Georeferencing of American Society of Mining and Reclamation Proceedings: A New Tool and Patterns in Reclamation Research

Ashley Rovder, Zach Shoff, David Madl, Staci Wolfe, Stefan Long, William Strosnider, Peter Smyntek

OVERVIEW

Introduction

Purpose and proposal

Methods

Results

Open Discussion

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ASMR PROPOSAL

"Data related to… the earlier technical work associated with specific mine sites… is at risk of being lost or ignored by researchers and remediation practitioners."

ASMR PROPOSAL

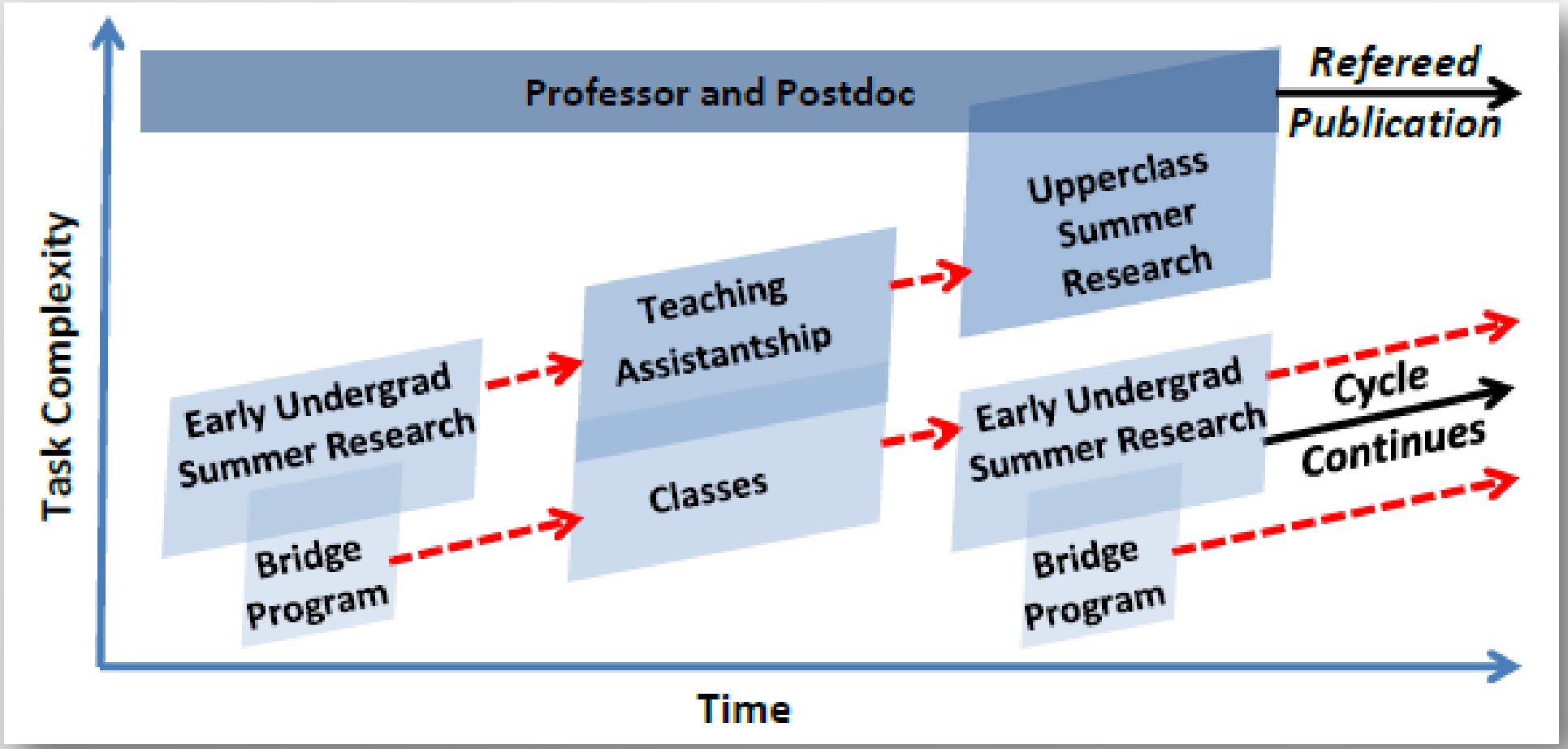
- Team up with a senior ASMR member who will provide guidance
- Cross reference each ASMR paper with a geographic location
- Create a placemark in Google Earth™ for each site, include a reference to the paper
- Organize the database by state and technical division
- Forward the Google Earth placemark folders to the ASMR webmaster
- Present findings at ASMR conference

SFU CWRS PROPOSAL

- In addition to ASMR's requests, the following products will also be developed:
  - An ASMR abstract with an undergraduate lead author for poster presentation at the 2017 meeting
  - An oral presentation at the 2017 meeting
  - A Reclamation Matters article with an undergraduate lead author describing:
    - Summary of findings
    - Research-Learning opportunity

SFU CWRS PROPOSAL

- SFU's Research-Learning model



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METHODS-SFU

- Assign each team member a series of articles (1998-2007)
- Locate article
- Determine technical division
- Find coordinates on Google Earth™
- Fill out data on excel sheet
- Double check each site
- Send completed sheet to Pete and Zach at Saint Vincent College

Year	Form/Media	Conf.	Authors	Title	Keywords/Comments
2001	Paper and ASMF	ASSMR Albuque	Athay, Nairn and Strevett	Biotic and Abiotic Iron Oxidation Kinetics in Net Alkaline Mine Drainage	Treatment wetlands, Superfur design, Tar Creek, ecological engineering
2001	Paper and ASMF	ASSMR Albuque	Brookens, DeAngelo and Stearns	An Evaluation of Biotic Integrity Associated with Coal Mine Reclamation in the Dry Creek Drainage Basin, Tennessee	Biotic integrity, benthicmacroinvertebrate, pas treatment system
2001	Paper and ASMF	ASSMR Albuque	Eger and Wagner	Sulfate Reduction - Decreases in Substrate Reactivity and the Implication for Long-Term Treatment	Acid drainage, copper, nickel, metals, treatment lifetime
2001	Paper and ASMF	ASSMR Albuque	Garrett, Jr., Bartolucci and Vermace	Constructed Wetland Research for the Treatment of the Plant Gorgas Coal Pile Runoff	Reducing and alkalinity produ system, RAPS, successive a producing system, SAPS, recirculating RAPS, ReRAPS reduction

Keywords/Comments	Technical Division	Latitude	Longitude	Place Name	Confidential	Dummy Sites	Country	State	Lead Student Done
Treatment wetlands, Superfund, design, Tar Creek, ecological engineering	Landuse Planning and Design	36.970474	-94.846243	Tar Creek			USA	OK	Staci
Biotic integrity, benthicmacroinvertebrate, passive treatment system	Water Management-Mine Water Treatment	35.5196	-85.540162	Dry Creek Basin			USA	TN	Staci
Acid drainage, copper, nickel, trace metals, treatment lifetime	Water Management-Mine Water Treatment	No Location		n/a		No Location Island			Staci
Reducing and alkalinity producing system, RAPS, successive alkalinity producing system, SAPS, recirculating RAPS, ReRAPS, sulfate reduction	Water Management-Mine Water Treatment	33.644662	-87.198958	Gorgas Plant	X		USA	AL	Staci

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Authors

Athay, Nairn and Strevett

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Title
Biotic and Abiotic Iron Oxidation Kinetics in Net Alkaline Mine Drainage

Keywords/Comments

Treatment wetlands, Superfund, design, Tar Creek, ecological engineering

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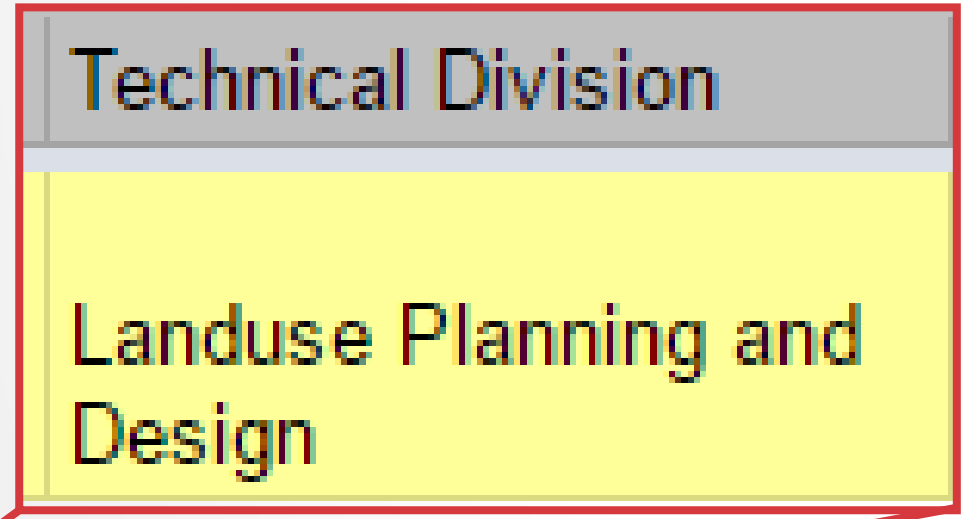

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US Dept of State Geographer
© 2016 Google
© 2009 GeoBasis-DE/BKG
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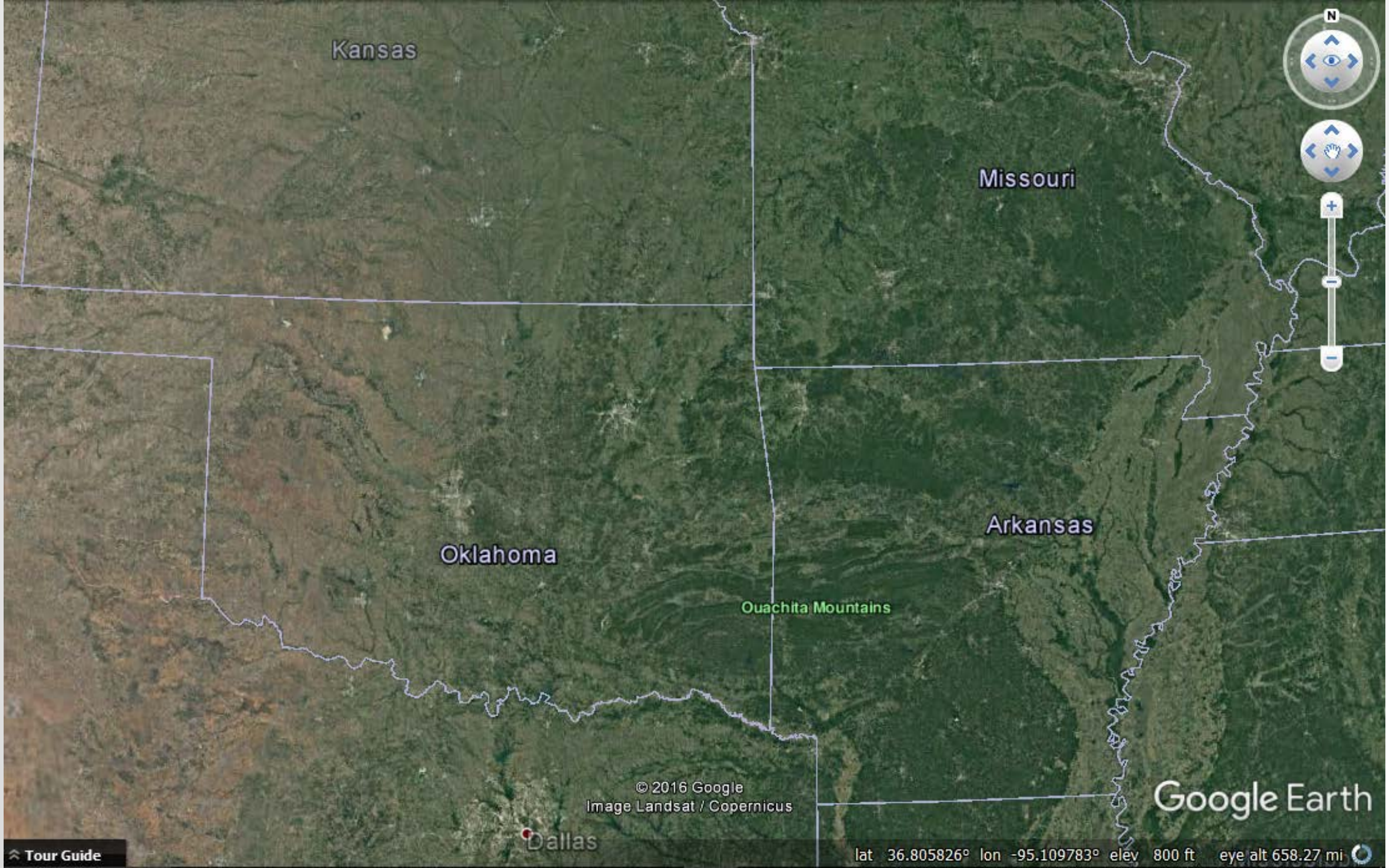
Kansas
Missouri
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Arkansas
Ouachita Mountains
Dallas
© 2016 Google
Image Landsat / Copernicus
Google Earth
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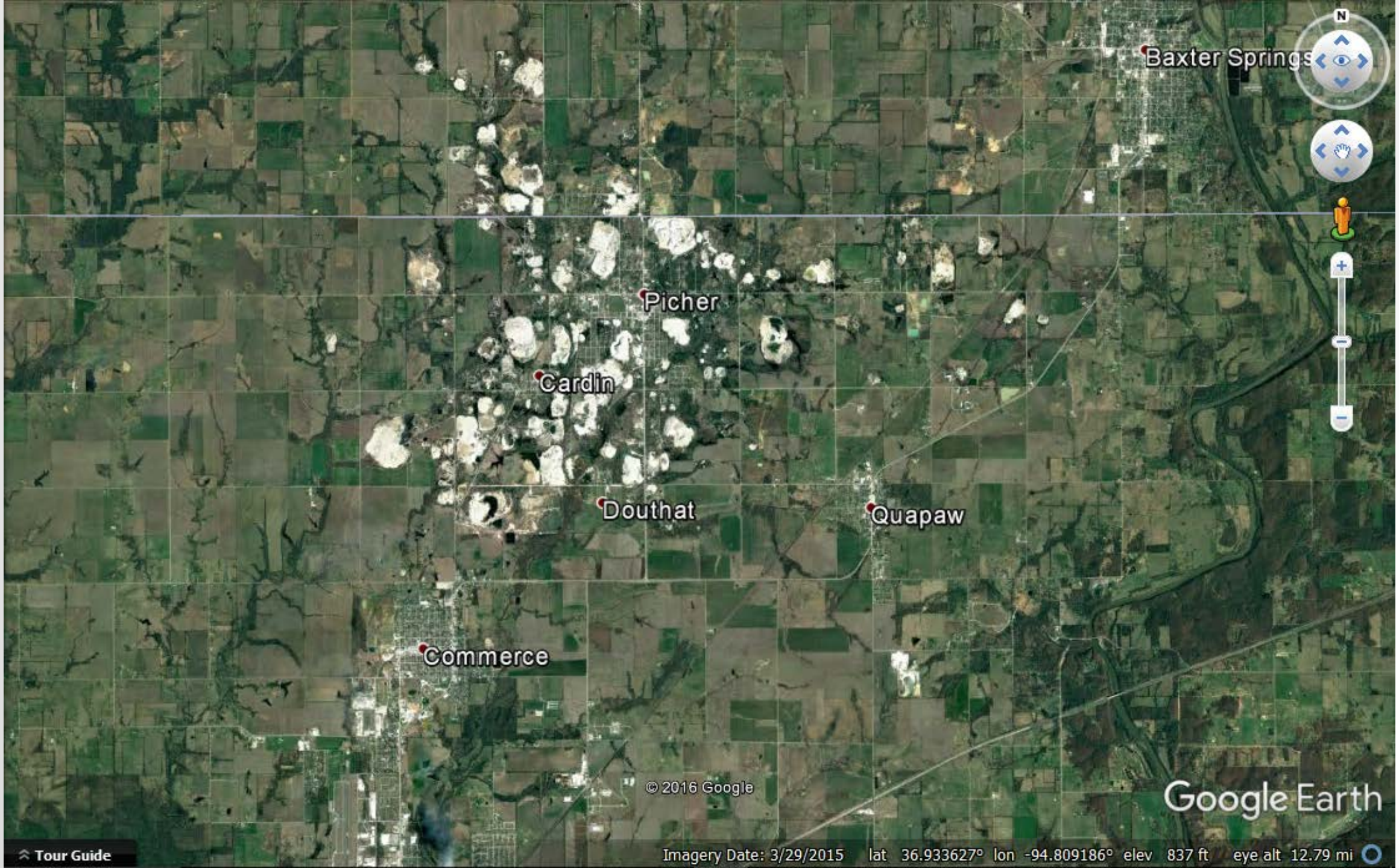
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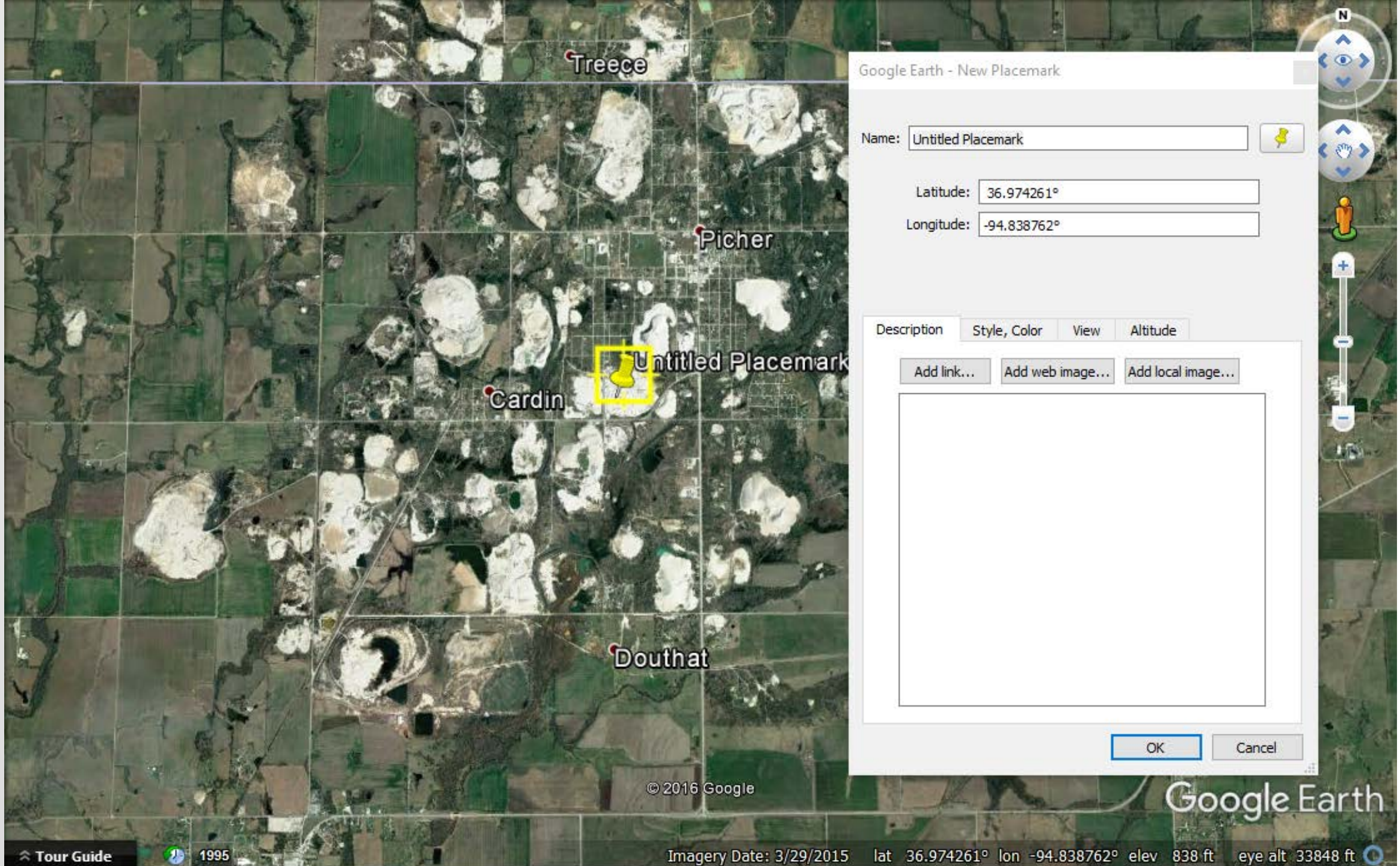
Treece
Picher
Untitled Placemark
Cardin
Douthat
© 2016 Google
Google Earth
Google Earth - New Placemark
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Longitude: -94.838762°
Description
Style, Color
View
Altitude
Add link...
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Tour Guide
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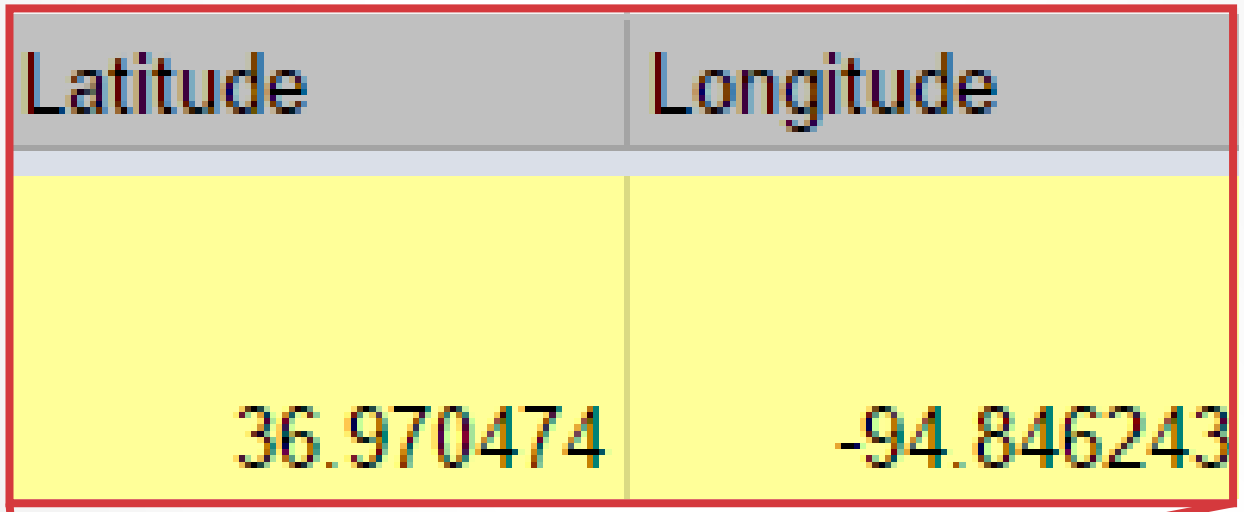

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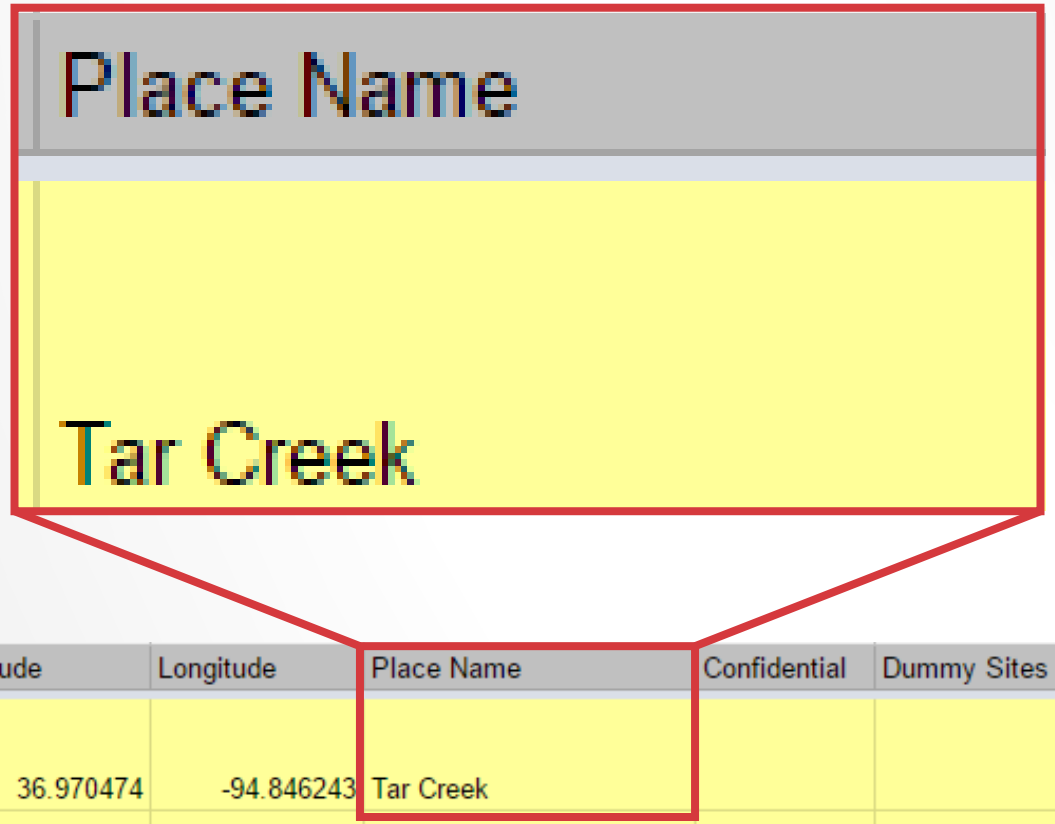

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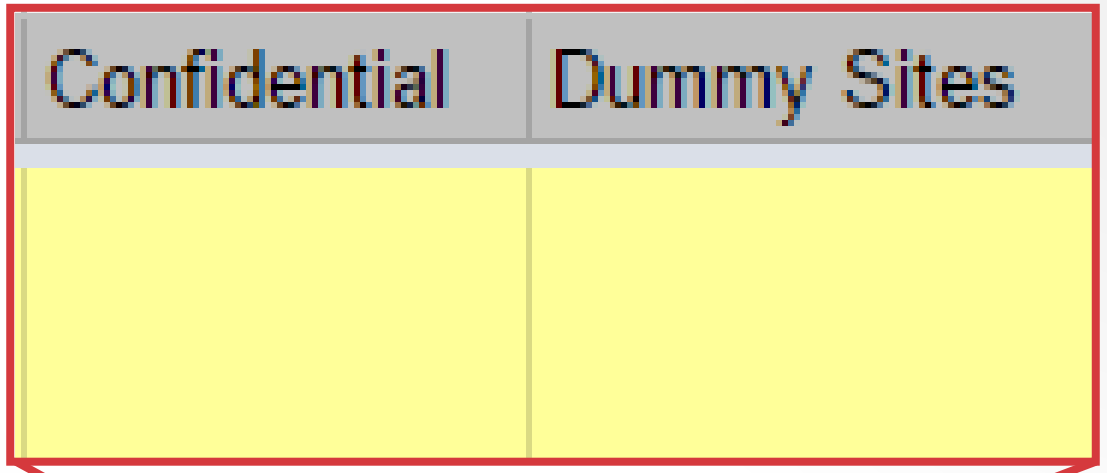

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Country	State	Lead Student Done	Check Student
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METHODS-SFU

- Necessary distinctions/ problems encountered
- Clarifications
  - Technical divisions: tailings (general); education
- Identifying all of the sites in a single paper
- Form of latitude/longitude coordinates
- Older papers were more challenging

METHODS-SVC

- Zach Shoff and Peter Smyntek
- Utilized the Earthpoint website (http://www.earthpoint.us/)
- Converted Excel files to .kmz files with Google Earth placemarks
- Rapid, bulk conversions aided error detection & correction

METHODS-SVC

- Sorted with color-coded technical divisions
- 1200 abstracts
  - 700 “known” locations
  - 250 known state/country
  - 250 no location
- Unnamed sites were denoted by a circle; abstracts without location details were placed in the North Pacific (SE of Hawaii)
- Two databases- organized by location and technical division

OVERVIEW

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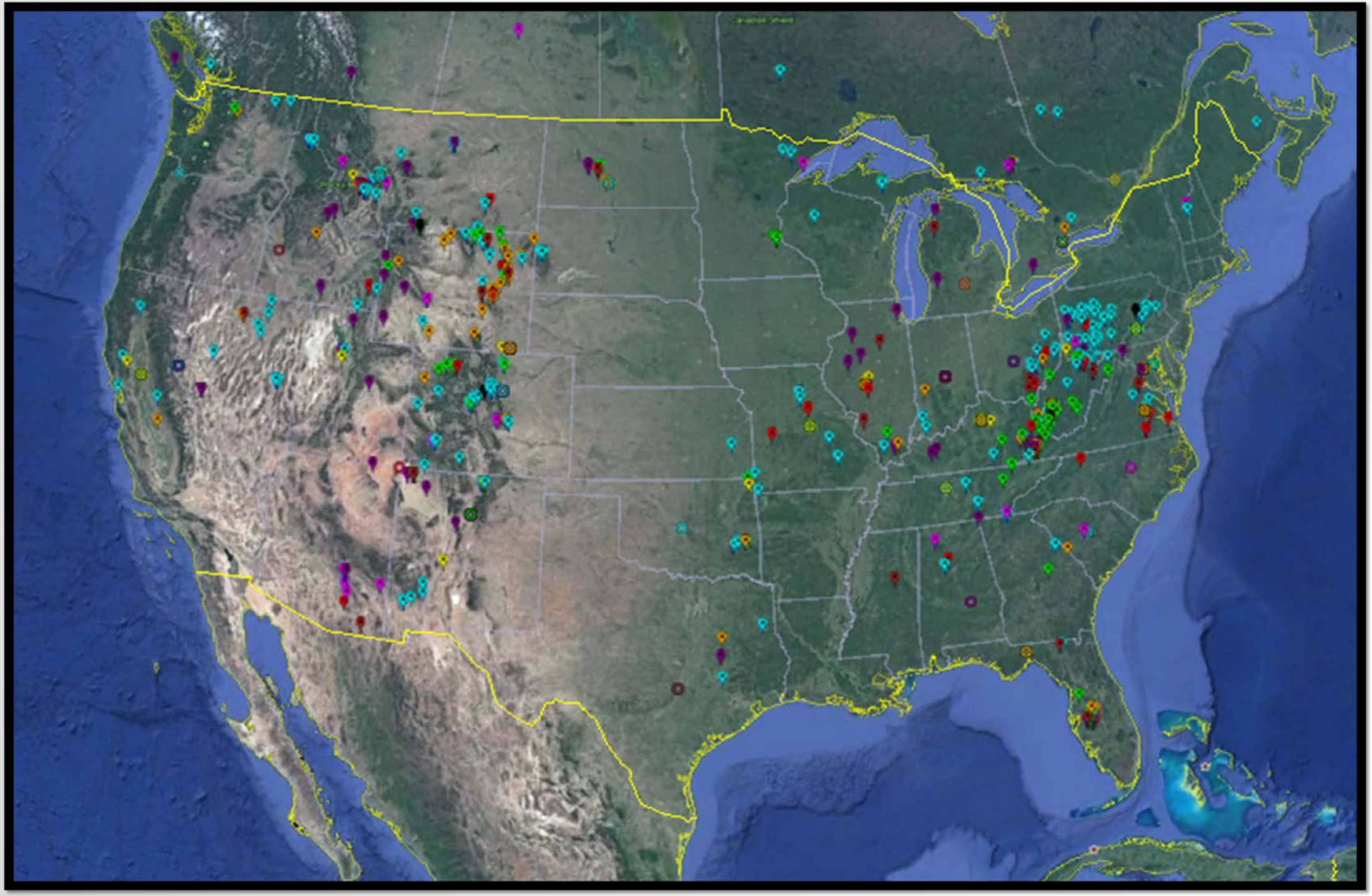
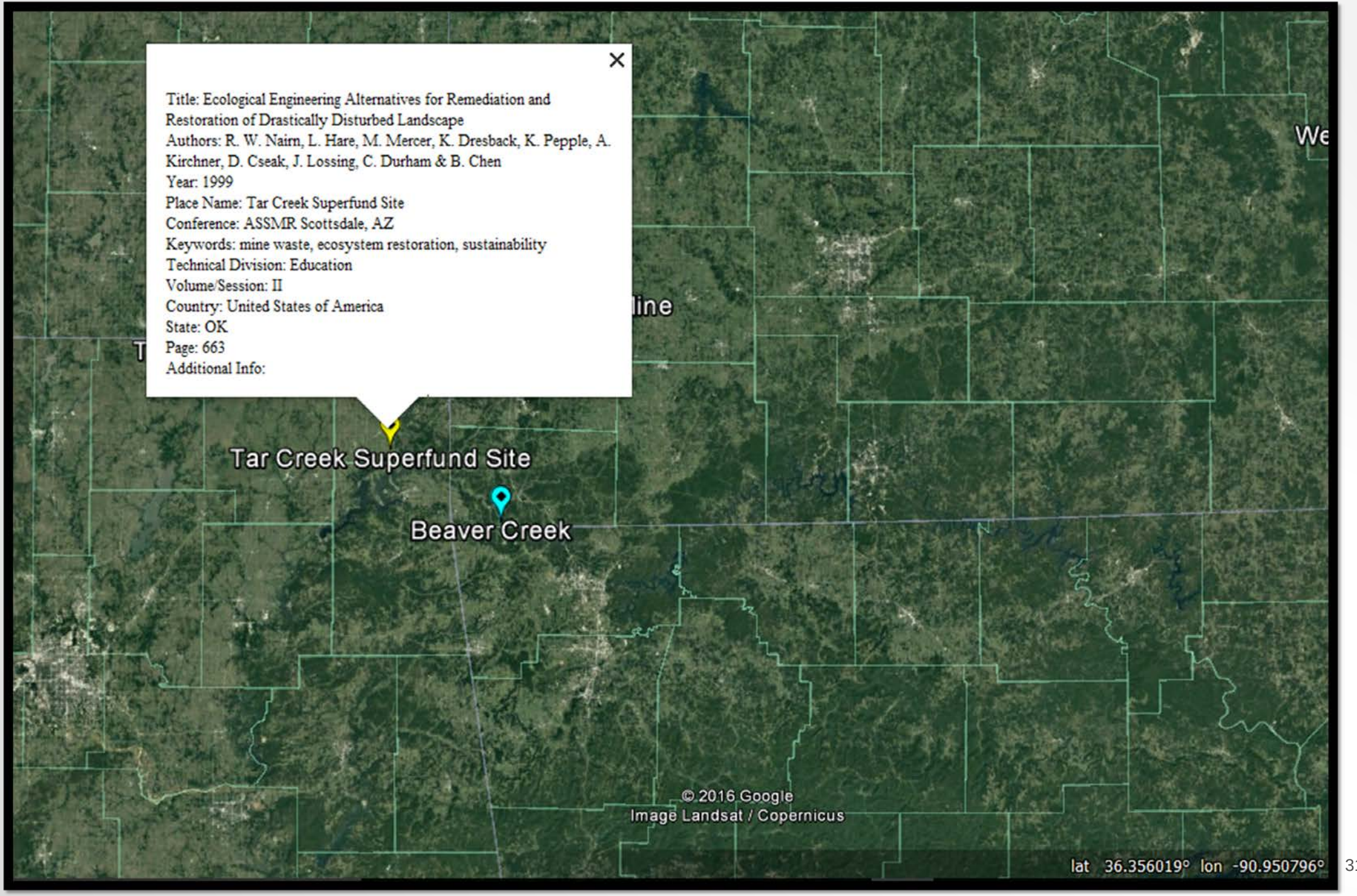
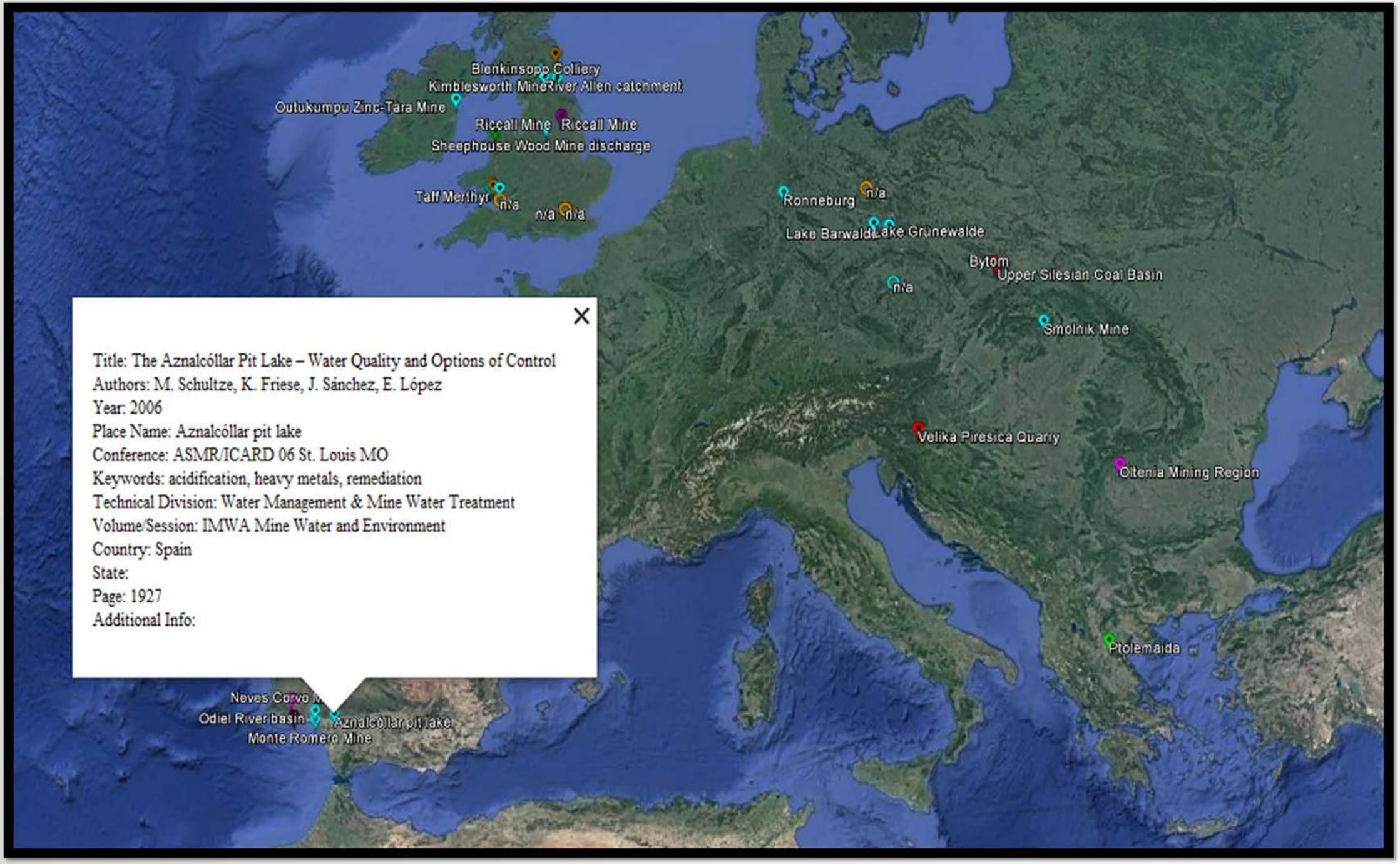



Title: Ecological Engineering Alternatives for Remediation and Restoration of Drastically Disturbed Landscape
Authors: R. W. Nairn, L. Hare, M. Mercer, K. Dresback, K. Pepple, A. Kirchner, D. Cseak, J. Lossing, C. Durham & B. Chen
Year: 1999
Place Name: Tar Creek Superfund Site
Conference: ASSMR Scottsdale, AZ
Keywords: mine waste, ecosystem restoration, sustainability
Technical Division: Education
Volume/Session: II
Country: United States of America
State: OK
Page: 663
Additional Info:
Tar Creek Superfund Site
Beaver Creek
© 2016 Google
Image Landsat / Copernicus
lat 36.356019° lon -90.950796°


Blenkinsopp Colliery
Kimblesworth MineRiver Allen catchment
Outukumpu Zinc-Tara Mine
Riccall Mine Riccall Mine
Sheephouse Wood Mine discharge
Taff Merthyr
n/a
n/a
n/a
Ronneburg
n/a
Lake Barwalde
Lake Grünewalde
Bytom
Upper Silesian Coal Basin
n/a
Smolnik Mine
Velika Piresica Quarry
Oltenia Mining Region
Ptolemaida
Neves Corvo
Odiel River basin
Aznalcóllar pit lake
Monte Romero Mine
Title: The Aznalcóllar Pit Lake – Water Quality and Options of Control
Authors: M. Schultze, K. Friese, J. Sánchez, E. López
Year: 2006
Place Name: Aznalcóllar pit lake
Conference: ASMR/ICARD 06 St. Louis MO
Keywords: acidification, heavy metals, remediation
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State:
Page: 1927
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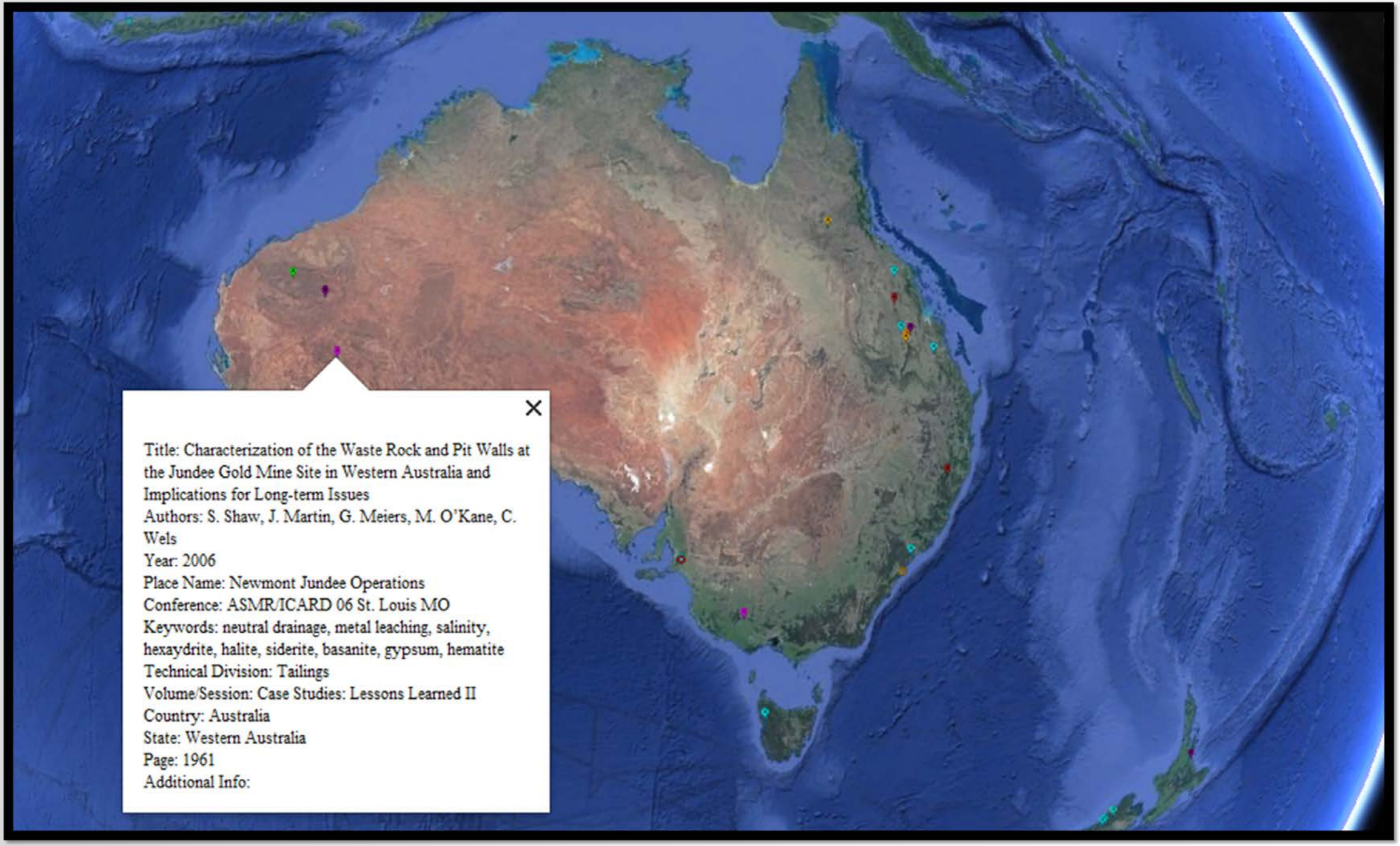
Title: Characterization of the Waste Rock and Pit Walls at the Jundee Gold Mine Site in Western Australia and Implications for Long-term Issues
Authors: S. Shaw, J. Martin, G. Meiers, M. O'Kane, C. Wels
Year: 2006
Place Name: Newmont Jundee Operations
Conference: ASMR/ICARD 06 St. Louis MO
Keywords: neutral drainage, metal leaching, salinity, hexaydrite, halite, siderite, basanite, gypsum, hematite
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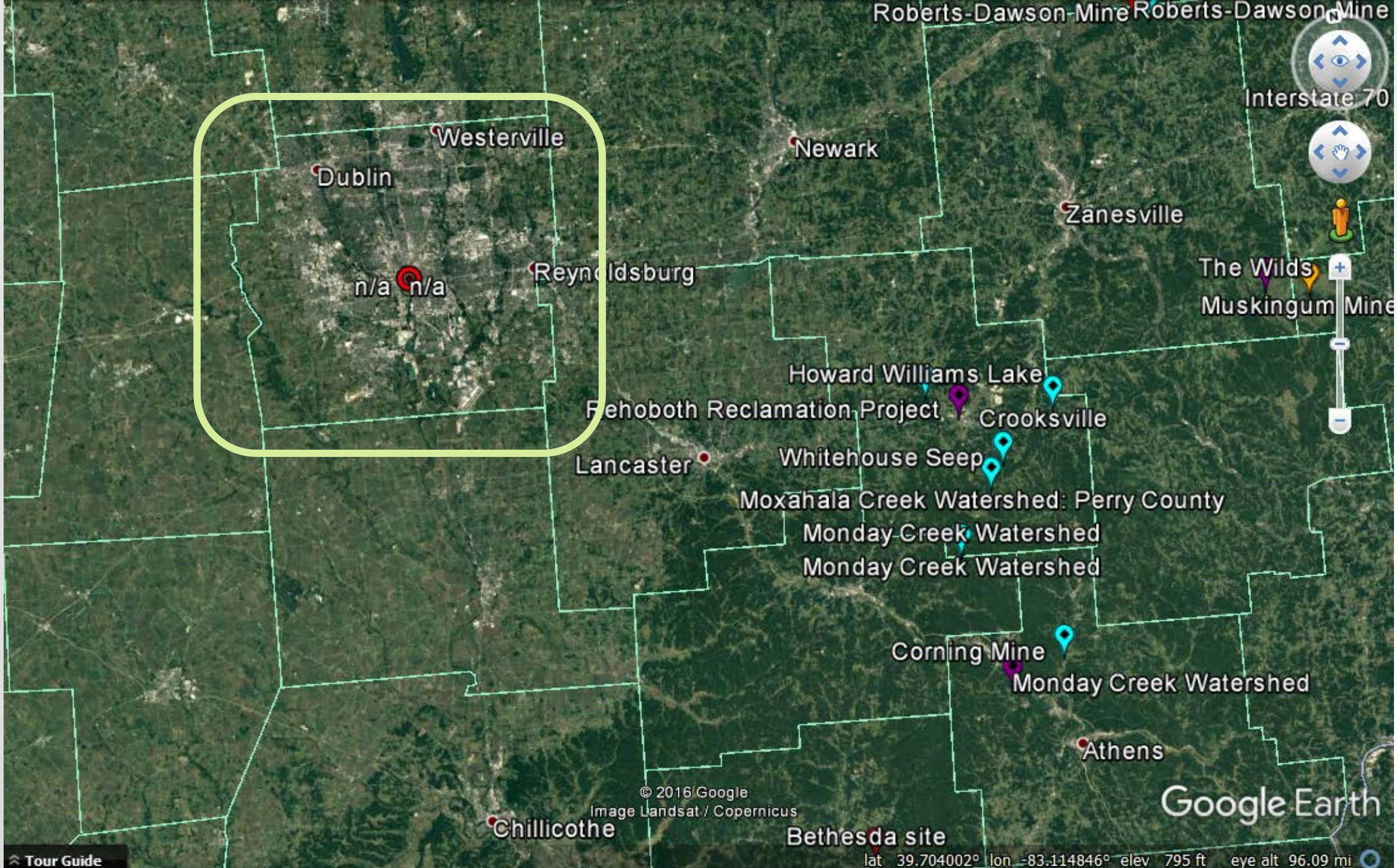
Roberts-Dawson Mine
Roberts-Dawson Mine
Interstate 70
Westerville
Dublin
Newark
Zanesville
n/a
n/a
Reynoldsburg
The Wilds
Muskingum Mine
Howard Williams Lake
Rehoboth Reclamation Project
Crooksville
Lancaster
Whitehouse Seep
Moxahala Creek Watershed: Perry County
Monday Creek Watershed
Monday Creek Watershed
Corning Mine
Monday Creek Watershed
Athens
© 2016 Google
Image Landsat / Copernicus
Chillicothe
Bethesda site
Google Earth
Tour Guide
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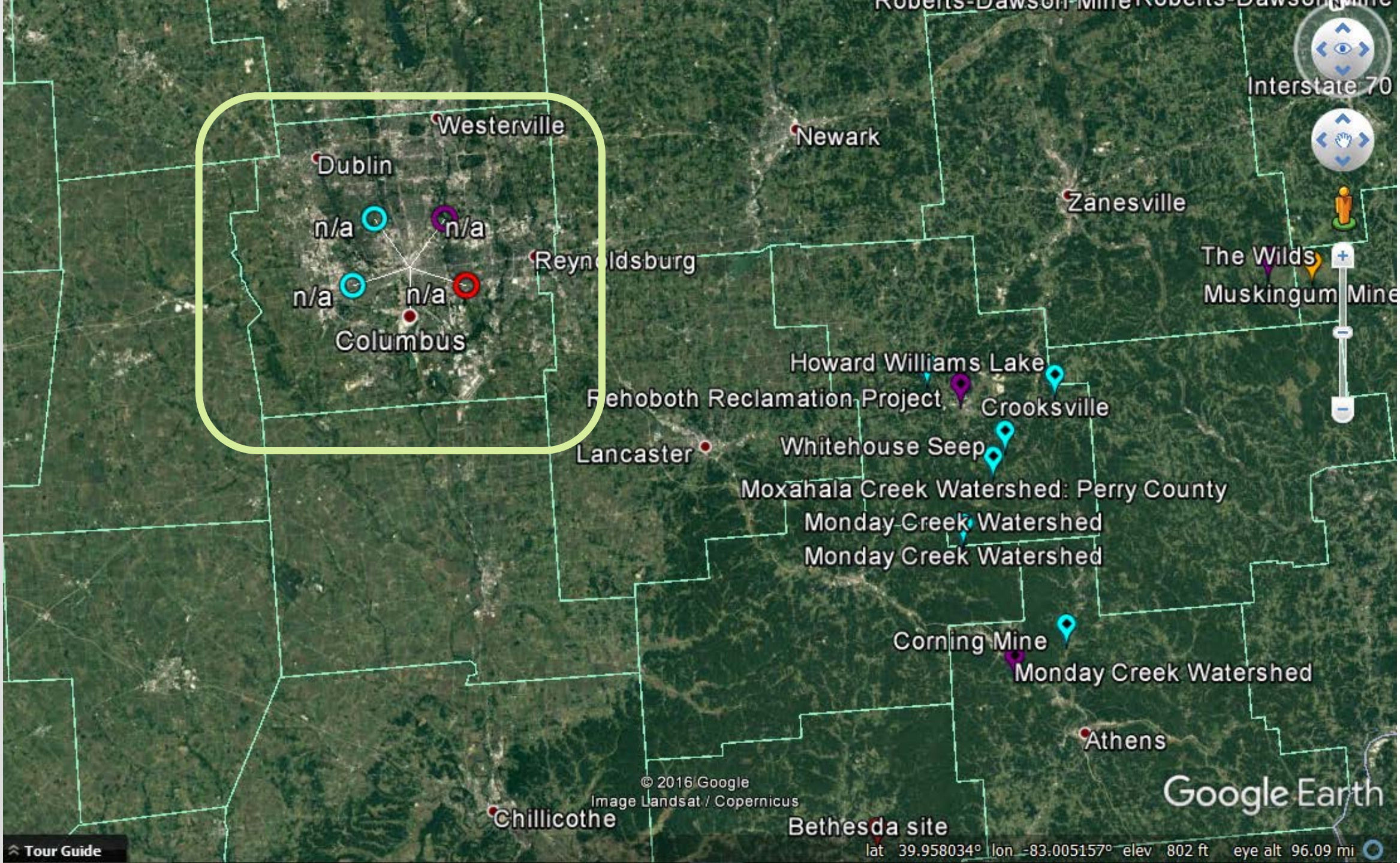
Roberts-Dawson Mine
Interstate 70
Westerville
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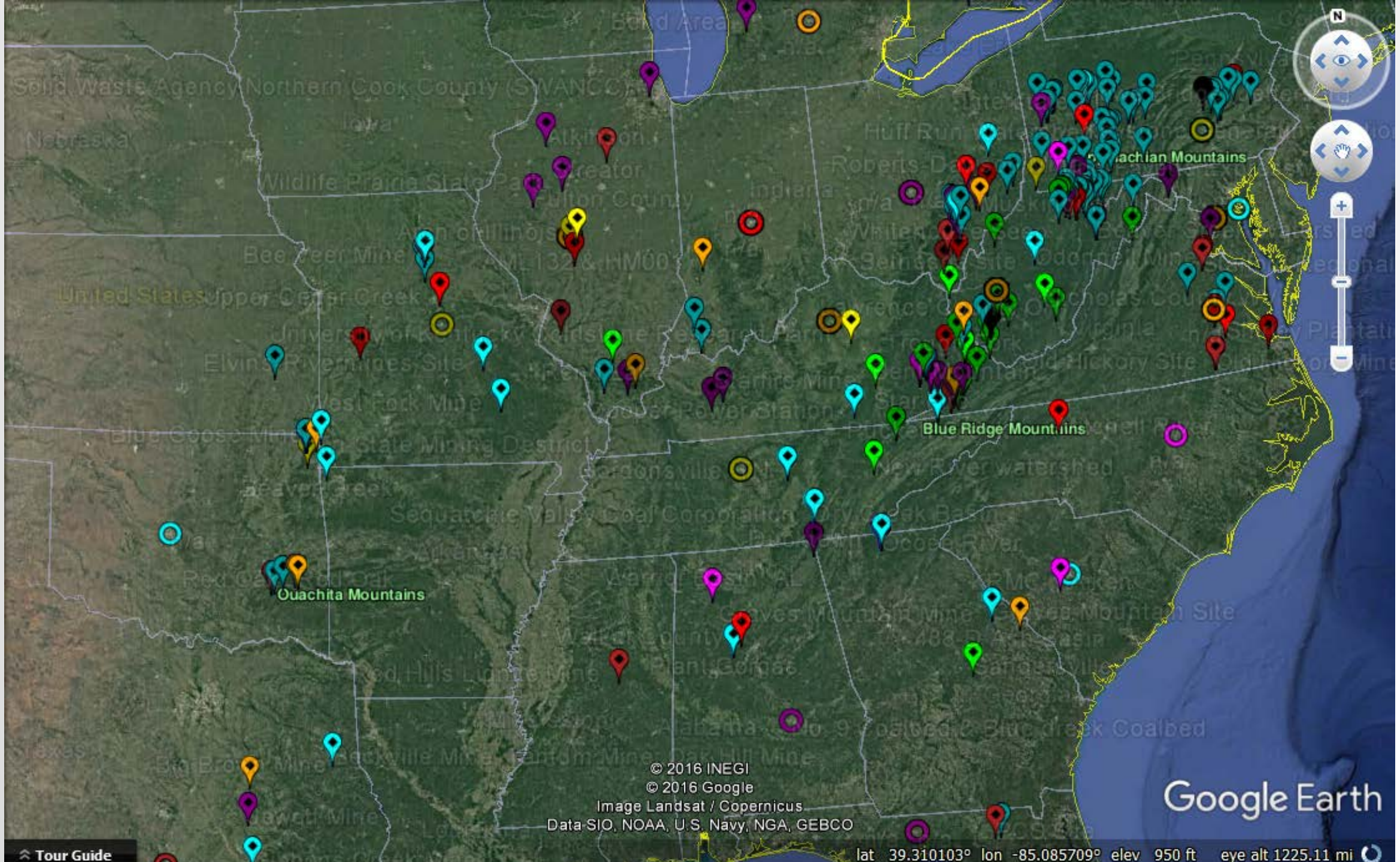
Reynoldsburg
The Wilds
Muskingum Mine
Columbus
Howard Williams Lake
Rehoboth Reclamation Project
Crooksville
Lancaster
Whitehouse Seep
Moxahala Creek Watershed: Perry County
Monday Creek Watershed
Monday Creek Watershed
Corning Mine
Monday Creek Watershed
Athens
© 2016 Google
Image Landsat / Copernicus
Chillicothe
Bethesda site
Google Earth
Tour Guide
lat 39.958034° lon -83.005157° elev 802 ft eye alt 96.09 mi


Blue Ridge Mountains
Ouachita Mountains
© 2016 INEGI
© 2016 Google
Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google Earth
Tour Guide
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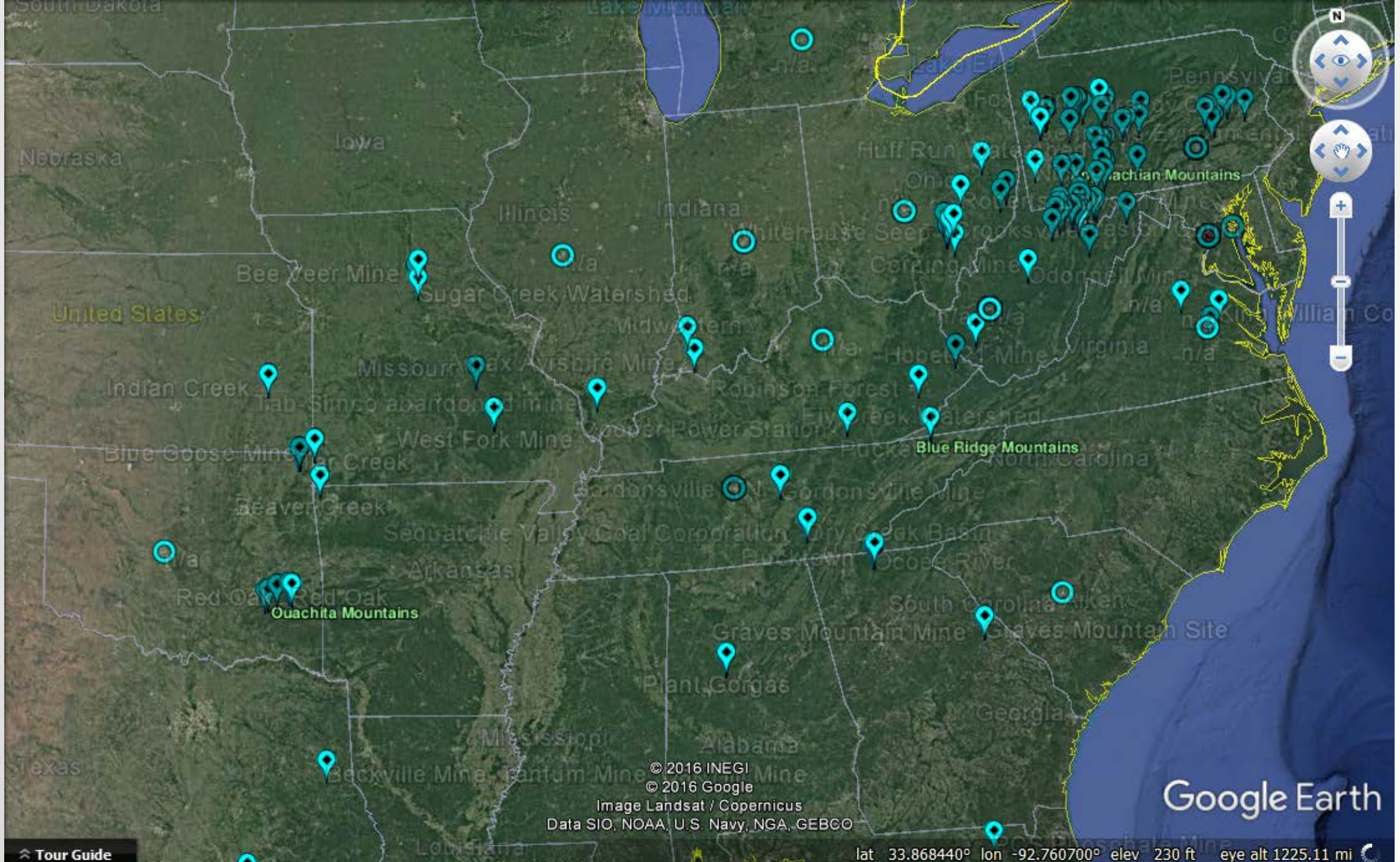
Nebraska
Iowa
Illinois
Indiana
United States
Missouri
Indian Creek
Beaver Creek
Arkansas
Red Oak
Ouachita Mountains
Blue Ridge Mountains
North Carolina
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Georgia
Alabama
Mississippi
Louisiana
Texas
Plant Gorgas
Graves Mountain Mine
Graves Mountain Site
Sugar Creek Watershed
West Fork Mine
Robinson Forest
Gordonsville Mine
Virginia
Pennsylvania
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Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google Earth
Tour Guide
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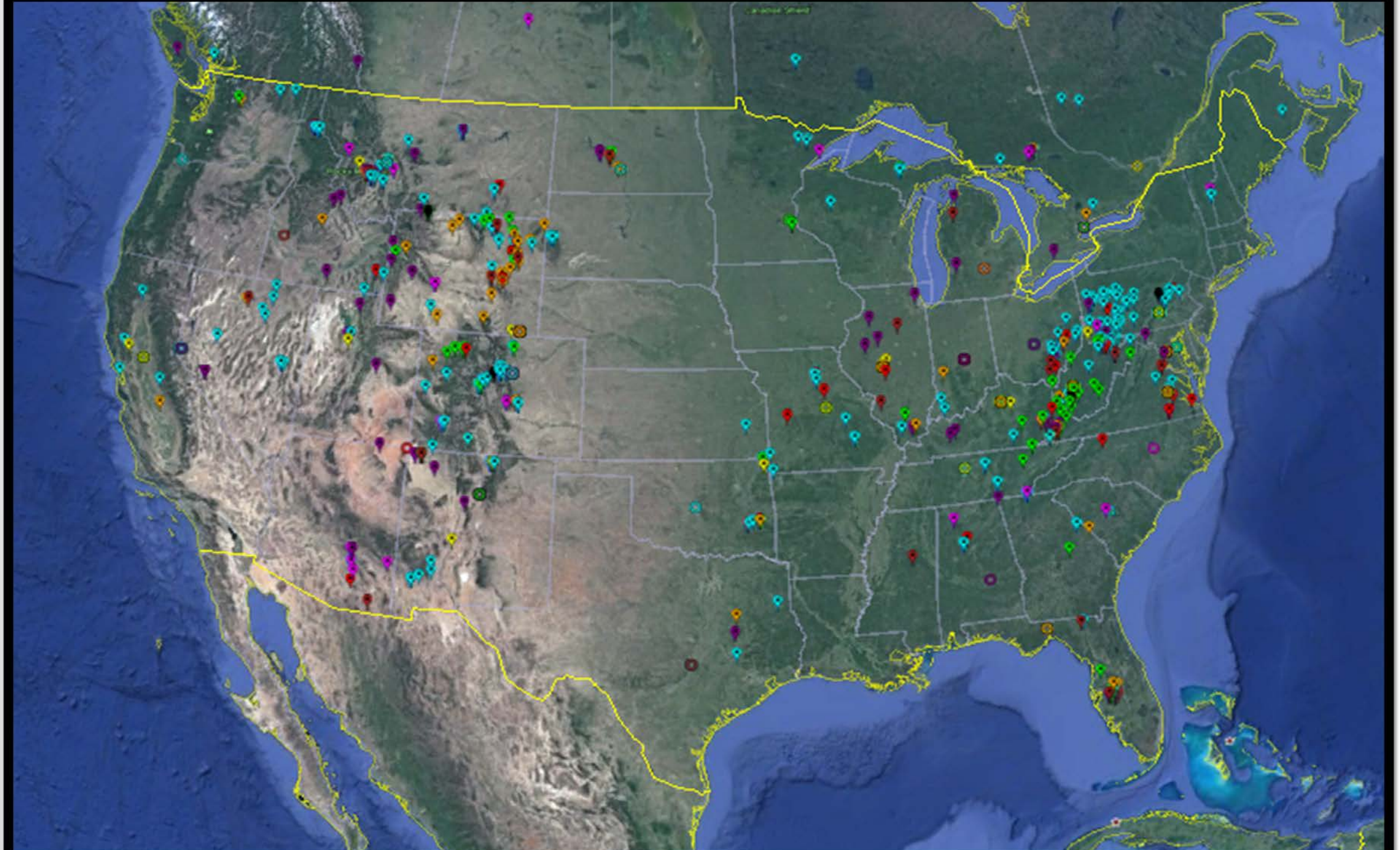

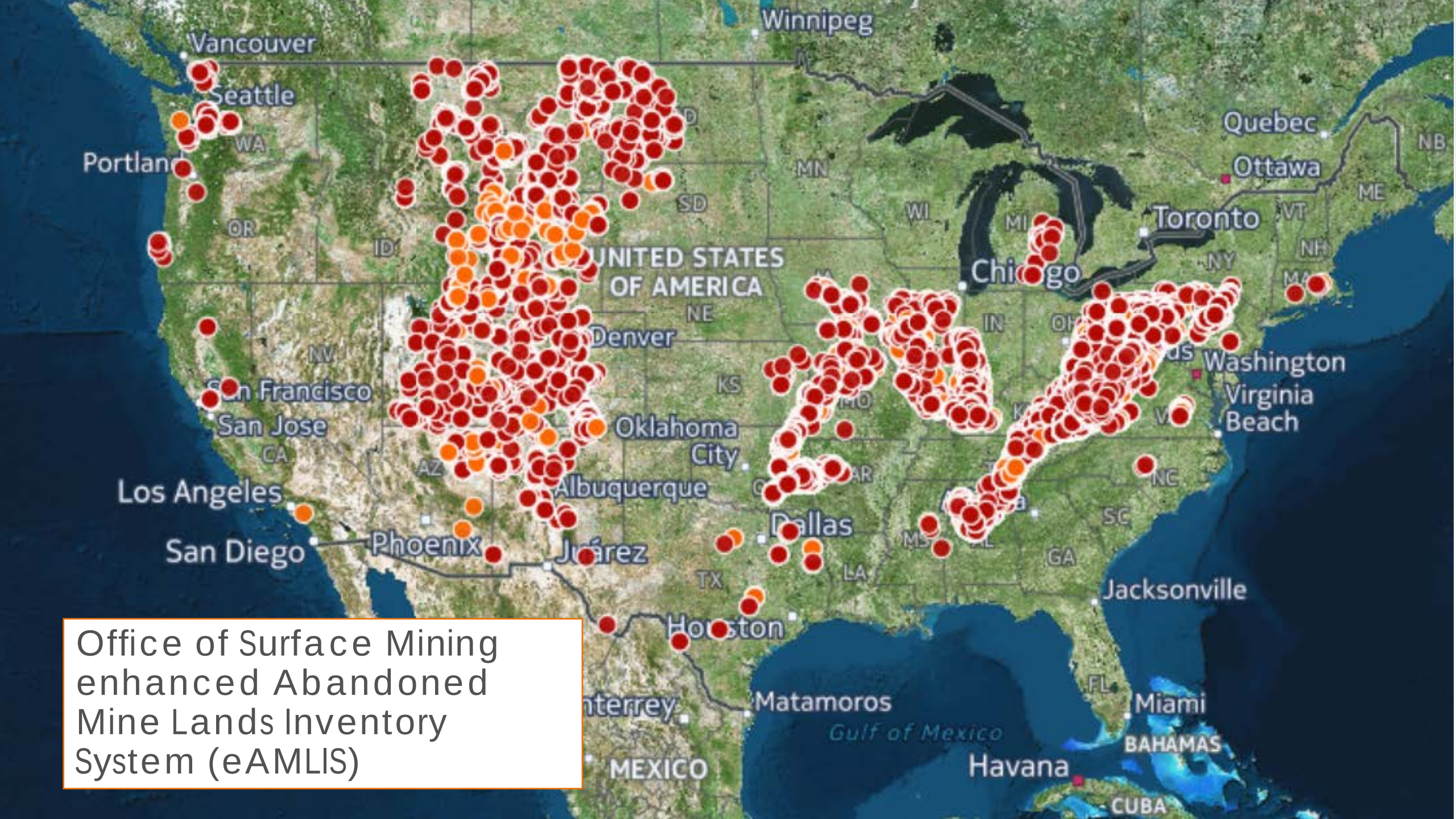
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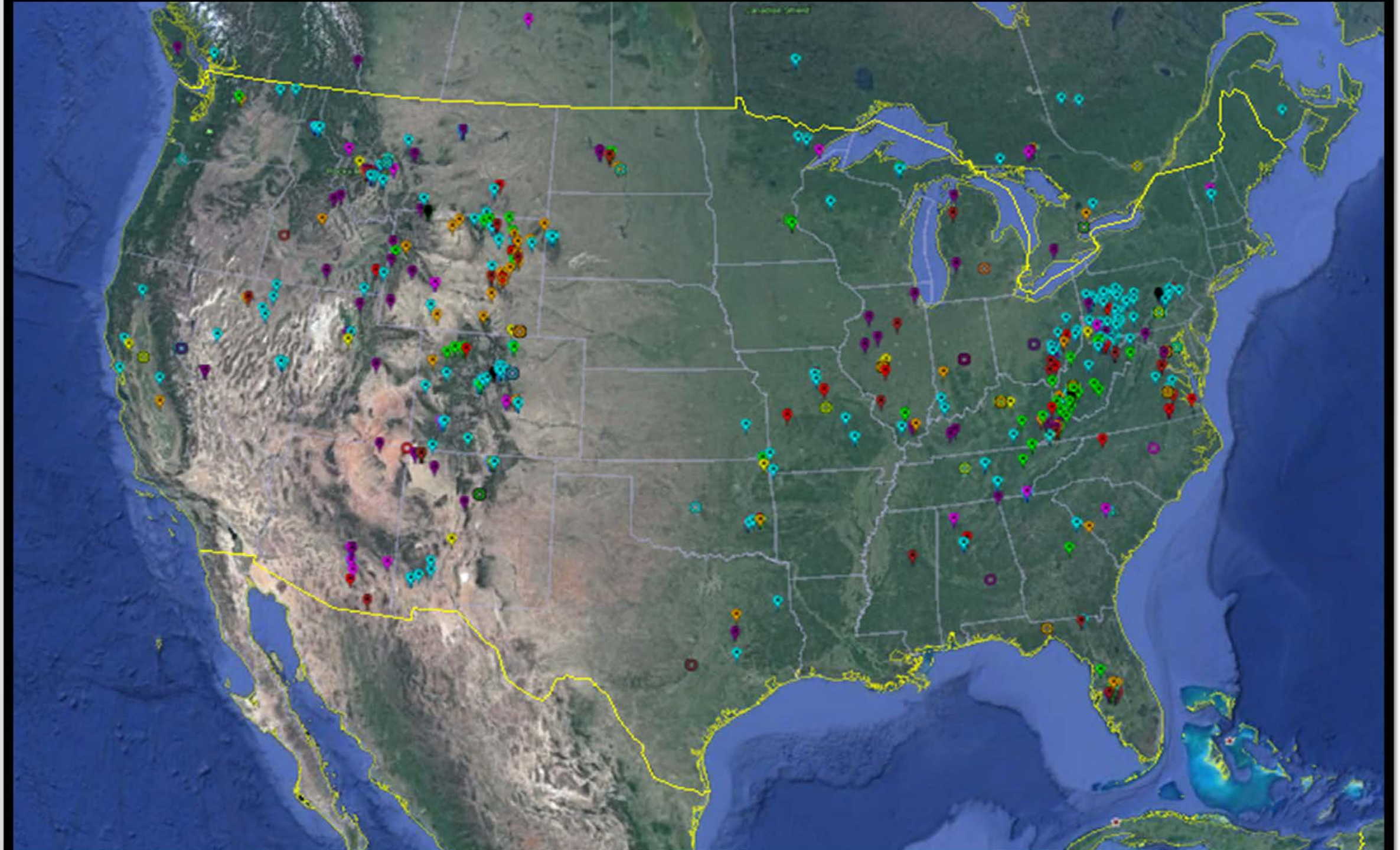
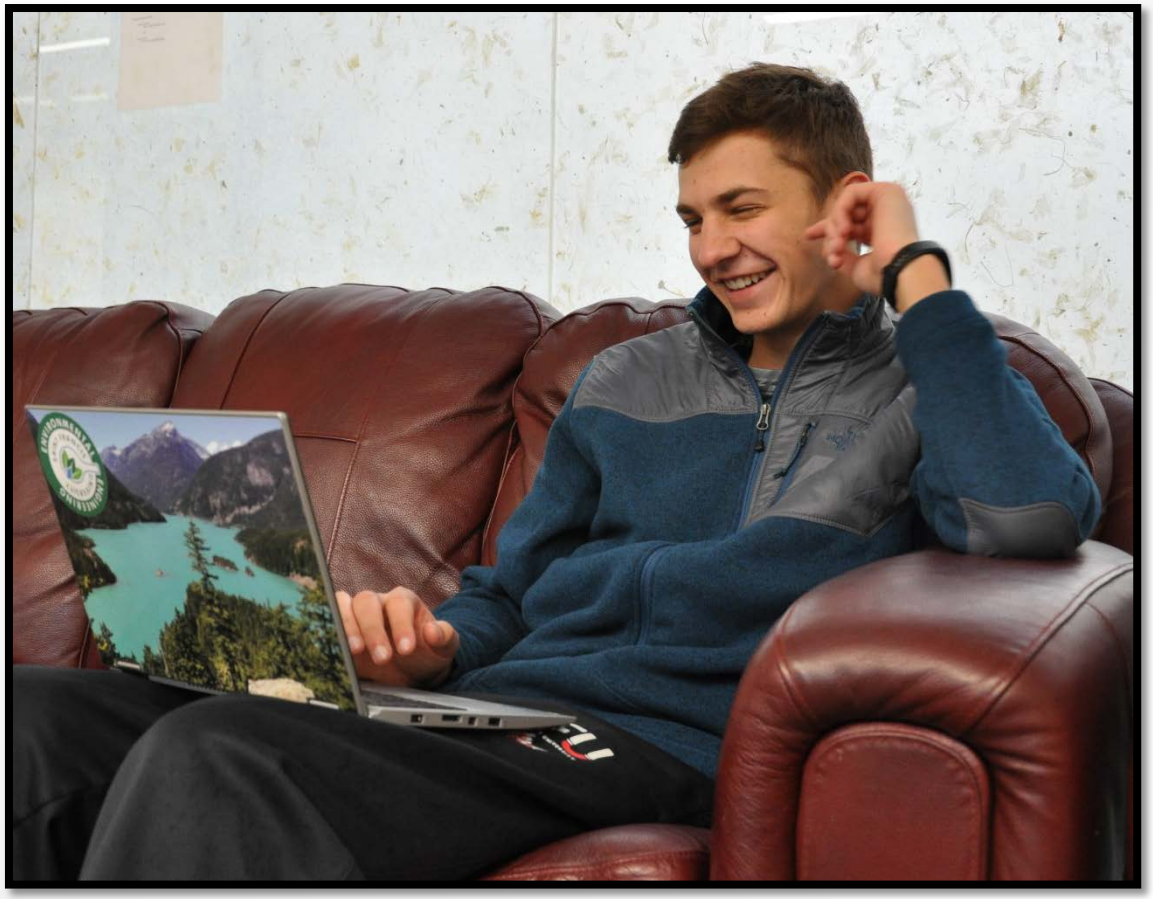


RESEARCH-LEARNING

- Opportunities to expand understanding of reclamation
- Fall 2017 integration in class




AMERICAN SOCIETY
of MINING and RECLAMATION

OVERVIEW

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