from Mexico to Utah

Arizona National Scenic Trail

Sharing Authoritative Data with our Partners

for the greatest good

The Arizona Trail

- Designated by Congress in 2009 as one of America's 11 National Scenic Trails
- 800 mile route showcasing Arizona's diverse geology, vegetation, wildlife, natural scenery, history and culture.
- Connects deserts, mountains, forests, wilderness, canyons, historic sites, communities and people.

Assigned to Sec. of Agriculture

Forest Service administering agency

BLM, NPS managing agencies

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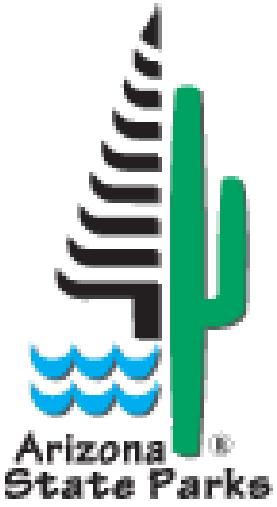
Partners


FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE


NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT


NATIONAL
PARK
SERVICE


Arizona Trail
ASSOCIATION


Arizona
State Parks


THE SEAL OF PIMA COUNTY
ARIZONA


THE SEAL OF PINAL COUNTY ARIZONA
18
75


COCONINO COUNTY ARIZONA
1891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11 National Scenic Trails

Trail Name	Year Designated	Miles	Lead
Appalachian	1968	2,174	
Pacific Crest	1968	2,638	
Continental Divide	1978	3,100	
North Country	1980	4,600	
Ice Age	1980	1,200	
Florida	1983	1,400	
Potomac Heritage	1983	700	
Natchez Trace	1983	695	
Arizona	2009	807	
New England	2009	220	
Pacific Northwest	2009	1,200	

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National Scenic Trails

There is no consistent national trail content protocol and we lack a strategic way to manage and update the trail geography and associated attributes from multiple partners.

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Challenges: Managing data contributions from stakeholders

How is national trail data shared and stored?

- No methodology to exchange data or trail edits
- There is no designated authoritative steward for entire AZNST – multiple publishers
- Updates are manual and ad-hoc
- No common data standard for national trails – each agency uses unique data content and publishes the trail in multiple formats

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FGDC Document Number FGDC-STD-017-2011

Automating, sharing, and leveraging trail data through a widely-accepted standard can provide a variety of important benefits:

Federal Trail Data Standards

Federal Trails Data Standards Team
Federal Geographic Data Committee

November 2011

Value of using FGDC Trail Data Standards

- **Efficiency –** create and gather trails data
- **Compatibility –** compiling data from one project that is compatible with other applications.
- **Reliability –** improving the quality of shared trail data by increasing the number of people who find and correct errors
- **Consistency –** using the same standards meshing data produced by one organization with another organization and meshing across boundaries
- **Conflict resolution –** resolving conflicting trail data more easily if compliant to the same standard.
- Published in 2011 – however no spatial geodatabase was developed

TASK 1

Create a National Trail data standard and schema

- National Trails geodatabase design matches FTDS closely
- Minimum of attributes
- Domains built to reflect National Trail Standards
- Work with ESRI – assessment of final trail data standard
- Portable – simple
- Whole trail, not just parts
- Worked with ESRI for NTDS review

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Task 1 ESRI Review

- Review Existing AZNT geodatabase design against FTDS
- Summarize outcomes and draft a report
- Final deliverable: AZNT Geodatabase Recommendations Report

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Crosswalk of FS, Federal, and Arizona NS Trail Attributes

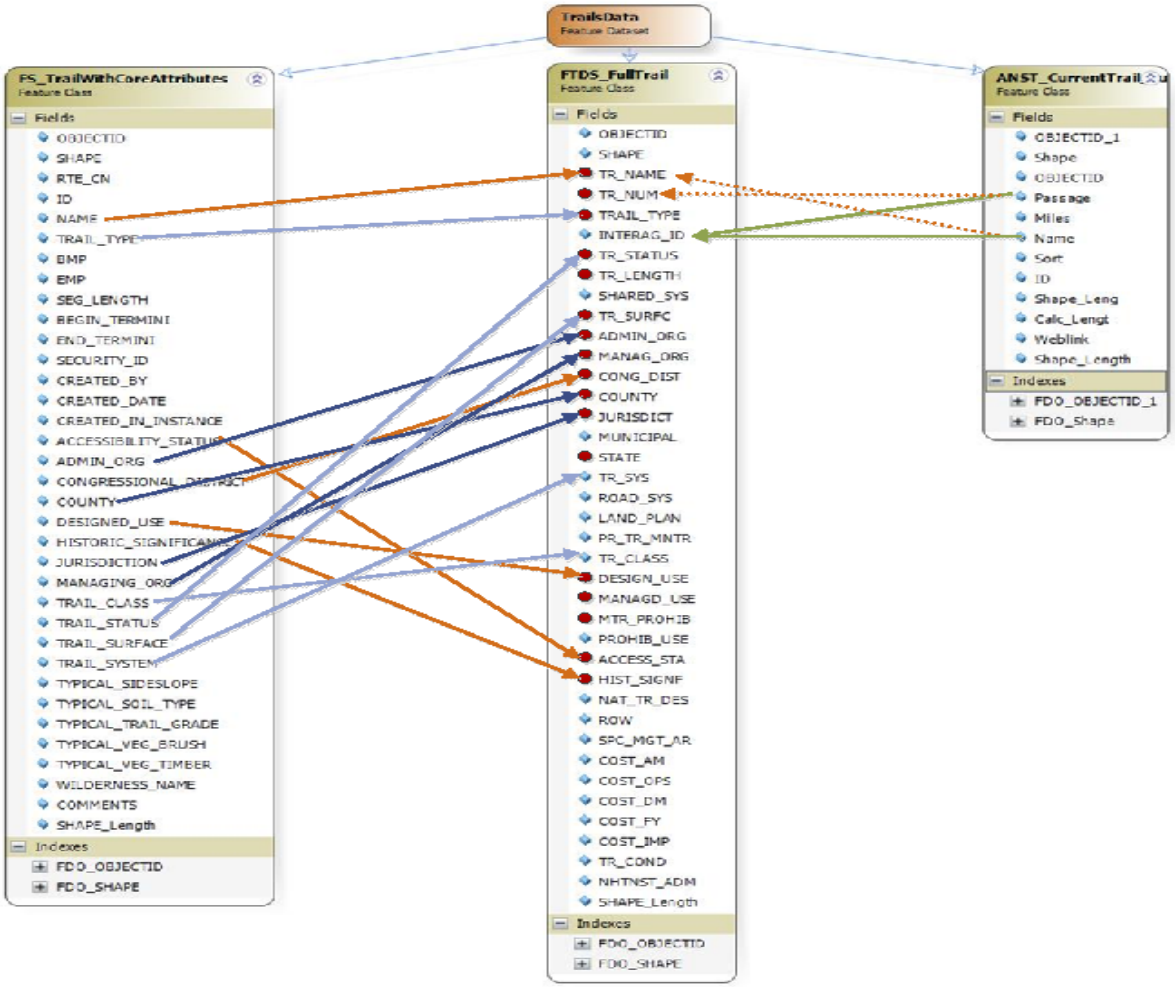
This diagram shows the trail attribute linkage between the Forest Service Trails spatial data, the Federal Trails geodatabase schema, and the Arizona National Scenic Trail spatial data.

The Forest Service trail data was linked to core attributes using the Geospatial Interface tool. The tool pulls core attributes from Infra, links them to the spatial Trails data layer, and exports a new spatial dataset. As a result of this transformation, not all trails attributes are shown as would be seen in the Region 3 Data Dictionary Guide. However, more attributes are available to crosswalk to the Federal Trails data schema.

The Federal Trails geodatabase schema was created from the Federal Trail Data Standards document, FGDC Document Number FGDC-STD-017-2011. Attributes were created according to the document, with assumptions made in line with other attributes if no information was available.

The Arizona National Scenic Trail was obtained from Region 3's Collaboration ANST folder on the T drive. This data is originally sourced from the Arizona Trails Association.

This diagram is to be used for purposes of planning only.



Arizona National Scenic Trail Geodatabase Findings and Recommendations

ESRI Database Services

Prepared by: Matt Keeling
Last Modification Date: 12/19/2017

Table of Contents

Change History		
Date	**Description**	**Person Responsible**
11/13/2017	Initial Draft Issue	Matt Keeling
12/8/2017	Second Draft Issue	Matt Keeling
12/17/2017	Third Draft Issue	Matt Keeling
12/19/2017	Final Issue	

This project has been requested by the USDA Forest Service Southwestern Region - Laura White, Arizona National Scenic Trail Administrator, Dennis Garcia, Recreation Data Management Specialist and Candace Bogart, Regional GIS Coordinator

Challenges: How is national trail data shared?

How is national trail data shared?

- Federal & State agencies maintain their own disparate information about the trail - geography and attributes
- No methodology to exchange data
- Multiple versions and content for national trails – who has authoritative version?
- Multiple publishers
- Trails are segmented differently

Feature Service Requirements

- Enterprise Geodatabase – based on National Trail Data standards
  - Registered as versioned
- ArcGIS Server – creates feature services based on versioned data.
  - Must allow connections from outside the organization
- ArcGIS Online – grants access to the feature services
- Each partner agency edits a version of the AZNST alignment
- Other agencies may need ETL to be transferred into a version of AZNST

Steps to Public Trail – on the ground and in the cloud

- Developed a geodatabase schema based on FGDC Trail Standards
- Populated the schema with the best geography of entire trail location in a feature class. (FS Data uploaded from SDE Forest Library)
- *Proposed: Built a feature service on the edit version*
- *Serve the edit version to designated partners through AGOL*
- *Partners have full edit capability to edit trail locations*

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Develop process for AZNST Review and Comment

Worked with ESRI to develop methodology for trail updates

- Using Versioned Feature service

Data steward can check edits and promote to authoritative Access controlled through AGOL

Each editor uses an AGOL account

All agencies receive same copy of data

Edit versions are vetted through governance AZTrail Board

User Types for Workflow

- ArcGIS Online Account Manager – which AGOL users have access to edit version of trail, create AGOL accounts for users that require them
- Data Steward – only ones capable of reconciling and posting data from multiple editing versions.
  - Promote data into authoritative AZNST alignment.
  - Updates go through governance process
- Feature Service Publisher – Publishes a new version of the data
- Editor – members of partners that can send AZNST alignment edits to FS R3.
- Viewer – Anyone who can view or download the data including the public

How do we exchange data and update our trail?

Workflow through AGOL Feature services

- Looking for ways partners can submit new or revised alignments
- Could be multiple data formats – GPS, shapefile, version
- Entire geography served based on NTDS
- Governance and approval done through data stewards and Board
- Standardized workflow - promoting edits to authoritative data
- Roles determined by workflow – access level

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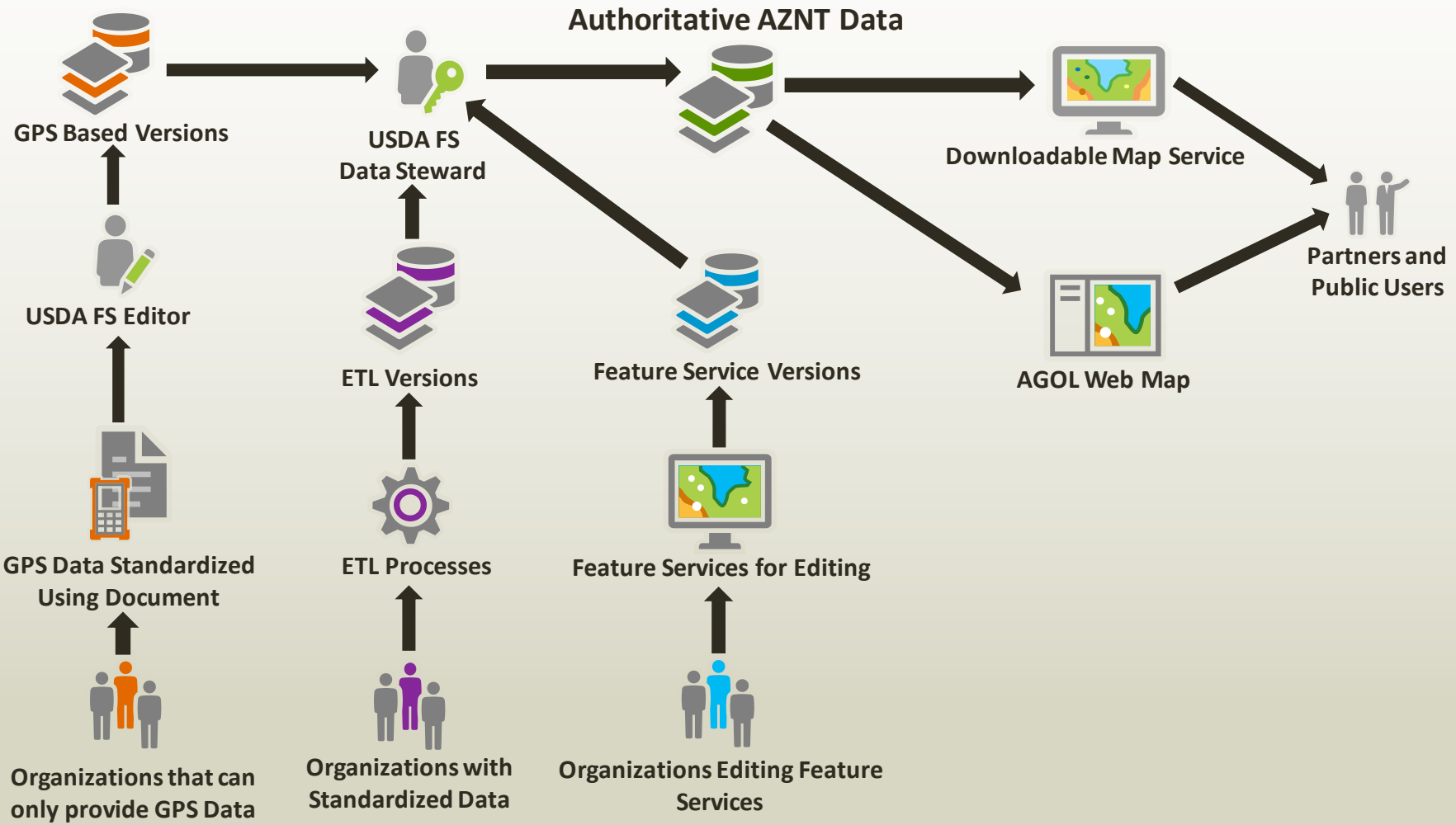
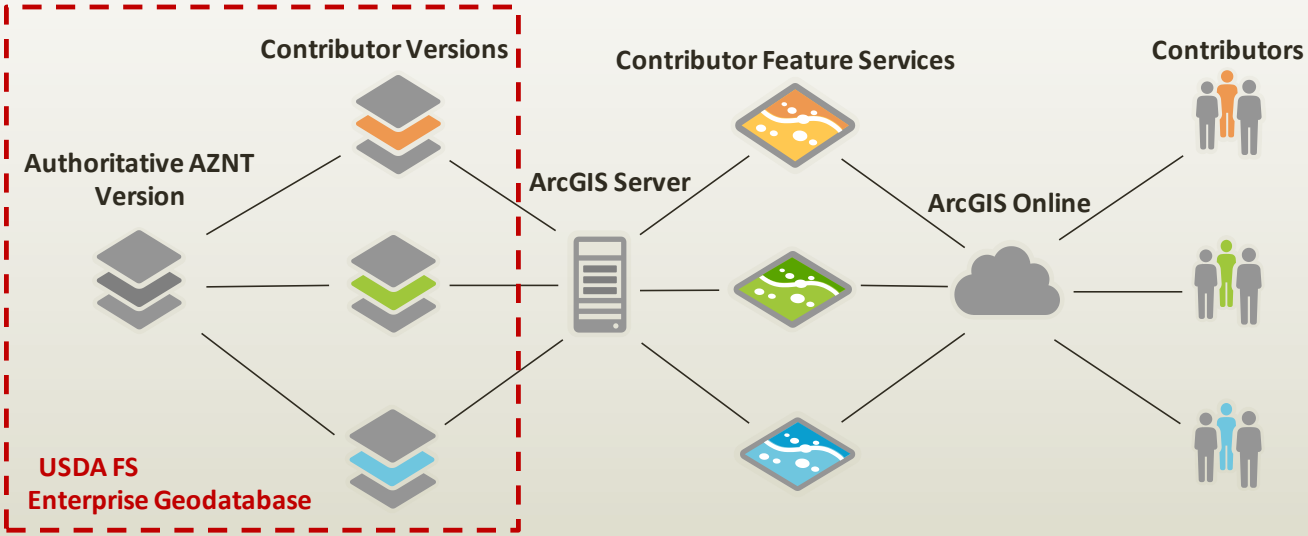

Authoritative AZNT Data
GPS Based Versions
USDA FS
Data Steward
Downloadable Map Service
Partners and
Public Users
USDA FS Editor
ETL Versions
Feature Service Versions
AGOL Web Map
GPS Data Standardized
Using Document
ETL Processes
Feature Services for Editing
Organizations that can
only provide GPS Data
Organizations with
Standardized Data
Organizations Editing Feature
Services


Contributor Versions
Contributor Feature Services
Contributors
Authoritative AZNT Version
ArcGIS Server
ArcGIS Online
USDA FS
Enterprise Geodatabase

Arizona National Scenic Trail Feature Service Findings and Recommendations

ESRI Database Services

Prepared by: Matt Keeling
Last Modification Date: 1/04/2018

Table of Contents

Change History		
Date	**Description**	**Person Responsible**
12/17/2017	Initial Draft Issue	Matt Keeling
12/28/2017	Second Draft Issue	Matt Keeling
01/04/2017	Final Issue	Matt Keeling

This project has been requested by the USDA Forest Service Southwestern Region - Laura White, Arizona National Scenic Trail Administrator, Dennis Garcia, Recreation Data Management Specialist and Candace Bogart, Regional GIS Coordinator

Conclusion

How we are doing

- Working with our national and regional groups to implement
- Permission for editors in USDA FS R3 Enterprise geodatabase. (eAuththentication)
- Collecting a viable complete trail location
- Implementing FS trail portions into national database

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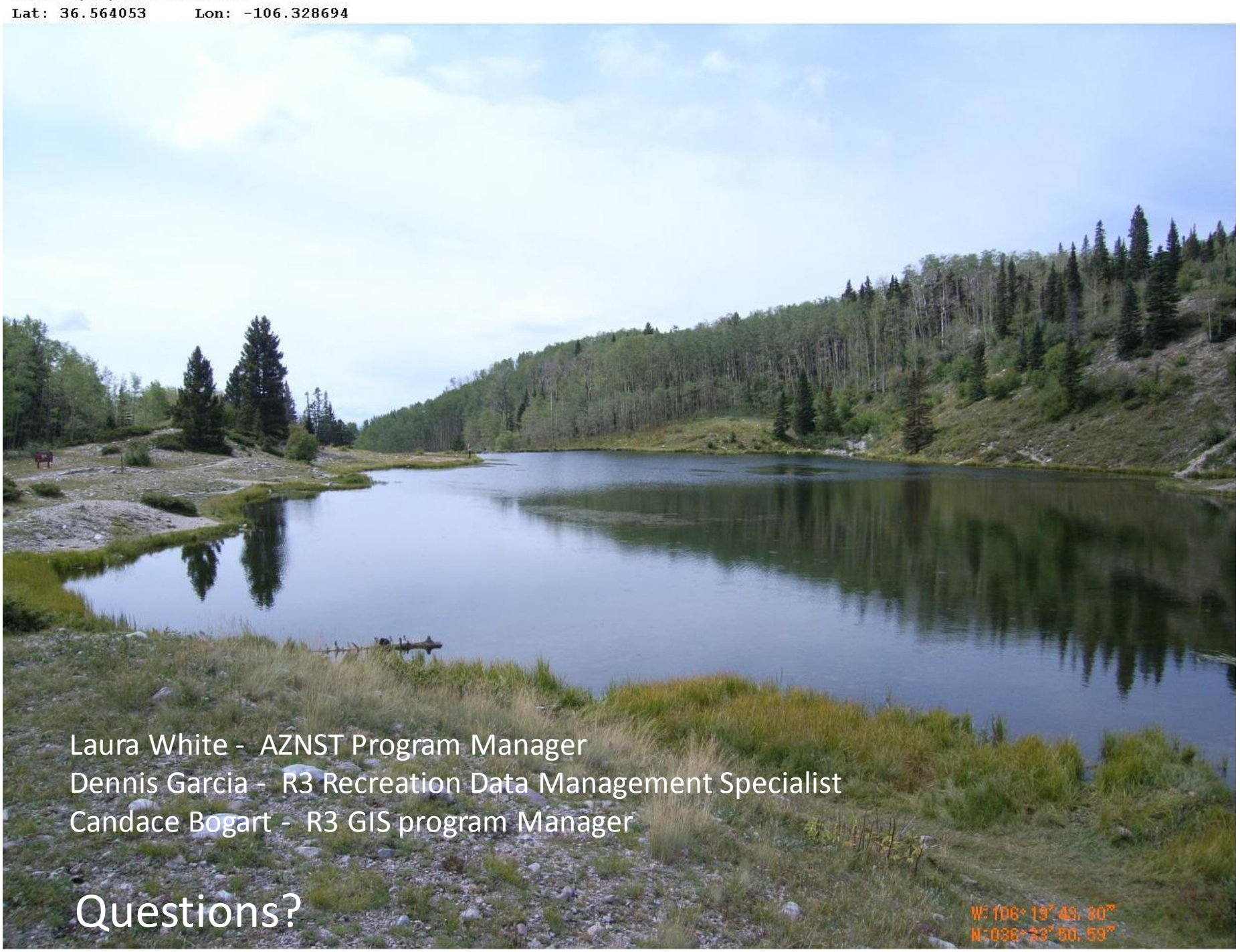
Lat: 36.564053 Lon: -106.328694
Laura White - AZNST Program Manager
Dennis Garcia - R3 Recreation Data Management Specialist
Candace Bogart - R3 GIS program Manager
Questions?
W:106°19'49.80"
N:036°33'50.59"