portal | Notifications
Search
Maps
Toolboxes
Databases
Styles
Folders
Reviewer Results
Session Results
1 : Data Validation
Reviewer Batch Jobs
Locators


ArcGIS Pro - v7_FedData - Map
PROJECT
MANAGE QUALITY
MAP
INSERT
ANALYSIS
VIEW
EDIT
IMAGERY
SHARE
Not signed in
Paste
Cut
Copy
Clipboard
Explore
Bookmarks
Navigate
Basemap
Add Data
Add Preset
Layer
Select
Select By Attributes
Select By Location
Attributes
Clear
Selection
Infographics
Measure
Locate
Inquiry
Pause
View Unplaced
More
Labeling
Contents
Search
Drawing Order
Hypsography Points
Transportation Ground Cur
Feature Code Subtype
BRIDGE_C
BRIDGE_SPAN_C
BRIDGE_SUPERSTRUCTUI
CABLEWAY_C
CART_TRACK_C
CULVERT_C
FORD_C
GATE_C
RAILWAY_C
RAILWAY_SIDETRACK_C
RAMP_C
ROAD_C
ROCKSHED_SNOWSHED_
STEEP_GRADE_C
TRAIL_C
TUNNEL_C
VEHICLE_BARRIER_C
<all other values>
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Hydrography Surfaces
Culture Surfaces
Imagery dark
Imagery light
World Imagery
Map
Reviewer Rules: Map
1:30,837
111.61°W 40.47°N
Selected Features: 0
Project
Project | Portal | Notifications
Search
Maps
Toolboxes
Databases
Styles
Folders
Reviewer Results
Session Results
1 : Data Validation
TrailsValidation_Fed.rbj
Active Map Extent
Execute
Full Database
Active Map Extent
Run batch job on all data sources in the active map extent using the Execute Reviewer Batch Job geoprocessing tool.
Reviewer Results
Session 1 : Data Validation
Phase
Status
ID
Source
Check Title
Severity
Reviewed 33596 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33606 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33609 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33627 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33648 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33650 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33719 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33729 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33795 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33797 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33799 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33808 TransportationGroundCrv TRAIL_C name is NULL 1
Reviewed 33810 TransportationGroundCrv TRAIL_C name is NULL 1

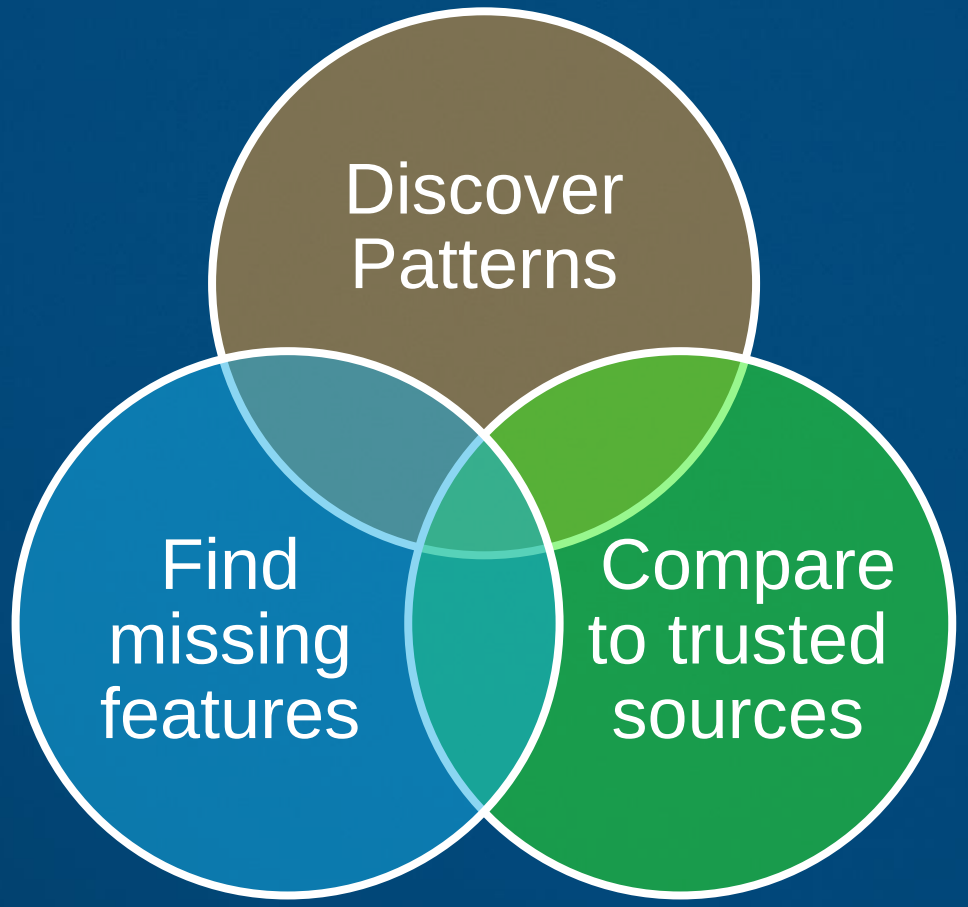

ArcGIS Pro - v7_FedData - Map
PROJECT
MANAGE QUALITY
MAP
INSERT
ANALYSIS
VIEW
EDIT
IMAGERY
SHARE
Not signed in
Paste
Cut
Copy
Explore
Bookmarks
Basemap
Add Data
Add Preset
Select
Select By Attributes
Select By Location
Attributes
Clear
Infographics
Measure
Locate
Pause
View Unplaced
More
Clipboard
Navigate
Layer
Selection
Inquiry
Labeling
Contents
Search
Drawing Order
Hypsography Points
Transportation Ground Cur
Feature Code Subtype
BRIDGE_C
BRIDGE_SPAN_C
BRIDGE_SUPERSTRUCTUI
CABLEWAY_C
CART_TRACK_C
CULVERT_C
FORD_C
GATE_C
RAILWAY_C
RAILWAY_SIDETRACK_C
RAMP_C
ROAD_C
ROCKSHED_SNOWSHED_
STEEP_GRADE_C
TRAIL_C
TUNNEL_C
VEHICLE_BARRIER_C
<all other values>
Contour lines
Hydrography Curves
Vegetation
Structure Surfaces
Settlement Surfaces
Hydrography Surfaces
Culture Surfaces
Imagery dark
Imagery light
World Imagery
Map
Reviewer Rules: Map
1:30,837
111.61°W 40.49°N
Selected Features: 0
Reviewer Results
Session 1 : Data Validation
Phase
Status
ID
Source
Check Title
Severity
Reviewed 39843 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 39844 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40324 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40325 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40336 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40427 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40459 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40594 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40595 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40596 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40736 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40817 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Reviewed 40824 TransportationGroundCrv Transportation Ground Curves: Roadway Type Check 3
Geoprocessing
Execute Reviewer Batch Job
Parameters
Environments
Reviewer Workspace
ReviewerWorkspace.gdb
Session
Session 1 : Data Validation
Batch Job File
C:\@FedGIS\TrailsValidation_Fed.rbj
Production Workspace
saltlakecitygold.gdb
Analysis Area
Extent
As Specified Below
-111.697233946817
-111.599424732163
40.471805376867
40.5025496086299
Run
Execute Reviewer Batch Job
Completed successfully
Loading Reviewer Session...
Setting environment properties...
Running Batch Job...
Optimizing Batch Job...
Executing Execute SQL Check
Running Execute SQL Check
(TransportationGroundCrv:BRIDGE_SUPERST
RUCTURE_C)
Executing Execute SQL Check
Running Execute SQL Check
(TransportationGroundCrv:ROAD_C)
Executing Execute SQL Check
Running Execute SQL Check
(TransportationGroundCrv:ROAD_C)
Validating StructureSrf
Validating TransportationGroundCrv
Validating VegetationSrf
Writing errors to reviewer table...
Continue Batch Processing
Adding errors
80 Record(s) Written to Reviewer Table
Batch Job executed successfully...
Generating Output...
Succeeded at Wednesday, February 15, 2017 12:18:26 PM (Elapsed Time: 6.99 seconds)
Project
Project
Portal
Notifications
Search
Maps
Toolboxes
Databases
Geoprocessing History
Styles
Folders
Reviewer Results
Session Results
1 : Data Validation
Reviewer Batch Jobs
TrailsValidation_Fed.rbj
Locators

Managing Quality Control

Quality Control Processes



Value of Performing Semi-Automated

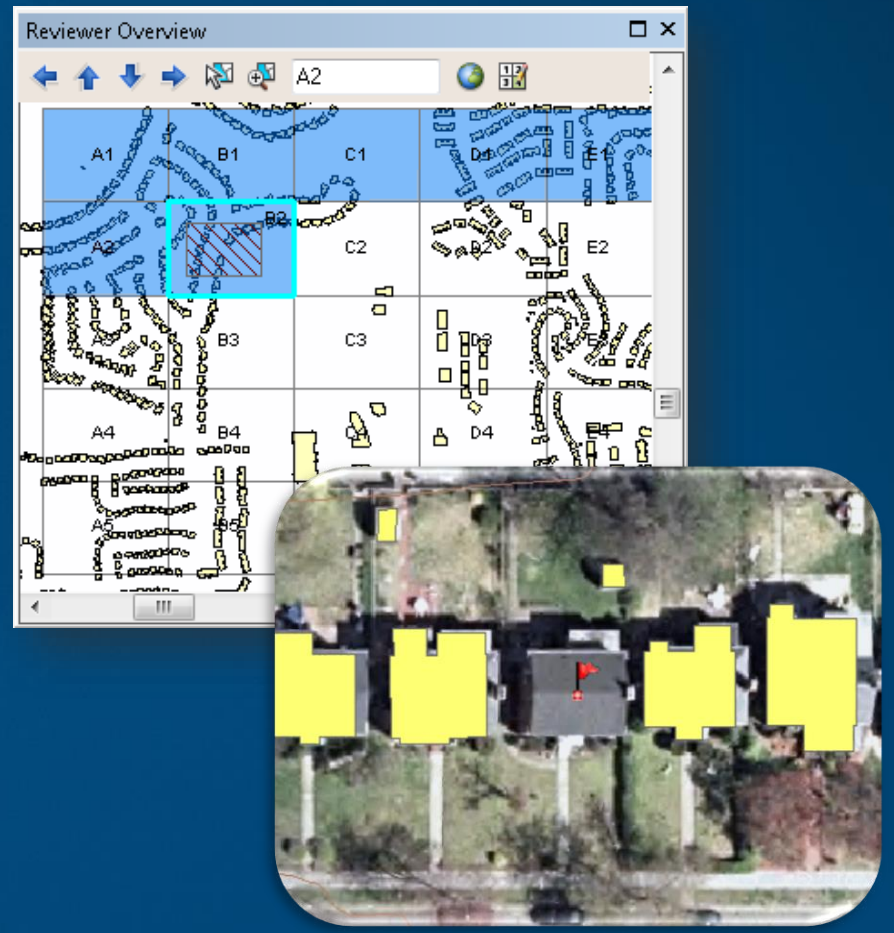


Semi-Automated Review

Leveraging ArcGIS for Desktop

Tools supporting

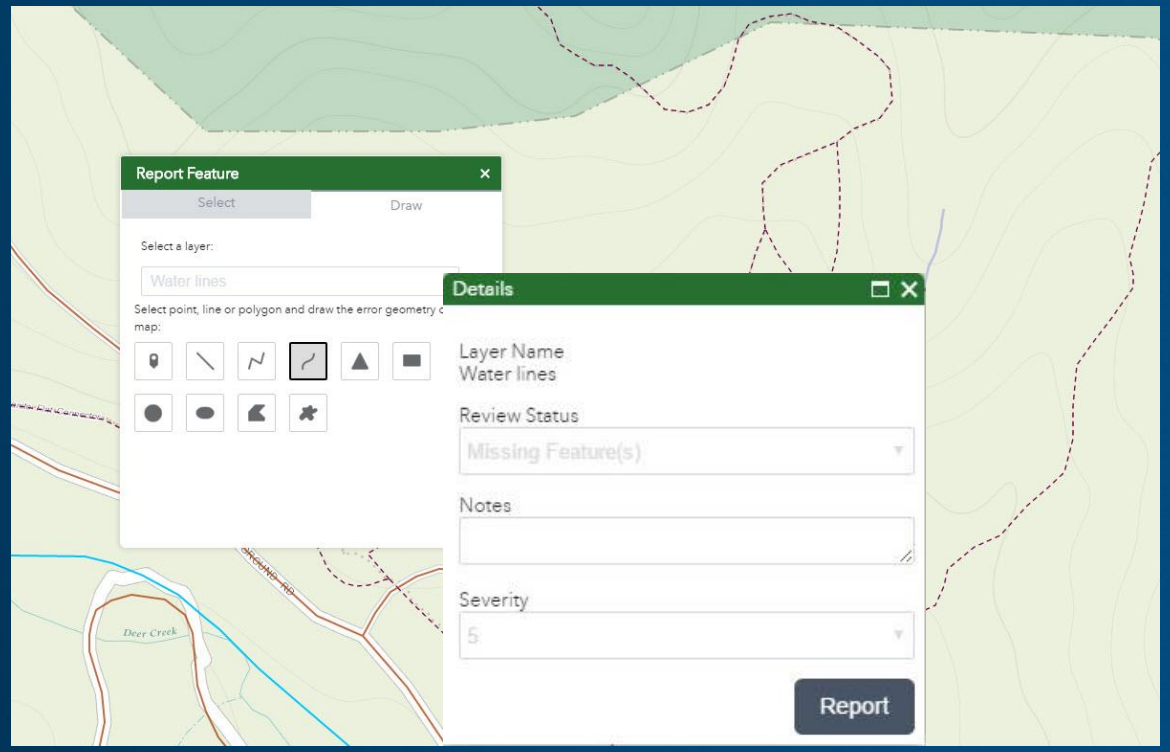
- Selecting/browsing features
- Redlining missing features
- Flagging features in error
- Assessing positional accuracy
- Comparing geodatabase versions
- Generating random samples



Semi-Automated Review

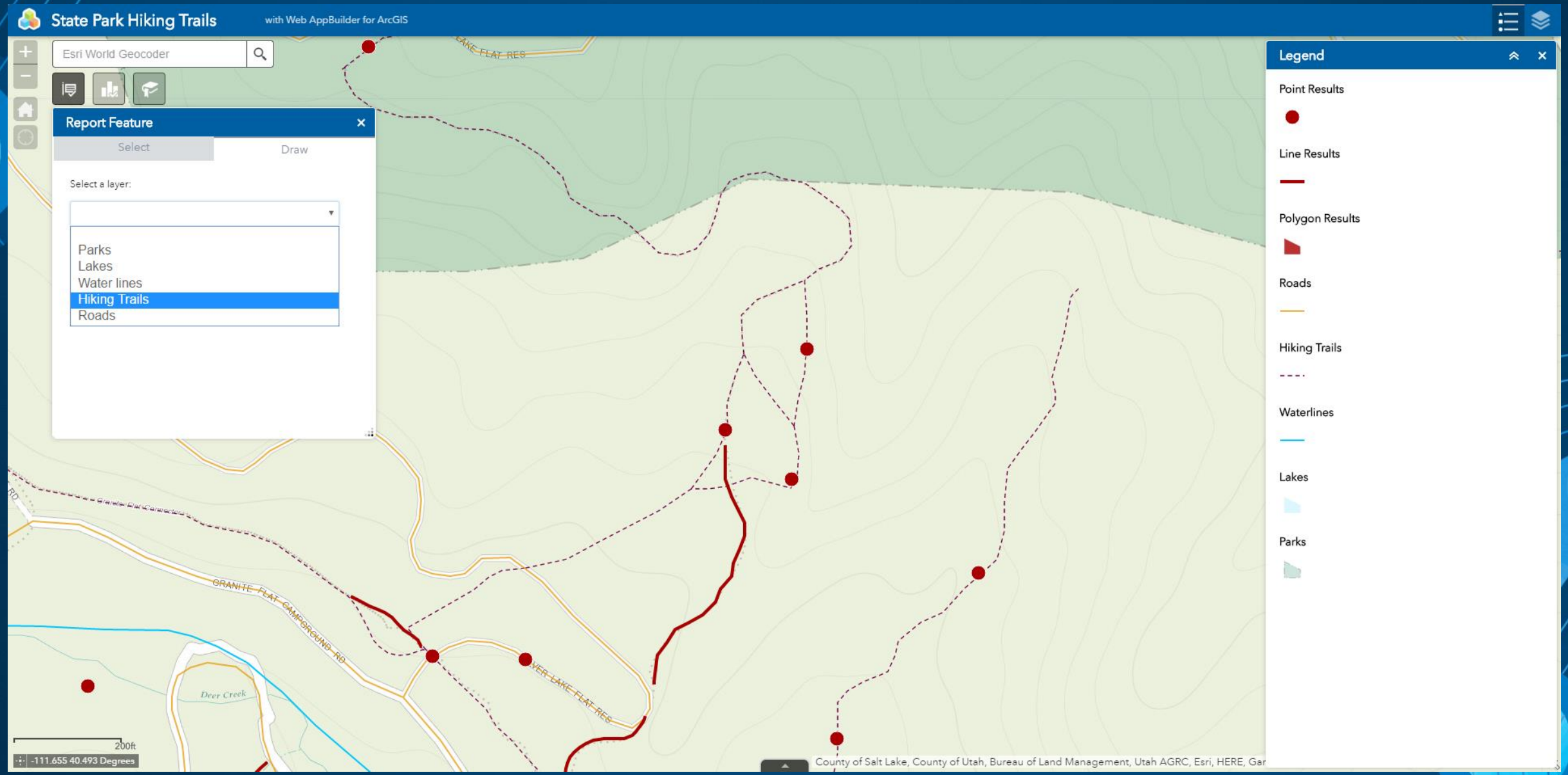
Leveraging ArcGIS Server

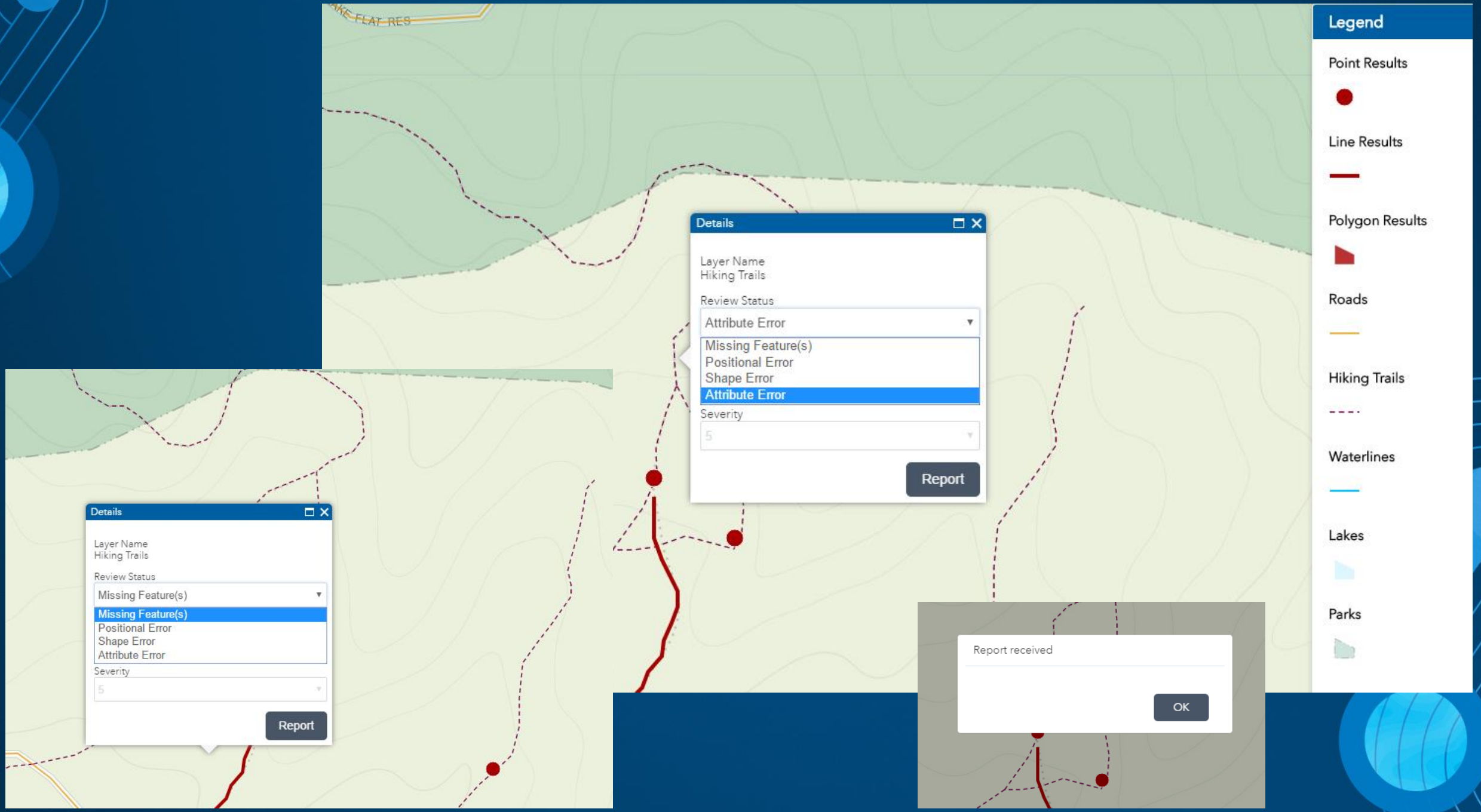
- **Extending quality control workflows into other communities**
  - **QC review across ArcGIS platform**
  - **Simple to use tools for error identification**
  - **Manual QC workflow “automation”**



Semi-Automated Review using Data Reviewer for Server

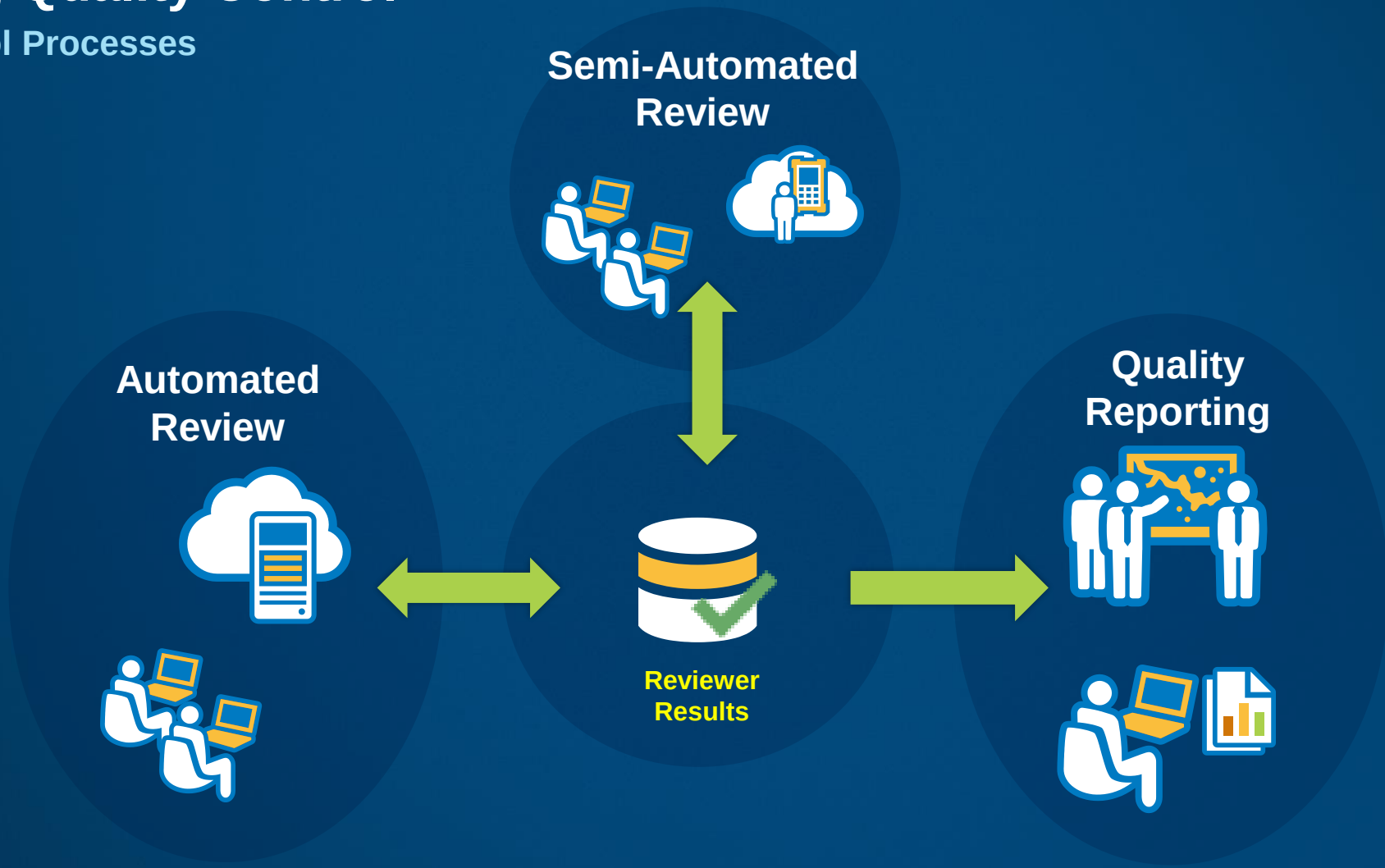
Sherry Fagin


State Park Hiking Trails
with Web AppBuilder for ArcGIS
Esri World Geocoder
Report Feature
Select
Draw
Select a layer:
Parks
Lakes
Water lines
Hiking Trails
Roads
Legend
Point Results
Line Results
Polygon Results
Roads
Hiking Trails
Waterlines
Lakes
Parks
LAKE FLAT RES
GRANITE FLAT CAMPGROUND RD
Deer Creek
200ft
-111.655 40.493 Degrees
County of Salt Lake, County of Utah, Bureau of Land Management, Utah AGRC, Esri, HERE, Gar


Legend
Point Results
Line Results
Polygon Results
Roads
Hiking Trails
Waterlines
Lakes
Parks
Details
Layer Name
Hiking Trails
Review Status
Attribute Error
Missing Feature(s)
Positional Error
Shape Error
Attribute Error
Severity
5
Report
Details
Layer Name
Hiking Trails
Review Status
Missing Feature(s)
Missing Feature(s)
Positional Error
Shape Error
Attribute Error
Severity
5
Report
Report received
OK

Managing Quality Control

Quality Control Processes



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**

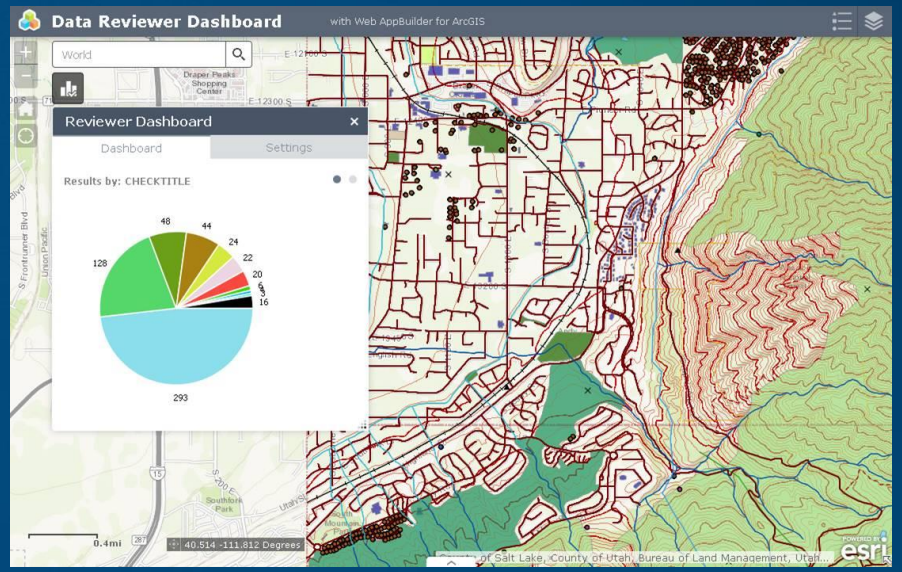
Date/Time	Origin Table	Subtype	Total Records	Confidence Level	Margin of Error	Sampling Number	Acceptable Error Percentage	Acceptable Error	Number of Errors	Pass/Fail	QC Complete
7/4/2010 11:05:59 AM											
	AtlasMap		153	98%	3%	0	2%	0	0	Pass	Yes
						0			0		
	wControlValve		302	98%	3%	9	2%	1	1	Pass	Yes
		AirRelease				2			0		
		BackflowControl				4			0		
		BlowOff				3			1		
	wFitting		297	98%	3%	9	2%	1	2	Fail	Yes
		Reducer				7			0		
		Tap				2			2		
	wLateralLine		18690	98%	3%	544	2%	17	9	Pass	Yes
		Hydrant Lateral				50			0		
		Service Lateral				493			8		
		Service Lateral To Meter				1			1		

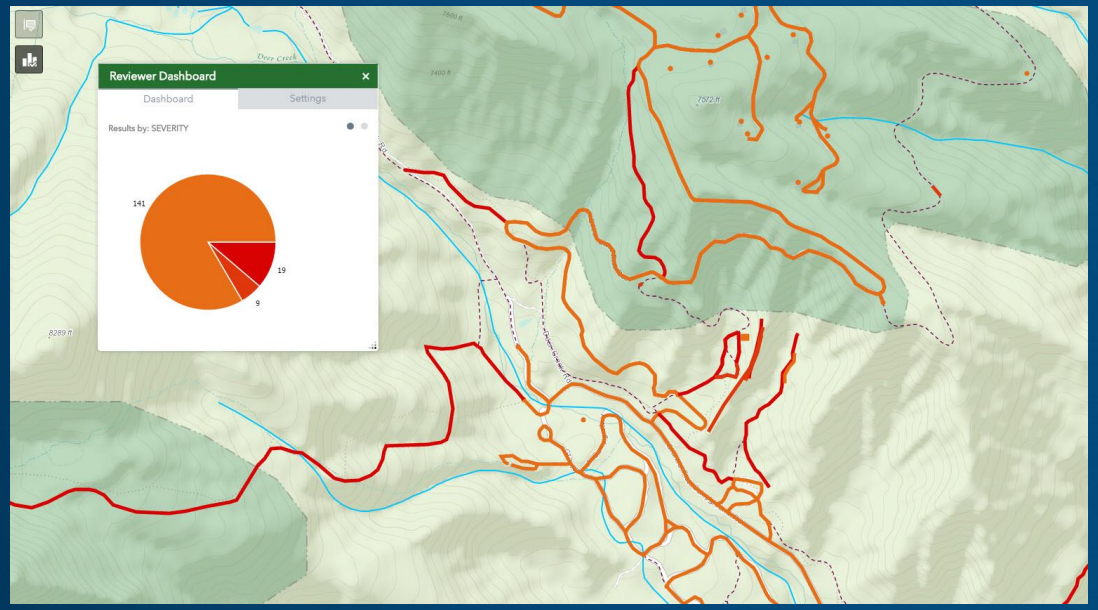
Data Quality Reporting

ArcGIS for Server

Dashboard

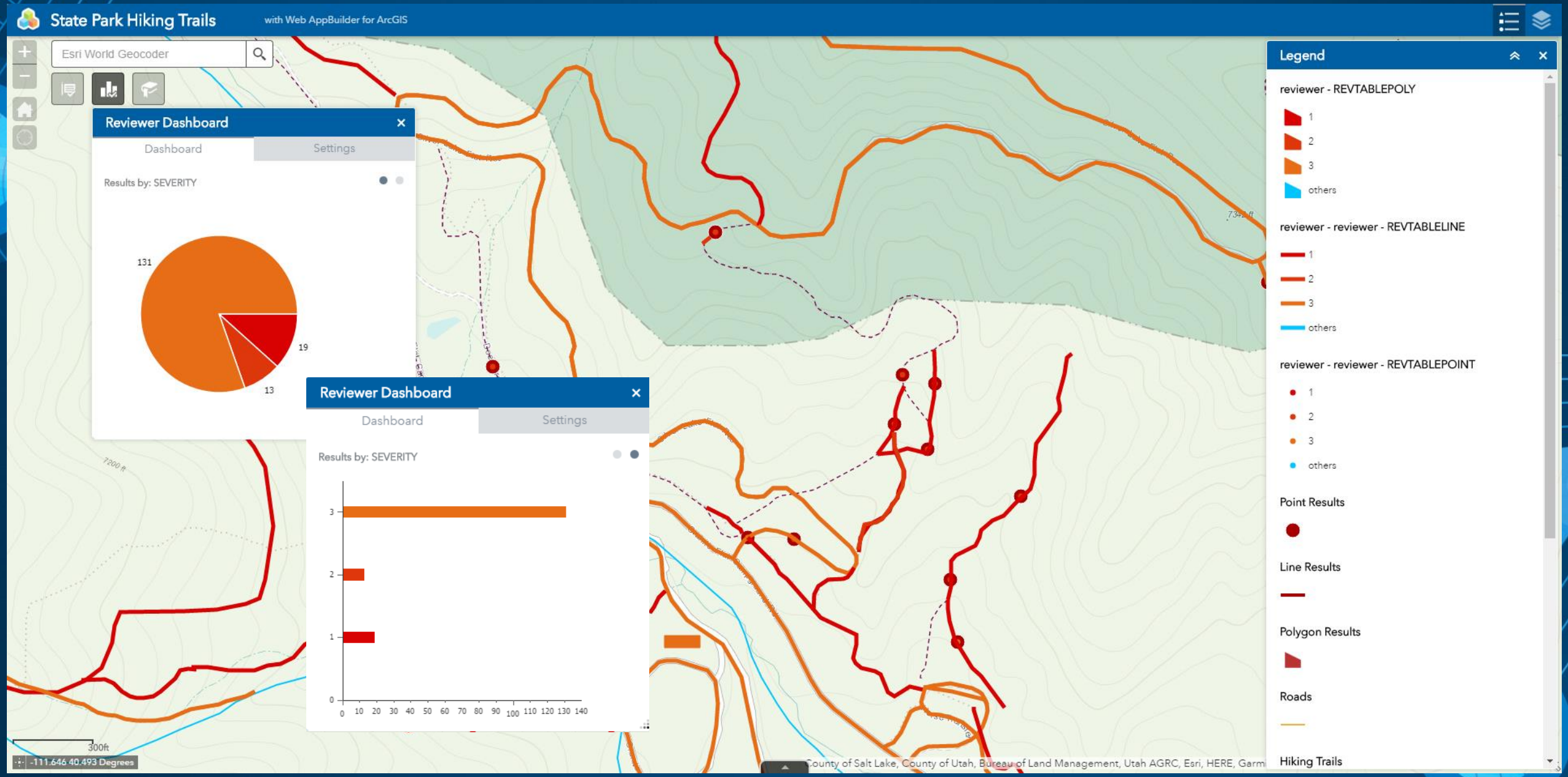
- Enabling transparency in data quality
- Better decision making by communicating data quality across stakeholders
- Open quality reporting
- Shared across ArcGIS system
- Tools and methods to communicate quality

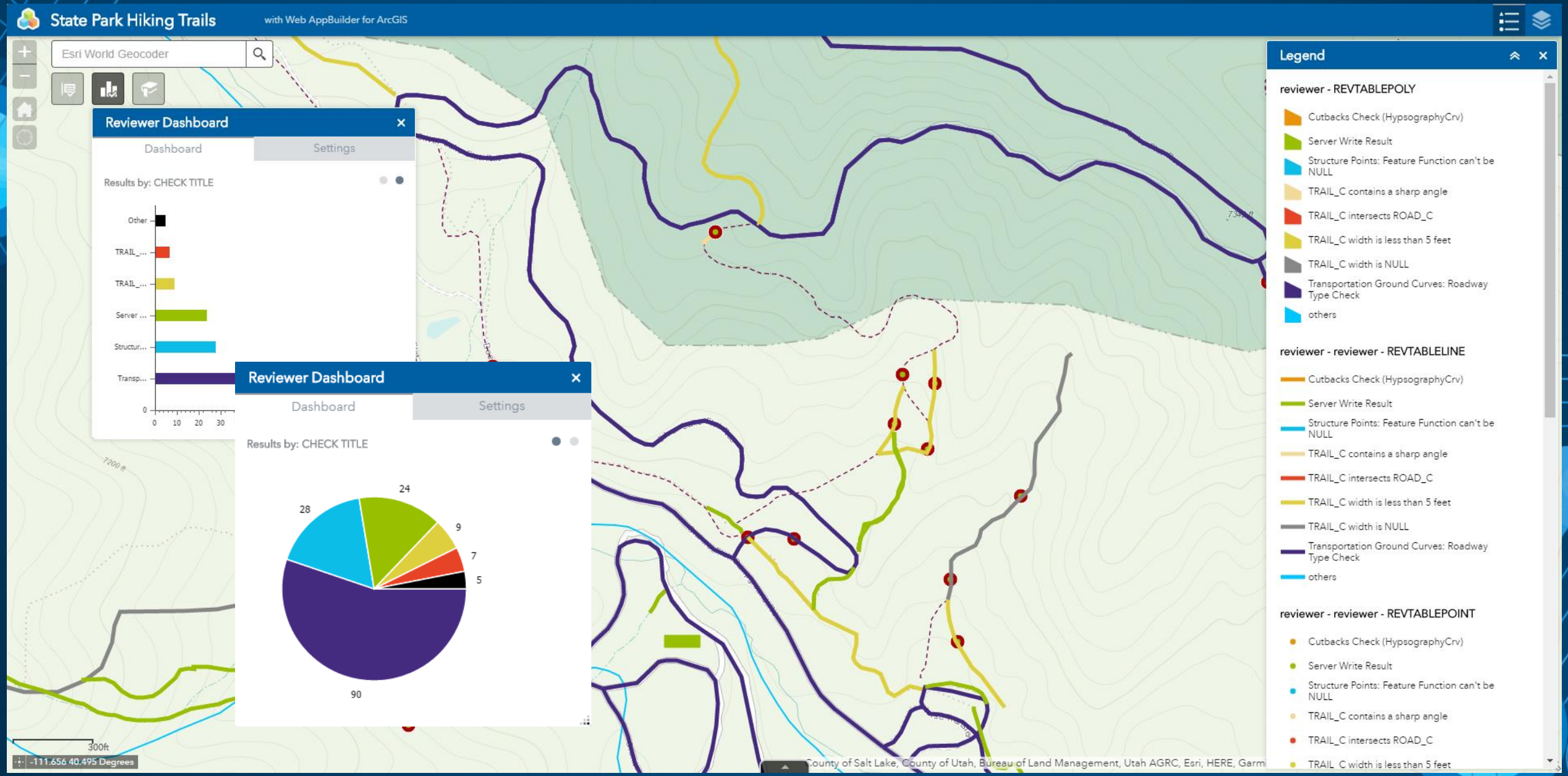


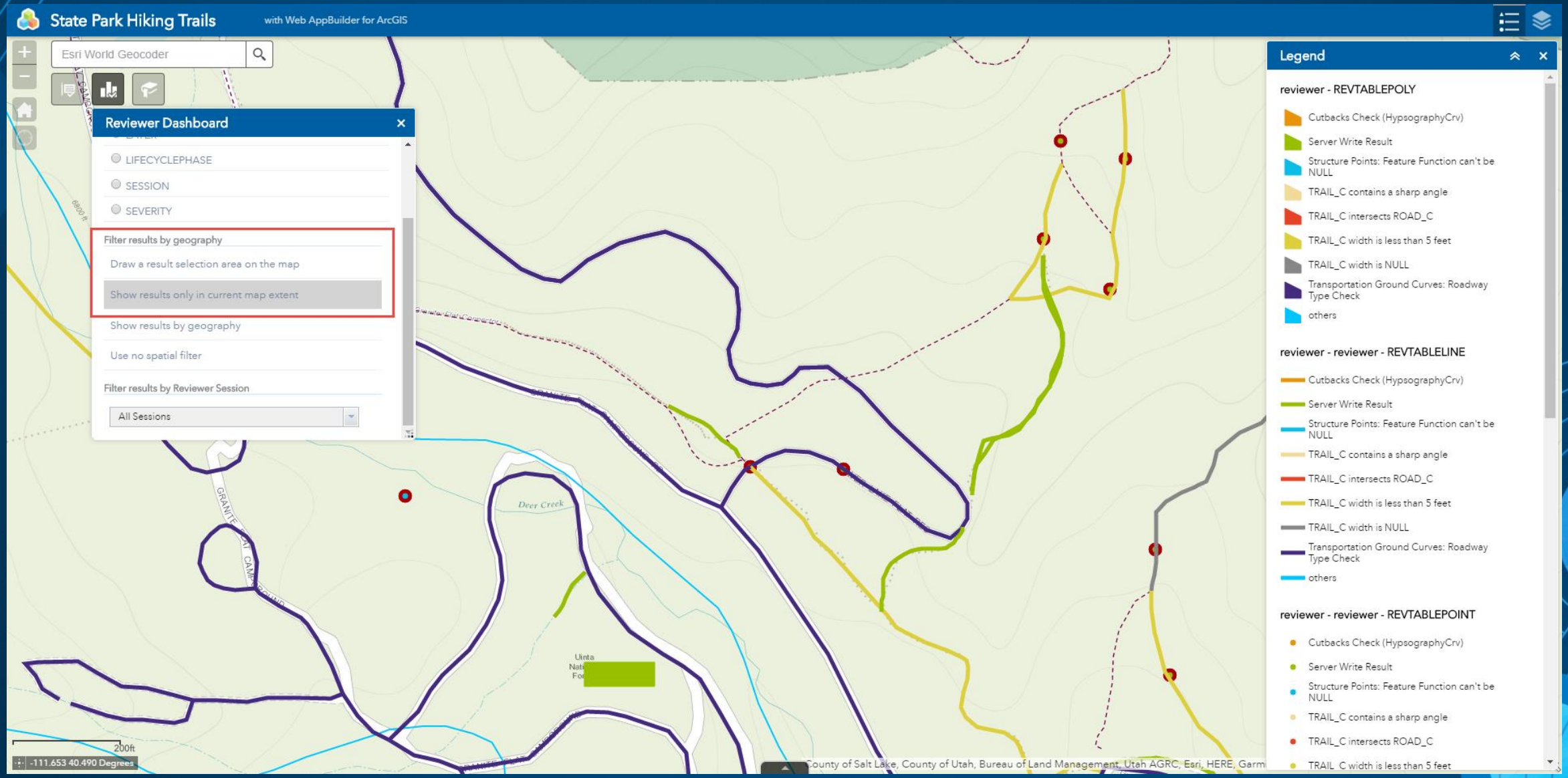


Data Reviewer Dashboard – Data Reviewer Server

Sherry Fagin


State Park Hiking Trails
with Web AppBuilder for ArcGIS
Esri World Geocoder
Reviewer Dashboard
Dashboard
Settings
Results by: SEVERITY
131
19
13
Reviewer Dashboard
Dashboard
Settings
Results by: SEVERITY
3
2
1
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140
Legend
reviewer - REVTABLEPOLY
1
2
3
others
reviewer - reviewer - REVTABLELINE
1
2
3
others
reviewer - reviewer - REVTABLEPOINT
1
2
3
others
Point Results
Line Results
Polygon Results
Roads
Hiking Trails
7200 ft
7340 ft
300ft
-111.646 40.493 Degrees
County of Salt Lake, County of Utah, Bureau of Land Management, Utah AGRC, Esri, HERE, Garmi


State Park Hiking Trails
with Web AppBuilder for ArcGIS
Esri World Geocoder
Reviewer Dashboard
Dashboard
Settings
Results by: CHECK TITLE
Other
TRAIL_...
TRAIL_...
Server ...
Structur...
Transp...
0
10
20
30
Reviewer Dashboard
Dashboard
Settings
Results by: CHECK TITLE
24
28
9
7
5
90
Legend
reviewer - REVTABLEPOLY
Cutbacks Check (HypsographyCrv)
Server Write Result
Structure Points: Feature Function can't be NULL
TRAIL_C contains a sharp angle
TRAIL_C intersects ROAD_C
TRAIL_C width is less than 5 feet
TRAIL_C width is NULL
Transportation Ground Curves: Roadway Type Check
others
reviewer - reviewer - REVTABLELINE
Cutbacks Check (HypsographyCrv)
Server Write Result
Structure Points: Feature Function can't be NULL
TRAIL_C contains a sharp angle
TRAIL_C intersects ROAD_C
TRAIL_C width is less than 5 feet
TRAIL_C width is NULL
Transportation Ground Curves: Roadway Type Check
others
reviewer - reviewer - REVTABLEPOINT
Cutbacks Check (HypsographyCrv)
Server Write Result
Structure Points: Feature Function can't be NULL
TRAIL_C contains a sharp angle
TRAIL_C intersects ROAD_C
TRAIL_C width is less than 5 feet
7200 ft
7342 ft
300ft
-111.656 40.495 Degrees
County of Salt Lake, County of Utah, Bureau of Land Management, Utah AGRC, Esri, HERE, Garmi


State Park Hiking Trails
with Web AppBuilder for ArcGIS
Esri World Geocoder
Reviewer Dashboard
LIFECYCLEPHASE
SESSION
SEVERITY
Filter results by geography
Draw a result selection area on the map
Show results only in current map extent
Show results by geography
Use no spatial filter
Filter results by Reviewer Session
All Sessions
Legend
reviewer - REVTABLEPOLY
Cutbacks Check (HypsographyCrv)
Server Write Result
Structure Points: Feature Function can't be NULL
TRAIL_C contains a sharp angle
TRAIL_C intersects ROAD_C
TRAIL_C width is less than 5 feet
TRAIL_C width is NULL
Transportation Ground Curves: Roadway Type Check
others
reviewer - reviewer - REVTABLELINE
Cutbacks Check (HypsographyCrv)
Server Write Result
Structure Points: Feature Function can't be NULL
TRAIL_C contains a sharp angle
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TRAIL_C width is less than 5 feet
TRAIL_C width is NULL
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others
reviewer - reviewer - REVTABLEPOINT
Cutbacks Check (HypsographyCrv)
Server Write Result
Structure Points: Feature Function can't be NULL
TRAIL_C contains a sharp angle
TRAIL_C intersects ROAD_C
TRAIL_C width is less than 5 feet
Deer Creek
200ft
-111.653 40.490 Degrees
County of Salt Lake, County of Utah, Bureau of Land Management, Utah AGRC, Esri, HERE, Garm

Case Study

Timmons Group

HOW MANY OF YOU SHARED DATA?

TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

How are you sharing data?

- Data portals / web sites

- Data requests
- Data agreements – routine

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BUILDING PROCESSES AROUND THIS SHARED DATA?

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Shared data – shared quality?

- How do we know the data we're receiving is quality?
  - Metadata
  - Understanding the organization
  - Contractual agreements
  - Etc

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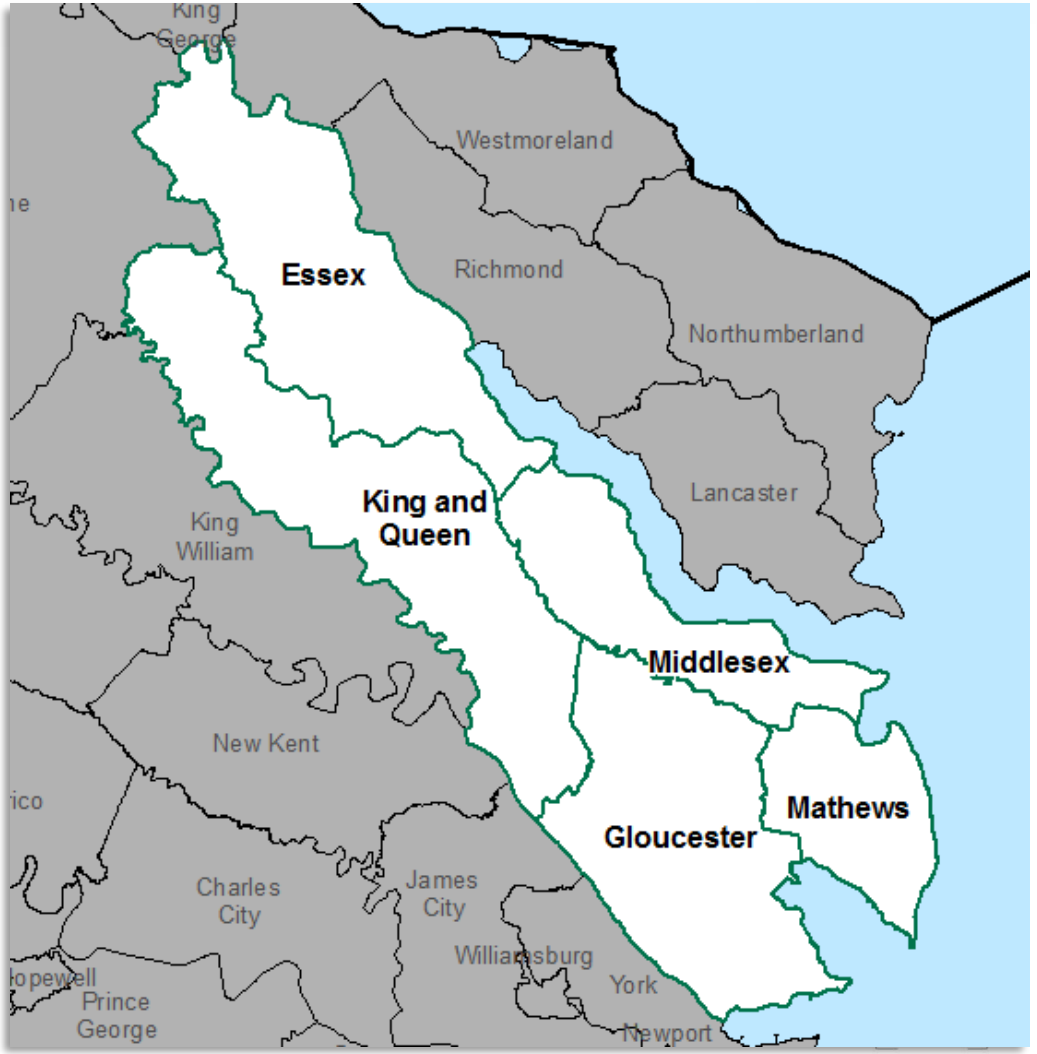
Project spotlight

- Mutual Aid between 5 localities
  - When an emergency needs backup from another locality
- Middle Peninsula in Virginia (MidPen)
- Sheriff, EMS & Fire resources
- NG911



TIMMONS GROUP
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Mutual Response

- Responding localities unfamiliar with response area
- Need high quality data
- Tools built to migrate locality data into Regional dataset
- Closed roads? Locked gates? Hazardous areas? Bridges with weight constraints? Unpaved/gravel roads?

Dataset	FeatureClass	Gloucester Data
ReferenceData		
	BuildingFootprint	BuildingFootprint
	CommunicationTower	CellTower
	FireStation	Emergency Services
	ParkArea	Park
	ParkPoint	new feature class
	PierLine	Dock
	Pier	new feature class
	PowerCompany	new feature class
	PublicAccess	BoatLandingSite
	RescueSquad	Emergency Services
	RoadCenterline	RoadCenterline
	SheriffStation	EmergencyServices
	Waterline	Waterline
	Waterbody	Waterbody
	Trail	Trail

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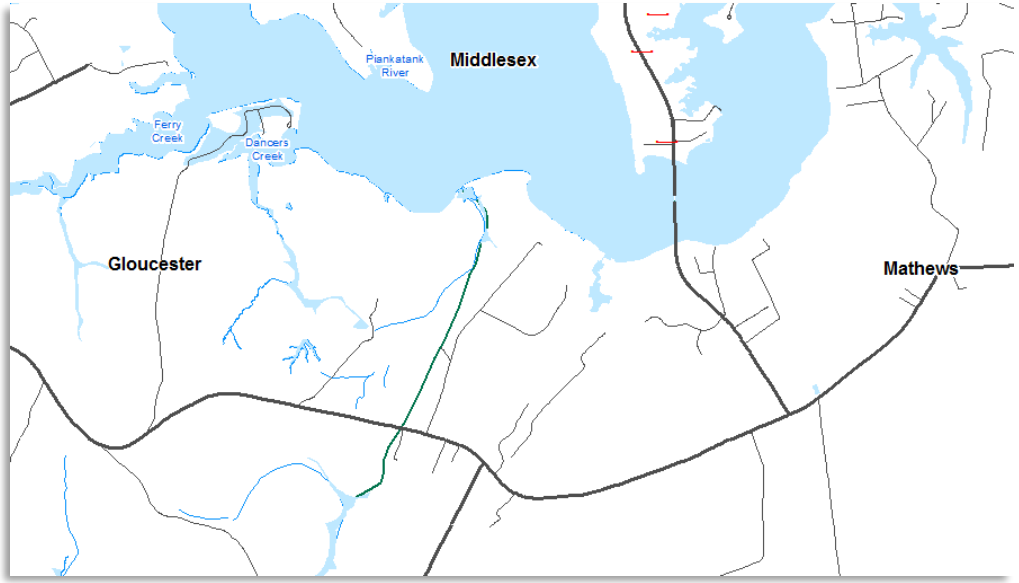
MidPen GIS

- Various GIS environments around the region
  - Open source & 9.3.1
  - 10.1/2 with file geodatabases
  - 10.4 ArcGIS Enterprise

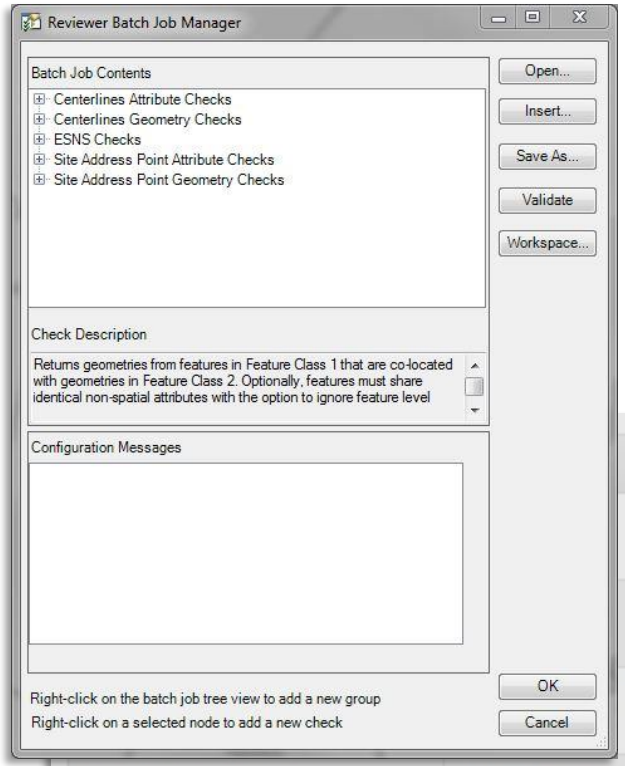


Dataset	FeatureClass	Essex Data	Gloucester Data	King & Queen Data	Mathews Data	Middlesex Data
Address						
	AddressEntrancePoint			access_point		
	Driveway	AddressEntranceLine	DrivewayCenterline		Driveway	Driveways
	SiteAddressPoint	SiteAddressPoint,EducationFacilities,PointofInte	SiteAddressPoint, Library,	structure_point	GPS	Address

Assessing Data Quality

- Needed method to provide quality snapshot & specifics to localities

Data Reviewer for Server



		Notes	Severity
		FULLNAME is null	3
		FULLNAME is null	3
		FULLNAME is null	3
Zip Left or Right is NULL	RoadCenterline	ZipLeft is null or ZipRight is null	3
ESNLEFT within ESN poly check	RoadCenterline	ESNLEFT does not match containing ESN	2

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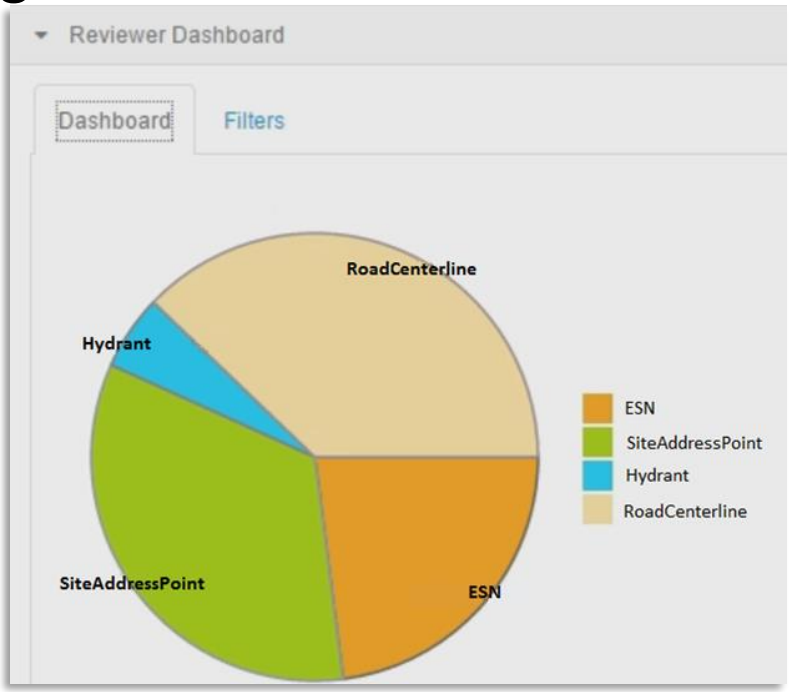
Shared resources – shared quality

- Central portal for data quality
- Graphical interface – easy to understand/navigate
- Very similar to Desktop application
  - But – without Desktop requirement



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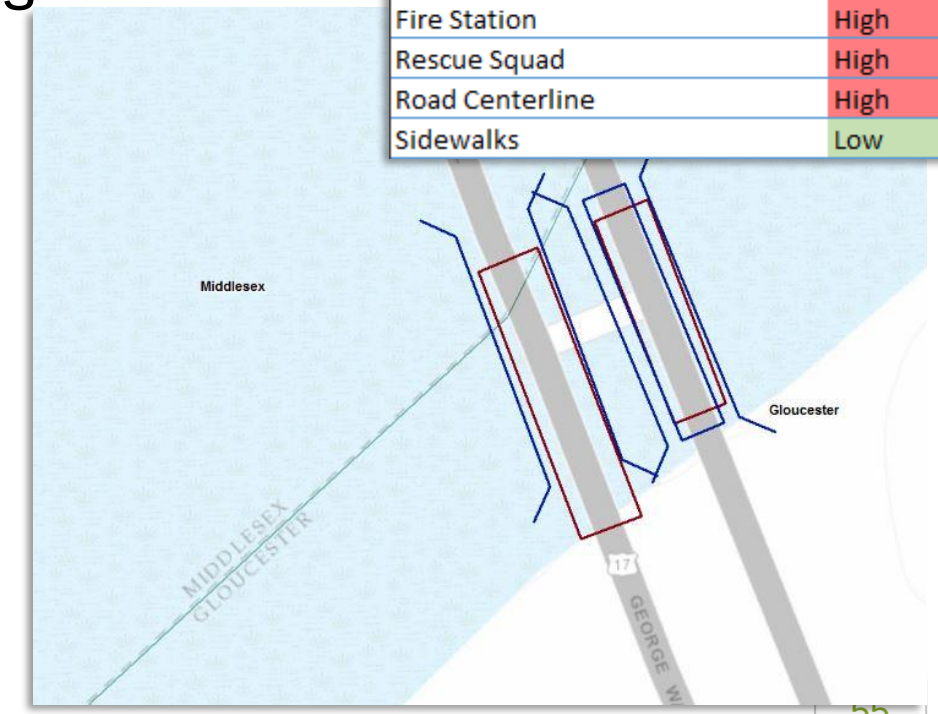
Regional Data Quality

- Few compromises
  - Using State data for County boundary
  - Using Federal data for water boundaries
  - FEMA data
  - Etc
- Which datasets are MOST important?
- Helping localities with achieving quality

Name	Priority
Address Entrance Points	High
Fire Response Restrictions (points)	High
Hydrant	High
Fire District	High
EMS District	High
ESN	High
Sheriff Station	High
Fire Station	High
Rescue Squad	High
Road Centerline	High
Sidewalks	Low



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USING THIS FOR SHARED DATA QUALITY

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YOUR VISION ACHIEVED THROUGH OURS.

Extending example…

1. Prioritizing the data layers
2. Documenting what is an error
3. Ranking the errors
4. Showing a clear level of quality for data

Road Centerline

Attribute Checks

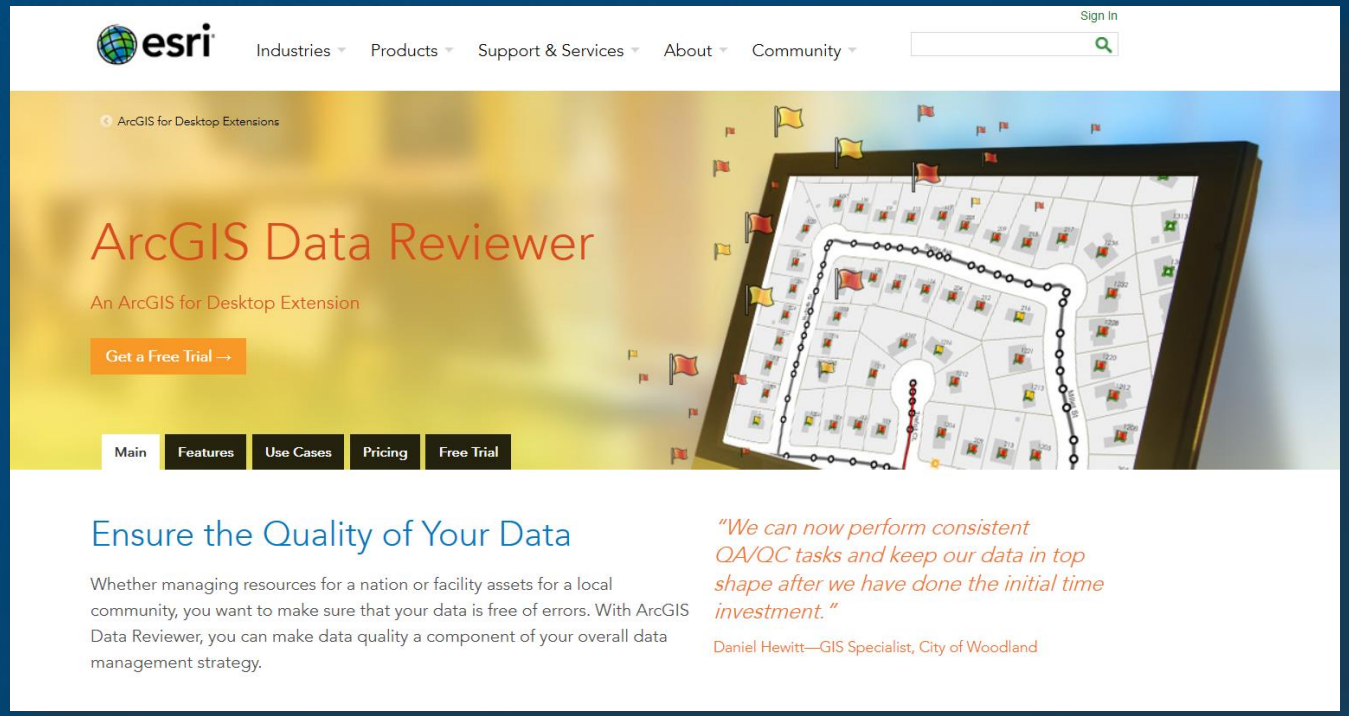
- FULLNAME is null
- Trailing Space: FULLNAME: Finds features with a space following FULLNAME (ex: “Pine Road “)
- ESN is null: Finds features where ESNLEFT or ESNRIGHT is null
- Zip Left or Right is null: Finds feature where ZipLeft or ZipRight is null
- Centerline Ranges are null: Finds features where FROMLEFT or TOLEFT or FROMRIGHT or TORIGHT are null
- Municipality is null

Geometry checks

- ESNLEFT within ESN poly Check: Finds road features where ESNLEFT does not equal ESN from the ESN polygon it is within
- ESNRIGHT within ESN poly Check: Finds road features where ESNRIGHT does not equal ESN from the ESN polygon it is within
- Centerline has Cutbacks: Finds features with acute ‘cutback’ angles (smaller than 25 degrees)
- Road self-intersection: Finds features that crossover themselves (rather than ending at an intersection)
- Right Address – To/From: FROMRIGHT is greater than TORIGHT. FROMRIGHT should be the origin, and therefore a smaller number
- Left Address – To/From: FROMLEFT is greater than TOLEFT. FROMLEFT should be the origin, and therefore a smaller number
- Duplicate: Find Road Centerlines with duplicate geometry and attributes (excepting Editor Tracking fields)

Want to learn more?

- **Product page**
  - **www.esri.com/datareviewer**



Want to learn more?

Training and Technical Support

- **Documentation**
  - **Desktop**
  - **Server**

- **Training *(training.esri.com)***
  - **Assessing Data Quality using ArcGIS Data Reviewer** *(Seminar)*
  - **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)*

- **GeoNet *(geonet.esri.com)***
  - **Data Reviewer place**

Please Take Our Survey on the **Esri Events App!**

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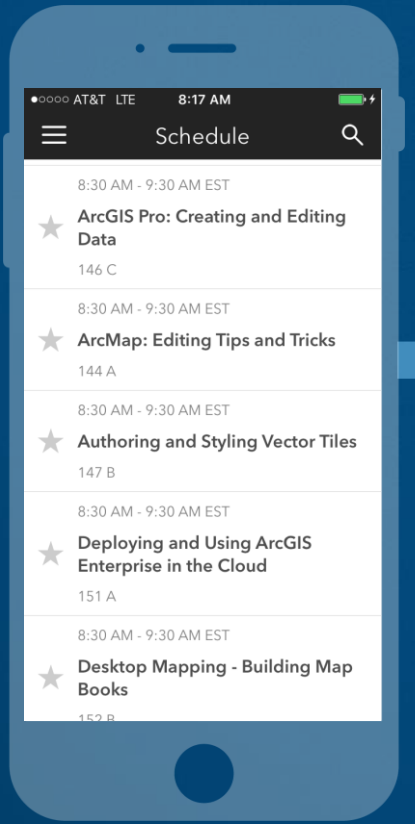
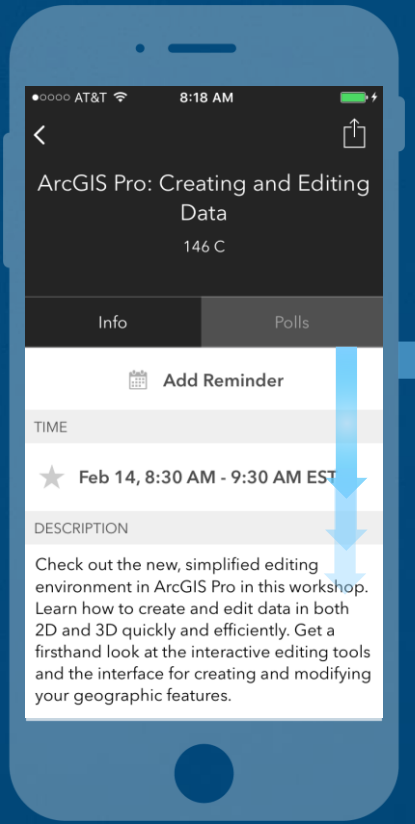
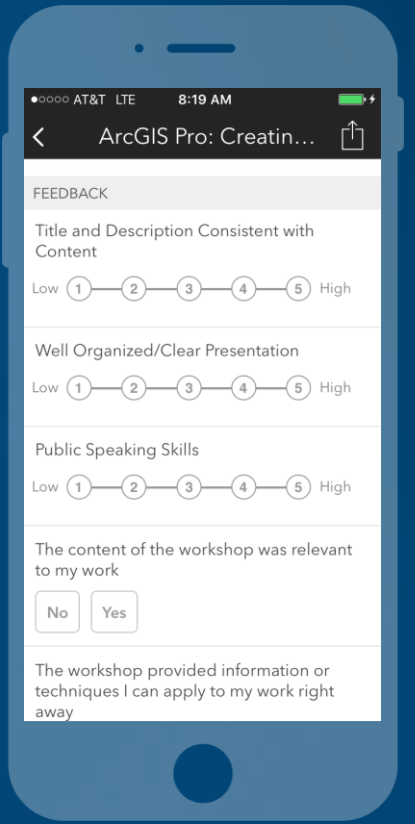
Select the session you attended



Scroll down to find the survey



Complete Answers and Select “Submit”



Print Your Certificate of Attendance

Print stations located in the 140 Concourse

Monday

12:30 PM – 6:30 PM

GIS Solutions Expo,
Hall B

5:15 PM – 6:30 PM

Expo Social,
Hall B

Tuesday

10:45 AM – 5:15 PM

GIS Solutions Expo,
Hall B

6:30 PM – 9:30 PM

Networking Reception,
Smithsonian National Air and Space Museum

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