OFC Geographic Information System (GIS) Prototype

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ESRI Federal User Conference

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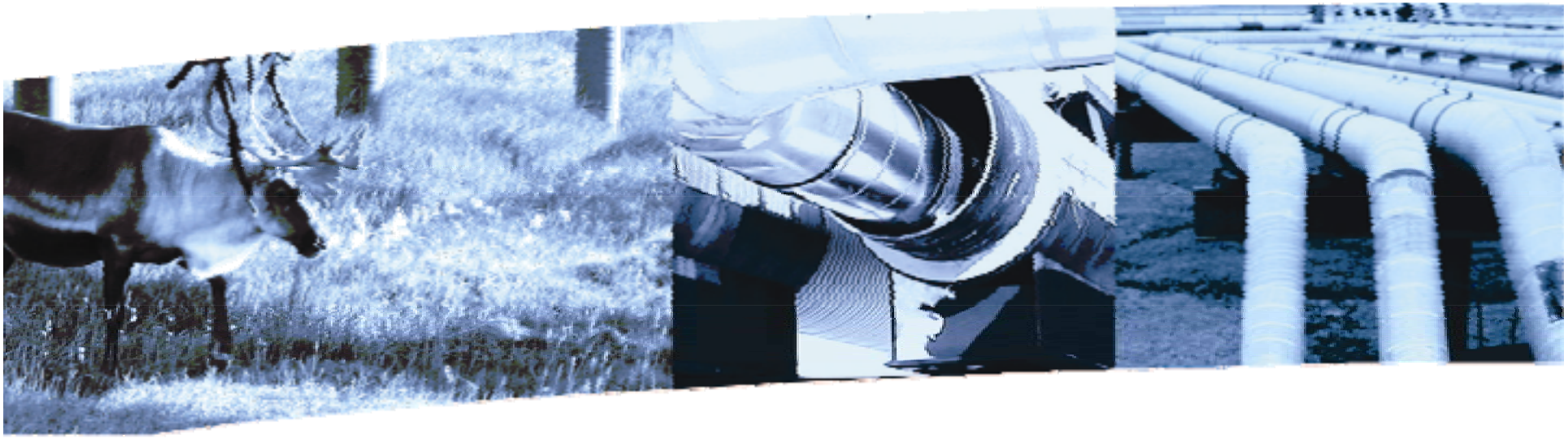
ALASKA NATURAL GAS TRANSPORTATION PROJECTS
OFFICE OF THE FEDERAL COORDINATOR

Baker



- **OFC Roles and Responsibilities**
- **Overview of Project**
- **Prototype**
  - **Requirement**
  - **Data Integration**
  - **Access**
  - **Applications**
- **Path Forward**

OFC Roles and Responsibilities

- Coordination
- Compliance
- Information Source

Mission Statement

Advance our Nation's energy, environmental and economic security by expediting the delivery of clean natural gas from the North Slope of Alaska to North American markets

US Federal Agency Interaction

- **Office of Federal Coordinator**
- **Council on Environmental Quality**
- **Federal Energy Regulatory Commission**
- **Department of Interior**
  - BLM
  - BIA
  - FWS
  - MMS
  - NPS
  - USGS
- **Department of Energy**
- **Department of Transportation**
  - FHWA
  - PHMSA
  - FAA
- **Department of Treasury**
- **Department of State**
- **Department of Defense**
  - USACE
  - USAF
- **Department of Commerce**
  - NOAA
  - NMFS
- **Department of Homeland Security**
  - CBP
  - TSA
  - USCG
- **Department of Labor**
- **Environmental Protection Agency**
- **Department of Agriculture**
- **Advisory Council on Historic Preservation**
- **Department of Justice**
- **Federal Communications Commission**

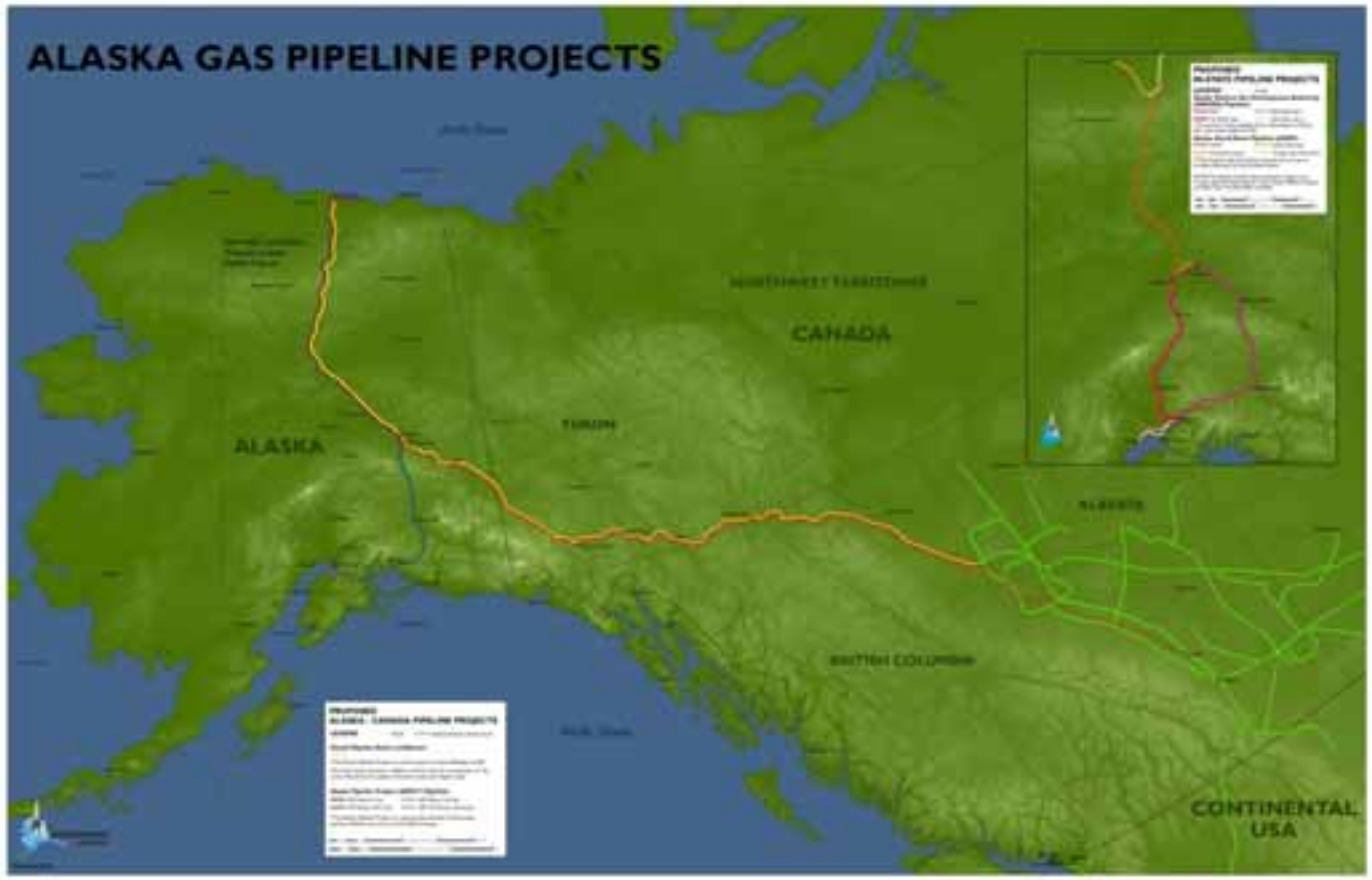
Coordination

- **Federal Agencies and the Administration**
  - Regular Interagency Meetings
  - Summer Visits and Briefings
- **State of Alaska**
  - Weekly Meetings with Permitting Staff
  - Surveillance and Monitoring Agreement
- **Canada**
  - Meet with Canadian Ministers, Senior Staff
  - Meet with U.S. and Canadian Ambassadors
- **Applicants**
  - Level playing field

Pipeline Applicants

- **Denali**
  - Pre-filed with the Federal Energy Regulatory Commission (FERC)
  - Filing Open Season package Apr 2010
  - Offering route from North Slope to Alberta
- **Alaska Pipeline Project**
  - State License - AGIA
  - Pre-filed with FERC
  - Filed Open Season package Jan 2010
  - Offering route from North Slope to Alberta or Valdez

Alaska Gas Pipeline Projects



What's Known

- **Competition to build this project**
- **Economic benefits huge for America**
  - Thousands of jobs on the table
  - Privately financed
- **Long term market for all domestic natural gas**
- **Multiple environmental benefits**
- **Infrastructure – minimize land use impact**
  - Current route utilizes existing Rights-of-Way
- **Achievable project**

OFC Initiatives

- **Gap Analysis**
- **Consolidated Implementation Plans**
- **Senior Intergovernmental Management Team and Interagency Meetings**
- **Technical Team**
  - Share engineering information and expertise
- **Permit/Authorization Matrix**
- **Geographic Information System (GIS) Prototype**

Prototype Need and Challenges

- Agencies use different sets of incompatible data and systems when studying the pipeline route
- Lack of a good, authoritative basemap to reference information relevant to permitting
- Much good data, but interrelation can be challenging
- Difficult for public to understand data picture from multiple sources

Goals

- **Establish an authoritative basemap and GIS for referencing data**
  - Provide a common standard and reference system
  - Single location to store/integrate historical data

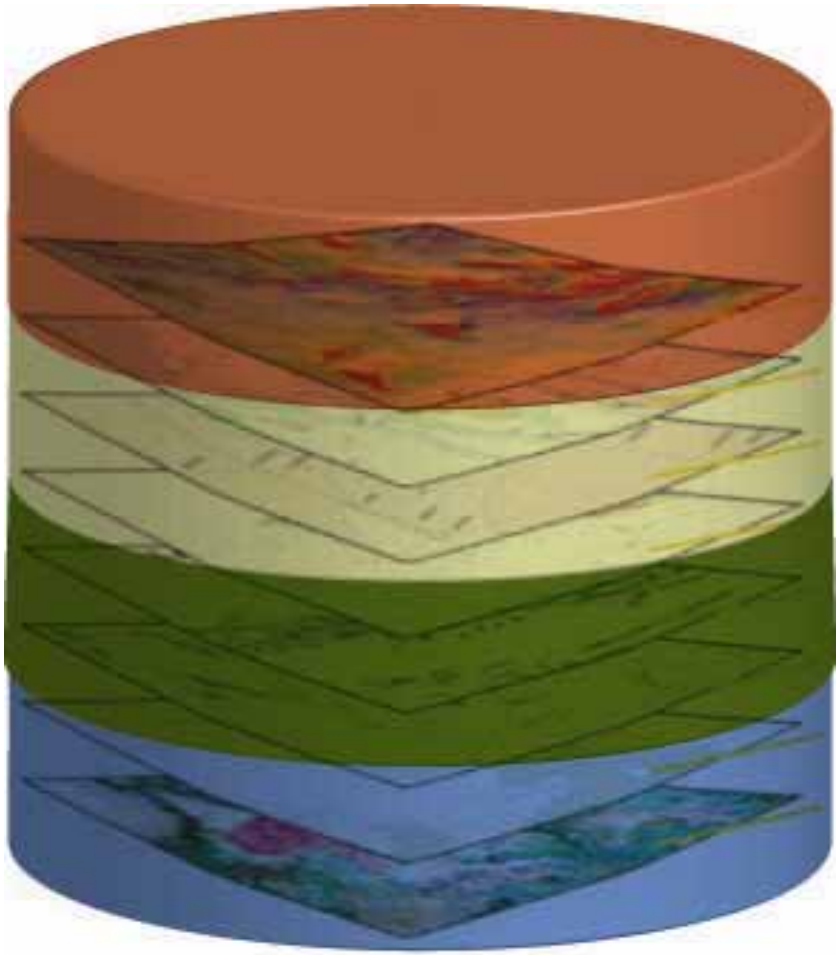
- **Provide transparent access to the public, agencies, stakeholders, applicants and OFC**
  - Create web-based access to the data

Demonstrate that the GIS prototype is an authoritative, consistent, and integrated source of information to construct, operate, and maintain the pipeline

OFC GIS PROTOTYPE

DATA INTEGRATION

GIS is a Database

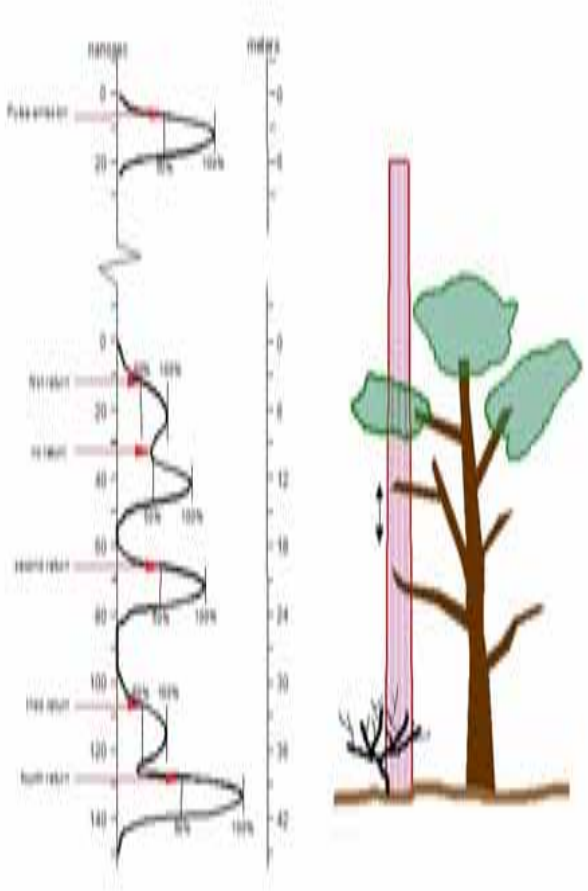


Basemap for GIS Prototype

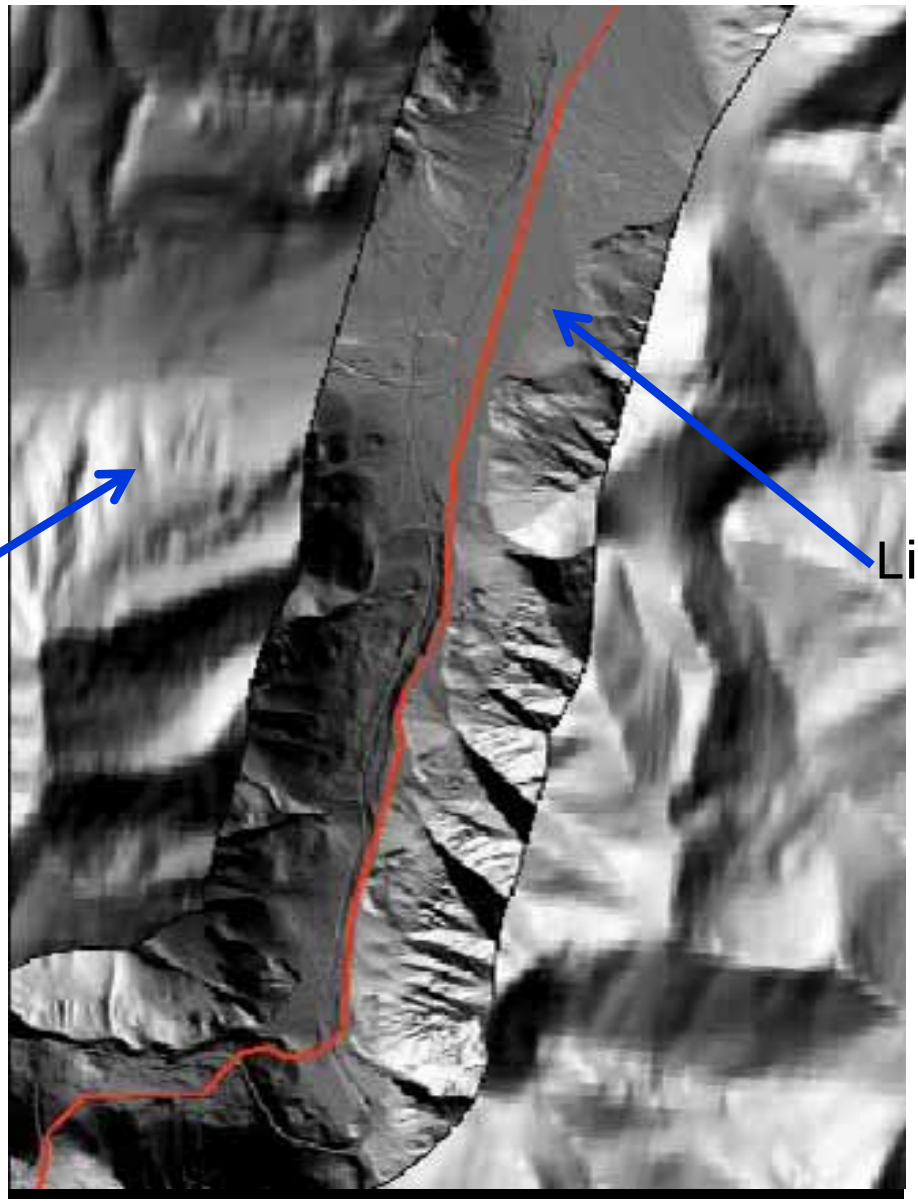
- **Light Detection and Ranging (LiDAR) Basemap:** Gives users an overview of broad, continuous features that would be other indistinguishable

- **LiDAR Specifications**

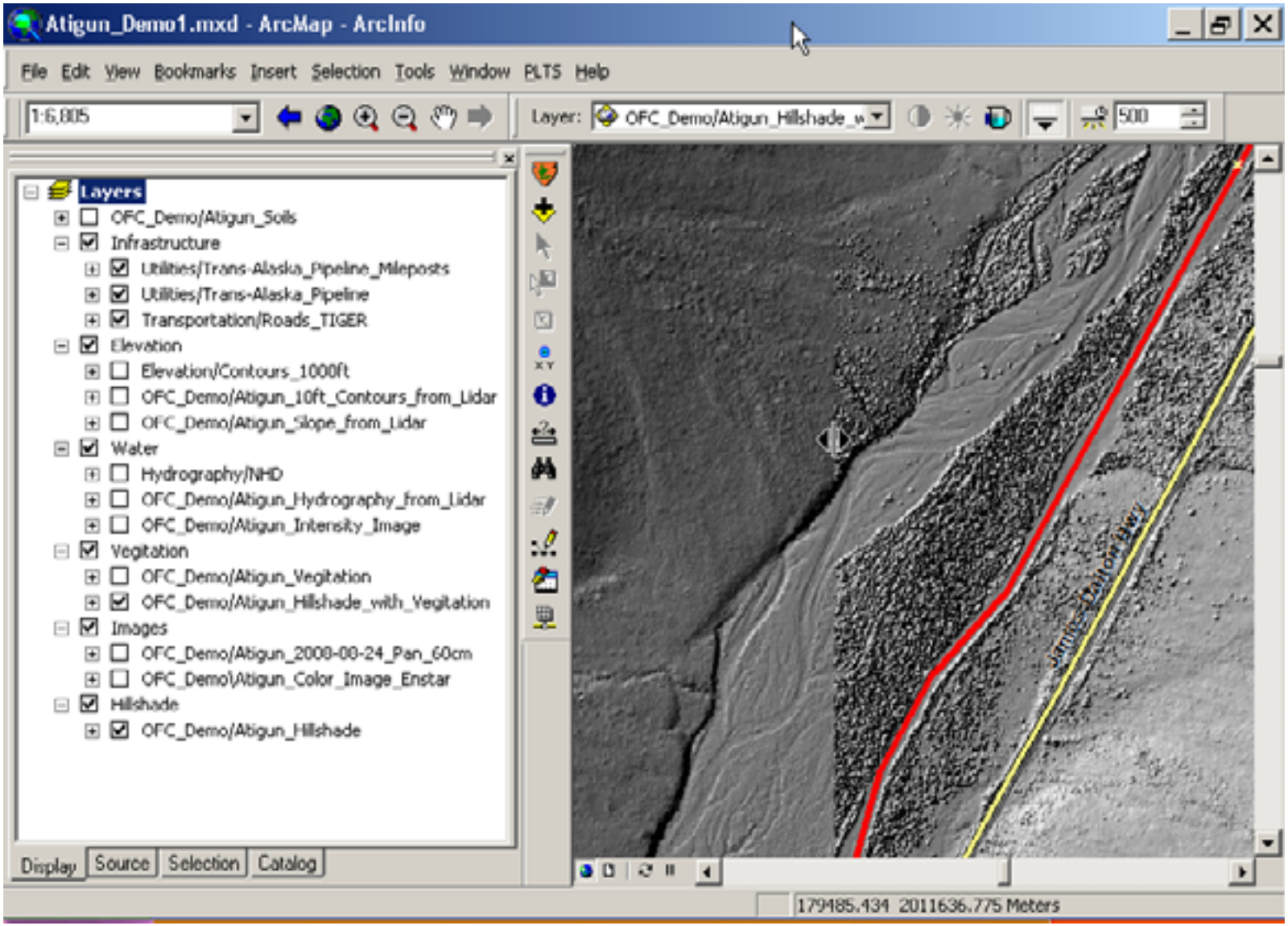
- **LiDAR Benefits**
  - **Geohazard detection**
  - **Wetlands**
  - **Stream mapping**
  - **Geotechnical and**
  - **Engineering aspects**



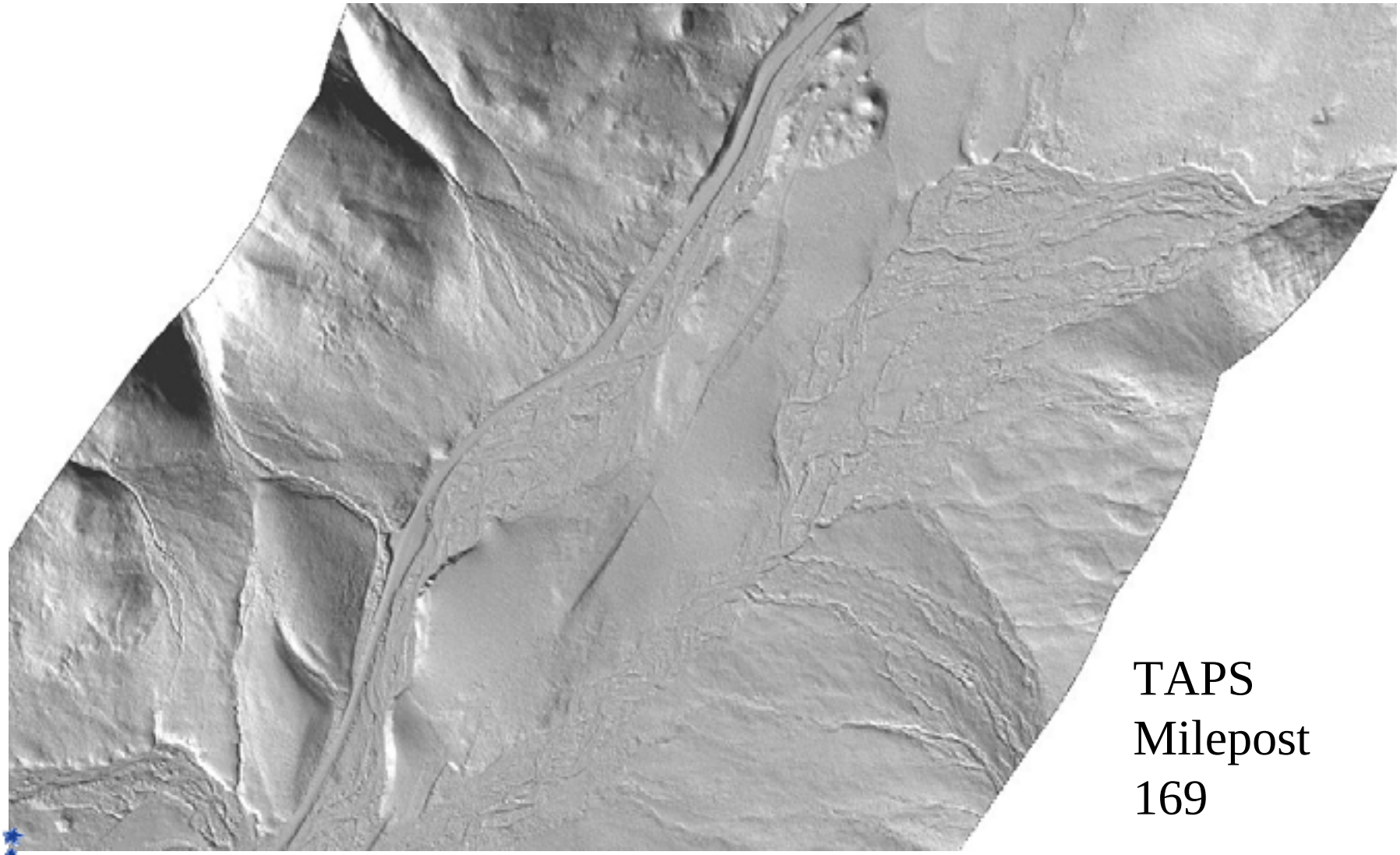
Importance of Data Quality



LiDAR Benefits



Bare Earth Hillshade



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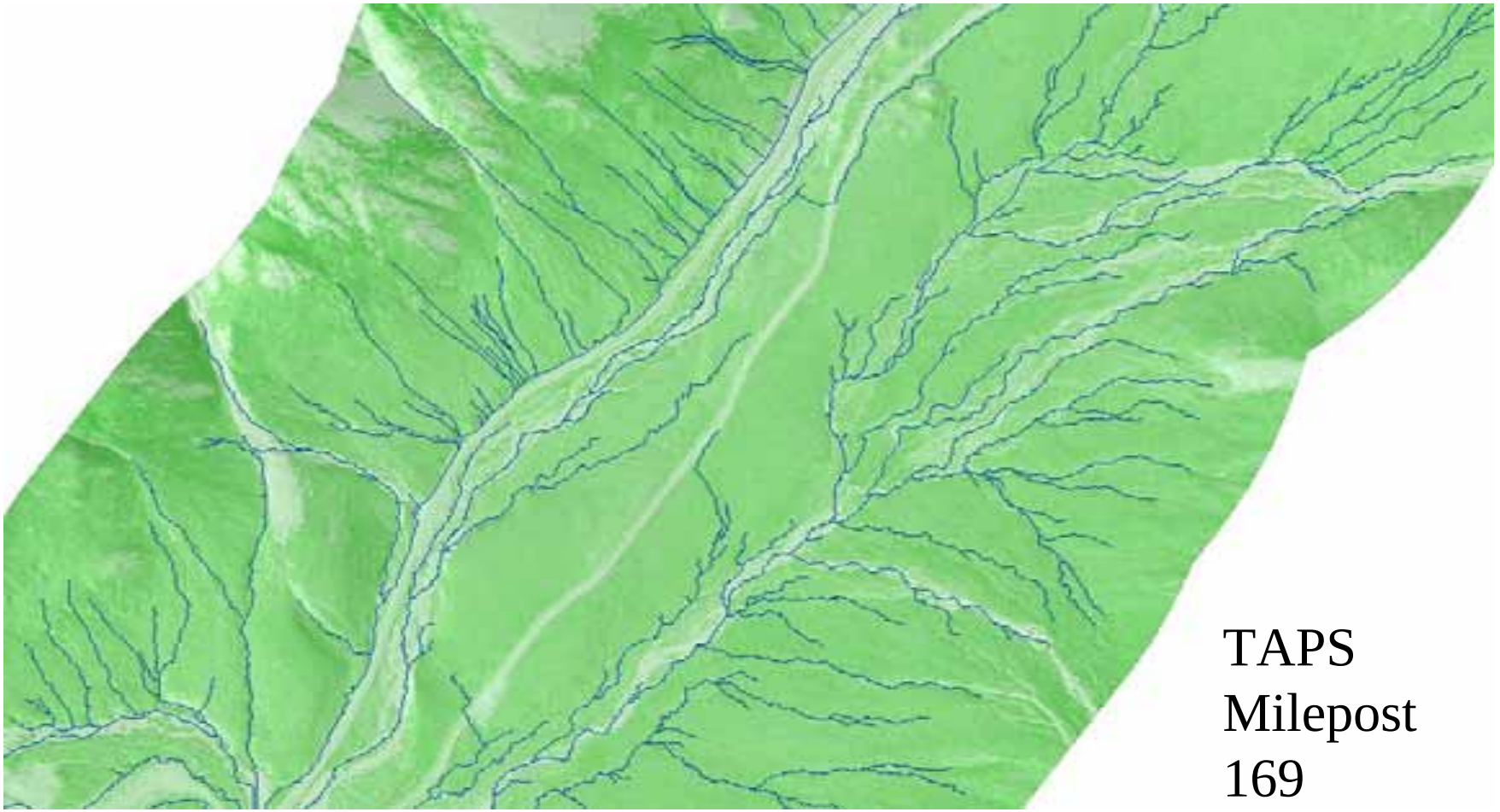
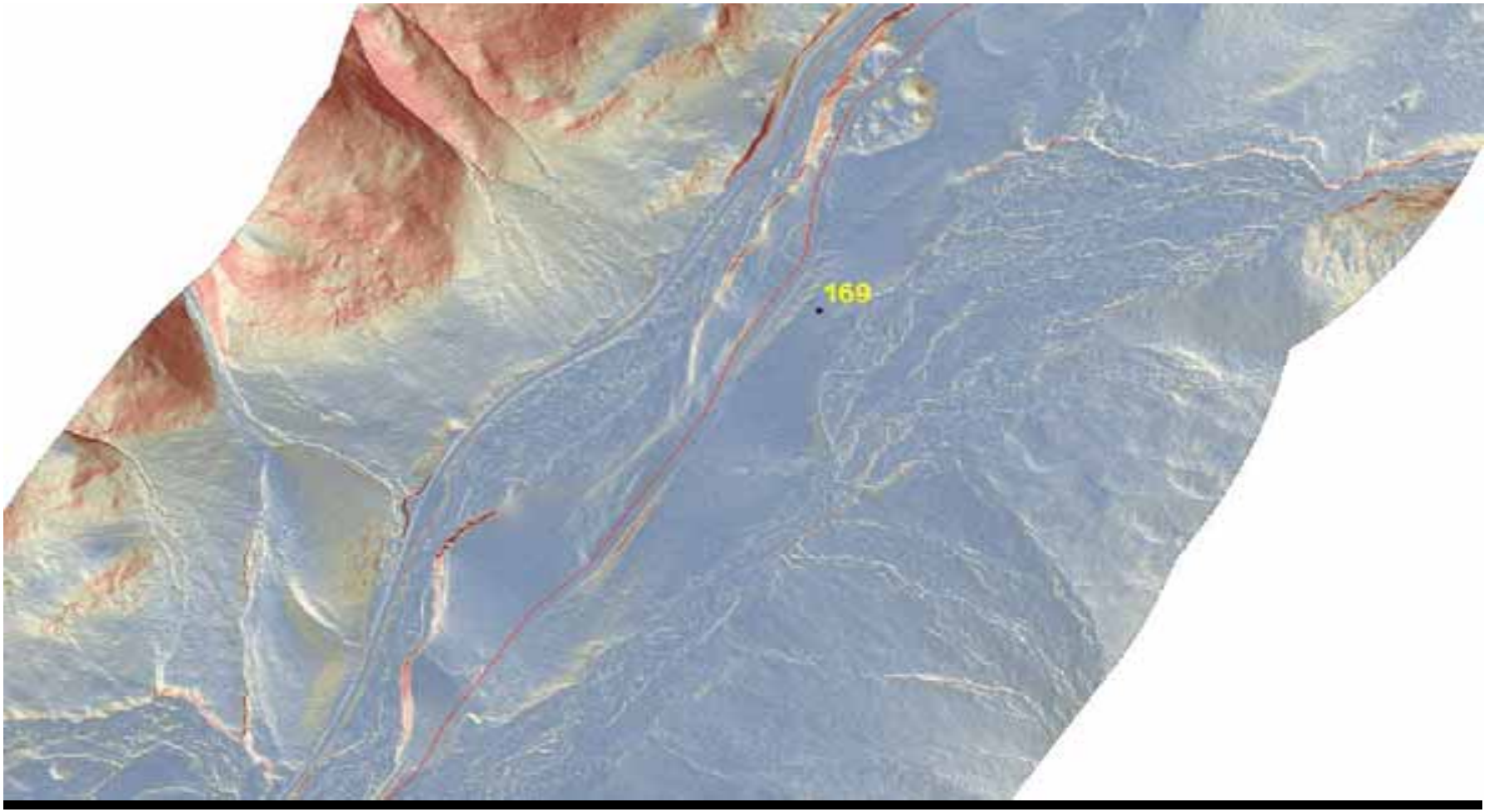
Milepost
169

LiDAR Derivative Analysis with GIS - Intensity Image and Streams

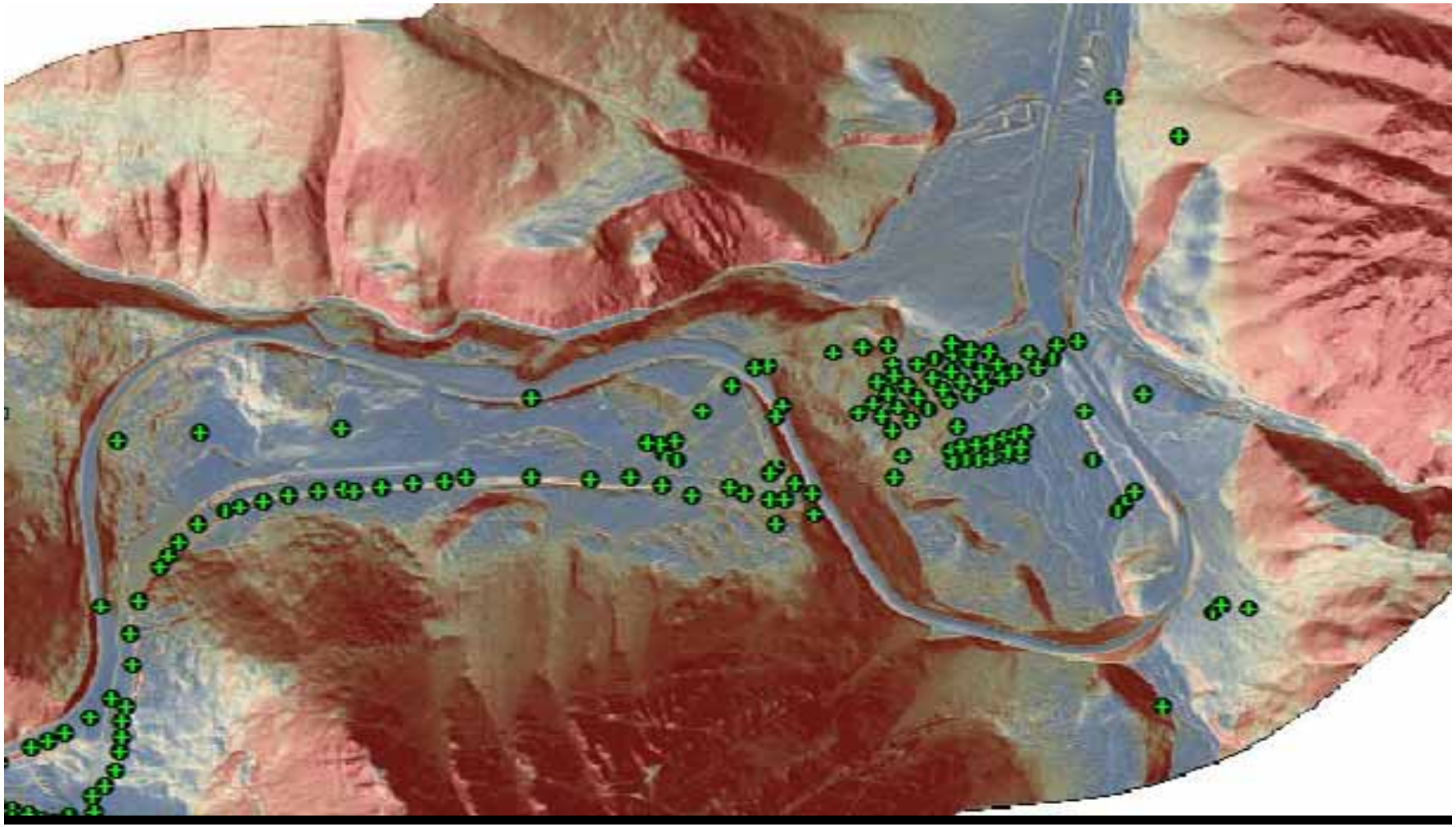


TAPS Milepost 169

LiDAR Derivative Analysis with GIS - Slope

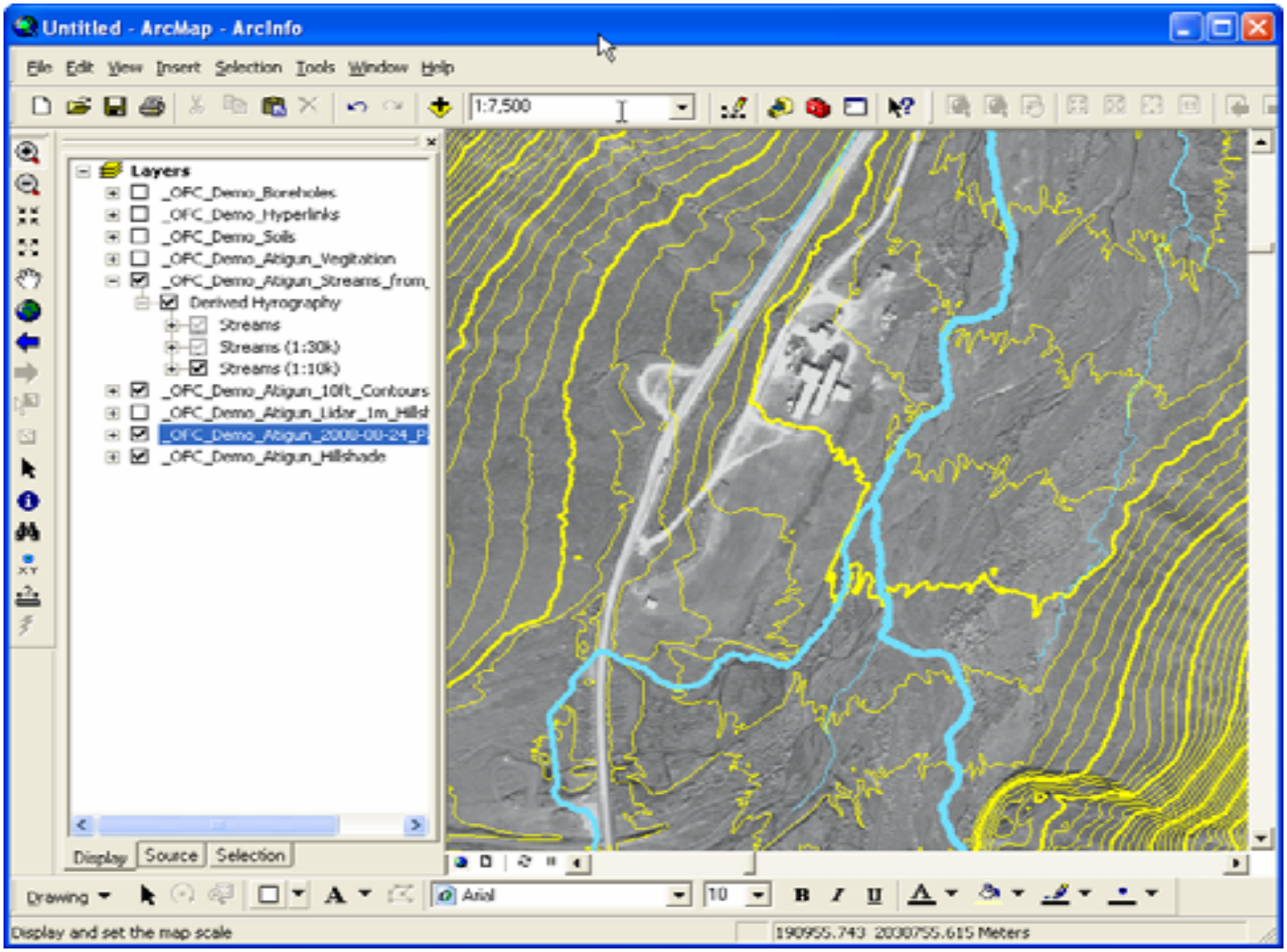


LiDAR Derivative Analysis with GIS - Slope



= BOREHOLES

LiDAR Derivatives - Streams and Topography



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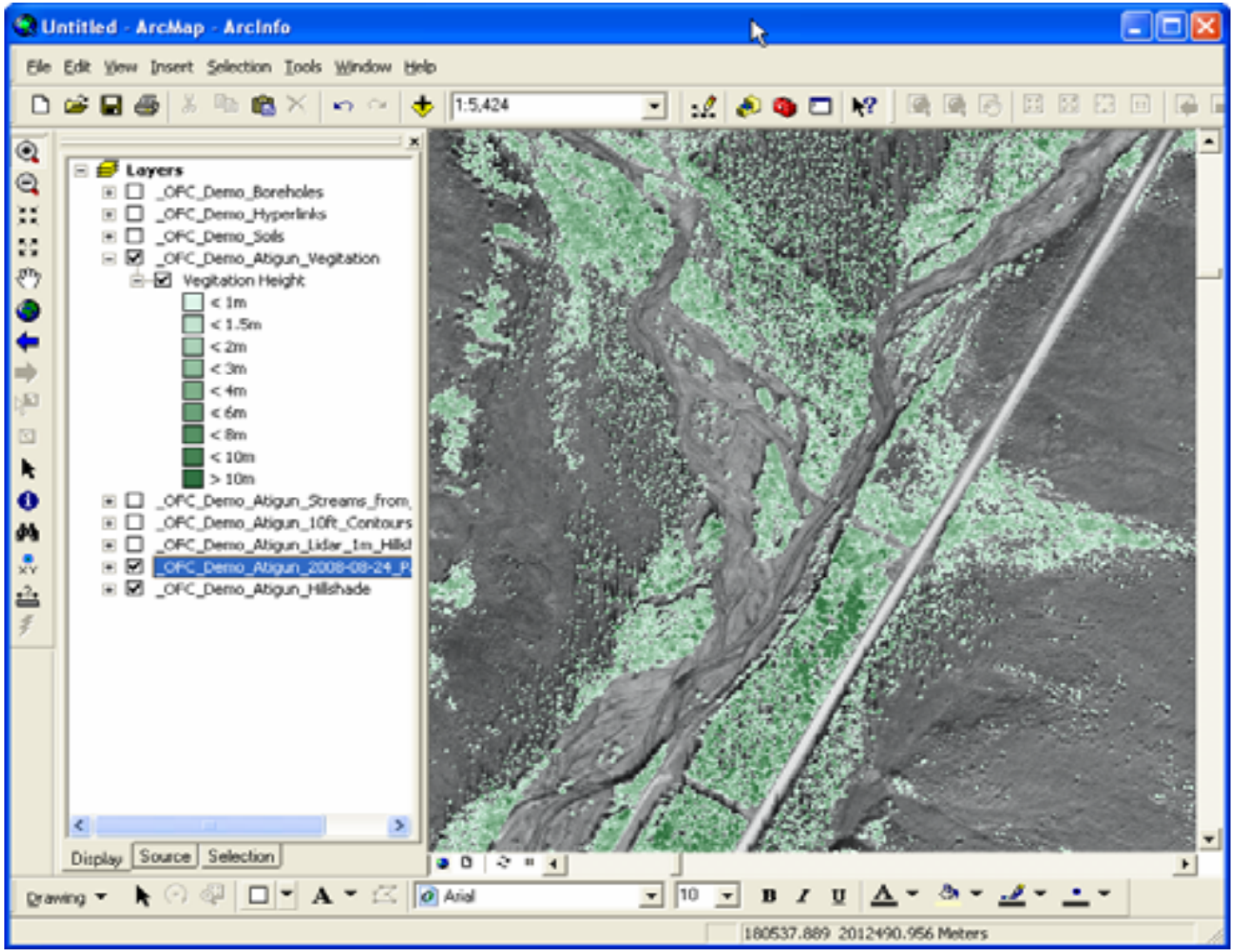
LiDAR Derivative - Vegetation



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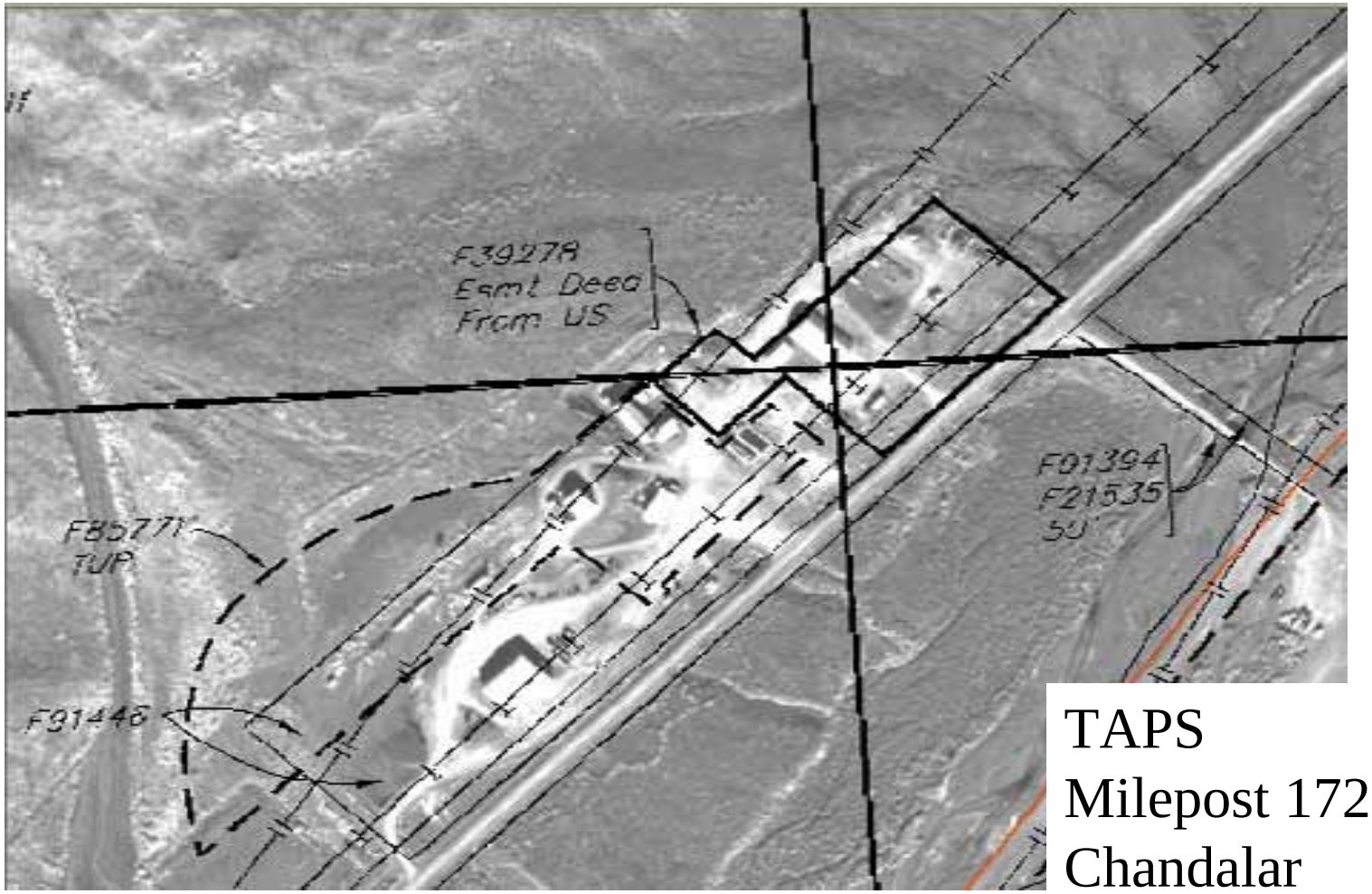
Data Integration -
Land Status, Real Estate with Basemap



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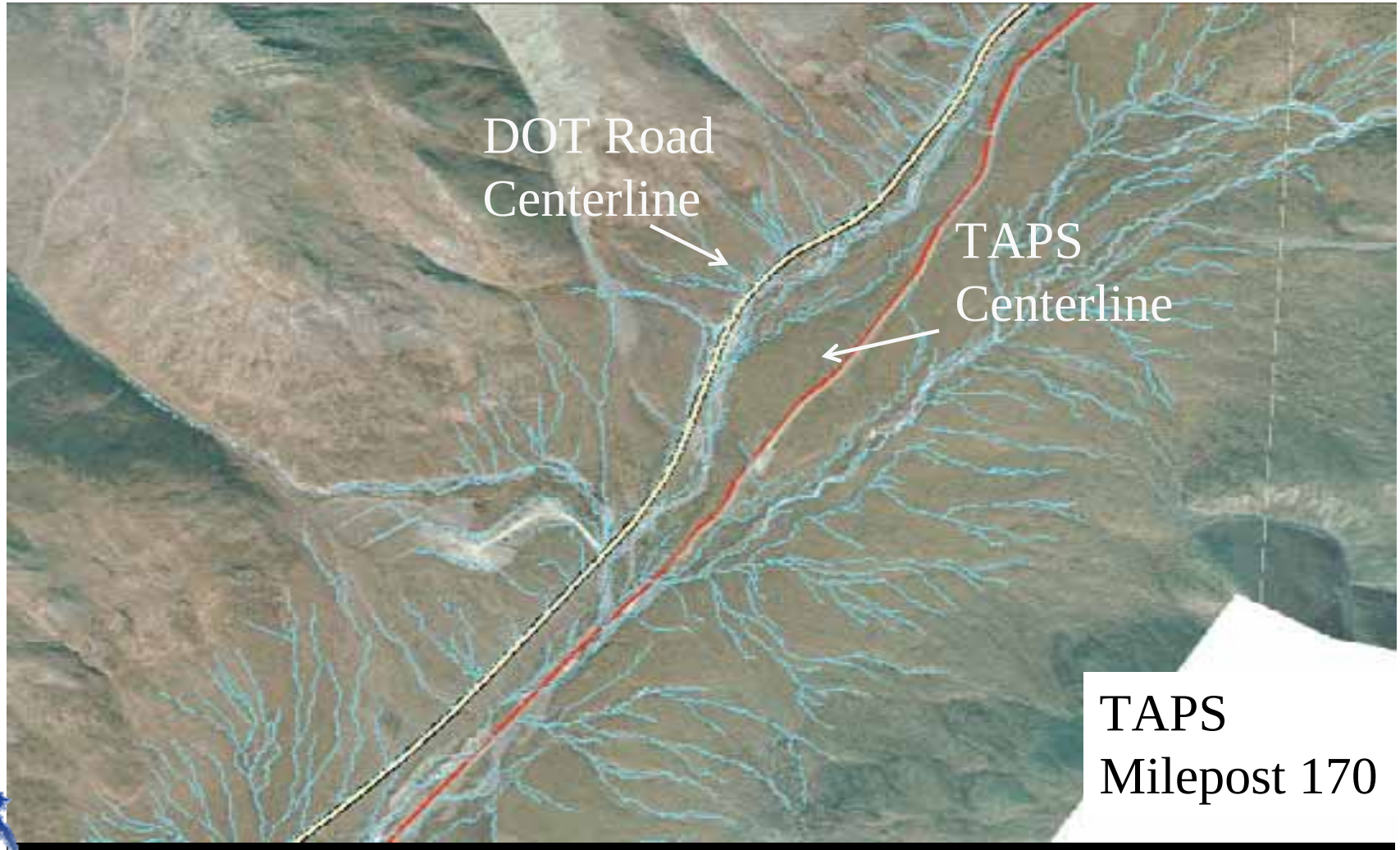
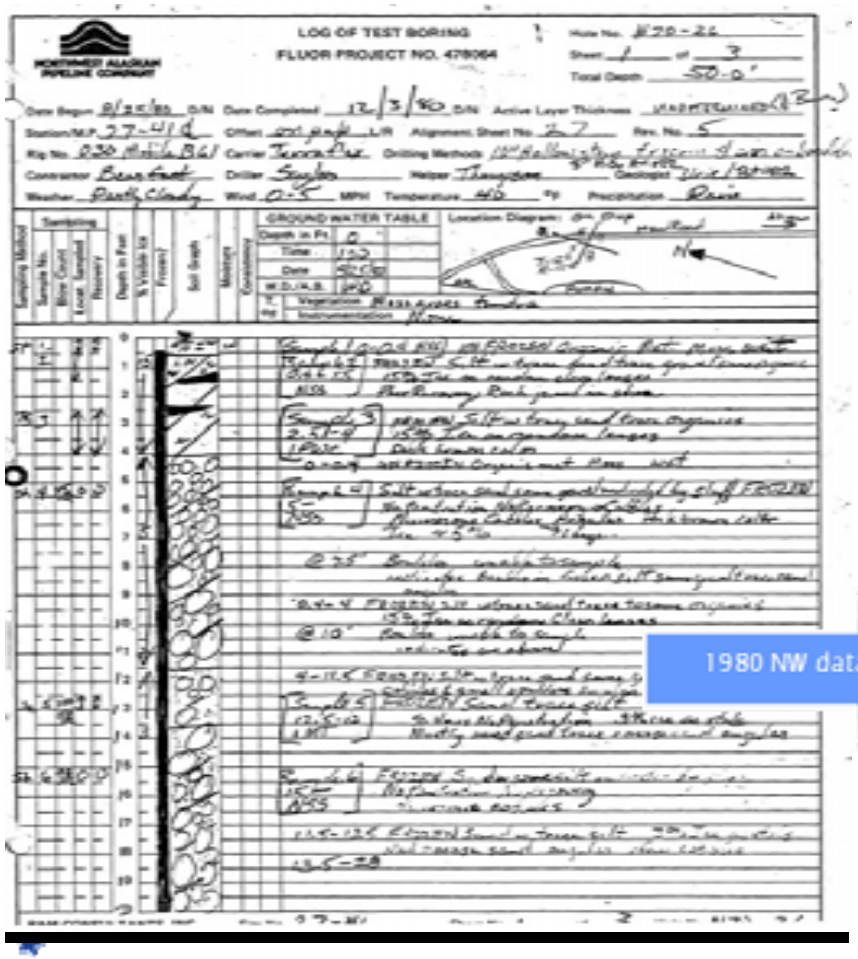
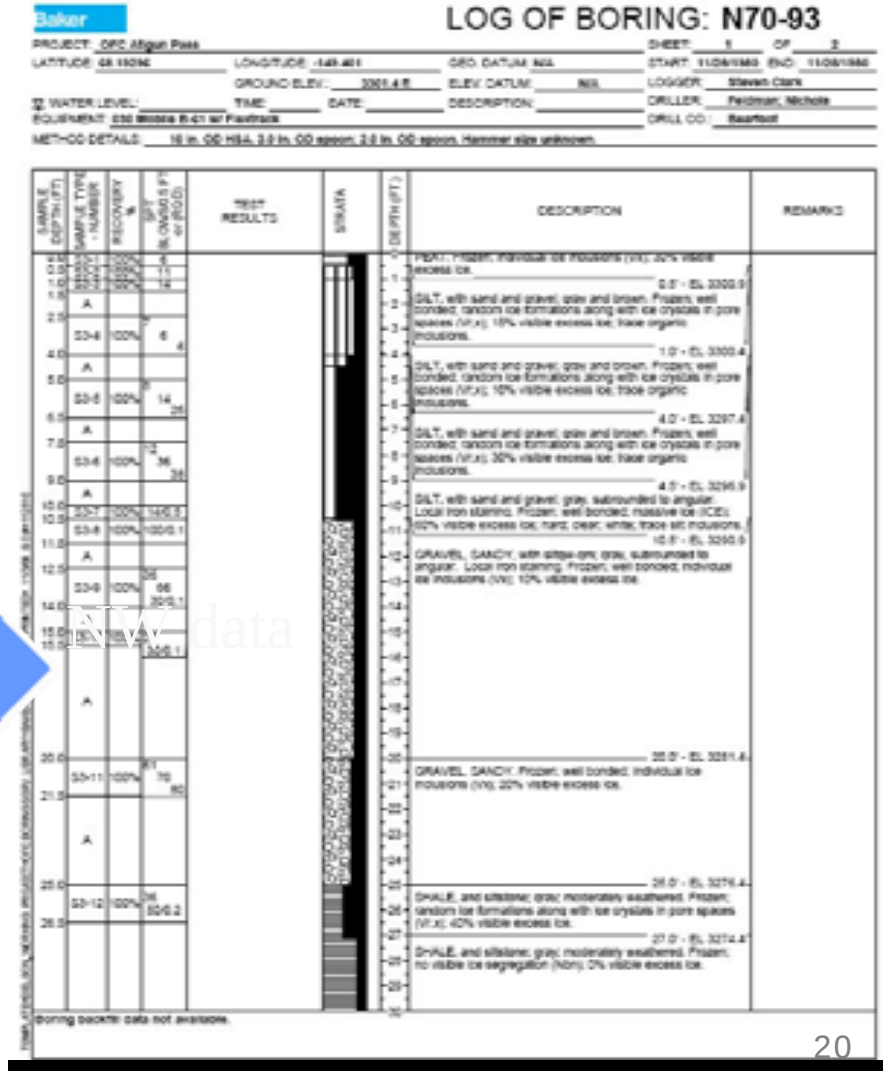
Data Integration - Infrastructure (roads, centerline) on Basemap



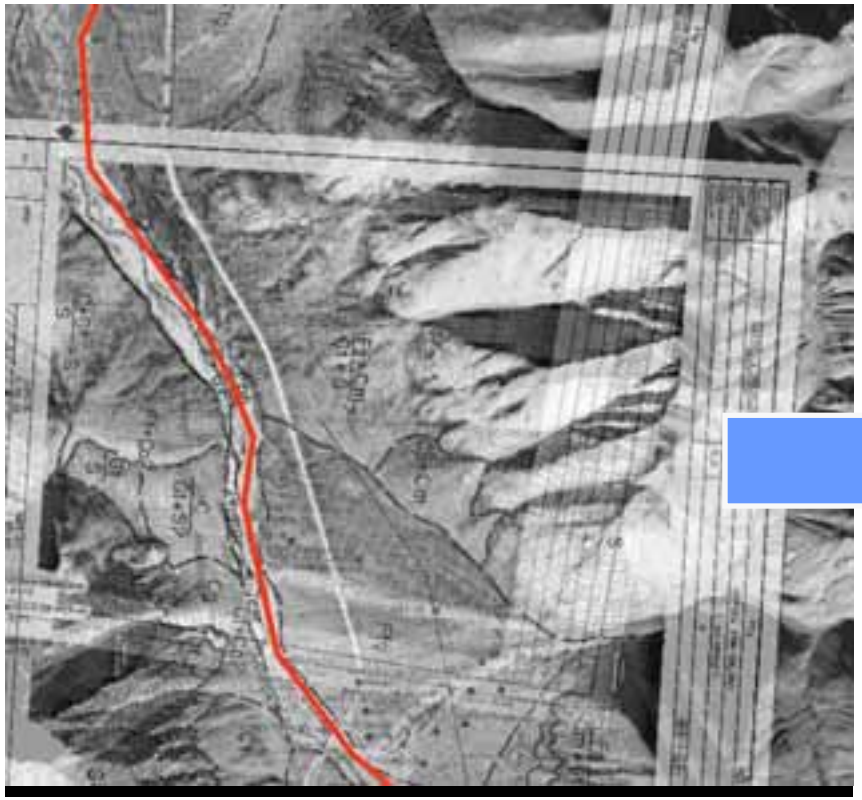
Data Integration - Incorporating Historical Geotechnical Data



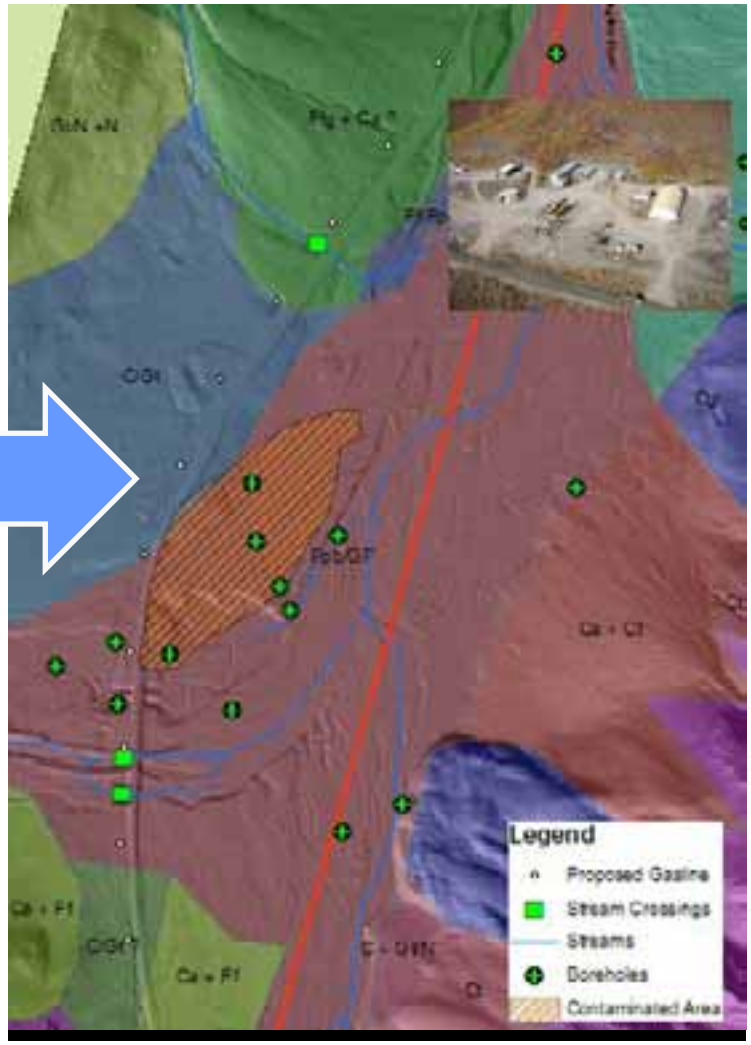
1980 NW data



Data Integration - Geotechnical

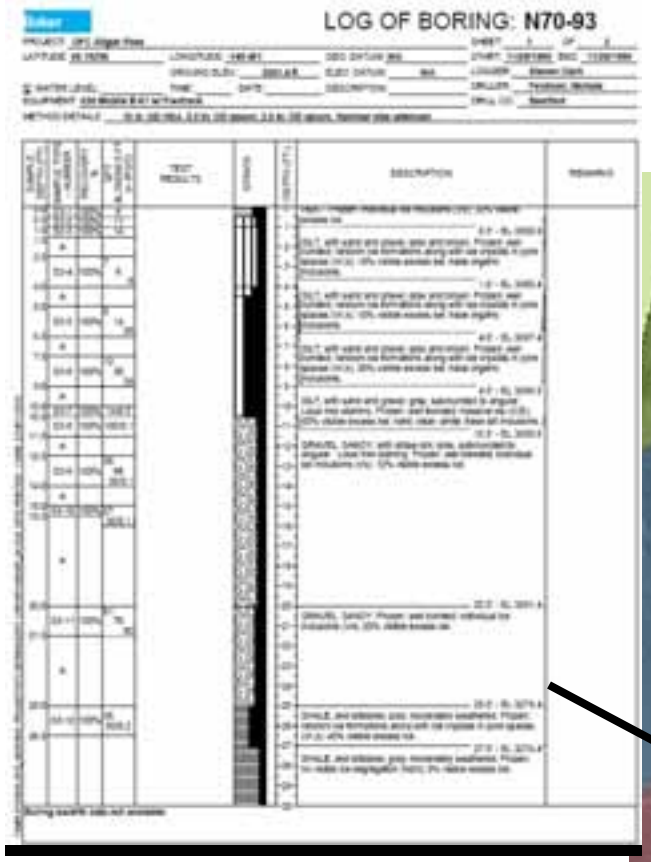


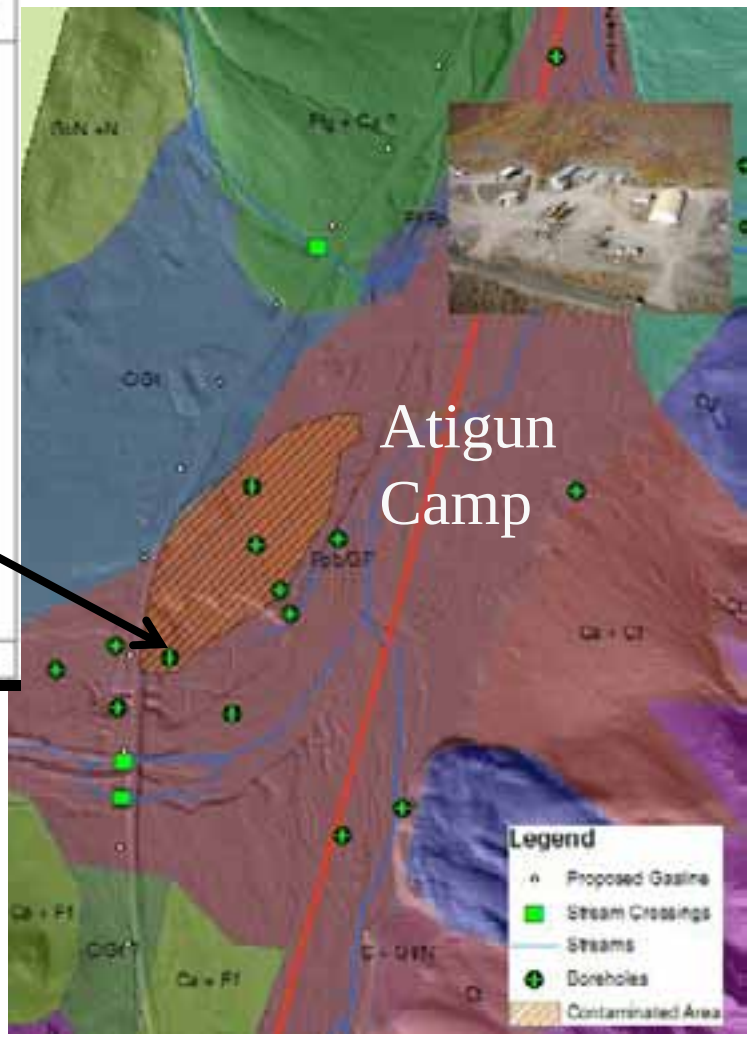
Basemap with geo-referenced alignment sheets



Data in GIS, geo-referenced to Basemap

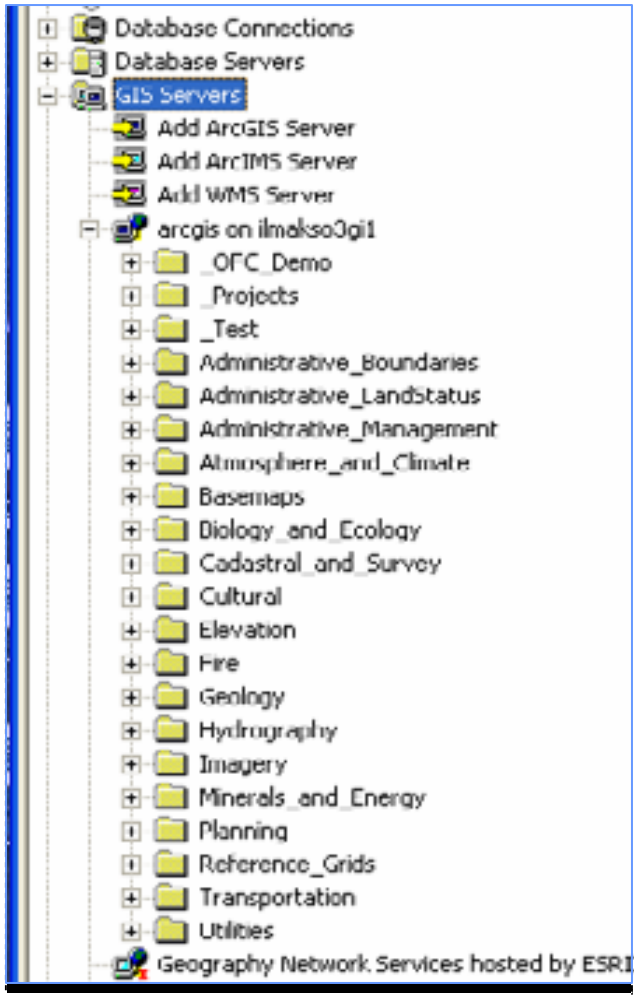
Data Integration - Putting the pieces together

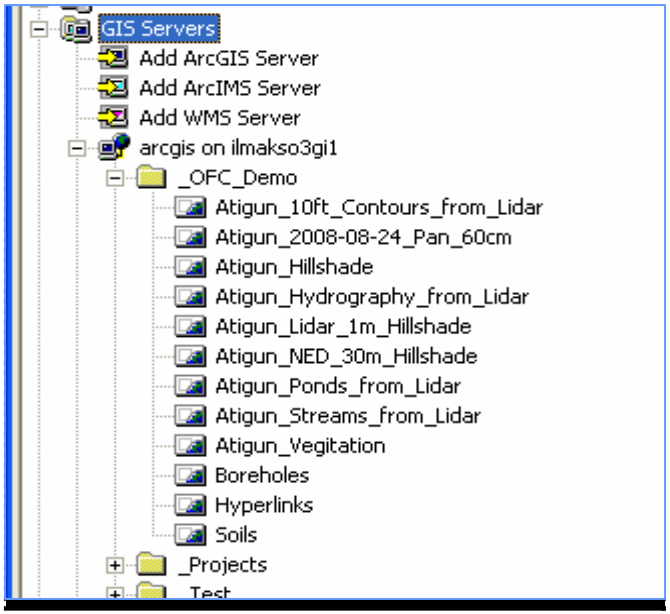


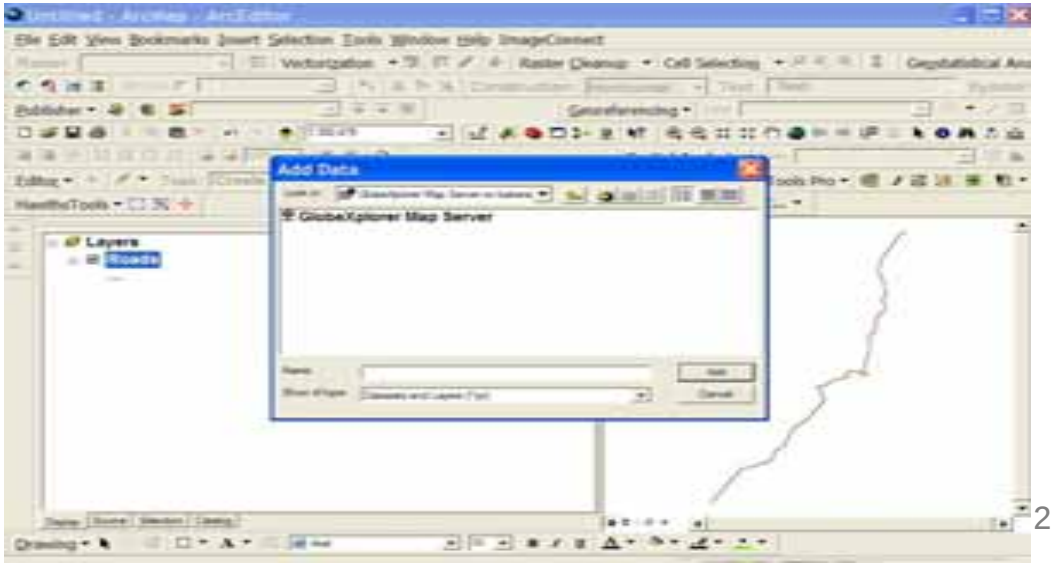


- Contaminated zones from ADEC
- Soils information from historical data
- Borehole logs and data from historical data
- Stream crossing data
- Incorporate photos and data

GIS Repository and Web Services







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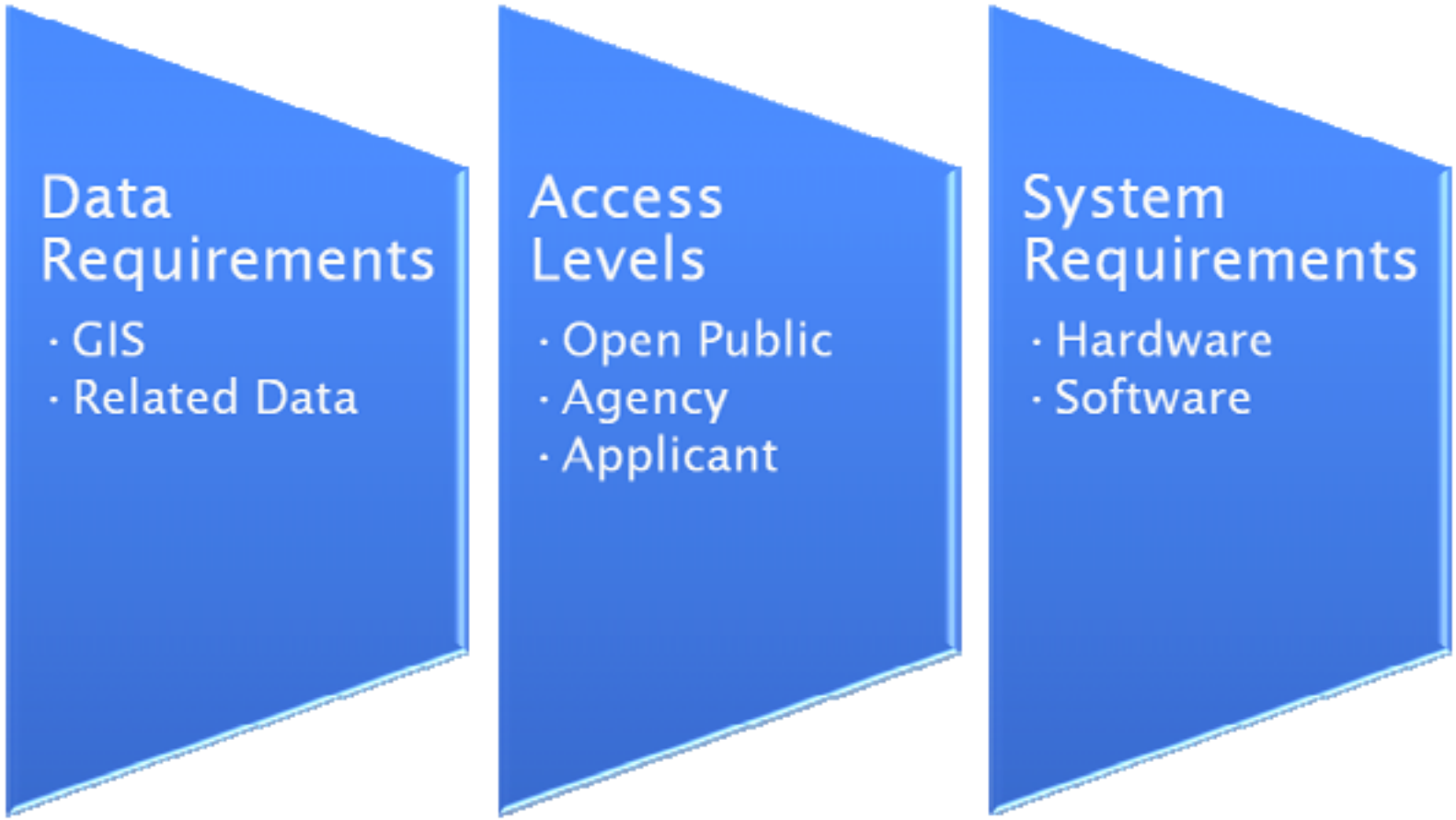
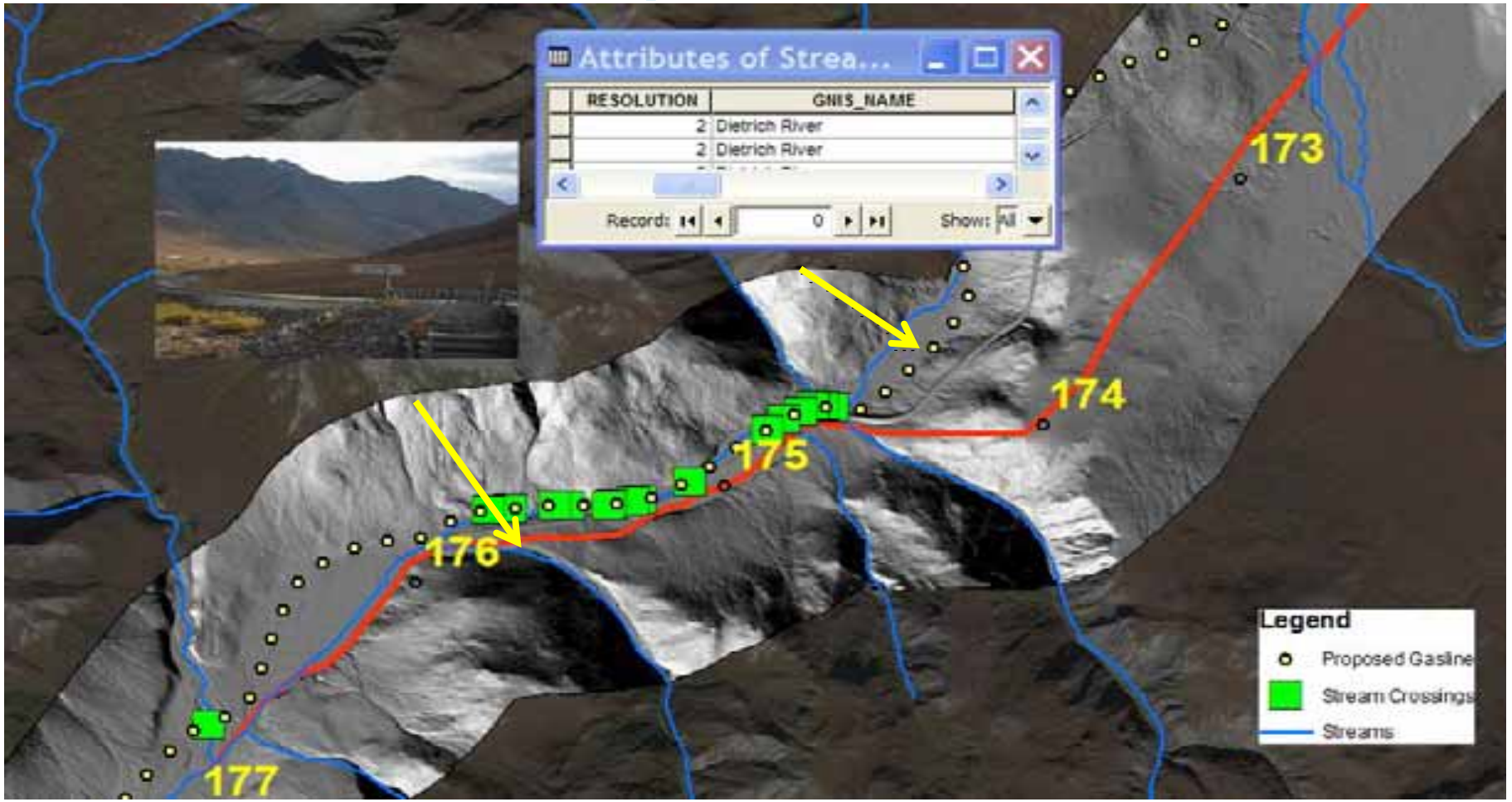
ACCESS TO DATA

Data Access – User Needs and Data Drive System Requirements



Data Access and Integration – Accessing Multiple Data Sets



OFC GIS PROTOTYPE

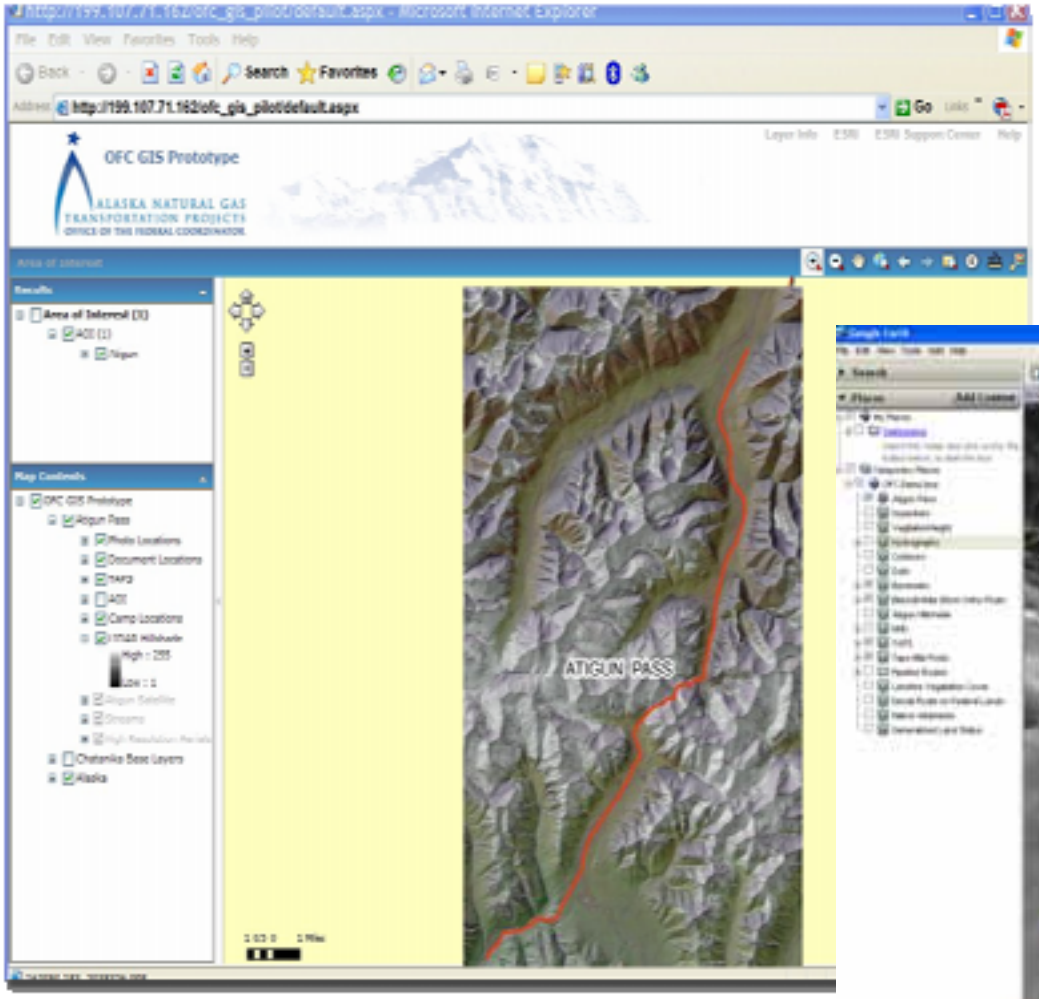
APPLICATIONS

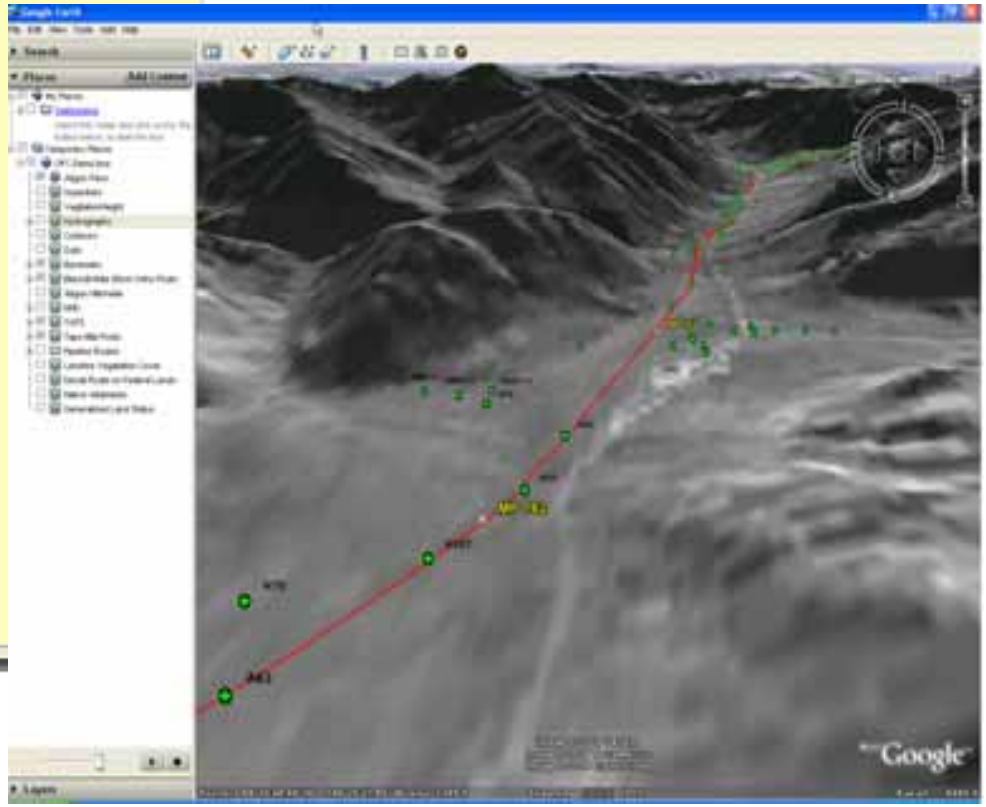
Application Types

- **Web Access Application**
  - Internet browser
  - Public transparency
  - ArcGIS map document

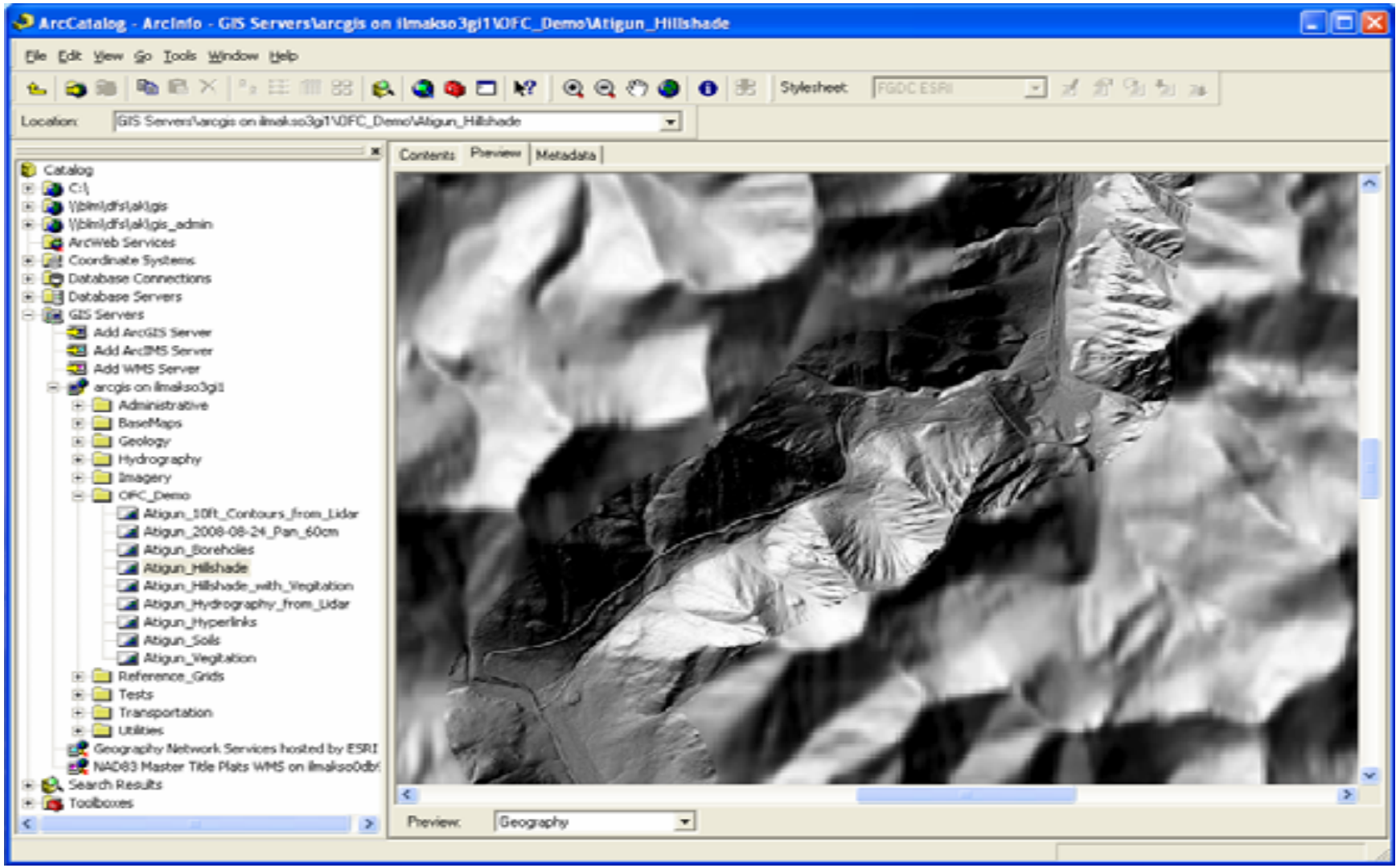
- **Agency Web Service Application**
  - GIS layer repository
  - ArcGIS server
  - ArcMap

Web Access to Data—Browser Level





Web Service – Public Access



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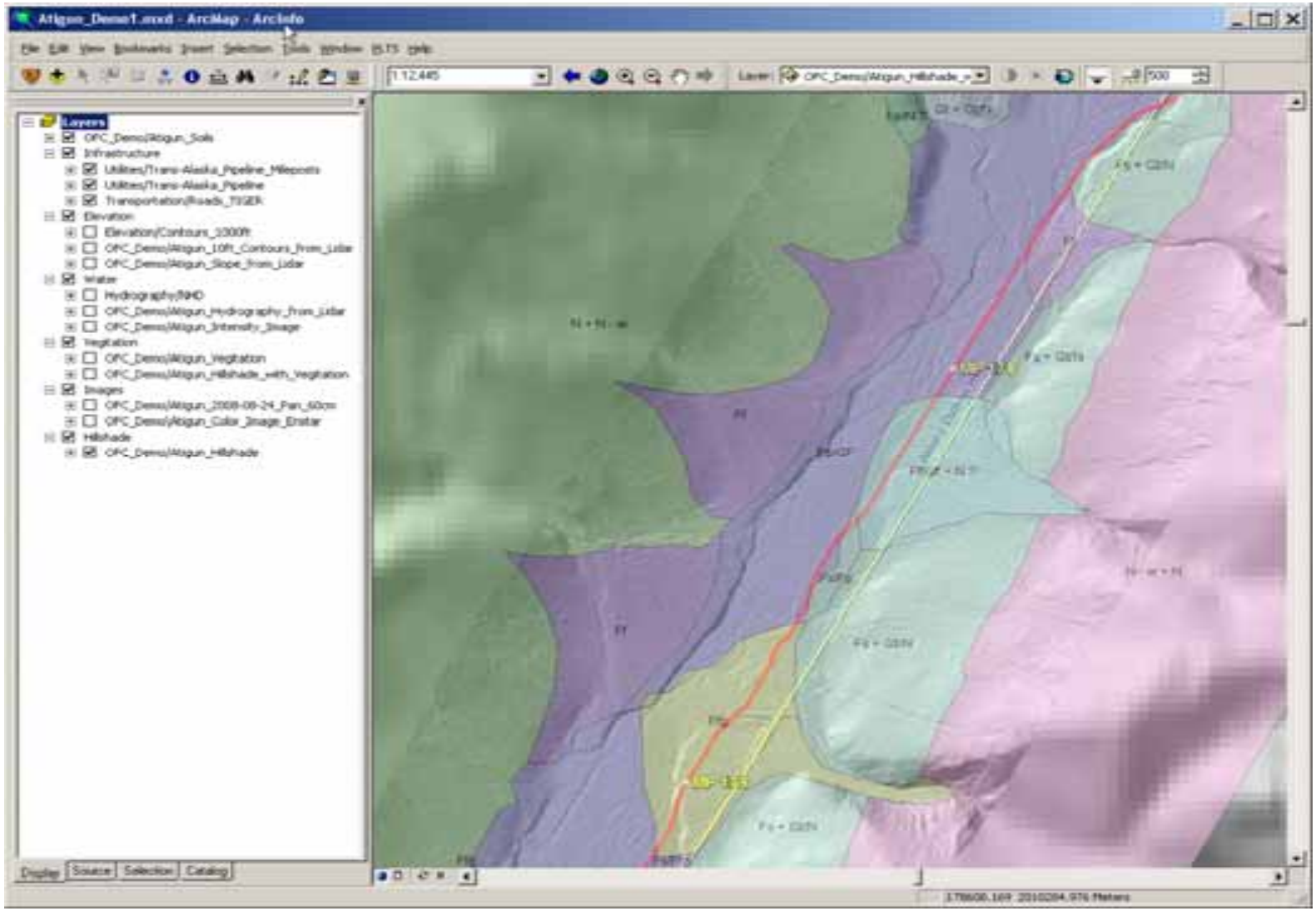
Data in GIS Web Service



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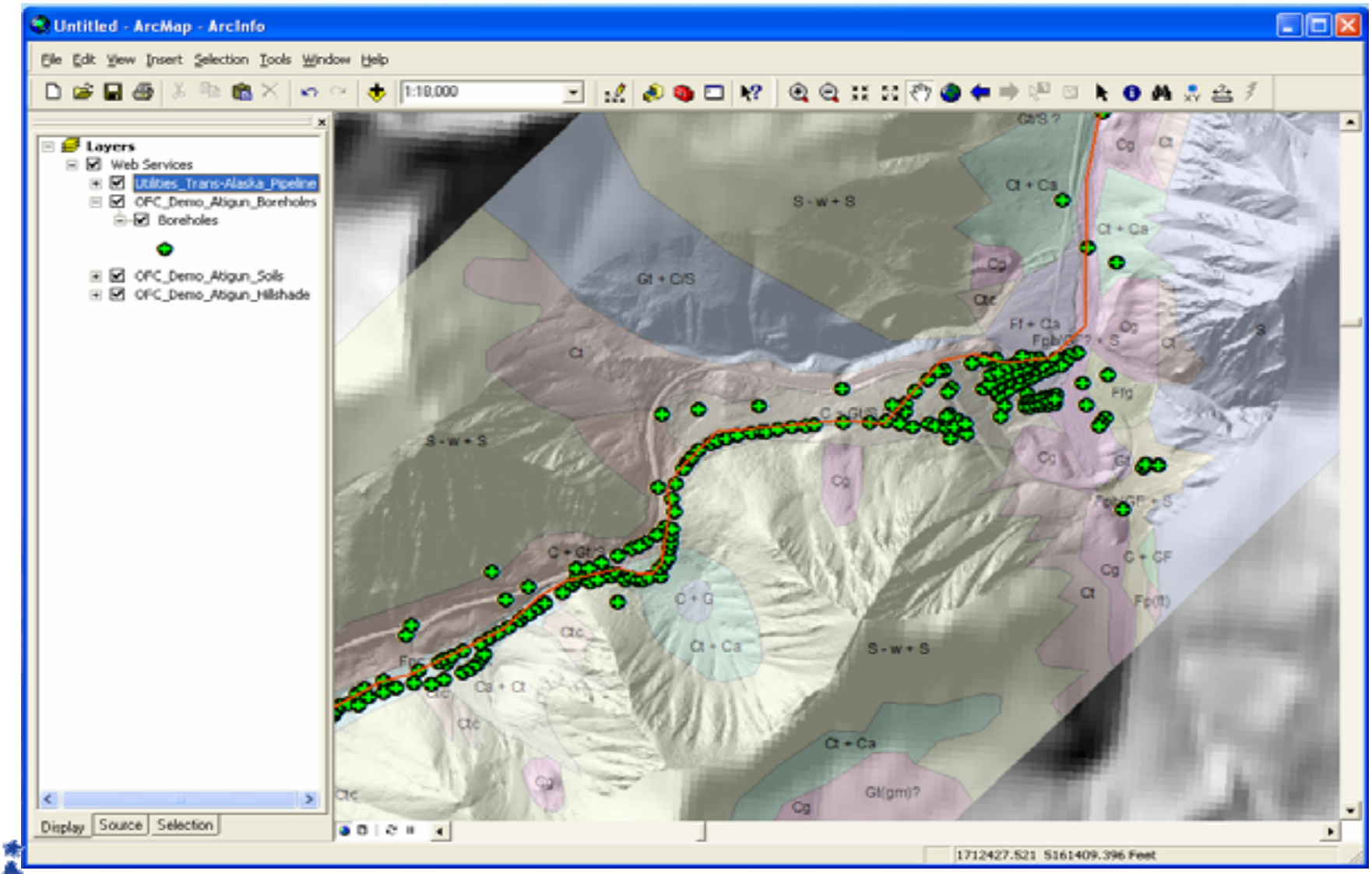
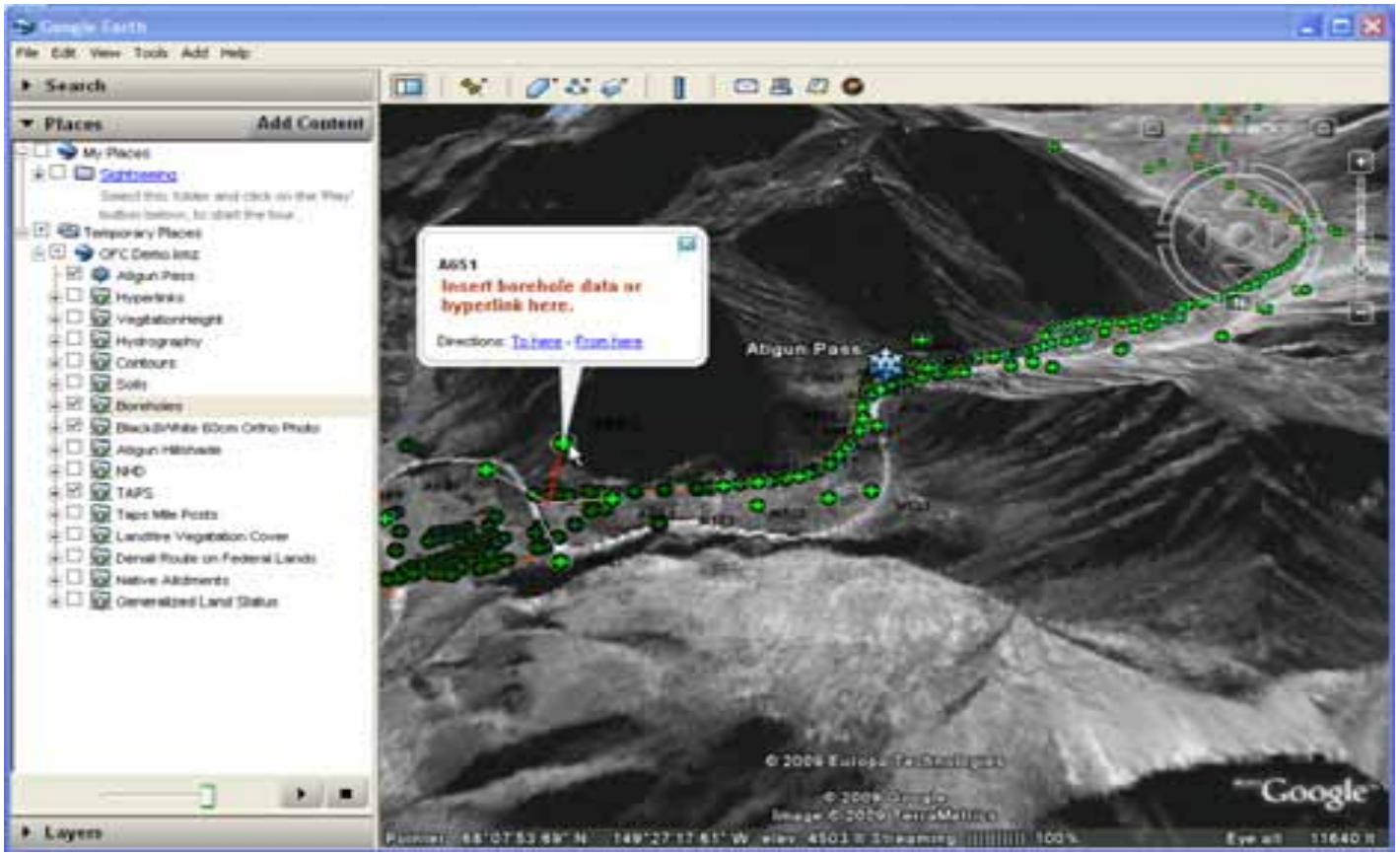
Web Service in ArcMap



Web Service Access

- Available at all access levels: example here Web Service publishing to Google Earth



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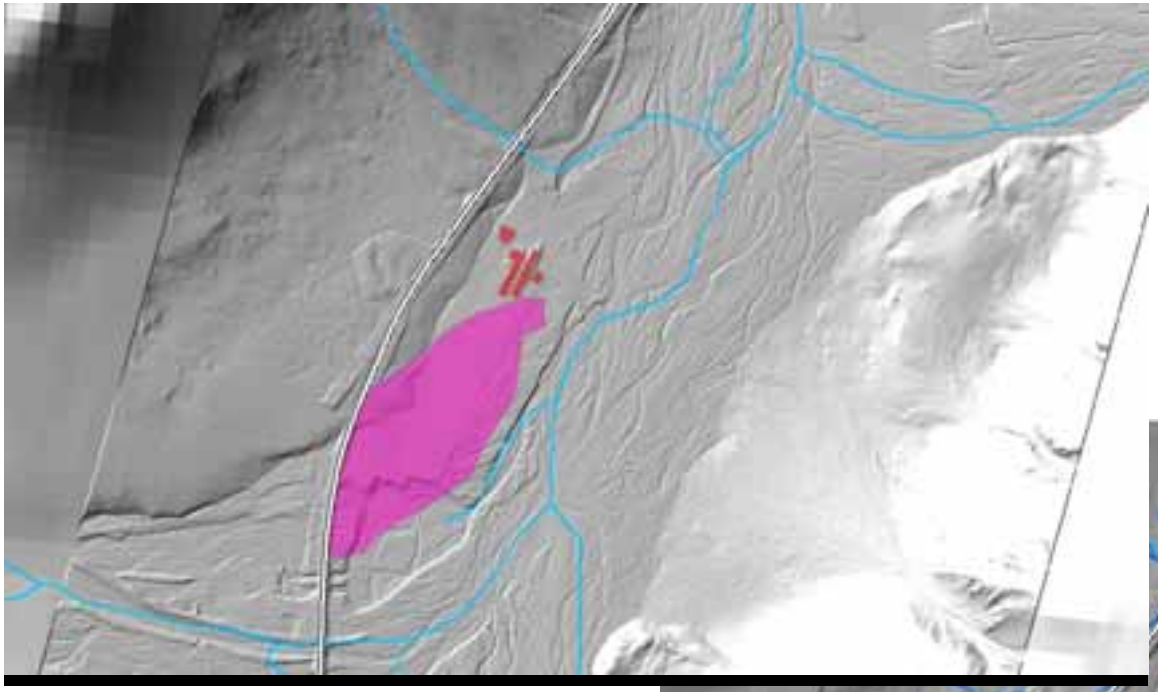
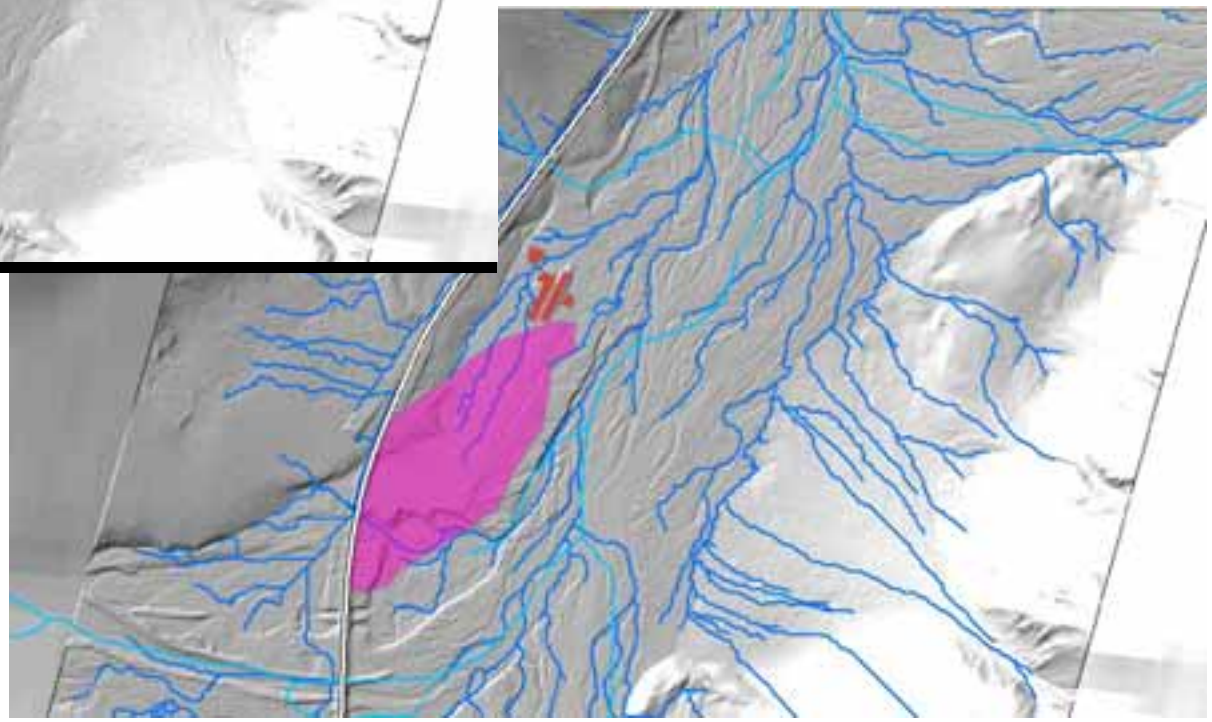
HOW GIS CAN BE USED

Using the Data - Permitting

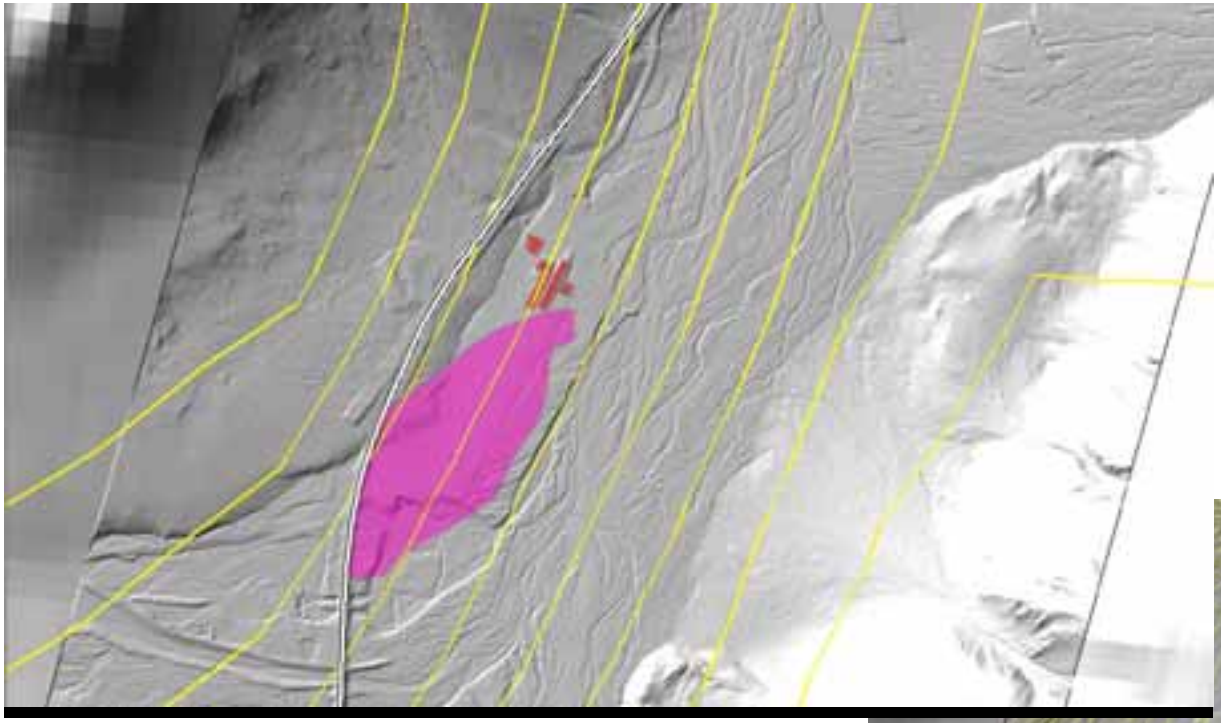


Streams
Left: Existing USGS
Right: LiDAR-derived

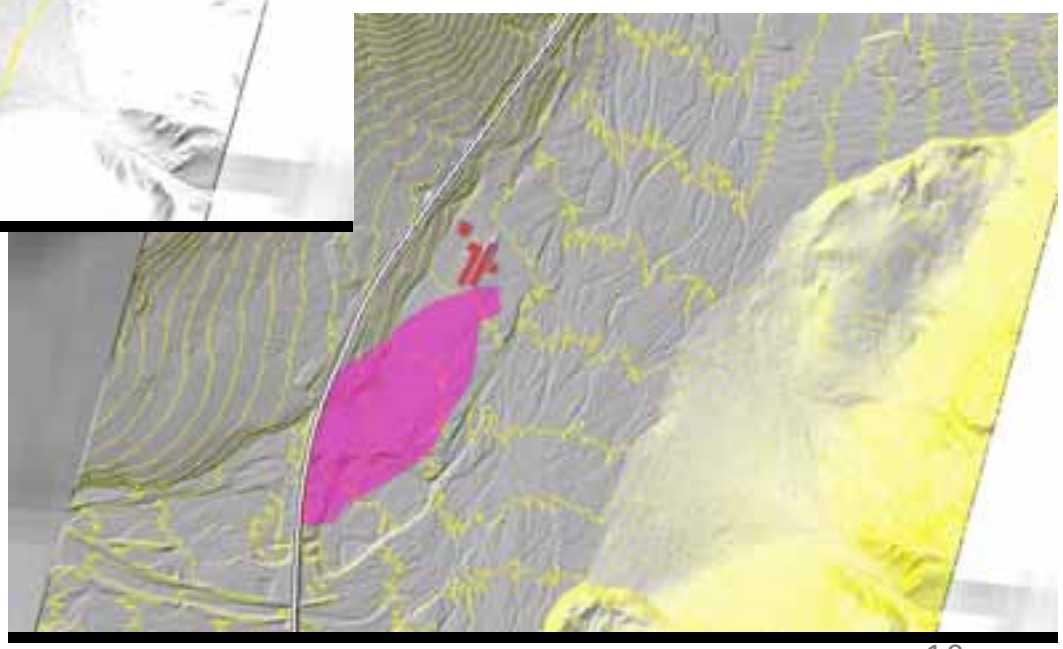


= EXAMPE CONTAMINATED ZONE

Improvement in Data Quality - Resolution



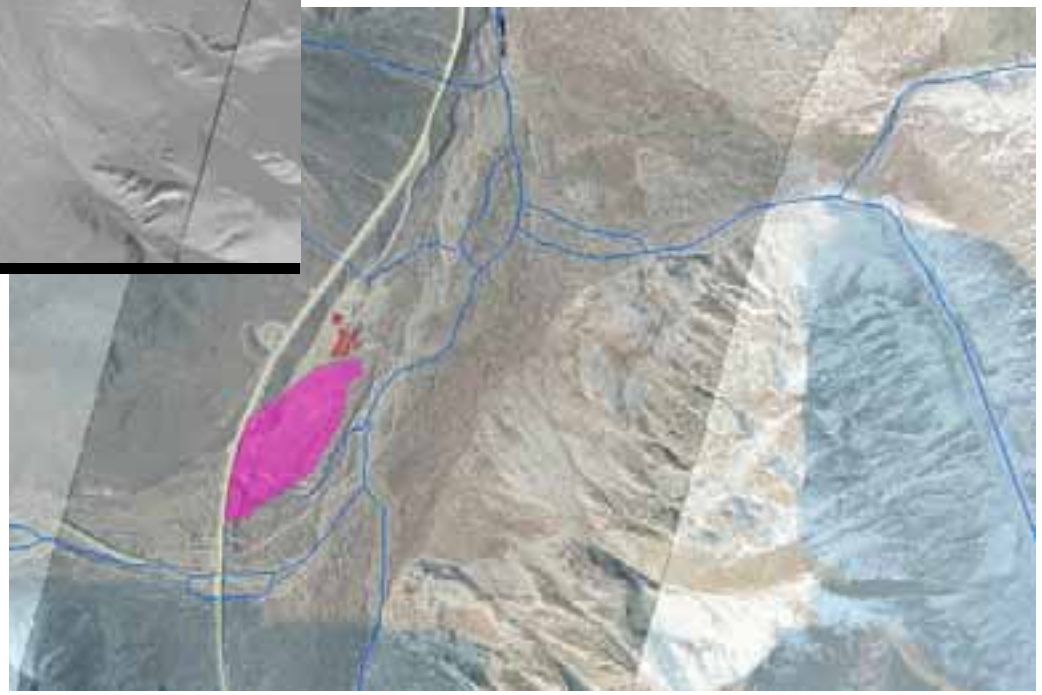
Topographic contours
Left: Existing USGS
Right: LiDAR-derived

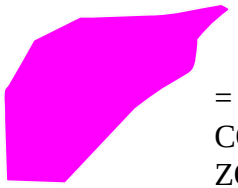


= EXAMPLE CONTAMINATED ZONE

Improvement in Data Quality – Real World View of the Landscape

Orthoimagery
Left: Satellite B&W, 2008
Right: Satellite color, 2006





= EXAMPLE CONTAMINATED ZONE

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PATH FORWARD

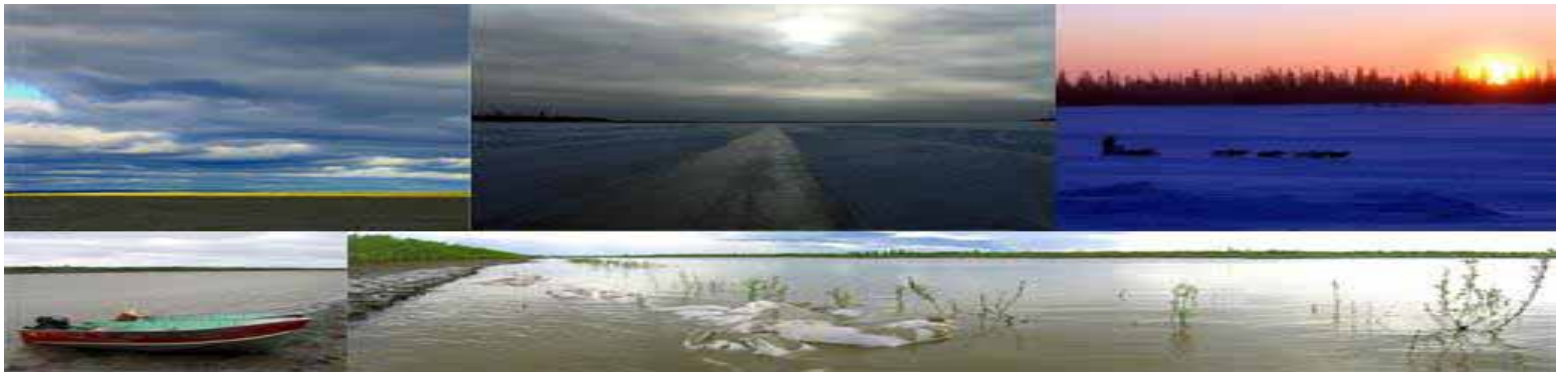
Key Findings

- **Identified Need - Authoritative basemap allows data to be integrated for multiple stakeholders**
  - Restoration mitigation, infrastructure planning, environmental permitting, etc
- **Closes Gaps**
  - Mapping - LiDAR coupled with good imagery provides a value-added database
  - Visualization
  - Historical Data Integration and Storage
  - Transparency - Web application provides transparent access to data
- **Target – Takes advantage of, and provides tool to enhance agency collaboration and efficiency**

Summary

- **Next Step - Acquiring Agency Inputs**
  - Coordinate with agencies on data
  - Develop a data integration plan
  - Complete capture of historical data

- **Accomplishments**
  - Established LiDAR standard
  - Established access levels
  - Integrated historical geotechnical data
  - Proof of concept



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