

**Finding Solutions** Clean air — it's been a federally mandated, National Park Service responsibility since the Clean Air Act was amended in 1977. We're striving to meet this goal! By monitoring the problem, we learn how and where pollution affects the parks' natural resources. Using the results, we can find effective solutions. We help people to understand the causes of pollution using brochures, outreach to schools, displays, and a National Park Service web site ([www2.nature.nps.gov/ard/](http://www2.nature.nps.gov/ard/)).



Coordinated monitoring and research programs compare ozone, acid rain, and particulate matter pollution among all regions of the nation.



Park staff make information available to park visitors like yourself. Ask a ranger about air quality.

## Become a Player

Informed people can make a difference. If each person makes one air-sparing, lifestyle change, air pollution can be beaten. Become a player — make a change!

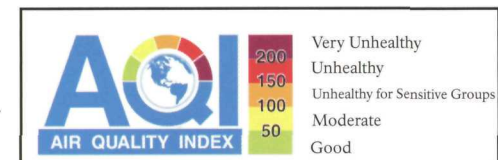
**In the car you can:** consolidate trips, carpool whenever possible, drive at moderate speeds, use the air conditioner less, and turn off the engine instead of idling. Don't forget to ride a bike or choose public transportation whenever possible.

**In the garage you can:** get regular tune-ups, keep tires inflated properly, and use energy conserving (API certified) oils and reformulated gasolines.

**At home you can:** use human-powered gardening tools, recycle trash, shut off lights, repair things instead of discarding them, use the fireplace less often, and dispose of solvents and paints responsibly.

**In your community you can:** take part in clean-up programs, and learn more about air quality, your health, and your environment. Vote on clean air issues.

**Understand the Air Quality Index:** find it in your favorite local newspaper, news program, or National Park visitor center.



When the air is "Good" and healthy, it's okay to go outside for play and exercise. When it is "Unhealthy for Sensitive Groups," it's better to stay inside to avoid ozone-induced respiratory symptoms like coughing and throat soreness.

"My mower runs on iced tea!"



"OK, help me remember - first the post office, then the drugstore, library, groceries and video store!"



"Are you finished with the AQI section Hon?"

Contact the National Park Service for more information:

Air Resources Specialist  
Sequoia & Kings Canyon  
National Parks  
Three Rivers, California 93271  
[www.nps.gov/seki/](http://www.nps.gov/seki/)

National Park Service, ARD  
P.O. Box 25287  
Denver, Colorado 80225-0287  
[www2.nature.nps.gov/ard/](http://www2.nature.nps.gov/ard/)

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Cartoons by Carolyn Kibbe.

Can you think of more ways to clean the air?



# What's in the Wind?



Clean air should contain 78% nitrogen, 21% oxygen, 0.03% carbon dioxide, and less than 1% of other gases. Pollution changes this composition. This is a clear, morning view of Moro Rock in Sequoia National Park.

## Air Pollution!

Clear vistas, healthy forests, and a diversity of wildlife — these are the reasons people come to Sequoia & Kings Canyon National Parks. Clean air is also a reason! Unfortunately, air pollution may sometimes be part of the park experience.



Pollution moves with the wind. Air currents carry pollutants up into these parks.

Because air quality affects everything — views, plants, animals, soils, water *and* people — the National Park Service is working to address the problem. You can help!

People living with ozone and particulate matter pollution often have some sinus inflammation.



Giant sequoia seedlings are vulnerable to air pollution.



Mountain yellow-legged frogs have almost disappeared over the past 15 years, possibly because of air pollution. Photo courtesy of V. Vredenburg.



This scenic view is almost completely hidden by particulate matter pollution on bad days (right half).

# Sources of Pollution

Valley-wide air currents, near and far, pick up pollution from cities, highways, and farms. They push it south against the slopes of the Sierra Nevada, and into Sequoia & Kings Canyon National Parks.



The arrows show how air moves from the San Francisco Bay Area and across the San Joaquin Valley. When it hits the mountains at the southern end of the valley, the air swirls counter-clockwise. The result is an eddy of air that traps higher and higher concentrations of air pollution.

**Air pollution travels, making it a global and regional problem, not just a local problem.**



**Automobiles** — With over 33 million Californians depending on combustion engines every day, cars have become the main source of air pollution.



**Agricultural practices** contribute dust, soot, and chemicals to the air. The most agriculturally intensive region in California, the San Joaquin Valley, is a substantial contributor to air pollution.



**Industry** is a major source of air pollution. It contributes to the three types of pollution that affect the parks: particulate matter, ozone, and acid rain.

# Affecting You & Your Environment

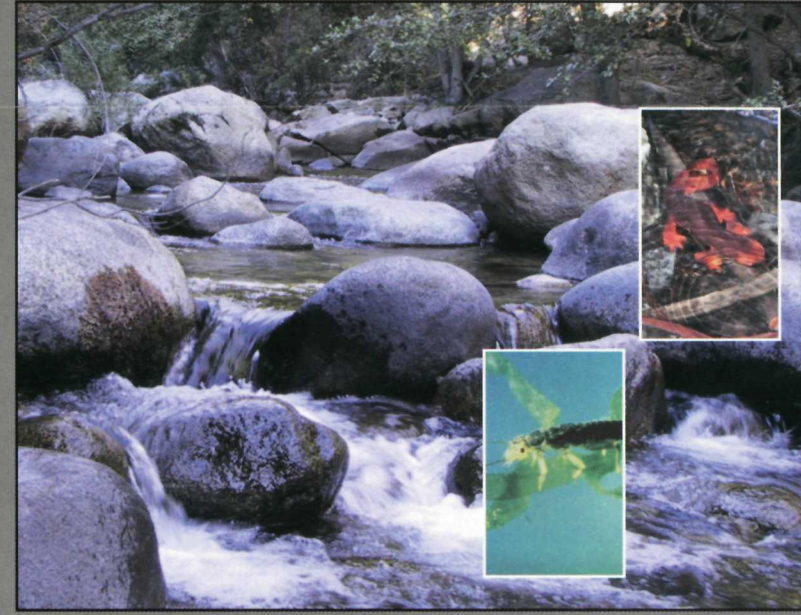
**Particulate matter (PM)** pollution hides scenic views with its tiny particles and liquid droplets. These may be made of nitrates and sulfates, as well as smoke and dust. Similar to other kinds of air pollution, PM pollution contributes to premature human death through both heart and lung complications.

When **acid rain** washes sulfates and nitrates out of the air, it damages land and the water acidity (or pH) changes. Acid rain deteriorates building materials and paints. It also harms plants and aquatic animals.

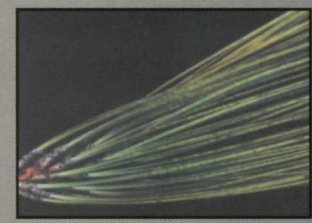
High concentrations of **ozone** injure plants, making it hard for them to grow. Ozone also injures cells in our lungs, increasing the incidence of asthma and other respiratory problems.



People may be affected by ozone and PM pollution without knowing it. Lungs can be permanently scarred with long-term exposure.



Acid deposition may be wet — rain, fog, and snow — or dry — particles and gases. All of it eventually reaches our streams. When it does, aquatic animals, such as this California newt (right inset) and this aquatic insect larva (left inset), may be harmed.

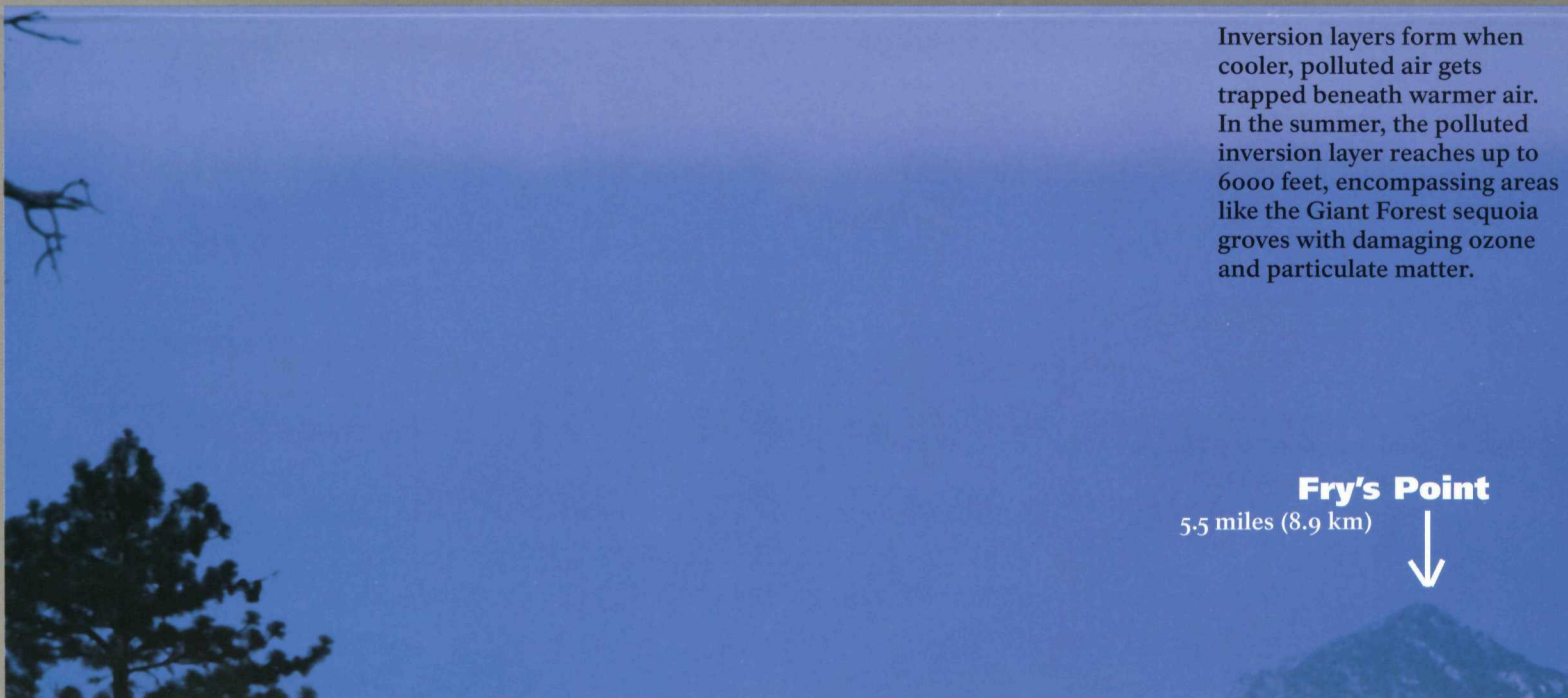


In the Giant Forest sequoia grove, 90% of Jeffrey pine trees have mottled needles (left). This is a sign of ozone injury.



**Coast Ranges**  
100 miles (161 km)

When visibility is good, you can see all the way to the Coast Ranges, 100 miles west of Sequoia National Park. The photo to the right is the same view — believe it or not — on a polluted day.



**Fry's Point**  
5.5 miles (8.9 km)

Inversion layers form when cooler, polluted air gets trapped beneath warmer air. In the summer, the polluted inversion layer reaches up to 6000 feet, encompassing areas like the Giant Forest sequoia groves with damaging ozone and particulate matter.