

# Mapping Potential Habitat with Remote Sensing

## Virtual Geomorphic Mapping of Off- channel Salmon Refugia

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LiDAR Learning Event, UW-DNR

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# Dosewallips River

- In partnership with Port Gamble S'Klallam Tribe
- **Relatively** undisturbed watershed; 10 miles of habitable river miles
- Eastern Olympic Peninsula, western Hood Canal
- Lower 3-5 miles lightly to moderately developed

# Current Conditions

- Dosewallips River historically clear cut
- Otherwise, near natural, recovering forest
- **LWD is making it's way to stream, sans anchor pieces**
- LWD is currently not providing consistent refugia



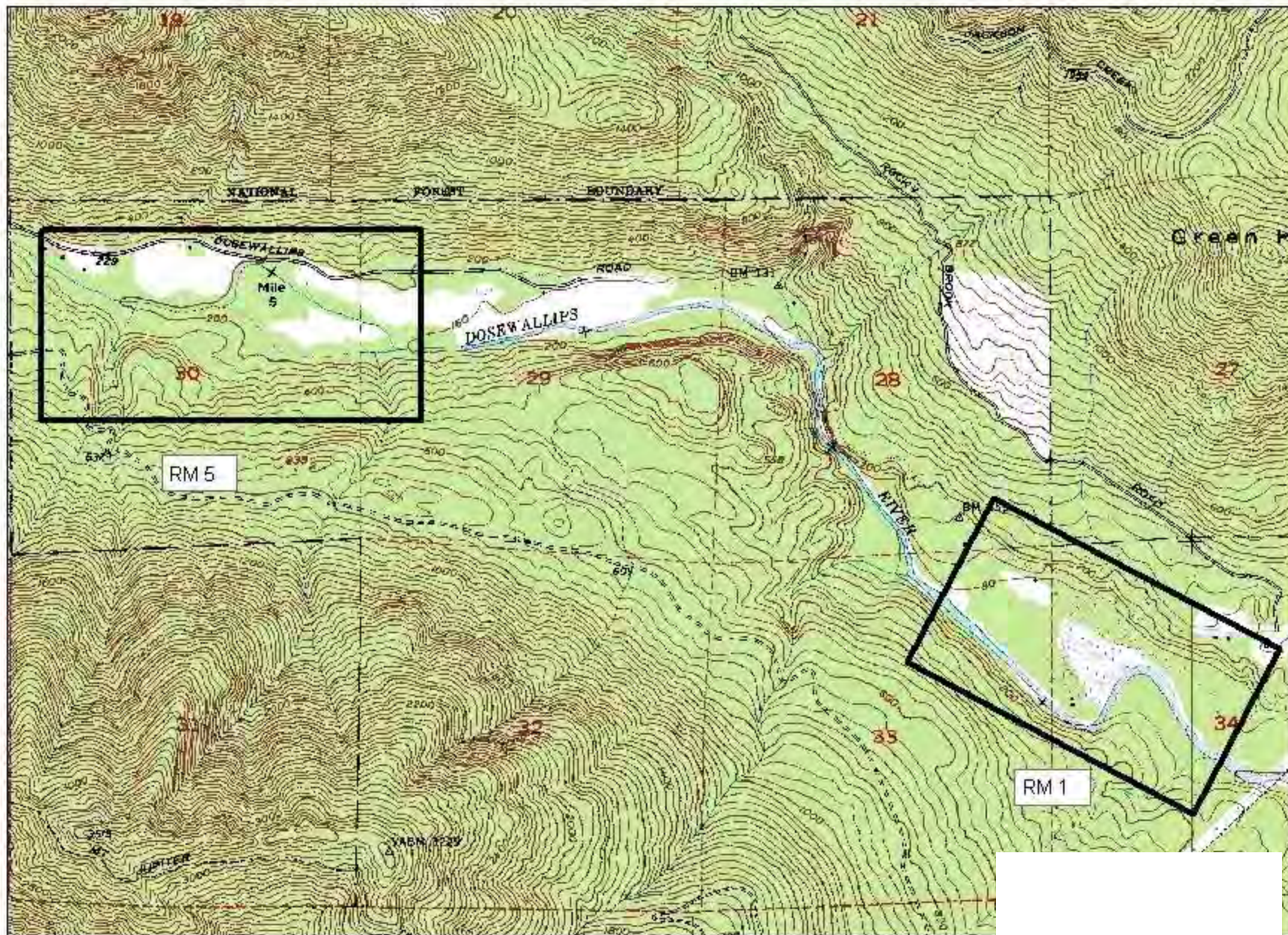
# Needs

- Identify potential near and off-channel habitat for endangered salmonids in a recovering stream
- Where are abandoned and overflow channels?
- What are their relative elevations to current stream elevations?

# Method Development

- Use LIDAR elevation data to identify potential habitat (avulsed, migrated, and overflow channels)
  - Elevation maps
  - Slope derivatives
- Use color orthophotography to verify and augment
- Multiple lines of evidence; LIDAR, color orthophotos, field mapping
- Test methods on several unique reaches





Map of Study Locations RM1 and RM 5





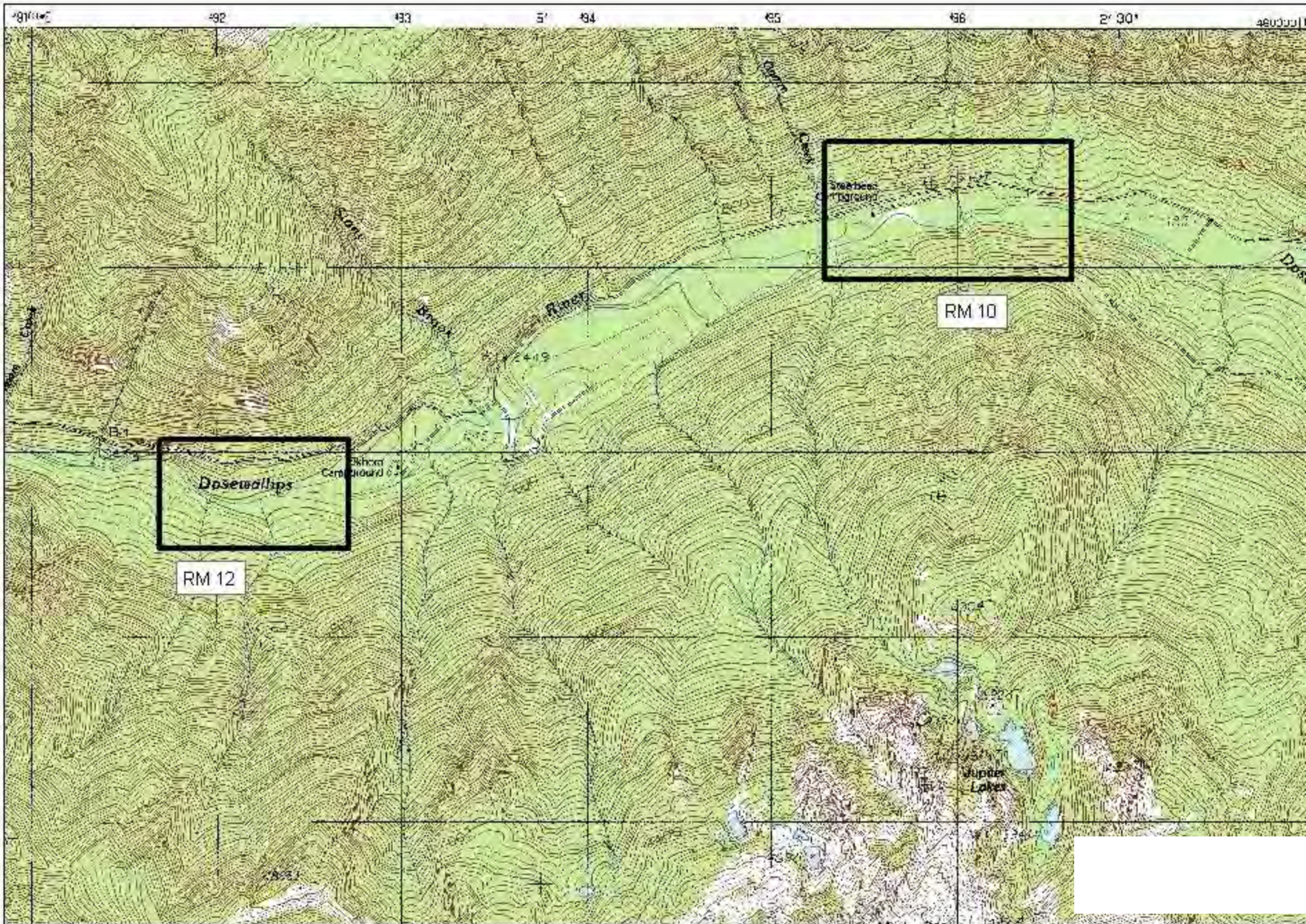
River Mile 1





River Mile 5





Map of Study Locations RM10 and RM 12



allips\_4.jpg  
allips\_30.jpg  
allips\_3.jpg  
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allips\_28.jpg  
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Unanchored LWD

River Mile 10





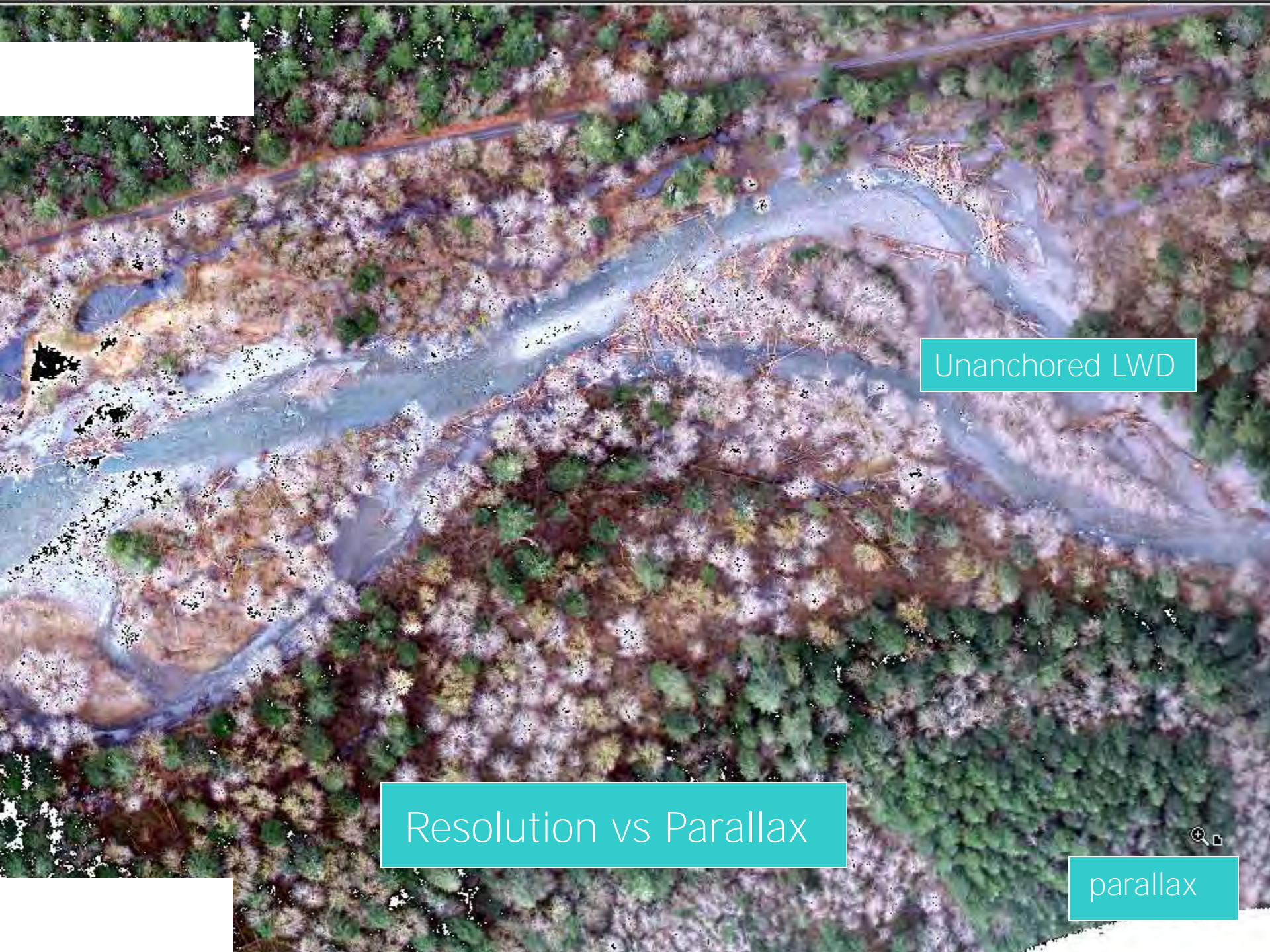




# LIDAR: lessons learned

- Low level flights
  - Resolution vs parallax; a tough choice
- Post-processing
  - Specifications; good contracts make good data
  - Reprocessing; the terrain under investigation **may not justify it.....**





Unanchored LWD

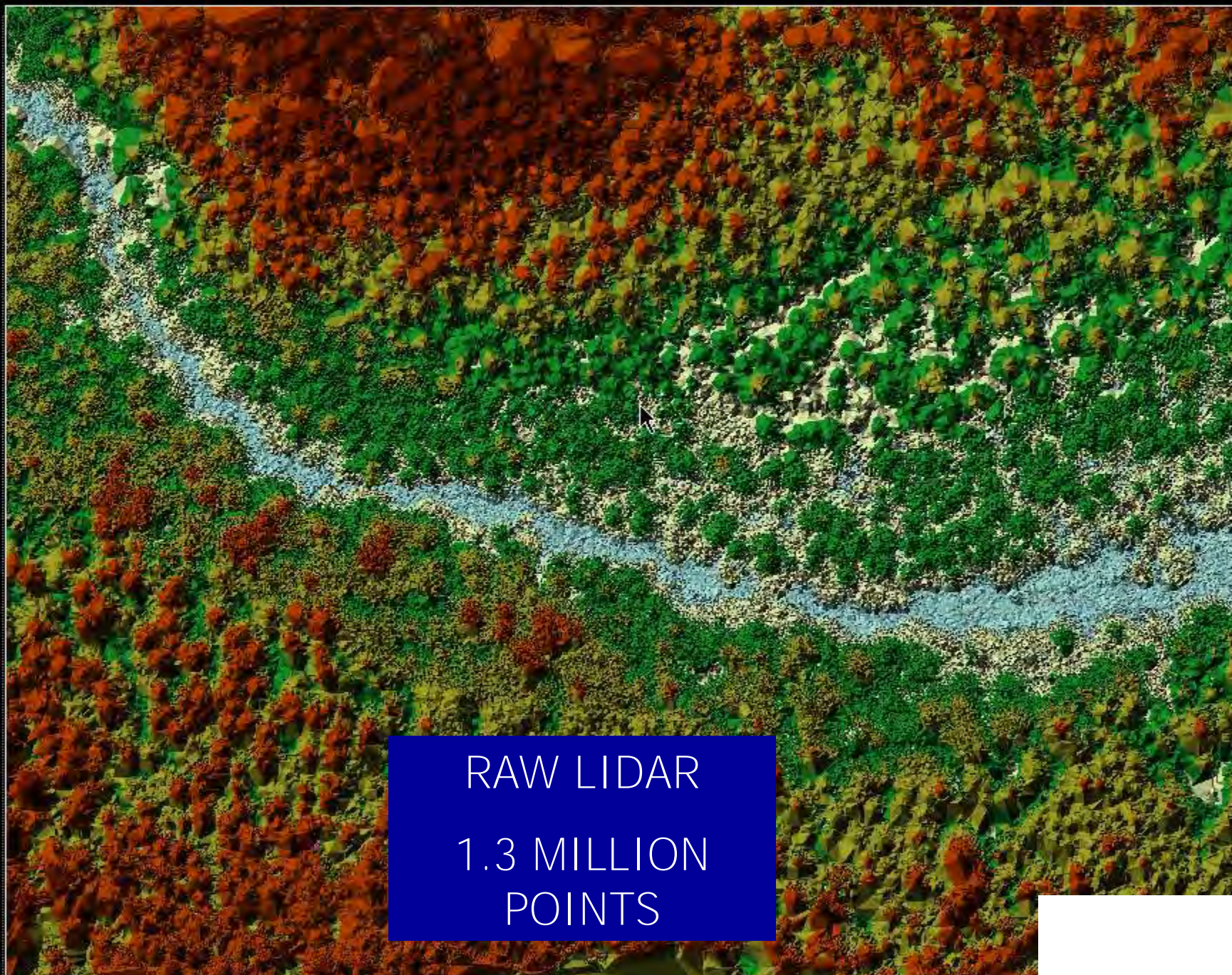
Resolution vs Parallax

parallax





8  
7  
6  
5  
4  
3  
2  
1



RAW LIDAR  
1.3 MILLION  
POINTS





FIRST PASS  
502,000 POINTS



0549

37

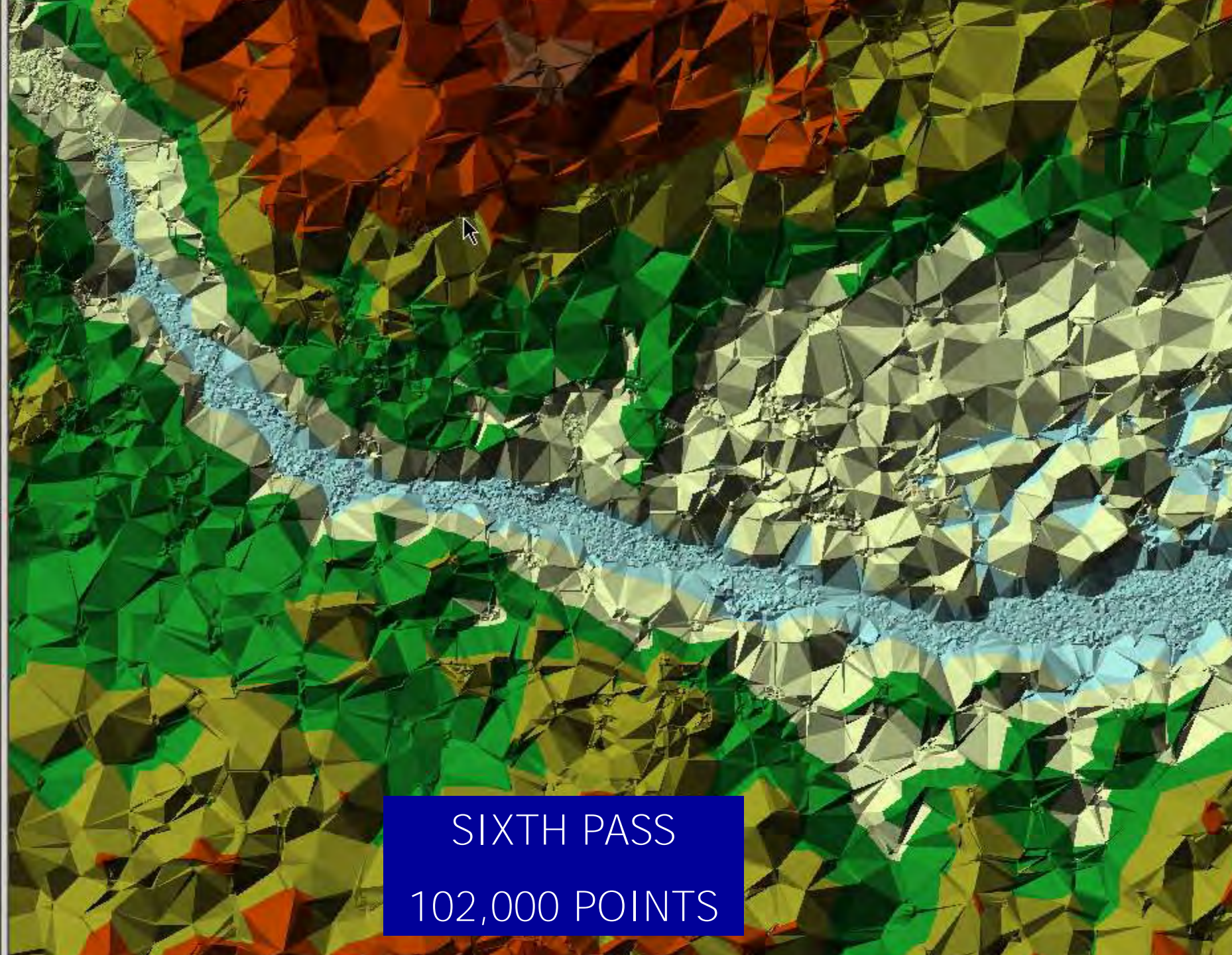


THIRD PASS  
207,000 POINTS



0549

37



SIXTH PASS  
102,000 POINTS



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37

NINTH PASS  
77,600 POINTS





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37

12th PASS

66,900 POINTS

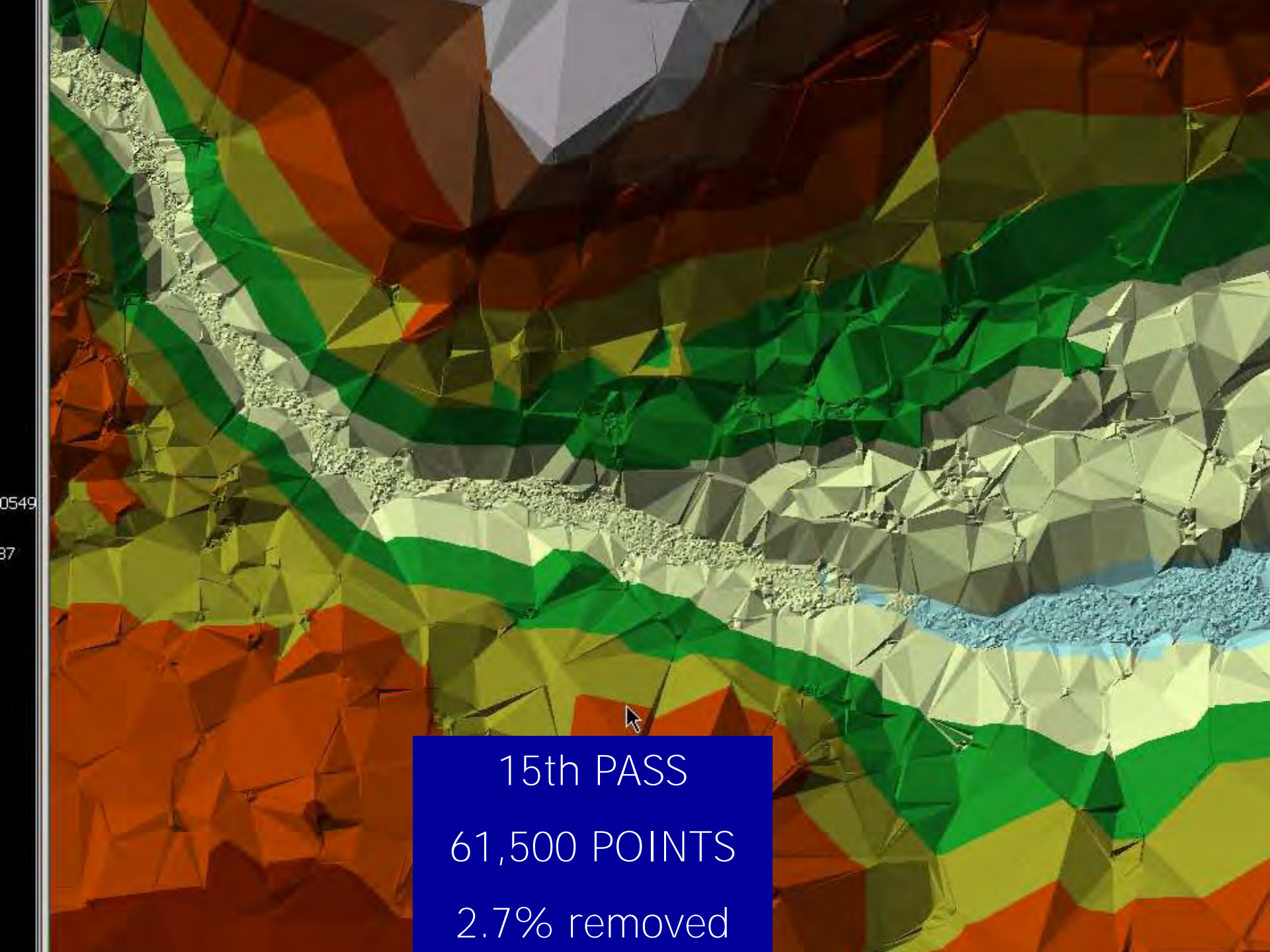
2.9% removed





0549

37



15th PASS  
61,500 POINTS  
2.7% removed





Benches identified better....no habitat

18th PASS  
57,400 POINTS  
1% removed



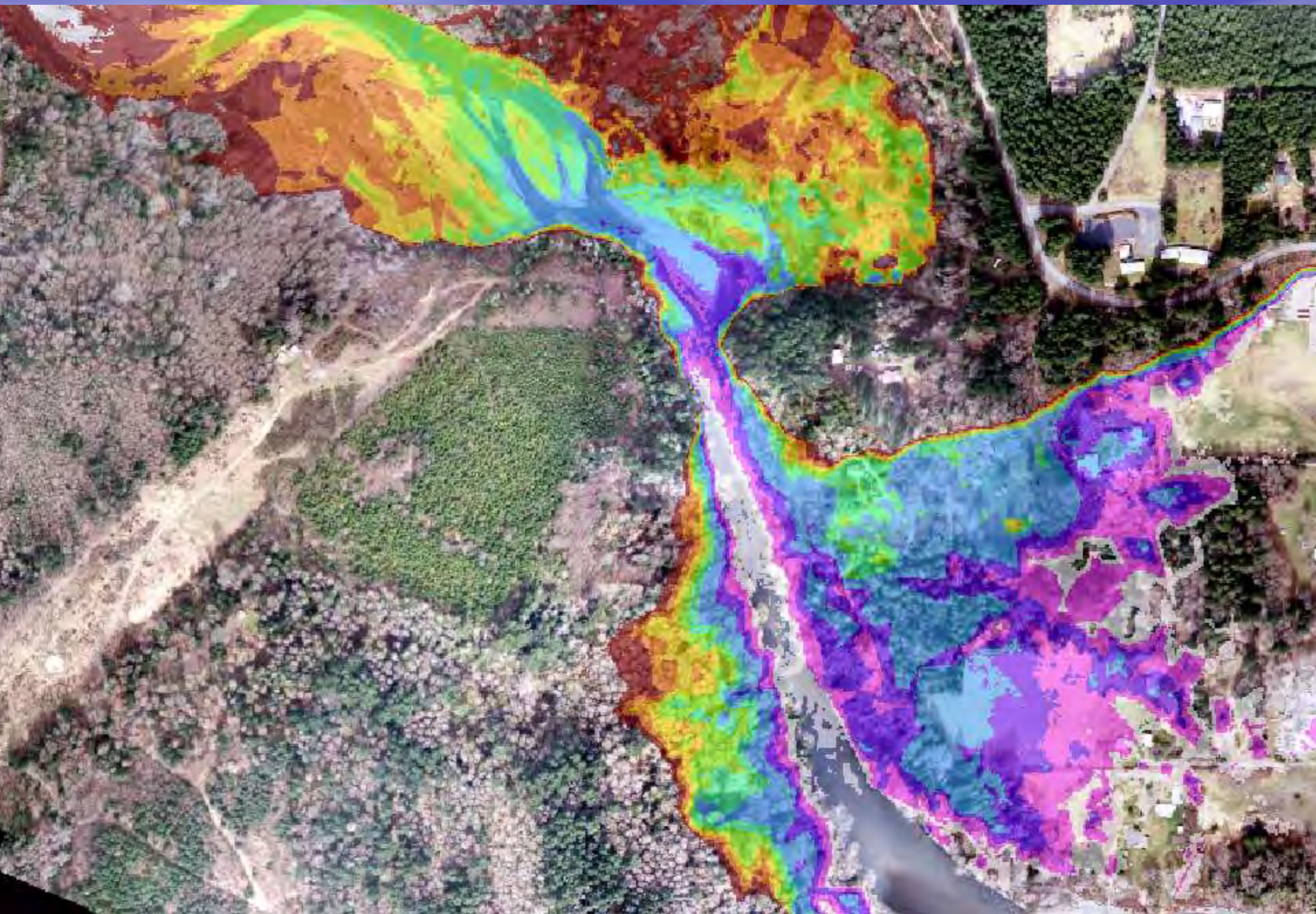
An aerial photograph showing a river valley. A road runs horizontally across the upper portion of the image. Below the road is a large, irregularly shaped field with a light brownish-tan color. The river flows through the valley, winding from the left towards the right. The surrounding landscape is a mix of green and brownish vegetation. In the bottom right corner, there is a teal-colored box containing white text.

▸ River Mile 5  
(area under  
investigation)

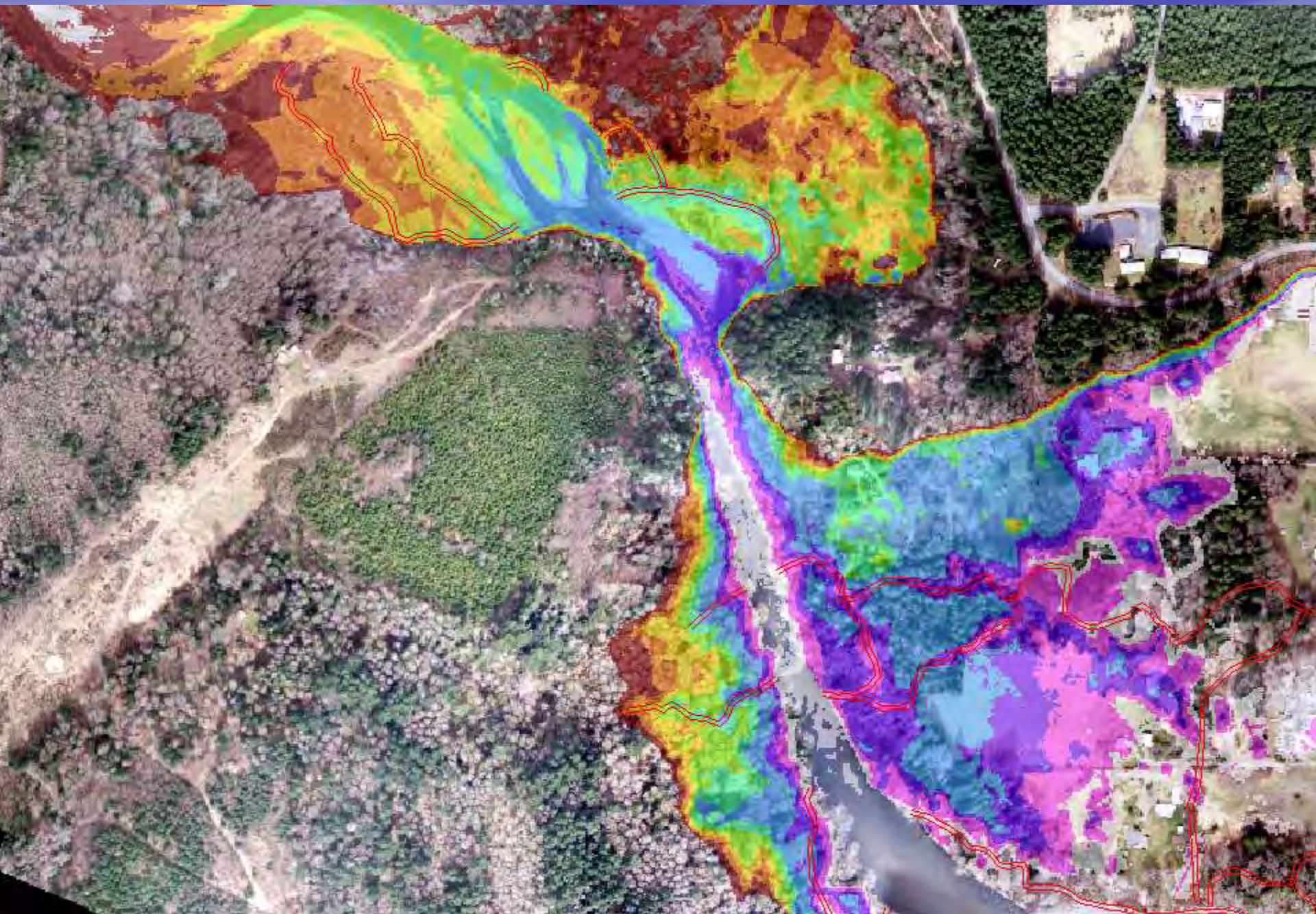












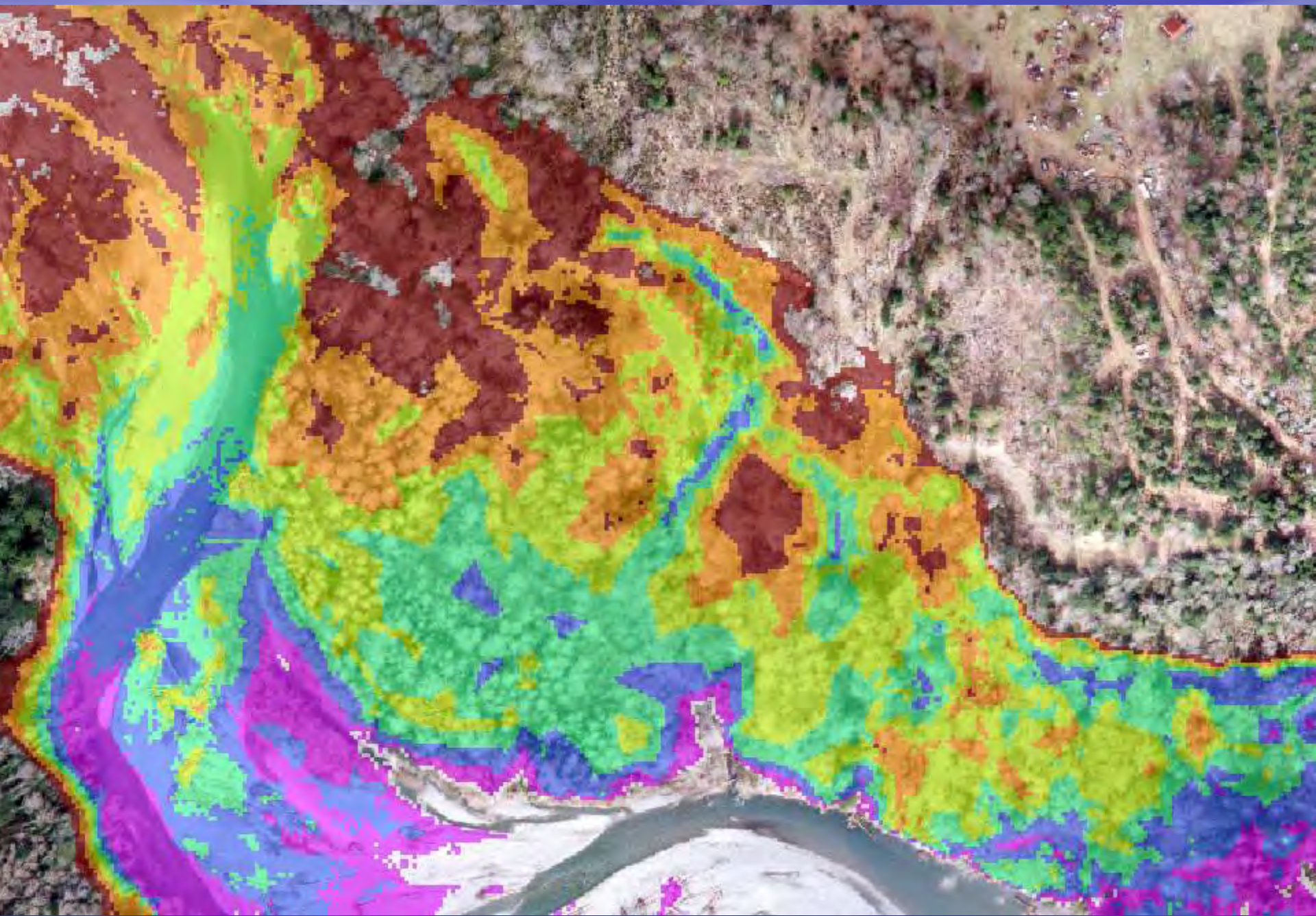




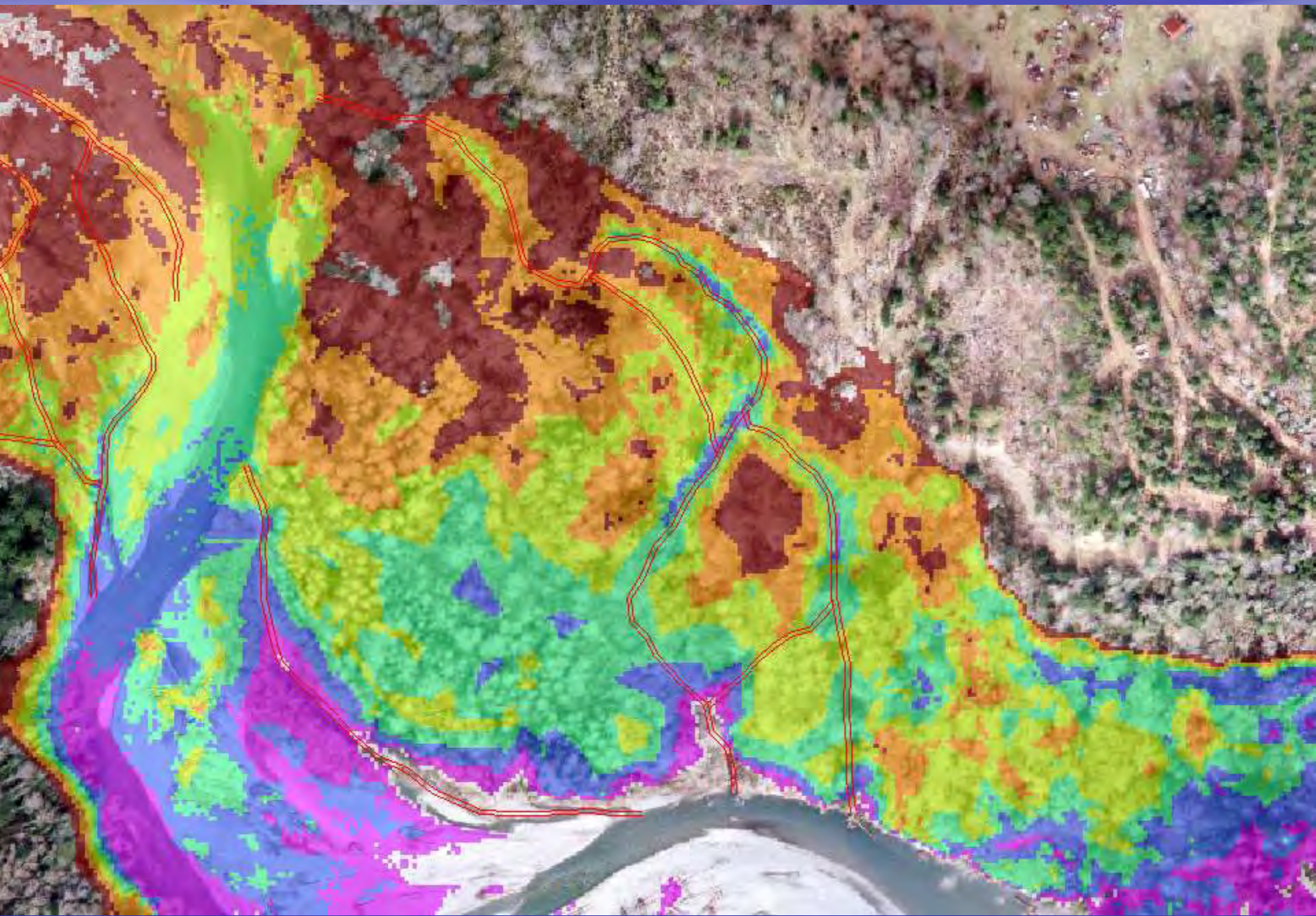
















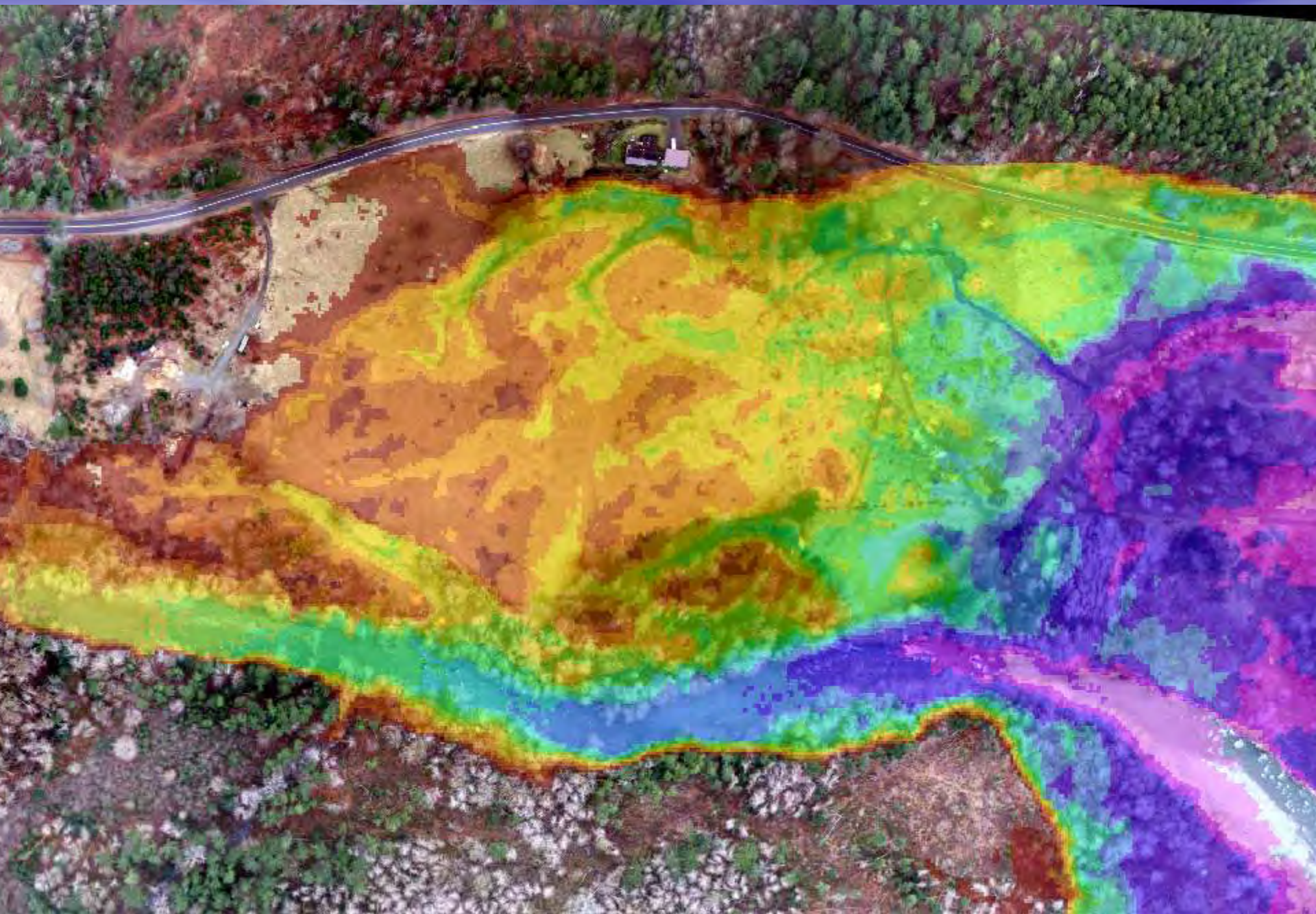




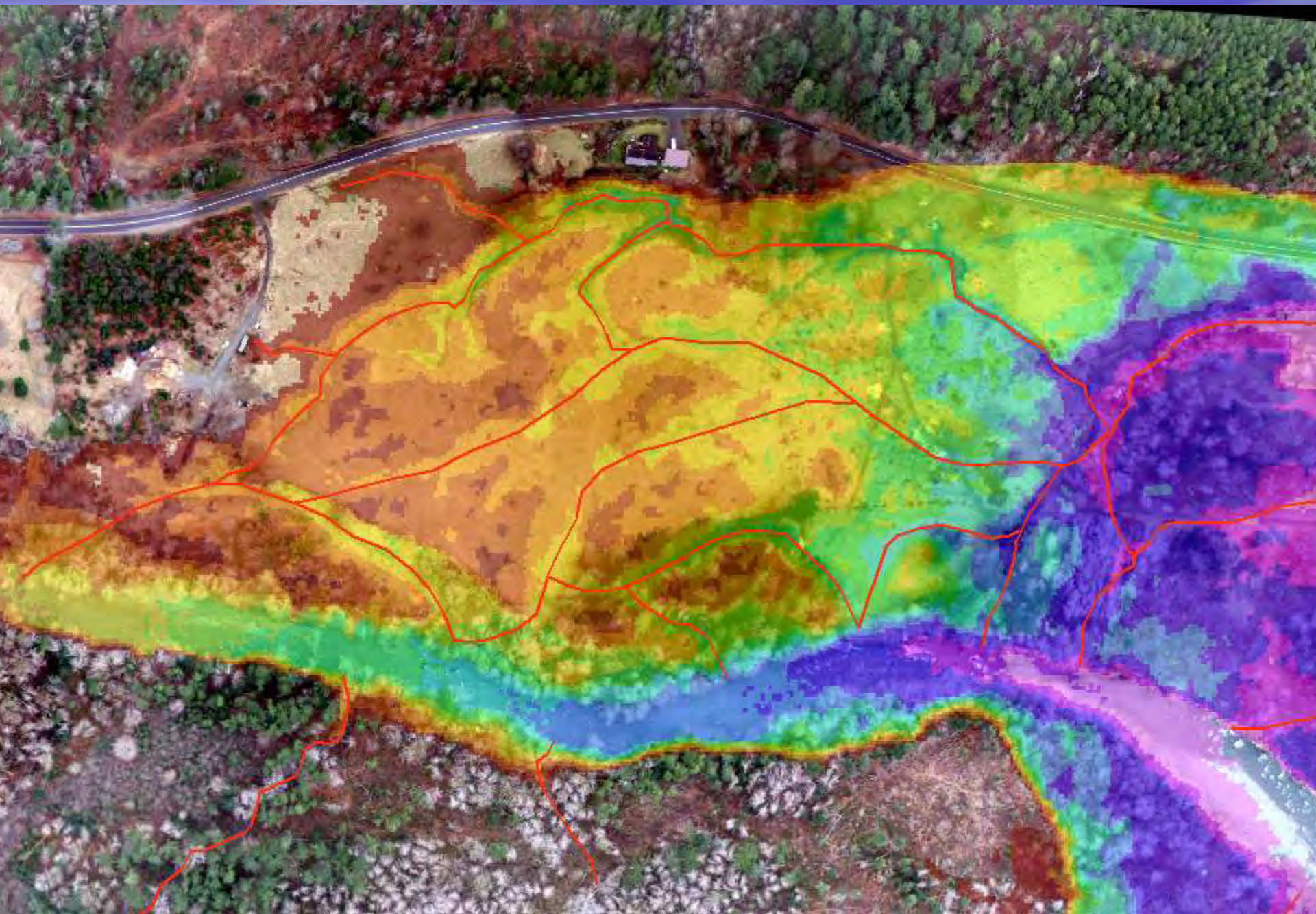








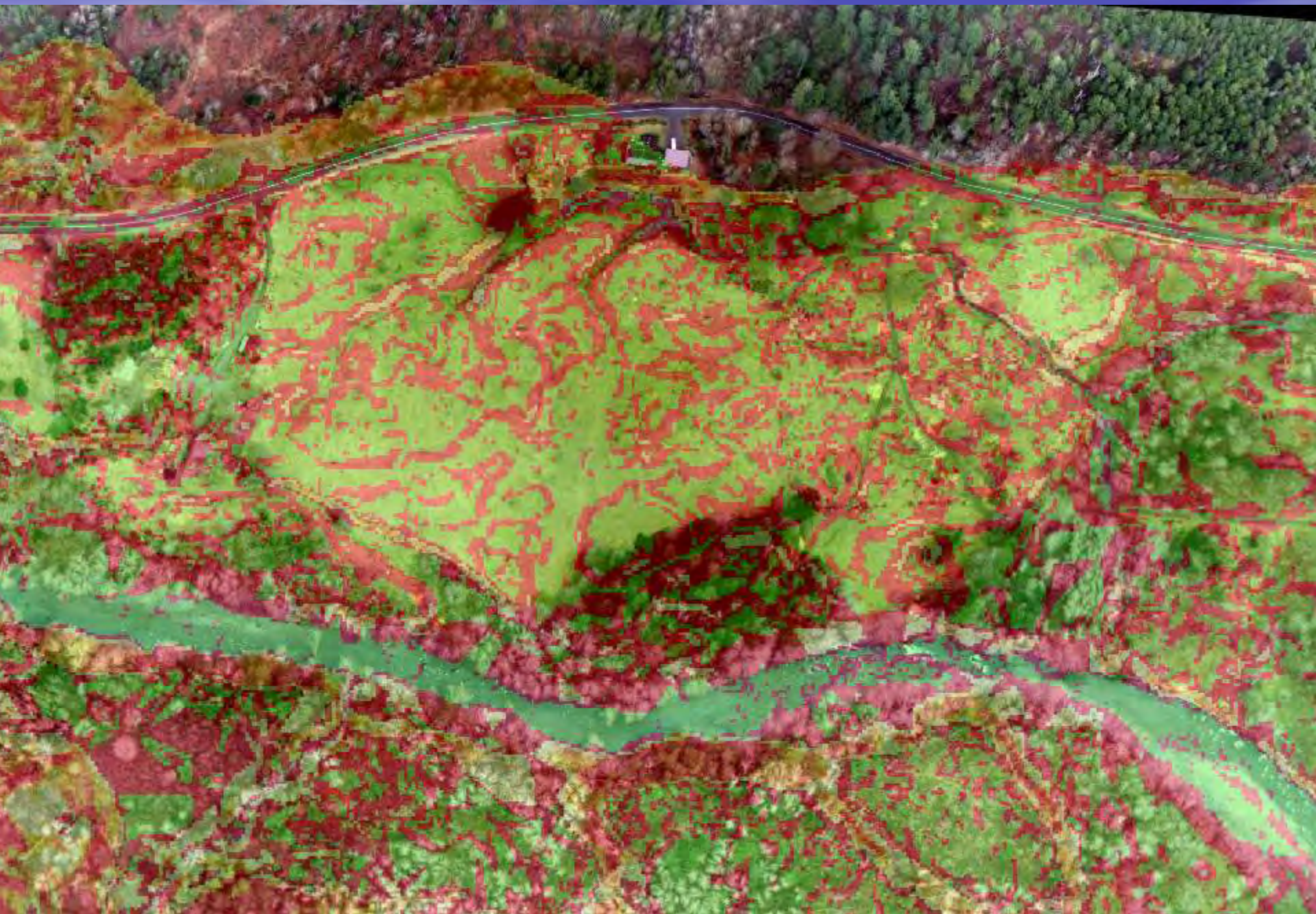




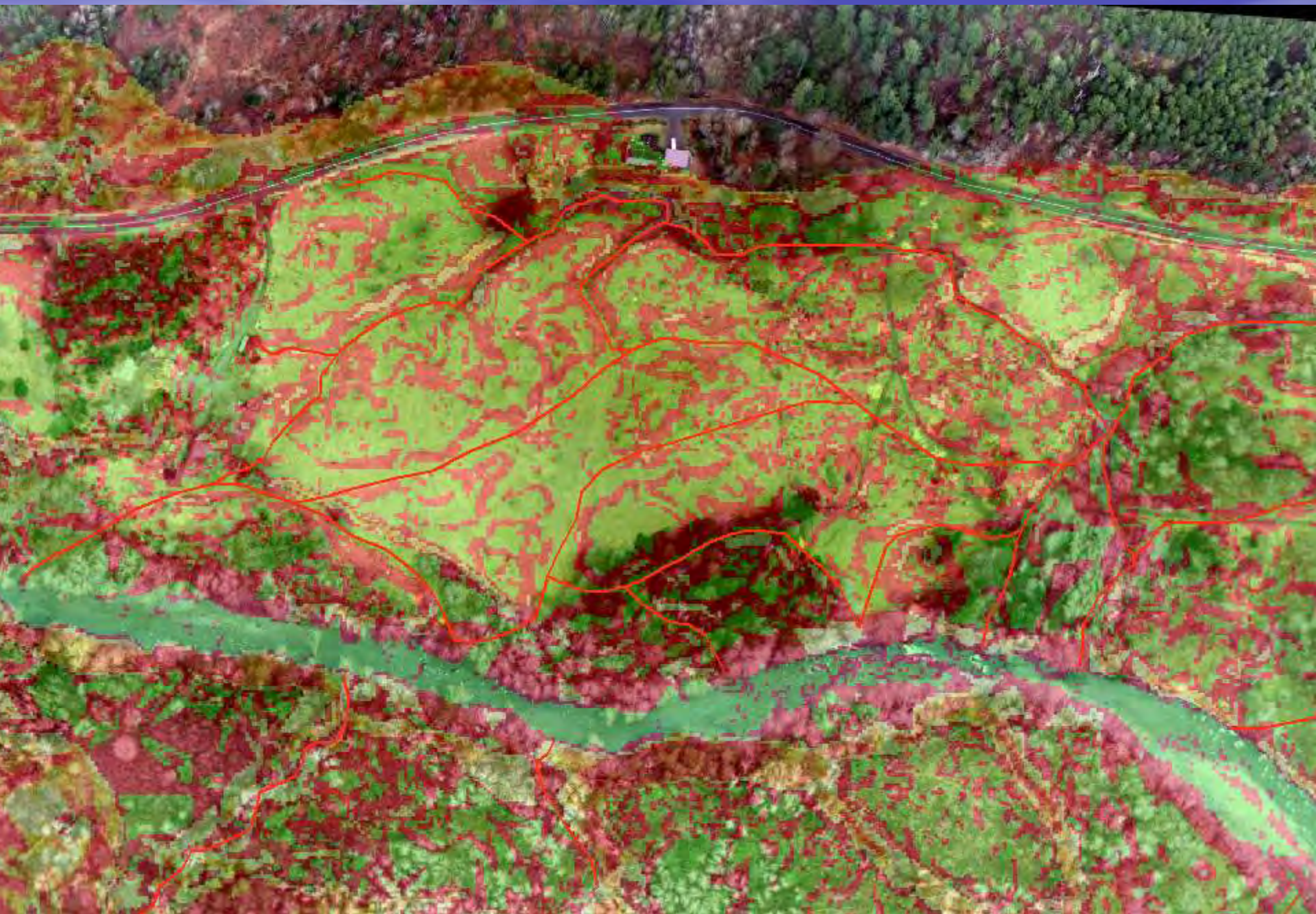












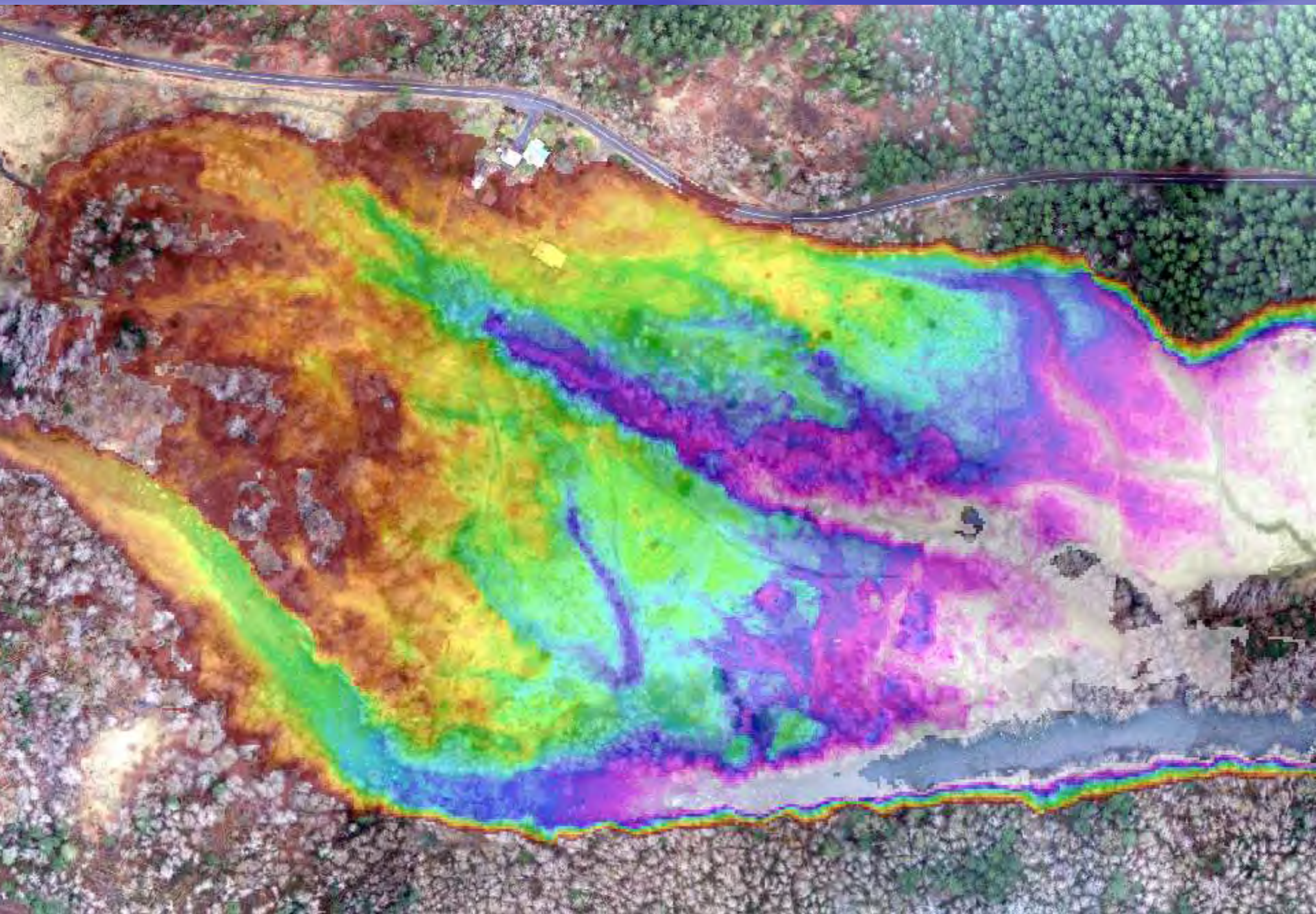




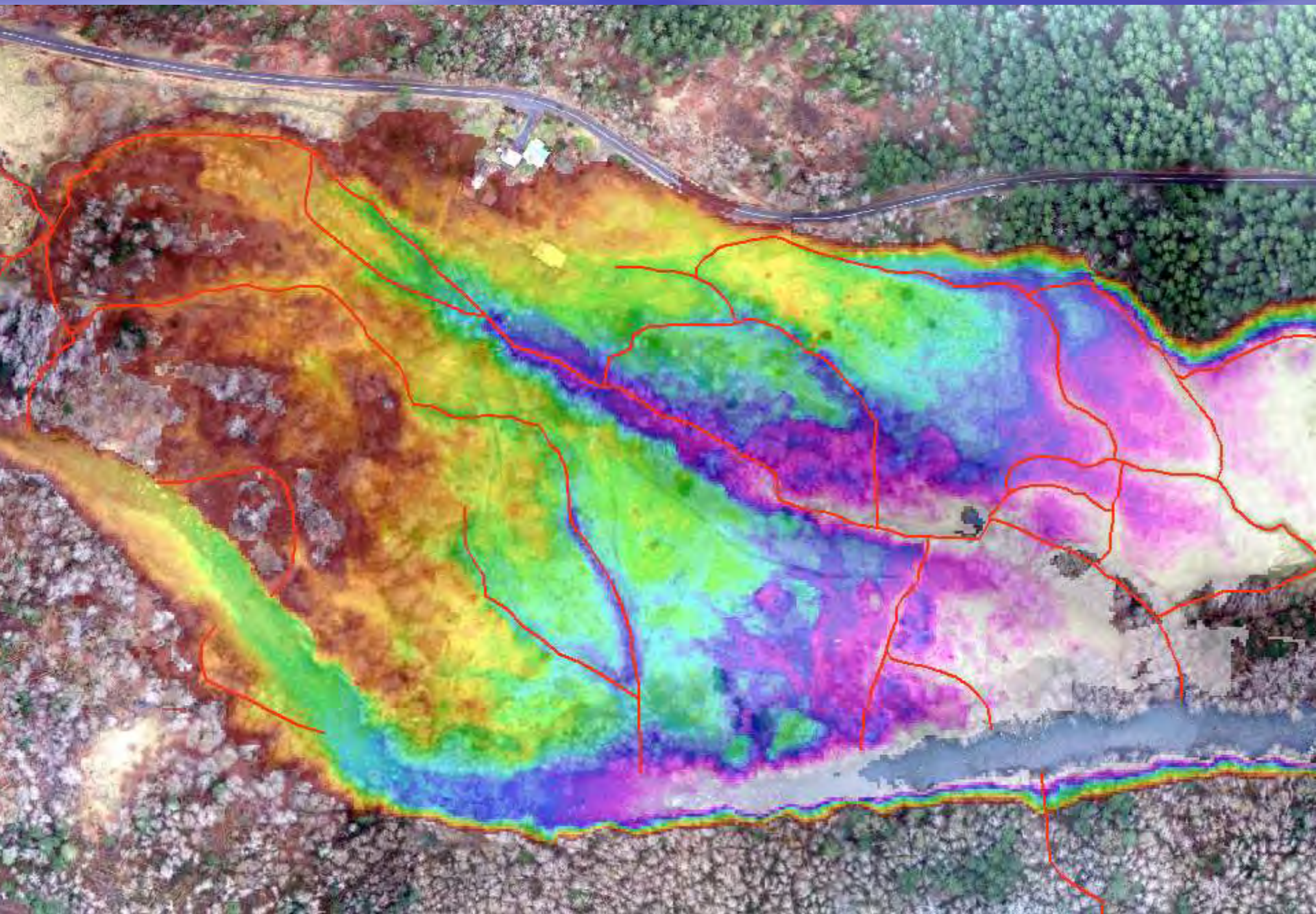








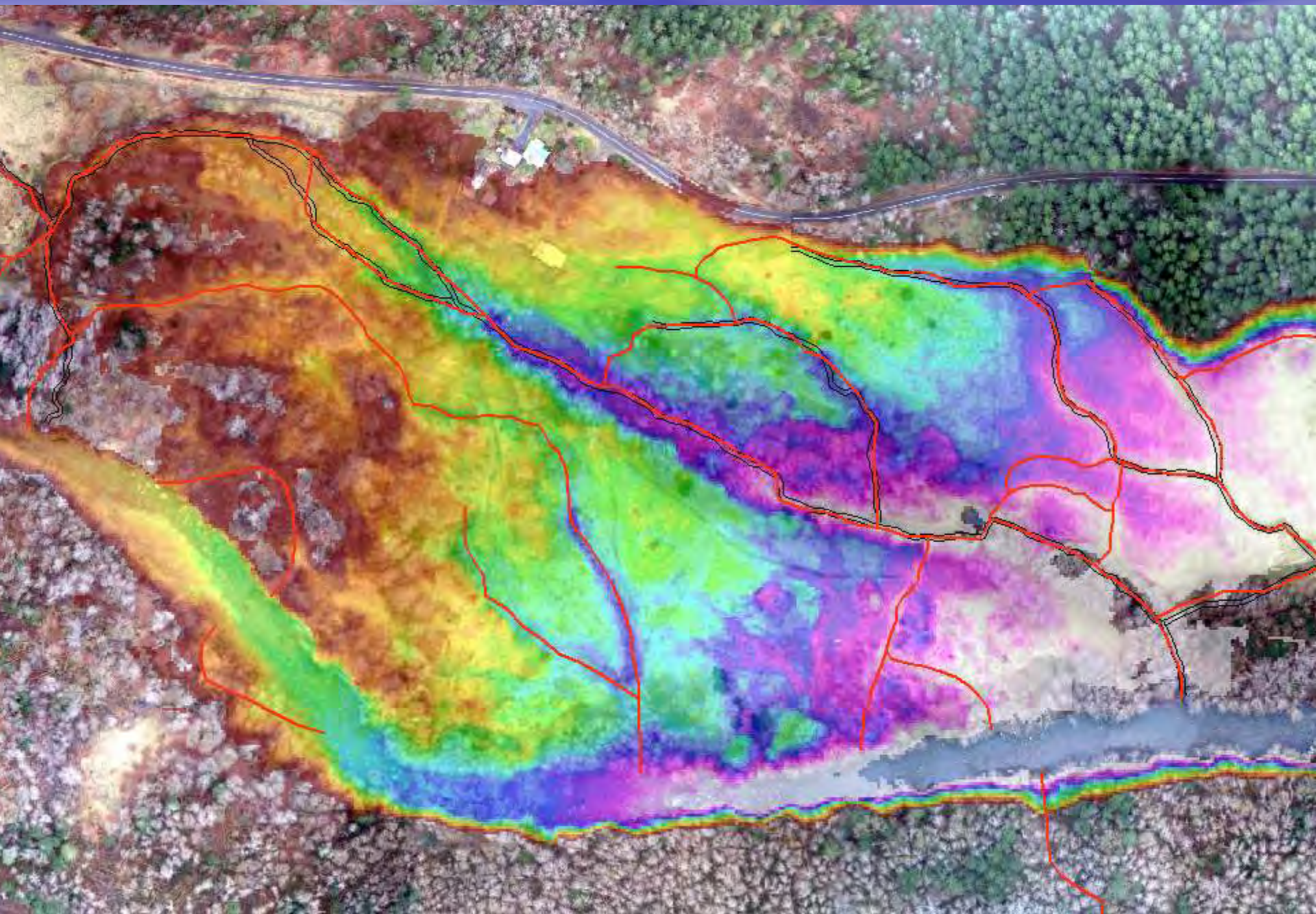




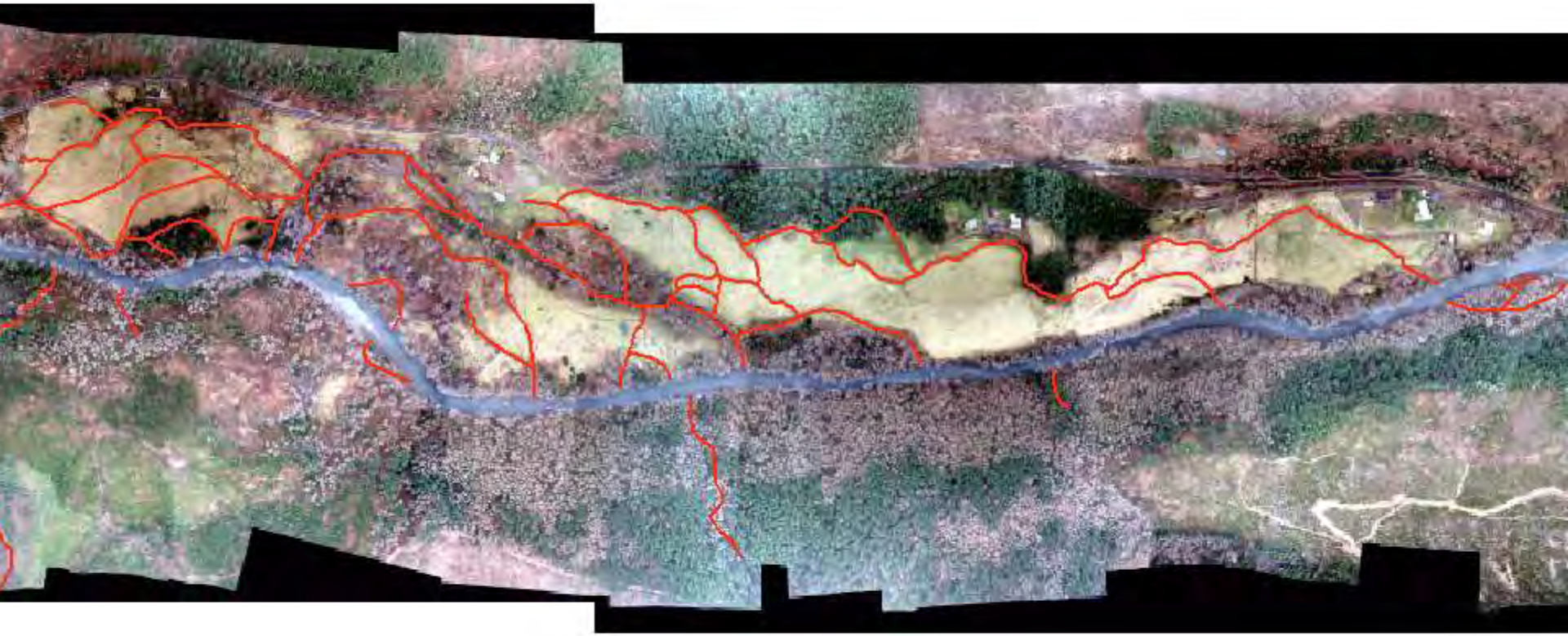








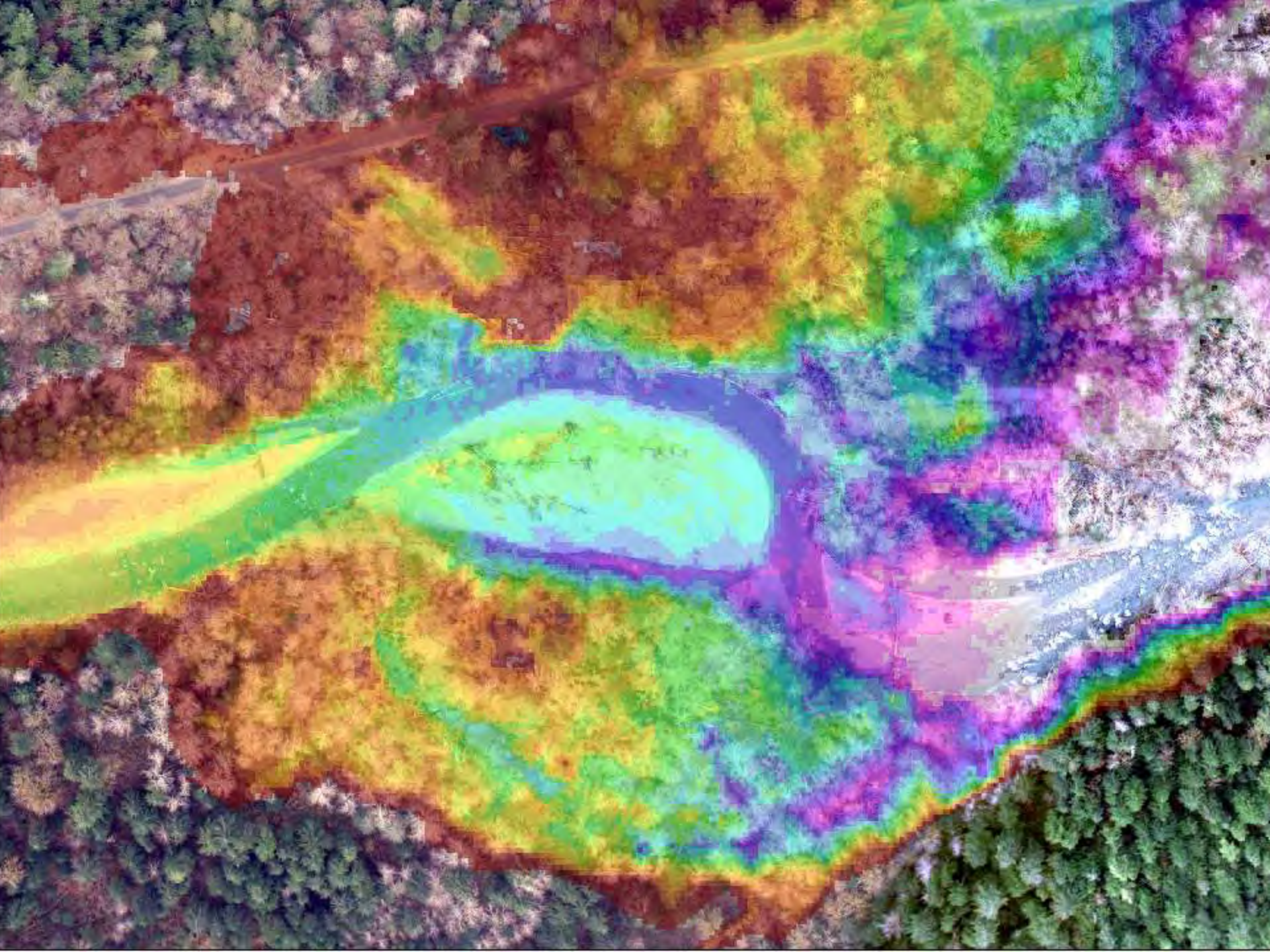




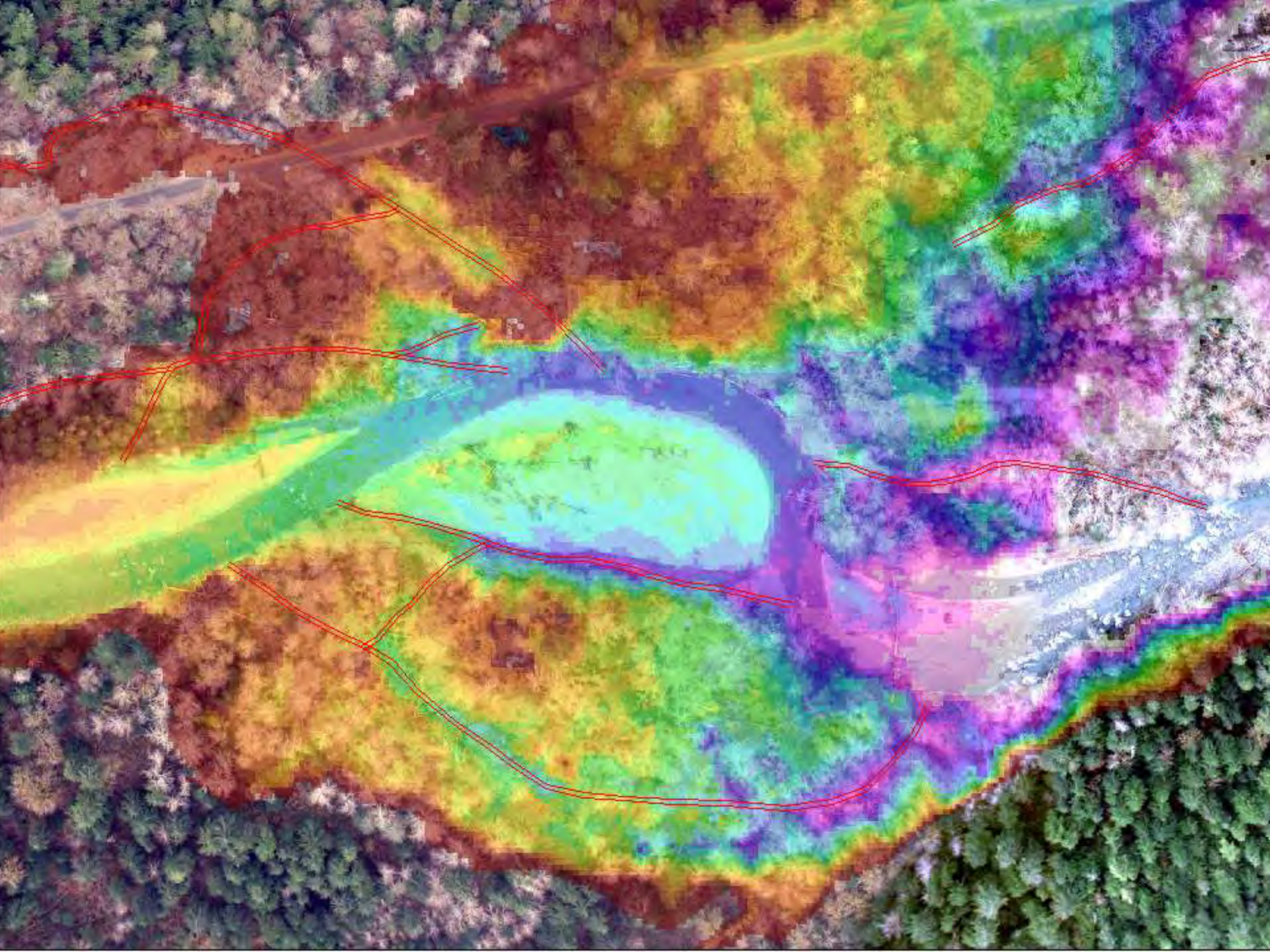




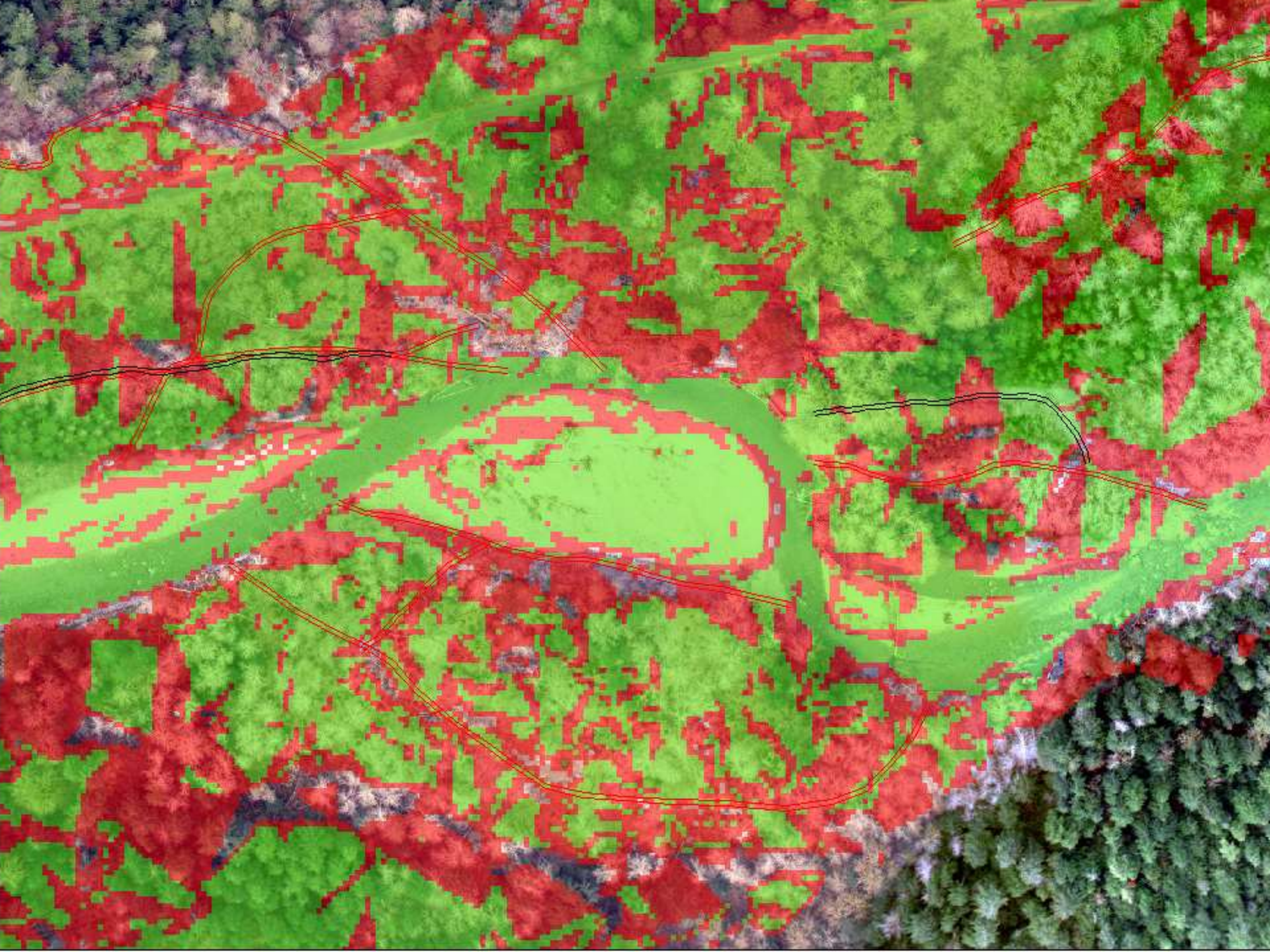








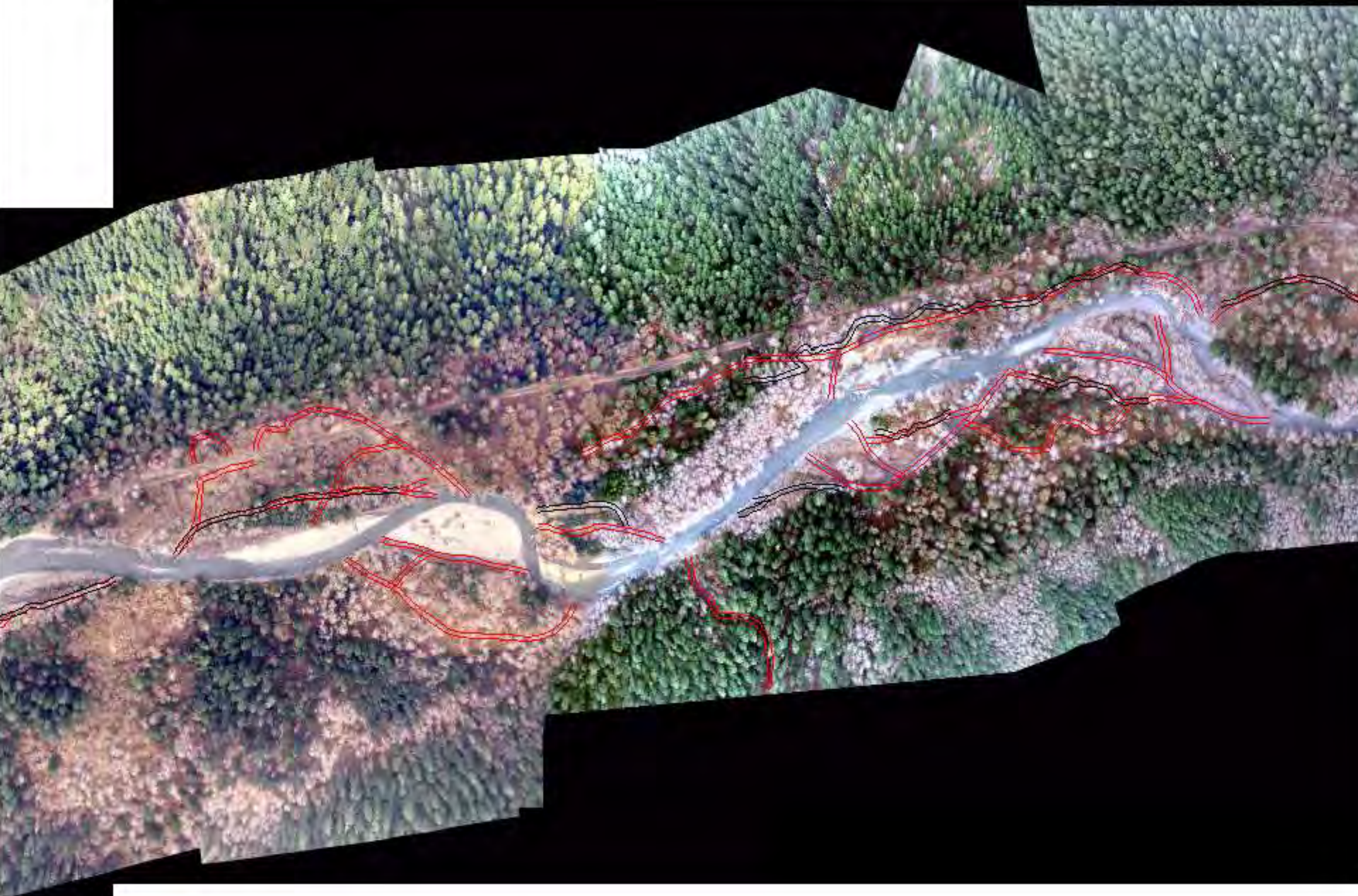










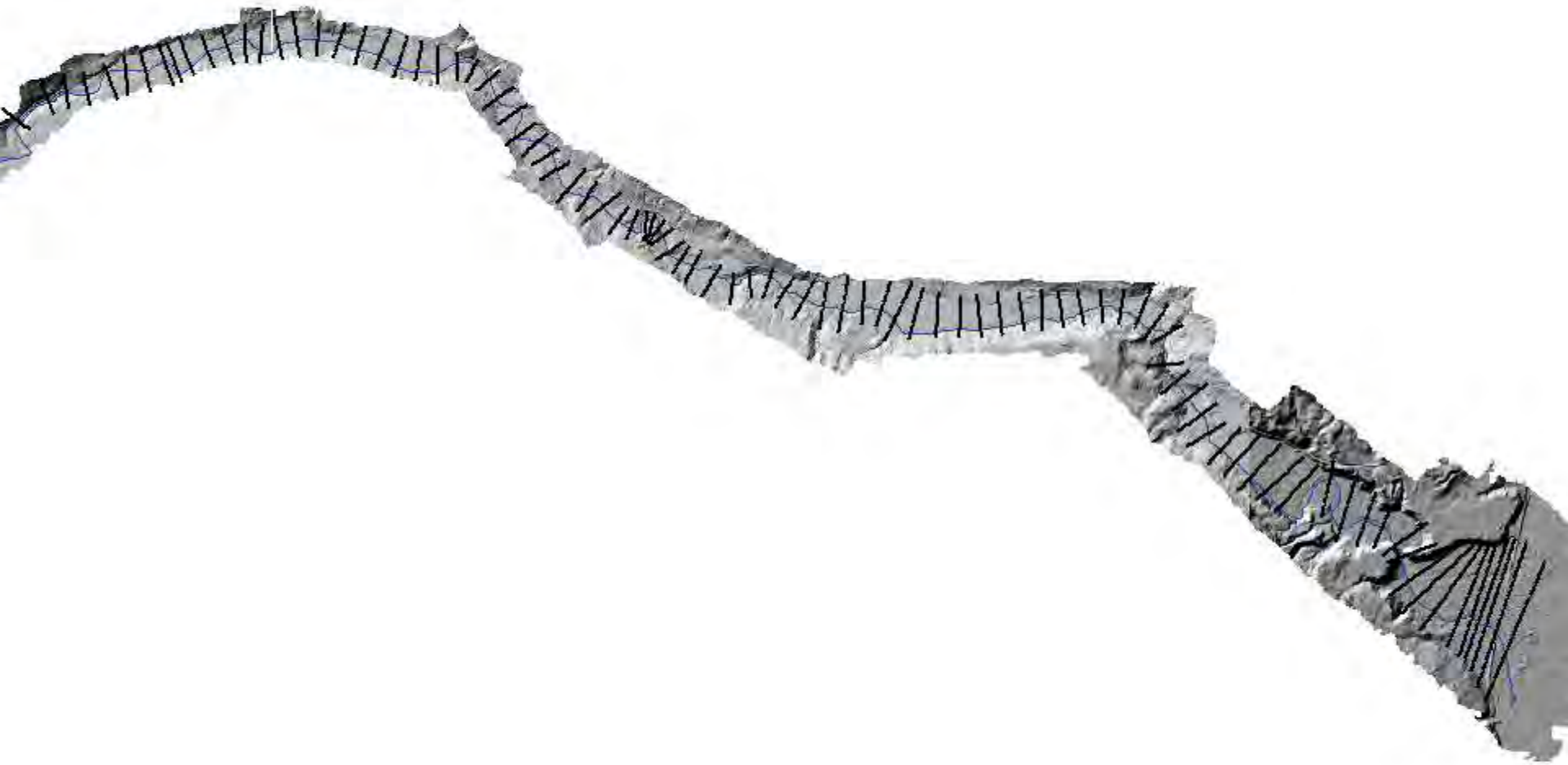




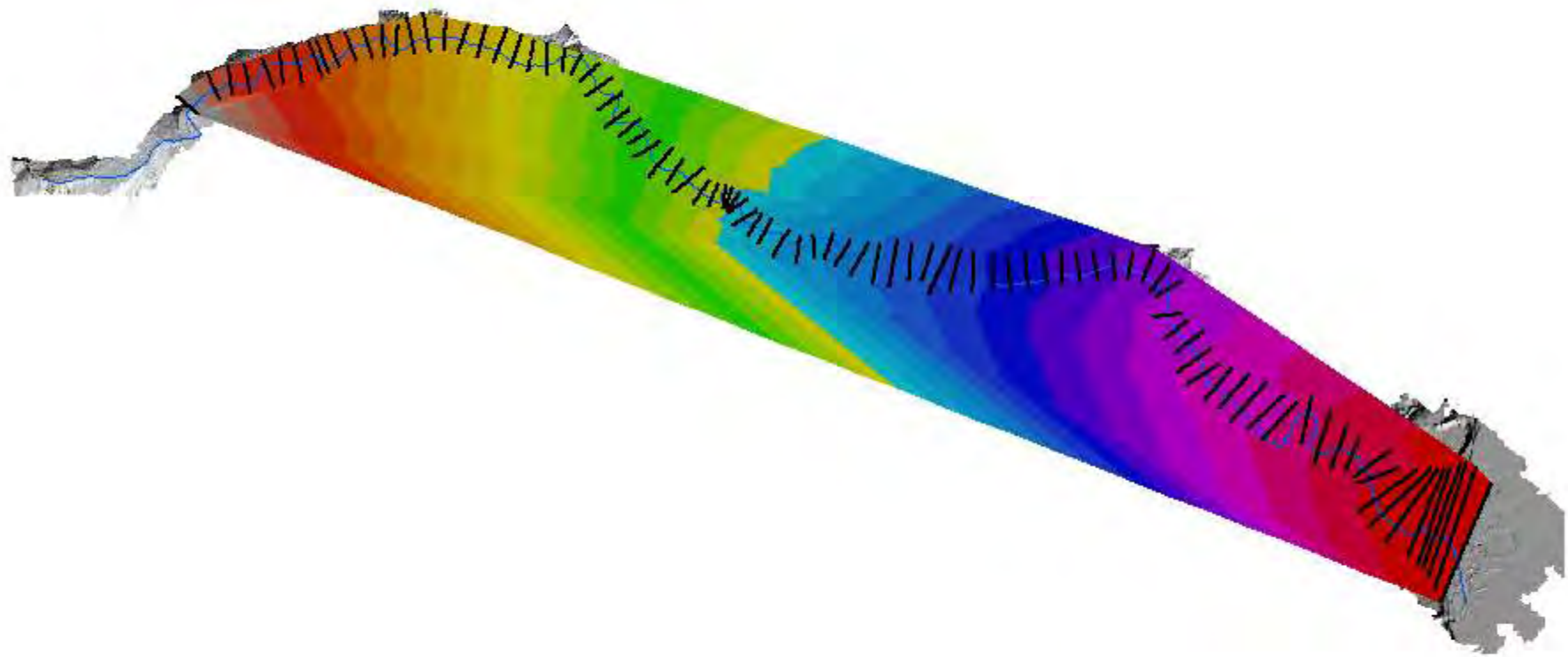
The background of the slide is a deep blue color with a subtle, wavy texture that resembles water. On the left side, there is a bright, glowing area representing the sun, which creates a shimmering reflection across the surface of the water, extending towards the center. The overall effect is a serene and naturalistic scene.

ELEVATION ABOVE RIVER  
ELEVATION

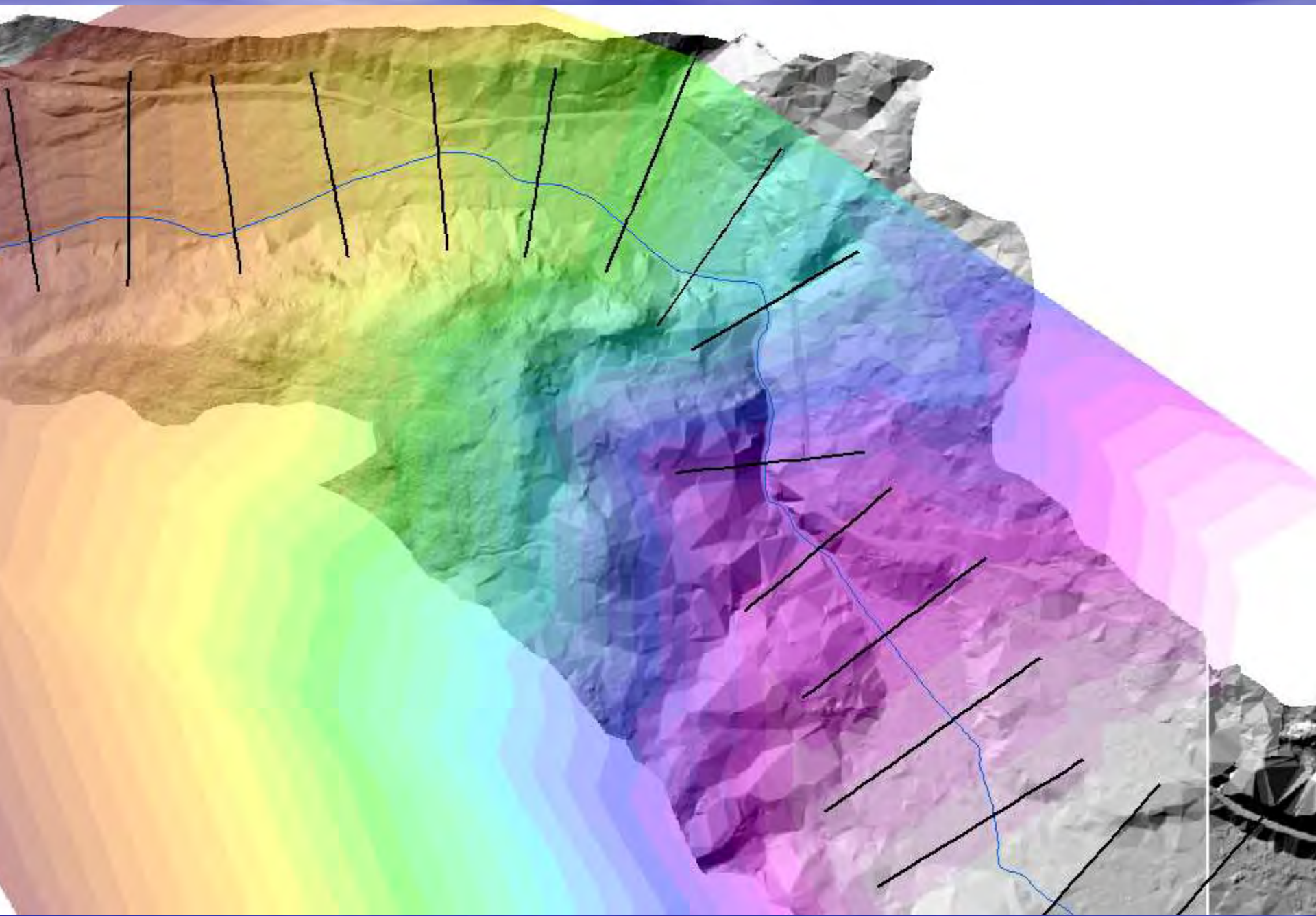




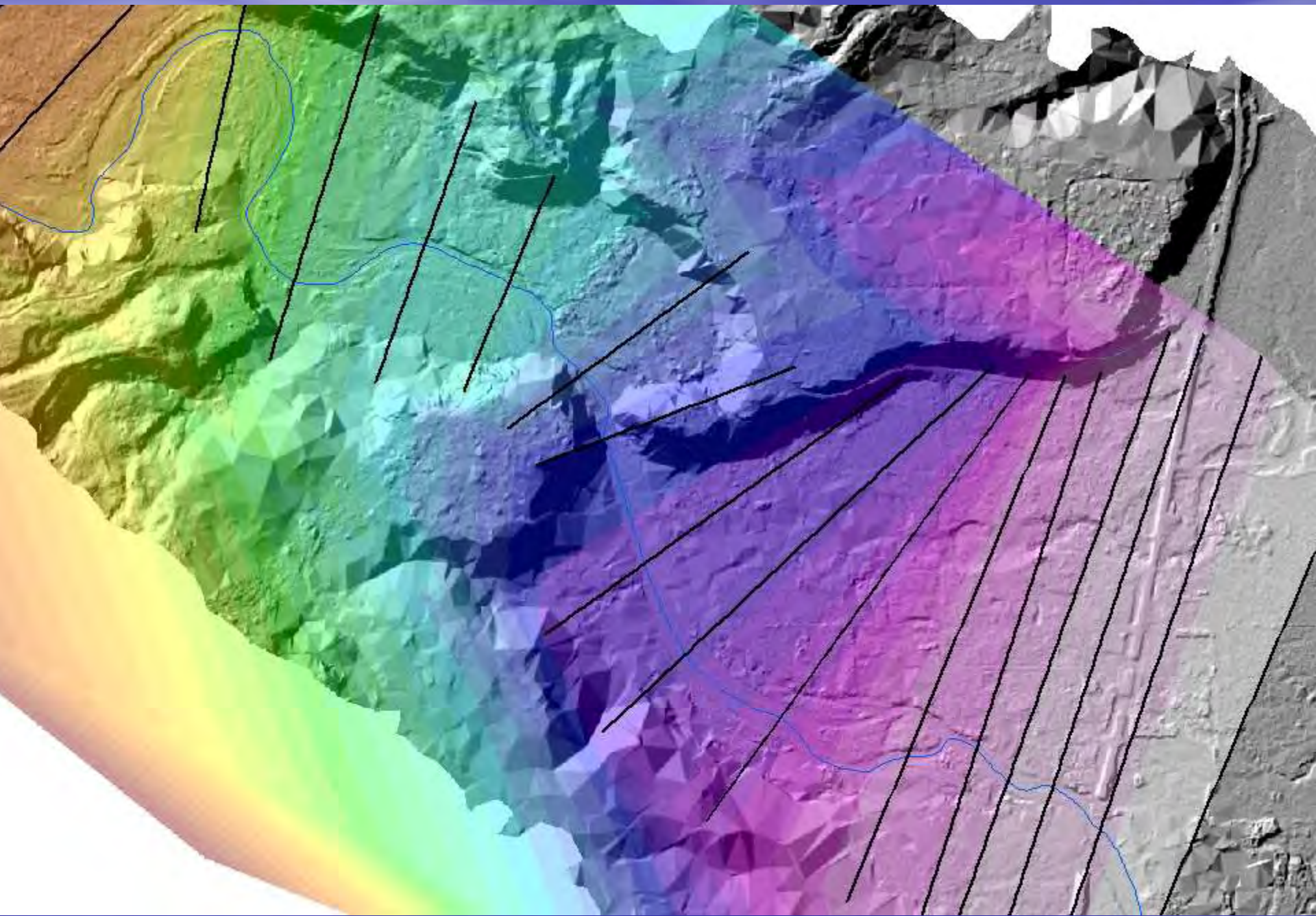




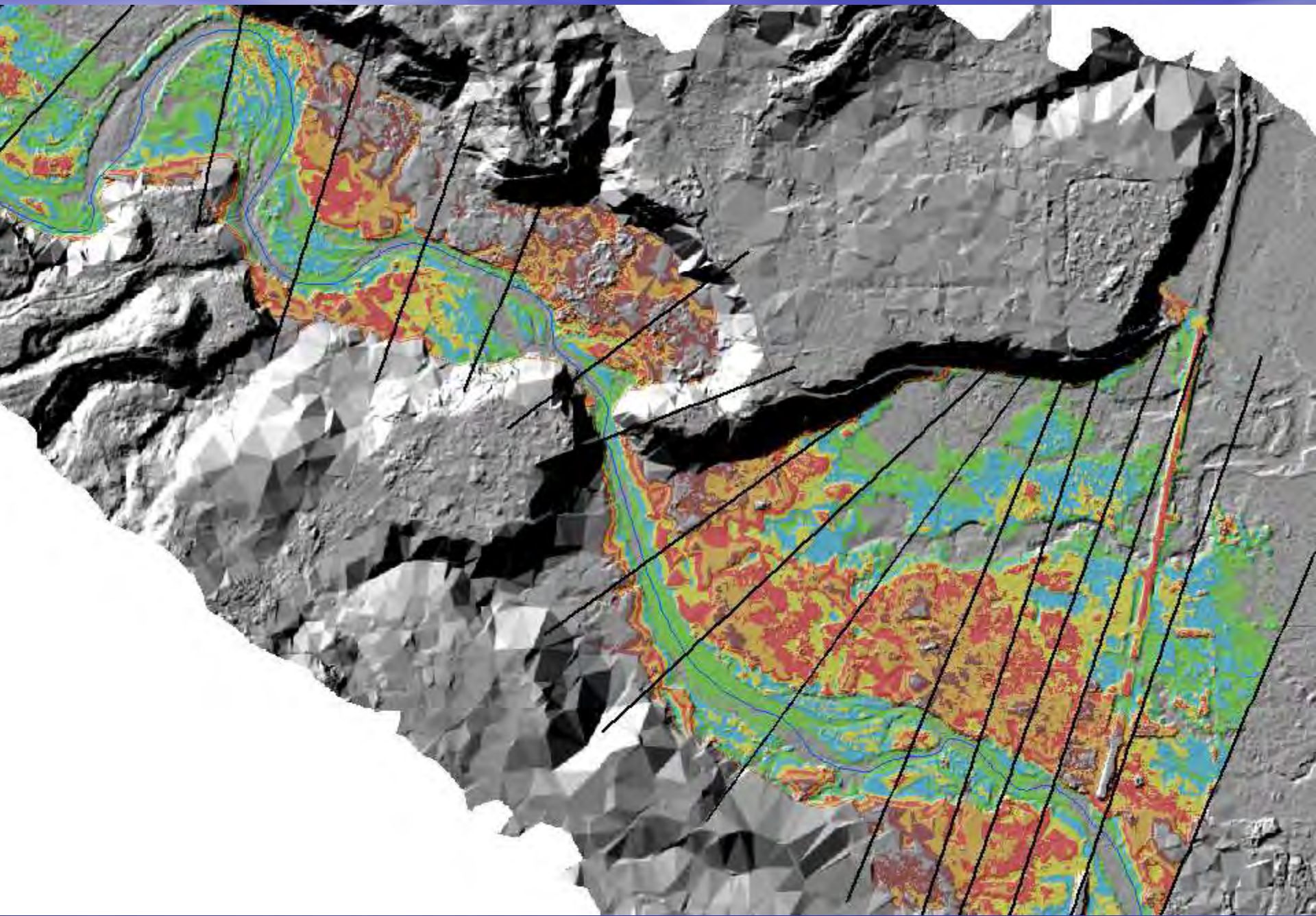




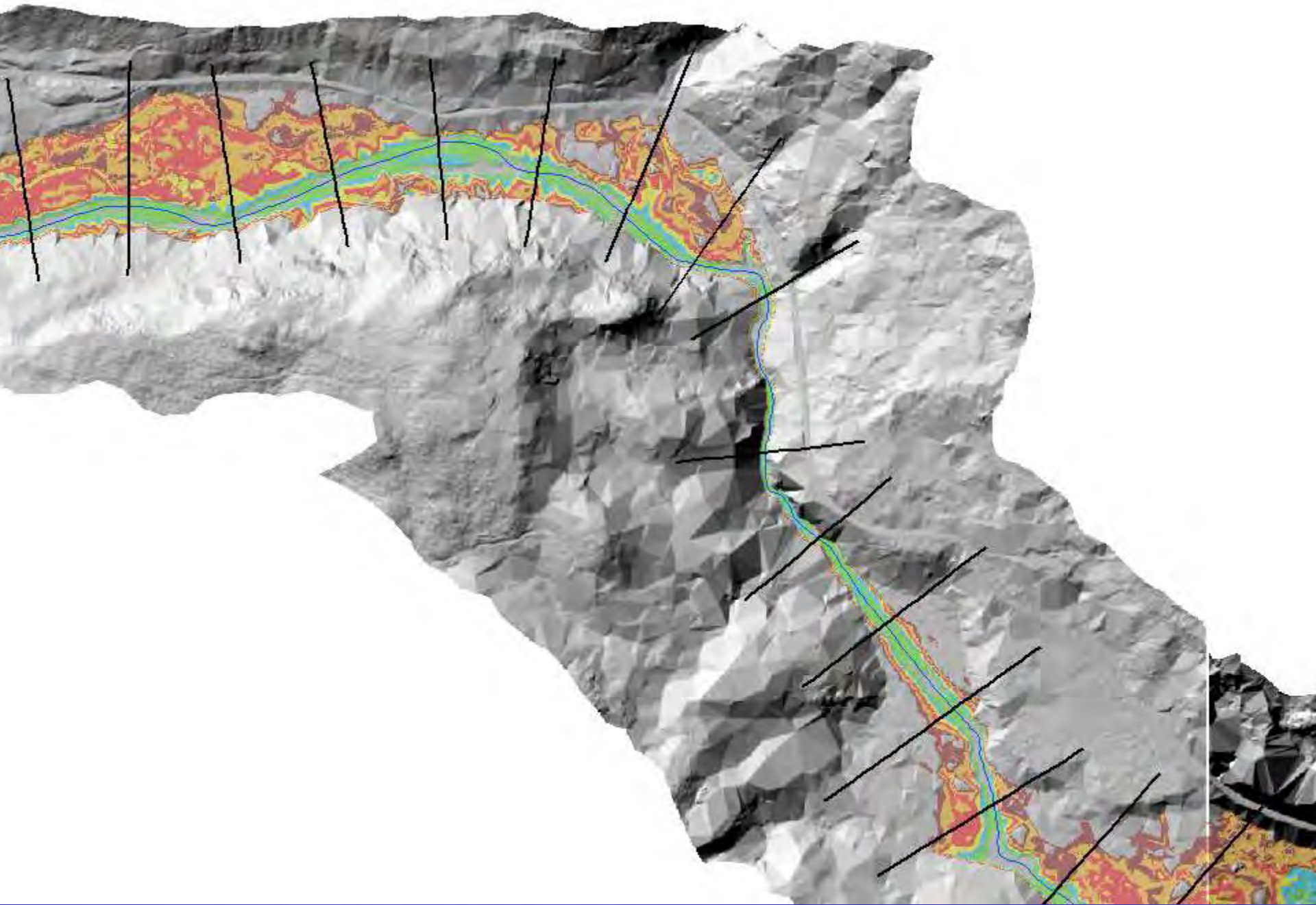




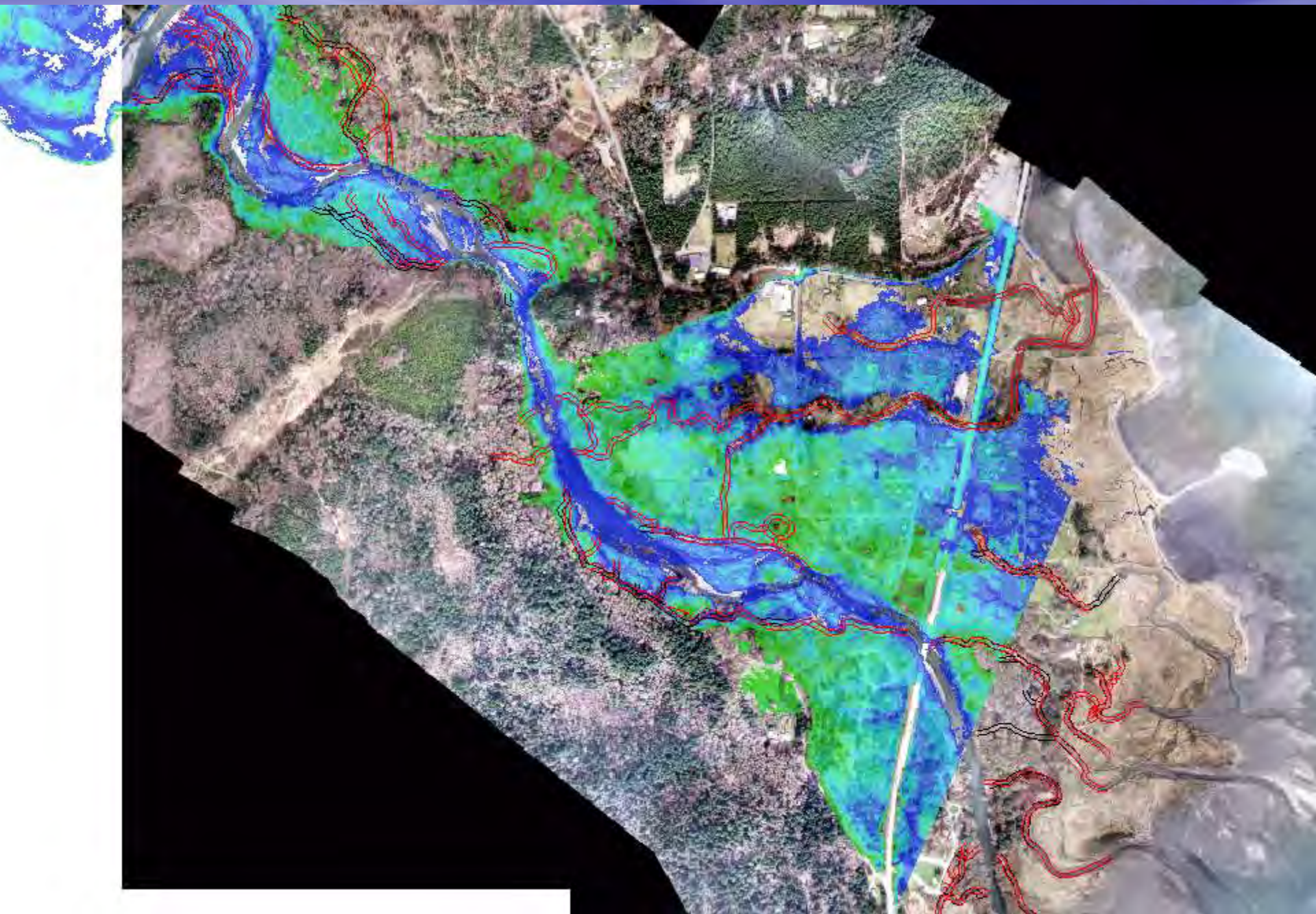




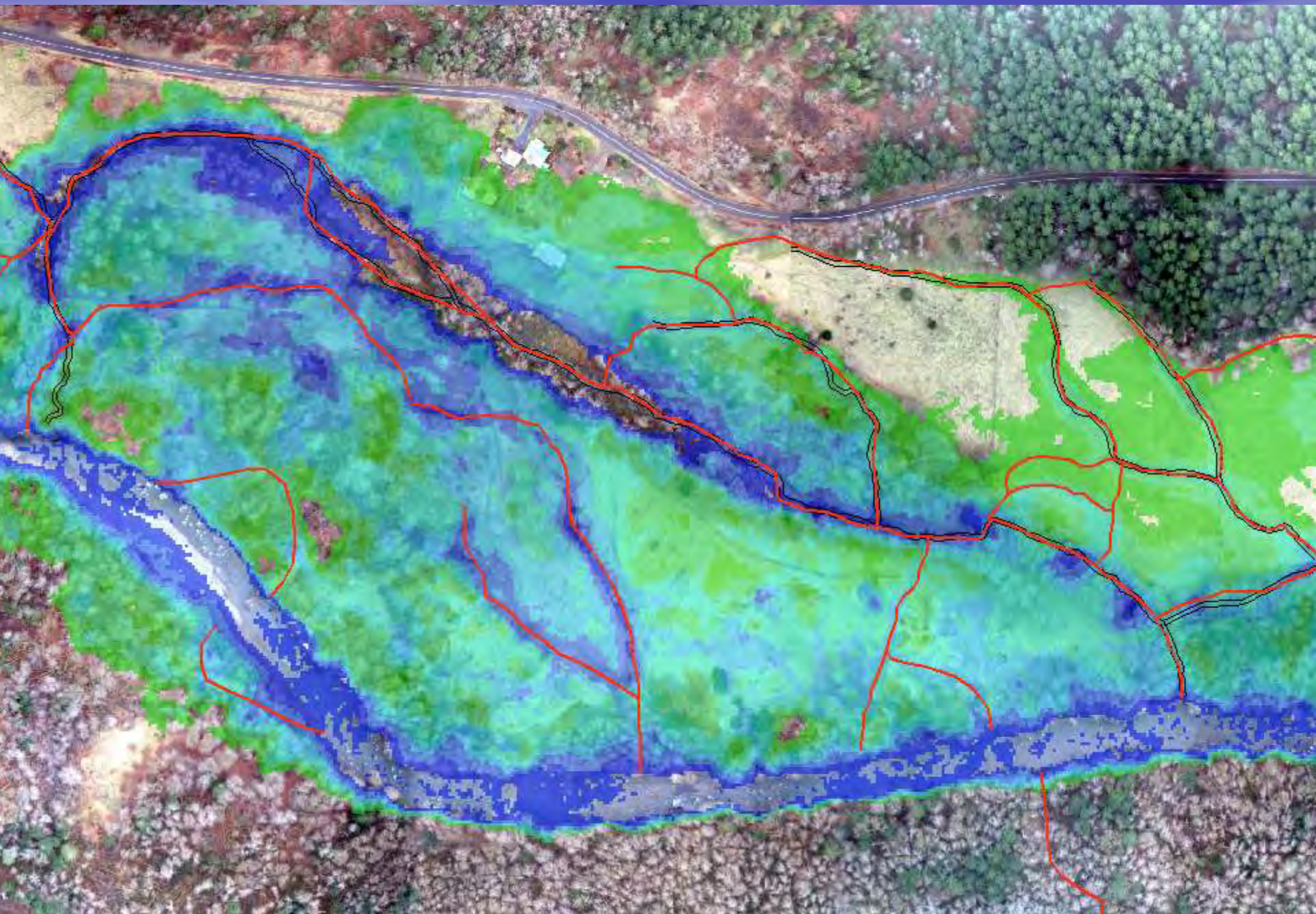




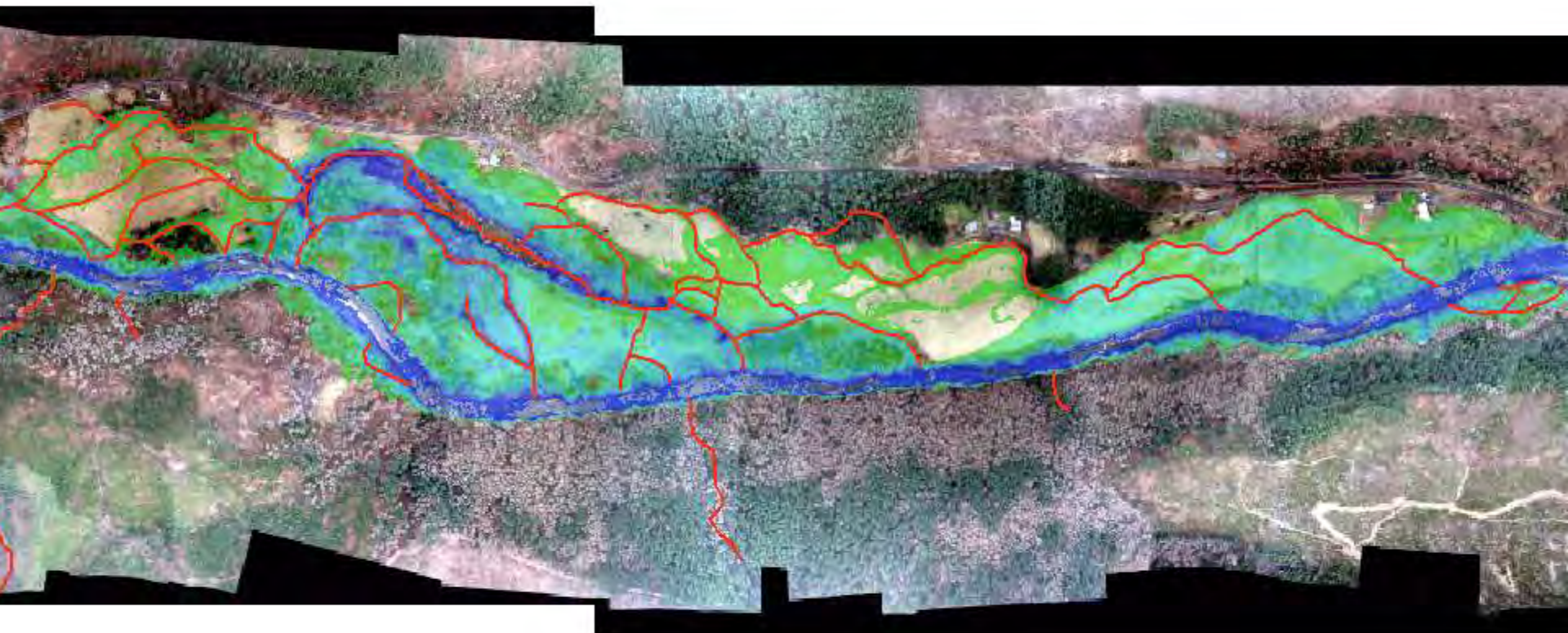




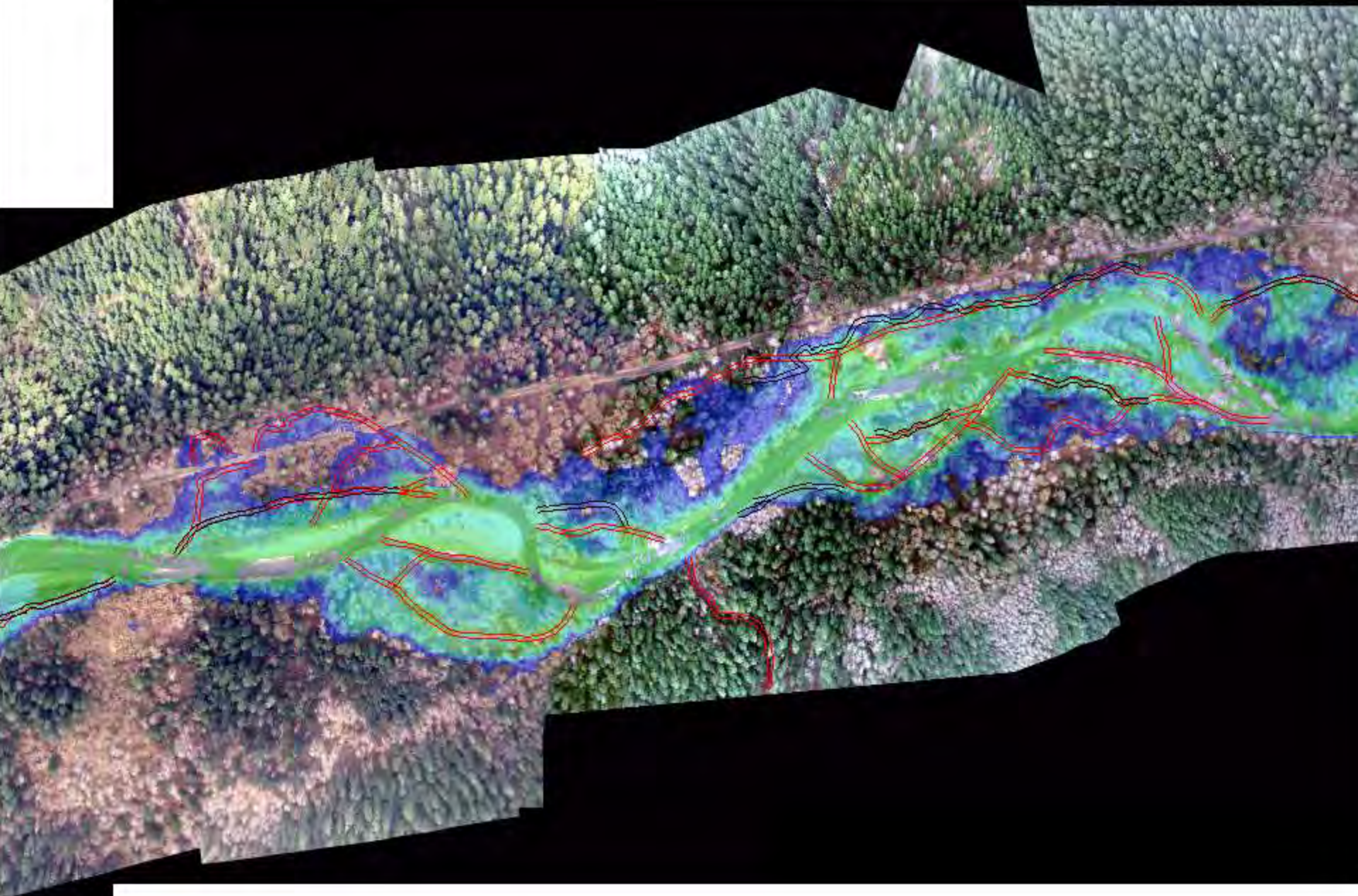




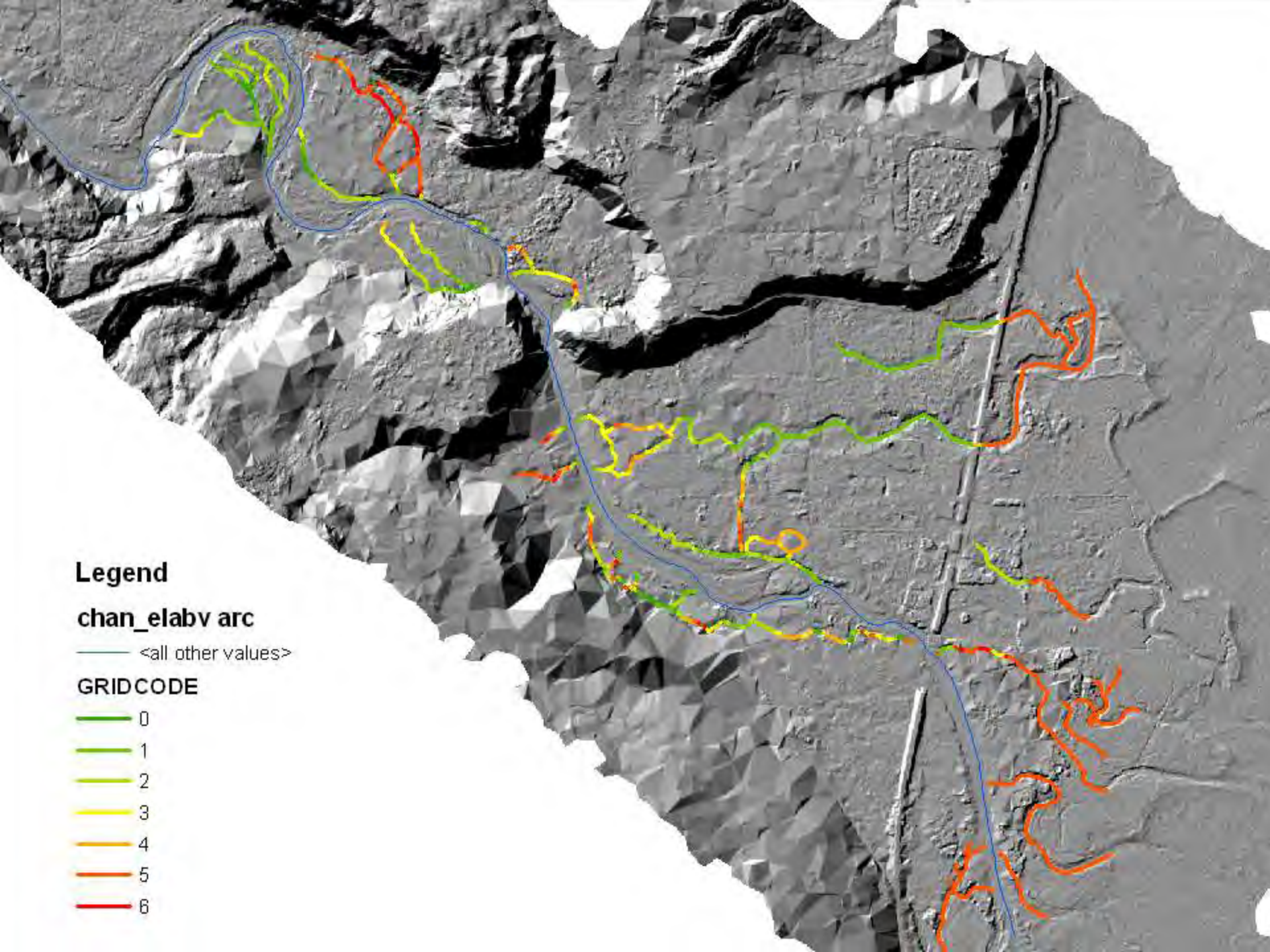












### Legend

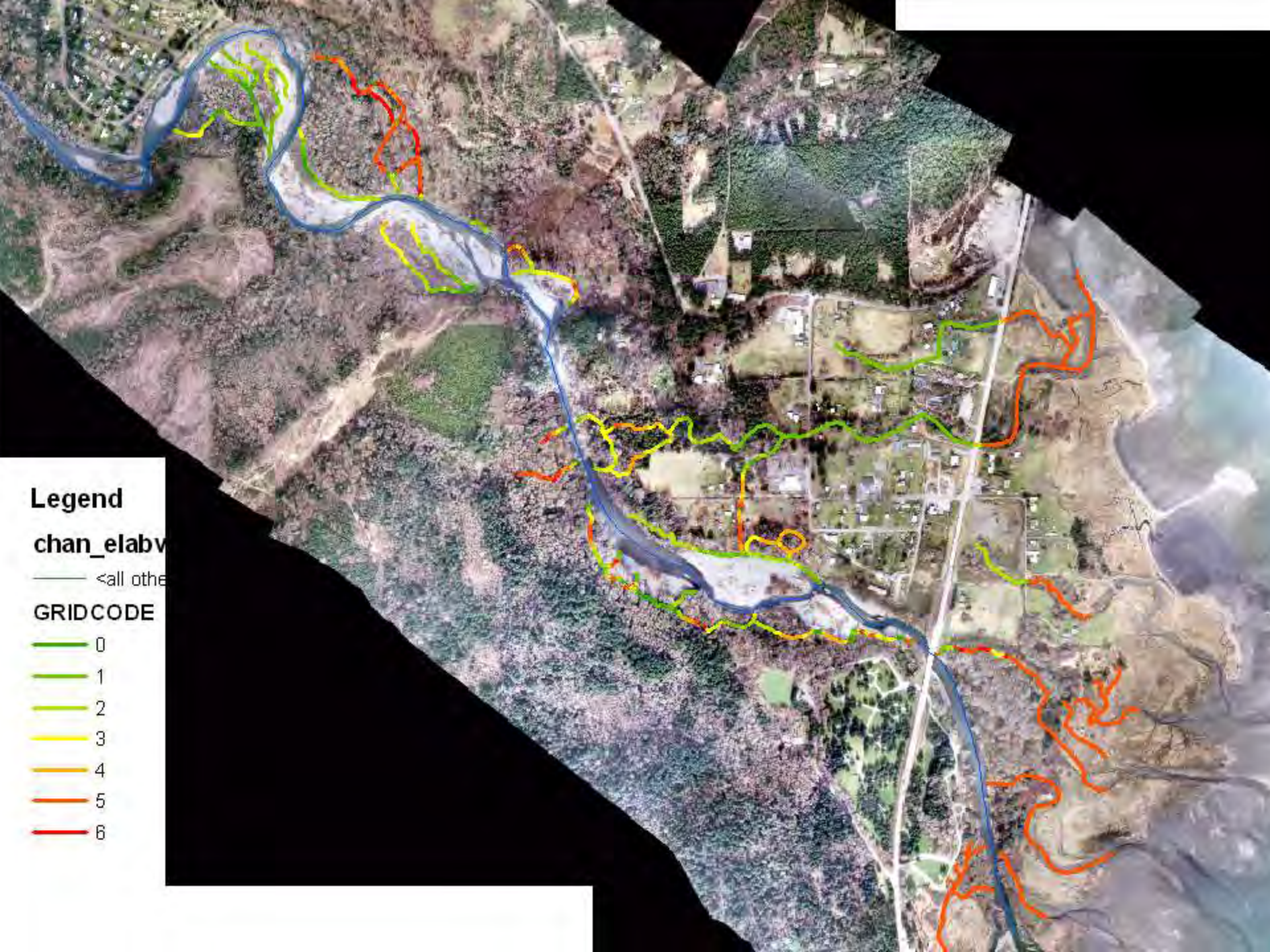
chan\_elabv arc

— <all other values>

### GRIDCODE

- 0
- 1
- 2
- 3
- 4
- 5
- 6





**Legend**

**chan\_elabv**

— <all other

**GRIDCODE**

- 0
- 1
- 2
- 3
- 4
- 5
- 6



- MidColumbia LiDAR

