

# Stages of Fire

- ❖ preheating phase (remove H<sub>2</sub>O; bring cellulose to 300°C/575°F)
- ❖ pyrolysis (decompose wood -> flammable gases)
- ❖ flaming combustion
- ❖ glowing combustion

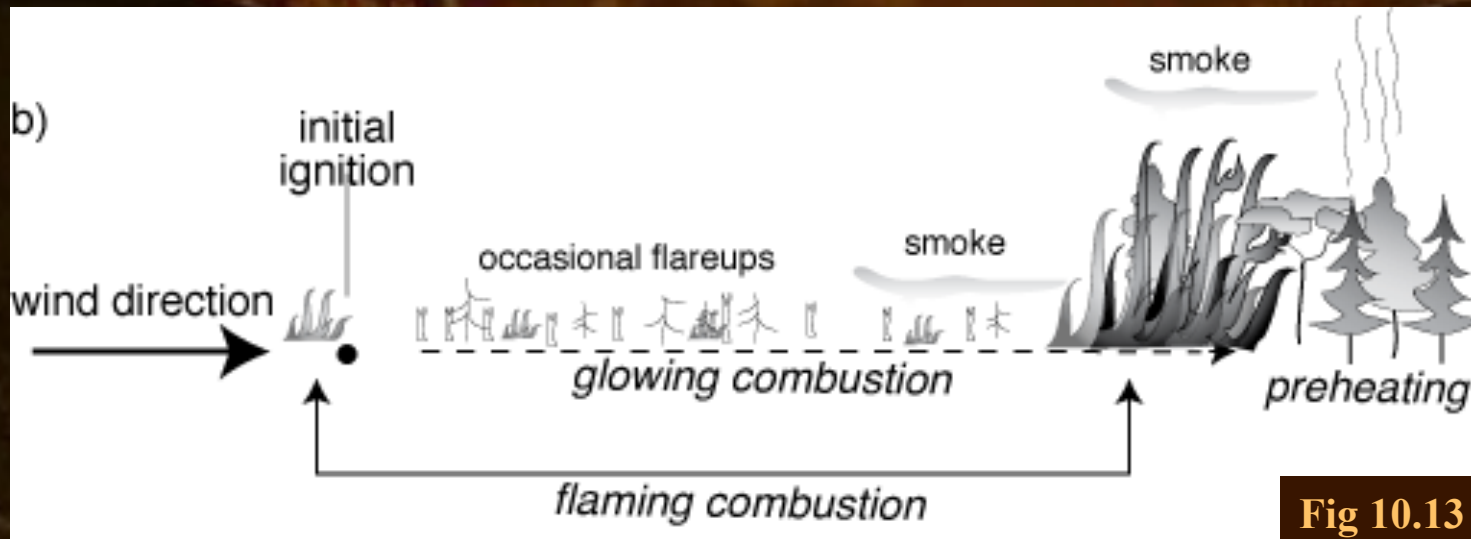


Fig 10.13

- ❖ Santa Ana weather with low humidity provides a shortcut!
- ❖ winds also drive fires

# Wind-driven Wildfires

## FOEHN WINDS

- high pressure system in Great Basin
- low humidity through adiabatic heating
- September - February (April)
- also in Australia!!

source: Abbott "Natural Disasters"

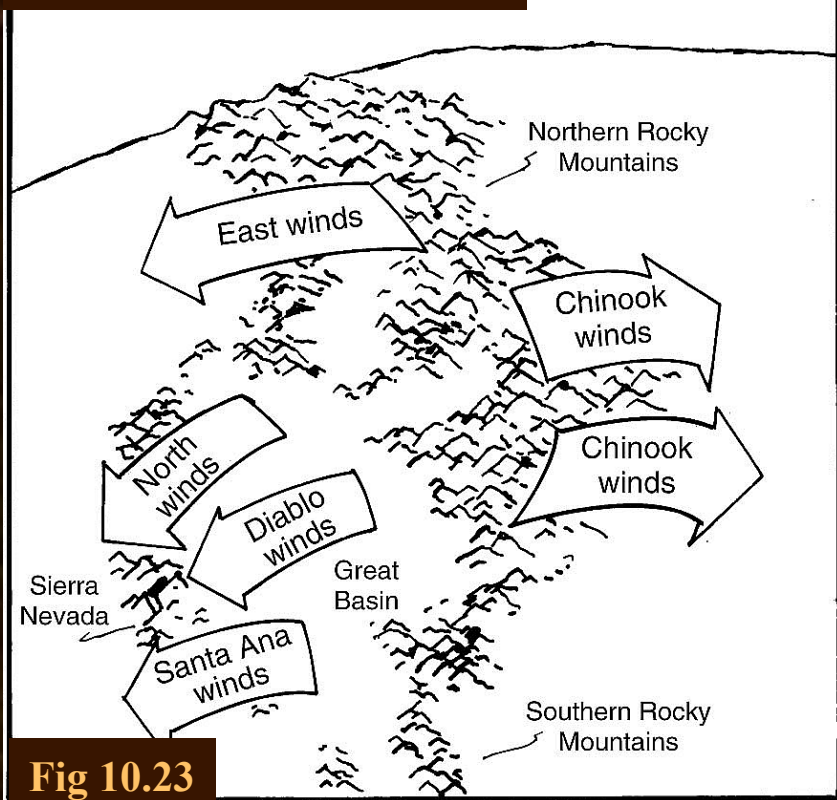
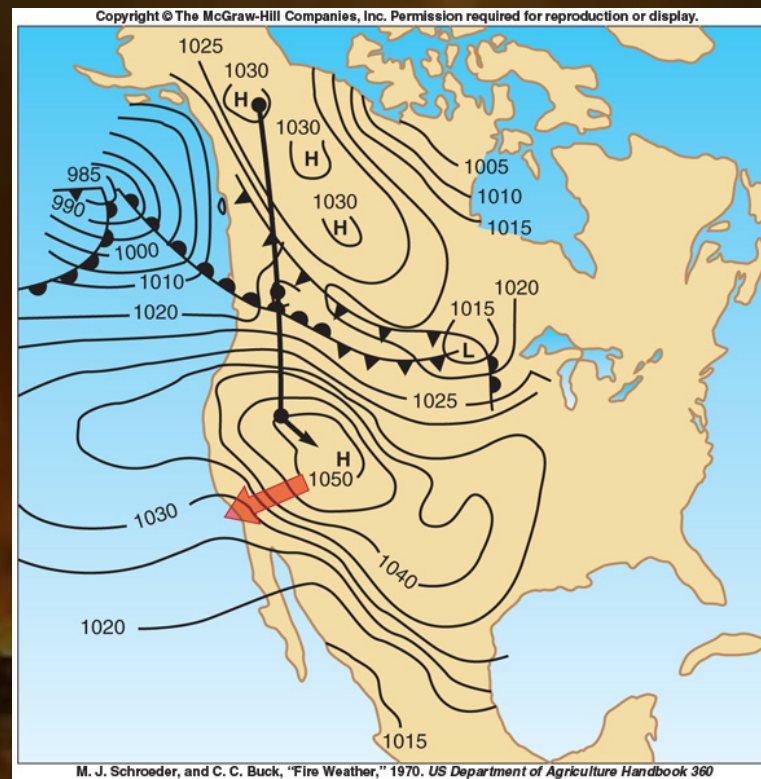
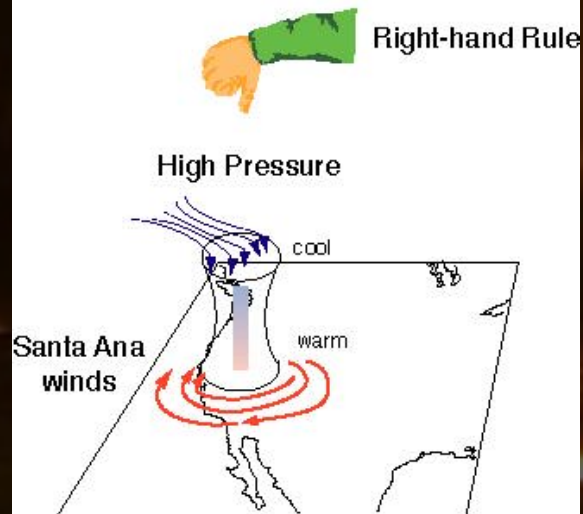


Fig 10.23



# Santa Ana Weather in So. Cal.

Air Flow in the  
Santa Ana Weather Condition



air in high pressure

- sinks and warms
- relative humidity goes down

Santa Ana in S.D. county

- hot in October! ( $> 100^{\circ}\text{F}$ )
- windy ( $> 20\text{mph}$ ; gusts  $> 50\text{ mph}$ )
- dry (15% vs  $> 50\%$  normal)

e.g. at Gabi's house by UCSD

Oct 15, 2007:  $65^{\circ}\text{F}$  (54% indoors)

Oct 21, 2007:  $87^{\circ}\text{F}$  (30% indoors)

(Witch Creek Fire Oct 21)

Air Flow during Santa Ana

