ArcFuels - Rapid Design and Evaluation of Landscape Fuel Treatment Projects

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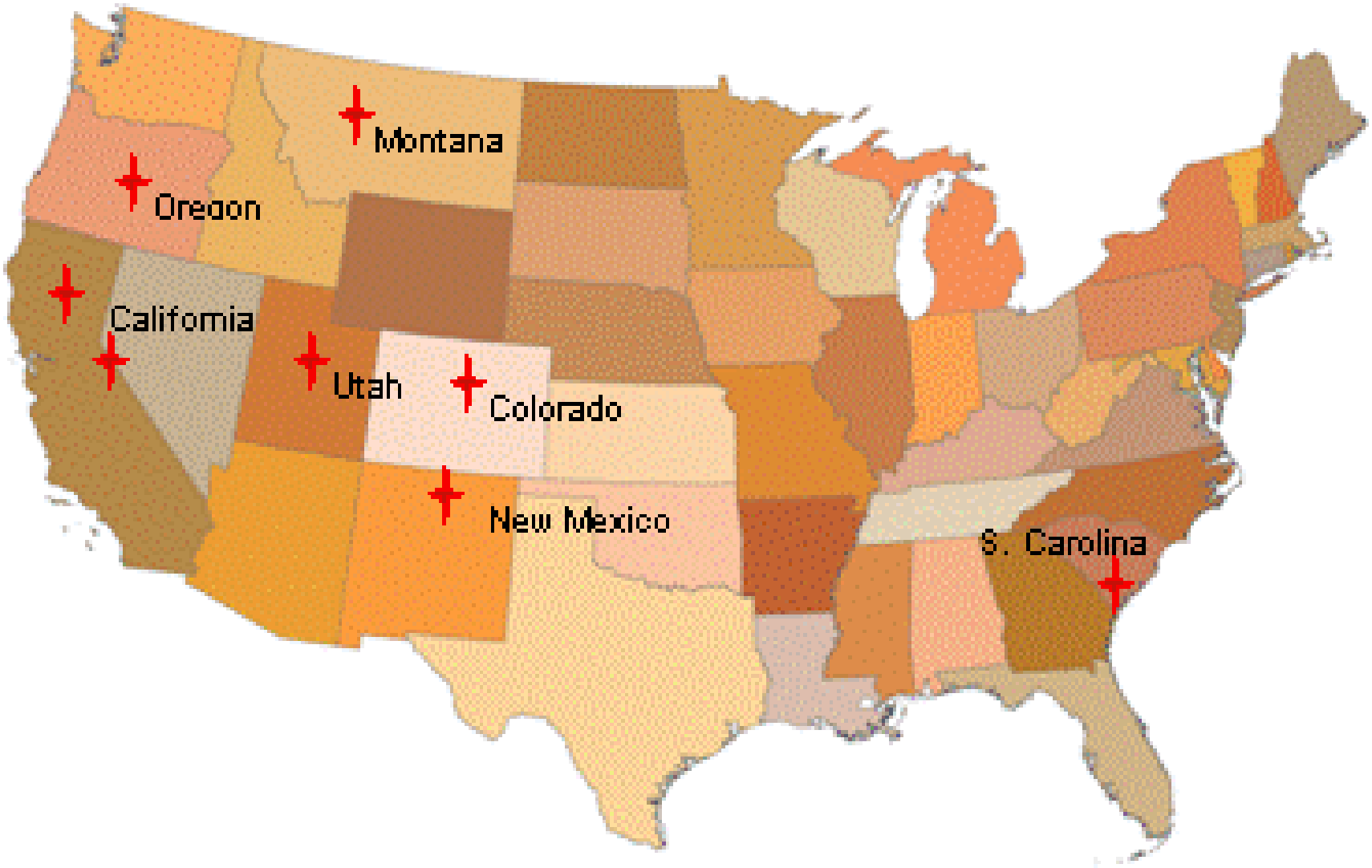
2005 SPOTS Pilots

1. SPOTS: Spatially optimized treatments
2. Create a consistent, interagency framework for strategic placement of treatments
3. Identify interconnecting suite of tools for strategic spatial analysis
4. Identify barriers
5. Accountability and metrics

2005 SPOTS Pilot Locations



OTS Evaluates Landscape
atment Pattern
ectiveness on “Problem”
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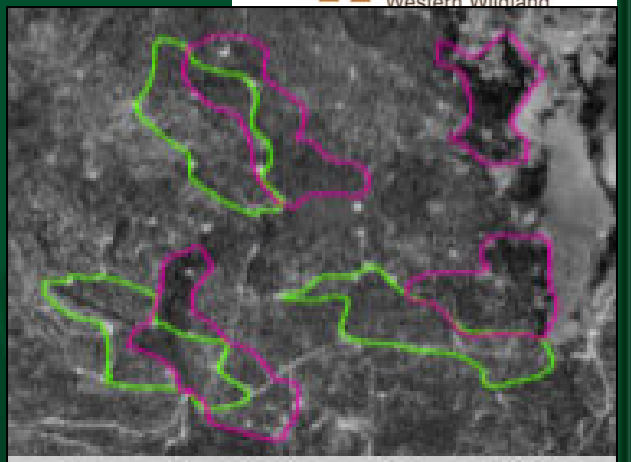
ge fires
ngerous to the public
maging to private property and
able resources

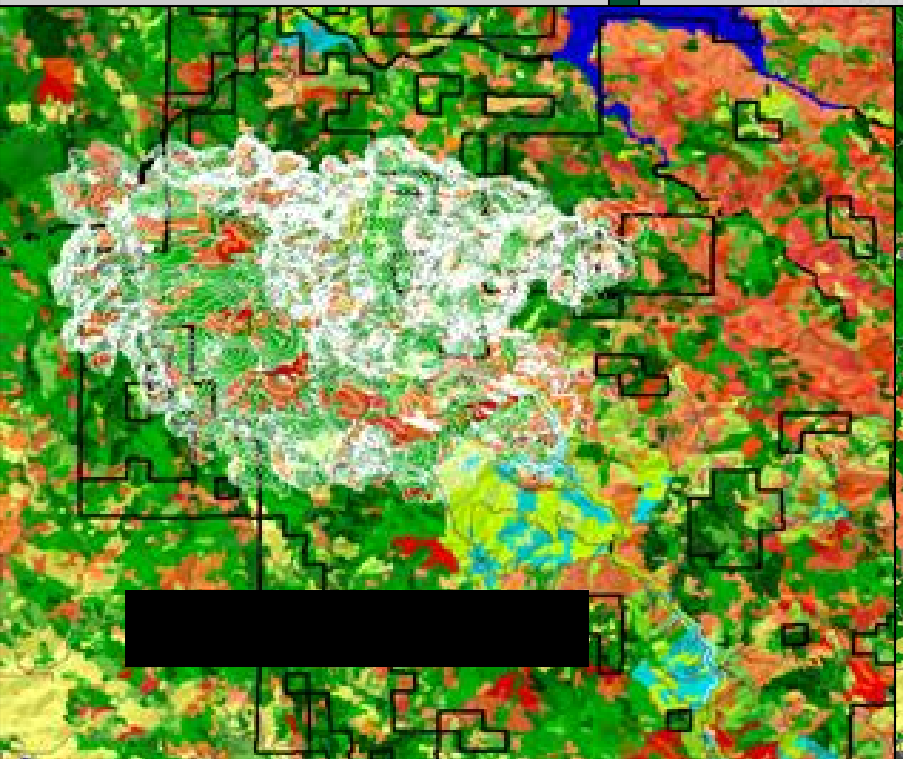
SPOTS Process

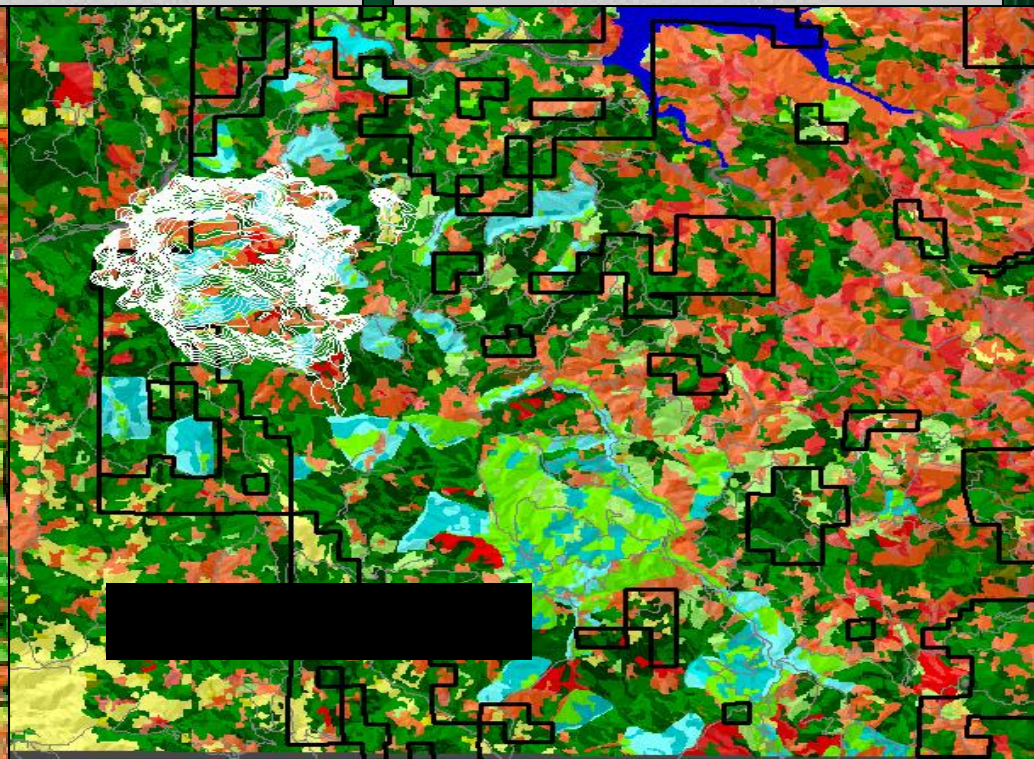
Collabortive learning in action

Real-time scenario building on dry erase whiteboard



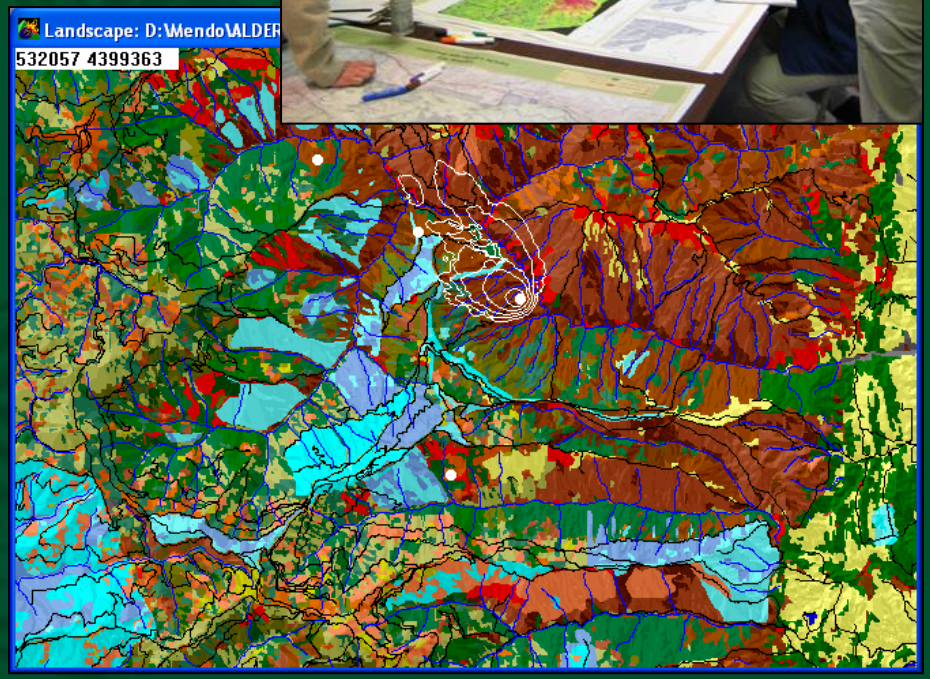
Scenario adjustments for multiple resource benefits





What we learned from SPOTS

- Data prep and modeling treatment alternatives was a huge workload
- Lacked a consistent metric treatment performance metric
  - Needs to consider unpredictable wildfire events
- Excellent communication and consensus tool



Developing an Analysis and Planning Framework for District-Level Fuels Treatment Projects

JFSP Project 03-4-1-04

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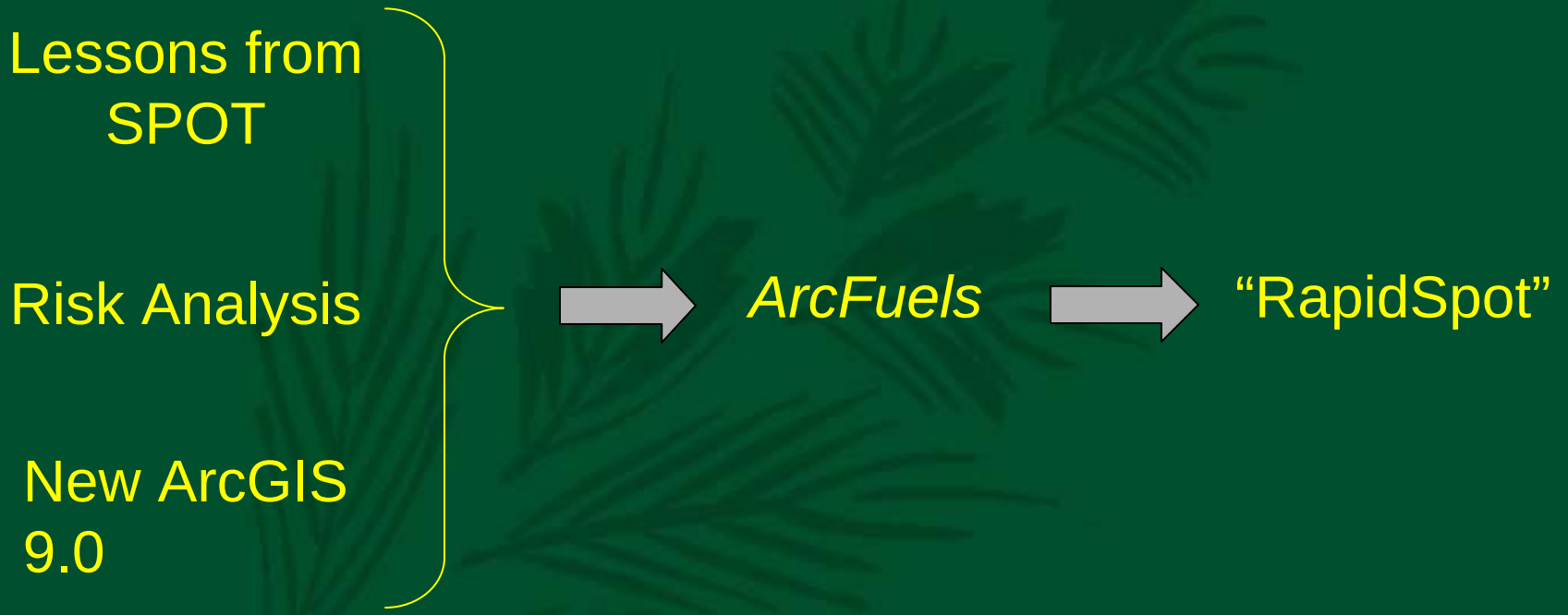
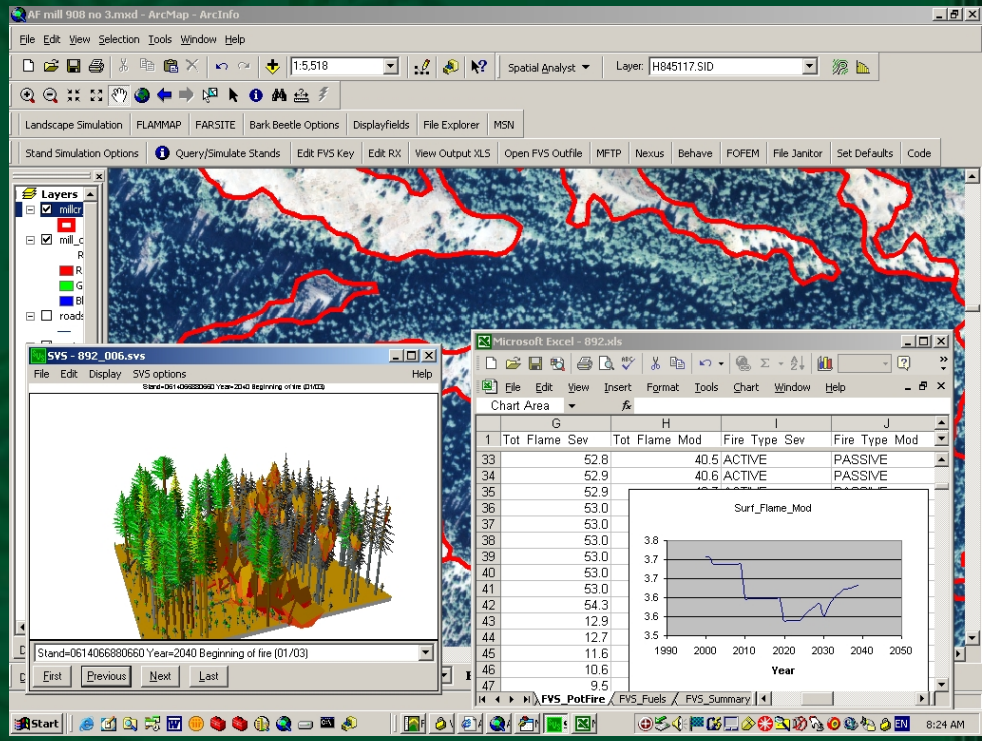


ArcFuels

- Integrates fuels data, fire models, desktop office software into ArcMap
- Helps bridge the gap between the GIS analysts/data stewards and fire modeling community
- Appears as two toolbars in ArcMap
- Rapid design and testing of fuel treatment scenarios
- Uses both Landfire and stand inventory data
- No installation, etc.



Case Study: Five Buttes Project, Deschutes NF

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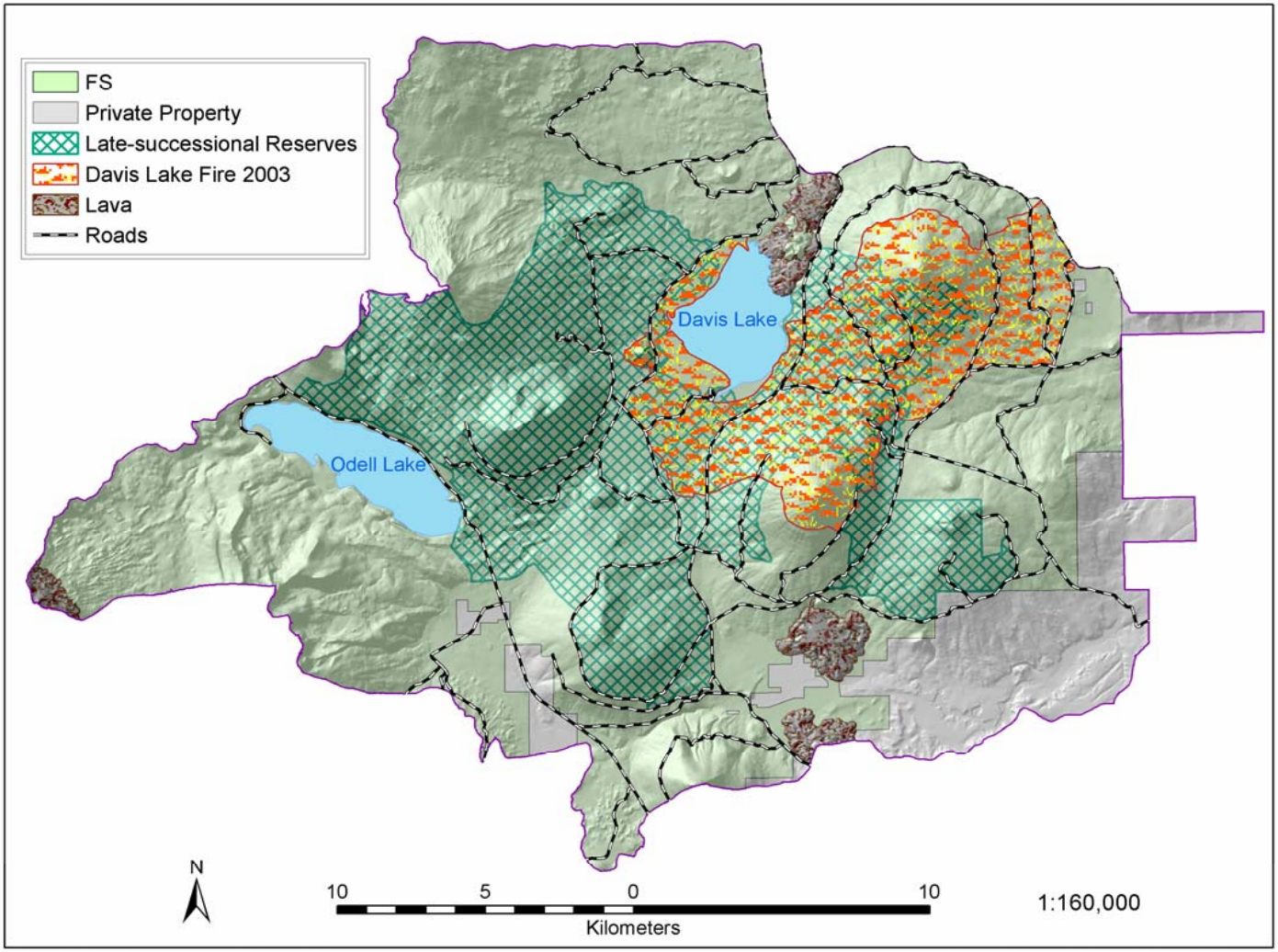

Ager et al. Forest Ecology and Management 246:45-56

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2003 Davis fire
- 21,000 acres
- 24% of the Davis owl reserve burned
- 5,759 acres of habitat lost

2004 District proposes Five Buttes fuel treatment project

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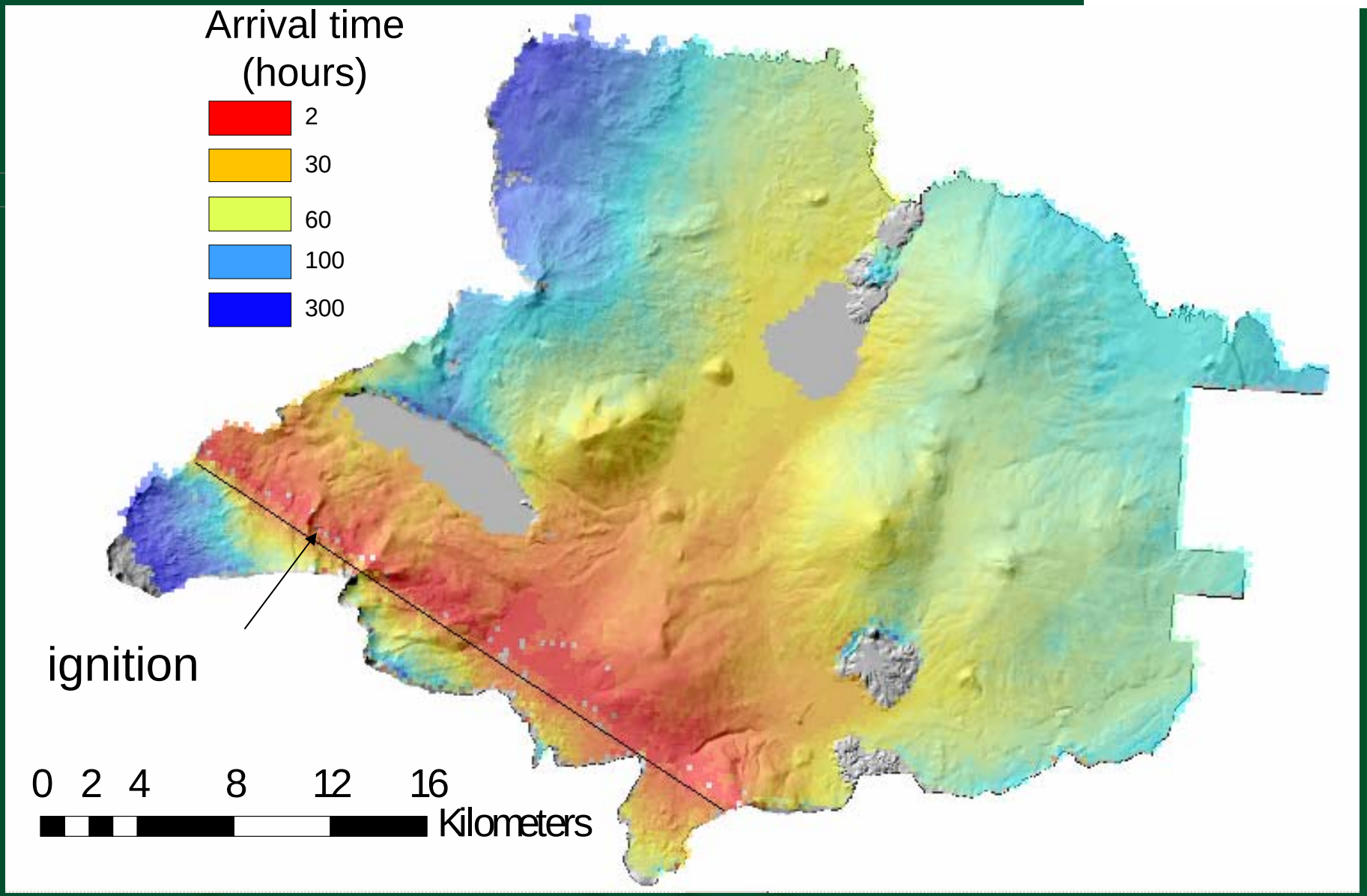
Step 1. Assess problem fire topology with FlamMap

- Arrival time
- Travel routes
- Burn probability
- Fire size potential

Wildfire arrival time for a large fire



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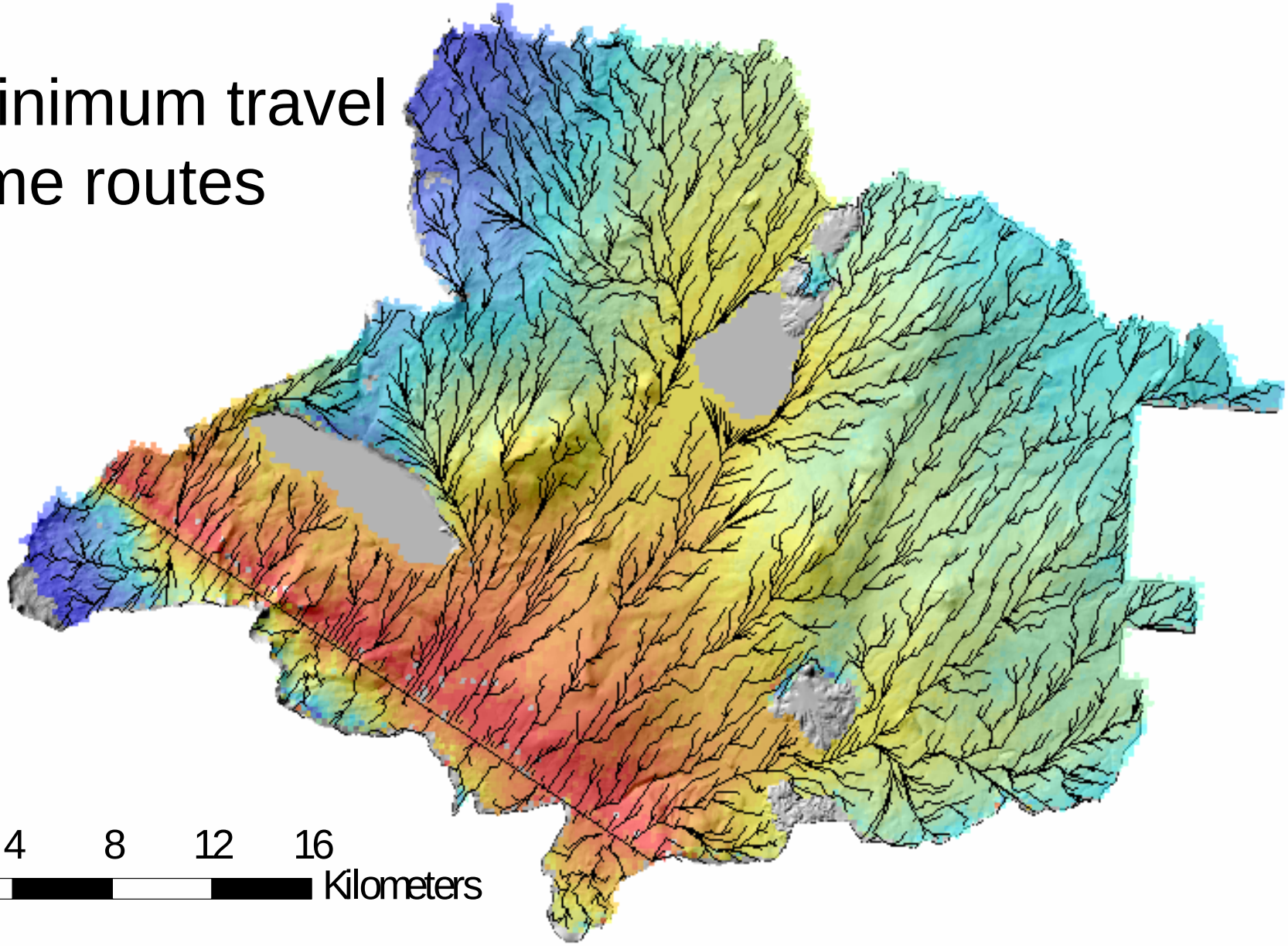
Minimum travel time routes



Burn Probability - No treatments, 2000 wildfires, 24 hour burn periods

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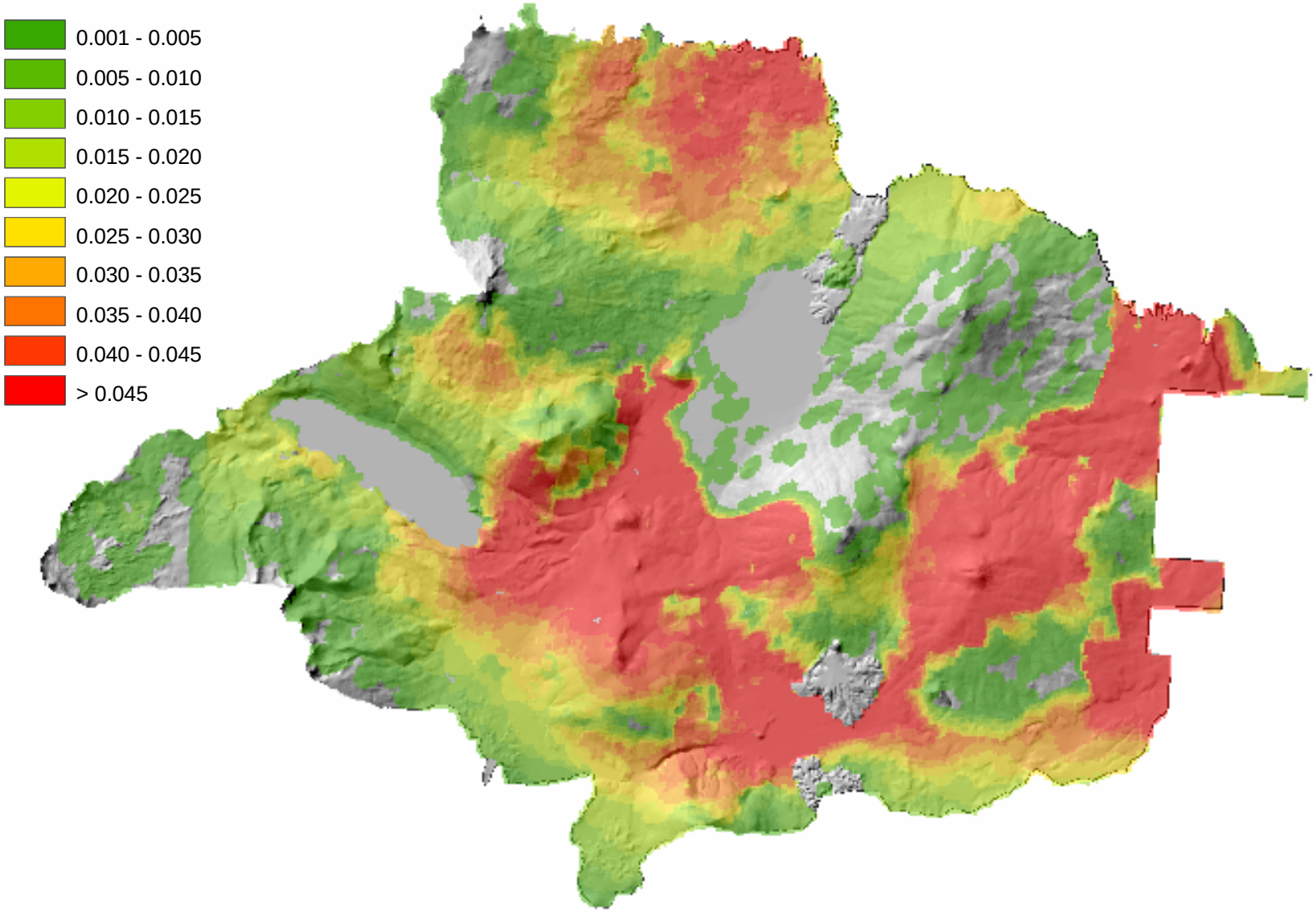

Minimum travel time and burn probabilities

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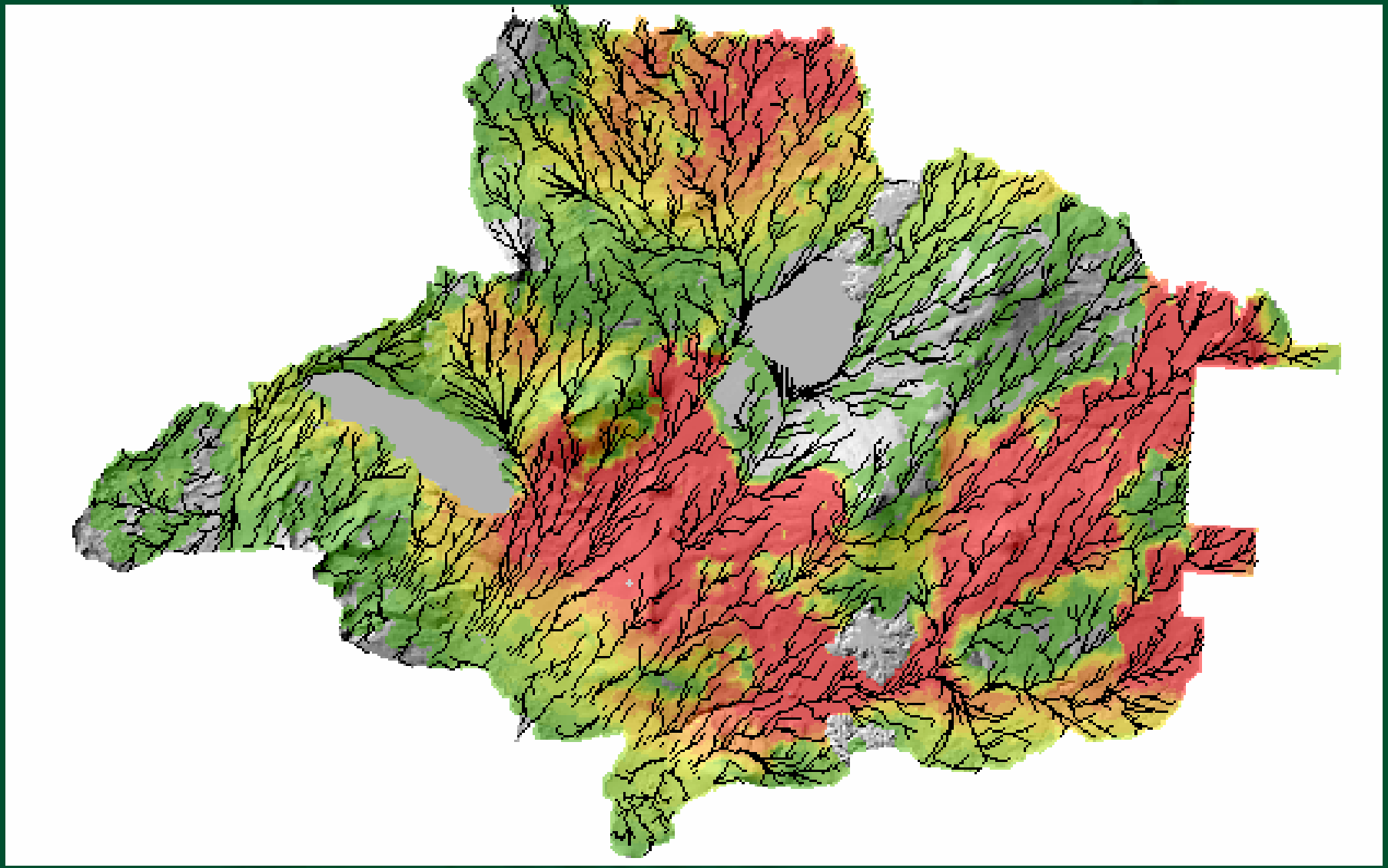

Potential fire size - size of fire generated from each ignitions

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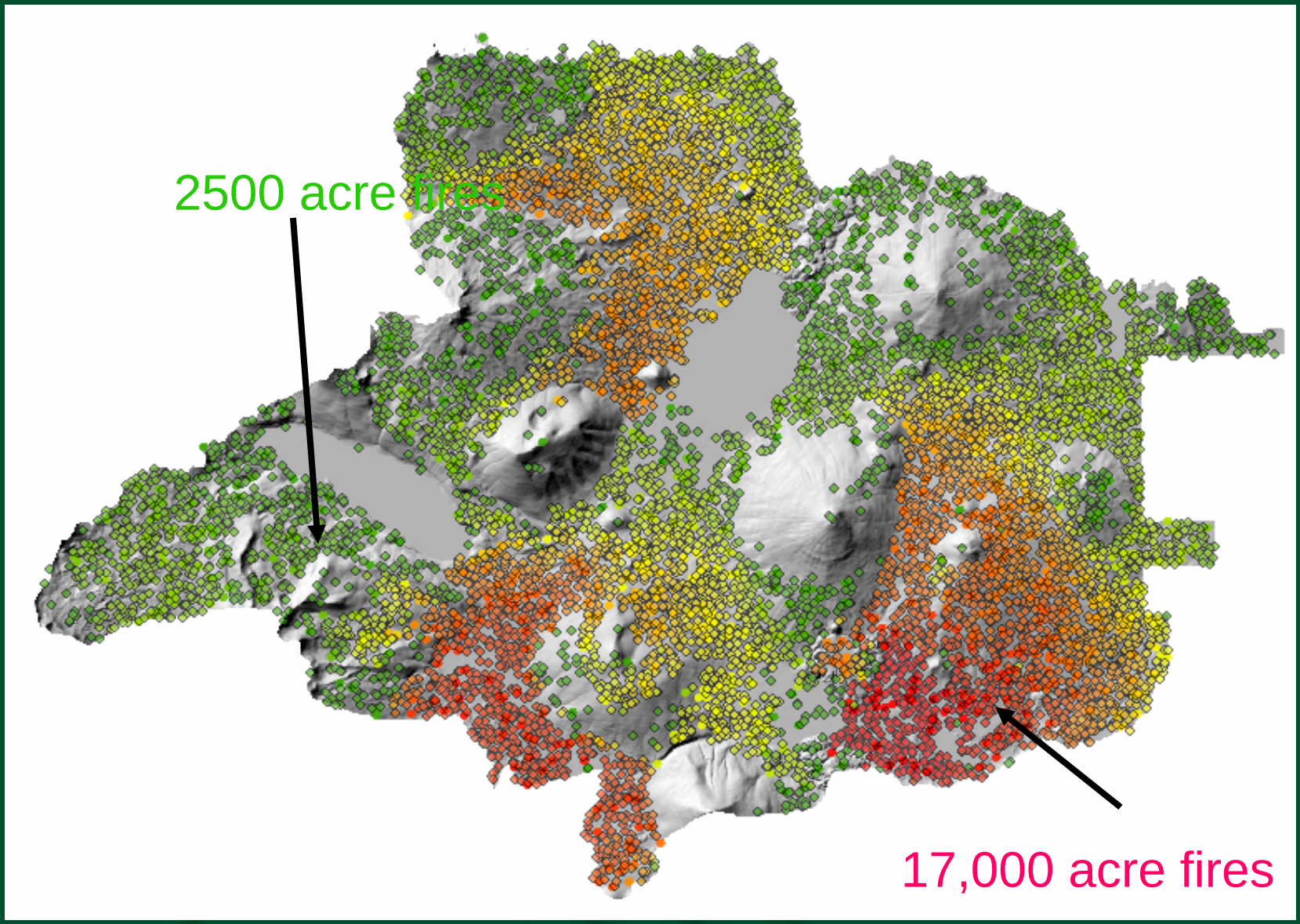

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Step 2. Design treatments

- Treatment Optimization
- Protect specific resources
- FRCC
- Etc.

Treat 20% of the landscape to protect remaining owl habitat

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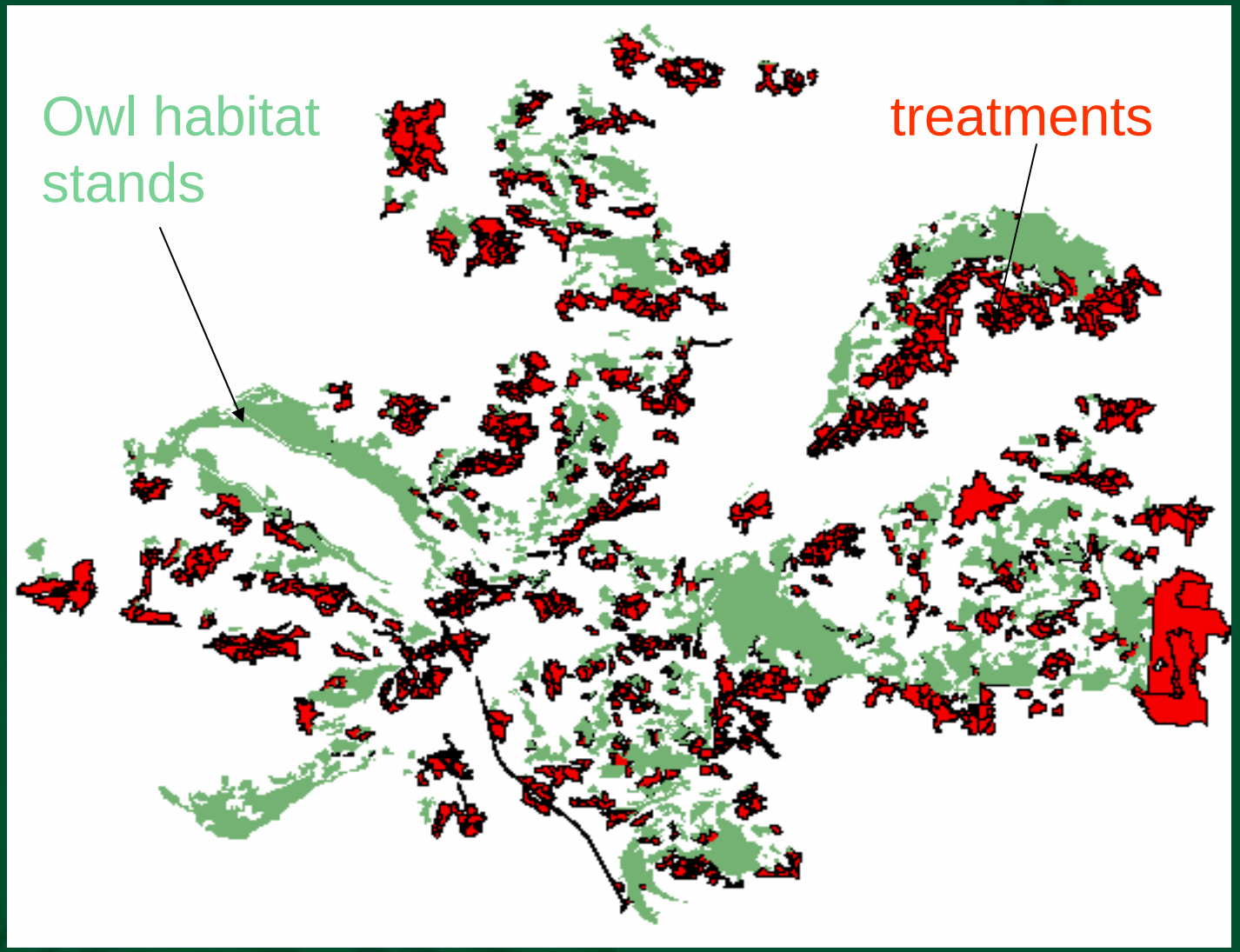

Step 3. Assess treatments

- Change in burn probability
- Reduction in risk

Burn probability for 4 treatment scenarios

0% treatment

10% treatment

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20% treatment

50% treatment

Burn probability does not indicate loss – need to consider fire intensity

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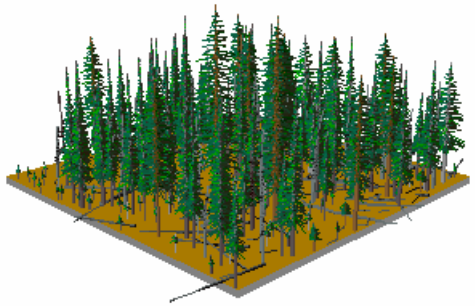
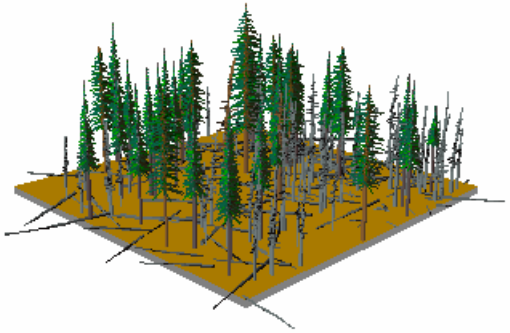
Stand=954 Year=2007 Beginning of cycle

No fire – 55% canopy = suitable habitat



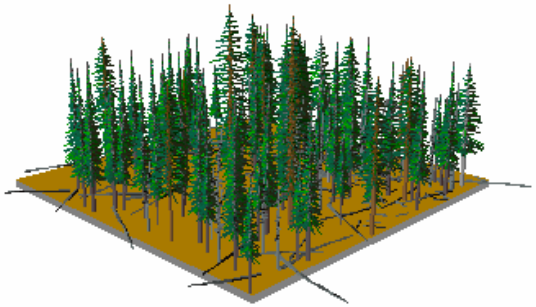
Stand=954 Year=2007 Beginning of cycle

5 ft Flamelength → 30% canopy = not suitable habitat



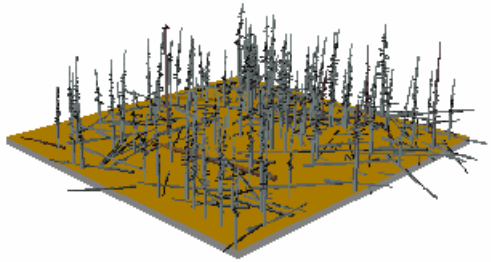
Stand=954 Year=2007 Beginning of cycle

3 ft Flamelength → 45% canopy = still suitable habitat



Stand=954 Year=2007 Beginning of cycle

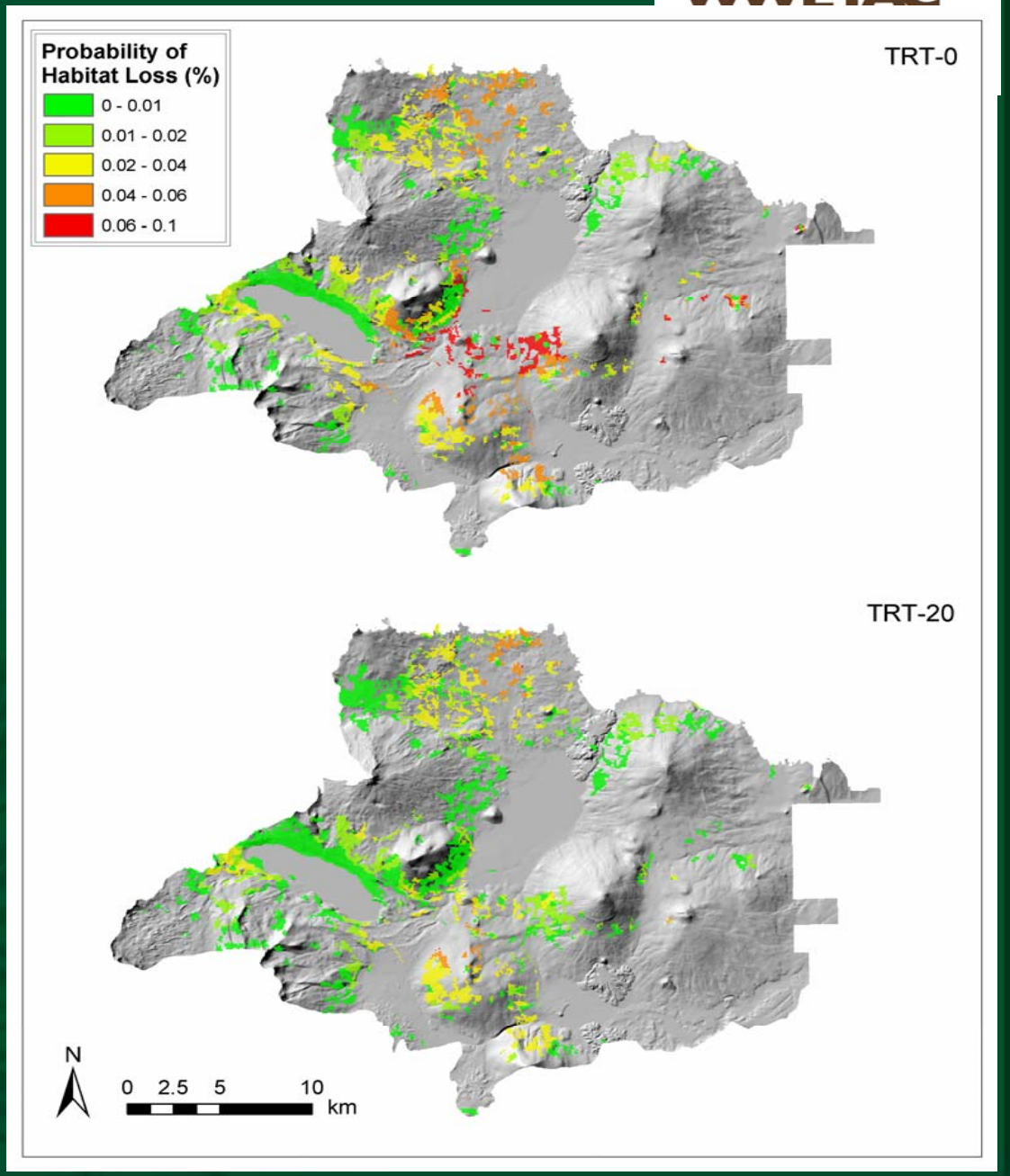
10 ft Flamelength → o% canopy= not suitable habitat



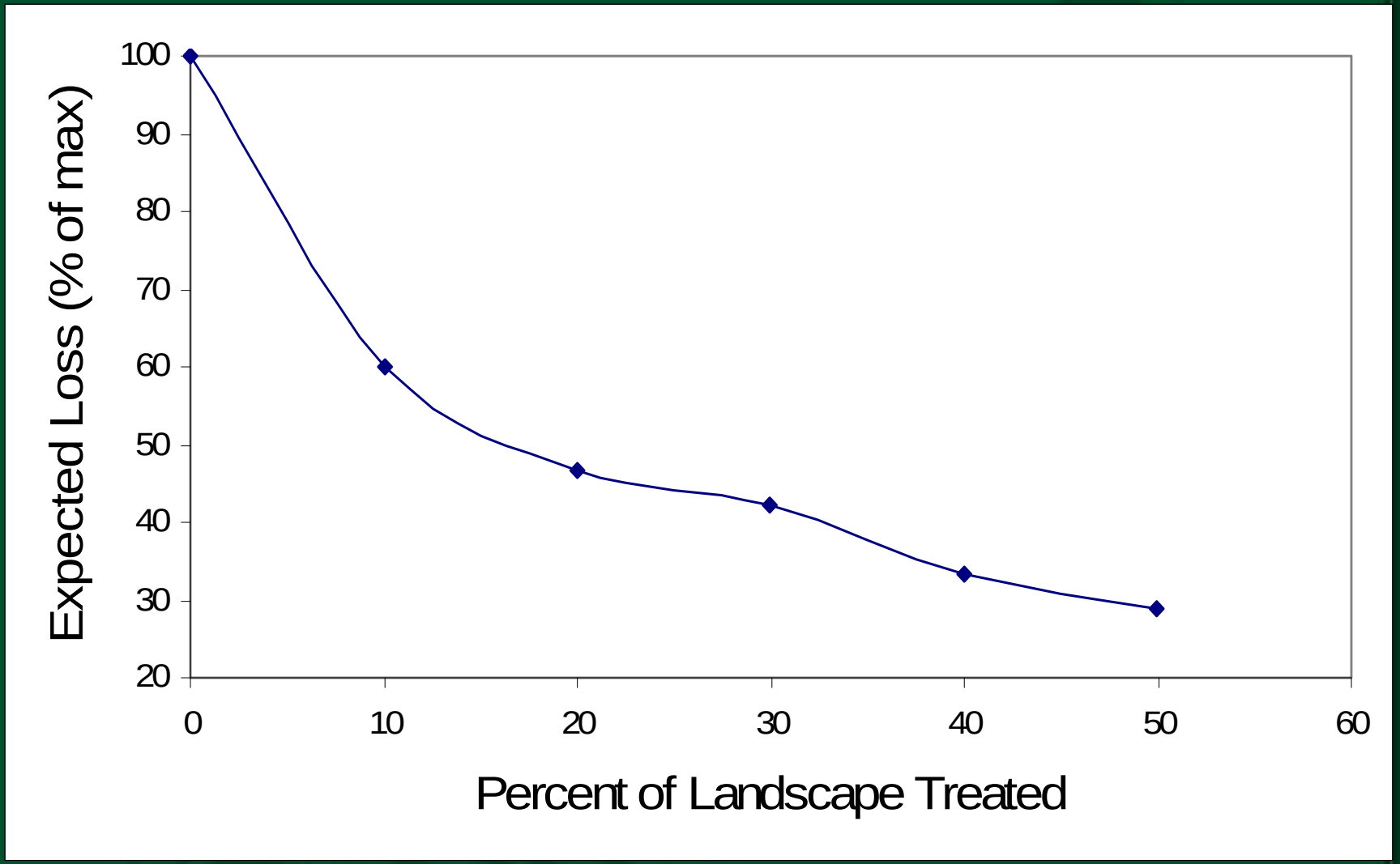
Calculala the probability of a fire that eliminates owl habitat

"expected loss"

Integrates fire spread, intensity, and effects of a problem fire



Expected Loss of Spotted Owl Habitat for 6 Treatment Intensities



Towards a Risk Analysis Framework

- Consider likelihood, intensity, and effects
- Risk = probability$_{(intensity)}$ x loss$_{(intensity)}$
- Fuel treatments can mitigate risk by targeting one or more risk factors
  - Reduce likelihood
  - Reduce intensity
  - Reduce effects

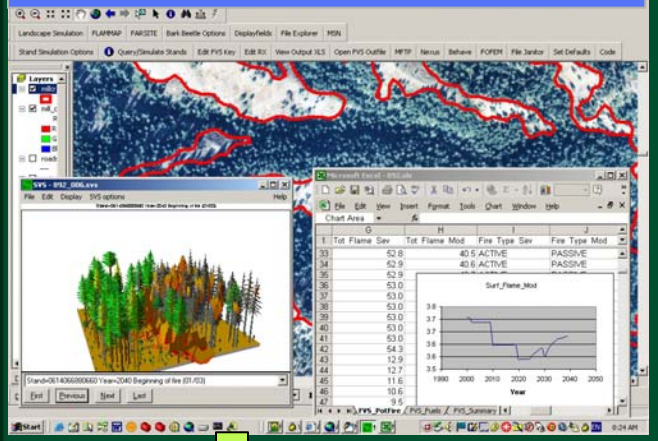
ArcFuels - Status

- Website online
- Adopted by the R5 Fireshed and Stewardship Assessment Process
- Support by the WO RD&A Charter (Szymoniak), Fuels Modeling Institute, INFORMS, and the Western Threat Center
- User interest from all federal land management agencies
- Three workshops completed last spring
- National Rapidspot workshop in Portland Nov 6-8
  - Co-sponsored by WWETAC and WO
  - Nine invited teams come with data and projects
  - Teams leave with substantial part of the analysis completed for the selected project

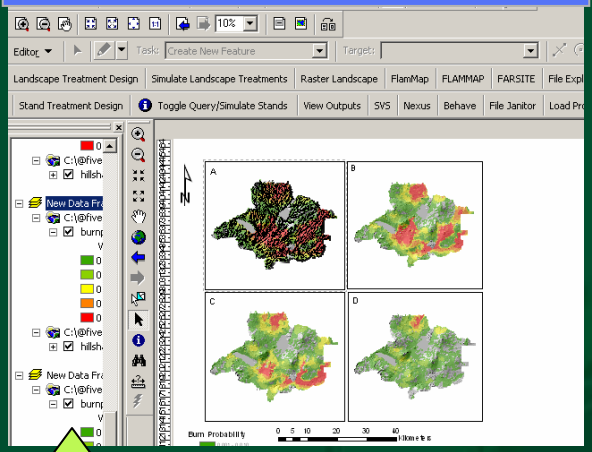
Future

- Integrate Rapidspot training into fire management coursework
- Hybridize Rapidspot with the WFDSS style web-based project management system
  - Create an interagency inventory and reporting system for fuel treatment and wildfire risk assessment projects at all scales
  - District NEPA, Forest level risk assessments, FPA, Forest Planning, etc.
  - Strive for a uniform analysis framework
  - Integrate risk assessment process to address GAO and OIG reports

Treatment design - ArcFuels



Risk outputs for NEPA



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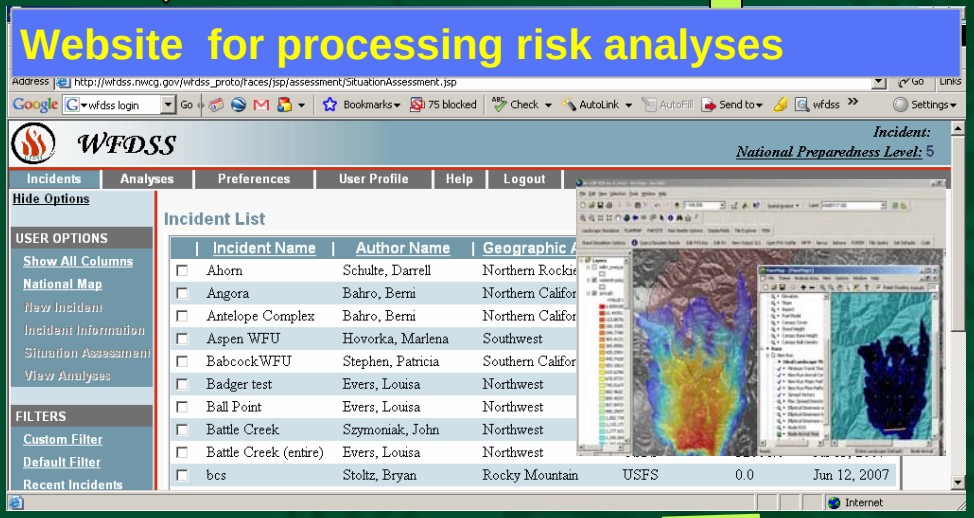
Website for processing risk analyses



High performance computing

National fuel treatment summaries

Ochoco NF

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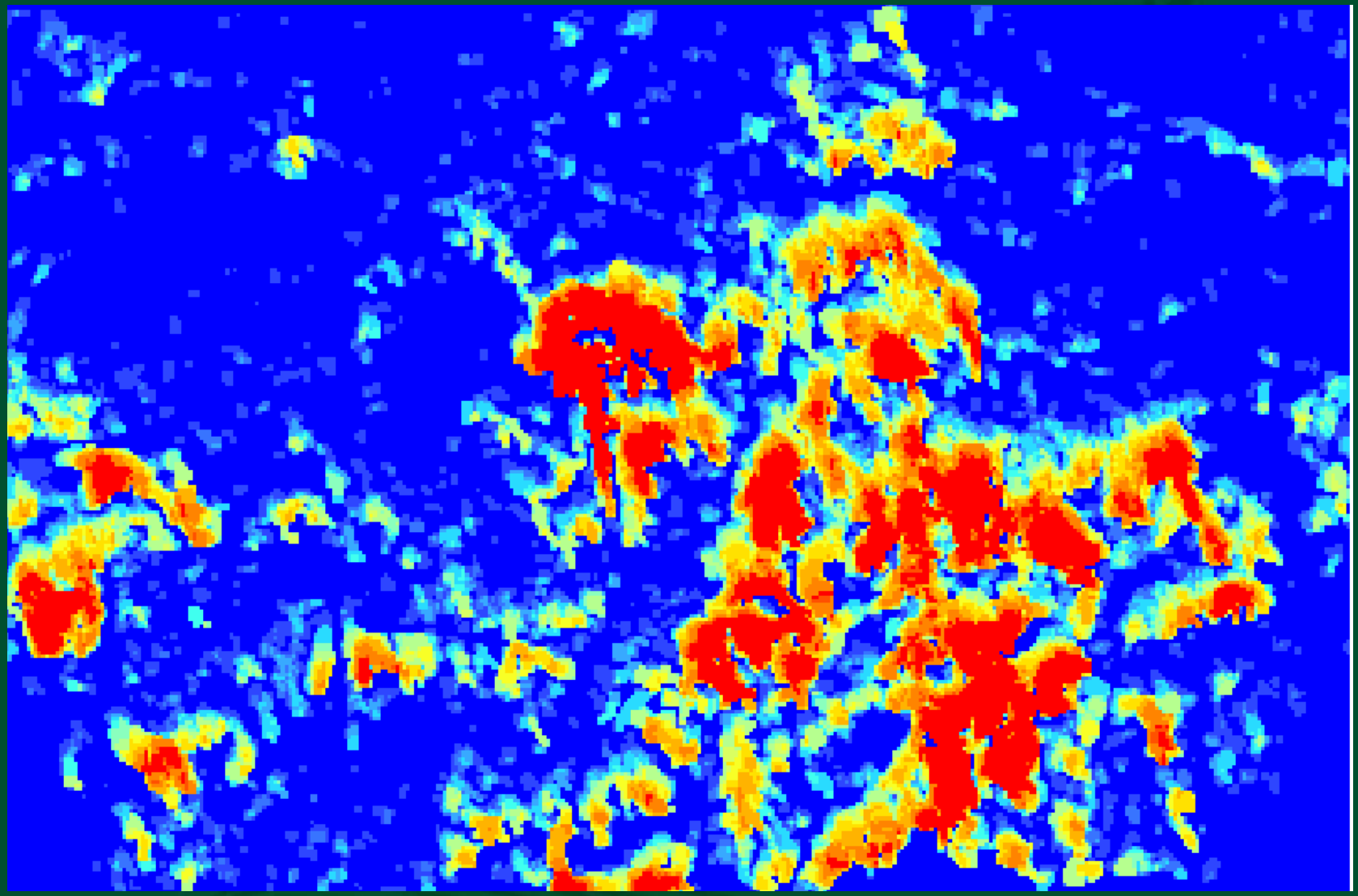

8.5 million acres SW Oregon

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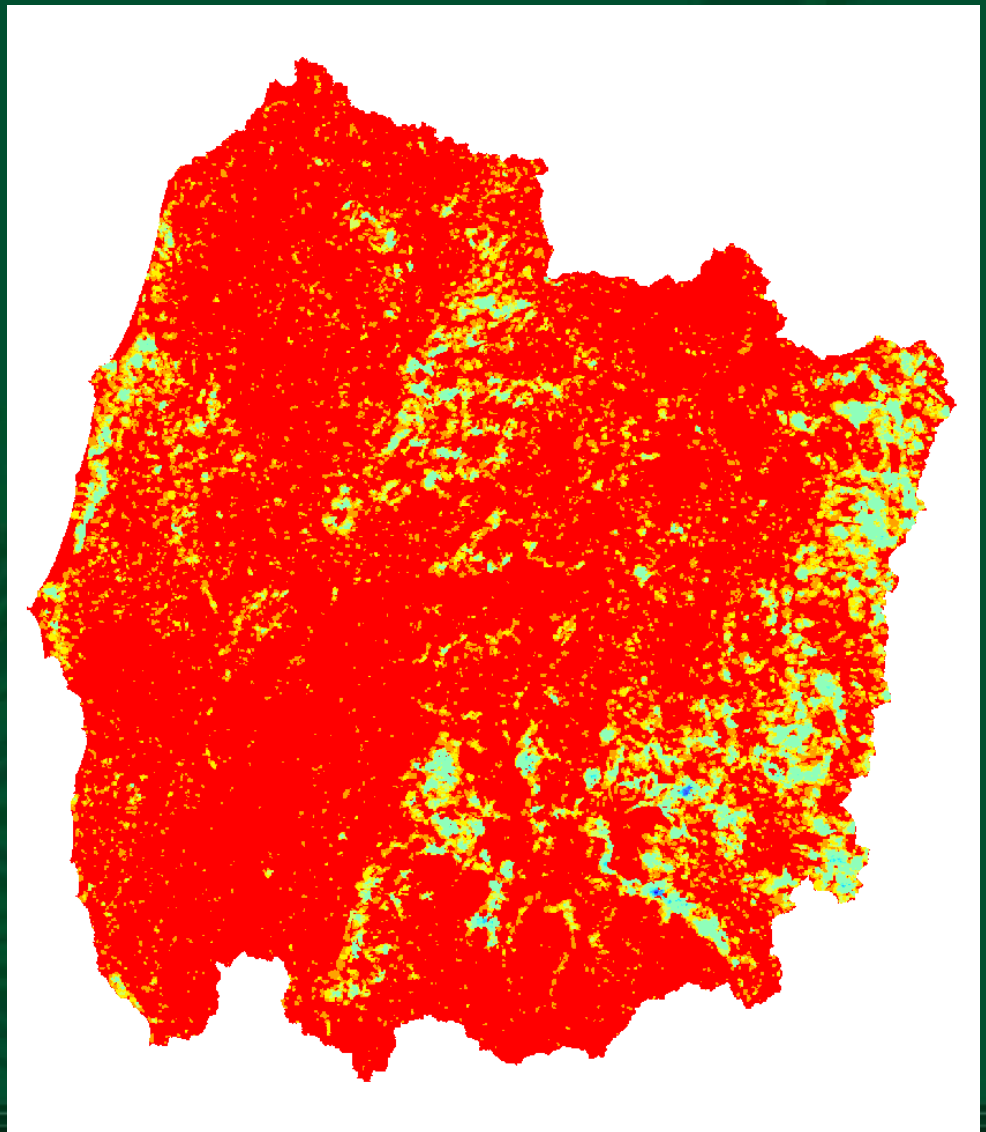

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