In this issue

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Native Voices

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The Tribes and Mercury Pollution

A sixth of childbearing-aged women in the U.S. have elevated levels of it in their blood; the eggs of Arctic seabirds are weakened by it; loons and mink in the state of Maine are at risk of extinction because of its toxic presence; and 45 U.S. states and territories have issued fish-consumption advisories against it for their lakes and streams—17 of them advising that no fish at all be consumed from any lake or stream within their borders.

Mercury is a pervasive poison—the single worst air-pollution threat that we face. That threat is rising as developing nations expand their power-generation capacity and laws are weakened that would reduce mercury emissions from coal-burning power plants, the major source of mercury pollution (see accompanying story). Airborne mercury is a threat that respects no borders, moving on the wind to eventually settle in water, where bacterial processes intensify its toxicity and set the stage for its ingestion by people and wildlife.

What can the tribes do to address this widespread threat to human health and the environment? As their environmental expertise grows, more and more tribes have come to recognize the gravity of the mercury problem and have chosen to act. Despite the magnitude of the challenge, a number of tribes are stepping up to monitor, analyze, and where possible to clean up mercury contamination in and around their lands.

Defining the Problem

Fred Corey, Environmental Director for the Aroostook Band of Micmacs in Maine, describes mercury’s toxic reach: “Even if we could eliminate all other sources of pollution, mercury still makes fish unsafe to eat, even from the most remote lakes and streams. It’s coming from the Midwest—at least that’s what everyone suspects. It’s the unregulated coal-fired utilities, and it’s very unfair. We’re having exceedances of mercury here, but we have no sources. We’re penalized from further development, we’re in violation of the Clean Air Act, and the pollution is not originating here.”

Corey says reservation residents have shown neurological symptoms that could be linked to mercury. However, careful epidemiological studies have not been conducted that might distinguish symptoms that might be linked to mercury exposure. Some Micmac tribal members practice subsistence hunting and fishing (mainly consuming salmon and trout) which magnifies the mercury threat, as subsistence consumers typically eat much greater

Mercury Basics

Mercury, a toxic metal that pervades our modern technological lifestyle, was named for the swift messenger in Greek mythology who traveled on winged feet ferrying missives to and from the gods. The heavy element, used in a host of high- and low-tech conveniences and released from the stacks of electric power and chorine manufacturing plants and other sources, is a far less benign actor. Near the end of the Clinton administration, U.S. EPA declared that, based on the results of scientific research released in 1998, mercury posed the greatest concern to public health of a variety of air pollutants examined in the study.

When ingested or absorbed through the skin, mercury can cause a wide range of often-severe health effects. Fetuses are particularly susceptible to mercury toxicity. When pregnant mothers ingest mercury, it crosses the placental barrier and poisons the developing fetus, creating a host of neurological disabilities that can persist throughout the individual’s lifetime. Even relatively tiny amounts of mercury poisoning can have severe, permanent effects on thinking and functioning. Presently, one in six mothers and 600,000 children in the U.S. each year are at risk for elevated mercury levels in their blood and tissues. And the risks aren’t limited to the unborn and very young; adults who ingest or absorb mercury can suffer a variety of maladies, including liver damage, problems with balance and movement, and other physiologically based maladies that

Tribes and Mercury (cont. on p. 4)

Mercury Basics (cont. on p. 5)
For tribes, particularly those whose members practice a subsistence lifestyle, the mercury threat is magnified...
improve in the near-term. We simply must work harder to ensure that our concerns are heard and addressed.

A second, related positive factor is the improved flow of communication evident between tribal leaders and environmental line staff. As the comment letters demonstrate, a synergy is developing between the different levels of tribal government that can’t help but benefit the tribes as a whole. Leaders are often focused on the larger issues, such as threats to sovereignty and overall economic development. Most tribal members understand and respect that focus. Recent responses to mercury pollution, however, demonstrate that the two segments are working more closely than in the past.

In the case of mercury, sovereignty issues loom large, as the states will apparently be involved in the enforcement of mercury-reduction rules. Clearly this is a case where a solid working relationship between leadership and line environmental staff will help to effectively address specific ecological concerns and broader issues such as sovereignty. I hope that this improved communication continues to evolve.

Finally, I believe the mercury issue has demonstrated a philosophical shift among some tribes: a narrowing of focus to the local level. I view this apparent shift with mixed emotions. Many tribes have long held the value that we are responsible for the fate of the world at large. In my own Hopi tradition, for example, our katsi’na dancers perform their rituals for the circle of life, and in doing we join in nation of people tending to their small part, we become part of an entire backyard.” Perhaps by doing our one professional put it, “tend to your own backyard.”

And yet, when a threat like mercury arises, the only realistic course might be to, as one tribal environmental professional put it, “tend to your own backyard.” Perhaps by doing our one small part, we become part of an entire nation of people tending to their small circle of life, and in doing we join in the most effective kind of collective, taking the local, individual actions that, together, help to improve the lives of all people.

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To Your Good Health: Protecting Yourself from Everyday Mercury Risks

Although the threat from airborne mercury may seem intractable and beyond practical solutions on the personal level, there are steps you can take in everyday life to reduce your risk of mercury poisoning.

- Mercury thermometers: Old-style mercury thermometers may seem harmless, but a single oral thermometer holds enough mercury to poison a small lake. Mercury fumes from a broken thermometer can be inhaled; burning one with trash can create highly toxic fumes; and skin exposure to mercury can result in poisoning. Tribes and municipalities across the nation have responded to this threat by enacting “thermometer swapping” programs where owners trade mercury thermometers for safe digital versions.

  - Mercury switches: Many temperature-sensitive switches, such as those used in home air conditioning systems, contain mercury; such switches pose risks similar to those from thermometers. Swapping programs can replace mercury switches with digital ones, and homeowners can easily replace old or malfunctioning switches with minimal effort or expertise. Contact your tribal environmental department for guidance on disposing of mercury switches.

  - Drug preservatives: Some childhood vaccines, such as those for measles, mumps and rubella, contain the preservative thimerosal, which is 94.6% mercury. Though links between thimerosal in vaccines and medical problems such as autism and muscular dystrophy remain inconclusive, many experts agree that no quantity of mercury in the body is safe, particularly in the case of small children whose nervous system are still developing. Insist that your physician avoid using vaccines containing mercury.

  - Batteries: Though their production has largely been phased out in the U.S., some batteries (e.g., watch and hearing-aid batteries) contain mercury that, through improper disposal, can contaminate the environment. Newer batteries made without mercury are adequate for most uses and should always be substituted for mercury batteries where possible. Avoid burning trash containing mercury batteries, as mercury fumes are highly toxic.

  - Skin ointments: Mercury is still used in some skin-lightening creams and antiseptic ointments. Check the labels when purchasing items and steer clear of skin applications that contain mercury.

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  - Medical waste: For those in the healthcare professions, U.S. EPA Region 5 has created an informative webpage on reducing mercury in the medical waste stream. On the Web, visit: http://www.epa.gov/reg5oair/glakes/fact2.htm

  - Dental amalgams: Debate is ongoing in the dental community regarding the safety of traditional, metallic dental amalgams used for filling cavities. Some say that as they age and abrade, mercury-amalgam fillings release trace levels of mercury into the system. More clear are risks associated with breathing vapors and ingesting fine particles of mercury when amalgams are replaced or re-shaped using high-speed drills and grinders. The standard line among many dentists is that amalgams are safe, but as the risks of mercury toxicity become more apparent, an increasing number of dentists are replacing amalgam with newer, less-toxic filling materials—acknowledging that the safest amount of mercury in the body is no mercury at all.
In doing so they can absorb lethal levels of methylmercury.

In Maine, mink and otters are threatened by mercury deposition and may not be viable into the near future. “Those creatures are not following the fish-consumption advisories,” Corey notes. The Miccosukee Tribe of Indians inhabits a remote patch of land on the edge of the Everglades in Florida. The extent of their regional mercury problem was demonstrated dramatically when a Florida panther was found dead from mercury poisoning. Such predators, at the top of the food chain, consume fish-eating creatures already several steps up the trophic ladder. In doing so they can absorb lethal levels of methylmercury.

Religious and cultural practices tied to the natural world are also at risk when a toxin invades an ecosystem and impacts wildlife and plants that play central roles in tribal religion and lifeways. In a comment letter to U.S. EPA regarding mercury-reduction regulatory proposals now under consideration, Tribal Chief of the Aroostook Band of Micmacs, William W. Phillips, writes, “The fish consumption advisory has had a severe impact on the culture of our tribe. The loss of our cultural ceremonies, language, and songs associated with fishing represents a significant impact on our tribe and results in a permanent loss of the culture which defines our tribe.”

**Measurements and Measures Taken**

The Fond du Lac Band of the Lake Superior Chippewa in Minnesota has been monitoring for mercury for about seven years. Sources in the area include coal-fired power plants within 150-200 miles, taconite (iron ore) plants that burn coal, and some natural deposits. Mercury has been detected throughout the reservation’s abundant wetland areas.

Fond du Lac Air Quality Technician Joy Wiecks says the tribe has conducted mercury-deposition studies as well as fish-tissue and sediment sampling. The tribe’s water specialist, Nancy Costa, has assembled a comprehensive picture of the mercury problem. That information has been presented to tribal leaders, tribal members, and others.

Study results vary widely across the 100,000-acre reservation, a largely boreal/wetland topography surrounded by another eight million acres of traditional tribal hunting and fishing grounds. Mercury levels are most elevated in shallow bodies of standing water, particularly where organic sediment is highest. A third of the reservation’s major lakes show elevated levels of mercury. On a more-positive note, a paper mill three miles from Fond du Lac’s border has made efforts to switch to low-sulfur coal and natural gas, resulting in lower mercury emissions in the area. Still, some 3600 pounds of mercury were released in Minnesota in 2000, all but a fraction going into the atmosphere. Remarkably, those emissions were responsible for just 10–30% of total deposition in the state. (Transport of mercury in the atmosphere carries it virtually everywhere on Earth, even to the waters of once-pristine alpine lakes.)

A fish-consumption advisory for wall-eye, large-mouth bass and other species, was issued in 2001 at Fond du Lac, along with special guidance for expectant mothers. Other, fish species, including species not found in local waters, were also listed with accompanying consumption guides. The report was careful to note that no identifiable “safe” limit on mercury consumption has been established.

Mercury impacts on the Fond du Lac tribe include not only health threats to tribal members, some of whom practice...
Fish are the main transporters of methylmercury into humans, but other creatures that subsist on and recreational hunters consume, such as ducks, geese and some large mammals associated with wetlands, can also pass mercury on to humans.

For tribes whose members rely on subsistence fishing and hunting for food, the problem can be particularly serious, as the amounts of wild game consumed by subsistence hunters and anglers are generally many times higher than average consumption levels. Mercury does not readily degrade in the environment or break down in the body, so prolonged ingestion results in ever-higher concentrations in blood and tissues, eventually causing an array of health problems.

It isn’t just humans who suffer from methylmercury contamination. A variety of wildlife species, most of them with direct connections to wetlands, are impacted by the problem. In Maine for example, two of the state’s iconic species, loons and minks, may face extirpation throughout the state in the coming decades as a direct result of mercury poisoning.

The Regulatory Thicket

Though virtually all other mercury-emission sources are regulated by federal and state government, political pressure from the utility industry has resulted in that sector enjoying a complex environmental-deposition process that ends with ingestion, most notably by way of marine contaminated fish. Although the direct-exposure mode is serious and poses serious health risks (see accompanying article on prevention), mercury contamination of our waterways and aquatic life is a far more pervasive problem, world-wide in its scope and growing as more nations expand their industrial capacity—most notably China and other developing nations.

The mechanism for methylmercury contamination begins when power plants and other industrial sources emit mercury-laden particulates into the air. The pollution settles on water or on land scavenged by rain and snow. Lakes, streams and oceans are often the endpoints for airborne mercury. Once in bodies of water, mercury mixes with sediment, where bacteria act upon it to create a more-toxic substance, methylmercury. Small fish feed on contaminated invertebrates, larger fish ingest them, and the process continues up the trophic ladder until game fish such as largemouth bass, pollock and tuna contain up to a million times the mercury concentrations found in the surrounding water. Generally, the tissues of older and larger fish bear the greatest concentrations of mercury.

Exposure Pathways

Humans are exposed to mercury in two ways: through direct exposure, such as when a thermometer breaks and releases mercury into the lungs; and through a complex environmental-deposition process that ends with ingestion, most notably by way of mercury-contaminated fish. Although the direct-exposure mode is serious and poses serious health risks (see accompanying article on prevention), mercury contamination of our waterways and aquatic life is a far more pervasive problem, world-wide in its scope and growing as more nations expand their industrial capacity—most notably China and other developing nations.

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Mercury Basics (cont. from p.1)

include irritability, shyness, tremors, vision and hearing problems, and memory loss. Research is ongoing on additional effects of mercury poisoning, including its possible link to autism and cancer.

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Native Voices

Tribes and Mercury (cont. from p. 4)

Thorough the data are not yet in, Tribal Environmental Planner Scott Andrews suspects levels in some game species will be elevated. He says there are presently no advisories on shellfish in the area. “Those advisories are generally based on much lower consumption rates,” he points out. “Our rates are 20 to 40 times higher than for the general population.” When the data crunching is complete, the tribe will likely develop a public education program to inform tribal members of the level of mercury (and risk) in area game species. Many Miccosukee tribal members, though not generally “subsistence” fish consumers, are avid anglers. Methylmercury levels in Everglades fish can be high, and in some tribal areas sulfate “hot spots” in local waters, originating from farm-based fertilizer runoff, enhance the process of mercury-methylization, increasing the risk for wildlife and anglers. The state of Florida has addressed an important component of the mercury-deposition problem by retiring area waste incinerators. That move has resulted in a notable decrease in mercury levels in area fish. Still, the mercury problem lingers.

Addressing the Problem

Mercury pollution occurs worldwide, and some have suggested that attempts

Mercury Basics (cont. on p.5)

of comprehensive research that left no doubt about the gravity of the problem. Those proposals would have drastically reduced mercury-tainted emissions from coal-burning power plants and incinerators, cutting mercury emissions by about 50% by 2005. The proposals required modern pollution controls on all power plants as well as an emphasis on cleaner fuels and better efficiency.

Within months after George W. Bush took office in 2001, he rescinded the Clinton proposals and replaced them with a less ambitious goal: reducing mercury emissions from power plants by 30% by 2010 and 70% by 2018. According to some experts, the latter target date appears unrealistic and will probably have to be extended until 2025, resulting in hundreds of additional tons of mercury deposited in our environment. Final rules on mercury will be announced in December of 2004. Meanwhile, the public-comment process, and the industry lobbying, continue.

A two-option proposal has been put forth by the Bush administration: along with MACT standards, they have proposed that mercury be “market-traded” in the way that carbon dioxide credits are traded by industrial sources. Polluters who have cut their emissions under this system obtain “credits” that they can sell to dirtier plants, allowing the latter to pollute at a higher level. This system would rely largely on older plants being decommissioned over time.

However, an executive order by Pres. Bush relaxed pollution-control standards on older plants, allowing upgrades of up to 30% of the facility’s total worth without their having to install new pollution controls. This will enable many older plants to extend their functional lives well beyond earlier projections.

Air-quality experts, including all of the tribal environmental profes-

"Municipal waste incinerators have reduced emissions by 90% and medical waste by 94% since 1990. To propose that utilities cut their emissions by only 30% and by the end of the decade is ludicrous."

-Excerpt from the Fond du Lac Tribe’s comment letter to EPA
Mercury Basics (cont. from p. 6) 

To mitigate the problem in the U.S. are meaningless because newly industrialized “third-world” nations are dramatically expanding their coal-based electrical generating capacity. Micosaukee environmental professional Steve Terry believes that such thinking is counter-productive and threatens to undermine efforts to take the small steps that can reduce the threat to individual communities. “You do what you can in your own backyard,” he says.

Tribes and Mercury (cont. from p. 6) 

A number of tribes have acknowledged the seriousness of the mercury problem and some have developed programs to gauge the threat and develop plans to reduce its impact. As one tribal environmental professional puts it, “The problem of mercury is nationwide. All that you can do sometimes is try to clean up your own backyard. That’s what we can do here, and that’s what we’re trying to do.”

Tribes and Mercury (cont. on p. 8)
came after the proposals had largely been developed. The tribes share a widespread perception that they were ignored during the consultation process. “Commenting is not consultation,” Wiecks points out. Late-hour discussions were held with a small number of tribes, but most believe that the proposals were drafted with no serious attempts to seek tribal input.

EPA’s Tribal Program Coordinator, Laura McKelvey, says that in her mercury-related discussions with the tribes she noted several recurring themes: the belief that they were not consulted in a timely manner; threats to tribal sovereignty (the new mercury rule, regardless of its form, will likely be implemented through the states); and a near-unanimous perception that neither the proposed MACT standards nor the “cap and trade” proposals under consideration are adequate to address mercury’s threat to human health and the environment.

Only an aggressive solution, says Micmac environmental director Corey, will turn things around. “We’ve made a lot of environmental progress in the last 30 years, since EPA’s been around. If we start backsliding now, it’ll be much more expensive to deal with it later. We’ll have a big price to pay in the future for [the present administration] rolling back our environmental regulations.” As one tribal environmental professional recently summed up the regulatory strategy now in play: “EPA is going at this backwards. We should be telling them how much fish we’re eating, and they should make it safe for us to do so.”

Just as mercury pollution is everywhere, Corey believes, fighting it requires a wide-ranging strategy. Along with aggressive regulation, he says, “One of the keys is public education. Citizens of the U.S. are not aware of what’s going on. If we get the word out to the public, there would be a lot of people who would jump up and demand that we stop giving these handouts to the utility industry; that we stand up to them. Over 30 years ago, people saw fish floating in the rivers, and one river in Ohio caught fire. It was despicable, and people got tired of it and demanded that the government take action. With air, it’s a little different. You can’t see mercury, or taste or smell it, but it’s impacting us. If people knew, they would demand that the government take stronger action. There’s really no excuse that I can think of for ignoring the mercury problem.”

EPA Administrator Visits TAMS Center

On Monday May 24, 2004, EPA Administrator and former Utah governor, Mike Leavitt, visited ITEP’s Tribal Air Monitoring Support (TAMS) Center in Las Vegas, Nevada. Farshid Farsi, TAMS Center Co-director, accompanied Administrator Leavitt on a tour of the facility and its various training components. During a stop at the TAMS monitoring platform, Leavitt repeatedly inquired about the status of tribal air monitoring and how many tribes that have received training at the TAMS Center are actually conducting ambient air monitoring on their reservations. Leavitt was upbeat about the EPA/ITEP collaborative work in Las Vegas at the TAMS Center.

Farshid Farsi summarized the tasks that have been accomplished by the TAMS Center in the past four years and described the Center’s future plans, including integrated multimedia training to meet the needs of tribes in areas such as drinking water sampling/analysis. Admin. Leavitt expressed his support for the TAMS Center’s work and noted that a need exists for increased collaborative efforts between the tribes and other governments to fill gaps in environmental resource management.

Later, Leavitt held a meeting with all staff at the facility (EPA and TAMS), where he discussed his environmental background and emphasized the need for an improved government-to-government working relationship between the tribes and EPA.