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Alaska National Parks News Release

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Airborne Contaminants Study Released
Measurable Levels Detected in Alaska National Parks

A survey of four lake basins and fish in three Alaska national park units has detected measurable levels of mercury, pesticides and other airborne contaminants. The study also found airborne contaminants in other western United States national parks.

The primary Alaska surveys took place at Denali National Park & Preserve, Gates of the Arctic National Park & Preserve, and Noatak National Preserve. Contaminant concentrations were measured mainly in lake trout, a species present in all three parks.

Contaminants such as mercury and the insecticide dieldrin were likely carried to the Alaska ecosystems in the air from distant sources like Europe and Asia, indicating a global background signal. In the Lower 48, the other western parks studied receive global inputs but also receive contaminant loads from local agricultural sources (those within 150 km), or local industrial sources.

Findings are the result of the Western Airborne Contaminants Assessment Project (WACAP), a six-year, multi-agency study funded primarily by the National Park Service. Results of the project add considerably to the state of the science concerning contaminant transport and the subsequent biological and ecological effects in remote areas of Alaska and the Lower 48. “These well-documented and carefully analyzed data will provide a basis for evaluating future changes in the status of these ecosystems,” said Dr. Dixon Landers, the U.S. Environmental Protection Agency (EPA) scientist who headed the study. National park managers in Alaska said they anticipate continuing the assessment work by sampling more lake trout and other fish species in other locations.

State and federal researchers familiar with the results noted that lake trout are a relatively long-lived fish species at the top of the food web, and as such are more likely to biomagnify mercury and other toxins over their life spans. For the most part, they are not consumed in great quantities by either sport or subsistence fishermen. The risk to people is therefore likely low, but is variable given location and frequency of fish consumption. However, the extent of the effects on fish-eating birds and mammals that depend on these resources for survival is unknown.

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In addition to testing fish samples in lakes, researchers also examined lake sediments, lichen, conifer needles, water, air and snow in eight core parks across the western United States. Within Alaska, the lakes tested include Wonder and McLeod Lakes at Denali, Burial Lake in Noatak, and Matcharak Lake in Gates of the Arctic. The study evaluated contamination in vegetation at 20 park units in the western United States, including Alaska. Additional areas tested in Alaska included Katmai, Wrangell-Saint-Elias and Glacier Bay National Parks, and the Stikine-LeConte Wilderness area in the Tongass National Forest.

Within the study, the two contaminants of highest concern for human and wildlife health in Alaska park units included: 1) Mercury – a heavy metal emitted through processes such as burning coal for electricity and smelting ore that causes neurological and reproductive impairment; and 2) Dieldrin – an acutely toxic insecticide banned from use in the U.S. since 1987 that decreases the effectiveness of the immune system.

In the Noatak, the average mercury concentration in lake trout at Burial Lake was the highest concentration of mercury in fish among all parks studied in the western U.S., averaging 218 parts per billion of mercury. However, how that data is used to make recommendations for people's diet varies. According to Dr. Lori Verbrugge from the Alaska Division of Public Health, state fish consumption guidelines specify that health risks associated with exposure to contaminants in most Alaska fish species, including all five species of wild Alaska salmon, are outweighed by the benefits of continued consumption of traditional/country foods. While the average mercury concentration in Burial Lake trout exceeded EPA's human health consumption threshold, suggesting that the general adult population should consume no more than 2.3 meals of these lake trout per month, the State of Alaska's fish consumption guidelines indicate that sensitive members of the population, such as pregnant women and children, can safely eat up to 16 meals per month of Burial Lake trout.

Mercury concentrations in some fish also exceeded EPA's human health consumption threshold at the other Arctic park unit, Gates of the Arctic. Although mercury deposition was relatively low in these two parks based on sediment data, in-lake biological processes that vary among lakes likely contributed to higher rates of mercury bioaccumulation in the arctic aquatic food web. Mercury concentrations in fish at all three Alaska park units exceeded health thresholds suggested for fish-eating birds (kingfisher) and mammals (otter and mink).

Dieldrin concentrations in lake trout from Noatak, Gates of the Arctic, and Denali (which includes other fish species, Burbot and Whitefish) exceeded the EPA's human cancer risk threshold for subsistence fish consumers (adults eating 19 or more meals of these fish per month). However, Dr. Verbrugge noted this recommendation is conservative and in consideration of the numerous advantages to eating fish, the State of Alaska guidelines advise that fish from the remaining lakes in this study are safe to eat in unlimited quantities.

The analysis of fish tissue provided a window into the contaminant situation in various parks, regardless of what fish species were sampled, said Landers. Any one fish species, or lake, excluded from the study is not necessarily exempt from contaminant concentrations of concern.

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Additional findings from the Western Airborne Contaminants Assessment Project can be accessed at http://www.nature.nps.gov/air/Studies/air_toxics/wacap.cfm. Other participating institutions included 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 the collaborating agencies to plan and conduct the WACAP study.

For more information on WACAP results and implications, contact Dr. Dixon Landers at 541-754-4427 or e-mail Landers.Dixon@epamail.epa.gov (USEPA, National Health and Environmental Effects Research Laboratory, Western Ecology Division, Corvallis, OR).

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