



MAPPING ALASKA

Resources Committee

Nick Mastrodicasa

Large Project Manager DOT/PF

Deputy Commissioner Fogels, DNR

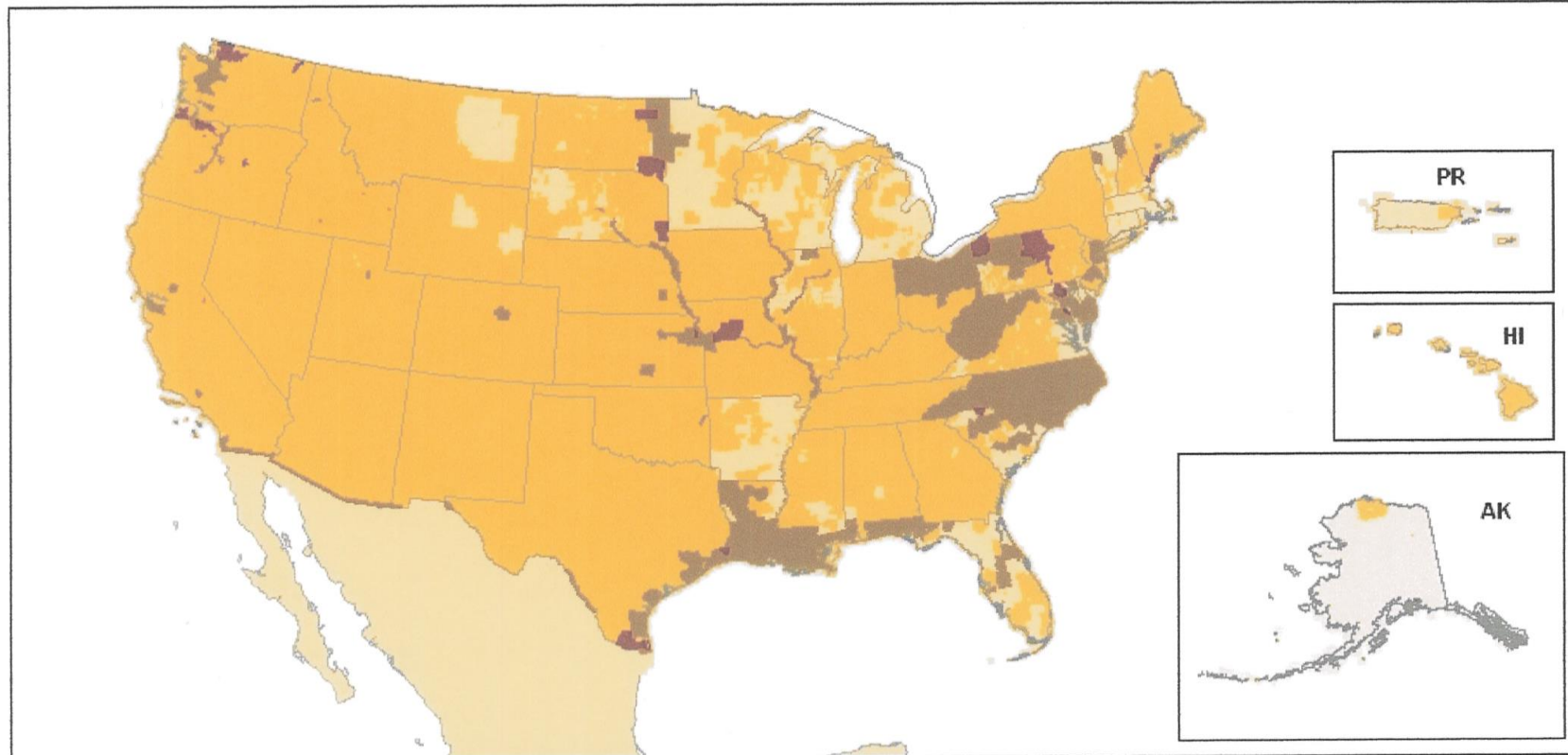
Feb 8, 2017

Where Have We Been?

What have we accomplished?



National Elevation Dataset Source Information



NED is a multi-resolution data collection which provides the best available digital elevation data to the public. 173600 square miles of lower quality 30 meter data were replaced by 10 meter or better source data in 2009.

The NED 1/9-arc-second data layer has increased by 90,000 square miles and now cover 273595 square miles.

The country of Mexico was also added at 30 meter resolution in 2009.

NED RESOLUTION

- High Resolution Data Being Processed
- 1/9 Arc-Second (~3 meter or LIDAR Source)
- 1/3 Arc-Second (~10 meter or better source)
- 1 Arc-Second (~30 meter source)
- 2 Arc-Second - Alaska Only

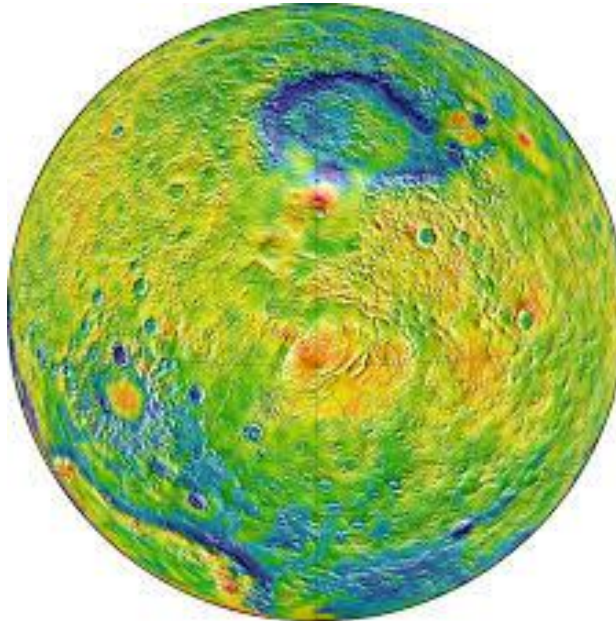
September 2009

In 2009 Mars Was Better Mapped Than Alaska

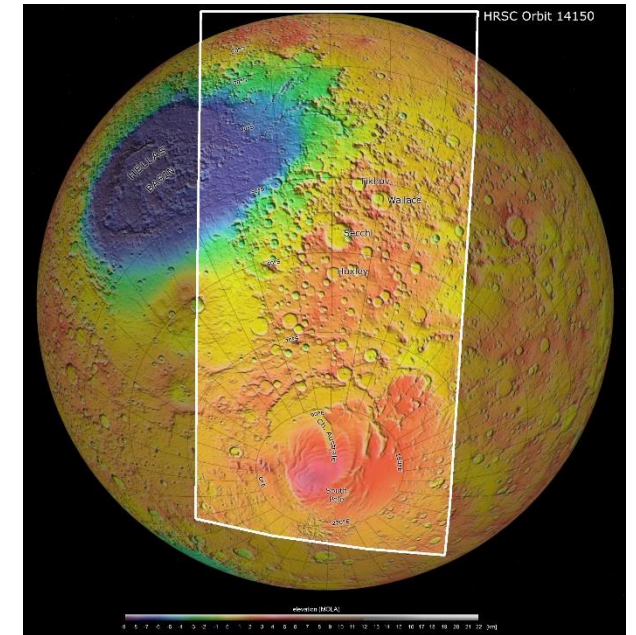
Mars Image Map



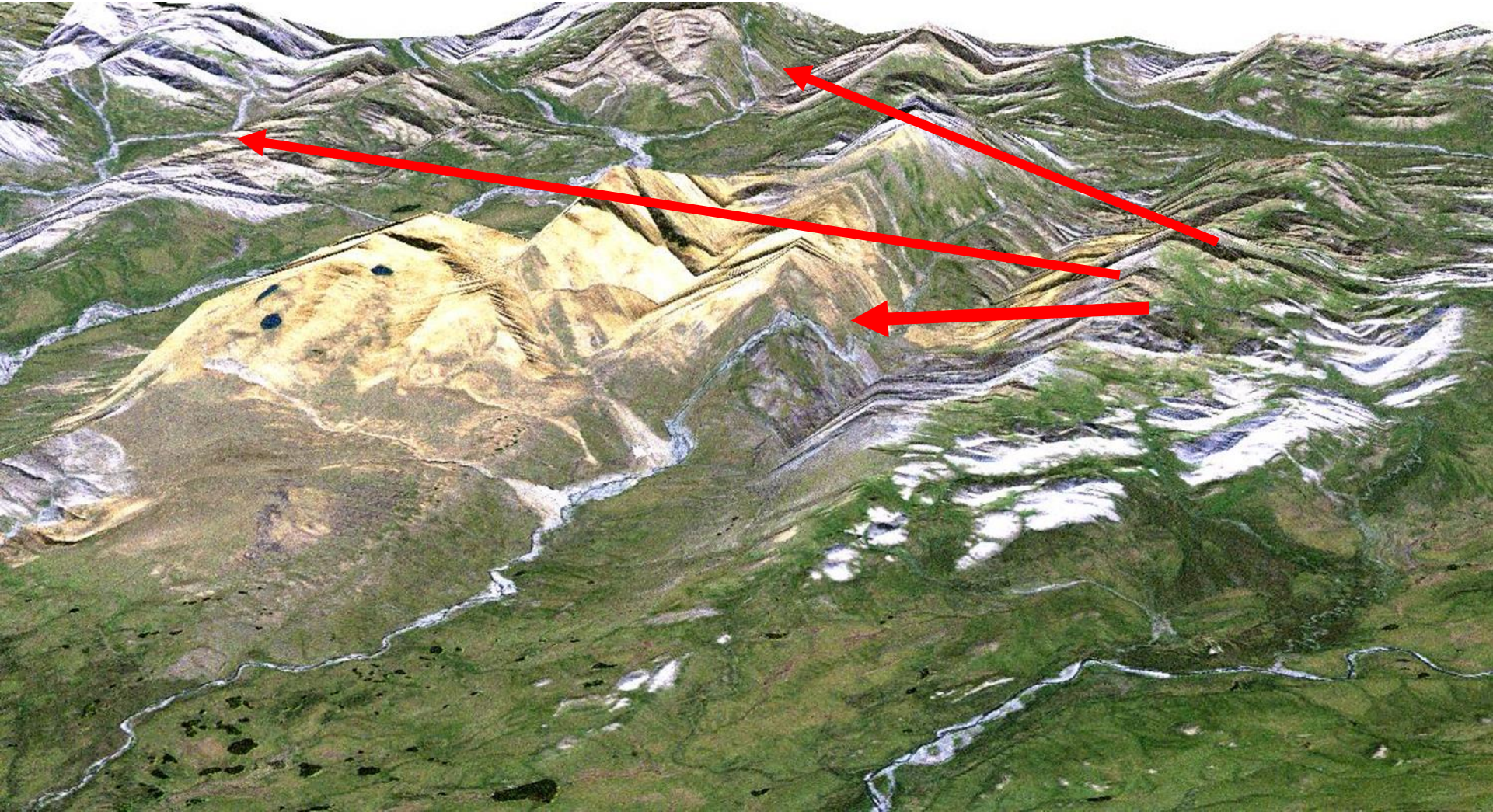
Mars Gravity Map



Mars DEM Hillshade Relief



RIVERS DON'T FLOW UP HILL





ALASKA CIP FUNDING

• 2006	\$ 2,000,000
• 2007	\$ 2,000,000
• 2008	\$ 2,000,000
• 2012	\$ 1,750,000
• 2013	\$ 3,687,030
• 2014	\$ 3,000,000
• 2015	\$ 5,000,000
TOTAL	\$19,437,030

IFSAR Partner Contributions

AGENCY	2010	2011	2012	2013	2014	2015	2016	TOTAL
 BLM	216,213	20,000	-	141,139	262,000	2,112,149	465,837	3,217,355
 FWS	-	250,000	300,000	-		250,000	150,000	950,000
 NGA	2,399,895	-	-	-	-	-	-	2,399,895
 NPS	98,091	147,143	178,533	30,000	-	931,581	690,000	2,075,384
 NRCS	98,090	227,287	728,095	450,000	450,000	350,000	700,000	3,003,472
 USFS	-	-	354,310	50,000	547,292	383,127	302,113	1,636,842
 USGS	99,995	870,276	3,066,402	3,608,512	2,893,166	3,646,683	4,777,034	19,862,068
FEDERAL SUB TTL	3,812,301	1,514,706	4,627,340	4,279,651	4,152,458	7,673,470	7,084,984	33,144,980
ALASKA SUB TTL	1,874,918	-	4,998,388	2,550,000	2,617,285	-	1,300,000	13,340,591
COMBINED TTL	5,687,219	1,514,706	9,625,728	6,829,651	6,769,743	7,673,540	8,384,984	46,485,571

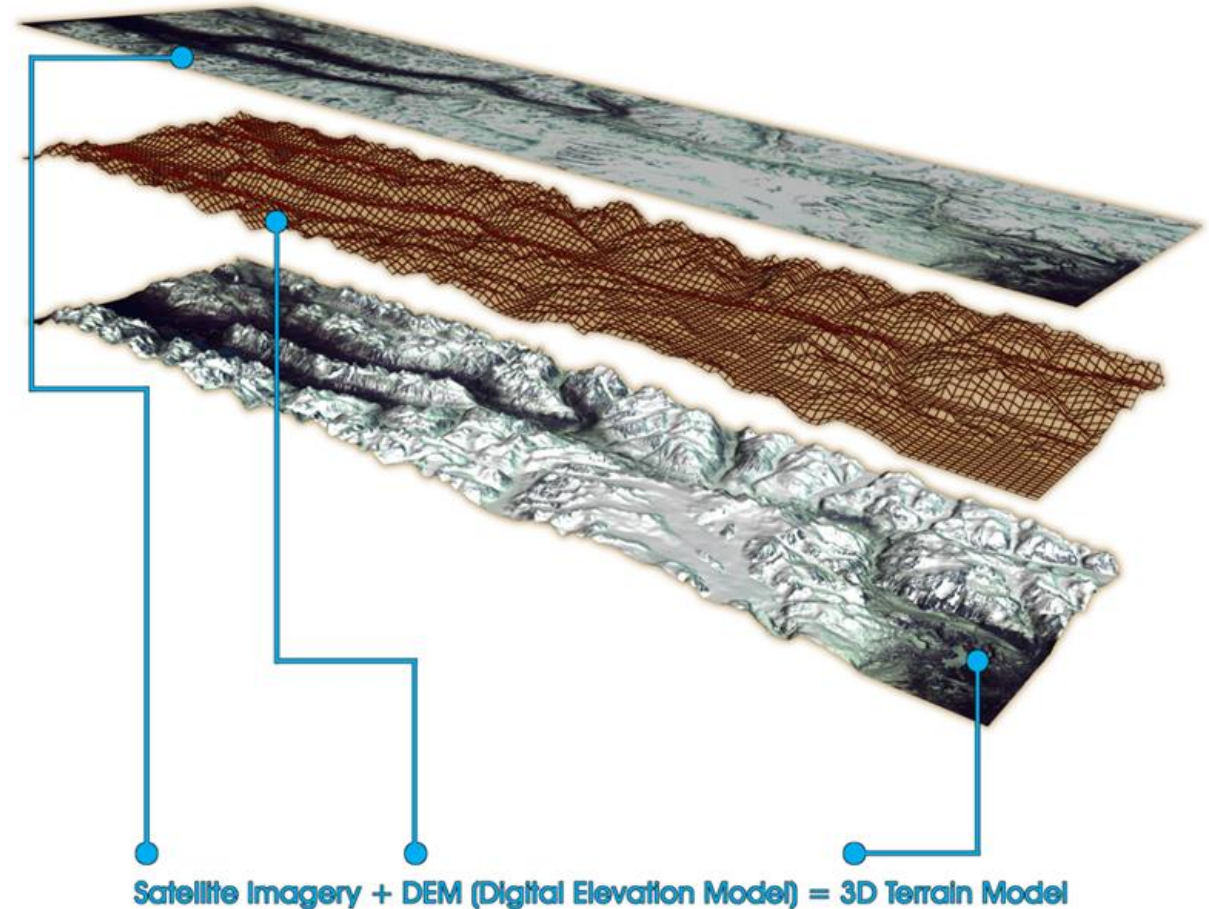
2016 Carry Over **\$1,192,968**

Statewide Digital Mapping Initiative (SDMI)

- Established 2006
- Stated Goals: Create an Accurate Basemap of Alaska:

	<u>Status</u>
• Satellite Imagery	98% \$ 4.5M
• Digital Elevation Model	77% \$46.5M
• Co-Registration of Data	
• Warehousing of Data	

- The SDMI became the Alaska Geospatial Council in 2014

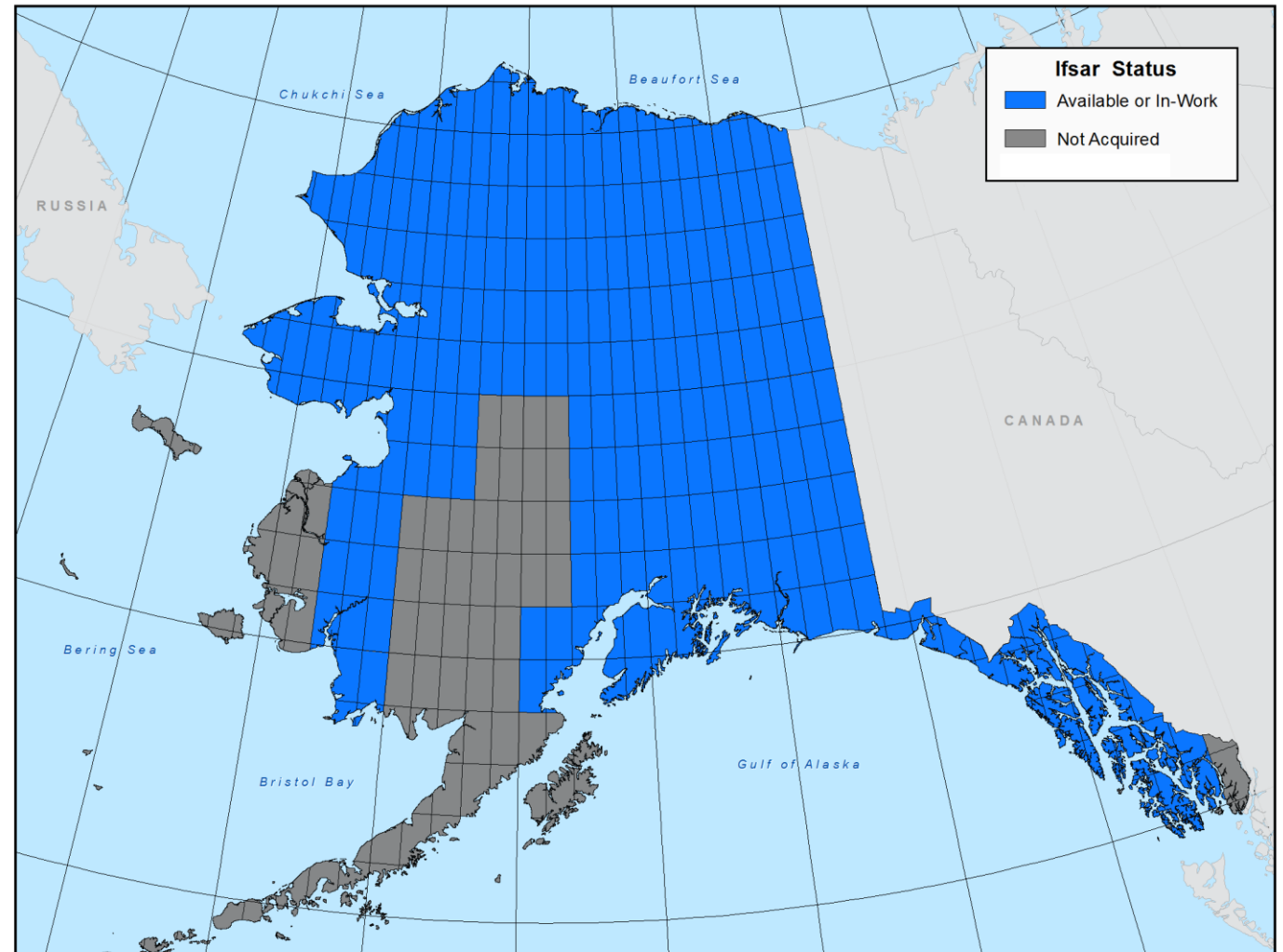


ELEVATION 77% COMPLETE

OLD VS. NEW

- Ridgelines in excess of 100 meters too high or too low
- In one instance a mountain range was horizontally displaced by one mile
- Much higher resolution & accuracy

Alaska IfSAR Elevation Status - 77% Available or In-Work

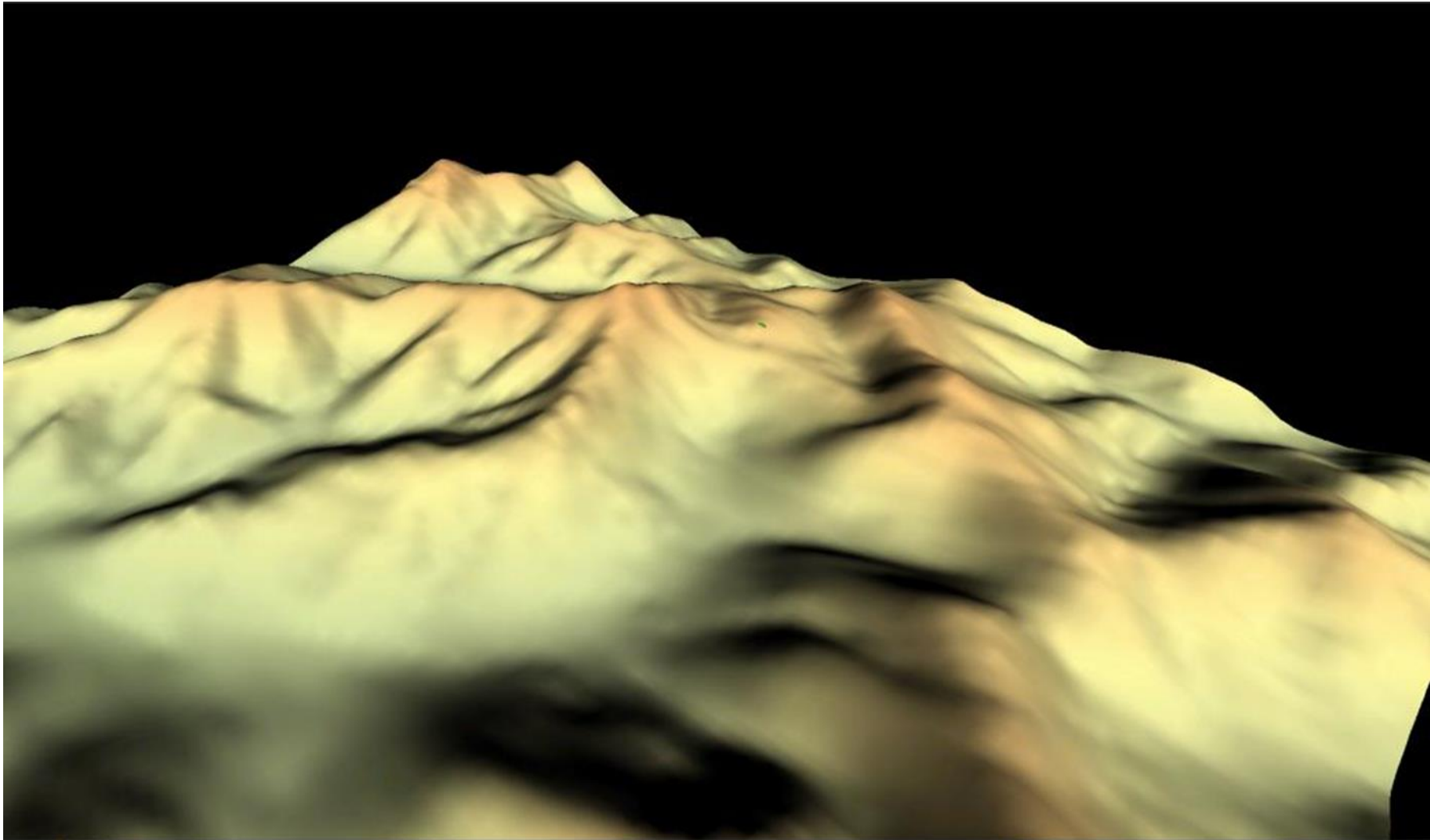


SO, WHAT DID WE GET?

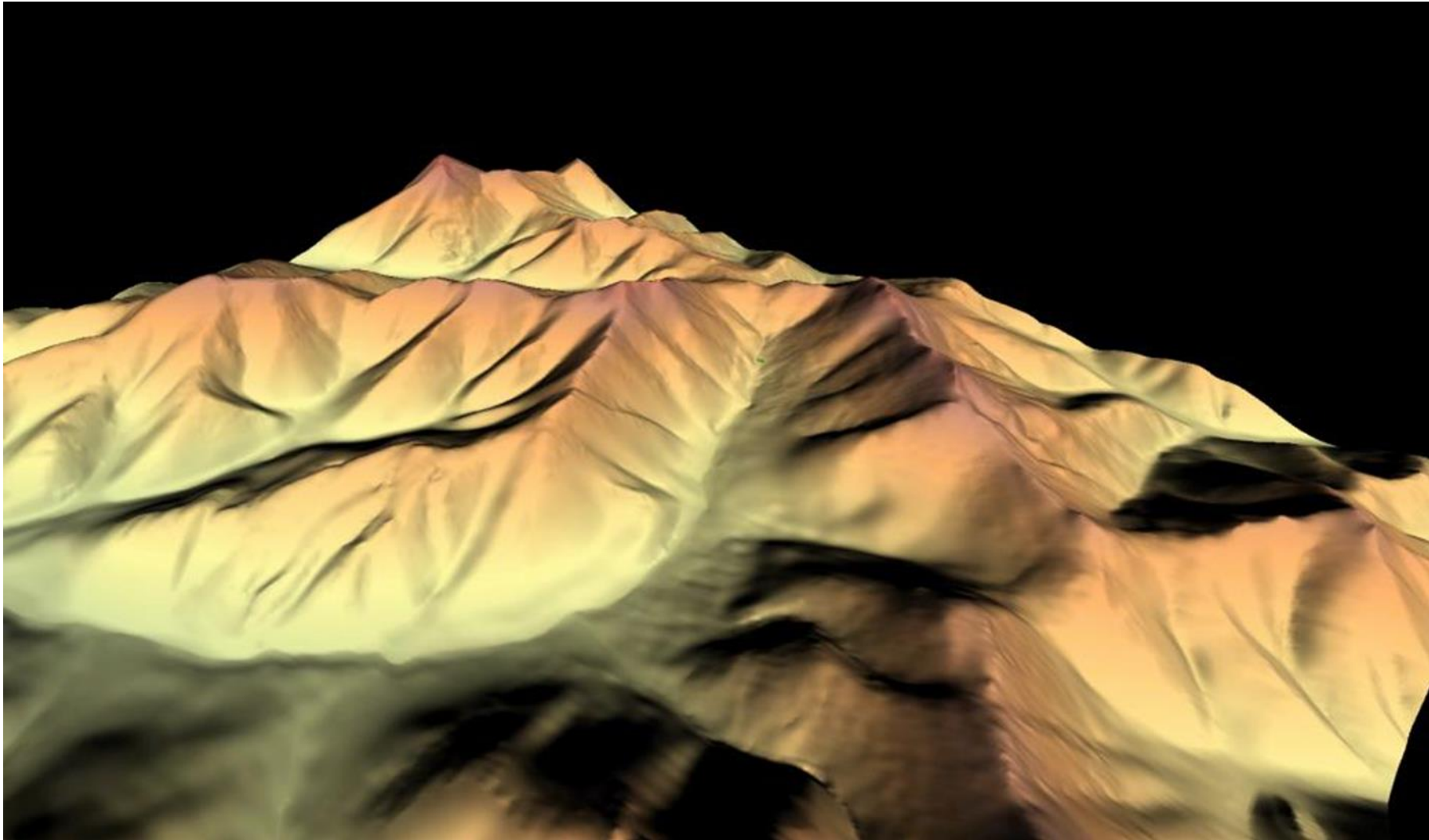
WHAT DID WE FIND?



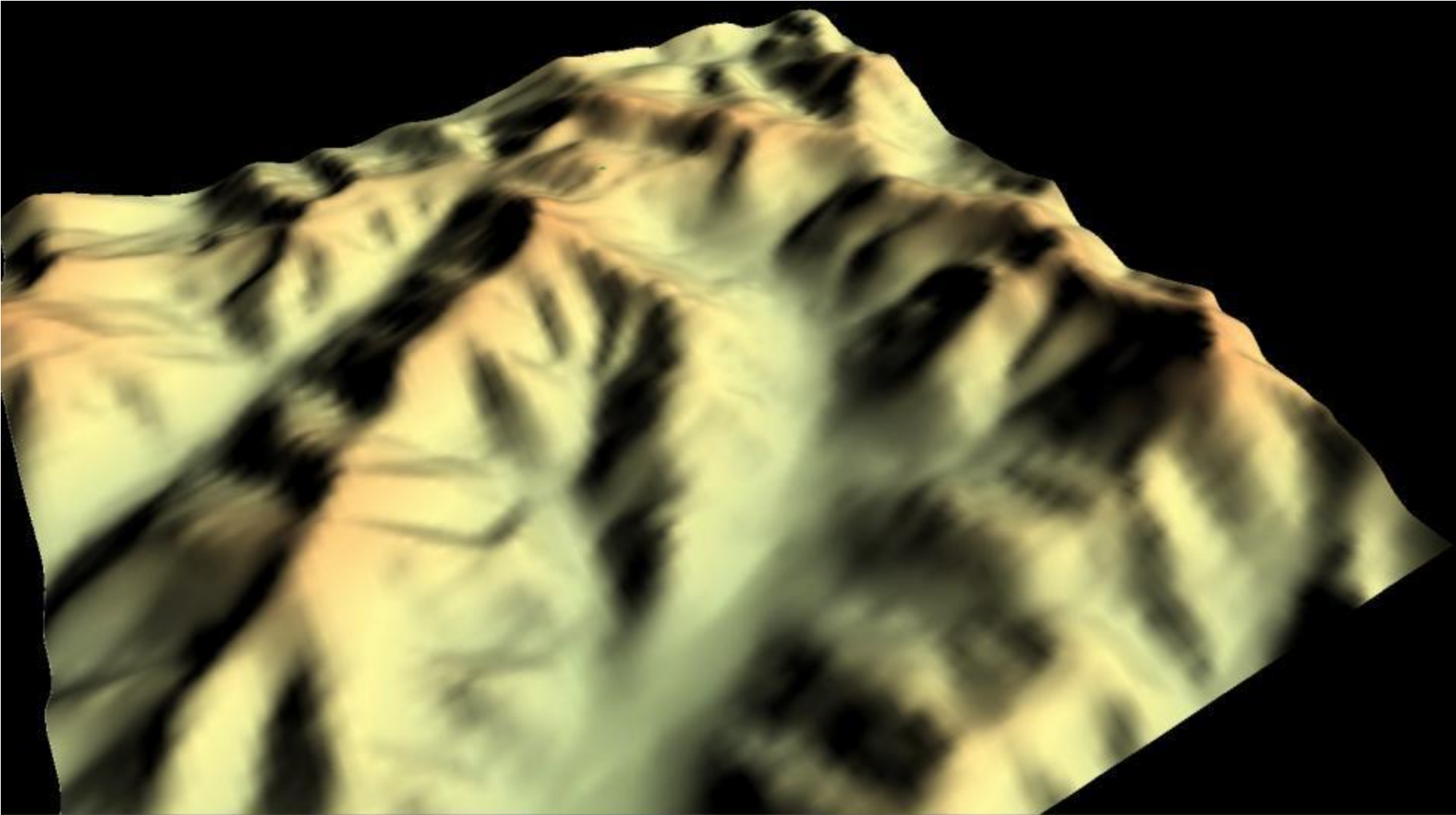
Yukon Koyukuk – OLD Elevation



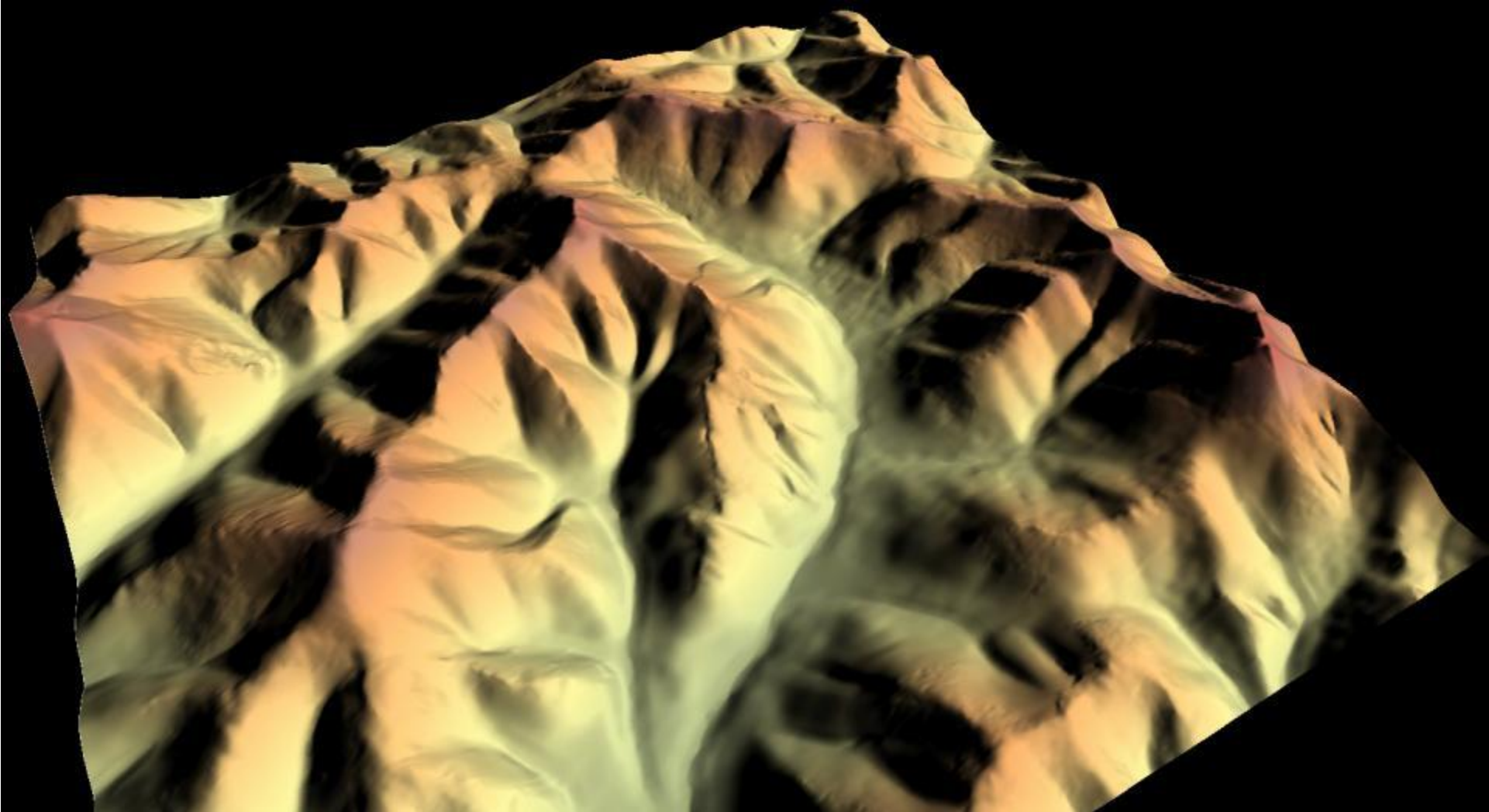
Yukon Koyukuk – NEW Elevation



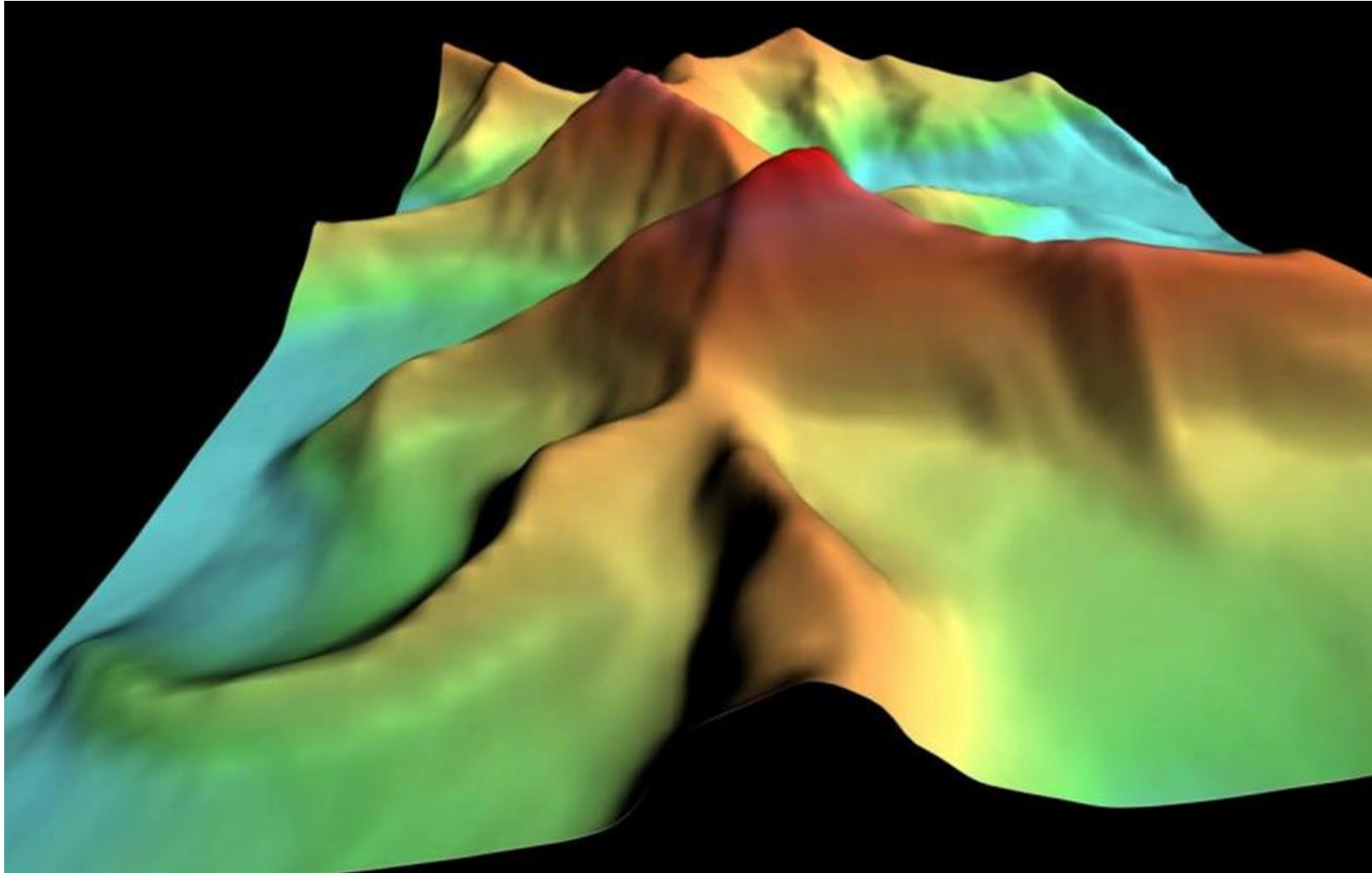
YUKON-KOYUKUK



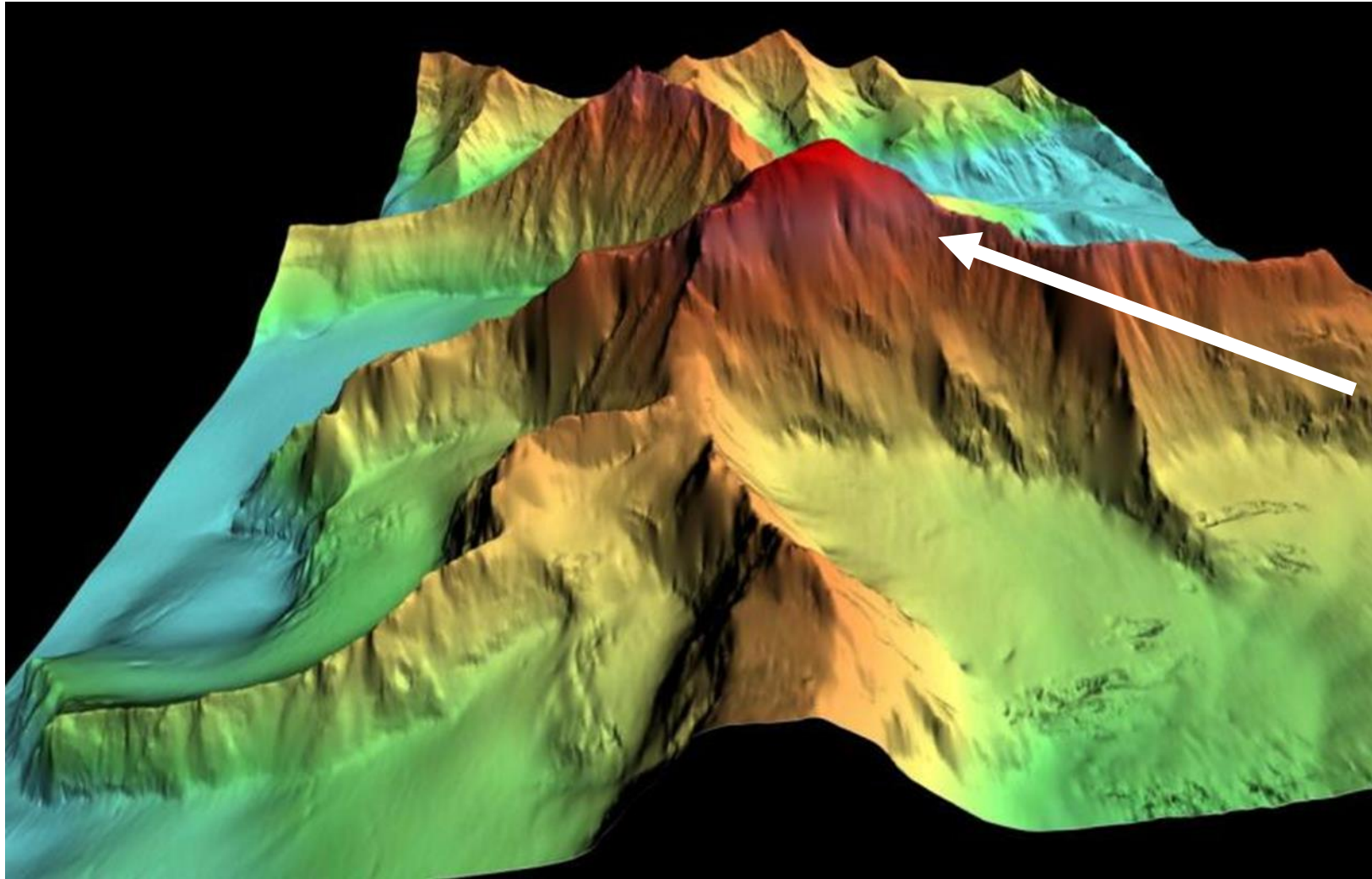
YUKON-KOYUKUK



MOUNT BALCHEN OLD DATA

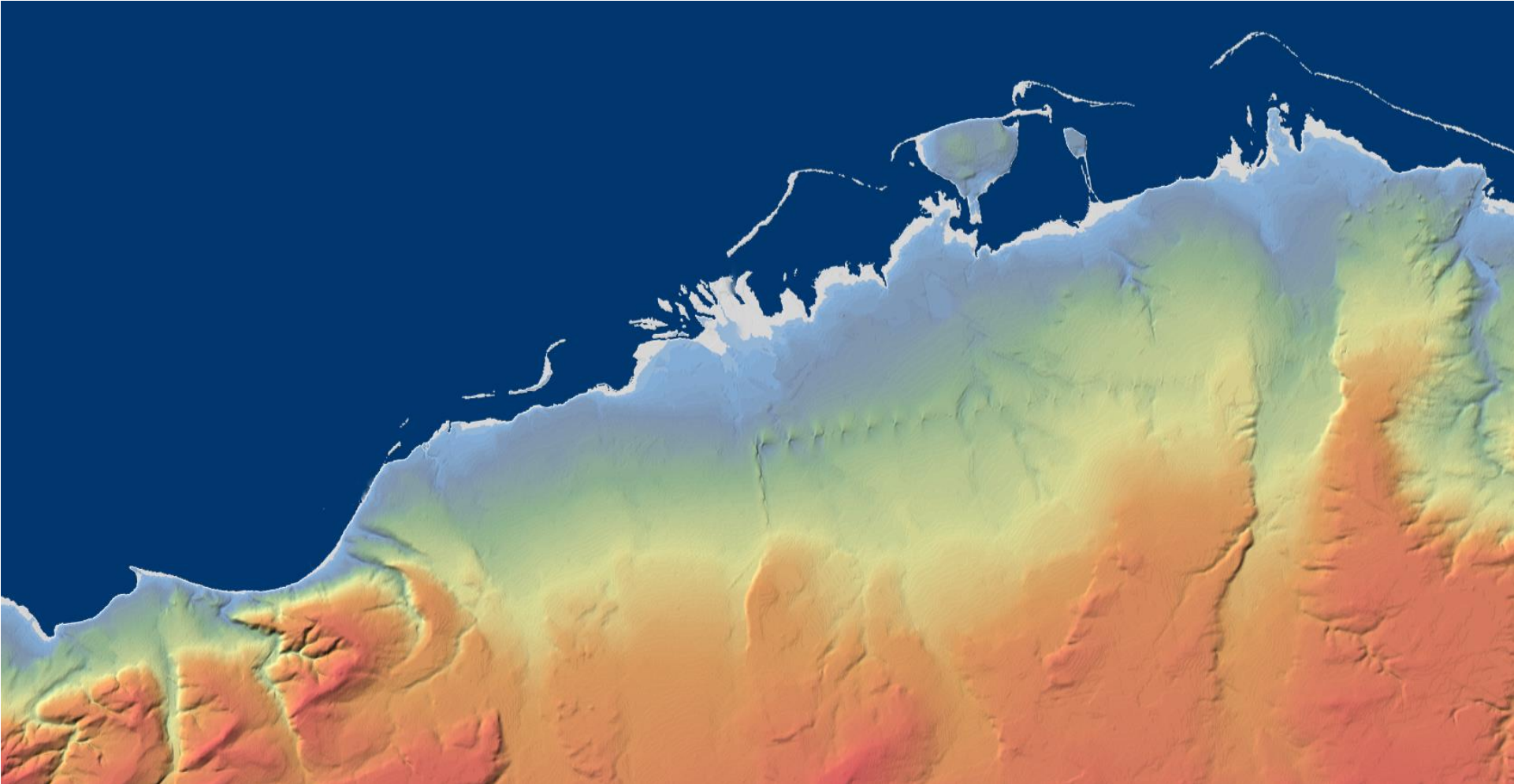


MOUNT BALCHEN NEW DATA

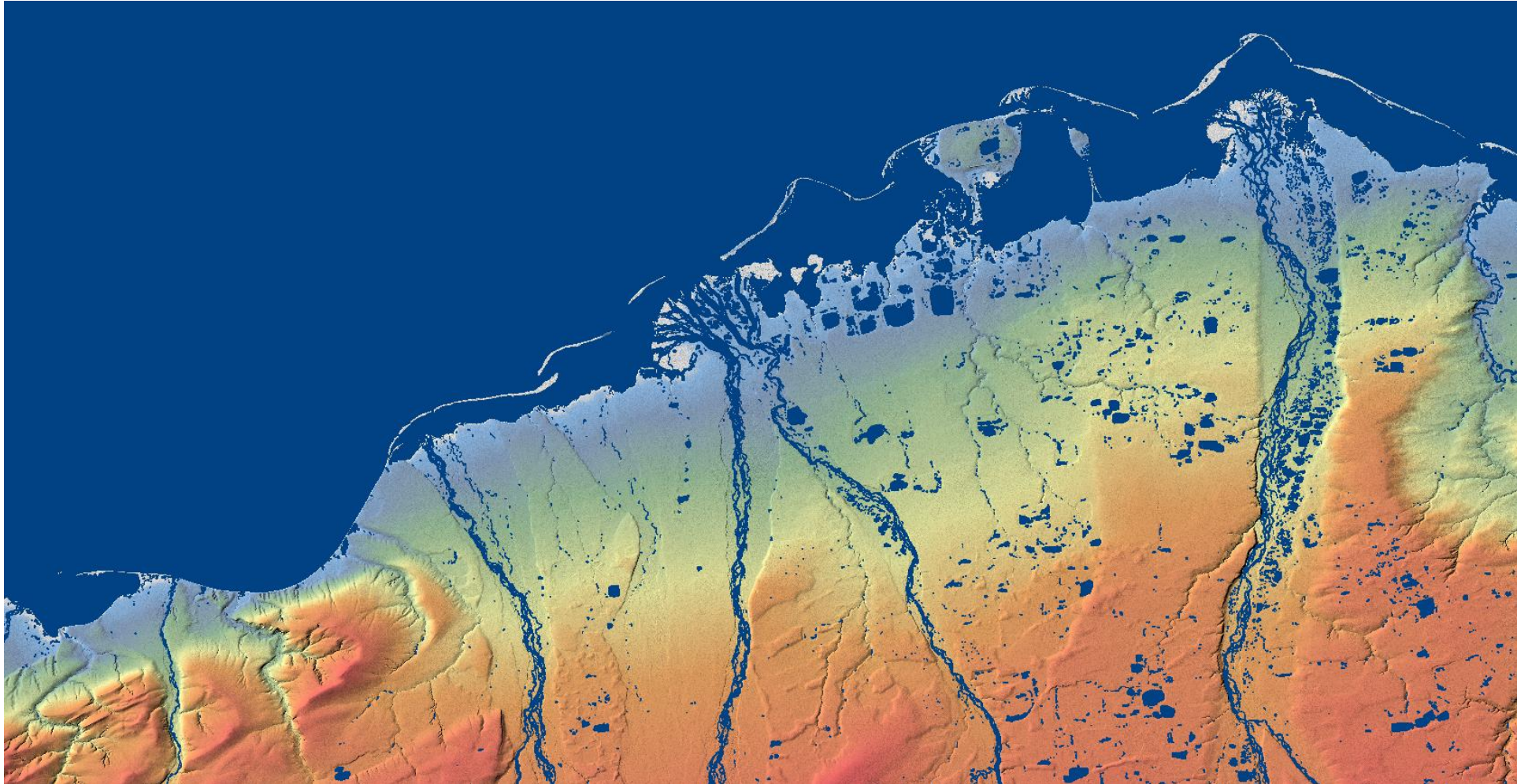


1,200 vertical
feet difference

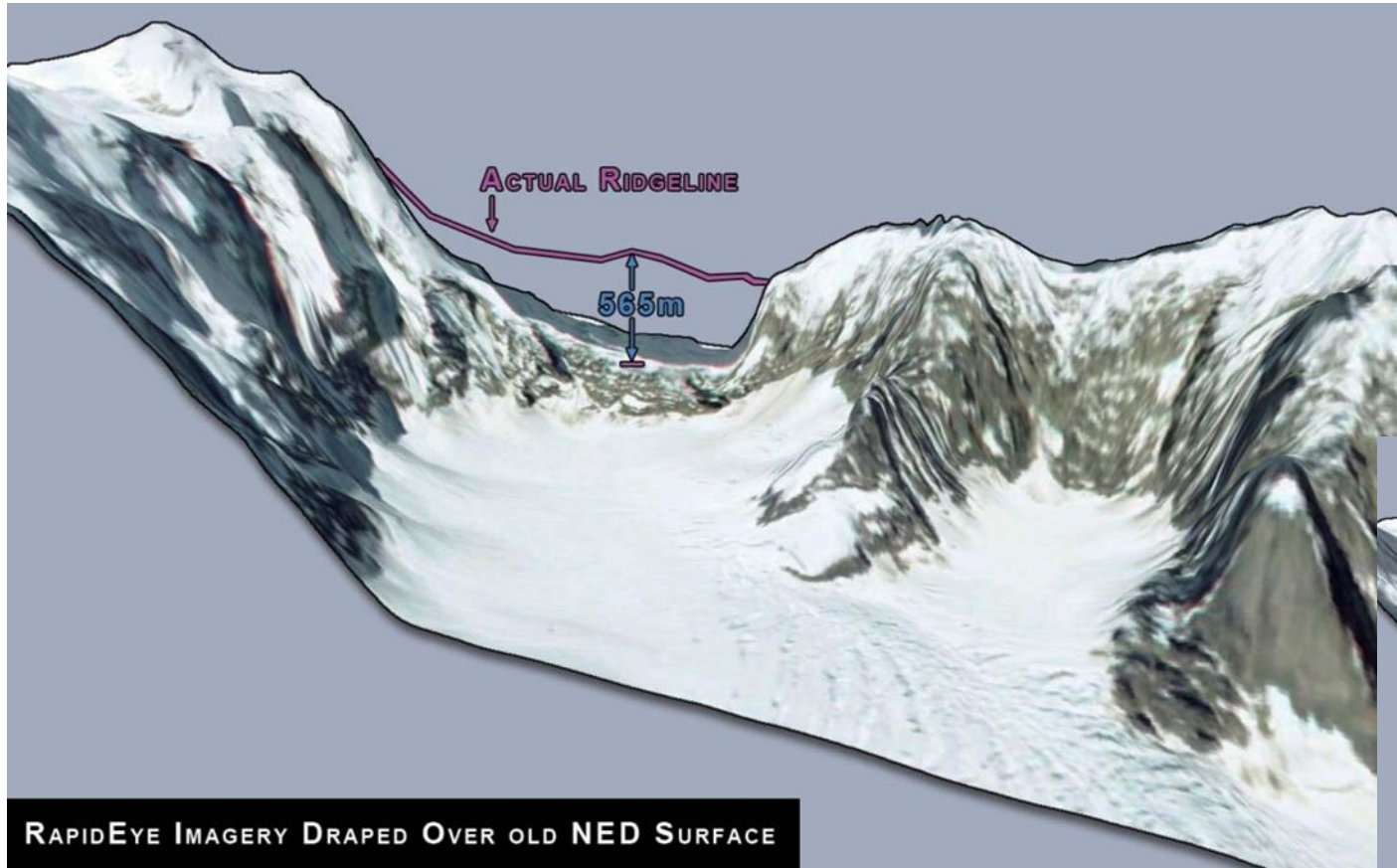
North Slope Borough—Old



North Slope Borough—New



TOKASITNA



MISSING
RIDGELINE
565m



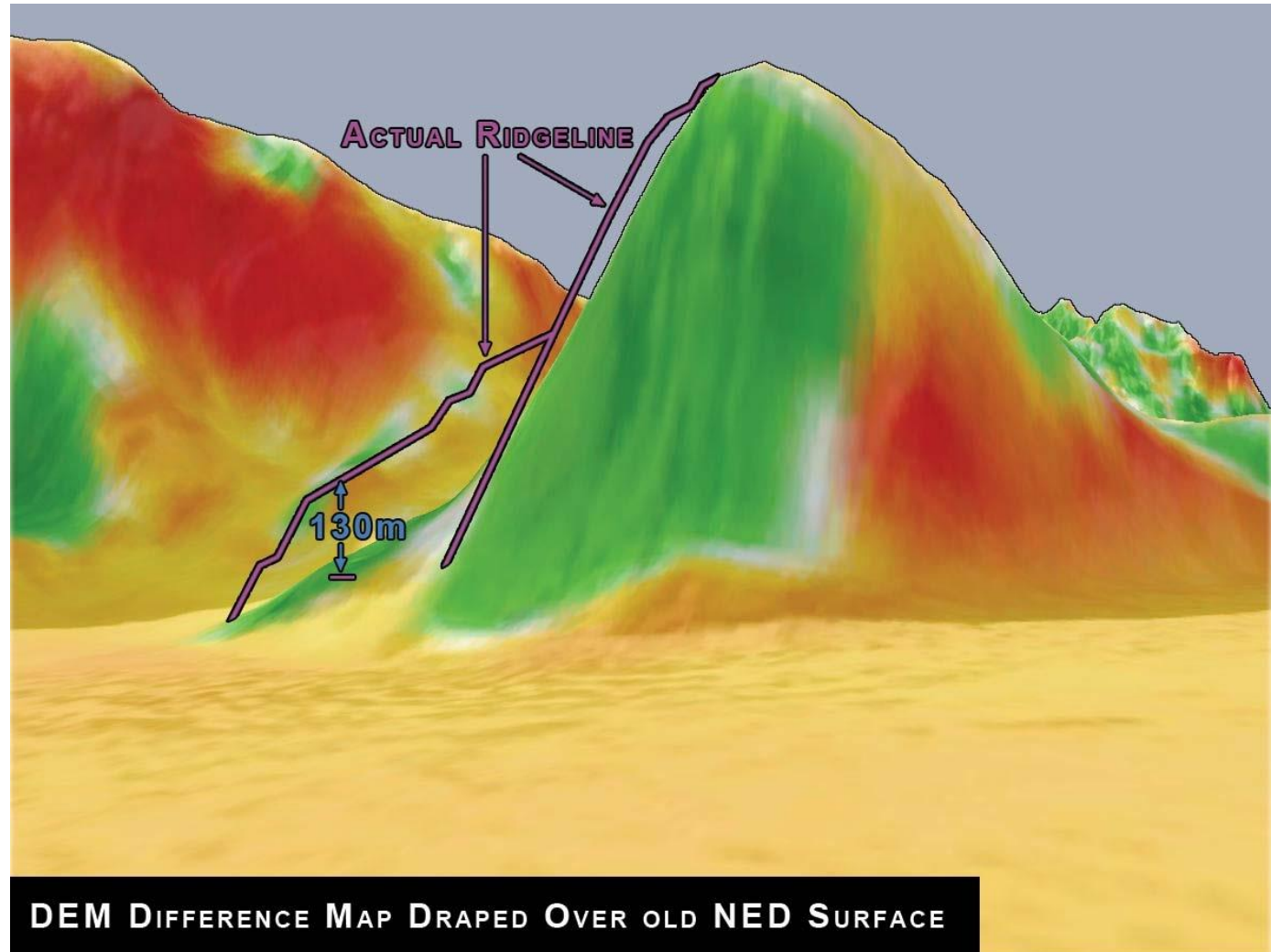
AVIATION SAFETY

GREAT GORGE – DENALI 750m



MOUNT DICKEY - DENALI

DEM / IFSAR
Difference
Mount Dickey,
Denali National
Park



MOUNT DICKEY

Aerial photo
of Mount
Dickey in the
Ampetheater,
Denali
National Park



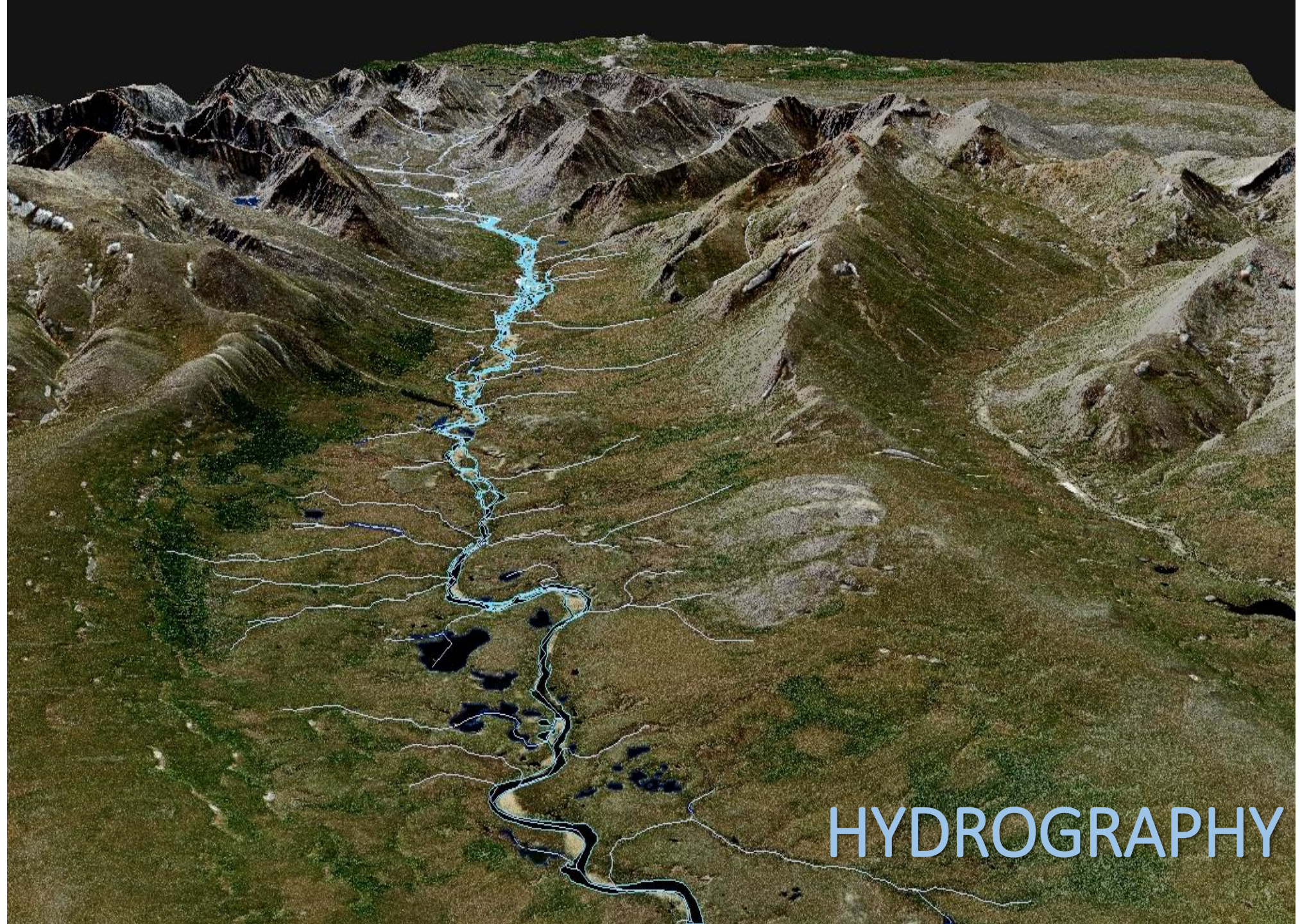
WHAT CAN WE DO WITH IT?

HOW WILL WE USE IT?



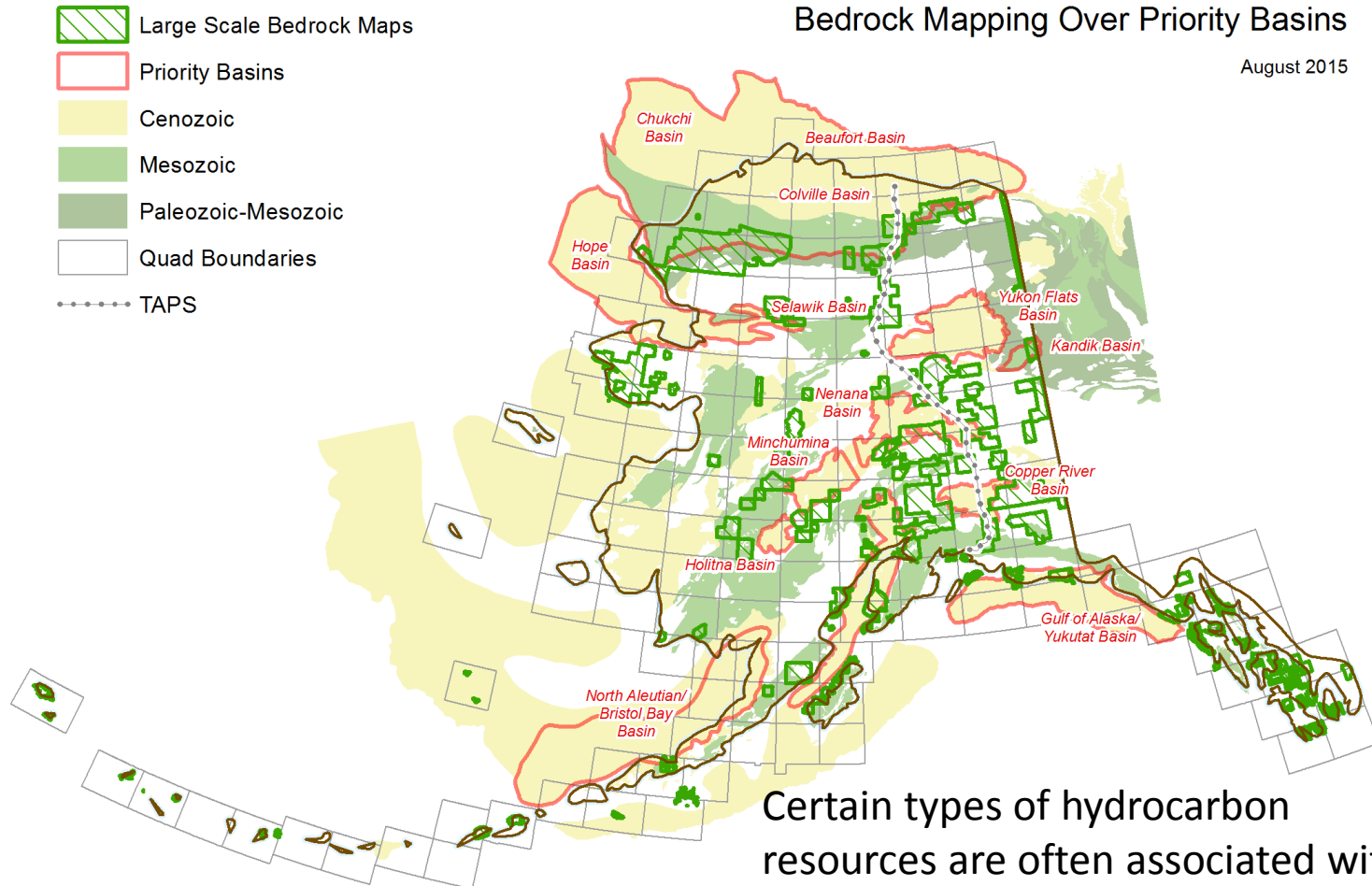


HYDROGRAPHY



HYDROGRAPHY

Oil & Gas Exploration



Certain types of hydrocarbon resources are often associated with specific geological structures which IFSAR captures.

Important for:

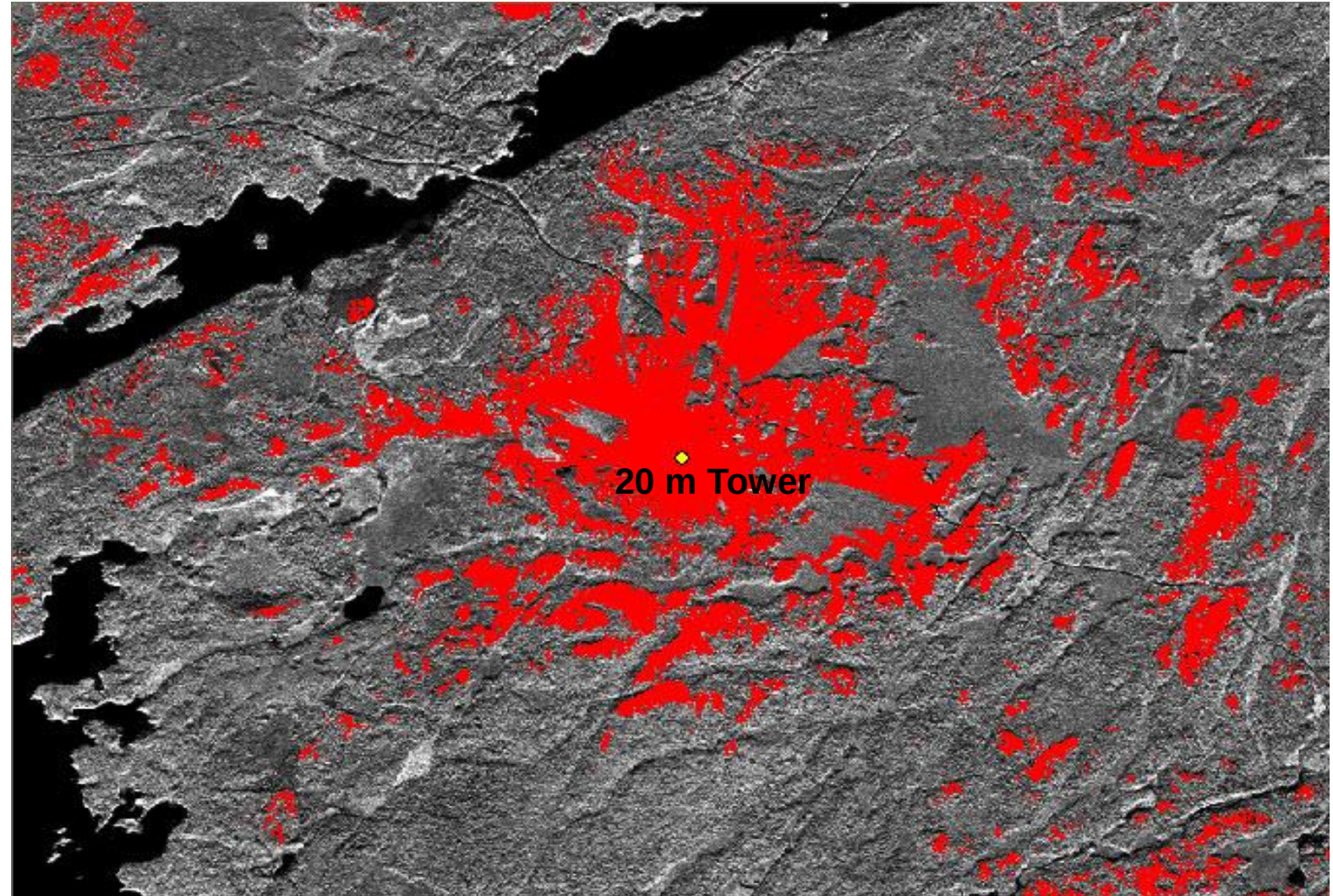
- Resource assessments
- Energy independence
- Energy security
- Resource development

Needs:

- ❖ Increased mapping rate



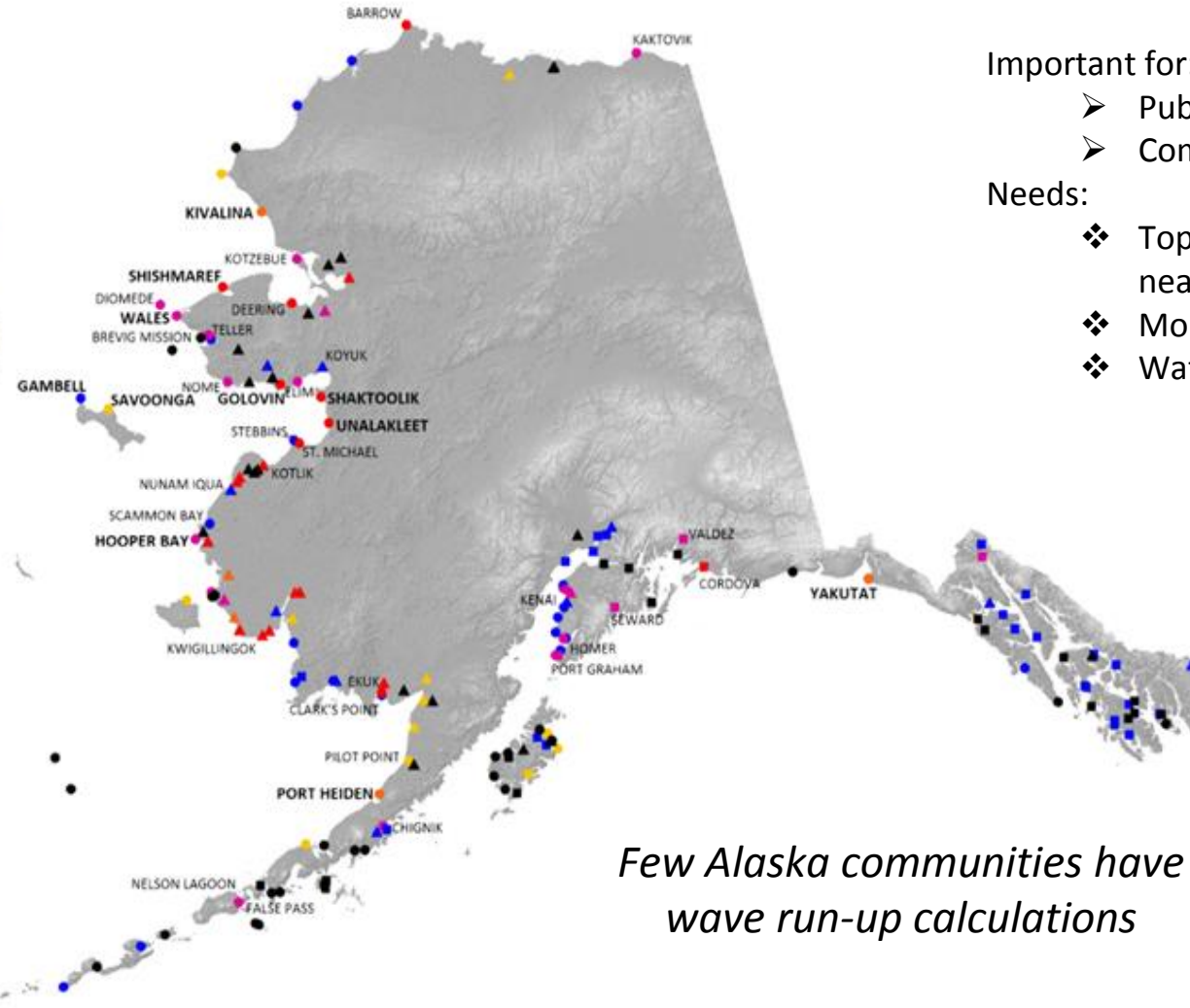
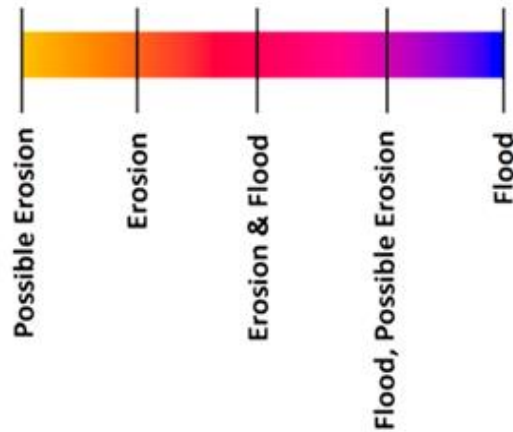
Telecom Propagation Modeling



Storm Surge Analysis

Key

- Exposed Coast
- Sheltered Coast
- ▲ Riverine Coast



Important for:

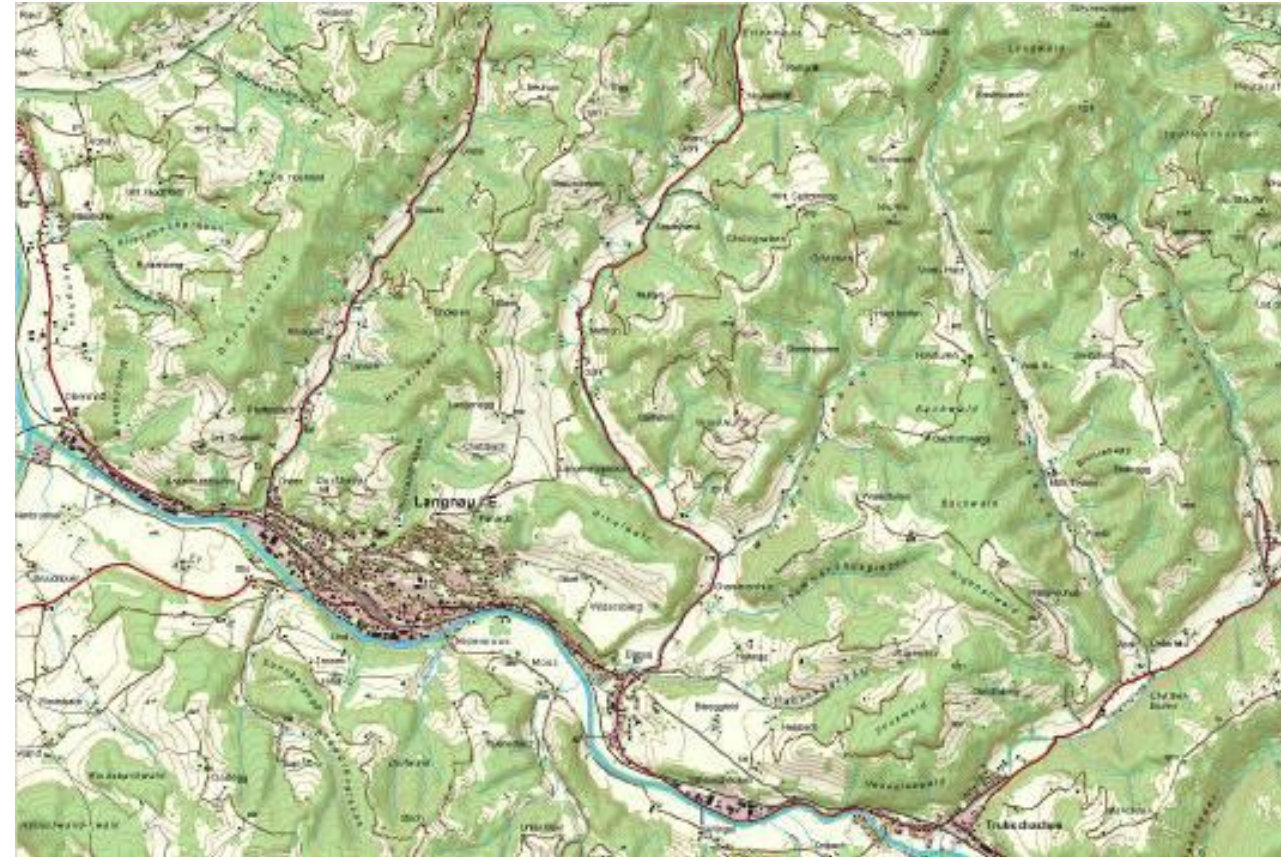
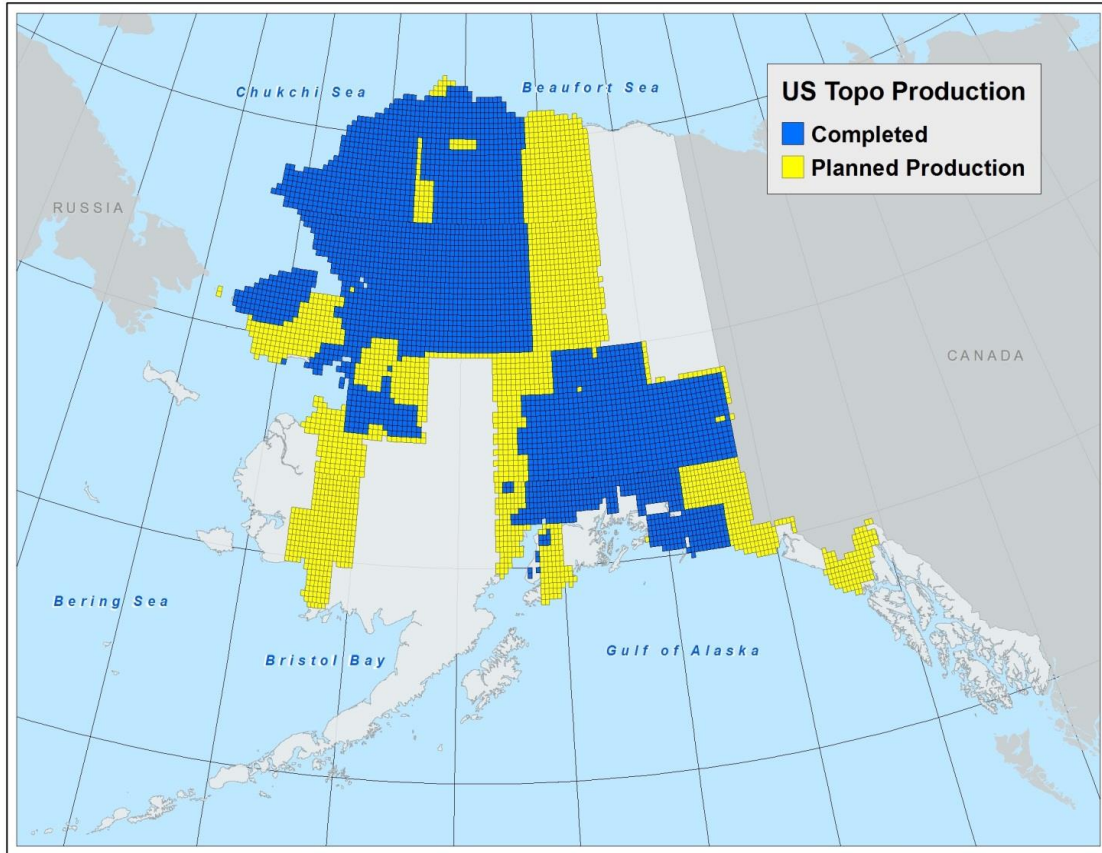
- Public safety
- Community resilience

Needs:

- ❖ Topobathy collections near communities
- ❖ More tidal gauges
- ❖ Water level network

Few Alaska communities have wave run-up calculations

Topographic Line and Base Mapping



Tsunami Inundation Studies

Status of Tsunami Inundation Mapping

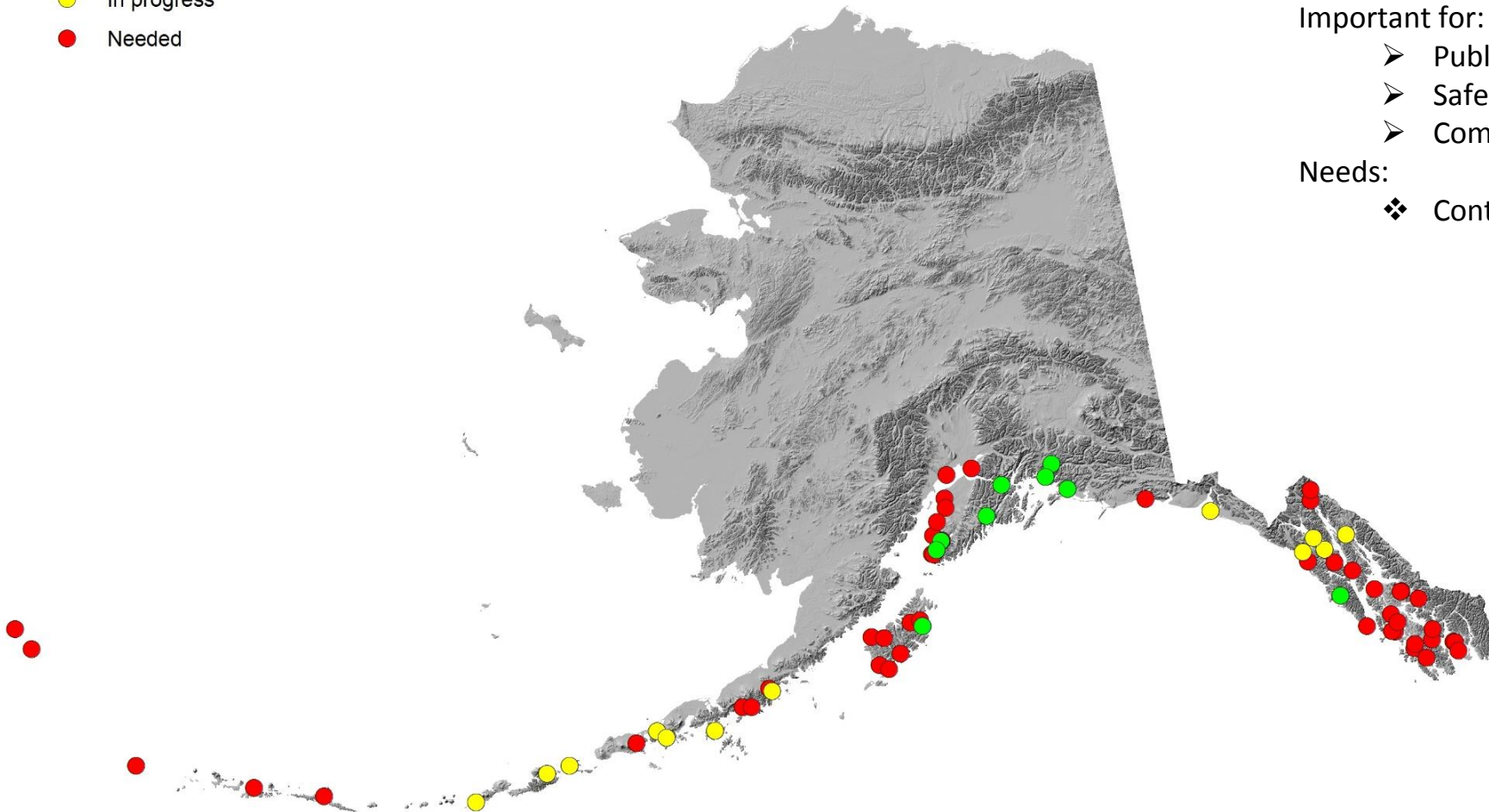
- Completed
- In progress
- Needed

Important for:

- Public safety
- Safe evacuation routes
- Community resilience

Needs:

- ❖ Continued funding



Avalanches / Slope Analysis

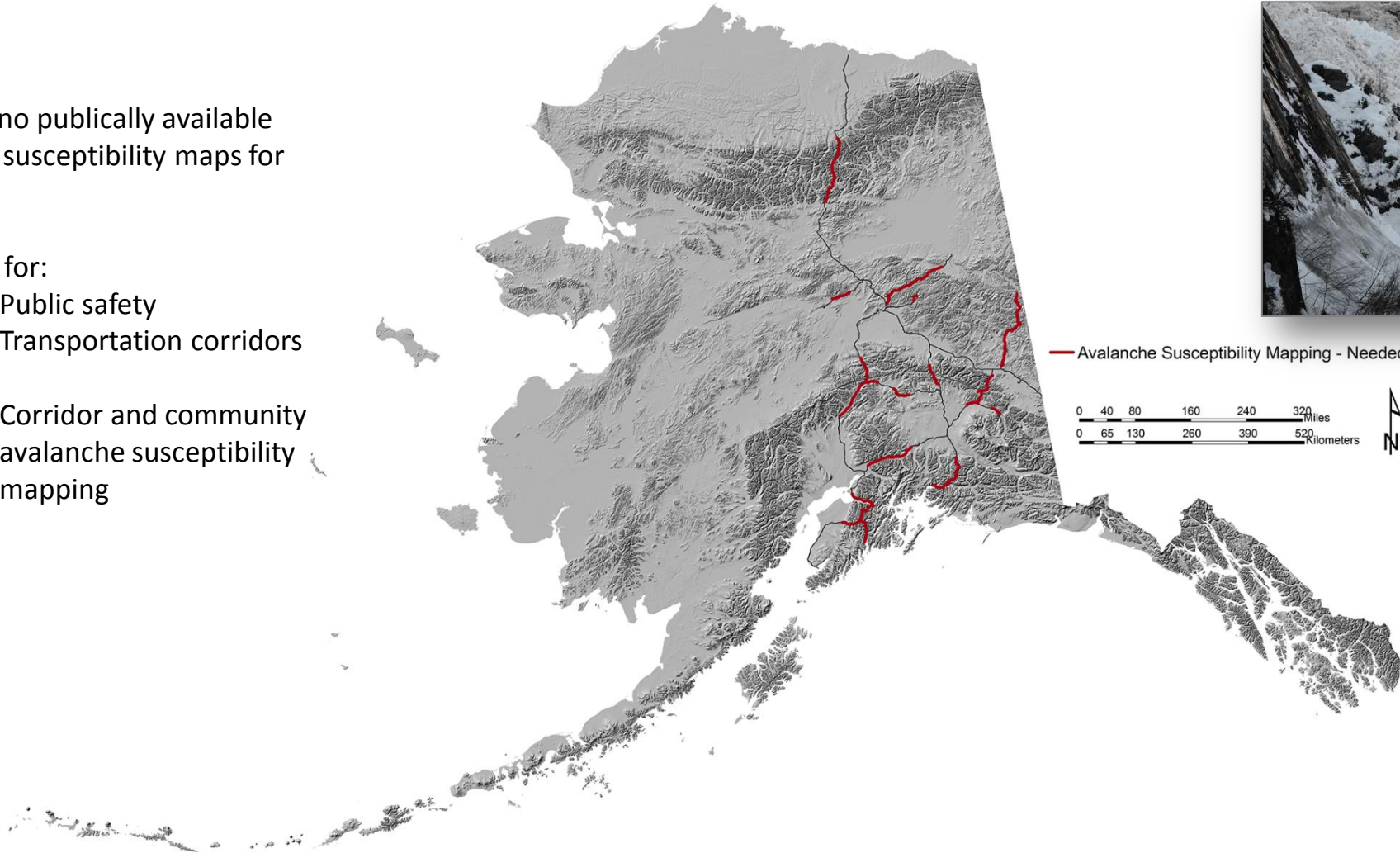
There are no publically available avalanche susceptibility maps for Alaska

Important for:

- Public safety
- Transportation corridors

Needs:

- ❖ Corridor and community avalanche susceptibility mapping





WHERE WE NEED TO GO

GEOSPATIAL SUPPORTS INFORMED PUBLIC POLICY

FRAMEWORK DATA THEMES

Baseline (Maritime)
 Biological Resources
 *Cadastral
 *Cadastral (Offshore)
 Climate
 Cultural and Demographic
 Statistics
 Cultural Resources
 *Digital Orthoimagery
 Earth Cover
 *Elevation Bathymetric
 *Elevation Terrestrial
 Buildings and Facilities
 Federal Land Ownership
 Status
 Flood Hazards
 *Geodetic Control
 Geographic Names
 Geologic
 *Governmental Units

Housing
 *Hydrography
 International Boundaries
 Law Enforcement Statistics
 Marine Boundaries
 Offshore Minerals
 Outer Continental Shelf
 Submerged Lands
 Public Health
 Public Land Conveyance
 (patent) Records
 Shoreline
 Soils
 *Transportation
 *Transportation (Marine)
 Vegetation
 Watershed Boundaries
 Wetlands
 *Indicates framework theme

Framework Themes



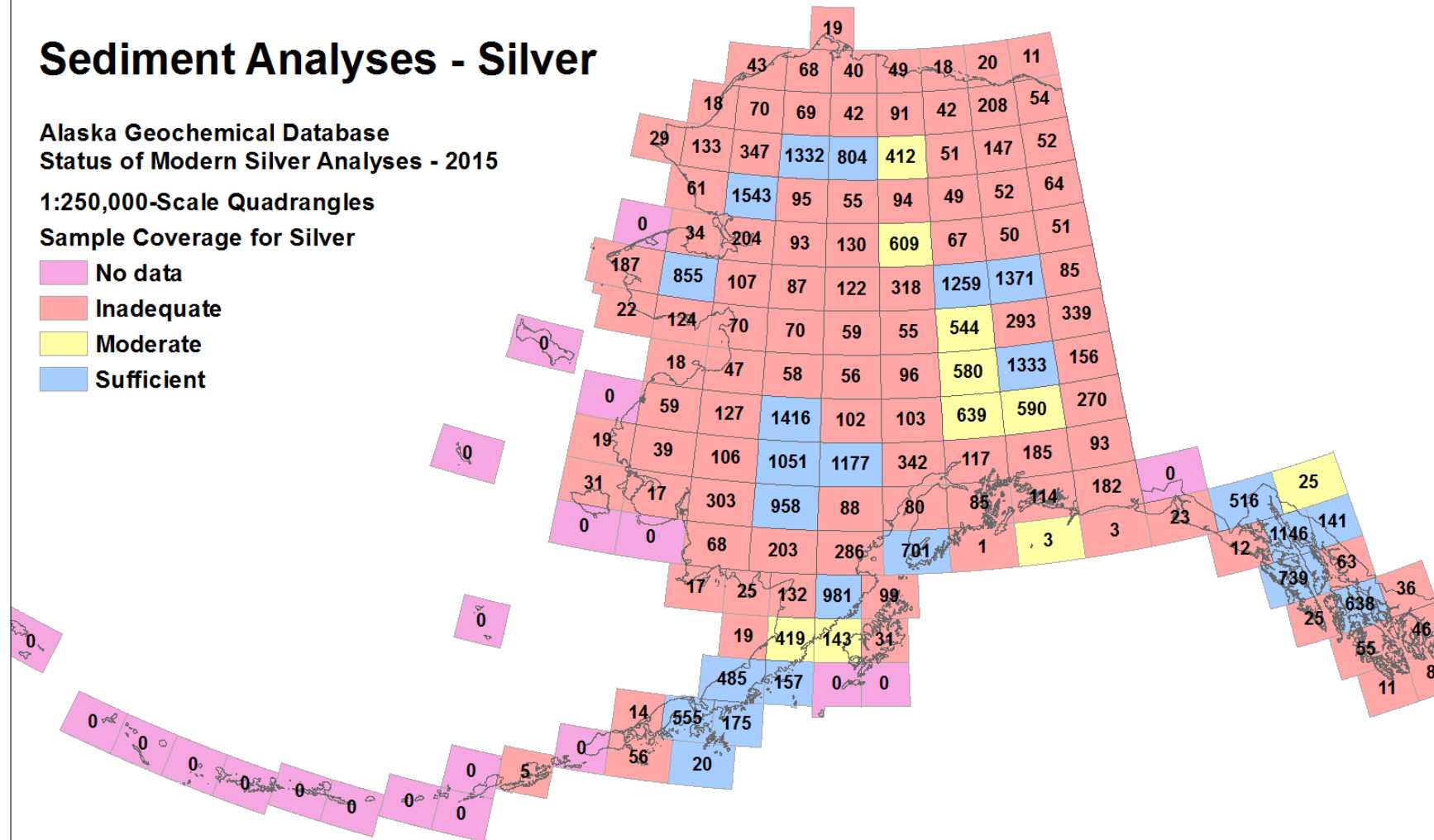
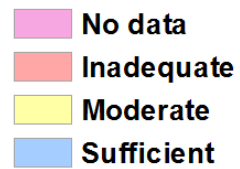
Geochemistry

Sediment Analyses - Silver

Alaska Geochemical Database Status of Modern Silver Analyses - 2015

1:250,000-Scale Quadrangles

Sample Coverage for Silver



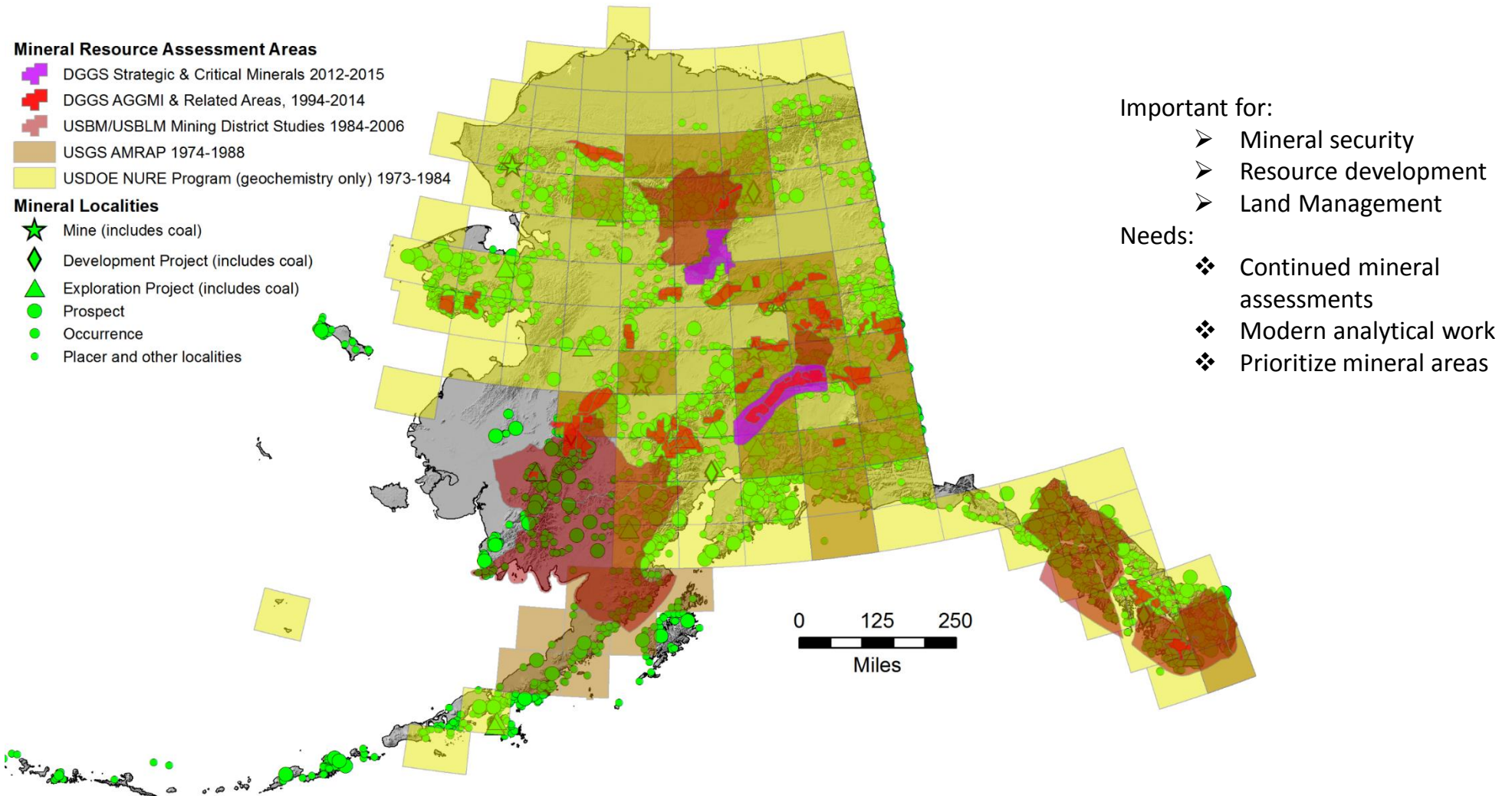
Important for:

- Resource assessments
- Mineral security
- Resource development

Needs:

- ❖ Re-analyses of pulps
- ❖ Additional Sampling

Mineral Resources



Geophysics & Remote Sensing

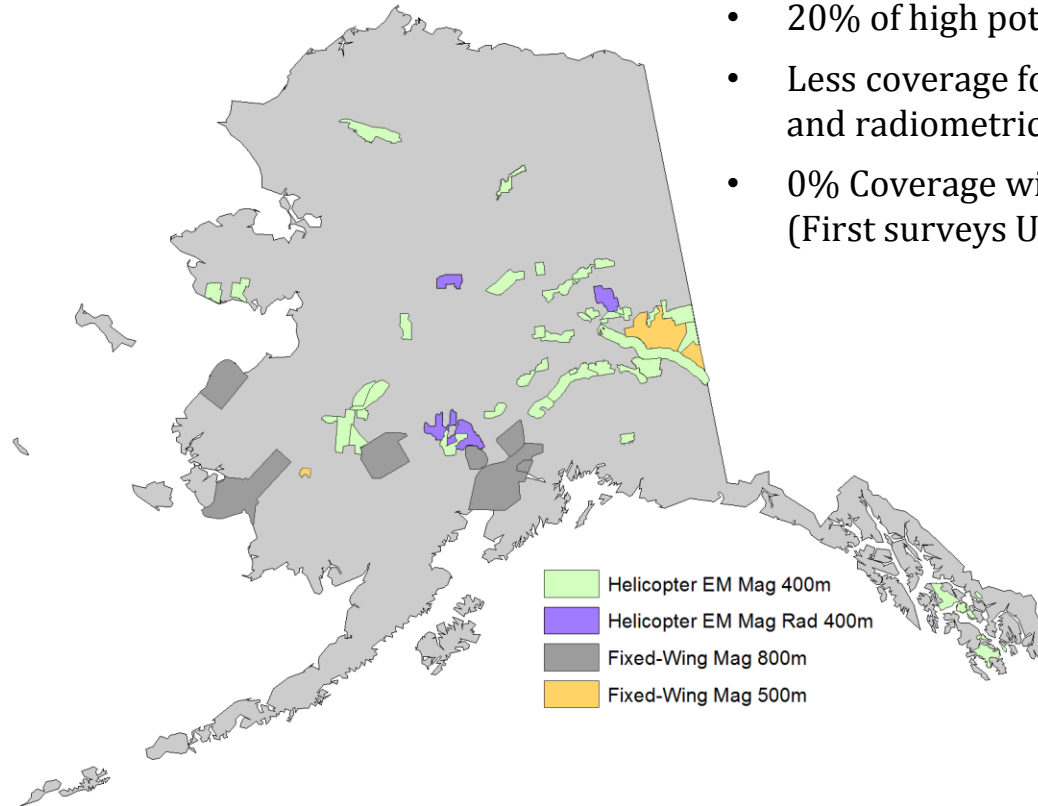
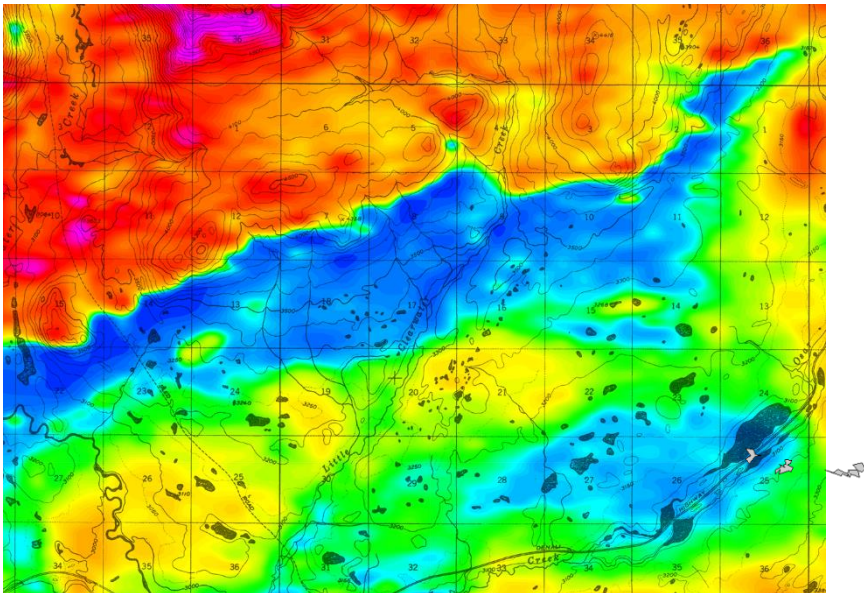
Important for:

- Geologic mapping
- Mineral security
- Resource development

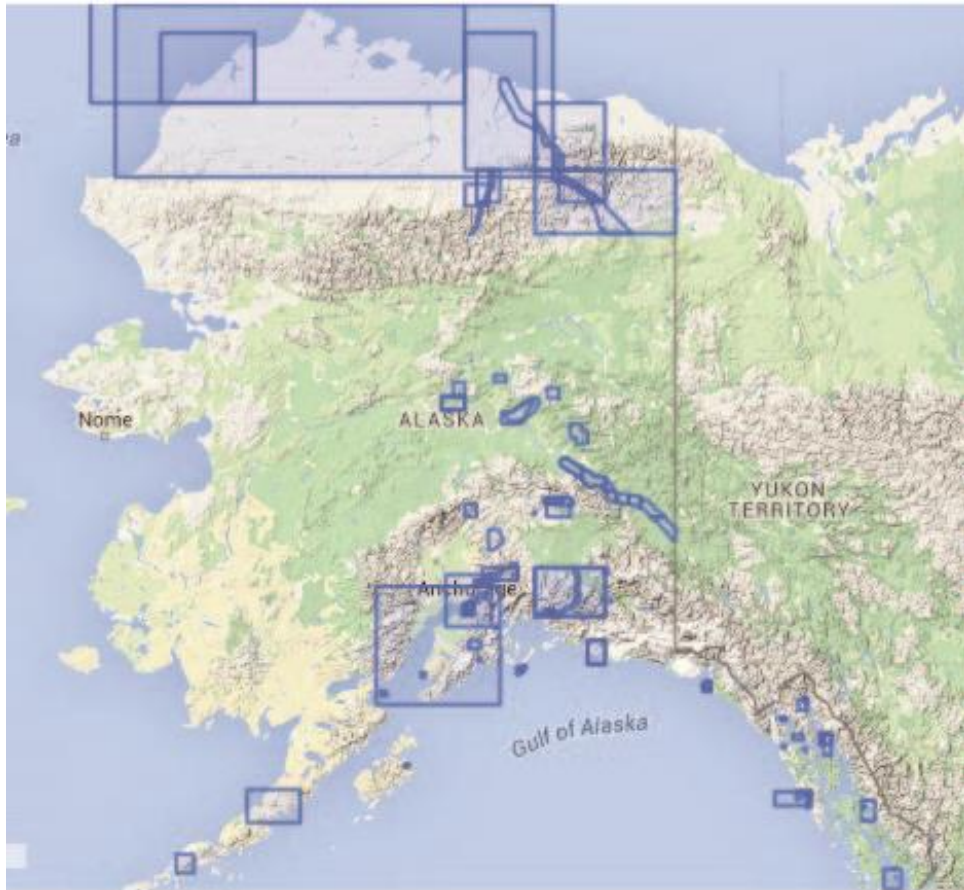
Needs:

- ❖ Increased rate of data acquisition

- 4% State coverage magnetics
- 20% of high potential areas flown
- Less coverage for electromagnetic and radiometric
- 0% Coverage with hyperspectral (First surveys USGS-2014/2015)



Landslides / LiDAR



August 18, 2015 Sitka Landslide,
homes destroyed, 3 people missing

Landslide mapping of communities and infrastructure is critically inadequate

Important for:

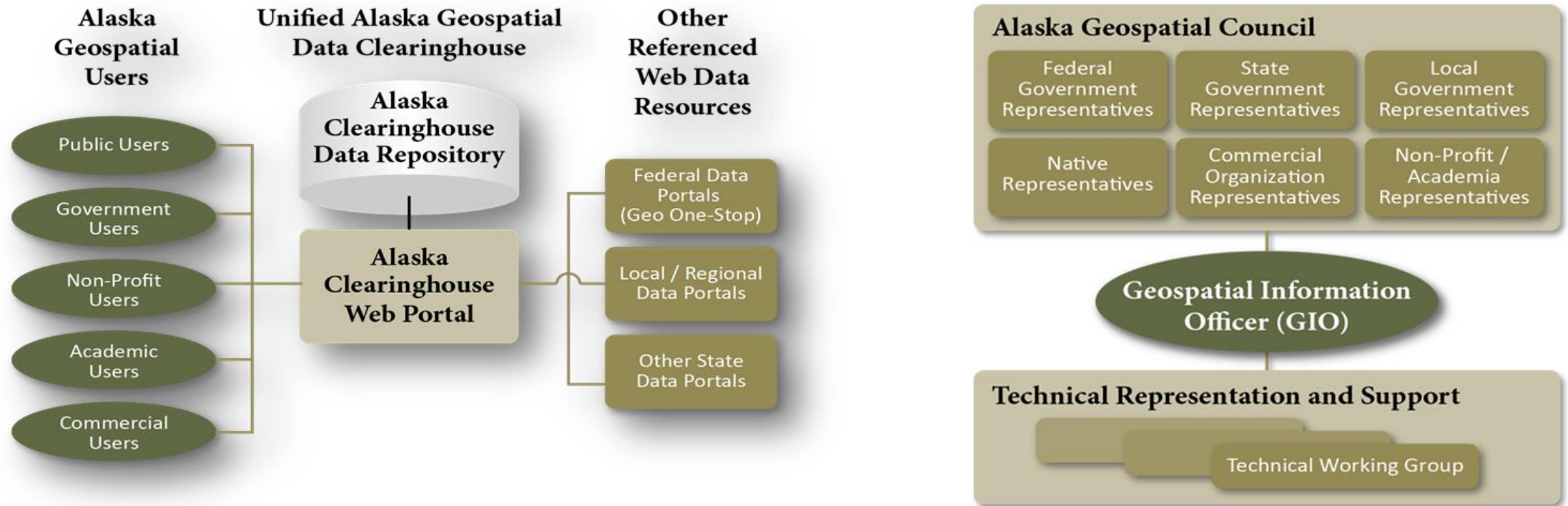
- Public safety
- Infrastructure resilience

Needs:

- ❖ Community and infrastructure landslide mapping



ALASKA GEOSPATIAL COUNCIL



ALASKA GEOSPATIAL STRATEGIC PLAN

- Intergovernmental
- Stakeholder Driven
- Open / Transparent

http://agc.dnr.alaska.gov/geospatial_plans.cfm



Thank You To All Of Our Partners

Doing together what no one could do alone



John Wesley Powell 2nd Director USGS

1881 - 1894



“A Government cannot do any scientific work of more value to the people at large than by causing the construction of proper topographic maps of the country.”