



**National Wetlands Inventory:
A Program Ahead
of It's Time**

GeoSpatialServices



The Evolution of NWI Mapping
and How It Has Changed
Since Inception



Some Basic NWI Facts:

- Established in 1974
- Goal to create database on characteristics and extent of U.S. wetlands
 - Maps & Statistics
- In 1979, initiated national wetland trends study
- By 2013, produced digital wetland data for almost 100% of lower 48 states and over 40% of Alaska
- Five national trends reports produced to date
- National wetland geodatabase one of the largest spatial datasets in the world

Comprehensive Classification System

Classification of Wetlands and Deepwater Habitats of the United States



NWI wetland delineation and classification is completed using one of the most comprehensive, scientifically based, recognized systems in the world.

By

Lewis M. Cowardin¹, Virginia Carter², Francis C. Golet³, and Edward T. LaRoe⁴

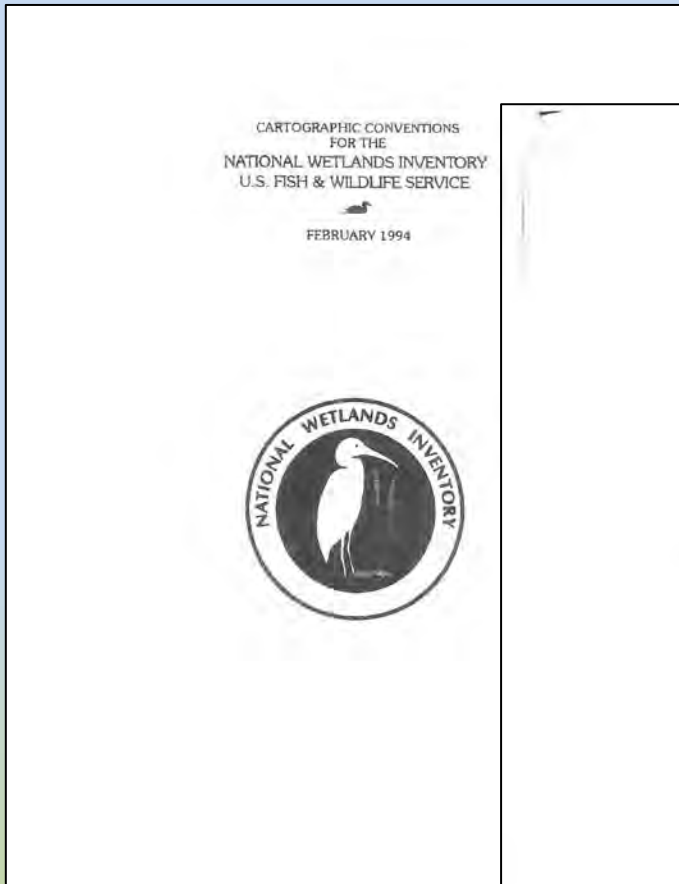
U.S. Department of the Interior

Fish and Wildlife Service

Office of Biological Services

Washington, D.C. 20240

Supported by Rigorous Conventions



Cartographic

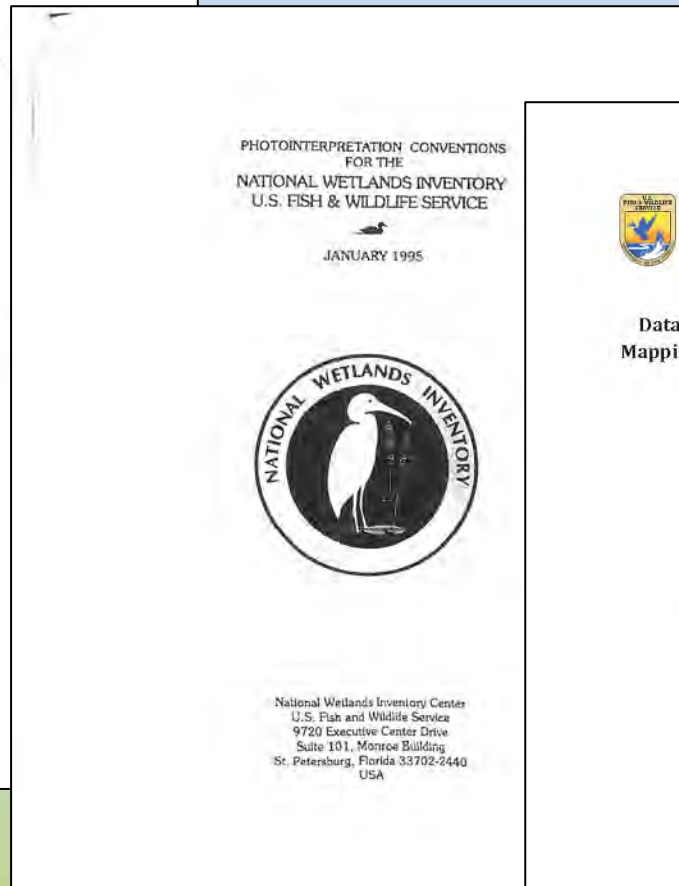
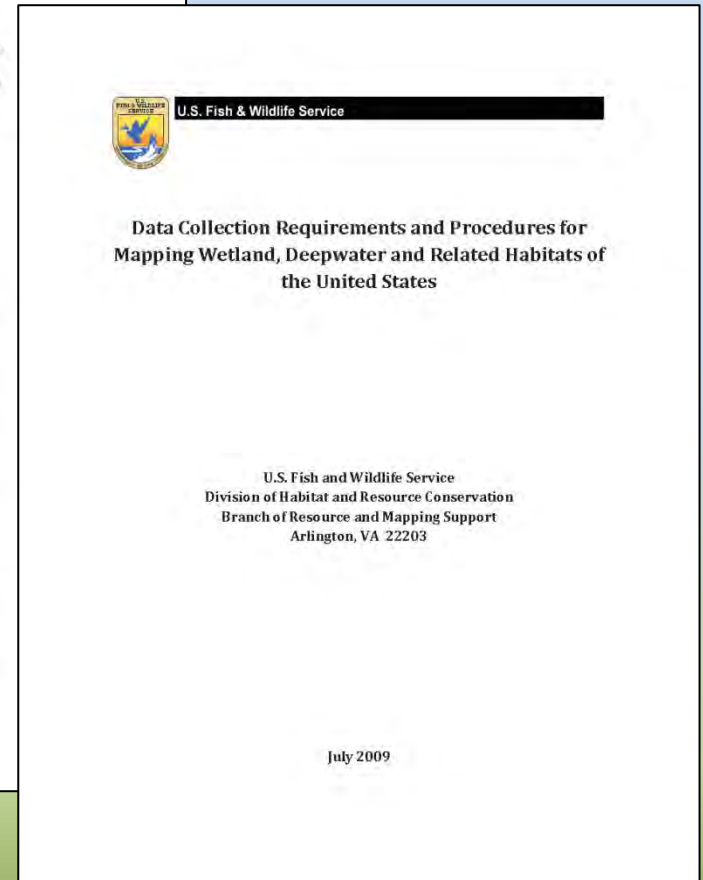


Photo Interpretive

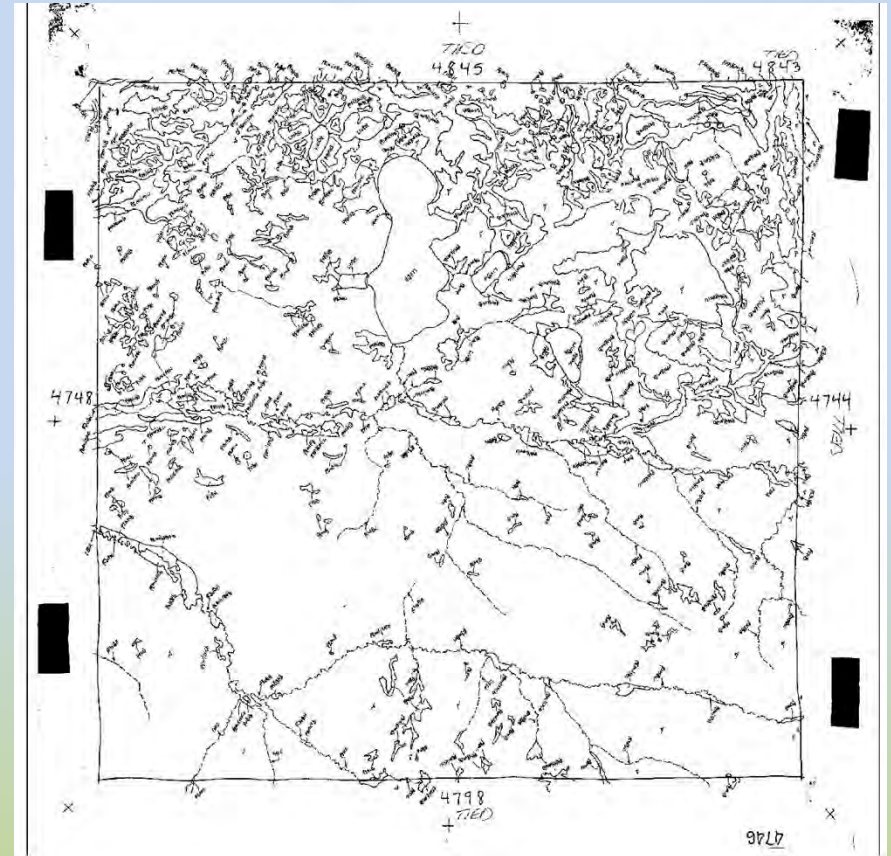
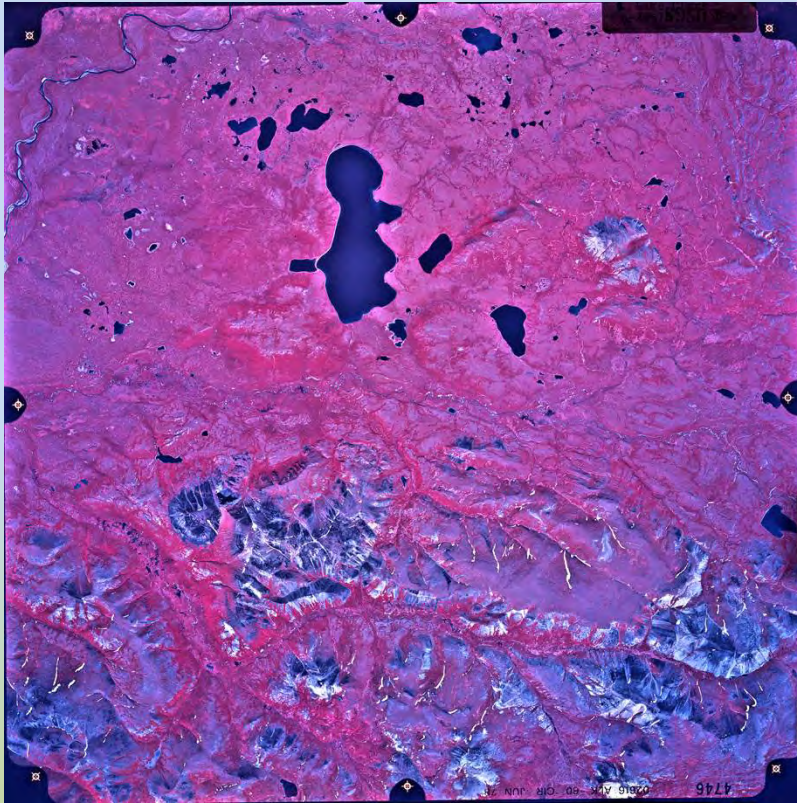


Digital Data Collection

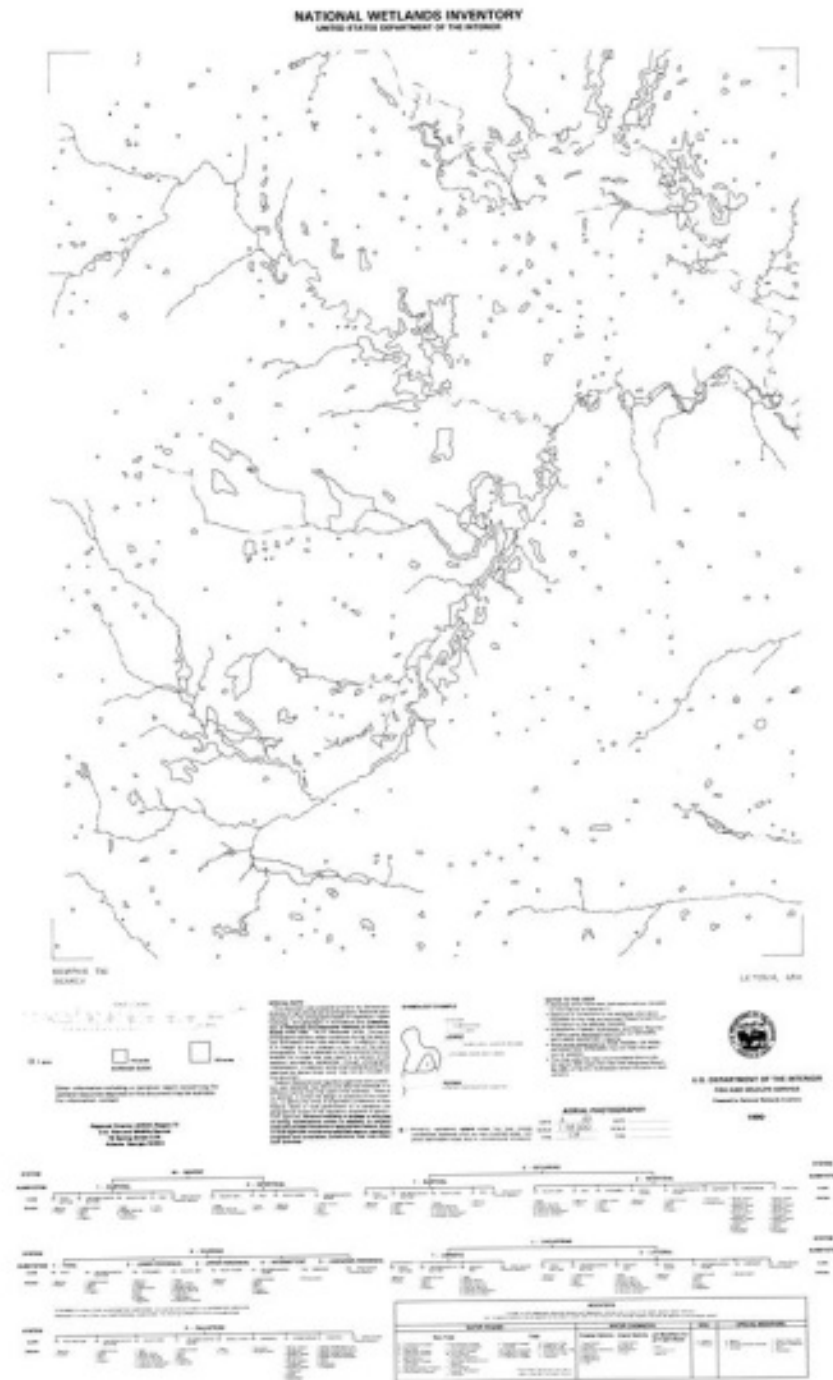
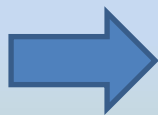
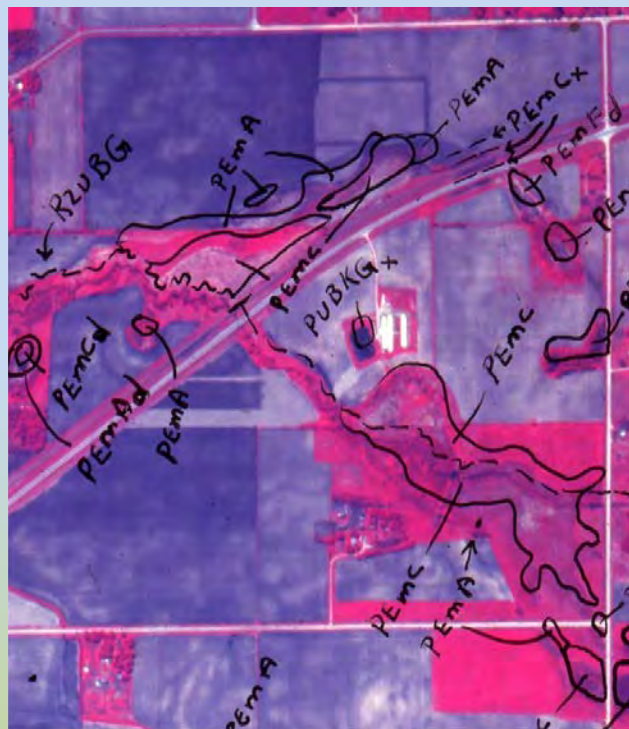
Traditional Mapping Processes



Traditional Mapping Processes



Traditional Final Product



User Comments

Current perceptions about the quality of existing NWI data:

“Wetlands were well mapped using available technology but are out of date”

“Good data, but does not match more recent imagery”

“It’s OK as a reconnaissance level data set..”

“Works at the landscape level but not appropriate for site level decisions”

“Well, it is better than nothing”

So What Has Changed?

The screenshot displays the ArcMap interface for a project named 'Jemez_NW_Update.mxd'. The map shows a topographic view of a region with various wetland features overlaid. A specific polygon is highlighted in cyan, and an 'Identify' window is open, providing details for that feature.

Identify Window Data:

Field	Value
OBJECTID	5226
SHAPE	Polygon
ATTRIBUTE	PEM IB
SHAPE_Length	3238.992596
SHAPE_Area	344322.176493
Riparian	<null>
Checksite_Number	<null>
LLWW	TEMSLOUhw
DMR	<null>
EcoRegion_41	21h Volcanic Mid_Elevation Forests
EcoRegion_42	21g Volcanic Subalpine Forests
HUC8_Name1	13020102 Rio Chama, Colorado, New Mexico
HUC8_Name2	<null>

Map Layers (Left Panel):

- Photos
- Jemez_May2013_Checksites
- NWI Check Sites
- Cold_Fish
- CarsonNF_Springs_20120315
- Lineries**
- CONUS_wet_linear
- CONVEYANCE
- Wetland Lineries
- GPS Routes
- NWI_Lineries
- LLWW_Lineries
- Polygons**
- Wetland Polygons
- Quads4_CRB_Jemez
- LLWW_Polygons
- NWI_Polygons
- Santa_Fe_Quads**
- Conus_wet_poly_Additional
- Conus_wet_poly
- Jemez_Riparian
- 2012_aq_aquatic_life
- coldwater_streams
- Check_Sites_Routes

NWI Today

So What Has Changed?

- GIS based spatial data
- Being produced in a fully digital environment
- Using a combination of traditional image interpretation augmented by new digital tools
- Supported by robust collateral datasets
- Validated by pre and post mapping field data
- Prepared to rigorous national data standards

So What Has Changed?

Some of the improvements that we will look at:

1. Level of mapping detail in new NWI
2. Incorporation of robust collateral data sources
3. Utility of new classification methodologies
4. New decision support tools
5. Additional descriptive attributes assigned to wetlands

Level of Mapping Detail

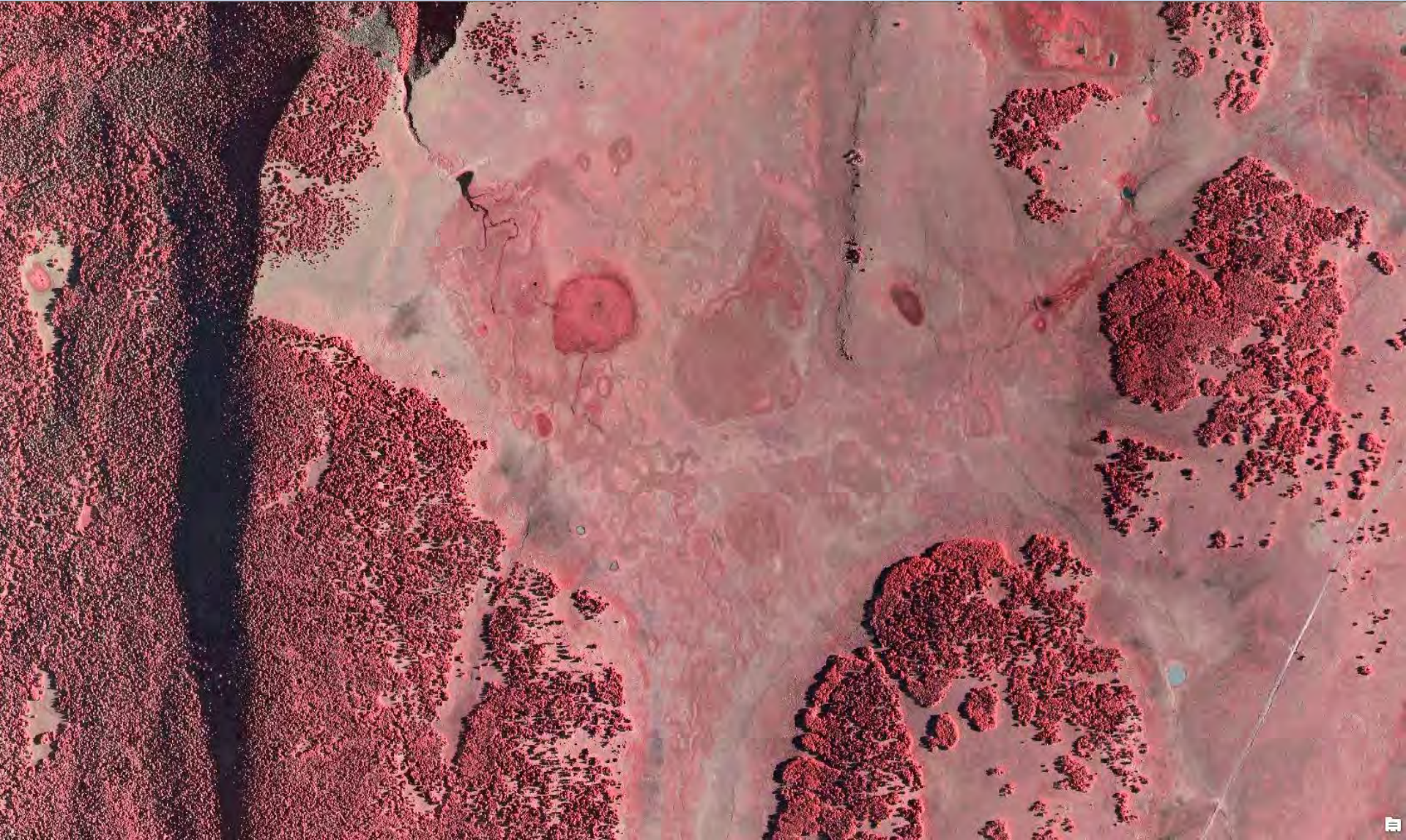
FGDC National Wetland Mapping Standard:

- Mapping (data capture) at scale of 1:12,000
- Wetlands to one ½ acre in size
- Feature accuracy wetland vs. upland: 98%
- Classification accuracy: 85%
- Spatial resolution of source imagery: 1 meter
- Horizontal accuracy: +/- 5 meters

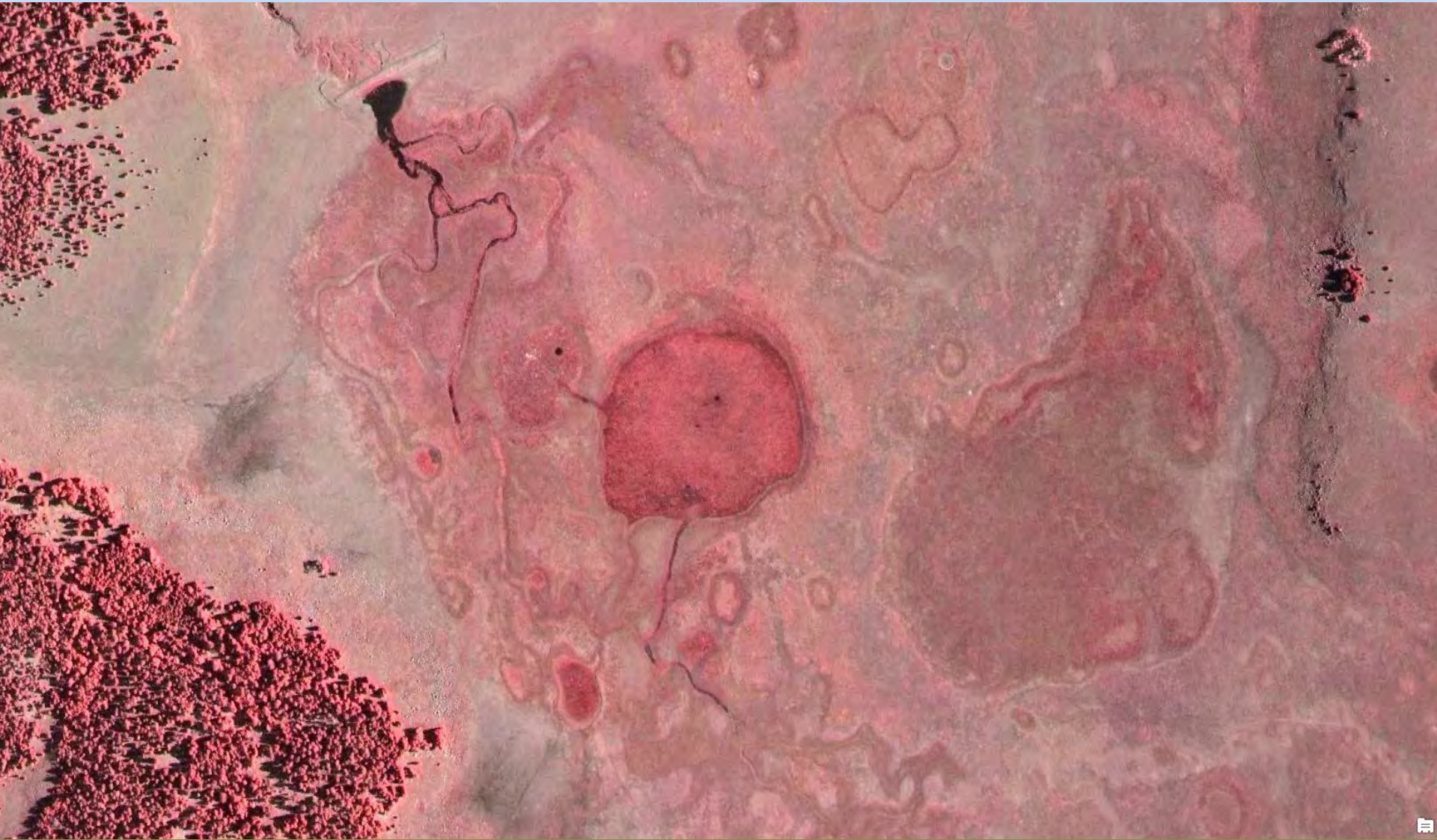
Original Delineation Scale 1:65,000



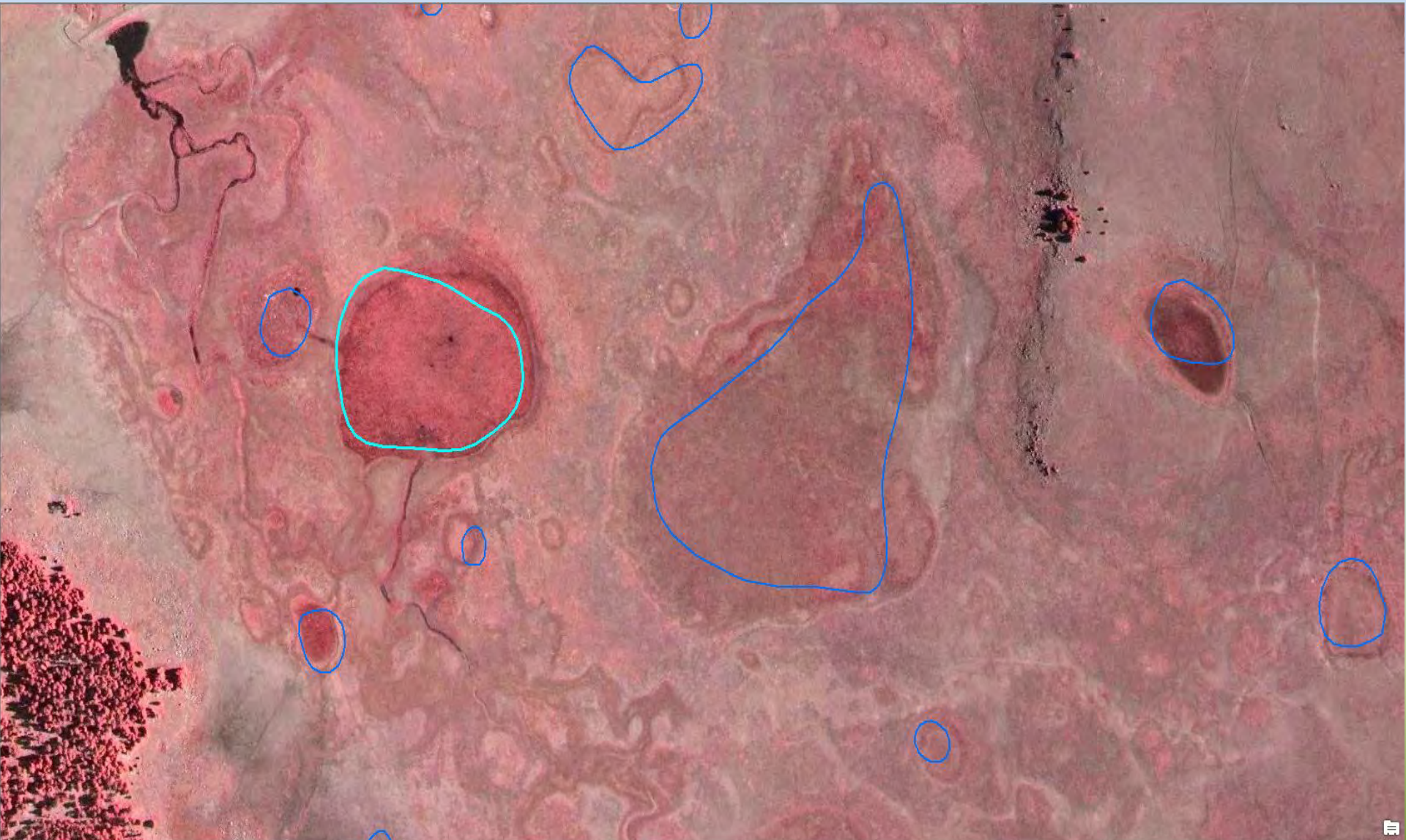
FGDC Scale – 1:12,000



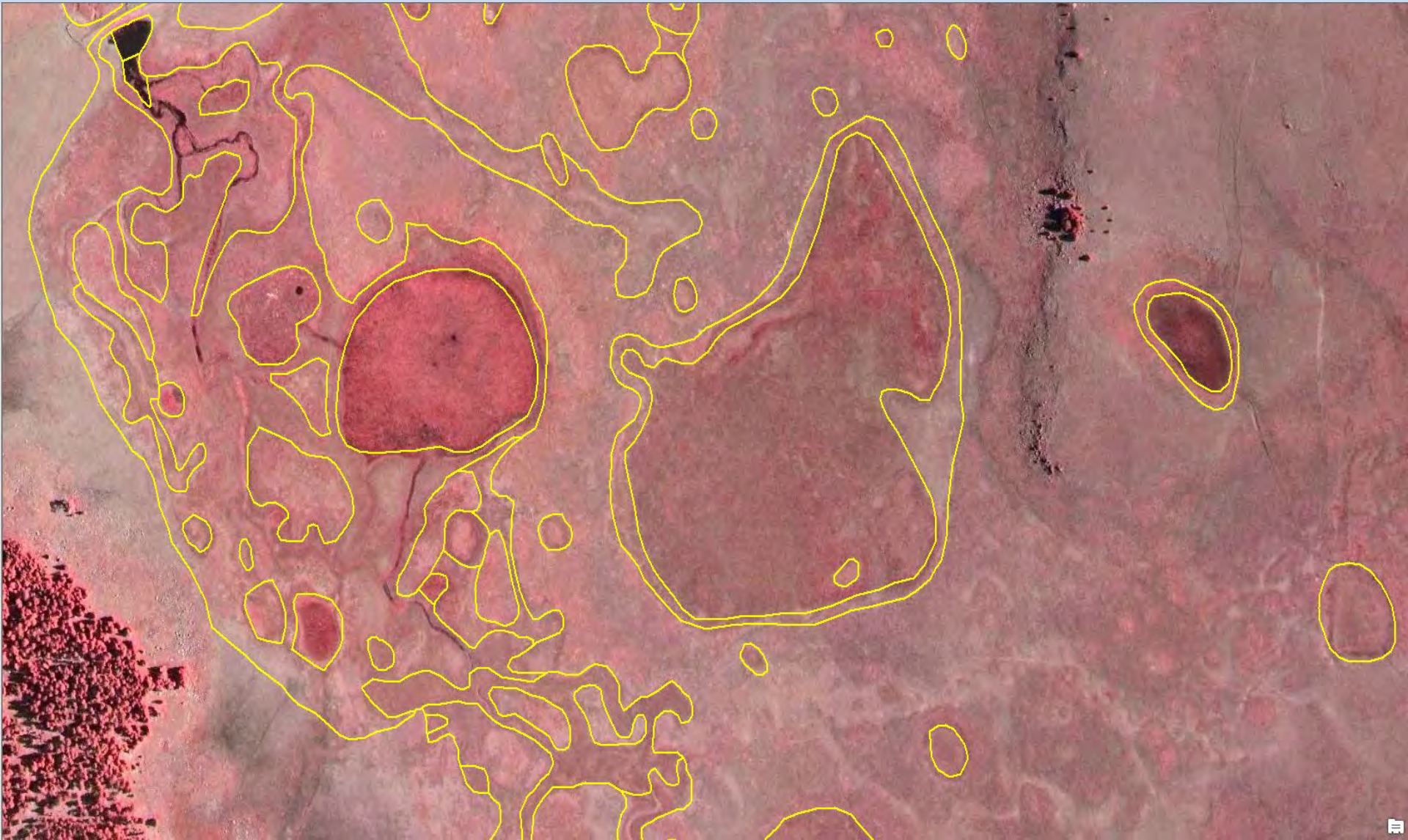
Actual Delineation Scale 1:5,000



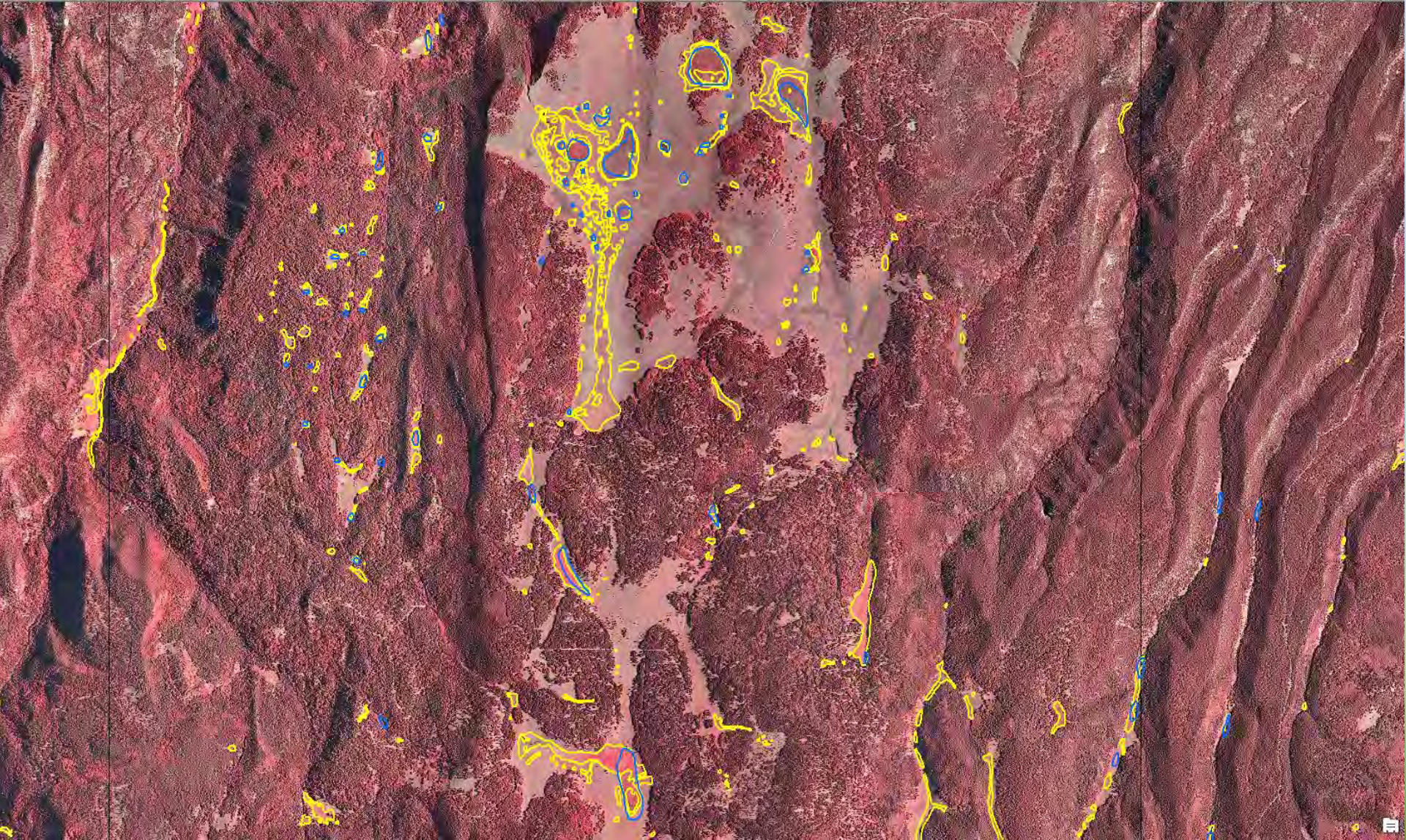
Original 1984 NWI Mapping



2014 NWI Mapping



Overview – Old vs. New

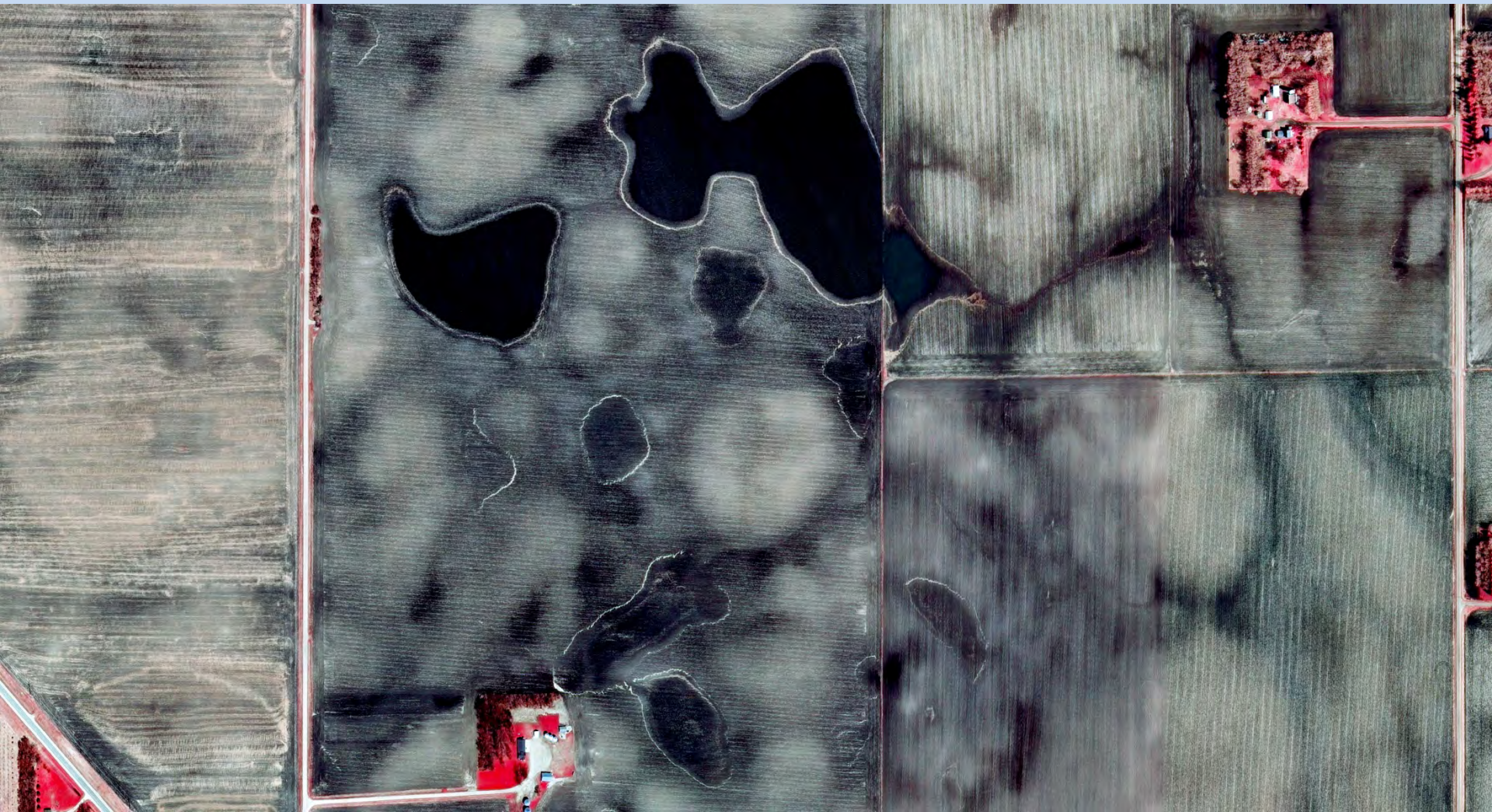


Validation Field Work



Availability of Collateral Data

MN NWI Update



Availability of Collateral Data

MN NWI Update



Availability of Collateral Data

MN NWI Update



Availability of Collateral Data

MN NWI Update



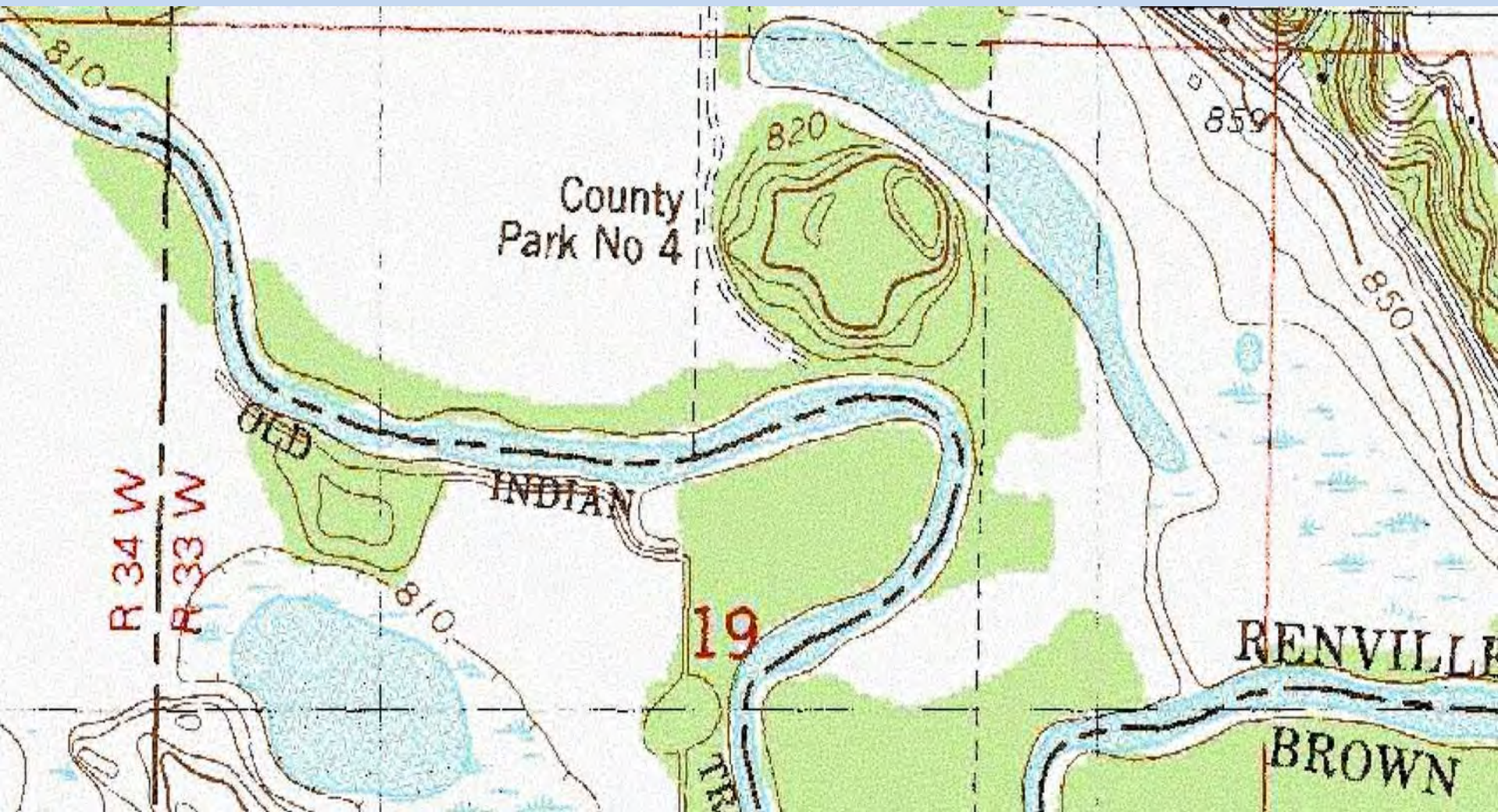
Availability of Collateral Data

MN NWI Update



Availability of Collateral Data

MN NWI Update



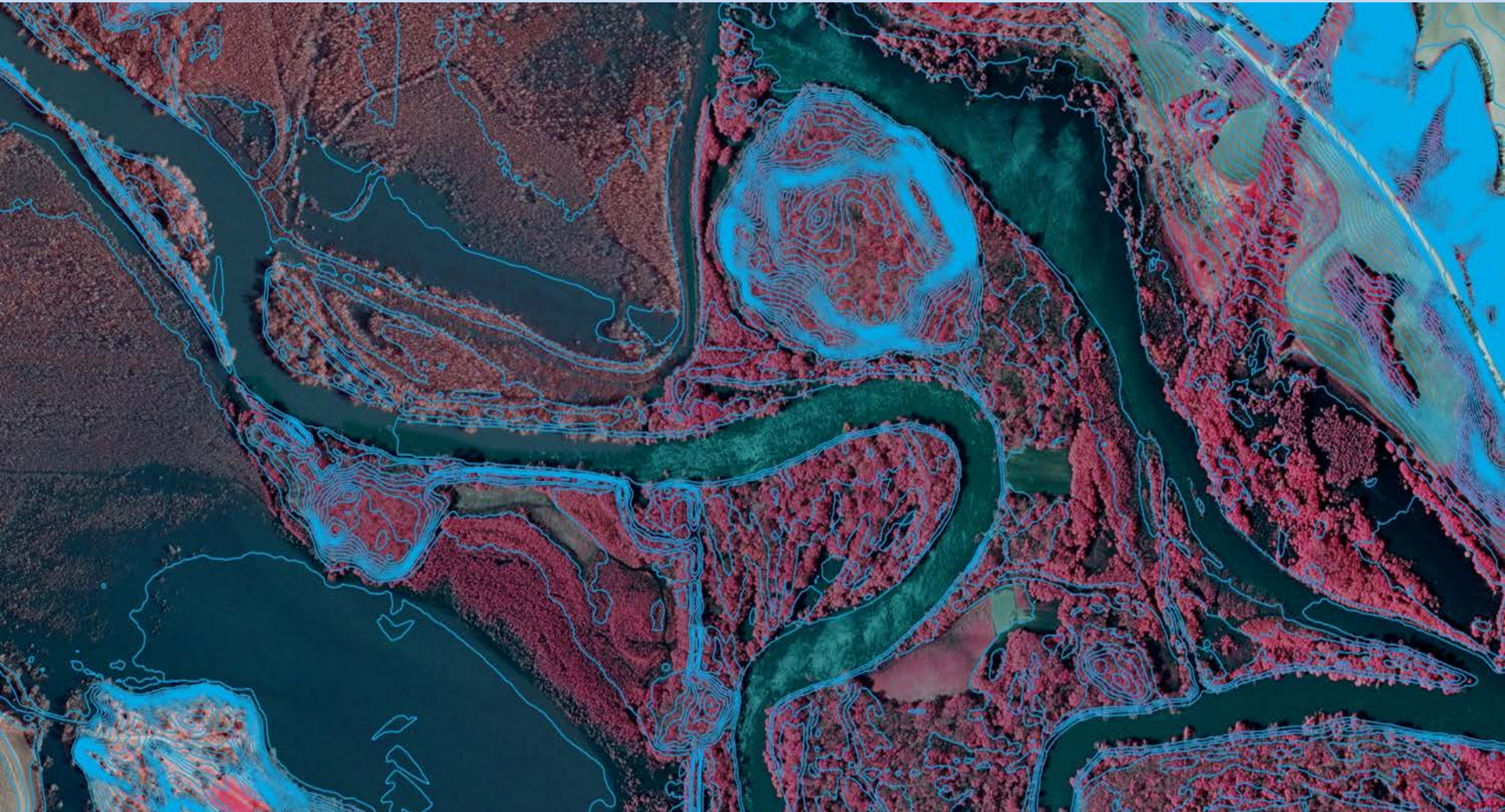
Availability of Collateral Data

MN NWI Update



Availability of Collateral Data

MN NWI Update





Availability of
Collateral
Data:
New Mexico
NWI Update

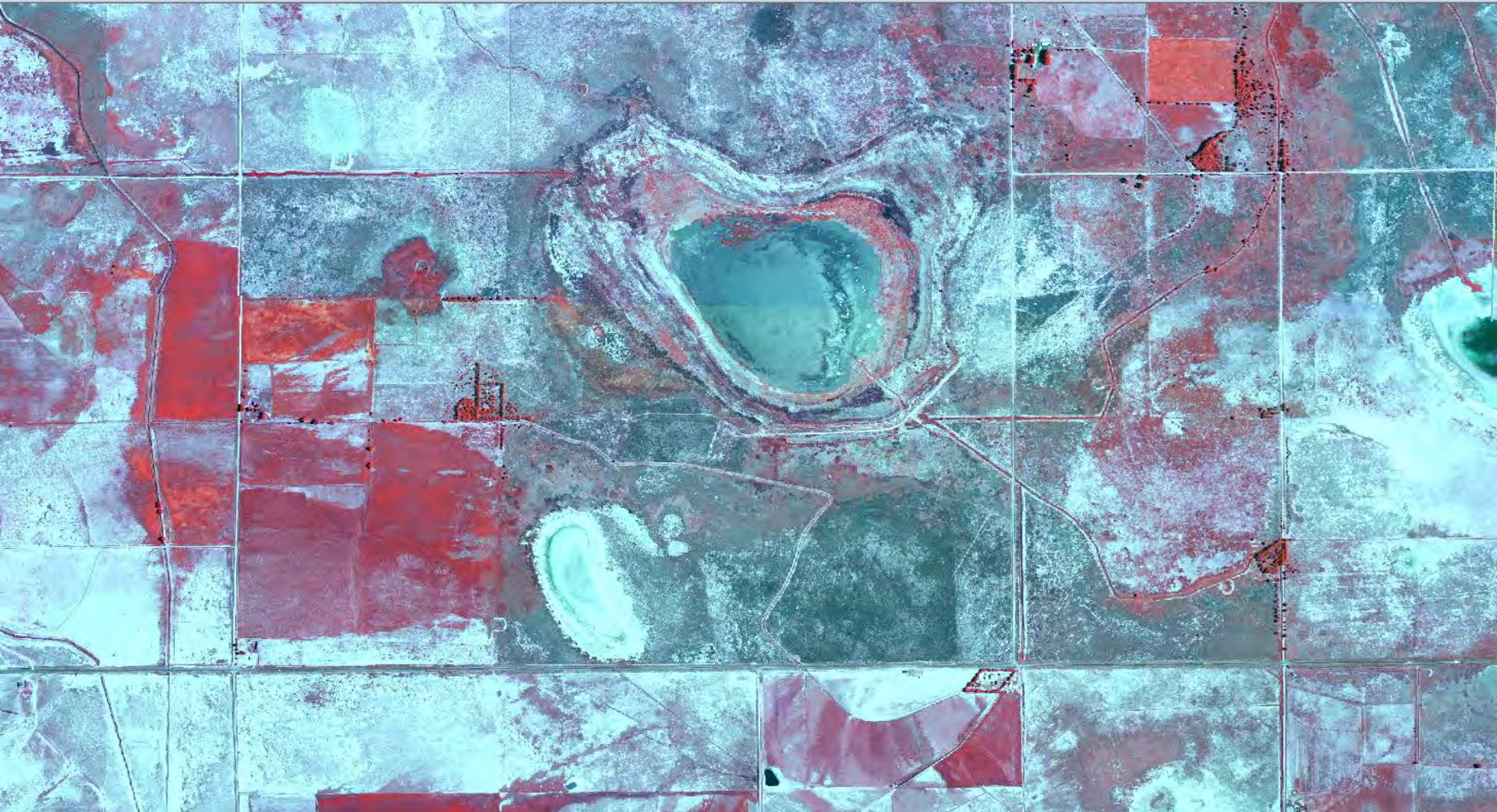
Availability of Collateral Data

New Mexico NWI Update



Availability of Collateral Data

New Mexico NWI Update



Availability of Collateral Data

New Mexico NWI Update





Availability of
Collateral
Data:
New Mexico
NWI Update

Additional
Digital Tools
New Mexico
NWI



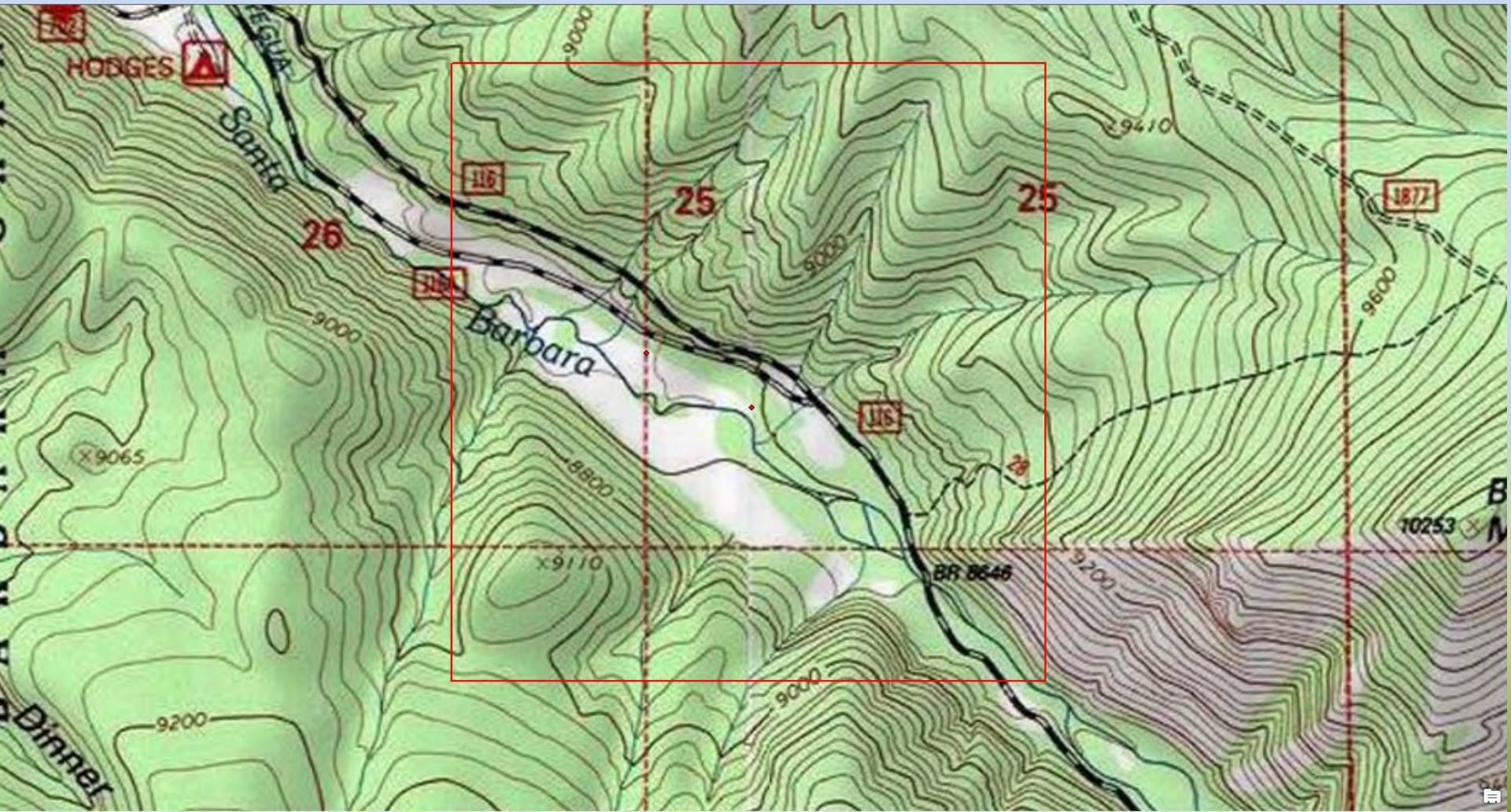
Additional Digital Tools

New Mexico NWI



Additional Digital Tools

New Mexico NWI



Additional Digital Tools

New Mexico NWI



Additional Digital Tools

New Mexico NWI

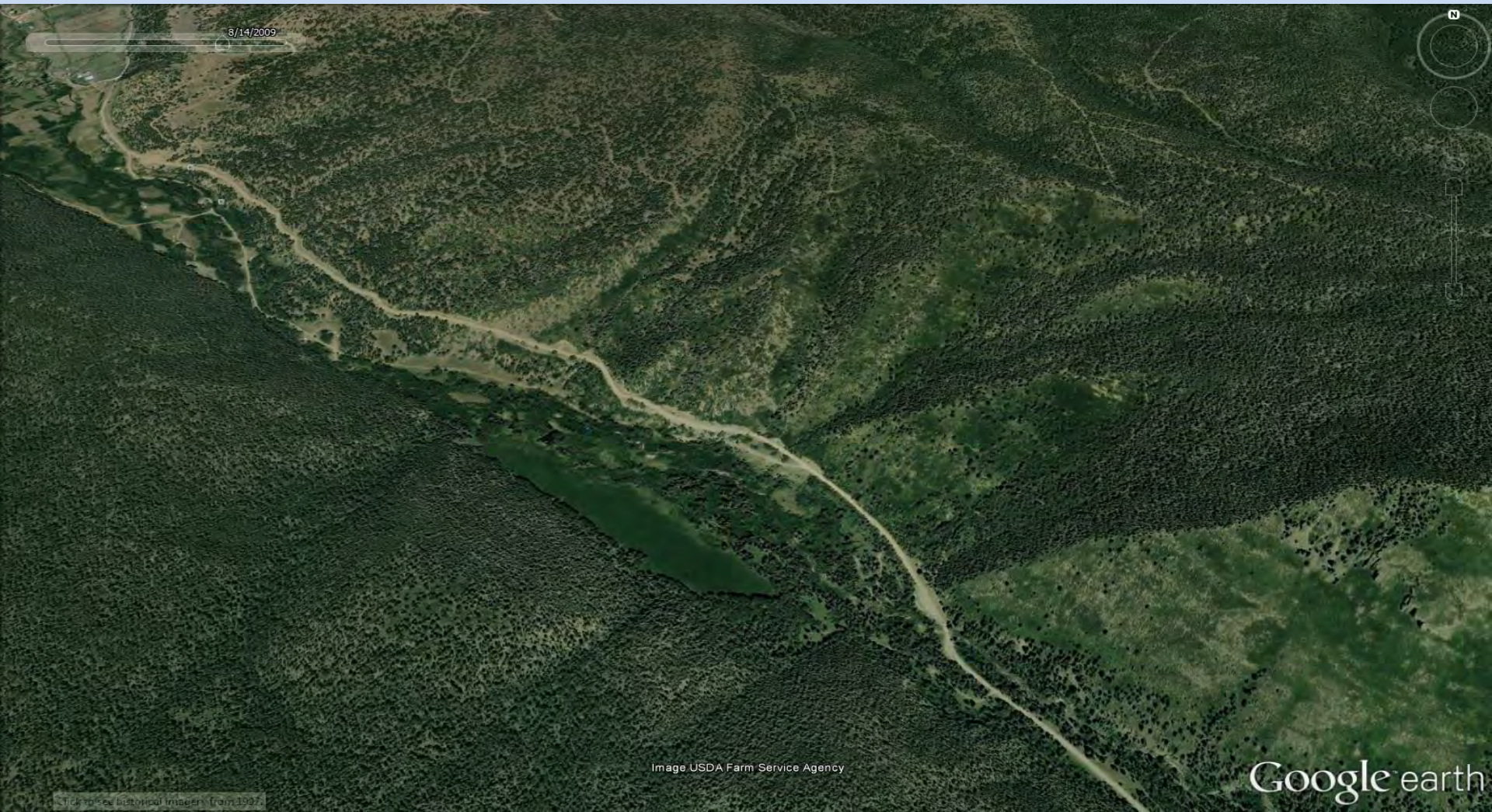


Image USDA Farm Service Agency

Google earth

Click to see historical images from 1997

Additional Digital Tools

New Mexico NWI



Additional Digital Tools

New Mexico NWI



Additional Digital Tools

New Mexico NWI



6/16/2011

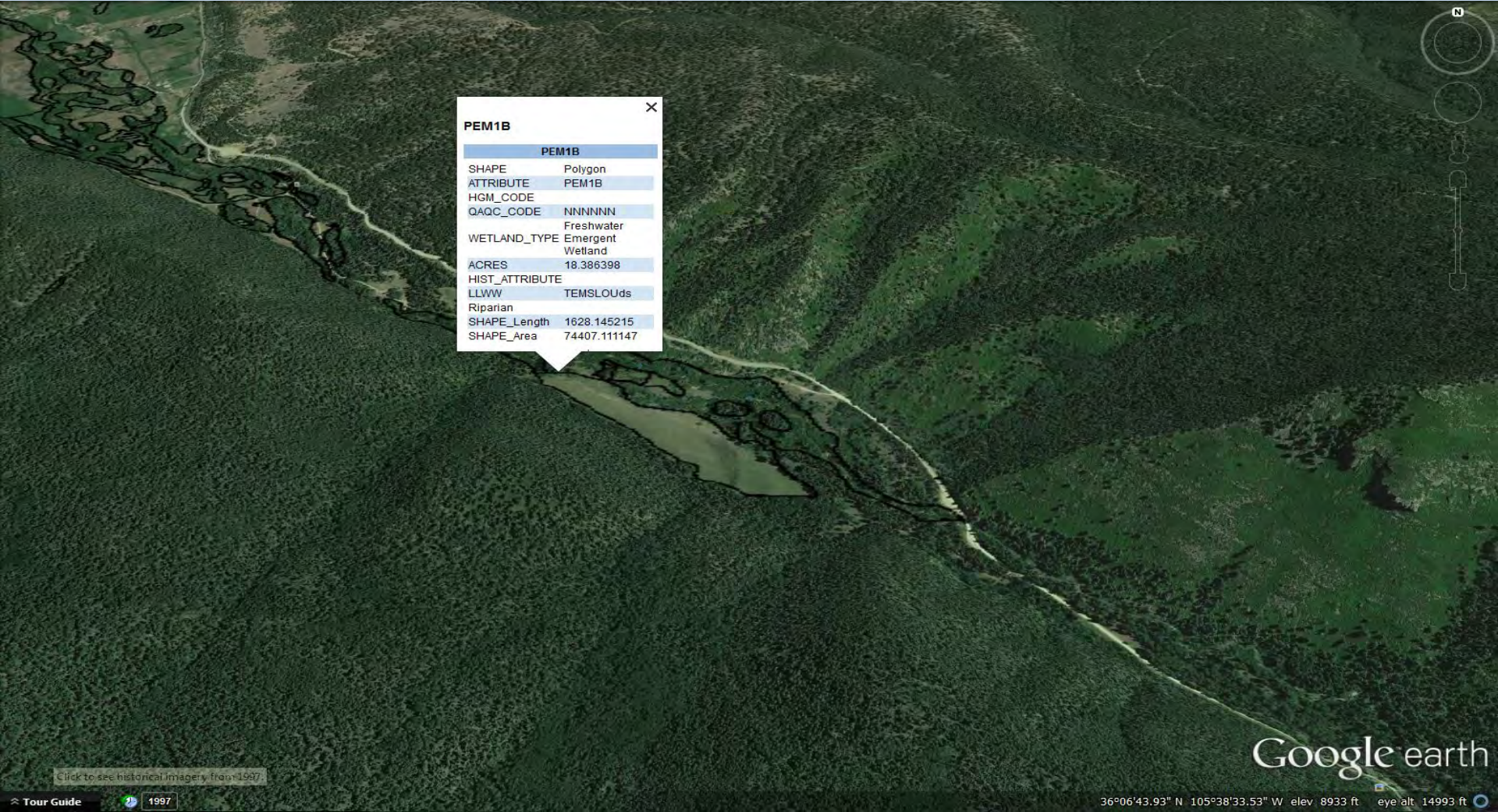
Google earth

Imagery Date: 6/16/2011 36°06'18.18" N 105°37'17.15" W elev. 8685 ft eye alt. 10440 ft

Tour Guide 1997

Additional Digital Tools

New Mexico NWI



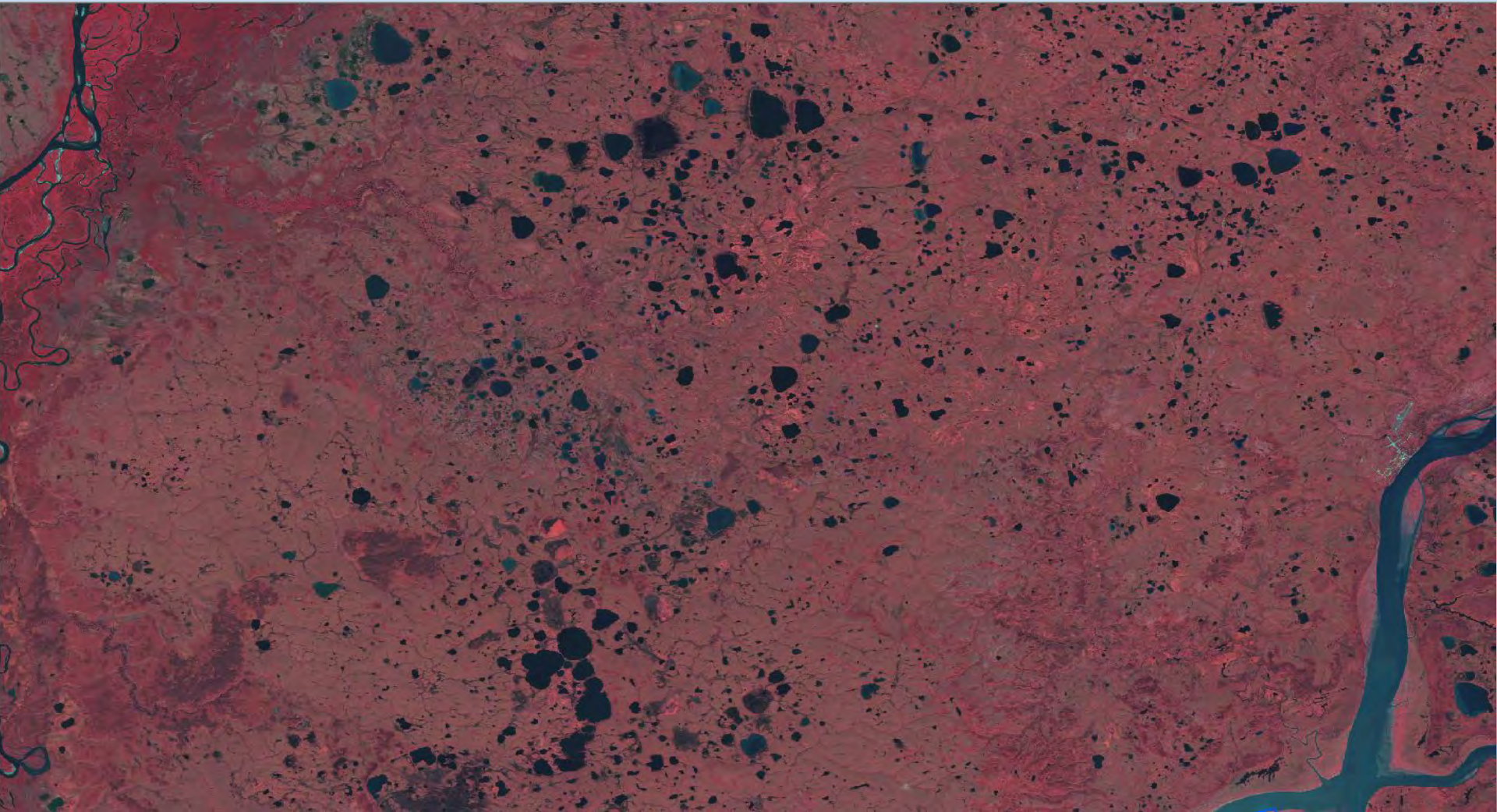
PEM1B

PEM1B	
SHAPE	Polygon
ATTRIBUTE	PEM1B
HGM_CODE	
QAQC_CODE	NNNNNN Freshwater
WETLAND_TYPE	Emergent Wetland
ACRES	18.386398
HIST_ATTRIBUTE	
LLWW	TEMSLOUds Riparian
SHAPE_Length	1628.145215
SHAPE_Area	74407.111147

Click to see historical imagery from 1997.

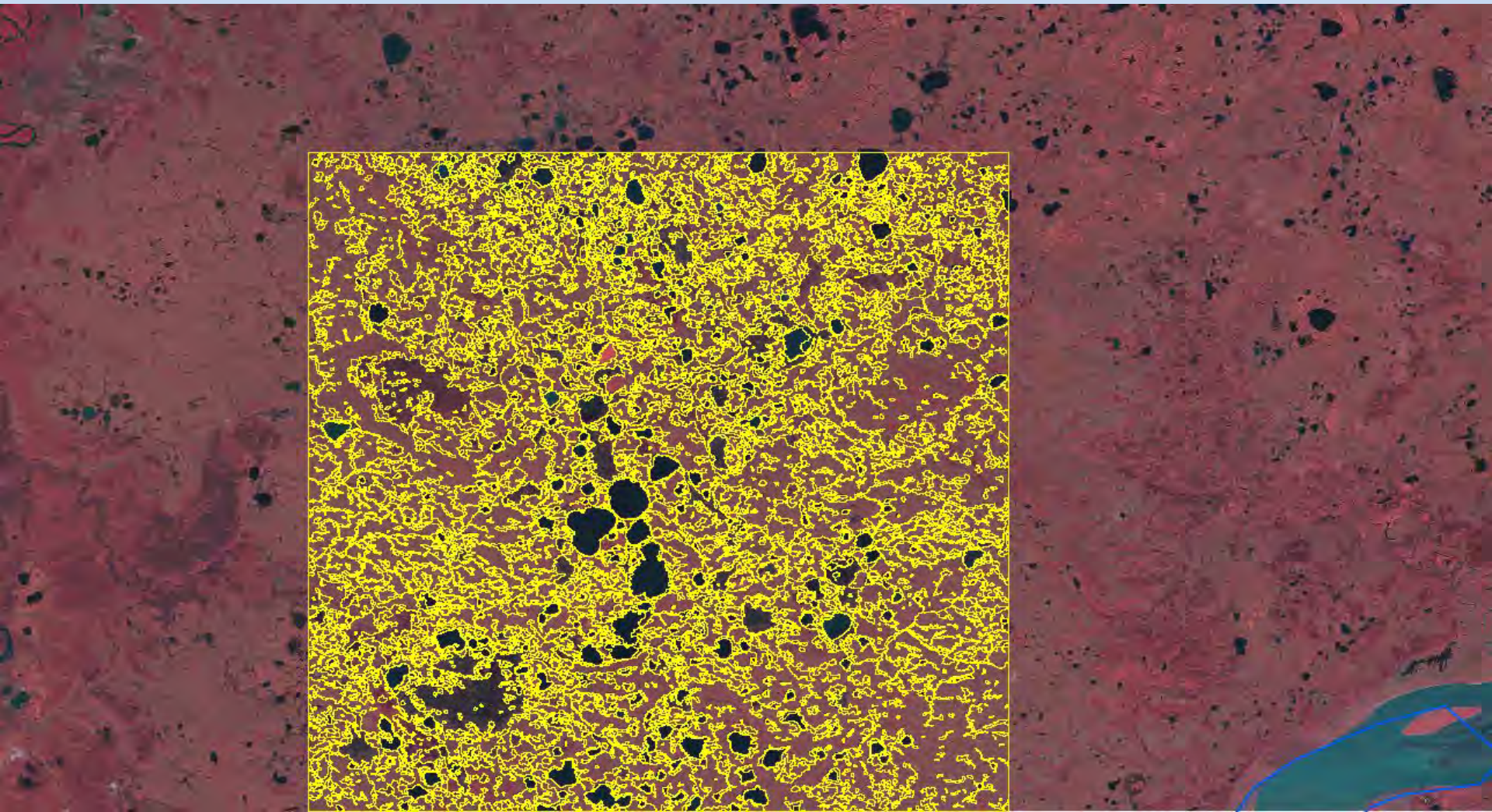
New Classification Techniques

Alaska NWI



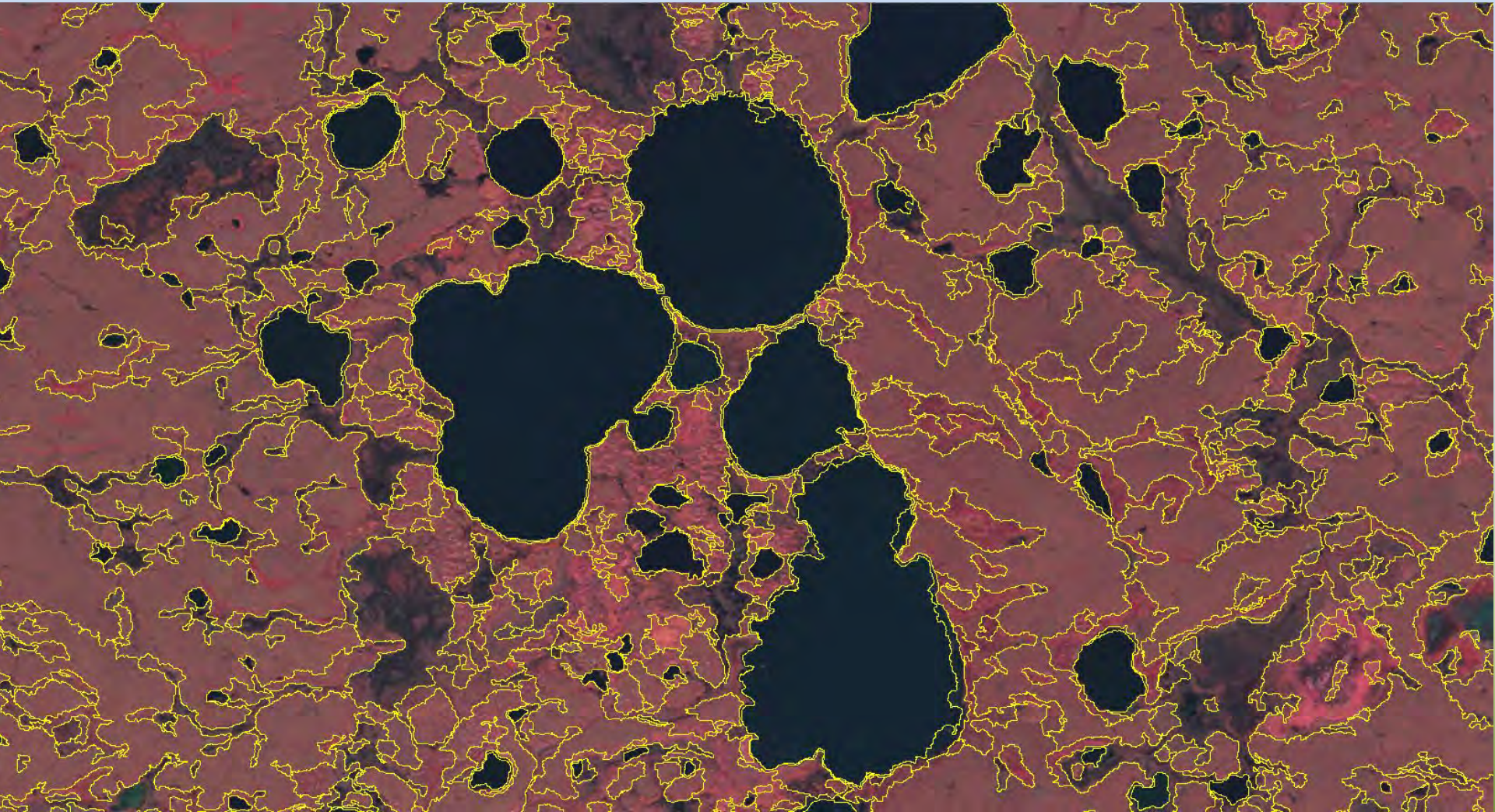
New Classification Techniques

Alaska NWI



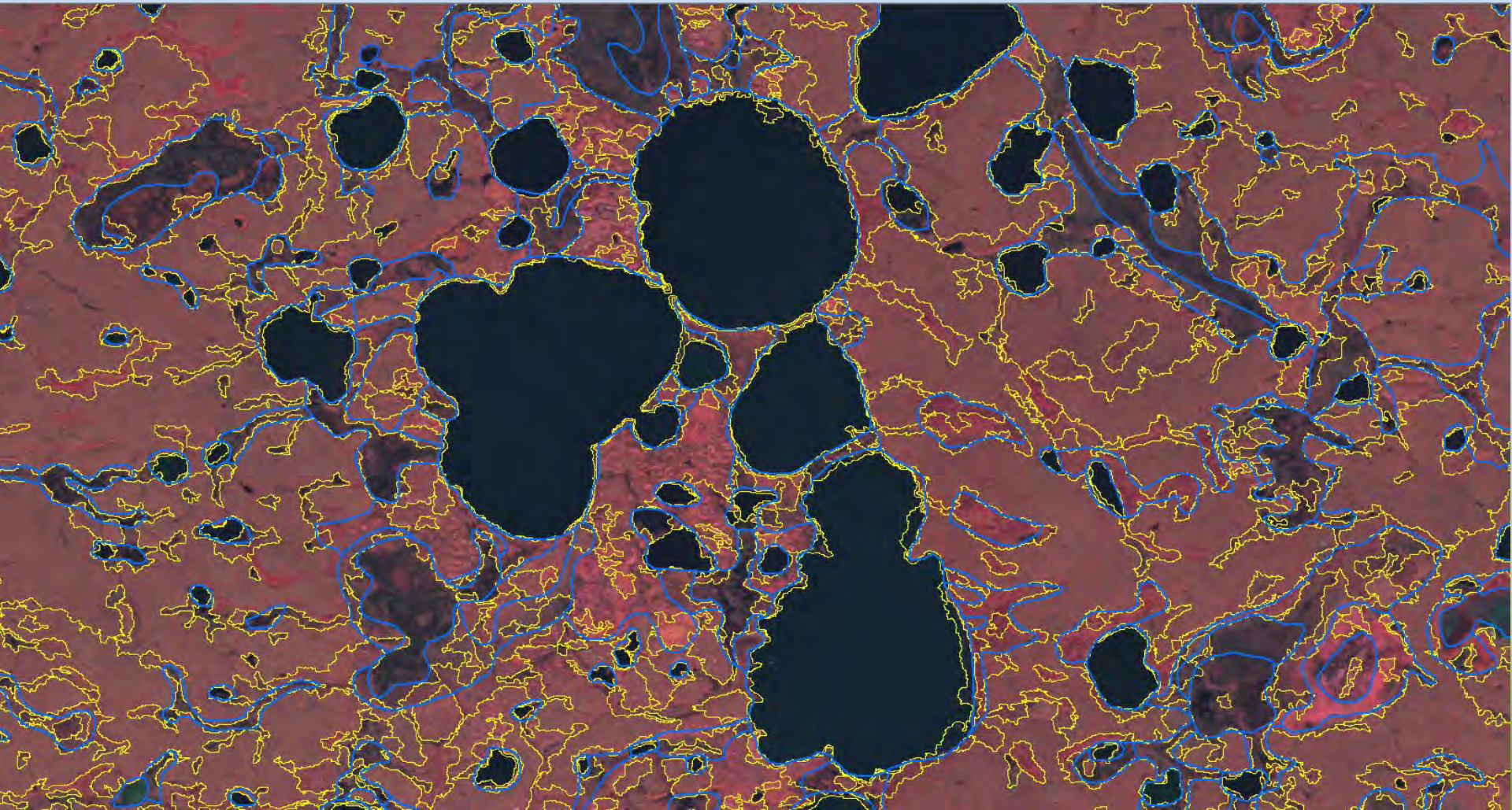
New Classification Techniques

Alaska NWI



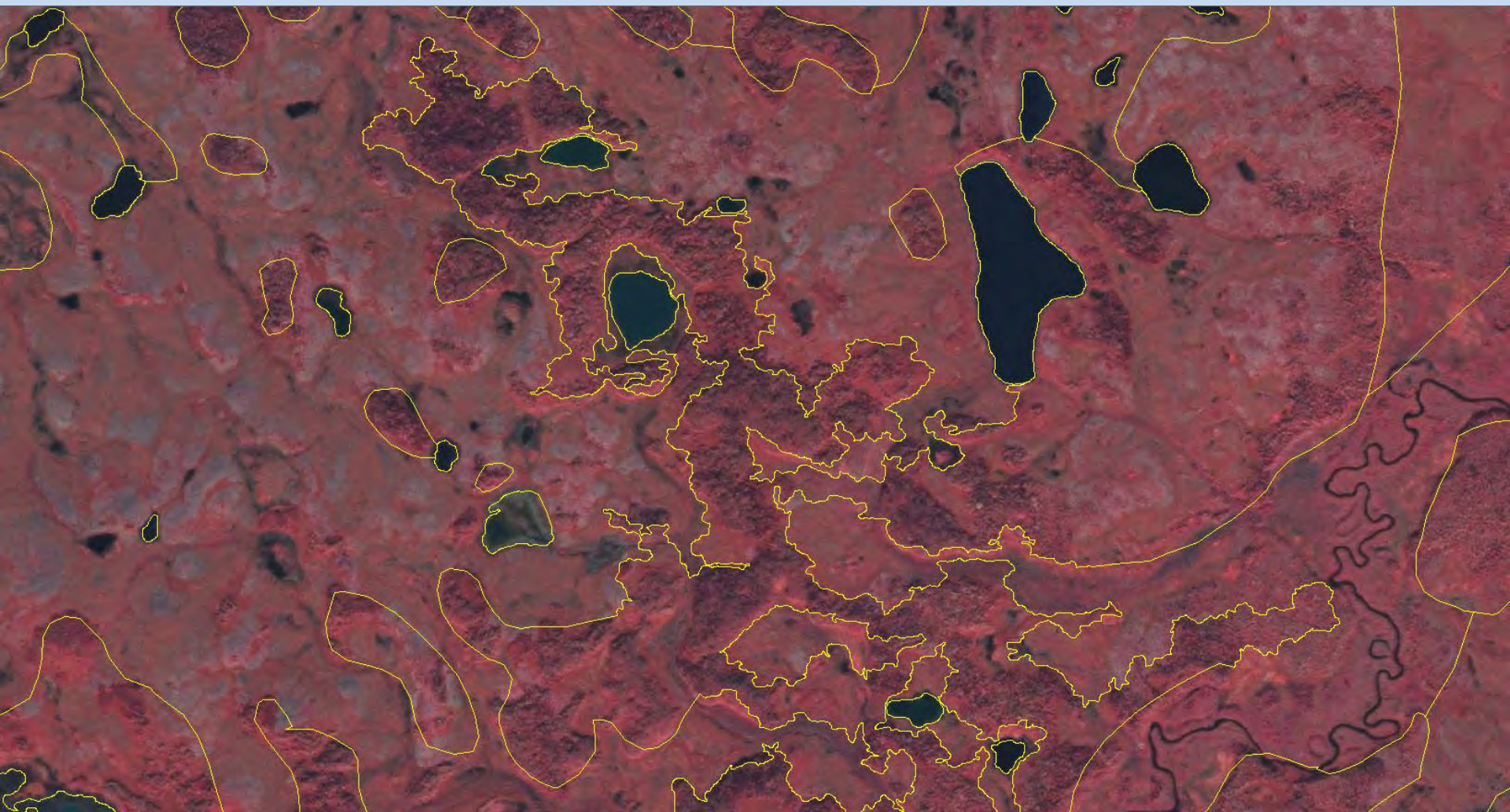
New Classification Techniques

Alaska NWI



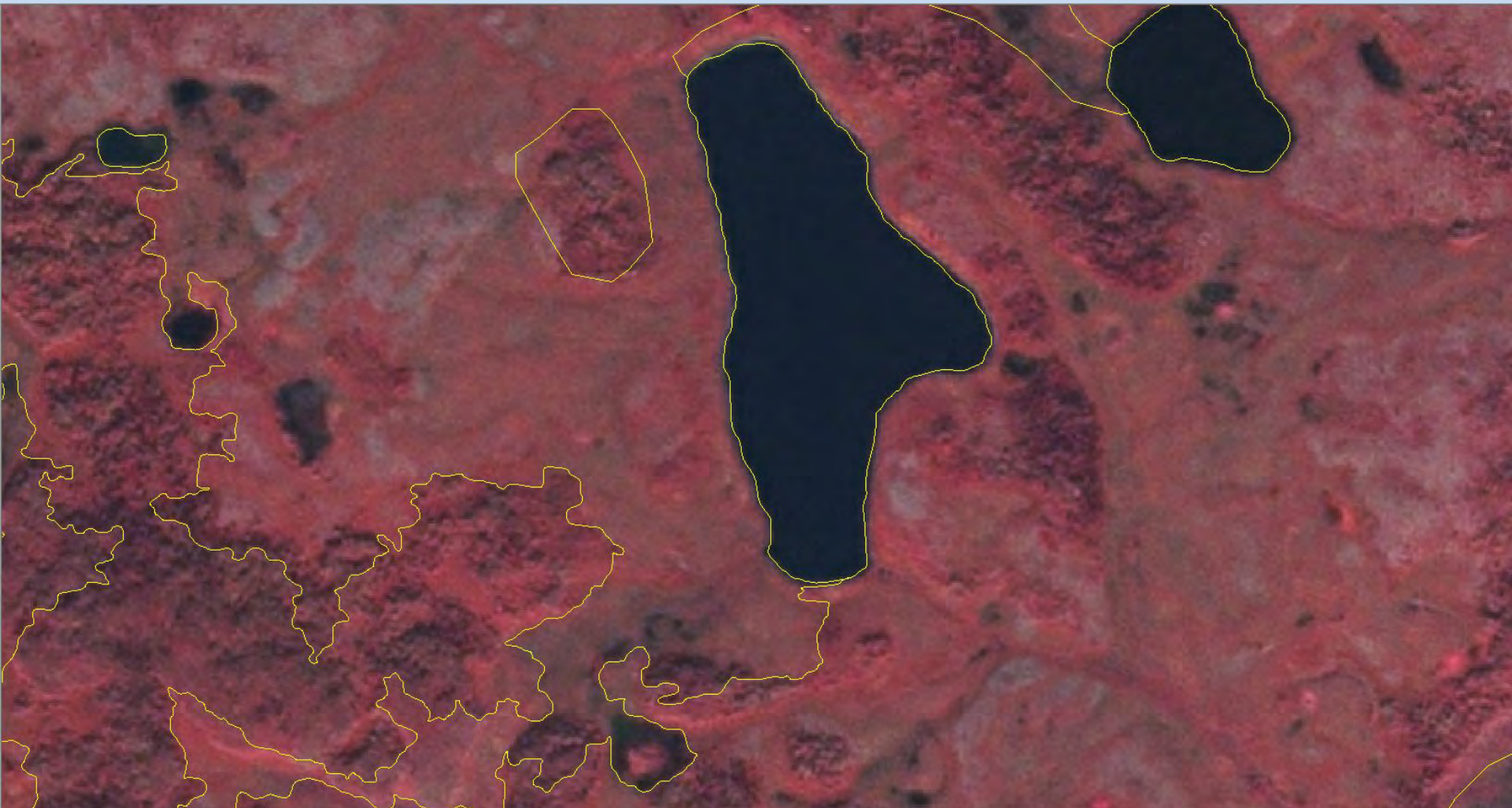
New Classification Techniques

Alaska NWI

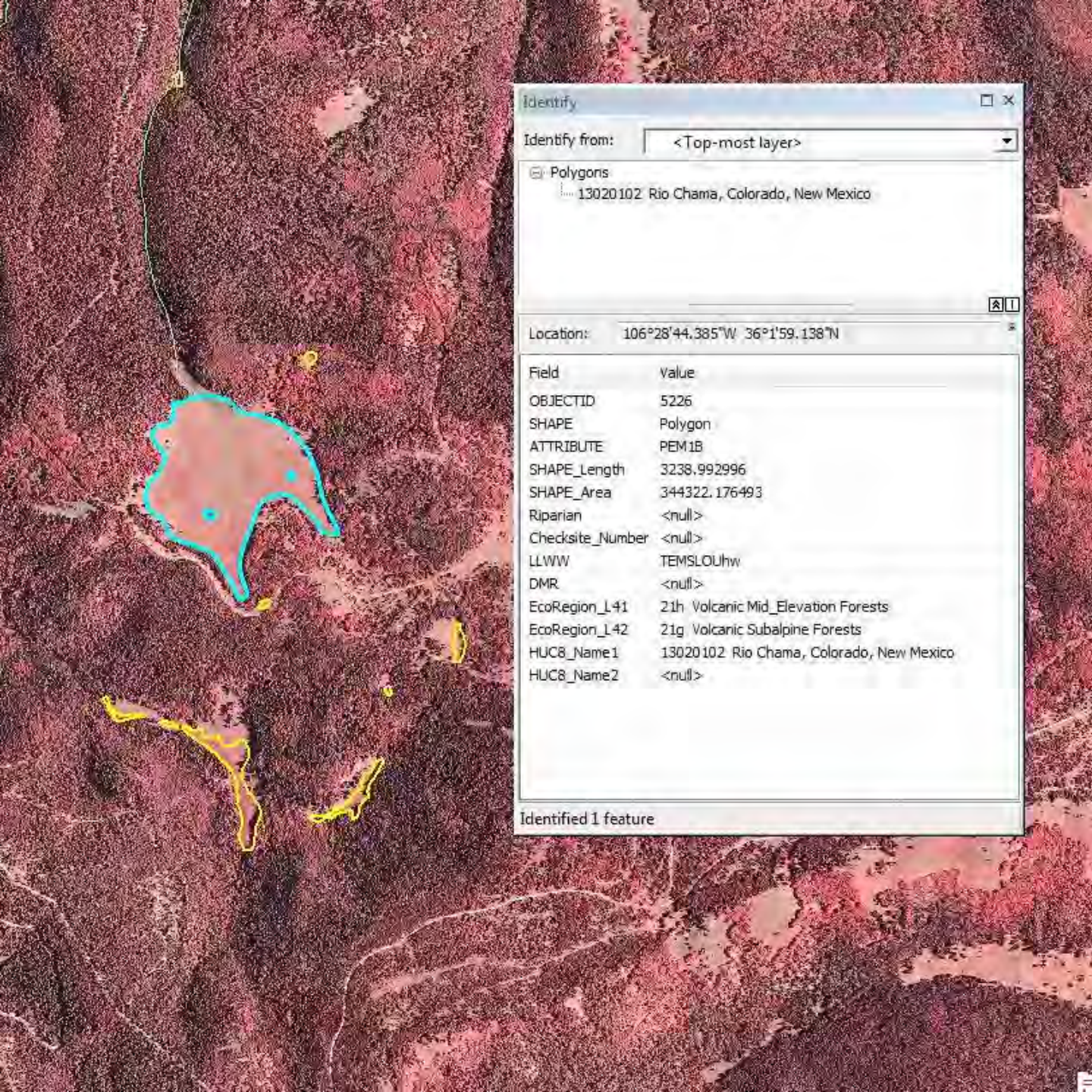


New Classification Techniques

Alaska NWI



Additional Database Attribution New Mexico NWI



Identify

Identify from: <Top-most layer>

Polygons

- 13020102 Rio Chama, Colorado, New Mexico

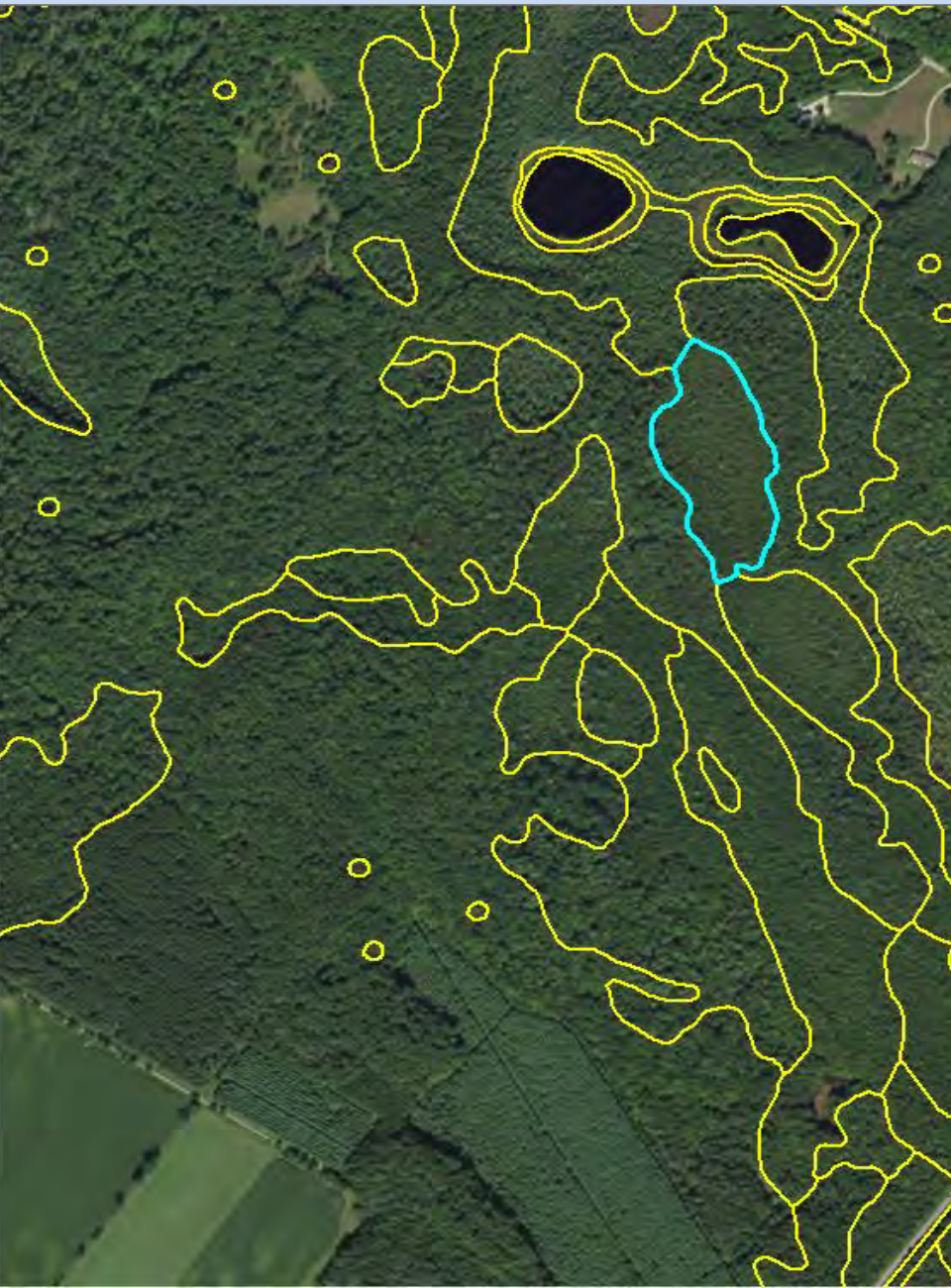
Location: 106°28'44.385"W 36°1'59.138"N

Field	Value
OBJECTID	5226
SHAPE	Polygon
ATTRIBUTE	PEM1B
SHAPE_Length	3238.992996
SHAPE_Area	344322.176493
Riparian	<null>
Checksite_Number	<null>
LLWW	TEMSLOUhw
DMR	<null>
EcoRegion_L41	21h Volcanic Mid_Elevation Forests
EcoRegion_L42	21g Volcanic Subalpine Forests
HUC8_Name1	13020102 Rio Chama, Colorado, New Mexico
HUC8_Name2	<null>

Identified 1 feature

Additional Database Attribution

Wisconsin NWI



Identify

Identify from: <Top-most layer>

NWI_Plus_WetlandFunctionalCorrelation
PFO4B

Location: 4,450,701.471 1,813,946.376 Meters

Field	Value
ACRES	7.320677
Shape_Leng	788.663164
Perimeter	788.386004
Area	45919968.392314
Hectares	2.962573
LLWW	TEFLOUhw
Poten_Culv	<null>
Comments	<null>
small_wetland_type	<null>
NWI_System	P
NWI_Subsystem	<null>
NWI_Class	FO
NWI_Class2	<null>
NWI_SubClass	4
NWI_SubClass2	<null>
NWI_Regime	B
NWI_Modifier	<null>
Parser_Flag	<null>
Parser_Details	<null>
Pot_Cedar	1
WWI_SpecialMod	<null>
Addtnl_desc	<null>
Surface Water Detention	Moderate
Surface Water Maintenance	High
Nutrient Transformation	Moderate
Sediment/Partide Retention	<null>
Carbon Sequestration	Moderate
Shoreline Stabilization	Moderate
Fish Habitat	<null>
General Wildlife Habitat	High
Shape_Length	788.386004
Shape Area	29625.726808

Identified 1 feature

Summary

1. Fully digital environment cost effective and flexible
2. Minimum polygon size down to 1/10 acre
3. Cover large land areas quickly and in detail
4. Additional attributes contribute to wetland functional assessment, watershed planning, stakeholder engagement
5. Increased classification and delineation accuracy means more utility in the final product for a variety of applications.
6. Continuity with EPA Level 1, 2 and 3 Assessment

Questions?

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GeoSpatialServices



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University
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