

Figure 1. Giant sequoias contain detailed histories of low severity forest fires (left) within their tree rings, recorded as fire scars (right). Comparisons of fire frequency from fire-scar records in five sequoia groves with temperature estimates from bristlecone pine tree-ring width measurements (graph) show that warm periods corresponded with increased fire frequency. The fire-scar record (red line) shows a sharp drop in fires after about 1860, when livestock grazing began, but temperatures rose in the past century (Swetnam 1993).

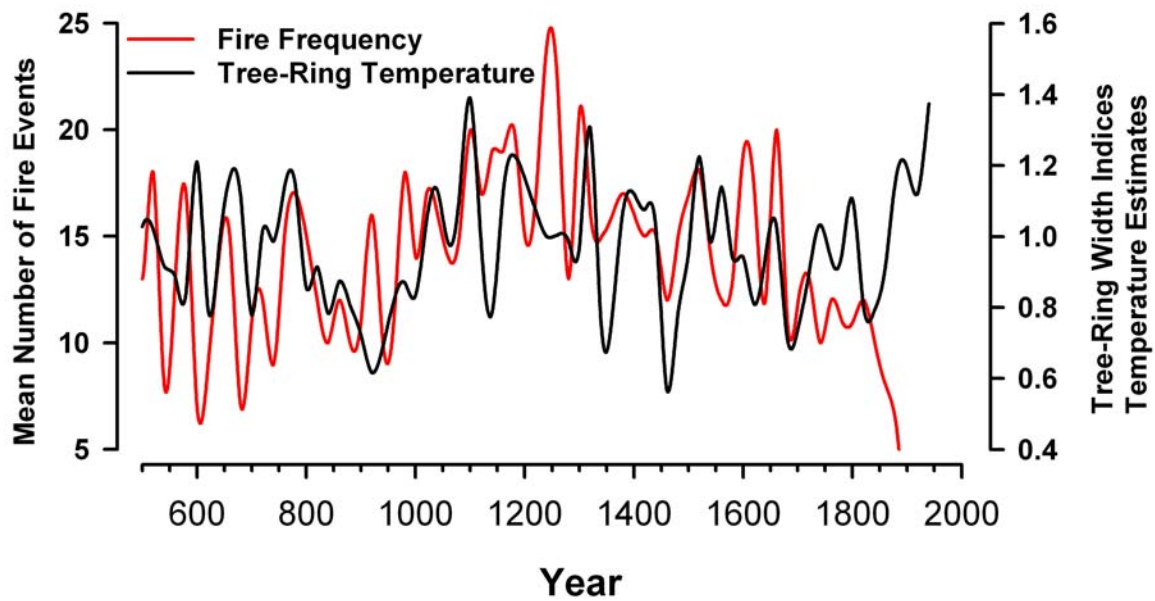
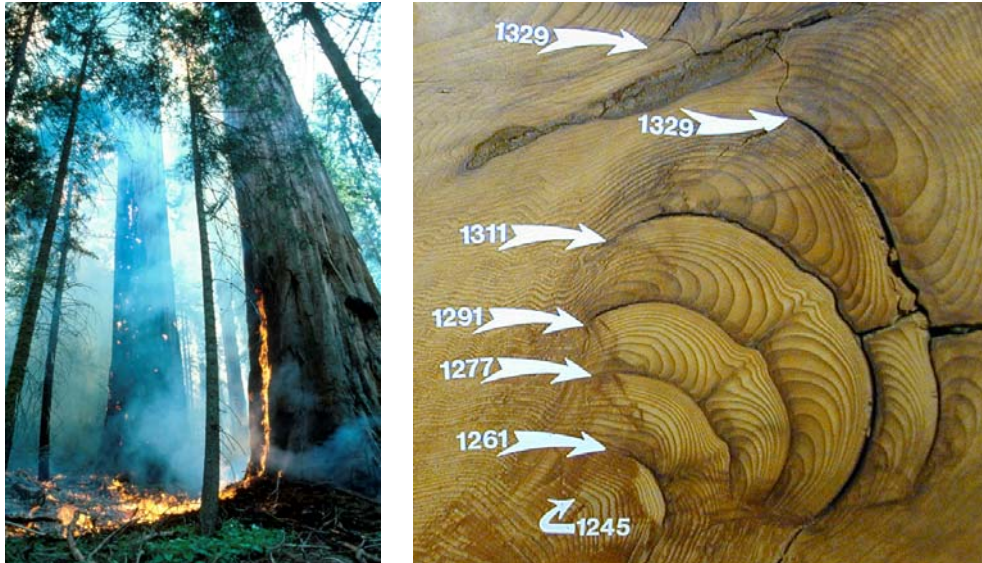


Figure 2. There is a clear trend of increasing area burned on all lands in the eleven western states, especially since the mid-1980s. Fire statistics are less complete and reliable before the 1970s. Estimates shown here are based on an adjustment of changing areas protected (included) in the land database through time (data compiled and adjusted by A. Westerling). More than 7 million acres have burned each year in the West since 2004, and nearly 6 million acres to date (September 13) in 2007.

Annual Area Burned Adjusted for Area Protected

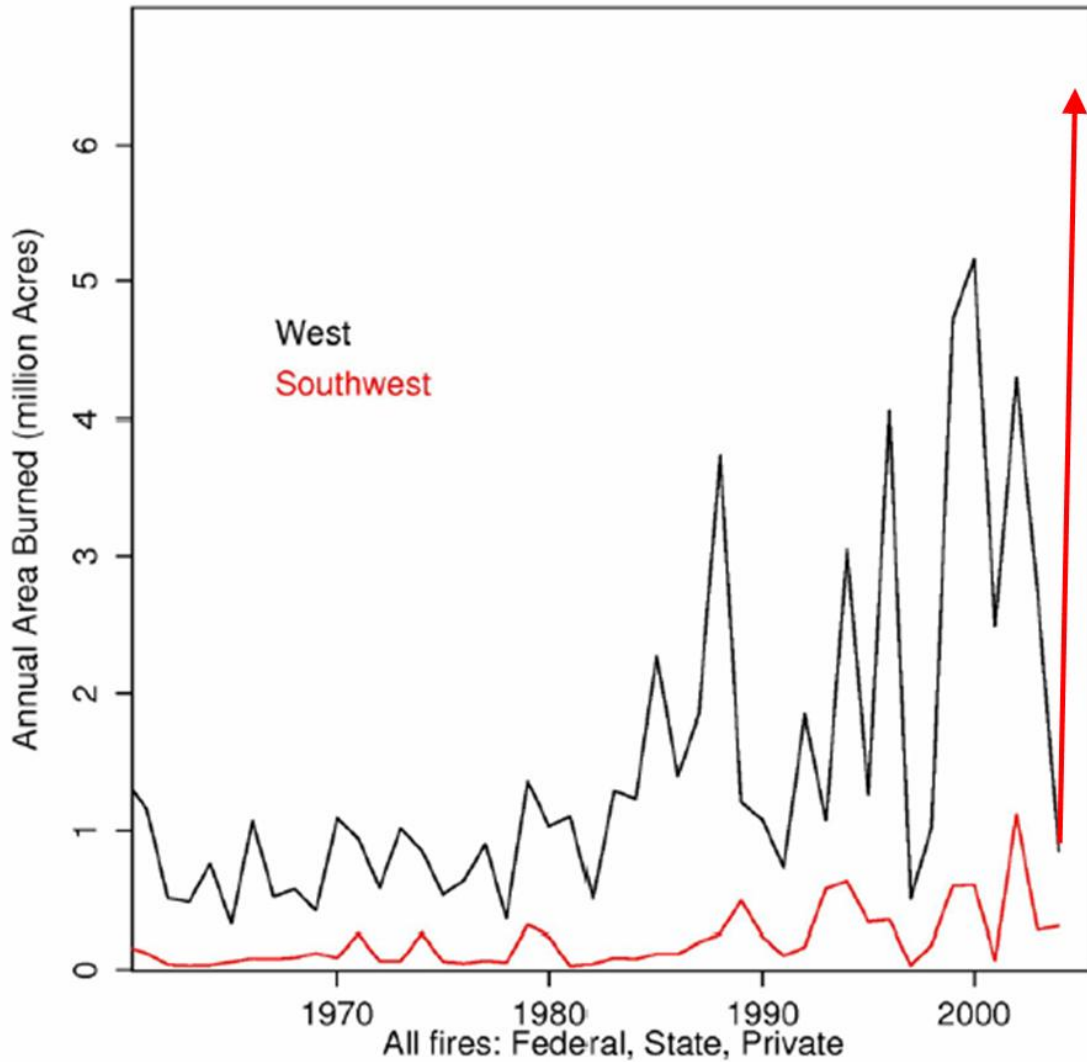


Figure 3. The numbers of large fires (> 1,000 acres) shows a distinct upward trend in the data from forested landscapes on federal lands (upper two plots), but not clear trends in the non-forested landscapes (lower two plots).

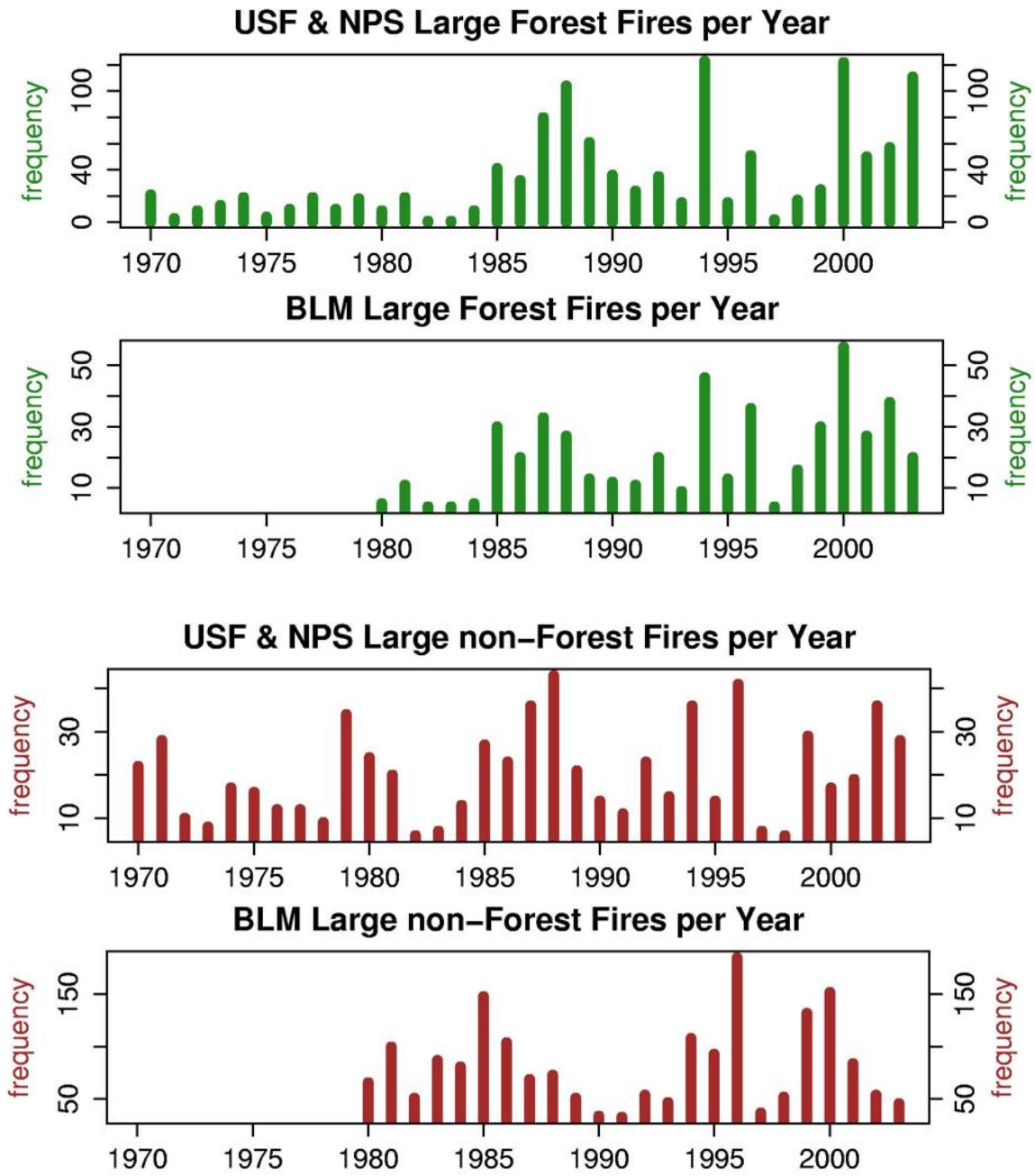
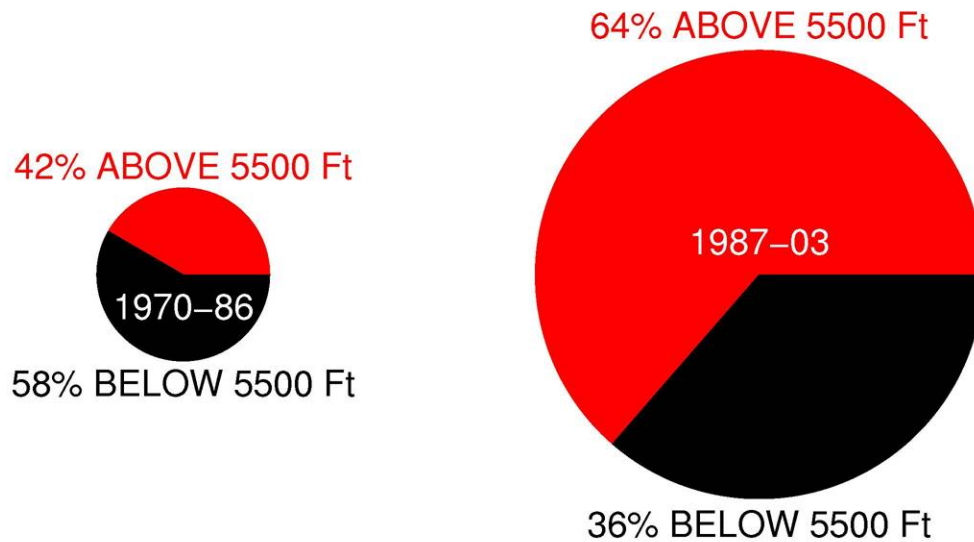


Figure 4. The relative forest areas burned in two time periods (1970-1986 versus 1987 to 2003) show clear increases in the latter period. A shift to a greater proportion of area burned above 5,500 feet elevation in the latter period is also evident.

1987-03 FOREST AREA BURNED IS 6.7 TIMES 1970-86 AREA



AREA BURNED IN FORESTS IN FIRES > 1000 ACRES, USF & NPS UNITS
REPORTING FROM 1970 ON

Figure 5. A. The number of large (>1000 acres) forest fires (red bars) from 1970 to 2003 is well-correlated with spring and summer temperatures (black line) (Westerling et al. 2006). The Spearman correlation coefficient of this association is 0.7, with a probability level of achieving this match by chance of one in one thousand. **B.** The timing of spring snowmelt as indicated by peak runoff in river flow data (Stewart et al. 2005). There were eight early spring event years after 1986 and only 3 such years before this time.

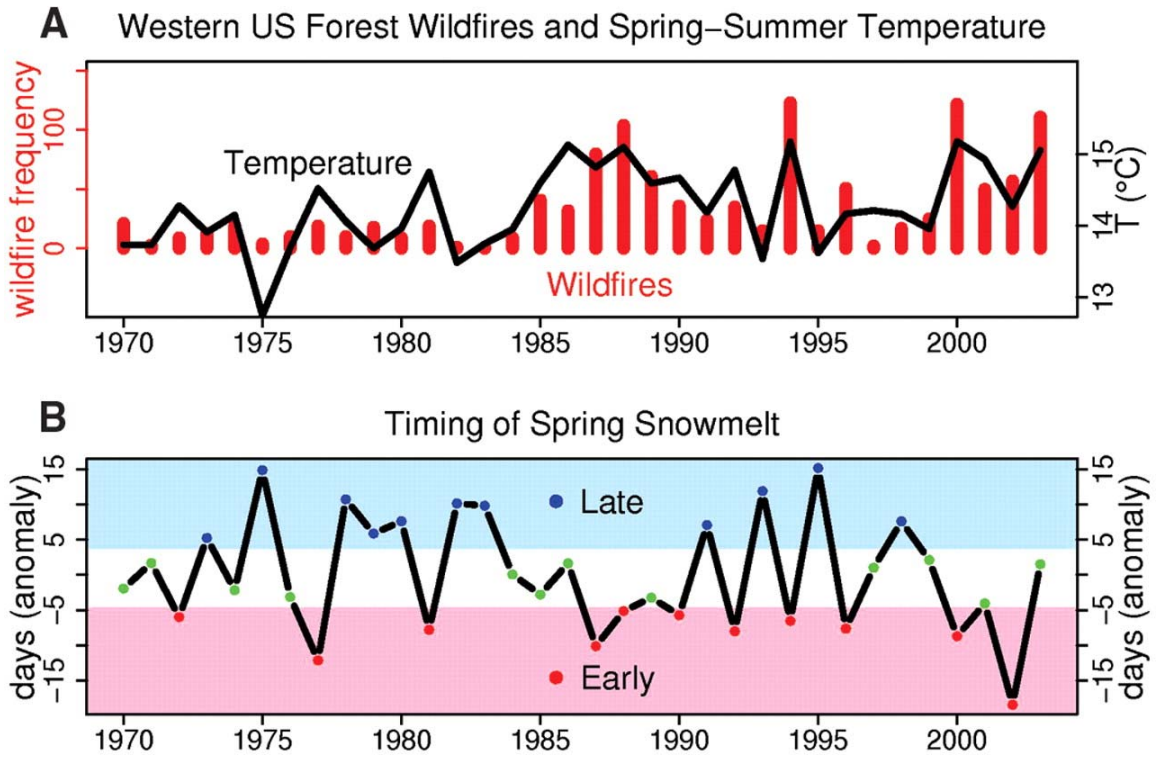


Figure 6. Many more large forest fires occurred during early snowmelt years than late snowmelt years. The size of the red circles are proportional to the area burned in the whole data set (but not to scale relative to the map).

