Presentation outlining details of final basleine fire model layers for Sagehen Experimental Forest. SPLATs performance analysis pending final determination of area treatments.

Translating SPLATs from a theoretical to a real world landscape

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10/14/2007

B) Strategically PLaced Area TreatmentS

- SPLATs are blocks of land, ranging from **25 to 195 acres**, where the vegetation has been treated to reduce fuel loading.
- The treatment areas are placed so that a spreading fire **does not have a clear path** of untreated fuels from the bottom of the slope to the ridgetop.
- Local fire managers **considered historic fire regimes** and the potential for severe wildfires (based on fuel loading, prevailing wind direction, and terrain features) in deciding where to place area treatments.
- The spatial pattern of the treated areas is designed to **reduce rates of fire spread and reduces fire intensity at the head of the fire**.

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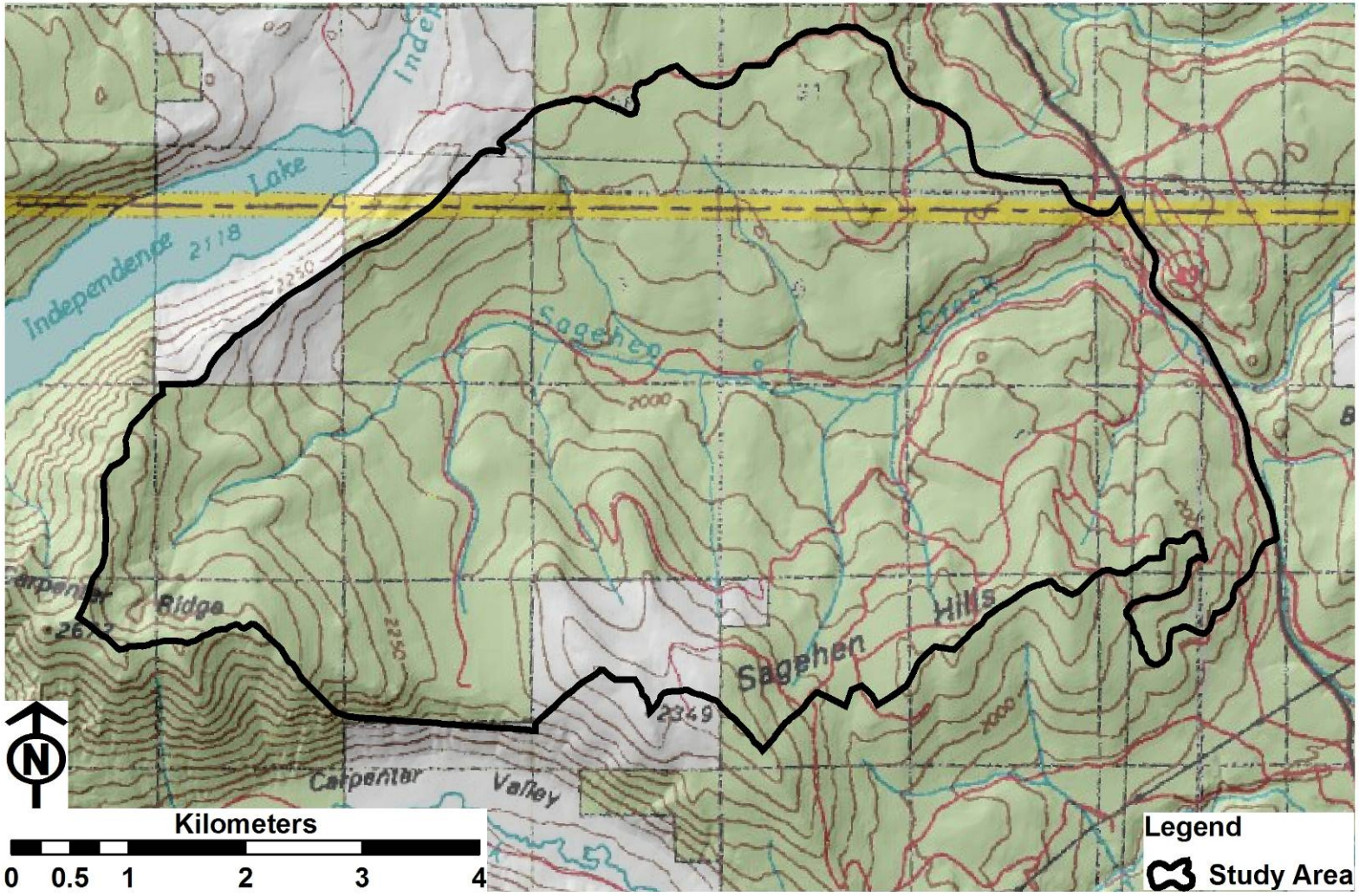
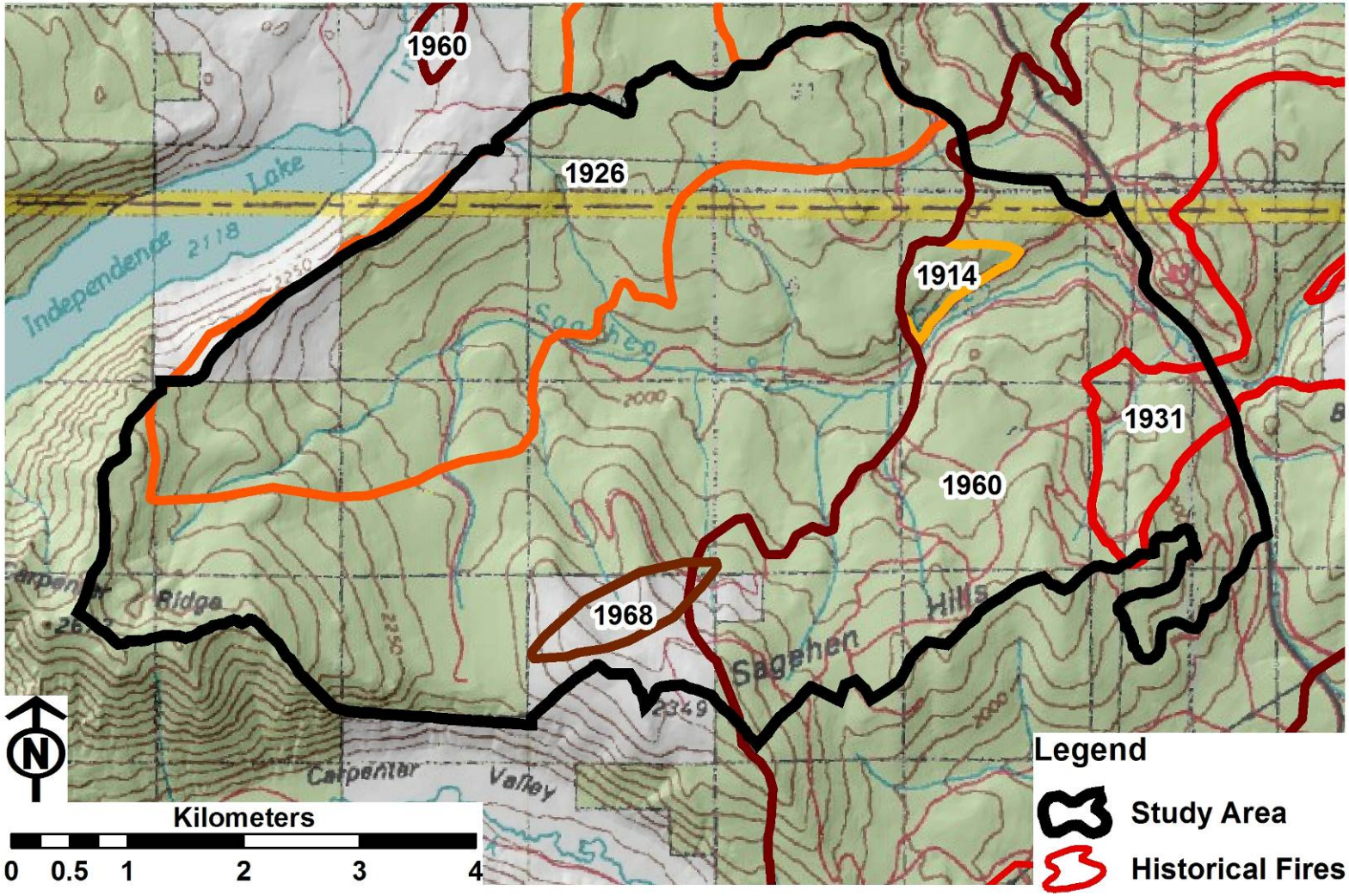
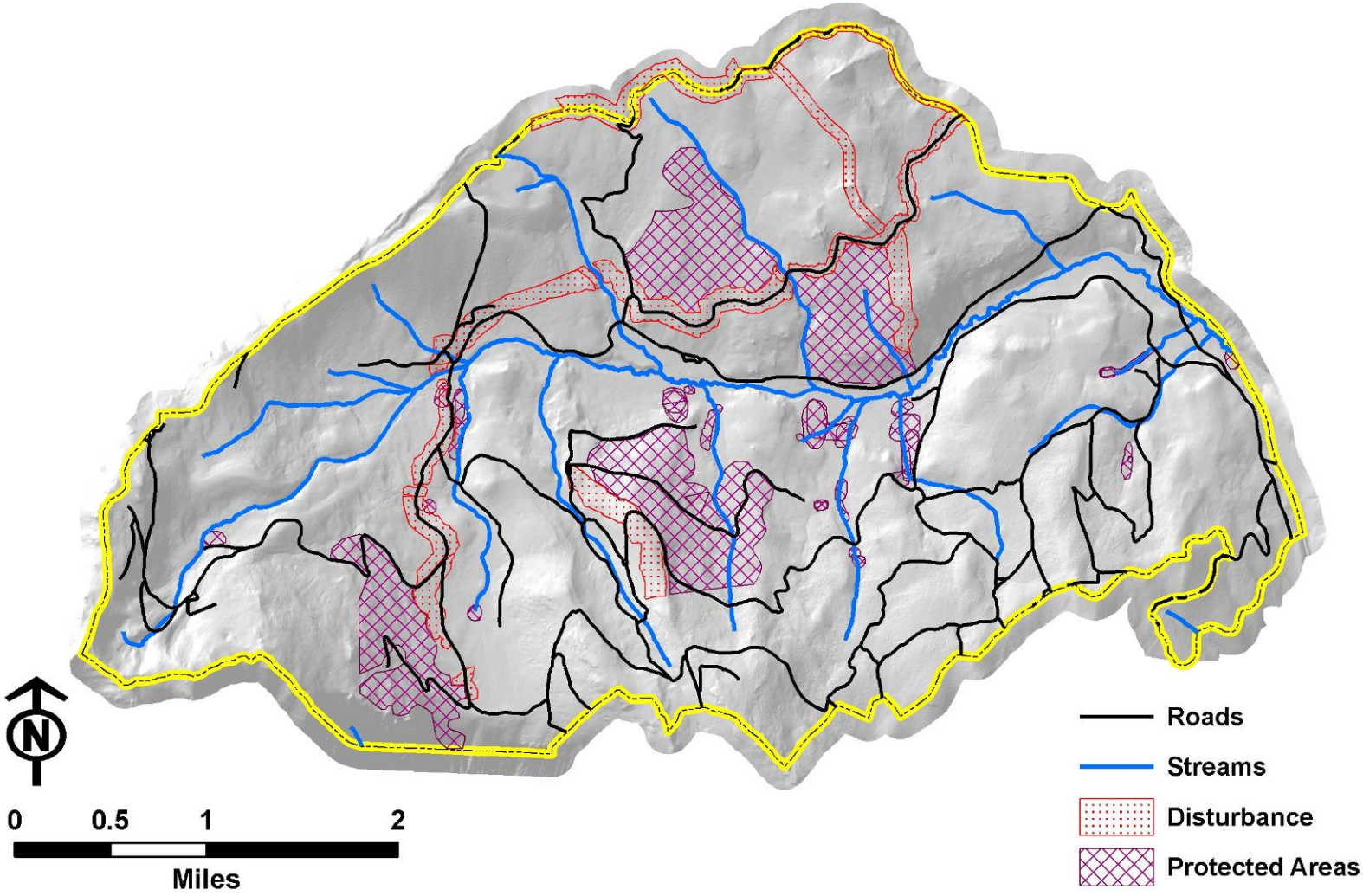
A) Study Area


Lake
Independence
2118
2250
Sagehen
Creek
2000
Ridge
2250
Sagehen
Hills
2349
Carpenter
Valley
N
Kilometers
0 0.5 1 2 3 4
Legend
Study Area

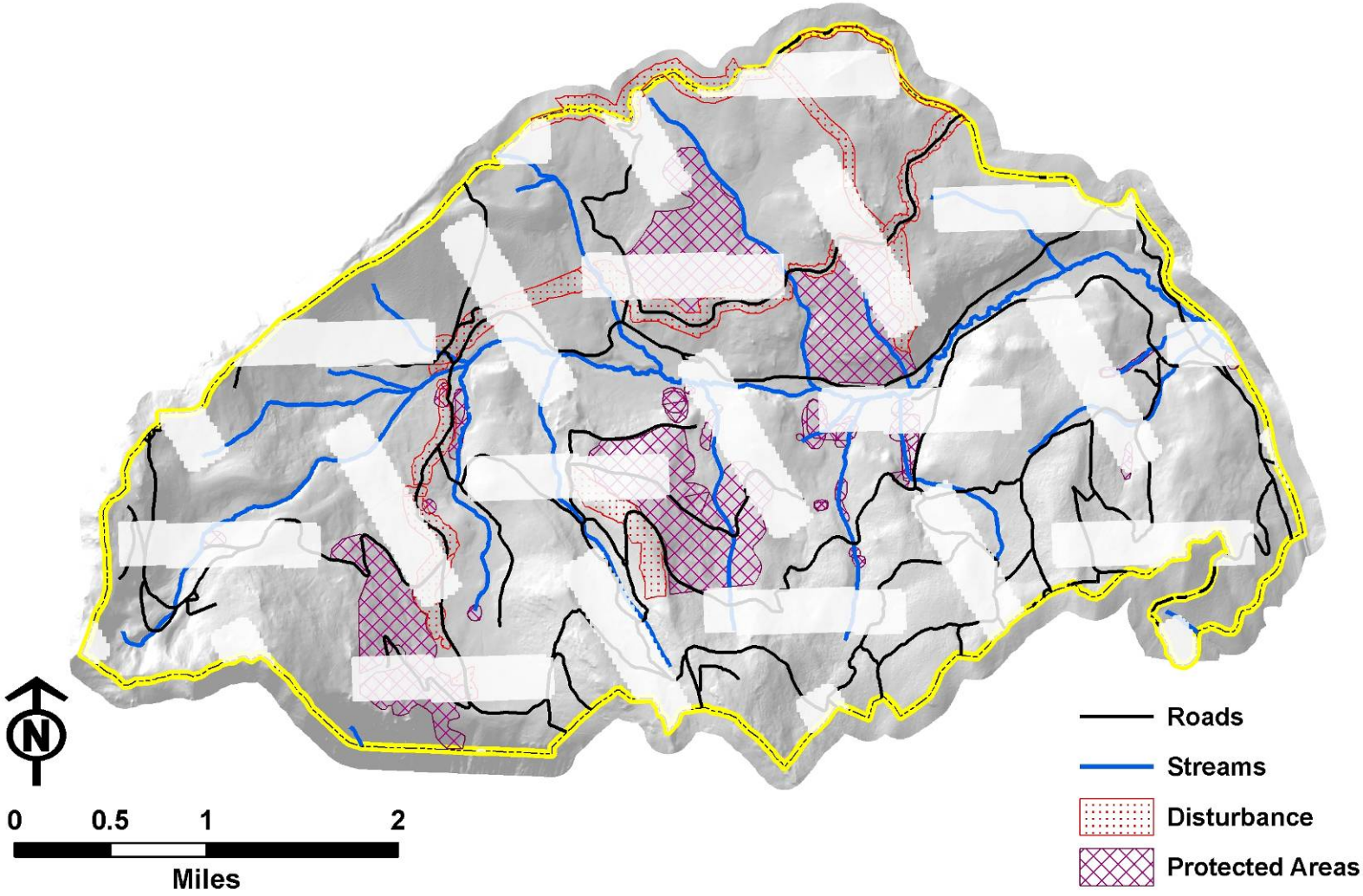
Fire History



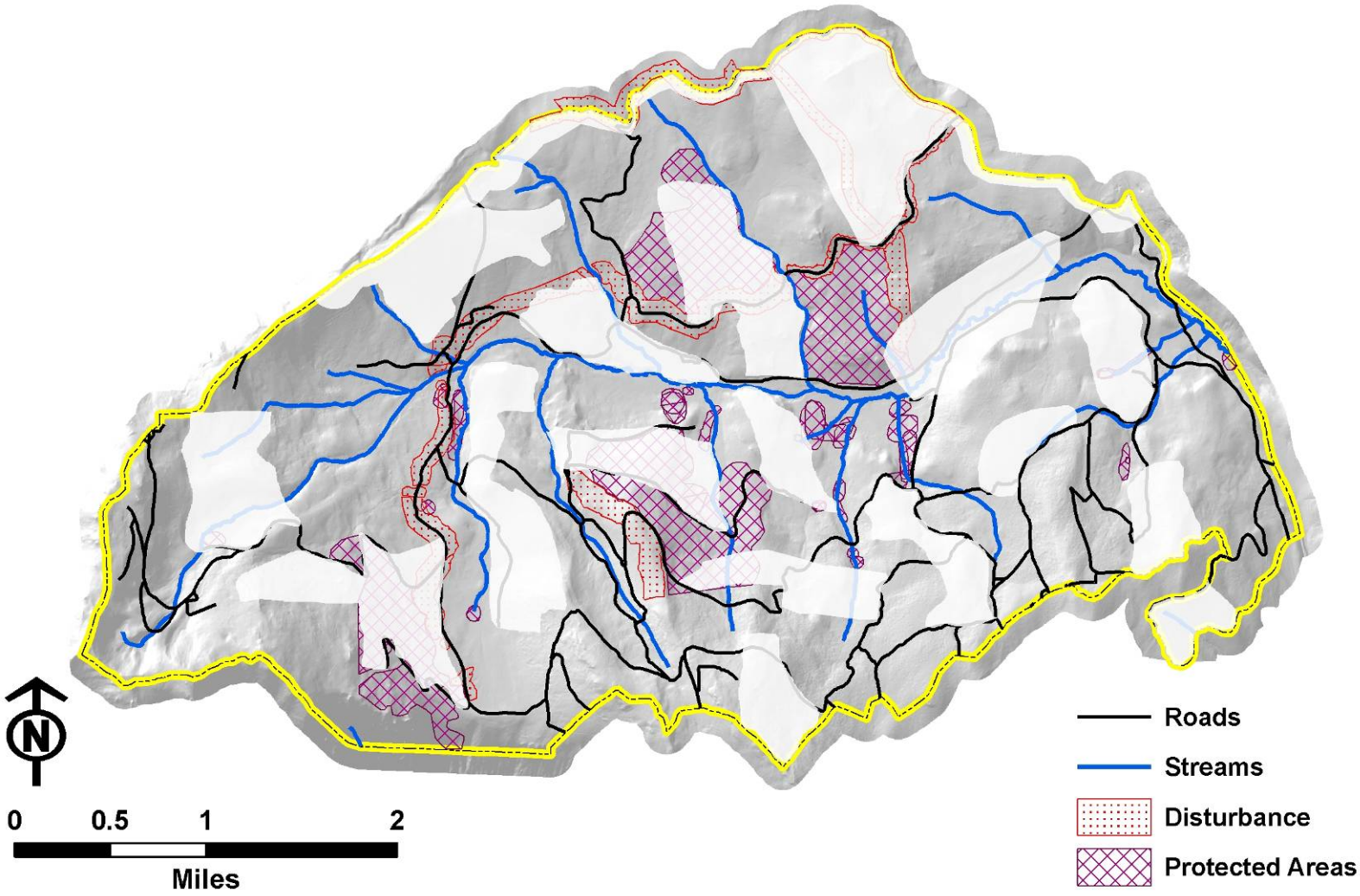
SPLAT: Landscape



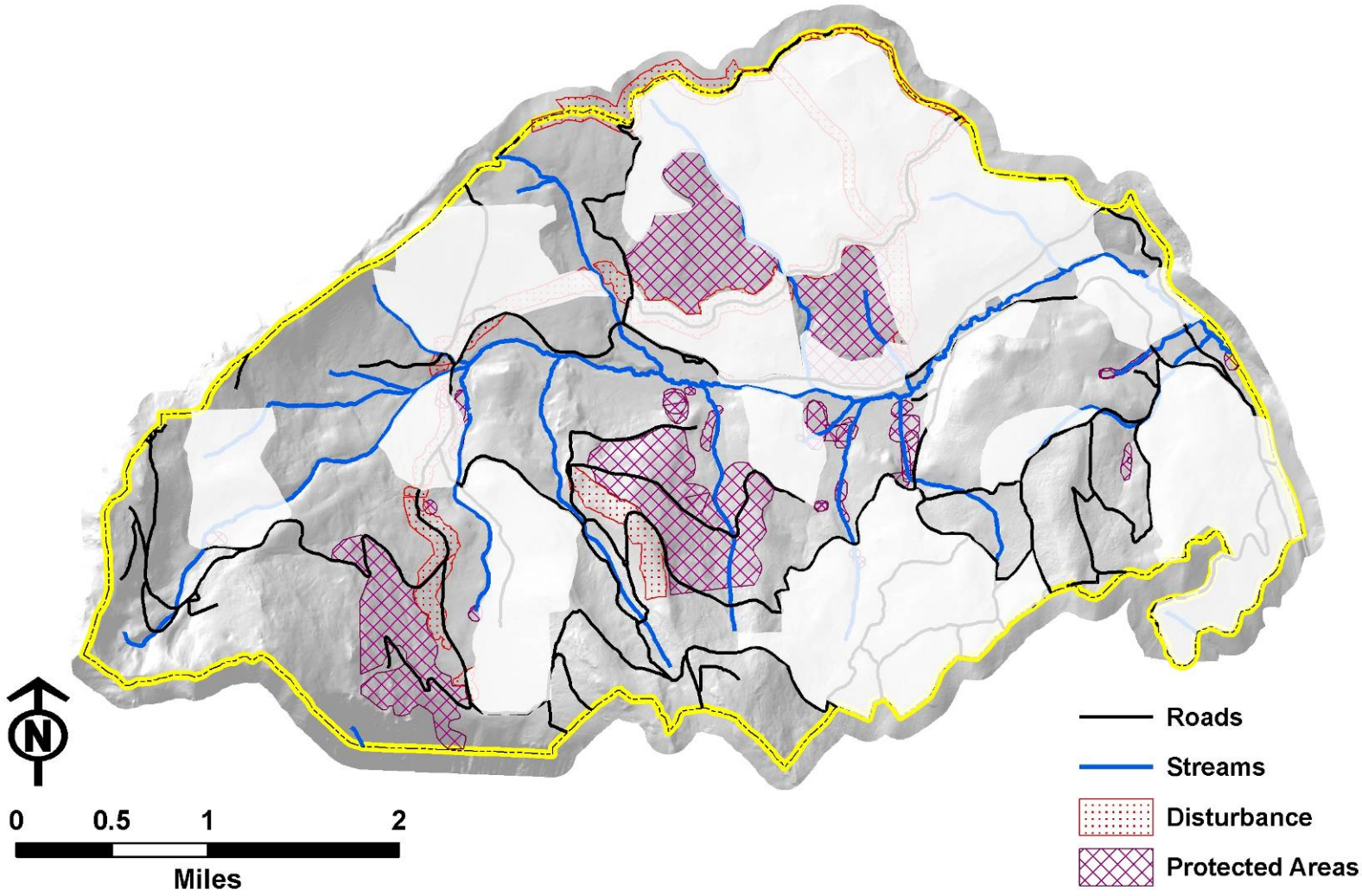
SPLAT: Finney



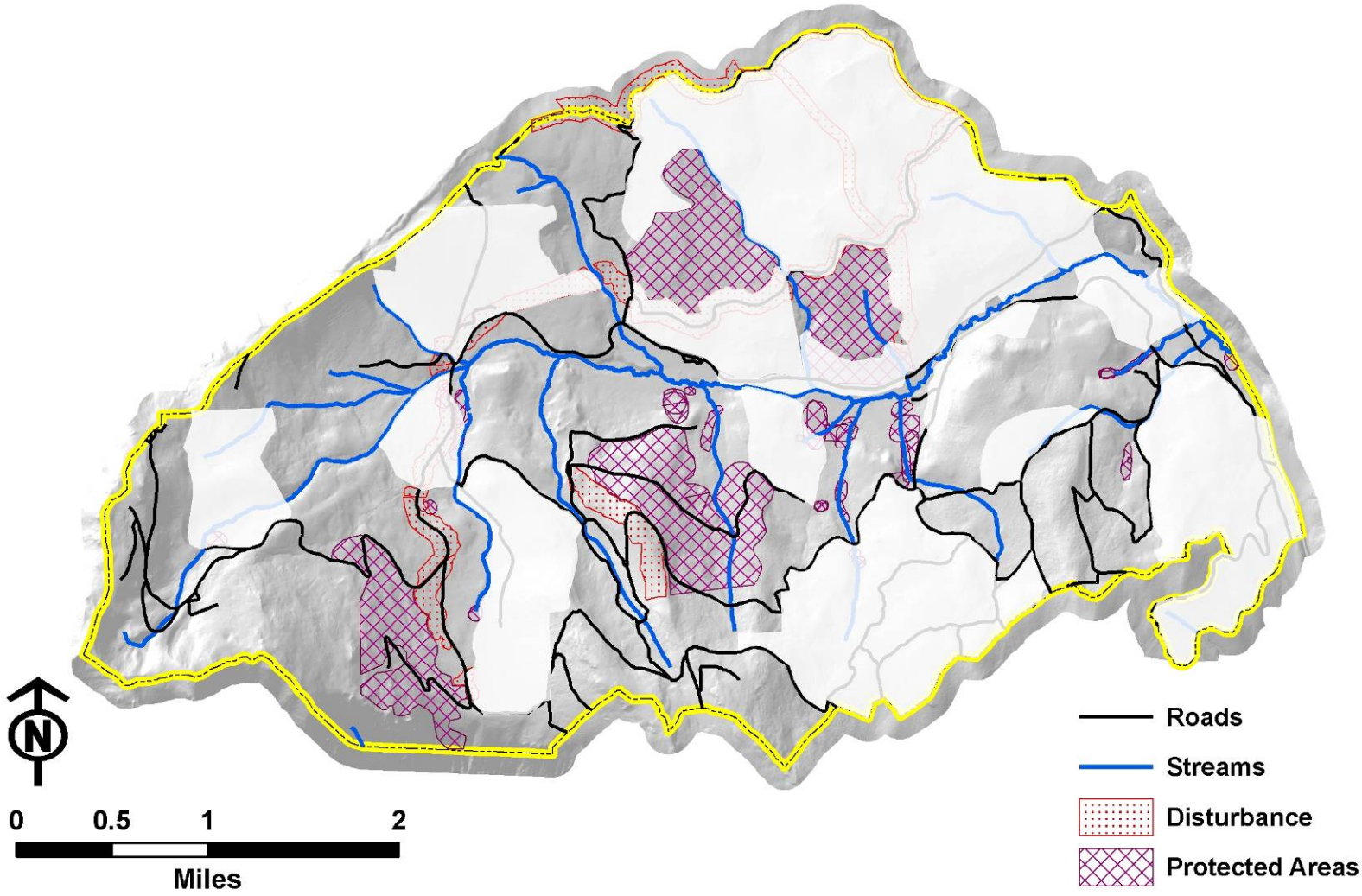
SPLAT: Modification 1



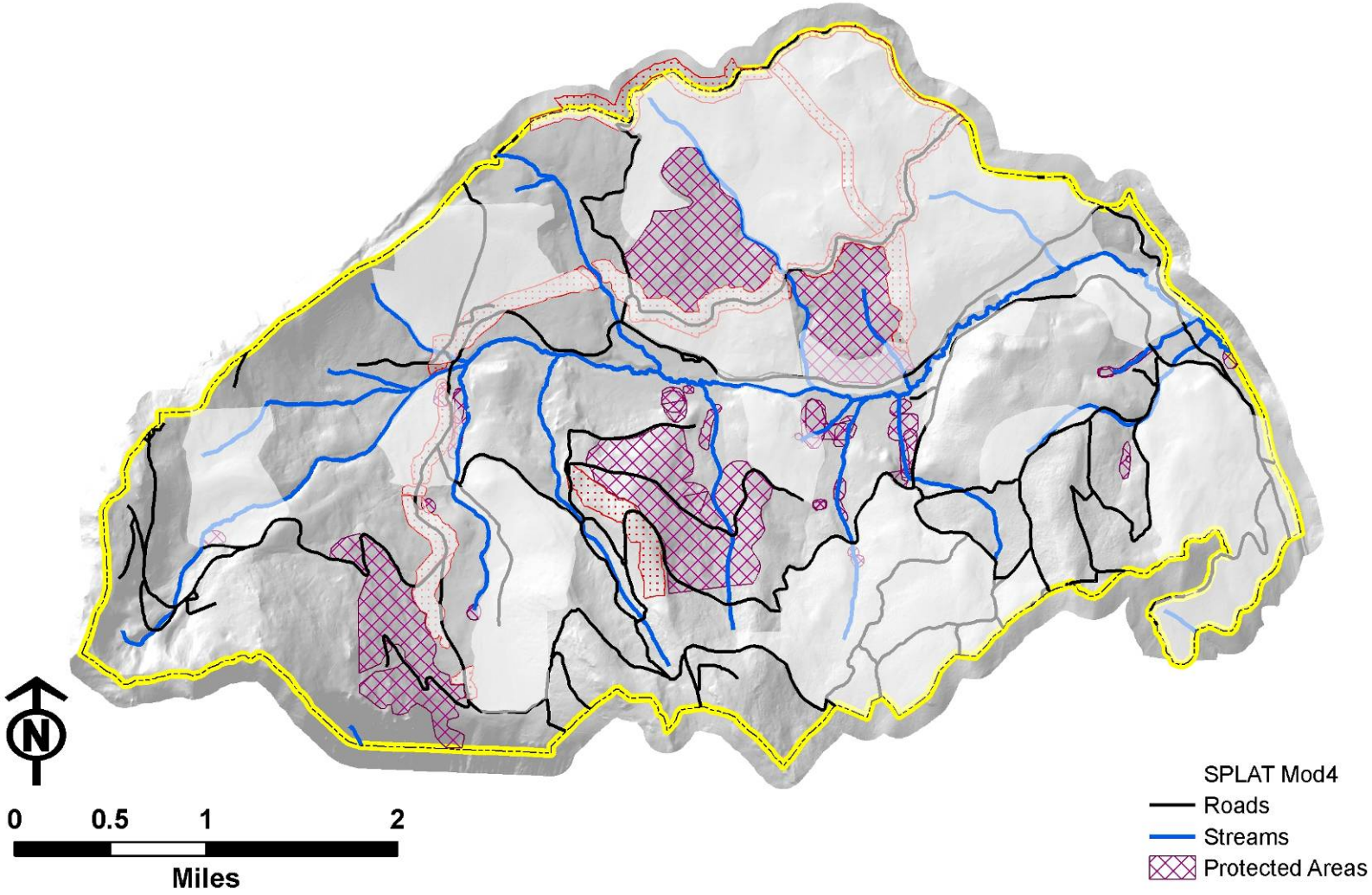
SPLAT: Modification 2



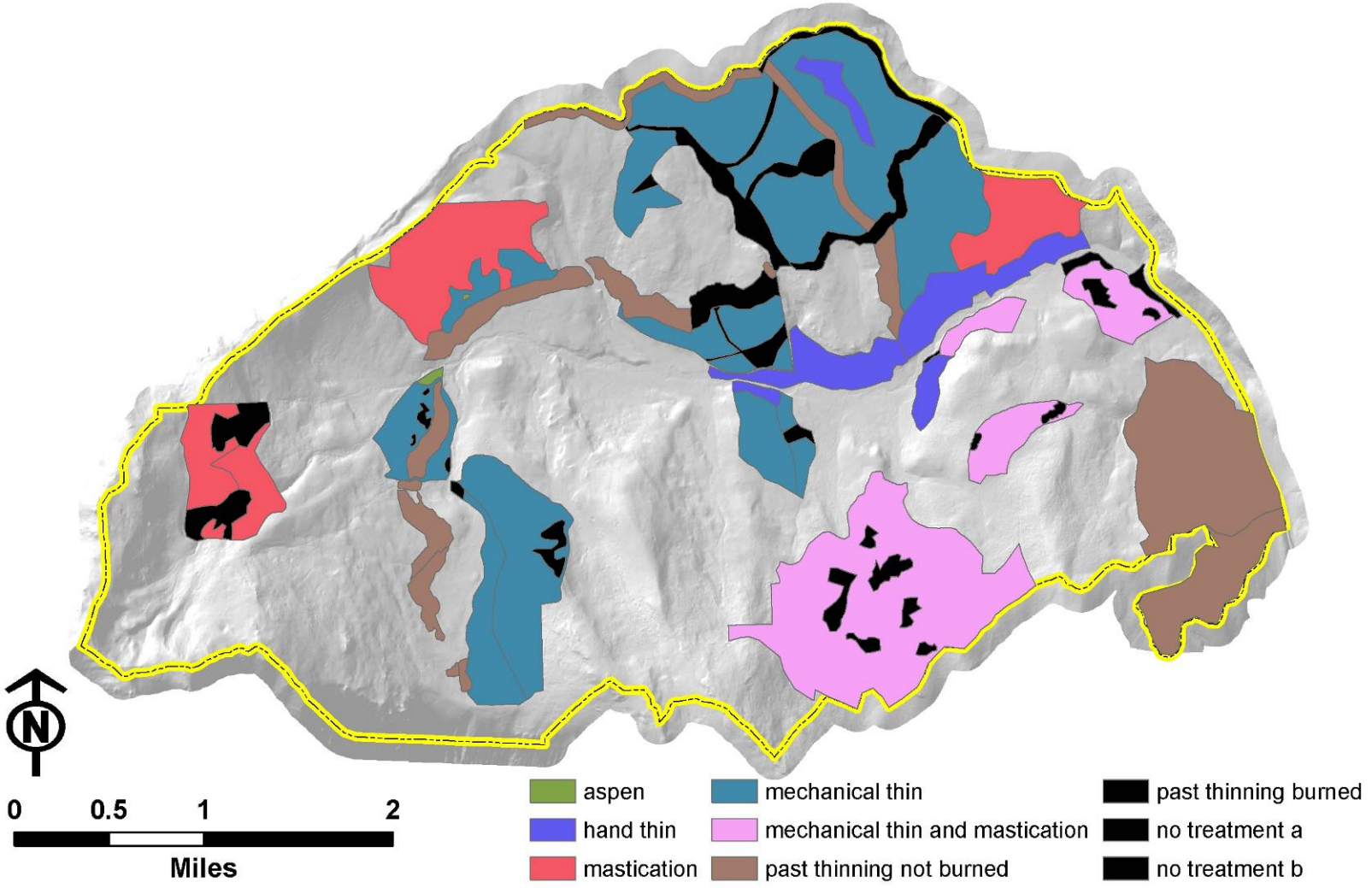
SPLAT: Modification 3



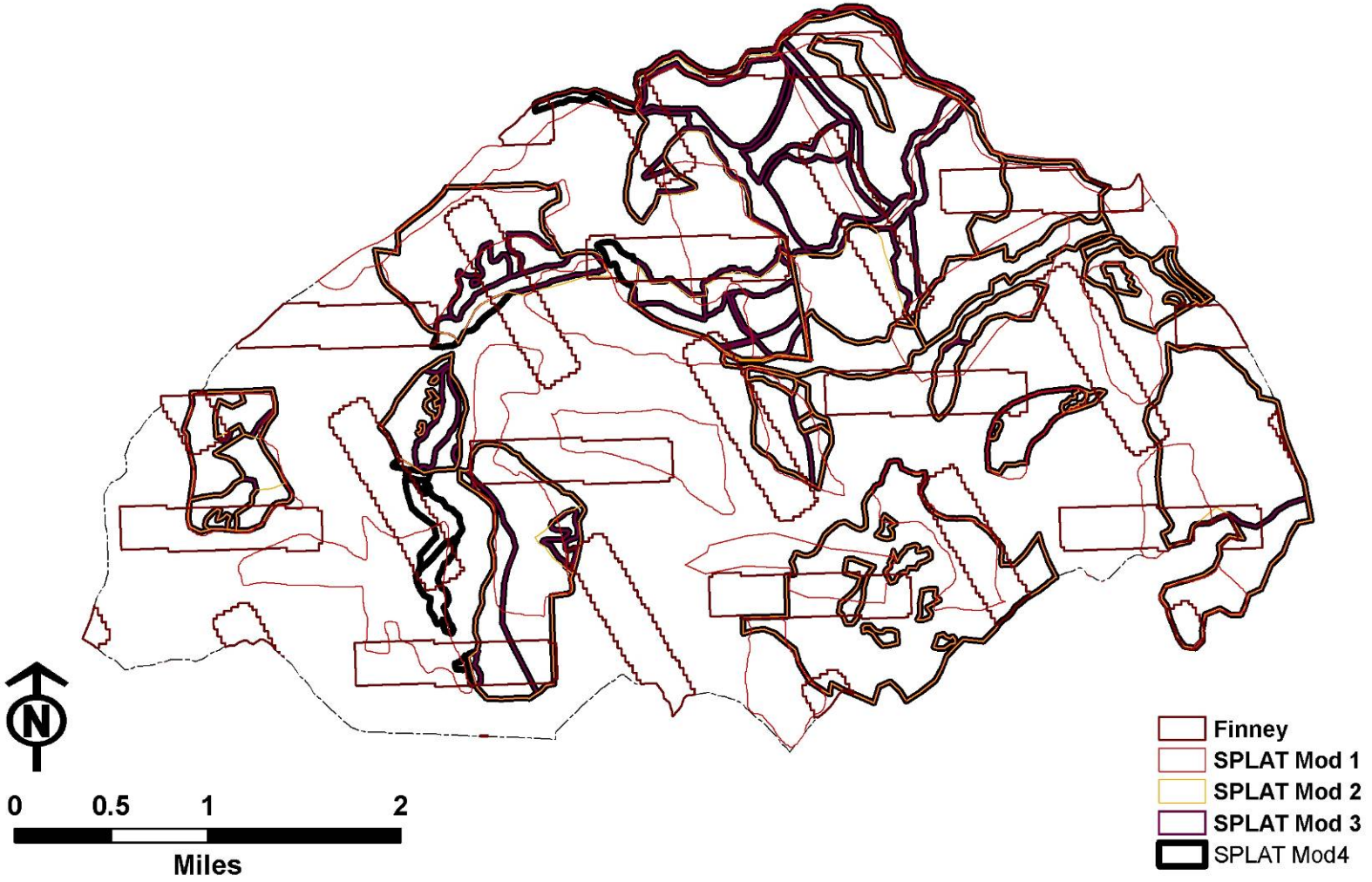
SPLAT: Modification 4



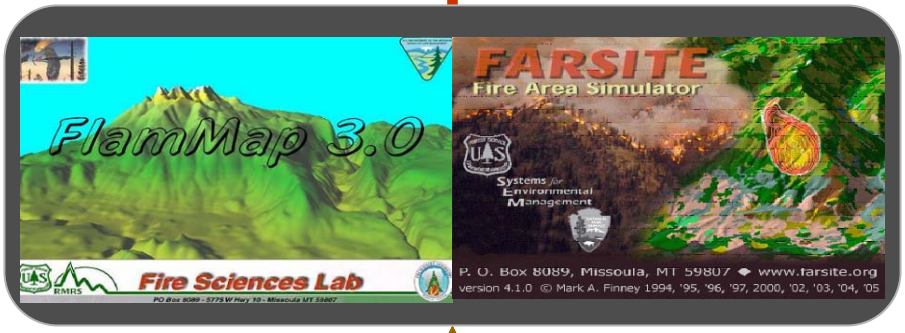
SPLAT: Modification 4 Details



SPLAT: Comparison



Fire Hazard Analysis



- Fire Hazard
  - Landscape File
    - Required
      - Elevation
      - Slope
      - Aspect
      - Fuel Model
      - Canopy Cover
    - Crown Fuels
      - Stand Height
      - Canopy Base Height
      - Canopy Bulk Density
  - Weather File
    - RAWS
  - Wind File
    - RAWS

Outputs

Crown Fire Activity
1 (surface)
2 (torching)
3 (active crown)

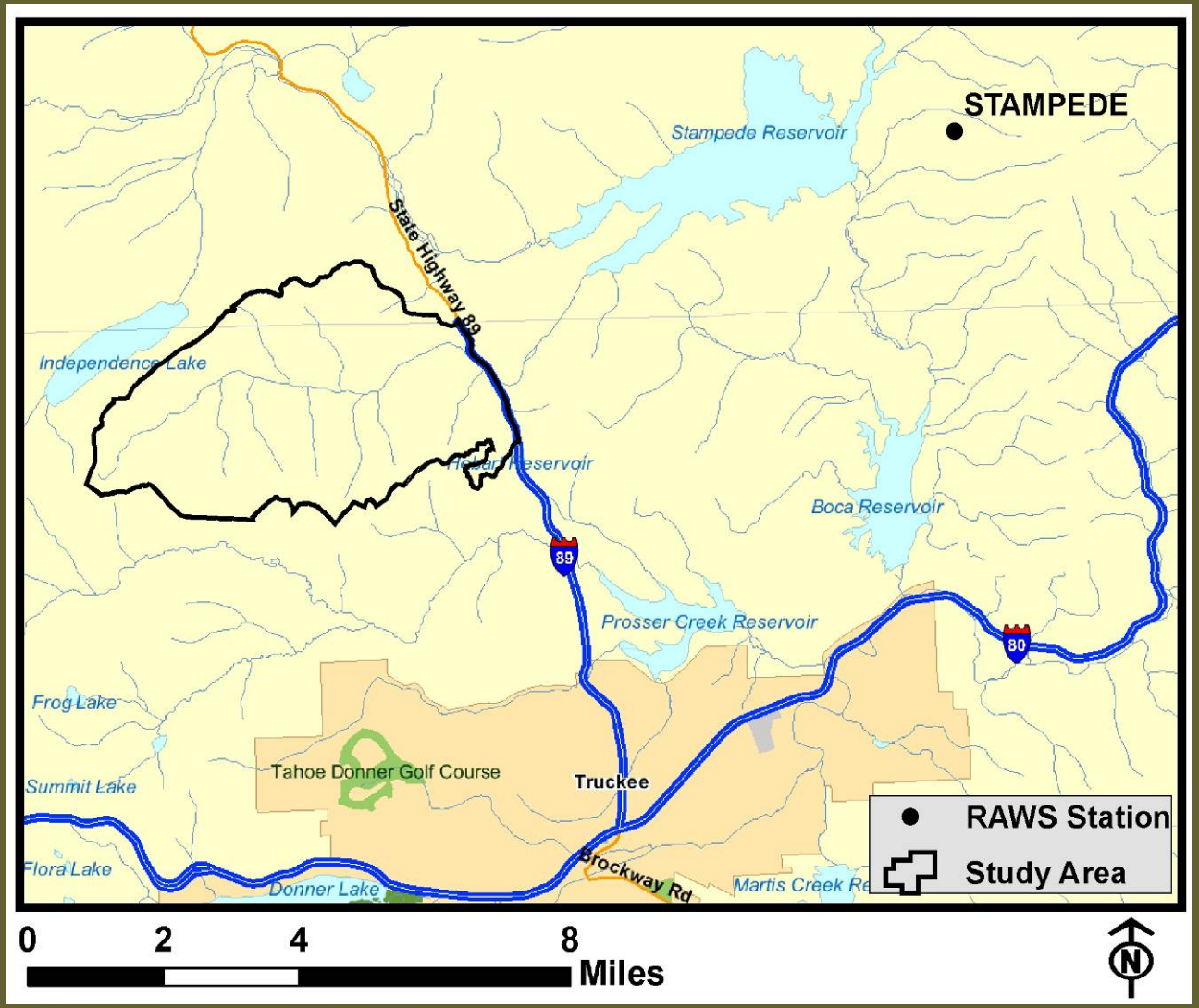
Flame Length (m)

Heat/Unit Area (kJ/m^2)

Rate of Spread (m/min)

Base Data

INPUT Weather File Data Sources



INPUT Weather File Data Sources

RAWS Climate Data

- Spread Component (SC) ← Filtered: 95%
- Max Temp
- Min Temp
- Relative Humidity
- Max Relative Humidity
- Min Relative Humidity

→ Weather File (.wtr)

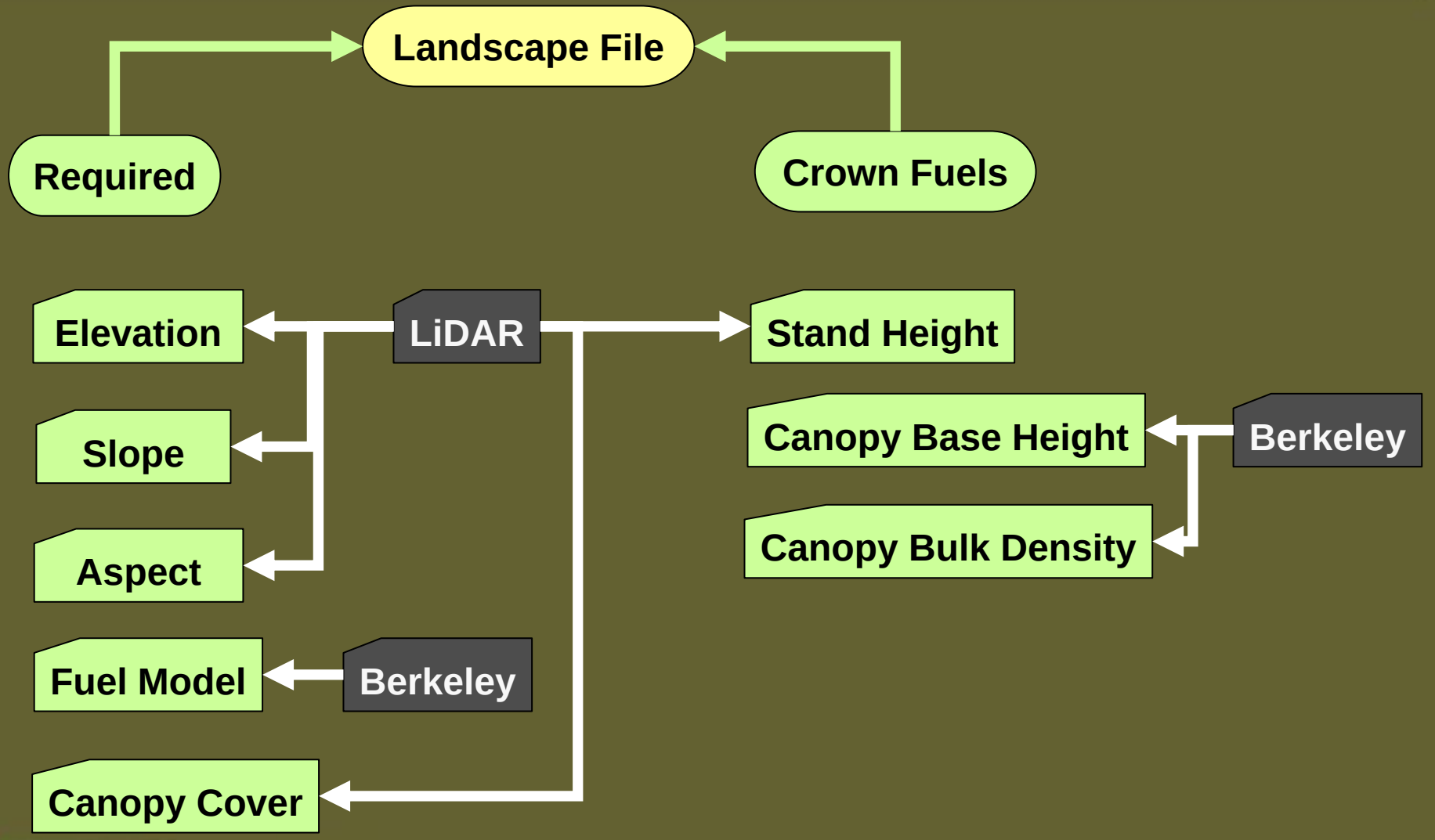
- Wind Speed
- Wind Direction

→ Wind File (.wnd)

- 1hr Fuel Moisture
- 10 hr Fuel Moisture
- 100 hr Fuel Moisture
- Herbaceous Fuel Moisture
- Woody Fuel Moisture

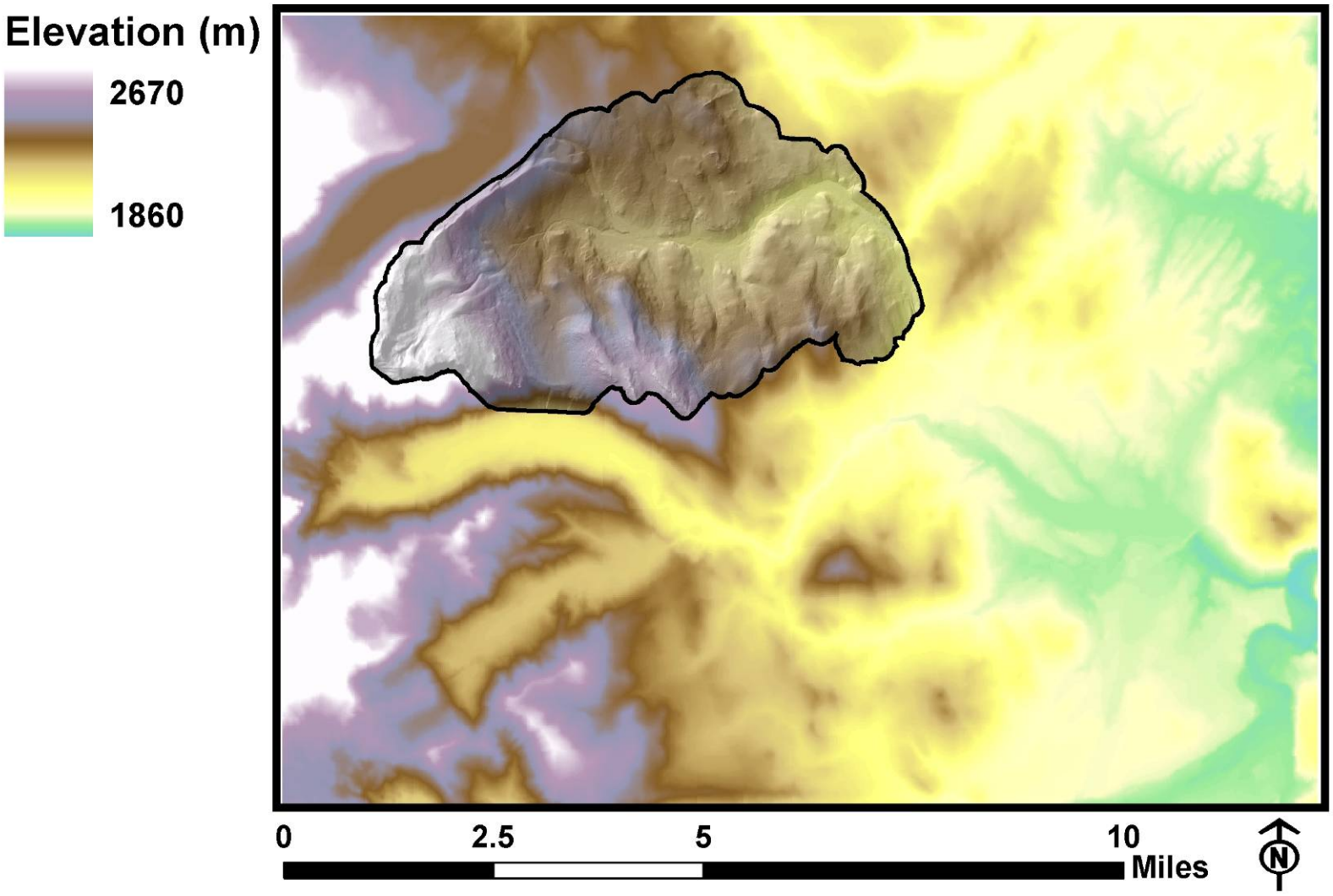
→ Fuel Moisture (.fms)

INPUT Landscape File Data Sources

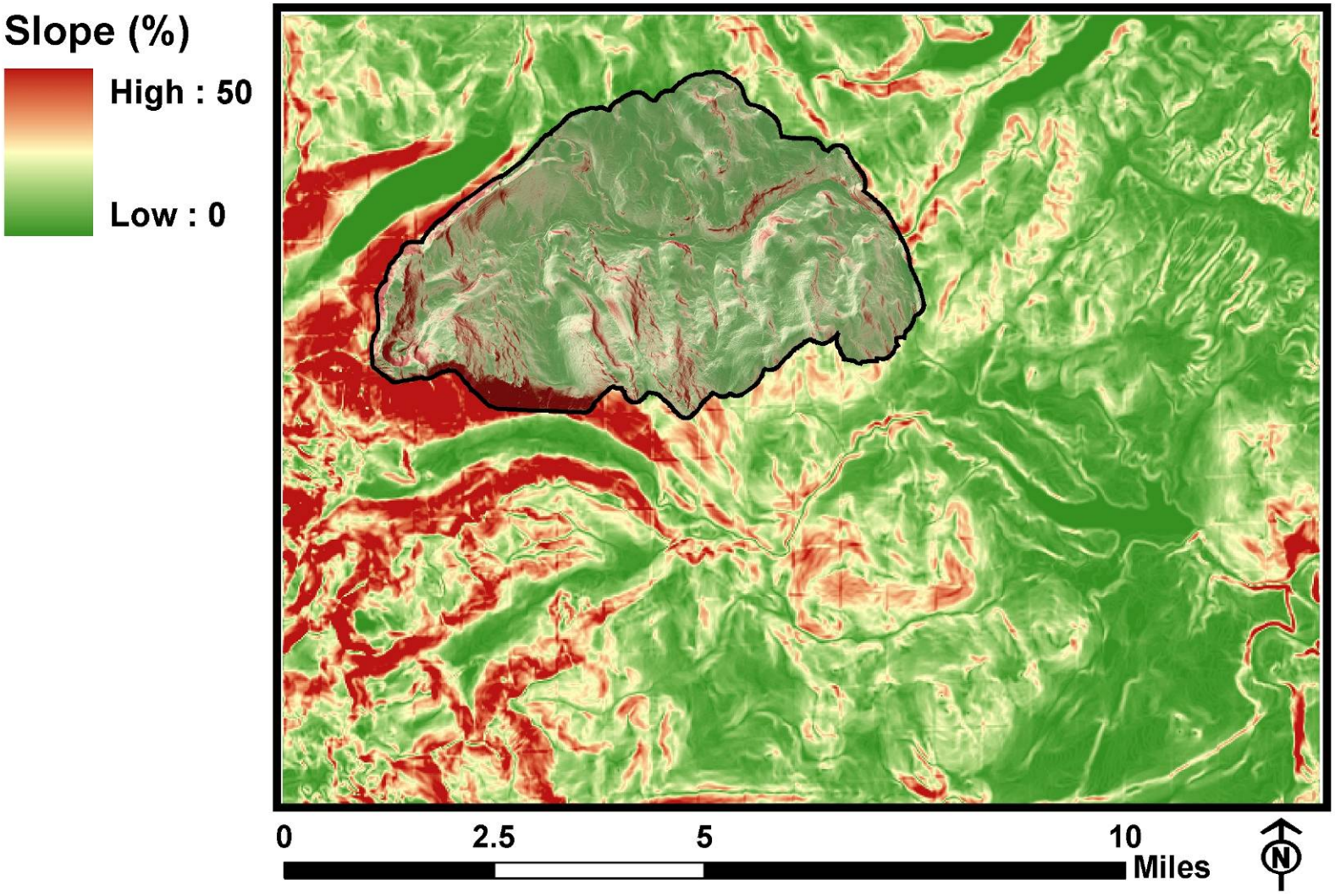


Baseline Input

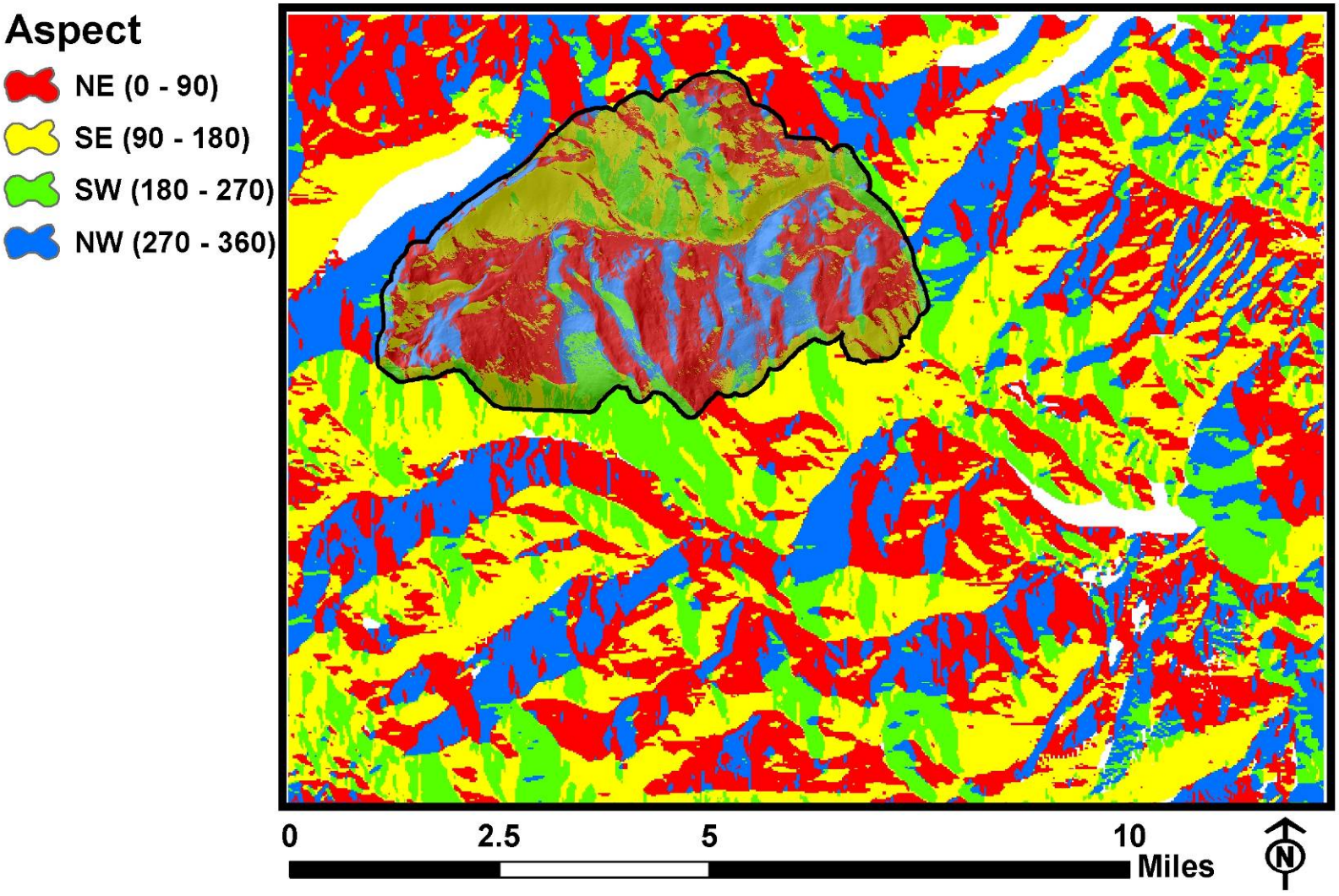
Elevation (meters)



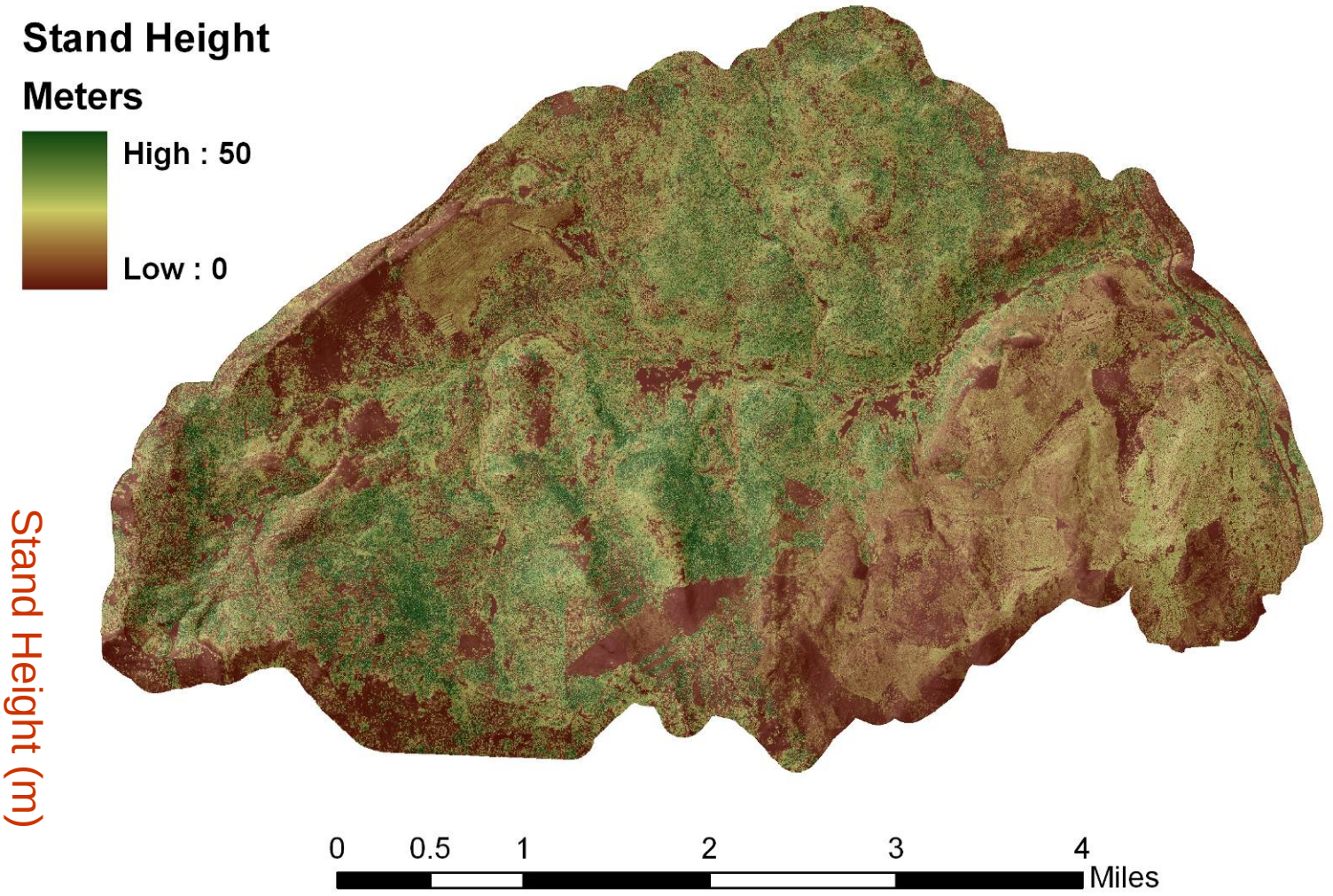
Slope (Percent)



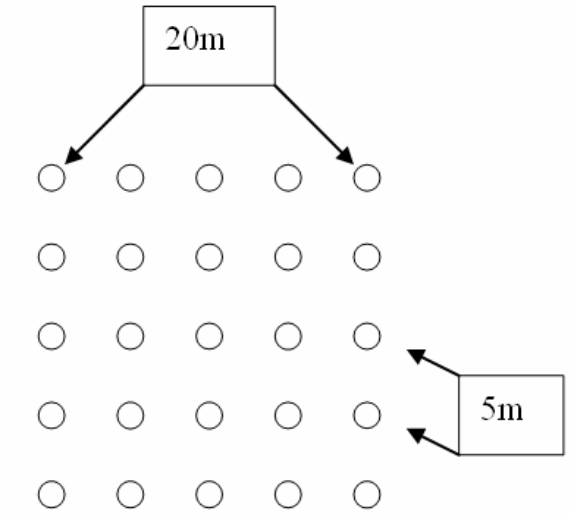
Aspect (Degrees)

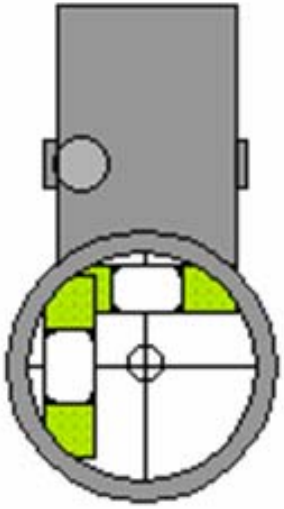


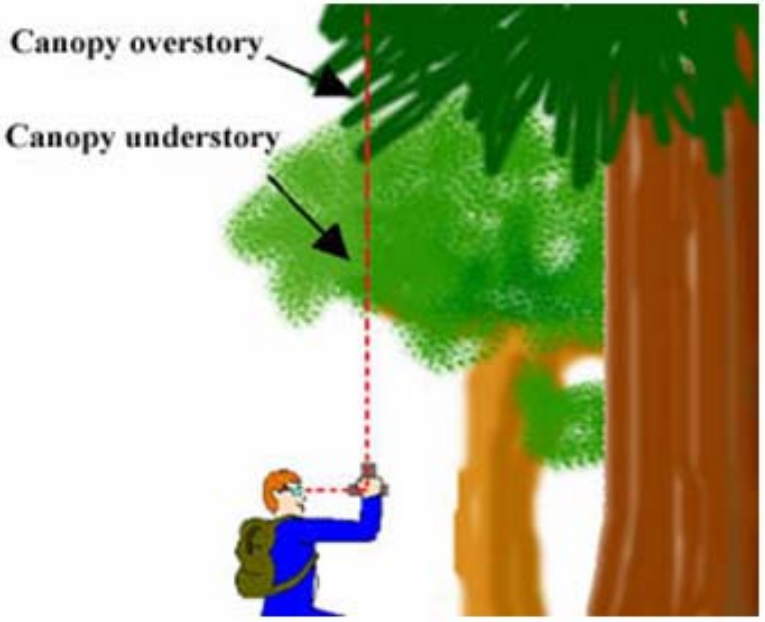
Stand Height (m) Results



Canopy Cover Base Method





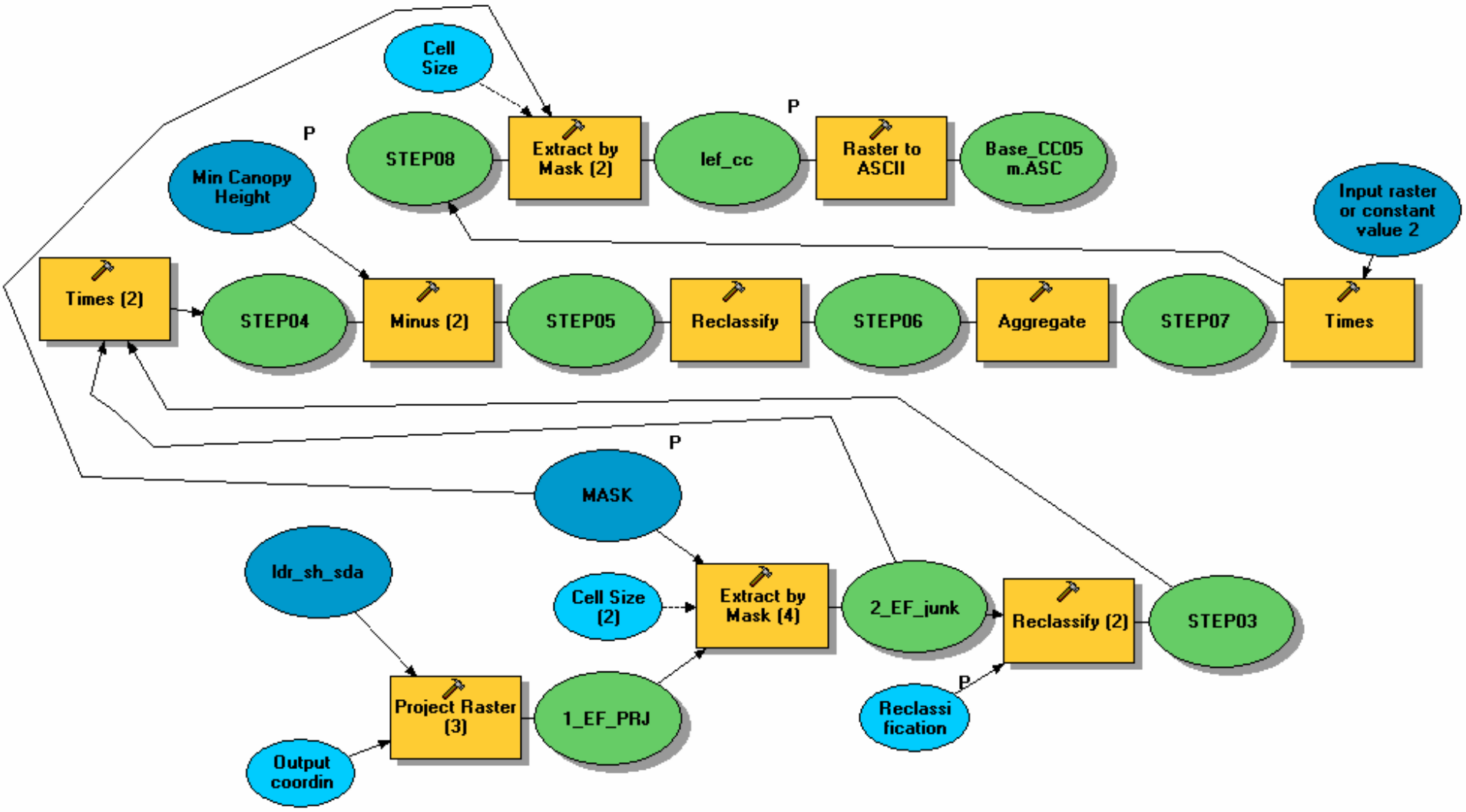


3	0	0	1	2
3	6	7	6	4
2	6	8	2	0
0	7	8	10	11
0	3	2	12	11

0	0	0	0	0
0	1	1	1	0
0	1	1	0	0
0	1	1	1	1
0	0	0	1	1

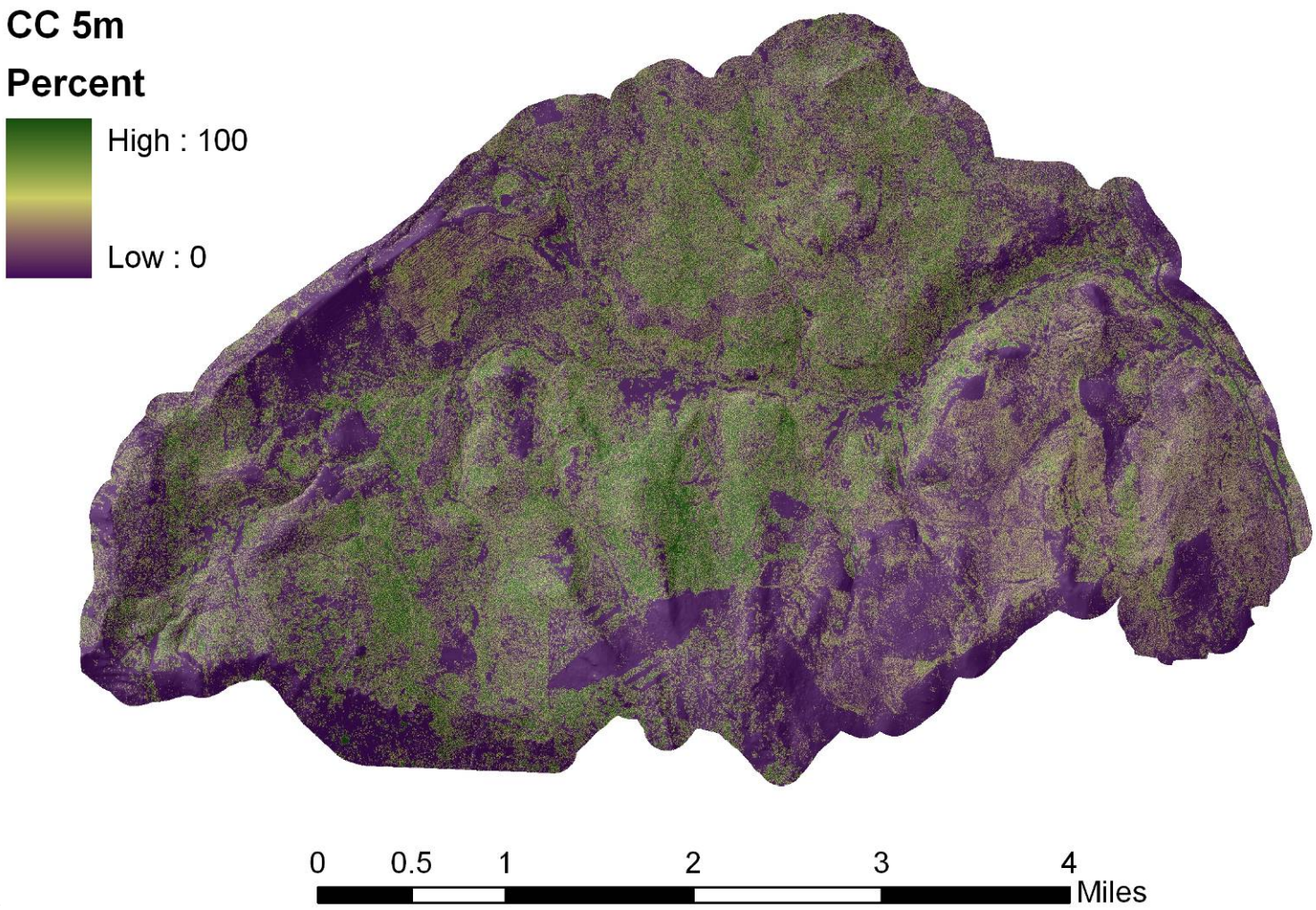
44%

Canopy Cover Base Method

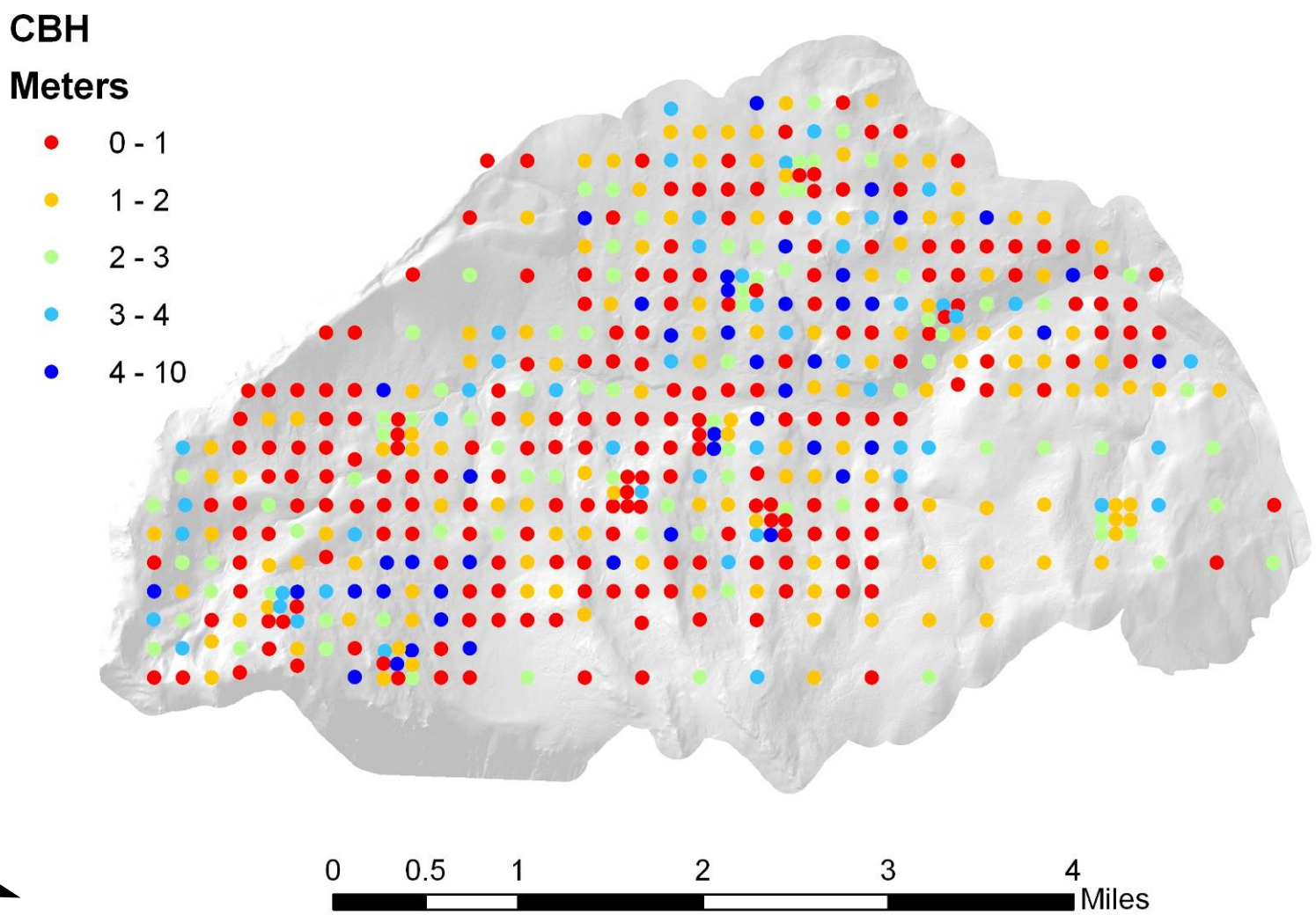


Base Canopy Cover (%) Results

Canopy Cover (%)



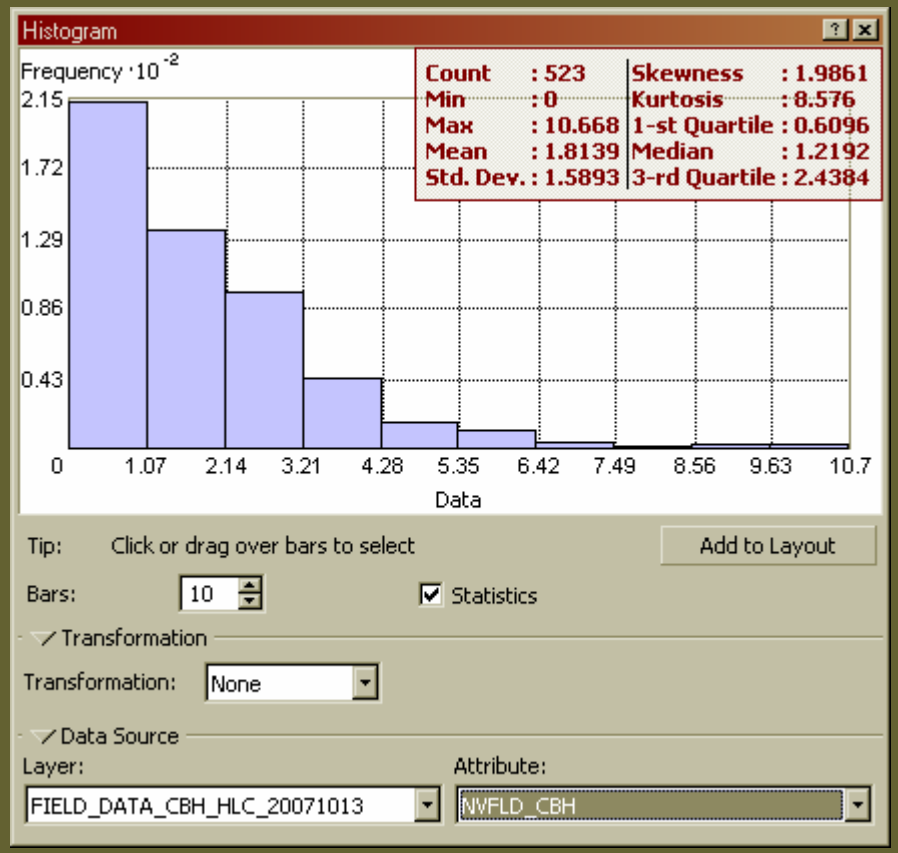
Canopy Base Height Field Data

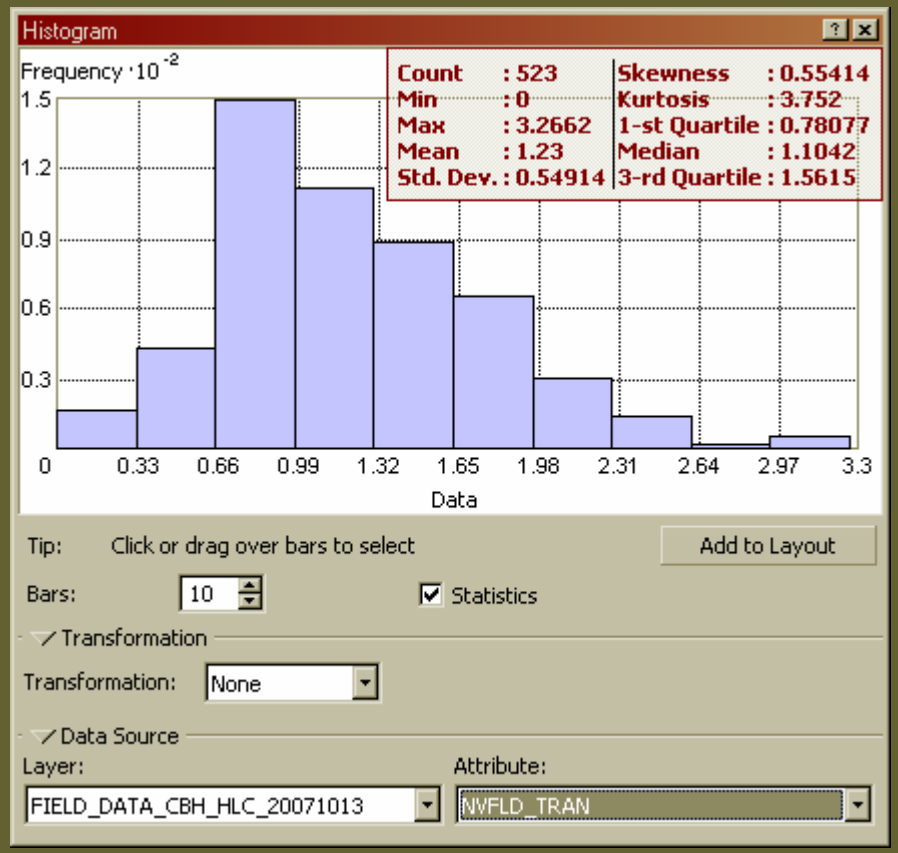


Canopy Base Height (m)

Canopy Base Height Methods

Transformation

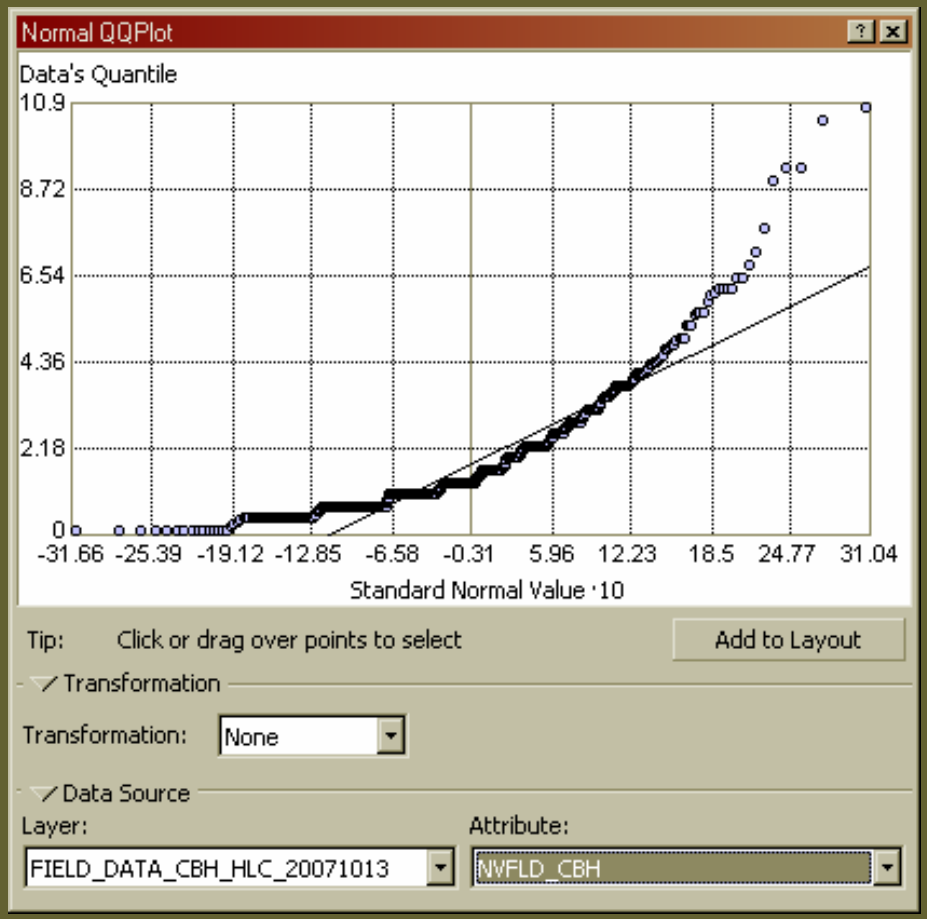


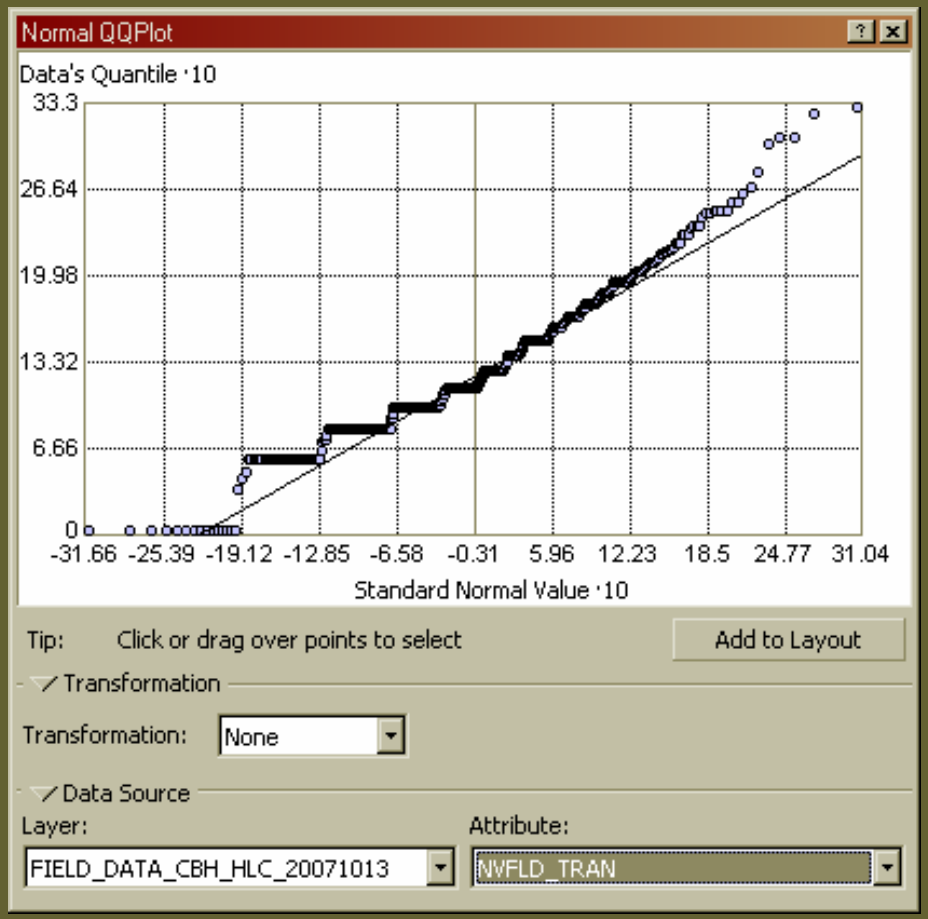


SQRT(NVFLD_CBH)

Canopy Base Height Methods

Transformation





SQRT(NVFLD_CBH)

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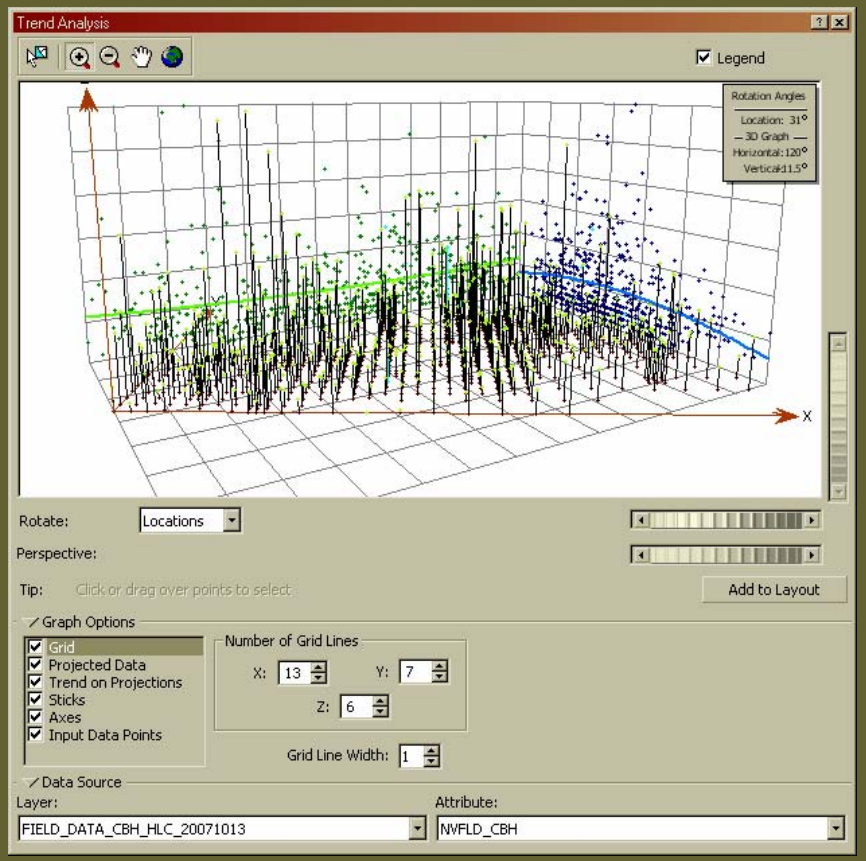
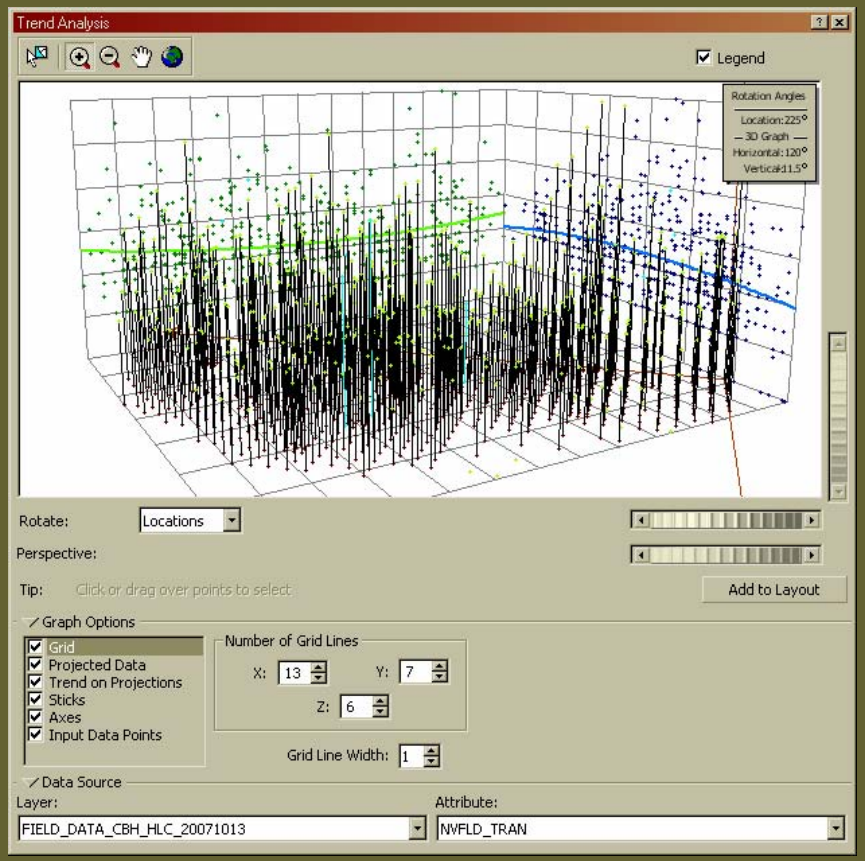
Canopy Base Height Methods

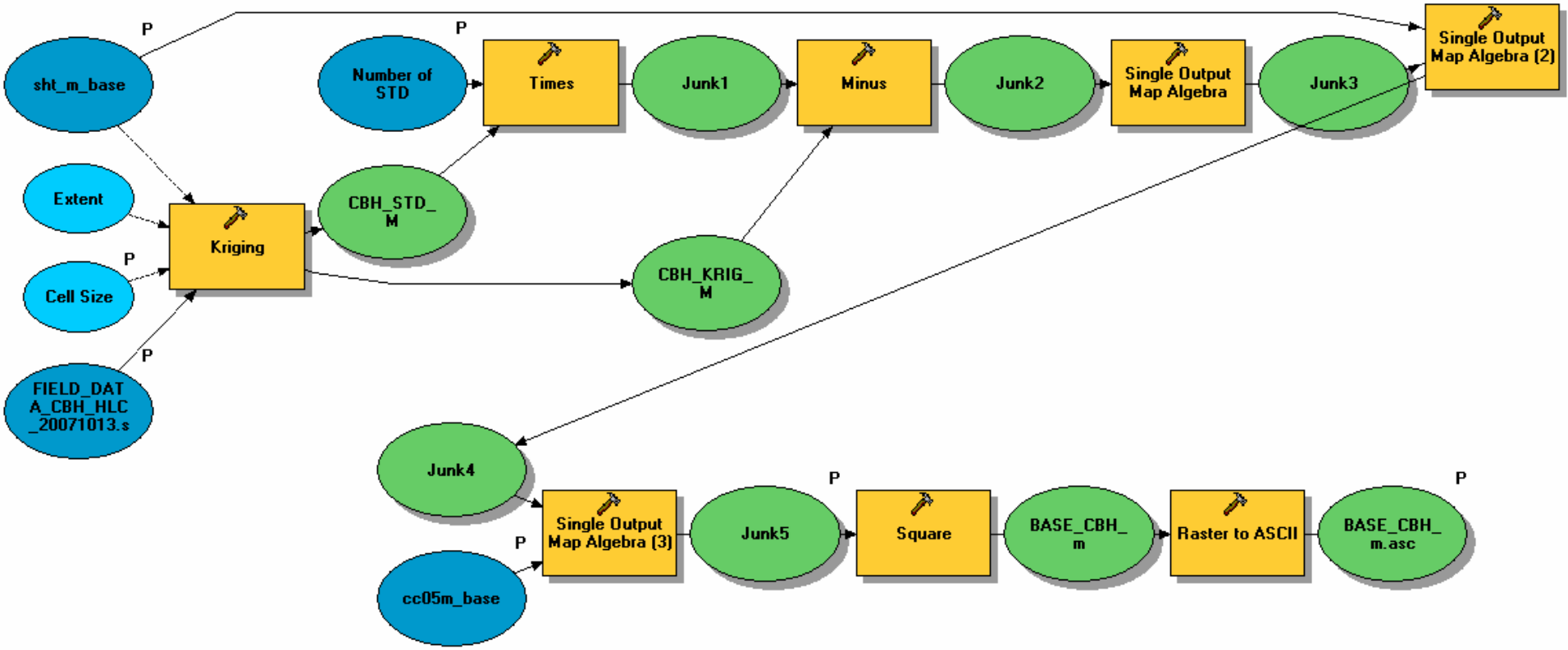
NO TREND Transformation



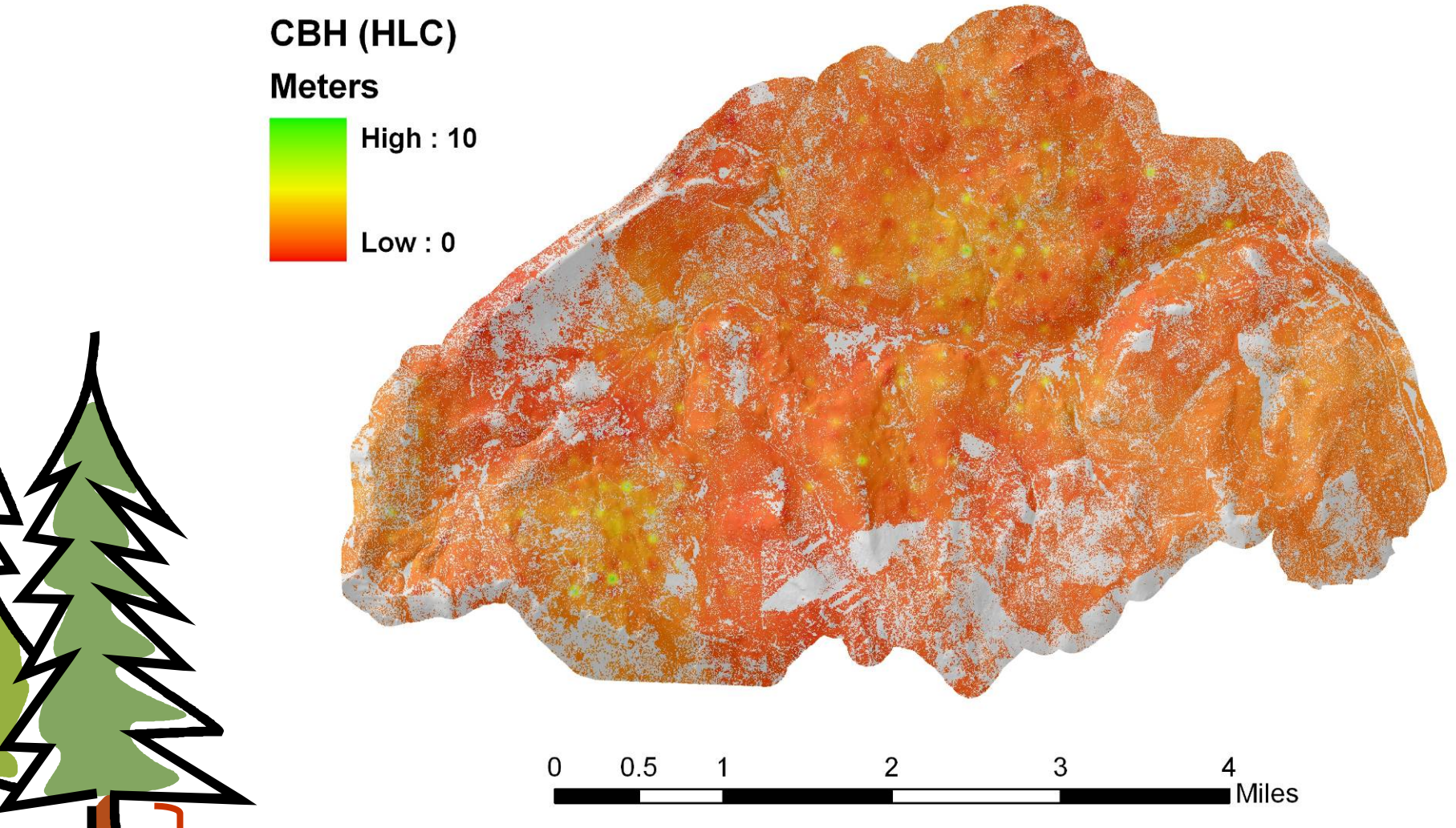


SQRT(NVFLD_CBH)

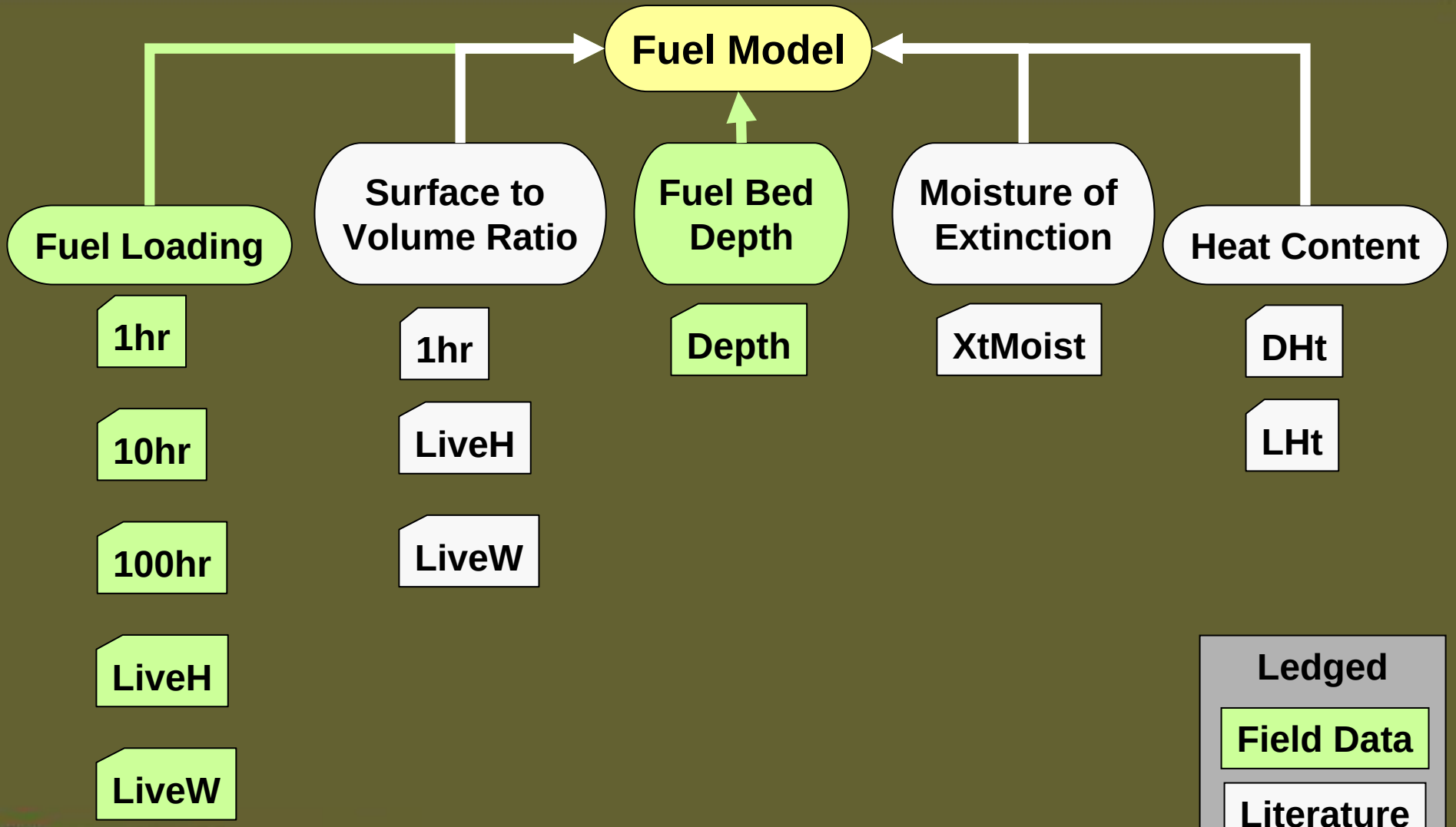
Canopy Base Height Method (m)



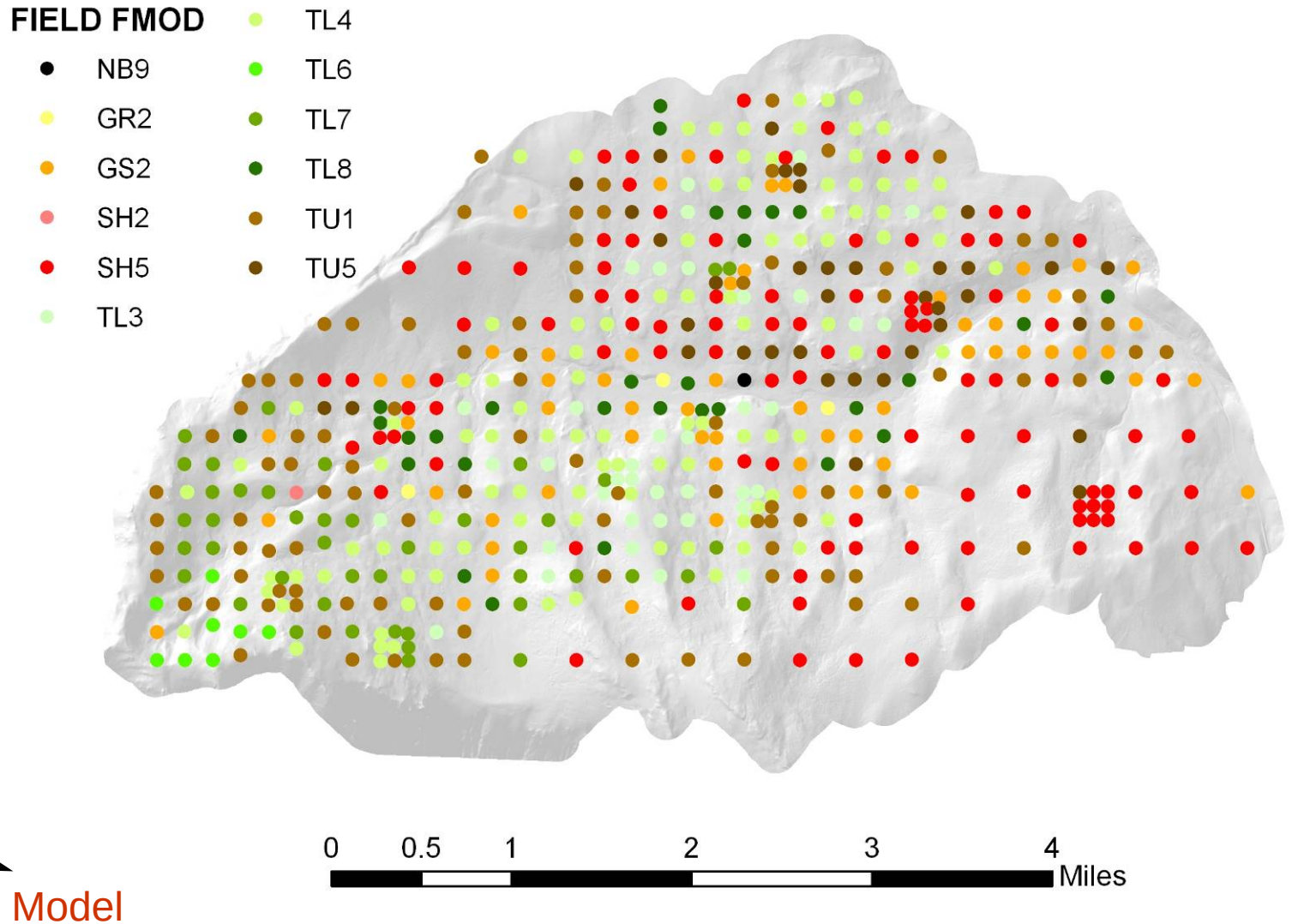
Canopy Base Height (0sd) (m)



FUEL MODEL Method

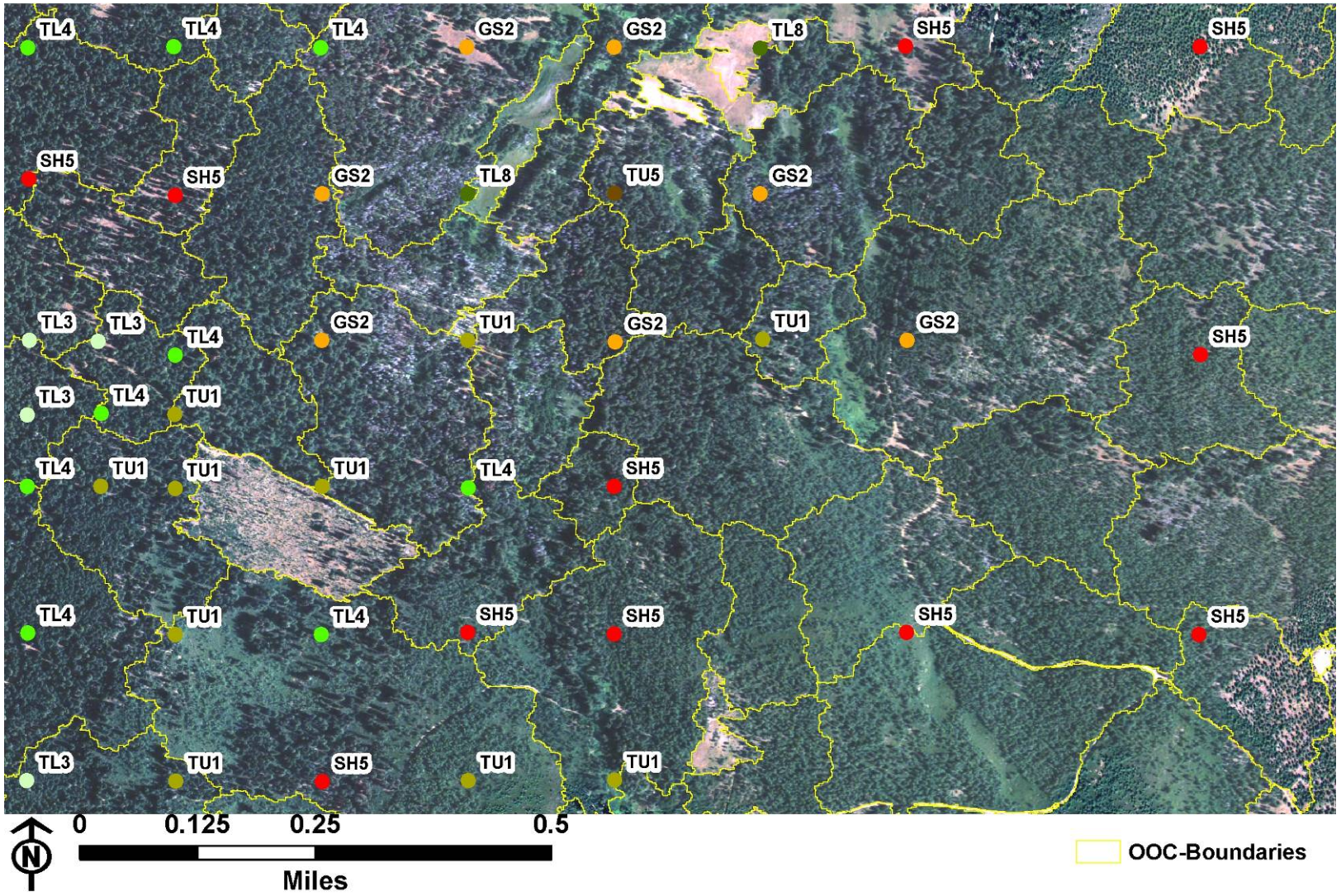


Berkeley: Fuel Field Data

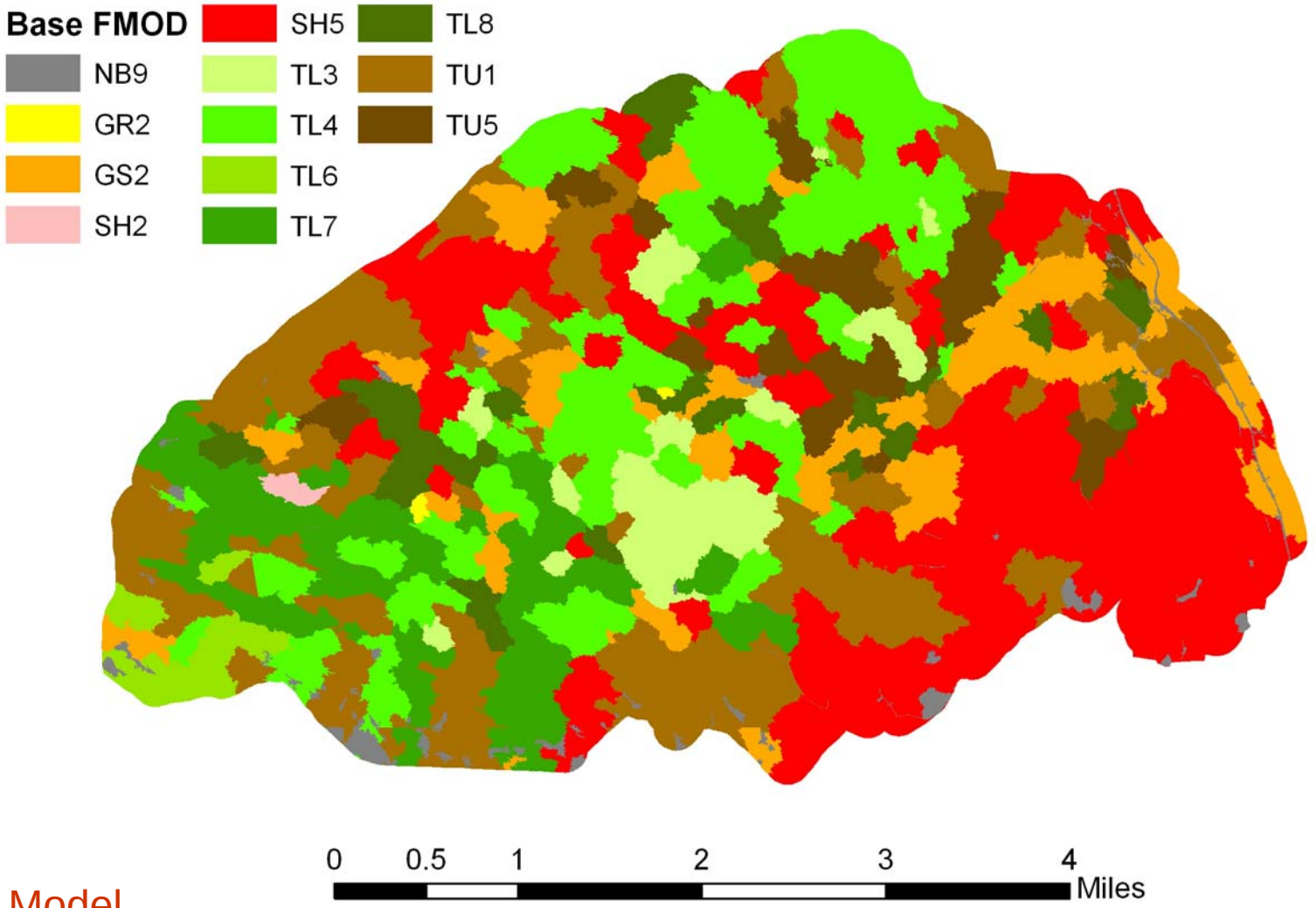


Fuel Model

Vegetation Segmentation

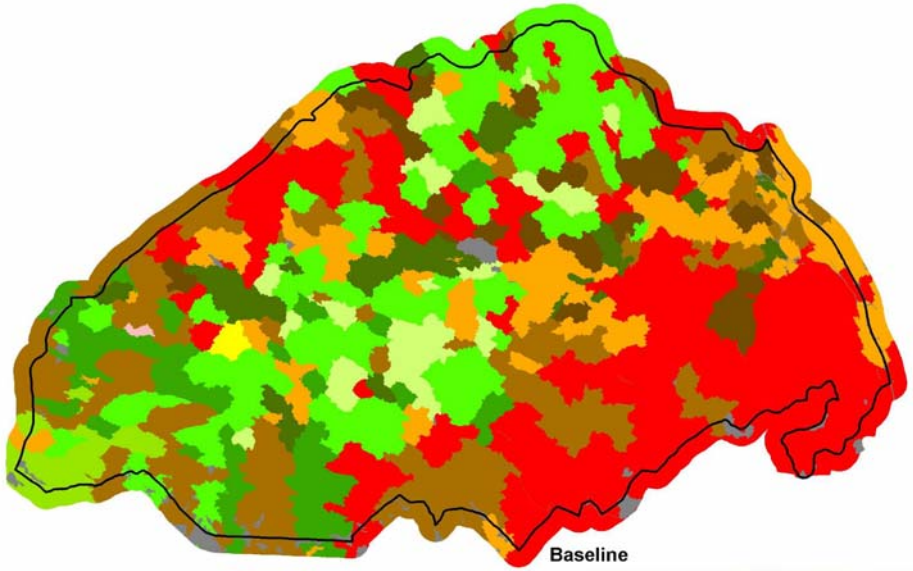


Fuel Model – Baseline



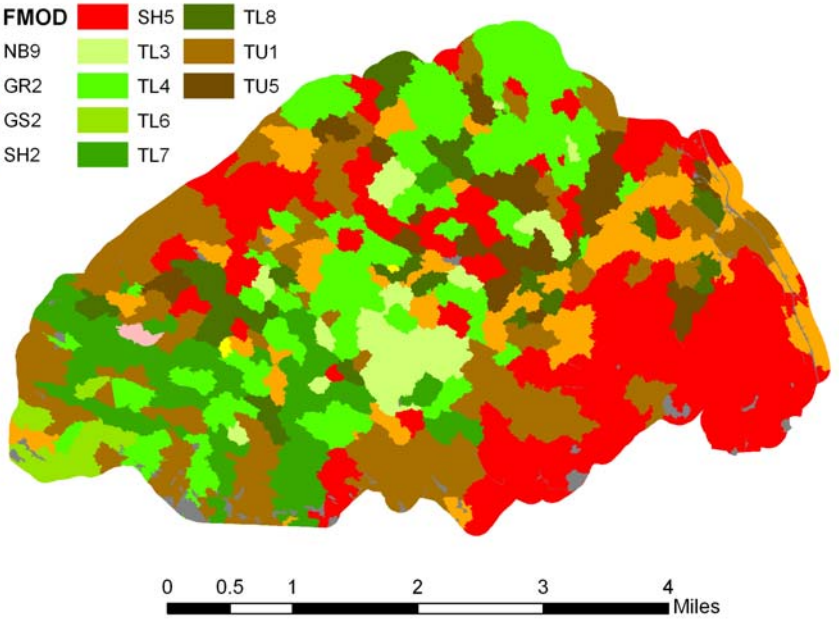
Fuel Model

Fuel Model – Baseline



Old Results

New Results

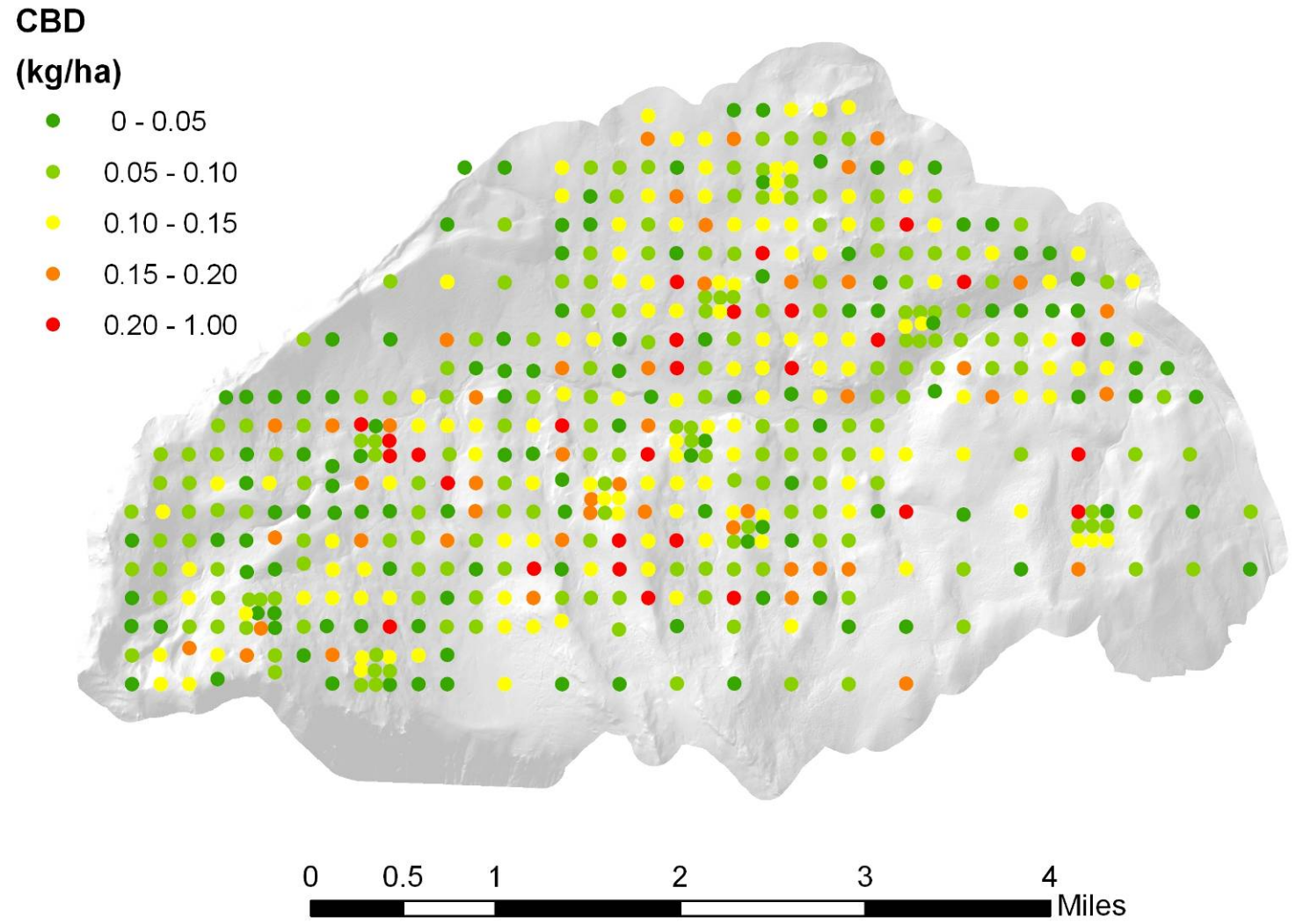


SB Fuel Model Data

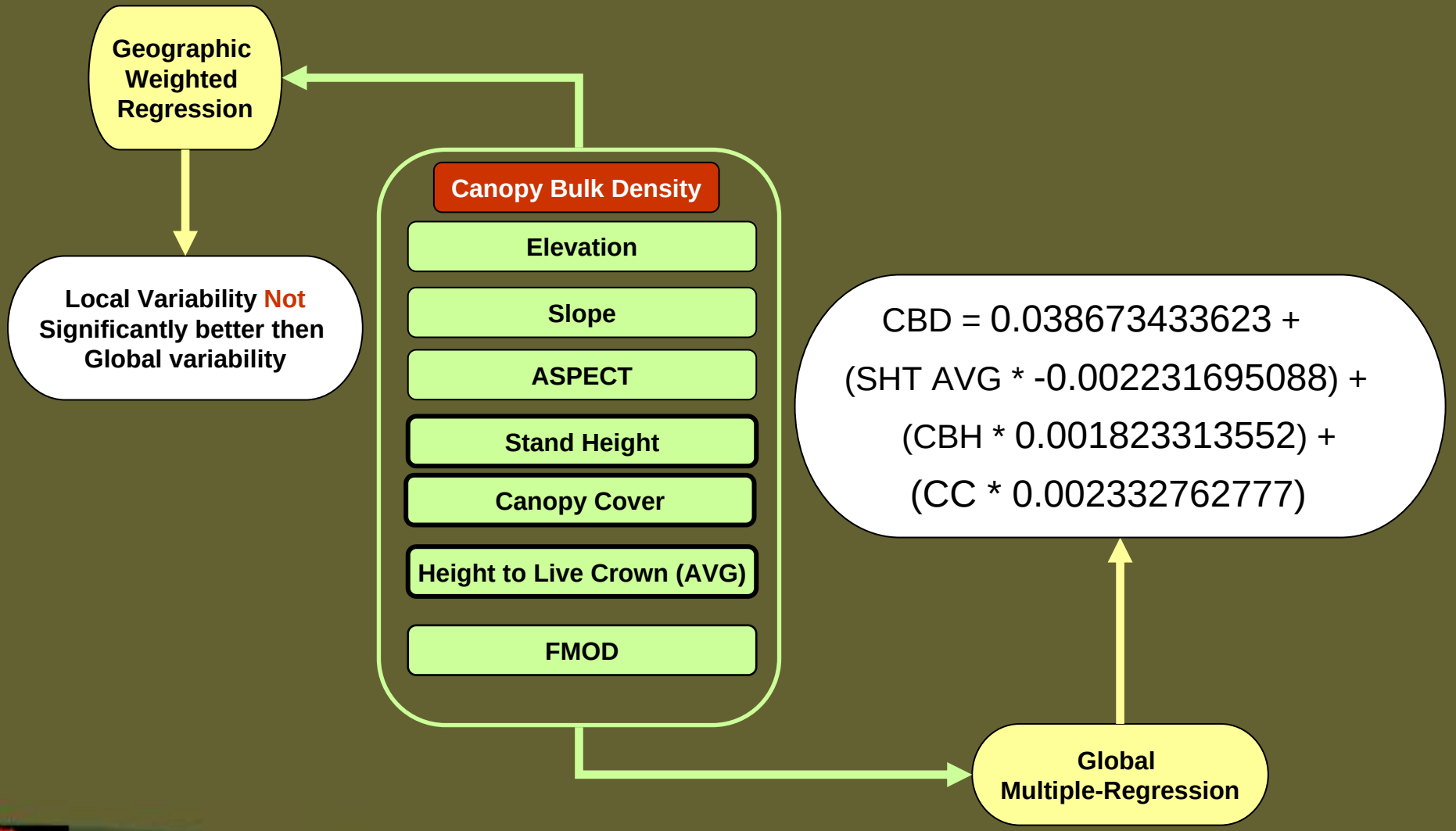
ID	Fuel Loading						Surface to Volume Ratio			Fuel Bed	XtMoist	Heat Content	
FMCODE	ton/acre						1/ft			feet	%	BTU/lb	
FMCODE	1h	10h	100h	LiveH	LiveW	FMTYPE	1HSAV	LiveHSAV	LiveWSAV	Depth	Xmoist	DHt	LHt
101 GR1	0.1	0	0	0.3	0	dynamic	2200	2000	9999	0.4	15	8000	8000
102 GR2	0.1	0	0	1	0	dynamic	2000	1800	9999	1.0	15	8000	8000
121 GS1	0.2	0	0	0.5	0.65	dynamic	2000	1800	1800	0.9	15	8000	8000
141 SH1	0.25	0.25	0	0.15	1.3	dynamic	2000	1800	1600	1.0	15	8000	8000
142 SH2	1.35	2.4	0.75	0	3.85	N/A	2000	9999	1600	1.0	15	8000	8000
144 SH4	0.85	1.15	0.2	0	2.55	N/A	2000	1800	1600	3.0	30	8000	8000
145 SH5	3.6	2.1	0	0	2.9	N/A	750	9999	1600	6.0	15	8000	8000
161 TU1	0.2	0.9	1.5	0.2	0.9	dynamic	2000	1800	1600	0.6	20	8000	8000
162 TU2	0.95	1.8	1.25	0	0.2	N/A	2000	9999	1600	1.0	30	8000	8000
163 TU3	1.1	0.15	0.25	0.65	1.1	dynamic	1800	1600	1400	1.3	30	8000	8000
164 TU4	4.5	0	0	0	2	N/A	2300	9999	2000	0.5	12	8000	8000
165 TU5	4	4	3	0	3	N/A	1500	9999	750	1.0	25	8000	8000
181 TL1	1	2.2	3.6	0	0	N/A	2000	9999	9999	0.2	30	8000	8000
183 TL3	0.5	2.2	2.8	0	0	N/A	2000	9999	9999	0.3	20	8000	8000
184 TL4	0.5	1.5	4.2	0	0	N/A	2000	9999	9999	0.4	25	8000	8000
185 TL5	1.15	2.5	4.4	0	0	N/A	2000	9999	1600	0.6	25	8000	8000
187 TL7	0.3	1.4	8.1	0	0	N/A	2000	9999	9999	0.4	25	8000	8000
188 TL8	5.8	1.4	1.1	0	0	N/A	1800	9999	9999	0.3	35	8000	8000
201 SB1	1.5	3	11	0	0	N/A	2000	9999	9999	1.0	25	8000	8000
202 SB2	4.5	4.25	4	0	0	N/A	2000	9999	9999	1.0	25	8000	8000
203 SB3	5.5	2.75	3	0	0	N/A	2000	9999	9999	1.2	25	8000	8000
99 NB9													

Scott & Burgan

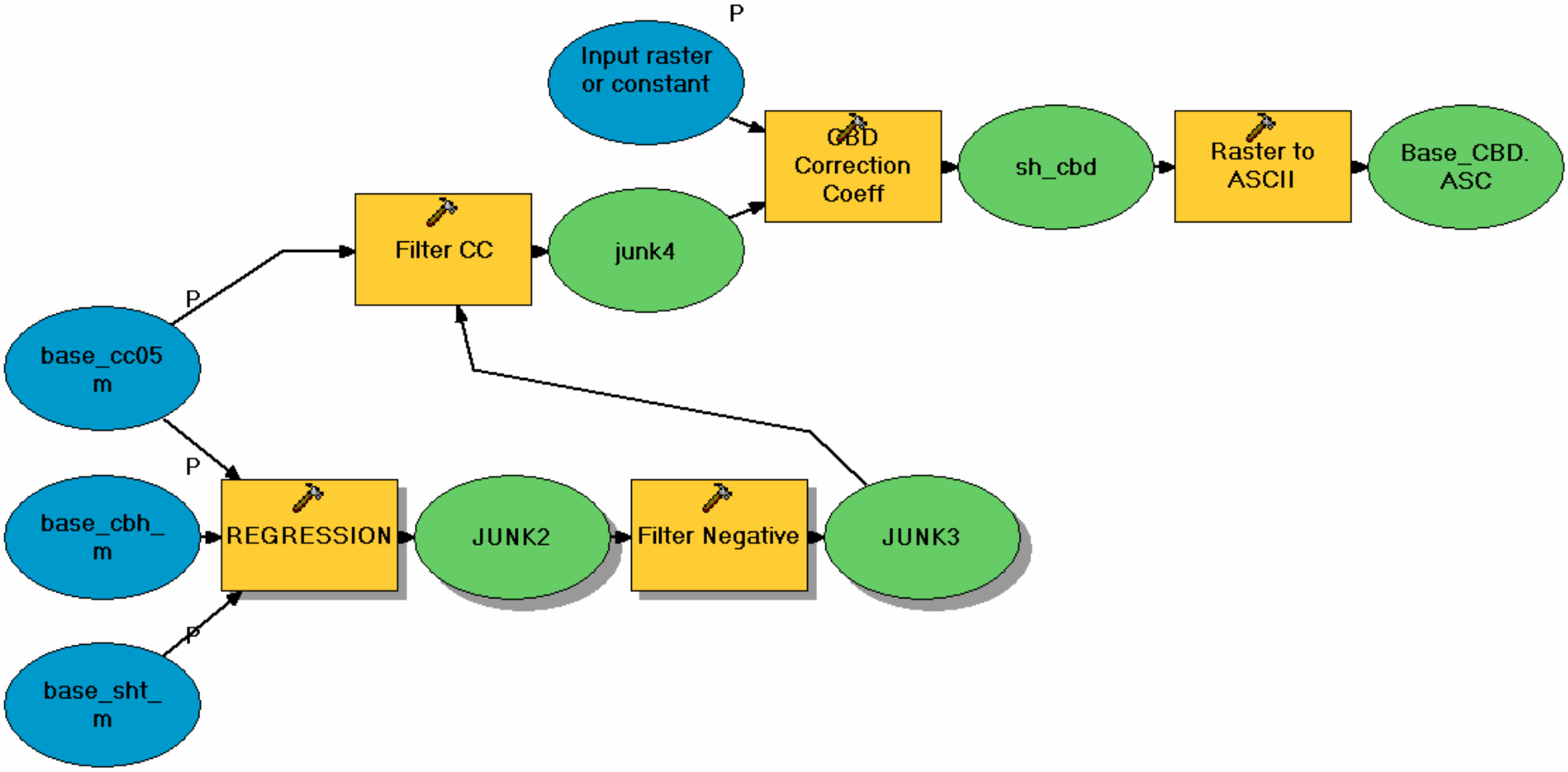
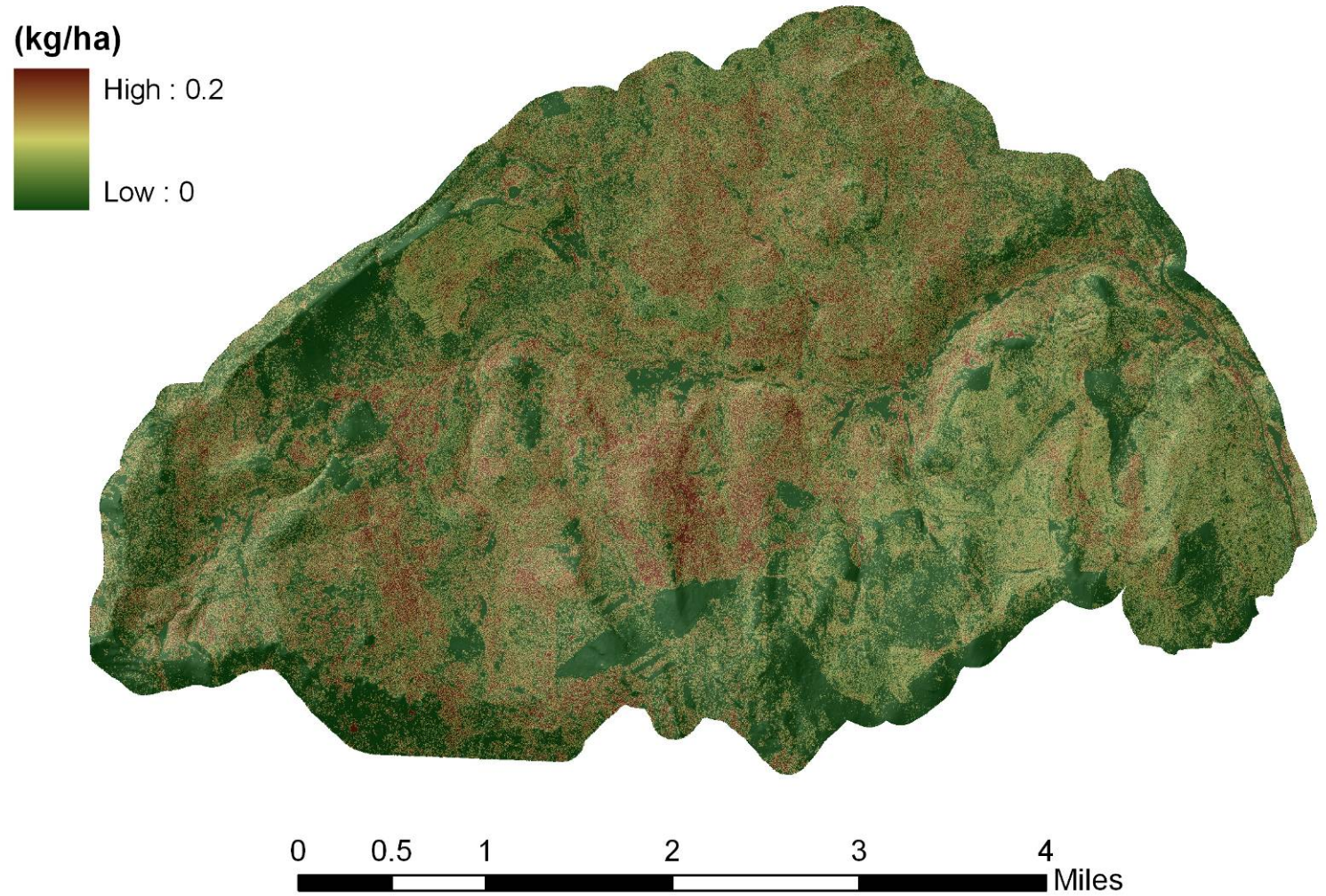
Canopy Bulk Density Field Data



Canopy Bulk Density Method



Canopy Bulk Density Method



Canopy Bulk Density (kg/ha) Results