

# Measuring the effects of slash pile burning

Collaborative science to inform management



Three year project to study the environmental effects of pile burning

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# Measuring the effects of slash pile burning

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We examined how pile age and burn season affect:

- the amount of biomass consumed,
- the rate of pile combustion,
- carbon dynamics,
- soil characteristics, and
- vegetation response



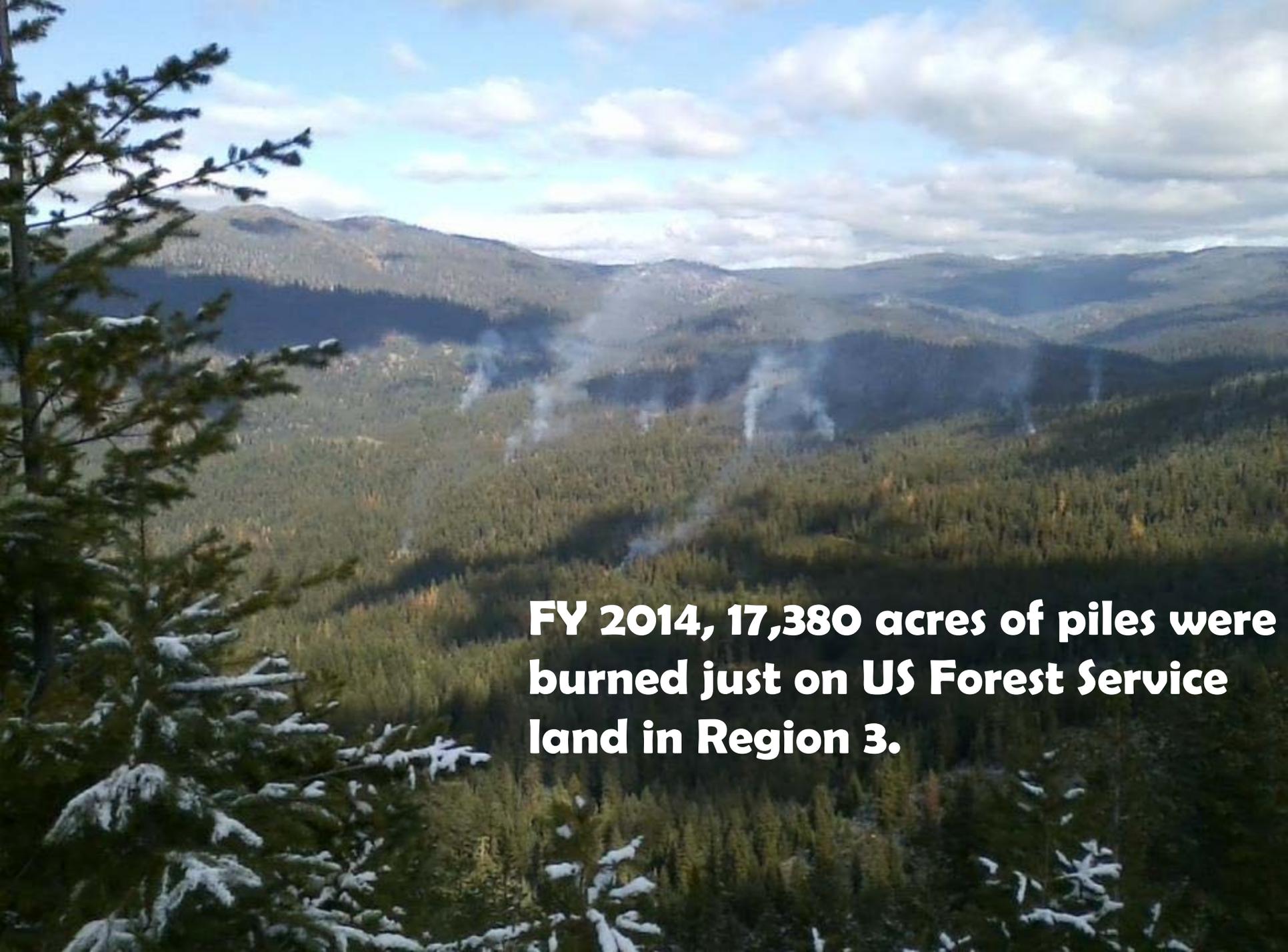
# Why do we burn slash piles?



Scott Isaacson, National Park Service



Kari Greer



**FY 2014, 17,380 acres of piles were burned just on US Forest Service land in Region 3.**

# What are the potential impacts?

- **Reduce fuel loads**
- **Soil sterilization**
- **Scorching trees**
- **Fire spreading**
- **Incomplete combustion**
- **Smoke**

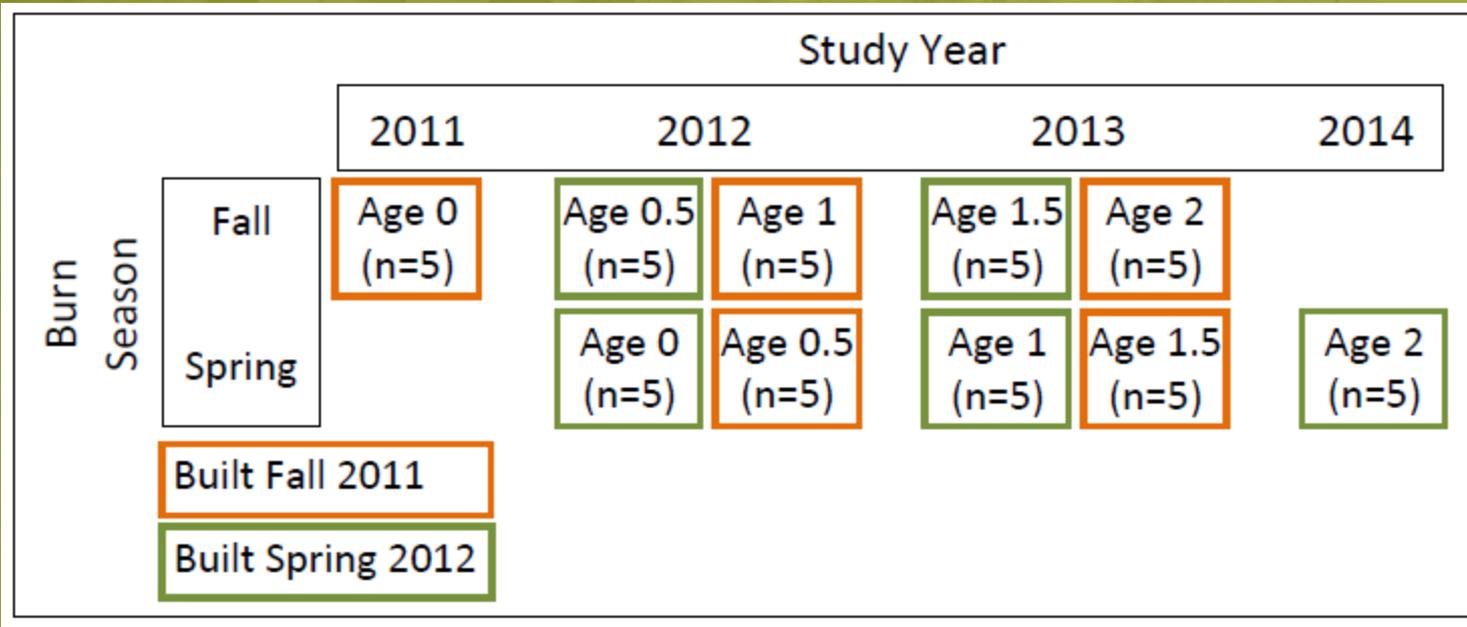


# How can we study the effects of pile burning?



# Controlled experiment

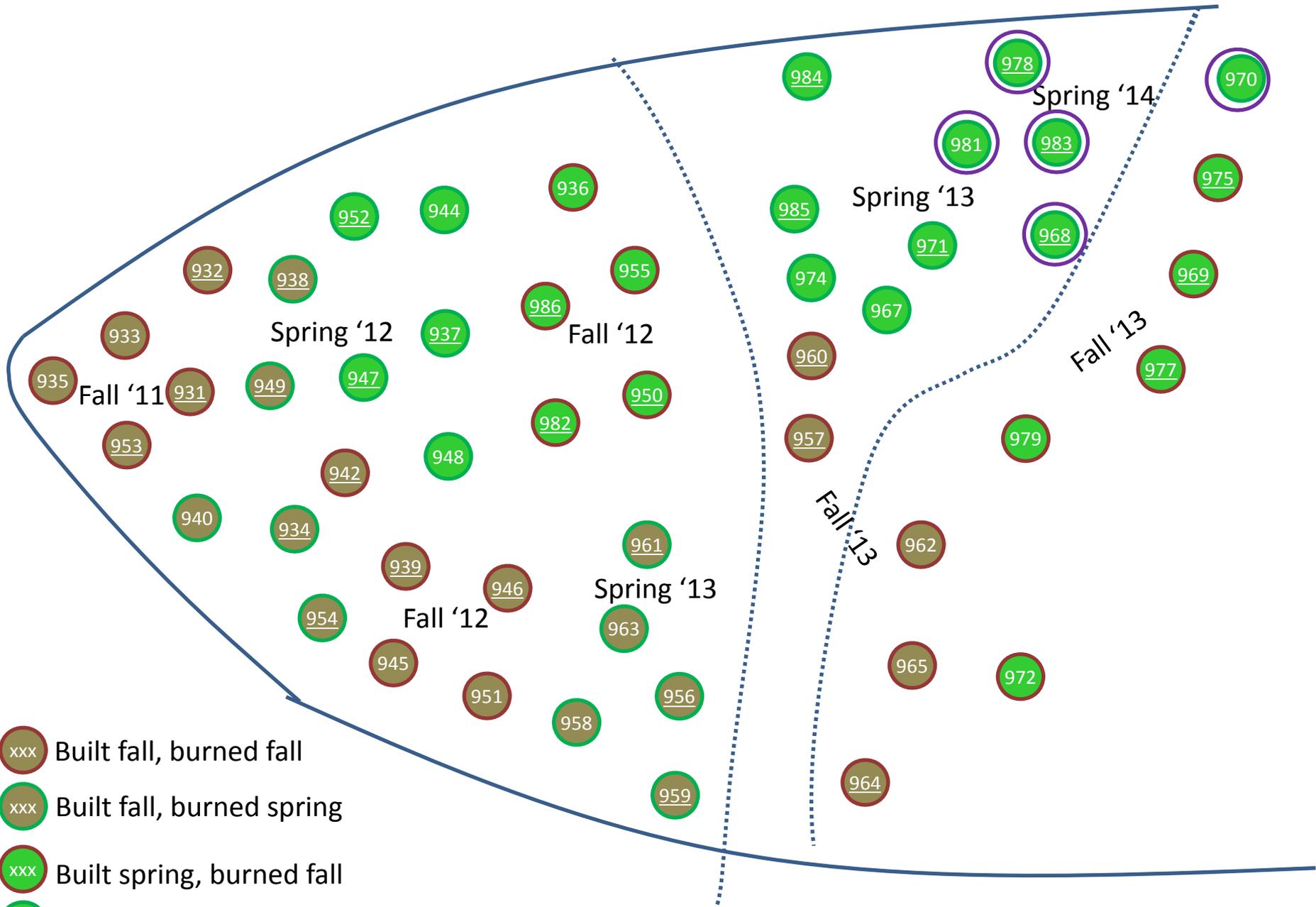
**5 Ages X two seasons X 5 piles = 50 piles**





4 feet high

8 feet wide



- xxx Built fall, burned fall
- xxx Built fall, burned spring
- xxx Built spring, burned fall
- xxx Built spring, burned spring

# Vegetation plots



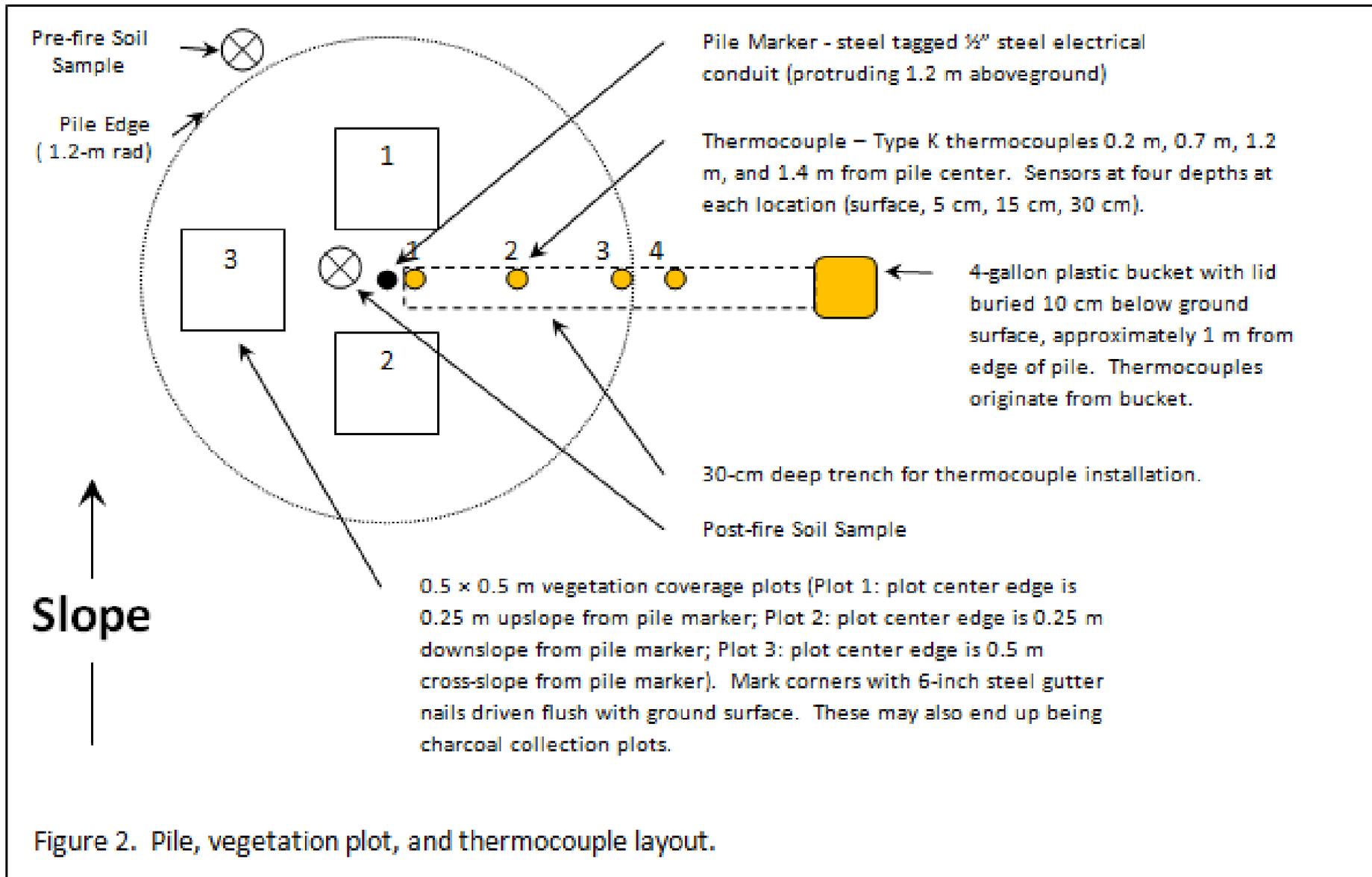


Figure 2. Pile, vegetation plot, and thermocouple layout.

# Measuring soil temperature

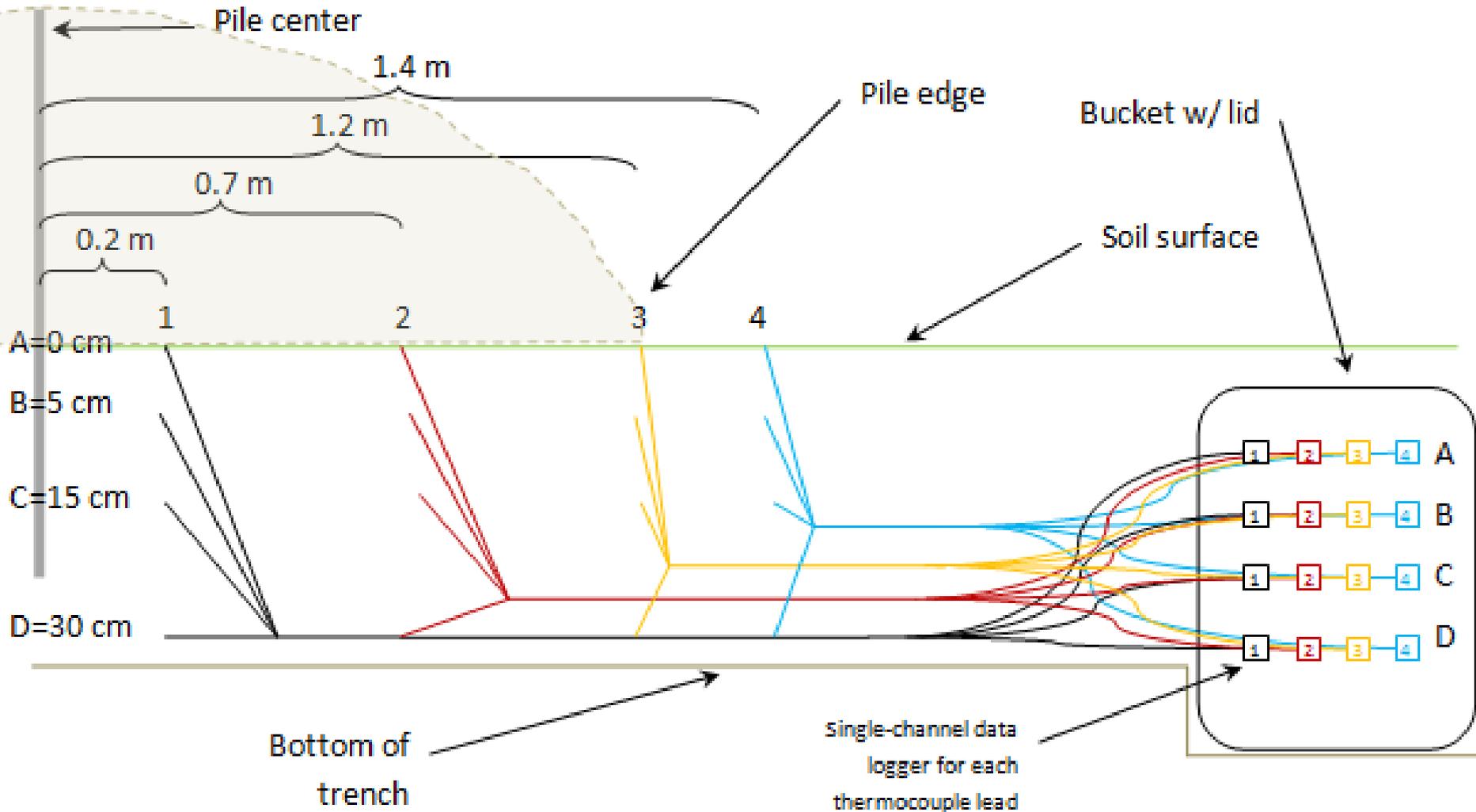
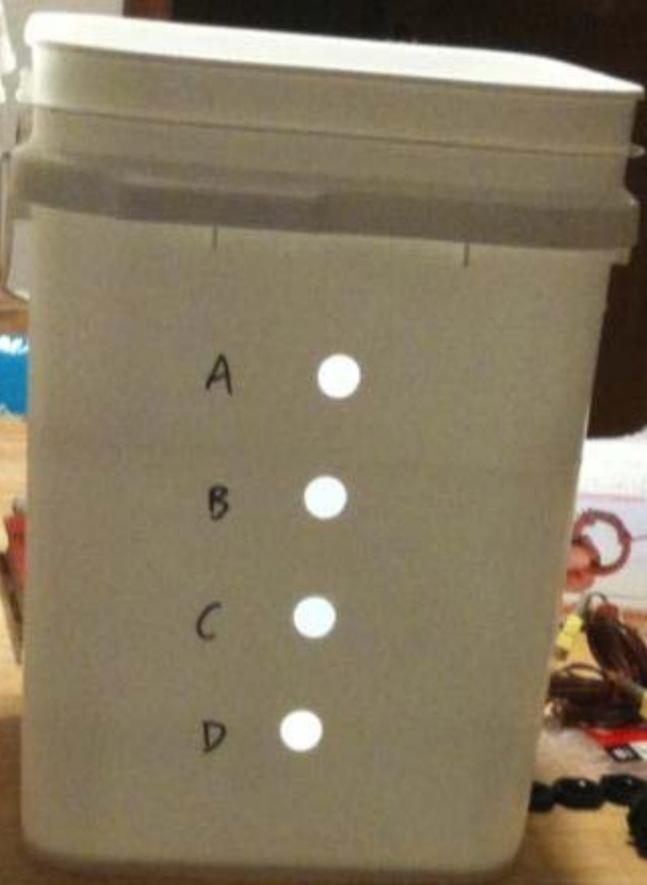


Figure 3. Thermocouple installation diagram.





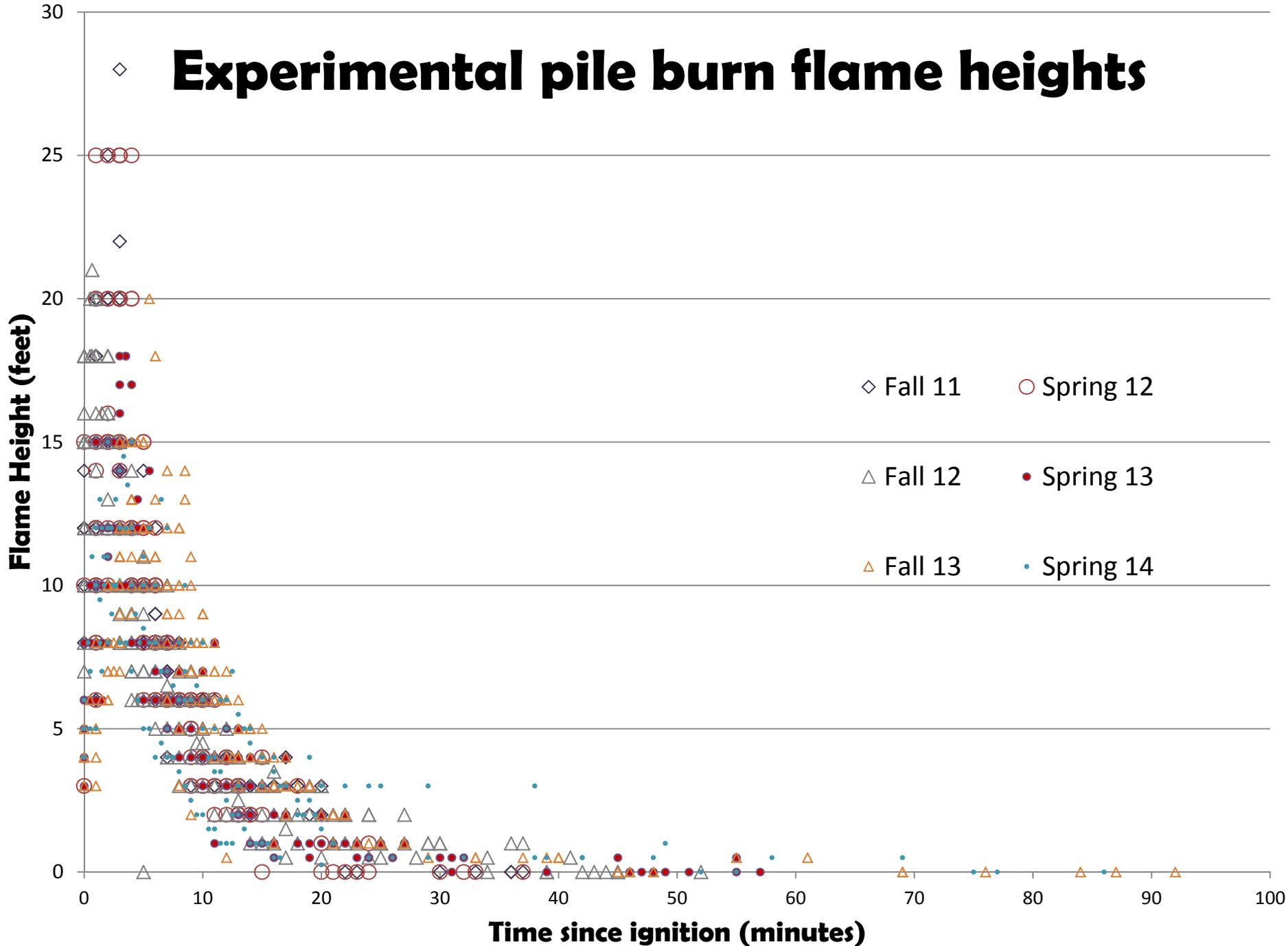




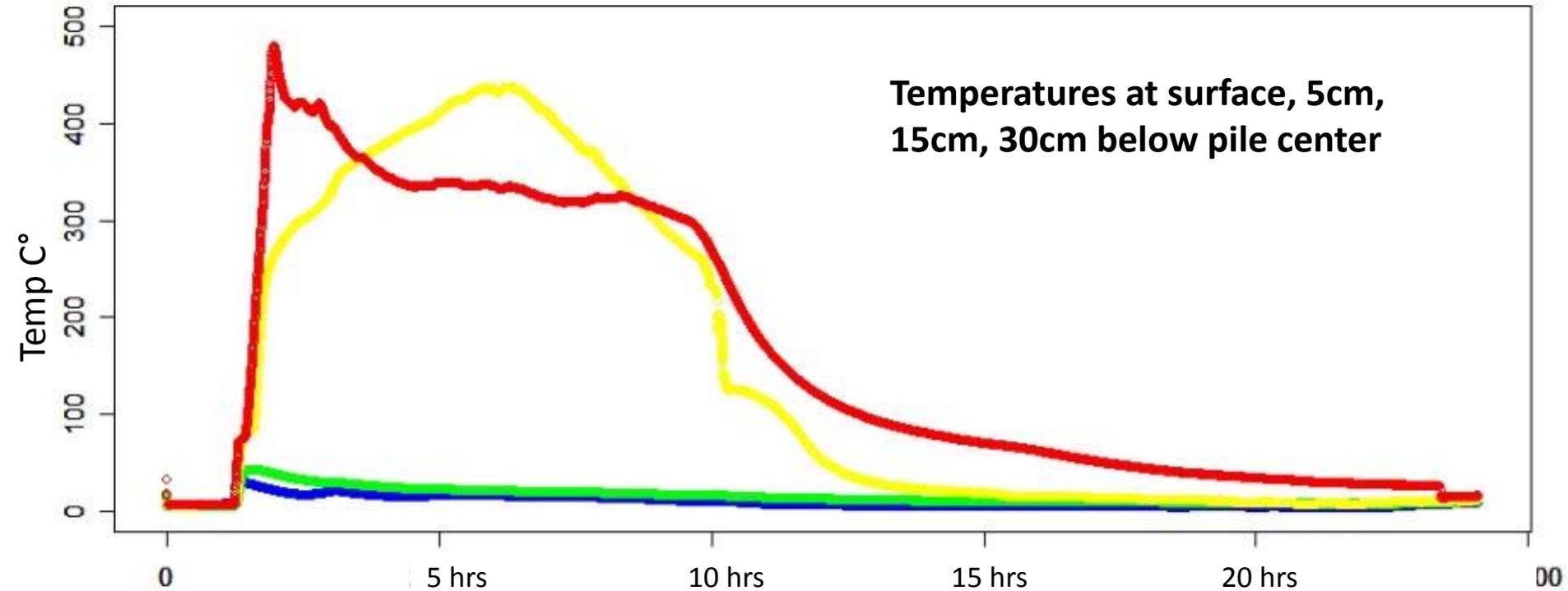
**What did we learn?**



# Experimental pile burn flame heights

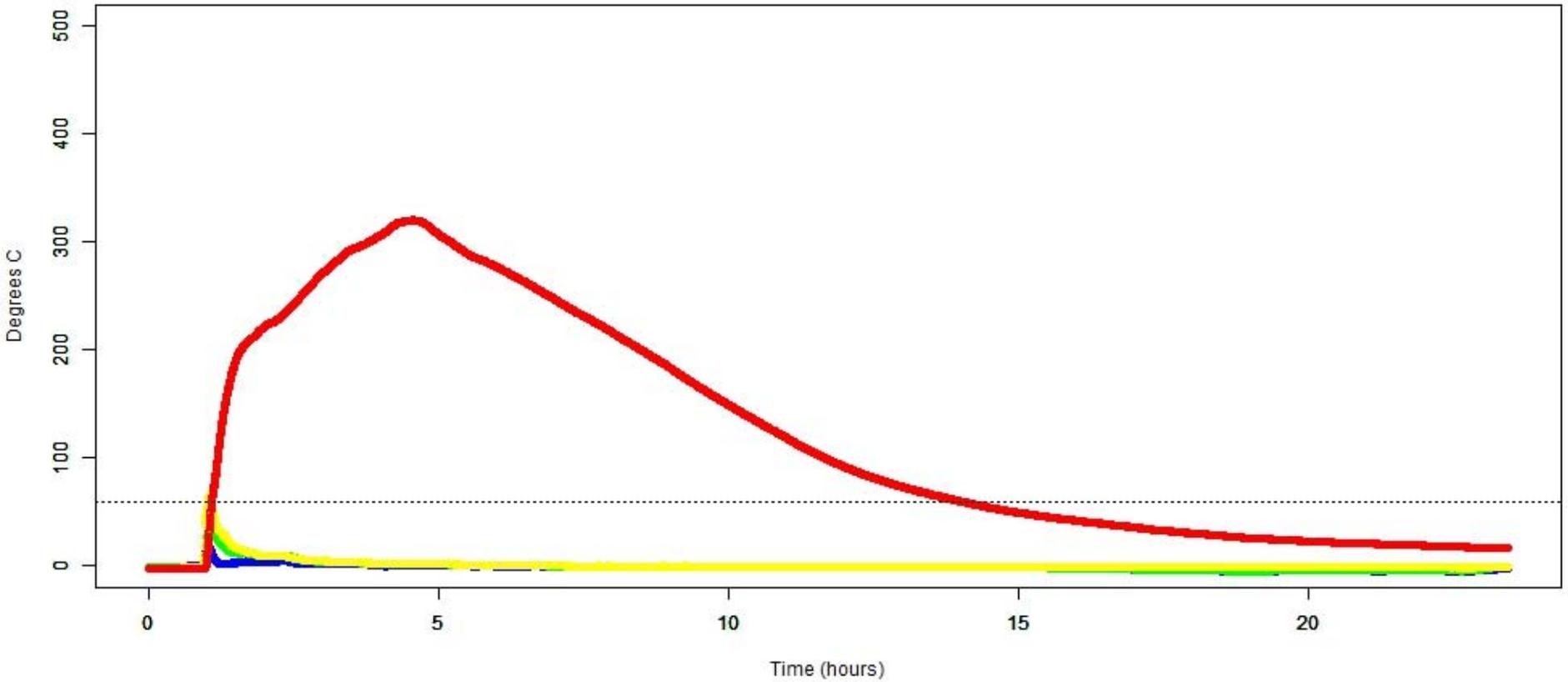


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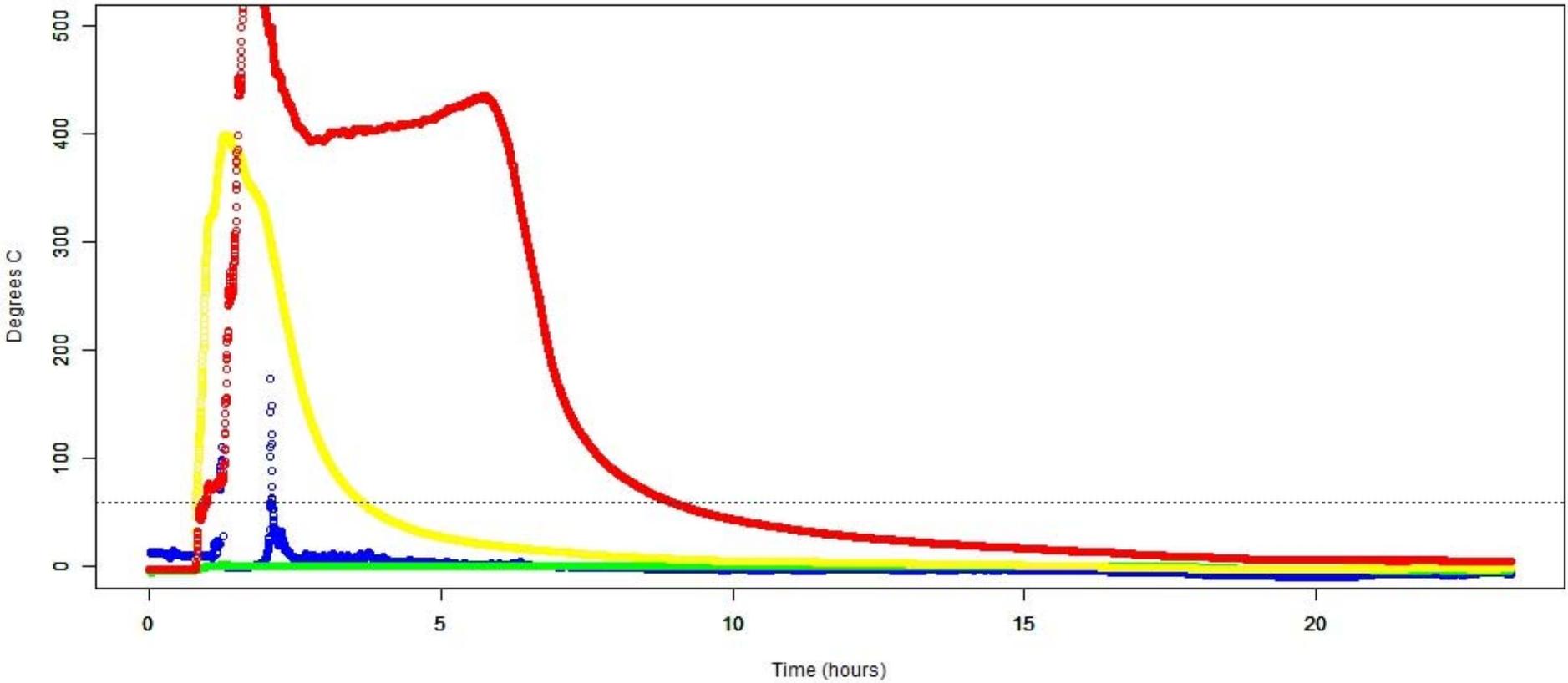


Surface temperatures are significantly higher than 15cm or 30cm below the surface

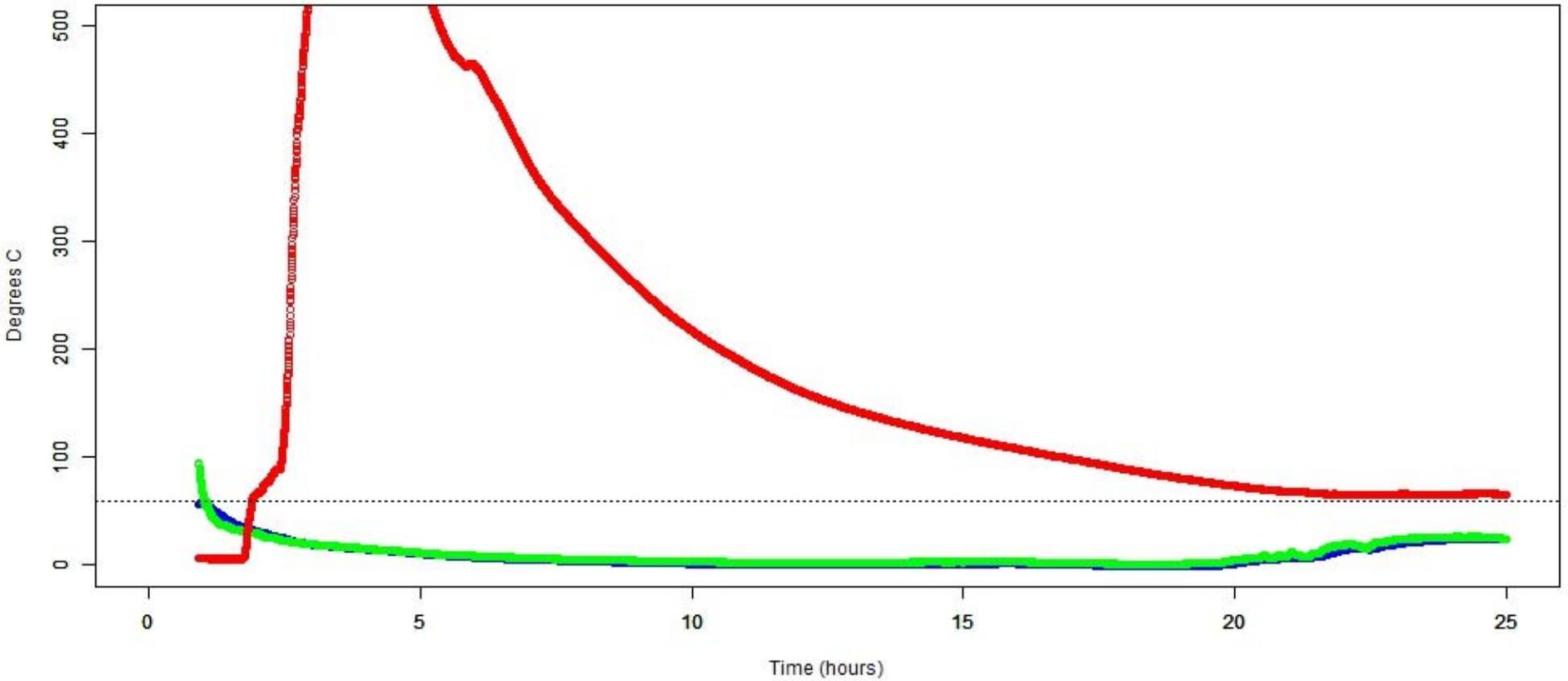
# New Mexico



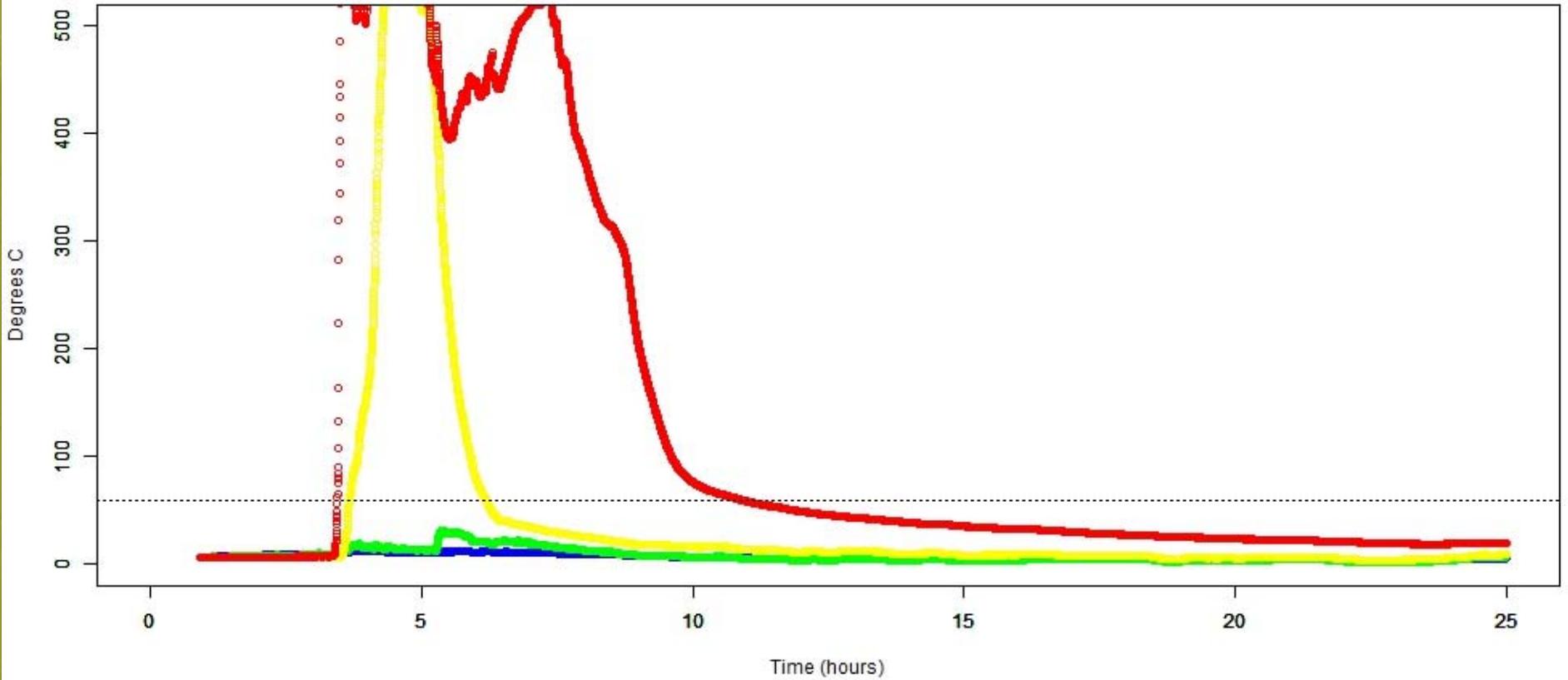
# New Mexico



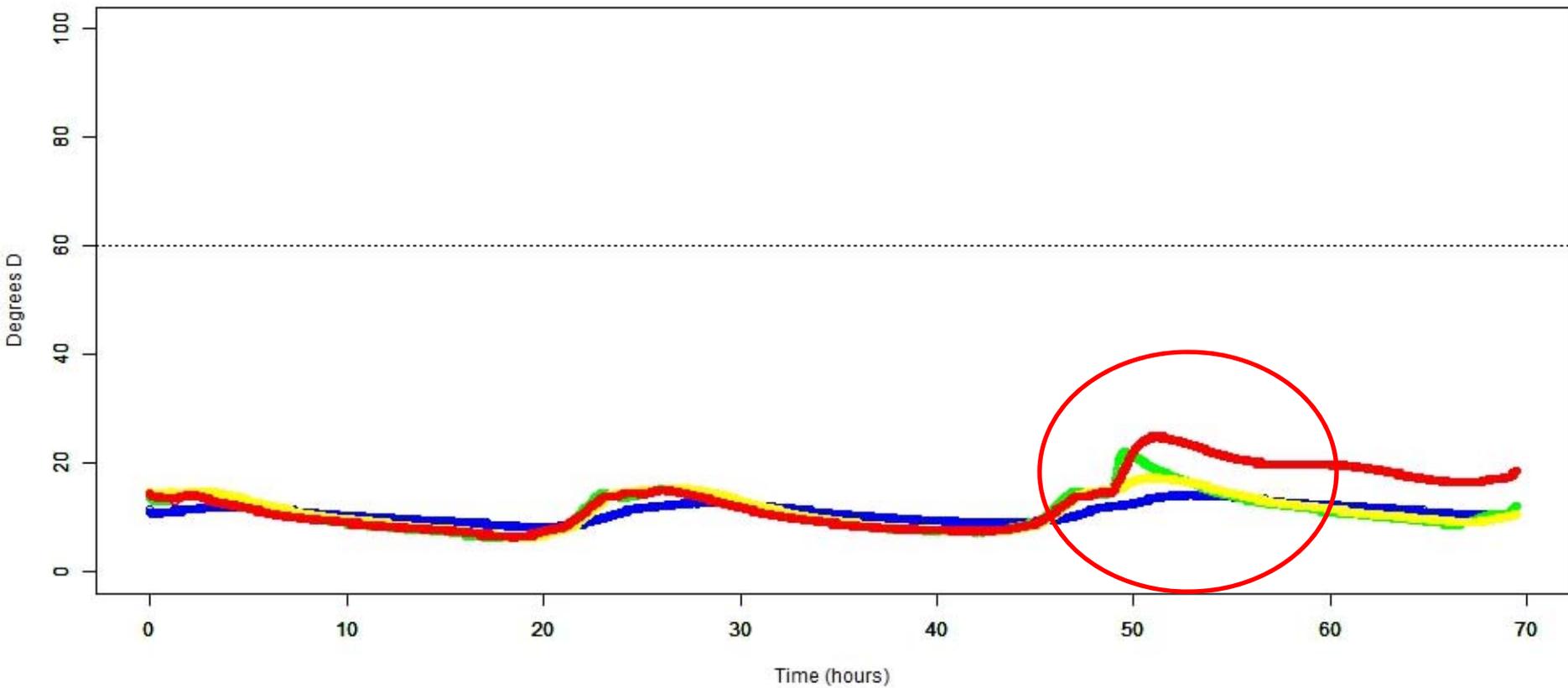
# Washington



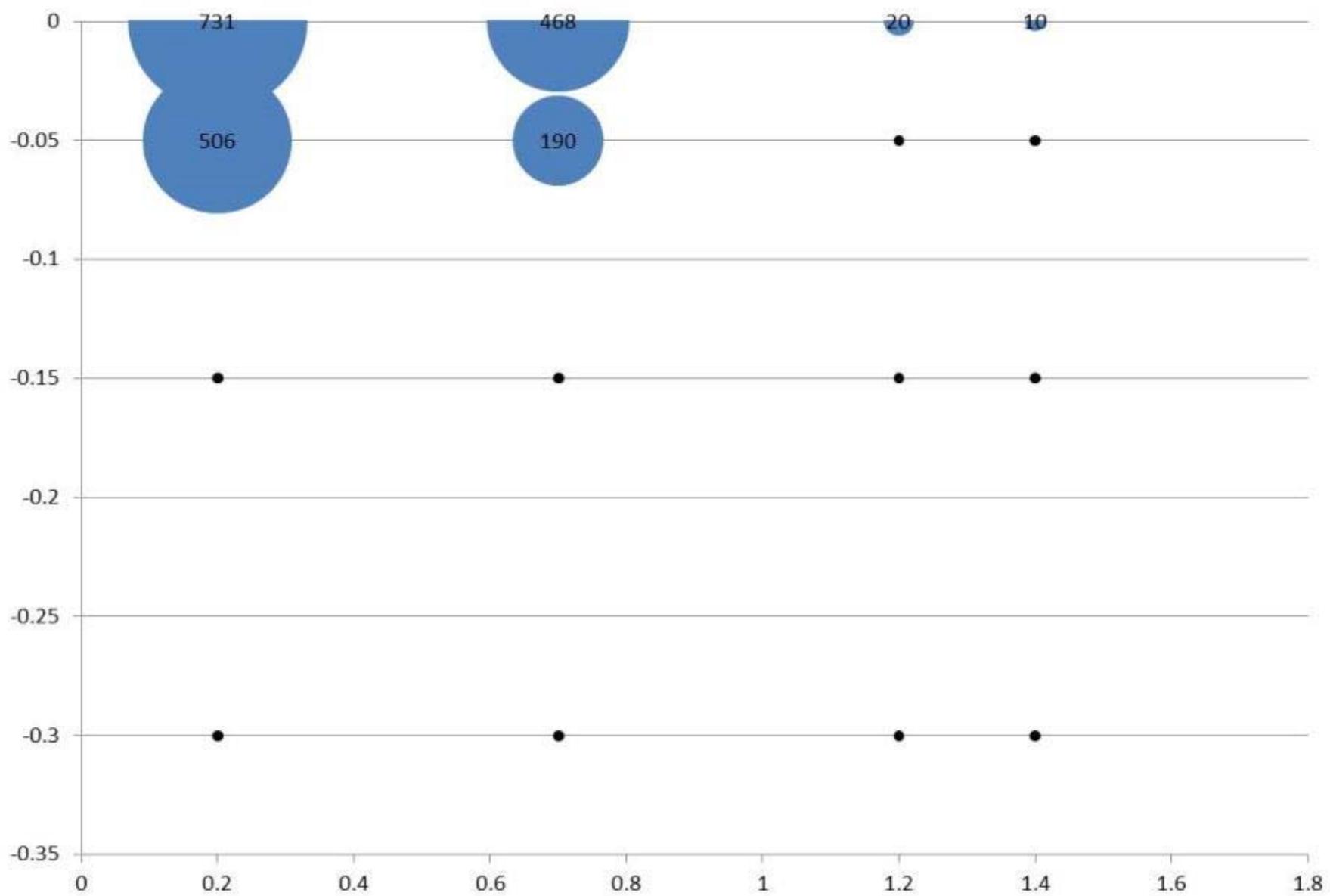
# Washington

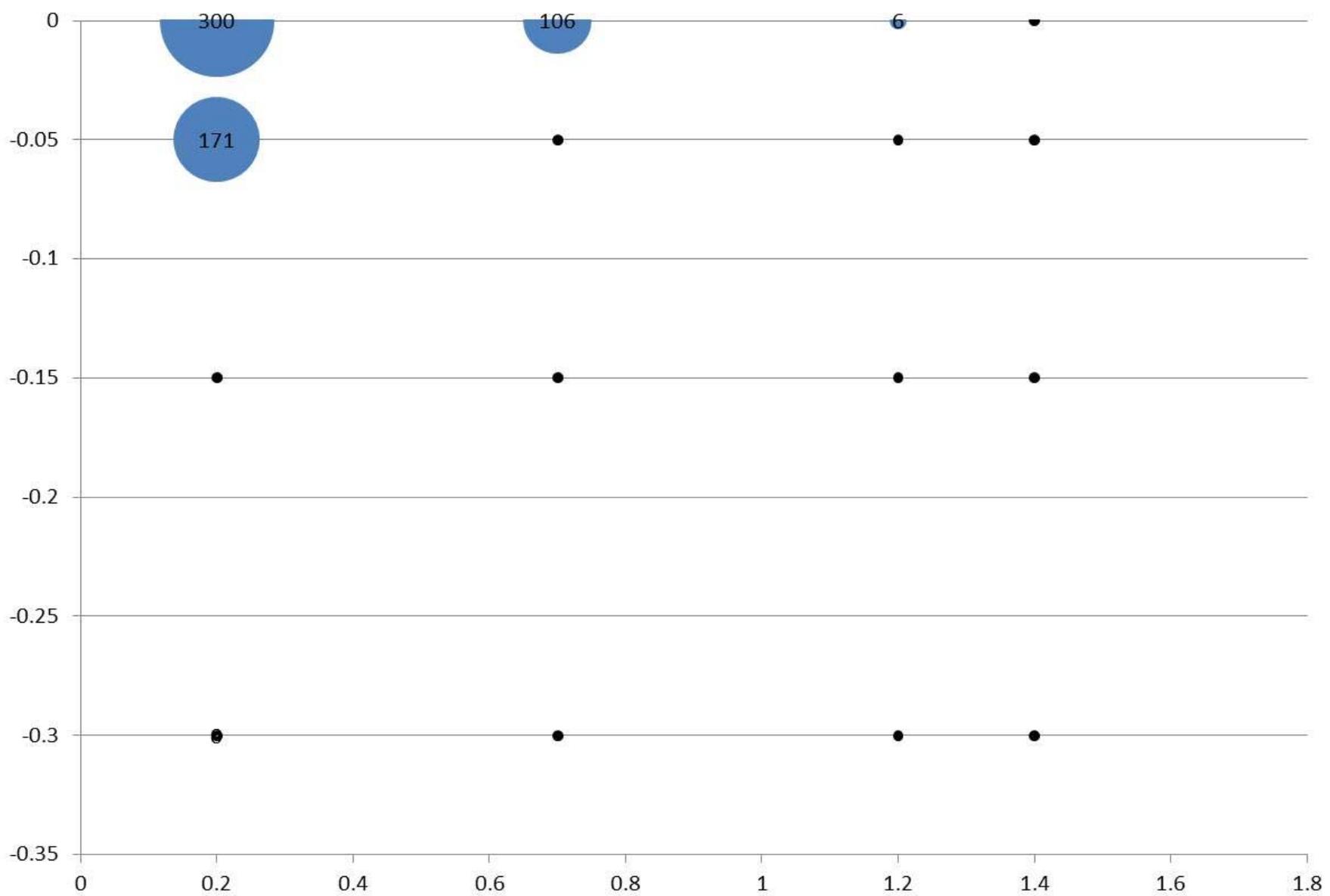


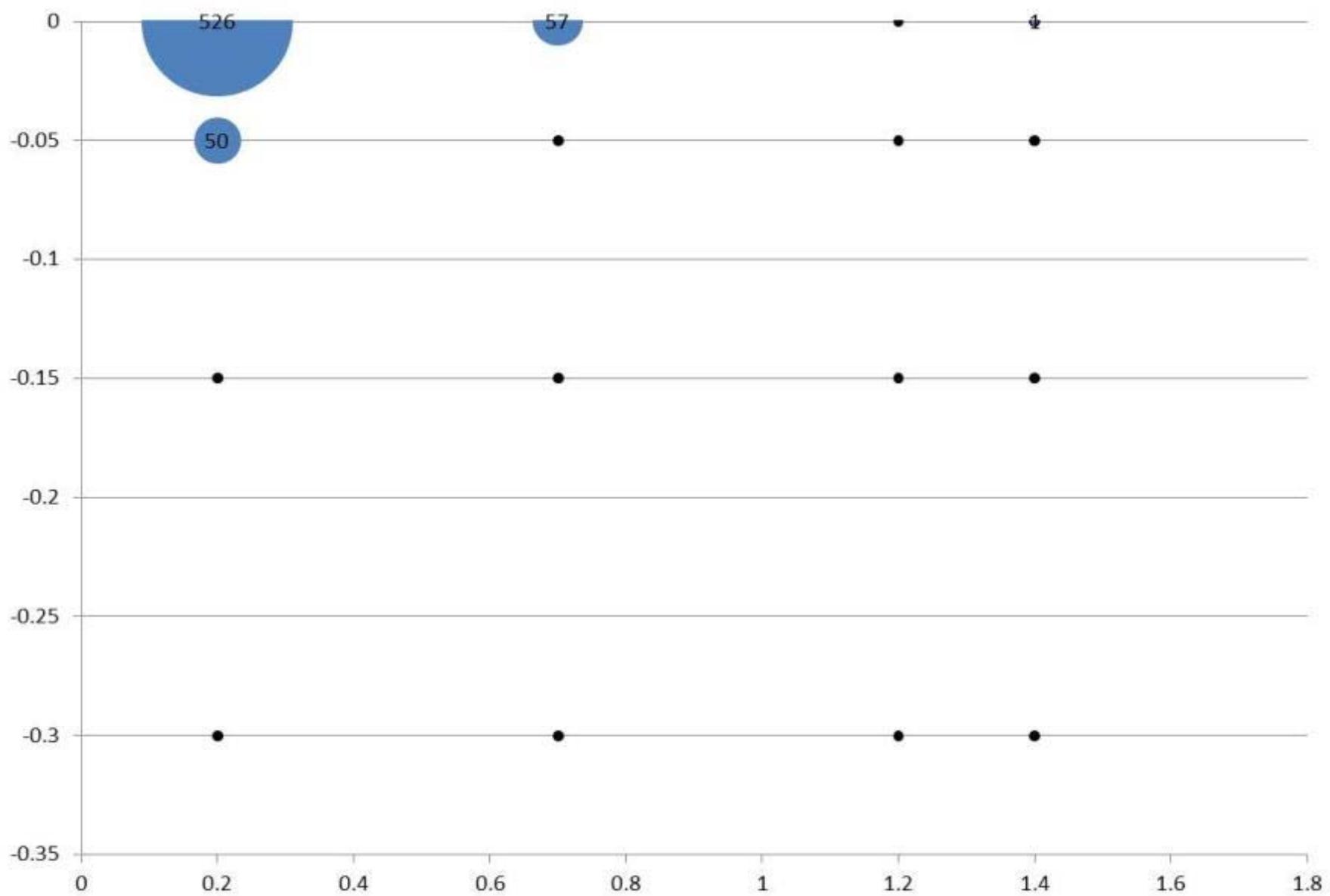
# Wildfire





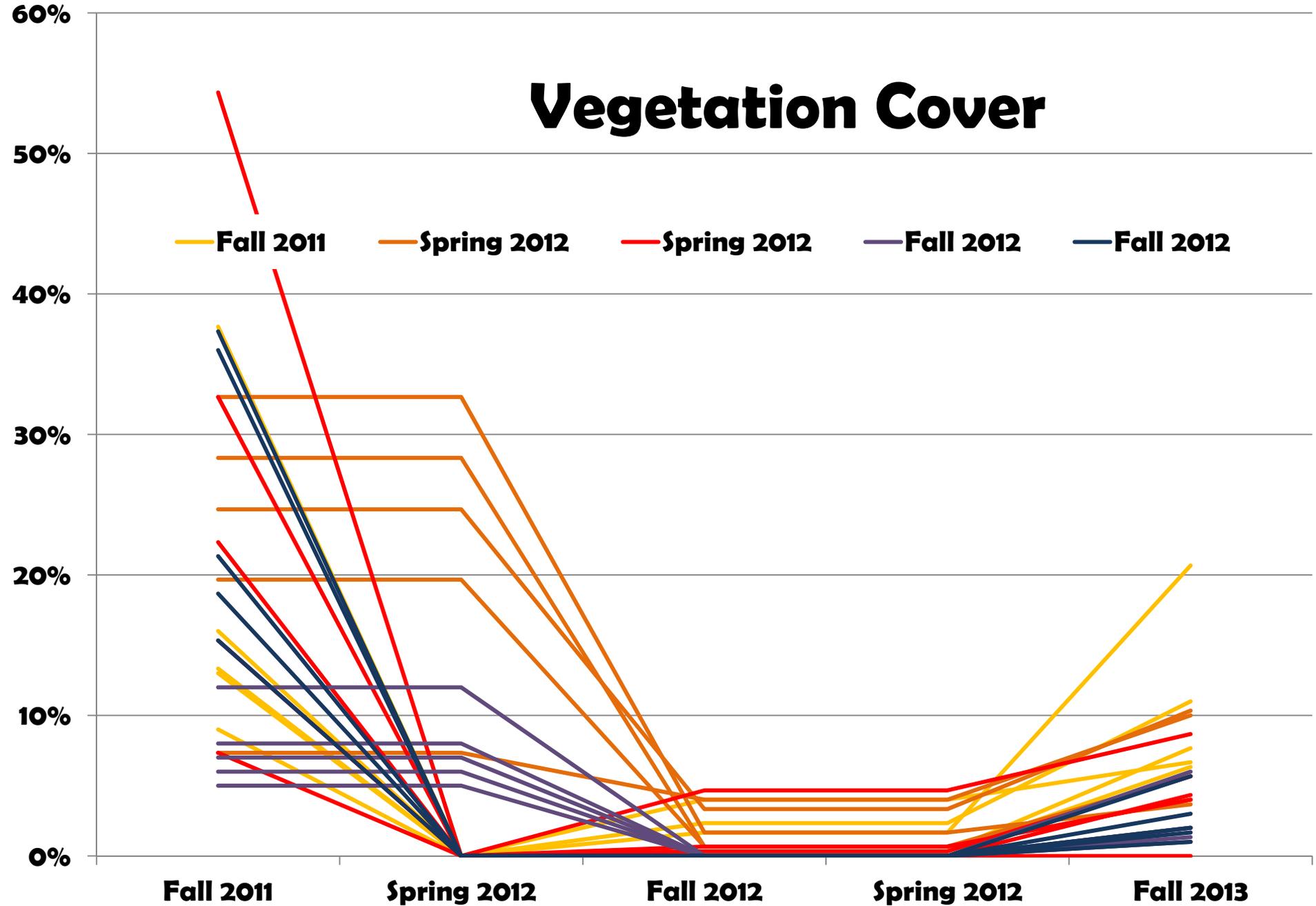






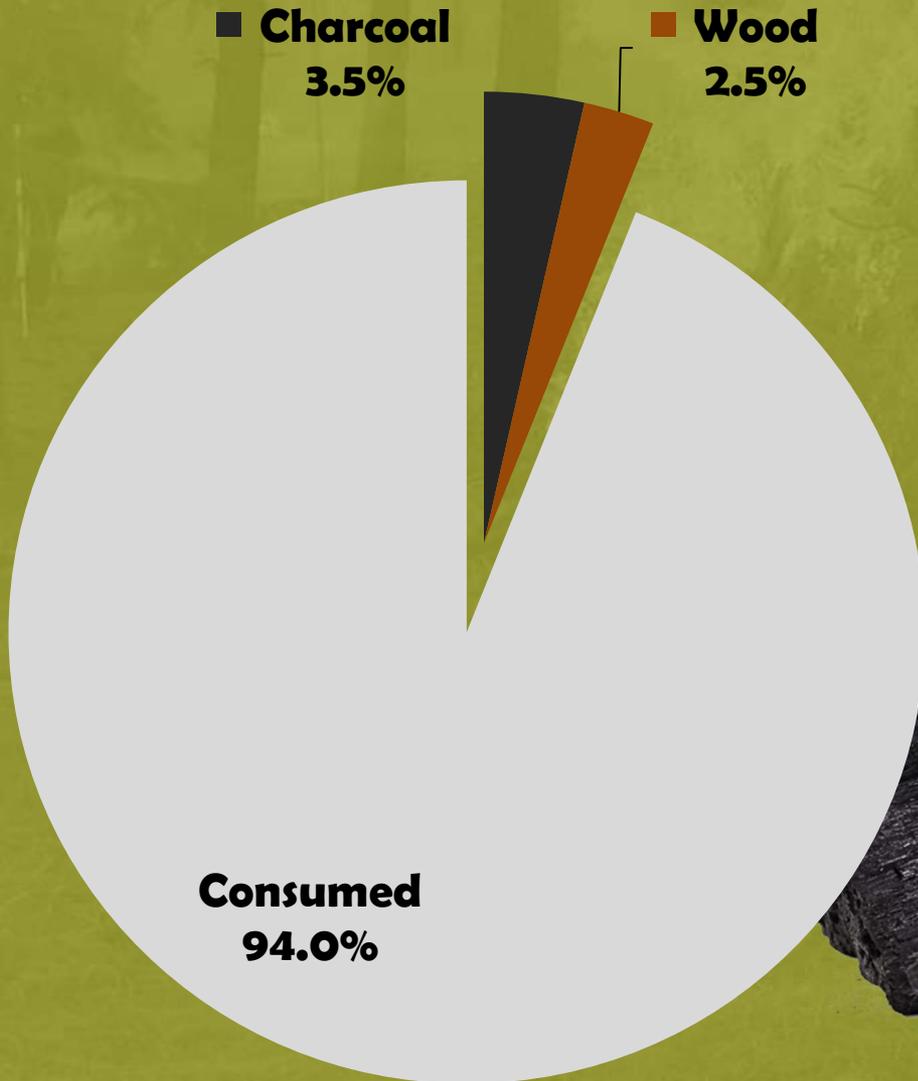
# Vegetation Cover

Fall 2011 Spring 2012 Spring 2012 Fall 2012 Fall 2012





# Consumption



**Experimental piles generate about 8 lbs of charcoal**





# Soil

- **No significant change in surface soil carbon with pile burning.**
- **In Washington it looks as if there might be a slight *increase* in soil carbon with burning.**





# Uplanned Fires

Jane Laboa



The Forest Guild's Mission: To promote ecologically, economically, and socially responsible forestry as a means of sustaining the integrity of forest ecosystems and the human communities dependent upon them.