



# MAPPING ALASKA

## Resources Committee

Nick Mastrodicasa

Large Project Manager DOT/PF

Deputy Commissioner Fogels, DNR

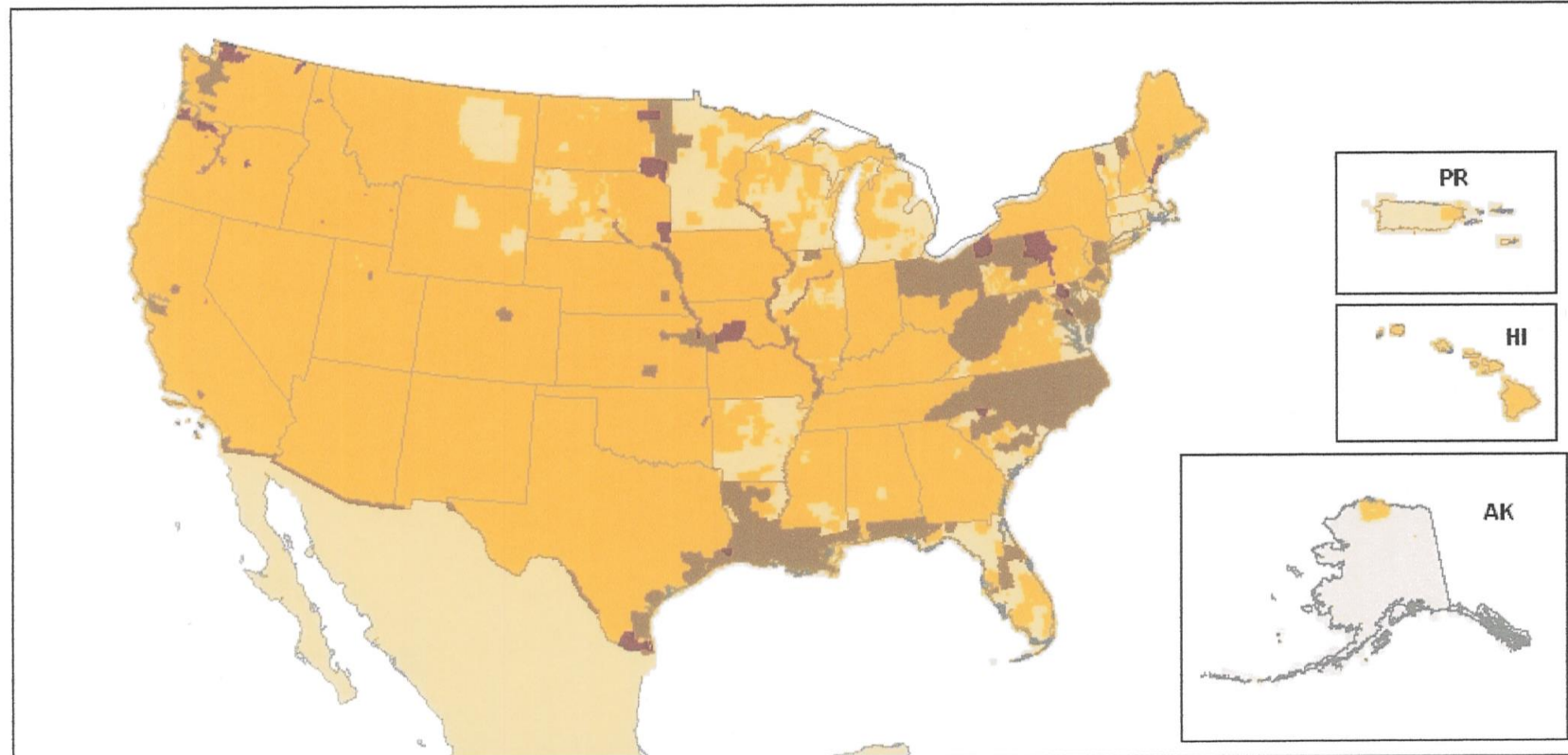
Feb 8, 2017

# 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

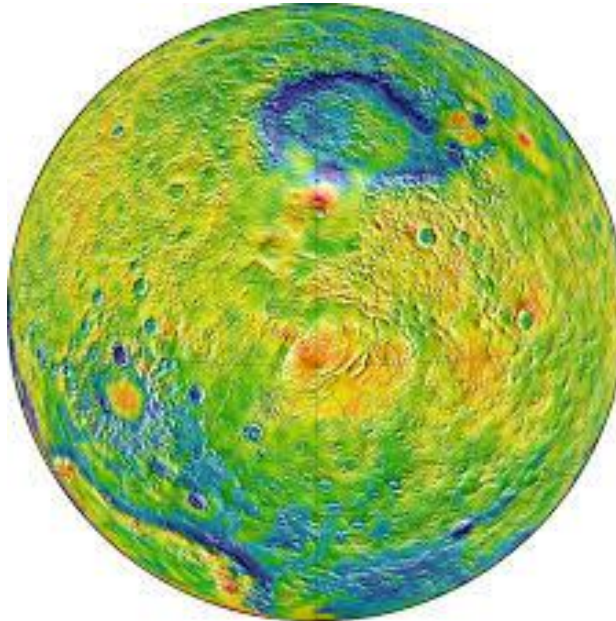
September 2009

# In 2009 Mars Was Better Mapped Than Alaska

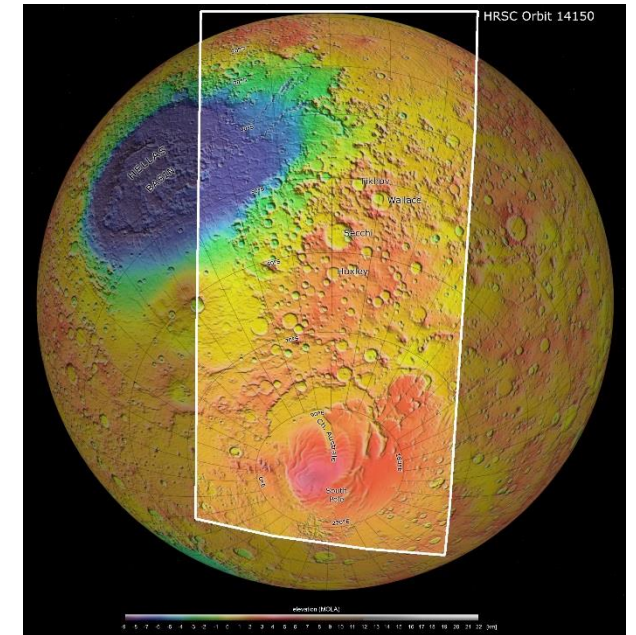
Mars Image Map



Mars Gravity Map



Mars DEM Hillshade Relief














# 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
<b>TOTAL</b>	<b>\$19,437,030</b>

# IFSAR Partner Contributions

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

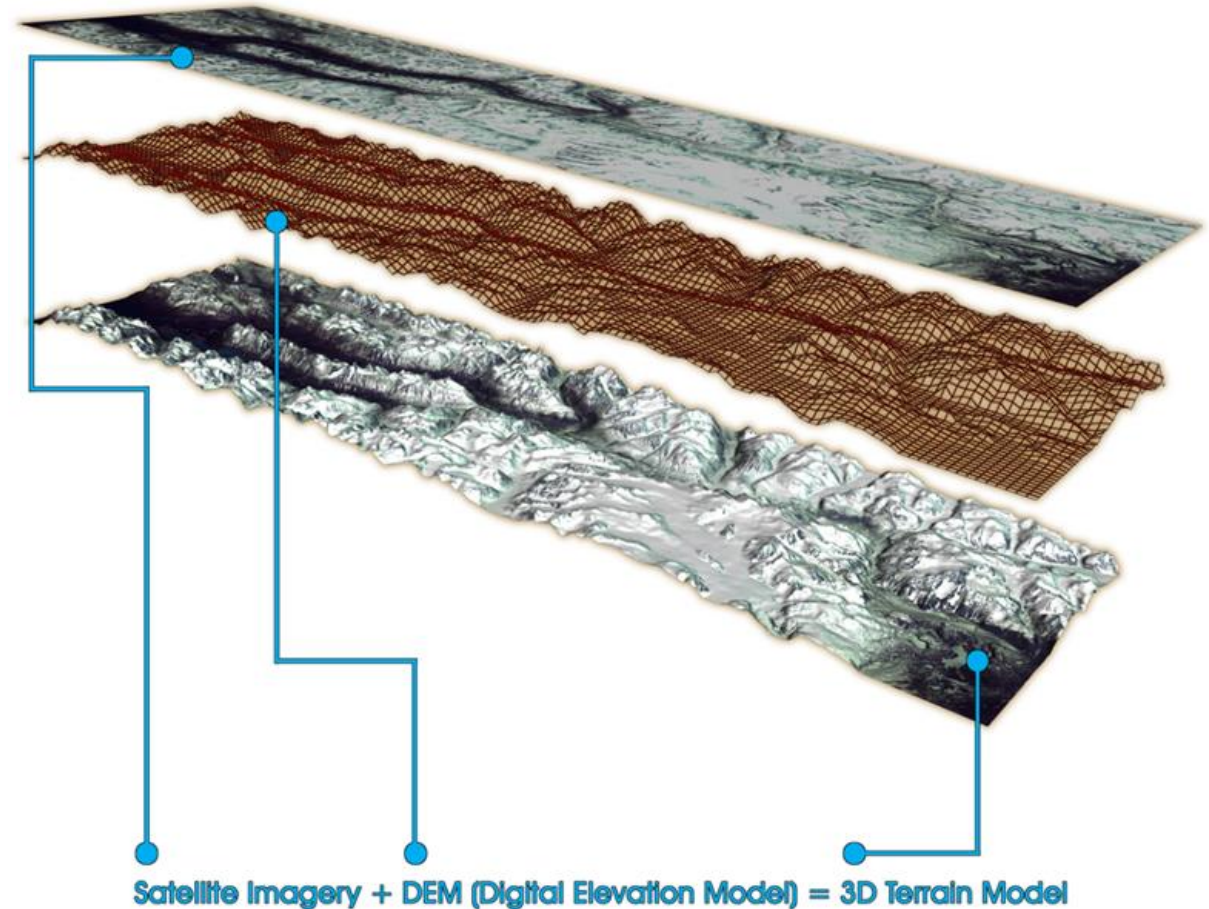
2016 Carry Over **\$1,192,968**

# Statewide Digital Mapping Initiative (SDMI)

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

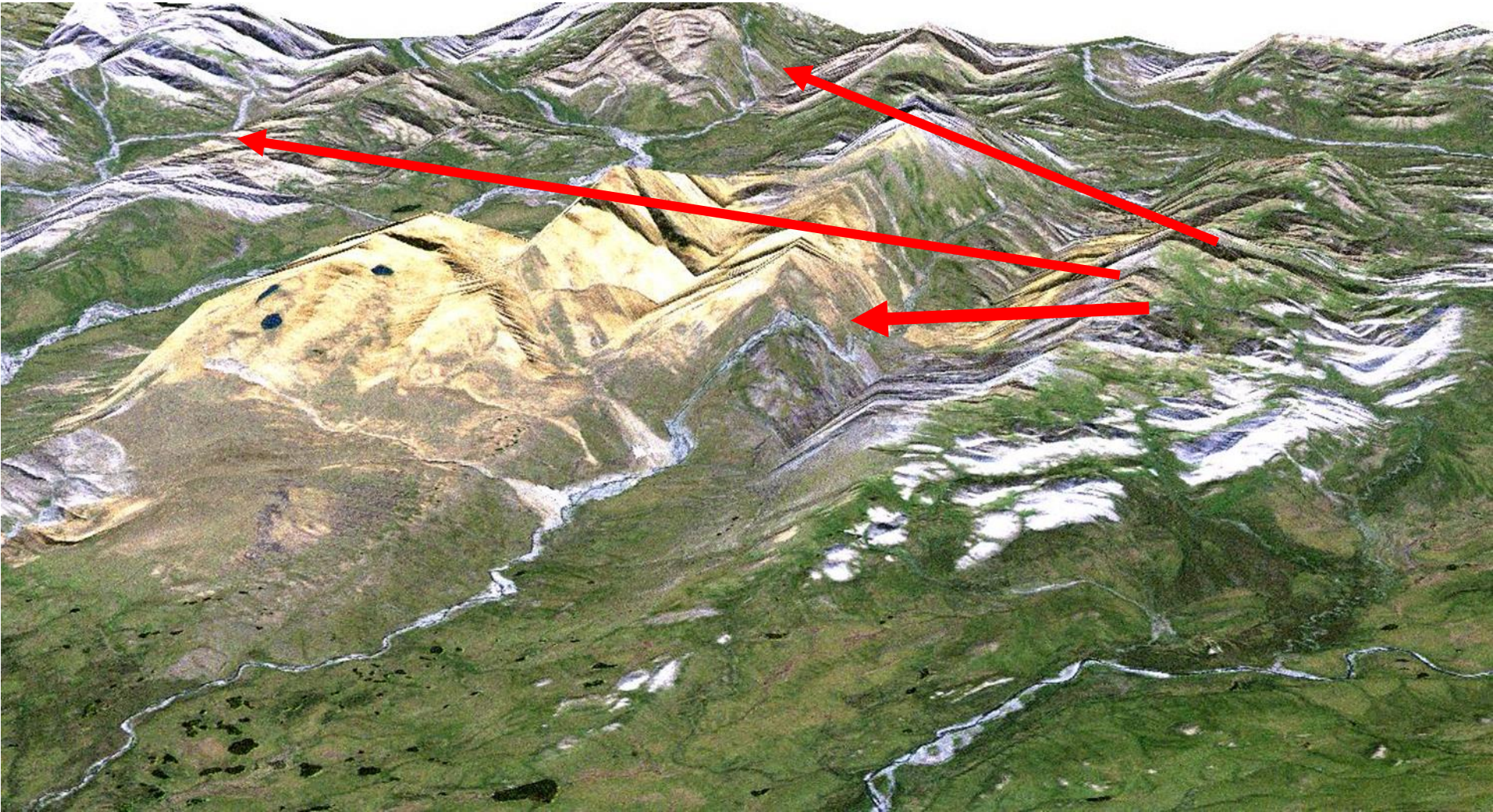
	<u>Status</u>
• Satellite Imagery	98% \$ 4.5M
• Digital Elevation Model	77% \$46.5M
• Co-Registration of Data	
• Warehousing of Data	

- The SDMI became the Alaska Geospatial Council in 2014





# Rivers Do Not Flow Uphill



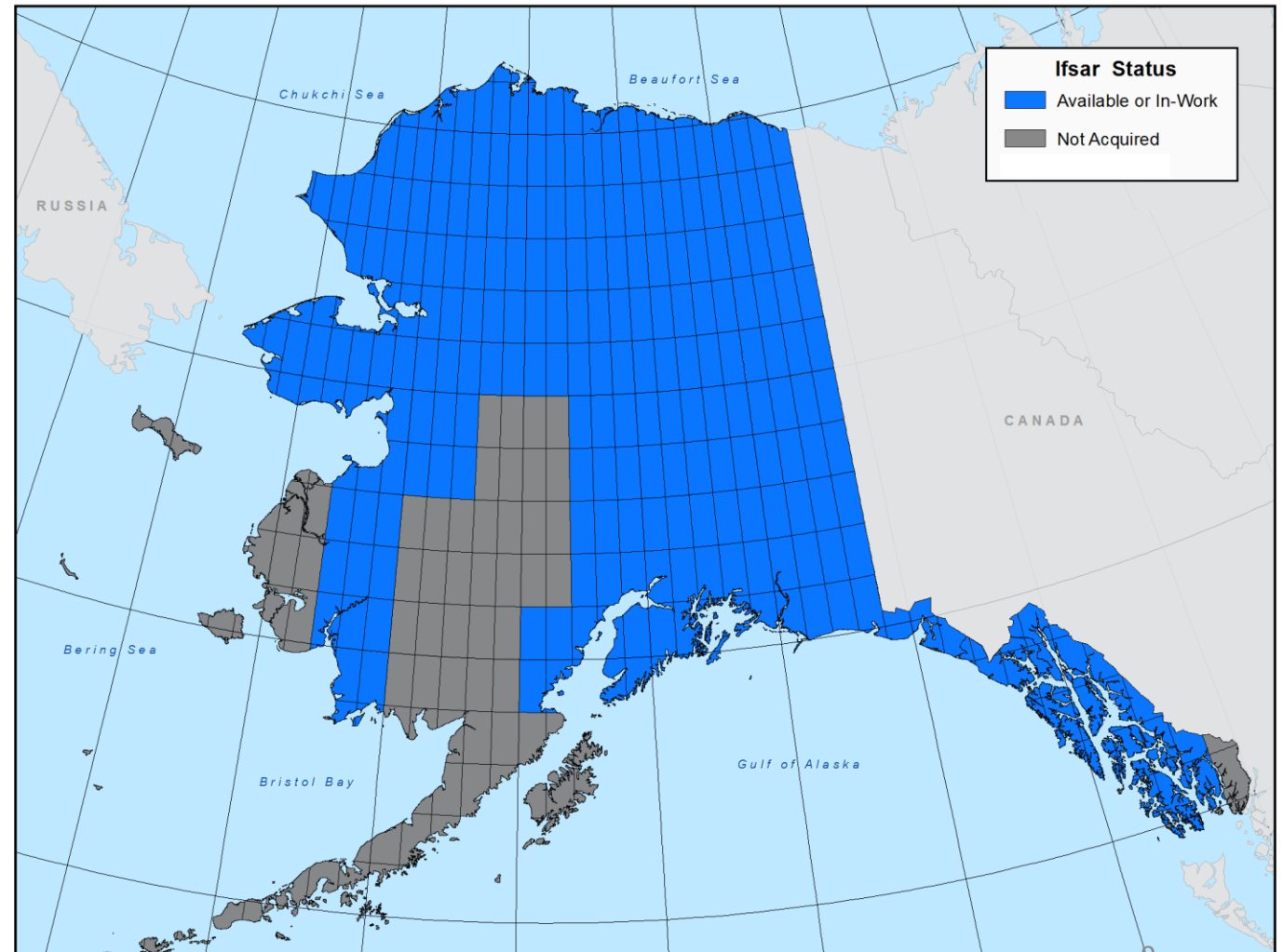


# Elevation 77% Complete, in 2016

## 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

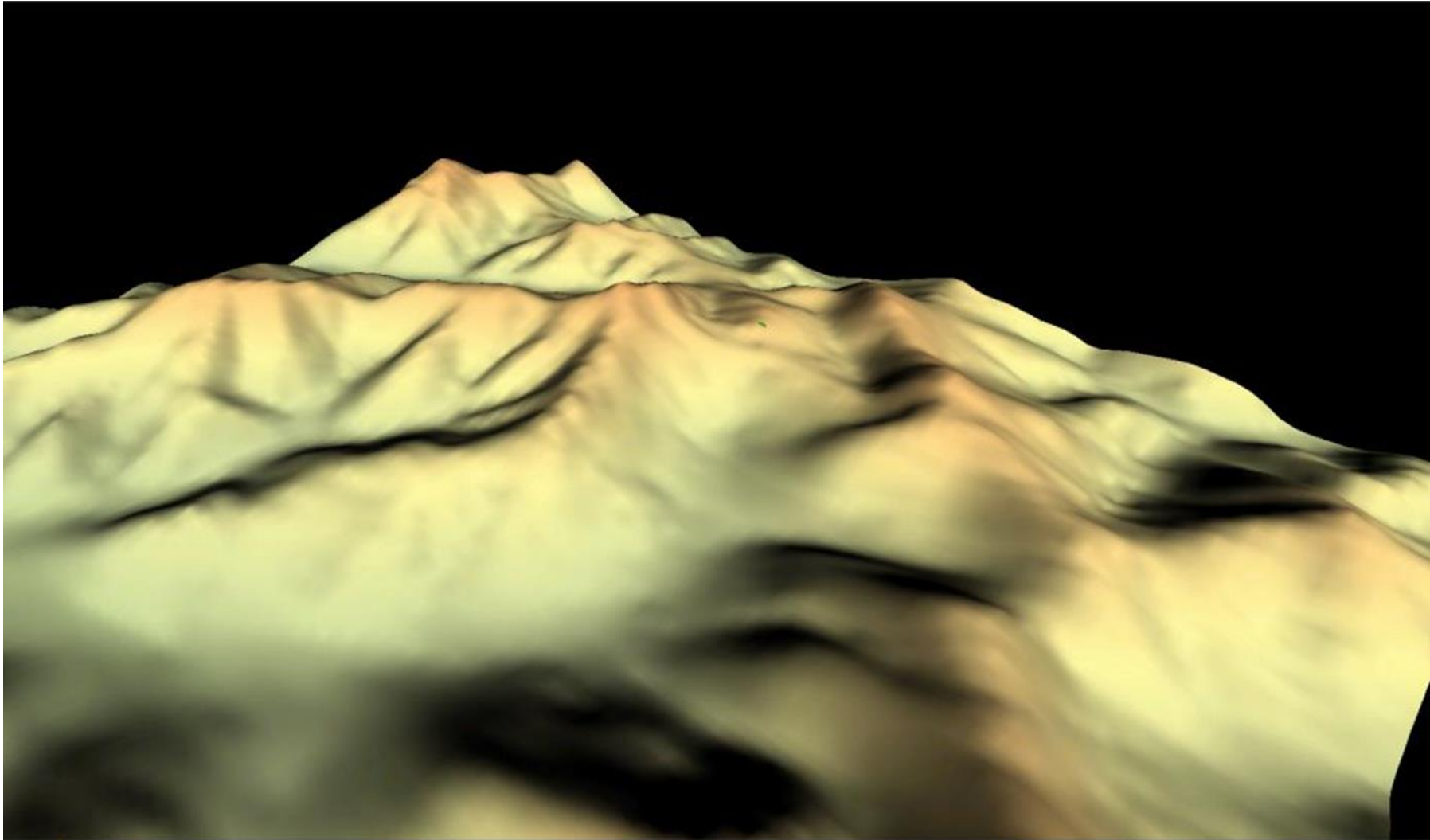


# SO, WHAT DID WE GET?

WHAT DID WE FIND?

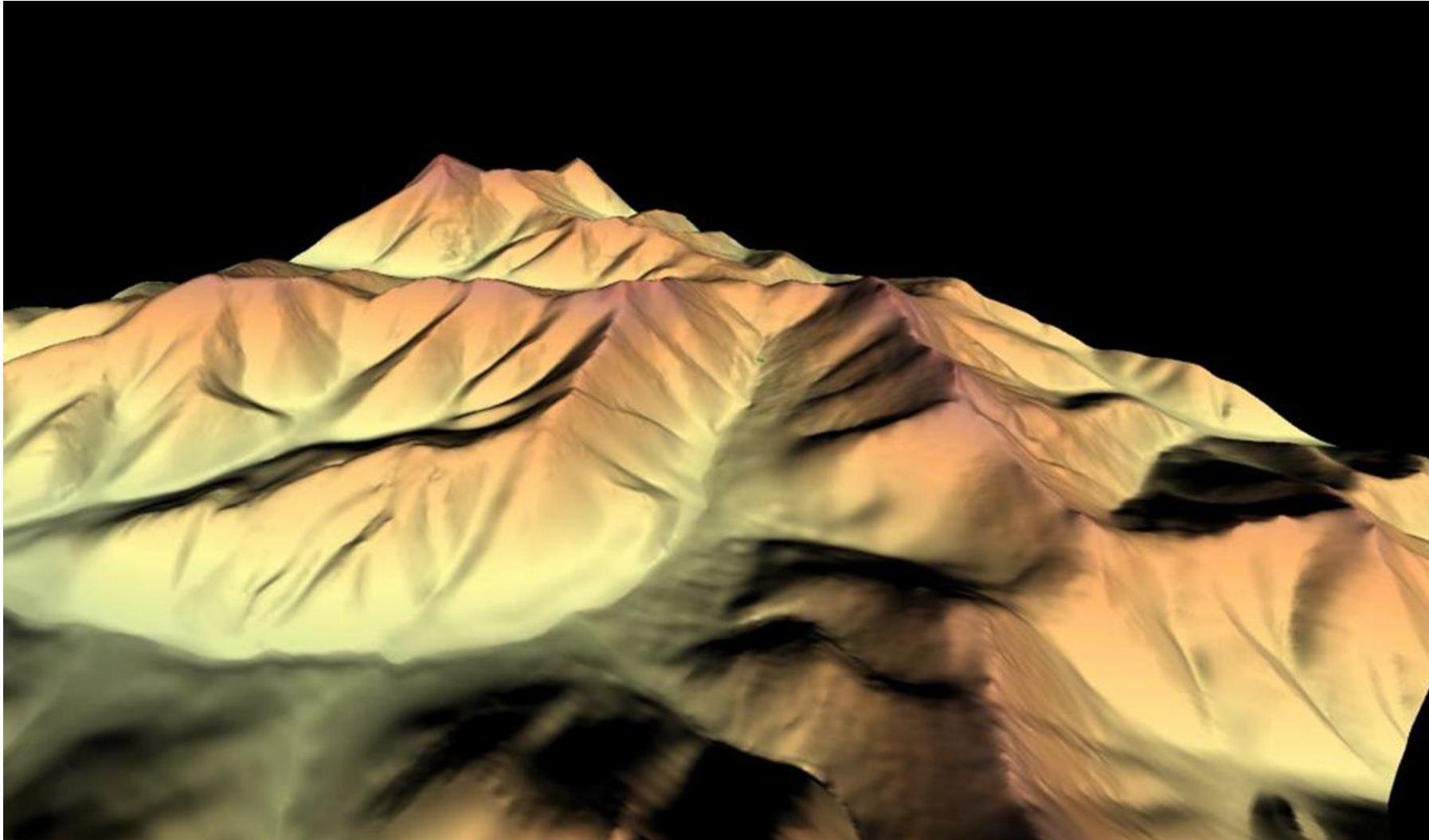


# Yukon Koyukuk – Legacy Data

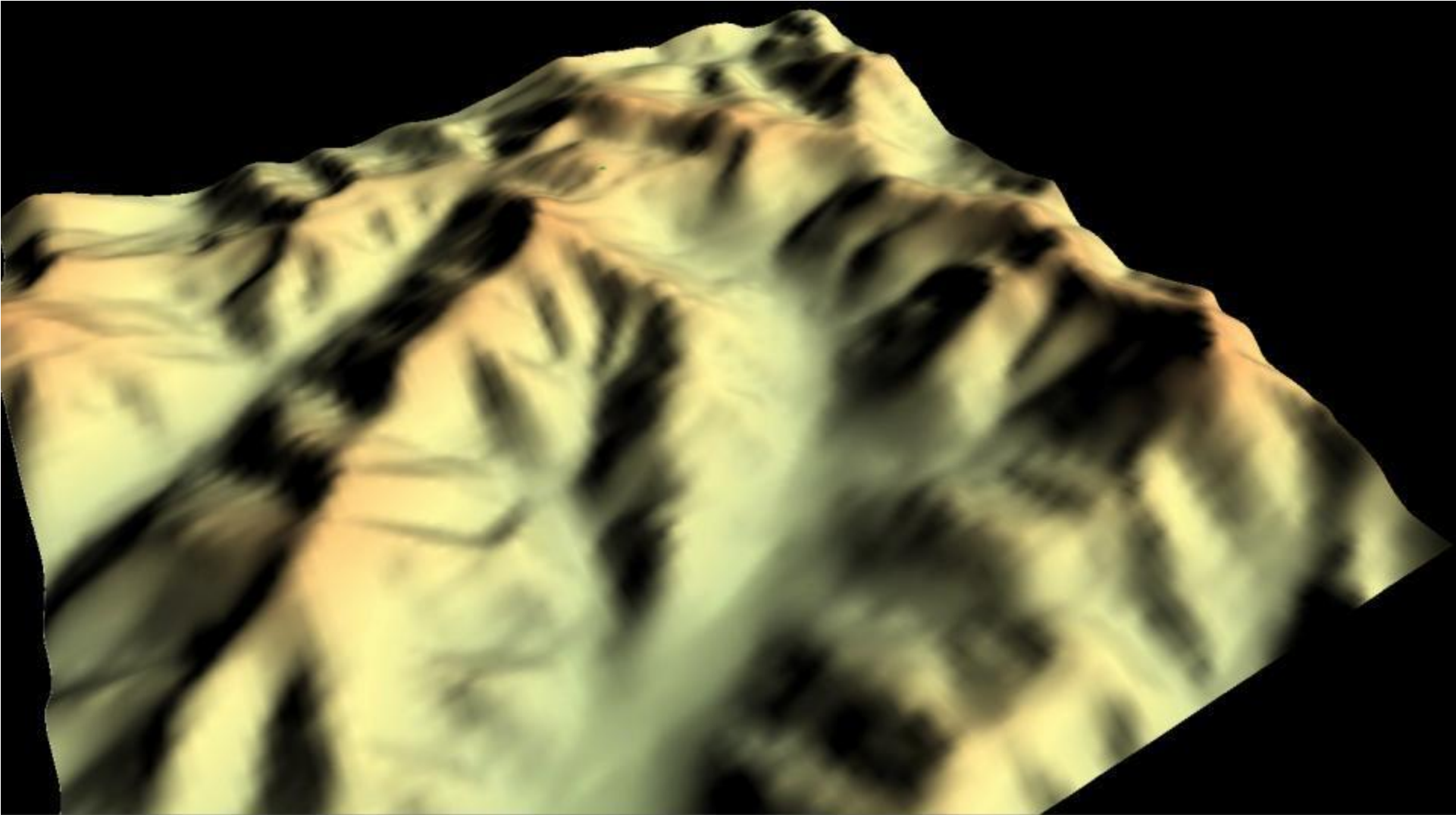




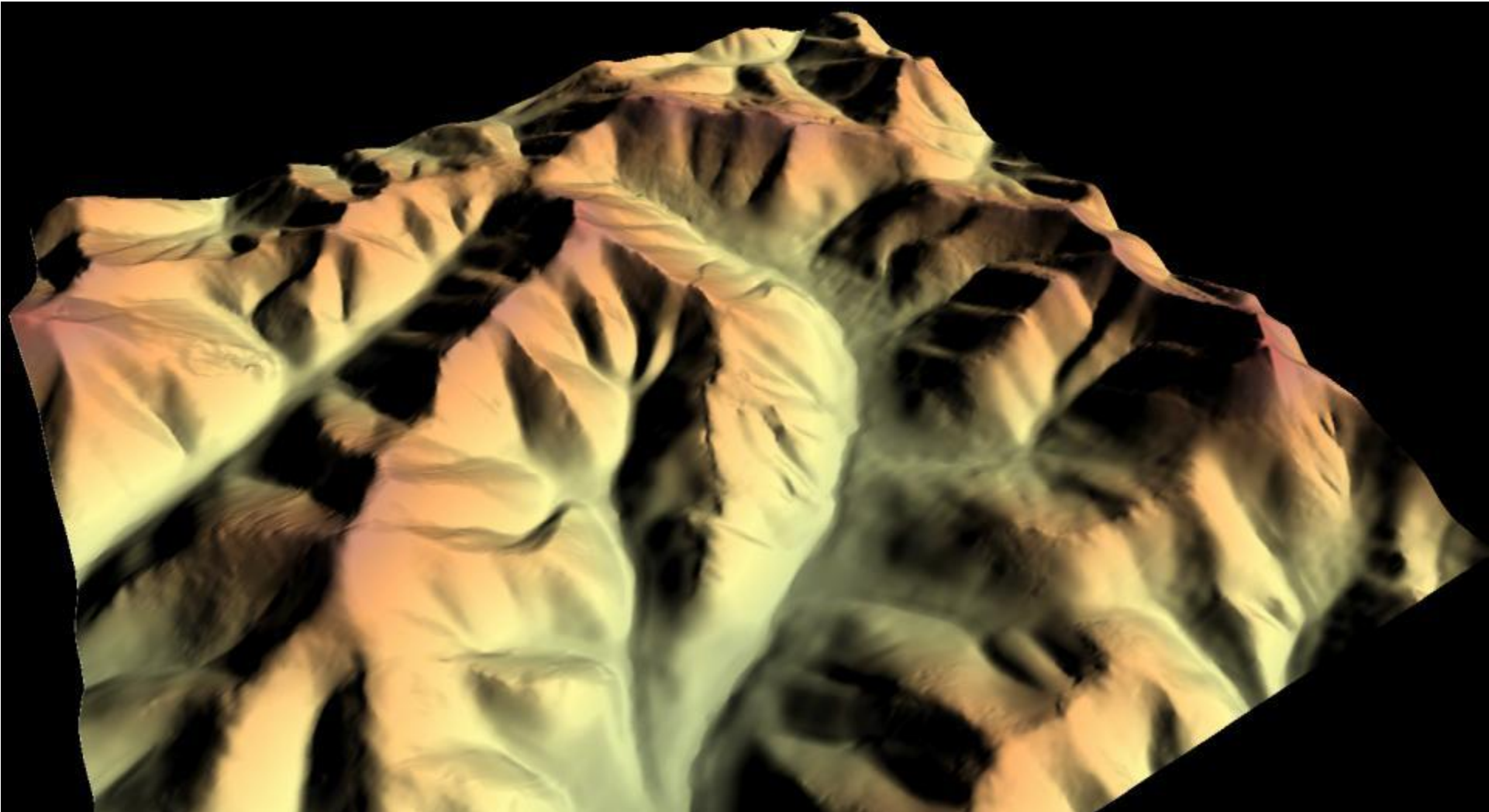
# Yukon Koyukuk – IFSAR Data



# Yukon-Koyukuk, Legacy Data

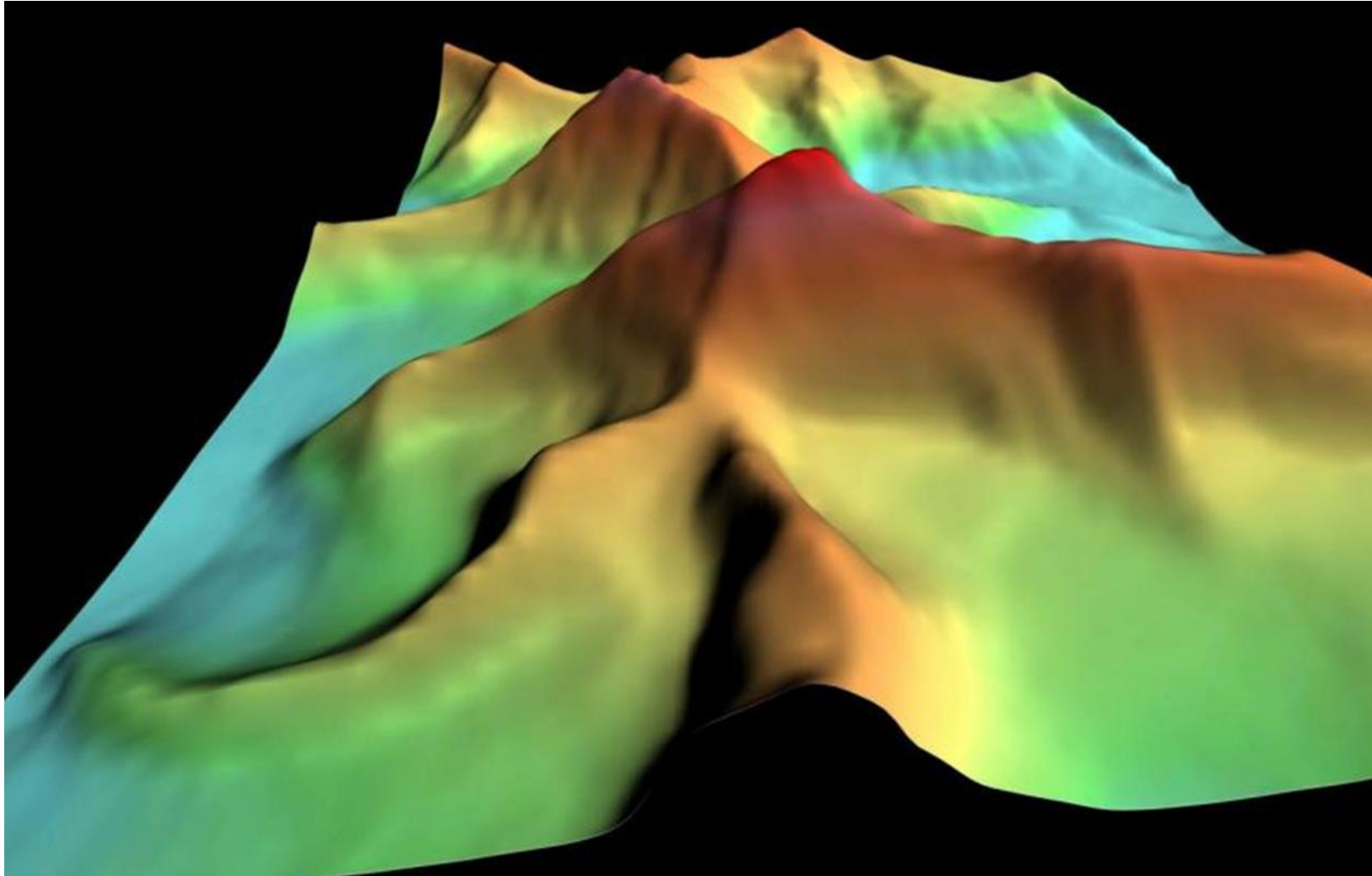


# Yukon-Koyukuk, IFSAR Data

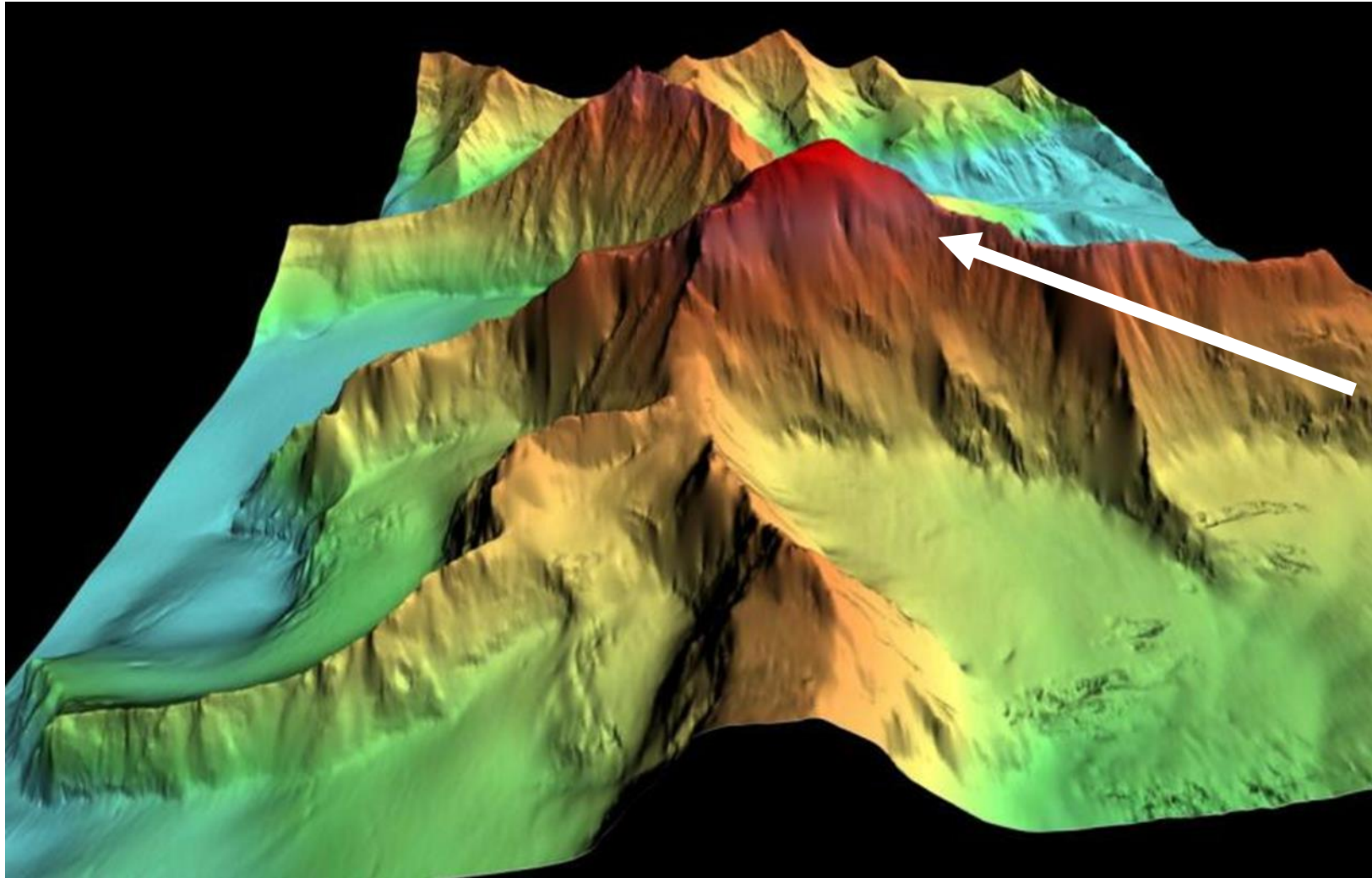




# Mount Balchen – Legacy Data

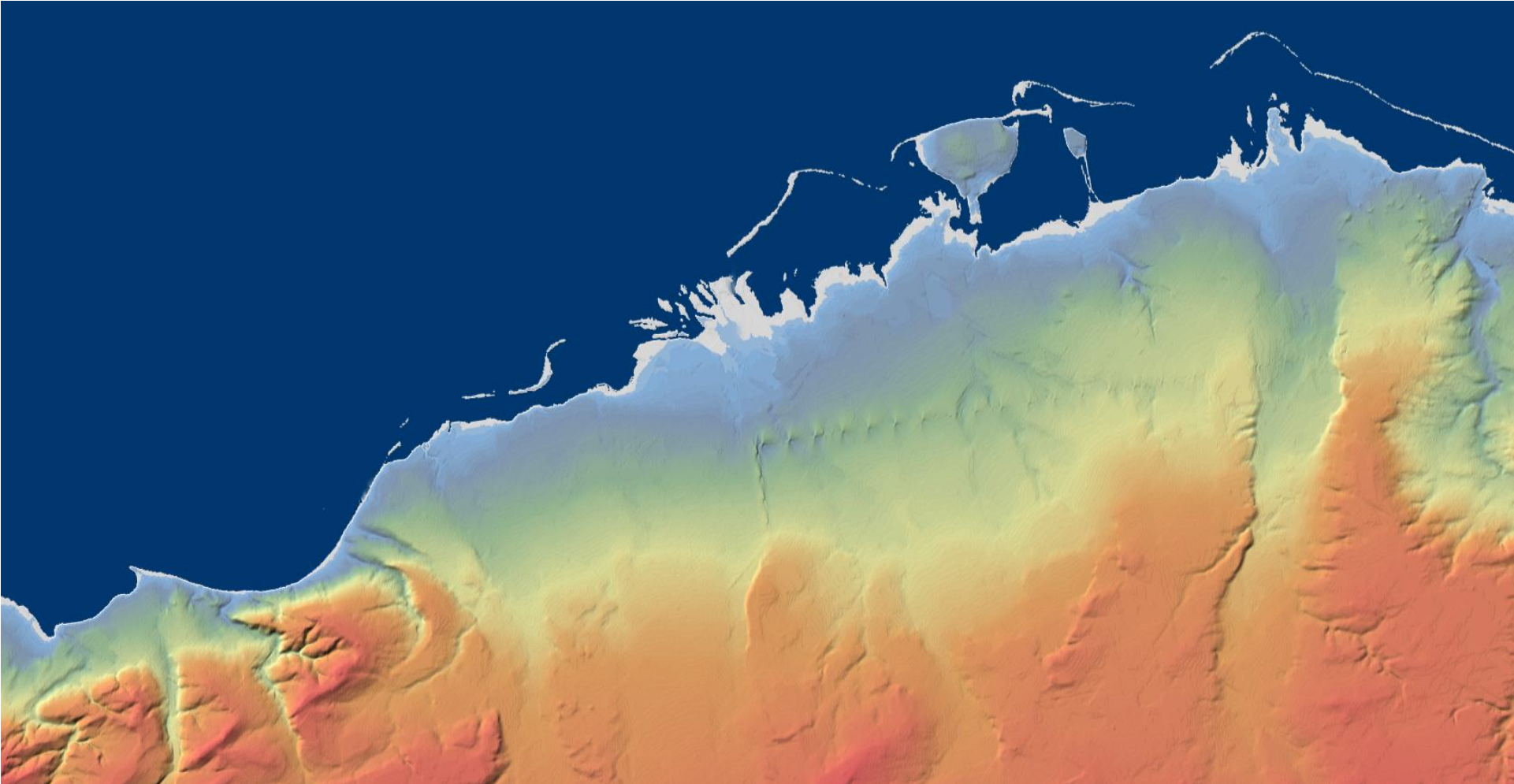


# Mount Balchen – IFSAR Data



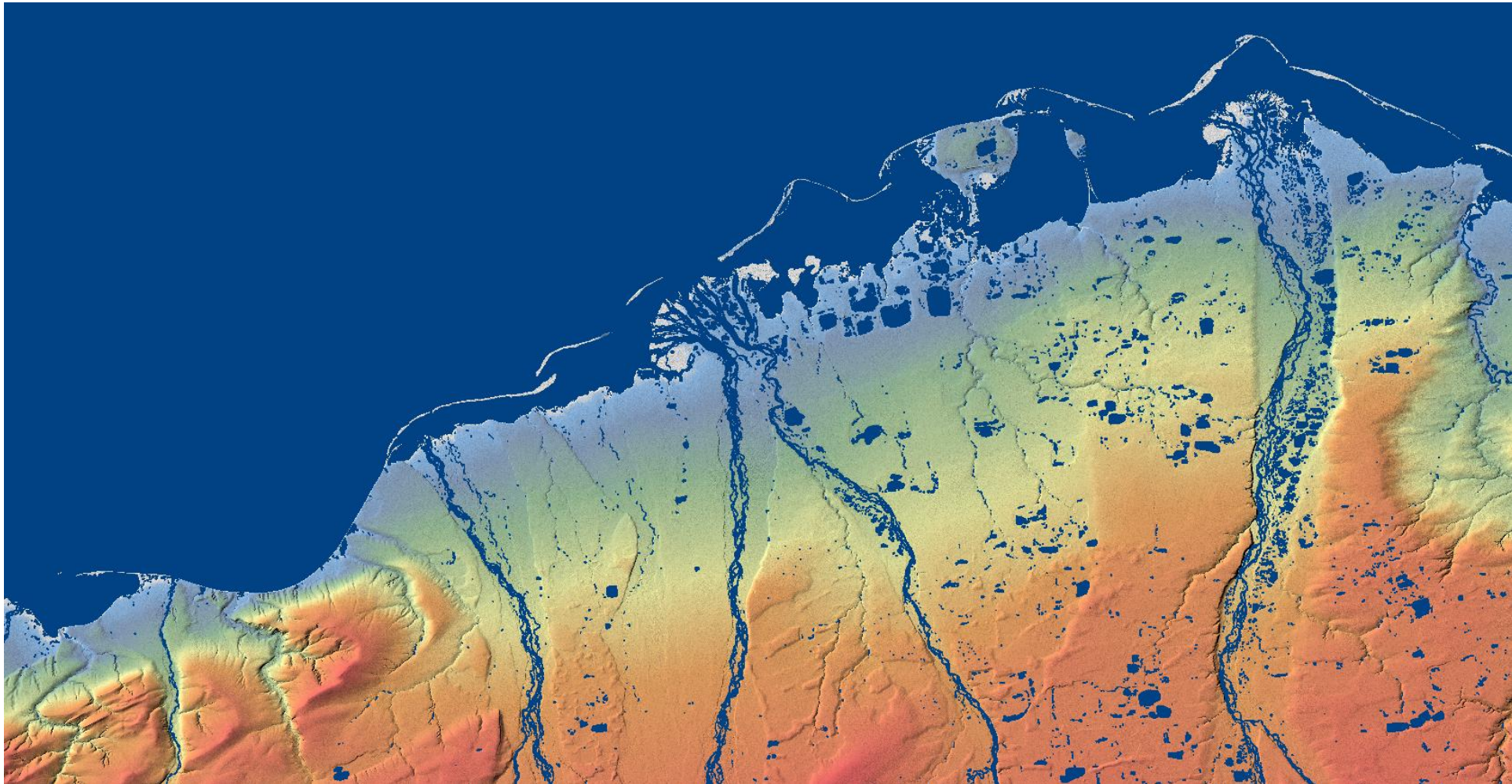
1,200 vertical  
feet difference

# North Slope Borough—Legacy

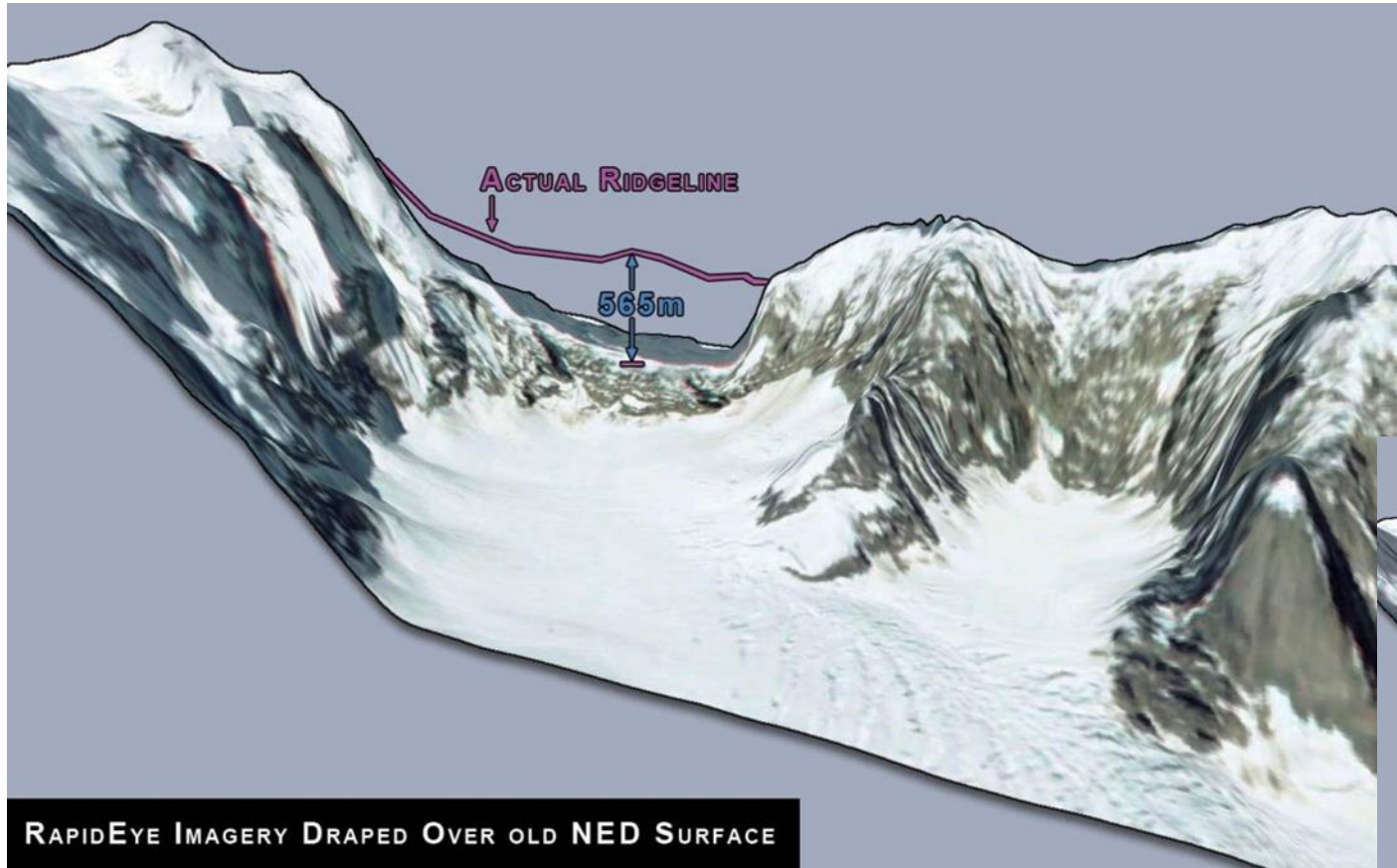




# North Slope Borough—IFSAR



# Tokasitna



MISSING  
RIDGELINE  
565m



AVIATION SAFETY



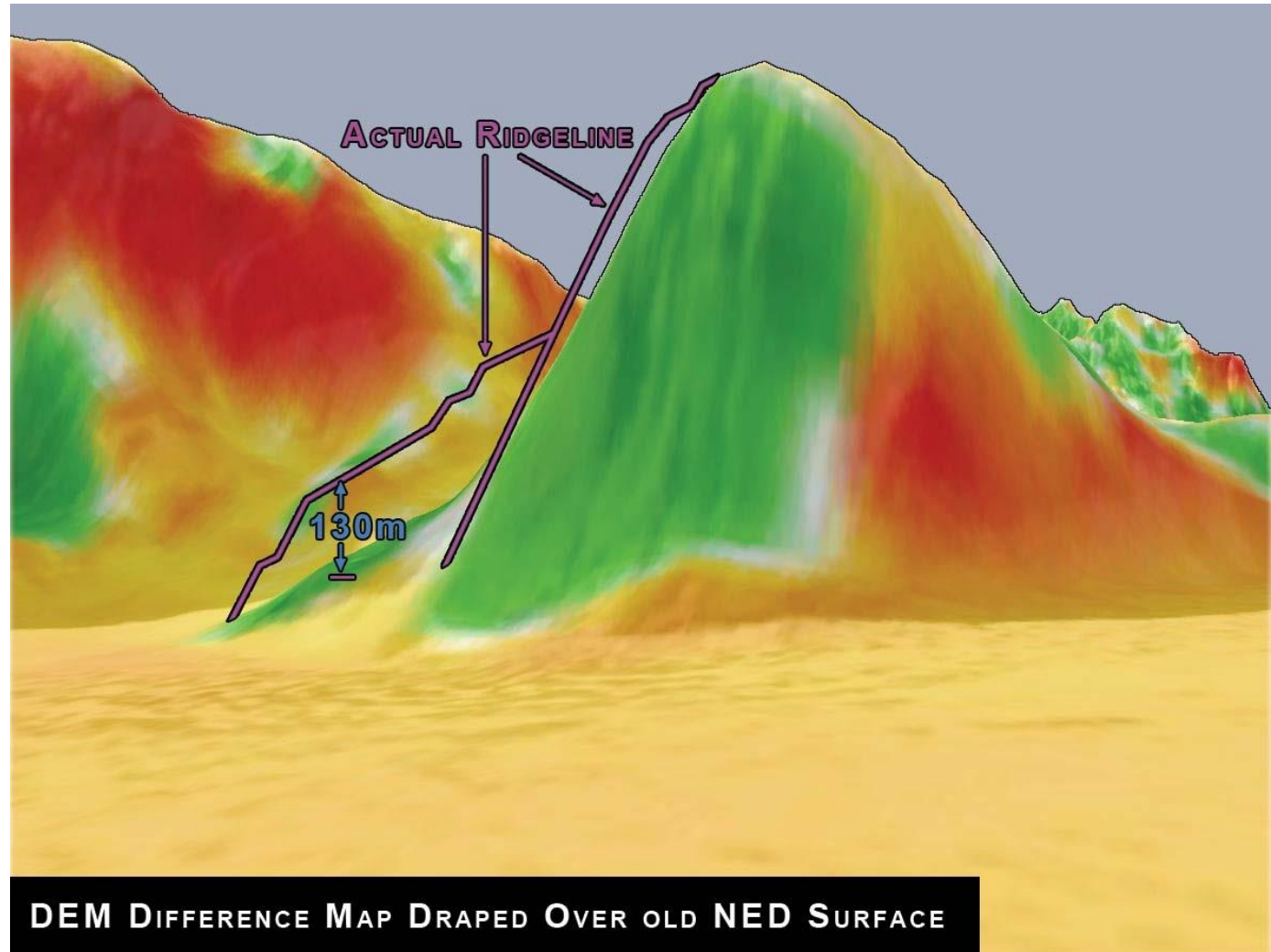
# Great Gorge – Denali, 750m





# MOUNT DICKEY - DENALI

DEM / IFSAR  
Difference  
Mount Dickey,  
Denali National  
Park



# MOUNT DICKEY

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

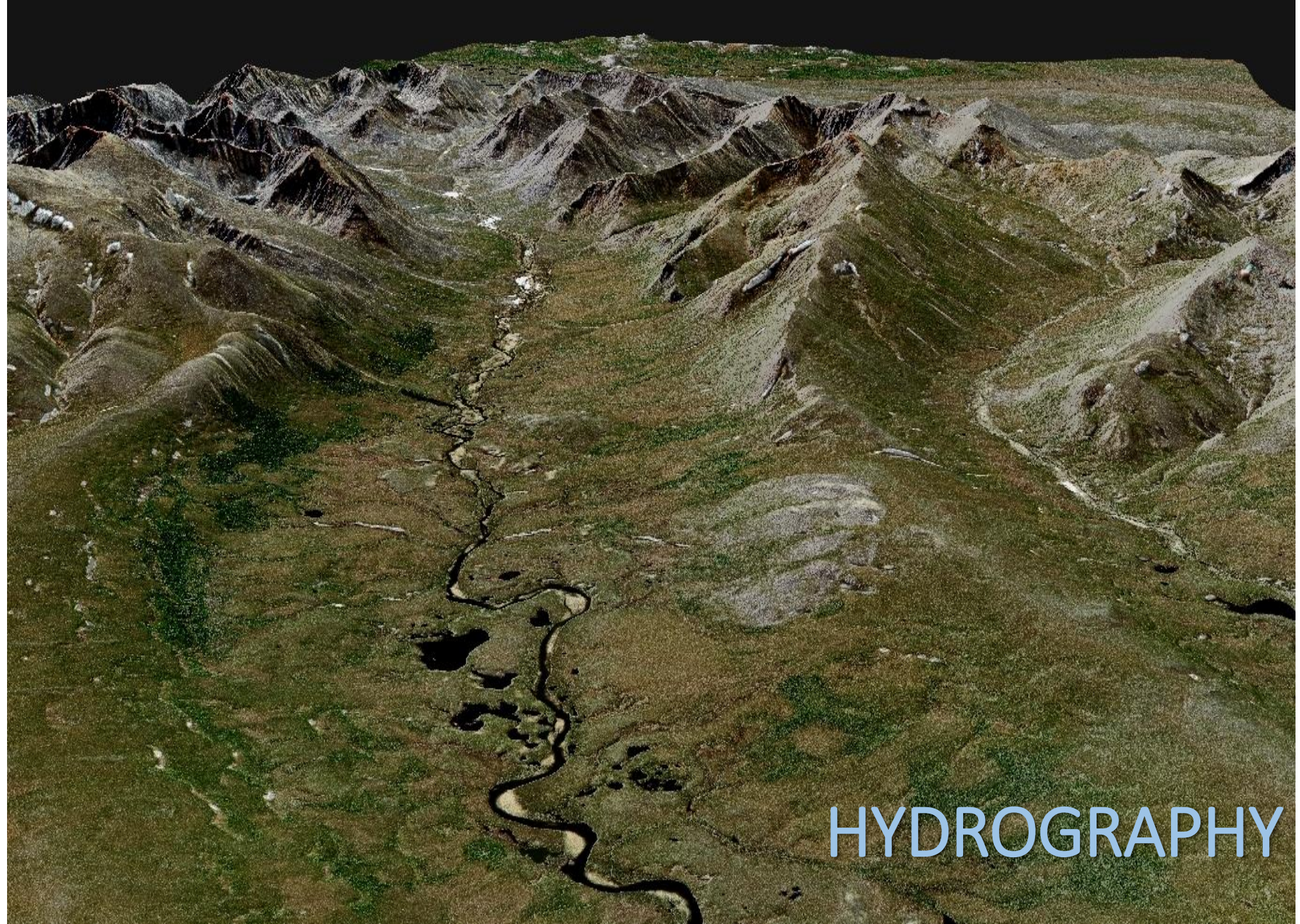


# WHAT CAN WE DO WITH IT?

HOW WILL WE USE IT?

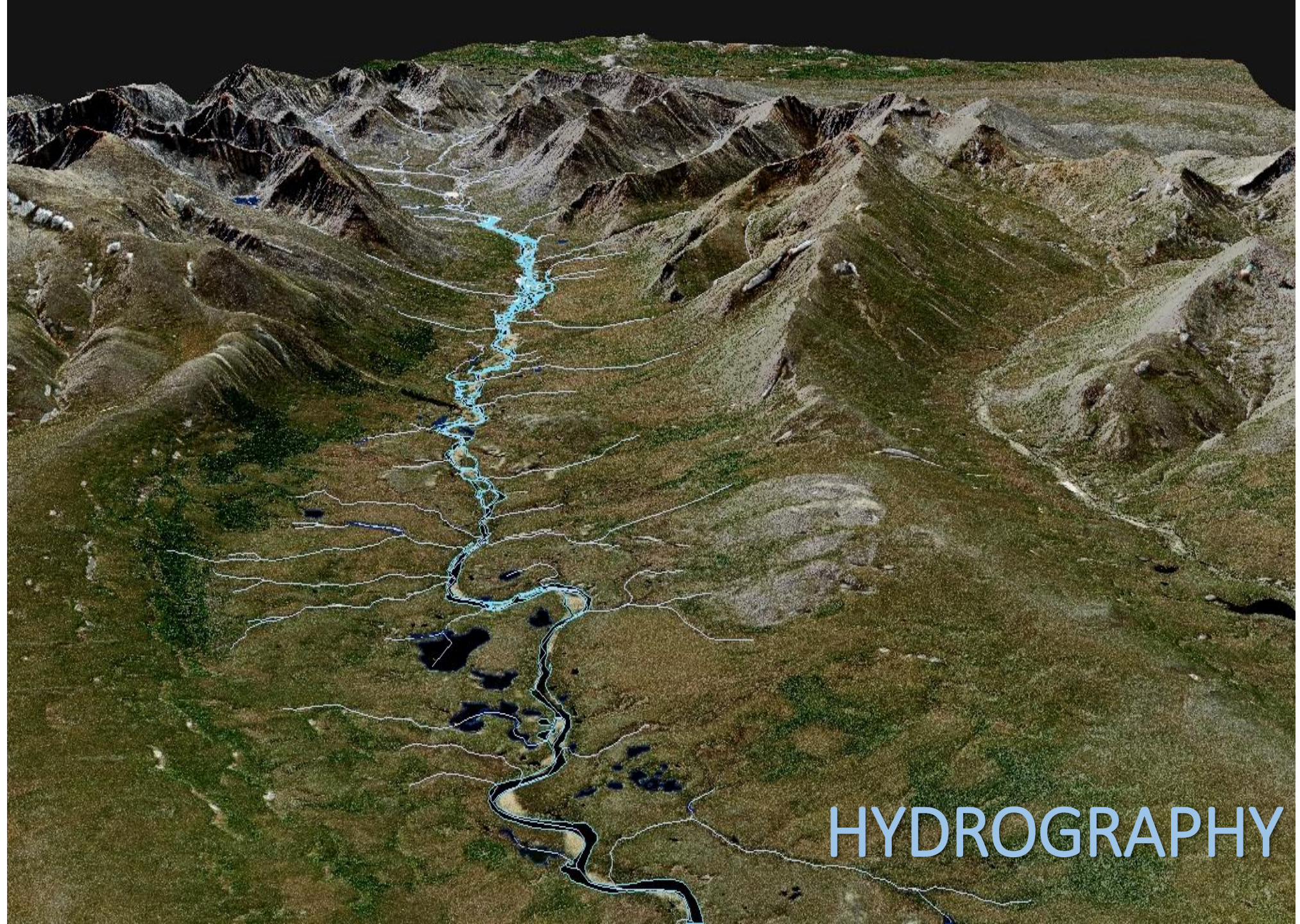






# HYDROGRAPHY

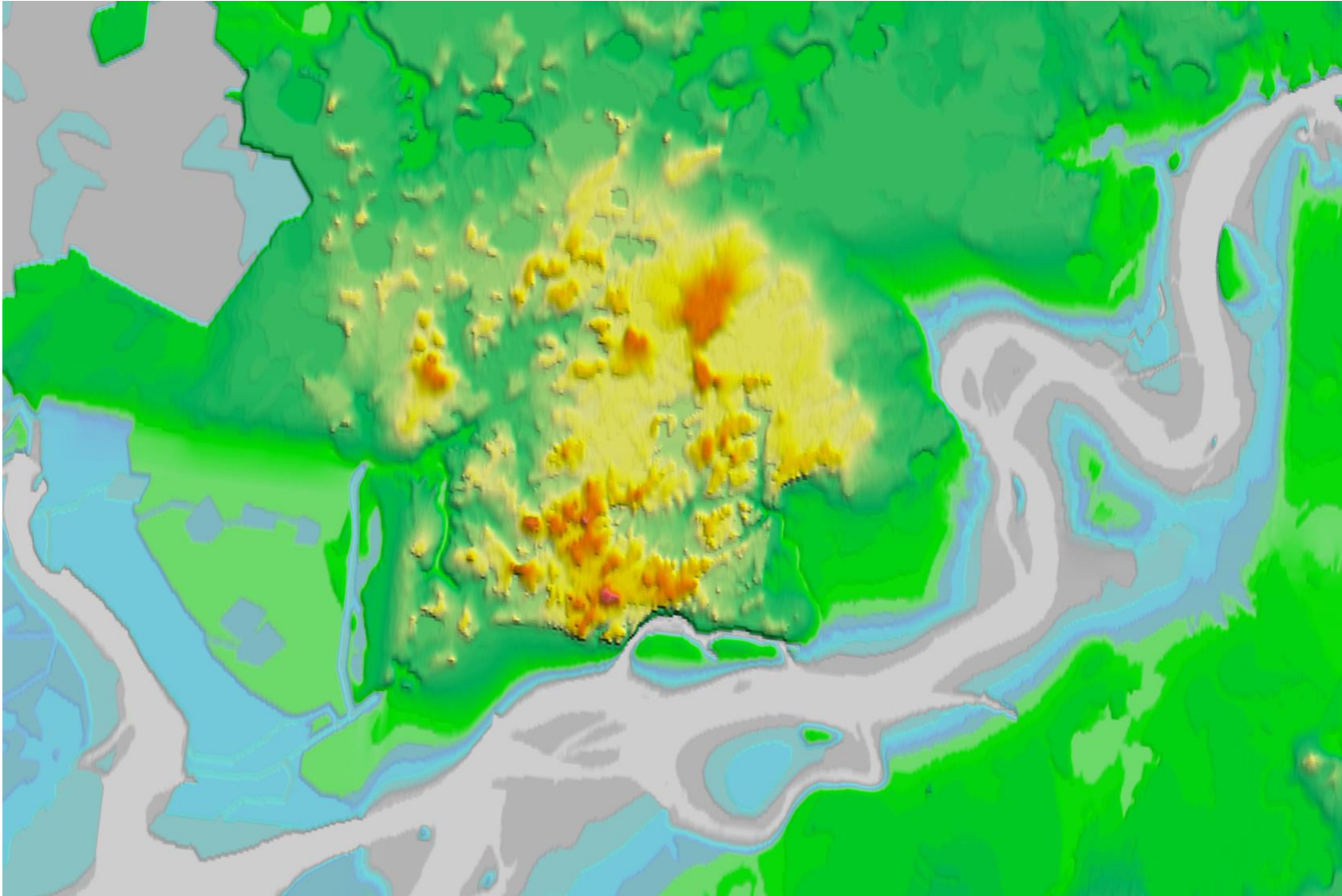




# HYDROGRAPHY

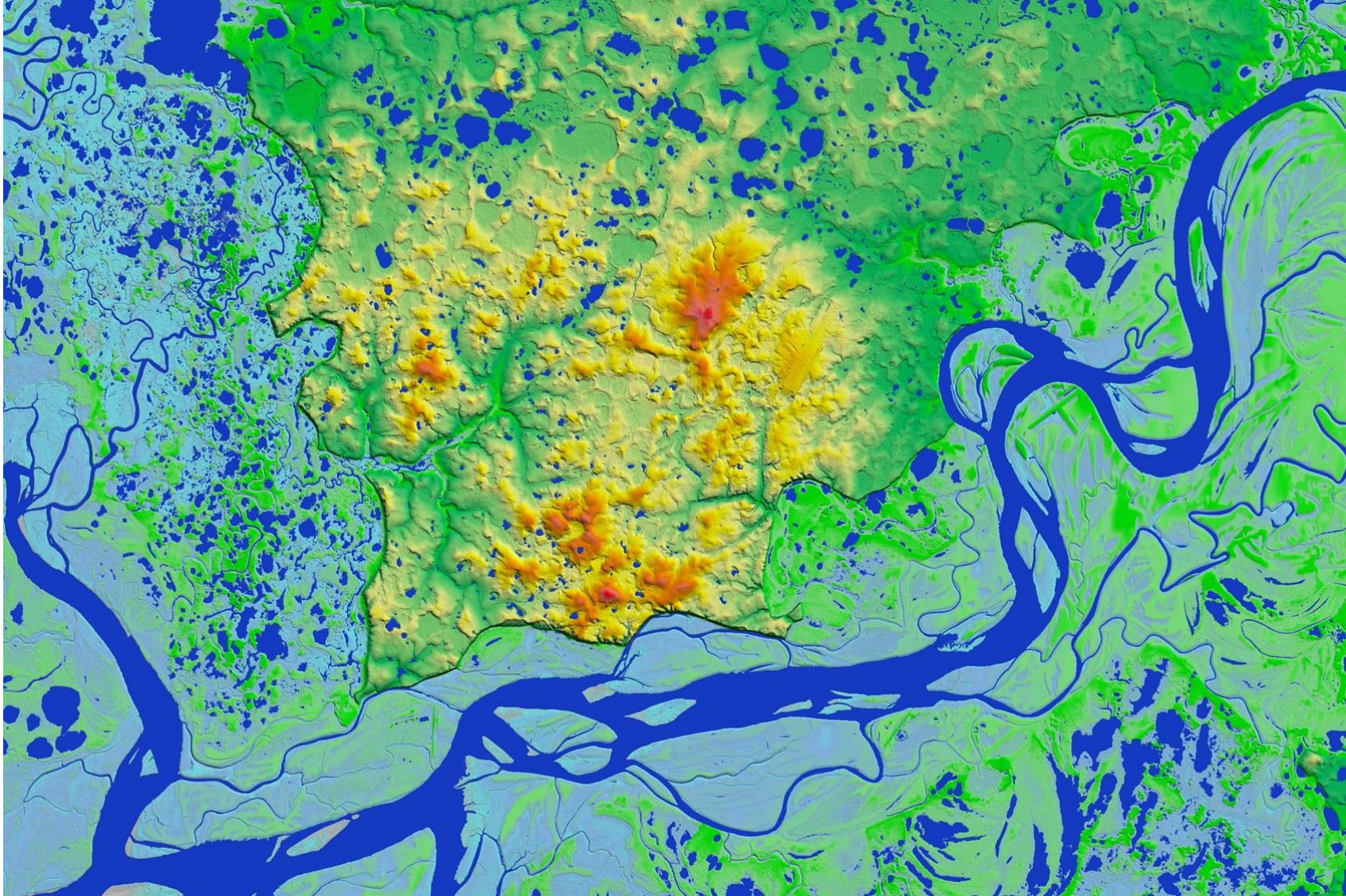


# Hydro – Old Legacy NED Data





# Hydro – New IFSAR Data

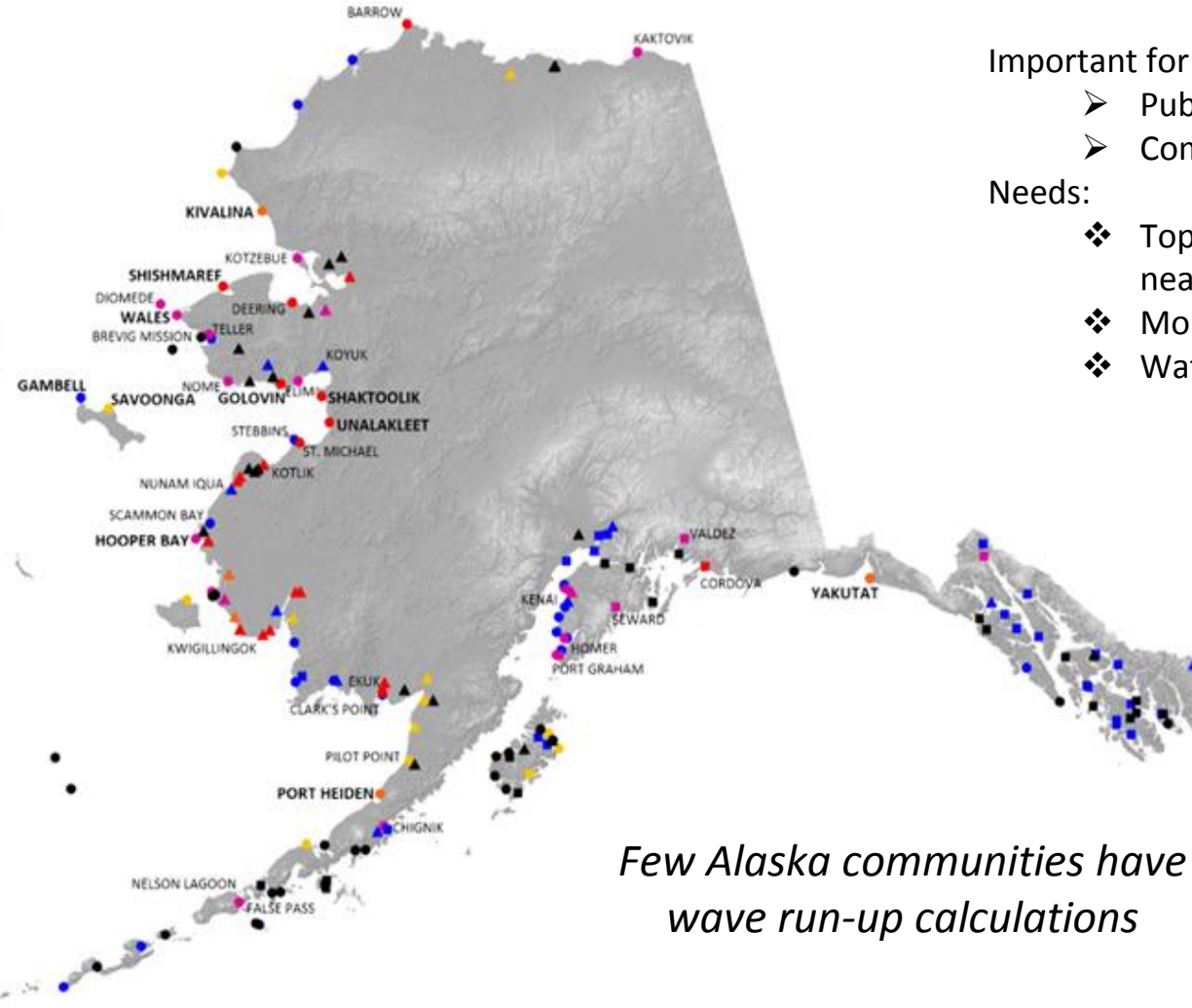
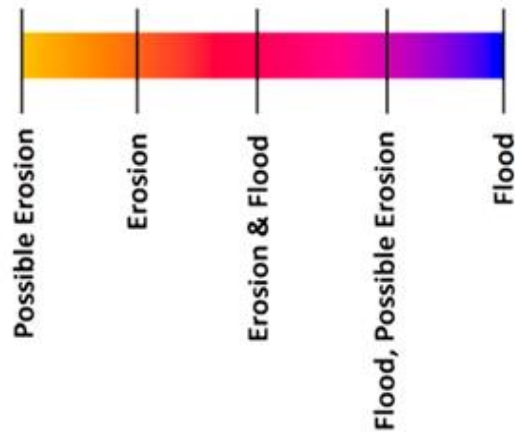




# Storm Surge Analysis

## Key

- Exposed Coast
- Sheltered Coast
- ▲ Riverine Coast



Important for:

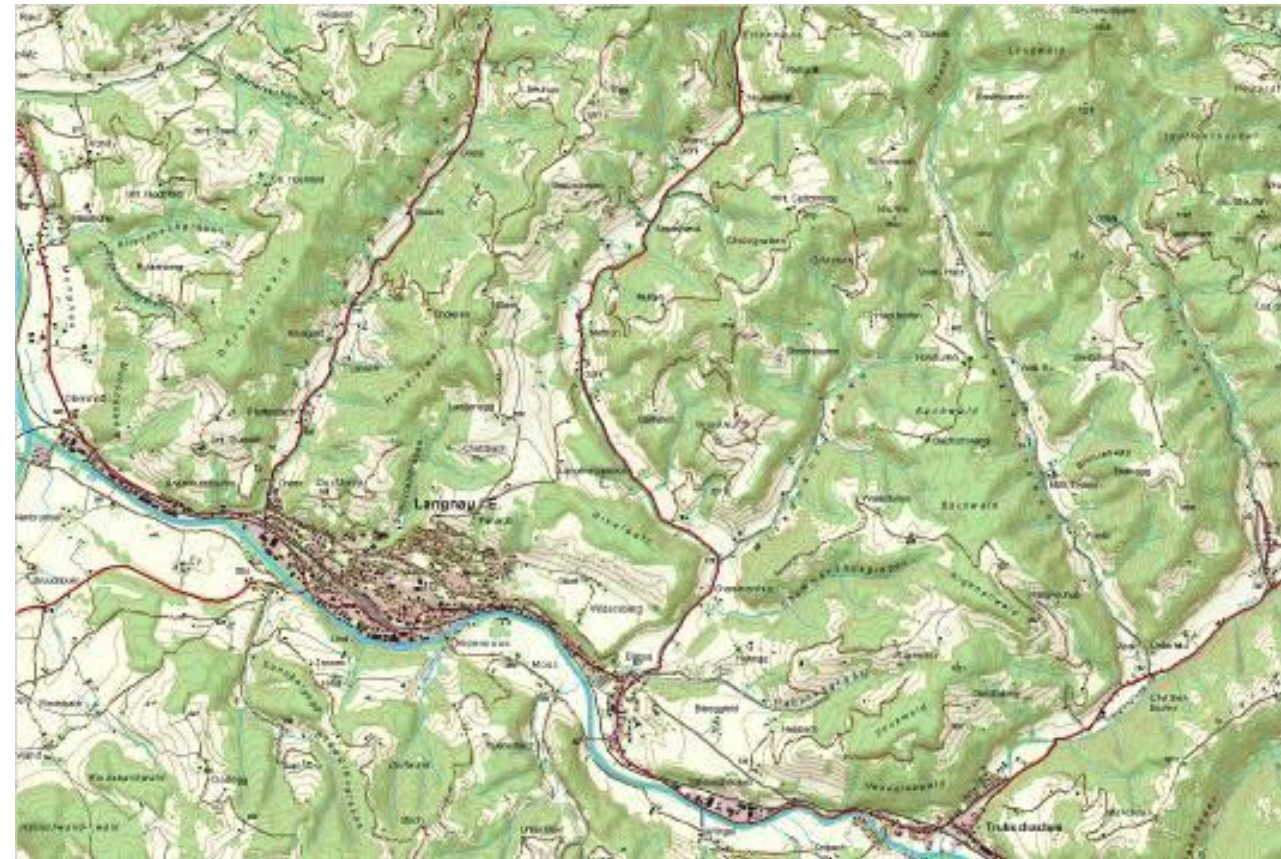
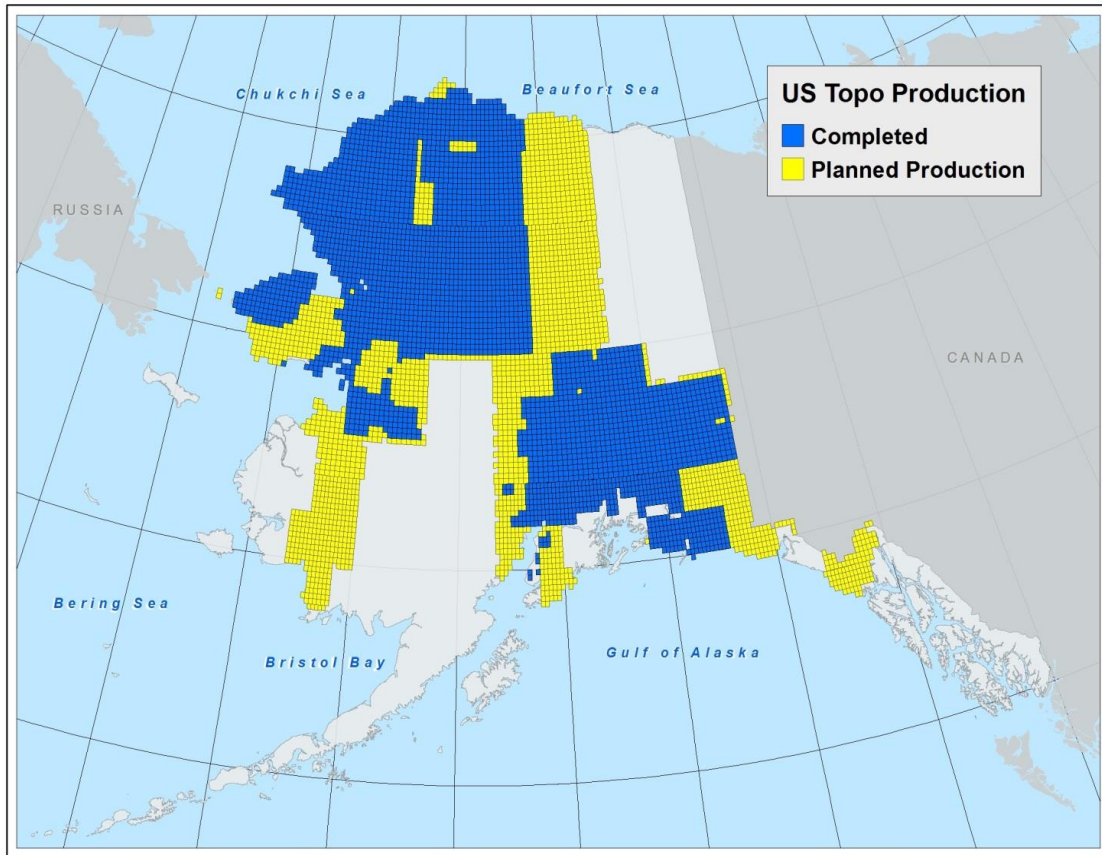
- Public safety
- Community resilience

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

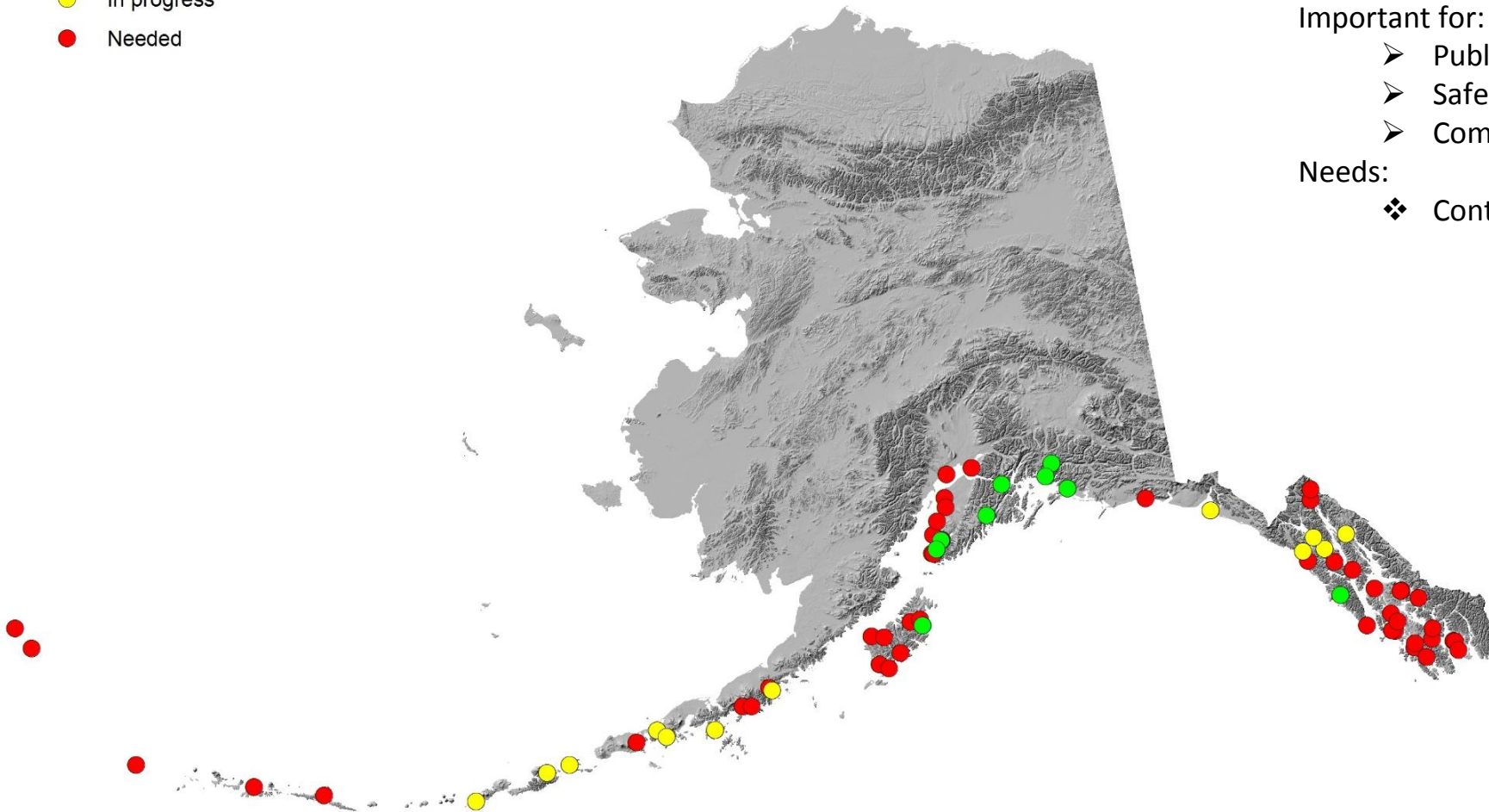
- Completed
- In progress
- Needed

Important for:

- Public safety
- Safe evacuation routes
- Community resilience

Needs:

- ❖ Continued funding



# Avalanches / Slope Analysis

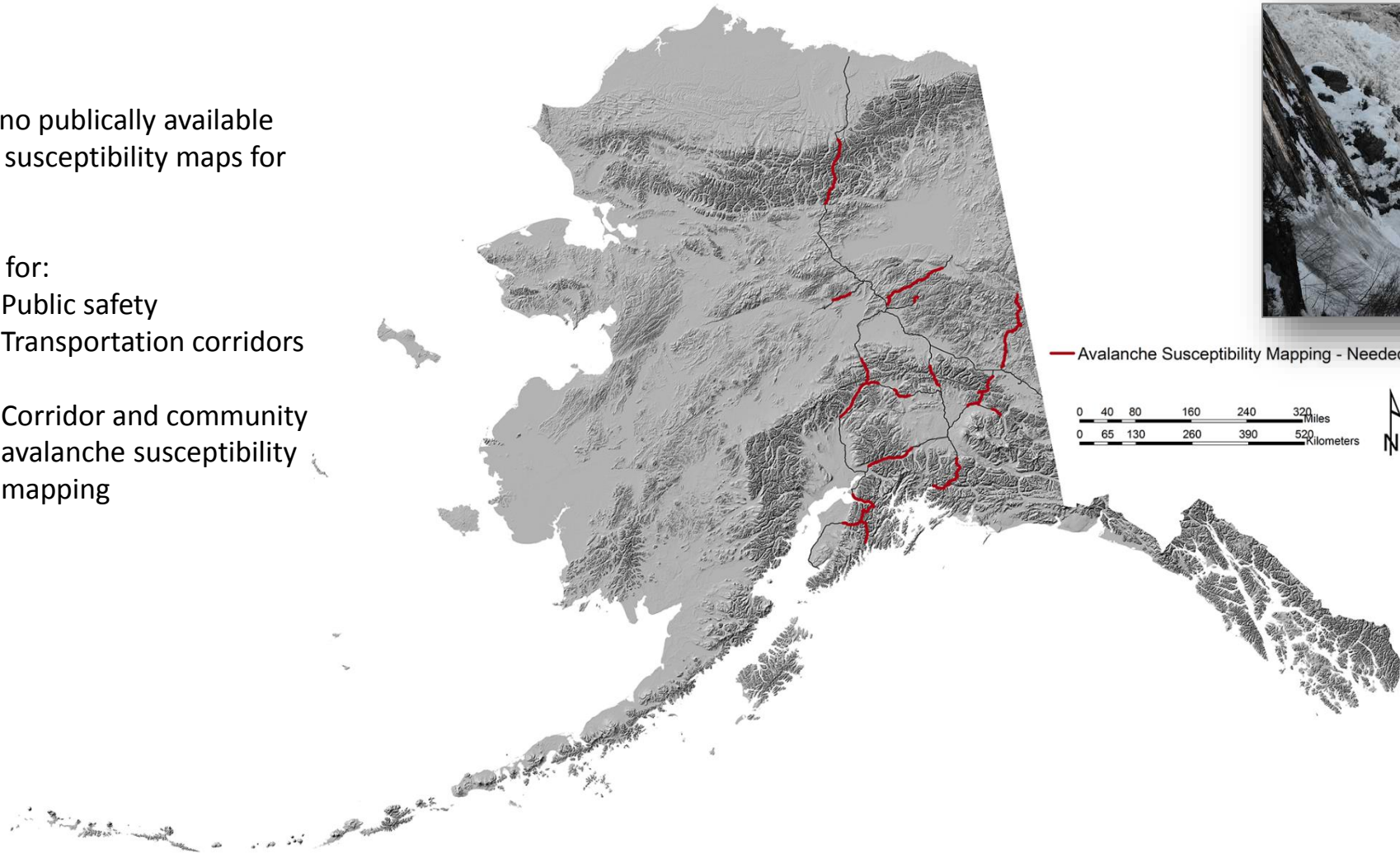
There are no publically available avalanche susceptibility maps for Alaska

Important for:

- Public safety
- Transportation corridors

Needs:

- ❖ Corridor and community avalanche susceptibility mapping





# WHERE WE NEED TO GO

GEOSPATIAL SUPPORTS INFORMED PUBLIC POLICY



# Statewide mapping

Framework data

Framework Themes



Hydrography

Elevation

Cadastral

Digital Orthoimagery

Governmental Units

Transportation

Geodetic Control

# Data Acquisition Accomplishments

Winter 2016

Theme	Metric	Status
Elevation	% IfSAR acquired	77% complete
Imagery	% coverage within 5 yrs	72% current
Hydrography	% updated to 1:24k National Hydrography Dataset standards	15% updates complete
Wetlands	% updated to 1:24k National Wetlands Inventory standards	Unknown
Transportation	% road network complete	100% complete
Administrative Boundaries	% boundaries updated to 1:24k map accuracy	Unknown
Cadastral	% cadastral complete	Unknown
Geodetic Control	% area within 250km of 3 CORS	74% coverage; 47% at risk
GRAV-D	% GRAV-D acquired	50% complete
Coastal Mapping	% AK shoreline updated	43% complete
Bathymetric Mapping	% submerged lands mapped	Unknown



# Thank You To All Of Our Partners

Collaboration = Doing together what no one can do alone.

A rising tide lifts all boats





# John Wesley Powell

## 2<sup>nd</sup> Director, US Geological Survey

1881 – 1894 13 years



*“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.”*