Costs vs Benefits of Fuel Modifcations in Crown-Fire Ecosystems

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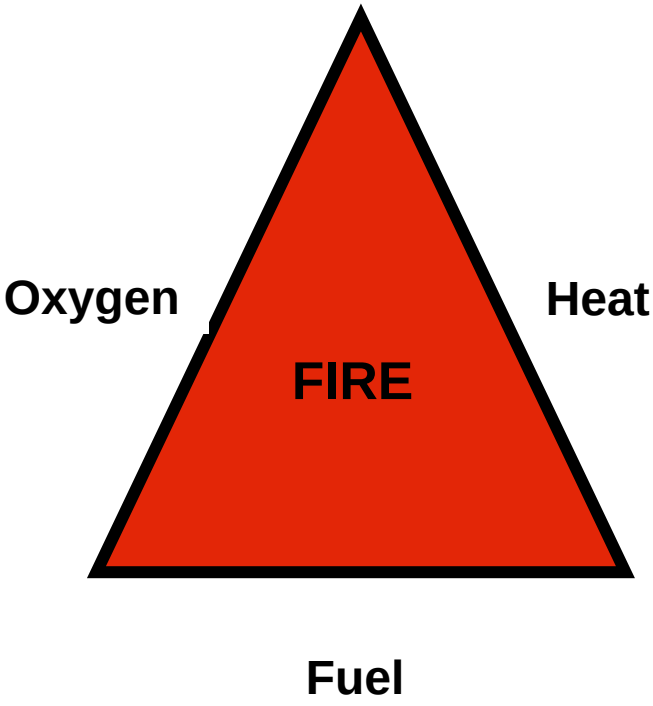

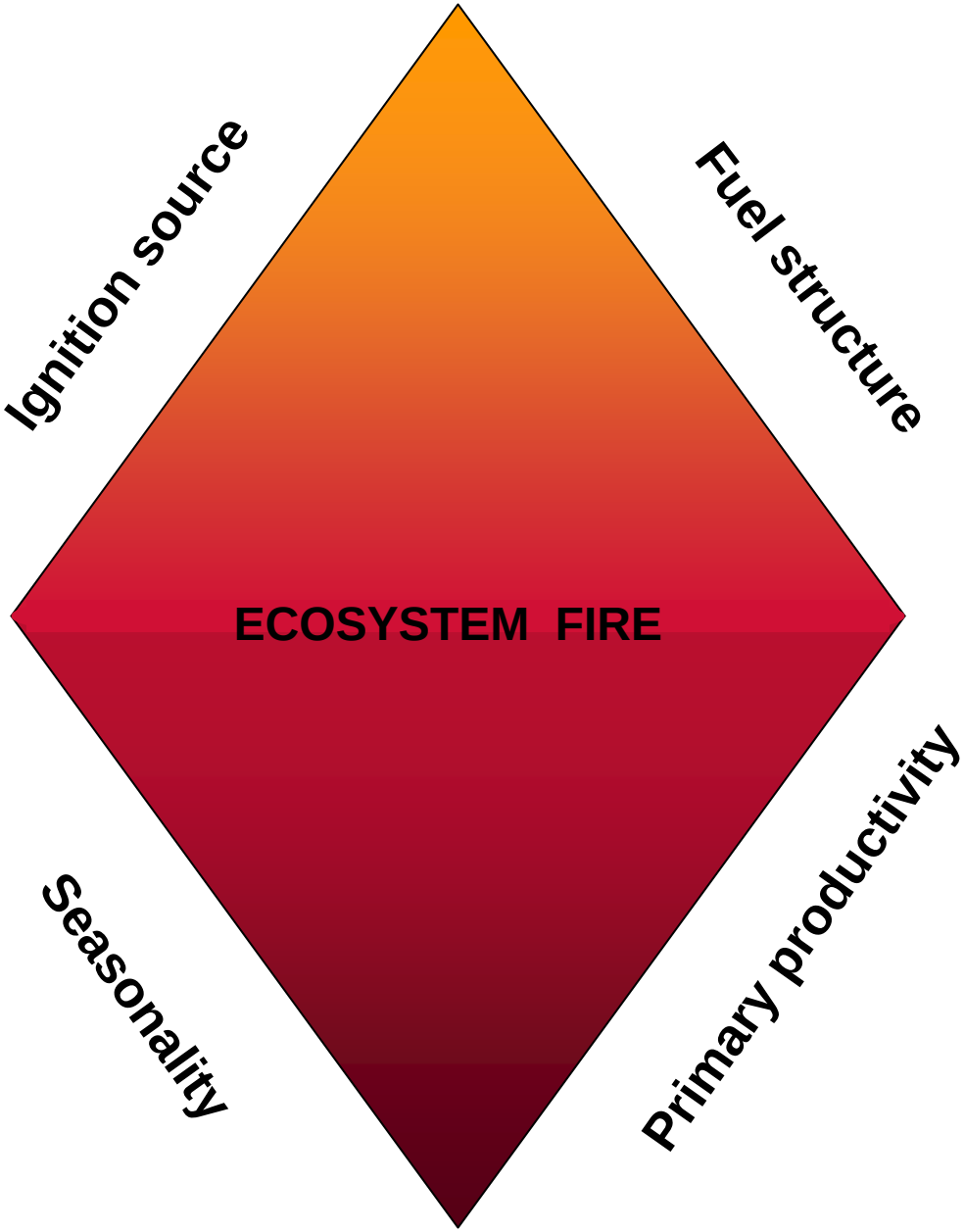

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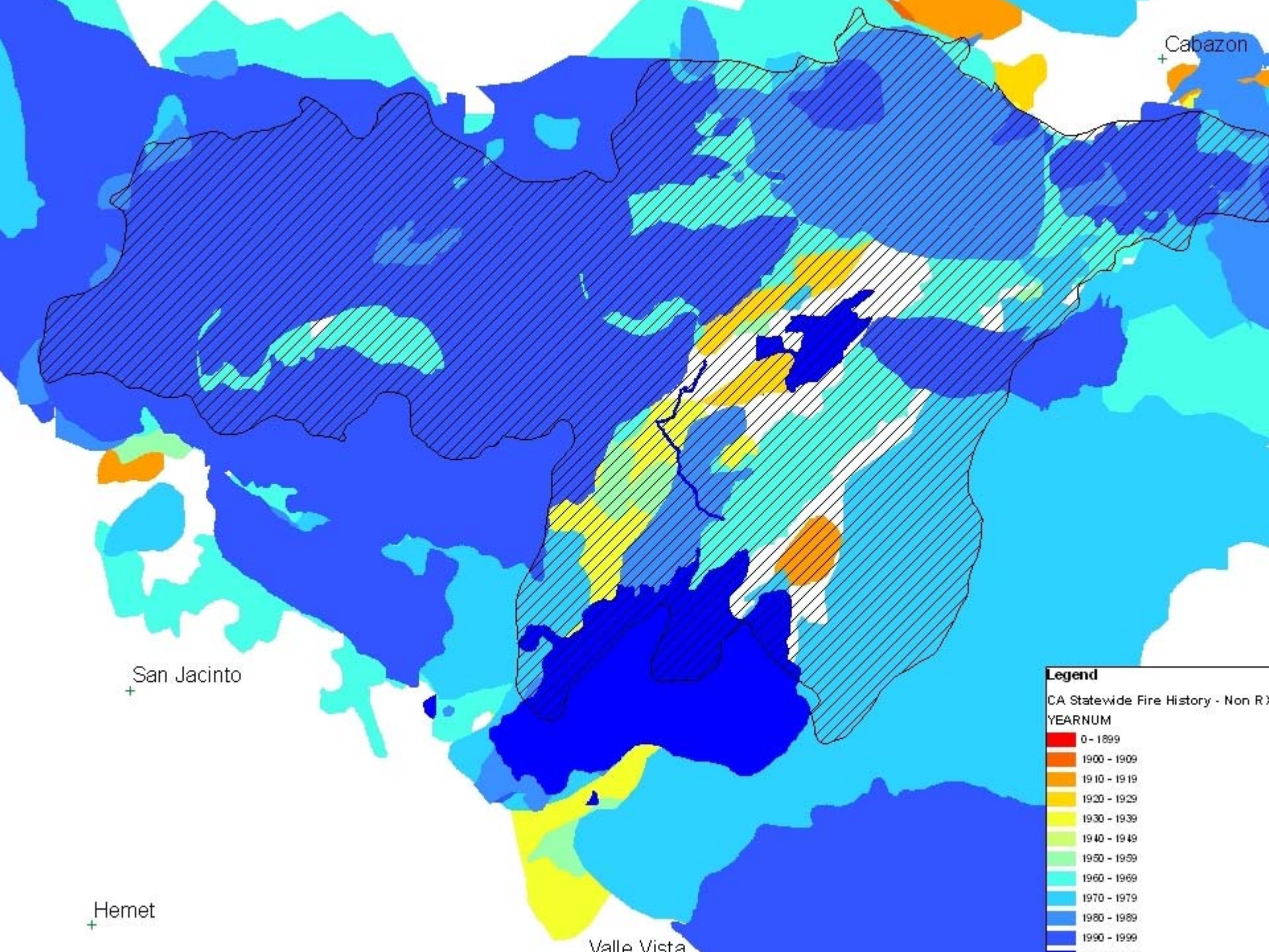
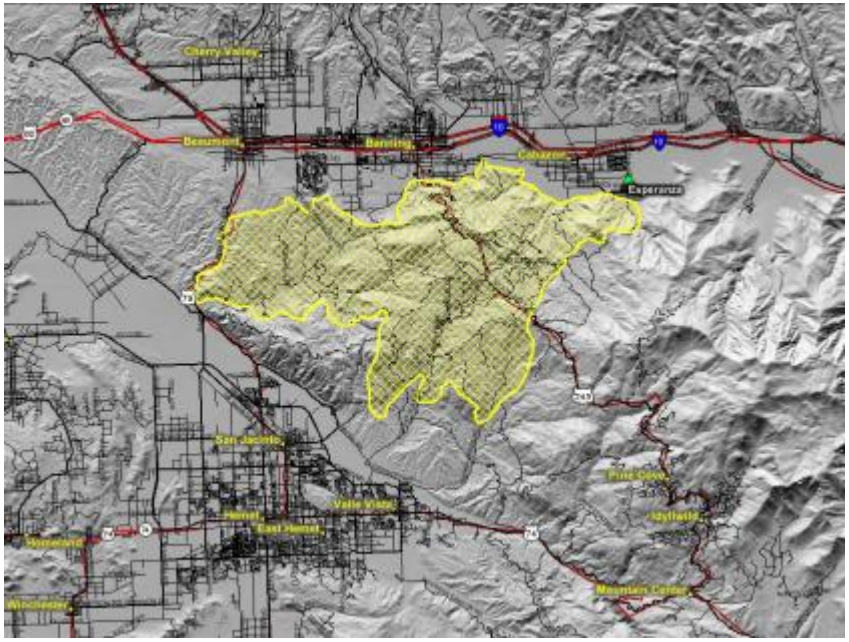
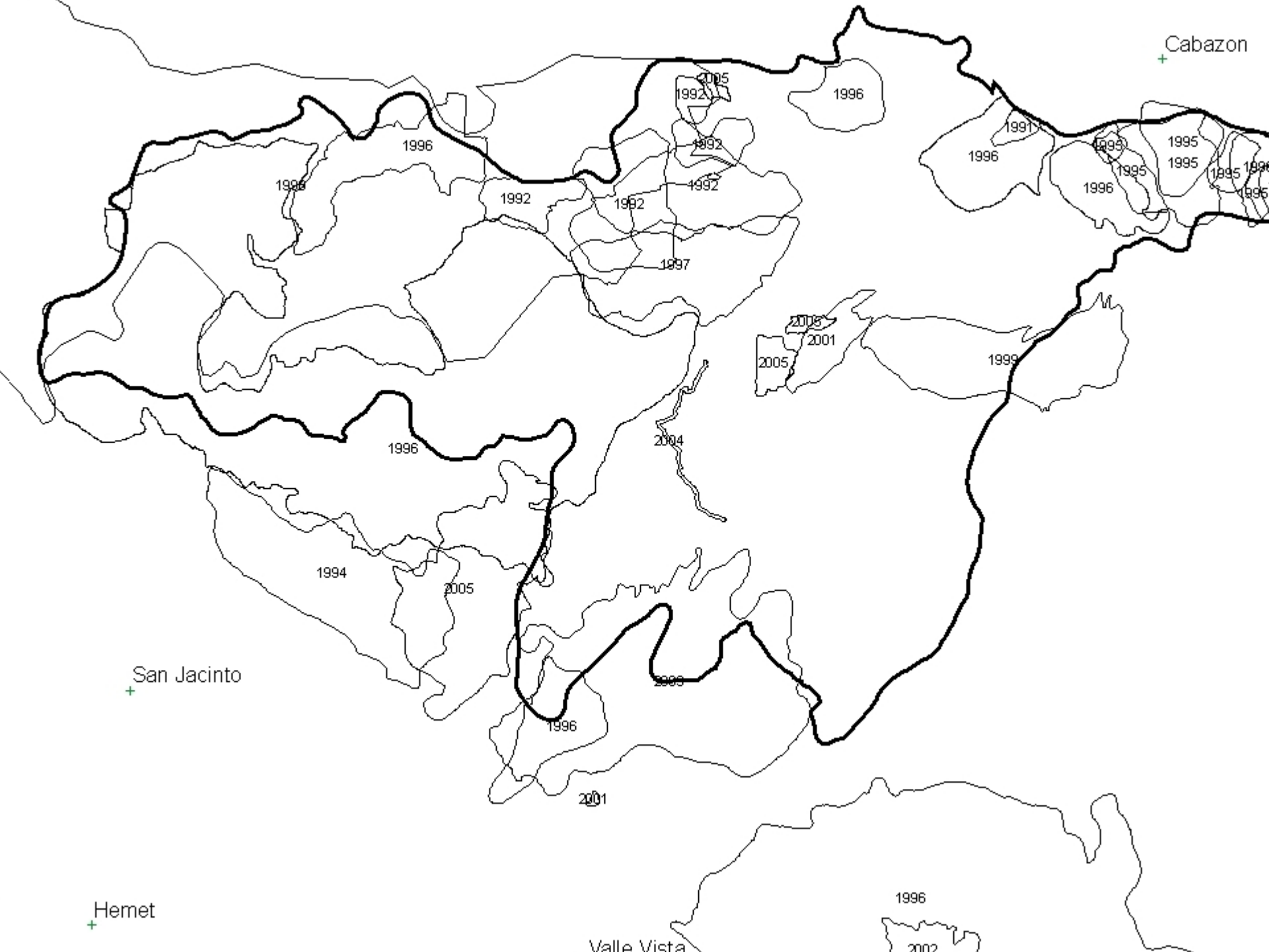
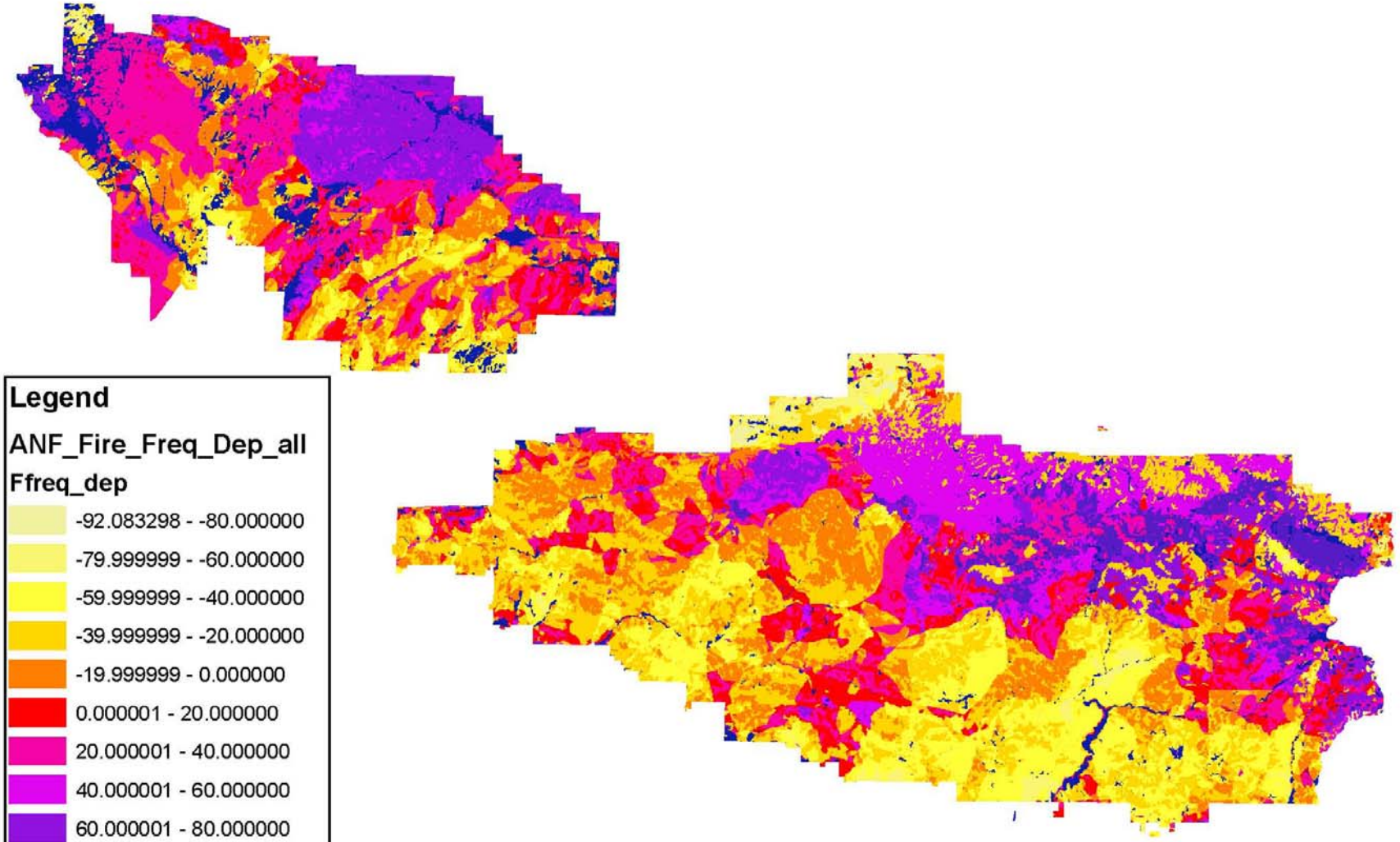
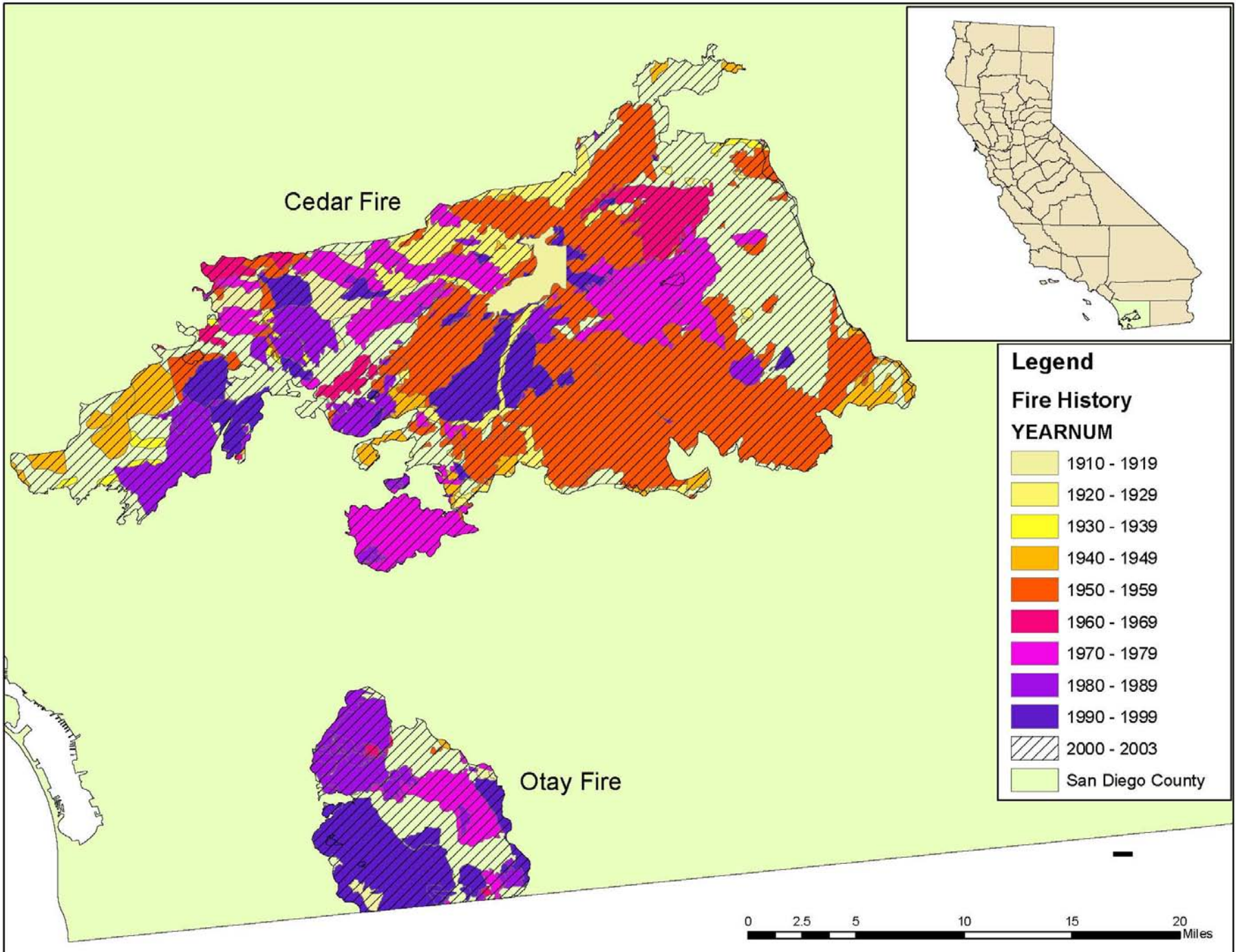

Cabazon
San Jacinto
Hemet
Valle Vista
Legend
CA Statewide Fire History - Non RX
YEARNUM
0 - 1899
1900 - 1909
1910 - 1919
1920 - 1929
1930 - 1939
1940 - 1949
1950 - 1959
1960 - 1969
1970 - 1979
1980 - 1989
1990 - 1999


Cherry Valley
Beaumont
Banning
Cabazon
Esperanza
San Jacinto
Hemet
East Hemet
Valle Vista
Homeland
Winchester
Pine Cove
Idyllwild
Mountain Center


Cabazon
San Jacinto
Hemet
Valle Vista
1996
1992
2005
1991
1995
1997
2001
1999
2004
1994
2002

Angeles National Forest
Fire Frequency Departure




Cedar Fire
Otay Fire
Legend
Fire History
YEARNUM
1910 - 1919
1920 - 1929
1930 - 1939
1940 - 1949
1950 - 1959
1960 - 1969
1970 - 1979
1980 - 1989
1990 - 1999
2000 - 2003
San Diego County
0
2.5
5
10
15
20
Miles

Surface-Fire Regime Forests

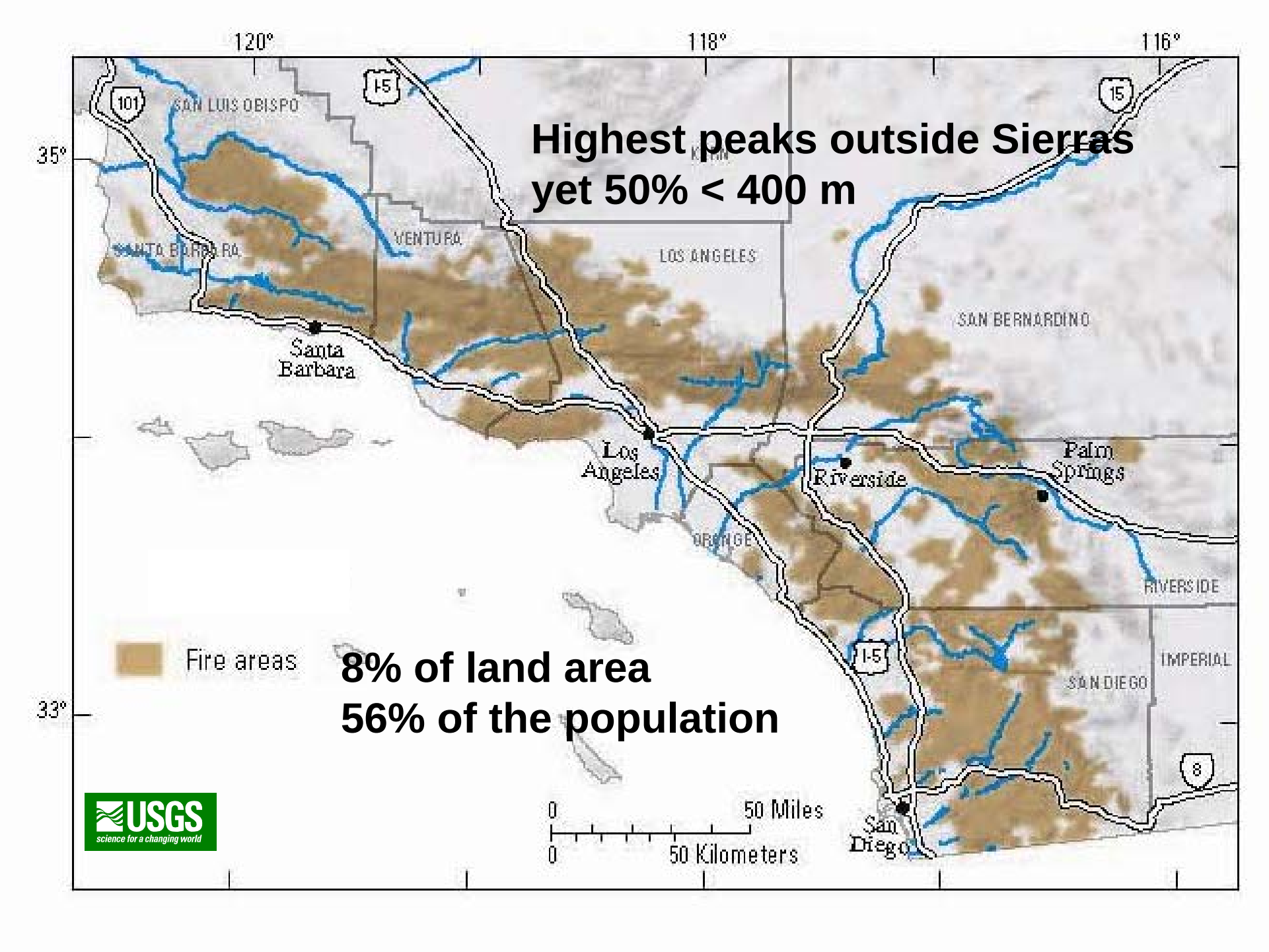
Past Management

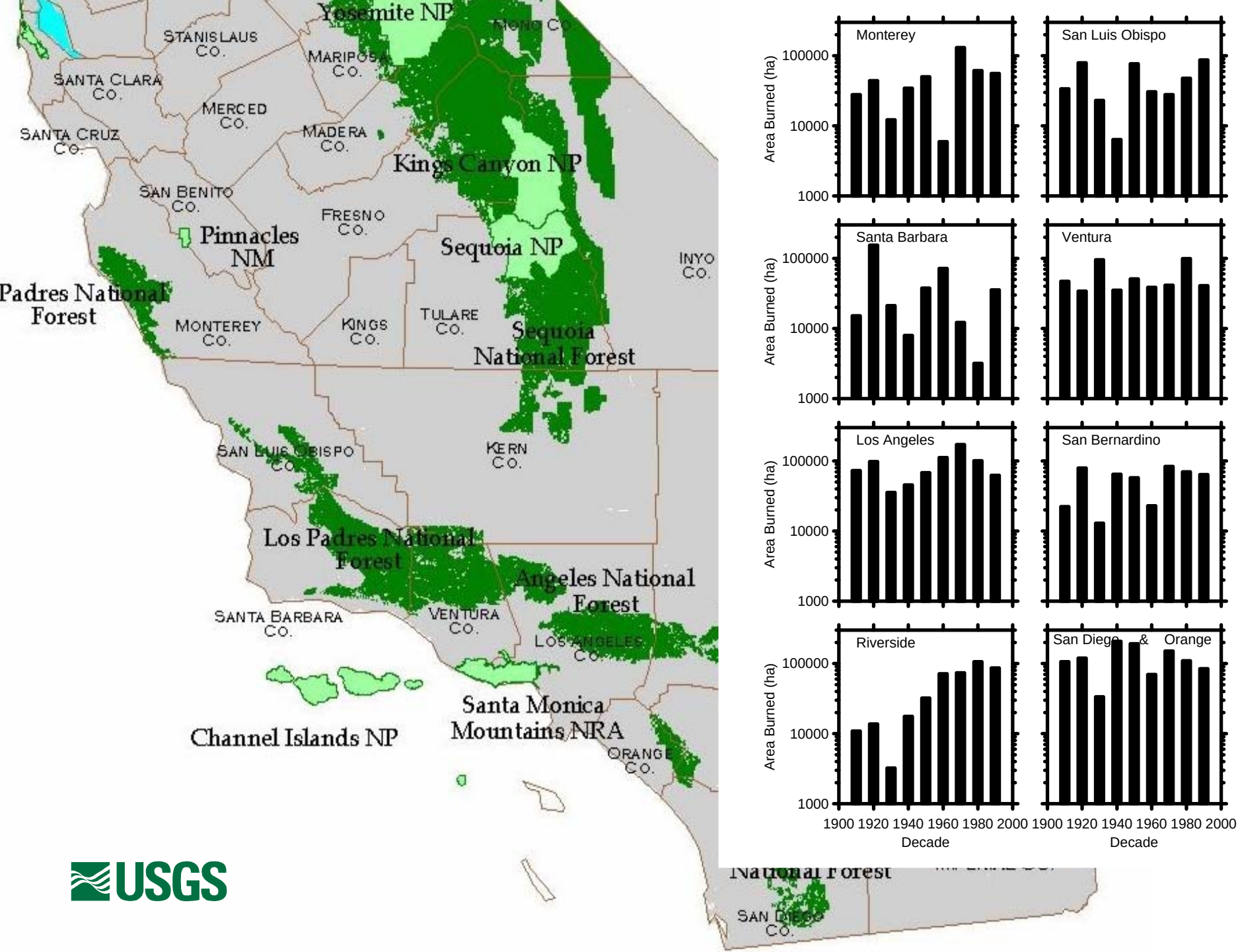
Fire suppression = fire exclusion
Hazardous fuels in excess of historical (natural) patterns

Present Management

Restore historical forest structure and process with fire or harvesting

➡ **Fire Mgmt Goals: reduce hazard**
➡ **Resource Mgmt: sustainability of 'natural' ecosystems**


120°
118°
116°
35°
33°
101
I-5
15
SAN LUIS OBISPO
VENTURA
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
IMPERIAL
SAN DIEGO
Santa Barbara
Los Angeles
Riverside
Palm Springs
San Diego
Highest peaks outside Sierras
yet 50% < 400 m
Fire areas
8% of land area
56% of the population
0
50 Miles
0
50 Kilometers
USGS
science for a changing world


Yosemite NP
STANISLAUS CO.
MARIPOSA CO.
TUOLUMNE CO.
SANTA CLARA CO.
MERCED CO.
SANTA CRUZ CO.
MADERA CO.
Kings Canyon NP
SAN BENITO CO.
FRESNO CO.
Pinnacles NM
Sequoia NP
INYO CO.
Padres National Forest
MONTEREY CO.
KINGS CO.
TULARE CO.
Sequoia National Forest
SAN LUIS OBISPO CO.
KERN CO.
Los Padres National Forest
Angeles National Forest
SANTA BARBARA CO.
VENTURA CO.
LOS ANGELES CO.
Santa Monica Mountains NRA
Channel Islands NP
ORANGE CO.
SAN DIEGO CO.
Monterey
San Luis Obispo
Santa Barbara
Ventura
Los Angeles
San Bernardino
Riverside
San Diego & Orange
Area Burned (ha)
100000
10000
1000
1900 1920 1940 1960 1980 2000
Decade

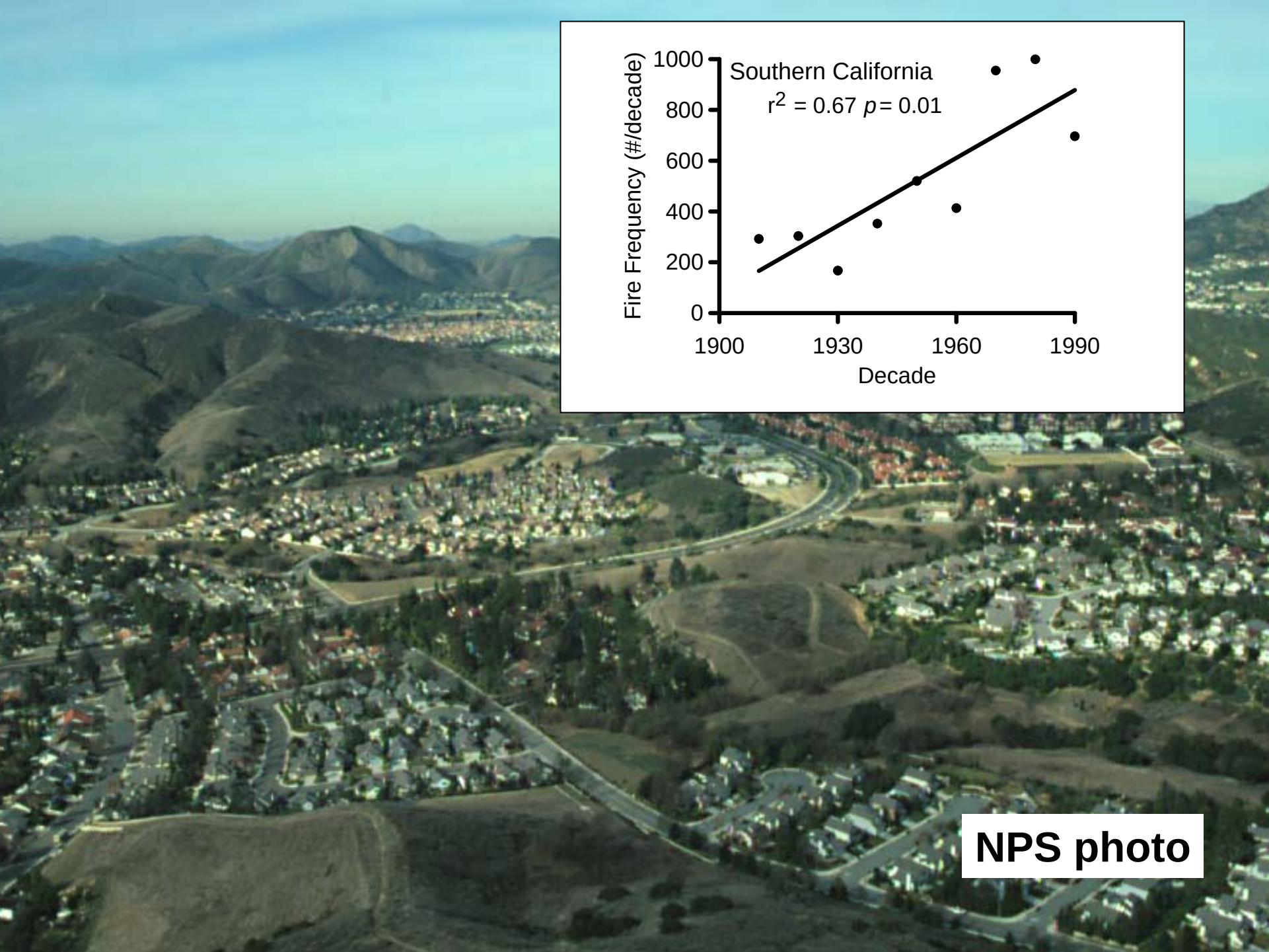
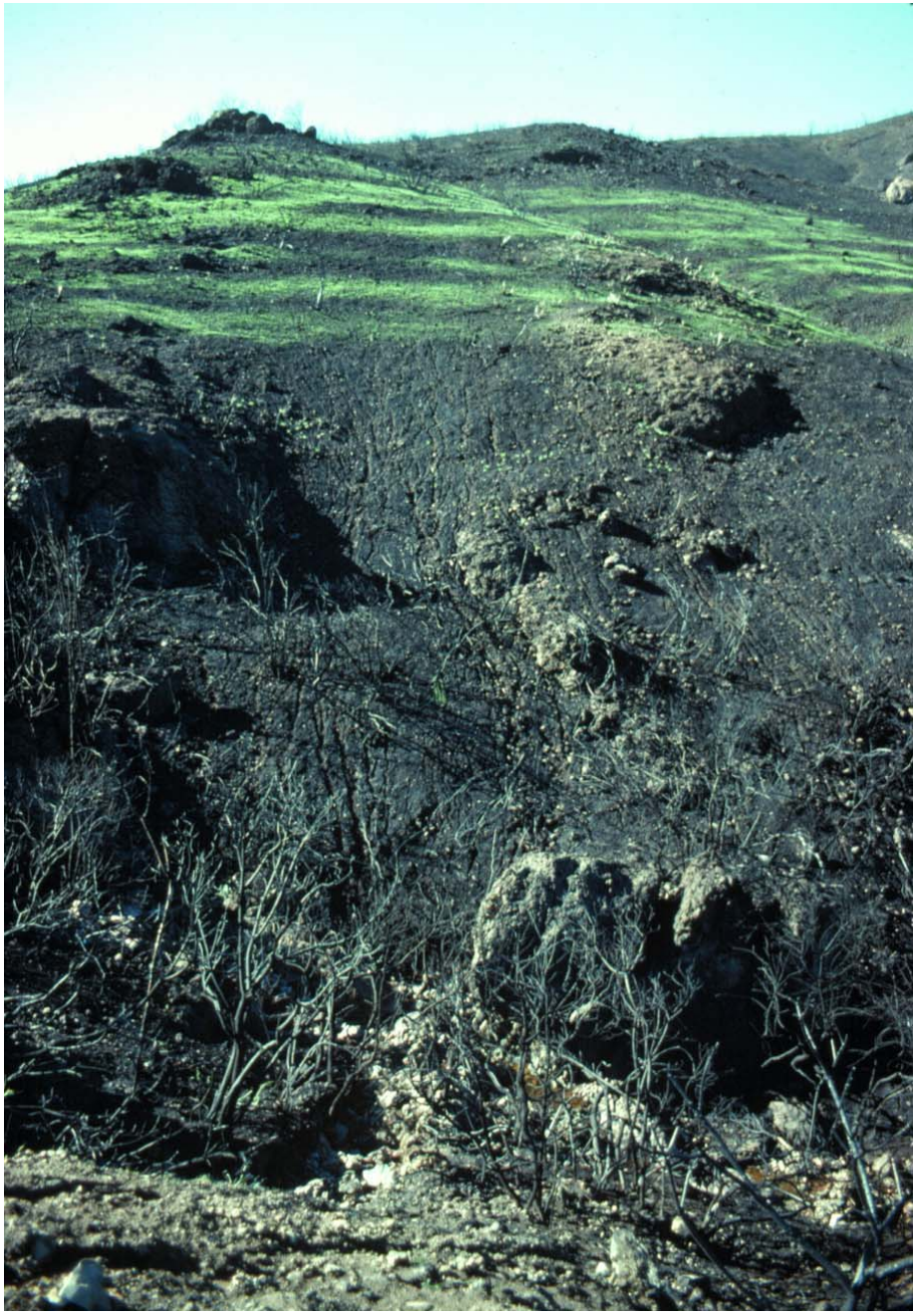
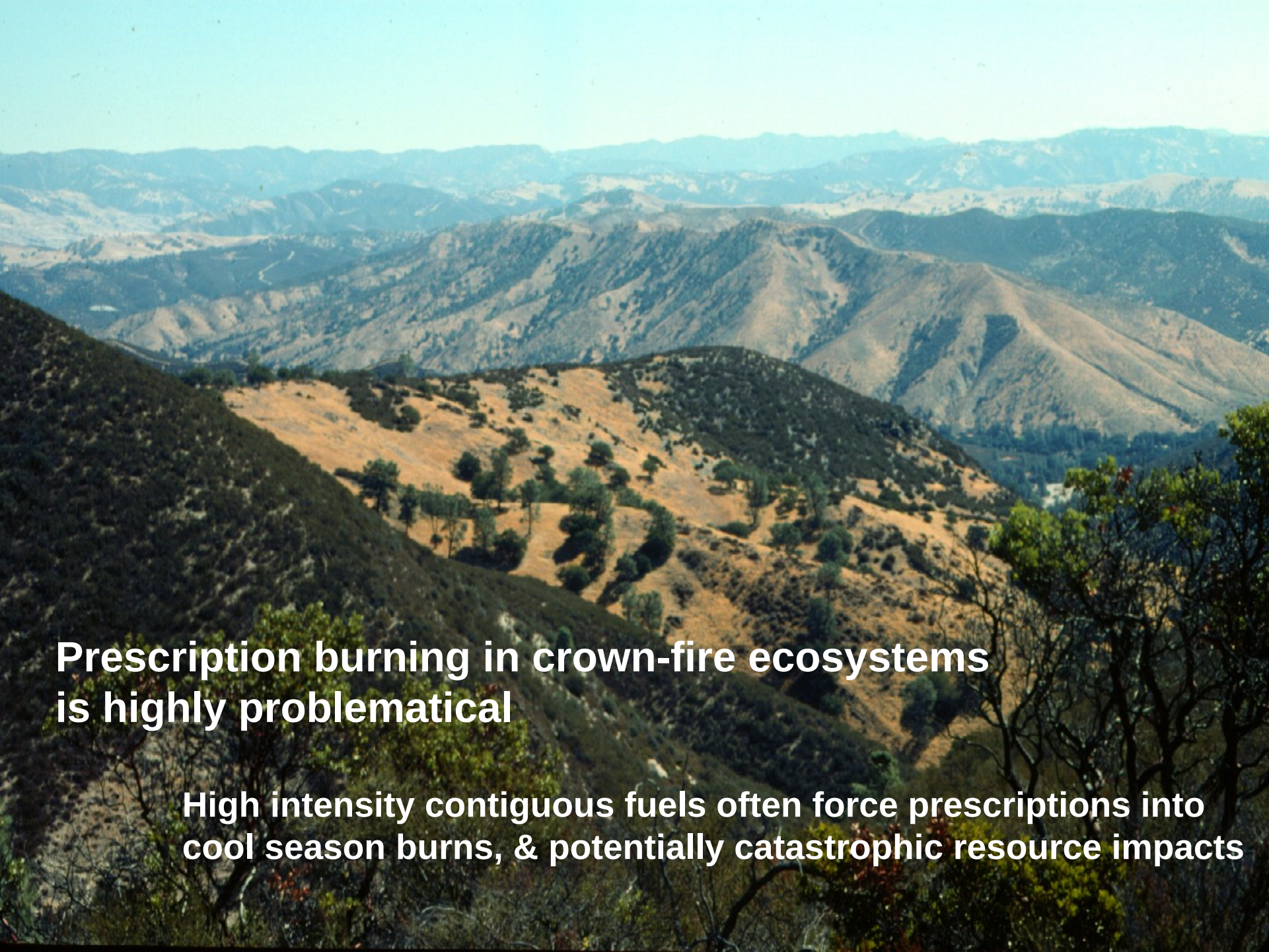

Southern California
r2 = 0.67 p = 0.01
Fire Frequency (#/decade)
1000
800
600
400
200
0
1900
1930
1960
1990
Decade
NPS photo

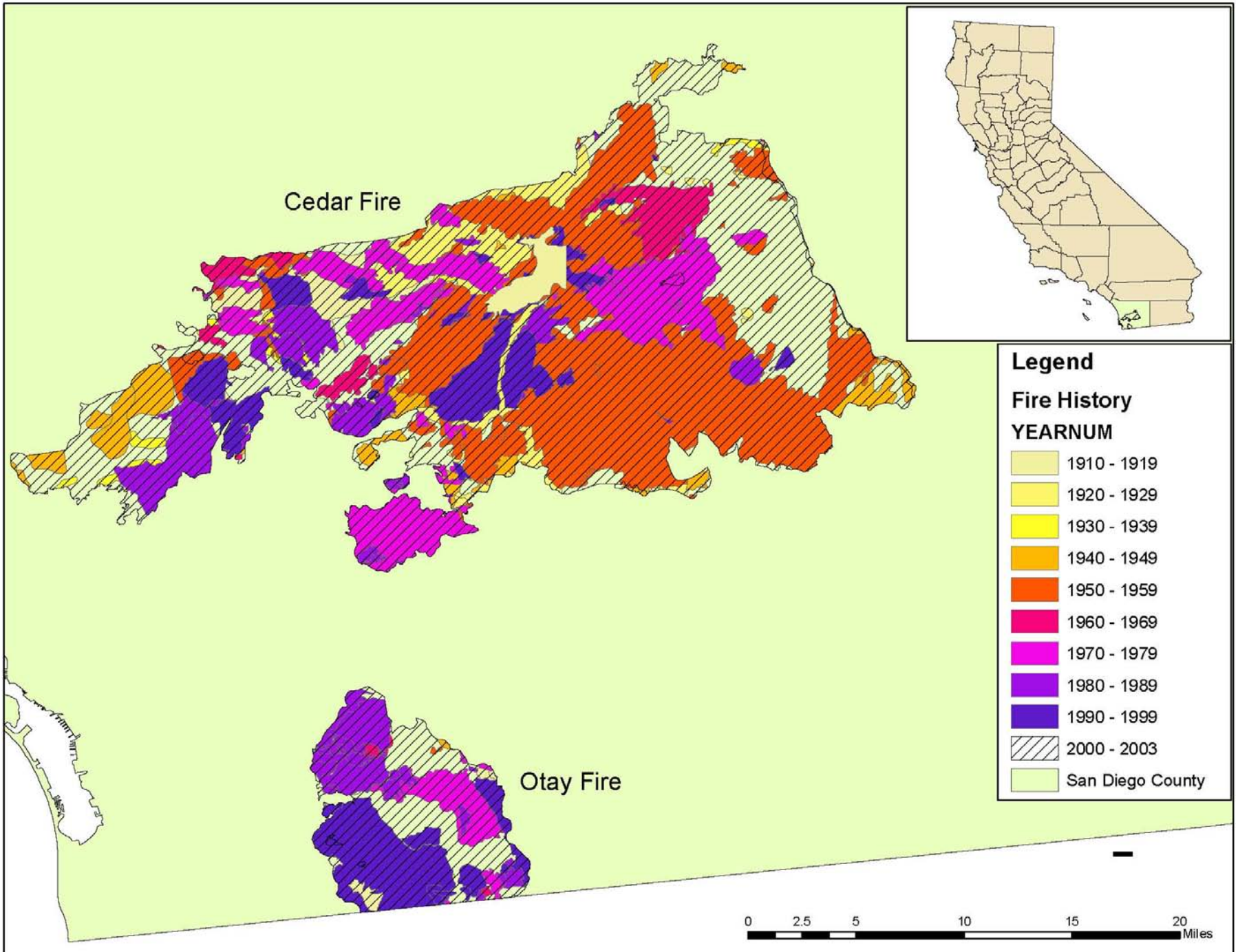
Photo by Anna Jacobsen, Pepperdine University




Prescription burning in crown-fire ecosystems
is highly problematical
High intensity contiguous fuels often force prescriptions into
cool season burns, & potentially catastrophic resource impacts

Fuel breaks provide ideal sites for alien invasion

- They act as corridors and transport aliens into wildlands
- Lower fuels enhance alien seed survivorship from fire
- High perimeter to area ratio enhances colonization following fire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0
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To What Extent Can Fuel Manipulations Affect the Fire Outcomes?

a. They have limited ability to act as barriers during severe fire weather.

b. Their primary value is reducing fire intensity and thus providing defensible space, thus, strategic placement at WUI is likely of greater value than landscape age mosaics

c. Under moderate weather conditions fuel treated areas may play a role in altering fire outcomes. However, these fires present a substantially less hazard… are they cost-effective?

Chaparral Crown-fire Shrublands

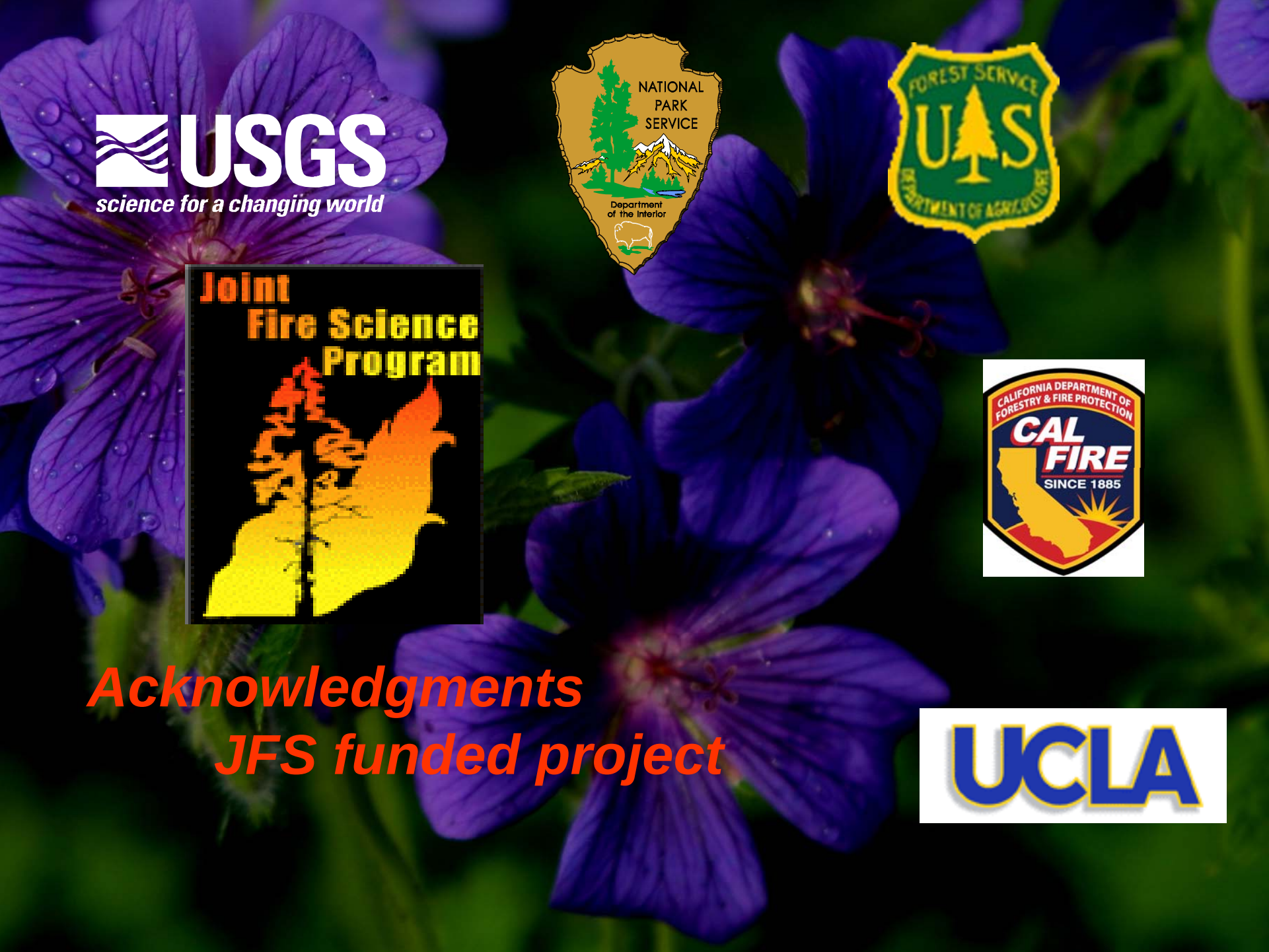
Past Management

Fire suppression ≠ fire exclusion
Fuels are not in excess of historical patterns
Fire frequency increased on much of landscape
Type conversion to non-native grasslands

Present Management

Frequent burning or other fuel modifications

➡ **Fire Mgmt Goals: reduce hazard**
Resource Mgmt: sustainability of 'natural' ecosystems is threatened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Department of the Interior
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
Joint Fire Science Program
CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION
CAL FIRE
SINCE 1885
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UCLA