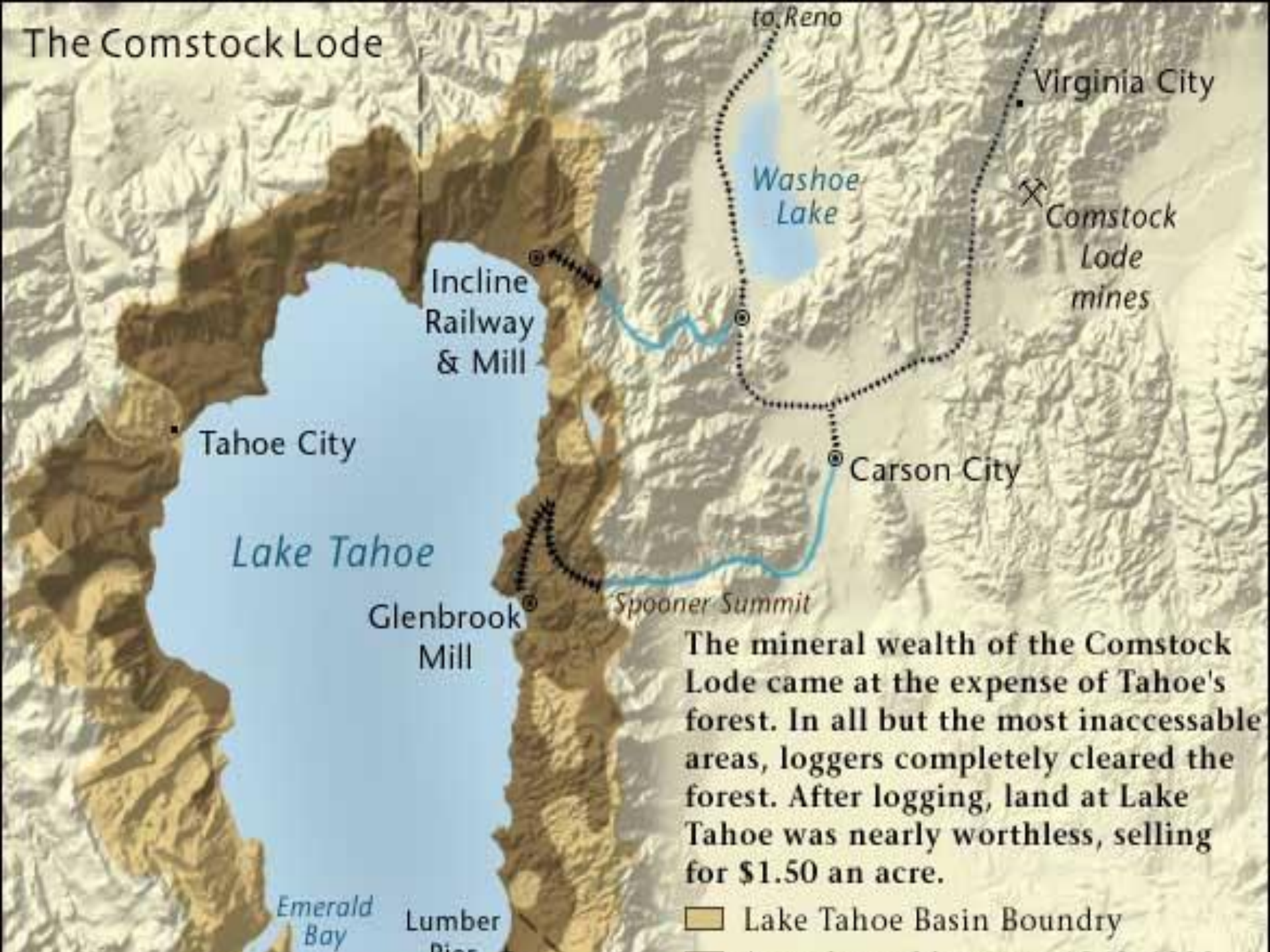



# The Comstock Lode



The mineral wealth of the Comstock Lode came at the expense of Tahoe's forest. In all but the most inaccessible areas, loggers completely cleared the forest. After logging, land at Lake Tahoe was nearly worthless, selling for \$1.50 an acre.

 Lake Tahoe Basin Boundry





Prey Meadows 1873



Prey Meadows 1993



# Research Objectives

- Identify the Stand Characteristics of the Pre-Comstock forests
- Identify the Characteristics of Canopy and Surface Fuels and Potential Fire Behavior in Pre-Comstock Forests
- How have Forest Conditions and Potential Fire Behavior Changed since the Pre-Comstock Period

# Research Approach

- Dendroecology
- Vegetation Simulation Models (FVS)
- Surface and Crown Fire Simulation Models (FMA)

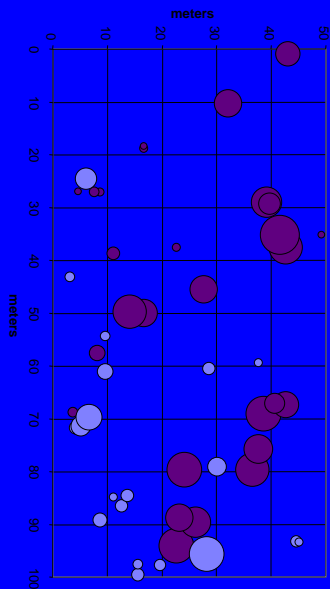






# Forest Reconstruction

- Vegetation mapping
- Stand structure analysis



















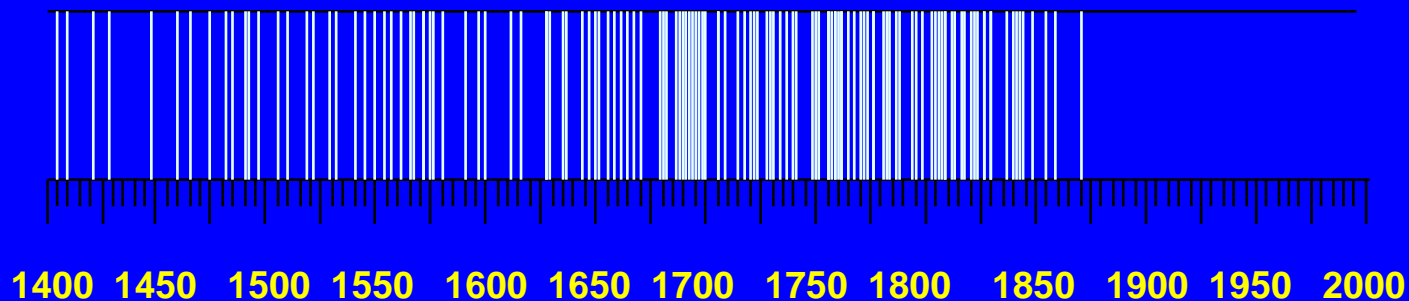
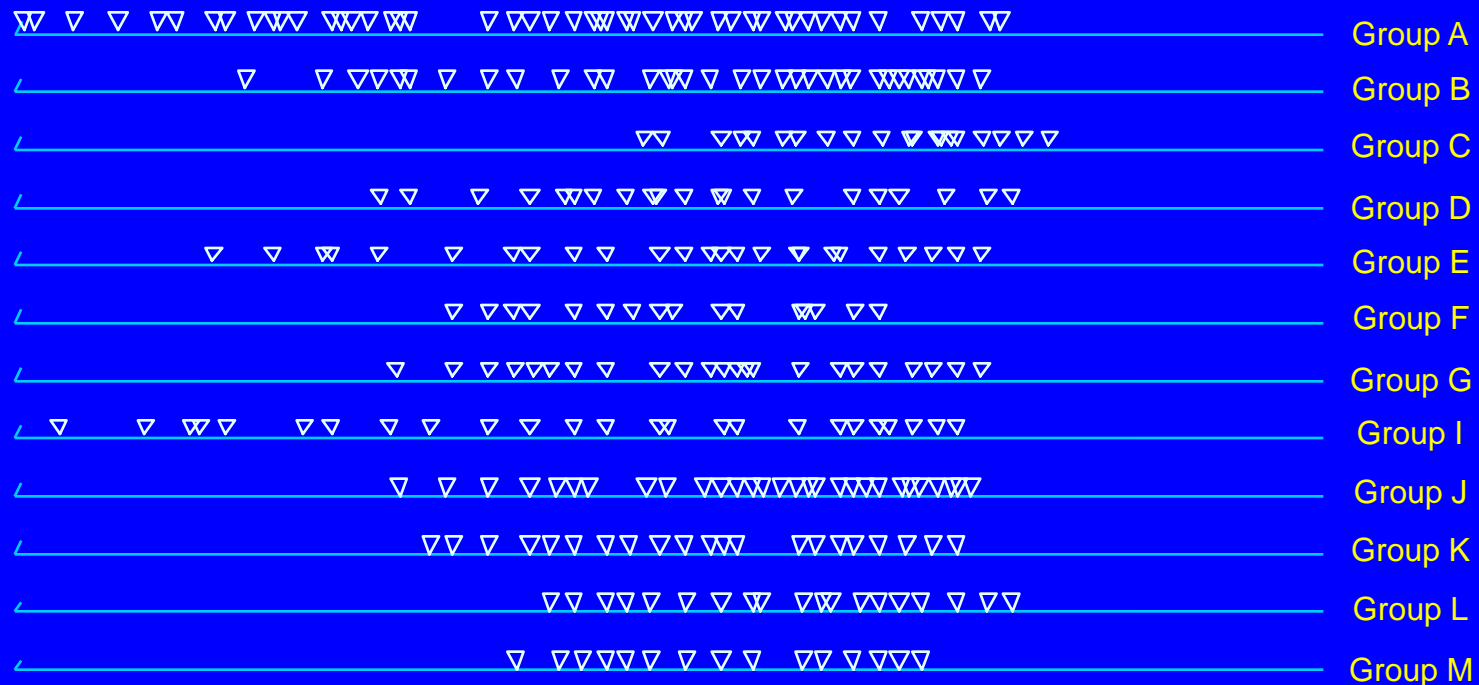






# Pre-Euroamerican Fire History

Jeffrey pine forests, Lake Tahoe Basin





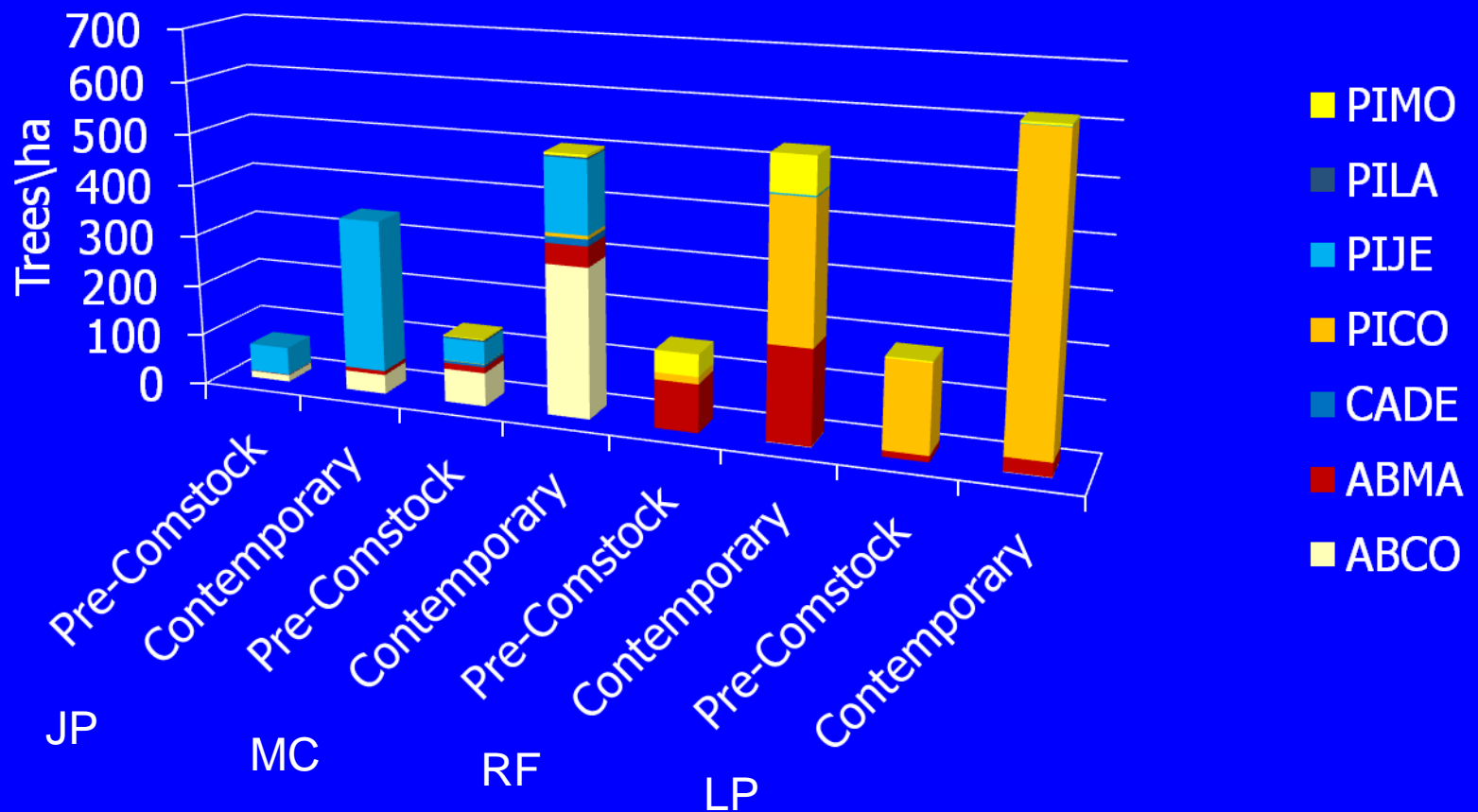
# Pre-Comstock Fire Return Intervals

## Grand Mean Point Fire Return Interval

- Jeffrey Pine 15 years
- Mixed Conifer 22 years
- Red Fir 76 years
- Lodgepole Pine 50 years

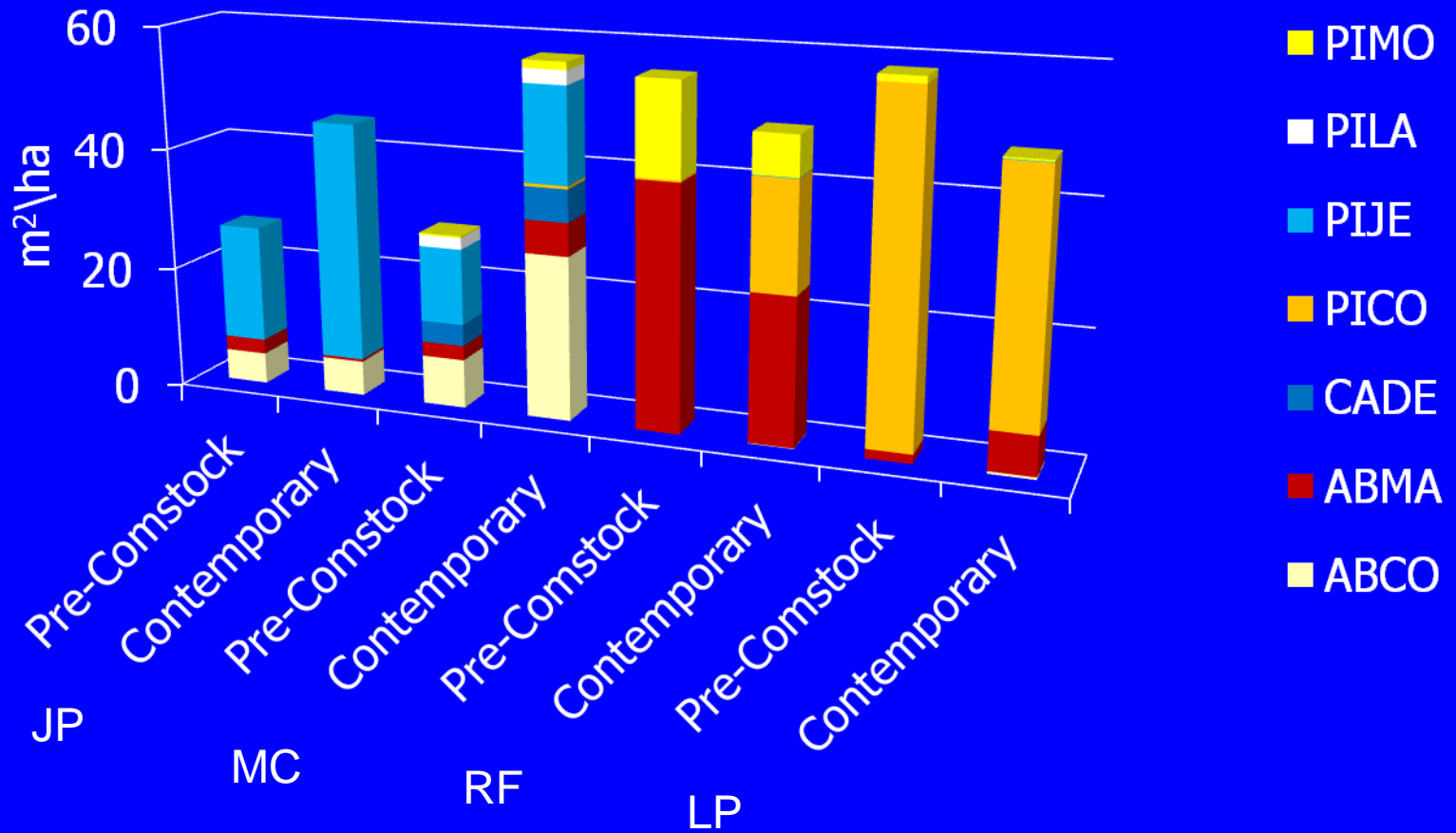


# Stand Density



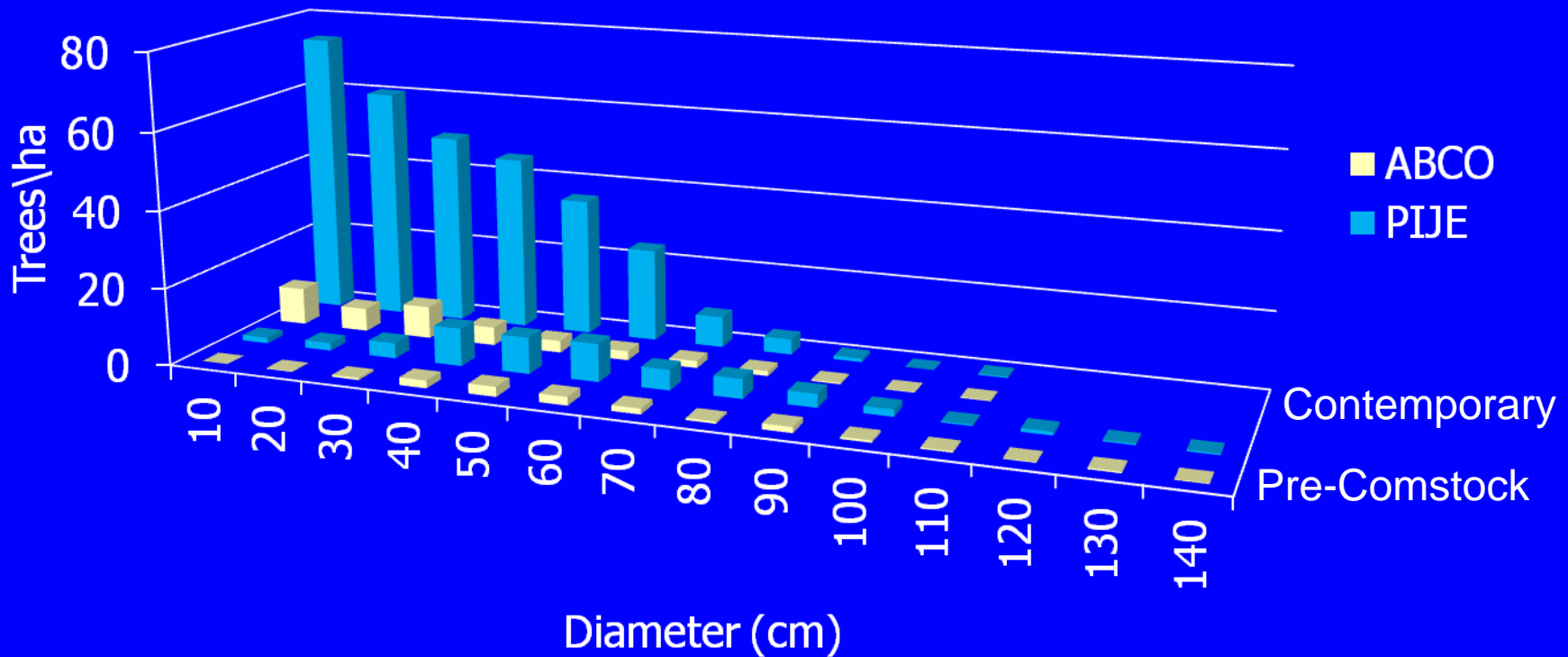


# Stand Basal Area





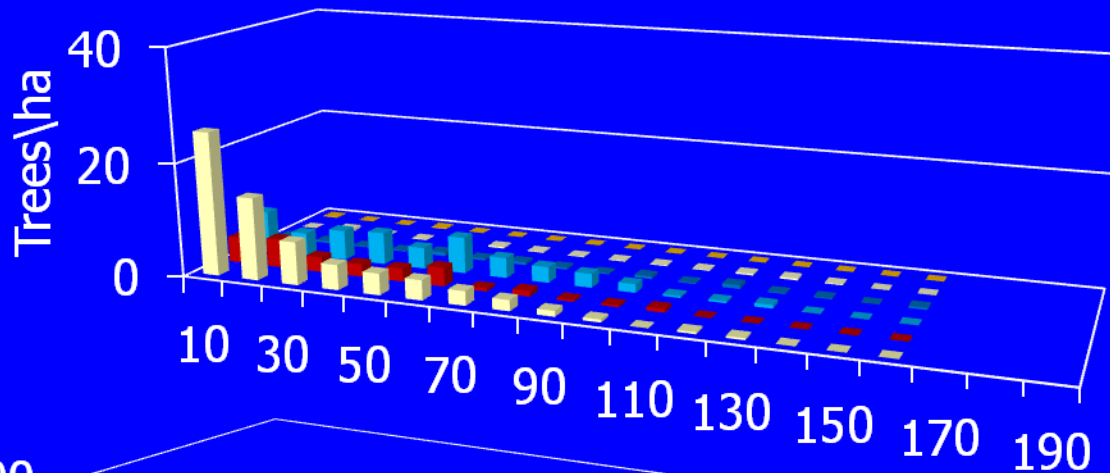
# Jeffrey Pine Forest Size Structure



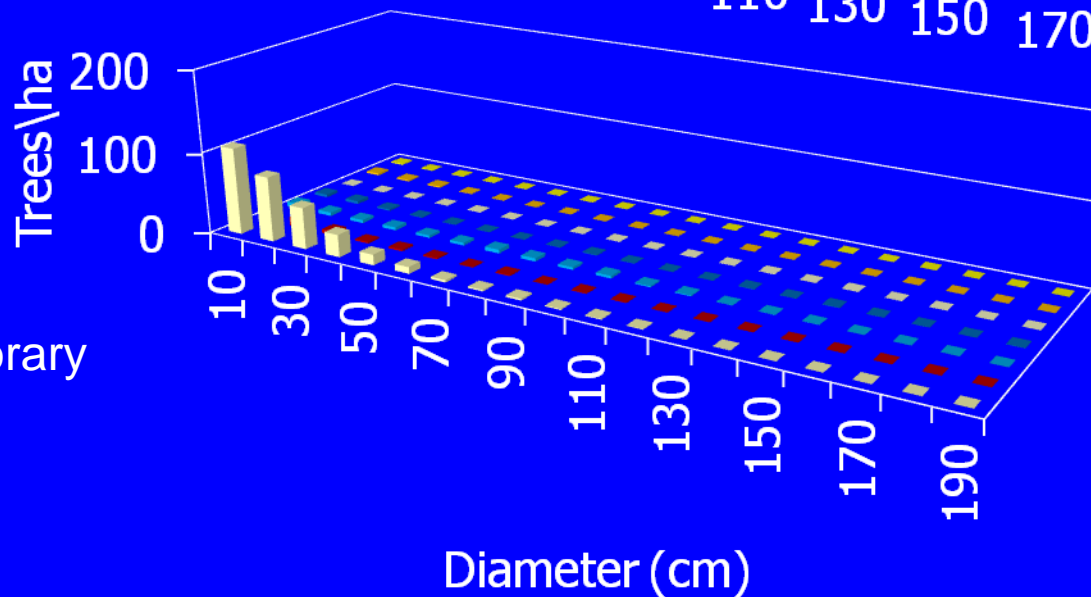


# Mixed Conifer Forest Structure

Pre-Comstock



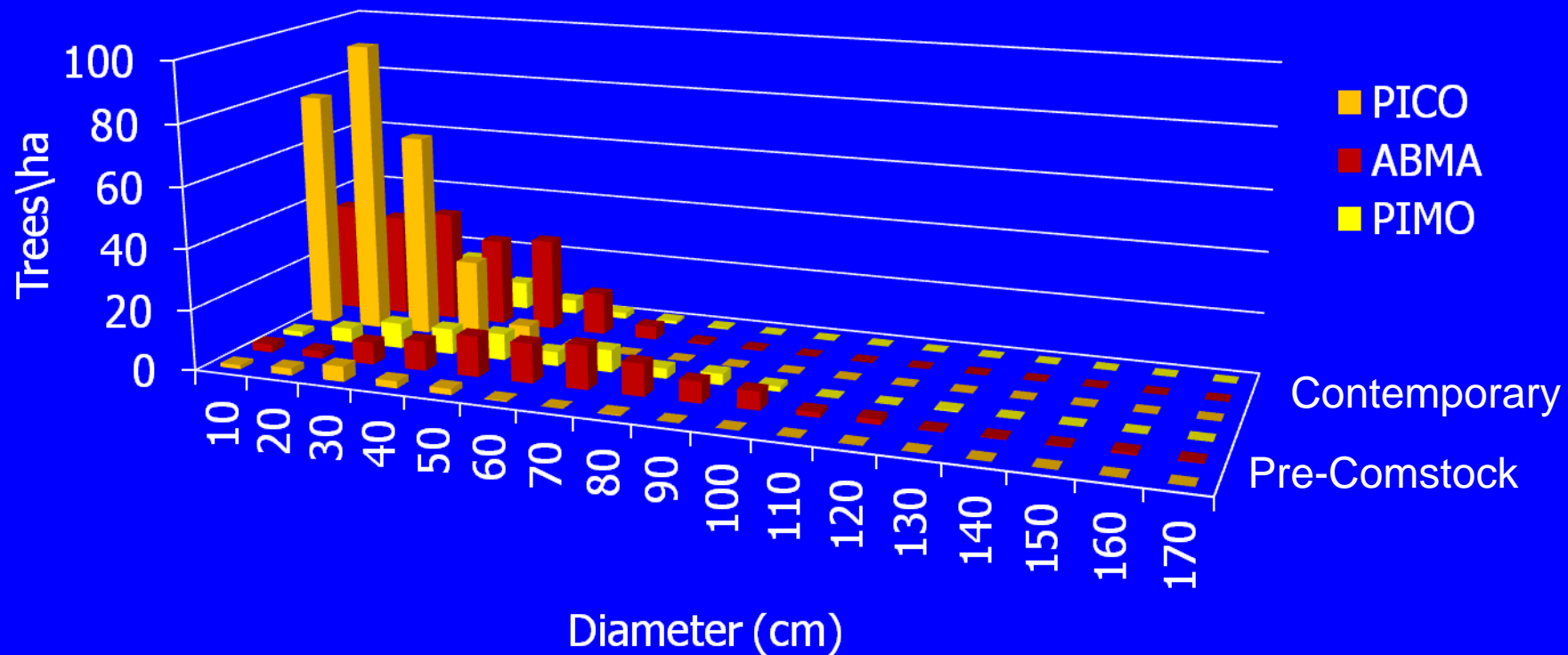
Contemporary



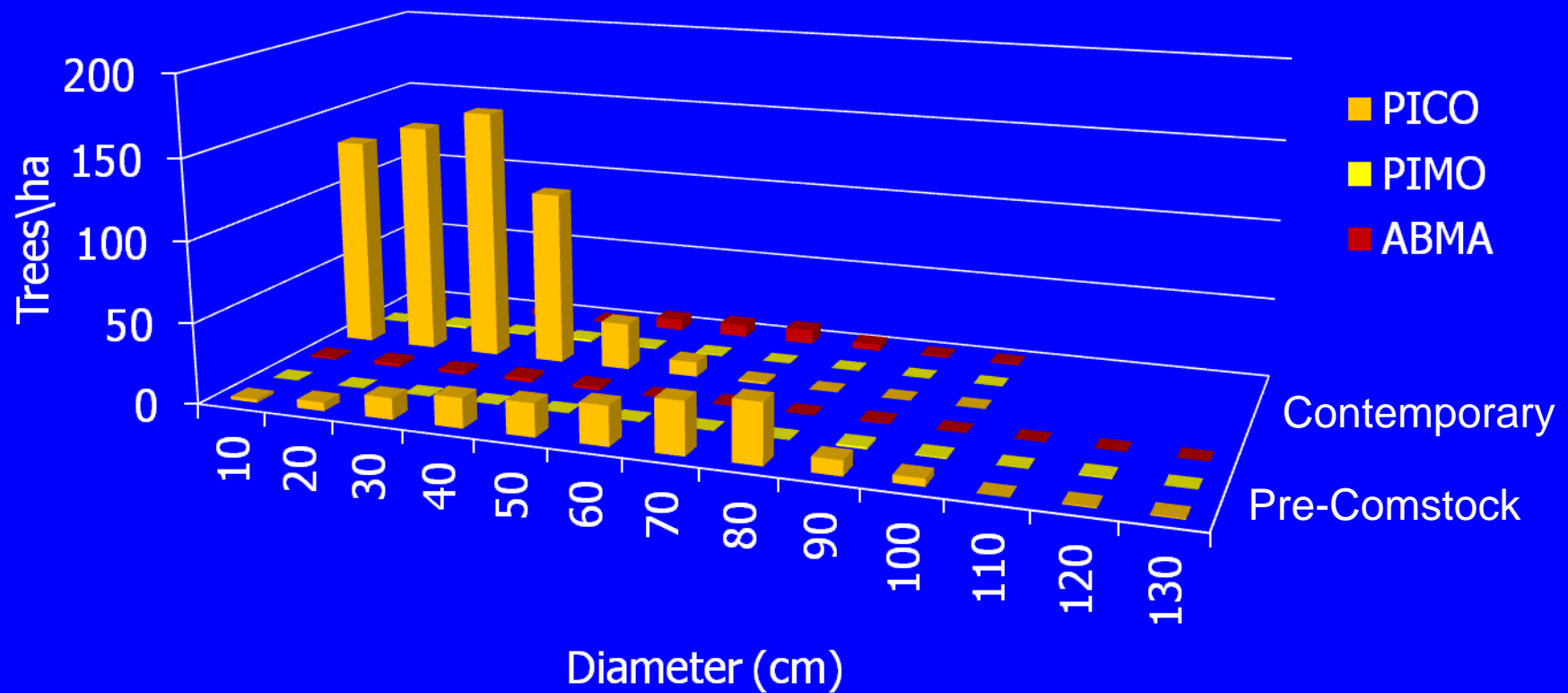
- ABCO
- ABMA
- PIJE
- CADE
- PILA
- PICO
- PIMO



# Red Fir Forest Size Structure



# Lodgepole Pine Forest Structure

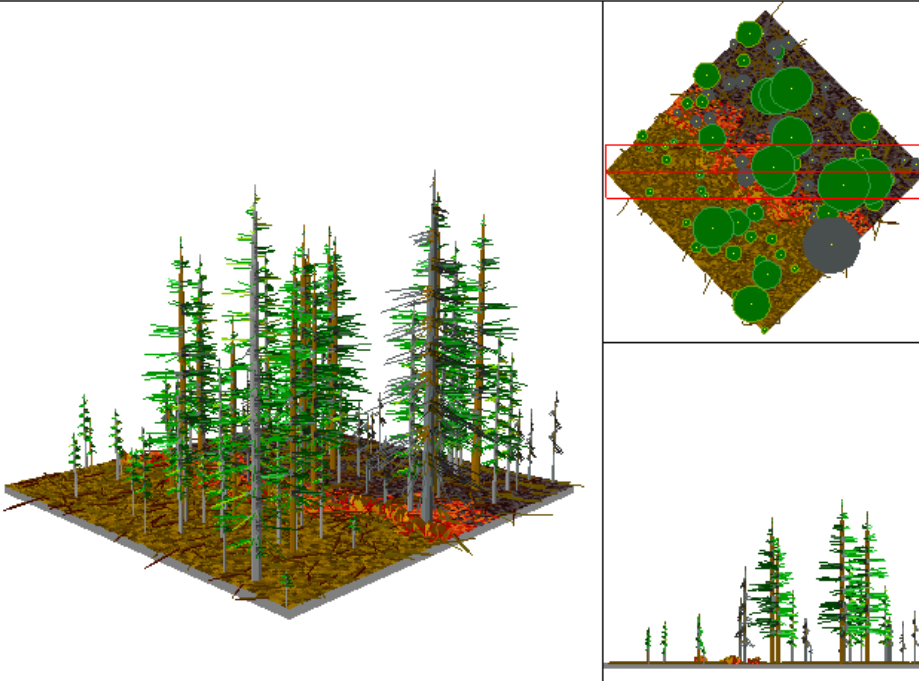




# FVS

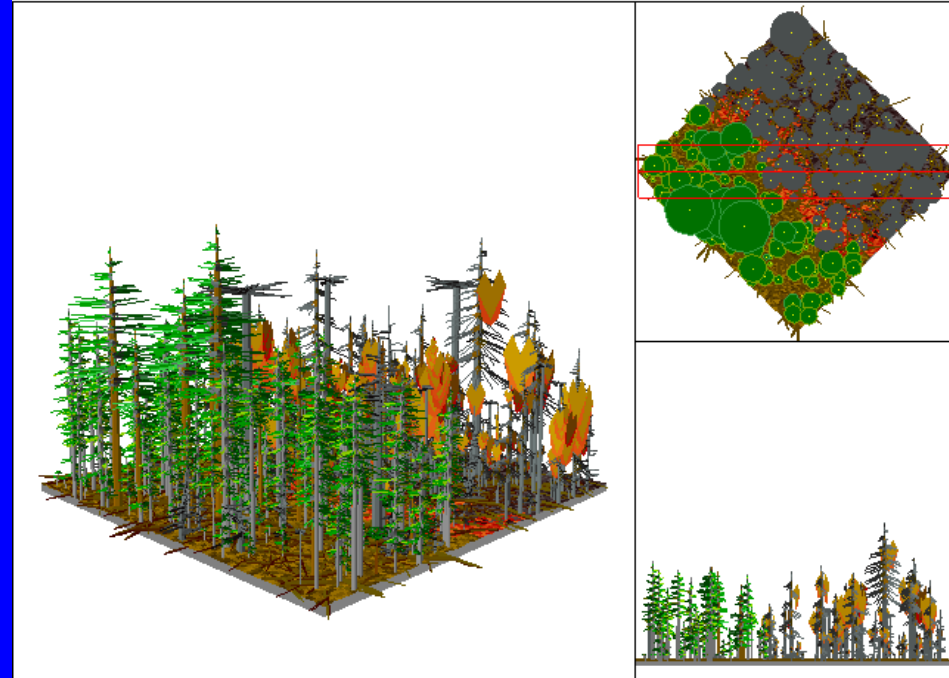
Stand=9 Year=1873 Beginning of fire (01/03)

spp9\_1873\_90percent\_defaultfuels\_002.svs



Stand=100009 Year=2010 Beginning of fire (01/03)

spp9\_2010\_90percent\_100mgmt\_002.svs



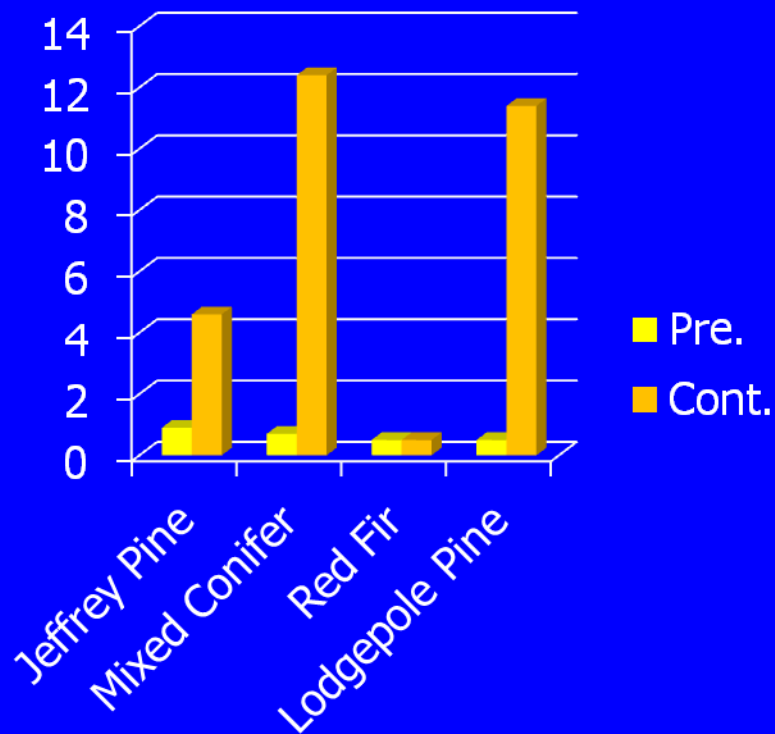
Pre-Comstock Mixed Conifer Stand  
90<sup>th</sup> Percentile Weather Conditions

Contemporary Mixed Conifer Stand  
90<sup>th</sup> Percentile Weather Conditions

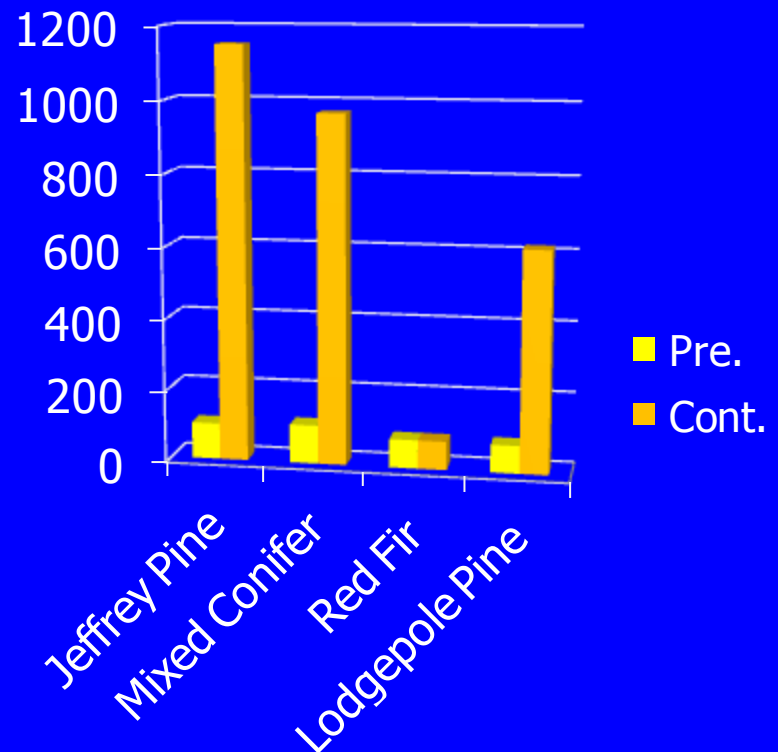
# Potential Fire Behavior

98<sup>th</sup> Percentile Fire Weather

## Flame Length (m)



## Rate of Spread (km\hr)

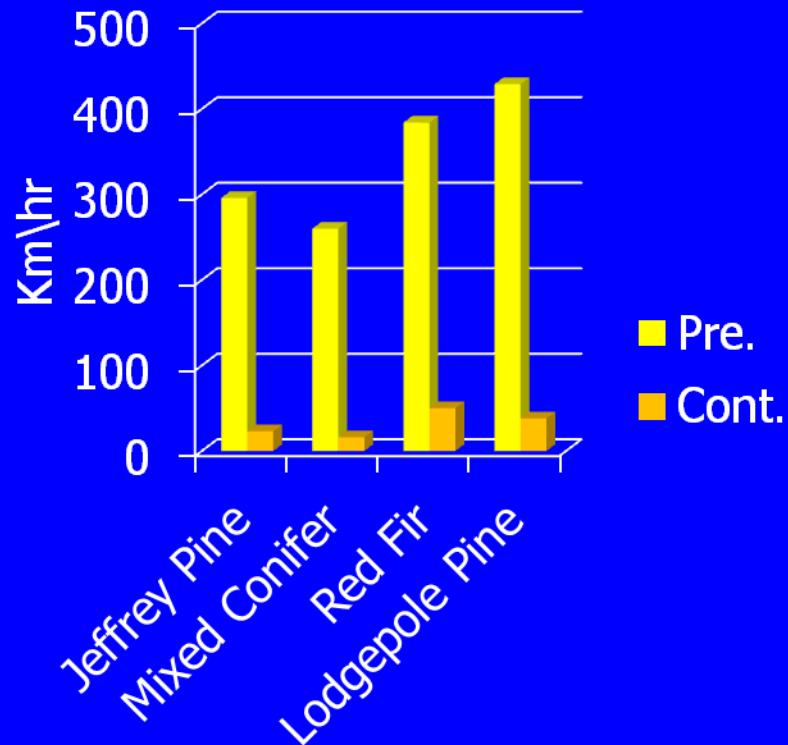




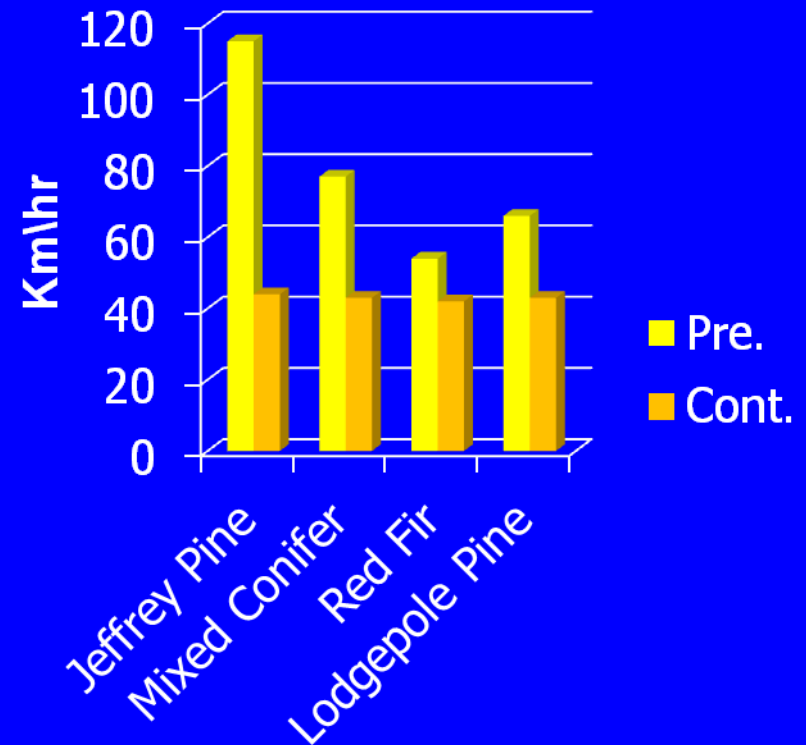
# Potential Fire Behavior

98<sup>th</sup> Percentile Fire Weather

## Torching Index



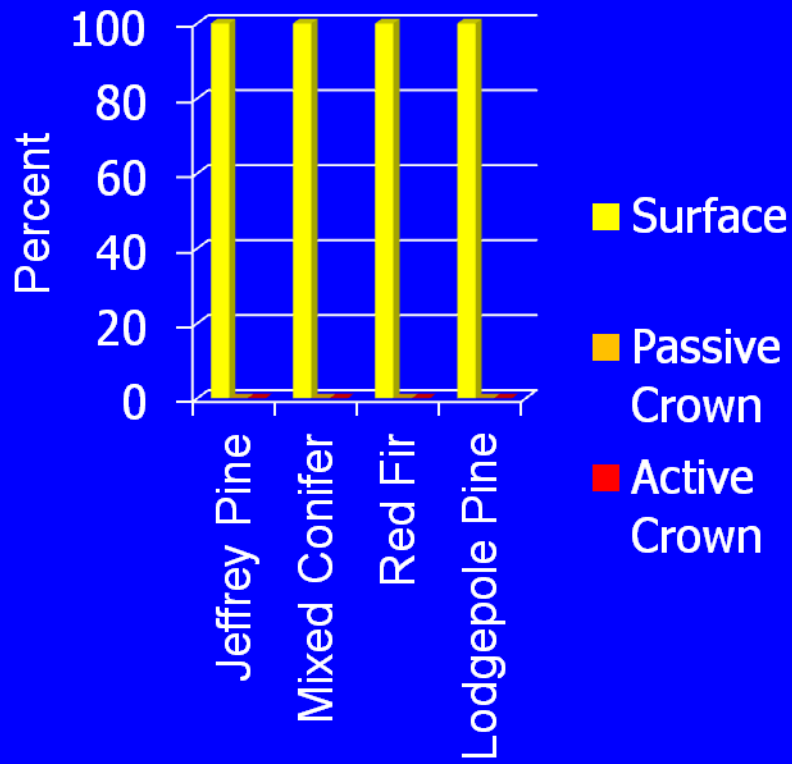
## Crowning Index



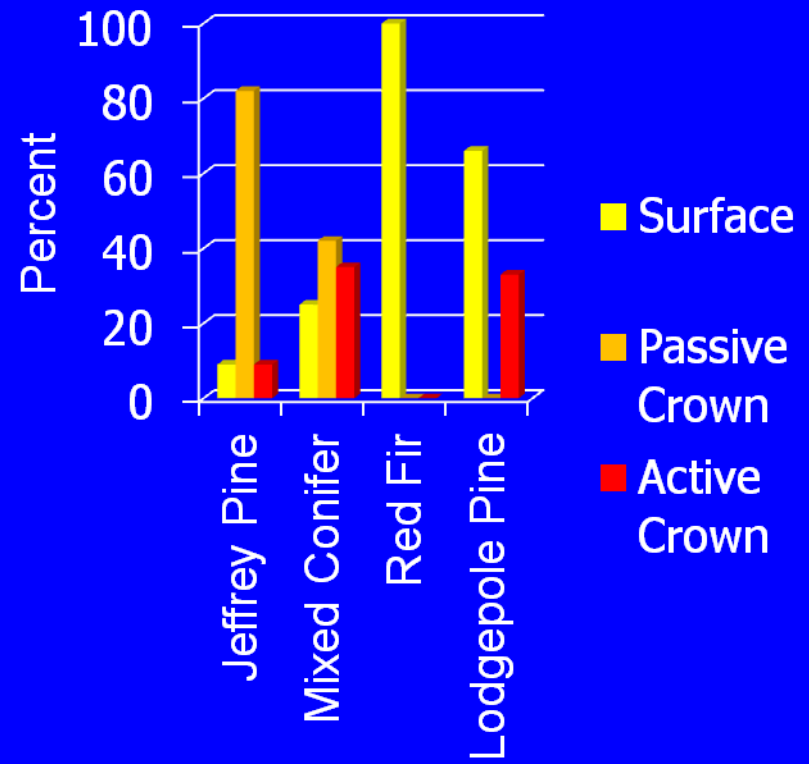
# Potential Fire Behavior

## 98<sup>th</sup> Percentile Fire Weather

### Pre-Comstock Fire Type



### Contemporary Fire Type



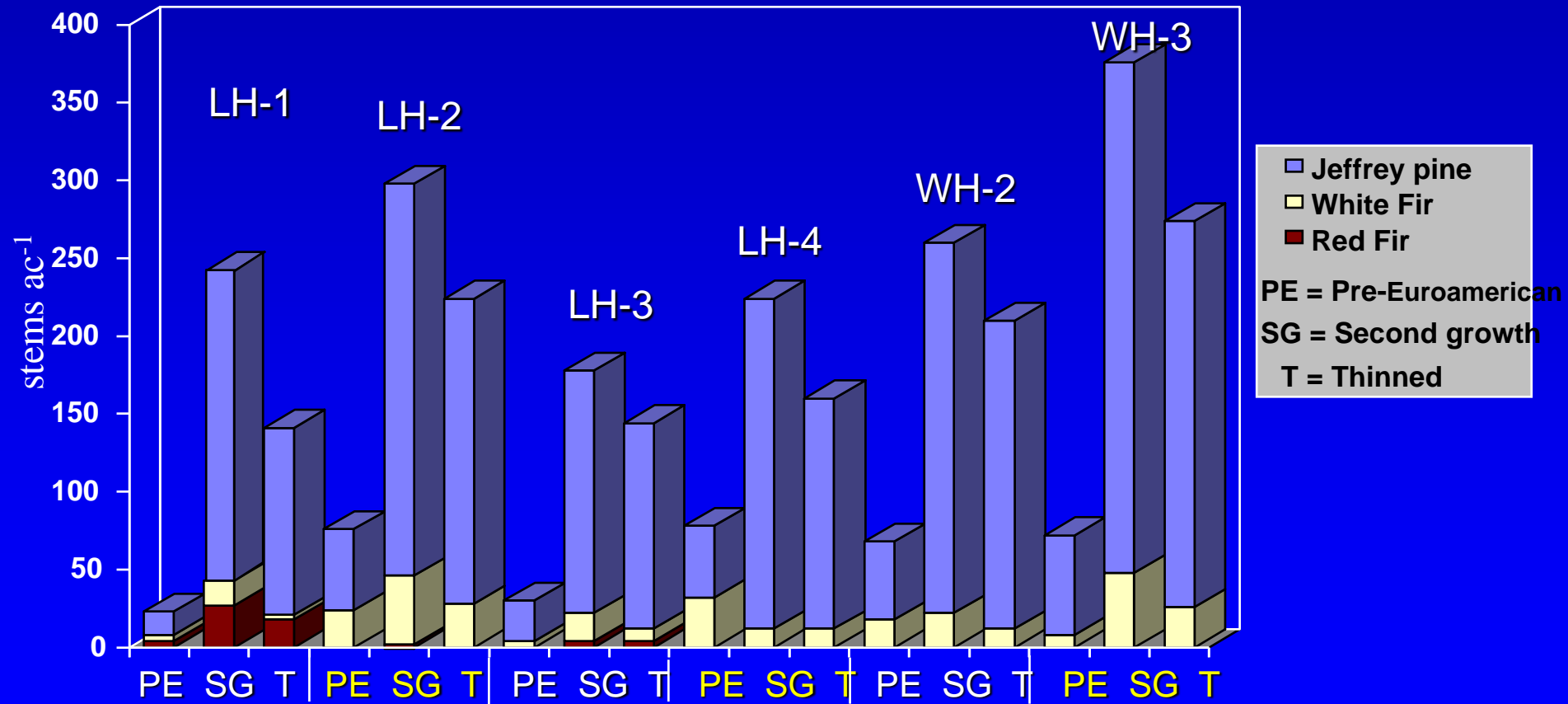






# Density of Pre-Comstock Second Growth, and Thinned Stands

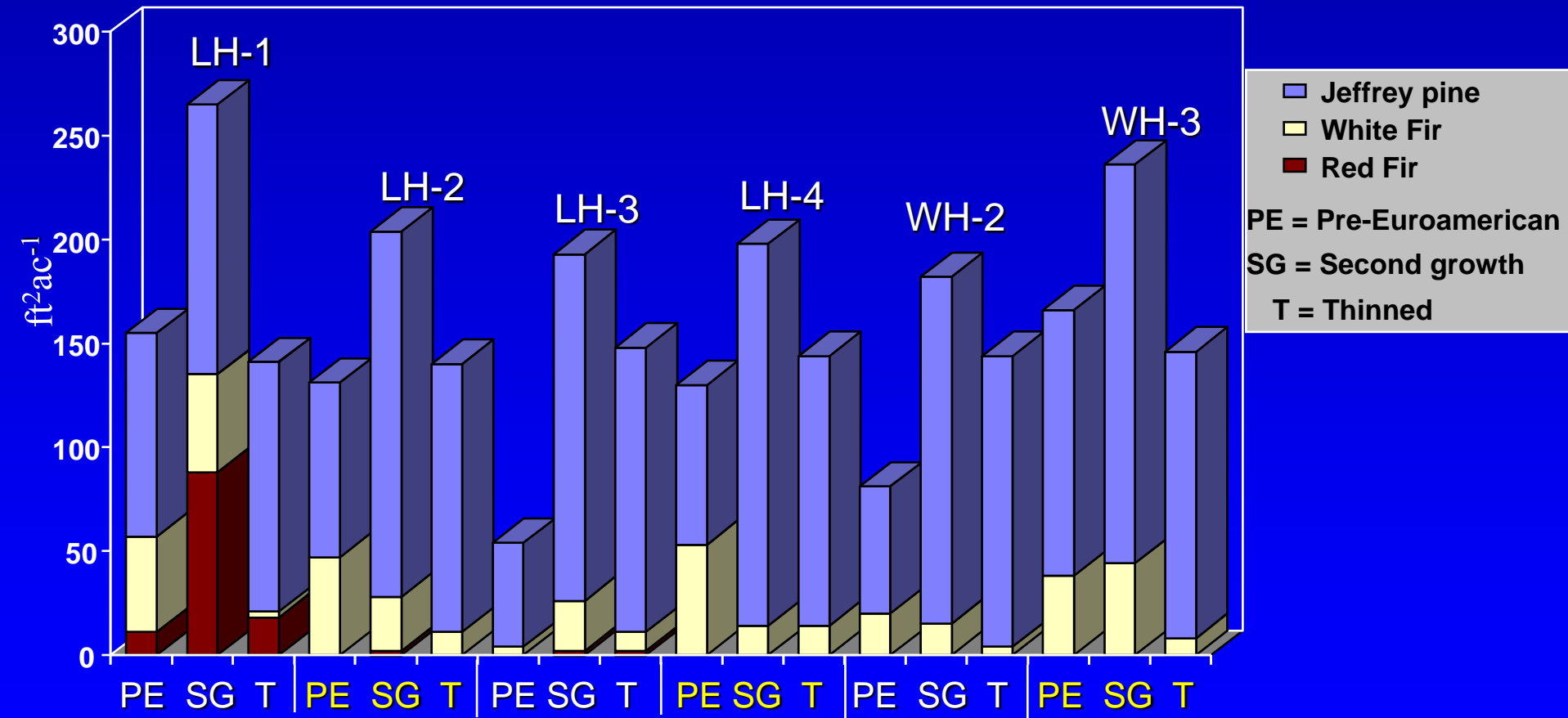
Jeffrey Pine Forests, Carson Range





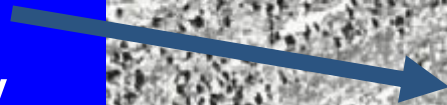
# Basal Area of Pre-Comstock Second Growth, and Thinned Stands

## Jeffrey Pine Forests, Carson Range

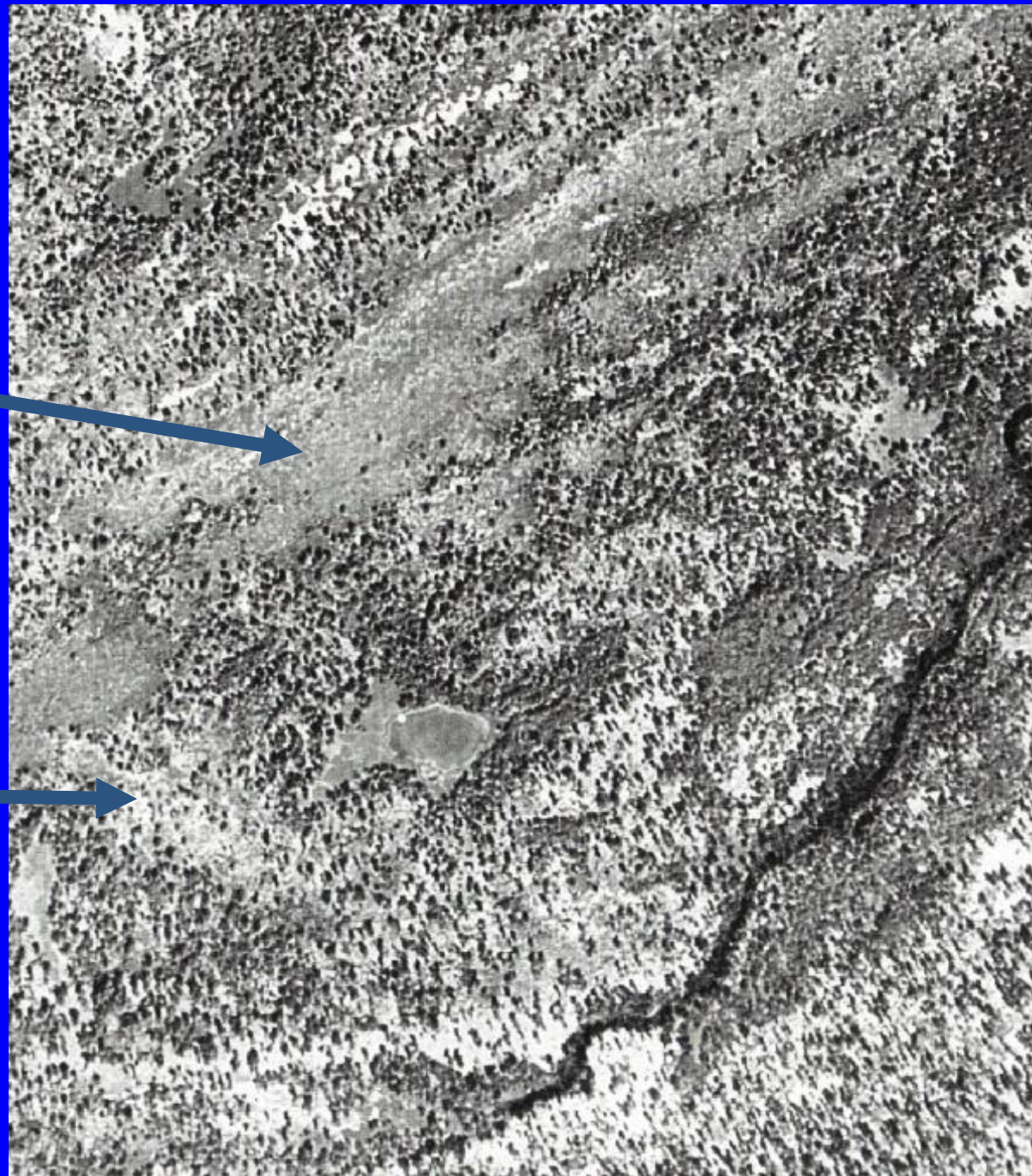


# 1939 Air Photo

Brushfield  
1861 Fire  
High Severity



Forest/Brush  
1873 Fire  
Mixed Severity

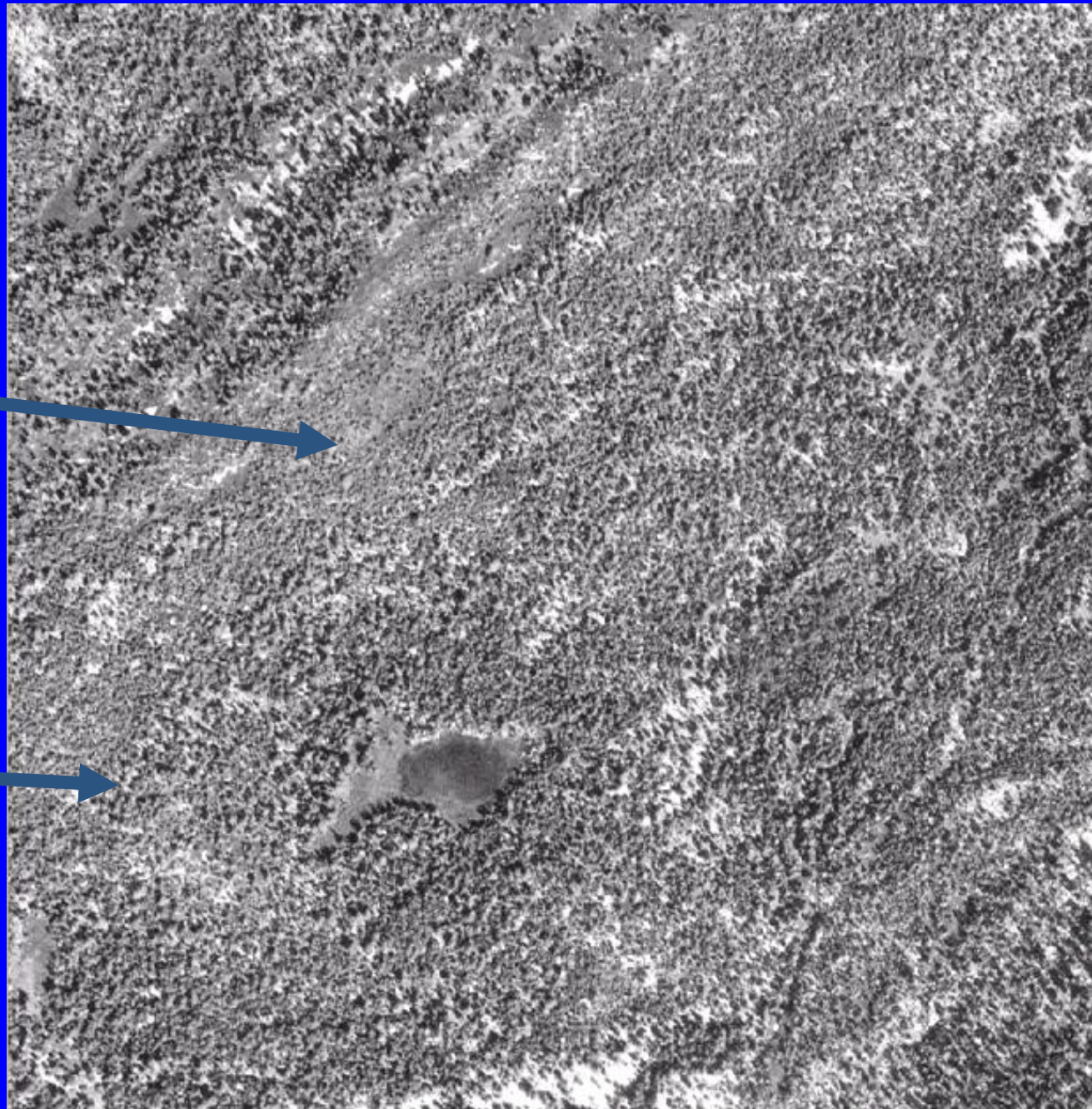




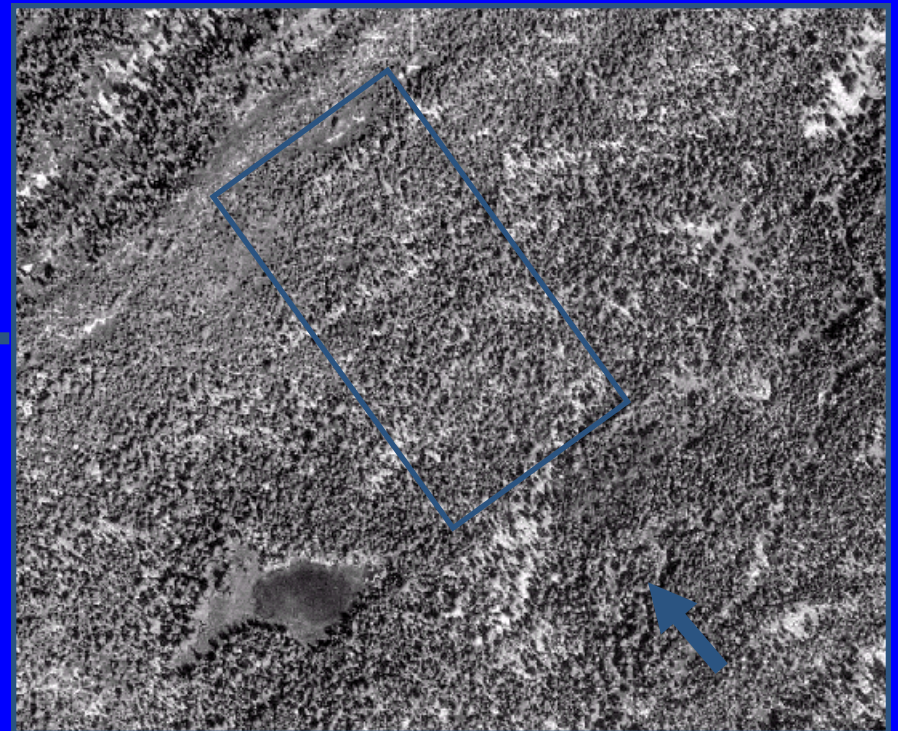
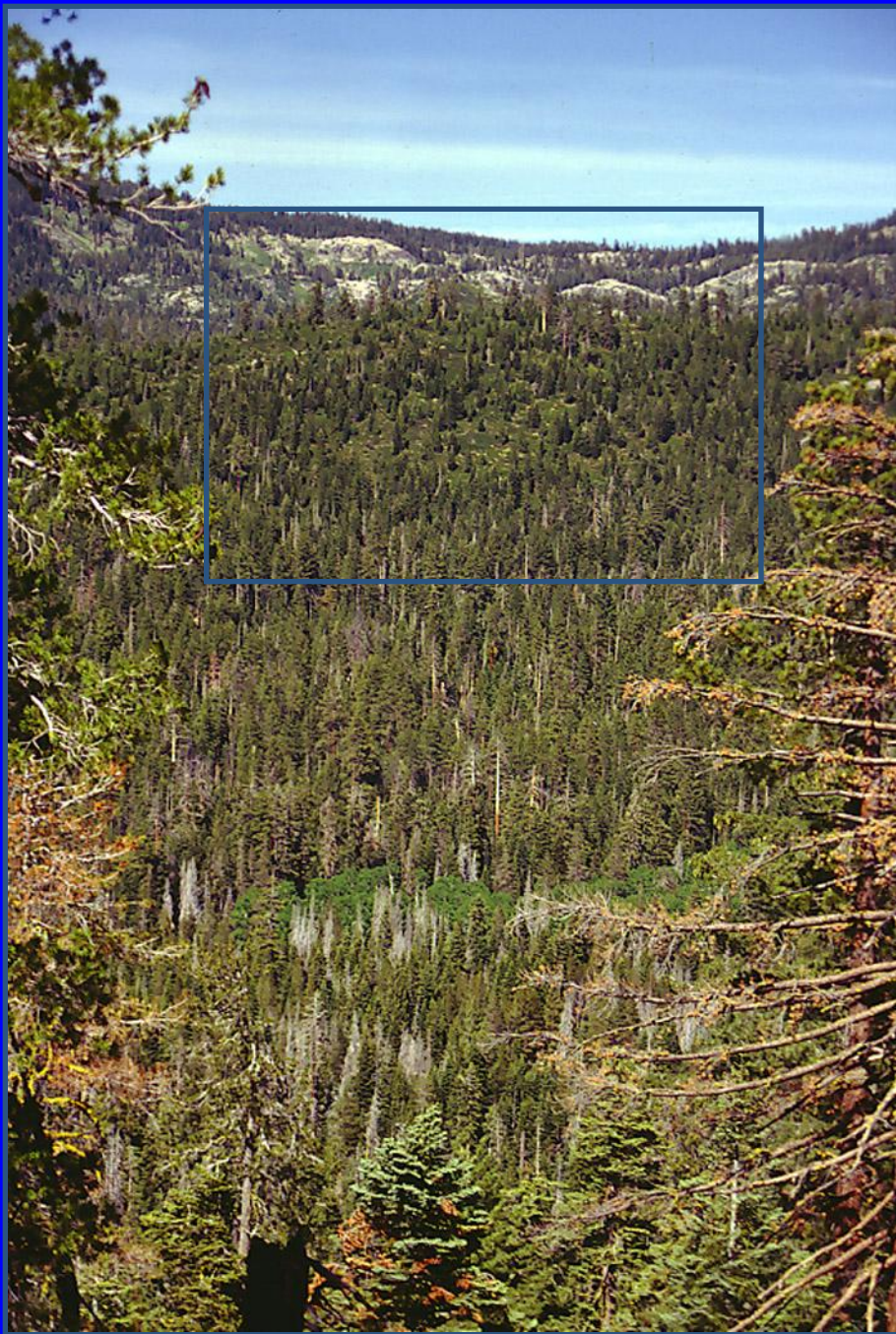
# 2000 Air Photo

Brushfield  
1861 Fire  
High Severity

Forest/Brush  
1873 Fire  
Mixed Severity

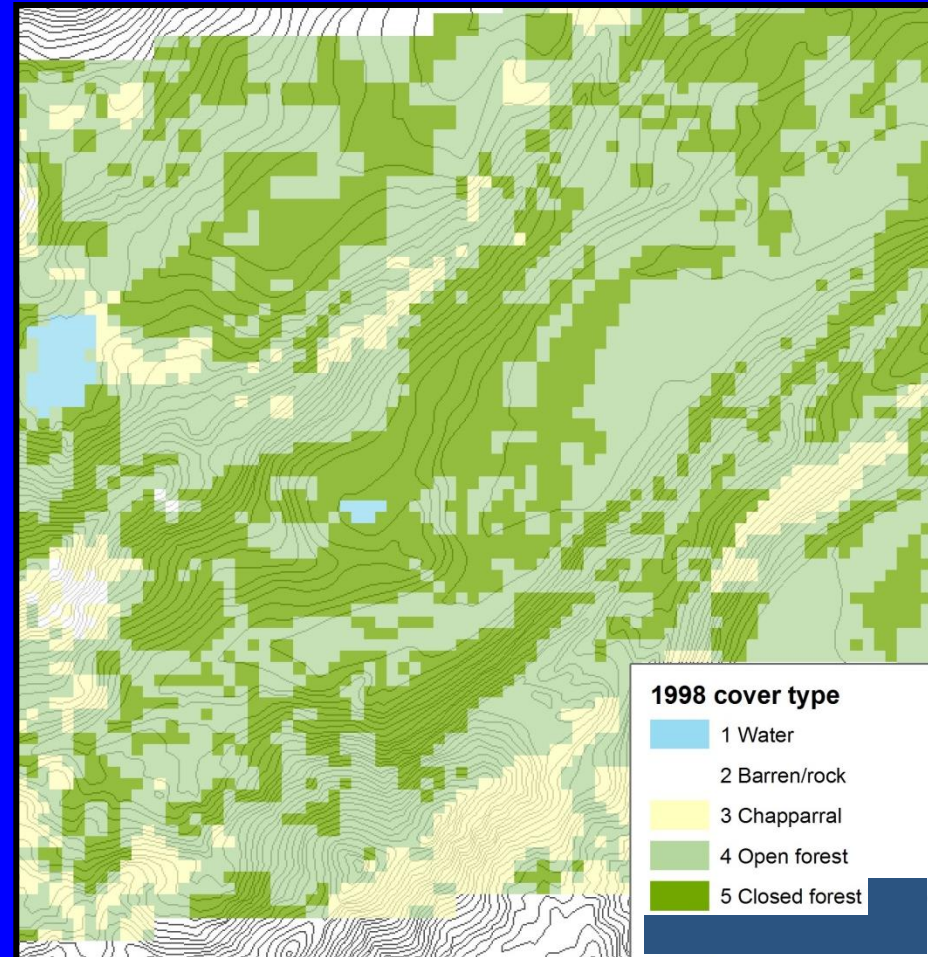
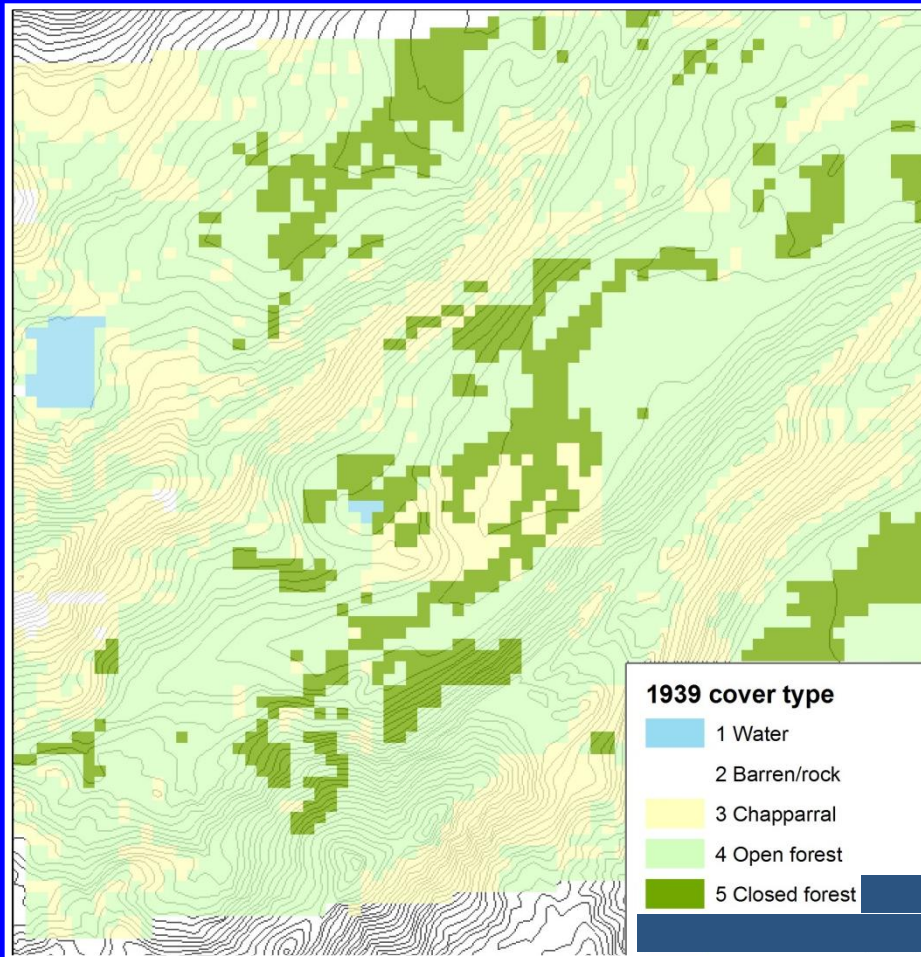








# 20<sup>th</sup> century landscape change



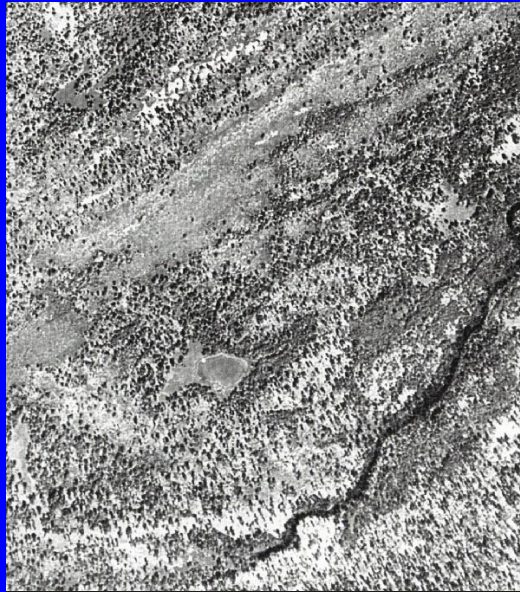
# Landscape scale

- Vegetation patterns related to differences in fire severity
  - Areas of high severity burns were present
  - Fire severity patterns related to topography

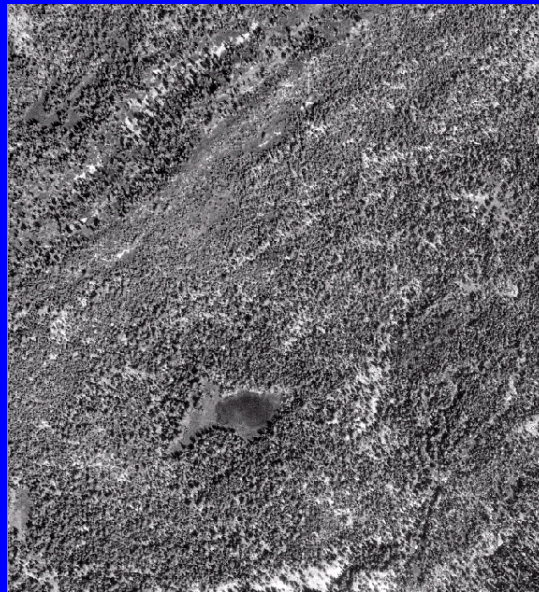




1939



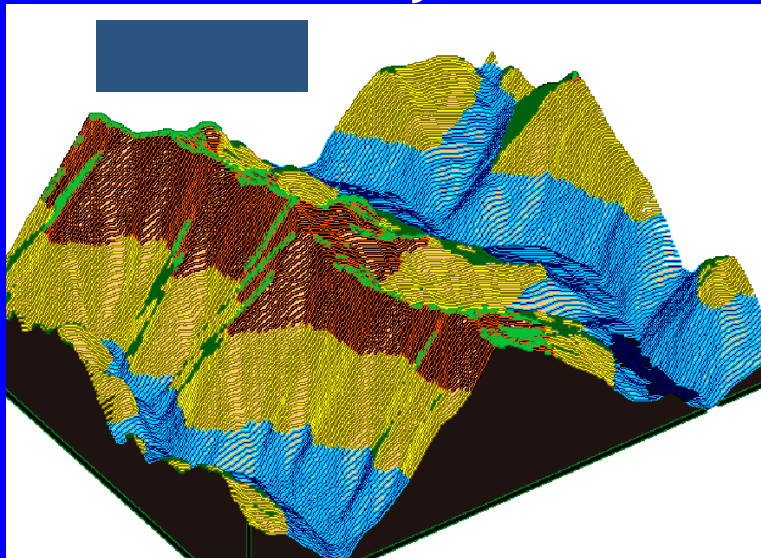
1998



# Landscape scale dynamics

- Repeat historical aerial photography
- GIS and Image Analysis
- Vegetation sampling and ground-truthing
- Fire History Reconstruction

## Fire Severity Patterns



- Landscape patterns and processes
- Change detection

