

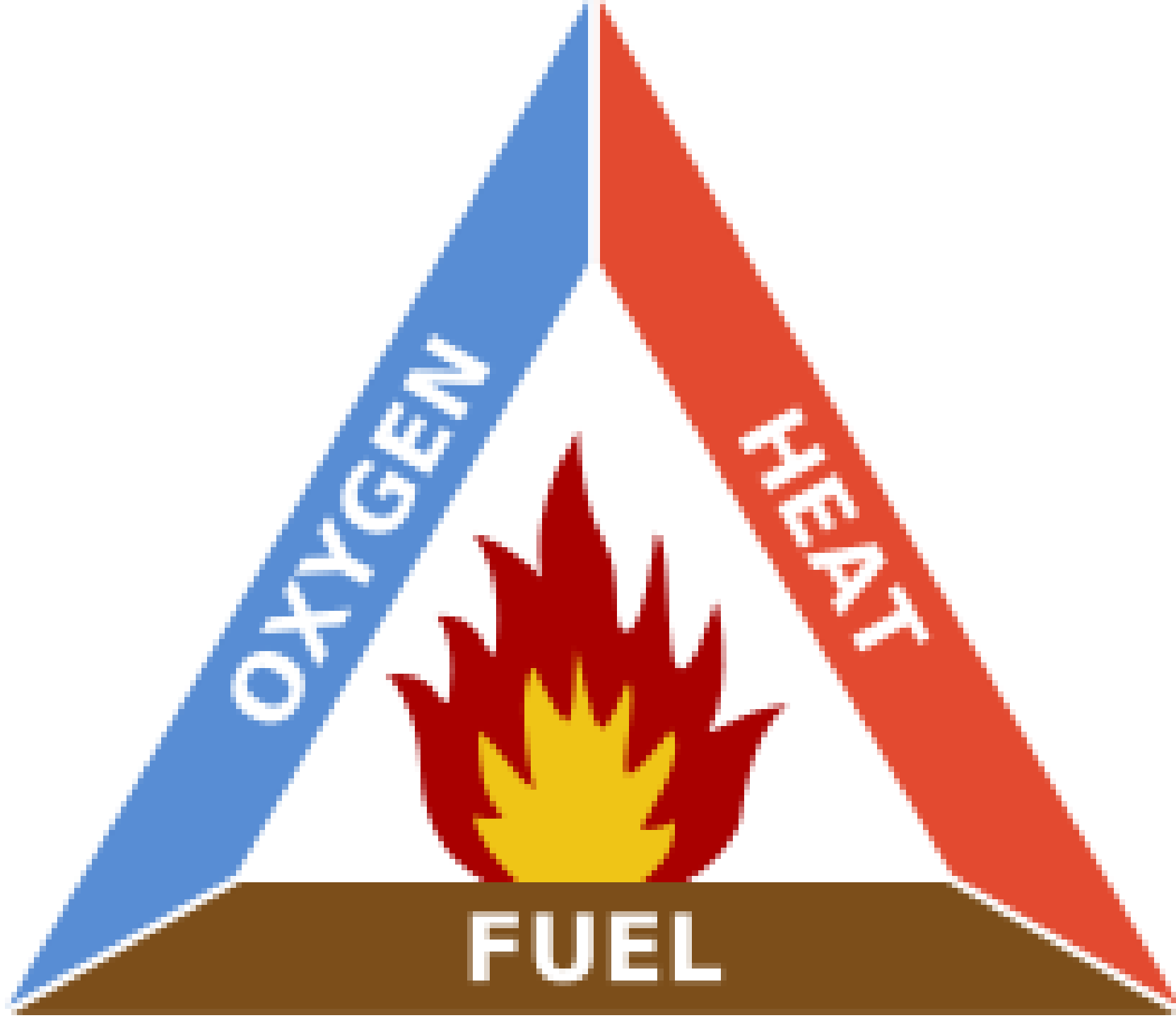
# Fire behavior

Dr. Kate Wilkin

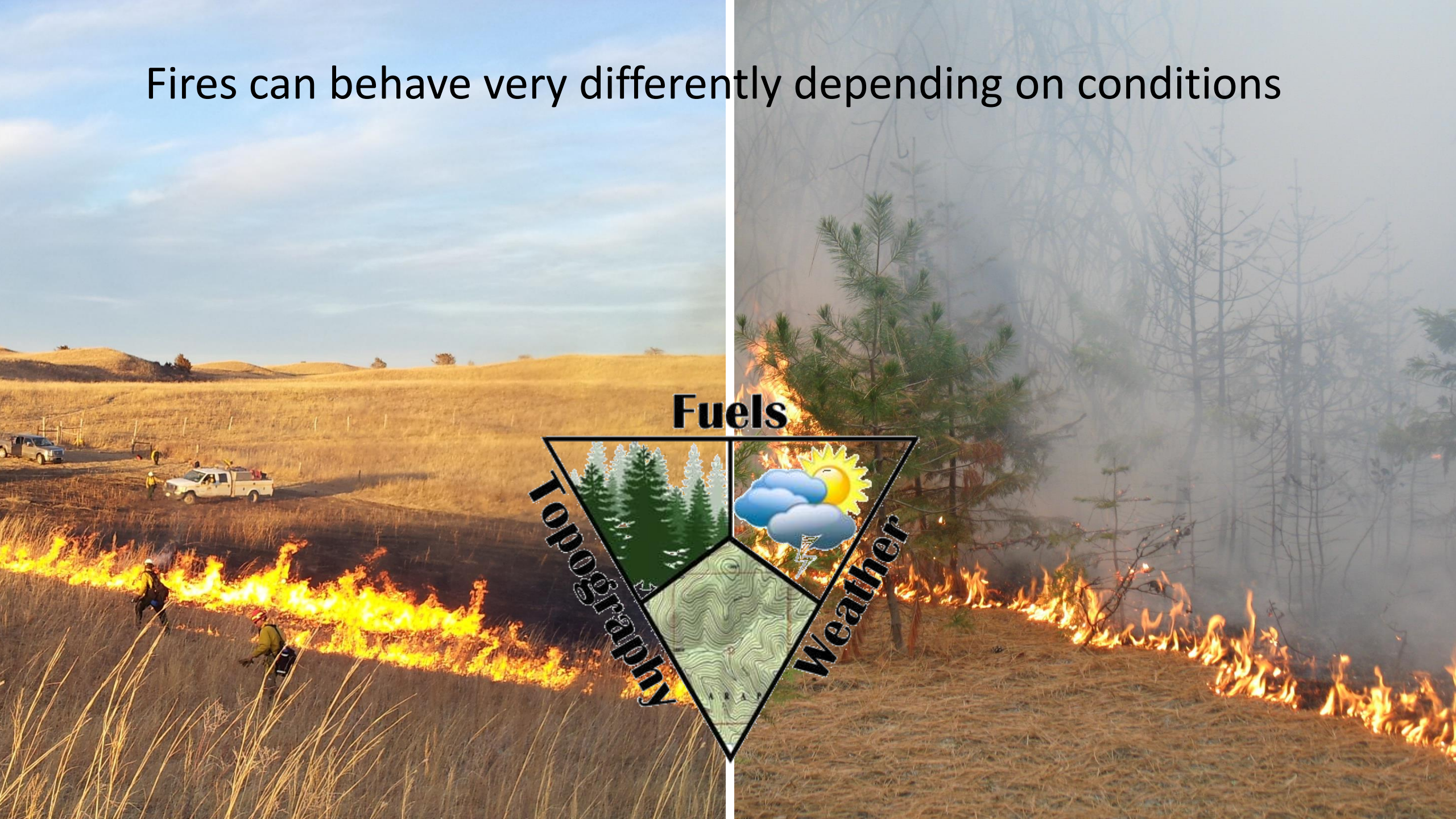
UC's Blodgett Forest

May 14, 2018





Fires can behave very differently depending on conditions



**Fuels**

**Topography**

**Weather**

# Factors for Fire Behavior

- Topography
  - Slope
  - Aspect
  - Elevation
- Weather
  - Wind speed and direction
  - Temperature
  - Relative Humidity
- Fuel
  - Fuel model
    - Ladder fuel
    - Canopy cover
    - Canopy base height
  - Fuel moisture

# 13 Anderson Fuel Models

## Grass



## Shrub



## Timber



## Logging Slash



Anderson, H. E. 1982. Aids to determining fuel models for estimating fire behavior. Gen. Tech. Rep. INT-122. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 22 p.

# Factors for Fire Behavior

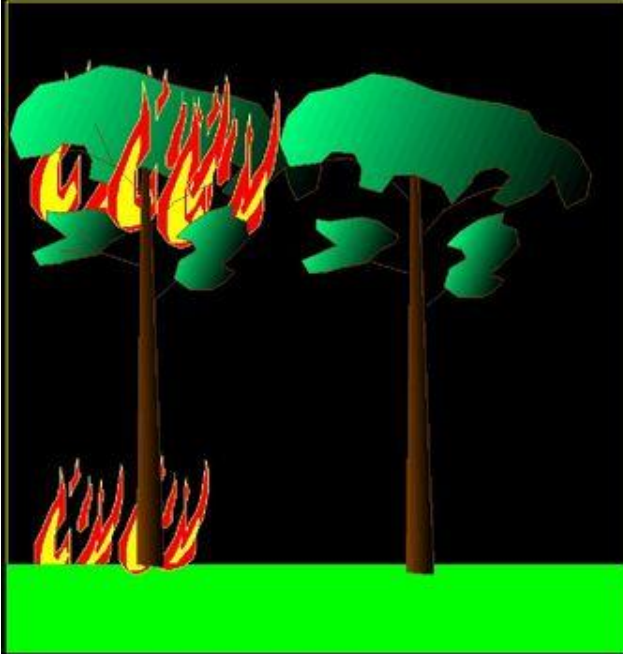
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TIME LAG	FUEL SIZE	DETERMINATION
1-hour	<0.25 inch diameter	Fine flashy fuels that respond quickly to weather changes. Computed from observation time temperature, humidity, and cloudiness.
10-hour	0.25 to 1 inch diameter	Computed from observation time temperature, humidity, and cloudiness. Can also be an observed value, from a standard set of fuel sticks that are weighed as part of the fire weather observation.
100-hour	1 to 3 inches diameter	Computed from 24-hour average conditions composed of day length, hours of rain, and daily temperature/humidity ranges.
1000-hour	3 to 8 inches diameter	Computed from a 7-day average conditions composed of day length, hours of rain, and daily temperature/humidity ranges.

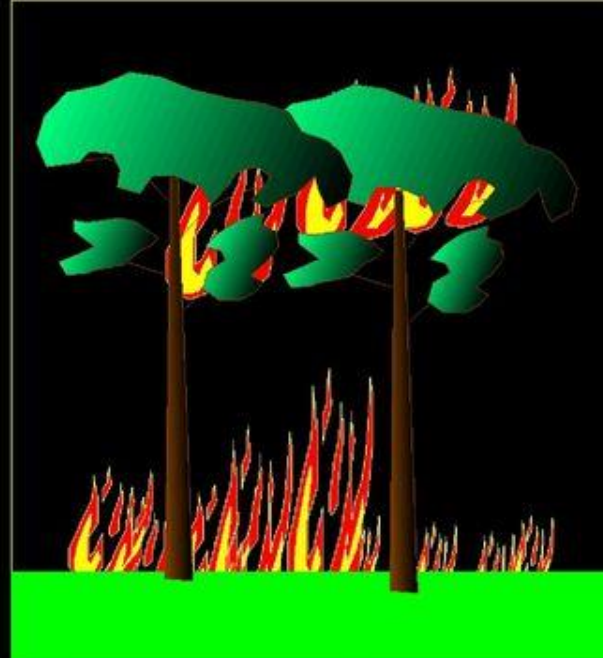
# Prescribed fire terms

- Test burn
- Anchor point
- Back fire or Burn-out
- Backing fire
- Head fire
- Flanking Fire
- Spot Fire
- Blackline
- Understory burn
- Crown burn

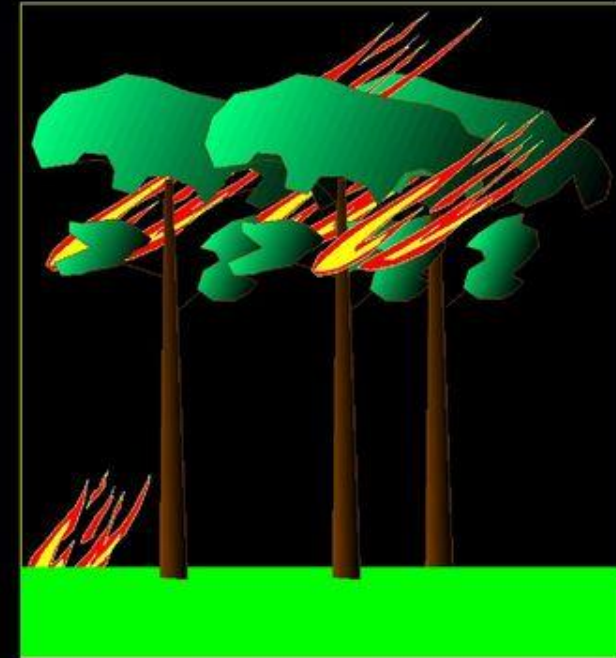
# Types of Crown Fires



**PASSIVE =  
SINGLE TREE  
OR  
CLUMPS  
TORCHING**



**ACTIVE =  
FLAMES IN  
CROWNS  
SUPPORTED BY  
SURFACE FIRE**



**INDEPENDENT =  
FLAMES ADVANCING  
THROUGH CROWNS  
WITH/WITHOUT  
SURFACE FIRE**

# Fire effects

- Consumption
- Char height
- Crown scorch
- Soil burn severity
- Vegetation burn severity

# *Fire behavior questions?*

Dr. Kate Wilkin

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