



FROM THE AIR PROGRAM

Some Basic Facts about Wildfire Smoke

Do some wildfires generate more smoke than others, apart from their size in acres? Yes, but there are patterns typically seen in all fires relating to smoke generation. There will typically be more smoke when the fire is burning less efficiently, at a lower temperature, i.e. when smoldering and burning damp and ground-level materials with less oxygen available. Some fuel types also have greater burning efficiency than others, such as vegetation that hold low water content or are fire-adapted and have flammable resin-coated leaves.



How does the smoke disperse? This is dependent on winds in the area, and the stage of the fire. At peak heat, a flaming fire has updrafts that lift the smoke to higher elevations in a plume. The wind direction defines the initial plume. Then, when it begins to cool aloft in the atmosphere, it loses the force of updraft and begins to disperse, also being more diluted with distance gained from the source. Mountainous terrain can provide the conditions for smoke being down-mixing into valleys, funneled through passes, and trapped in valleys via night time inversions. Changing diurnal temperatures in air masses in and above the valley can drive it up and down, with more being added, or more dispersion, depending on the wind direction.

Picture: Schaeffer Fire about 10 days after ignition by lightning

Is visibility a good indicator of smoke conditions? For practical purposes, yes it is common sense. One caveat here is that water vapor (as well as smoke) in the air will often “dull” or reduce visibility by absorbing all light wavelengths somewhat evenly, creating a grey or white effect, and this visual effect is increased with the distance you might be viewing.

How could I know if the smoke level gets unhealthy? Data collection systems run by monitoring agencies generate automated alerts which are passed on to the public typically via emails to other agency officials or posted on their website. Most of these notification systems are electronic because that is the only way they can stay accurate as time passes. Sometimes, an air quality reporter is assigned for specific fire event. For example, during the Schaeffer Fire, the Forest Service ran reports for various towns, and assigned a daily qualifier for each town on each day they examined; Bishop’s air quality did not exceed the “good” level during this time. The qualifiers are based on averages, usually 24-hour periods.

Real time weather and air quality data are available at http://www.bishoptribeemo.com/index_air.htm, where there is also a link to another data dashboard. Both of these display air quality in real time (15 minutes), color coded. **GREEN** is good. **YELLOW** is moderate. Less likely seen, **ORANGE** is unhealthy for people with asthma and some elders and children, and **RED** is unhealthy.

For more info on smoke, you can check out AirNow.gov, then go to Air Quality Basics, then Smoke from fires. Or https://airnow.gov/index.cfm?action=topics.smoke_events