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## Sequoia and Kings Canyon National Parks

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### Six-Year Study Finds Airborne Contaminants in Sequoia National Park

**Sequoia National Park** – The National Park Service has released results from a six-year, multi-agency study about airborne contaminants in eight western national parks, including Sequoia. The study provides both regional and local information on exposure, accumulation, impacts, and probable sources of contaminants.

The study, released on Monday, February 25, 2008, involved intensive work in Sequoia National Park; Mount Rainier and Olympic in Washington State; Rocky Mountain in Colorado; Glacier in Montana; and Denali, Gates of the Arctic, and Noatak in Alaska. Twelve additional western park areas were sampled less intensively.

In Sequoia National Park, sampling took place at Pear and Emerald lakes (9541 and 9219 feet in elevation, respectively), with additional measurements taken along the elevation gradient from Ash Mountain (in the foothills at 1650 feet) to Pear Lake. Samples were taken from snow, fish, water, lake sediment, lichens, other vegetation, and passive air samplers. The results indicate that numerous pesticides that are in current use, as well as some that have been banned in the United States, are detectable at measurable levels. It is not well understood whether these findings are representative of other high elevation lakes in Sequoia and Kings Canyon National Parks.

Three of the contaminants found in Sequoia National Park may be of concern regarding human and wildlife health: mercury, dieldrin, and DDT. Mercury, a heavy metal emitted by processes such as burning coal for electricity, can cause neurological and reproductive impairment. Dieldrin, an acutely toxic insecticide banned from use in this country since 1987, decreases the effectiveness of the immune system. DDT (dichlorodiphenyltrichloroethane), an insecticide banned in the U.S. since 1972, reduces reproductive success. The risk from these contaminants to people is considered low and varies with the amount of fish consumed from these lakes. Park managers plan to add a statement to park wilderness information to suggest that visitors limit consumption of fish caught in high Sierra lakes and that they remove the skin, fat, and internal organs where pollutants, are most likely to accumulate, before cooking. Recommendations regarding levels of contaminants that are safe for human consumption varies between states. The extent of the effects of these contaminants on wildlife that eat fish is unknown.

Of additional concern are the levels of pesticides found in the Emerald and Pear lakes. At Sequoia National Park, air, vegetation, and snow had among the highest concentrations for current-use pesticides, compared with the air, vegetation, and snow samples from the other parks studied.

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Air pollution presents an enormous challenge to park managers. National Parks are often thought of as pristine refuges from the polluted parts of the world. Studies such as this make it clear that parks are not immune from human activities occurring hundreds, or even thousands, of miles away. The presence of pesticides and other airborne pollutants in our parks illustrates the vulnerability of these national treasures. Both regional and global air pollutants have the potential to affect the landscape of Sequoia & Kings Canyon National Parks.

For this reason, these parks actively participate in a number of groups involving federal, state, and local governments as well as private entities to address these issues. By studying indicators such as fish, snow, vegetation, and lake sediments, we can assess the health of these ecosystems and focus on where and how to better protect the national parks.

Other participating institutions in this study include the U.S. Environmental Protection Agency, the U.S. Geological Survey, the U.S. Forest Service, Oregon State University, and the University of Washington. National park resource managers worked with scientists from these collaborators to plan and conduct the WACAP study. Key findings from the six-year study can be accessed at: [http://www.nature.nps.gov/air/Studies/air\\_toxics/wacap.cfm](http://www.nature.nps.gov/air/Studies/air_toxics/wacap.cfm).

For additional information on WACAP findings and implications, contact Dr. Dixon Landers at 541-754-4427 or e-mail [Landers.Dixon@epamail.epa.gov](mailto:Landers.Dixon@epamail.epa.gov) (USEPA, National Health and Environmental Effects Research Laboratory, Western Ecology Division, Corvallis, OR). For more information on contaminants and other air pollution that blows into Sequoia and Kings Canyon or other national parks visit <http://www2.nature.nps.gov/air/> on the internet.

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