CalFire
FRAP Fire Perimeters
1920-2017
Area burned (large fires only before 1950)

- Interior
- Coastal

Year

Area burned (km²)

1920 1940 1960 1980 2000 2020
Climate and fire

- Wet winters fuel plant growth
- Hot summers dry out fuels (live and dead)
  - Low fuel moisture critical to high fire danger

- Climate trends in North Coast (1950-2017)
  - Daytime temps stable
  - Nighttime temps have warmed about 2°F

- Future:
  - Rainfall trends uncertain, will continue to be highly variable year to year
  - Rising temperatures will contribute to summer fire risk
  - Projections of wind and fire weather outside the scope of most climate models
Climate Trends – 1950-2017

**Interior Region - Max Temps**

- Daytime Maximum Temps
  - No trend

**Interior Region - Min Temps**

- Nighttime Minimum Temps
  - ~ 1°C increase
Tubbs Fire unleashed tornadoes

In the late night hours of Oct. 8, the first hours of the Tubbs Fire, a high pressure system over the Central Valley was moving air west in a northeasterly flow to a low pressure system over the coast of California. The change in pressure was so marked that hurricane-force gusts were the result.

Gusting up to 80 mph, the wind funneled into a steep, hilly drainage area along Mark West Springs Road, and was increased in speed by a phenomenon called a Venturi effect.

**Fire tornado explained**

Mini weather system caused by fire.

1. A thermal column is able to reach wind speeds of well over 100 mph, causing damage similar to hurricanes and tornadoes.
2. The heated air rises creating a thermal column.
3. Cooler air gusts into the space left behind the rising air, bringing in oxygen and combustible material.
4. Wind moves horizontally over a fire and the turbulence creates vortices.

Super-heated, the roaring wind entered north Santa Rosa and encountered square-edged buildings and homes that trapped the wind in small spaces, creating swirling vortices from the angular momentum.

Sources: Western Regional Climate Center; National Geographic; Howitworksdaily.com

John Blanchard / The Chronicle
Landsat 8 OLI Relativized Burn Ratio
(Matthew Clark, Sonoma State)