



Interface Between People and Wildfires

Jon E. Keeley

Alexandra D. Syphard

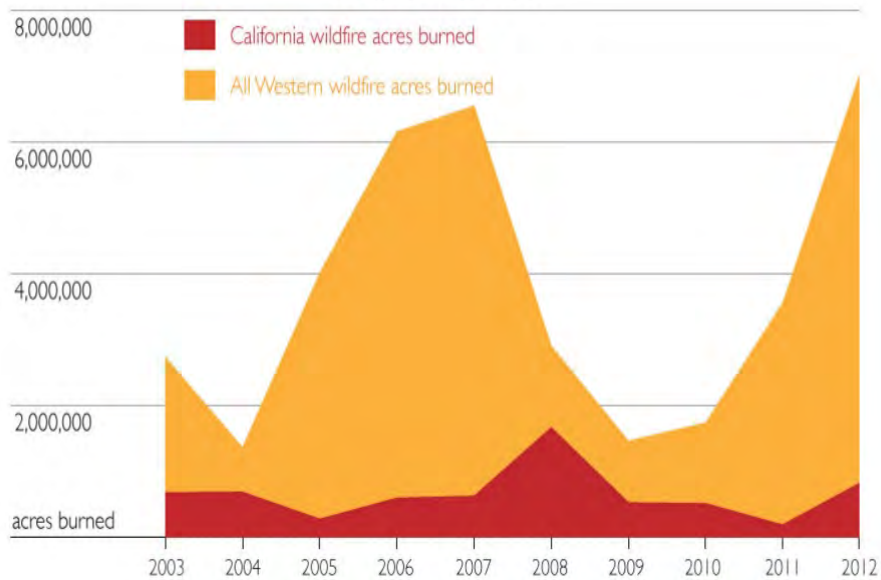
U.S. Geological Survey / UCLA

Conservation Biology Institute

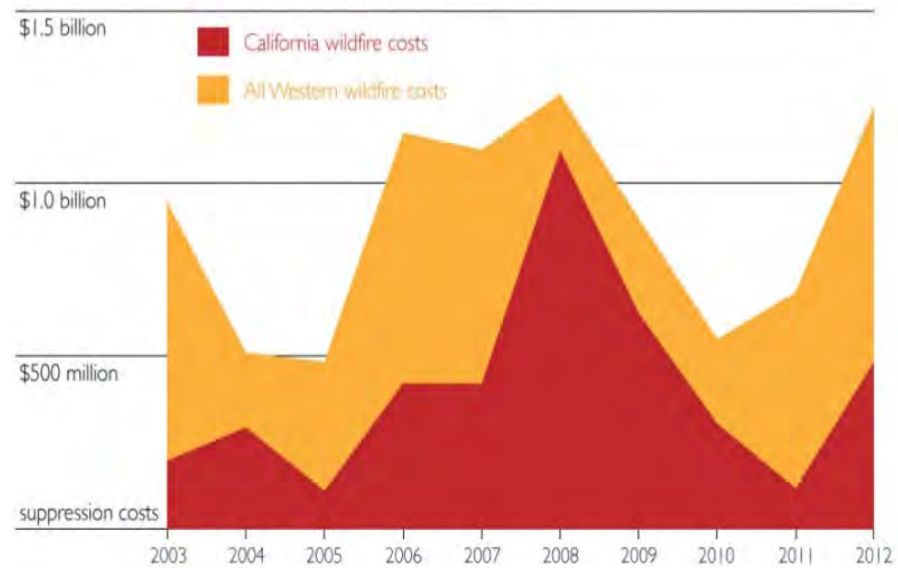


California Wildfires in Perspective

Acres Burned



Suppression Costs



<http://www.climatecentral.org/news/nearly-half-of-all-wildfire-costs->



WASHINGTON

CANADA

MONTANA

OREGON

IDAHO

WYOMING

NEVADA

UTAH

COLORADO

CALIFORNIA

ARIZONA

NEW MEXICO

Seattle

Olympia

Spokane

Portland

Salem

Helena

Boise

Cheyenne

Sacramento

Reno

Carson City

Salt Lake City

Denver

Colorado Springs

45

San Francisco

San Jose

50

Las Vegas

49

Los Angeles

Santa Fe

Albuquerque

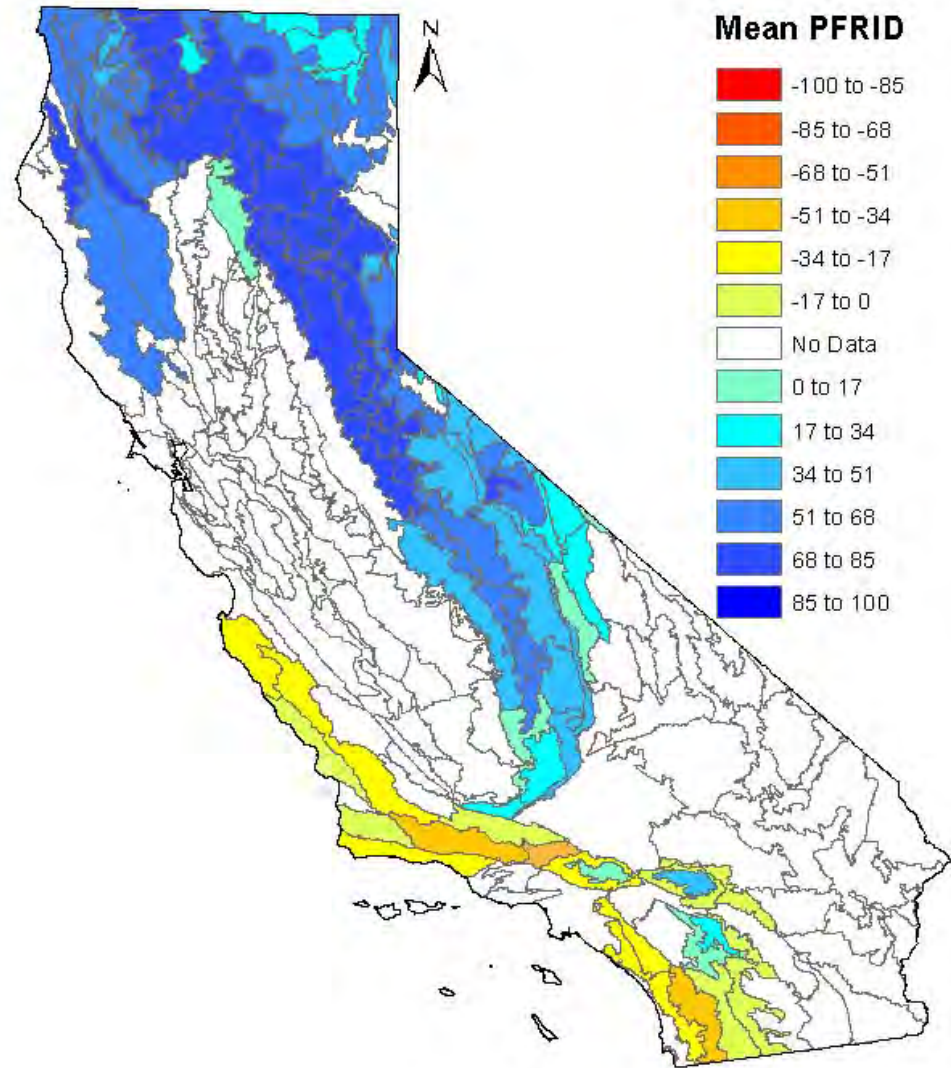
San Diego

55
16
Phoenix

Fire Return Interval Departure

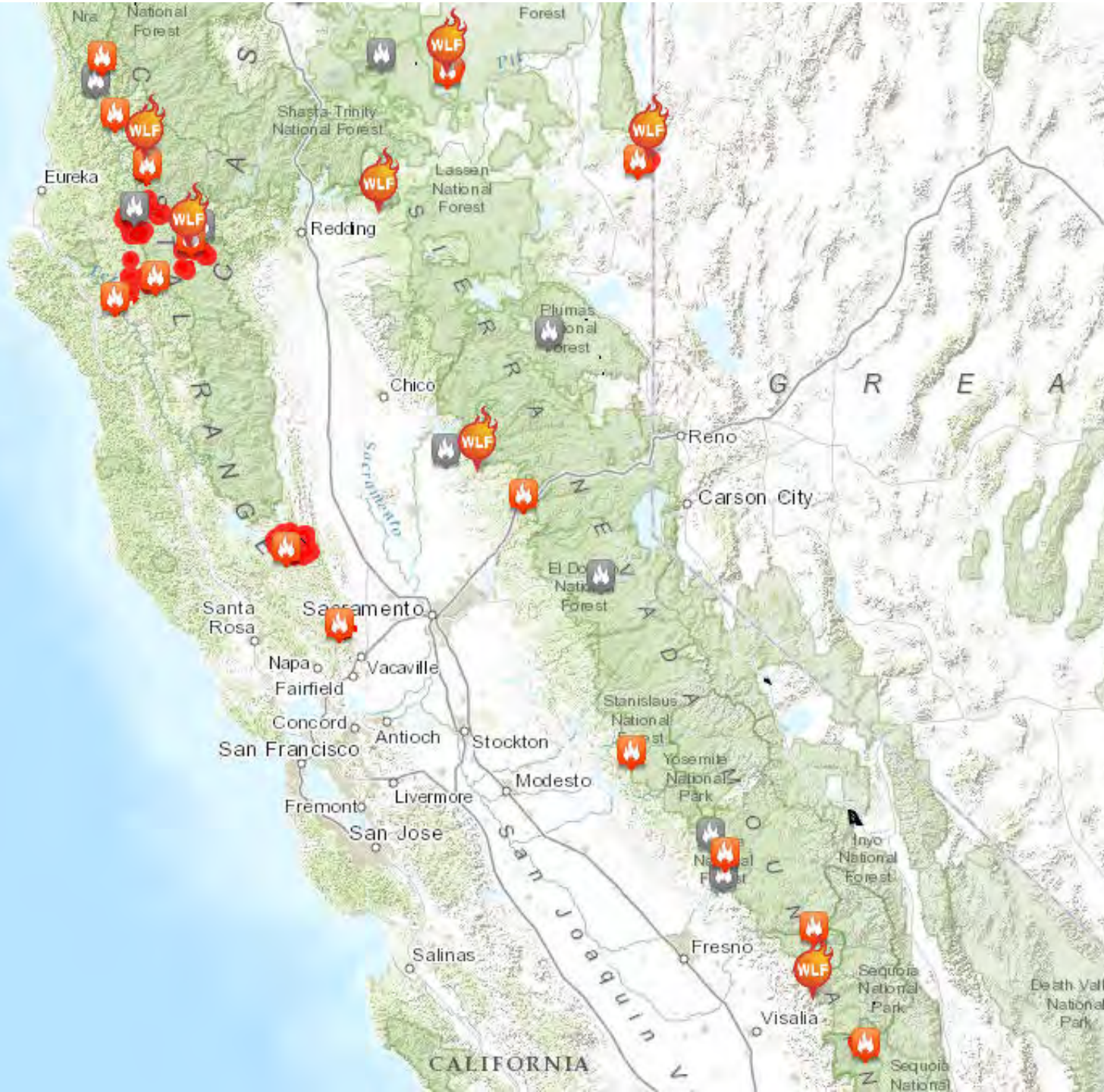
Extent to which 20th & 21st
century fires burned
at frequencies similar to
pre-Euroamerican
settlement

Northern CA (deficit)
Southern CA (excess)



(Safford and Van de Water 2014)

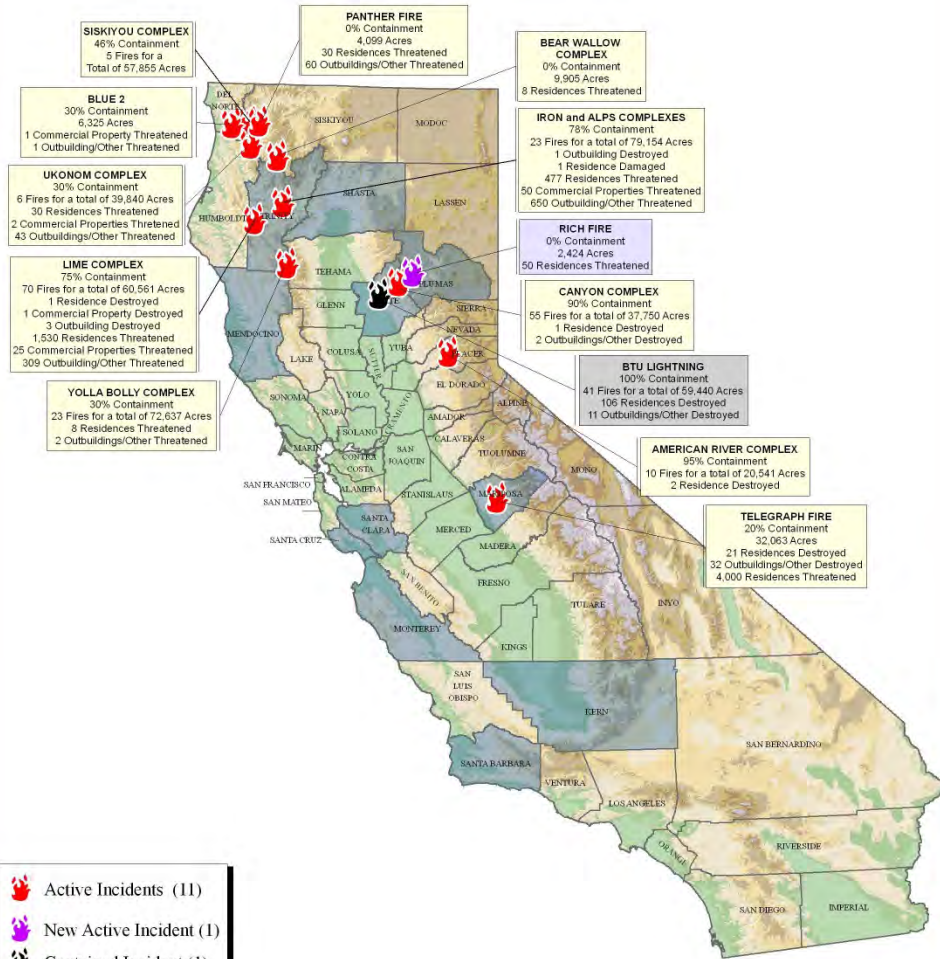
2015





FEMA

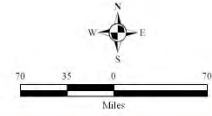
June Lightning Fires EM-3287-CA California Wildfires as of 07/30/08 - 0700 Hrs with Presidentially Declared Counties



- Active Incidents (11)
- New Active Incident (1)
- Contained Incident (1)
- Declared County

There are numerous small fires scattered throughout Northern California. These fires are organized into complexes for suppression and tactical purposes.

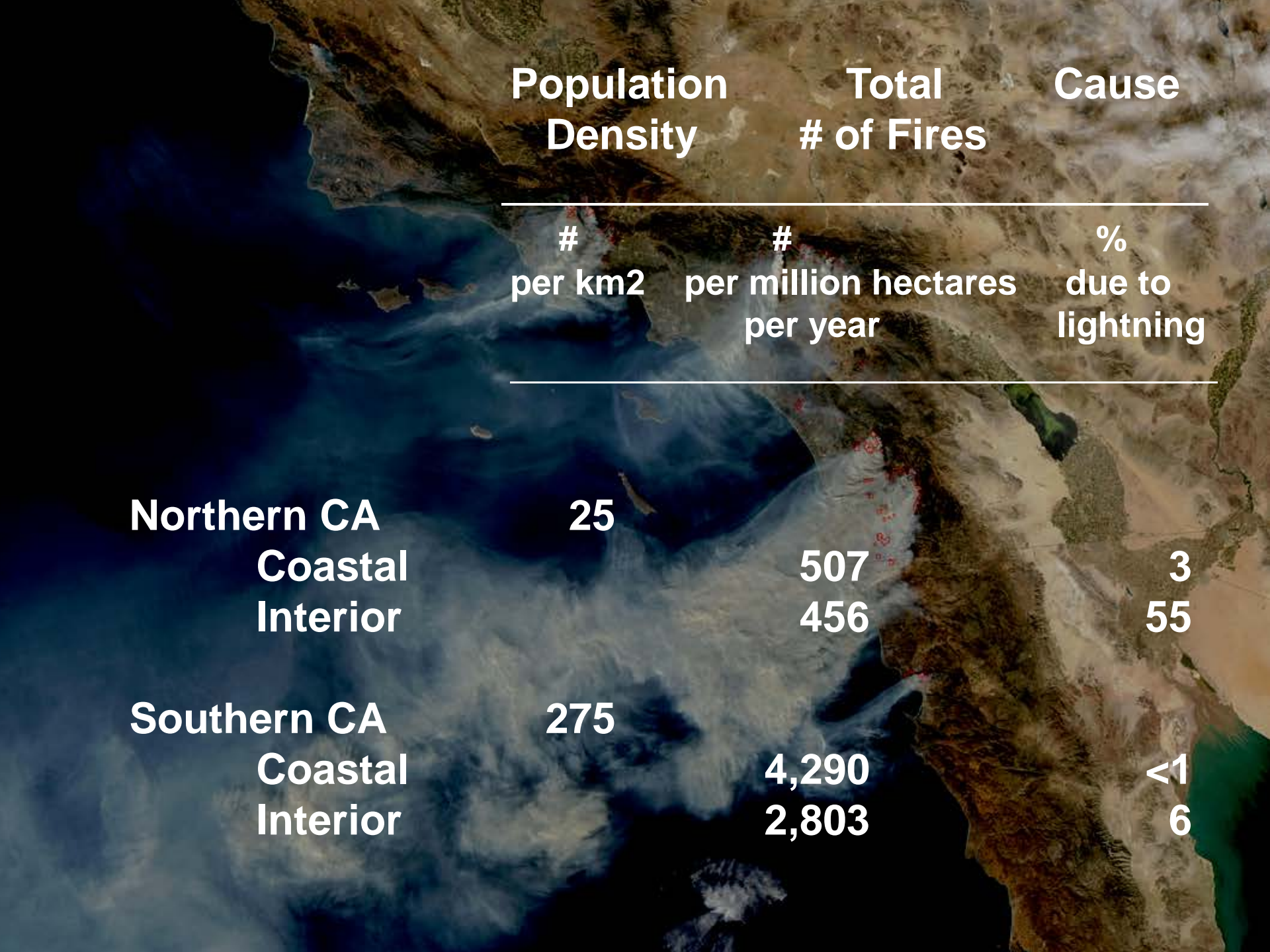
Please Note: Fire locations are rough estimates based upon various field sources



Created by OES - GIS, Kris Higg
July 30, 2008 Source: EAM/EEB 2008
/active_incident fires 2008/July/Projects/
statewide_fires_073008_0700_a.mxd

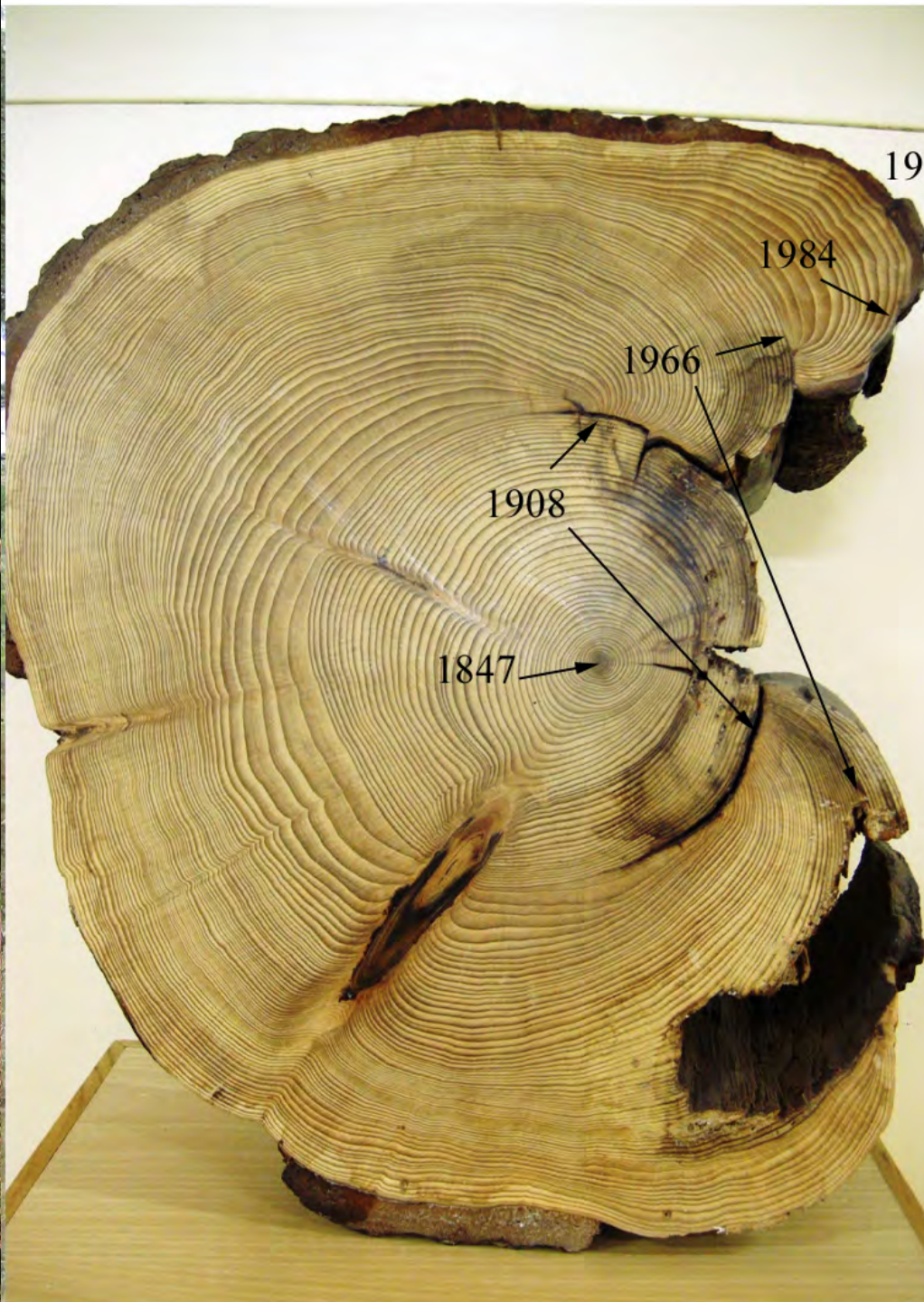


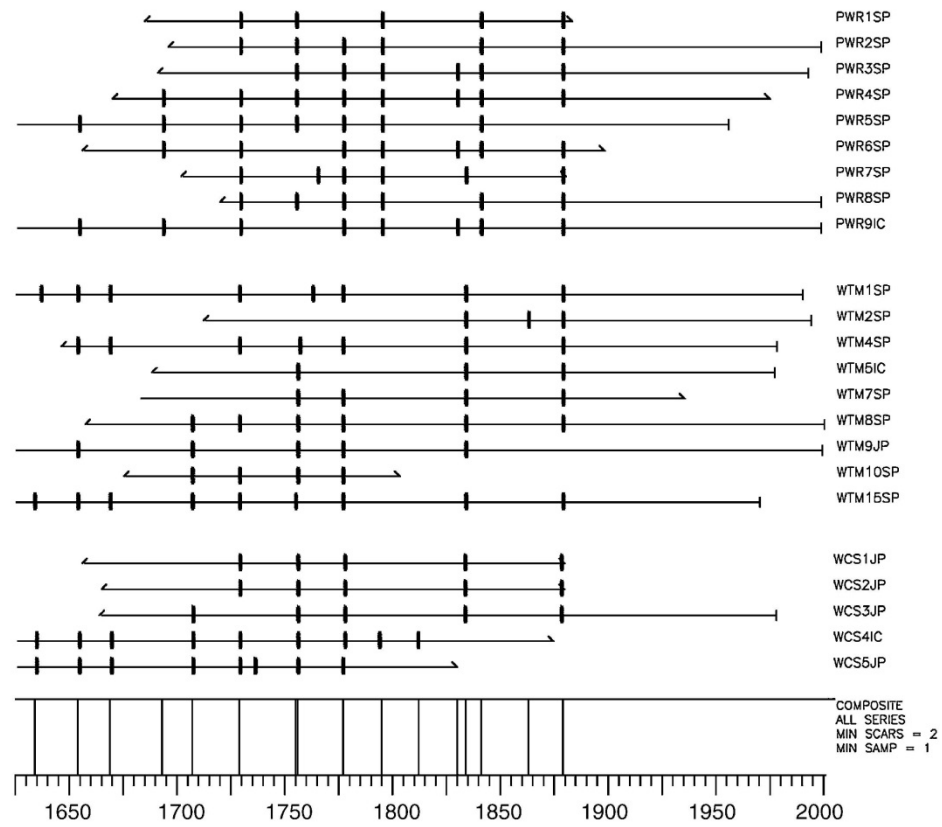
U.S.
Mexico





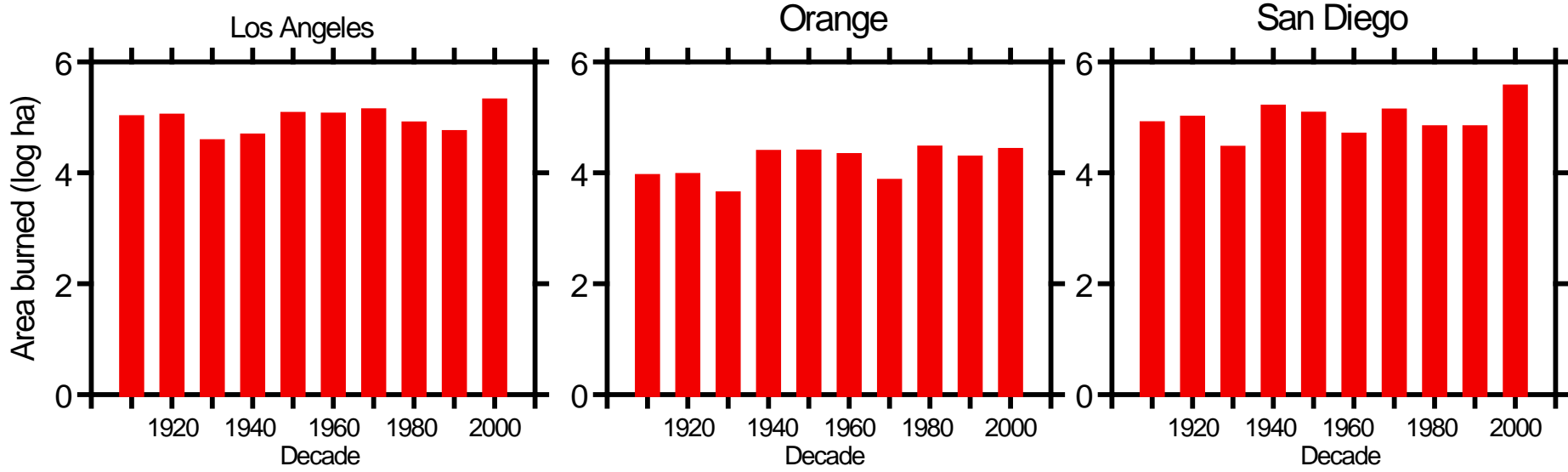
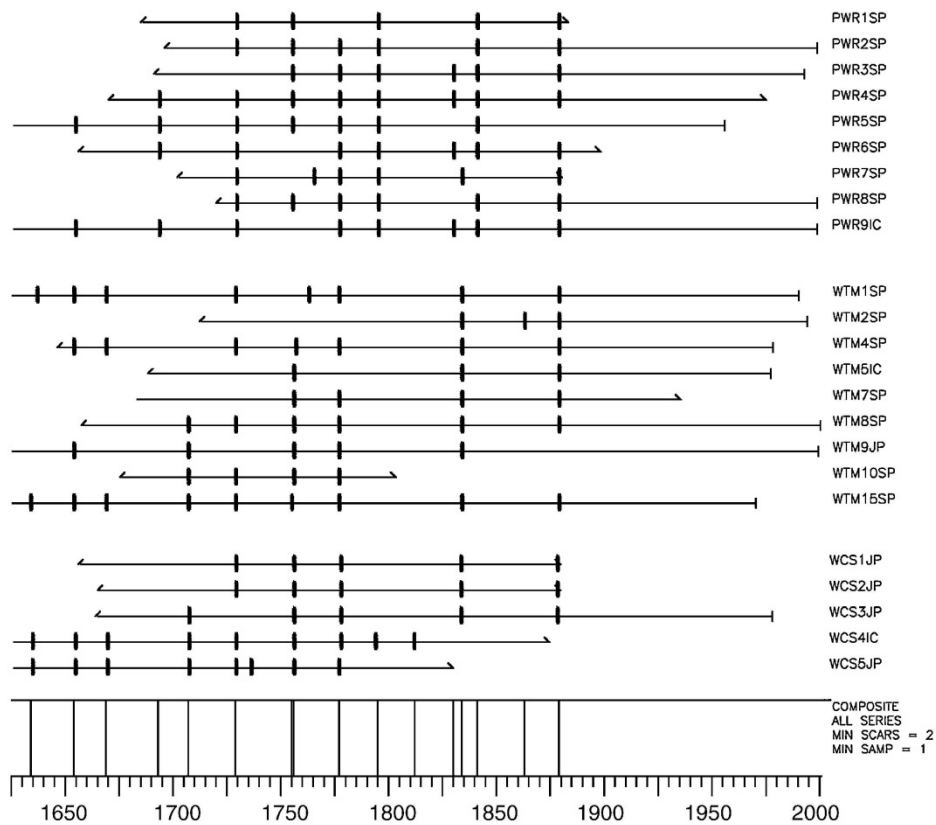
















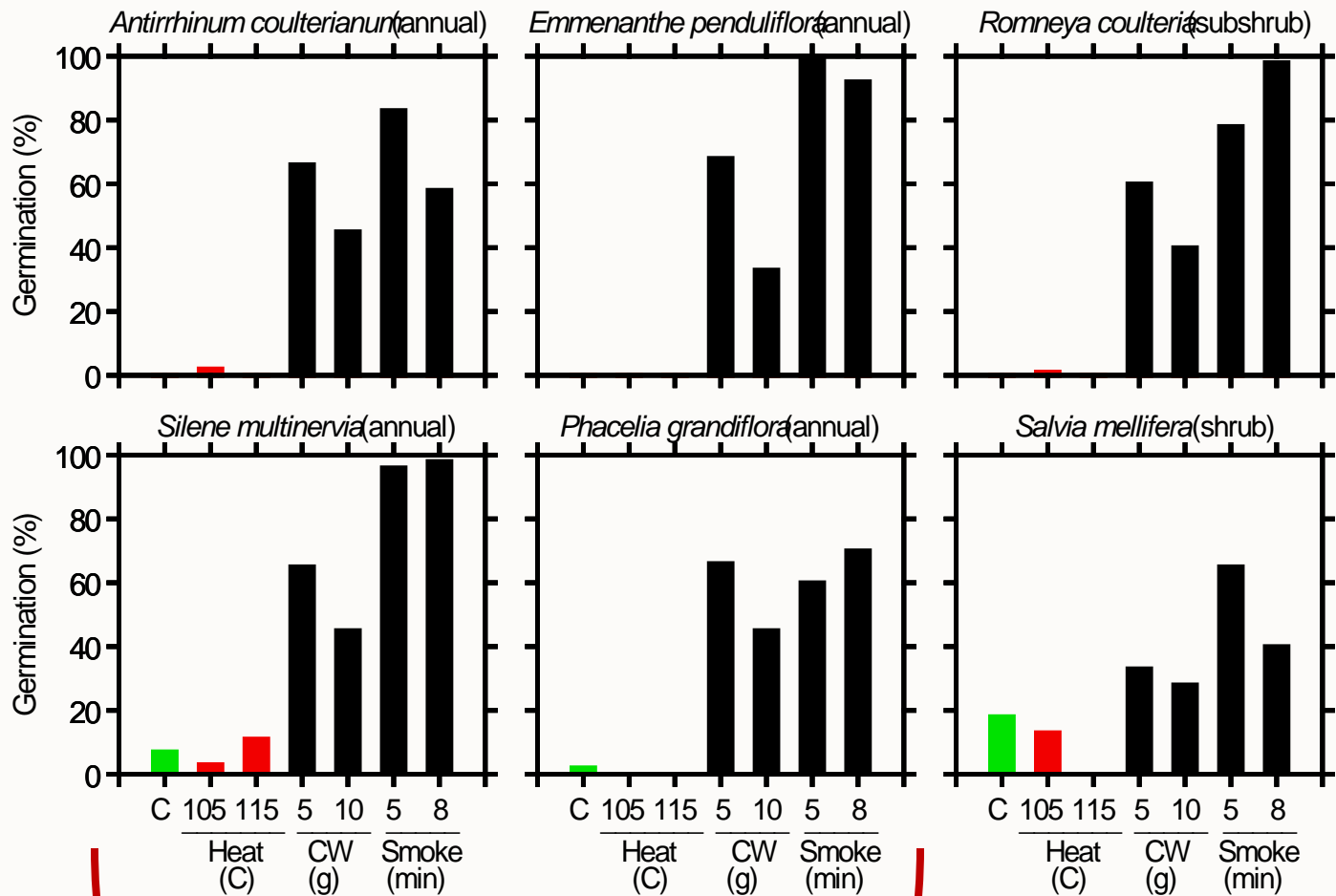
Arctostaphylos spp



Adenostoma fasciculatum



Ceanothus spp

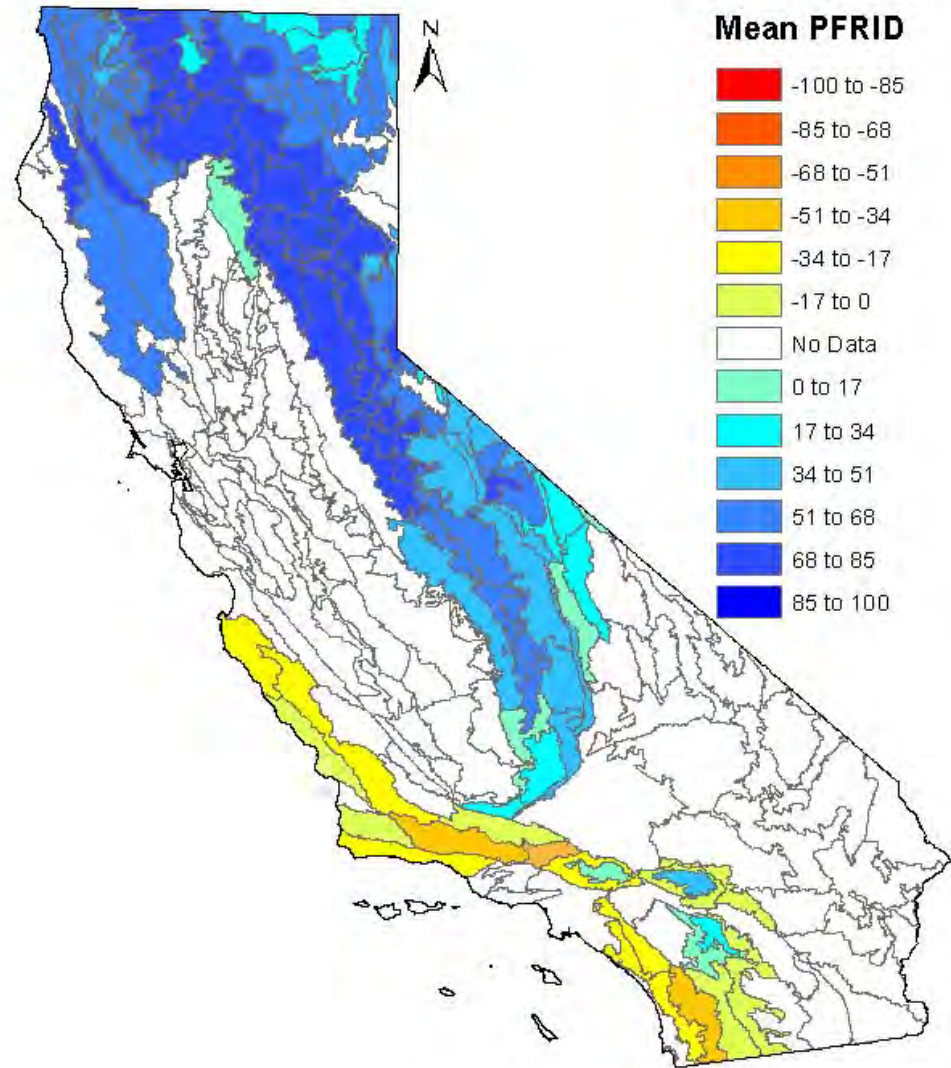


postfire endemics

Fire Return Interval Departure

Extent to which 20th & 21st
century fires burned
at frequencies similar to
pre-Euroamerican
settlement

Northern CA (deficit)
Southern CA (excess)



(Safford and Van de Water 2014)



Laguna Fire 1970

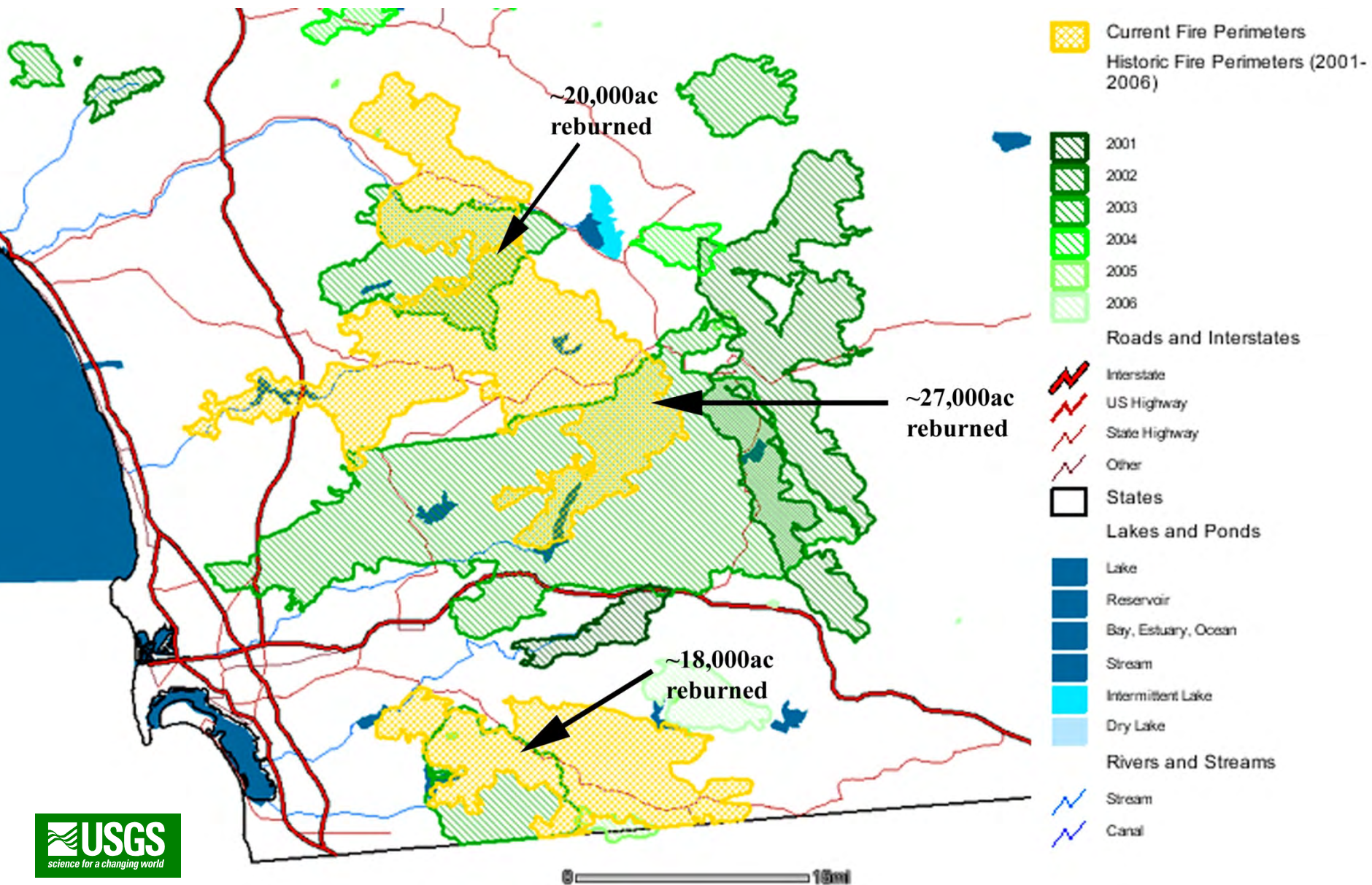
Laguna 1970
Viejas Fire 2001

Laguna 1970
Viejas 2001
Cedar Fire 2003

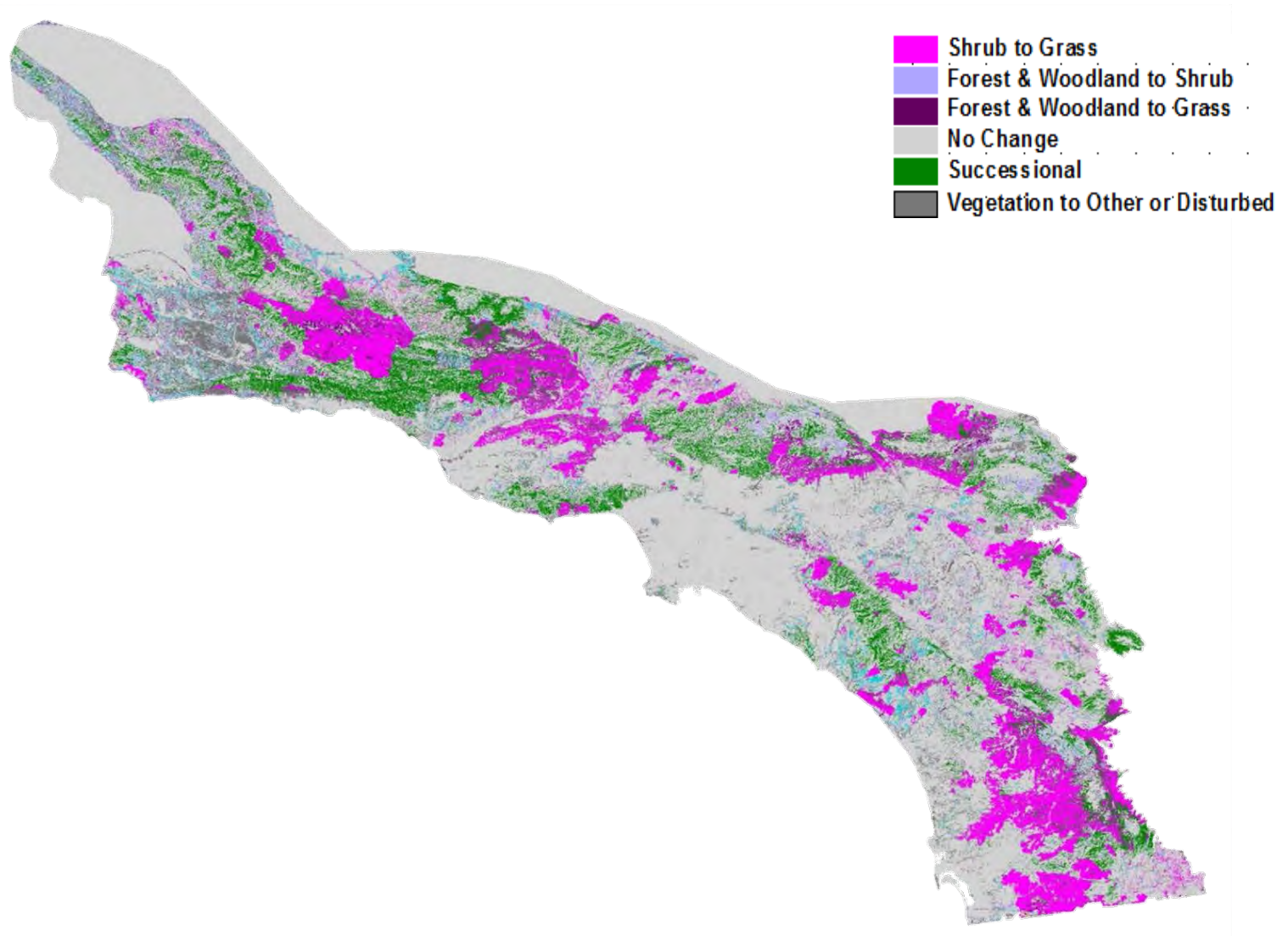
Photo: Richard Halsey

(photo by R. Halsey)

San Diego County --- 2003 & 2007 fires

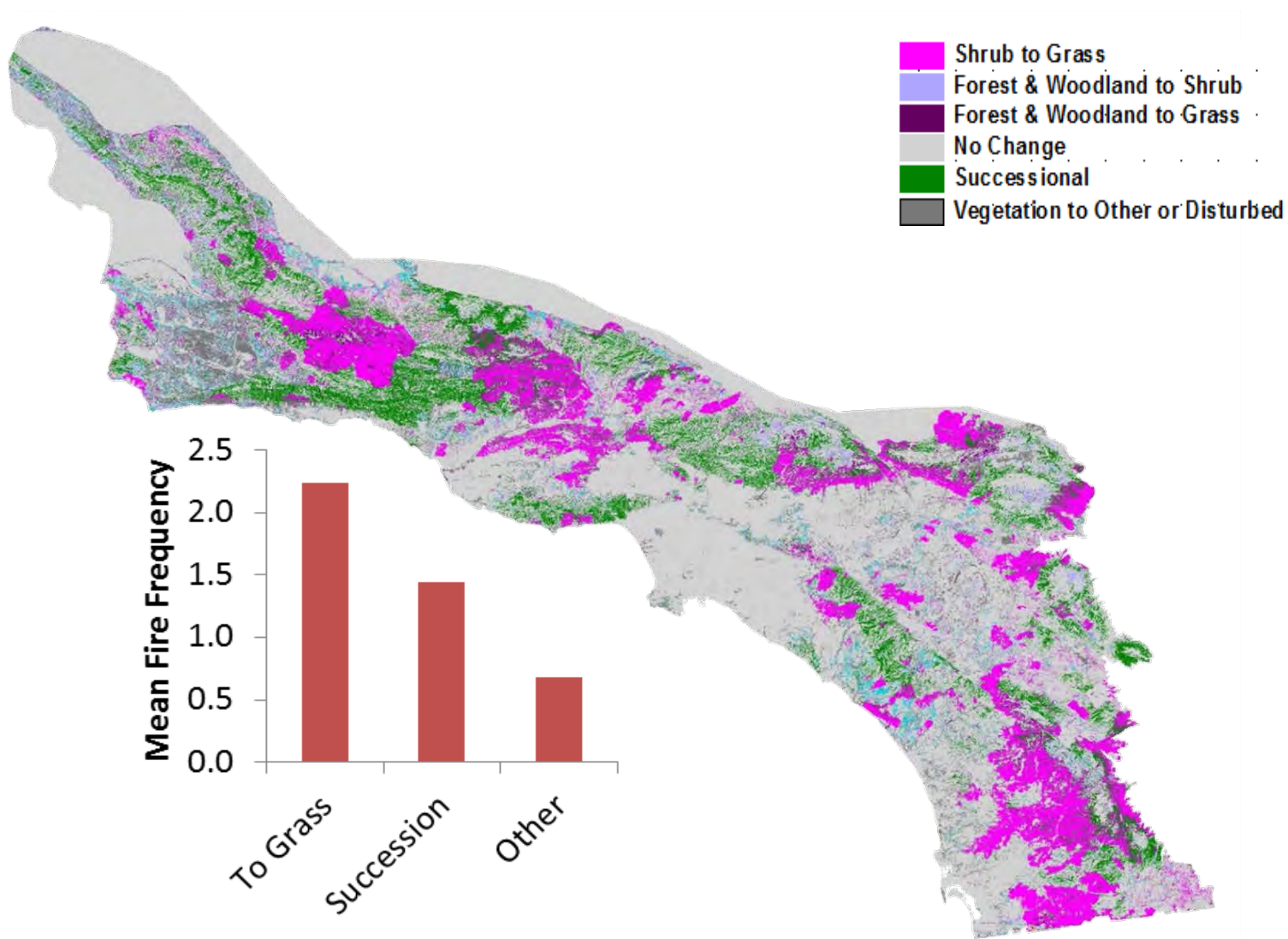


Type conversion from native shrubland to exotic grassland has been significant in the 20th century



(Syphard unpublished data)

Highest historical fire frequency in those areas mapped as having changed from shrubland to grassland



(Syphard unpublished data)

Short interval fires



Type conversion

Longer fire season
Increased fire frequency
Accelerated type conversion





Landscape conversion

Accelerated increases in fire frequency

Collision between

human footprint & human welfare

(Photo: Richard Halsey)



Photo: Chris Doolittle



Californians Gather To Celebrate Annual Wildfire Tradition

Residents took part in rituals like picking through the charred remains of their homes and feigning shock that this could happen to them.

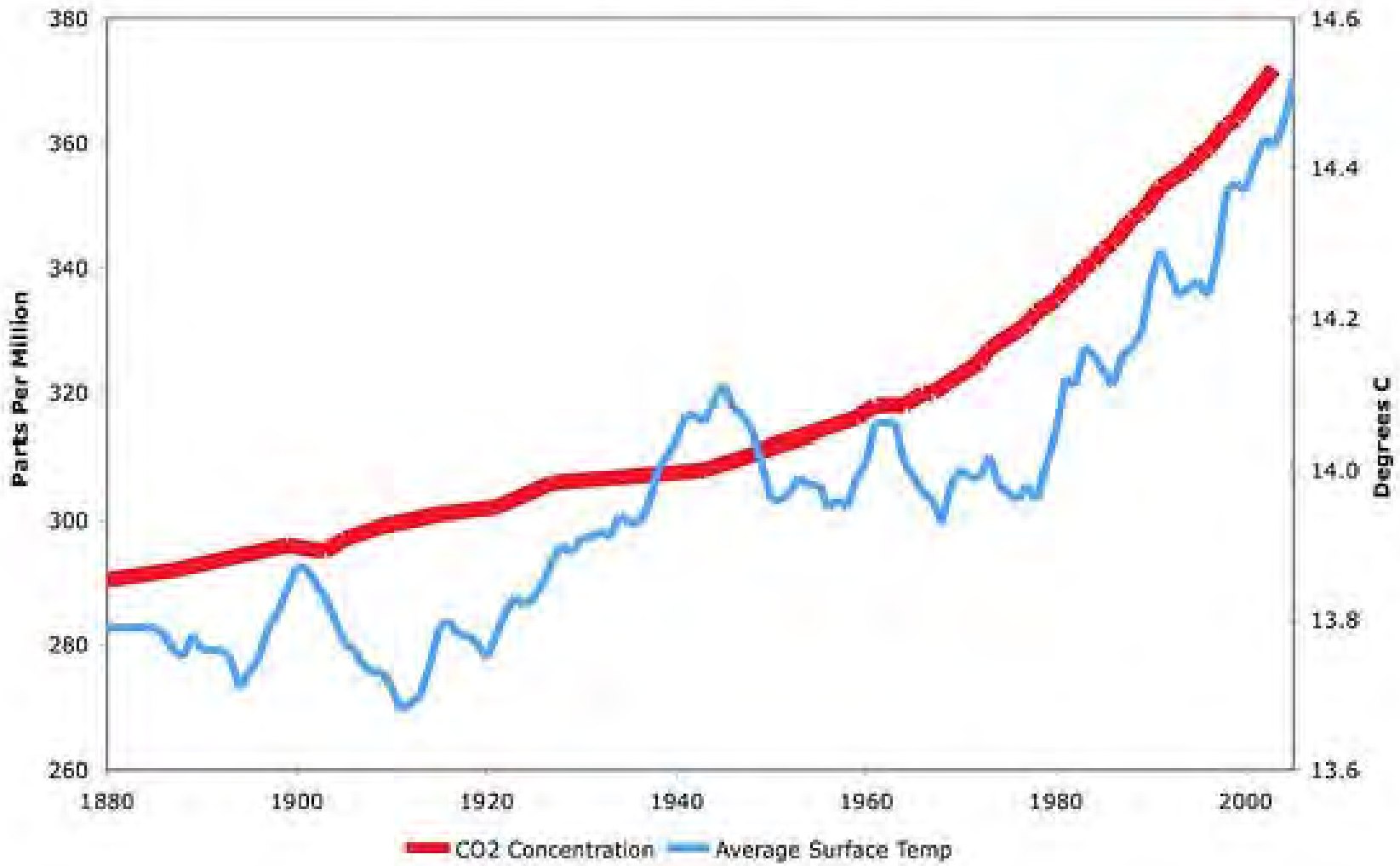




Large Fire Events Are a Natural Feature of This Landscape

Year	Fire	County	Ha	Losses	
				Structures	Lives
1889	Santiago Cyn	Orange	125,000	0	0
1932	Matilija	Sta Barbara	88,990	0	0
1970	Laguna	San Diego	70,500	382	5
1985	Wheeler #2	Ventura	49,700	0	0
2002	Pines	San Diego	24,965	45	0
2003	Cedar	San Diego	109,500	2,232	14
2003	Paradise	San Diego	22,905	169	2
2006	Day	Ventura	65,500	11	0
2007	Zaca	Sta Barbara	97,300	1	0
2007	Witch	San Diego	80,200	1,650	2
2007	Harris	San Diego	36,715	548	5
2007	Old	San Bernardino	80,200	993	6
2009	Station	Los Angeles	64,990	209	2

CO2 Concentration and Surface Temperature



THURSDAY, JUN 16, 2011 08:45 AM PDT

ADVERTISEMENT

Global warming is burning down the American West

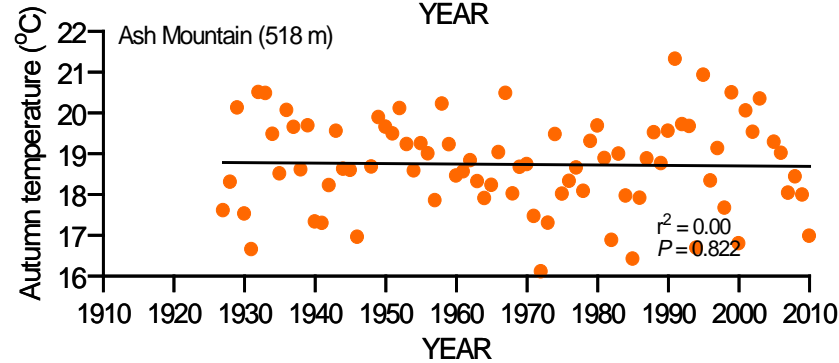
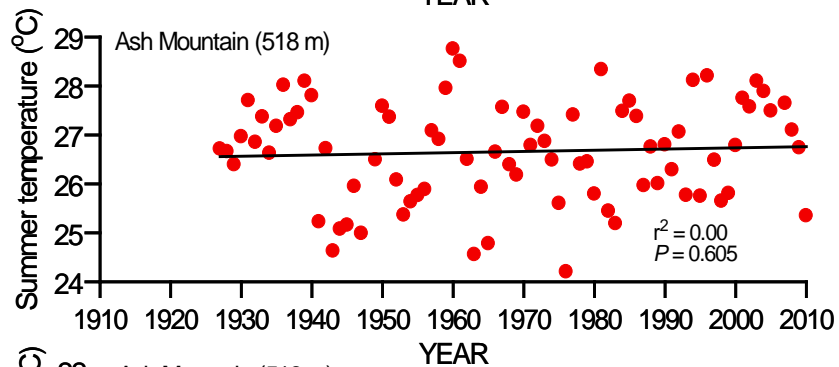
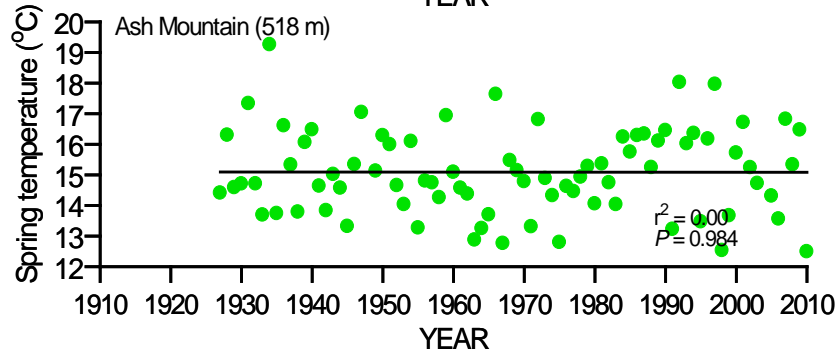
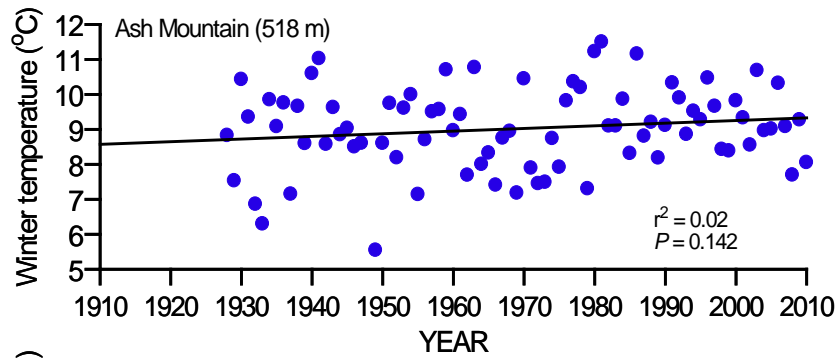
As wildfires ravage Arizona and Texas, it's time for us to take action on climate change before it's too late

CHIP WARD



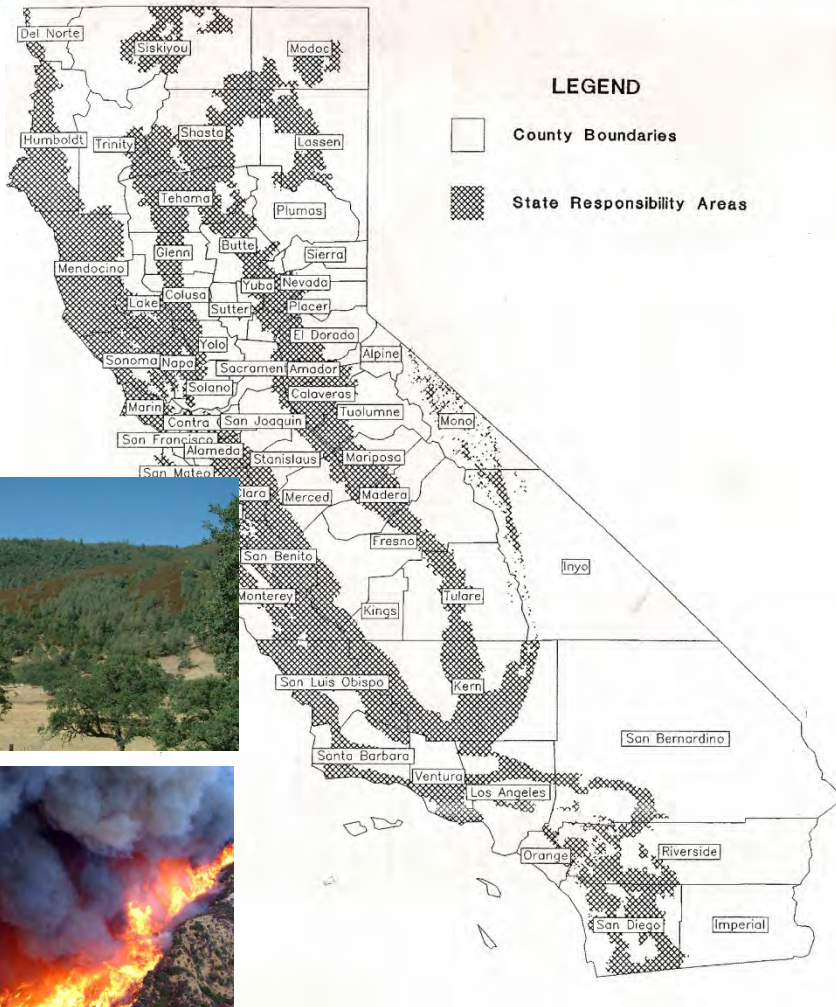
TOPICS: GLOBAL WARMING, WAR ROOM, ENVIRONMENT, TEXAS, POLITICS NEWS







California Department of Forestry and Fire Protection



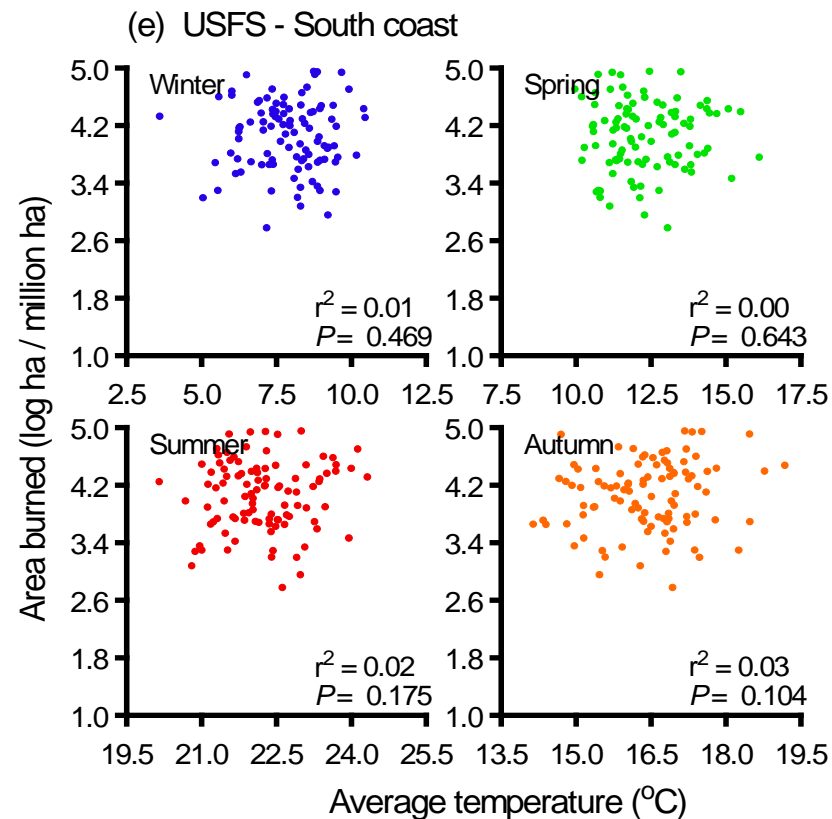
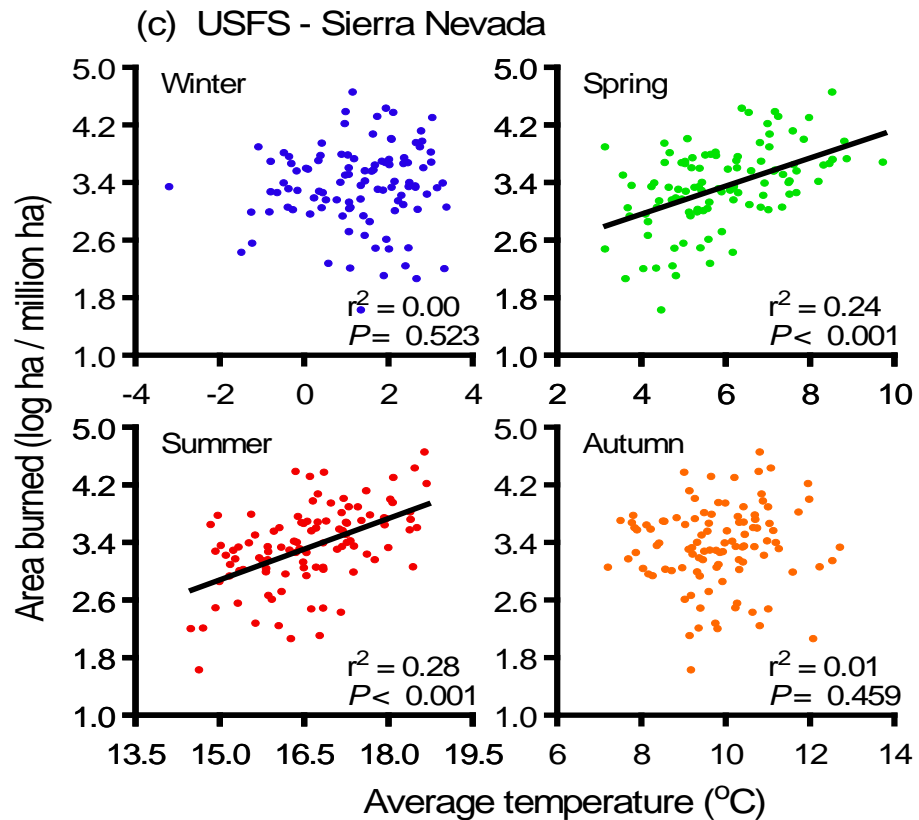
Cal Fire 1919-2013



U.S. Forest Service

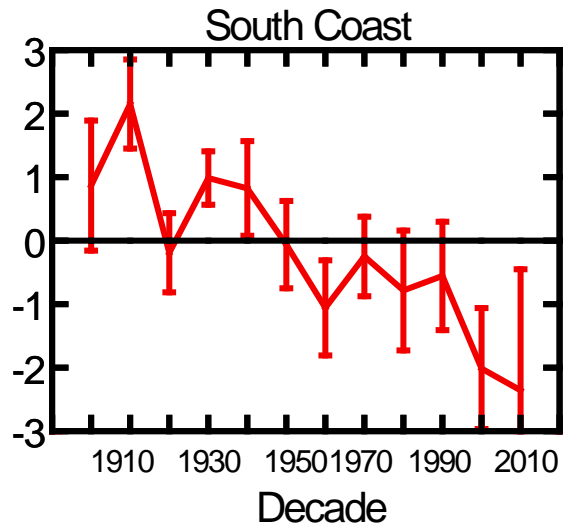
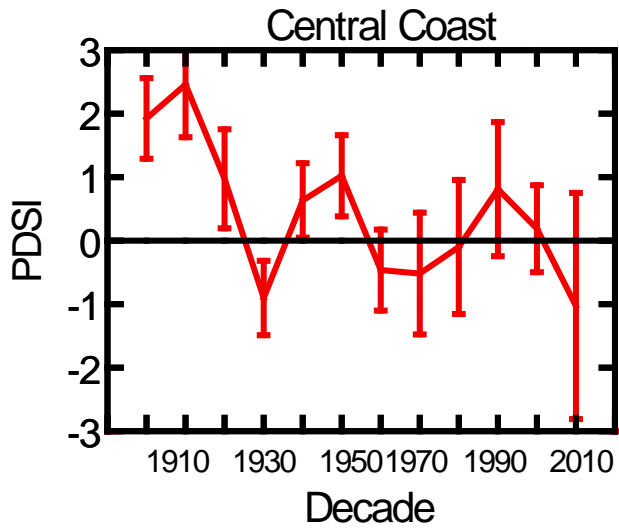
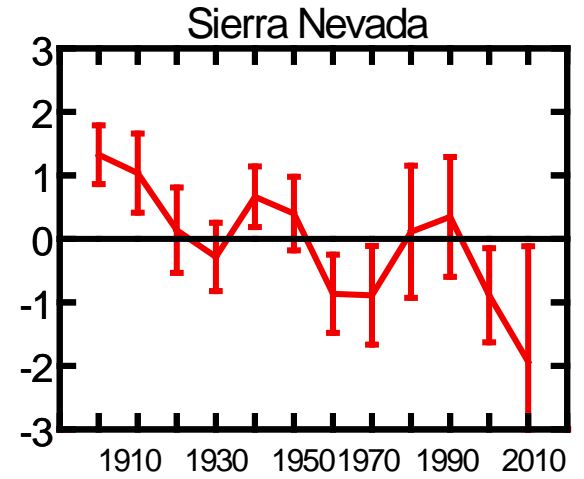
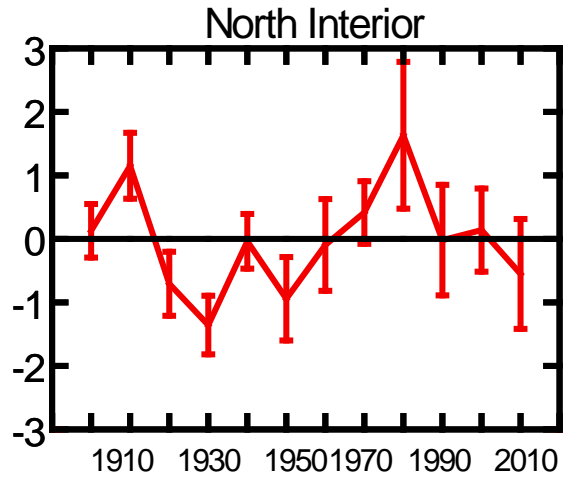
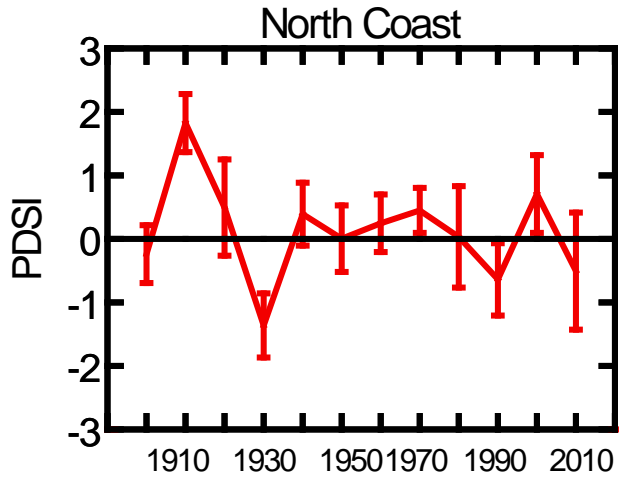


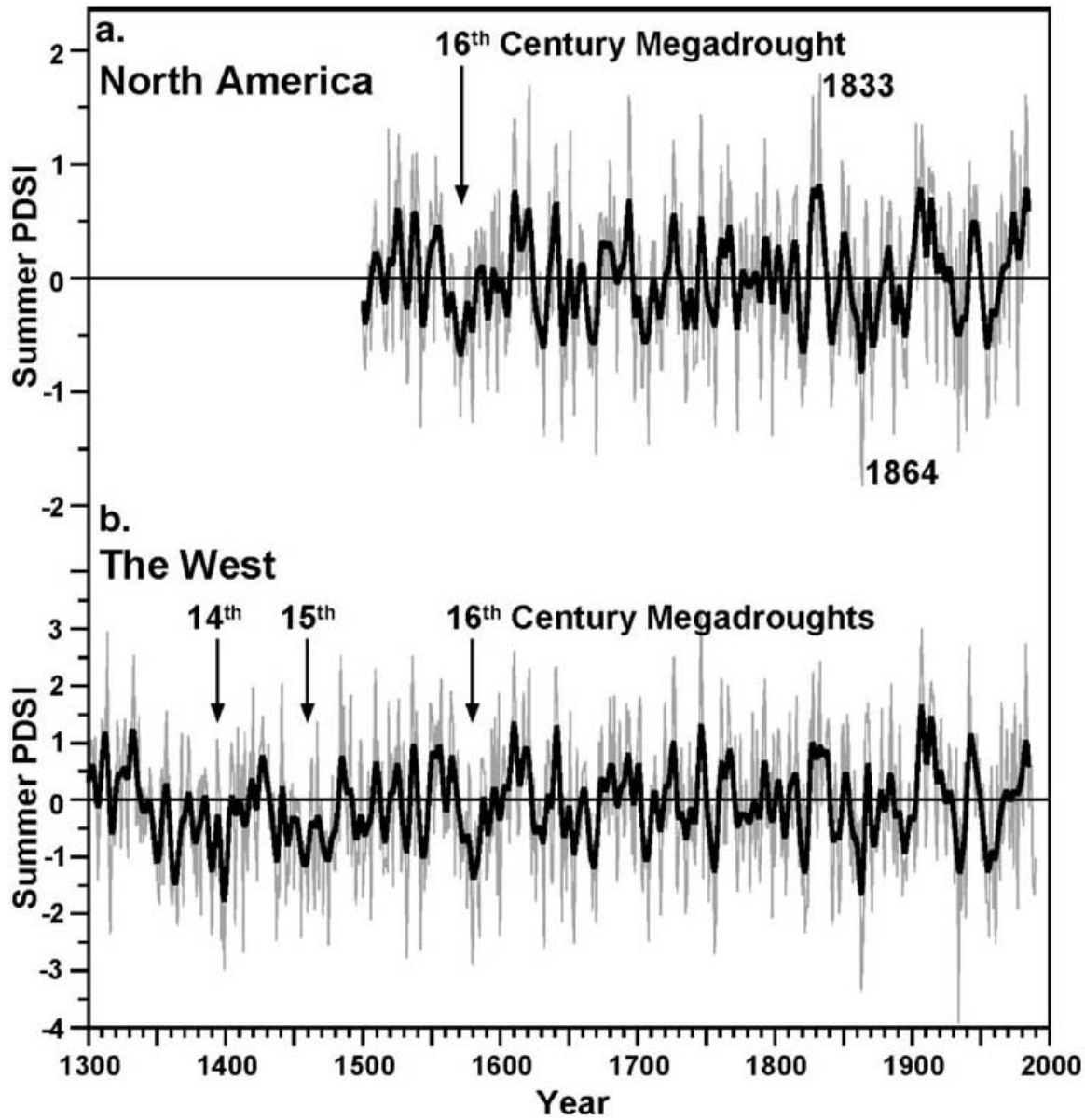
USFS 1910-2013



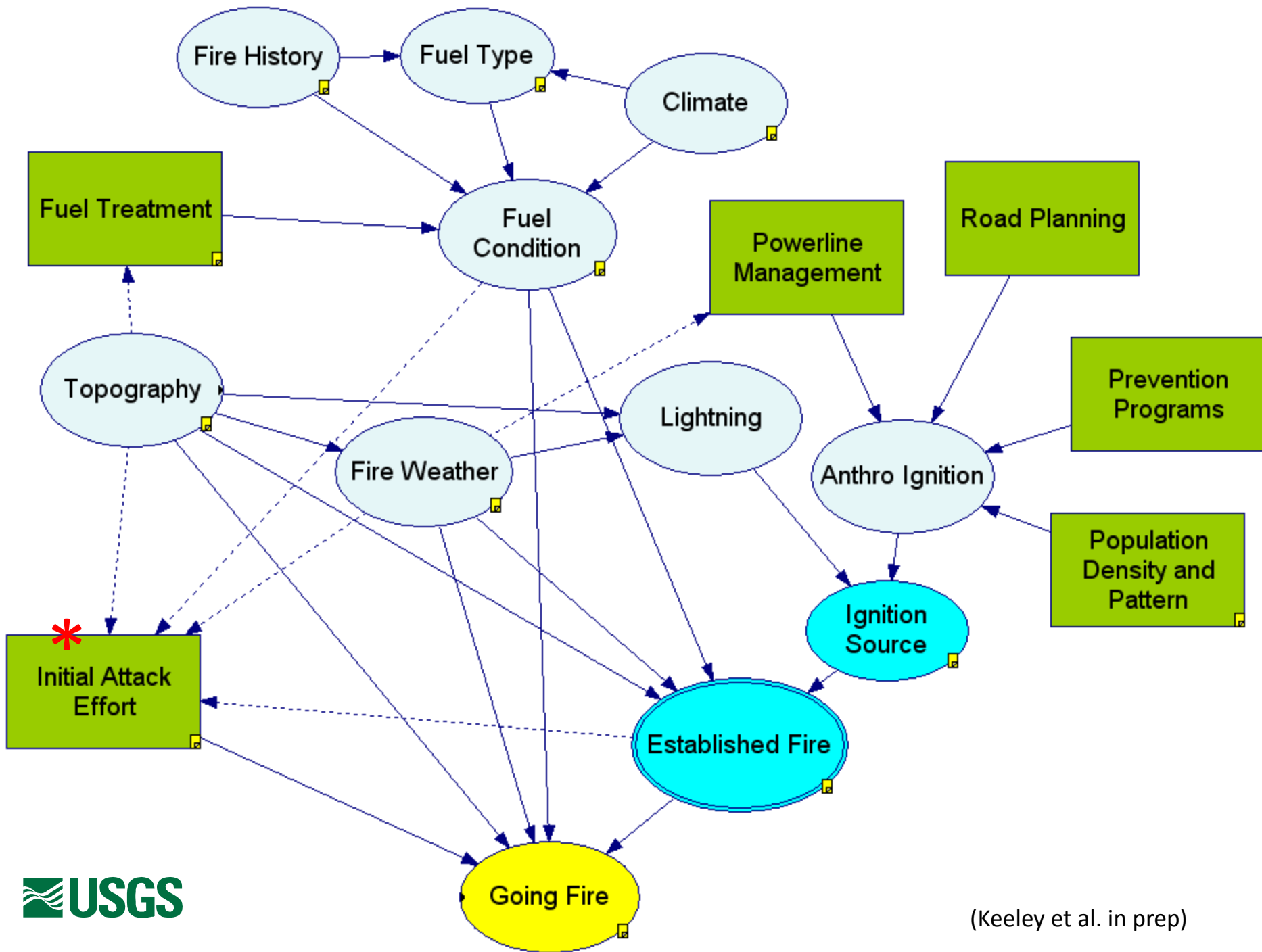
(from Keeley & Syphard 2015, in review)







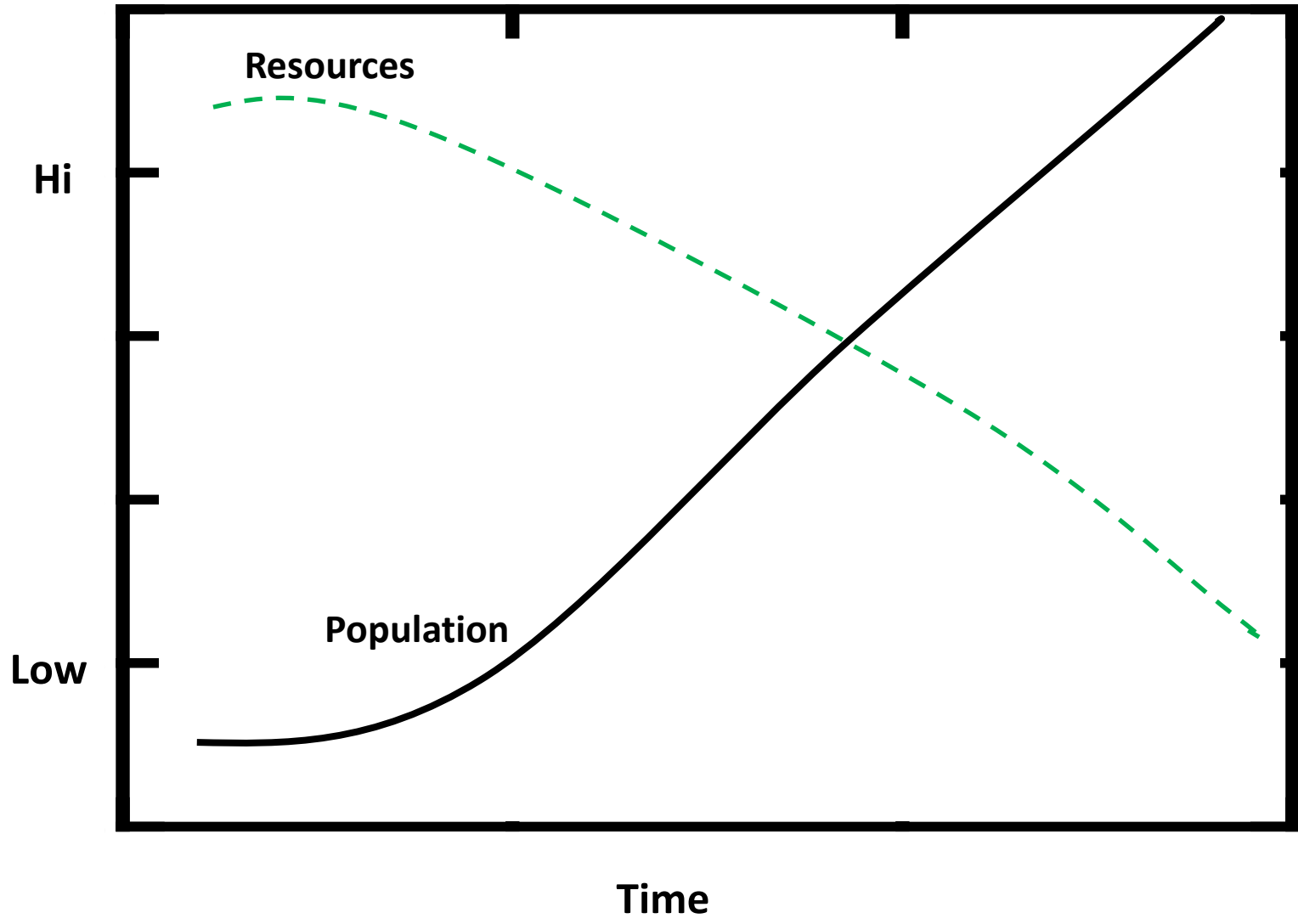
(Stahl et al. 2007)

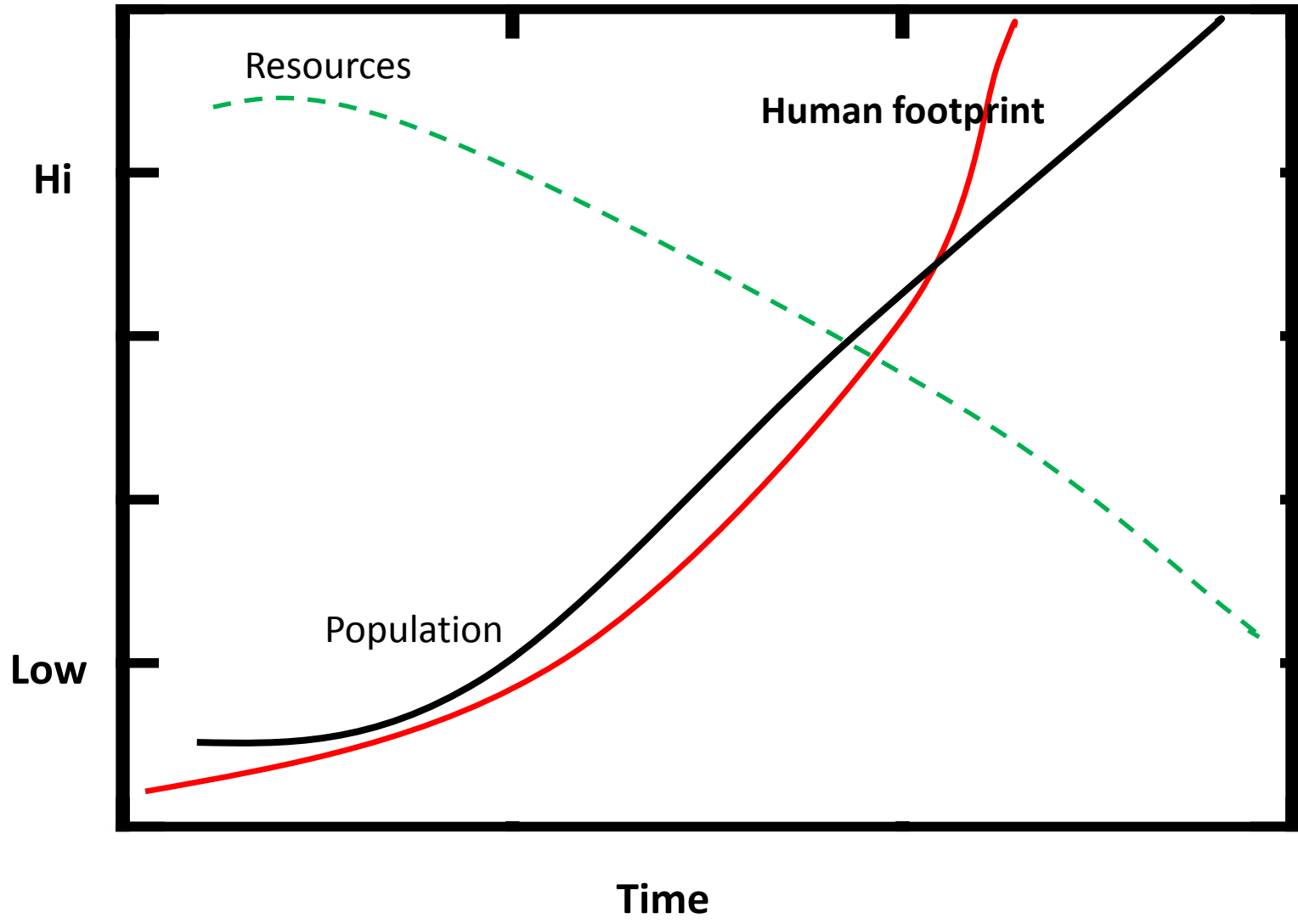


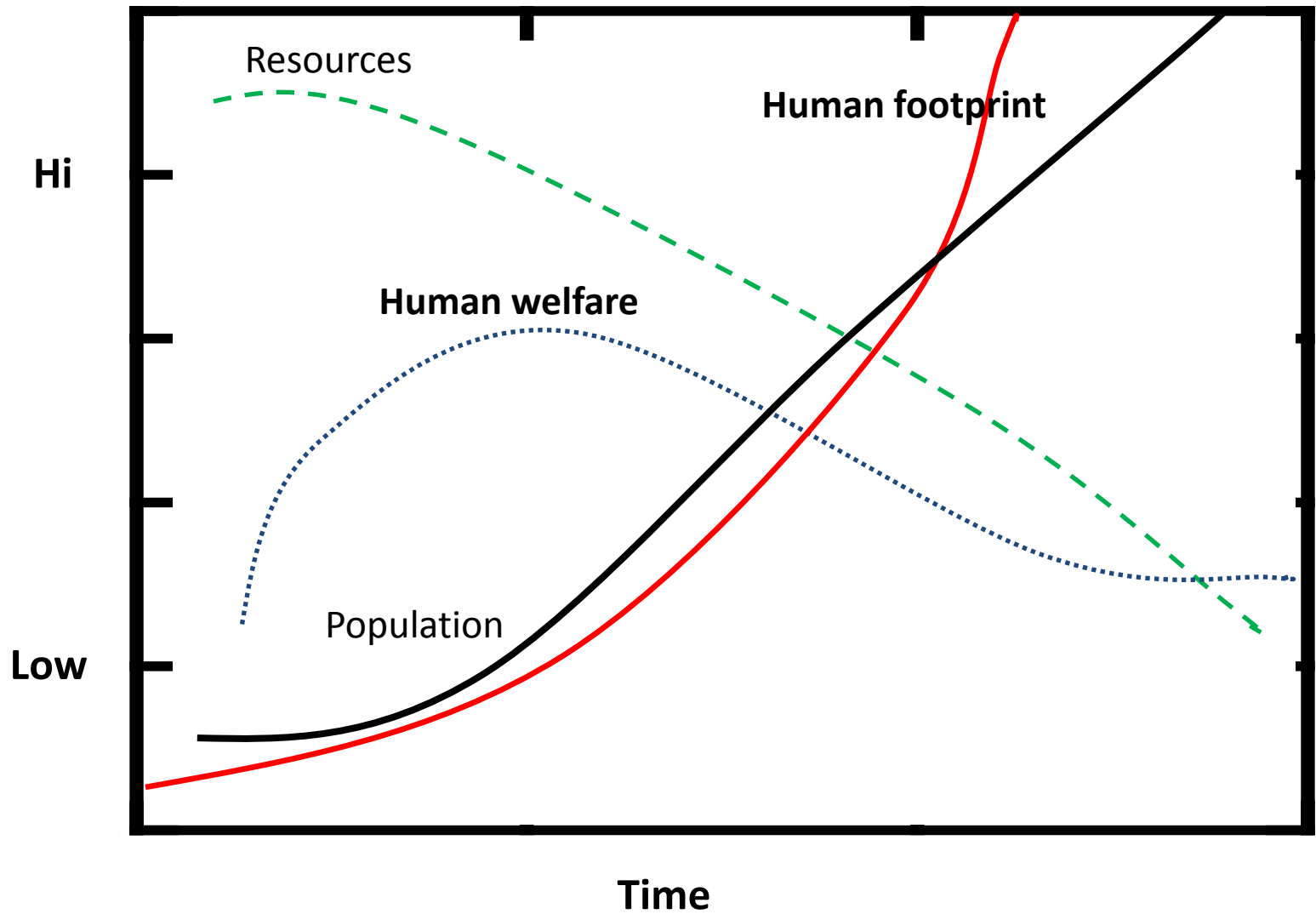


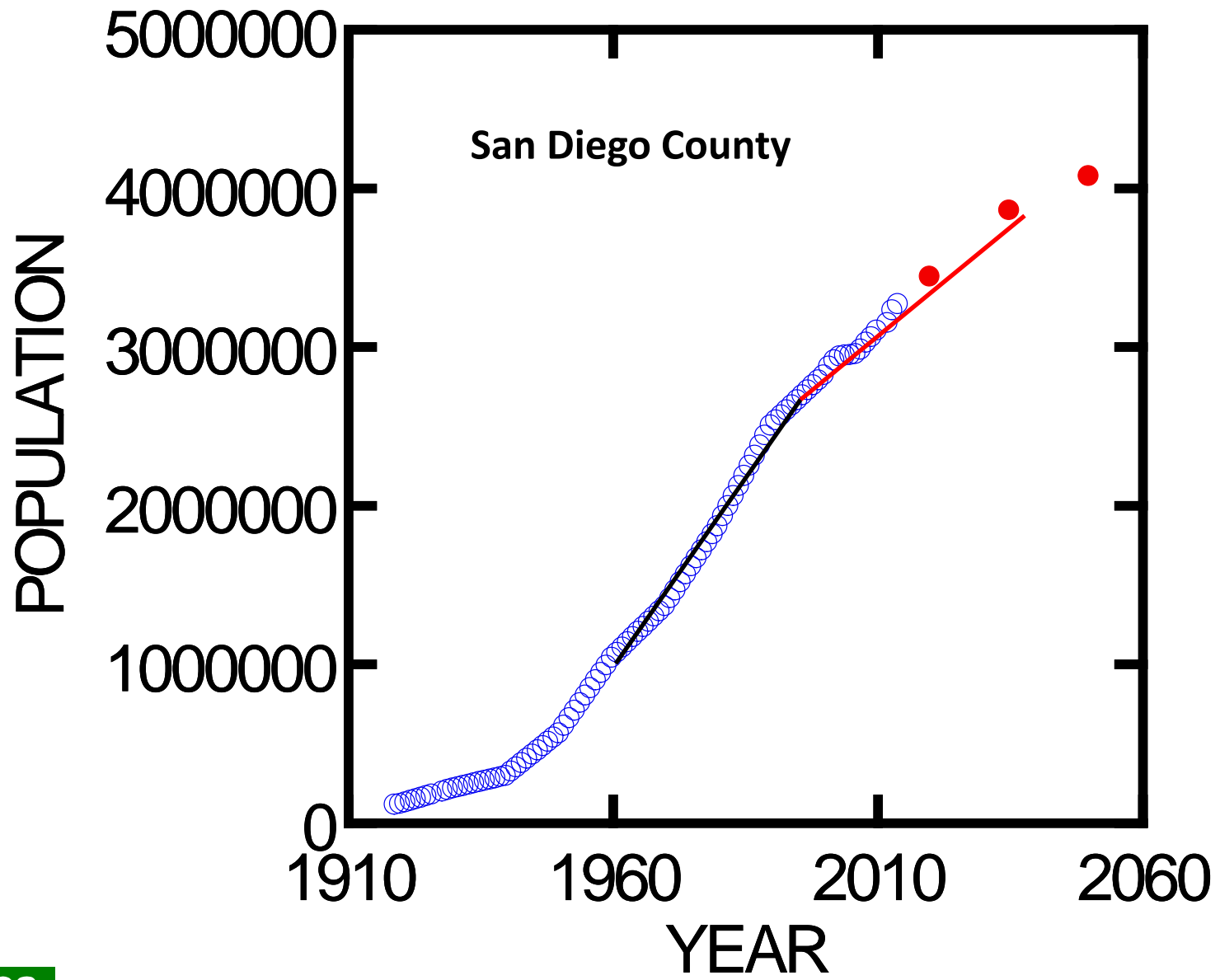
*Fires are more destructive today because of urban sprawl that forces homes into watersheds of dangerous fuels
Since 2000, an average of 1000 homes per year lost to fire*



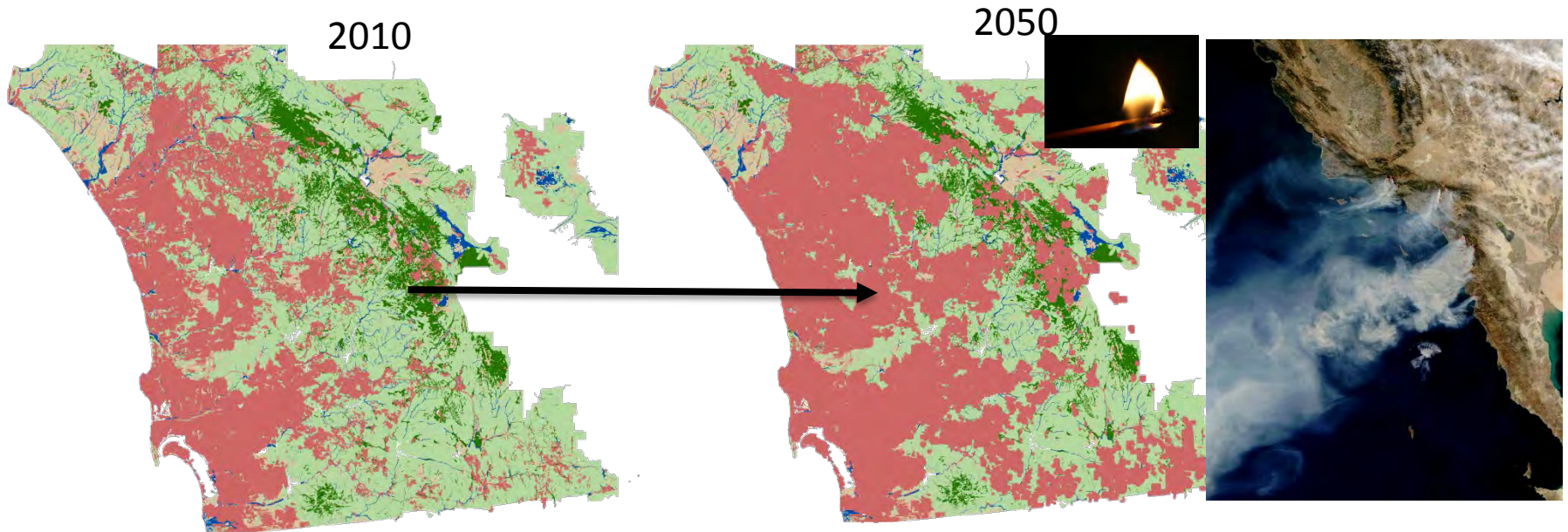








Potential Collision Ahead



As populations increase, ignitions during severe fire weather events are likely to increase
As populations move eastward, the potential size of Santa Ana wind driven fires increase
Losses of lives and property will likely increase dramatically