

“Man has possessed fire so long that the inquiry as to whether it is a human characteristic has some point.”

-Walter Hough



Good fire
(characteristic of
an ecosystem)



Bad fire
(NOT
characteristic of
an ecosystem)

Fire Regime

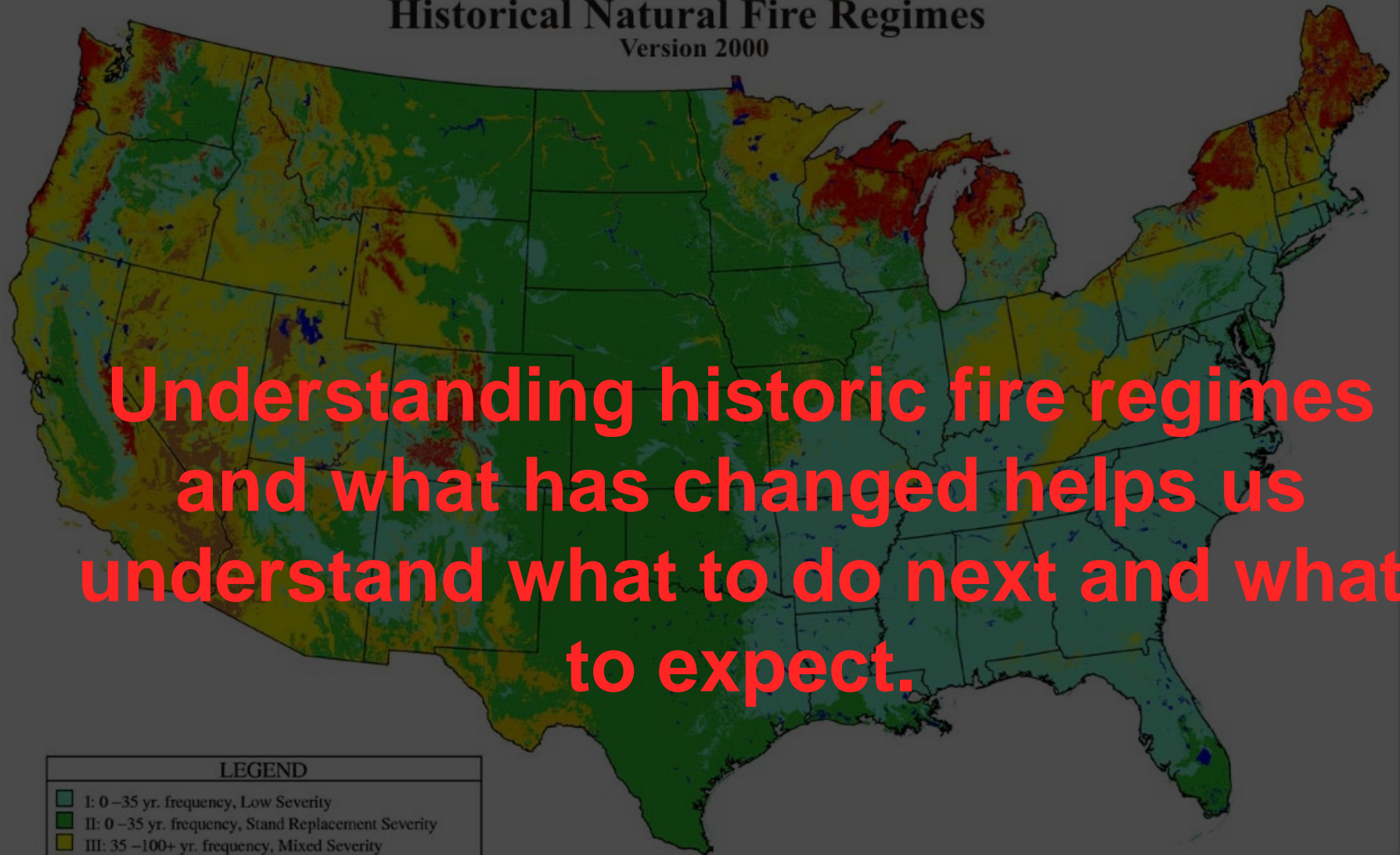
A set of recurring conditions that characterize an ecosystem within an historic, natural or human induced context, within a given climate. The set of recurring conditions includes a specific range of attributes including:

1. intensity
2. severity
3. fire type
4. frequency

5. size
6. seasonality
7. spatial complexity

Historical Natural Fire Regimes

Version 2000



Understanding historic fire regimes and what has changed helps us understand what to do next and what to expect.

LEGEND

- I: 0-35 yr. frequency, Low Severity
- II: 0-35 yr. frequency, Stand Replacement Severity
- III: 35-100+ yr. frequency, Mixed Severity
- IV: 35-100+ yr. frequency, Stand Replacement Severity
- V: 200+ yr. frequency, Stand Replacement Severity
- Barren
- Water

Intensity = QUANTITATIVE

- A *measure of fire behavior*
- The rate of heat produced by a fire
 - A property of the fire itself

Indicators:

- Flame Length
- Peak Temperature
- Residence Time

Severity = QUALITATIVE

- A measure of the immediate effects of a fire
 - A *Classification*, of fire effect/s

Indicators:

- Percent of fuel cover consumed
- Leaf or needle scorch
- Duff consumption
- Char height and depth
- Mortality

INTENSITY

- Qualitative
- Fire behavior
- Rate of energy release
- Measurement

SEVERITY

- Quantitative
- Fire effects
- Degree of change (before/after)
- Classification

Current Condition

Initial Analyses

- Fire Regime/Condition Class
- Fire Return Interval
- Fire Type
- Ignition Densities



Passive Crown Fire



Crown Fire



Surface Fire



Fire Type



Strategic Placement of Treatments (SPOTS)

- 1) Define problem fire – Schultz and...Oak Creek Canyon?
- 2) Identify assets and protection targets (LSWG, other specialists, other publics – part of why we're here today)
- 3) Define analysis area on a map (pipo analysis area)
- 4) Design treatment patterns to mitigate the problem fire and meet a range of objectives (collaborative effort in progress).
- 5) Test treatment patterns with FARSITE or FlamMap; adjust, re-test (working on it)
- 6) Display trade-offs
- 7) Follow-up w/monitoring and AM mgmt

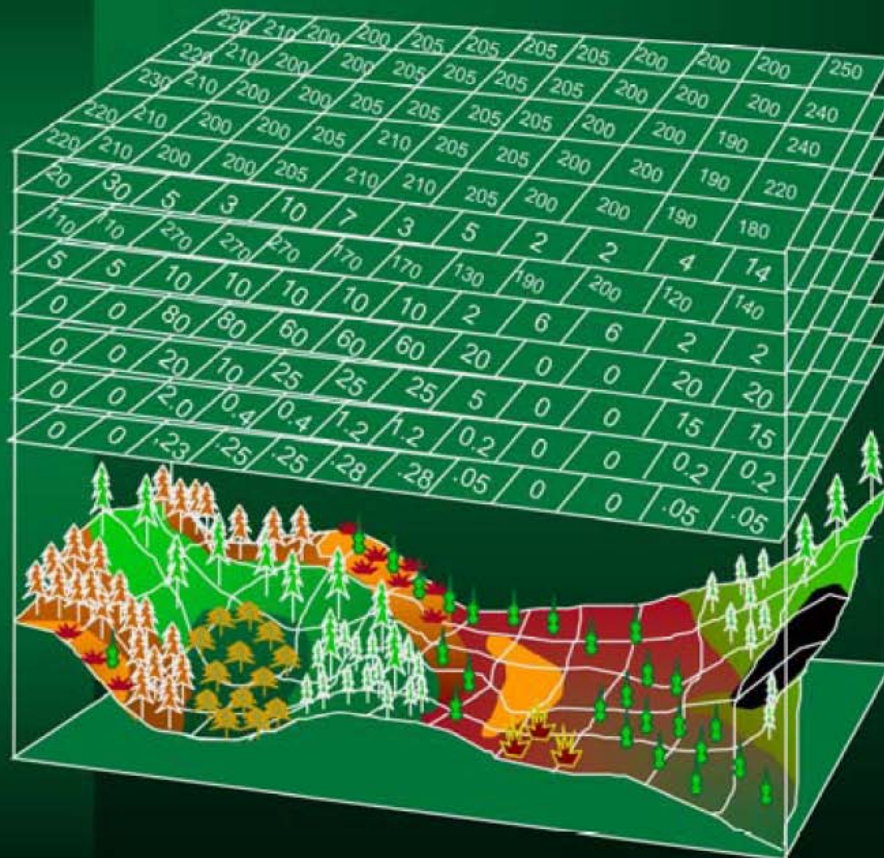
”models and their results are often not meant to give “the answer”, but to provide insight, understanding, and knowledge regarding complex phenomena.”

“all models need to be validated and calibrated to some past or current documented and observed condition.”

Fire Behavior Modeling Data

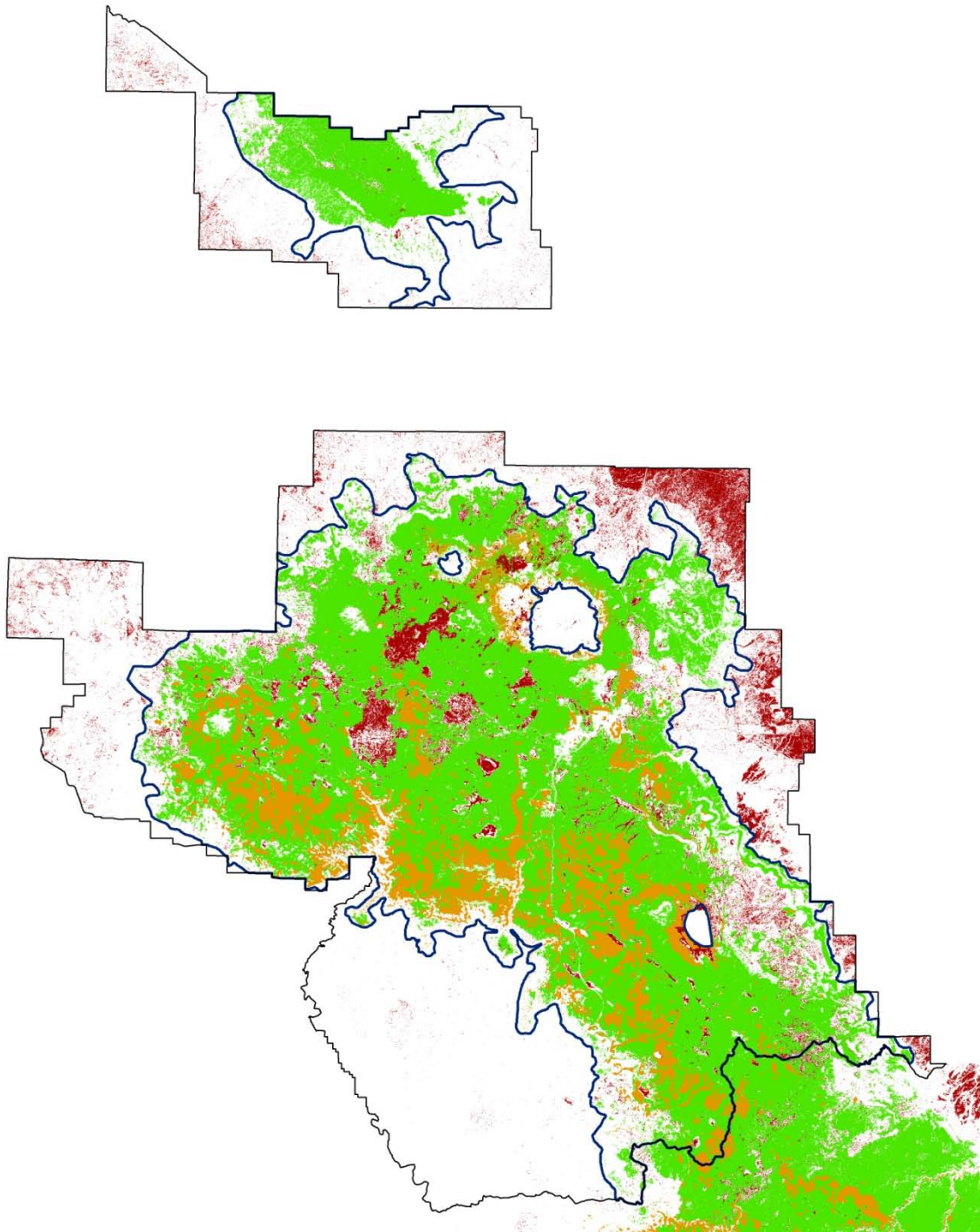


Landscape Data for Spatial Fire Models



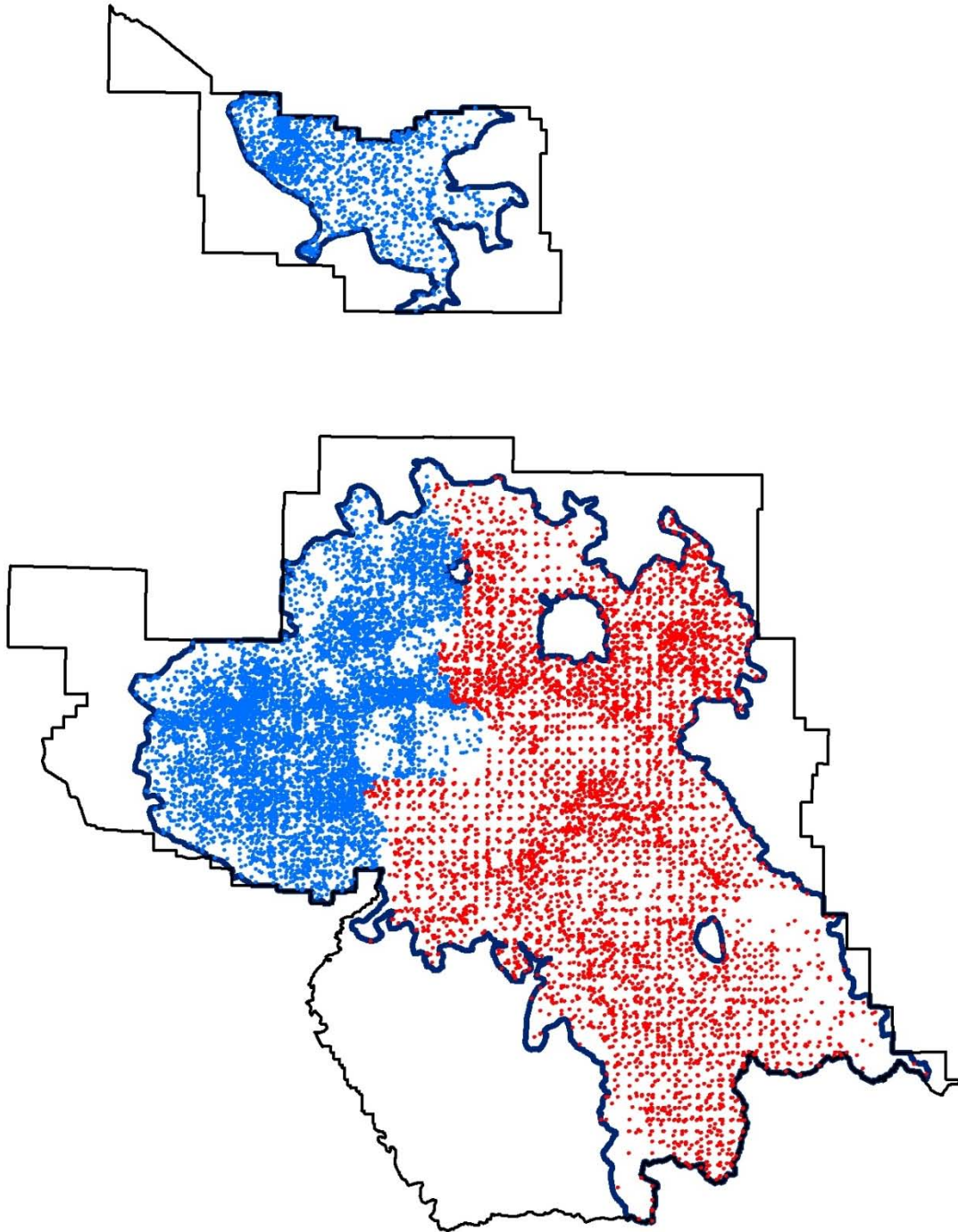
- Elevation
- Slope
- Aspect
- Fuel Model
- Canopy Cover
- Canopy Height
- Crown Base Height
- Crown Bulk Density

Major vegetation types



- Grassland
- Ponderosa Pine/Oak
- Ponderosa Pine
- Other

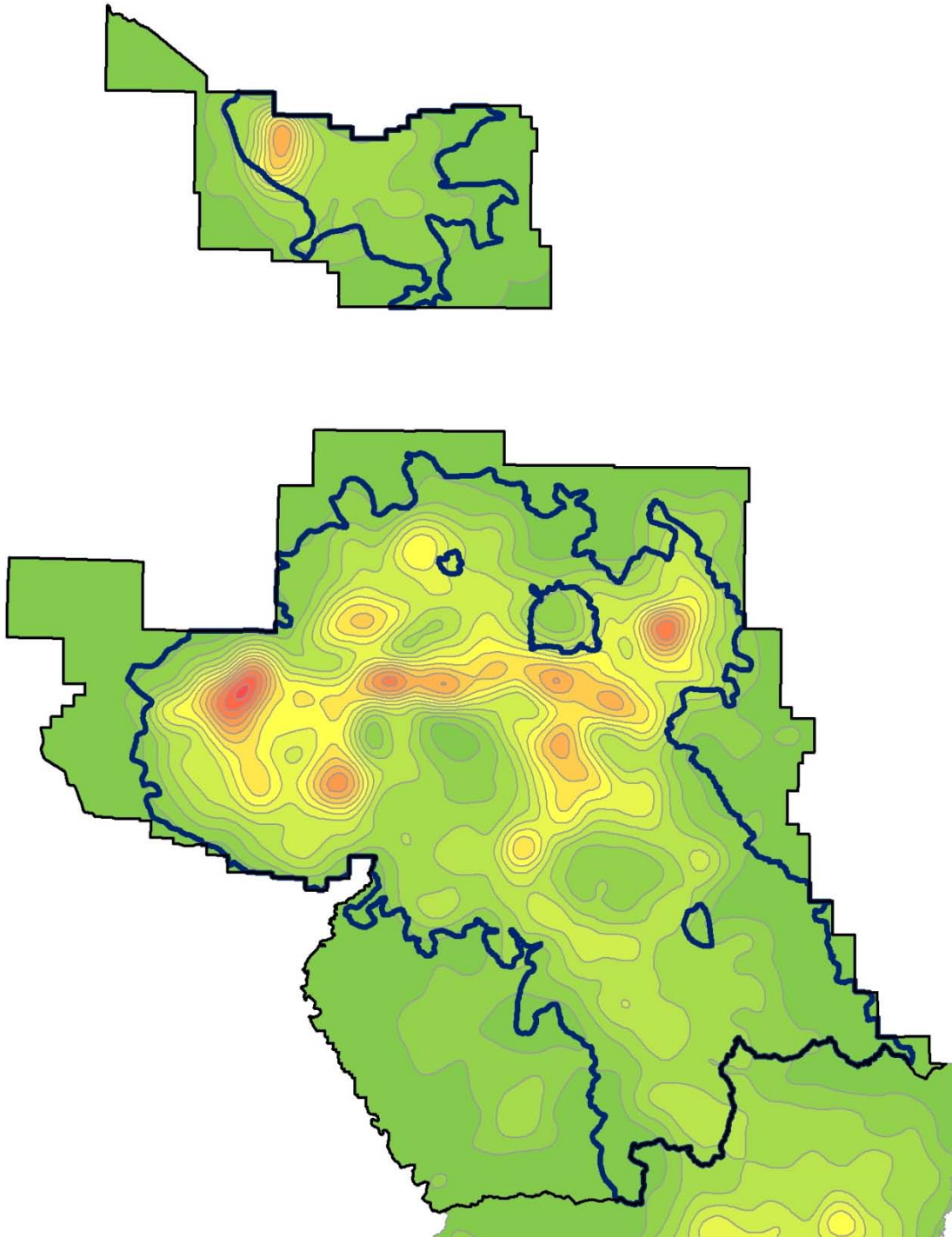
Fire Return Interval



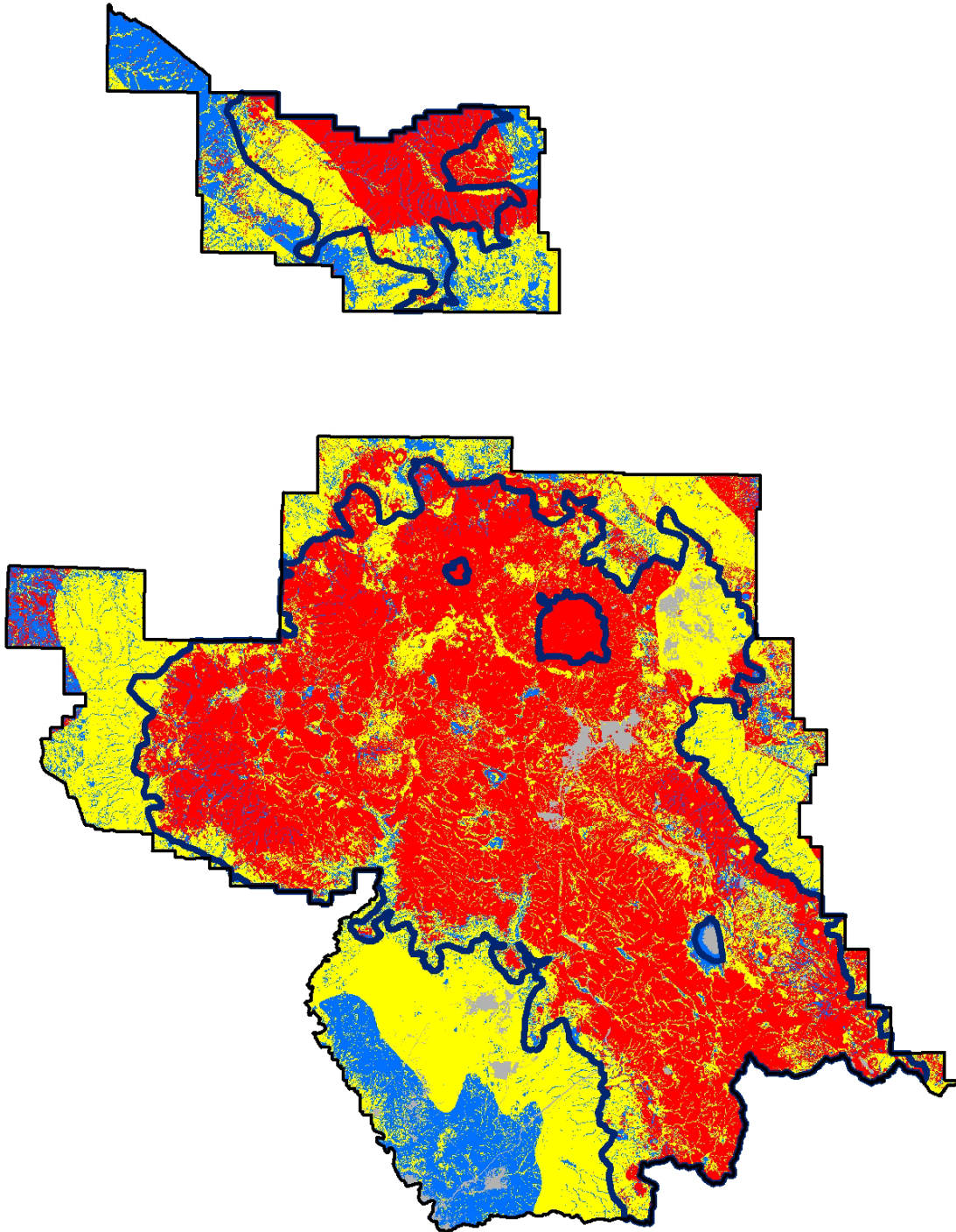
Historic FRI for
analysis area
= ~ 2 – 20

Current FRI for
analysis area
= ~43

Ignition Density (starts per acre)



Fire Regime / Condition Class (FRCC)

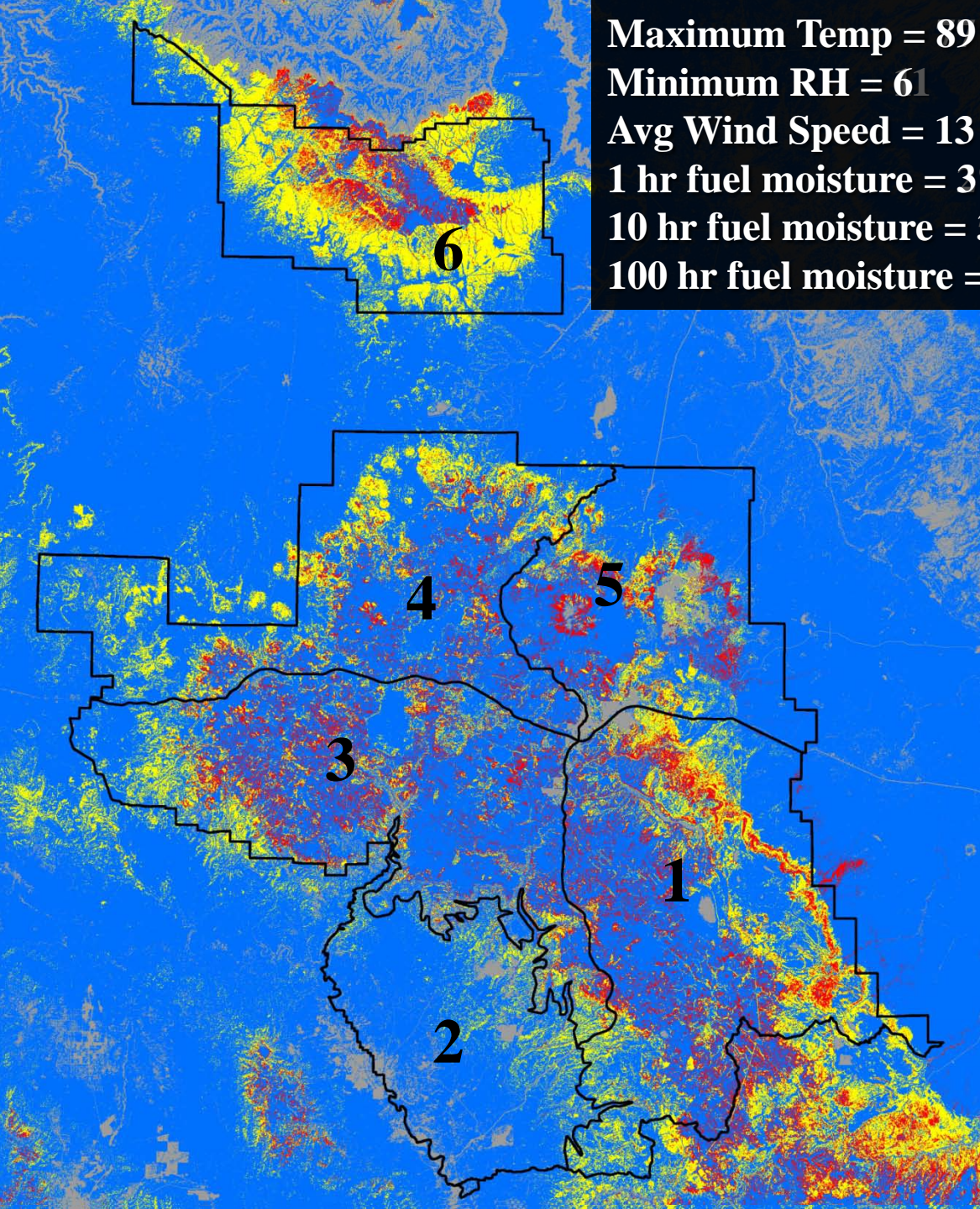


Fire Behavior Potential

Maximum Temp = 89
Minimum RH = 61
Avg Wind Speed = 13
1 hr fuel moisture = 3%
10 hr fuel moisture = 3%
100 hr fuel moisture = 6%

95th weather percentile
Schultz wx parameters

- Active crown fire
- Passive crown fire
- Surface fire
- No fire



Current Condition

Initial Analyses

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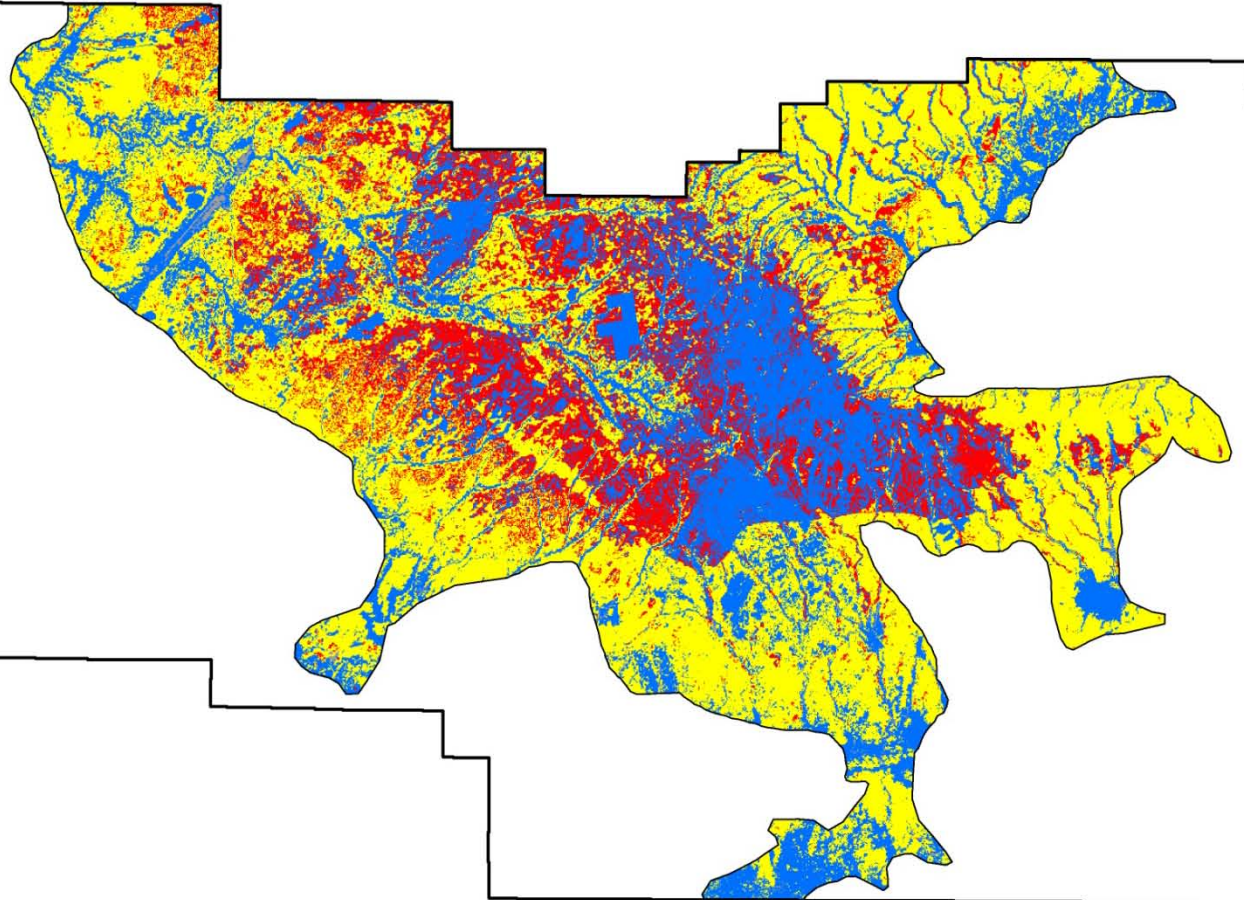
Extended Analyses

- Fire Paths (risk/probability to given areas)
- Fireline Intensity (fire effects)
- Heat per unit area (fire effects)
- Treatment Optimization Model Simulation (TOM), or similar method of optimizing proposed treatments


Fire Behavior Potential – Firescape 6

Schultz wx/fuel parameters

- Active crown fire
- Passive crown fire
- Surface fire
- No fire



Fire Behavior Potential – Firescape 6



**Fire Paths
+
Heat per unit area**

Planning for prescribed fire:

- Where can fire be used safely and effectively?
- Can we produce the effects we want?
- Is pre-treatment needed?
- Maintenance burn or ‘treatment’?

Prescribed Fire

- Pile burning
- Broadcast Burning

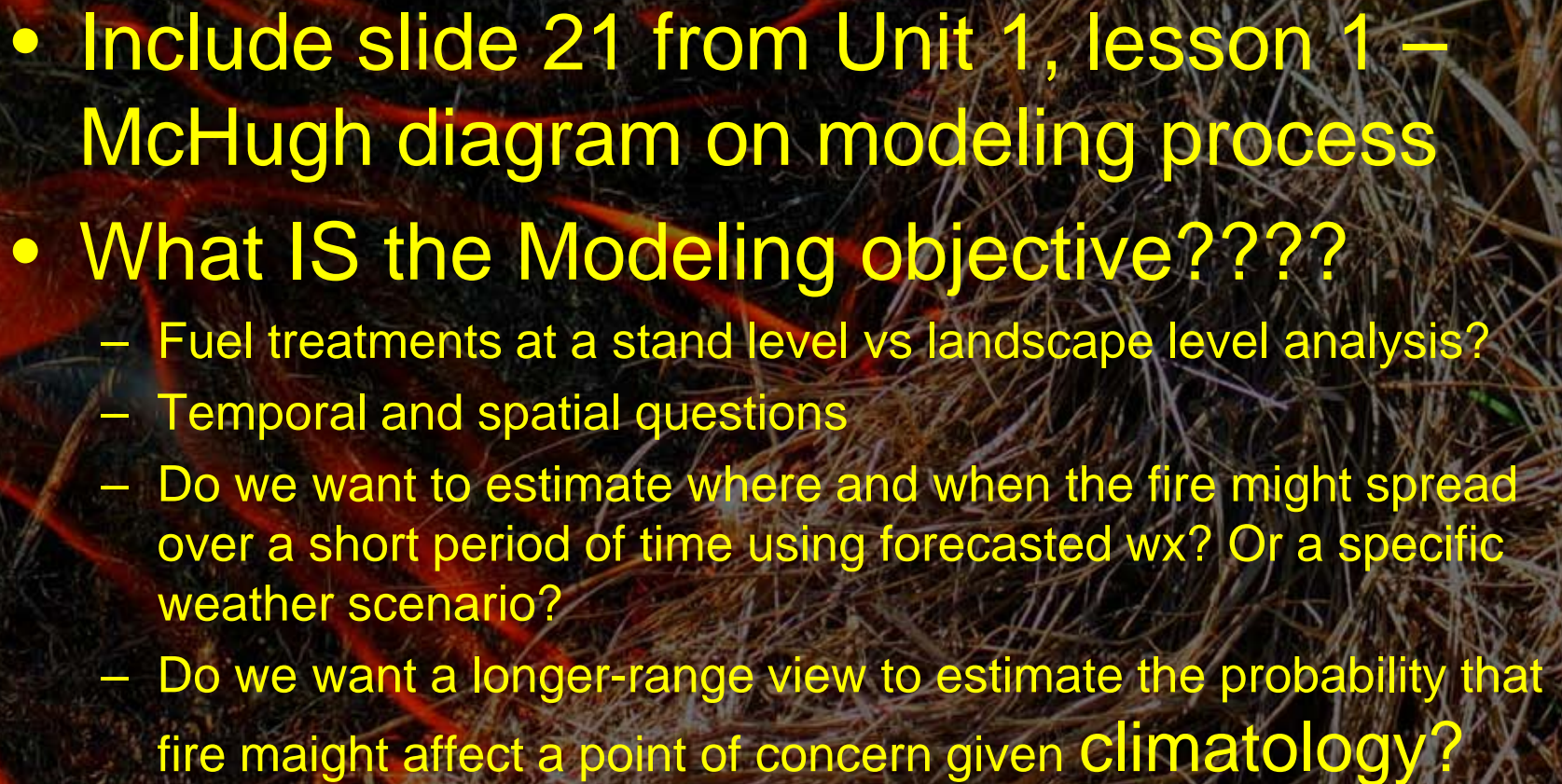


Thank you for your attention!

Questions??

Mary Lata
Fire Ecologist
Four Forest Restoration Initiative - Core Team



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- Include slide 21 from Unit 1, lesson 1 – McHugh diagram on modeling process
 - What IS the Modeling objective????
 - Fuel treatments at a stand level vs landscape level analysis?
 - Temporal and spatial questions
 - Do we want to estimate where and when the fire might spread over a short period of time using forecasted wx? Or a specific weather scenario?
 - Do we want a longer-range view to estimate the probability that fire might affect a point of concern given climatology?