

MERCURY IN THE ENVIRONMENT

STATES RESPOND TO THE CHALLENGE



A Compendium of State Mercury Activities



***Clean Air Network &
Environmental Council of States
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Acknowledgements

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The compendium is available on the internet from ECOS and Clean Air Network.

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MERCURY IN THE ENVIRONMENT: STATES RESPOND TO THE CHALLENGE

From 1983 to 1994, the use of mercury (primarily in batteries) in the United States has, according to the U.S. Environmental Protection Agency, decreased by 72 percent, a real success story in terms of pollution prevention. Yet, mercury remains a perplexing and troublesome contaminant in the environment since:

- The amount of mercury in the atmosphere has increased by roughly 1.5 percent per year over the past decade. (Major sources are coal combustion, waste incineration, manufacturers and metal processing.)
- It persists in the environment and “bioaccumulates.” In other words, organic mercury stays around and increases up the food chain. (Mercury surpasses PCBs as a cause of fish consumption advisories. Forty states have issued such health advisories for fish contamination.)
- It is toxic to the nervous system, and unborn children are the most at risk. Women of childbearing age, especially expectant mothers, should be very knowledgeable of fish advisories. (The National Academy of Sciences recently concluded that over 60,000 children born each year may be at risk for neurodevelopmental problems due to mercury exposure in utero.)

Recognizing the challenge of mercury in the environment, many states have taken a proactive approach. This compendium provides a vehicle for States to share and highlight some of the approaches underway, both voluntary and regulatory, to address the mercury problem in their state. The compendium was developed for participants attending the ECOS Mercury Conference (October 18-20, 2000). Twenty-six States are included in this compendium.

Arkansas Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Arkansas has taken no regulatory action regarding the mercury issue.

2. non-regulatory

- Arkansas Department of Environmental Quality implemented a mercury collection program that was very successful in eliminating some of the elemental mercury that individuals and small businesses had obtained over the years. Most of them were glad to get rid of it.

Public outreach/education efforts

- The Arkansas Department of Environmental Quality (ADEQ), Arkansas Department of Health (ADH), and the Arkansas Game and Fish Commission worked very hard toward public outreach and education. The ADH put together several pamphlets and brochures describing the mercury problem and the need for caution. They held focus group meetings to try and determine the best way to reach the populations at risk and at-large. The three agencies worked closely to put together an advisory pamphlet outlining the fish consumption advisory areas, the advisories, and what they meant. The AGFC took the lead in this function. They also included the information in the fishing regulations book they publish annually. TV stations worked with the agencies, sometimes for free, sometimes not, to put out public service announcements about the mercury problem.
- We had many individuals from the three agencies at bass club meetings, at county fairs, or anywhere else that they were allowed showing a video that was developed by the Arkansas Mercury Task Force and talking about the implications of the mercury problem. There are a number of other initiatives taken by the ADH and AGFC to do public outreach. Many are not listed here, but were equally important and somewhat productive.

Research/monitoring efforts

- The Arkansas Department of Environmental Quality, with the help of the Arkansas Game and Fish Commission, undertook an extensive fish flesh monitoring program to delineate the extent of the problem. Upon completion of the original monitoring program, the two agencies worked to “give back” some of the fish that were taken away. By that I mean that we worked to develop species specific rather than group advisories; develop size class-based advisories; reanalyze borderline advisories that were done with limited data or data interpolation; and to study different reaches of the stream/river to determine if upstream areas could be removed from the advisory.
- The Arkansas Department of Environmental Quality did some monitoring of treatment plant effluents to determine if mercury was being discharged to the impacted streams, rivers, and lakes. We did some limited atmospheric monitoring but that met with little success since we had no major funding program. We also did some studies to determine the correlations between water quality, habitat, and mercury in Arkansas lakes.

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- The Arkansas Department of Health, with funding from the mercury task force, performed some limited blood analysis in our initial advisory areas. A broader screening program was also initiated, in conjunction with their blood lead program, to screen two of the high-risk groups, mothers and children.

Resources developed by state

- There were many brochures, pamphlets, and presentations developed for the mercury problem. One of our most significant resources developed was a video that was either used in presentations or distributed to video stores for free rental. We also issued two major reports and several smaller reports regarding the mercury problem in Arkansas. Through funding by the Arkansas legislature we sponsored two major studies regarding mercury availability to the biota. There were many smaller scale studies that were performed during the project. Most are still awaiting publication in a final report that has been in progress for 5 years or so.

Mercury Committees/Task Forces

- Arkansas developed a task force consisting of representatives from the Arkansas Department of Health, Arkansas Game and Fish Commission, Arkansas Department of Environmental Quality, University of Arkansas Water Resources Research Center, and a local water quality researcher from a private university. The task force was very active in delineating the problem, getting the word out, and doing further research. Much of their work was proactive after the initial reactionary phase. It worked well until the new governor and legislature cut funding. Part of task force's responsibility was to establish an advisory committee made up of private individuals, other state agencies, and impacted businesses. It was their responsibility to determine the research and information needs of the public at large.
- We participated in the Southern States Mercury Task Force including hosting a meeting to look at ways to mitigate the mercury problem. The results of that meeting are still awaiting publication due to a lack of funding.

Current statistics on fish consumption advisories

Total number of advisories: 23
Total river miles: ~240
Total lake acres: over 24,000

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Connecticut Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Adopted the .028 mg/dscm emission limitation for municipal waste incinerators regardless of size.
- Developed a streamlined permit to facilitate the recycling of fluorescent lamps at municipal recycling drop sites.
- Added mercury-containing lamps to state listing of Universal Wastes.

2. non-regulatory

- School audit and cleanout program to remove elemental mercury and mercury compounds from labs.
- Participating in Thermostat Recycling Corporation program to recycle thermostats.
- Conducting mercury thermometer exchanges through health fairs and household hazardous waste collections.
- Funding program for removal of mercury switches from cars at junkyards and car dealers. (Partnering with state Dismantler's Association)

Public Outreach

- Issued a statewide fish consumption advisory through DEP and Department of Public Health with signs posted at lakes.
- Series of commercials to focus on mercury and thermometer exchanges.
- Development of a table-top exhibit on mercury.
- Promote mercury reduction for Pollution Prevention week in September
- Established goal of 2001 pounds of mercury collected by the end of 2001 and using a promotional thermometer to measure progress.

Research/monitoring efforts

- DEP and the Environmental Research Institute (ERI) conducted a three phased fish tissue mercury monitoring program from 1995-1999. The study looked at total mercury concentrations in fish, bioaccumulation, and seasonal fluctuations.
- DEP and ERI conducted a three year atmospheric mercury monitoring project. The project is assessing spatial and seasonal distribution of atmospheric mercury and deposition in Connecticut.

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- DEP and UCONN and have been studying sources and cycling of mercury and methylmercury in Long Island Sound. The study focuses on the distribution, mechanisms, and sea-air exchange of elemental mercury, the seasonal and spatial distribution of total, reactive and methylmercury, the Connecticut River and estuarine zones contribution of mercury, atmospheric deposition and transport, construction of a mass balance model for mercury and monomethylmercury cycling in Long Island Sound and the historical changes in the Long Island Sound mercury burden.

Resources developed by state

- Fact sheets and other information on mercury and mercury initiatives added to website.
- Developed and distributed "The Environmentally Responsible Dental Office: A guide to Proper Waste Management in Dental Offices".
- Released a state mercury plan, "Toward the Virtual Elimination of Mercury From the Solid Waste Stream".

Mercury Committees/Task Forces

- Conference of New England Governors and Eastern Canadian Premiers Mercury Task Force.
- Universal Waste Committee which recommended including mercury-containing devices to the state listing of universal wastes.

Current statistics on fish consumption advisories

- Statewide for all freshwater bodies. From four specific waterbodies, the high risk group (pregnant women, women planning on becoming pregnant, and children under six) are advised not to eat pickerel, smallmouth bass and largemouth bass. All others are advised to limit consumption to one meal per month. From all other waterbodies, the high risk group is advised to limit consumption of all species of freshwater fish to one meal per week and others to one meal per month.

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Delaware Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Delaware's Surface Water Quality Standards specify applicable water quality criteria for the protection of aquatic life and for the protection of human health. OxyChem (a chloralkali facility) is the only NPDES permittee in Delaware with a water quality-based effluent limitation designed to comply with Delaware's water quality criteria.
- With respect to air emissions Oxychem is permitted under Delaware Reg. 21, Sec. 12, which specifies a plantwide emission limit of 2,300 grams/24-hour period (1,850 lbs/yr). Parametric monitoring is used to demonstrate compliance. No other facilities are permitted for mercury. AP-42 emission factors exist for coal, oil, and municipal waste combustion, so presumably mercury emissions could be calculated for the utilities and other large combustion units, including the dormant Energy Generating Facility at Pigeon Point.
- Twenty-five facilities reported the generation of wastes containing mercury during 1995. Additionally, Oxychem reported on wastes generated from several mercury cell processes. Oxychem reported approximately 500 tons of mercury-containing wastes, all of which were shipped off-site for further waste management. The remaining 24 facilities reported the generation of from 1 to 11,200 pounds of wastes. The DuPont Experimental Station was the only facility that reported receiving mercury-containing wastes from off-site and was the only facility that managed mercury waste on-site.

2. non-regulatory

- There are no mercury recycling facilities in Delaware. Mercury-containing household batteries are accepted at the Delaware Solid Waste Authority drop-off centers. No data exist for mercury in municipal landfill leachate. Mercury in wastes is not expected to be soluble.

Public outreach/education efforts

- Over 40,000 copies of the "Delaware 2000 Fishing Guide" were distributed this year to fishermen and to bait & tackle shops. The Guide contains a listing of current fish consumption advisories in Delaware, including those involving mercury. The Delaware Division of Public Health posts advisory signs on all waterways with advisories at public access points. Delaware commissioned a major fish consumption survey of the Delaware Estuary in the early 1990s.

Research/monitoring efforts

- Since 1993, Delaware has tested for mercury and other PBT chemicals in over 175 fish samples collected from waters throughout the State. Based on the data, mercury has (only) contributed to 5 fish advisories. The vast majority of advisories in Delaware are due to elevated levels of PCBs, and to a lesser degree, dioxins/furans, and chlorinated pesticides. Aquatic sediments have also been tested for mercury

during several special studies in targeted watersheds. Mercury was not identified as a major contaminant of concern in those studies. Finally, surface waters throughout Delaware have also been tested for mercury with very few criteria exceedances being observed.

- No data on mercury exist from either point source or ambient air monitoring. Mercury, however, is not typically a monitored parameter.
- There are 45 sites statewide that have data indicating some mercury contamination in one or more of the following media: surface soil, sub-surface soil, groundwater, surface water, and sediments. Most sites (32 of 45) have contamination below 1 mg/kg. Those sites with greater than 1 mg/kg contamination mostly exhibit these higher concentrations in the soil, although three sites have sediments with contamination above 1 mg/kg. The DuPont Louviers-MBNA site possesses the highest concentration of mercury contamination at 680 mg/kg in the surface soil.

Resources developed by state

- Information on Delaware's fish consumption advisories is available at the following web site: <www.dnrec.state.de.us/entryfsh.htm>

Mercury Committees/Task Forces

- Delaware previously participated in the Northeast Regional Mercury Task Force spearheaded by the NJDEP.

Current statistics on fish consumption advisories

Total number of advisories: 5
Total river miles: not available
Total lake acres: 2 lakes (183.4)

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Georgia Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- The GA Environmental Protection Division (EPD) regulates mercury through several programs in different media branches
 - Air Protection Branch (APB) regulates air releases of mercury from sewage sludge, medical waste, and municipal incinerators, also from one chlor-alkali plant.
 - Hazardous Waste Management Branch (HWB) has "risk reduction" standards for mercury in both soil and water for state superfund sites
 - Water Protection Branch (WPB) has NPDES permits for mercury at several industries, WPB has health based water quality criteria for mercury

2. non-regulatory

- Pollution Prevention Division (PPD) has developed information on source reduction, recycling, and disposal for mercury
- PPD also works directly with industry and local governments to reduce waste streams (i.e., PPD has worked with a large power company in Georgia to reduce emissions from coal burning, and with a local government to establish a pilot collection center for mercury containing products
- PPD worked to encourage the location of a thermostat recycling facility in Georgia, projected to begin operations in 2001 - will establish contractors as (free) collection and recycling points for homeowners with mercury containing thermostats

Public outreach/education efforts

- EPD produces extensive set of fish consumption guidelines (43 chemicals routinely monitored in multiple species of fish) - released annually
- Guidelines distributed through EPD offices, fisheries offices, and the state Health Department, and included in the annual Fishing Regulations
- Guidelines are posted on the EPD website (www.ganet.org/dnr) and information is reported to U.S. EPA for listing on national list
- Signage used to a limited extent (special cases only) - detailed site-specific brochures are produced for some high interest areas
- Creel surveys conducted routinely to evaluate angler habits - one site-specific detailed fish consumption survey has been conducted in Georgia

Research/monitoring efforts

- TMDLs currently being developed for several watersheds in Georgia (by U.S.EPA)
- Ecological monitoring conducted at federal superfund sites (U.S. EPA) and state superfund sites (HWB)

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- Ambient monitoring of mercury conducted throughout the states waters (WPB)
 - Air monitoring has occurred in isolated instances (special study circumstances) - recently obtained air mercury analyzer, this analysis will be added to a limited number of state-wide air monitoring sites (APB)

Resources developed by state

- In addition to PPDs brochures and EPDs consumption guidelines and website, EPDs annual report addresses mercury issue

Mercury Committees/Task Forces

- One EPD associate is an active member of the Southern States Mercury Task Force - a group that has historically dealt with fish tissue and water pollution issues
- One PPD associate is a member of a National Mercury Task Force - responsible for development of outreach materials to educate homeowners on the danger of mercury and the household products it is a component of

Current statistics on fish consumption advisories

- Total number of advisories: U.S.EPA lists 96 total with 80 for mercury
- EPD counts differently, 89 total with mercury accounting for or contributing to 76 (either way mercury is most significant contributor to Georgia's fish consumption guideline restrictions)

Total river miles: 2306, approximate
Total lake acres: 332,948, approximate

Contacts:

APB- Tony Cutrer, 404.363.7115
WPB- Linda Harn, 404.675.1647
HWB- Cliff Opdyke, 404.657.8644
PPD- David Gipson, 404.657.5208
Fish Advisories- Randall Manning, 706.369.6376

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Illinois Mercury Efforts

Public outreach/education efforts

- Illinois has only 2 Hg fish advisories: large mouth bass greater than 18 inches at Cedar Lake and all size large mouth bass in Kincaid Lake
- The Department of Public Health is conducting education outreach about fish advisories to women of childbearing age throughout the state. Also, Illinois annually conducts predator fish surveys for Hg and other toxin analysis from selected water bodies throughout the entire state. Contact Tom Hornshaw at IEPA 217-785-0830.

Research/monitoring efforts

- Illinois EPA has recently received a grant to purchase a Tekran Hg monitor to initiate an Hg air-monitoring program in Cook County which will identify atmospheric Hg concentrations through an ambient monitoring program and identify sources of concern for Hg emissions. Contact Paula Mullenix-Mara at IEPA 217-782-2113.
- The DWPC has recently arranged for the IEPA laboratory to change to a much more sensitive analytical method for measuring mercury in ambient surface waters and wastewater effluents. The new method has a minimum detection level (MDL) of 10 parts per trillion (ppt) whereas the previous method had an MDL of 100 ppt. This will enable the DWPC to assess whether effluents and waters of the state meet stringent mercury water quality standard for human health (12 ppt) adopted in 1996. Initial findings from the Ambient Water Quality Monitoring Network stations sampled since January, 2000 show that mercury has not yet been detected in water samples from rivers and streams. Contact Bob Mosher at IEPA 217-782-3362.
- The DWPC will monitor more effluent discharges for mercury on a prioritized basis. Our goal is to sample major municipal discharges, and industrial discharges where mercury would potentially be present, once a year. This information may lead to the discovery of facilities that have mercury problems in their wastewater, eventually leading to NPDES permit limits if water quality standards are not met. NPDES permit limits would then lead to control of mercury through local regulation of tributary wastestreams to publicly owned sewage treatment plants or increased treatment and internal control at industrial facilities. Consistent finding of mercury levels above the water quality standard in these self-monitoring analyses may also lead to permit limits for mercury. Contact Bob Mosher at IEPA 217-782-3362

Current statistics on fish consumption advisories

Large mouth bass > 18 inches at Cedar Lake
All size large mouth bass at Kinkaid Lake
Total number of advisories: 2
Total lake acres: 4500

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Indiana Mercury Efforts

Scope of mercury reduction efforts

- Indiana has raised efforts related to mercury to an agency-wide priority as of 1997. Focusing on children's health issues and the widespread contamination of mercury in our waterbodies, IDEM has worked through regulatory and non-regulatory ways to monitor for mercury in the environment, to prevent additional mercury from being released to the environment and to clean up mercury contamination.

1. regulatory

- IDEM is doing scientific work to improve the available water quality and air deposition database to guide future regulatory and voluntary efforts. Our work includes partnering with federal agencies to expand monitoring and to compile a more detailed inventory of potential sources of mercury contamination. IDEM's mercury workgroup is working on the development of a mercury air emissions inventory for the state. This inventory, based on emissions data from 1993, will be used to identify industry sectors that most heavily contribute to emissions and to help in targeting outreach and pollution prevention efforts.

- Through IDEM's environmental permit systems, we regulate facilities that emit mercury into the air, water, and waste streams. In addition, IDEM has been working to modify current regulations so that mercury may be more easily recycled. The Agency has controlled certain mercury emissions through permitting sources such as: NPDES permits for POTW and industrial sources, air and waste permits for waste incinerators and air permits for fluorescent lamp and ballast recycling. IDEM is also implementing updated water quality standards consistent with the Great Lakes Initiative.

- IDEM's water office (OWM) has been collecting fish tissue and sediment samples from Indiana's lakes, rivers and streams for many years. This data set is being used to develop mercury trends throughout the state. OWM is currently working on maintaining a consistent set of data points in order to compare the fish and sediment samples from one year to the next.

2. non-regulatory

- In an unprecedented, cooperative action, the Indiana Regional Household Hazardous Waste Task Force and the Indiana Department of Environmental Management are working with Indiana solid waste management districts, communities, and businesses to reduce mercury contamination. Indiana's Mercury Awareness Program (M.A.P.) started taking shape early in January of 1998 as a part of Governor O'Bannon's Building Bright Beginnings Program.

- Statewide public education on the dangers of the use and improper disposal of mercury. Household mercury collections were established in every Indiana county (92) in the fall of 1998. Indiana residents turned in over 2100 pounds of household mercury and mercury-containing devices for recycling during the first few months of the program. A total of over 4,300 pounds of mercury has been turned in since October 1998. A comprehensive education program that included brochures, posters, spill clean up guidance and promotional items accompanied the collections.

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- Indiana has focused on:
 - Mercury thermometer exchanges over 5,000 mercury thermometers have been exchanged for a free digital one in cooperation with the Task Force, the local solid waste management districts, Eli Lilly and Cinergy.
 - Collected over 4,300 pounds (since October 1998) of elemental and other mercury devices and debris.
 - Ongoing mercury collection and education programs.
 - A school pledge program to get mercury out of Indiana schools - 27 schools are participating.
 - Three major Indiana Steel Mills came together with USEPA, IDEM and the Delta Institute to work on the Mercury Steel Mill Virtual Elimination Initiative. US Steel, Ispat Inland Steel and Bethlehem Steel have completed two phases of the work. They have completed a report identifying all the areas where mercury is located and developed a plan to the facilities of mercury with a time line.
 - IDEM is working with the hospitals to develop a hospital pledge program to identify, inventory and recycle mercury and mercury-containing devices. These will be replaced with mercury-free devices.
 - In the winter of 1996, a Mercury Thermostat Reduction and Recycling Program was developed for the heating, ventilation, air conditioning and refrigeration industry. As part of the program, HVAC-R contractors and suppliers agree to a pledge indicating the company's commitment to protecting customers and the environment from the dangers of mercury. Approximately 120 HVAC-R contractors and 30 HVAC-R suppliers are participating in this voluntary program. In addition, we have approximately 10 architectural and mechanical engineers specifying non-mercury (electronic) thermostats.

Public outreach/education efforts

- The 2000 Indiana Fish Consumption advisory, made available by the Indiana State Department of Health (ISDH), the Indiana Department of Natural Resources (DNR) and IDEM is available both on the web and in hard copy. The A copy goes to each retailer who sells fishing licenses, to each Solid Waste Management District and to a variety of interested parties. There is abbreviated (one page) FCA information in the annual Indiana Fishing Guide put out by the DNR. It gives information on the top 12 streams, risks, and proper cooking. These are distributed with every fishing license sold which number in the hundreds of thousand.
- ISDH produces and distributes a brochure ("An Expectant Mother's Guide to Eating Indiana Fish: What You Should Know If You Are Pregnant, Planning to Be Pregnant, Nursing a Baby")
- Several posters are also distributed to anglers and those who sell the fishing licenses.
- A fishing license holder was also sent to the retailers to provide when a license is sold. The holder provides information about mercury as well as a number to call for questions or to obtain a copy of the FCA.

Research/monitoring efforts

- Because of mercury's human health effects, IDEM has embarked on a mission to reduce human exposure. An internal mercury workgroup was developed and has met every two months to discuss and analyze existing data. The workgroup worked with

the United States Geological Society (USGS) to gather mercury data in air, land and water. The result of this work has led to a potential contract between IDEM and the USGS. The contract will include mercury monitoring in dry and wet deposition at four sites in Indiana.

- TMDL study occurred at the Grand Calumet/Indiana Harbor Ship Canal.
- Indiana conducted a Pilot Project for Trace Metal Collection and Analysis and the report is available on the web.
- OWM collected information on trace metals in precipitation in Northwest Indiana.

Resources developed by state

- Indiana has two main web sites for mercury information that contains links to our brochures, reports and other materials: < www.state.in.us/idem/ctap/mercury/index.html > and < www.state.in.us/isdh/dataandstats/fish/fish_2000/fish_cvr_2000.htm > .

Mercury Committees/Task Forces

- The Indiana Department of Environmental Management (IDEM) has been working on mercury issues since 1995. IDEM formed an internal mercury workgroup. The goal of this workgroup is to direct the agency toward our priorities and to reach mercury objectives through the Environmental Performance Partnership Agreement. The work and activities of each office are coordinated through the group throughout the year. The workgroup insures all IDEM mercury initiatives take a multi-media approach and not only address the use of mercury, but also determine how mercury is getting to the environment.

Current statistics on fish consumption advisories

Total number of advisories: 2000: 53 rivers and streams and 66 lakes for a variety of advisory levels.

Total lake acres: 69,260 lake acres

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Kentucky Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- No state air pollution standards for mercury
- Wastewater discharge limits based on water quality criteria. Contact Bruce Scott , Division of Water at (502) 564-3410
- No bans on disposal/incineration of mercury-bearing products

2. non-regulatory

- No state sponsored mercury take back programs
- Pollution prevention training for Health Care Providers includes mercury recycling. Contact Lissa McCracken, Kentucky Pollution Prevention Center at (502)852-0965
- Pollution prevention training for Office Buildings and Managers includes handling of fluorescent bulbs and thermostats to prevent mercury releases. Contact Lissa McCracken, Kentucky Pollution Prevention Center at 502(852-0965)
- Business/household recycling programs for mercury batteries are part of the City of Louisville recycling program. Contact Robert Schindler, Jefferson County Waste Management District at 502(574-7336)
- Electronic Environmental Solutions(EES) in Lexington, Kentucky is a mercury collection center and accepts any product containing mercury. Contact EES at (859)252-0321

Public Outreach/education efforts

- News release on statewide fish consumption advisory. Contact Rice Leach, Commissioner, Department for Public Health at (502)564-3596.

Research/monitoring efforts

- One TMDL for mercury is scheduled near Paducah Gaseous Diffusion Plant. Contact Kevin Ruhl, Division of Water at (502)564-3410
- Mercury testing in wildlife and fish at Paducah Gaseous Diffusion Plant. Contact Jon Maybriar, Division of Waste Management at (502)564-6716
- Mercury is tested in state ambient rivers water quality monitoring program. Contact Tom VanArsdall, Division of Water at (502)564-3410
- State has acquired mercury air sampling equipment and begun site-specific testing. Contact Jerry Sudduth, Division for Air Quality at (502)573-3382

Resources developed by state

- Report on state fish tissue monitoring program for mercury is being drafted and will be put on Division of Water's web site and be available by hard copy. Contact

Mike Mills, Division of Water at (502)564-3410

· Website at Kentucky Pollution Prevention Center describes training programs dealing with mercury at <www.kppc.org>.

Current statistics on fish consumption advisories

Statewide advisory is in effect

Total river miles 49,769

Total lake acres 218,362

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Louisiana Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- If identified as a possible component in a wastewater discharge, a limit (mass and/or concentration) would be developed and included in the LPDES permit. Guideline values, if applicable, would be compared to state Water Quality Criteria (human health and aquatic toxicity), and the more stringent limit (technology vs. water quality based) would be incorporated as the effluent limit.
- Air emissions are modeled against state ambient standards to ensure that permitted levels will not present an unacceptable risk.

2. non-regulatory

- There is at least one lamp recycler that participates with DEQ in Household Hazardous Waste collection efforts. That service is of course available to industrial clients for a fee.

Public outreach/education efforts

- LDEQ's Website contains: fish consumption advisories; a description of health problems associated with mercury; some of the sources of mercury; a pointer to the Mercury Deposition Network
- LDEQ and the Department of Health and Hospitals (DHH) have jointly published informational brochures about Hg consumption advisories. Distribution was handled by DHH.
- Hg consumption advisory information is posted at publicly owned boat launches of affected waterbodies. Signs contain site specific information detailing the advisory.
- The Department of Wildlife and Fisheries (WLF) has conducted fish consumption studies in conjunction with creel surveys. The purpose of the study was to aid in determining fish consumption patterns of recreational fishermen.

Research/monitoring efforts

- LDEQ is currently monitoring fish tissue, water sediment and epiphytes for Hg at about 100 sites each year and about 1000 fish tissue samples are analyzed per year. Fish Tissue monitoring includes freshwater, estuarine and saltwater species. LDEQ has also analyzed for mercury in Alligators, Shrimp, Crabs and Crawfish.
- At these same locations, LDEQ is monitoring soil type, % sand, silt and clay.
- LDEQ is participating in the national air deposition study, currently with three sites and another to be added this FY. Both mercury and methyl-mercury are monitored at these sites.
- DHH has conducted blood mercury monitoring in parishes with Hg advisory sites.

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- LDEQ has contracted with LSU Wetland Biochemistry Institute – “Mercury Contamination in Louisiana Freshwater Lakes: The Effect of Anaerobic Sediment Conditions on Methylation and Demethylation of Mercury”.

Resources developed by state

- www.deq.state.la.us is LDEQ’s website address. All mercury monitoring data is posted on the website within 30 days of its validation, and all fish consumption advisories are posted upon issuance.
- Brochures have been developed jointly with DHH
- WLF devotes part of its Hunting and Fishing brochure to Hg issues and prints the most current list of advisories for distribution with fishing licenses.

Mercury Committees/Task Forces

- LDEQ/DHH/WLF participate as members of the Southern States Mercury Task Force

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Maine Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Product labeling/disposal ban. *38 MRSA sec. 1661 et seq.* Maine requires manufacturers of some mercury-added products to affix a label stating that the product contains mercury and may not be placed in the trash. There is also a ban on disposal of specified products listed in law, including all non-residential fluorescent lamps by July 2002, and household mercury-containing products by 2005. Contact John James, Bureau of Remediation and Waste Management, DEP 207-287-7866
- Air emissions. *38 MRSA sec. 585-B(5).* Air emission sources may not emit more than 100 pounds of mercury per year after January 1, 2000 or more than 50 pounds per year after January 1, 2004. Compliance with these requirements must be specified in air licenses. Contact Kevin MacDonald, DEP 207-287-7598.
- Water discharges. *38 MRSA sec. 420(1-A).* No discharge is allowed if it would increase concentrations in receiving waters. Maine is developing regulations to establish interim discharge limits for every facility with a NPDES license, developing model pollution prevention plans for use by communities and industries and will issue new water quality criteria in 2001. Municipalities and industries are required to implement a mercury pollution control plan, conduct sampling using clean techniques, establish interim limits and verify compliance with limits, and report progress to DEP in December 2000. Contact Sterling Pierce, DEP 207-287-4868.

2. non-regulatory

- Maine is developing a program to provide funding and technical assistance to municipalities for collection of household hazardous waste. Mercury-added products will be targeted under this program. Contact George MacDonald, Maine State Planning Office 207-287-5759
- Maine is working with dentists and other interested parties to develop a pollution prevention plan, including source reduction, for mercury in dental procedures. We produced an "Environmental Guide for Dentistry" that prominently features mercury. Contact Ron Dyer, Office of the Commissioner, DEP 207-287-4152
- Maine is removing mercury manometers from dairy barns and replacing them with non-mercury vacuum pressure gauges at no cost to the farmer. Contact Chris Rushton, Office of the Commissioner, DEP 207-287-7100
- Maine is working with health care facilities to reduce their use of mercury-added medical instruments and health care products. Contact Scott Austin, Bureau of Remediation and Waste Management, DEP 207-287-7854

Public outreach/education efforts

- Maine has created a staff position in the Department of Environmental Protection to conduct an education program related to mercury-added products. Carole Cifrino, Bureau of Remediation and Waste Management, DEP 207-287-7720

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- SPO provides information to municipalities on conducting HHW collection programs and has a couple of reports on the subject. Contact Sam Morris, Maine State Planning Office 207-287-3261
 - Using the EPA methodology on issuing fish advisories, Maine has a statewide mercury advisory on all inland waters, striped bass, and bluefish. Separate advice regarding fish consumption is given for sensitive populations such as women who are pregnant, may get pregnant, or are nursing and for children under eight. An updated advisory will be publicly issued in the next few weeks. Contact Andy Smith, State Toxicologist, 207-287-5189.

Research/monitoring efforts

- Wet Deposition. As part of the National Mercury Deposition Network (MDN), we measure mercury in wet deposition at four sites in Maine. Description of the program can be seen at <<http://nadp.sws.uiuc.edu/mdn/>> .
- Mercury in Fish. Collection of additional data on mercury levels in fish from various lakes, ponds, rivers and streams to aid fine tuning of the Bureau of Health's fish consumption advisory.
- Mercury in Loons. Studies on the effect of high levels of mercury on Maine loons.
- Mercury in other species. A study of the effects of high levels of mercury on mink, otter, and other species.
- Facility specific monitoring. Ambient air monitoring data around Holtrachem, a mercury process chlor-alkali facility.

Contact Barry Mower, Biologist, Bureau of Land and Water, DEP 207-287-7777

Resources developed by state

- Reports:
 - *Mercury in Maine*, Land and Water Resources Council, 1997 Annual Report, Appendix A
 - *Labeling and Collection of Mercury-Added Products*, Land and Water Resources Council report to the Joint Standing Committee on Natural Resources, 119th Maine Legislature, January 1999.
 - *Mercury in Wastewater*, Maine Department of Environmental Protection report to the Joint Standing Committee on Natural Resources, 119th Maine Legislature, February 1999.
 - *Lessons Learned from Four Years of Regional Household Hazardous Waste Collections, 1995-1998*, Androscoggin Valley Council of Governments, February 1999
 - *Managing Household Hazardous Waste*, Maine State Planning Office and Androscoggin Valley Council of Governments, August 1995
- Brochures:
 - "Mercury Management in the Health Care Environment", April 1999
 - "The Environmental Guide for Dentistry", April 2000
 - "Does Your Milking System have a Vacuum Gauge with Mercury?", August 2000

· Websites

- DEP: <<http://janus.state.me.us/dep/mercury.htm>>
- SPO: <www.recyclemaine.com>

Submitted by:

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Maine Department of Environmental Protection

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Massachusetts Mercury Efforts

Scope of mercury reduction efforts

Overall Reduction Strategies

- The New England Governors and Eastern Canadian Premiers Regional Mercury Action Plan. This plan was unanimously adopted by the New England Governors (NEG) and Eastern Canadian Premiers (ECP) in June, 1998. It calls for the virtual elimination of mercury emissions in the region with an intermediate 50% reduction by 2003. MA strongly supports this plan and cochairs the NEG-ECP Mercury Task Force guiding its implementation. Contact C. Mark Smith, DEP. 617-292-5509.

- Massachusetts Zero Mercury Strategy. This multi-agency strategy was developed by the MA Executive Office of Environmental Affairs (EOEA) and adopted this year. In addition to the NEG-ECP commitments noted above, this strategy includes an additional interim mercury emission reduction goal of 75% by 2010 and calls for both the elimination of mercury releases and preventable uses of mercury in MA. Contact Cheri Peele, EOEA. 617-626-1047.

1. regulatory

- Municipal Solid Waste Combustor Regulations (MSWC). The Massachusetts Department of Environmental Protection (DEP) adopted stringent regulations on MSWCs in 1999. MSWCs are required to: 1) meet an emission limit of 28 ug of mercury per dry standard cubic meter (dscm) with no % reduction alternative; 2) test stack emissions quarterly and provide inlet concentration data; and, 3) develop and implement mercury source separation plans. The source separation requirements will result in approximately \$1.5 million in new funding to support pollution prevention efforts over the next year. DEP received the Mercury Policy Projects Outstanding Pollution Prevention Award in 1999 for these regulations. Contact Judy Shope, DEP. 617-292-5597.

- Utility Regulations. MA proposed stringent new regulations on utility emissions in June 2000. These regulations address nitrogen oxides, sulfur oxides, carbon dioxide and mercury. They set a timeline to establish an emission limit for mercury, allowing for developing information to be considered. Additionally, two of MA's largest coal fired facilities were recently chosen by the U.S. Department of Energy (DOE) to participate in the nation's first full-scale evaluation of mercury emissions control technology for coal-burning power plants. Contact Nancy Seidman, DEP. 617-556-1020.

- Medical Waste Incinerator Regulations. Draft regulations for MWIs will be released by DEP for public comment this fall. DEP is considering a phased-in emission limit of 28 ug/dscm for mercury and pollution prevention requirements. Contact: Steve DeGabriele, DEP. 617-556-1120.

- MA Toxic Use Reduction Act. MA manufacturers must report any release or use of mercury that exceeds the new TURA threshold of 10 pounds per year. Contact: Barbara Kwetz, DEP. 617-292-5593.

- Massachusetts Water Resource Authority (MWRA) Mercury Limits. MWRA treats wastewater for the Boston area and prohibits mercury from industrial wastewater.

This prohibition is enforced at a 1 part per billion influent concentration. MWRA works with institutions to achieve this limit and is investigating sources of mercury, including those proposed for the federal Categorical Standards (Clean Water Act).
Contacts: Kevin McManus/Charles Bering, MWRA. 617-242-6000.

· Fish and Other Foods. The Massachusetts Department of Public Health (DPH) regulates mercury contaminants in foods and issues fish consumption advisories.
Contact: Elaine Krueger. 617-624-5757.

2. non-regulatory

· 2001 Massachusetts Mercury Initiative. Includes approximately \$500,000 in new DEP funding for the 01 fiscal year to support statewide mercury reduction and research efforts. Contact: C. Mark Smith.

· Municipal Assistance Program: Provides funding for municipal P2 programs on mercury. Includes a subsidized statewide contract to reduce mercury pickup and recycling costs. Contact: Judy Shope.

· Permanent Hazardous Household Products Collection Programs. Have been established with DEP and EOEAs technical assistance and funding. Mercury is one of several hazardous household wastes targeted. Contact: Lori Segall, DEP. 617-292-5704.

· Collection of Bulk Elemental Mercury from Dental Offices. DEP, Stericycle and the Mass. Dental Society are collaborating to collect and recycle elemental mercury and raise awareness among dentists about safe handling and recycling/substitution opportunities. Contact: Judy Shope

· Western MA Mercury Pollution Prevention Project. DEP funds a universal waste coordinator who works with 21 western MA. towns on mercury recycling/reduction programs. Contact: Judy Shope

· Federal Facilities Audit Program. DEP, the New England Waste Management Officials Association (NEWMOA) and EPA are collaborating to audit mercury management policies and practices at federal facilities and identify mercury reduction/recycling opportunities. Contact: Judy Shope

· Clean-sweep Projects. DEP has funded and/or participated in a number of targeted "clean-sweeps" including mercury thermometer collection/replacement projects. Contact: Judy Shope

Public outreach/education efforts

· School Mercury Education and Pollution Prevention Programs. A curriculum on mercury for high and middle schools is being developed and a pilot outreach program planned by DEP and EOEAs. The program will include mercury "clean sweeps" for participating schools. Environmental Management Systems (EMS) tools will also be provided to improve overall school chemical management. DPH also assists schools with managing mercury through its indoor air quality program. Contacts: C. Mark Smith, DEP and Mike Feeney, DPH. 617-624-5757

· Mercury Clean-Sweep Manuals and Pilot Projects. Guidance manuals for mercury collection programs are being developed targeting municipalities and organizations/

institutions. Selected "clean-sweep" pilot projects will also be funded. Contacts:
Cheri Peele/Judy Shope

- Outreach to Dentists. MWRA and DEP are developing information on best management practices for mercury and criteria for evaluating amalgam separators. Contacts: Charles Bearing/Judy Shope
- Environmentally Preferable Purchasing Newsletter. This quarterly newsletter by the MA Office of Technical Assistance (OTA) regularly includes information on mercury. OTA also provides on-site mercury P2 guidance. Contact: Lara Sutherland, OTA. 617-864-3730
- Waste Audit Program for Hospitals DEP is developing a hospital audit training program and manual focusing on source reduction for mercury and other medical wastes. Contact: Judy Shope
- Database of Trace Mercury Test Results A searchable web database for reagents used in health care has been completed with funding from EOE, MWRA, and OTA. Contact: Cheri Peele
- UMass Lowell Sustainable Hospitals Project With partial funding from DEP, this project offers health care facilities technical guidance on non-mercury products and includes a website with information on mercury-added products and alternatives. Contact: Judy Shope
- Outreach and Education to Pregnant Women and Fisherpeople DPH issues fish consumption advisories for mercury and implements outreach and education programs. DPH is expanding these efforts with funding from DEP and EOE. This work includes a mercury awareness survey; focus groups; expanded outreach to pregnant women, fisherpeople, and non-English speaking minorities; and posting advisory signs. Contacts: Elaine Kruger and Julie Watts, DPH. 617-624-5757
- Mercury Education Signs. The MA Department of Environmental Management and EOE is posting mercury education signs at State properties. Contact: Cheri Peele
- Household Hazardous Products (HHP) Forum. DEP sponsors an annual forum, which addresses mercury and other household hazardous waste issues. Contact: Lori Segall

Research/monitoring efforts

- Atmospheric Deposition Monitoring: To track temporal trends in mercury deposition DEP is supporting a monitoring network at 3 sites in the State. Contact: C. Mark Smith
- Environmental Monitoring. DEP will support several research projects this year on mercury levels in key indicator species. Contact: Carol Rowan West/C. Mark Smith
- Continuous Emissions Monitoring (CEM) Verification Project. The EPA Environmental Technology Verification program is evaluating CEM technologies for mercury. MADEP will help fund full-scale field tests in 2001. Contact: C. Mark Smith

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- Coastal Monitoring Programs- The MA Office of Coastal Zone Management (CZM) participates in Musselwatch, (National Oceanic and Atmospheric Administration) and the Gulfwatch Program (Gulf of Maine Council), which collect information on mercury and other chemicals in mussels and sediments. The Coastal 2000 Program (CZM, UMass, USEPA) is also analyzing sediment and fish from MA estuaries (40 stations/year for two years). Contact: Christian Krahforst, CZM. 617-626-1216.
 - Innovative Technology Assistance. DEP and EOEA Innovative Technology groups have assisted SolmeteX. Inc. to meet regulatory requirements for a technology that removes wastewater mercury. Contact: Claire Barker, DEP. 617-5556-1128
 - POTW's and Sewage Sludge Incinerator Assessment. DEP will evaluate mercury discharges associated with wastewater and wastewater sludges and control options. Contact: Barbara Kwetz
 - Medical Waste Sterilization Technology Assessment. DEP will evaluate mercury releases potentially associated with medical waste autoclave and microwave units. Contact: Judy Shope/C. Mark Smith
 - Environmental Indicators Project. MA supports work by the New England Goals and Indicators Partnership on environmental indicators for mercury and a project by the NEG Environmental Information Management group on regional systems for managing key data on environmental pollutants including mercury. Contact: Carol Rowan West
 - Model Legislation. DEP has worked with a regional NEWMOA workgroup to draft model legislation addressing mercury containing-products. Contact: Terry Goldberg, NEWMOA. 617-367-8558

Resources developed by state

- 1996 DEP Mercury in MA Report and 1998 NEG-ECP Mercury Action Plan and Annual Reports. Contact: C. Mark Smith
- 2000 MA Zero Mercury Strategy. Contact: Cheri Peele
- Reports on Mercury in Freshwater Fish. Contact: Carol Rowan West
- Fish Consumption Advisories and Statewide List. Contact: Elaine Krueger
- Mercury Indicators Project Reports. Contact: Carol Rowan West
- Websites: additional information on MA mercury activities and resources can be found at the EOEA Website: < www.state.ma.us/envir > ; DEP Website: < www.magnet.state.ma.us/dep > and DPH Website: < www.state.us/DPH/beh > .

Mercury Committees/Task Forces

- NEG-ECP Regional Mercury Task Force. Contacts: C. Mark Smith/Judy Shope
- Executive Office of Environmental Affairs Massachusetts Mercury Task Force: Multiagency group that coordinates statewide Zero Mercury Strategy. Contact: Cheri Peele

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- MADEP Mercury Team. Multibureau team addressing mercury from a cross media perspective, integrating pollution control and pollution prevention approaches. Contact: C. Mark Smith
 - Health Care Environmentally Preferable Purchasing Roundtable Contact: Lara Sutherland
 - New England Governor Conference, Inc. An interstate organization supported in part by MA, which addresses regional issues on behalf of the Governors of the New England States. NEGC is coordinating and administrating the NEG-ECP Regional Mercury Action Plan. Contact: John Shea. 617-423-6900.
 - Northeast Waste Management Officials' Association (NEWMOA). An interstate organization, partially supported by MA, that is working on numerous mercury projects relating to pollution prevention and outreach and education. Contact: Terry Goldberg. 617- 367-8558
 - Northeast States For Coordinated Air Use Management. An Interstate organization, partially supported by MA, that is working on numerous mercury related projects focused on utilities and other emission sources, monitoring and policy development. Contact: Jason Grumet. 617-367-8540

Key MA Mercury Contacts:

- Cheri Peele, Executive Office of Environmental Affairs, Chair, MA Zero Mercury Strategy Task Force.
- Carol Rowan-West, M.S. Department of Environmental Protection, Office of Research and Standards. Chair, Interagency Fish Toxics Committee. 617-292-5510
- Judy Shope, Department of Environmental Protection, Bureau of Waste Prevention. CoChair DEP Mercury Team; NEG-ECP Mercury Task Force representative.
- C. Mark Smith, Ph.D., M.S. Department of Environmental Protection, Office of Research and Standards. CoChair DEP Mercury Team; CoChair, NEG-ECP Mercury Task Force. 617-292-5509
- Elaine Krueger, Department of Public Health, Bureau of Environmental Health Assessment 617-624-5757

Current statistics on fish consumption advisories

Total number of advisories: 80

MA has a statewide fish consumption advisory in effect for mercury. This advisory, focused on pregnant women, covers all native freshwater fish caught in the state.

Submitted by:

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Michigan Mercury Efforts

Scope of Mercury Reduction Efforts

1. regulatory

- Michigan utilizes its base regulatory programs to reduce mercury released from air point sources through the facility permit process. Michigan's air program has air toxics rules in place that require best available control technology for all new and modified permits for all toxic pollutants, followed by a demonstration that the ambient impact is no greater than the health-based screening levels. Typically, these screening levels only consider exposure from direct inhalation. Because the primary concern for mercury is from indirect exposure pathways (i.e. consumption of fish), the health-based screening level of 0.3 micrograms per cubic meter (mg/m^3) (24-hour averaging time) was withdrawn and emissions of mercury are evaluated on a case-by-case basis.
- Mercury emission limits for new and modified sources are primarily set on a case-by-case basis. The Michigan Department of Environmental Quality (MDEQ) has developed stricter standards for medical waste incinerators, because documented mercury stack test data has demonstrated that with the application of mercury controls and a mercury waste management plan, facilities can easily meet an emission limit much lower than the federal standard. The MDEQ's Air Quality Division (AQD) has also included mercury education outreach and collection of mercury-containing wastes as part of a permit requirement for a municipal waste combustor. Michigan auto shredders, as part of their permit conditions, must remove mercury switches prior to vehicle shredding.
- National Pollutant Discharge Elimination System permits are issued to municipalities, industries, and other entities that discharge directly to waters of the state. Permit limits restrict the amount of mercury that can be discharged. Consideration was given to mercury's highly bioaccumulative nature in the environment when setting the permit limit of 1.3 nanogram per liter (ng/l). Because of the ubiquitous presence of mercury in the environment and potential widespread compliance problems that will surface with use of the new U.S. Environmental Protection Agency (EPA) mercury method, a "level currently achievable" of 30 ng/l has been established as a permit limit for those facilities needing a mercury limit. In addition, facilities with a permit limit for mercury are required to develop and implement a mercury source elimination program to reduce the amount of mercury being discharged. The MDEQ works closely with communities to help identify and eliminate known mercury sources. The MDEQ's Surface Water Quality Division (SWQD) also requires the control of mercury in the land application of biosolids.
- The MDEQ's Waste Management Division (WMD) adopted the Universal Waste (UW) Rule in Michigan in 1996. Thermostats, batteries, banned pesticides, electric lamps, mercury-containing thermostats, switches, thermometers, and any waste device that contains only elemental mercury as the hazardous waste constituent, is classified as UW. The UW management alternative provides several advantages for handling these characteristic hazardous wastes. A UW fact sheet can be accessed electronically at: <http://www.deq.state.mi.us/wmd/docs/hwprogram/hwmlit.html>.

- Enforcement Settlements

As part of the MDEQ settlement agreements with facilities, several mercury reduction and research activities have been required.

2. non-regulatory:

- Numerous pollution prevention activities have been implemented within the state. Michigan's Mercury Pollution Prevention (M2P2) Task Force has led many of these efforts by releasing their final report in 1996 that included 70 recommendations for mercury pollution prevention by a variety of sectors. One very notable accomplishment was securing commitments from Ford, General Motors, and DaimlerChrysler to phase-out the use of mercury switches (10 tons per year) in automobiles. Additional successes include: sponsoring a mercury clean sweep from dental offices (1350 pounds recovered), sponsoring a mercury thermometer exchange program for state employees, working with the Michigan Department of Agriculture on a statewide dairy farm mercury manometer exchange program, working with the automobile manufacturers on phasing out the use of mercury switches, in-depth outreach to healthcare facilities, and general outreach to schools and the general public on mercury use.

Public Outreach/Education Efforts

About 1.6 million copies of the fish consumption advisories were distributed in Michigan in 2000. Copies were distributed to bait and tackle shops, local health departments, and all WIC (Women, Infants, and Children) clinics. Fish advisory posters are currently being distributed with the help of environmental groups in the state for display at all boating and fishing access locations. Other fish advisory posters are being distributed to pediatric clinics. The Michigan Department of Community Health (MDCH) and the Michigan Department of Natural Resource hotline numbers are included on both posters. An angler survey was conducted in Kalamazoo in cooperation with two local health departments that found 50 percent of the people were not aware of any advisory. Another survey has been conducted called the "Michigan Behavioral Risk Factor Survey" that included questions about fish consumption. For information on these surveys you may contact Brendon Boyle, MDCH, at 517-335-8138.

Research/Monitoring Efforts

- The AQD has negotiated settlement funds with facilities that have violated their air use permit to be used for implementing mercury research. In 1996, about 1.3 million dollars was allocated to the University of Michigan (U of M) to conduct a comprehensive mercury-monitoring program in the Lake Superior Basin to understand the sources, transport, and fate of mercury. The final report is expected in 2001 and the contact is Dr. Jerry Keeler, U of M, at 734-936-1836.

- The AQD, along with the Minnesota Pollution Control Agency and the Wisconsin Department of Natural Resources, received a grant in 1999 to purchase two ambient mercury monitors that are housed in a trailer and shared between the three states to assist in identifying fugitive mercury sources.

- The AQD, along with the U of M, will be receiving a grant from the Michigan Great Lakes Protection Fund in the fall of 2000 to develop an ambient mercury monitoring network in Michigan.

- Water/Ecological Monitoring

In November 1998, the citizens of Michigan passed the Clean Michigan Initiative, a

\$675 million bond to clean up, protect, and enhance Michigan's environmental quality, natural resources, and infrastructure. Some of these funds were allocated for an environmental quality monitoring program. The primary mercury assessment activities are described below.

- Trends/Tributary Loadings: A team of SWQD and U.S. Geological Survey (USGS) staff recently developed a revised water trend plan that is being initiated in 2000 and will continue in future years. The USGS collects water samples to determine contaminant loads and to measure trends near the mouths of 30 tributaries, as well as the connecting channels and bays. Most of the tributary samples are collected during high flow conditions, defined as greater than the 20 percent exceedance flow for each river. Samples are analyzed for mercury, trace metals, and nutrients.
- Inland Lake Trends: The inland lake sediment trend monitoring effort began in 1999 through a grant to Michigan State University and continued in 2000. Core samples will be collected from approximately 25 lakes throughout the state. The use of core samples allows for an examination of long-term trends of contaminant levels in the lake sediments, based on known rates of sedimentation. The samples will be analyzed for mercury, trace metals, and other selected organic contaminants.
- Bald Eagles: This activity began in 1999 with a grant to Lake Superior State University to collect and analyze bald eagle blood and feather samples for mercury and other bioaccumulative chemicals of concern. The purpose of this activity is to evaluate spatial and temporal trends in contaminant levels in an upper trophic level organism. Samples are collected from nesting bald eagles using non-lethal methods from nests in targeted watersheds primarily in northern Michigan.
- Resources Developed by Michigan: Most of the mercury reduction resources developed by Michigan can be found at: <http://www.deq.state.mi.us/ead/p2sect/mercury>. This includes brochures on mercury source reduction for use in various sectors such as schools, healthcare facilities, general public, cultural use; and use and alternatives in various products such as thermostats, thermometers, dairy manometers; and brochures on cleaning up mercury spills.

Mercury Committees/Task Forces

- In 1991, Michigan Governor John Engler announced that a Michigan mercury reduction strategy would be developed. The state responded by the Michigan Environmental Science Board (MESB) releasing their report, "Mercury in Michigan's Environment: Environment and Human Health Concerns," completed in April 1993. This report can be found at: <http://www/mesb/org/pubs.html>.
- Following the release of the MESB mercury report, a mercury action plan was developed that recommended the formation of a M2P2 Task Force convened in 1994. Their final report was released in 1996. This report can be found at: <http://www.deq.state.mi.us/ead/p2sect/mercury/>. This state task force led to the formation of other efforts such as the following two groups:
 - Hospitals for a Healthy Environment, which includes members from the MDEQ and Michigan's Health and Hospital Association to further mercury pollution prevention and other activities in healthcare facilities.
 - Mercury Reduction Task Force of Southeast Michigan. Members include the MDEQ, the EPA, the MDCH, and the Poison Control Center of the Detroit Medical Center. This group is focusing on outreach to schools, cultural uses, veterinary clinics, and doctor offices.

Current Statistics on Fish Consumption Advisories

· Since 1988, the MDCH has issued a statewide fish consumption advisory for all of Michigan's 11,000 inland lakes due to mercury contamination. Between 1985-1996, the MDEQ sampled fish from 200 lakes in Michigan. Approximately two-thirds or 66 percent of the lakes sampled had at least one fish that exceeded the 0.5 parts per million (ppm), the trigger limit set for fish consumption by the MDCH and 15 percent exceeded the 1.5 ppm "do not eat" consumption limit. The MDEQ also has monitored whole fish at 26 stations since 1990 as part of SWQD's fixed station monitoring program. The same size and species are sampled every two to three years. In most species/sites, the MDEQ has not seen a change in mercury concentrations.

Submitted by:

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Minnesota Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

Minnesota has air emission standards for waste combustors and wastewater discharge limits. Various disposal bans are in effect for mercury-bearing products, such as fluorescent lamps. Sales bans are in effect for some products such as shoes and batteries.

2. non-regulatory

· Two state agencies, the Pollution Control Agency and the Office of Environmental Assistance, administer varied programs. Most of these programs are oriented toward partnerships with local governments and business firms. Some examples include, thermometer exchanges, manometer exchanges and community education programs.

Public outreach/education efforts

· Minnesota's Department of Health (DEH) administers the state's fish consumption advisory. Other state agencies, such as the Department of Natural Resources, help with distribution of the information in the advisory. State and local government agencies cooperate in production and distribution of educational materials. A survey of specific communities is underway with support from the MPCA and the DEH.

Research/monitoring efforts

· Minnesota's plans to develop TMDLs for two watersheds – one in the northeastern part of the state and the other covering the rest of the state – began earlier this year. Research into the environmental effects of mercury have been underway for nearly ten years. Research continues, with expansion expected from the business firms that participate in the state's Mercury Contamination Reduction Initiative.

Resources developed by state

· A web site was developed when the Mercury Contamination Reduction Initiative began two years ago. That site is being upgraded and integrated into a broader communications program. The state's Office of Environmental Assistance produced a few years ago an instructional video tape on the subject of mercury reduction in medical wastes.

Mercury Committees/Task Forces

· An Advisory Council convened in 1998 to inform the MPCA's Mercury Contamination Reduction Initiative. This Council produced a report in which recommendations for further action were described. The MPCA is now acting on those recommendations and will produce an evaluation report next year, in October.

Submitted by:
John Wachtler
Minnesota Pollution Control Agency
651) 297-8333

Missouri Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- CSR 10-6.2 Emission standard – adopted federal NSPS standard – Hospital, medical infectious waste incinerators on May 19, 1995.

- There are water quality standards for surface waters and groundwater, and these standards can be incorporated into wastewater discharge permits when needed.

2. non-regulatory

- None in Air Pollution Control Program.

- Management of materials like mercury from nonpoint sources of pollution is included (but not specific to mercury) in the state nonpoint source management plan.

Public outreach/education

- None in Air or Water Pollution Control Programs

Research/monitoring efforts

- Conducted ambient monitoring at Blair Street in St. Louis since February 2000. This monitoring including mercury concentration collected once every third day.

- We have some TMDL's for unknown toxicity, but they have not been linked to mercury, although that might be the case. Monitoring has detected mercury in some surface waters and that may be implicated in impairments, but no conclusion has been reached thus far.

- WPCP has maintained its current efforts to monitor for mercury, but has not increased these efforts.

Resources developed by state

- Developed mercury emission inventory for the big power plants based on coal analysis submitted by the power industry.

Mercury Committees/Task Forces

- There are discussions, but no committees or task forces related to water quality issues.

Current statistics on fish consumption advisories

- There are no fish consumption advisories based on mercury, the current information is on the EPA website.

Submitted by:

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New Hampshire Mercury Efforts

Scope of mercury reduction efforts

NOTE: New Hampshire's mercury reduction efforts have resulted in a 37% decrease in statewide mercury emissions from 1997 through 2000.

1. regulatory

- Established a mercury emission limit of 0.028 mg/dscm for municipal waste combustors, which are subject to federal regulations and have a design capacity to burn 100 tons per day, or more, of municipal solid waste.

- Established a mercury emission limit of 0.055 mg/dscm for medical waste incinerators.

- Passed legislation relative to mercury that:
 - Bans the sale of mercury fever thermometers without a prescription
 - Bans the sale of mercury-containing "novelty" items such as games, toys, clothing, and ornaments.
 - Prohibits the use of mercury and mercury compounds in K-12 classrooms.
 - Restricts the sale of elemental mercury to a few specific purposes (research, medical, dental, and manufacturing).
 - Requires manufacturers of mercury-added products (i.e. fluorescent lamps, batteries, thermostats, electrical switches) to notify the state of the type of products that they manufacture, and how much mercury is in them.
 - Requires the New Hampshire Department of Environmental Services (NHDES) to create a public outreach and education program on the hazards of mercury and ways to reduce mercury released to the environment.

- Established regulations restricting the sale of certain mercury containing batteries, prohibits the disposal of mercuric oxide batteries, and sets certain requirements on products containing mercury-containing batteries.

- Established regulations for toxics in consumer packaging that prohibits the sale of any package that intentionally contains mercury, lead, cadmium, or hexavalent chromium.

- Established a 24-hour and annual ambient air limit for mercury emissions.

- Adopted a Universal Waste Policy that facilitates recycling of mercury-containing devices, and are in the process of adopting rules.

- Adopted Wastewater Biosolid Rules that established a mercury limit of 10 mg/kg for Biosolid and 7 mg/kg for land-applied biosolids.

- Banned the use of all mercury-containing pesticides.

2. non-regulatory

- Co-sponsored two mercury reduction workshops with the New Hampshire Hospital Association (NHHA).

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- Working with NHHA to provide on-site mercury reduction assistance.
 - Helped organized and participated in the Pollution Prevention (P2) in Healthcare track at the national P2 Roundtable.
 - Working with New Hampshire Dental Society to develop proper compliance practices including collection and recycling of mercury amalgam waste, and encouraging the use of non-mercury amalgam.
 - Developing a Best Management Practice manual and training program for auto salvage yard operators, which includes methods on removal of mercury switches and proper recycling/disposal prior to vehicle crushing.
 - Added language to grant applications for Household Hazardous Waste Collection Grants, which encourages municipalities to include mercury and mercury-containing wastes in their collection activities and also provide funding for 50% of the cost of local and regional collection programs.
 - Established a contract to collect and recycle all state agencies fluorescent lamps. Contract also available to municipalities.

Public outreach/education efforts

- New Hampshire Department of Health and Human Services (NHDHHS) developed a brochure, "Mercury in New Hampshire Freshwater Fish".
- NHDES produced, in conjunction with local statewide television station, an Ecowatch commercial describing the hazardous nature of mercury and proper management of mercury-containing wastes.
- NHDHHS produced, in conjunction with local statewide television station, an Ecowatch commercial concerning the NH freshwater fish consumption advisory.
- Incorporated information on identifying and properly managing mercury-containing devices and products in the Solid Waste Operator Training Certification Program.
- Working with the state Department of Education on a project to encourage the removal of mercury and other hazardous substances from schools.
- Helped promote thermometer exchange program with the owners of the two largest municipal waste incinerators. To date, over 1200 mercury thermometers have been collected, properly recycled, and exchanged for digital thermometers.

Research/monitoring efforts

- NHDES currently maintains two mercury deposition monitoring sites.
- NHDES recently completed mercury emission stack testing on a sewage sludge incinerator and two medical waste incinerators in order to more accurately determine mercury emissions from these sources.
- NHDES is assisting EPA in the collection of fish in support of their National Fish Contaminant Study.

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- NHDES is participating in the Connecticut River Fish Tissue Study, which is a multi-state and federal effort to sample and analyze Connecticut River fish for mercury and selected organics (PCBs, dioxins, and pesticides).
 - NHDES is participating in a joint New Hampshire and Vermont Regional Environmental Monitoring and Assessment Program that will look at mercury levels in lake water, sediments, and biota in randomly selected lakes.
 - On-going statewide program since 1990 to collect and sample freshwater fish.
 - NHDES is currently assisting in mercury remediation efforts at a former chlorine generation facility.

Resources developed by state

- The New Hampshire Mercury Reduction Strategy was adopted in October 1998. This strategy contains 40 recommendations for reducing mercury emissions in the state by 50% in 2003.
- Developed several fact sheets on mercury hazards, managing mercury wastes, and mercury deposition & transport.
- NHDES established a mercury web page that provides general information on mercury, mercury related projects, Mercury Task Force Activities, and the Mercury Reduction Strategy. The Address is: < www.des.state.nh.us > .

Mercury Committees/Task Forces

- Established a multi-stakeholder New Hampshire Mercury Task Force to advise the state on the implementation of the New Hampshire Mercury Reduction Strategy.
- Established four workgroups under the Mercury Task Force: Public Outreach, Municipal Waste Combustors, Healthcare, and Utility/Non-Utility Boilers.
- Member of New England Governor's / Eastern Canadian Premier's Regional Mercury Task Force.

Current statistics on fish consumption advisories

- The New Hampshire Department of Health and Human Services has issued a statewide freshwater fish consumption advisory. It applies to all freshwater fish species collected from all inland waters and recommends that women of childbearing age and young children limit their consumption of freshwater fish to no more than one meal per month. All other people are encouraged to limit their freshwater fish consumption to no more than four meals per month.

Submitted by:
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New Jersey Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Dry Cell Battery Management Act requires reduction in mercury in alkaline batteries, and bans the sale of consumer mercury oxide batteries and Toxic Packaging Reduction Act to reduce mercury in packaging. (Develop model Mercury Containing Products Acts similar to Dry Cell Battery and Toxic Use Packaging Acts.)
- Municipal Solid Waste Incinerator rule for mercury limits in emissions for 65ug/dscm in 1995 and 28 ug/dscm in 2000.
- Solid waste planning provisions to require alternate management mechanisms for heavy metal-containing products including mercury-containing lamps, switches, and batteries.
(Gil Mueller, DEP Division of Solid & Hazardous Waste (DSHW) 609-984-3438)

2. non-regulatory

- Dry Cell Battery Management Act required product managed collection system, including financial mechanism, for all other mercury oxide batteries, through approval of management plan. Without an approved plan, manufacturers could not sell product in NJ. Mercury oxide battery manufacturers choose not to submit a plan and instituted a de facto ban for all mercury oxide batteries.
- Universal waste rule (UWR) for fluorescent lamps, mercury switches, gas regulators and thermostats to allow them to be safely collected and recycled without the burden of a full RCRA system. This was incorporated into our state recycling rules to aid in this effort.
- State/EPA funding for startup and evaluation of full-scale demonstration projects to collect and recycle mercury-containing products.
- Working with the county household hazardous waste program to collect mercury-containing items from households, small businesses and other sectors of universal waste. This includes outreach and education on program availability.
- Informal agreements with product manufacturers to reduce mercury in products. Pilot mercury switch collection program in Camden County. Demanufacturing of appliances for mercury switches in Union County. Fluorescent light bulb collection programs in three counties. These pilot programs formed the basis for UWR.
(Robin Heston, DEP DSHW 609-292-8341)

Public outreach/education efforts

- Distribution of over 10,000 copies of A Woman's Guide to Eating Fish and Seafood to NJ health clinics, obstetricians-gynecologists, and environmental groups. The guide, which includes mercury exposure reduction information, was produced in conjunction with NJ Department of Health and Senior Services.
- Annual publication of fish advisories in Fish & Wildlife Digest and posting of contaminated waterbodies.

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- Urban Fishing Education Program, curriculum and community-based education programs.
 - Annual press release for the community in the Newark Bay Complex. (Kerry Kirk Pflugh, DEP Division of Science, Research & Technology (DSRT) 609-633-2312)

Research/monitoring efforts

New Jersey Mercury-Related Research Projects: NJDEP's Division of Science, Research and Technology has and is conducting a number of mercury-related research projects related to mercury occurrence, fate & distribution in air, water, and soils; fish tissue contamination; and human exposure.

- Characterization of Mercury Contamination of Ground Water and Soils and its Contribution to Surface Water Sediments in New Jersey (Judy Louis, DSRT, 609-292-9692)
- New Jersey Atmospheric Deposition Network - 3 year monitoring program of 9 sites includes mercury (Mike Aucott, DSRT, 609-292-7530)
- PCB's, Organochlorinated Pesticides & Mercury Residues in Selected Fish Species as Indicators of Potential Human Health Hazard (Bruce Ruppel, DSRT, 609-984-6548)
- Preliminary Assessment of Total Mercury Concentrations in Fish from Rivers, Lakes and Reservoirs of New Jersey (and Follow-Up) (Bruce Ruppel, DSRT, 609-984-6548)
- Adsorption of Mercury and Arsenic to New Jersey Soils for Use in Development of Soil Cleanup Standards: Year 3 (Paul Sanders, DSRT, 609-292-9998)
- Estimation of Fish Consumption and Methylmercury Intake in the New Jersey Population (Alan Stern, DSRT, 609-633-2374)
- Determination of Background Blood Mercury Levels in the New Jersey Pregnant Population (Alan Stern, DSRT, 609-633-2374)
- Development and Application of Speciation Methods for Mercury Analysis in Various Environmental Media (and Analysis of Mercury Species in Contaminated Soil) (Randy England, DSRT, 609-984-7927)
- Estimates of Mercury Consumption Due to Historical Use of Mercurial Pesticides in (1) Agriculture and (2) Industry in New Jersey (Eileen Murphy, DSRT, 609-633-2342)
- Development of Alternate Use Recommendations for Waters Contaminated with Mercury, Disinfectant By-products and VOCs (Gloria Post, DSRT, 609-292-8497)
- Multi-Media Investigation & Evaluation of Residual Contamination & Background Levels of Mercury (with Monitoring Trace-Levels of Mercury in Precipitation) (Edward Stevenson, DSRT, 609-633-1342 or Randy England, DSRT, 609-984-7927)
- Analysis of Mercury Species in Ground Water Using Inductively Coupled Plasma-Mass Spectrometry and Gas Chromatography (Eileen Murphy, DSRT 609-633-2342)

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- Mercury Distribution, Sources, and Mobility in the Kirkwood-Cohansey Aquifer System, New Jersey Coastal Plain (Eileen Murphy, DSRT, 609-633-2342)
 - Environmental Occurrence and Properties of Mercury and its Compounds: Literature Search (Eileen Murphy, DSRT, 609-633-2342)

Resources developed by state

- Brochures:
 - A Guide to Mercury Health Advisories for Eating Fish from New Jersey Freshwaters
 - A Woman's Guide to Eating Fish and Seafood
 - Mercury in the Environment
- Teachers Guide: Fishing for Answers in an Urban Estuary – teachers guide to urban watershed issues (due 2001)
- Reports:
 - Task Force on Mercury Emissions Standard Setting Final Report on Municipal Solid Waste Incineration, July 1993
 - Mercury in Ground Water, Soils, and Sediments of the Kirkwood-Cohansey Aquifer System in the New Jersey Coastal Plain, 1998
 - Preliminary Assessment of Total Mercury Concentrations in Fish from Rivers, Lakes and Reservoirs in New Jersey, 1994
 - Excerpts from Mercury Contamination in New Jersey Freshwater Fish, 1994
- Video: Woman's Health Video describes health effects from consumption of recreationally caught fish and crabs.
- Websites:
 - Mercury brochures can be viewed on DEP Division of Science, Research and Technology website: <http://www.state.nj.us/dep/dsr/>
 - NJ Department of Health and Senior Services provides information on mercury exposure and clean up of spills at website: <http://www.state.nj.us/health/eoh/> (Sue Shannon 609-292-1156)

Mercury Committees/Task Forces

- In 1992, NJDEP established a Mercury Emissions Standard Setting Task Force to begin the process of setting mercury emission standards. This first mercury task force included representatives from the scientific community, business & industry, environmental organizations, federal and local government, and 20 DEP staff. The task force developed a proposed mercury emission standard for municipal solid waste incinerators in a three-volume final report. This proposed standard was subsequently adopted. (Randy England, DSRT, 609-984-7927)
- The New Jersey Mercury Pollution Task Force was established in 1998 and is comprised of representatives from industry, academia, fishing organizations, environmental organizations, government, and DEP staff. The charge of the Task Force is to review current science on impacts of mercury pollution; inventory and assess current sources; determine impact on NJ's ecosystems and human health; review current policies; and develop a mercury reduction plan for New Jersey. The Task Force is finalizing its report which is expected to include recommendations for reducing

mercury pollution through pollution prevention; source reduction (e.g., municipal solid waste handling, metals processing, sludge incineration); potential emission controls (e.g., iron & steel manufacturing, coal combustion); indicator development in aquatic systems; ecosystem monitoring (e.g., eagles and ospreys); research on sources (e.g., aluminum scrap processing), and outreach/education. (Mike Aucott, DSRT, 609-292-7530; Sue Shannon, DSRT, 609-292-1156)

- By invitation, NJDEP has been assisting the Conference of New England Governors and Eastern Canadian Premiers for approximately three years with the development of their Mercury Reduction Plan. (Randy England, DSRT, 609-984-7927)

- NJDEP Internal Mercury Work Group has been meeting during the past three years to discuss technical issues and informally coordinate departmental activities related to mercury. The work group also acts as a steering committee for the NEPPS process. (Joann Held, Air Quality Permitting, 609-633-1110; Randy England, DSRT, 609-984-7927)

Current statistics on fish consumption advisories

- Total number of advisories: New Jersey has waterbody-specific mercury fish advisories in place for 120 waterbodies. These advisories are for largemouth bass and chain pickerel (both freshwater fish species). New Jersey has statewide advisories in place for these species.

Submitted by:
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New Mexico Mercury Efforts

Scope of Mercury Reduction Efforts

1. regulatory

- No discharge of mercury to landfills

Contact: Jerry Bober, 505 827-0197

- 17 NPDES permits with numeric mercury effluent limitations or monitoring requirements. Contact: James Davis, PhD, 505 827-0187

2. non-regulatory

- Pollution Prevention Program: In cooperation with the city of Albuquerque and WERC P2, outreach to hospitals, medical and dental offices concerning mercury releases. Contact: Patricia Gallagher, 505 827-2855

Public Outreach/Education Efforts

- Distribution of fish consumption advisory
- Posting of Mercury White Paper at Surface Water Quality Bureau website
- Posting of fish consumption advisory on Surface Water Quality Bureau website.

Contact: James Davis, PhD, 505 827-0187

Research/monitoring efforts

- In cooperation with EPA EMSL (Cincinnati), high resolution mercury survey of most watersheds in New Mexico, 1995-1996.
- Participation in EPA National Fish Tissue Contaminants Study.
- Monitoring of post-wildland fire runoff.
- In cooperation with US Fish and Wildlife Service, monitoring of fish tissue mercury concentration changes due to mercury inputs to reservoirs from post fire runoff.
- A project to resample the state's water bodies for fish tissue mercury and other contaminants is under development.
- Continuing monitoring of known mercury sources e.g., abandoned mines, DoD and DoE facilities. Contact: James Davis, PhD, 505 827-0187.
- Establishment of Mercury Deposition Network station at Palomas Point on Caballo Reservoir. Contact: Colleen Caldwell, PhD, 505 646-8126.

Resources developed by state

- Distribution of fish consumption advisory.
- Posting of Mercury White Paper on Surface Water Quality Bureau website at <www.nmenv.state.nm.us>.

· Posting of fish consumption advisory on Surface Water Quality Bureau website at <www.nmenv.state.nm.us>. Contact: James Davis, PhD, 505 827-0187.

Mercury Committees/Task Forces

None.

Current statistics on fish consumption advisories

Total Number of Advisories: 30

Submitted by:

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Surface Water Quality Bureau

Surveillance and Standards Section

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New York Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- New York State (NYS) has four (4) water quality standards for mercury in NYS Regulation.
 - The protection of potable water (0.7 ug/L Total mercury).
 - The protection of aquatic life propagation (0.77 ug/L dissolved) and survival (1.4 ug/L dissolved).
 - The protection of human health from the consumption of contaminated fish tissue (0.7 X 10⁻³ ug/L dissolved).
 - The protection of wildlife (2.6 X 10⁻³ ug/L dissolved). For all point source dischargers, where mercury is suspected or known to be in a discharge, the discharge is regulated to avoid contravention of water quality standards or use impairments in all ambient waters. Contact: Peter Jones (518) 457-6674

- Pretreatment and source control programs are in effect at POTWs across the State which are implemented by the Division of Water and local municipalities). Average mercury levels in biosolids have dropped from 7.4 ppm (1980-89) to 2.8 (1995-98). Contact: Peter Jones(Water) (518)457-6674/Sally Rowland (Solid Waste) (518)457-7337

- NYS has adopted the federal emission limit for Medical Waste Incinerators (MWIs). The minimum mercury emission limit is 0.55 mg/dscm or an 85% reduction in mercury emissions. An alternative minimum standard was included of 7.5 mg/dscm for small existing MWIs located more than 50 miles from a standard metropolitan statistical area. MWIs are required to prepare a waste management plan to reduce the amount of toxic emissions from incinerated waste. Contacts: Tom Gentile/ Barbara Nuffer (518) 457-7230

- NYS has adopted the federal emission limit for Municipal Waste Combustors (MWCs). Large MWCs (with a combustion capacity greater than 250 tons per day) have a mercury emission limit of 0.080 mg/dscm or a demonstration of an 85% reduction by weight of the uncontrolled emissions. The MWC owners can comply with either alternative, whichever is less stringent. This language allows the source to exceed 0.080 mg/dscm if there is a demonstration of an 85% mercury reduction by weight. However, NYS is in the process of lowering the state mercury emission limit for large MWCs to 0.028 mg/dscm, as recommended in the Northeast States and Eastern Canadian Provinces Mercury Action Plan, and already adopted by all of the other northeast states. Contacts: Tom Gentile/Barbara Nuffer (518) 457-7230

- NYS's current mercury limit for land application of sludges and compost is 10 ppm, dry weight basis. Contact: Sally Rowland (518) 457-7337

- NYS has adopted the provisions of Coalition of Northeastern Governors (CONEG), Model Toxics in Packaging Legislation that includes mercury reduction and control. That legislation was adopted into NYS law under Chapter 286, of the Laws of 1990. Contact: Peter Pettit (518) 457-7337

- NYS has adopted legislation requiring the reduction of mercury in batteries under Chapter 304, of the Laws of 1991. Contact: Peter Pettit (518) 457-7337

- NYS requires solid waste incinerators to implement a waste control plan that addresses mercury battery management for incinerators. Contact: Ted Williams (518) 457-1859

2. non-regulatory

- NYS encourages mercury reduction through technical assistance and education for household hazardous waste collection programs. Mercury-containing batteries, fluorescent lamps and other mercury-containing products are included in many household hazardous waste collection programs. Contact: David Vitale (518) 457-7337

Public outreach/education efforts

- Annual NYSDEC Fishing Regulations Guide includes a listing of waters with fish consumption advisories. This is updated and revised each year.

- NYS Dept. of Health prepares an annual booklet "Chemicals in Game and Sportfish," which discusses mercury and other contaminants, fish consumption advisories, and methods for reducing exposure to contaminants. Contact: Howard Simonin (315) 337-0910

- New York State's Monroe County, in cooperation with Strong Memorial Hospital, of Rochester New York, prepared a How-to Manual for reducing mercury use in the health care sector. This was funded through a USEPA Grant. Contact: Carole Beal (716) 274-8102

Research/monitoring efforts

- Ambient Surface Water Monitoring: Ambient surface waters are monitored and assessed through the Rotating Intensive Basin Studies (RIBS) sampling program. Over a six-year period, all basins in NYS are monitored. For the 2000 sampling season, the EPA 1600 series ultra-low-level sampling, handling and analytical techniques for the determination of mercury concentration in ambient waters was incorporated into the Routine Network. Contact: Peter Jones (518) 457-6674

- Contaminated Sediment Assessment and Monitoring: Fifteen (15) sites statewide are routinely sampled annually for reporting to the National Sediment Inventory. At each site, a toxic substance test pattern (which includes mercury) is chemically analyzed in vertical core characterizations as well as in surficial sediment, and the sediments are tested for toxicity, bioaccumulation potential and benthic invertebrate community structure. Contact: Peter Jones (518) 457-6674

- Watershed Management Programs: Mercury is one substance of a list of persistent toxic substances which are included in the development of Watershed Restoration and Protection Strategies and in Watershed Management Plans, as well as in the development of Total Maximum Daily Loads and Water Quality Based Effluent Limits. Contact: Peter Jones (518) 457-6674

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- Research;
 - "Effects of Atmospheric Deposition of Sulfur, Nitrogen and Mercury on Adirondack Ecosystems"- ongoing research by SUNY College of Environ. Sci. & Forestry
 - "Mercury in Adirondack Wetlands, Lakes and Terrestrial Systems" - ongoing research by Tetra Tech, Inc. Both of the above are funded by the NYS Energy Research and Development Authority. Other research is also planned or ongoing in the New York City Reservoir Watersheds. Contact: Howard Simonin, (315) 337-0910
 - Monitoring;
 - NYSDEC Division of Fish, Wildlife and Marine Resources collects fish for mercury analysis from 5 to 10 previously untested waters each year.
 - In a cooperative project with the US Fish & Wildlife Service the NYSDEC is monitoring mercury levels in the blood and feathers of loons in Adirondack lakes.
 - Atmospheric deposition of mercury is being monitored at Huntington Forest in the Adirondacks by SUNY College of Environ. Sci. & Forestry. Contact: Howard Simonin, (315) 337-0910

Resources developed by state

- Websites: < www.dec.state.ny.us/website/dfwmr/habitat/hoa1b2e.htm# > and < www.health.state.ny.us/nysdoh/environ/fish.htm > .
- Northeast States and Eastern Canadian Provinces Mercury Study, A Framework for Action. 1998. Coordinated by NESCAUM, NEWMOA, NEIWPC and EMAN.
- "Mercury in yellow perch from Adirondack drainage lakes (New York, U.S.)." 1994. by H. Simonin, et al. In: Mercury Pollution: Integration and Synthesis, C.J. Watras and J.W. Huckabee, eds., Lewis Publishers.
- "Mercury and other air toxics in the Adirondack region of New York." 1998. By H.A. Simonin and M.W. Meyer. Environ. Sci. & Policy 1:199-209.
- "The role of dissolved organic carbon in the chemistry and bioavailability of mercury in remote Adirondack lakes." 1995 by C.T. Driscoll et al. Water, Air & Soil Pollut. 80:499-508
- Additional earlier publications by C.T. Driscoll, R.J. Sloan, and J.A. Bloomfield.

Mercury Committees/Task Forces

- NYS provided assistance in the review of the draft mercury study and Mercury Action Plan (MAP) adopted in 1998 by the New England Governors/Eastern Canadian Premiers (NEG/ECP).
- Most recently, NYS participated with the Northeast Waste Management Officials' Association (NEWMOA) to address the mercury in solid waste issues proposed in the MAP Action Plan This included development of model legislation to address mercury in products. Contact: Peter Pettit (518) 457-7337

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- NYS continues to work on the Great Lakes Mercury initiatives.

Current New York statistics on fish consumption advisories

Total number of advisories: 25, plus a general statewide advisory

Total river miles: 200

Total lake acres: 341,700

Contact: Fish and Wildlife Information is Howard Simonin, (315) 337-0910

Submitted by:

Peter M. Pettit

New York Department of Environmental Conservation

(518) 457-7337

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North Carolina Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- The NCDENR Division of Air Quality (DAQ) limits airborne emissions from subject point sources under its Air Toxics program. These ambient air guidelines are based on risk resulting from modeled inhalation exposures. The DAQ is currently exploring, through its Scientific Advisory Board on Toxic Air Pollutants (SAB), the feasibility of generating ambient air level guidelines that would be protective of indirect routes of exposure, including fish consumption.

- The Division of Water Quality (DWQ) regulates aquatic discharges of mercury through the NPDES and Water Quality Standards programs. Once a water quality standard has been determined, the NPDES program is administered such that the water quality standard will not be violated. The Division of Waste Management (DWM) regulates disposal of mercury-containing lamps by waste generators through the Universal Waste Rules.

2. non-regulatory

- NCDENR, through its Division of Pollution Prevention and Environmental Assistance (DPPEA), is engaged in many efforts to reduce mercury waste and increase awareness of mercury as a pollutant of concern. DPPEA representatives make regular presentations to dental and hospital groups describing methods to reduce mercury in waste. Handouts are provided to hospital engineers describing new Federal regulations on waste minimization and recycling of lamps containing mercury. In addition, several fact sheets have been produced to communicate to the public at large about ways to avoid and/or responsibly dispose of mercury-containing products. Several of these documents are available on-line at [Error! Bookmark not defined.](#) DPPEA representatives are also working with DWM staff to identify major waste generators and target those responsible for wastes containing persistent, bioaccumulative and toxic (PBT) compounds. Mercury is a focus PBT under this effort.

Public outreach/education efforts

- Communication with the public on the risks of eating fish contaminated with methylmercury is the responsibility of the Occupational and Environmental Epidemiology Branch of the NC Department of Health and Human Services (DHHS). Fish consumption advisories are posted at boat launches with signs that explain the species of fish affected and specific consumption guidelines. In addition, pamphlets explaining the risks of consuming mercury-contaminated species are distributed at public meetings and with fishing licenses. DHHS staff will periodically release press statements if new advisories are issued or old advisories are updated or extended.

- In early 2000, North Carolina joined the states of South Carolina, Georgia and Florida in announcing coastal consumption advisories for king mackerel. Communication efforts in all three states have targeted the lay press as well as anglers at fishing shows and commercial fishing organizations. This multi-state effort has been very effective at getting a consistent and digestible message out to a substantial affected population.

Research/monitoring efforts

- The DWQ is increasingly focusing on identifying and characterizing its impaired waters. DWQ has extensively characterized fish methylmercury levels in river basins across the state over the past decade and is participating in several studies to better understand changes in fish mercury levels over time. In the future, DWQ will begin utilizing ultra-sensitive techniques to measure mercury and methylmercury levels in sediments, surface waters, and wastewater effluent. TMDL proposals have been developed and shared with EPA Region IV for a critical area of North Carolina.
- The DAQ is engaged in several studies to characterize mercury levels in air and precipitation. DAQ has operated two sites in eastern North Carolina in support of the National Mercury Deposition Network since 1996 and remains committed to the program. In addition, long-term characterization of ambient air mercury levels has been performed at several sites in eastern North Carolina. In May 2000 the DENR was awarded a grant from EPA to expand ambient air and fish tissue monitoring in sensitive areas of southeastern North Carolina. These funds have been used to develop methods for measurement of reactive gaseous mercury in ambient air.

Resources developed by North Carolina

- Information on DAQ mercury studies can be found at <http://daq.state.nc.us/Offices/Technical/Toxics/Studies/Mercury/wet_dep_site.htm> .
- More information on DPPEA mercury efforts can be found at <<http://wrrc.p2pays.org/indsector.htm>> .
- More information on SAB efforts to determine the relationship between airborne mercury emissions and indirect exposures through fish consumption (see below) can be found at <<http://daq.state.nc.us/Offices/Technical/Toxics/Risk>> .
- Fish consumption advisory information can be found at <<http://www.schs.state.nc.us/epi/fish>> .
- Several brochures are also available from DHHS, describing marine and freshwater fish consumption advisories in various parts of the state. Similar information is also included in the North Carolina Wildlife Fishing Digest that is given to individuals purchasing a fishing license.

Mercury Committees/Task Forces

- The DENR Mercury Task Force, comprised of representatives of DAQ, DWQ, DPPEA, DHHS and DWM, as been in place since the mid-1990s. This group meets periodically to discuss developments in the various Divisions and to cooperate on targeted environmental monitoring studies. Representatives of this task force recently cooperated to successfully petition for EPA grant funds under the PBT initiative.
- The Water Quality Mercury Work Group has met on a regular basis over the past year to discuss water quality projects including TMDL model development and funding opportunities to improve monitoring of mercury in North Carolina waters.
- The Pollution Prevention Committee is comprised of representatives of DPPEA and DWM. A current goal of this group is to identify the top waste generators in North

Carolina to target those that release persistent, bioaccumulative toxics. Future pollution prevention and waste minimization efforts will focus on priority PBTs, including mercury.

· The Secretary's SAB on Toxic Air Pollutants is a volunteer body of members with expertise in areas such as Toxicology, Environmental Sciences and Engineering, Environmental and Occupational Medicine, and Biostatistics. Over the course of the past 18 months the SAB has been engaged in reviewing the state of the science to determine whether mercury emission reductions will result in quantifiable improvements in local or regional water quality endpoints. In this endeavor, the SAB has entertained national and international experts in all areas of mercury research, thus greatly improving the level of understanding about conditions in North Carolina. All SAB meeting proceedings and reports are available on-line (see above for URL).

Current statistics on fish consumption advisories

See DHHS website, above, and refer to EPA for river and lake statistics.

Submitted by:

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Ohio Mercury Effects

Scope of Mercury Reduction Efforts

1. regulatory efforts:

· The Division of Air Pollution Control's contributions to the Great Lake's Strategy are summarized in the activities that support the mandates of the Clean Air Act as listed below:

· Mercury and Mercury compounds are considered Hazardous Air Pollutants (HAPs) under the Clean Air Act. To date, EPA has established National Emission Standards for Hazardous Air Pollutants (NESHAPs) for mercury emissions from three source categories: ore processing facilities, mercury cell chlor-alkali plants, and municipal waste incinerators. EPA has also set mercury emission limits for Medical Waste Incinerators.

· EPA is developing emission standards for over 170 categories of stationary sources of air toxic emissions based on control technology (MACT). To date, there are at least two emission standards pertaining to mercury emissions.

· Ohio EPA has a well-developed MACT Program and permit system that will assure that new and existing sources understand and comply with Federal mandates (Contact: Radhica Sastry, Division of Air Pollution Control, 614-728-1354).

· Ohio EPA's Division of Surface Water has water quality standards for aquatic life protection and human health (statewide) and wildlife protection for the Lake Erie Basin. Requirements are implemented through the NPDES program by;

- NPDES permit discharge limits
- Pollution Minimization Plans required by NPDES permits
- Pretreatment local limits (lower or narrative limits based on implementation of Best Management Practices) (Contact: Jenny Leshnock, Division of Surface Water, 614-644-2022)

2. non-regulatory efforts

· In 1998 the Ohio Dental Association (ODA) received an Ohio Environmental Education Fund grant to develop educational materials for dental offices. The Ohio Dental Association worked with the Ohio EPA and others and developed a mercury reduction education program for dental offices and a bulk elemental mercury collection program. The Ohio Dental Association collected 838 pounds of bulk elemental mercury in their collection program. (Contact: Bill Narotski, Office Pollution Prevention, 614-644-3469).

· Currently the Ohio EPA Office of Pollution Prevention is working with the Ohio Hospital Association and CGH Environmental Strategies, Inc. on the Ohio Healthy Hospital Pollution Prevention Initiative. Mercury prevention is a priority of the project. A product of the project is "The Mercury Challenge Handbook - The opportunity to become a mercury-free facility." The document is currently in draft form. (Contact: Bill Narotski, Office Pollution Prevention, 614-644-3469).

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- Ohio EPA Office of Pollution Prevention has created a list of potential mercury reduction projects and is using this list to identify feasible projects. Some of the projects being considered include reducing mercury from dairy manometers, reducing mercury use in public schools and voluntary programs to reduce mercury use by business. A fact sheet for mercury reduction in the home has been created and a website providing information on mercury pollution prevention is located at < www.epa.state.oh.us/opp/mercury_pbt.html >. (Contact: Bill Narotski, Office Pollution Prevention, 614-644-3469).

Public outreach/education efforts

- The Ohio Department of Health distributes annual State fish advisory brochures to the public. The fish advisory information is also on their website at < www.odh.state.oh.us/Alerts/Alertmain.htm > .

Research/monitoring efforts

- Ohio has a number of facilities that operate scrap metal melting furnaces. Ohio EPA realized that these furnaces had potential to emit fairly large quantities of mercury and other metals. In an effort to confirm this hypothesis, and to quantify the amount and type of scrap being melted in these furnaces, Ohio EPA conducted a survey. This survey was sent to facilities that operate electric arc furnaces, cupolas, induction furnaces and other furnaces that melt scrap metal in order to find out the type and quantity of scrap being melted. From the results of the survey, we expect to be able to identify the extent of mercury emissions from scrap metal processing facilities and to isolate facilities and/or regions in Ohio where we may expect higher amounts of ambient mercury. Based on these findings, we anticipate forming a workgroup to develop a mechanism to control emissions from these sources either in the form of regulations or voluntary action (Contact: Radhica Sastry, Division of Air Pollution Control, 614-728-1354).
- As a part of the Great Lakes Mercury Deposition Workgroup, Ohio EPA was granted Section 105 grant funds for mercury monitoring in the state. Ohio EPA is planning to use the grant money allotted to them to purchase one Tekran continuous mercury monitor to collect ambient mercury data in the Southern portion of the Great Lakes. This effort is being coordinated with other Great Lake states. We expect that this project will furnish us with vital ambient mercury data, which we can use to assess the extent of mercury emissions in the Great Lakes portion of the state (Diane McClure, Division of Air Pollution Control, 614-644-4835).
- Ohio EPA has evaluated/monitored for mercury in sediments and turtle tissue for the Lake Erie Basin. (Contact: Dr. John Estenik, Surface Water, 614-644-2866)

Resources developed by the state

- Lake Erie Basin Sediment Report (Contact: Dr. John Estenik, 614-644-2866)
- The Ohio Department of Health distributes annual State fish advisory brochures to the public. The fish advisory information is also on their web site: <http://www.odh.state.oh.us/Alerts/Alertmain.htm>

Mercury Committees/ Task Forces

- Ohio EPA is an active participant in the following task forces formed to address mercury emission issues.

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- Great Lakes Mercury Deposition Workgroup (Contact: Diane McClure, Division of Air Pollution Control, 614-644-4835).
 - Region V has a mercury workgroup; Ohio NPDES permit representative (Jenny Leshnock, Division of Surface Water, 614-644-2022) participates.
 - Ohio EPA TMDL External Advisory Group, Mercury Subgroup (Contact Gary Martin, Division of Surface Water, 614-644-2141)

Current statistics on fish consumption advisories

- Total number of advisories: Ohio has 56 advisories; 28 advisories identify mercury as a problem. There is also a State-wide mercury advisory which covers all waters of the State.

Submitted by:
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Rhode Island Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Regulations for Hospital/Medical/Infectious Waste Incinerators (Air Pollution Control Regulation No. 39) became effective on August 21, 2000. Establishes a 0.055 milligrams per dry standard cubic meter emission rate and a plan to become a mercury free facility by 2003.

- The Department will be proposing mercury legislation in 2001 based on the model legislation developed by the Northeast Waste Management Officials Association (NEWMOA) and the New England Governor's Conference (NEGC). The proposed legislation will address the following issues: Interstate Clearinghouse, Bans on Certain Mercury-Added Products, Labeling, Disposal Ban, Collection, Disclosure Requirements for Certain Products That Are Used by Health Care Facilities and Contain Incidental Mercury, Control on the Sale of Elemental Mercury, Public Education and Outreach, Universal Waste Rule, and State Procurement.

2. non-regulatory

- Rhode Island participates in the Thermostat Recycling Corporation take-back program.

- Also participating with EPA Mercury Challenge Program for hospitals. Currently, two hospitals have applied to the program. The Department, through a partnership with the University of Rhode Island, is working with a third to address mercury reduction/elimination issues.

Public outreach/education efforts

- Fish advisories issued through the Department of Health. Last one issued on April 6, 2000. < www.health.state.ri.us/000406a.htm > .

Research/monitoring efforts

- Participating in regional deposition/monitoring studies through NESCAUM Acid Rain Task Force and NEGC Mercury Task Force.

Resources developed by state

Information through regional website at < www.newmoa.org > .

Mercury Committees/Task Forces

- Rhode Island participates in the New England Governor's Council (NEGC) Mercury Task Force.

Current Information on Fish Advisories

- One fish advisory issued on April 6, 2000 (see URL above).
- Do not eat any fish from the Woonasquatucket River below the Smithfield line.
- Do not eat bass from the Quidnick Reservoir

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- Eat no more than one meal per month of the following saltwater fish: striped bass, bluefish, swordfish and shark.

Submitted by:
Rhode Island Department of Environmental Protection

South Carolina Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

The water quality standards contained in stream values for mercury as follows:

- Freshwater Aquatic Life (numbers applied at 7Q10 stream flow)
 - average (chronic) - 0.012 g/l
 - maximum (acute) - 2.4 g/l

- Saltwater Aquatic Life (numbers applied at critical flow conditions)
 - average (chronic) - 0.025 g/l
 - maximum (acute) - 2.1 g/l

- Human Health (numbers applied at average annual flows)
 - Organism Consumption average (chronic) - 0.15 g/l

- We calculate monthly average and daily maximum permit limits using the above numbers and a simple mass balance considering the stream and the discharge flows. Even though the human health numbers are applied at annual average stream flow, the aquatic life numbers are normally governing since they are much lower than the human health numbers.

Public outreach/ education efforts

- Distribution of state fish advisory – advisories are generally issued and reissued on an annual basis.

- Published in all major newspapers in SC. Published (abbreviated form) in the SC Dept. of Natural Resources’ annual Hunting and Fishing Regulations.

- On numerous State & Federal Agencies’ web sites, on web sites of several academic institutions and on web site of SC Extension Service.

- Postings at boat landings.

- Health brochures for populations of concern – SCDHEC has distributed the advisories and brochures aimed at pregnant women to all county health departments and obstetrician/ gynecologists offices.

- Other – SCDHEC has developed pencils, magnets, book marks and drink coolers as items to distribute to children and families, fishermen, citizens groups, etc. All of these items have advisory information, advisory web site and phone numbers printed on them.

Research/ monitoring efforts

- Annually collect and analyze a minimum of 1500 fish samples (freshwater lakes and rivers, estuaries, near shore coastal waters).

- Air monitoring of ambient Hg concentrations and collection of samples for Hg in

Precipitation at the Congaree Swamp National Park. Precipitation collection is part of the National Air Deposition Program/ Mercury Deposition Network(NADP/MDN).

- Quarterly water monitoring at 300-400 sites
- Annual sediment monitoring at 300-400 sites

Resources developed by state

- 2000 South Carolina Fish Consumption Advisories web site.
- Brochures
- 2000 South Carolina Fish Consumption Advisories
- various pamphlets and fact sheets for the general public and specific target populations (e.g. pregnant women)

Mercury Committees/ Task Forces

- The SCDHEC has an internal task force to deal with developing and issuing advisories. SCDHEC is currently involved with preliminary plans to develop a state-wide mercury task force made up of state & federal agencies, colleges, research institutions, citizen groups, environments groups and others.

Current Statistics on fish consumption advisories

Total number of advisories: 48 for mercury
Total river miles – see EPA database
Total lake acres – see EPA database

Submitted by:
South Carolina Department of Environmental Protection

South Dakota Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Surface water discharge permits – Certain wastewater permits are required to monitor and meet a mercury discharge limit. (Kelli Buscher(605) 773-3351)
- Surface water quality standards – The surface water quality standards are used in developing surface water discharge limits as well as other enforcement actions. (Bill Baer (605) 773-4055)

Public outreach/education efforts

- Bitter Lake Fish Consumption Advisory – The Bitter Lake advisory was issued through press releases, web pages and posted at area boat launches. (Dave Micklos (605) 773-4130)

Research/monitoring efforts

- Ambient surface water quality monitoring near mining point sources (Patrick Snyder (605) 773-4279)
- Fish flesh sampling – 10 sites are sampled each year for mercury in fish flesh (Patrick Snyder (605) 773-4729)

Current statistics on fish consumption advisories

- 1 advisory covering one 10,000 acre lake (Bitter Lake) (Dave Micklos (605) 773-4130)

Submitted by:

Patrick Snyder

South Dakota Department of Environment and Natural Resource

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Tennessee Mercury Efforts

Water and Fish Tissue Monitoring

Mercury is a routine component of ambient water quality sampling. Additionally, special projects such as ecoregion reference stream and probabilistic monitoring also include mercury sampling. However, mercury is rarely detected in water samples. Mercury is measured as total mercury and the required detection limit used in Tennessee is 0.2 (in water).

Additionally, the Department of Environment and Conservation, in cooperation with other agencies, maintains a network of fish tissue monitoring sites in larger bodies of water. Typically 15 fish are collected - 5 of the same species from 3 target groups: game fish, catfish, and rough fish. Large fish are neither targeted nor excluded. The fish are analyzed by the state laboratory in Nashville and may be processed as individual or composite samples, depending on the range of sizes within the collection.

Fishing Advisories

Procedures for issuance of fishing advisories in Tennessee have been promulgated in our water quality standards [Chapter 1200-4-3-.03 (j)]. For application of this standard, the total mercury levels are assumed to be methyl mercury. At this time, mercury in fish is treated as a noncarcinogen, thus the applicable advisory level would be based on the FDA Action level.

If the average total mercury level in a certain species of fish is equal to or greater than 1.0 ppm, a “do not consume” advisory would be issued. If the average level in fish is equal to or greater than 0.5 ppm, a “precautionary” advisory would be issued. A precautionary advisory warns the public to limit consumption of fish, except for children, pregnant or nursing mothers, or others that may have had previous exposure to mercury. These higher risk groups are advised to avoid consumption.

The following streams in Tennessee currently have a fishing advisory for mercury.

- North Fork Holston River in Sullivan and Hawkins County, River Miles 0.0 - 6.2. The Tennessee portion of the stream is posted for mercury. Fish should not be consumed. The advisory goes to the TN/VA line. The source of the mercury is historical discharges from an industrial facility in Saltville, Virginia.
- East Fork of Poplar Creek including the Poplar Creek embayment, in Anderson and Roane counties, River Miles 0.0 - 15.0. The stream is posted for Mercury and PCBs. Fish should not be consumed. The source of the mercury is historical and current discharges from the Department of Energy’s Oak Ridge Reservation.

Water Quality Assessment

Tennessee considers the issuance of a fishing advisory to equal the loss of recreational use of a stream or lake. Thus, the above listed streams are considered polluted. The year 2000 statewide water quality assessment did not identify any additional streams with the condition of pollution for mercury.

NPDES Permitting

The Department places mercury limits on industrial and municipal dischargers when it feels that there is reasonable potential that mercury is present in effluent. Additionally, mercury is a routine component of pretreatment requirements.

Submitted by:
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Texas Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Standards:
 - Public Drinking Water Standards: Texas Administrative Code, Chapter 290, effective November 3, 1995, establishes concentration limits in treated drinking water.
 - Surface Water Quality Standards: Texas Administrative Code, Chapter 307; adopted July 26, 2000, effective August 17, 2000, establishes instream criteria to protect for human consumption of fish and drinking water.
 - Risk Reduction Rules: Texas Administrative Code, Chapter The Risk Reduction Rule, Title 30, Texas Administrative Code Chapter 335, Subchapter S, sets forth the requirements for the three risk reduction standards.
 - Land application: Texas Administrative Code, Chapter 312, Sludge Use, Disposal and Transportation, subchapter B Land Application for Beneficial Use, among other things, sets cumulative metal loading rate including mercury; adopted August 26, 1995, effective October 13, 1995.
 - Effluent standards: Texas Administrative Code Chapter 319, Subchapter B hazardous metals, establishes maximum effluent limits for any wastewater discharge.
- Controls:
 - Mercury-containing lamps/universal waste: Texas Administrative Code, Chapter 335, Industrial Solid Waste and Municipal Hazardous Waste, §335.261; adopted April 5, 2000, effective April 30, 2000.
 - Medical waste incinerators: Texas Administrative Code, Chapter 113, Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants, Subchapter D, §113.2072; adopted May 17, 2000, effective July 11, 2000.
 - Hazardous waste combustion: Texas Administrative Code 335 Subchapter H sets emissions requirements for mercury from hazardous waste burning boilers and industrial furnaces. While the hazardous waste regulations have no explicit requirements for mercury emissions from hazardous waste incinerators, in accordance with the TNRCC Combustion Strategy and 30 TAC 305.127(4)(A), mercury limits are also being included in hazardous waste incinerator permits. The emission limits set in permits for hazardous waste combustion units are evaluated for protectiveness in a site specific risk assessment. In the future, mercury emissions will be regulated from hazardous waste combustion units through the Title V program and through site specific risk assessment.
 - Wastewater permits: Texas Administrative Code Chapters 305, 309, 311, 312, 315, 315, 319, and Prodecures to Implement the Texas Surface Water Quality Standards, establish limits in permitted discharge to ensure best available technology, protect instream water quality standards, and meet established total maximum daily loads for individual water bodies.

2. nonregulatory

- Collection and recycling programs. The TNRCC includes mercury in its Agricultural Waste Pesticide Collection Program and the Household Hazardous Waste Collection Program: < www.tnrcc.state.tx.us/exec/sbea/disposal.html > . In addition, the agency

offers Recycle Texas Online, an online database that contains information on recycling businesses in Texas and the materials they handle including mercury: < www.tnrcc.state.tx.us/exec/sbea/rtol/index.html > .

- Wastewater pretreatment. The TNRCC and the Texas Water Utilities Association provide pollution prevention and waste minimization assistance for customers who discharge to wastewater treatment facilities, focusing on the top pollutants of concern, including mercury.
- Waste exchange. RENEW, the Resource Exchange Network for Eliminating Waste is a materials exchange network run by the TNRCC to promote the reuse or recycling of industrial wastes including mercury. The network is a marketing channel for industries, businesses, and governmental units that want to sell surplus materials, by-products, and wastes to users who will reclaim or reuse them.

Public outreach and education efforts

- Fish consumption advisories. The Texas Department of Health issues consumption advisories and aquatic life closures through press release and a toll-free hotline: 1-800-685-0361 (in Texas).
- Community Right to Know. Only one Texas facility reported mercury to the Toxics Release Inventory (TRI) for 1998; this is most likely due to a high reporting threshold. Thresholds are now much lower for mercury and mercury compounds under EPA's October 1999 final rule on PBTs, persistent bioaccumulate toxic chemicals; first reports are due July 1, 2001. In addition, EPA added seven new industry groups to the TRI in July 1999, including electric utilities, the largest remaining source of mercury emissions to air according to EPA. Contact: Margie McAllister, 512-239-1967.

Research/monitoring efforts

- Total Maximum Daily Loads (TMDLs). Mercury/fish consumption is a concern in two of the state's five river basin groups, addressed by TMDLs: < www.tnrcc.state.tx.us/water/quality/tmdl/index.html > . Texas water quality assessments have identified nine water bodies with mercury contamination that TMDLs will address. Contacts: Arthur Talley at 512-239-4546 and Steve Twidwell at 512-239-4607.
- Surface water quality monitoring. Mercury is routinely monitored in water, sediment, and fish tissue samples at approximately 50 statewide network sites each year. The TNRCC's laboratory and mobile monitoring section produced a May 2000 study called Bioaccumulation of Mercury in Selected East Texas Water Bodies to determine the relationships between mercury concentration in fish and physico-chemical variables in water and sediment. For more information, call the author Steve Twidwell at 512-239-4607. The Texas Parks and Wildlife samples fish in East Texas water bodies to determine if they are contaminated with mercury.
- Clean rivers program. Funds and coordinates water quality monitoring by river authorities and other agencies with the TNRCC monitoring program: < http://www.tnrcc.state.tx.us/water/quality/data/wmt/tcrp.html#how_crp > .

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- Air monitoring. Total mercury is monitored in rainwater at the Gregg County Airport near Longview as part of the National Atmospheric Deposition Program. For more information, call Tom Porter at 512-239-1722. Plans are in the works for another mercury monitor (rainwater) near Fort Worth. The City of Fort Worth will be the sponsor; the contact person is Clarence Reed at 817-871-5465. To find the mercury air deposition data, go to this Web site: <<http://nadp.sws.uiuc.edu/mdn/>>.
 - Utility generation. In 1998 about 23 percent of Texas utility generation was provided by coal and 21 percent by lignite. Source: Texas Public Utility Commission 1999 Annual Update of Generating Electric Utility Data.

Mercury committees or task forces

- Southern State Mercury Task Force, which meets annually to exchange information concerning mercury monitoring, assessment, and public education. Contact Steve Twidwell at 512-239-4607.
- National Atmospheric Deposition Program. Contact Tom Porter at 512-239-1722.

Current statistics on fish consumption advisories

- There are currently eight sites in Texas (five lakes and reservoirs, two streams, and the Gulf of Mexico) under Texas Department of Health fish consumption advisories and one aquatic life closure due to mercury in fish tissue. Contact: Steve Twidwell 512-239-4607.

Submitted by

Herb Williams, Director, Policy and Regulations, Office of Environmental Policy, Analysis, and Assessment, Texas Natural Resource Conservation Commission, 512-239-4884, hwilliam@tnrcc.state.tx.us

Vermont Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- Law and rules require certain mercury added products to be labeled.
- Law requires separation and bans disposal of certain mercury added products in landfills and incinerators.
- Law requires that Solid Waste Districts provide for collection and proper recycling or disposal of certain mercury added products.

2. non-regulatory

- Laboratory chemical cleanouts, materials handling plans and staff training for secondary and middle schools.
- Voluntary pledge programs for pharmacies to refrain from selling mercury fever thermometers (100 out of 125 have pledged).
- Mercury fever thermometer exchange programs using digital replacements for employee, parents of newborns, low income people, general public (planned for winter 2001).
- Hospitals surveys and guidance / training for reduction of mercury added product use assistance to implement best management practices in dental offices.

Public outreach/education efforts

- Advisories that cover both fresh native and salt water fish.
- Brochures distributed to business through direct mailing and to homeowners through Solid Waste District household hazardous waste activities.
- Press releases and story coverage of the school cleanout, thermometer pledge and exchange programs, the dairy manometer exchange program etc. We expect to have our Governor involved with these press events.

Research/monitoring efforts

- REMAP Mercury Program (Investigators Kamman, N., C. T. Driscoll, et al.): This program is measuring Hg, methylHg, and related physico-chemical parameters in multiple physical and trophic compartments of 94 lakes across the VT-NH Region. The goal of this program is to identify the physico-chemical identities of lakes which pose elevated risk of Hg transfer to upper trophic-level biota (such as endangered piscivores and humans), and to understand Hg's trophic transfer pathway. This research program has several on-going studies.
- Hg Atmospheric Deposition Monitoring Program (Investigators Scherbatskoy, T. G. Keeler, et al.): This long-term monitoring program has for a goal to document levels of Hg falling to the landscape in several important chemical forms. Embedded within this program are studies to understand small watershed-scale cycling of Hg in both forested and agricultural areas.

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- Hg in Streamflow Project (Investigators Shanley, J. et al.): This project is characterizing Hg in streamflow of a small rural VT stream system to understand downstream Hg delivery.
 - Hg modeling for Lake Champlain Project (Investigators Gao, N., Shanley, J., et al.): This small-scale modeling project has for a goal to synthesize available information regarding Hg processing within the Lake Champlain Basin (developed from the above projects), with the aim of developing an empirical model to describe Hg partitioning within various compartments of the Basin.

Resources developed by state

- Mercury website < www.mercvt.org > includes the law and rule and manufacturer's information on labeling, advisory committee information, contact information, school project information.
- Public and business brochures concerning identification and handling of mercury added products.
- Laboratory Chemical Management Program for Vermont Schools - Guidance and Samples.

Mercury Committees/Task Forces

- Advisory Committee on Mercury Pollution established in law with technical, health, regulatory, business and legislative membership intended to evaluate progress in Hg reduction and recommend improvements to the executive and legislative branches.

Current statistics on fish consumption advisories

Total number of advisories: 2 (general pop. and woman/children < 6)
Total river miles: 7,099
Total lake acres: 228,920

Submitted by:
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Virginia's Mercury Efforts

The Virginia Department of Environmental Quality's Office of Pollution is working to promote and coordinate statewide efforts to reduce the use of mercury and mercury-containing products; and to collect unused elemental mercury for proper management and recycling. Virginia's initiative will draw heavily upon the strengths of other successful mercury-related programs in other states and cities. In furthering this initiative, Virginia plans to utilize existing partnerships with industry mentors, state and local government, and the dental industry; and to create new partnerships within federal government, the hospital and pharmaceuticals industry, and local school systems.

Dental Mercury Sweep

The Virginia Dental Association has worked with the Virginia Department of Health (VDH) to coordinate a system of collection sites for dental offices that have antiquated supplies of elemental mercury. The VDA contracted with a mercury recycler to collect the mercury at 22 VDH collection sites. The collection was held from April 1 – May 31, 2000, resulting in the collection of more than 400 pounds of mercury.

Schools Sweep

Virginia plans to coordinate with the VDH to create a mercury collection project with state school laboratories who also have antiquated supplies of elemental mercury. This collection would be similar to the dental sweep in that it would ideally utilize many of the 22 collection sites from that project. Virginia plans to utilize the "Virginia Mentoring Network", individuals from around the state who have volunteered to provide one-on-one assistance to business and other entities. Mentors will be challenged to contact their local school officials and to assist in coordinating the transport of elemental mercury to the collection sites. Upon completion of an initial collection, VADEQ plans to focus on the participating schools for other mercury reducing projects such as thermometer exchange.

Healthcare Industry / Thermometer Exchange

Because of the prevalence of hospital waste incinerators, the hospital industry is second only to power plants in the aggregate poundage of mercury that it introduces to the environment. This statistic can be related by risk factors to a significant number of deaths each year, and is in stark contrast to the overall mission of the healthcare industry. For this reason, in 1998, the American Healthcare Association entered into a Memorandum of Understanding with the Environmental Protection Agency that specified, along with various other waste-related pledges, a commitment to eliminate all mercury-containing devices by the year 2005".

Virginia is currently working with Washington, DC, which is coordinating with healthcare companies in the DC area and a retail pharmacy chain to support a thermometer exchange program. Virginia plans to utilize these same partners to develop a similar program and to promote a comprehensive P2 project with the healthcare industry.

Department of Defense Sweep

Virginia is in the process of signing a Memorandum of Agreement (MOA) with 20 + Department of Defense (DoD) facilities. The MOA commits to partnerships in P2 efforts and in the development of Environmental Management Systems. The DoD facilities have committed to performing a mercury collection and an overall mercury reduction initiative that would be closely coordinated with state efforts.

State Agencies / University Laboratories

Since 1997, the VADEQ has been working with the 44 state agencies / universities that have P2 Plans in place. In conjunction with the collection of mercury from local school systems, Virginia plans to coordinate with several of the Universities to serve as collection sites as well.

Virginia hopes to commence planning for the schools, healthcare, and DoD projects in the Fall of 2000 and to achieve measurable results in 2001.

Submitted by:
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Wisconsin Mercury Efforts

Scope of mercury reduction efforts

1. regulatory

- NR 105 sets surface water quality criterion at 1.3 ng/L, although a majority of our waters do not attain this standard. Maximum discharge concentrations calculated under NR 106 would be set at the criterion or at background, depending on the source of the permittee's water supply. Some permits contain these maximum concentrations as effluent limitations. However, the Wisconsin Strategy for Regulating Mercury in Wastewater Discharges (implemented since May 1996) provides a means, within the regulatory framework, to forego limits in permits in favor of pollution reduction activities at a large percentage of permitted facilities. Due to recent EPA promulgation of the low-level test method (Method 1631), we should now revise our strategy.
- State air emission regulations contained in chapters NR 445 and 446, Wis. Adm. Code. These regulations provide public protection against acute and chronic inhalation health effects from mercury and are expressed as acceptable ambient concentrations.
- Developed and implemented a Wisconsin specific universal waste policy to encourage the recycling of Hg containing products.

2. non-regulatory

- Free mercury-product recycling for participating communities (Collected over 5000 lbs of Hg)
- Thermometer exchanges
- School mercury-product "collection bounties"
- Dairy manometer exchange program
- Medical mercury workshops for hospitals and clinics
- Dental mercury best-management-practices literature distribution
- School mercury reduction workshops
- Thermostat recycling promotion
- Community mercury reduction programs: local programs that promote using non-mercury alternative products, recycling mercury products, and preventing mercury spills
- Distribution of fish consumption advisories and mercury reduction literature at state fairs, sport and home shows, and professional association conferences

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- Distribution of mercury spill management literature and compilation of reported spill statistics

Public outreach/education efforts

- Annual Fish Advisory Publication
- Advisory messages have been distributed through the customary channels of the media (radio, TV, newspapers), DNR service centers, county health departments. Recently begun to specialize message for a focused group of people - namely women and minorities who may not have been getting message in the past. Sponsored outreach programs with minority centers such as English as a Second Language courses, Hmong community centers, and the 16th Street Community Health Center (Milwaukee). Posters were created for doctors and pediatric clinics and WIC programs. We've created specialized brochures aimed at women who are pregnant.

Research/monitoring efforts

Research Investigation:

- Assessing the Ecological Risk of Mercury in Wisconsin Lakes: Laboratory and field studies and exposure modeling using the common loon (*Gavia immer*). (1997-2001)
- Watershed Influences on Transport, Fate and Bioavailability on Mercury in Lake Superior. (1999-2002)
- An Investigation of Processes Influencing Elevated Fish Mercury Levels in Isle Royale National Park, Michigan. (1999-2001)
- Speciation and Bioavailability of Mercury and other Metals in the Great Lakes Ecosystem. (2000-2002)
- Methyl Mercury in Atmospheric Precipitation in the Great Lakes Region. (1998-2001)
- Watershed Transport and Transformations of Atmospherically Derived Mercury: A whole ecosystem amendment study. (2000-2003)
- Impacts of Reservoir Creation in Forested Uplands on Greenhouse Gas Emissions and Methyl Mercury Production. (1998-2000)
- The Source and Fate of Methyl Mercury in Freshwater Ecosystems. (1997-2000)
- Mercury TMDL Pilot Study at Devil's Lake, WI. (1998-2001)
- Devil's Lake TMDL Pilot Project – Participating with USEPA in a pilot project at Devil's Lake (near Madison) to investigate the relationship between air emissions of mercury and water quality impacts.
- Air Monitoring – Presently operating three MDN (Mercury Deposition Network) sites located at Brule River and Trout Lake (northern Wisconsin) and Lake Geneva (southeast Wisconsin). Have recently received a grant from USEPA to operate a MDN event-sampling site at Devil's Lake.
- Fish Monitoring — Sample around 30 new waters each year, but have stepped up the effort with our new baseline monitoring program. Targeting about 50 - 60 new

sites per year. Each year about 10 - 12 new sites to the fish advisory are added to the advisory list. Our current advisory listing stands at 341 for mercury.

- Lichen Study - Conducted a study to determine the upwind and downwind accumulation of Hg from a Hg chlor-alkali plant using lichens.

Resources developed by state

- Mercury website is under development
- Numerous mercury-related reports, brochures, and other literature
- Mercury Sourcebook

Mercury Committees/Task Forces

- Policy Committees/Workgroups
 - Department sponsored external stakeholder group
 - Proposed State Legislation
 - Department Persistent Bioaccumulative Toxics Team
 - Municipal mercury reduction workgroup
 - Participation in the Region V Mercury Strategy Workgroup.
 - Participation in Binational Strategy and Great Lakes Workgroups
- Scientific Committees
 - Dr. James Hurley – Research Scientist Wisconsin DNR/Associate Director of Research, University of Wisconsin Water Resources Institute (608)262-1136
 - Technical Advisory Team, International Mercury Conference, Minimata, Japan, 1999-2001.
 - USEPA Science Advisory Board, Mercury Study Report to Congress, 1997.
 - Peer Reviewer for USEPA document “Draft National Bioaccumulation Factors (BAF’s) for Methyl Mercury”, July 2000.
- Dr. Michael Meyer – Research Scientist Wisconsin DNR (715)365-8858
 - USEPA Mercury Risk Assessment Workshop, Narragansett, RI, Sept. 2000
 - USEPA-National Health & Environmental Effects Research Laboratory- advisor on the risk of mercury exposure to piscivorous birds.
 - Environment Canada/Canadian Wildlife Service – advisor on the risk of mercury exposure to piscivorous birds.
 - USEPA Science Advisory Board, Mercury Study Report to Congress, 1997.
- Dr. Carl Watras – Research Scientist Wisconsin DNR (715)356-4892
 - Peer reviewer for USEPA mercury mass balance of Lake Michigan, 1999.
 - Technical Advisor Team, International Mercury Conference, Minimata, Japan, 1999-2001.

Current statistics on fish consumption advisories

Total number of advisories: 341

Submitted by:
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