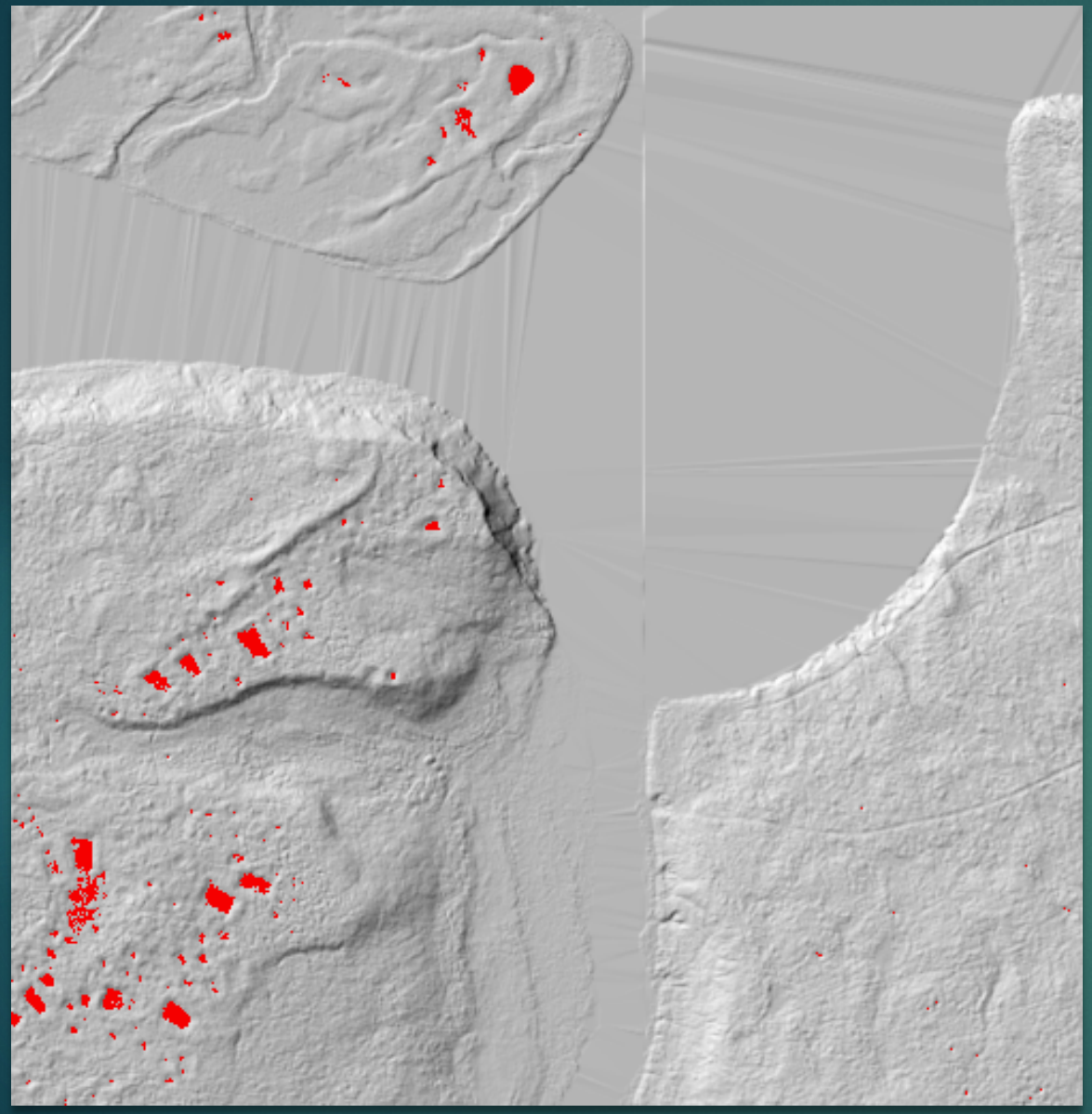
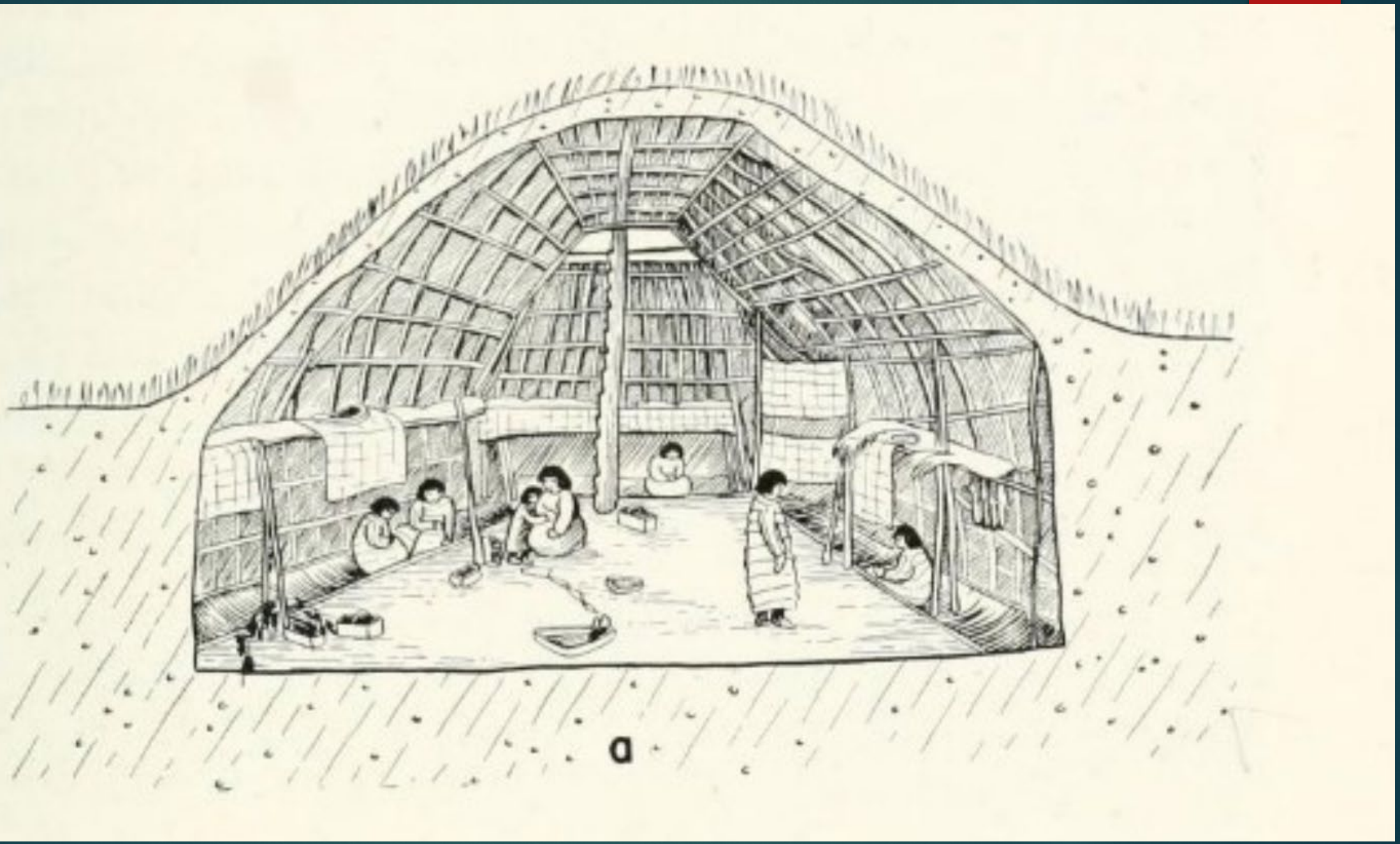
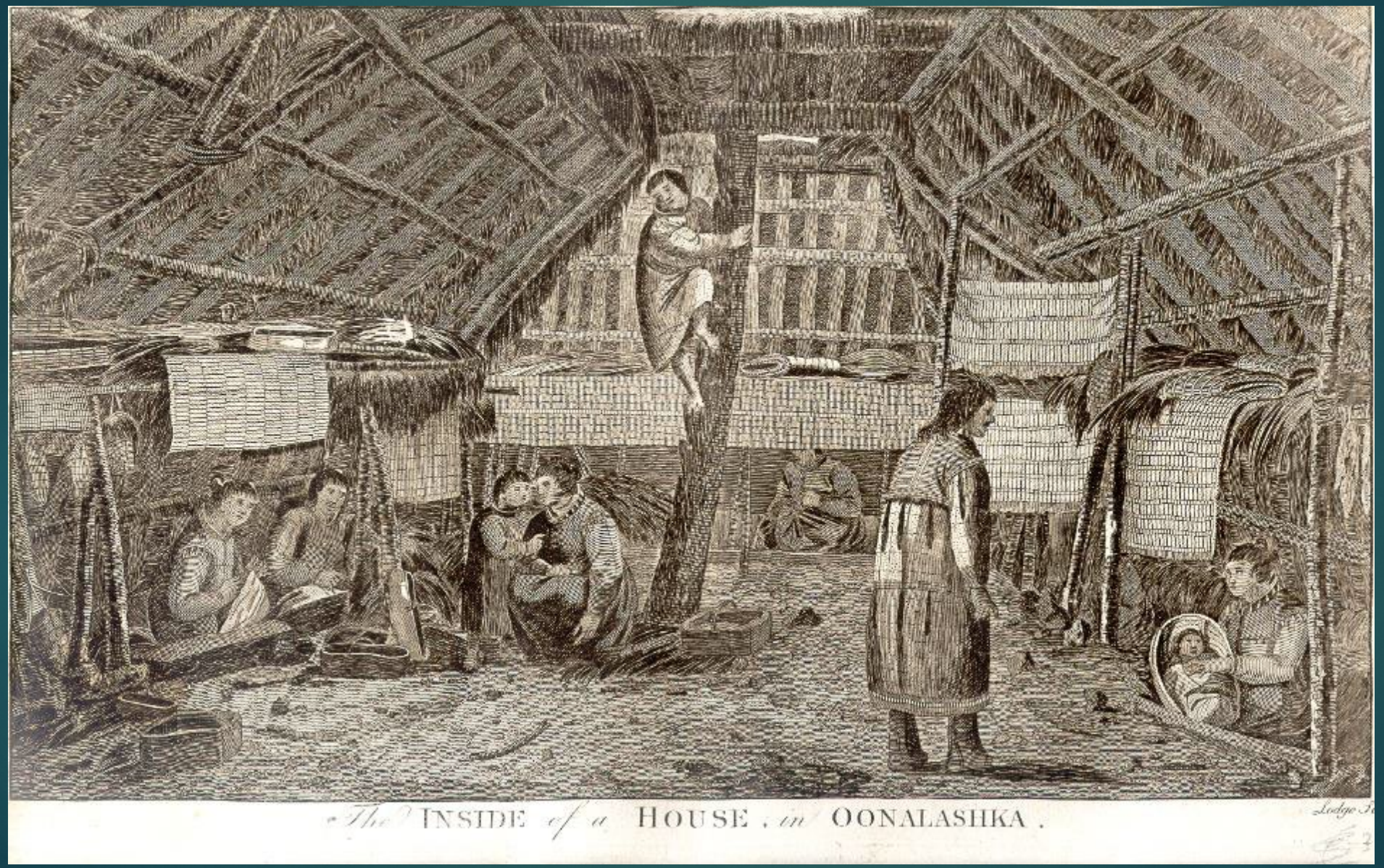


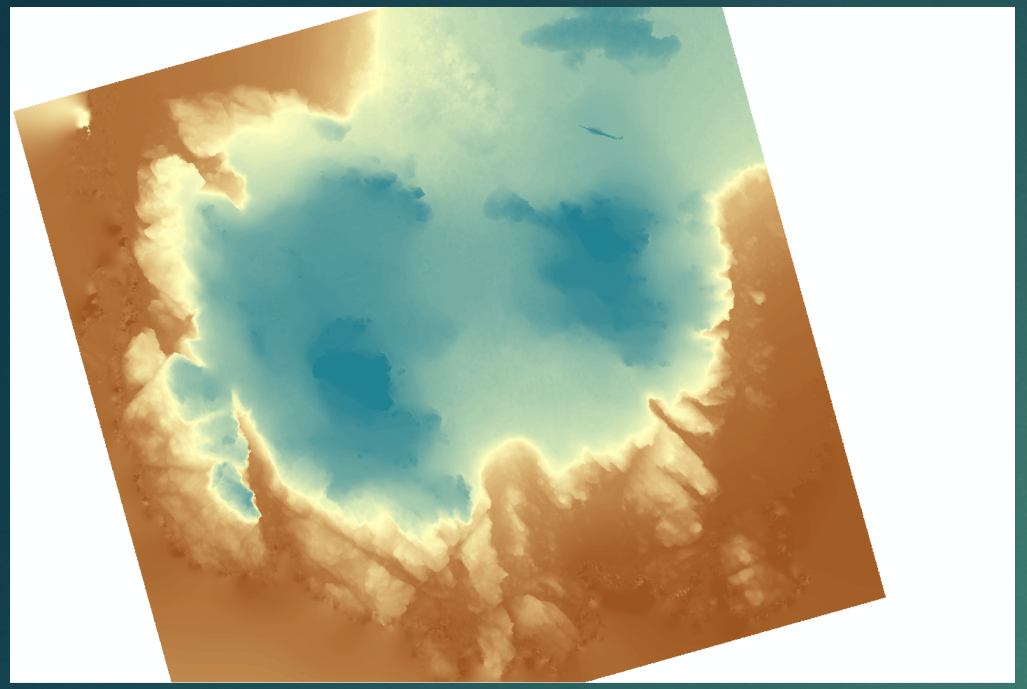
Using LiDAR Data for Automated Archaeological Site Detection Near Igiugig, Alaska

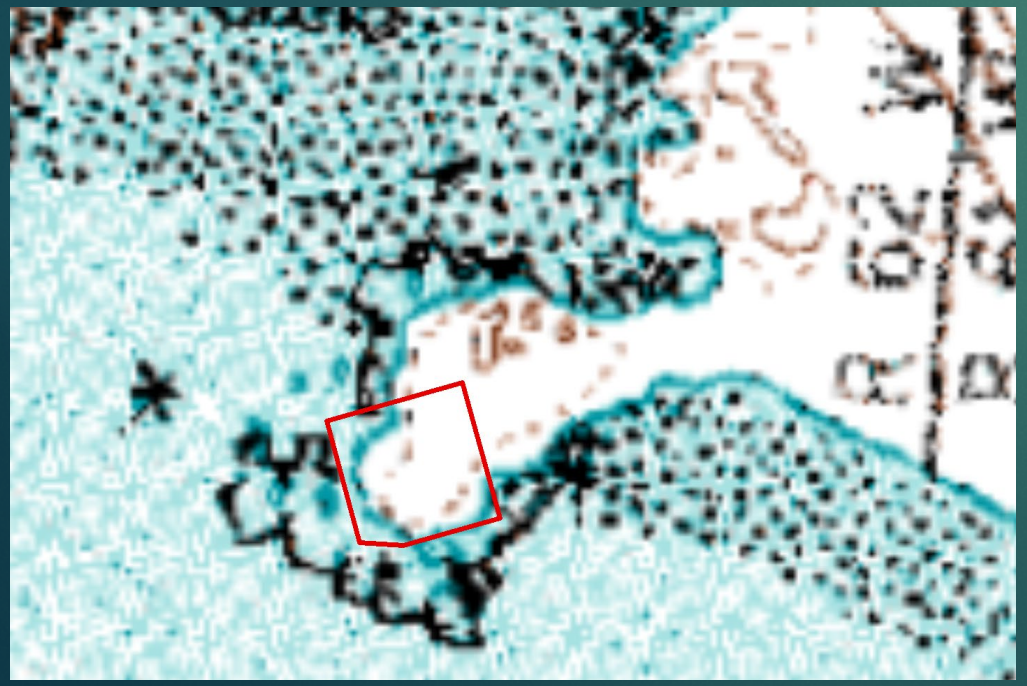
What do archaeological sites in Alaska look like?

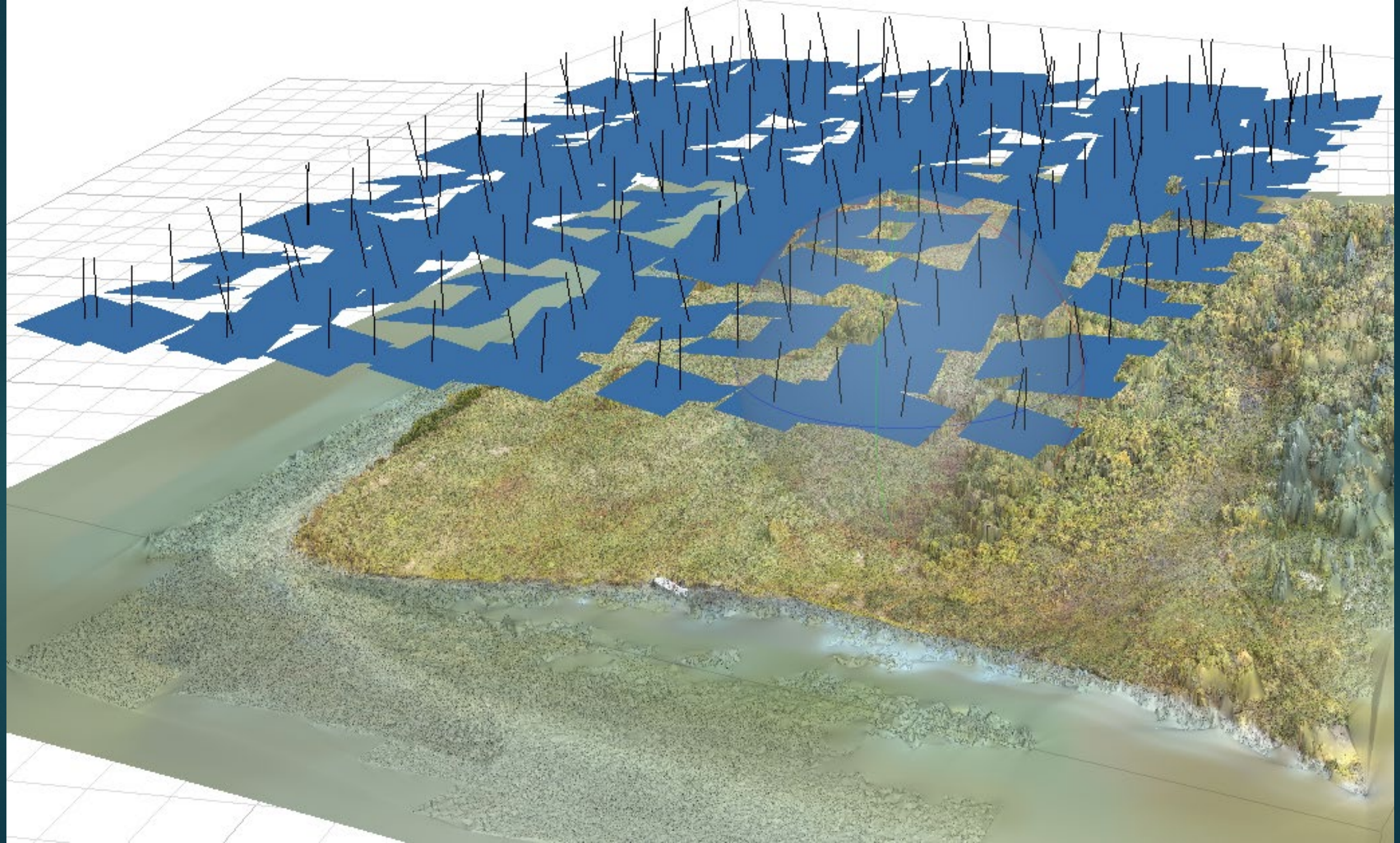

a

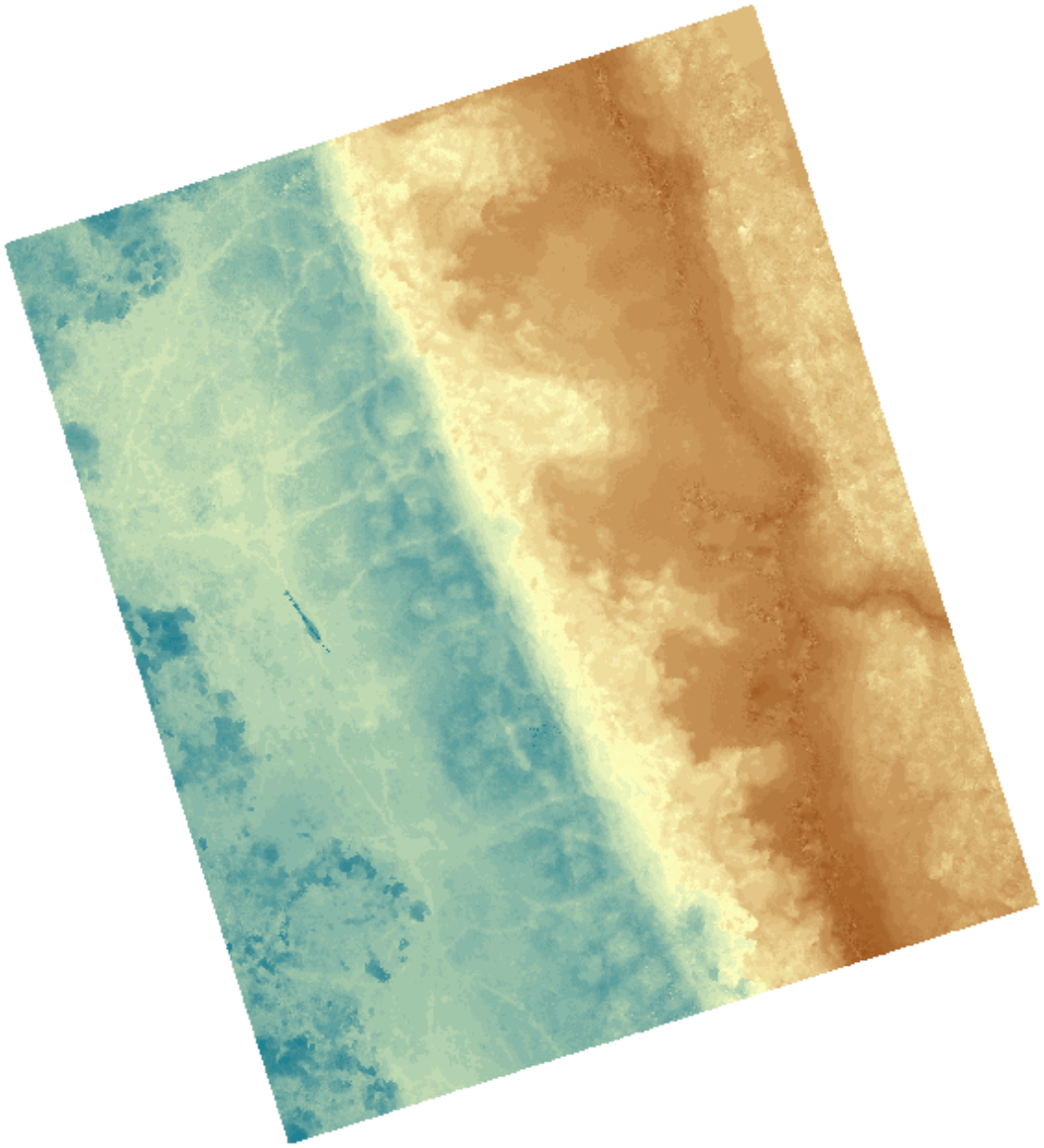


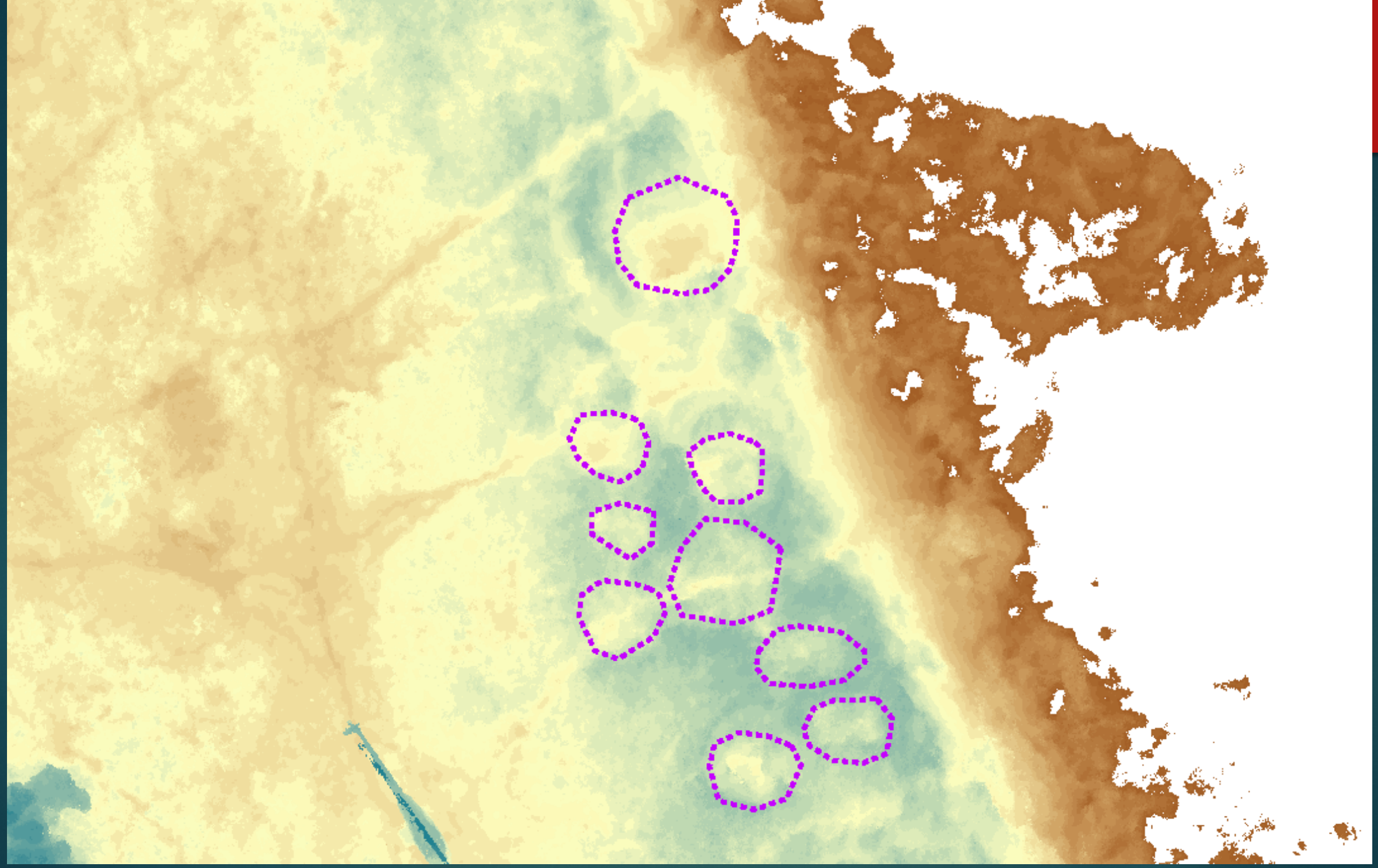
The INSIDE of a HOUSE, in OONALASHKA.

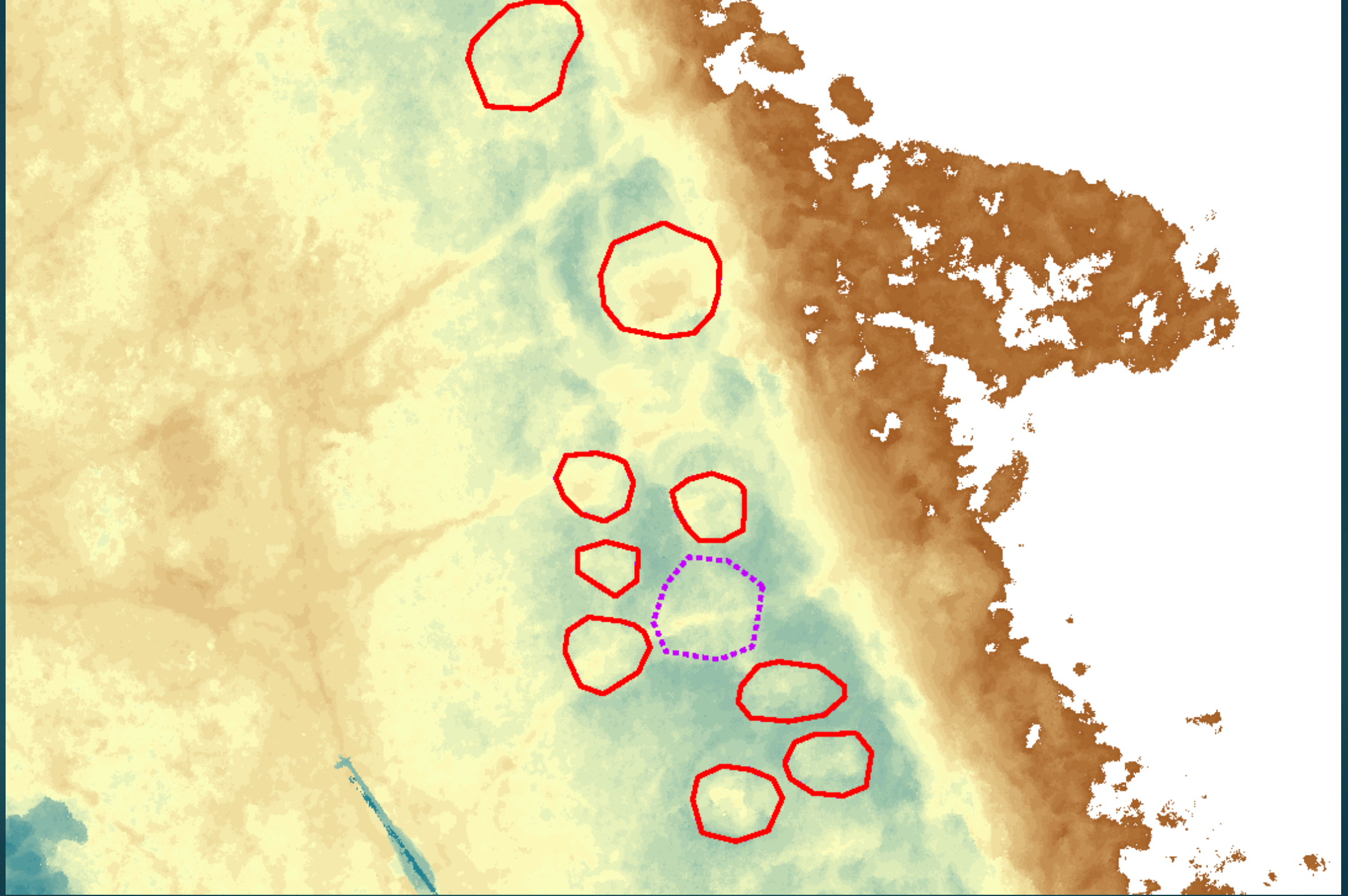




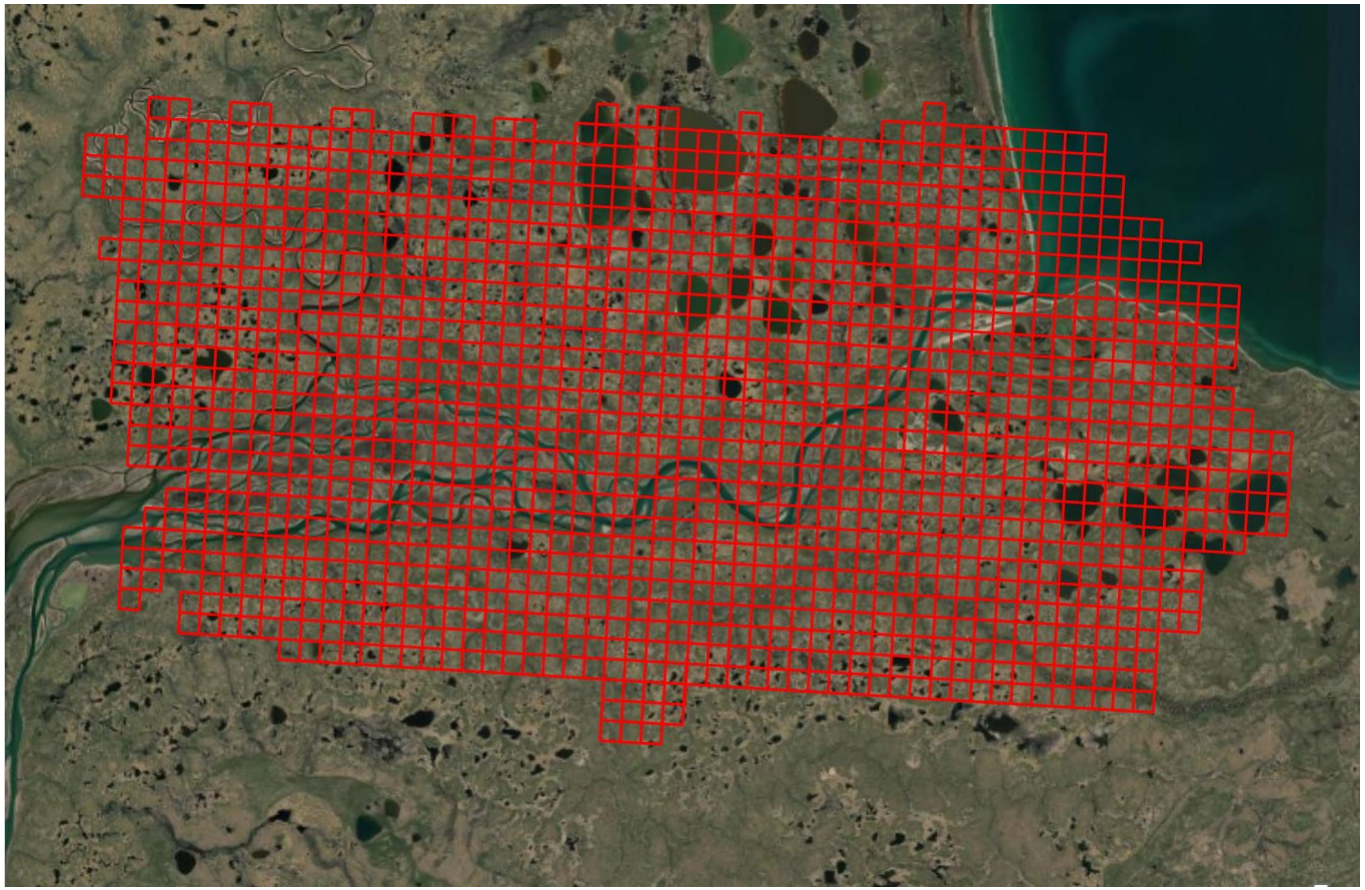




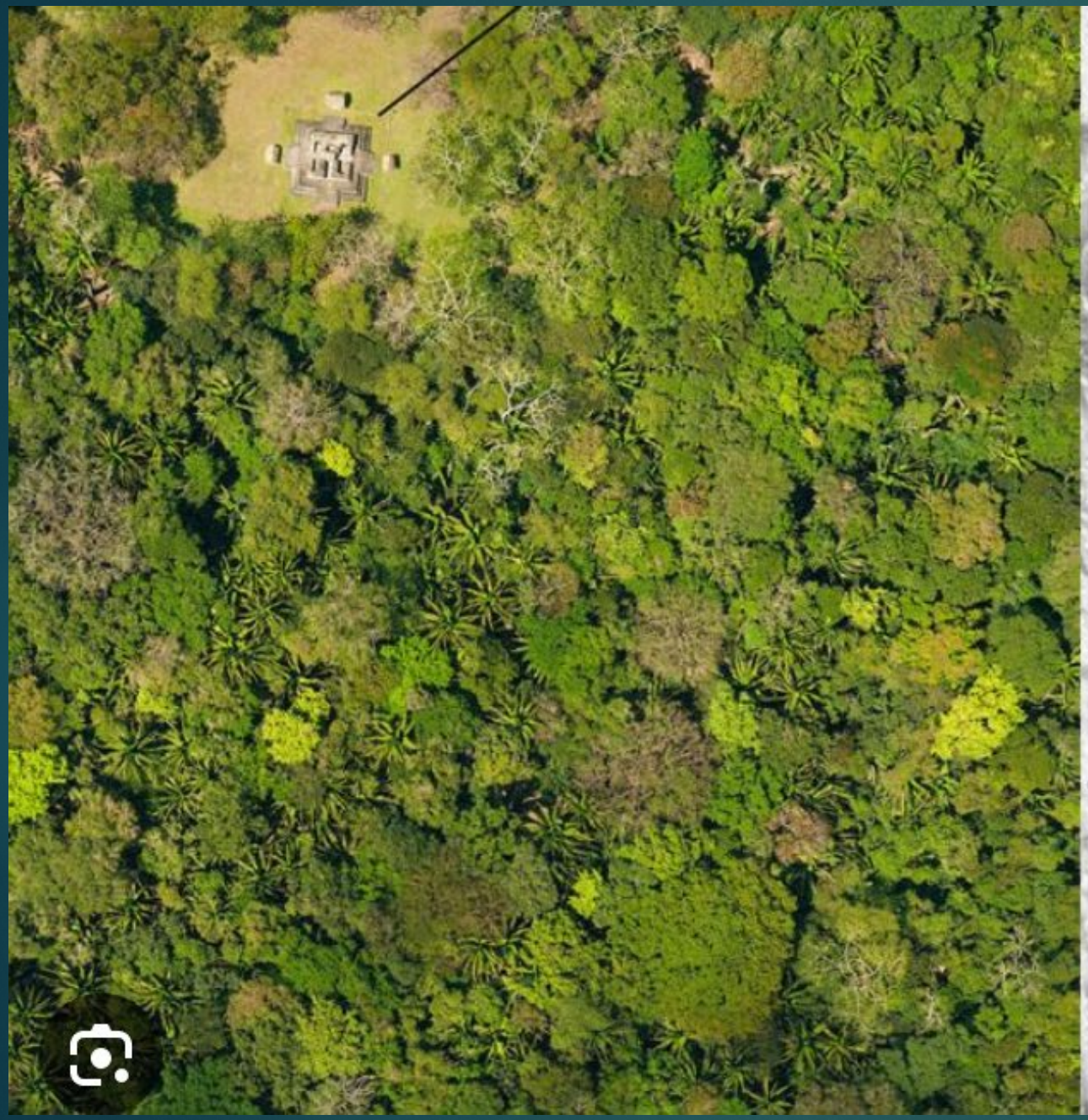


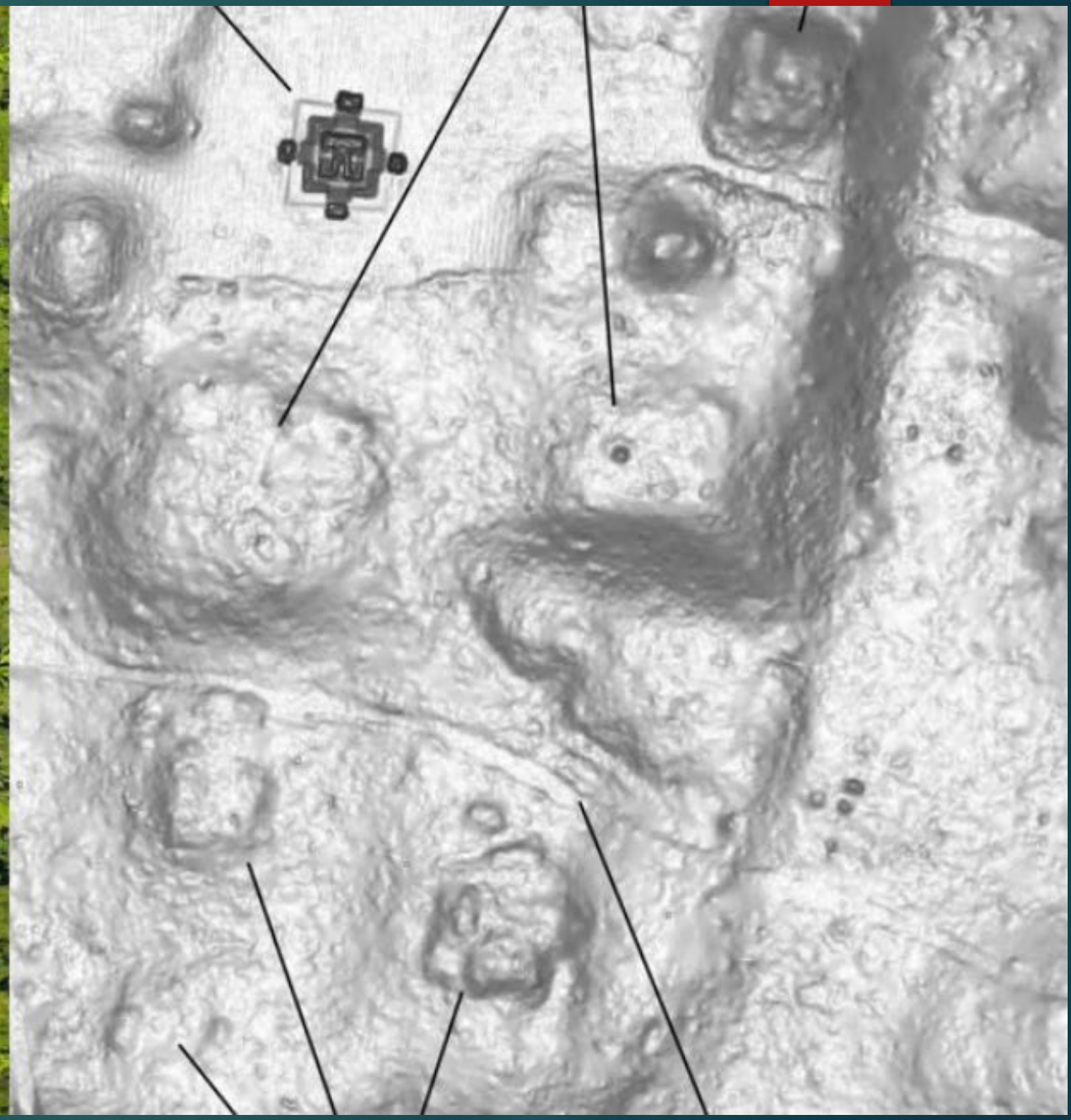


Data Set



Data Set

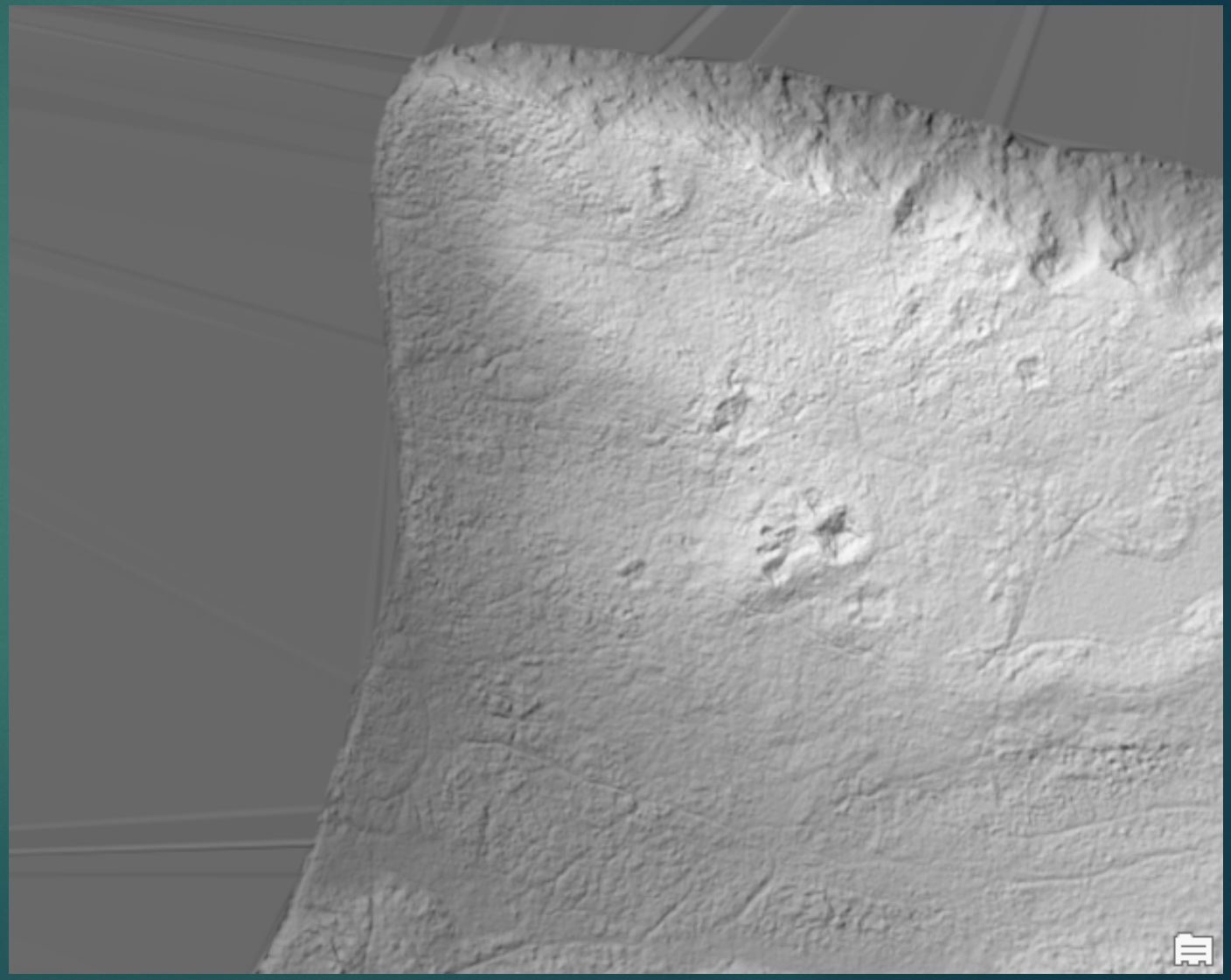


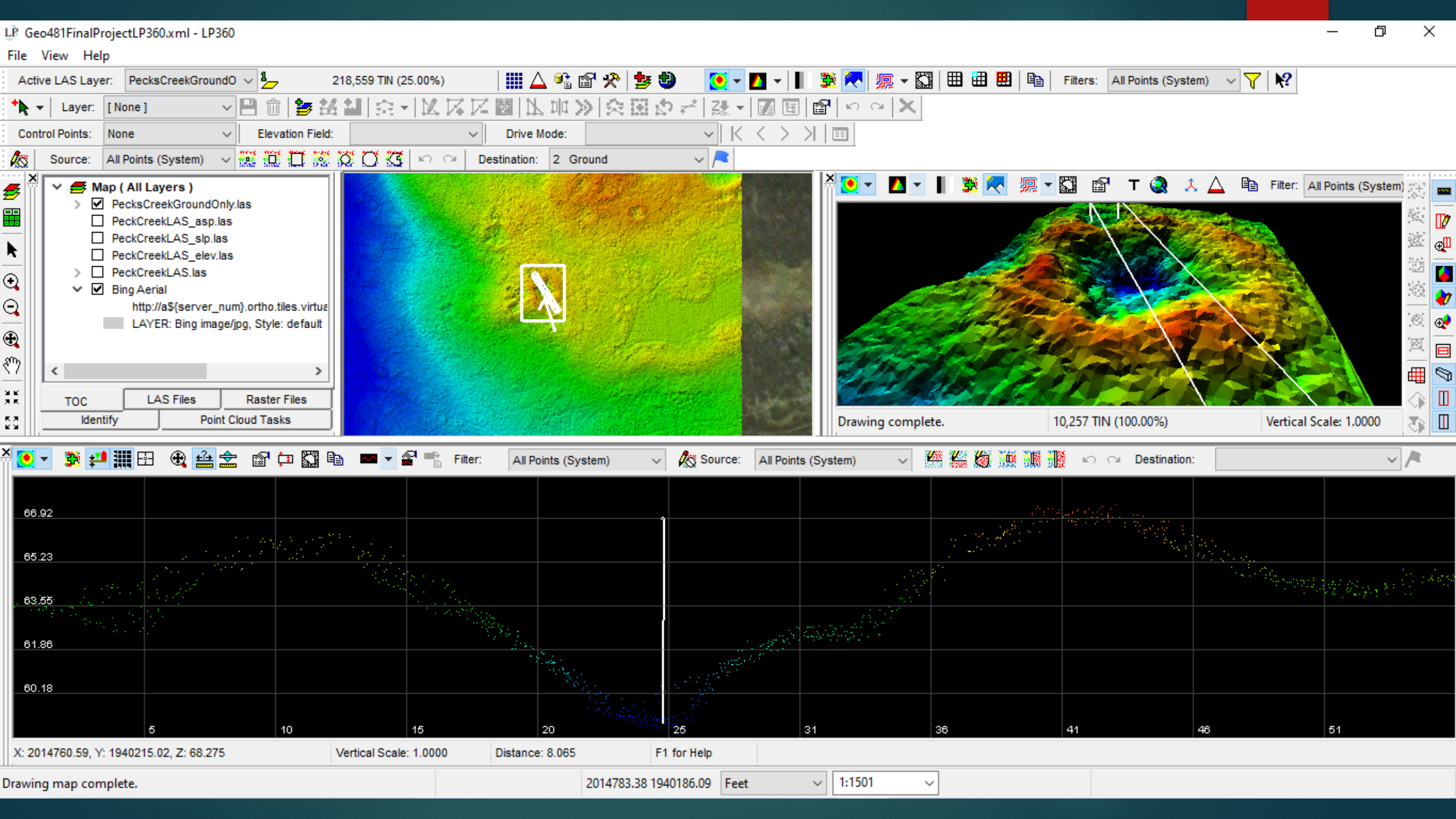


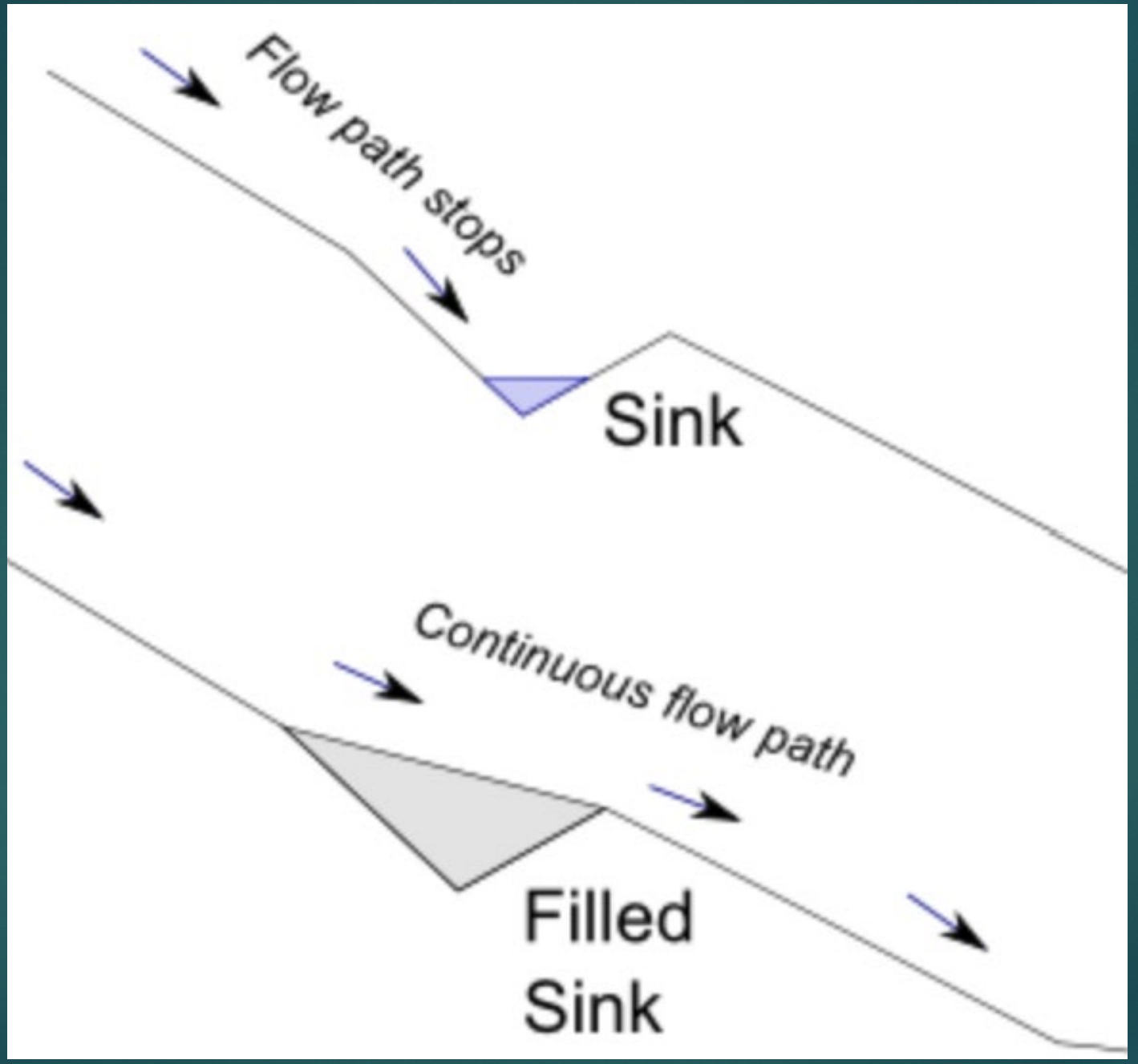
Field Work Can Be Dangerous

Qukaqliq
Nurileng
Newhalen
Curyung
Dillingham
Nunarpak
Anchorage
Liivlek
Levelock
Qarr'unaq
Kokhanok
Welcome
IGIUGIG
ALASKA

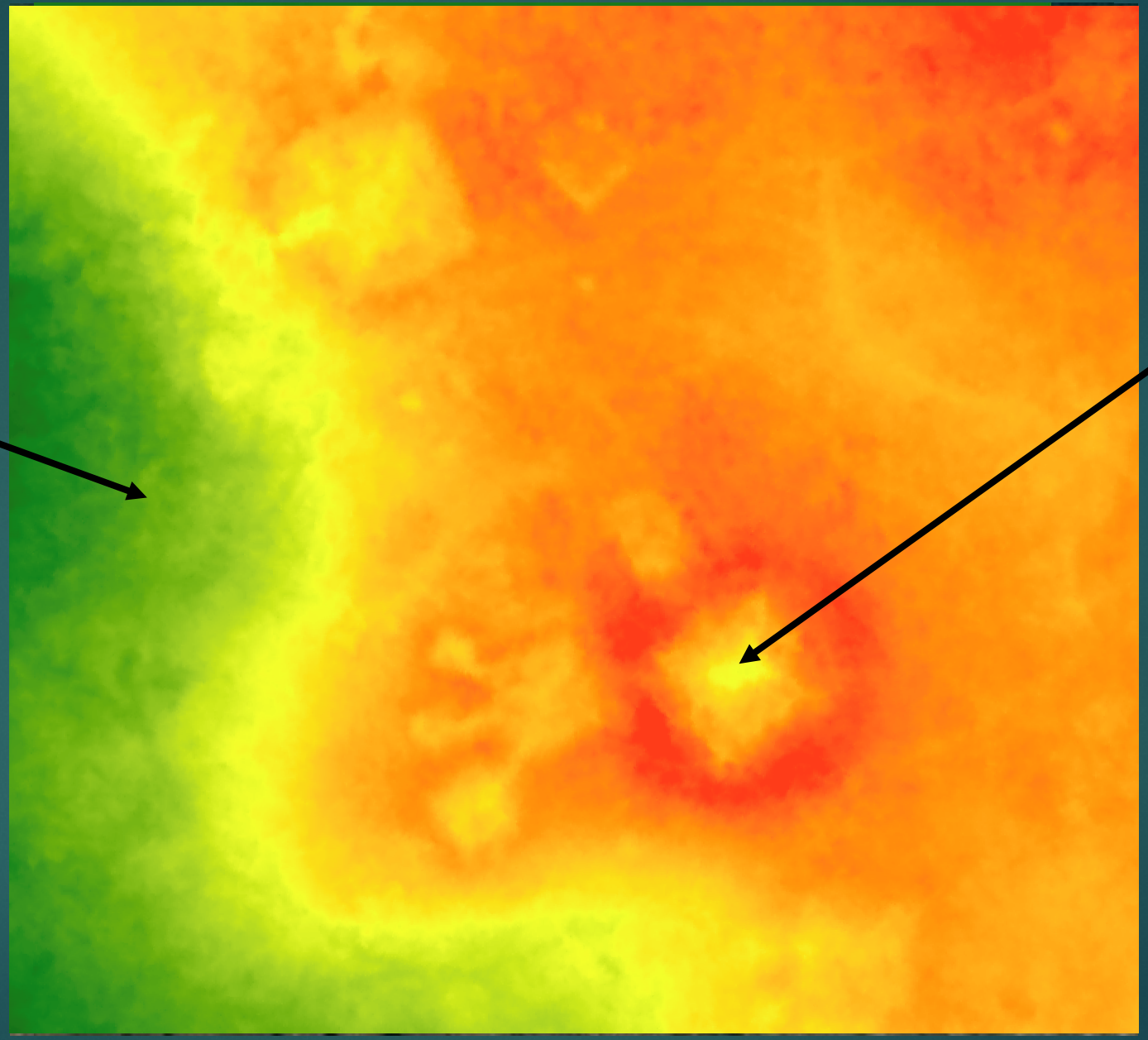
Manipulation in ArcGIS Pro




Geo481FinalProjectLP360.xml - LP360
File View Help
Active LAS Layer: PecksCreekGroundO
218,559 TIN (25.00%)
Filters: All Points (System)
Layer: [None]
Control Points: None
Elevation Field:
Drive Mode:
Source: All Points (System)
Destination: 2 Ground
Map (All Layers)
PecksCreekGroundOnly.las
PeckCreekLAS_asp.las
PeckCreekLAS_slp.las
PeckCreekLAS_elev.las
PeckCreekLAS.las
Bing Aerial
http://a${server_num}.ortho.tiles.virtua
LAYER: Bing image/jpg, Style: default
TOC
LAS Files
Raster Files
Identify
Point Cloud Tasks
Filter: All Points (System)
Drawing complete.
10,257 TIN (100.00%)
Vertical Scale: 1.0000
Filter: All Points (System)
Source: All Points (System)
Destination:
66.92
65.23
63.55
61.86
60.18
5
10
15
20
25
31
36
41
46
51
X: 2014760.59, Y: 1940215.02, Z: 68.275
Vertical Scale: 1.0000
Distance: 8.065
F1 for Help
Drawing map complete.
2014783.38 1940186.09
Feet
1:1501

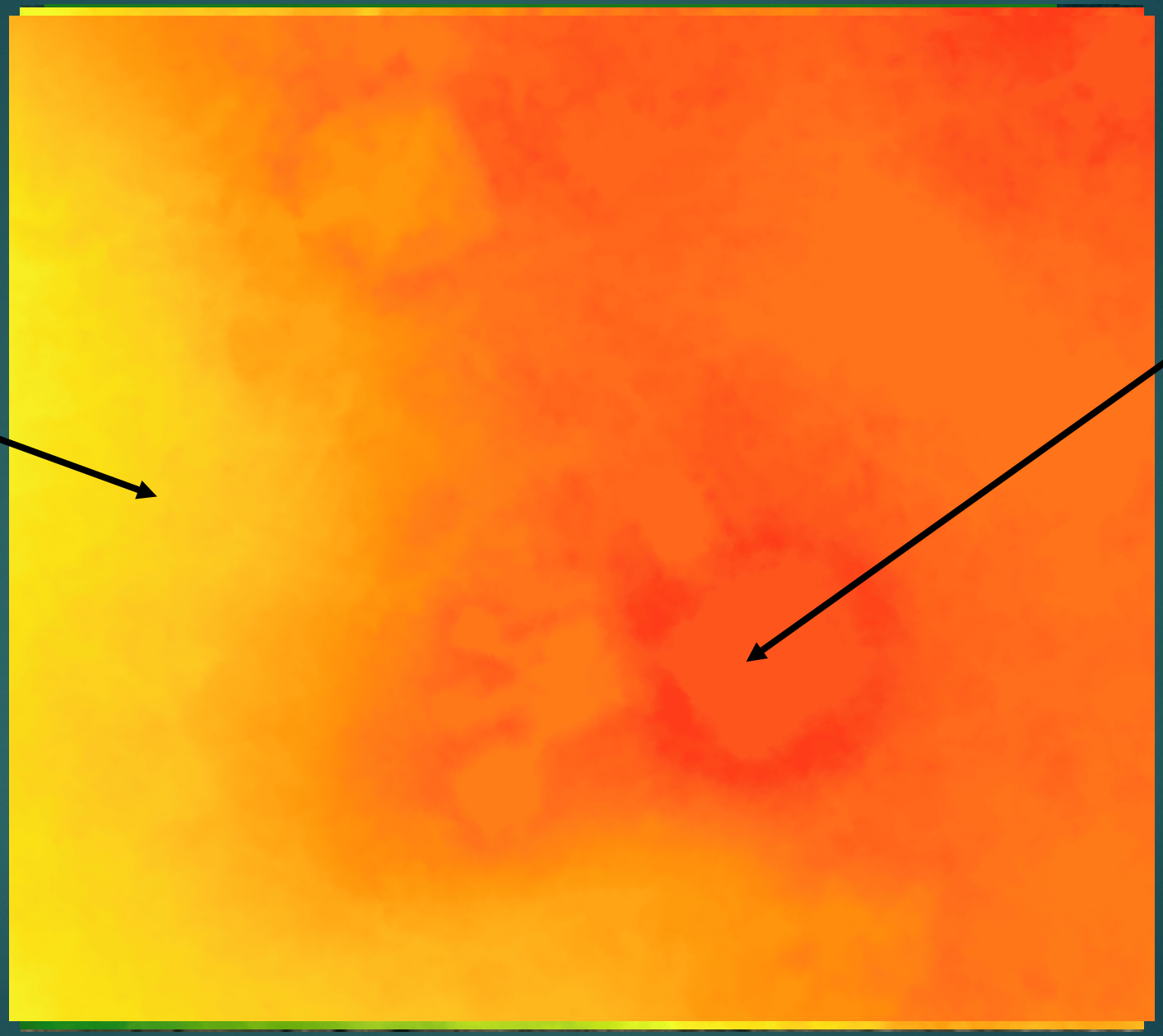

Flow path stops
Sink
Continuous flow path
Filled
Sink

5 Meters Above Sea Level

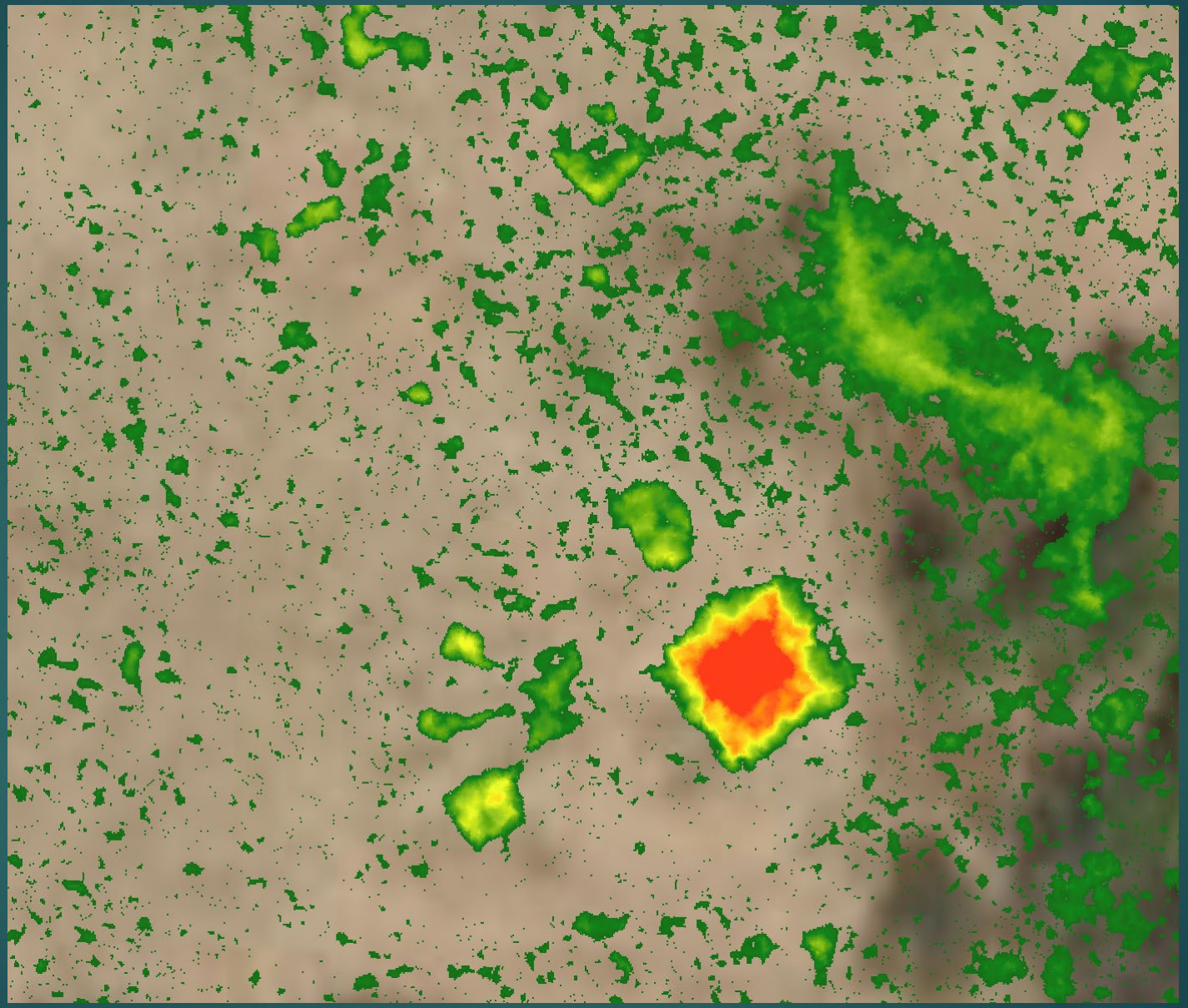


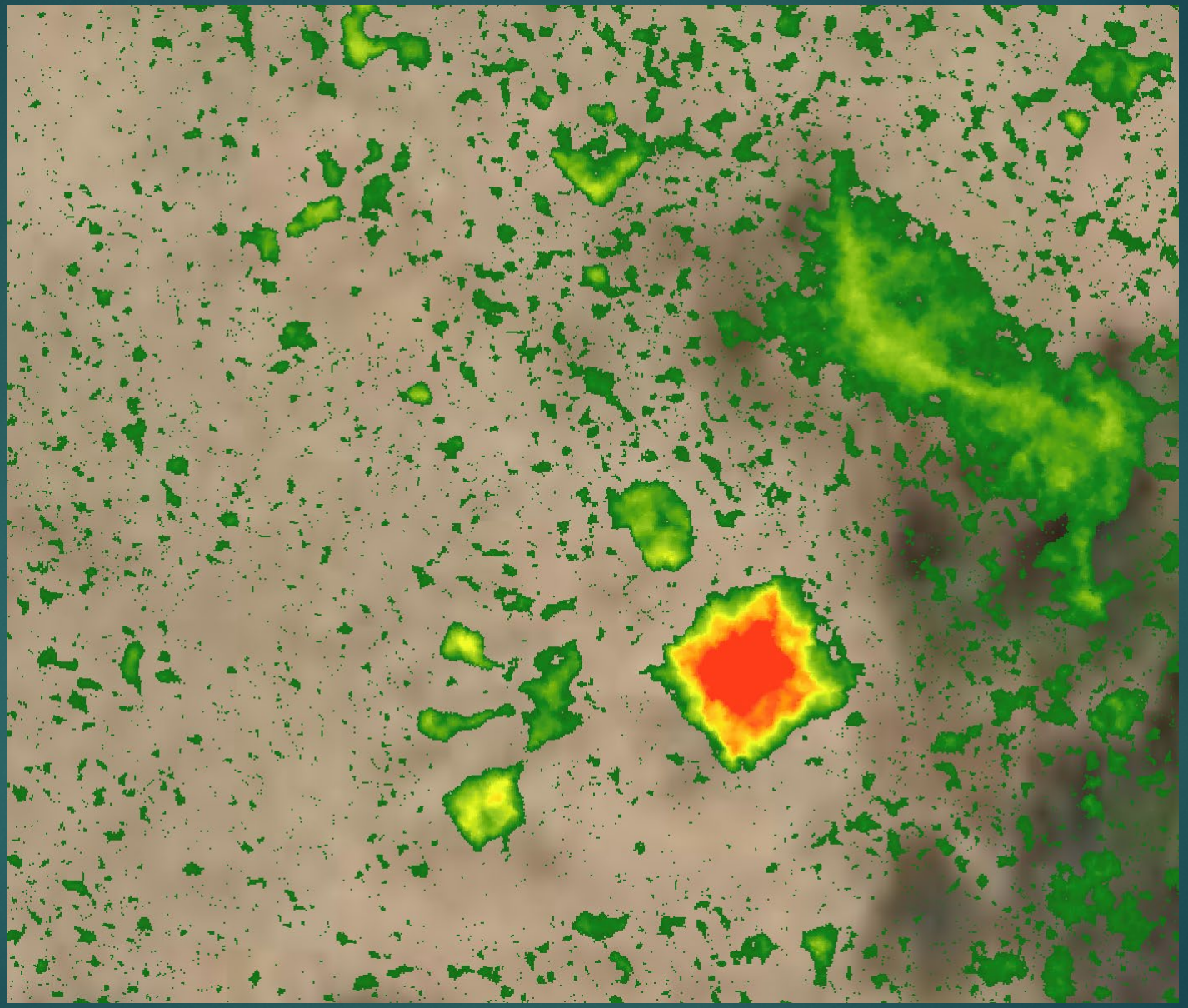
10 Meters Above Sea Level

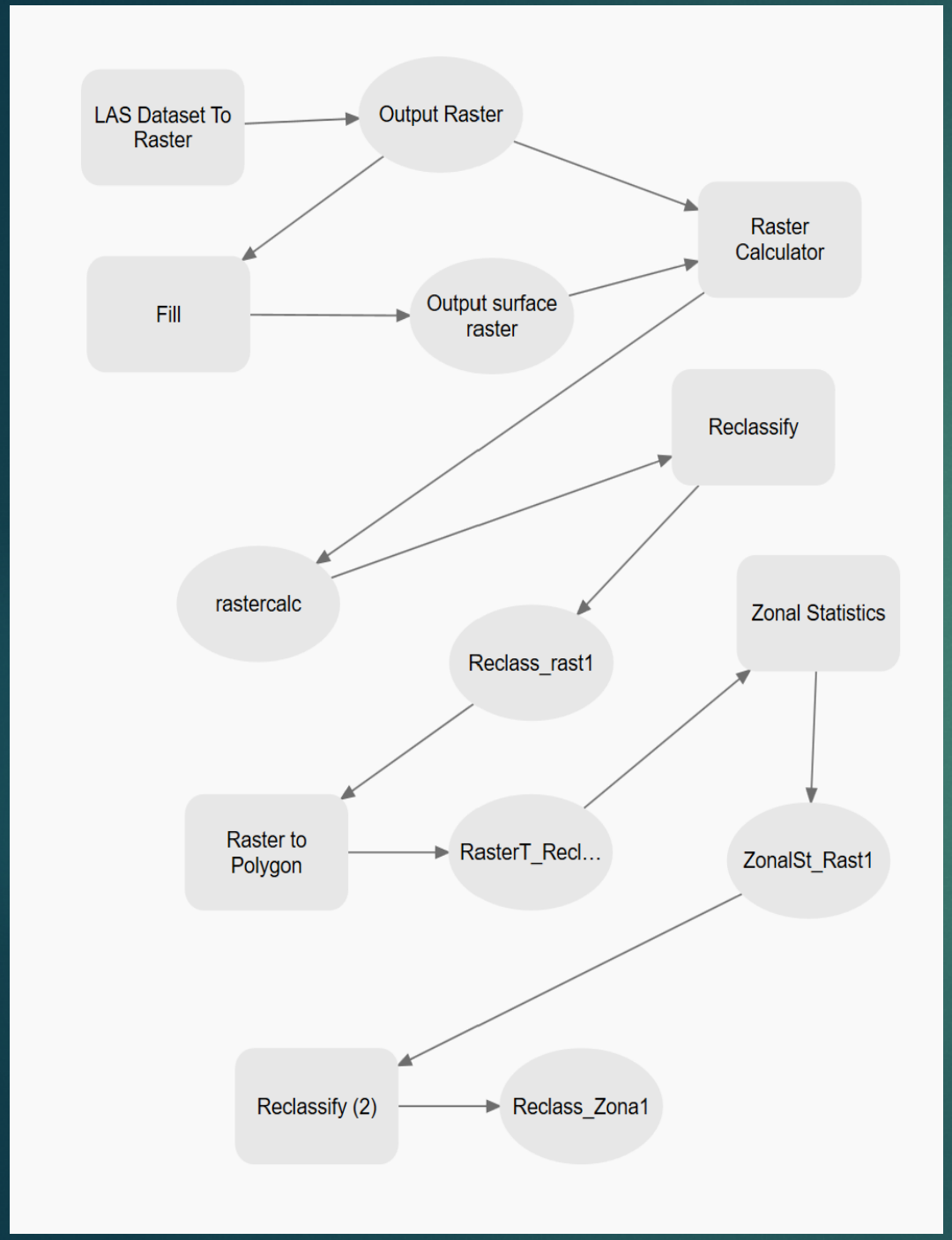
5 Meters Above Sea Level



20 Meters Above Sea Level







Parameters Environments

* Input LAS Dataset
* Output Raster
Value Field: Elevation
Interpolation Type: Binning
Cell Assignment: Average
Void Fill Method: Linear
Output Data Type: Floating Point
Sampling Type: Cell Size
Sampling Value: 10
Z Factor: 1

Parameters Environments

* Input raster
* Reclass field
* Reclassification
Reverse New Values
Start | End | New
Classify Unique
* Output raster
Change missing values to NoData

Parameters Environments

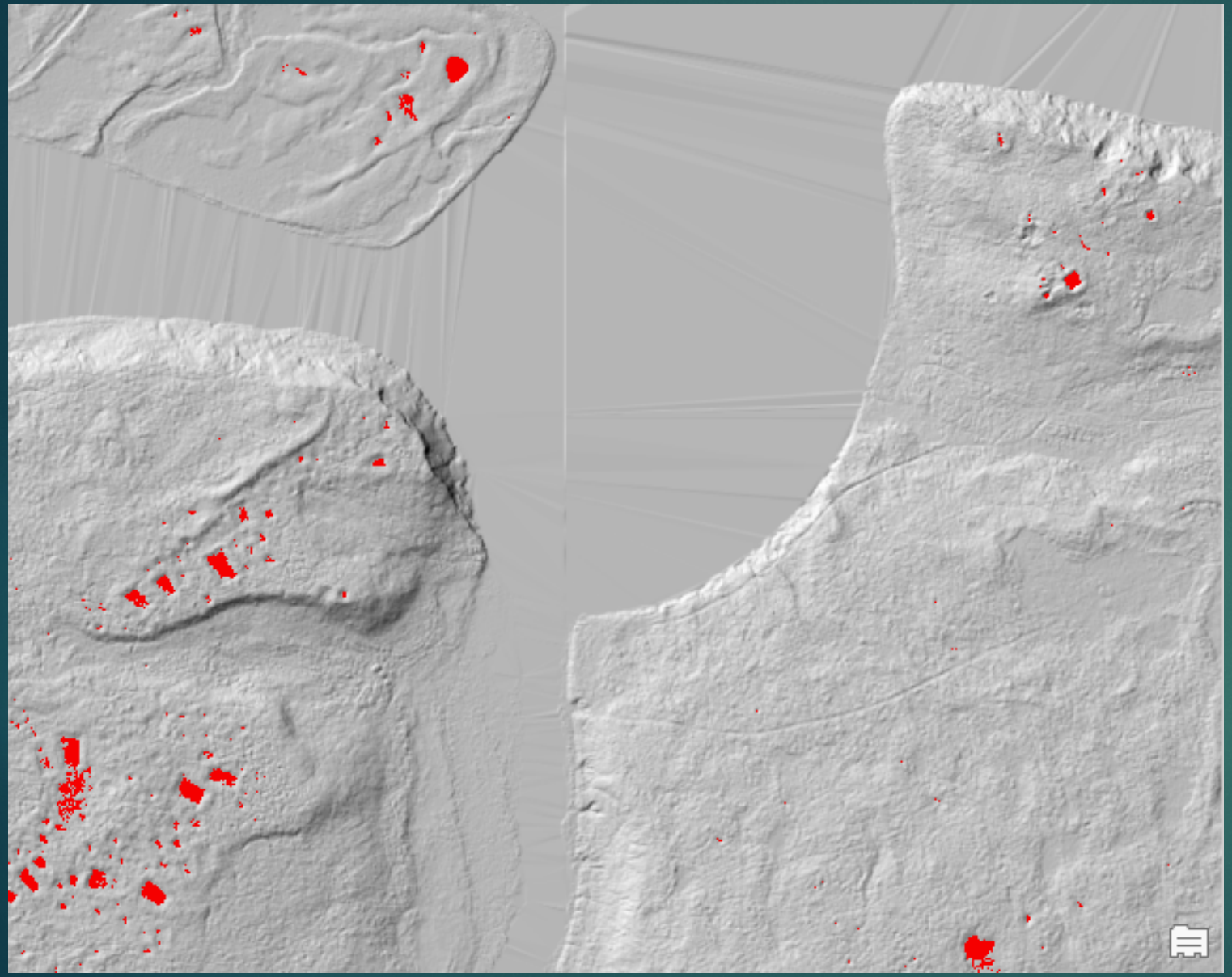
* Input raster
Field
* Output polygon features
Simplify polygons
Create multipart features
Maximum vertices per polygon feature

Parameters Environments

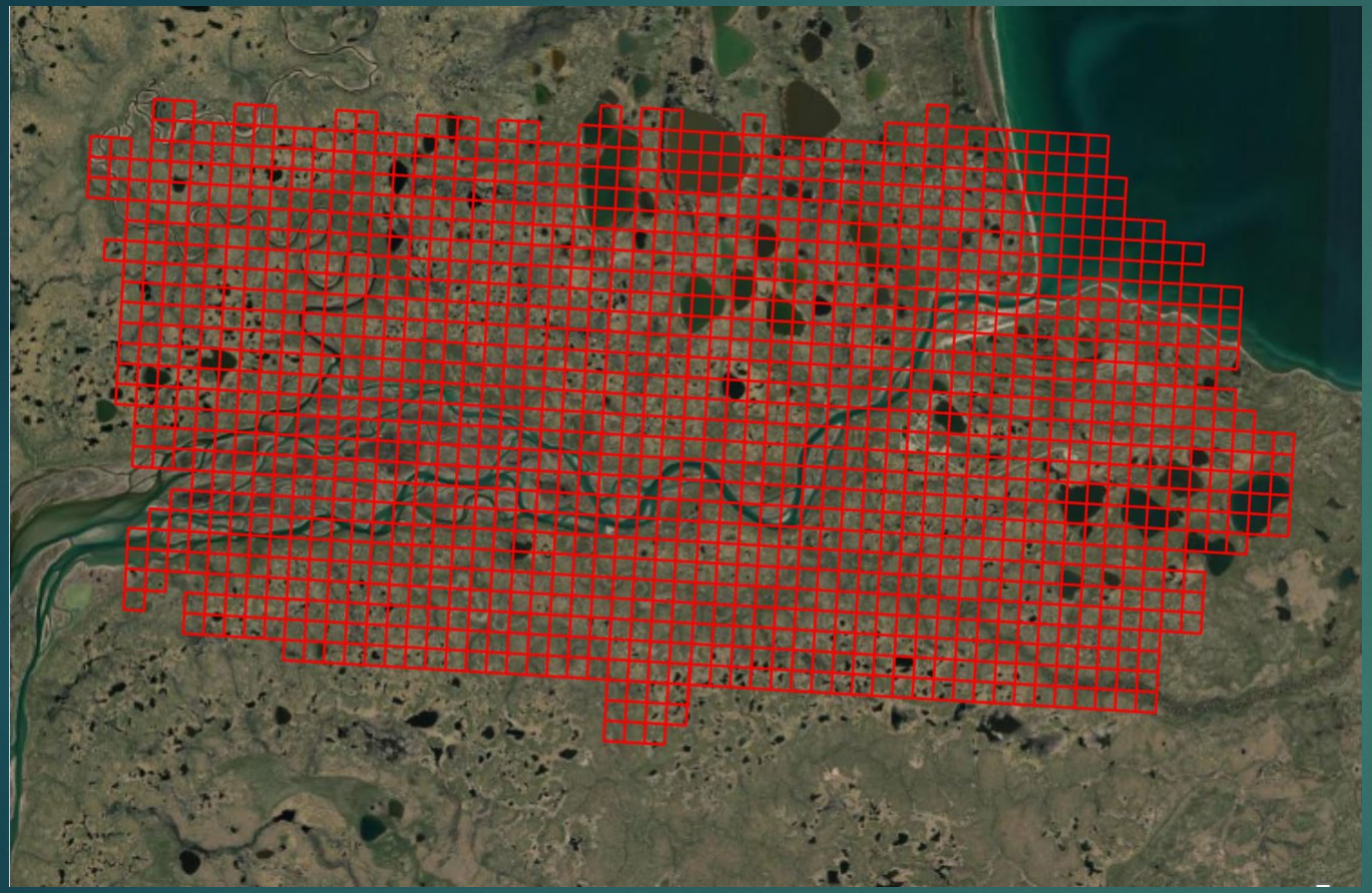
* Input Raster or Feature Zone Data
* Zone Field
* Input Value Raster
* Output Raster
Statistics Type: Mean
Calculate Circular Statistics
Ignore NoData in Calculations
Process as Multidimensional

Parameters Environments

* Input surface raster
* Output surface raster
Z limit



All sinks/depressions deeper than 1ft



Data Set

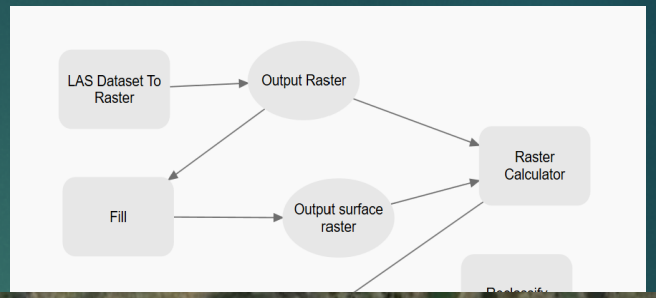
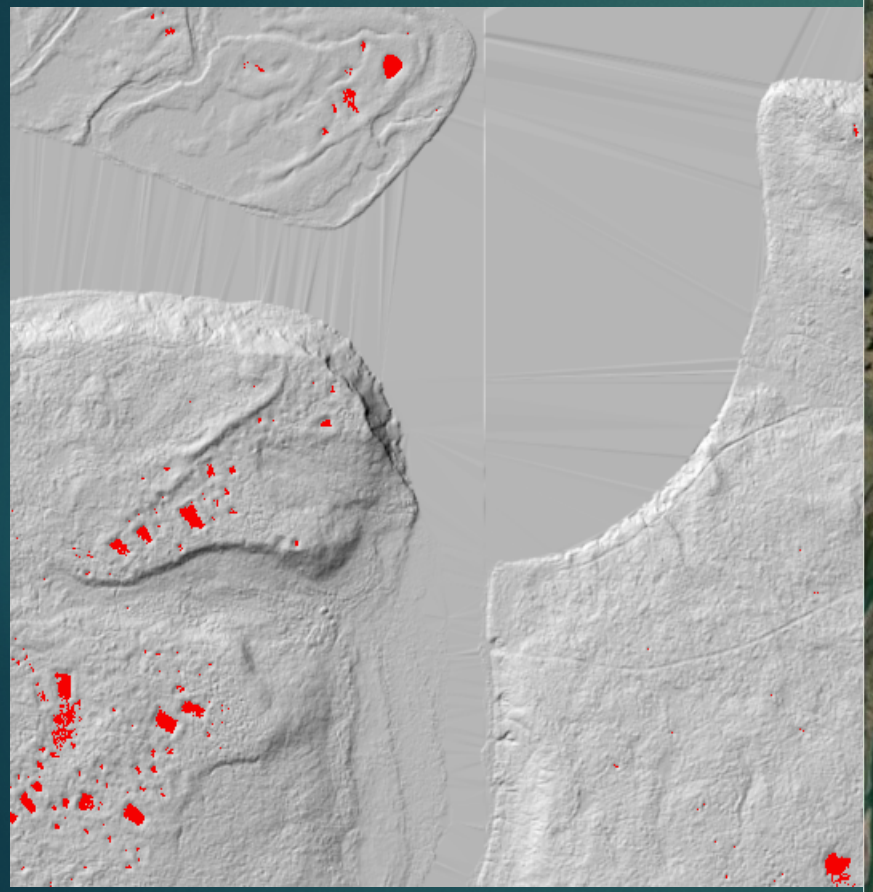
Project Timeline

- Acquire Data: Done
- Test Methodology: Ongoing, anticipated finish date of 10/18/2023
- Expand Methodology to larger Study Area: Complete before GEOG-596B Spring Starts 01/03/2024
- Create Tool: 01/03/2024 – 02/02/2024
- Complete Final Research Paper: Complete by end of GEOG-596B 03/13/2024

50th

Anniversary Meeting

Alaska Anthropological Association

Alaskan Anthropological Association Annual Conference 02/21/2024 Fairbanks, AK

Anticipated Results