

Fire Weather: useful websites and tools



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Livestock and Natural Resources Advisor

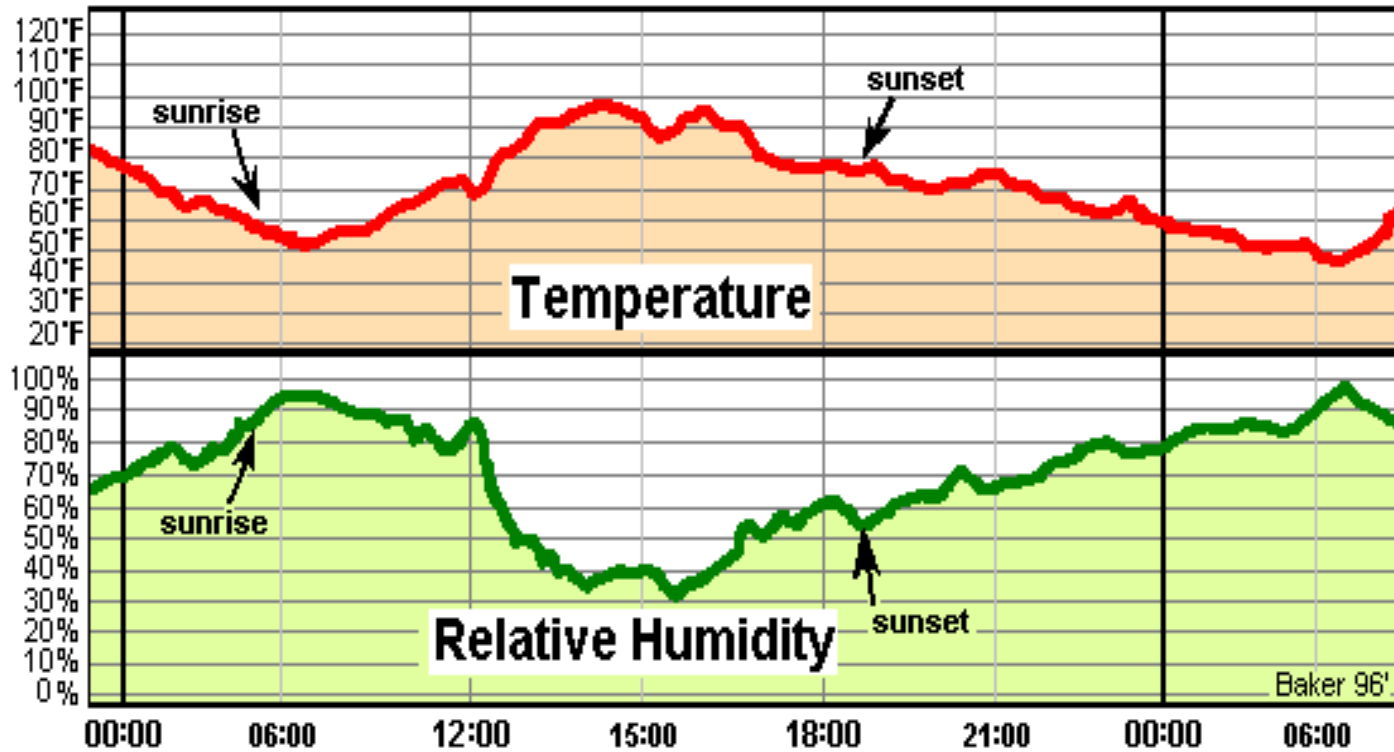
Weather and Prescribed Fire

- Weather is the most dynamic factor that affects fire behavior
 - Most difficult to predict



Daily Temperature (“Dry bulb”) and Humidity (“RH”) Relationship

Thermograph depicting 24 hours of temperature and relative humidity.



Note the diurnal relationship between temperature and relative humidity.

Relative humidity (RH): amount of moisture in the air divided by the amount the air could hold when saturated at the same (or “Relative”) air temperature; usually expressed in percent.

Moisture

Fine Fuels

- gain and lose moisture quickly
- Example: 1 hr fuels (time-lag-class) is how long it takes for that fuel class to equilibrate to the RH
- react rapidly to moisture

Heavy Fuels

- gain and lose moisture slowly
- react slowly to moisture

Precipitation Duration vs. Amount

- Duration has greater impact on fuel moisture than amount



“PIG” or Probability of Ignition

PowerPoint Slide Show - [WeatherMonitoringFor_RiFire.pptx] - PowerPoint

Fire Weather Monitoring Review

Step 4:

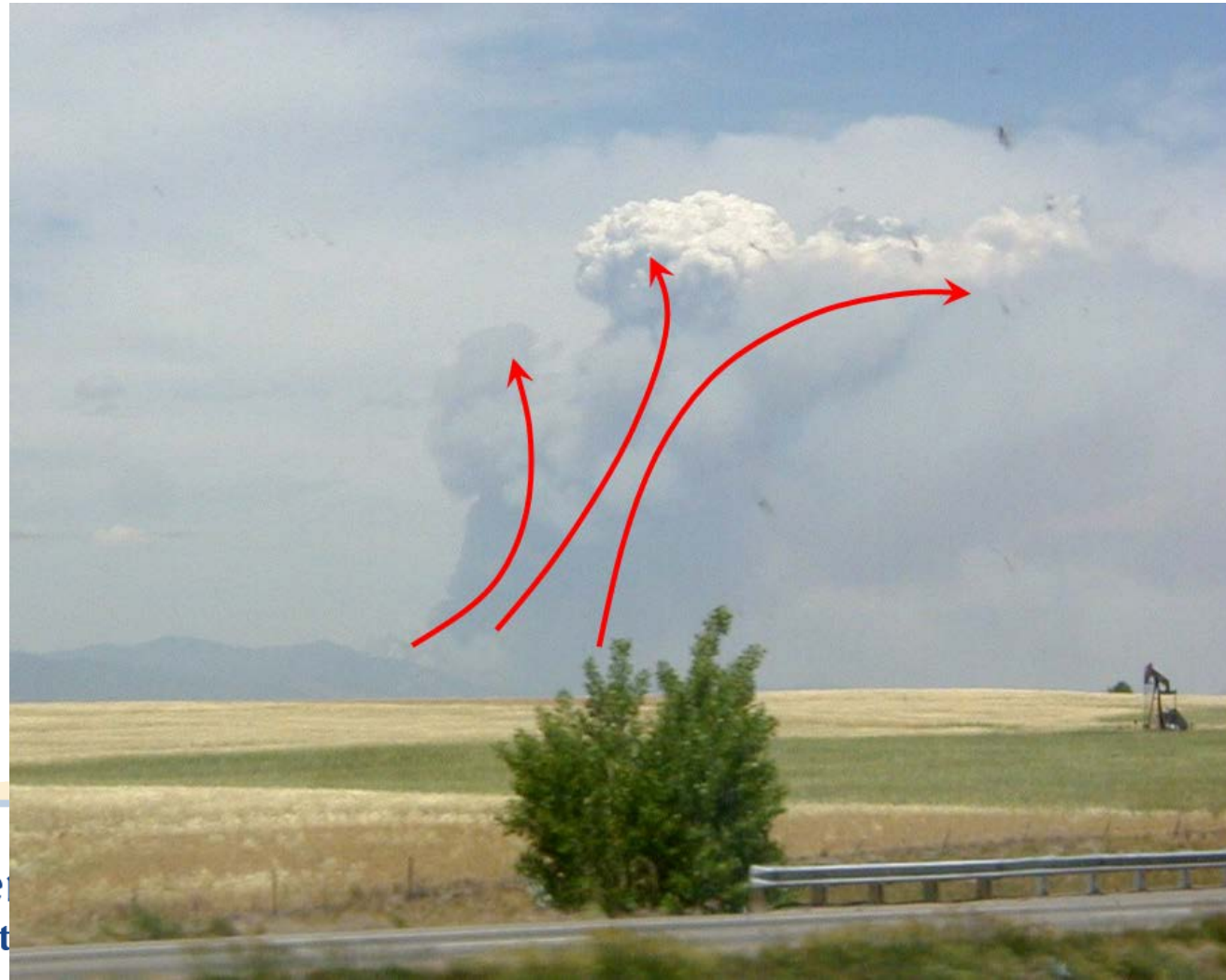
Calculate Probability of Ignition

- Use your Fine Dead Fuel Moisture, Temperature, and Shaded/Unshaded status to calculate the POI in table.
- For Example: *with a temperature of 60 degrees F, canopy cover less than 50%, and a fine dead FM of 9%, the probability of ignition is 30%.*

		PROBABILITY OF IGNITION TABLE																
		Shading (%)	Dry Bulb Temperature (°F)	Fine Dead Fuel Moisture (%)														
				2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
EXPOSED	3E Unshaded <50%	110+	100	80	70	60	60	50	40	40	30	30	20	20	20	20	10	10
		100 - 109	100	90	80	70	60	60	50	40	40	30	30	20	20	20	10	10
		90 - 99	100	90	80	70	60	50	40	40	30	30	20	20	20	10	10	
		80 - 89	100	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10
		70 - 79	100	80	70	60	60	50	40	40	30	30	20	20	20	10	10	10
		60 - 69	90	80	70	60	50	50	40	30	30	20	20	20	20	10	10	10
		50 - 59	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		40 - 49	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		30 - 39	80	70	60	50	50	40	30	30	20	20	20	10	10	10	10	
SHADED	3S Shaded >50%	110+	100	90	80	70	60	50	50	40	40	30	30	20	20	10	10	
		100 - 109	100	90	80	70	60	50	50	40	30	30	20	20	20	10	10	
		90 - 99	100	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10
		80 - 89	100	80	70	60	60	50	40	40	30	30	20	20	20	10	10	10
		70 - 79	90	80	70	60	50	50	40	30	30	30	20	20	20	10	10	10
		60 - 69	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		50 - 59	90	80	70	60	50	40	40	30	30	20	20	20	10	10	10	10
		40 - 49	90	80	60	50	50	40	30	30	30	20	20	20	10	10	10	10
		30 - 39	80	80	60	50	50	40	30	30	20	20	20	10	10	10	10	

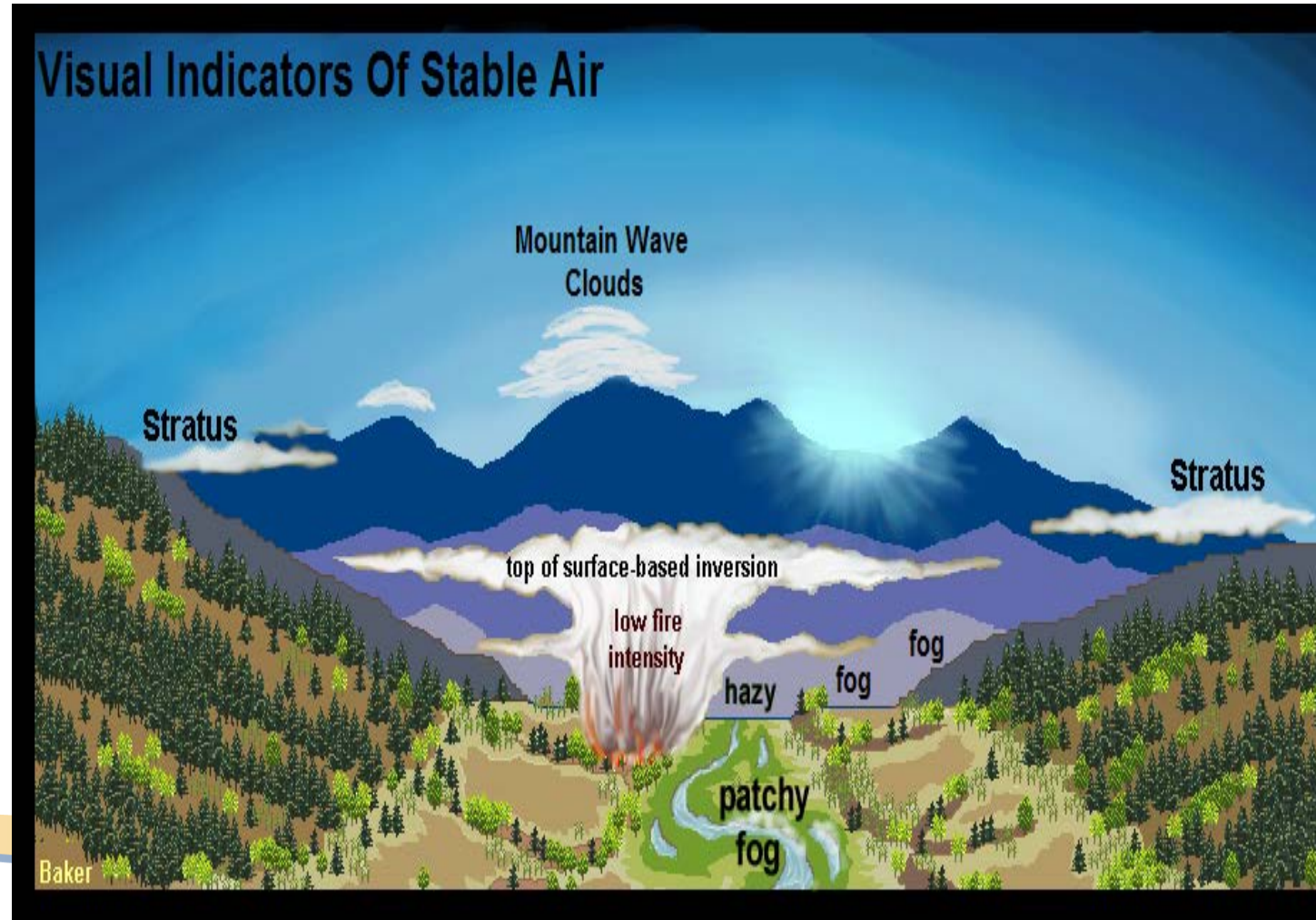
Atmospheric Stability

How vertical motion in the atmosphere is ENHANCED or SUPPRESSED.



Stable Atmosphere

- **Visual Indicators**
 - Clouds form in layers
 - Smoke drifts apart after limited rise
 - Poor visibility due to smoke or haze
 - Fog layers
 - Steady winds

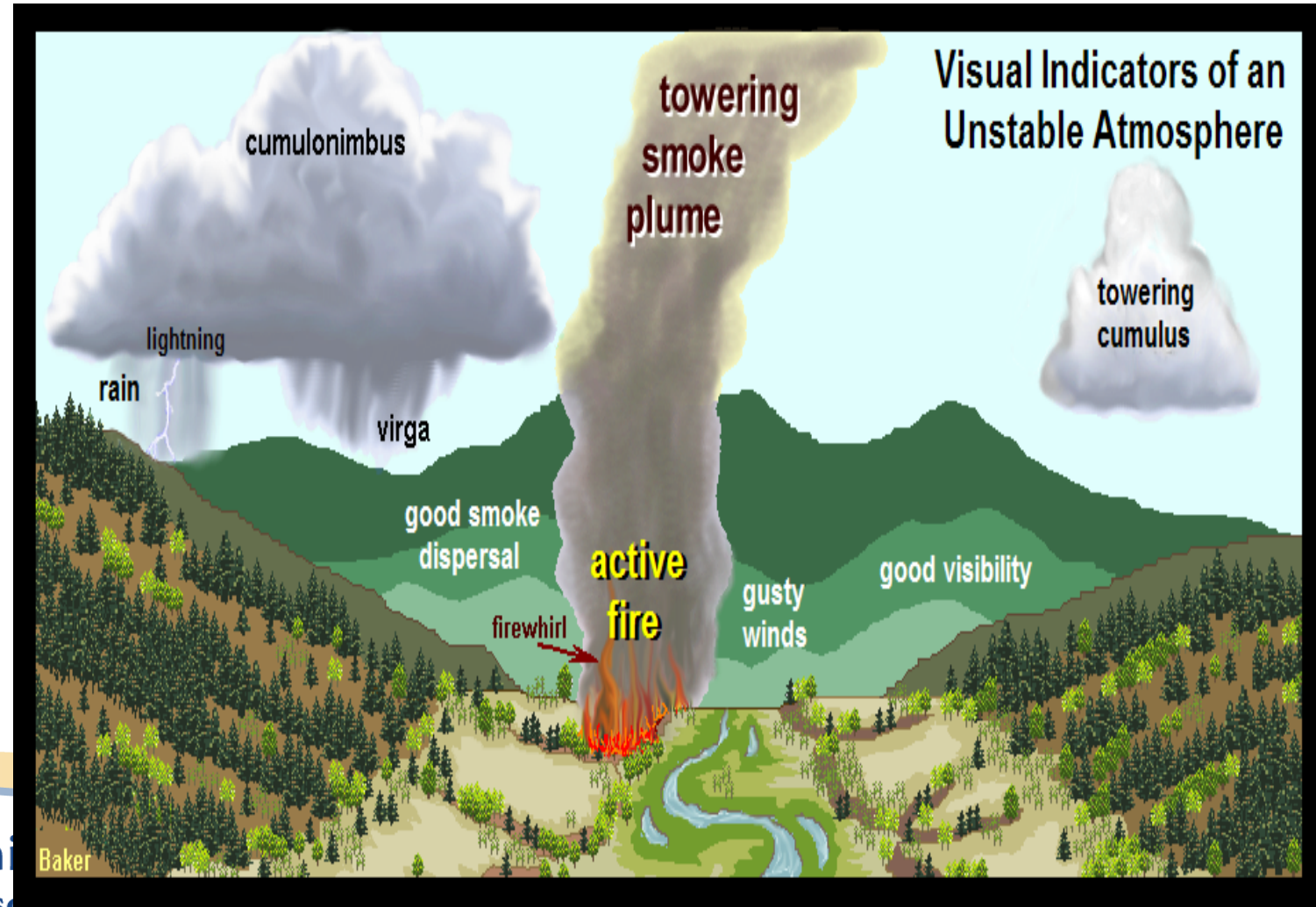


Unstable Atmosphere

Visual Indicators

- **Visual Indicators**

- Clouds grow vertically and smoke rises to great heights
- Cumulus clouds
- Good visibility
- Gusty winds
- Dust devils and firewhirls



Winds

- Wind impacts the fire environment by:
 - Increasing the supply of oxygen to the fire.
 - Determining the direction of fire spread.
 - Increasing drying of the fuels.
 - Carrying sparks and firebrands ahead of the main fire causing new spot fires.
 - Preheating of fuels ahead of the fire: bending flame



Predictive Services



- Monitors, analyzes, and predicts precipitation, wind, and RH as it relates to fire growth or resource safety:
 - Fire weather
 - Fire danger
 - Interagency fire management resource impact!

National Weather Service: weather.gov

- National Weather Service

Products produced:

- for fire weather zones
- by meteorologists
- Geared toward tactical planning



Hourly
weather
forecast:

Text Discussions: allow you to get into the head of the forecaster.

- Gauge confidence
- Convey threats
- Understand forecast challenges and significant trends



National Weather Service Weather Forecast Office
Sacramento, CA

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Area Forecast Discussion

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943
FXUS66 KSTO 111120
AFDSTO

[Area Forecast Discussion](#)
National Weather Service Sacramento [CA](#)
420 AM PDT Fri May 11 2018

..SYNOPSIS...
Period of windy conditions today. Temperatures remaining slightly above [normal](#). Showers and [thunderstorm](#) chances mountains through the middle of next week.

&&

..Discussion...
Upper low now centered over northeast Oregon will drop southeast into the Great [Basin](#) today. Surface high pressure pushing in behind over the Pacific Northwest will create a tight northerly [gradient](#) over the north state which when combined with [upper level](#) northerly [flow](#) will bring breezy north winds. Northerly winds already starting to pick up over the northern Sacramento valley with current wind speeds in the mid teens. Winds are expected to pick up above wind advisory criteria throughout the Sacramento valley by late morning as surface gradients increase to above 12 [mb](#) from Sacramento to Medford. [Shortwave](#) dropping down backside of low may bring a few showers over the northern Sierra. Cooler air will filter into the area bringing a decrease in daytime highs today but maximum temperatures should remain a bit above [normal](#). Winds will stay breezy during the evening hours but will be on the decrease.

Upper low remains over the Great [Basin](#) through early next week. Shortwaves rotating around the low will bring a threat of showers over the Sierra Cascade range Saturday. [Stability](#) progs indicate enough [instability](#) for a slight threat of thunderstorms as well. Only minor changes are expected in the weather pattern Sunday and Monday with upper low expected to only move slightly. This should [mean](#) only slight changes with high temperatures and afternoon/evening Sierra [crest thunderstorm](#) threat Saturday through Monday.

&&

..EXTENDED DISCUSSION (Tuesday THROUGH Friday)
An [upper level](#) low centered over the Great [Basin](#) weakens, and exits the area on Tuesday, only to be replaced by a Pacific upper low. Afternoon/evening thunderstorms are expected to continue over the mountains and foothills at least through Friday, and



Windy.com



University of California
Agriculture and Natural Resources

96 hr Air Quality Forecast: CA Air Resources Board

ARB's Meteorology Program

Up Links

- Reducing Air Pollution - ARB Programs
- Smoke Management Program
- Meteorology Program

PROGRAM LINKS

Agricultural Burning

- Burn Forecast
- Historical Air Basin Burn Decisions
- Sacramento Valley Allocation
- Ag Rx Burn Report Form

Data and Current Observations

- Aircraft Soundings
- Frequently Asked Questions
- Meteorological Database
- Real-Time Air Quality and Meteorological Data
- Walnut Grove Tower

Prescribed Burning

- PFIRS
- CB3 Form

Specialized Forecasts

- Diesel PM Study

RESOURCES

- Contact Us
- Join Any Smoke Management Email List(s)
- RSS / Newsfeed

The Meteorology Section manager is **Pinguan D. "Ping"** (916) 322-6040.
The Modeling and Meteorology Branch manager is **John DaMassa** (916) 324-7167.

For questions or comments regarding this page, please contact Air Pollution Meteorologist forecaster at (916) 322-6014.

PFIRS Prescribed Fire Information Reporting System

Controlled Burn Notices (CB3s)

Page is updated by 3 p.m. each day

Entire State | North Coast | NE Plateau | Sac Valley | Mtn Counties | San Joaquin | Lake Tahoe | Lake County | Bay Area | NC Coast | SC Coast | Great Basin | Mojave Desert | Salton Sea | South Coast | San Diego

The notices on this page do not necessarily reflect the burn status of your local area. You must contact your local fire permit official (local air district or fire agency) for final authorization to burn.

Fire Weather Links: California | Oregon | Nevada | Arizona

Mountain Counties

Basin	24-hr Decision Fri May 11	48-hr Forecast Sat May 12	72-hr Outlook Sun May 13	96-hr Trend Mon May 14
Mountain Counties North (Plumas, Sierra, Nevada, Placer, El Dorado)	Burn (Good)	Favorable (High Confidence)	Favorable	Favorable
Mountain Counties South (Amador, Calaveras, Tuolumne, Mariposa)	Burn (Good)	Favorable (High Confidence)	Favorable	Favorable

Air Basin Map

Notes and Instructions

El Dorado County Burn Line:

- Mtn Counties: (530) 621-5897 or (866) 621-5897
- Lake Tahoe: (530) 621-5842 or (888) 332-2876

Placer County Burn Line: (530) 889-6868

Northern Sierra Burn Lines:

- Western Nevada County: (530) 274-7928
- Eastern Nevada County: (530) 582-1027
- Western Sierra County: (530) 289-3662
- Eastern Sierra County: (530) 994-3561
- Quincy Area: (530) 283-3602
- Greenville: (530) 294-6520
- Chester: (530) 258-2588
- Portola: (530) 832-4528

Amador County Burn Line: (209) 223-6246

Calaveras County Burn Line:

- All: (209) 754-6600
- Copperopolis: (209) 785-7664

Mariposa County Burn Line: (209) 966-2220 or 1-888-777-0377

Tuolumne County Burn Line: (209) 533-5598

District Contact Information

Mountain Counties North	Mountain Counties South
El Dorado County AQMD Phone: (530) 621-7501 Fax: (530) 295-2774 Website	Amador County APCD Phone: (209) 257-0112 Fax: (209) 257-0116 Website
Placer County APCD Phone: (530) 745-2330 Fax: (530) 745-2373 Website	Calaveras County APCD Phone: (209) 754-6504 Fax: (209) 754-6521 Website
Northern Sierra AQMD Phone: (530) 274-9360 Fax: (530) 274-7546 Website	Mariposa County APCD Phone: (209) 966-2220 Fax: (209) 966-8248 Website
	Tuolumne County APCD Phone: (209) 533-5693 Fax: (209) 533-5520 Website

For more fire weather information, youtube: “Engber RxFire WeatherResources 2019”

The screenshot shows a YouTube video player with the following details:

- Video Title:** Weather Monitoring for Prescribed Fire
- Channel:** Fire Science
- Published:** May 24, 2019
- Category:** People & Blogs
- Views:** 1 view
- Engagement:** 0 likes, 0 comments
- Comments:** 0 comments (commenting as Jeff Stackhouse)

The video content includes:

- A title slide: "Weather Monitoring for Prescribed Fire" by Eamon Engber – Fire Ecologist.
- A screenshot of a weather monitoring software interface showing a table of weather conditions and a line graph of humidity over time.
- Images of a prescribed fire in progress and several wooden stakes.

Up next recommendations:

- Factors for Invasion: Best Defense (10:47)
- Davy WSARE RxFire Medusahead 2019: Fire Science (No views)
- Beekeeping 5 rookie mistakes in this video that you can learn... (25:59)
- How to Catch, Clean and Cook a Snapping Turtle! PT 1 (11:43)
- Cheap VS Expensive Solar Panels | 12v Touring | Project... (15:53)
- His Veins Run Cold When He Realizes Who's Been Haunting... (19:49)
- Most Efficient Chicken Coop Tour (12:07)
- How to Remove a Stump, Cheaply & Effectively! (21:44)
- Beginner Beekeepers: 3 Essential Skills