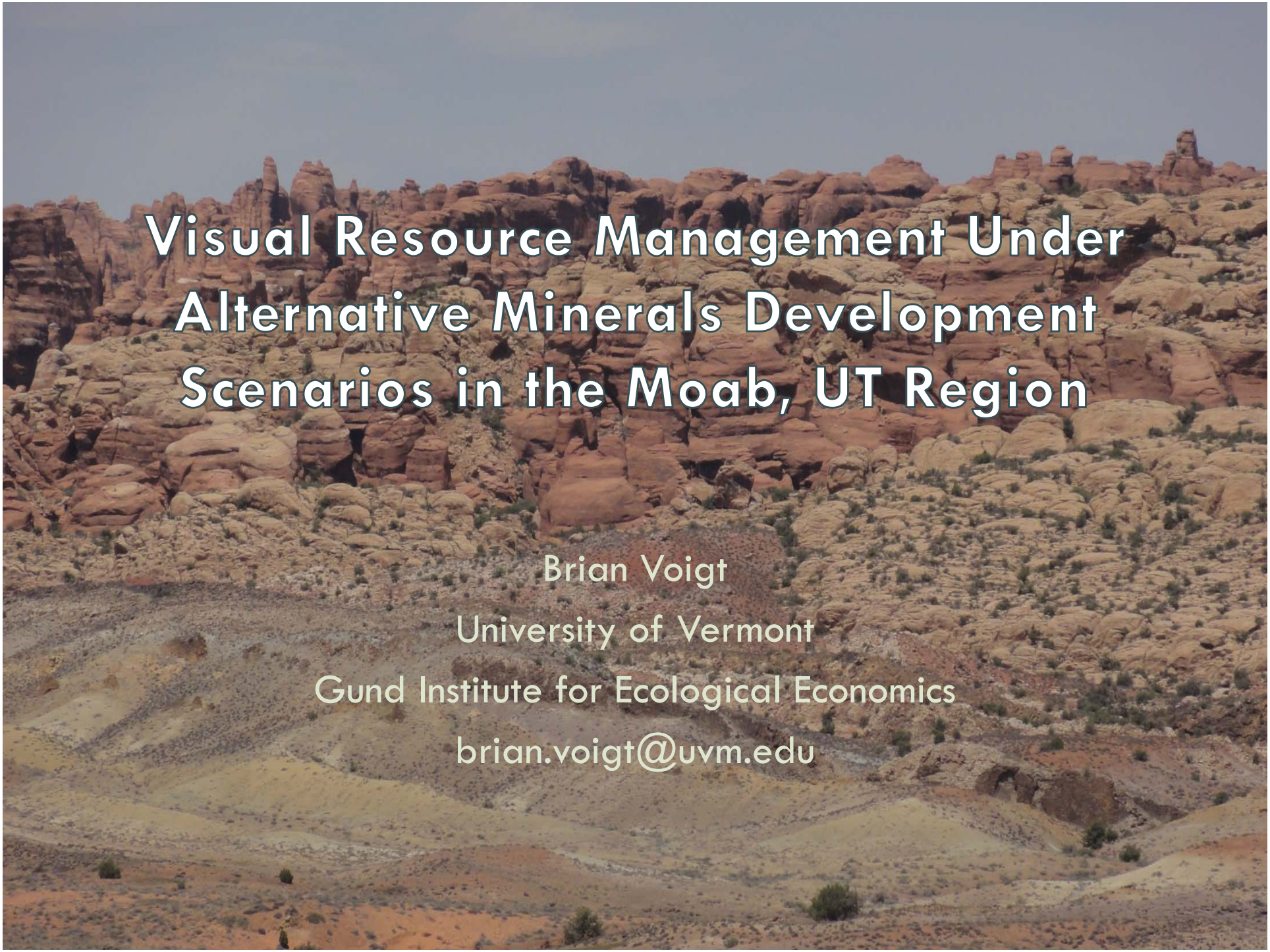

Visual Resource Management Under Alternative Minerals Development Scenarios in the Moab, UT Region

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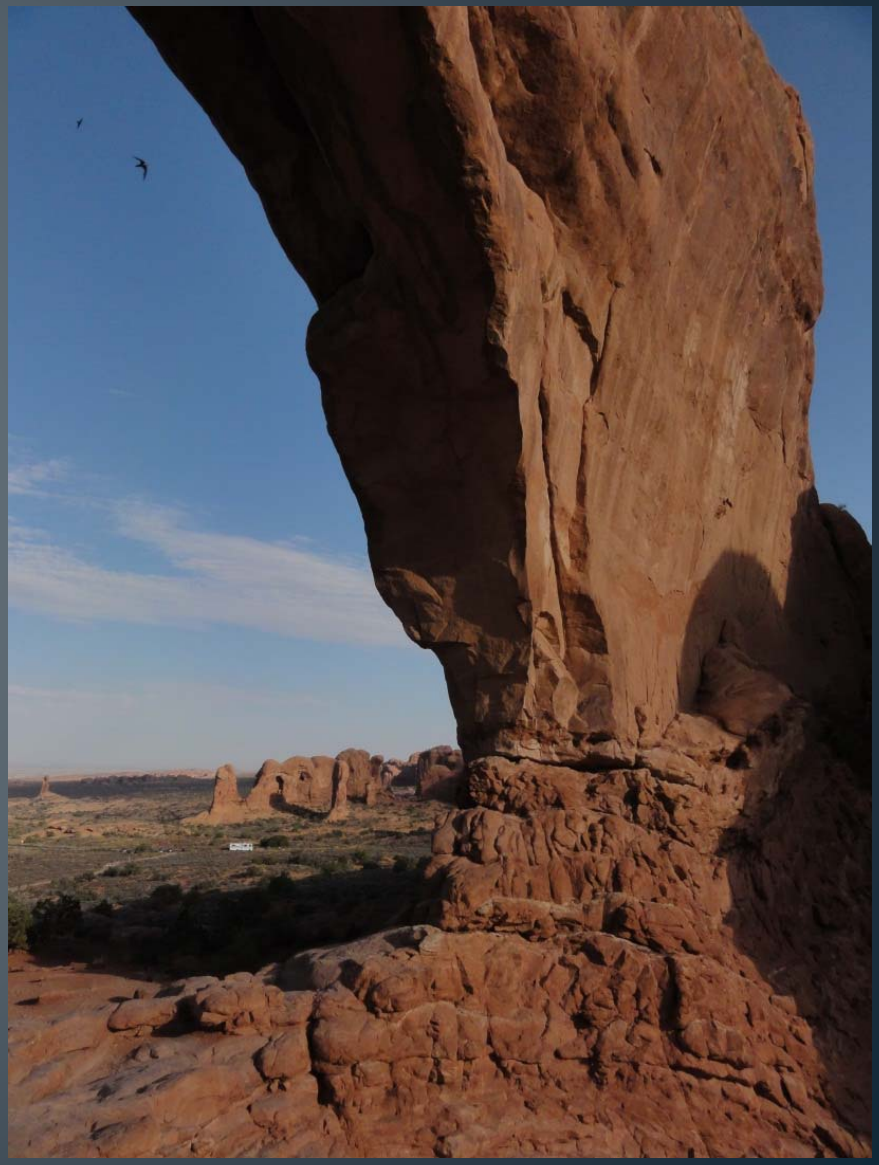
Project Details

- Minerals development & recreational resources
- Addendum to the existing Resource Management Plan
- 950,000 ac (385,000 ha) in east-central Utah
- BLM has identified lands with outstanding visual resources, high value recreation and wilderness areas
- Project collaborators: BLM, USGS, UVM

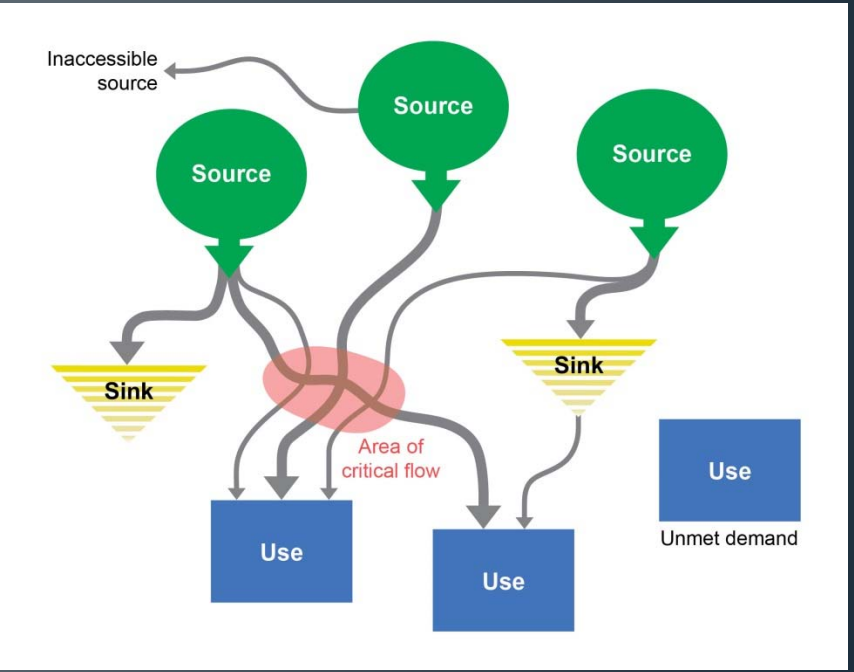


Resource Management and Minerals Development Potential

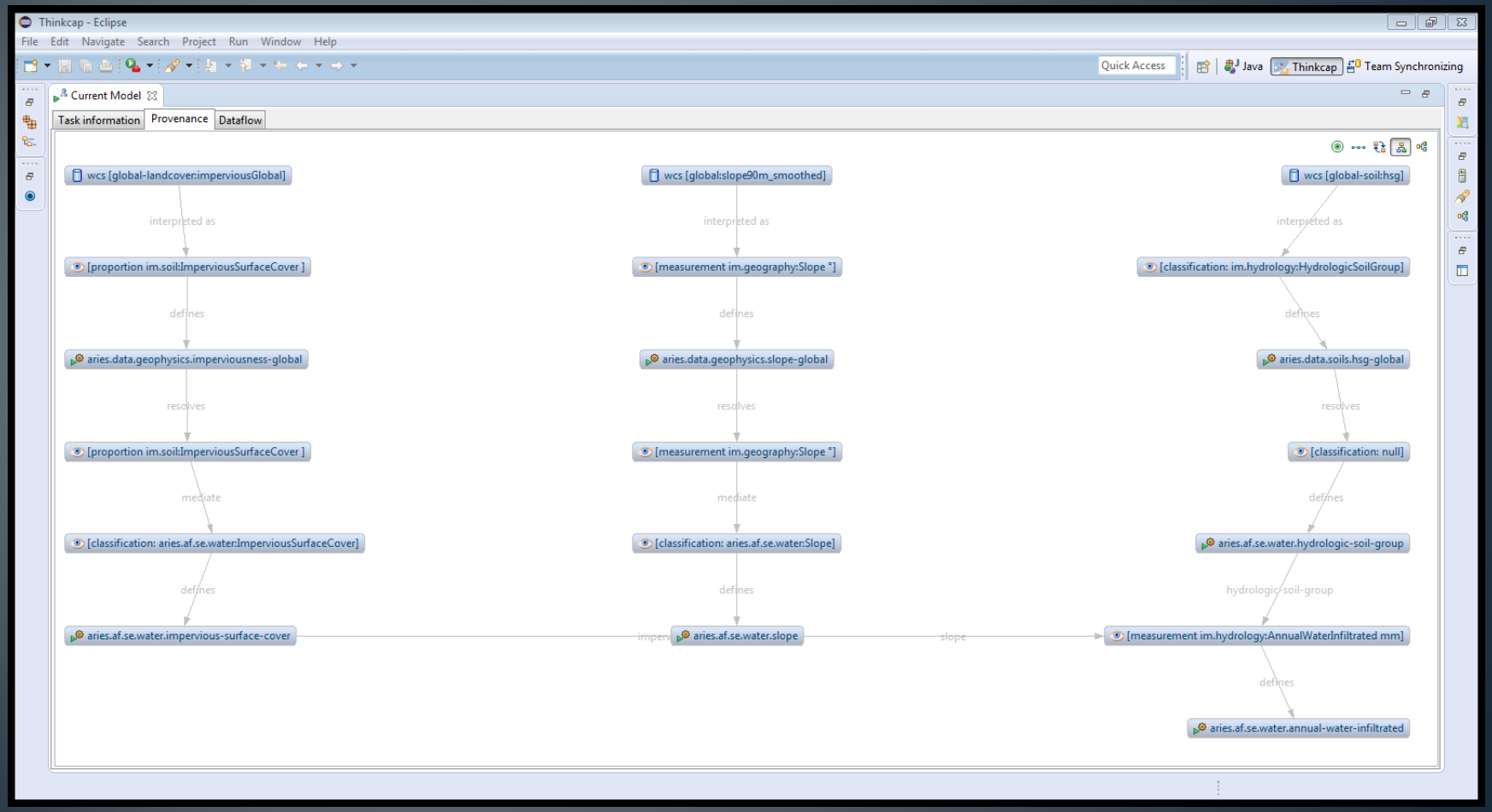
- Expressions of interest
  - Oil & gas: 120,000 acres of new development
  - Potash: 350,000 acres of new development
- Analysis of alternatives
  - Beneficiary groups: Hiking, horseback riding, jeep, moto & ATV tours, mountain biking, scenic viewpoints (BLM & NPS)
  - Support designation of Areas of Critical Environmental Concern
  - Identify potential conflict areas due to mineral development

Fundamental Questions

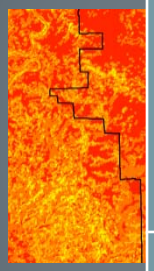
- Where are the ecosystems providing benefits?
- Where are the service users?
- How do benefits move from ecosystems to users?
- What is the quantity and value of the realized services?



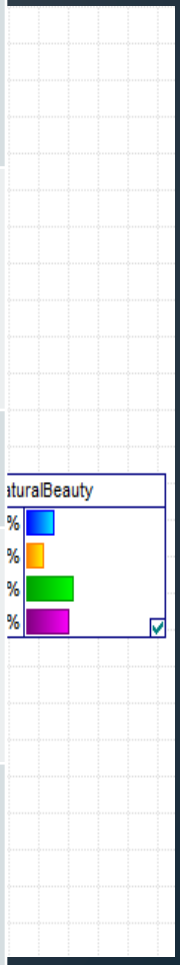
ARIES User Interface



Source Model

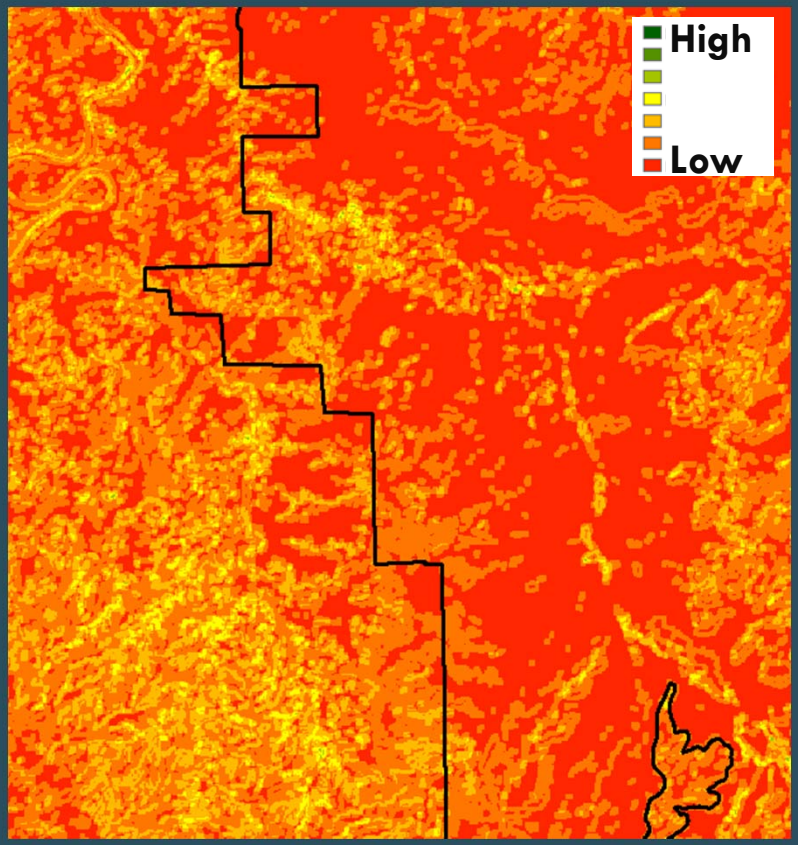


Data Name	Data Description	Data Source
Open Space	Land cover categories representing alternative types of open space	National Land Cover Data (NLCD), 2006
Landscape Heterogeneity	Count of the total number of land cover classes within 150 m^2 area	Derived NLCD 2006 using moving window analysis
Topography	Elevation model for the region	SRTM, 30-m
Topographic Heterogeneity	Variation in topography within 150 m^2 area	Derived from the SRTM, 30-m data using moving window analysis
Landmark	Point data of significant natural and cultural landmarks	Geographic Names Information System

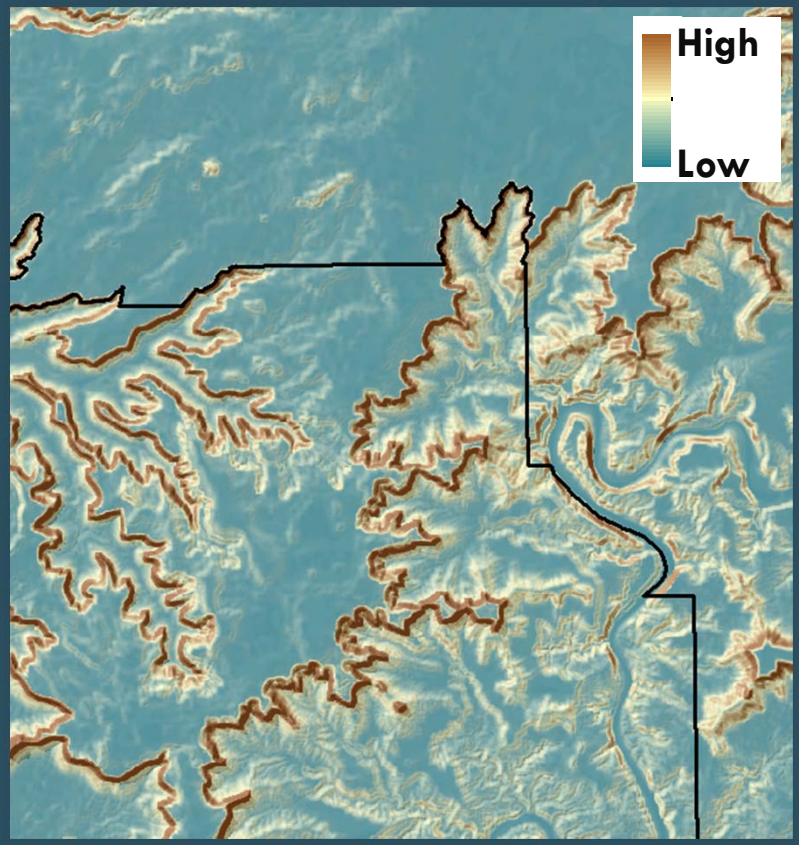


Source Model Factors

Land Cover Heterogeneity



Topographic Heterogeneity

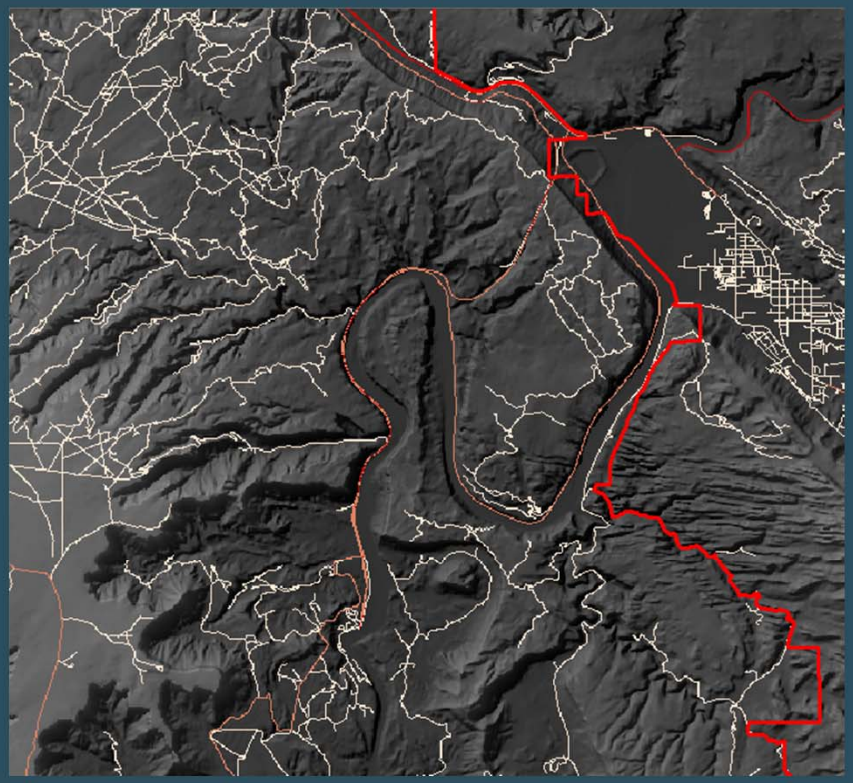


Sink Model

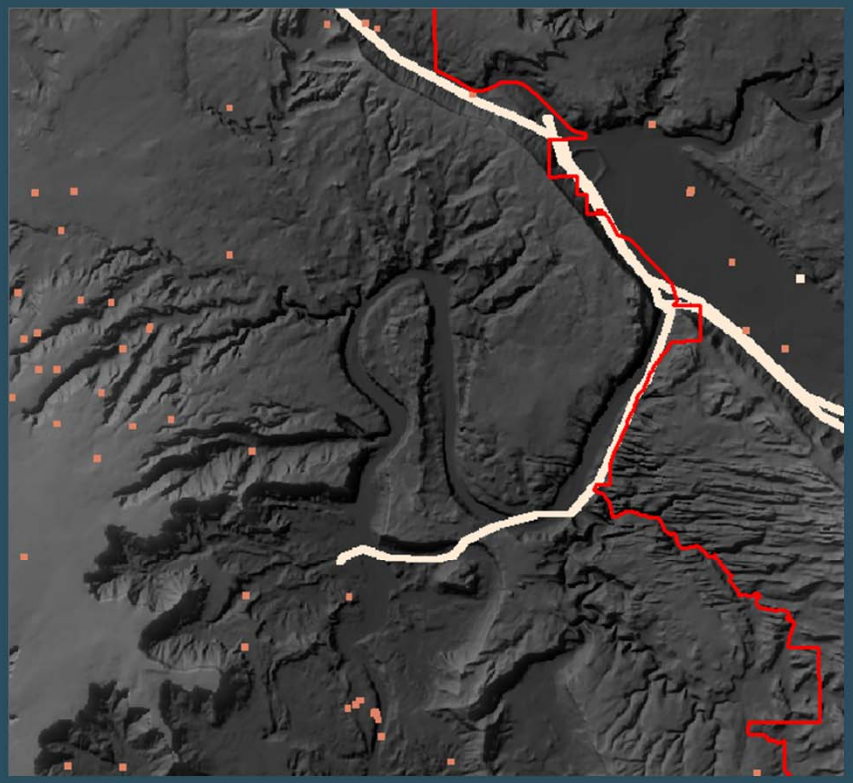
Data Name	Data Description	Data Source
Development Density	Density of human development	National Land Cover Data, 2006
Roads	Automobile transportation infrastructure	Utah AGRC
Railroads	Rail transportation infrastructure	Utah AGRC
Mining Infrastructure	Point location of existing mining operations	Utah AGRC
Power Lines	Electric transmission lines	Utah AGRC
Oil & Gas Infrastructure	Point location of existing oil and gas operations	Utah AGRC

Sink Model Factors

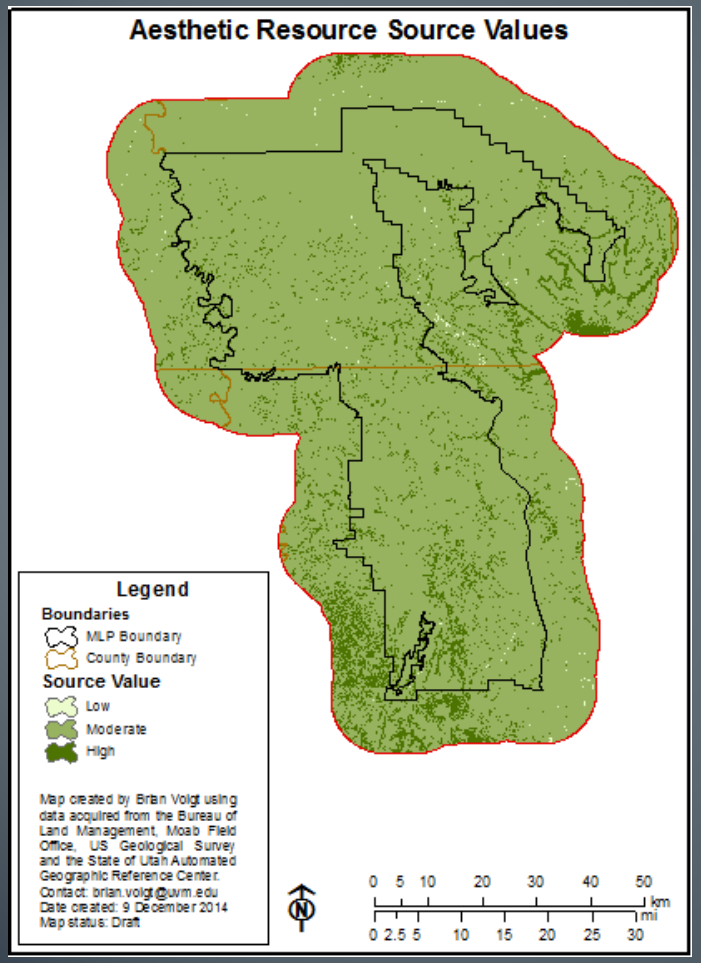
Transportation Infrastructure

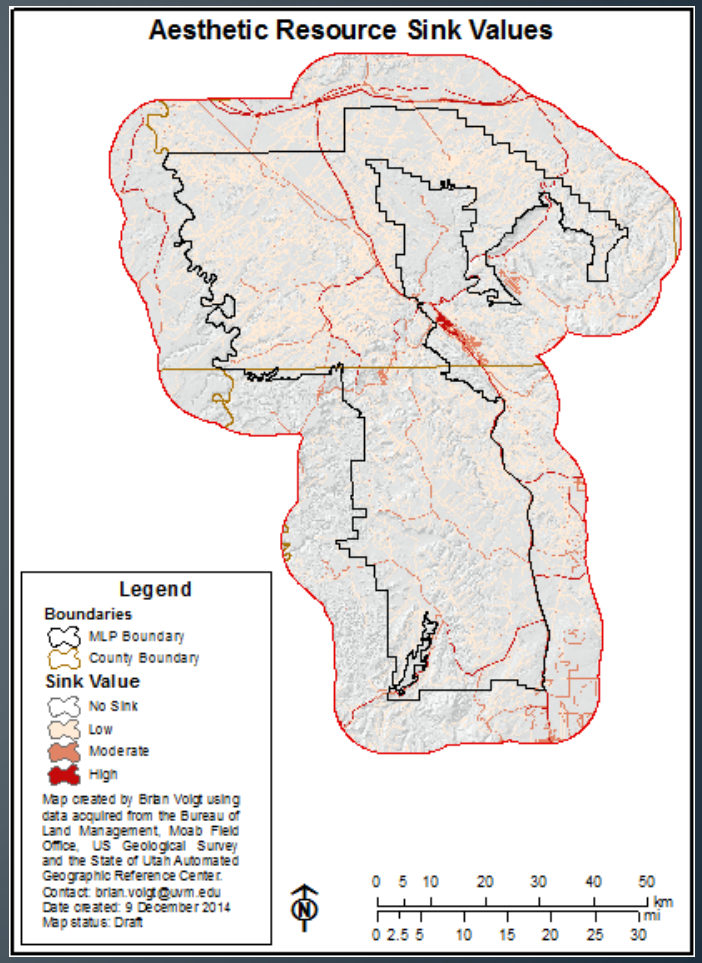


Energy Infrastructure

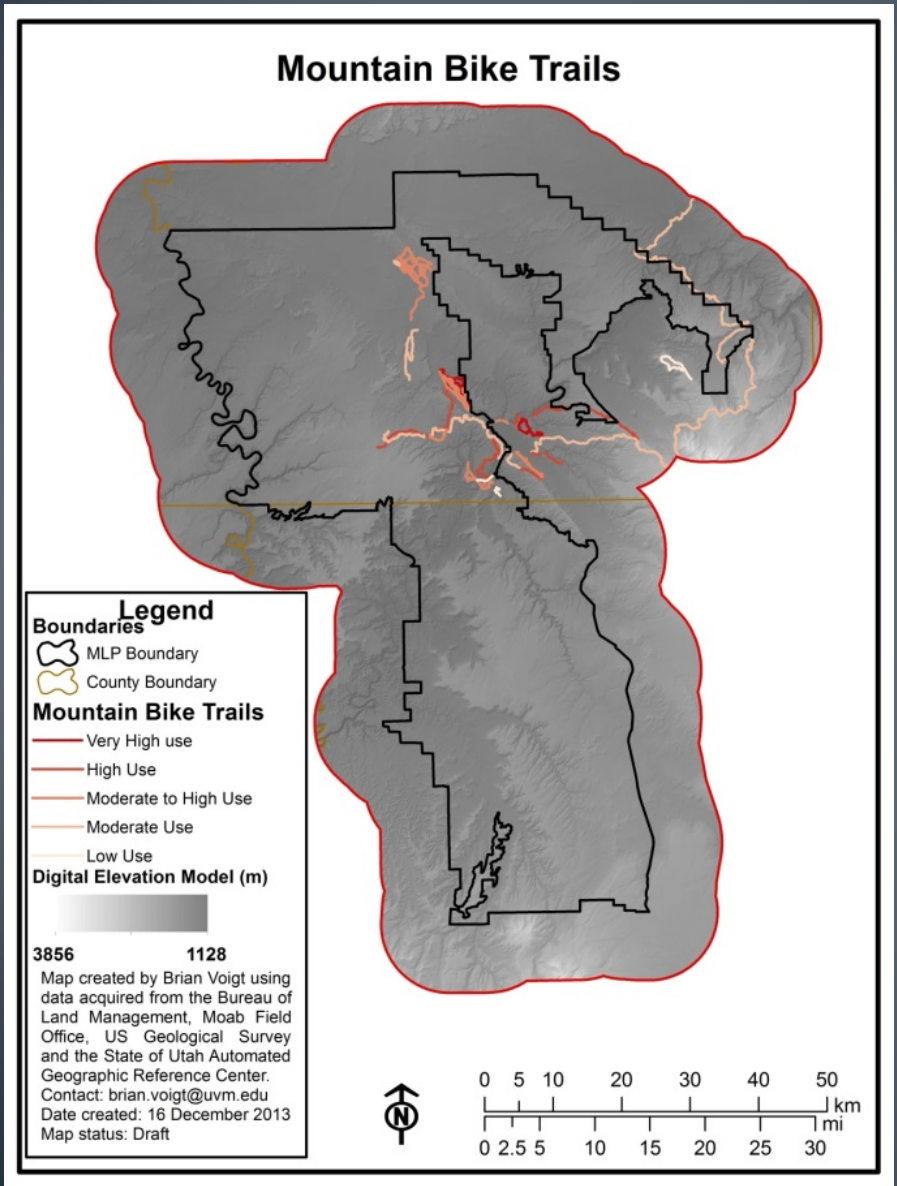


Source& Sink Model Outputs





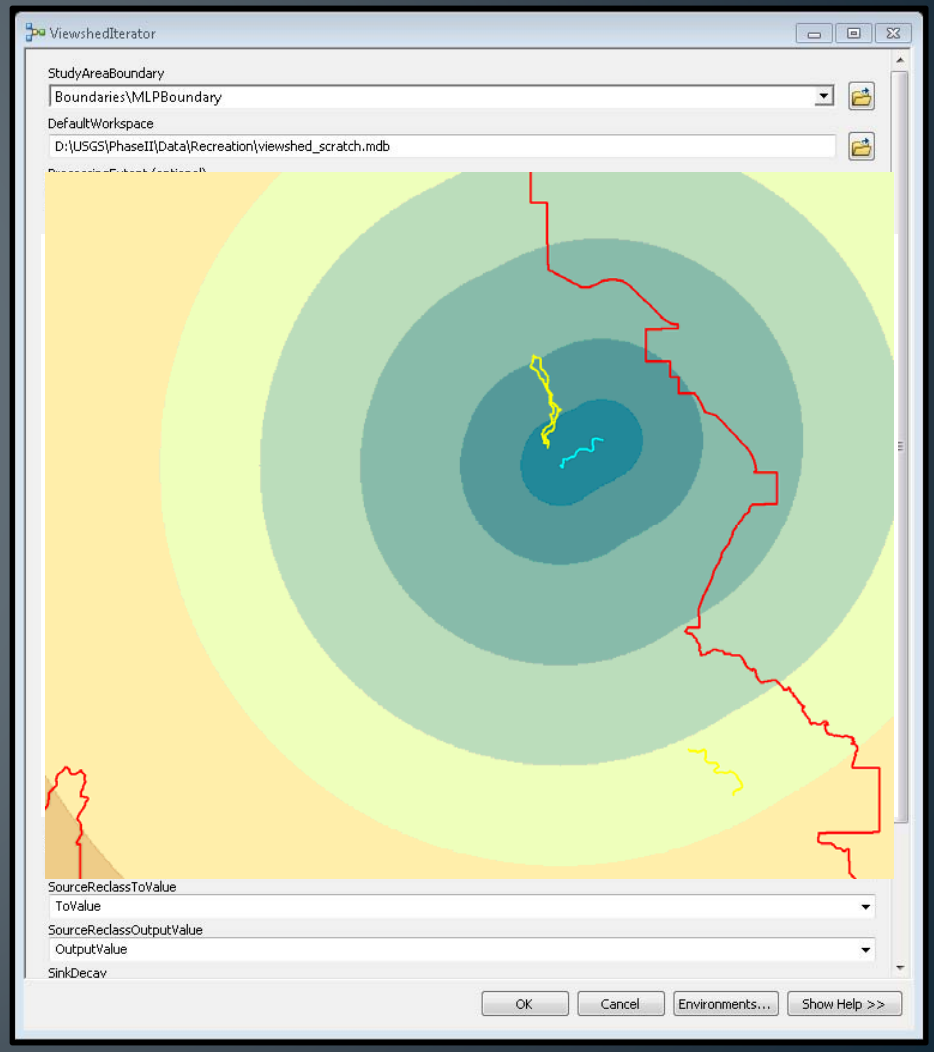
Use Model



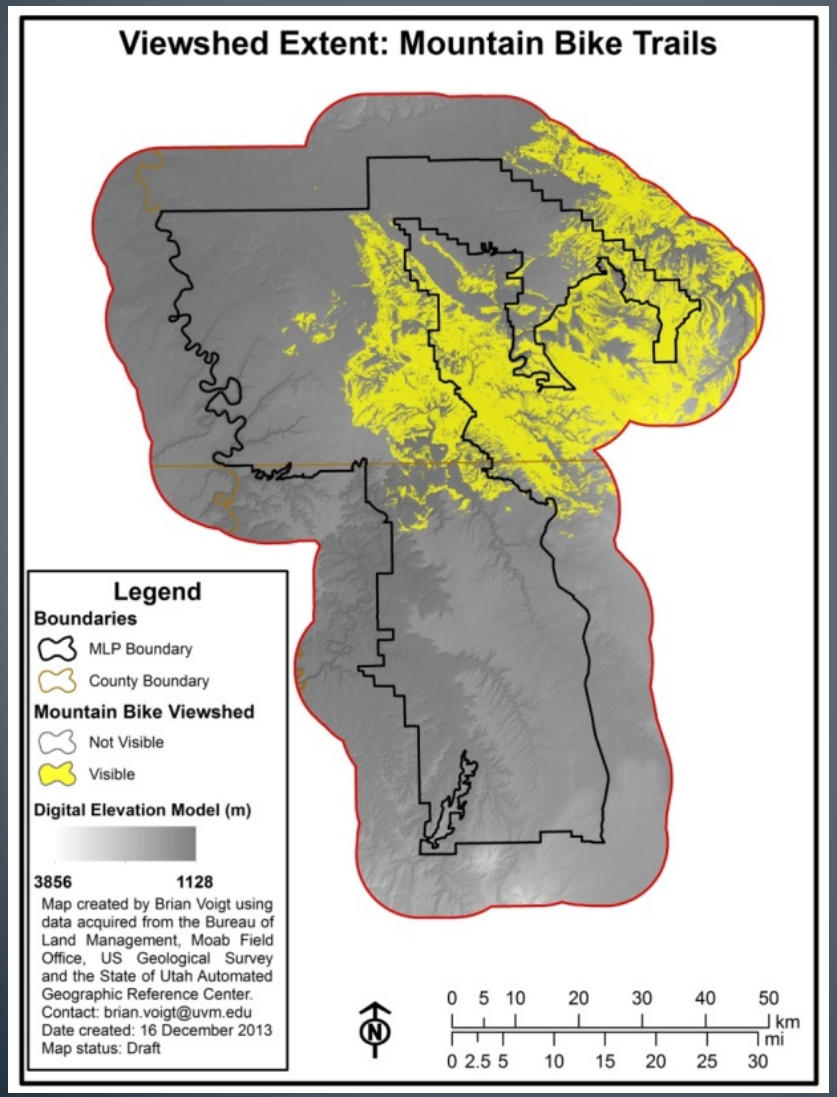
- ~9,000 point locations representing:
  - Hiking
  - Horseback riding
  - Jeep, motorcycle, ATV tours
  - Mountain biking
  - Scenic viewpoints (BLM & NPS)

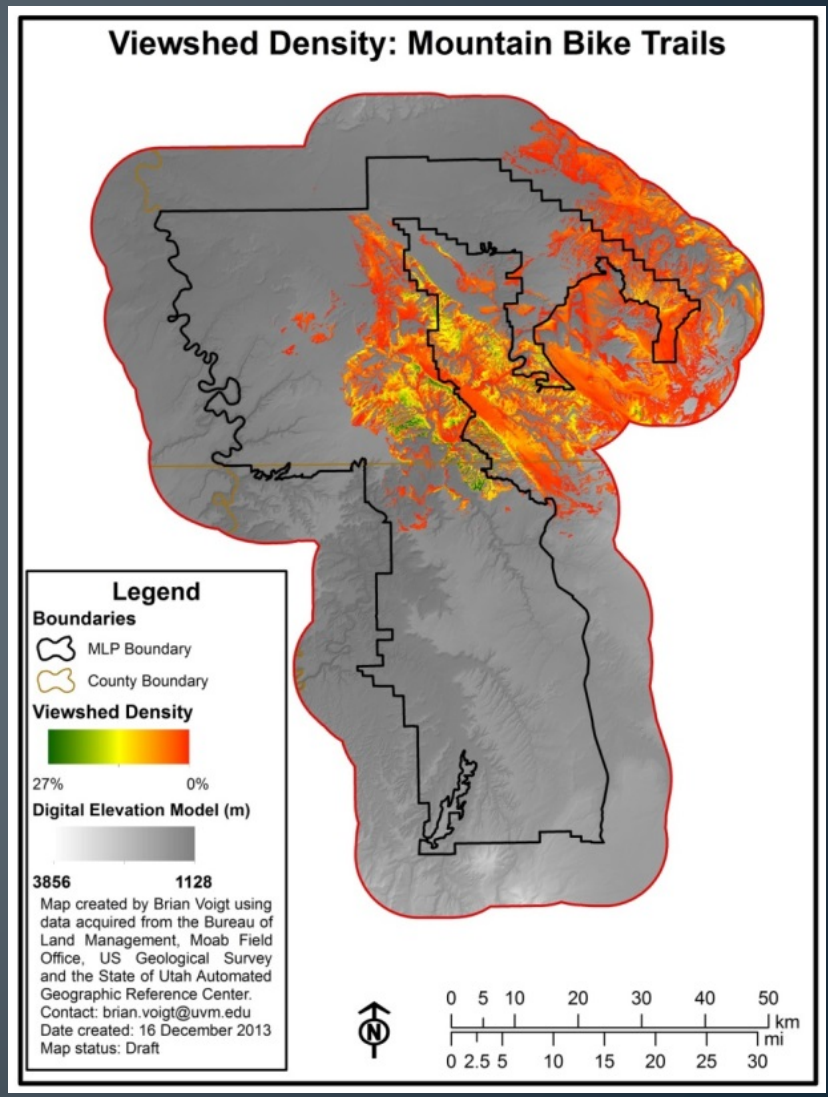
Flow Model

- ArcGIS toolbox + Model Builder
- Inputs:
  - DEM
  - Use locations (points)
  - Source & Sink values
- Compute viewshed
- Compute distance decay
- Summarizes values

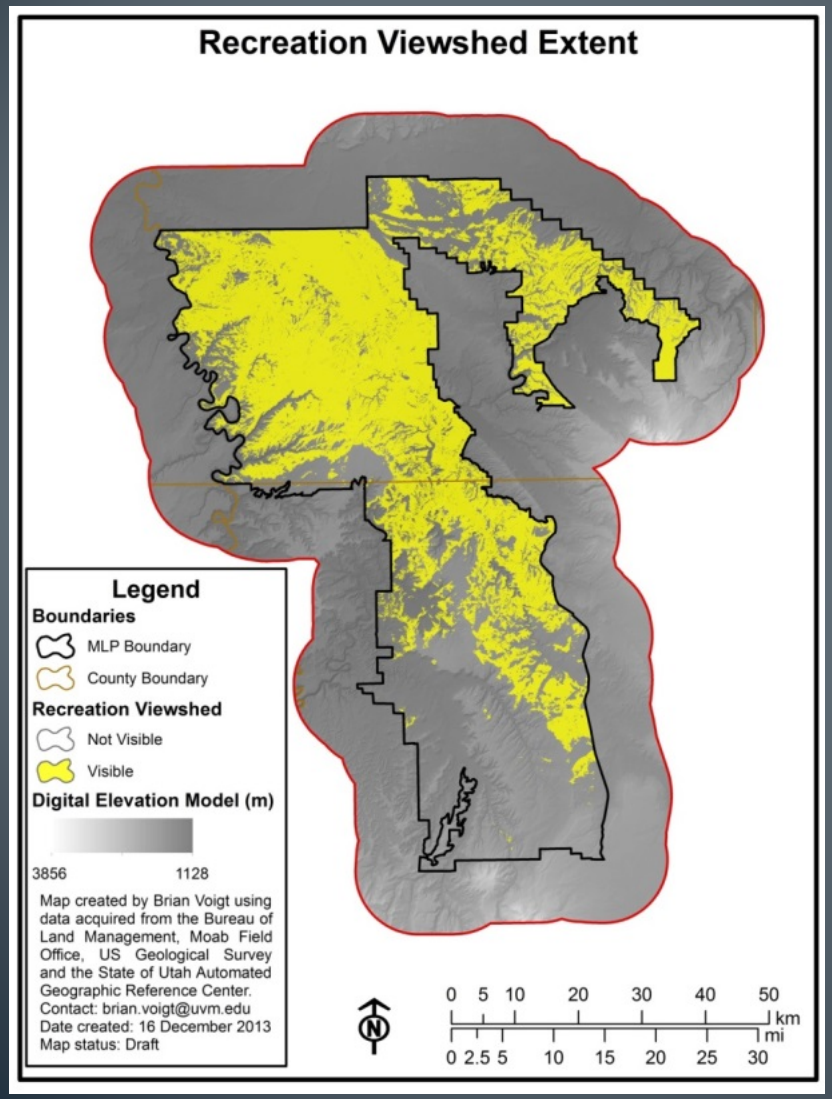


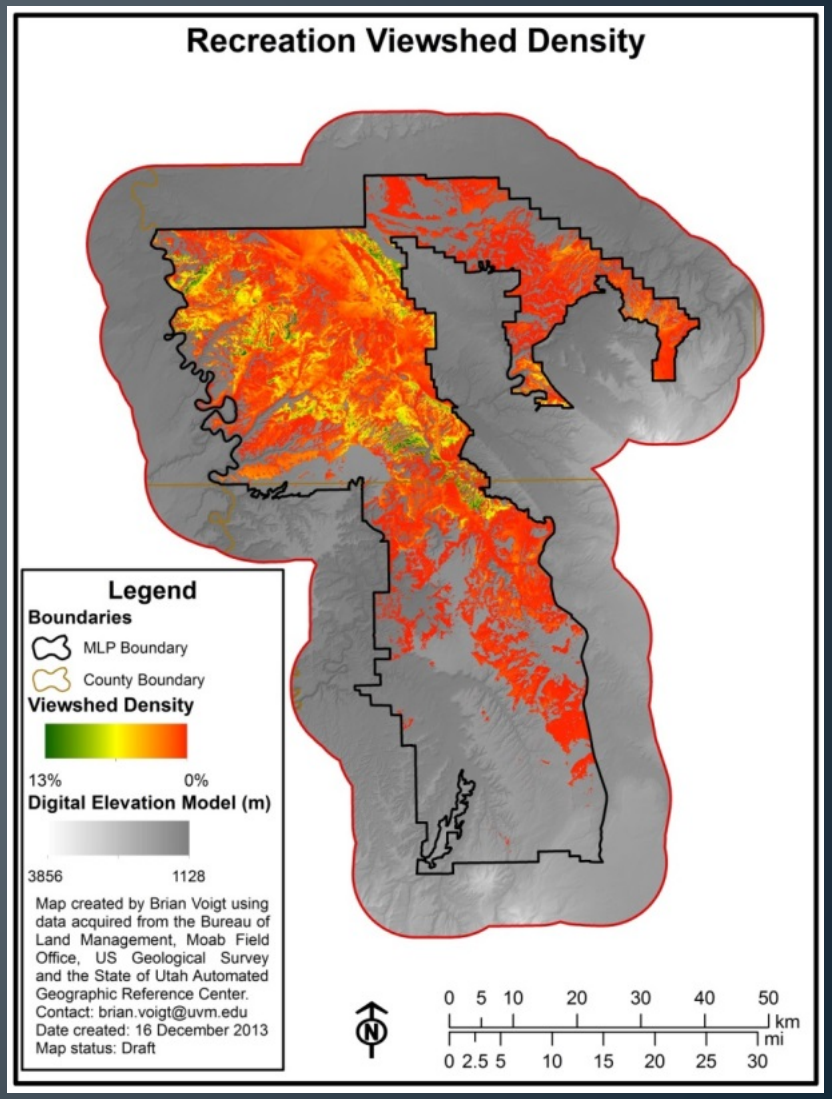
Flow Model Outputs: Mountain Bike



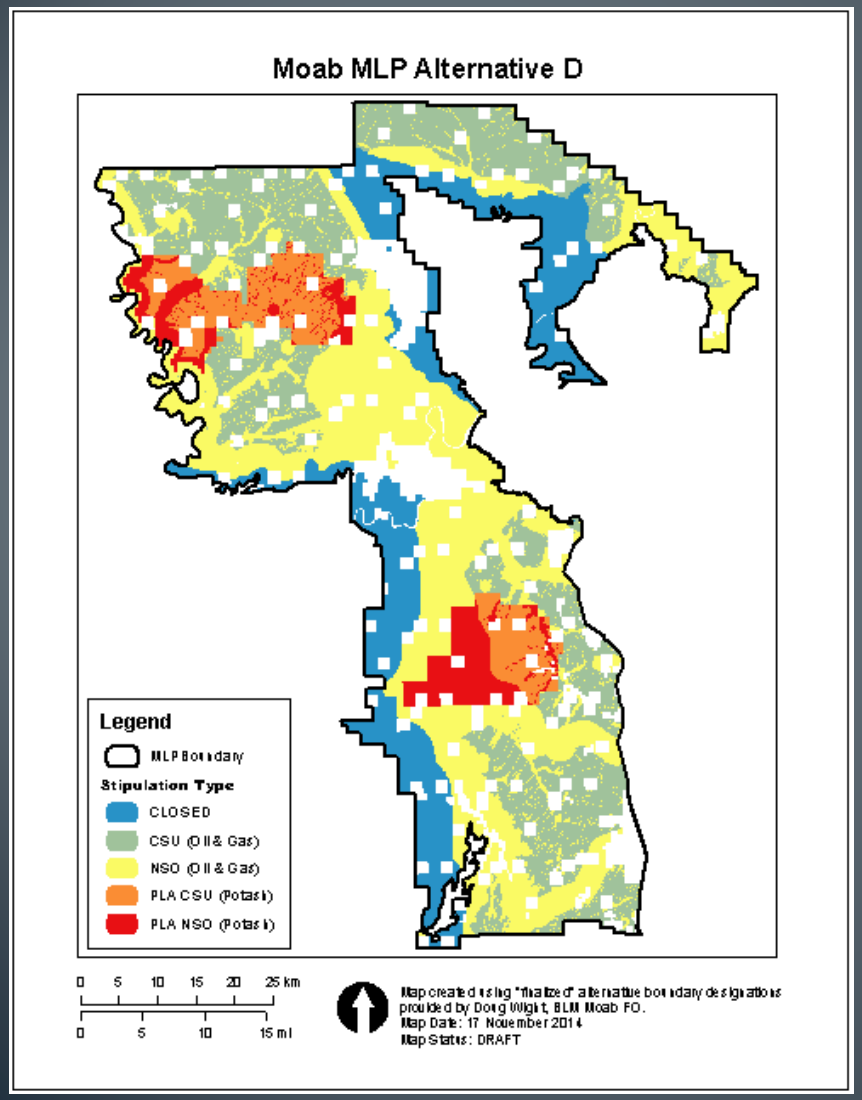


Flow Model Outputs: High Use Locations





Analysis of Alternatives



- Moab FO developed four alternative minerals development schemes
- Considered recreation & scenic resources + desire for minerals development
- Designations:
  - Closed
  - Controlled Surface Use
  - No Surface Occupancy
  - Potash Leasing Area

Analysis of Alternatives: Results

Alternative	Closed	CSU (Potash)	NSO (Potash)	NSO (OG)	CSU (OG)	Other
B	0.08%	0.00%	0.00%	53.58%	28.01%	18.32%
B1	0.08%	5.27%	4.29%	49.33%	22.70%	18.33%
C	20.29%	0.00%	0.00%	56.44%	4.94%	18.33%
D*	17.55%	5.30%	4.26%	31.53%	23.03%	18.33%

Questions?

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Project Collaborators:
BLM: Rob Winthrop, Rebecca Moore, Moab FO
USGS: Darius Semmens, Ken Bagstad, Zach Ancona