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Third Compendium of States' Mercury Activities

October 2012

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The *Third Compendium of States' Mercury Activities (October 2012)* updates and expands upon the *2005 Compendium of States' Mercury Activities, published by ECOS in October 2005*. This Third Compendium is based on a survey of state governments conducted from June 2011 through January 2012.

Members of the Quicksilver Caucus (QSC) wrote the survey, distributed it to states, and gathered state responses. Forty-two states responded to the survey. Many people played key roles in developing this compendium. Special thanks go to the many staff from state environmental agencies who gathered the information and work daily to reduce mercury pollution. Special recognition goes to the Compendium Team Members:

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Ian Wesley (Washington Department of Ecology and ECOS)
Edin Ferreira (ECOS Staff)
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The states and environmental associations donated their team members' time to develop and administer the questionnaire, analyze responses, and write the final report. The ECOS Alumna member volunteered her time to support states' development and deployment of the questionnaire, and analysis of responses. The United States Environmental Protection Agency (U.S. EPA) provided funding for management of the final report's development, editing, and formatting under Cooperative Agreement Number U.S. EPA X5-83395401.

The QSC, a coalition of state associations, formed to address and resolve health and environmental problems resulting from the release of mercury to the environment. The membership of the QSC includes, the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), the Environmental Council of the States (ECOS), the National Association of Clean Air Agencies (NACAA), the Association of Clean Water Administrators (ACWA), the Association of State Drinking Water Administrators (ASDWA), and the National Pollution Prevention Roundtable (NPPR) .

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Third Compendium of States' Mercury Activities

October 2012

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PART I: National Overview of State Mercury Programs

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Executive Summary

Introduction

The Quicksilver Caucus (QSC) sent surveys to all 50 state environmental agencies for information about their mercury issues and programs to assess the status of state and federal efforts to address mercury pollution. The following Compendium summarizes the information provided by 42 states, plus additional state information from other sources and state and national data from the United States Environmental Protection Agency (U.S. EPA). The document describes how state governments have responded to this critical issue, and provides a resource for organizations developing, implementing, and assessing mercury-reduction efforts. The report also identifies several challenges to continued progress.

Background

Mercury is a volatile metal that is very toxic to people and wildlife via inhalation and ingestion. The primary route of concern for exposure in the U.S. is through the ingestion of fish. Infants, children, and the developing fetus are at particular risk because the developing brain is very sensitive to mercury toxicity. Although mercury exists naturally, human activities are primarily responsible for the mercury levels that contaminate many lakes, rivers, and coastal waters across the nation. Mercury persists in the environment and accumulates up the food chain resulting in elevated levels in larger predatory fish that many people and wildlife eat. Mercury can be deposited locally and can be carried long distances in the air where results in wet (e.g., rain) and dry deposition that pollutes waterbodies which in some cases can be far from the original source. Some key sources of mercury releases of concern to states are shown in Table 1.

Table 1
Key Sources of Mercury of Concern to States

- Coal-fired power plants
- Electric arc furnaces
- Cement plants and other industrial sources
- Waste-burning incinerators
- Chloralkali and some other chemical plants
- Gold mining
- The dental sector
- Breakage and disposal of mercury-containing products

Many Americans are exposed to mercury at levels that may be potentially harmful, primarily by eating fish containing methylmercury; an organic form resulting from the bacterial biotransformation of mercury deposited in water. All 50 states have published fish consumption advisories, covering thousands of lakes and ponds and tens of thousands of river and stream miles, warning consumers to limit their fish consump-

tion or avoid eating some kinds of fish due to mercury contamination. Minnesota's and New Jersey's statewide assessments, and the Northeast regional assessment, conducted by New York, Connecticut, Massachusetts, Vermont, Rhode Island, Maine and New Hampshire, indicate that mercury pollution from anthropogenic sources will need to be reduced by 90 percent or more to restore many impaired waterbodies in order to meet the water quality objectives of the Clean Water Act. Mercury air pollution can be transported long distances before it is deposited on water or land, and as a result additional reductions in major sources across the U.S. and globally will be needed to restore mercury impaired waterbodies in these states.

State Action

States continue to implement many activities to reduce mercury in the environment despite significant budgetary challenges. While the actions vary from state to state, several areas of common concern and effort exist.

- Half (21) of the 42 states responding to the QSC survey have an overall mercury reduction plan or strategy now in place, a significant increase from 2005, and seven more plan to develop one.
- Most states consider coordination among states and with the federal government as especially critical to leverage efficiencies, reduce state program costs and enhance regulatory certainty and consistency.
- Over 90 percent of states are participating in multistate mercury workgroups. These include the QSC, New England Governors and Eastern Canadian Premiers Mercury Action Plan, Great Lakes Regional Collaboration, Gulf of Mexico Alliance and the Western North American Mercury Synthesis Workgroup.

The U.S. EPA's support, including funding for the Environmental Council of the States (ECOS) and QSC mercury projects over the last several years, has been critical for multistate and cross media collaborative efforts addressing mercury. However, QSC leadership is concerned that significant budgetary constraints at the state level and budget reductions at the federal level may jeopardize multistate initiatives and progress made to date. ECOS believes that continued U.S. EPA support for the QSC and further engagement in collaborative initiatives with the states is critical for maintaining momentum in reducing domestic and global mercury pollution.

The budget situation experienced by many states over the past few years has resulted in cutbacks for mercury pollution prevention, collection and recycling, outreach, monitoring and enforcement programs. The ability of states to coordinate and share information has also been affected by recent reductions in federal support to the

states and to interstate organizations that work on mercury, as well as other issues. As a result of these state and federal budget limitations, overall program efficiencies will likely be reduced as individual states are forced to work in isolation rather than share resources to address common problems. This fragmentation also increases inconsistencies among states, regulatory uncertainty, and compliance costs for the regulated community.

Another challenge noted by many states is the need for timely access to long-term national elemental mercury storage under the 2008 Mercury Export Ban Act (MEBA) to safely remove excess mercury from commerce. Delays in siting and opening this facility will necessitate interim storage with higher overall national and state agency costs attributable to re-packaging, shipping, and operational oversight. Towards this end QSC sent a letter in May 2012 to the U.S. Department of Energy (DOE), which is responsible for the MEBA facility, urging its timely completion.

In spite of the challenges noted above, the states, in collaboration with U.S. EPA, have achieved many successes, including:

- States have led the way on many sources, initiating actions prior to, and often exceeding federal programs and requirements. This has been the case with regulations on key emission sources, legislation addressing mercury-added products, and initiatives to address the dental sector.
- The news regarding trends in U.S. sources of mercury air pollution is very encouraging. Air emissions have declined as summarized in Table 2.
- Many states have enacted legislation focused on mercury-added products and mercury use in products in the U.S. decreased by almost 50 percent from 2001 to 2007.
- States and municipalities have also taken steps to reduce mercury pollution attributable to dental amalgam, and the number of states with programs addressing this source has increased from four in 2005 to 30 today.

Table 2
Reductions in U.S. Mercury Air Emissions

- Total U.S. air emissions dropped about 75 percent between 1990 and 2008.
- Some state air emissions have dropped by 90 percent between 1990 and 2008.
- Municipal solid waste combustors and medical waste incinerators dropped nationally by 95 percent between 1990 and 2008.
- Coal-fired electric generating units (although they remain the largest current mercury source) have dropped nationally by about 51 percent between 1990 and 2008.
- Other sources with large reductions include chloralkali manufacturing, gold mining, cement kilns and hazardous waste incinerators.

The states have also supported research and monitoring on mercury sources and levels in fish, other biota, and the environment. These data were critical to defining the scope of mercury contamination and impacts and establishing fish consumption advisories to protect children's health. Mercury monitoring is now allowing regulatory agencies and scientists to track progress and trends and has revealed unexpected mercury impacts on a variety of wildlife including songbirds. Encouragingly, declines in mercury levels in some freshwater fish, associated with local and regional emission reductions, have been documented in research studies in Massachusetts, Florida, and the Great Lakes Region. However, in all cases, fish mercury levels remain too high, pointing to the need for further national and international action. Maintaining state capacity to continue mercury reduction programs, to leverage successful programs nationally and internationally, and to monitor trends is critical to maintaining momentum and progress.

In conclusion, this report documents significant progress on the mercury issue by the states and U.S. EPA but also highlights that there is more work to be done to restore impaired waterbodies across the nation and the globe. State leadership on this issue has helped to define the scope of the problem and demonstrate what can be successfully accomplished. Their leadership has also supported efforts to reduce global sources of mercury pollution that impact our children.

Background: Environmental Sources of Mercury

Mercury is a volatile, toxic heavy metal. Although mercury exists naturally in the environment, human activities are primarily responsible for the high mercury levels that contaminate lakes, rivers, and coastal waters (U.S. EPA, 1997). Unnaturally high levels of mercury in the environment pose a significant risk to public health and our wildlife.

Mercury is released through a variety of sources including coal-fired power plants, chemical plants, product use and disposal, waste-burning incinerators, and the dental sector. Additionally, despite significant recent decreases, intentional mercury use in consumer products such as relays and switches (found in vehicles and many other products), fluorescent lamps, thermostats, thermometers, medical and measuring devices, lab chemicals, vaccines, pharmaceuticals, and dental fillings remains widespread in the U.S. The mercury in these products can be released into the environment when the products are disposed of in a landfill, incinerated with other waste, or discarded in wastewater. Although the manufacture and sale of mercury in products is declining due to the states' regulations and programs, large amounts remain in products that continue to be used in our society.

As a natural trace element in fossil fuels, particularly coal, mercury is also released into the air when they are burned to generate electricity or heat. Research indicates that these and other human activities have increased atmospheric concentrations of mercury by about a factor of three and have caused the rate of mercury deposition to increase by as much as a factor of 3–10, depending on location, over pre-industrial levels (United Nations Environment Programme, 2008; Bergan, T., et al., 1999).

As an element, mercury does not break down or decompose to non-mercury-containing substances in the environment. Instead, mercury continuously cycles between air, water, and land. After being released into air, mercury can travel short and long distances and be deposited nearby or across the globe in rain, snow, or dry particles. Once mercury finds its way into waterbodies, aquatic micro-organisms can convert mercury into methylmercury, a more toxic form of mercury that is readily absorbed by living organisms. Unlike many other pollutants, methylmercury is not readily excreted by fish and other organisms in the aquatic food chain. Thus mercury bioaccumulates in organisms and increases in concentration as it works its way up the food chain. As a result, species at the top of the food chain that are consumed by humans, such as largemouth and smallmouth bass, pike, swordfish and some tuna, can have mercury levels up to 1 million times that of the surrounding water (Zillioux et al., 1993).

Human Health

Recent research studies continue to demonstrate that many Americans are being exposed to mercury above recommended safe levels. Based on national monitoring of mercury in people's blood, about seven percent of the U.S. population is exposed to mercury above the level considered safe for the developing brain and neurological system of the fetus (http://www.epa.gov/hg/exposure.htm). This percentage can vary greatly, depending on the specific region or group considered. Mercury exposures have been found to be greater among those who eat more fish. Human subpopulations likely to eat more fish include some people who have higher incomes, people who live along the coasts, Native Americans, and Asians and Pacific Islanders.

In a study by the New York City Department of Health and Mental Hygiene, the geometric mean blood mercury concentration was found to be more than three times higher than the national estimate derived from 2001-2002 National Health and Nutrition Examination Survey (NHANES) data, with 25 percent of the 1,800 adults tested (equating to 1.4 million New York City adults) and close to 50 percent of Asians in the city exhibiting blood mercury levels above 5 μg/L (McKelvey, 2007). Researchers at the Minnesota Department of Health tested about 1,500 blood samples from infants born in the Great Lakes states of Minnesota, Wisconsin, and Michigan. Researchers also found eight percent had blood mercury levels above the recommended safe level (McCann, 2011).

Ongoing research highlights mercury's potent toxicity, with recent reports continuing to note associations between low levels of mercury exposure and neurological effects. Two studies also reinforce concerns about mercury's immunological effects, including research demonstrating associations between low mercury blood levels and atopic dermatitis (eczema) in adults (Park and Kim, 2011) and systemic inflammation and endocrine disruption in children (Gump et al., 2012).

People can be exposed to mercury in a number of ways. The predominant pathway is through the consumption of contaminated fish. All 50 states currently have fish consumption advisories in effect warning consumers to limit or avoid eating certain types of fish, or all fish from certain waterbodies. Thousands of lakes and ponds and tens of thousands of river and stream miles are subject to such advisories. Mercury contamination degrades recreational and commercial fishing opportunities and the economic benefits associated with these activities. It also poses risks of adverse effects on brain development, the immune system, and the cardiovascular system among those consuming contaminated fish caught recreationally and commercially.

State wide and regional assessments, called total maximum daily loads (TMDLs) for mercury developed individually by Minnesota and New Jersey, and regionally by the seven Northeast states, have all determined that mercury deposition to the states' waterbodies attributable to manmade sources will need to be reduced by greater than 90 percent to restore impaired lakes, ponds, and rivers in order to meet the water quality objectives of the Clean Water Act (Minnesota Pollution Control Agency, 2007; New England Interstate Water Pollution Control Commission, 2007; New Jersey Department of Environmental Protection, 2009). Mercury air pollution can be transported long distances before it is deposited on water or land. Mercury levels in these states' waterbodies and can only be reduced significantly as a result of additional reductions in major sources across the U.S. and globally.

Wildlife

Extensive studies of mercury's environmental impacts have been completed or are underway in many states including those in the Northeast and the Great Lakes regions, Florida, the Gulf of Mexico states, and the Western region. These studies have consistently documented troublesome mercury levels in a variety of wildlife, including fish-eating birds like loons and eagles, otters, amphibians, and upland birds. Researchers recently concluded that the scope and intensity of the impact of mercury on fish and wildlife in the Great Lakes region is much greater than previously recognized (Evers et al., 2011). In many areas, mercury concentrations exceeded human and ecological risk criteria, particularly in inland waters. The study also found that mercury is causing harm at levels once thought to be safe. In the common loon, for example, exposures that cause no effect in adults can impair egg fertility, survival of newly hatched chicks, and overall reproductive success.

Over the last decade, collaboration among state, federal, and international organizations on managing mercury in the environment has increased. This collaboration has led to increased coordination of activities, an overall reduction of mercury emissions in the U.S., and a greater awareness of mercury uses and impacts throughout the world.

Trends in Mercury Reduction

The news regarding trends in mercury air emissions from U.S. sources is very encouraging. Total mercury U.S. emissions reported in the U.S. EPA National Emissions Inventory (NEI) showed an overall 75 percent decrease from approximately 246 tons to 61 tons from the early 1990s through 2008 (http://www.epa.gov/ttn/chief/eiinformation.html):

Individual states have documented emission reductions of up to 91 percent (http://www.mass.gov/dep/toxics/stypes/08hginv.pdf). Further reductions are underway due to ongoing state and federal efforts to improve pollution controls and reduce unnecessary uses of mercury in products and processes. Mercury emission reductions of greater than 95 percent have been achieved by two of the three largest mercury source categories in the 1990s – municipal solid waste combustion and medical waste incineration.

The data also indicate that substantial reductions in emissions from coal-fired electric generating units (EGUs) occurred over the past few years. These data are consistent with state regulations on this sector, as well as co-benefits of pollution controls installed to address other regulated pollutants, and voluntary actions. Although coal-fired EGUs remain the largest current mercury source category, the further deployment and optimization of pollution control technologies, if implemented, will lead to significant further reductions in emissions of mercury from this sector.

The NEI data together with data from the Toxics Release Inventory (TRI) (www.epa.gov/tri) indicate that significant reductions in mercury emissions have also been achieved in other industrial sectors, including the chloralkali industry, gold mines, cement kilns, and hazardous waste incinerators. On the other hand, mercury air emissions from steelmaking facilities, as reported to TRI, increased from 2002 to 2010, despite pollution prevention efforts to remove mercury-containing switches from scrapped vehicles. This is likely due to improved emissions test data for the steel sector since 2002 (U.S. EPA Office of Toxic Release Inventory Program email communication, 2012).

Mercury use in products and processes has also decreased significantly. Use of

mercury in products decreased by 46 percent from 2001 to 2007, the last date data are available (Wienert, 2009). The number of states with programs addressing dental mercury increased from four in 2005 to 30 in 2011.

Decreasing levels of mercury in fish, associated with reductions in local and regional mercury emission sources, have been reported in research studies in Massachusetts (Massachusetts Department of Environmental Protection, 2006), Florida (Axelrad, et al., 2011), and the Great Lakes region (Monson, et al., 2011). However, in all cases fish mercury levels remain too high in many of the waterbodies studied. Mercury concentrations in some biota, including common loons in Wisconsin; walleye in Ontario, Minnesota, and Lake Erie; and northern pike in Minnesota have increased somewhat recently. This increase occurs in spite of declines in mercury levels in the Great Lakes region over the past four decades, concurrent with decreased emissions from U.S. sources (Monson, 2009). Taken together these results are encouraging but highlight the need for further action.

Successful state programs have established state leadership in reducing mercury emissions and uses of mercury. These efforts have put the states and the U.S. ahead in developing technologies and policies to address this global issue, and strengthen the U.S. position, creating opportunities for the U.S. government to call for other countries to reduce sources of mercury pollution that impact the U.S.

State Collaboration on Mercury Issues

In 1996, ECOS called for a permanent halt to mercury sales from the Department of Defense Mercury Stockpile and for an evaluation of options for the safe retirement of the stockpile in one of its first mercury policy positions. Since that time ECOS has focused on several policy areas that address managing and reducing mercury in the environment (http://www.ecos.org/section/policy/resolution). See table 1 on page 11

To enhance coordination on mercury issues, the QSC was formed in May 2001 by a coalition of state environmental association leaders. The QSC works to collaboratively develop holistic approaches for reducing mercury in the environment. QSC members who share mercury-related technical and policy information include the Environmental Council of the States (ECOS), the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), the Association of Clean Water Administrators (ACWA), the Association of State Drinking Water Administrators (ASDWA), the National Association of Clean Air Agencies (NACAA), and the National Pollution Prevention Roundtable (NPPR).

Table 1

Managing Mercury in the Environment: Key ECOS Policies

Policy Subject (ECOS Resolution Numbers)	Period in Effect
· Mercury Stockpile Sales, Retirement, and Management (96-02, 03-3, and 06-1)	Sept-1996 to 2012
· State - US EPA Collaboration for Creating and Implementing a National Vision and Program for Managing Mercury in the Environment (01-4, 05-31, and 07-1)	Feb- 2001 to 2013
· Mercury Air Emissions using Multi-Pollutant Strategies (01-2, 04-2, 05-1, 06-8, and 08-5)	Feb-2001 to 2014
· TMDL Approaches and Global Strategies to Address Atmospheric Deposition of Mercury (01-14 and 03-7)	Aug-2001 to 2015
· Effective Mercury Switch Recovery Program (04-7, 06-7, 10-9, and 12-8)	Oct-2004 to 2015
· Mercury Reduction, Stewardship and Retirement (09-2)	Mar-2009 to 2015
· Federal and State Capacity to Monitor Mercury in the Environment (10-2)	Mar-2010 to 2013

The QSC's long-term goal is that state, federal, and international actions result in net mercury reductions to the environment. Since its inception, QSC members have:

- ❖ Facilitated the development of policy positions and technical documents, as well as information sharing through workshops and conference calls (http://www.ecos.org/section/committees/cross_media/quick_silver).
- ❖ Participated in the mediated negotiations leading to the National Vehicle Mercury Switch Recovery Program and were involved in the Federal Stakeholder Panel on Commodity-Grade Mercury.
- ❖ Provided testimony and technical assistance, at the request of Congress, in the development of federal legislation to ban elemental mercury exports and provide safe long-term storage of unneeded mercury.
- ❖ Provided technical and policy input to the U.S. EPA and the U.S. Department of State (State Department) on international aspects of the mercury issue; assisted the United Nations Environment Programme Mercury Partnerships (UNEP) and shared information about successful state programs addressing mercury releases attributable to products and the dental sector. Table 2 on page 12 highlights some key activities of the states since 2000.

Table 2
Key Actions by States to Address Mercury in the Environment

- Sponsored a State Environmental and Public Health Policy Seminar (October 2000)
- Formed Quicksilver Caucus (May 2001)
- Hosted First QSC - U.S. EPA Leadership Meeting (February 2002)
- Sponsored Policy Workshop for State-U.S. EPA Leaders (October 2003)
- Published Compendium of State Mercury Activities (October 2005)
- Endorsed National Vehicle Mercury Switch Recovery Program (August 2006)
- Sponsored Policy Workshop for State-U.S. EPA Leaders (May 2007)
- Supported Ban on Unnecessary Mercury Exports/Issued Principles for Safe Management of Elemental Mercury (June 2007)
- Published State Actions for Managing Mercury in the Environment (April 2008)
- Urged U.S. EPA Development of a Mercury in Dental Amalgam Effluent Guideline Rule (December 2008)
- Supported Stronger Management of International Transboundary Mercury (February 2009)
- Recommended that the U.S. Delegation Push for Strong International Mercury Treaty Reduction Targets and Product Bans (January 2011)
- Urged Timely Implementation of the Mercury Export Ban Act (May 2012)

More Than a Decade of State Leadership and Action

In 2000, the ECOS and the Clean Air Network published the first compendium of state mercury activities which described how 26 states were addressing management of mercury in the environment. This first compendium included information from states on the scope of their mercury reduction efforts, public outreach and education efforts, research and monitoring efforts, publications and resources, mercury committees and task forces, and current statistics on fish consumption advisories.

In 2005, the QSC and the National Wildlife Federation published the second compendium of state mercury activities and a short update was completed in 2008. These reports also documented increased efforts by the states to address mercury issues including adoption of state mercury strategies and expanded efforts in the areas of mercury-added products, the dental sector, research and monitoring, and fish consumption advisories.

The states have also been actively engaged in global aspects of the mercury issue. Mercury's ability to be transported long distances in the air, combined with its continued use and release from many sources, has made mercury pollution a global problem. Accumulating evidence of the global reach and significance of mercury pollution and risk reached a tipping point in 2002, when the UNEP initiated a global assessment of mercury pollution, impacts, and sources (UNEP, 2002). State technical and policy experts provided input to this report, and urged global action to reduce mercury pollution. The UNEP Governing Council concluded in 2003 (based on the Global

Mercury Assessment Report) that there was "sufficient evidence of significant global mercury impacts to warrant immediate action".

Initial work under the UNEP declaration was implemented through several voluntary partnerships that were established to facilitate information sharing, capacity building, and short-term progress. These voluntary partnerships addressed mercury supply and storage, use in products and processes, emissions from coal combustion, and use in small scale gold mining, among other issues. The states assisted in several of these partnerships through the QSC State Mercury Resources Network. States also advocated for clearer terms of reference as well as the management and development of accountability metrics to guide and evaluate progress.

Consistent with the QSC recommendations, work to strengthen these partnerships through the development and inclusion of overarching frameworks, partnership goals, and operational guidelines was undertaken during 2008. The partnerships continue to be the primary vehicle for coordinated global action on mercury. However, in recognition of the serious nature of the issue and the need for additional measures, the Governing Council initiated action in 2009 towards a legally binding agreement on mercury, targeted for completion in 2013. QSC continues to provide technical and policy input to this initiative.

Federal Actions and Collaboration with the States

States indicated that they consider coordination between state and federal government agencies as a key element in efforts addressing mercury pollution. States have found that fiscal constraints present a challenge in addressing mercury pollution. Many environmental programs throughout the federal government have had their budgets reduced, including programs that address mercury pollution. U.S. EPA has used different approaches to maintain a level of involvement on mercury issues, including:

- Partnerships with states.
- Voluntary agreements to encourage best management practices.
- Bilateral, as well as regional and international partnerships.
- Collaborations to address mercury releases and uses and the resulting exposure.

"EPA's Roadmap for Mercury" was published in 2006. The Roadmap focused on six key areas, with the overarching goal of reducing health risks associated with mercury exposure. Table 3 on page 15 shows U.S. EPA rulemaking and voluntary activities since then. The U.S. Department of Energy (DOE) has also addressed aspects of the mercury issue. Under the 2008 Mercury Export Ban Act (MEBA), DOE was charged with establishing a national repository for the safe long-term storage of excess elemental mercury by 2013. In January 2011, DOE issued an Environmental Impact Statement regarding the site evaluation and selection process to identify a facility or facilities for the repository. This was completed with consultation and input from the states. However, in June, 2012, DOE issued a Notice of Intent to prepare a Supplemental Environmental Impact Statement on this issue, delaying the final site selection, which will likely necessitate interim storage of excess mercury at existing facilities. The states have urged DOE to expeditiously complete this process and to continue to involve the states. In 2012, ECOS adopted policy resolution 09-2 to urge the federal government establish a mercury storage facility under MEBA. The resolution also asked the federal government to cover any expenses that states may incur in implementing or overseeing the interim transport and storage of excess commodity mercury.

Table 3
Key U.S. EPA Mercury Activities
2006 to 2012

Final Rules

- TSCA Significant New Use Rule for Mercury used in Barometers, Manometers, Hygrometers and Psychrometers; 2012
- CAA Rule for Hazardous Air Pollutants from Coal-Fired Power Plants (aka Mercury & Air Toxics Standards for Power Plants); 2012
- U.S. EPA Rule to Update Existing Toxics & Air Rules to Reference Revised ASTM Standards That Allow for Use of Non-Mercury Industrial Thermometers; 2012
- CAA Rule for Hazardous Air Pollutants from Industrial, Commercial & Institutional Boilers & Process Heaters; 2011
- CAA Rule for Hazardous Air Pollutants from Sewage Sludge Incinerators, 2011
- CAA Rule for Mercury Emissions from Gold Mining; 2011
- CAA Rule for Hazardous Air Pollutants from Portland Cement Manufacturing Facilities; 2010
- TSCA Significant New Use Rule for Mercury Used in Flow Meters, Natural Gas Manometers, and Pyrometers; 2010
- CAA Rule Amendment for Hospital, Medical & Infectious Waste Incinerators; 2009
- CAA Rule for Hazardous Air Pollutants from Electric Arc Furnaces at Steelmaking Facilities; 2007
- TSCA Significant New Use Rule for Mercury Switches in Motor Vehicles; 2007
- CAA Rule Amendment for Large Municipal Waste Combustors; 2006

Currently Pending Rules

- Final CAA Rule Amendment for Industrial, Commercial & Institutional Boilers & Process Heaters
- Final CAA Rule Amendment for Hazardous Air Pollutants from Commercial & Industrial Solid Waste Incinerators
- Proposed CAA Rule Amendment for Electric Arc Furnaces at Steelmaking Facilities
- Final CAA Rule Amendment for Chloralkali Facilities
- Proposed CWA Rule to Limit Dental Amalgam Discharges to Wastewater from Dental Offices
- Proposed CWA Rule to Limit Multiple Pollutant Discharges to Wastewater from Power Plants (Especially Coal-Fired)
- Final RCRA Rule for Management of Coal Combustion Residue from Power Plants

Voluntary Initiatives

- MOU with American Dental Association and the National Association of Clean Water Agencies to have dental offices voluntarily install and maintain amalgam separators; Initiated in 2008

Note: CAA = Clean Air Act ; TSCA = Toxic Substances Control Act; RCRA = Resource Conservation and Recovery Act

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Overview of State Mercury Programs

In September 2011, ECOS and the QSC asked states to complete a comprehensive survey about their efforts to address mercury pollution. This compendium reflects the responses from the 42 states that completed the 37 question survey and other sources of information that contain data collected by states (e.g., U.S. EPA databases) or regional research conducted in collaboration with states (e.g., Regional mercury assessments coordinated by the Biodiversity Institute). The table below provides a snapshot of mercury programs in the 42 states participating in the 2011 survey. Summaries of individual state efforts based on the survey and other data are provided in Part 2.

Table 1: National Summary of State Mercury Programs

State	Overall Mercury Action Plan	Inventory Mercury Air Emissions Sources	Mercury Monitoring – Stack Testing	Mercury Monitoring – Air Deposition	Mercury Monitoring –Fish Consumption Advisory	Programs to Manage Mercury – Containing Products	Mercury Dental Programs	State Requirements for Mercury Switch Recovery Program	Participant in National Vehicle Mercury Switch Recovery Program
Total Number of States	***21***	***29***	***22***	***12***	***42***	***22***	***30***	***16***	***42***
Alabama		✓	✓		✓				✓
Alaska		*None*	✓		✓		✓		✓
Arizona	*P*	✓	✓		✓		✓		✓
Arkansas		✓			✓		✓	✓	✓
California	✓	✓	✓		✓	✓			✓
Colorado	✓	✓	✓	✓	✓				✓
Connecticut	✓	✓	✓		✓	✓	✓		✓
Delaware					✓				✓
Florida	*P*	✓			✓		✓		✓
Hawaii		✓	✓		✓				✓

Table 1: National Summary of State Mercury Programs

State	Overall Mercury Action Plan	Inventory Mercury Air Emissions Sources	Mercury Monitoring – Stack Testing	Mercury Monitoring – Air Deposition	Mercury Monitoring –Fish Consumption Advisory	Programs to Manage Mercury – Containing Products	Mercury Dental Programs	State Requirements for Mercury Switch Recovery Program	Participant in National Vehicle Mercury Switch Recovery Program
Idaho		✓			✓				✓
Illinois			✓	✓	✓	✓	✓	✓	✓
Indiana	✓	✓	✓		✓	✓	✓	✓	✓
Iowa			✓		✓	✓		✓	✓
Kansas		✓		✓	✓		✓		✓
Kentucky		✓			✓		✓		✓
Louisiana	✓	✓			✓	✓	✓	✓	✓
Maine	✓		✓	✓	✓	✓	✓	✓	✓
Maryland	✓	✓	✓	✓	✓	✓	✓	✓	✓
Massachusetts	✓	✓	✓	✓	✓	✓	✓	✓	✓
Michigan	✓	✓	✓		✓	✓	✓		✓
Minnesota	✓	✓	✓		✓	✓	✓		✓
Missouri		✓		✓	✓				✓
Montana	✓	*None*			✓	✓	✓		✓
Nebraska	✓	✓		✓	✓	✓	✓		✓
New Hampshire	✓	✓	✓		✓	✓	✓		✓
New Jersey	*P*	✓	✓	✓	✓	✓	✓	✓	✓
New Mexico		*None*			✓				✓
New York	✓	✓	✓	✓	✓	✓	✓		✓
North Carolina	✓	✓			✓			✓	✓

Table 1: National Summary of State Mercury Programs

State	Overall Mercury Action Plan	Inventory Mercury Air Emissions Sources	Mercury Monitoring – Stack Testing	Mercury Monitoring – Air Deposition	Mercury Monitoring –Fish Consumption Advisory	Programs to Manage Mercury – Containing Products	Mercury Dental Programs	State Requirements for Mercury Switch Recovery Program	Participant in National Vehicle Mercury Switch Recovery Program
North Dakota					✓		✓		✓
Ohio		*None*	✓	✓	✓	✓	✓		✓
Oklahoma	✓	*None*			✓		✓		✓
Oregon	✓	*None*			✓	✓	✓		✓
Rhode Island	✓	*None*			✓	✓	✓	✓	✓
South Carolina	✓	✓			✓		✓	✓	✓
Texas		✓	✓		✓			✓	✓
Utah	*P*				✓			✓	✓
Vermont	✓	✓	✓	✓	✓	✓	✓	✓	✓
Washington	✓	✓	✓		✓	✓	✓	✓	✓
West Virginia		✓			✓		✓		✓
Wisconsin		✓			✓	✓	✓		✓

P= Plan under development *Blank = No Response*

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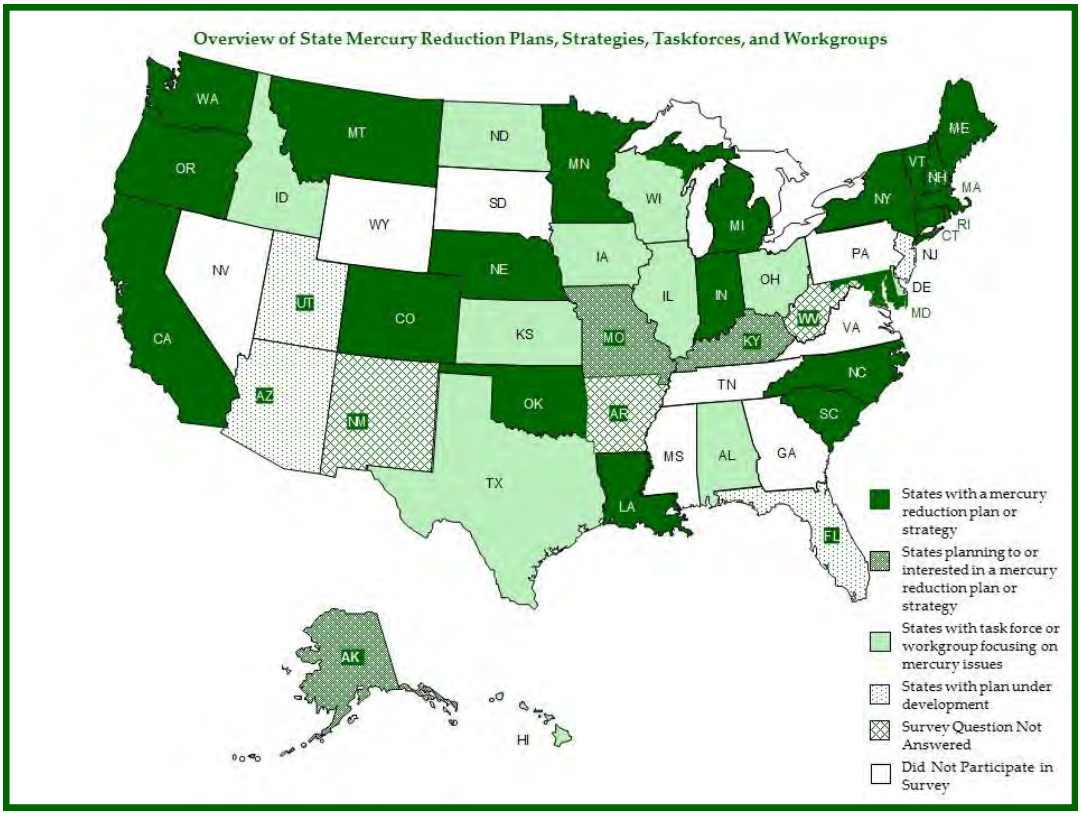
Mercury Reduction Plans and Strategies

State and local officials continue to use diverse approaches to address reducing mercury in products, mercury emissions and mercury contamination. As state mercury programs have progressed, these approaches have evolved from piecemeal approaches (i.e., not part of a coordinated comprehensive program to reduce and eliminate mercury uses and releases) towards a continually growing trend of developing comprehensive programs. States recognize the need for a broader commitment to phase out persistent toxic chemicals like mercury. Another emerging trend is for coordinated efforts between media programs, such as air, solid waste, and water. Thirty-nine (95 percent) of the 42 states responding to the 2011 survey consider coordinated efforts between media programs to be important to responding to the challenge of inadequate authority under the Clean Water Act to address impacts attributable to air deposition of mercury from national and international sources.

As the map below illustrates, 21 of the 42 states (50 percent) responding to the 2011 survey have an overall mercury reduction plan or strategy document in place, and seven more states are developing or plan to develop one in the future. In 2005, 16 states had mercury reduction plans or strategies and six states indicated that they were developing or planned to develop one in the future. Four of the six states that indicated in 2005 that they were planning, or had an interest in developing, an action plan now have mercury reduction plans or strategies in place.



For those 21 states with an action plan or strategy in 2011, the most commonly reported major elements in these documents are:

- Mercury recycling
- Public outreach and education to reduce exposure
- Small business and household mercury waste management
- Emission reduction
- Medical and dental mercury waste management
- Reduction of mercury use in consumer products

Even states without comprehensive mercury strategies are participating in task forces or workgroups; and/or regional, multistate, or bi-national initiatives, specifically focused on mercury issues. All 42 of the responding states participate in national collaboration efforts. These initiatives and collaborative efforts focus on a range of mercury issues such as: the health effects of mercury; fish consumption advisories; mercury air emissions; mercury-containing products; mercury's impact on public health; government procurement; health care uses; public education; mining; and total maximum daily loads (TMDLs).

Coordination and Collaboration — Key Elements of State Plans and Strategies

States indicate that they consider coordination between state and federal governments (86 percent) and among states (83 percent) as key elements for addressing mercury pollution. These coordination efforts are especially critical as states address a variety of challenges including the lack of authority under national and state water pollution programs to reduce air deposition of mercury. Mercury deposition is not only a state issue; coordinated regional, national, bi-national, and international efforts are essential to address this aspect of the mercury problem in order to maximize the effectiveness of state mercury reduction strategies. Coordination and information exchange at all levels also allow for the more efficient use of state resources to address mercury issues. Sharing of information and capacity building between states and with U.S. EPA also helps reduce program costs and harmonize efforts by enhancing regulatory certainty and consistency for various stakeholders. By building upon state and regional efforts to date, working together toward a common goal of reducing mercury use and emissions, and restoring land and water, the states have made much progress.

State environmental agencies are collaborating more with the medical community as their programs evolve towards a more comprehensive approach for addressing mercury in the environment. This coordination between environmental and health programs evolve towards a more comprehensive approach for addressing mercury in

the environment. This coordination between environmental and health programs allows both to gain knowledge about health and ecosystem key indicators and communicate that information to the public and industry more effectively. Table 1 shows how states are coordinating with the medical community.

Table 1
Coordinating with the State Medical Community

77%	Fish consumption advisories
67%	Dental issues
60%	Pollution prevention
55%	Waste management requirements, reduction of mercury from laboratories, and mercury spills

The interstate and intrastate collaboration approaches that follow further illustrate the types and extent of state collaborations.

- **Interstate Approaches— Three Examples**
  The three planning efforts that follow highlight different approaches states have taken to work collaboratively across state lines to manage mercury in the environment.
  - ***New England Governors and Eastern Canadian Premiers Mercury Action Plan*** — In June 1998, the Governors of the New England States and the Premiers of the Eastern Canadian Provinces unanimously adopted a comprehensive, multimedia northeast regional, bi-national Mercury Action Plan (MAP). As a long-term goal, the MAP called for the virtual elimination of sources of mercury pollution in the region with an interim 50 percent reduction target by 2003. In 2002, a second milestone goal was established, calling for a 75 percent reduction in regional mercury emissions by 2010. The MAP included stringent emission limits for a number of sources to ensure progress towards these goals and called on the jurisdictions to achieve maximum economically and technically feasible reductions from others, including the electricity generating sector. The plan also called for unnecessary uses of mercury in products and processes to be reduced or eliminated and for mercury to be recycled to the maximum extent possible. The MAP served as a catalyst for comprehensive mercury products legislation adopted across New England. The legislation adopted by these states included requirements that manufacturers:
    - Label mercury-added products.
    - Support mercury recycling programs.
    - Phase-out many unnecessary uses of mercury.
    - Notify the states of mercury-added product sales.

In addition, the MAP addressed mercury in schools, calling for educational and mercury clean-out activities. It also addressed mercury pollution attributable to the dental sector, which has resulted in state laws across New England requiring the use of amalgam wastewater pollution controls (amalgam separators) by dental offices. These efforts led to estimated reductions in mercury emissions of 55 percent by 2003 compared to a mid-1990s baseline across New England and Eastern Canada. By 2010 emissions were estimated to be down by approximately 75 percent with municipal waste combustors, medical waste incinerators, and chlor-alkalai plants reduced by over 90 percent. Some states report overall mercury emissions reductions in the 89-91 percent range. More details on the MAP and accomplishments can be found at http://www.ncbi.nlm.nih.gov/pubmed/15931956; and http://www.newmoa.org/prevention/mercury/.

- ***Gulf of Mexico Alliance*** — The Gulf of Mexico Alliance is a partnership initiated in 2004 by the states of Alabama, Florida, Louisiana, Mississippi, and Texas for the purpose of significantly increasing regional collaboration to enhance the ecological and economic health of the Gulf of Mexico. The Alliance has identified water quality as one of six priority issues that are regionally significant and can be effectively addressed through increased collaboration at the local, state, and federal levels. One of the long term goals for water quality is to reduce the risk of mercury-induced health effects from Gulf seafood consumption.
- ***Great Lakes Regional Collaboration*** — The Great Lakes Regional Collaboration (GLRC) is a wide-ranging cooperative effort to design and implement a strategy for the restoration, protection, and sustainable use of the Great Lakes. In 2003, at the request of a Great Lakes congressional delegation and as a first step in providing the leadership and coordination, the Council of Great Lakes Governors (CGLG) identified nine priorities for Great Lakes restoration and protection.

  Following a Presidential Executive Order that created a cabinet-level Great Lakes Interagency Task Force; city, state, tribal, and federal units of government convened to create what has become the GLRC. The GLRC created a *Strategy to Restore and Protect the Great Lakes*, which was released in 2005. This strategy built on eight of the nine CGLC priorities. Mercury is addressed primarily under the GLRC priority to continue to reduce the introduction of persistent bioaccumulative toxics in the Great Lakes ecosystem. Under the direction of the GLRC, the eight Great Lakes States and the

U.S. EPA staff produced a *Mercury Phase-down Strategy* in 2008 and a *Mercury Emissions Reduction Strategy* in 2010 (http://www.glrc.us). Both strategies are designed to motivate and achieve reductions that would not be achieved through existing requirements. This strategy built on eight of the nine CGLC priorities. Mercury is addressed primarily under the GLRC priority to continue to reduce the introduction of persistent bioaccumulative toxics in the Great Lakes ecosystem. Under the direction of the GLRC, the eight Great Lakes States and the U.S. EPA staff produced a *Mercury Phase-down Strategy* in 2008 and a *Mercury Emissions Reduction Strategy* in 2010 (http://www.glrc.us). Both strategies are designed to motivate and achieve reductions that would not be achieved through existing requirements.

- **Intrastate Approaches** — State environmental agencies are collaborating more with the medical community as their programs evolve toward a more comprehensive approach for addressing mercury in the environment. This coordination between environmental and health programs allows both to gain knowledge about health and ecosystem key indicators and communicate that information to the public and industry more effectively.

State Perspectives: Needs and Challenges

Although there is no shortage of challenges to solving our country's mercury contamination problems, several themes and needs were repeatedly expressed by states completing this survey.

- ***Access to long-term elemental mercury storage*** — Currently, only the United States Department of Defense (DOD) maintains a mercury stockpile. States, both individually and through ECOS and QSC, have expressed a need for the federal government to organize a national long-term mercury storage program for many years. Permanent storage and sequestration opportunities are needed within the U.S. to remove excess elemental mercury from commerce.

  The Mercury Export Ban Act of 2008 (Public Law 110-414) prohibits the export of elemental mercury from the U.S. beginning in 2013, and provides a process for U.S. EPA to issue limited exemptions for 'essential uses.' For further information, see U.S. EPA's Questions and Answers about the Mercury Export Ban Act of 2008, based on its interpretation of the Act, at www.epa.gov/mercury/exportban-ques.htm.

The law requires the Secretary of the United States Department of Energy (U.S. DOE) to designate one or more facilities for the purpose of long-term management and storage of elemental mercury generated within the U.S. In January 2011, U.S. DOE issued an Environmental Impact Statement regarding the site evaluation and selection process to identify a facility or facilities for the repository. This was completed with consultation and input from the states. This Final Mercury Storage Environmental Impact Statement (EIS) analyzed the potential environmental, human health, and socioeconomic impacts of elemental mercury storage at seven candidate locations:

- Grand Junction Disposal Site near Grand Junction, Colorado
- Hanford Site near Richland, Washington
- Hawthorne Army Depot near Hawthorne, Nevada
- Idaho National Laboratory near Idaho Falls, Idaho
- Kansas City Plant in Kansas City, Missouri
- Savannah River Site near Aiken, South Carolina
- Waste Control Specialists, LLC, site near Andrews, Texas

The U.S. DOE's Preferred Alternative for the long-term management and storage of mercury in the current EIS is the Waste Control Specialists, LLC, site near Andrews, Texas. Due to federal budgetary constraints the money necessary to proceed with the construction of the mercury storage facility has not been allocated.

The QSC sent a letter to the Secretary of the U.S. DOE in May 2012, urging U.S. DOE to request sufficient funds to finalize site selection and operational completion of the national elemental mercury storage facility in its FY 2013 budget, and in future budgets as necessary, and to move expeditiously to complete the facility and commence operations.

At this time, it is unclear when U.S. DOE will proceed with the construction of a national repository for elemental mercury. It is also unclear what mercury storage options are viable after the effective date of the export ban until such time as a national repository is operational. Mercury will need to be stored in Resource Conservation and Recovery Act (RCRA) permitted storage facilities until such time as one or more national repositories are established. In June 2012, DOE announced its intent to prepare a supplement to the January 2011 *Environmental Impact Statement for the Long-Term Management and Storage of Elemental Mercury* to evaluate the potential environmental impacts of identifying a facility or facilities at and in the vicinity of the Waste Isolation Pilot

Plant near Carlsbad, New Mexico. The goal is to issue a Record of Decision in early 2013. In 2012, ECOS adopted policy resolution 09-2 to urge the federal government to finalize and establish a mercury storage facility under MEBA. The resolution also asked the federal government to cover any expenses that states may incur in implementing or overseeing the interim transport and storage of excess commodity mercury.

- ***Challenges to mercury reduction and management*** — The most significant challenge to state mercury reduction and management programs is the lack of federal and state funding. Table 2 shows the percentage of states that identified specific challenges to mercury reduction and management in their states.

Table: 2
Challenges to Mercury Reduction and Management

Lack of long-term funding & Lack of U.S. EPA financial or technical support	85%
Lack of state human resources	77%
Lack of legislative or regulatory mandate	67%
Lack of technical expertise or equipment	41%

  - *Lack of funding and human resources* was one of the most common challenges reported by states to implementing their programs – whether the resources were for public education and outreach or for monitoring and research to identify the impacts of and solutions to mercury pollution. For many states, funding for mercury-pollution reduction initiatives has been sporadic and available only for short periods of time.

    Few states have provided for long-term funding. The budget crises in many states over the past few years have forced program cutbacks and resulted in the loss of personnel, expertise, and progress in their mercury management programs. Some states have had to significantly cut back mercury collection and recycling, outreach, and monitoring efforts. Enforcement efforts have also been negatively affected.

    The ability of states to share information and build capacity to address various aspects of the mercury issue has been adversely affected through reduced federal support of individual states and to interstate organizations including QSC. While these funding cuts reduce immediate expenses, overall program efficiencies are reduced as individual states are increasingly forced to go-it-alone rather than share resources to address common problems. This fragmentation also increases inconsistencies between states, exacerbating regulatory uncertainty and compliance costs. Increased and

sustained funding from state and federal governments remains critical to efficiently addressing the mercury pollution problem.

- *Lack of authority through enabling legislation* keeps many state agencies from initiating efforts to encourage or require mercury pollution reductions. State legislatures need to authorize and provide guidance and financial support for efforts to address this and other persistent, bioaccumulative and toxic (PBT) chemical problems.

Global aspects of the mercury issue are a significant concern to the QSC due to the fact that much of the mercury pollution impacting the states is from air deposition attributable to international emission sources and the global recirculation of historical releases. The QSC role in the global arena began during the 2000 Environmental Council of the States (ECOS) Mercury Workshop in St. Louis, Missouri — the first national effort by state environmental leaders to coordinate on actions to address mercury pollution. Discussion during the symposium highlighted the need for U.S. leadership on an international scale to reduce sources of mercury impacting the states. One of the outcomes of that workshop was a request that ECOS draft a resolution to the President and Congress articulating the need for a global mercury strategy designed to reduce mercury pollution at the national and international levels. Participants also noted that the states should seek out opportunities to share their experiences and mercury reduction strategies with each other as well as with other countries. The QSC has played an increasing role in the global arena since then and today participates in international mercury policy, reduction, outreach, and capacity building efforts.

Developing National Policy Positions

The QSC has actively engaged with its federal partners on a number of global mercury issues and has consistently called for international action to reduce global mercury pollution since 2001 (see http://www.ecos.org/section/committees/cross_media/quick_silver). These positions which have been articulated in several resolutions drafted by the QSC and endorsed by ECOS, are described in Table 1 on page 31 — and see http://www.ecos.org/section/policy/resolution.

Providing Policy and Technical Expertise

In addition to the policy positions articulated in the resolutions noted above, the QSC has also provided state technical expertise and perspectives to the following international initiatives:

- UNEP GMA, which identified mercury as a significant global environmental and public health problem (United Nations Environment Programme, 2001; http://www.chem.unep.ch/mercury/Report/GMA-report-TOC.htm
- Voluntary Global Mercury Partnerships, established under UNEP with the support of the U.S. under the Bush and Obama Administrations to better coordinate mercury partnerships and more rapidly advance international efforts

Table 1: Active ECOS Resolutions
Number, Title ,and Key Actions
03-7, approved August 11, 2003, reaffirmed August 29, 2006, revised September 22, 2009, and revised August 28, 2012. *The Need for Actions to Achieve Further Progress on Reducing Water Quality from Atmospheric Mercury*
• Calls on the Administration, U.S. EPA and the State Department to support efforts through the United National Environmental Programme (UNEP) to develop an international agreement to significantly reduce global sources of mercury pollution that impact states; • Requests that U.S. EPA and other federal agencies, in consultation with the States, develop national and international strategies that will lead to direct actions to reduce mercury pollution and that are informed by, and consistent with, the mercury reduction initiatives developed by the States and the QSC; and, • Affirms that ECOS and QSC members are committed to being active partners with U.S. EPA in developing and implementing a national strategy and international agreement.
07-1, approved March 20, 2007 and revised March 24, 2010. *Implementing a National Vision for Mercury*
• Calls on the President of the United States and the U.S. Congress to continue to pursue substantial reductions in mercury releases into the environment at the national and international levels; • Urges the federal government and other interested and affected parties to continue to work with States to ensure the safety of long term storage plans for mercury in excess of essential needs; take all appropriate measures to prevent introduction of excess mercury supplies into the global marketplace; and exercise leadership in appropriate international forums to work toward substantial global reductions in mercury production, uses, and releases; and, • Applauds U.S. leadership in efforts to address mercury on a global scale and urges the federal government to continue to work in collaboration with the States towards a binding international agreement that will achieve reductions in global sources of mercury pollution necessary to address mercury deposition in our states, and to identify and develop necessary tools and resources to enable the federal government and the States to effectively implement any such agreement.
08-5, approved April 15, 2008 and revised March 29, 2011. *Beyond EPA's Clean Air Mercury Rule*
• Calls on U.S. EPA and the U.S. State Department to continue to advocate for strong global efforts to reduce sources of mercury pollution.
09-2, approved March 23, 2009 and revised August 28, 2012, *Mercury Reduction, Stewardship, and Retirement*
• Commends U.S. EPA and the U.S. State Department for supporting international mercury reduction efforts and for seeking state input into these efforts; and requests that the federal government continue to involve the states in the development of an international mercury treaty.

to address "low-hanging" mercury reduction and research opportunities in various sectors (UNEP Global Mercury Partnerships, http://www.chem.unep.ch/mercury/partnerships/new_partnership.htm).

- Current negotiations for an international mercury agreement are being carried out under the framework of the UNEP Global Mercury Assessment (GMA) (http://www.unep.org/hazardoussubstances/MercuryNot/MercuryNegotiations/tabid/3320/language/en-US/Default.aspx).

Building International Capacity

States are also sharing scientific and policy information and assisting in international capacity building to advance mercury reduction efforts when possible. This has been accomplished, with U.S. EPA funding and in-kind state support, through the State Mercury Resource Network, established by the QSC to identify state technical, scientific, and policy experts to assist the Global Mercury Partnerships, and to share information in other international mercury reduction and outreach forums. Key areas where the states have assisted capacity building efforts include: initiatives to address mercury-added products, the dental sector, and mercury emission sources; state supported mercury monitoring and research; mercury TMDL development and implementation; and the use of science and policy by the states to reduce mercury use and releases. A summary of the State Mercury Resource Network activities is provided in Table 2.

Table 2:
State Mercury Resource Network Activities

Mercury in Products Technical Workshop (Taipei, Taiwan in October 2007) – Presented on the significance of mercury products as a source of releases. Highlighted successful state mercury reduction strategies addressing mercury in products, the health care sector, and the dental sector.

Mercury in Our World Conference on Mercury and Other Hazardous Chemicals in Southeast Asia (Bangkok, Thailand in April 2008) – Provided information to students, teachers, and administrators about chemical safety, including mercury, in Southeast Asia schools and homes.

9th International Conference on Mercury as a Global Pollutant (Guiyang, China in June 2009) – Presented information on state-level initiatives that address mercury-added products, dental sector mercury reduction initiatives, and the use of science and policy to reduce mercury use and releases.

8th and 10th International Conferences on Mercury as a Global Pollutant (Madison, Wisconsin in 2007 and Nova Scotia, Canada in 2011) -- Presented on state mercury reduction accomplishments.

Society of Environmental Toxicology and Chemistry (Boston, Massachusetts in 2011) -- Presented on mercury monitoring, research, and policy initiatives by the states to international group of toxicologists and chemists.

Through the QSC, the states continue to provide the U.S. State Department and U.S. EPA with information on state concerns, activities, and successes to help inform U.S. positions during the ongoing UNEP negotiations towards a global mercury agreement. See the copy of the most recent letter at http://www.ecos.org/files/4794_file_Letter_to_DOE_on_Mercury_Storage_Final_8_May_2012.pdf

To date, the QSC has suggested that the final global agreement should reflect:

- Successful state mercury programs in order to ensure effective and timely reductions in mercury use and emissions from significant international mercury pollution sources that impact the states.
- Better global mercury emissions and use inventories.
- Inclusion of mercury reduction targets, timelines and mechanisms to assess and verify progress in any agreement.

The QSC continues to be engaged in the global arena to address sources beyond our borders because international sources contribute to mercury pollution and exposure in the U.S. and globally, degrading our environment and threatening children's health worldwide. QSC outreach and capacity building efforts have helped to raise international awareness about mercury reduction opportunities and have enhanced the abilities of many countries to implement near-term mercury pollution prevention and control actions. In order to ensure long-term progress and to better level the playing field, the QSC is also providing input on state perspectives, successful state strategies, and scientific and technical information to help inform the ongoing UNEP negotiations towards a global mercury agreement. The QSC remains committed to further assisting in this process.

This section of the compendium provides a summary of information submitted by the 42 state programs that responded to the QSC survey, and describes the sources of mercury in the environment based on national data.

State Programs

In the compendium survey (conducted in 2011), the majority of the 42 responding states, 33 (79 percent) indicated that they have inventories of mercury air emission sources, 13 (31 percent) have inventories of releases from water pollution sources and seven (17 percent) from products and solid wastes. Six states indicated they also inventory mercury used in products and processes. Sixteen states have published mercury release data for their instate sources since 2000 and 18 states provided web links to their state inventory data, where additional information may be found on state specific emission sources and regulations.

Appendix S-A summarizes the data for state responses to the survey about:

- Specific mercury air emission point source categories that are present in their state.
- Whether requirements are in place for each category that are more stringent than those adopted by U.S. EPA.
- Statewide monitoring requirements that are in place for various source categories.

These data show that:

- A significant number of states have statewide requirements in place, some of which preceded and/or are more stringent than U.S. EPA rules promulgated by 2011, including 15 that address coal-fired electric power plants; nine for municipal solid waste combustors; seven each for sewage sludge incinerators, medical waste incinerators and scrap auto dismantlers; five for electric arc furnaces; and four for cement kilns.
- A relatively small percentage of states indicated that they had statewide requirements in place to monitor or otherwise measure mercury releases from mercury emission source categories. Instead, it is likely that many states assess emissions from these sources through individual facility permit requirements or through the use of emission factors.

National Data

The two national databases described in Table 1 provide information on releases of mercury to the environment – the National Emission Inventory (NEI) and the Toxics Release Inventory (TRI) — and are both maintained by U.S. EPA.

These two national databases provide valuable information about sources of mercury pollution. However, they differ in important respects:

- The NEI addresses only releases to the air. Air emissions are inventoried at the process level and process-level emissions are apportioned to release parameters to support fate and transport analyses. Estimates are reported by state, local, and tribal agencies or developed by U.S. EPA, with both parties using a variety of different methods to derive the process-level emissions, ranging from continuous emissions monitoring to emission factors. The NEI covers some sources of air emissions (e.g., municipal incinerators) that are not covered by TRI reporting.
- The TRI provides data on release and other waste management quantities of more than 650 chemicals or chemical categories to air, water, and land, in addition to other data and information. Release and other waste management quantities are usually estimates based on readily available information and are self-reported by thousands of facilities.

Table 1
U.S. EPA National Databases

National Emission Inventory (NEI)

- Presents detailed estimates of air emissions of criteria and hazardous air pollutants from all sources.
- Updated every three years based primarily upon emission information provided by state, local, and tribal environmental agencies, supplemented in some cases by data developed by the U.S. EPA.
- www.epa.gov/ttn/chief/eiinformation.html.

Toxics Release Inventory (TRI)

- Contains detailed information on the management of chemicals by industries and other institutions.
- Includes data on releases to the air, water and land from over 23,000 facilities.
- Data is self-reported and collected annually
- www.epa.gov/tri

Over time there have been changes in NEI emission estimation methods, TRI reporting requirements, and in categorization approaches that need to be taken into account when conducting year-to-year comparisons of data within either database[1]. NEI estimation approaches have also changed, with a trend towards use of more robust emissions monitoring data. The NEI and TRI estimates for mercury emissions for a given year are expected to, and do, differ from one another. Additionally, comparisons

across and within each database must carefully consider whether changes in estimated releases may be attributable to differing reporting requirements and/or estimation methodologies over time. Thus, the percentage changes in emissions over time summarized in the next sections should be viewed as approximations rather than precise values.

Both elemental mercury and all compounds that contain mercury are included on the TRI list of toxic chemicals. When facilities determine whether they have manufactured, processed or otherwise used more than 10 pounds of a mercury compound (or compounds) in a calendar year (i.e., have exceeded any of the reporting thresholds for a mercury compound or compounds), the entire mass of the compound (or compounds) manufactured, processed or otherwise used within a calendar year is considered. If any of the thresholds were exceeded, only the mass of the mercury portion of the compound that is released or otherwise managed as waste is to be reported. Thus, if within a given calendar year a facility subject to the TRI reporting requirements manufactures, processes, or otherwise uses more than 10 pounds of a mercury compound (or compounds), the facility only reports the mass of the mercury portion of the compound (or compounds) that is released or otherwise managed as waste, not the mass of the mercury compound (or mercury compounds).

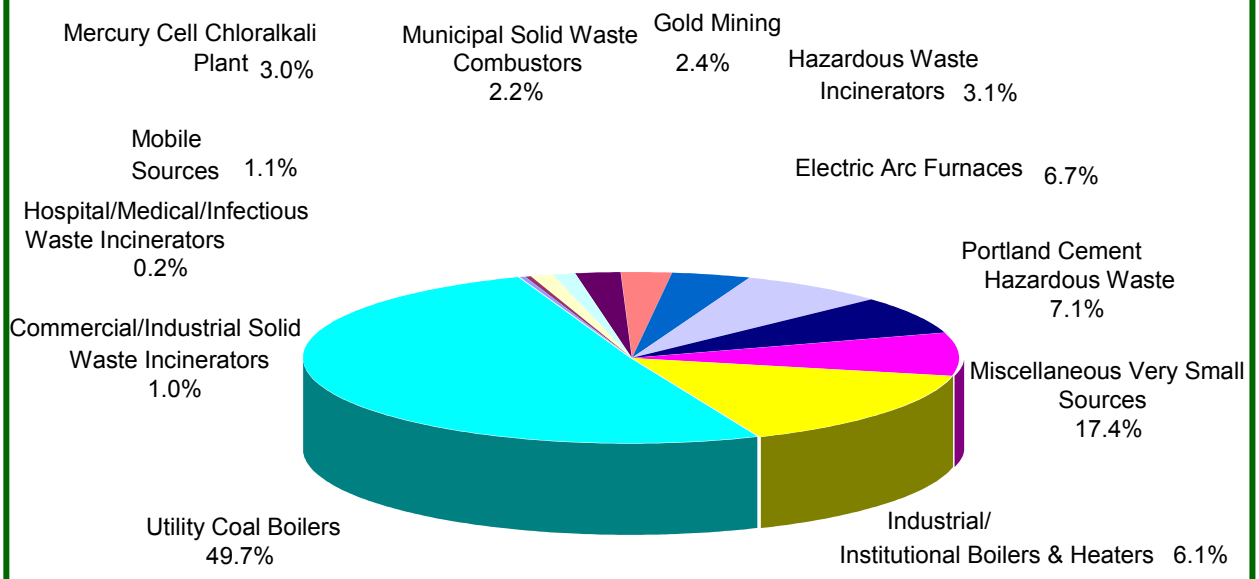
Sources and Trends – National Perspective

- **National Emission Inventory** — Source sector emission estimates from the NEI are summarized in Table 2 on the page 38 and the 2005 distribution of emissions across various source categories is summarized in Figure 1 on page 37. These data were provided by U.S. EPA and are grouped according to mercury emission regulatory sectors.
  - As indicated in Table 2 on page 38, the NEI data indicate that 61 tons of mercury were emitted in 2008, a decrease of 185 tons or 75 percent since 1990.
  - In the early 1990s, Municipal Solid Waste Combustors (MSWC), Medical Waste Incinerators (MWI), and coal-fired electricity generating utility boilers (EGU) were the largest mercury emission sources reported to the NEI, each accounting for over 50 tons of emissions per year.
  - By 2005, as a result of state and federal actions, NEI emission estimates for MSWC and MWI were reduced by over 95 percent while emissions from coal-fired electric generating units (EGUs) remained at over 50 tons per year, the largest source category accounting for about 50 percent of the total inventory.

- The 2008 NEI data indicate that emissions from the coal-fired EGU sector decreased to about 29.5 tons. The U.S. EPA attributes this significant decrease, in part, to the installation of mercury emission controls to comply with state requirements; co-benefit reductions in mercury emissions due to the installation of control devices targeting other pollutants (including sulfur dioxide and particulate matter as required by other state and federal regulations); fuel switching; and voluntary reductions[2].

Figure 1: 2005 U.S. Anthropogenic Mercury Emissions

Figure provided by U.S. EPA, Office of Pollution Prevention & Toxics, March 2012



U.S. EPA Notes

[1] Beginning in 2000, the TRI reporting threshold for mercury/mercury compounds was lowered from 10,000 pounds to 10 pounds per year resulting in a significant increase in mercury releases reported by several sectors. These do not reflect actual increases, only better data. NEI estimation approaches have also changed, with a trend towards use of more robust emissions monitoring data.

[2] Although updated stack test emissions and facility utilization data for estimating emissions from EGU and other sources may have contributed to the decreased emission estimate, the trend is consistent with ongoing state and federal efforts to reduce mercury emissions from this sector.

[3] Adapted from http://www.epa.gov/ttn/chief/net/2008neiv2/2008_neiv2_tsd_draft.pdf, table 7

Table 2
NEI Source Sector Emission Estimates (tons per year)[3]

Source Category	1990 [a]	2005 [b]	2008 [c]
Coal-fired Electricity Generating Utility Boilers	58.8	52.2	29.5
Municipal Waste Combustors	57.2	2.3	1.3
Hospital/Medical/ Infectious Waste Incineration	51	0.2	0.1
Industrial/Commercial/ Institutional Boilers and Process Heaters	14.4	6.4	4.5 [d]
Mercury Cell Chloralkali Plants	10	3.1	1.3
Electric Arc Furnaces	7.5	7.0	4.7
Commercial/Industrial Sold Waste Incineration	Not available	1.1	0.02
Hazardous Waste Incineration	6.6	3.2	1.3
Portland Cement Non-Hazardous Waste	5.0	7.5	4.2
Gold Mining	4.4	2.5	1.7
Sewage Sludge Incineration	2	0.3	0.45
Mobile Sources	Not available	1.2	1.7
Other Categories	29.5	18	10.3
Total (all categories)	**246**	**105**	**61**

Baseline NEI for HAPs, 11/14/2005
[b] 2005 MATS proposal, 3/15/2011
[c] 2008 NEI v21
[d] For Industrial/Commercial/Institutional Boilers and Process Heaters, the 2008 NEI v2 raw data (i.e., in "epa_2008_nei_v2 Hg.accdb") sums to 4.0 tons, but U.S. EPA has included the additional known 0.5 tons in this table.

- In 2008 the five largest emission sources were coal-fired utility boilers (29.5 tons/year), electric arc furnaces (4.7 tons/year), industrial/commercial/ institutional boilers and process heaters (4.5 tons/year), Portland cement manufacturing non-hazardous waste (4.2 tons/year), and gold mining (1.7 tons/year).

The complete 2008 NEI database is available at http://www.epa.gov/ttn/chief/net/2008inventory.html. This NEI database includes information on emissions of many pollutants in addition to mercury. Although it is organized using different sector groupings, and is thus not directly comparable to the mercury emission categories presented in Figure 1 and Table 2, since this database allows for state-by-state mercury emission estimates to be derived that are not otherwise available for a variety of sector categories, it was used as the basis of the state emission estimates presented in the Appendices S-B and S-C. In total, the NEI database indicates that 41 source categories emitted greater than ten pounds of mercury per year (see Appendix S-B). State-by-state emissions data, based on the 2008 NEI data for the top 10 national NEI emission sector categories, are presented in Appendix S-C.

Toxics Release Inventory

Table 3 below summarizes TRI data for releases of mercury, as elemental mercury in its neutral form and mercury from mercury compounds to air, water, and land for several years. As noted previously the annual reporting threshold for mercury and mercury compounds was reduced from 25,000 pounds (for manufacturing and processing mercury or mercury compounds) and 10,000 pounds (for otherwise using

Table 3: TRI Mercury Releases (pounds/year)*

Year	Releases to land/ surface impoundments	Total air emissions	Surface water discharges	Underground Injection	Other
2002	4,877,663	145,712	1,112	11,360	132,079
2005	4,127,290	140,040	713	8,711	100,423
2008	6,200,299	125,888	3,104	5,819	87,734
2010	4,637,107	98,829	1,389	8,038	39,351

* From U.S. EPA TRI website, TRI Explorer, March 12, 2012 update. The quantities expressed pertain to elemental mercury and mercury from compounds that contain mercury. (http://iaspub.epa.gov/triexplorer/tri_release.chemical; accessed 8/24/ 2012). Categories: Air emissions include fugitive and point source; Surface water discharges include surface water discharges; Underground injection includes all underground injection including Class I and Class II-V wells; Releases to land/surface impoundments include all landfill and surface impoundment, land treatment and land disposal; Other includes all other groups in the TRI Explorer database (e.g. storage, POTW treatment, solidification, unknown, etc.).

mercury or mercury compounds) to 10 pounds starting with the year 2000. Therefore TRI mercury data prior to 2000 should not be compared to later years. In order to avoid potential data issues associated with the transition to the new reporting limit, data from 2002 -2010 were compared and used to assess TRI trends. Over the 2002 to 2010 timeframe, total mercury released to:

- Land and surface impoundments dominated overall releases, and ranged from 4,127,290 - 6,200,299 pounds per year.
- Emissions to air ranged from 98,829 - 145,712 pounds per year.
- Releases to water ranged from 713 to 3,104 pounds per year.
- Underground injection ranged from 5,819 – 11,360 pounds per year.
- Other categories ranged from 39,351 – 132,079 pounds per year.

The data in Table 3 show a significant downward trend in reported releases to air from 2002 to 2010, consistent with the overall decrease in emissions seen in the NEI database. Overall releases attributable to the miscellaneous sources in the "Other" category also display a significant downward trend. However, no consistent trend with respect to land disposal, surface water discharge, and underground injection is apparent.

The three tables in Appendix S-D depict TRI data for total mercury in pounds (i.e., mercury in its neutral form and mercury from mercury compounds) broken out by a number of source sectors. Some facilities may fall into multiple sector categories so the data in these tables may include some double counting and thus the values for each media do not match the summary TRI data in Table 3.

The TRI data in Appendix S-D show a considerable increase in mercury emissions after 1999 for many sectors. As noted above, this is largely (if not entirely) due to the change in the reporting threshold from 25,000 pounds for manufacturing or processing and 10,000 pounds for otherwise using mercury or a mercury compounds to 10 pounds per year, bringing many new individual sources into TRI reporting after 1999. For later years, the TRI data in Appendix S-D indicate a general and significant downward trend in overall air emissions for several source sectors, while some others increased. The reported air emissions in 2010 compared to 2002 were down 24 percent for EGUs; 85 percent for chloralkali plants; 78 percent for gold mining; 42 percent for cement kilns; and 91 percent for hazardous waste treatment and disposal.

In contrast, reported air emissions from the EAF and integrated steel facilities were up by 78 percent in 2010 vs. 2002. Although this may reflect a real increase, it is also possible that it may be due to improved emissions estimates attributable to increased awareness and data regarding emissions from this sector, which may have occurred over this period.

Encouraging Trends in U.S. Mercury Emissions

The news regarding trends in mercury emissions from U.S. sources is very positive. Mercury emission inventory data from two national datasets indicate substantial overall reductions in mercury air emissions in the U.S. since the early 1990s with significant reduction continuing over the past decade.

Mercury emission reductions of greater than 95 percent have been achieved by two of the three largest mercury NEI source categories since the early 1990's – municipal solid waste combustion and medical waste incinteration. In both cases the technical and economic feasibility of the sectors' ability to achieve reductions of this magnitude were initially questioned, but innovations in pollution controls and successful efforts to reduce mercury wastes proved to be successful.

- Municipal solid waste combustors not only met, but reduced emissions to below state mercury emission limits through the use of improved pollution control technologies and efforts to reduce the amount of mercury in solid wastes.
- Medical waste incineration emissions were reduced through pollution prevention efforts, improved air pollution controls, and the development and use of cost-effective alternative technologies to sterilize medical waste across the nation.

The data indicate substantial reductions in emissions from coal-fired electric generating units also occurred over the past few years, consistent with state regulations on this sector, co-benefits of pollution controls installed to address other regulated pollutants and voluntary actions. Although coal-fired electric generating units remain the largest current mercury source category, the further deployment and optimization of pollution control technologies in response to U.S. EPA's 2012 Mercury and Air Toxics Standards for Power Plants and state regulations is expected to lead to significant further reductions in emissions of mercury and other pollutants as well.

The NEI and TRI data also indicate that significant reductions in mercury emissions have been achieved in many other categories as well, including the chloralkali industry, gold mining, cement kilns and hazardous waste incinerators. However, air emissions from electric arc furnaces and integrated steel facilities reported to TRI increased.

U.S. EPA Office of Toxic Release Inventory Programs, email communication, 2012. TRI Data for State Mercury Compendium.xlsx file Data were downloaded by U.S. EPA from TRI on January 27, 2012

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Mercury Research and Monitoring

Introduction

The states have long supported mercury research and monitoring. Some of these efforts have been designed and implemented by state agency staff. In other cases the states have provided academic research groups with funding and/or in-kind support. This support has included field and laboratory staff time to assist in sample collection, preparation and analyses, as well as data management, and data assessment. Information from state fish tissue and emission source monitoring programs was fundamental to the identification and understanding of the breadth and scope of the mercury pollution problem in the U.S. These monitoring and research efforts have also provided important information used to guide mercury pollution reduction policy and regulatory strategy development and implementation. Table 1 provides an overview of key state research activities. The remainder of this section summarizes mercury research and monitoring efforts supported by the states.

Table 1: Overview of Key State Research Areas

- Data collection to follow and assess mercury concentration trends in environmental media including sediments, rainfall, and biota.
- Mercury levels in indicator, recreational, and commercial fish species; mammals; birds; and amphibians to improve fish consumption advisories and to better assess environmental impacts, costs, and pollution trends.
- Regional mercury assessments coordinated by the Biodiversity Institute and academic research institutions in the Northeast, the Great Lakes Region and, currently underway, in the Western states.
- Mercury fate and transport, in particular relating to determinates of methylation and bioaccumulation rates.
- Studies to evaluate and improve emission control and monitoring technologies including amalgam separators and continuous emissions monitoring devices (CEMs).
- Studies to better understand the amounts of mercury present in various consumer products and waste streams and to identify alternatives.

Research Activities

Survey responses as well as discussions with QSC participants indicate that the states have conducted or supported a wide range of mercury-related research efforts (see Appendix R&M-A). The survey responses indicate that 29 states currently conduct or have recently completed research related to mercury. This is similar to the responses in the 2005 survey where 28 states indicated that they were pursuing mercury-related research.

Of the states that indicated they were conducting mercury research in the 2005 survey, four indicated that they were no longer doing so and three did not complete the survey. Eight additional states, including Alaska, Idaho, Kansas, Montana, Nebraska, South Carolina, Texas, and Utah responded positively in the latest survey. More detailed information on state mercury research can be found at the state webpages.

Transport and Deposition of Mercury in the Air: An Overview

Once mercury is released into the atmosphere, regardless of the source, it can be transported on local, regional, and global scales (United Nations Environment Programme, 2001; 2008). The concern over mercury in the atmosphere stems from its eventual deposition at the earth's surface and subsequent conversion to methylmercury. Mercury exists in the atmosphere in three states – gaseous elemental mercury, gaseous oxidized mercury and particulate bound mercury. Significant amounts of oxidized and particulate mercury can deposit out of the air close to emission sources, while elemental mercury tends to be transported further (Keeler et al., 2006; Keeler and Dvonch, 2005). Atmospheric deposition of mercury depends on its form and occurs through wet deposition, dry deposition, or flux events (gas exchange).

- Wet deposition of mercury occurs primarily during rainfall or snowfall events and is comprised largely of oxidized mercury, which is soluble, and particulate bound mercury, with a small percentage (< 2 percent) of methylmercury. Mercury oxidation can be significantly influenced by other chemicals in the air including ozone, hydroxide, and other oxidants (Lindberg et al., 2007).
- Dry deposition occurs continually except during periods of precipitation and can contribute a significant amount of mercury to aquatic, marine, and terrestrial ecosystems. Net dry deposition is thought to be primarily attributable to gaseous oxidized mercury and particulate bound mercury. Although data on dry deposition is limited, it has been estimated that dry deposition can be at least as significant as wet deposition and more so in some situations (Risch et al., 2011; Lindberg et al., 2007; Lindberg et al., 1992).
- Mercury flux occurs when elemental mercury crosses the air/surface interface on soil, or vegetation, or water, and can occur in both directions – deposition to the surface material or evasion away from the material.

Mercury Monitoring – Air

According to the results from the survey conducted in 2011, 31 percent of the states conduct ambient mercury monitoring. This is a significant decrease from the 2005 survey results when states reported that 44 percent monitored for ambient mercury; and 51 percent conducted monitoring to assess atmospheric deposition of mercury. Results from the survey also indicate that 38 percent of the participating states conduct indoor air sampling to assess mercury spill impacts.

There are currently two programs that monitor mercury from the air – the Mercury Deposition Network (MDN) and the Atmospheric Mercury Network (AMNet). In addition, federal legislation with bipartisan support has been introduced in several sessions of Congress to establish and authorize appropriations to U.S. EPA to develop a comprehensive National Mercury Monitoring Network (MercNet). A description of the existing networks and a summary of the proposed legislation are described in the paragraphs that follow.

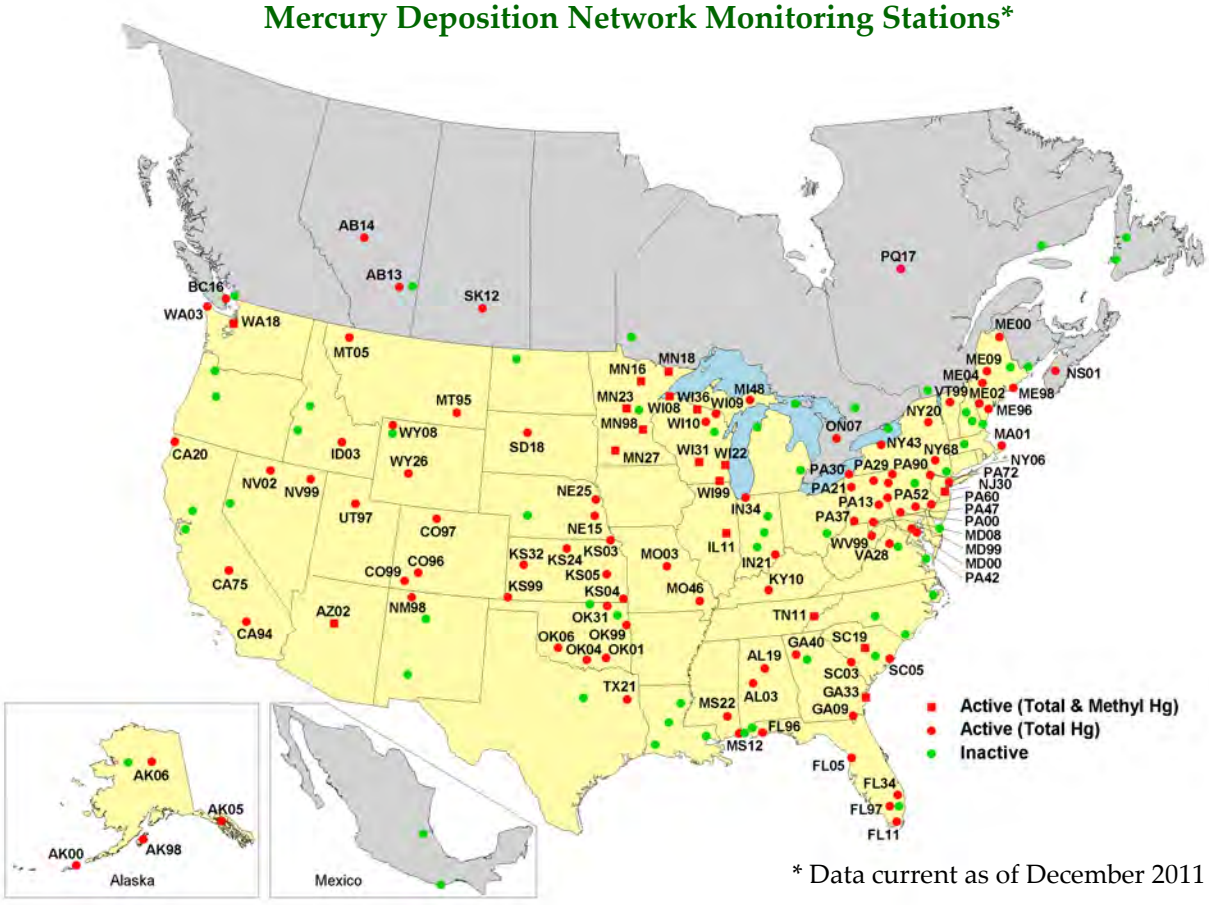
- **Mercury Deposition Network –** There is a significant amount of data available for wet deposition of mercury. Mercury deposition in the U.S. and Canada has been monitored since 1996 through the national Mercury Deposition Network (MDN). The MDN monitors mercury concentrations and total mercury deposition through integrated, weekly, wet-only sampling. The data have been used to examine spatial and temporal trends in mercury deposition (e.g. Risch et al., 2011). The map on page 48 identifies the MDN monitoring stations. Additional discussion of the MDN data can be found at http://nadp.sws.uiuc.edu/mdn/.

  According to the National Air Deposition Program (NADP) coordinator, there are currently 110 MDN sites. States fund 56 (or 51 percent) of them and operate 20. Sampling at the remaining sites is being implemented by research organizations, tribal authorities and other groups. Some states have not had the resources to continue their site operations and are identified as "inactive sites" in the map of MDN monitoring stations.

  The MDN sites are primarily located in more rural areas typically not impacted by large local atmospheric emission sources. Approximately ten sites have been located in urban areas. Although the MDN network provides important data on overall mercury deposition levels it is limited in its ability to assess local depositional impacts from many sources that emit particulate and oxidized mercury or to investigate trends attributable to point source controls. For example, work completed in the Northeast indicates that the areas with the largest

modeled deposition reductions attributable to state controls on major emission sources in the region do not contain ambient monitors. Additionally, MDN data are weekly composite wet deposition samples and most sites do not collect event based samples which limits the utility of the data in various modeling exercises including multi-pathway risk assessments.

Mercury Deposition Network Monitoring Stations*



* Data current as of December 2011

- **Atmospheric Mercury Network (AMNet) –** AMNet was formed in 2009 and includes both wet and dry deposition. Currently there are approximately 25 sites in operation funded through a variety of mechanisms including U.S. EPA and National Oceanic and Atmospheric Administration grants, state and tribal support, and funding from private organizations. AMNet data are available on the NADP website at: http://nadp.isws.illinois.edu/amn/.

- **National Mercury Monitoring Network –** This proposed new network, if created, would address key monitoring gaps and provide improved data on mercury fate and transport, bioaccumulation, and trends. Establishing such a network would greatly increase understanding about interactive effects with other large-scale drivers of environmental change and would help evaluate the effectiveness of environmental regulations and policy. (Additional information: http://nadp.isws.illinois.edu/mercnet/MercNetFinalReport.pdf).
- **Individual State Efforts –** Several states have conducted atmospheric mercury monitoring beyond MDN and AMNet related efforts. For example, additional information can be found at:
  http://www.michigan.gov/deq/0,4561,7-135-3310-96539--,00.html
  http://dnr.wi.gov/topic/AirQuality/Monitor.html#tabx2
  http://www.nescaum.org/topics/mercury, and http://www.dec.ny.gov/chemical/8519.html.

Mercury Monitoring – Water

Monitoring of mercury in water is conducted for several reasons. Concentrations in wastewater effluent and sludge are primarily monitored by wastewater treatment facilities to determine compliance with National Pollution Discharge Elimination System (NPDES) permits. Water column and waterbody sediment monitoring are conducted to assess the condition of waterbodies, determine if water quality standards are being met, and assess progress in remediation efforts.

Table 2 shows how the survey respondents reported their monitoring activities in 2005 and 2011. In the survey conducted in 2011, results show increases in the proportion of states monitoring everything except sediment. The survey also asked states about monitoring wastewater sludge, and 69 percent of states responded that they were monitoring this component.

Table 2
States Reporting in 2005 and 2011 Surveys

Percent		Mercury Monitoring Activities
2005	2011	
22	71	Water column
62	71	Wastewater effluent
62	57	Sediment

Mercury Monitoring – Fish Tissue

Fish tissue monitoring is an important aspect of states' monitoring programs due to its use in determining the need for fish consumption advisories and tracking trends

in environmental mercury levels. Results of fish tissue monitoring help protect public health by identifying waterbodies and species with elevated mercury levels and allowing for safe fish consumption recommendations to be developed and communicated. In 2005, 93 percent of states reported monitoring mercury in fish tissue and in 2011 that number rose to a full 100 percent. Forty states, or 95 percent of the states responding to the survey, indicated that they monitor fish tissue concentrations for the purpose of establishing, revising, and removing fish consumption advisories. Other primary reasons for fish tissue monitoring include:

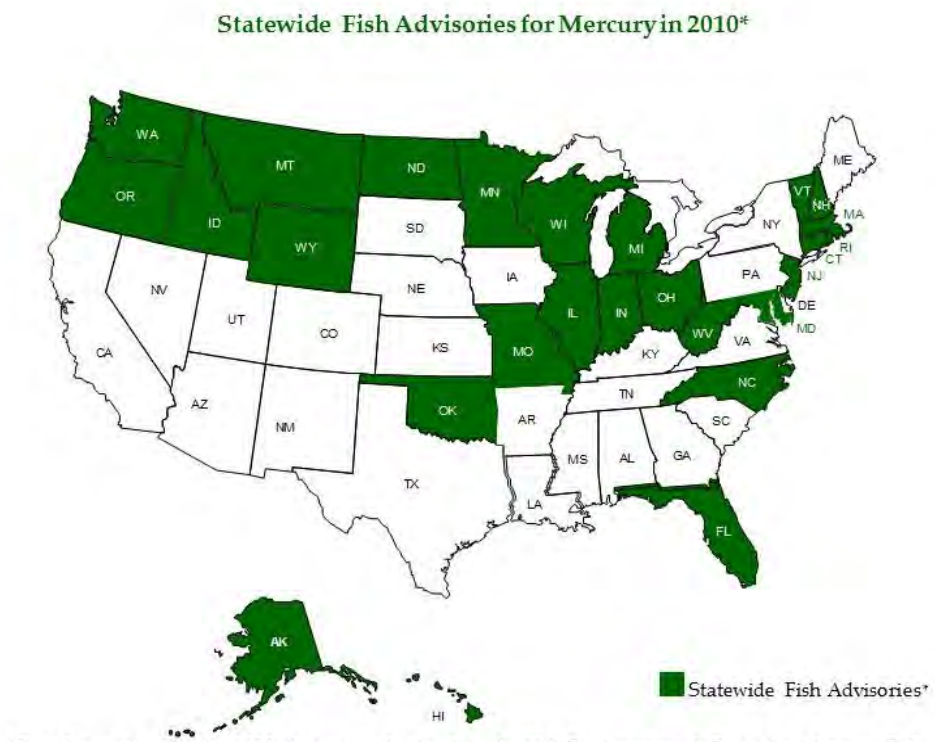
- Evaluating long term trends (81 percent) and evaluating changes in fish tissue concentrations as a result of mercury reduction programs (62 percent).
- Developing TMDLs, assessing risk to wildlife, evaluating the impact of contaminated sites, permitting, and Clean Water Act Section 303(d) reporting (14 percent).

In 2005, 46 of the 50 states had issued fish consumption advisories, and now in 2011 all 50 states have fish consumption advisories due to mercury. Advisories can be issued for individual waterbodies or on a statewide basis. According to the survey, the vast majority of states (93 percent) have waterbody-specific fish consumption advisories. A large number of states also have statewide freshwater advisories (62 percent), while fewer have statewide coastal

Mercury Bioaccumulation Research

Mercury bioaccumulation in the aquatic food chain is well documented. Consumption of fish with elevated concentrations of mercury is the primary way that people and fish eating wildlife are potentially exposed to mercury. High levels of mercury have been found in fish-eating wildlife such as loons, eagles, and river otters in many areas. More recently, monitoring and research have established that terrestrial food webs can also bio-magnify methylmercury to levels that may cause toxicity and adversely impact populations of songbirds, bats, and other genera that consume insects and other invertebrates (http://www.briloon.org/oae/the-science-of-bri/mercury-in-the-environment). Although bird species inhabiting wetland and estuarine ecosystems appear to be most at risk, upland bird species are also being exposed and studies have found surprisingly high levels of mercury in a number of insect eating species, including tree swallows, across ecosystems on the east coast from Virginia to Maine and in the Great Lakes Region (http://www.briloon.org/mercuryconnections/northeast http://www.briloon.org/mercuryconnections/greatlakes). Elevated levels of mercury in birds can impact brain development and at lower levels may impact reproductive success. Mercury levels in many species of bats have also been found to exceed those associated with biochemical changes in the brain.

advisories (17 percent). The map below shows states with statewide fish advisories. Appendix R&M-B contains detailed information about the each states' fish advisories.



* Based on state data for 2010 that was submitted to the U.S. Environmental Protection Agency Fish Advisory Database. Map reflects U.S. EPA database as of February 2012.

Looking to the Future

The states have supported and continue to conduct important mercury research and monitoring. Both activities are critical to targeting fish consumption advisories for protecting public health, delineating the scope of the mercury problem, and assessing trends in mercury levels in the environment. Although a few more states reported monitoring fish tissue, wastewater, and water column mercury in 2011 compared to the 2005 survey, reduced state and federal budgets are increasingly constraining state efforts to improve the science relating to mercury. Some states report that they have lost all funding for one or more mercury research and monitoring efforts while others have experienced significant reductions over the last few years. Tight state budgets are preventing many state scientists from participating in meetings, workshops, and multi-state initiatives addressing mercury and other environmental issues.

Mercury Research and Monitoring: Program Snapshots

Information about several states' mercury research and monitoring activities is provided below.

Florida

The Florida Department of Environmental Protection (FL DEP), the Florida Fish and Wildlife Conservation Commission, and the South Florida Water Management District (SFWMD) conduct mercury research and monitoring to better understand mercury sources, cycling, and impacts in Florida as well the relationships between sulfur and mercury cycling (Axelrad, 2011). Mercury levels have been monitored extensively in largemouth bass (LMB), American alligator, Florida panther, and the invasive Burmese python. Mercury levels in LMB in the Water Conservation Areas of South Florida were among the highest ever reported during early sampling efforts. However, over the last 20 years, LMB annual median mercury concentrations declined 62 percent, from a peak level of 1.6 parts per million (ppm) in 1991 to 0.6 ppm in 2009. This decline was associated with the installation of improved air pollution control equipment and reduced mercury emissions at waste incinerators in the state.

Since about 2000, median mercury levels in LMB have leveled off, with many tested fish still exceeding U.S. EPA health criterion for fish consumption. However, mercury levels have been found to vary both geographically and temporally, perhaps due to changes in biogeochemistry including sulfur inputs and cycling. Data from research in the Everglades indicate that mercury levels in fish can depend on both mercury and sulfur and ongoing research continues to investigate this interaction and sources of sulfur and mercury.

Massachusetts

The Massachusetts Department of Environmental Protection (MA DEP) has monitored mercury levels in yellow perch and largemouth bass, popular recreational fishing species that are often eaten, since the mid 1990s (http://www.mass.gov/dep/toxics/stypes/hgres.htm#monitoring). Data collected through this program demonstrated that the mercury levels in freshwater fish were above safe consumption levels in many waterbodies across the state, even in remote areas removed from local pollution sources. These findings led to a statewide advisory by the MA Department of Public Health warning pregnant women and children to avoid consuming native freshwater fish caught in the state.

Fish monitoring data delineated the widespread scope of the mercury problem, identified the need for fish consumption advisories, and helped to motivate and inform MA state and regional policies to reduce mercury pollution. Ongoing monitoring by MA DEP and the New England Interstate Water Pollution Control Commission has demonstrated that, over the period mercury emissions were significantly reduced under the New England Governors and Eastern Canadian Premiers Mercury Action Plan. Declines also occurred in mercury concentrations in freshwater game fish from lakes and ponds in MA. While these results are encouraging, mercury levels remain too high.

Minnesota

Minnesota's interagency Fish Contaminant Monitoring Program has been monitoring mercury in fish since 1970 (http://www.pca.state.mn.us/index.php/view-document.html?gid=9247). A trend analysis of mercury in northern pike and walleye for a 25 year period, 1982-2006, found a shift from a downward trend between 1982 and the mid-1990s to an upward trend thereafter (Monson, 2009). A more recent analysis of a much larger dataset for the entire Great Lakes Region (GLR) found a general downward trend of mercury in walleye and largemouth bass from 1970 to 2008; however, walleye in Ontario showed a similar pattern to the fish in Minnesota (Evers et al., 2011; Monson et al., 2011). The general downward trend in the GLR corresponds to the downward trend in the region's mercury emissions, thereby supporting a conclusion that mercury levels in fish are responding to local changes in mercury emissions. The confounding factors contributing to the upward trends in Minnesota and Ontario are thought to be multiple effects of changes in temperature, carbon dioxide levels, and precipitation dynamics that could be increasing the methylation, mobilization, and bioaccumulation of methylmercury in aquatic systems.

Western North America

The success of the Biodiversity Research Institute (BRI) efforts to assess environmental mercury deposition and impacts in the northeastern U.S. and eastern Canada (2001-05) and the Great Lakes region (2008-11) has led to a new initiative for North America that will include mercury studies in the western regions of the U.S. and Canada, as well as in parts of Mexico. The *Mercury Cycling, Bioaccumulation, and Risk Across Western North America: A Landscape Scale Synthesis Linking Long-Term Datasets* initiative is a tri-national synthesis of mercury cycling and bioaccumulation research and data throughout western North America (http://www.briloon.org/mercuryconnections#wmc).

The project will be conducted in collaboration with the U.S. Geological Survey and will encompass the largest mercury synthesis undertaken to date by BRI. Geographically it includes the states of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming as well as British Columbia and the Yukon Territory and the western coastal and interior regions of Mexico. BRI is coordinating an interdisciplinary international team of scientists and policy experts to accomplish the project's goals.

The project will address mercury levels in the environment, sources, and impacts with a particular focus on the influence of land use, habitat, and climatological factors on mercury risk. Public land comprises more than 60 percent of the total surface area in the region, and the results of this project will provide improved understanding and better management of resources at the state and national levels to reduce mercury impacts. The project will use several decades of collected data to holistically synthesize the spatiotemporal patterns of mercury in abiotic and biotic resources across the region and will also examine mercury exposure and effects on fish and wildlife. The work will also include a formal analysis of factors driving mercury methylation and accumulation and its resulting risks.

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Mercury Total Maximum Daily Loads

The Clean Water Act (CWA) requires states to develop a list of waterbodies that are failing to meet established water quality standards for pollutants. These waterbodies are known as impaired waters. The CWA also requires states to develop Total Maximum Daily Loads (TMDLs) for priority waters on this list. TMDLs establish the maximum load of a particular pollutant that a waterbody can receive and still achieve water quality standards, and an allocation of that load among sources. Once developed, the TMDLs are submitted to U.S. EPA for review and approval. While mercury is a pollutant primarily released into the air, its effects can be seen in the aquatic environment in the form of elevated fish tissue concentrations. Many states have listed waterbodies as impaired for failure to meet mercury water quality standards that allow people to eat fish. A number of these states have proceeded to develop TMDLs to set mercury reduction goals that will allow safe fish consumption to be restored.

These TMDLs can vary in the geographic area which they cover. Some TMDLs are developed to address just one specific waterbody, while others may cover all of the waterbodies in a particular basin or watershed. On a larger scale, TMDLs can be developed for an entire state or even an entire region. These different types of TMDLs can be seen in the results of the survey. Twenty of the states answering the survey currently have at least one U.S. EPA-approved mercury TMDL. Another nine states are either in the process of developing a mercury TMDL or have plans to develop a mercury TMDL in the future. Table 1 on page 58 shows the status of state mercury TMDL efforts.

Table 2 on page 59 summarizes the status of state mercury TMDLs. While there are currently only two U. S. EPA-approved statewide mercury TMDLs, the survey results demonstrate that there is an increasing trend in the development of statewide mercury TMDLs, with five of these TMDLs in the planning or development stage. Three of these five TMDLs are in the southeastern U.S. Given that this area of the country receives a large quantity of mercury deposition, it is not surprising that these states are employing large-scale mercury reduction strategies with the development of statewide TMDLs.

Mercury Total Maximum Daily Loads

Table 1: Status of State Mercury TMDLs								
	Approved TMDLs				TMDLs in Process or Planning			
State	Water-body-Specific	Water-shed/Basin	Statewide	Multistate	Water-body-Specific	Water-shed/Basin	Statewide	Multistate
Total Number of States	9	3	2	7	2	0	5	1
Alabama							√	
Alaska	√							
Arizona	√							
Arkansas	√							
California	√							
Colorado	√							
Connecticut				√				
Delaware					√			
Florida							√	
Idaho		√						
Kansas	√							
Louisiana	√	√						√
Maine				√				
Maryland	√							
Massachusetts				√				
Michigan							√	
Minnesota			√					
Missouri							√	
Montana	√							
New Hampshire				√				
New Jersey			√					
New York				√				
North Carolina							√	
Oregon		√						
Rhode Island				√				
Utah					√			
Vermont				√				

The Minnesota Statewide Mercury TMDL was the first one to cover a large geographic scale. The U.S. EPA approved it in March 2007 and it addresses 511 waterbodies.

Table 2: Status of State Mercury TMDL Activities

	Waterbody Specific	Statewide	Multistate/ Regional	Watershed or Basin
Approved TMDL	9	2	7	3
In process of developing TMDL or plan to develop TMDL	2	5	1	0

The TMDL primarily addresses atmospheric deposition of mercury and calls for a 93 percent reduction in mercury emissions to meet fish tissue goals. A short time later, seven Northeast states used a very similar approach to develop the Northeast Regional Mercury TMDL, which was approved by U.S. EPA in December 2007. This TMDL covers more than 10,000 lakes and ponds and 46,000 river miles and identified the need for a 87 to 98 percent reduction in anthropogenic atmospheric deposition from all sources inside and outside of the region. The similarity between the reductions identified by the Minnesota and Northeast TMDLs demonstrates that mercury pollution is a wide scale problem and underscores the need for significant mercury reductions nationwide.

As Table 3 shows, atmospheric deposition is overwhelmingly the primary source addressed by mercury TMDLs. Nineteen of the states that responded they have approved mercury TMDLs selected atmospheric deposition as the primary source. Other reported sources include wastewater treatment plant discharges, stormwater discharges, legacy sources, and active mining. Table 3 also shows the primary sources of mercury addressed by states that have approved mercury TMDLs.

Table 3: Primary Sources of Mercury Addressed by Mercury TMDLs

	Number of States
Atmospheric Deposition	19
Legacy Sources	5
Wastewater Treatment Plant Discharges	8
Stormwater Discharges	5
Active Mining	4

As mercury is a truly multimedia pollutant, many states are taking multimedia approaches to their reduction strategies. Seventeen of the states that have approved mercury TMDLs and five of the states with TMDLs in the planning or development stage have either used or are using multimedia approaches in their TMDLs. In the case where land-

based legacy or mining sources or wastewater treatment plant discharges are the primary source of mercury to a waterbody, a multimedia approach may not be necessary. However, when atmospheric deposition is the primary source, a multimedia approach may allow for a more comprehensive and coordinated reduction strategy.

It should be noted that TMDLs are one option for addressing mercury-impaired waters, but they are not the only option. States may choose to develop a watershed management plan, which is a strategy for achieving water resource goals that provides assessment and management information for the watershed of interest. The states were asked in the survey if they have developed watershed management plans in lieu of mercury TMDLs. None of the states responding indicated that they had developed any such plans. Some states may wish to address their needed mercury reductions without going through the process of a TMDL or a watershed management plan. These states may focus their mercury-related efforts directly on programs related to mercury-containing products and waste and controlling sources of mercury to the air without using the Clean Water Act as a vehicle for developing a reduction plan.

Background

Minnesota was the first state to enact laws addressing the sale, use, labeling, and disposal of household and business mercury-containing products. The laws were enacted from 1990 through 1993. Vermont adopted legislation in 1998 that incorporated much of what Minnesota had enacted and included labeling requirements for motor vehicles and mercury-containing lamps. Also in 1998, the Conference of New England Governors and Eastern Canadian Premiers released its Mercury Action Plan which includes recommendations for the proper management of mercury-containing products and decreasing the use of such products. A task force to implement the plan was also formed. In 1998 the Northeast Waste Management Officials' Association (NEWMOA) started developing model legislation and held meetings in January and December 1999 to develop and take public comment on their model legislation. Key components of the NEWMOA model legislation are:

- Manufacturer notification of mercury-containing products.
- Labeling of mercury-containing products.
- Banning the sale and/or phasing out the use of mercury-containing products.
- Proper end of life management of mercury-containing products.
- Process and criteria for obtaining an exemption from the sales ban and product phase outs.

States have states adopted similar legislation over the years as shown in Table 1 on pages 63-64.

Managing Mercury in Existing Products Remains a Challenge for States

When the 2005 Compendium of States' Mercury activities was released, 18 states (California, Connecticut, Florida, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, New Hampshire, New Jersey, New York, Oregon, Rhode Island, Virginia, and Washington) banned the sale of at least one type of mercury-containing product, with Connecticut and Rhode Island basing their bans on the amount of mercury in the product. By 2011, as indicated in Table 1 on pages 63-64, five more states (Iowa, Louisiana, Montana, Ohio, and Wisconsin) enacted laws banning at least one type of mercury-containing product. Louisiana's bans are based on the amount of mercury in the product. Also by 2011, several of the initial 18 states enacted additional laws to address more mercury-containing products. In addition, 12

states had created processes to exempt products from phase-outs, bans, or limits. In the 2011 survey, states also described sources of funding for programs (Table 2) that are collecting and managing mercury at the end of a product's life.

Table 2
Funding Sources for Collection Programs in States

Local Government – 19
State Government – 29
Federal Government – 10
Manufacturers – 21*
Waste Processors – 6

*Programs only cover collection of products each manufactures

Emerging Challenges for States

Between 2005 and 2011, while states and the federal government were working to create approaches to reduce and/or manage mercury in existing products, some manufacturers continued to introduce new mercury-containing products even though suitable alternatives existed in most situations. The products described below are examples of ones that were introduced since publication of the 2005 Compendium.

- Mercury-containing wheel weights and self-adjusting balances mainly for use in motorcycles, buses, and over the road trucks. Two states, Illinois and Maine, have banned the use of mercury wheel weights. Washington State also restricts the use of mercury wheel weights in many applications.
- Mercury in nanomaterial – This new material has been demonstrated to behave differently than the material from which it is derived. Little specific research has been conducted on mercury use in nanomaterial so the potential health and environmental impacts are unknown. States indicate that, given mercury's many unique properties, research needs to be conducted on mercury nanomaterials (G. V. Ramesh, Muvva D. Prasad, and T. P. Radhakrishnan, 2011).
- Others, including new vehicle display screens and some headlamps. These products when scrapped at the end of their life may lead to mercury releases.

Collection programs for mercury-containing products will require continued investment to prevent or reduce the amount of mercury disposed in landfills, emitted by incinerators, and discharged into rivers and streams as long as mercury-containing products are available on the market. However, state and local governments are finding it more difficult to provide funding for their existing mercury-containing product collection programs and are unable to create new ones to collect mercury in the new products due to decreasing budgets. In addition, the current manufacturer collection systems are not adequate to capture and safely manage new uses of mercury in many states.

States recognize the need for industry and consumers to take more responsibility "for reducing negative impacts to the economy, environment, public health and worker safety… [t]hese impacts can occur through out the life cycle of a product" (ECOS resolution 12-5 Principles of Extended Producer Responsibility and the Definition of Product Stewardship adopted on August 28, 2012. They are looking to manufacturers to voluntarily, or through legislative action, to include the total cost of their products in their pricing, including end-of-life management, and to more fully consider end-of-life management issues in front-end product design.

Addressing Existing and Emerging Challenges

The QSC and Interstate Mercury Education and Reduction Clearinghouse (IMERC) are leading states' efforts to manage mercury in products. Each plays a different but complementary role in assisting states. The QSC role has focused on strategies while IMERC has focused on legislative approaches and implementation of legislation. The federal government, led by the U.S. EPA, plays a key role in efforts to manage mercury in consumer products. Lastly, the Great Lakes Regional Collaboration, in their recently published strategy document, provides an approach for addressing the issues facing states. The Strategy contains eleven categories of recommendations for reducing mercury in products. (http:///www.glrppr.org/glmst)

Table 1: Mercury-containing Products											
			Sales ban, Use ban, or Phase out								
State	Labeling Requirements	Limits on Mercury Content in Products	Cosmetics	Measuring Devices	Medical Devices	Novelty Items/Toys	Switches and Relays	Thermometers	Thermostats	Other	Exemption Process
Number of States	10	4	7	15	14	13	14	17	16	13	12
Alabama											
Alaska											
Arizona											
Arkansas											
California		✓	✓	✓	✓		✓	✓	✓		✓
Colorado											
Connecticut	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Delaware											
Florida											
Hawaii											
Idaho											
Illinois			✓	✓	✓	✓	✓	✓	✓	✓	✓
Indiana						✓		✓			
Iowa										✓	
Kansas											
Kentucky											
Louisiana	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Maine	✓			✓	✓		✓	✓	✓	✓	✓
Maryland									✓	✓	
Massachusetts	✓			✓	✓		✓	✓	✓	✓	✓

Table 1: Mercury-containing Products											
			Sales ban, Use ban, or Phase out								
State	Labeling Requirements	Limits on Mercury Content in Products	Cosmetics	Measuring Devices	Medical Devices	Novelty Items/Toys	Switches and Relays	Thermometers	Thermostats	Other	Exemption Process
Michigan				✓	✓			✓	✓		
Minnesota			✓	✓	✓	✓	✓	✓	✓	✓	
Missouri											
Montana	✓								✓		
Nebraska								✓			
New Hampshire	✓			✓	✓	✓	✓	✓	✓		✓
New Jersey								✓			
New Mexico											
New York	✓			✓	✓	✓	✓	✓	✓		✓
North Carolina											
North Dakota											
Ohio				✓		✓	✓			✓	✓
Oklahoma											
Oregon						✓		✓			
Rhode Island	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
South Carolina											
Texas											
Utah											
Vermont	✓			✓	✓	✓	✓	✓	✓	✓	✓
Washington	✓			✓	✓	✓	✓	✓	✓	✓	
West Virginia											
Wisconsin			✓	✓	✓	✓	✓	✓	✓	✓	✓

Key QSC, Federal, and IMERC Activities

Key QSC Activities

Mercury-Added Product Labeling: Information for States (March 2006). The paper examined:

- Products covered and exemptions
- Label composition, content, and location
- Labeling requirements related to internet and catalog sales
- Coordination of labeling and notification among states
- Compliance assistance and enforcement

Mercury-Added Product White Paper (November 2006). This paper identified several mercury-added product sectors on which state and federal agencies could focus to reduce the use of mercury through both voluntary and regulatory mechanisms. It also characterized and made recommendations for future action on the following products:

- Non-vehicle switches, relays, and flame sensors
- Thermometers
- Dental amalgam
- Thermostats
- Lamps

State-Federal Collaboration

The QSC worked with its federal partners to:

- Phase out mercury thermometer use for industrial purposes National Institutes of Standards and Technology (NIST)
- Phase out use of mercury thermometers in its laboratories, if the use is not required by a regulation or standard (U.S. EPA)
- Improve the collection and recycling of mercury-containing thermostats. (U.S. EPA)

Interstate Mercury Education and Reduction Clearinghouse Leads States Efforts

In 2001 state environmental officials from eight states established the Interstate Mercury Education and Reduction Clearinghouse (IMERC) to help implement laws and programs aimed at getting mercury out of consumer products, the waste stream, and the environment. Seven other states joined since IMERC's inception. The IMERC provides technical assistance to the member states concerning: manufacturer applications for exemptions to the phase-out of mercury-added products; manufacturer applications for alternative labeling of mercury added products; and manufacturer plans for collection and proper waste management of mercury-containing materials. The following paragraphs summarize how IMERC works and the Table below summarizes information about individual states' participation in IMERC.

Notification – Eight states require anyone that manufactures, sells, distributes, or imports a mercury-containing product in their state to notify the state. Verified data are posted online in IMERC's Mercury-Added Product Database. Currently IMERC indicates that almost 500 companies have reported a total of approximately 5,000 mercury-containing products. In November 2011 IMERC launched an E-file notification system. The system allows for easier reporting, review, and analysis of notification data.

Labeling –Ten states require proper labeling of mercury-added products sold in their states. Labels must be legible and identify that the product contains mercury and provide information concerning proper disposal.

Additional information about IMERC is in Appendix P-A

Overview of States Participation in IMERC

	Founding Members	Current Members	Notification	Labeling
California		✓		
Connecticut		✓	✓	✓
Illinois		✓		
Louisiana		✓	✓	✓
Maine	✓	✓	✓	✓
Massachusetts	✓	✓	✓	✓
Michigan		✓		
Minnesota		✓		✓
New Hampshire	✓	✓	✓	
New Jersey	✓	✓		
New York	✓	✓	✓	✓
North Carolina	✓	✓		
Rhode Island	✓	✓	✓	✓
Vermont	✓	✓	✓	✓
Washington		✓		✓

Quicksilver Caucus. Mercury-Added Product Labeling – Information for States. March 2006. Available at: http://www.ecos.org/files/1917_file_formatted_draft_final.pdf

Quicksilver Caucus. Mercury-Added Product White Paper. November 2006. Available at: http://www.ecos.org/files/4494_file_Mercury_Added_Product_White_Paper_formatted_final_with_MS_changes.pdf

Quicksilver Caucus. Mercury-Added Product Work Plan. September 2007. Available at: http://www.ecos.org/files/4701_file_2007_Mercury_Added_Product_Work_Plan_final.pdf

G. V. Ramesh, Muvva D. Prasad, and T. P. Radhakrishnan, "Mercury Nanodrops and Nanocrystals," *Chemistry of Materials*, 14 November 2011: pp 5231–5236. Publication Date (Web): November 14, 2011

ECOS Resolution 12-5, Principles of Extended Producer Responsibility and Definition of Product Stewardship, adopted on August 28, 2012

Mercury In Dental Amalgam

Mercury in dental amalgam can be a significant source of mercury releases into the environment. Cain, et al estimated that releases of mercury from dental amalgam in the U.S. were 28.3 metric tonnes in 2005. Dental offices release mercury to the environment in several ways. Mercury can be released to indoor air when dental amalgam is prepared for use, dental amalgam is placed in or removed from teeth, and amalgam separators are emptied or serviced. Disposal, incineration, or land application of amalgam-related wastes and sewage treatment sludge can result in both air and water releases. Mercury may impact groundwater if a dental facility uses a septic system for waste water discharge.

The QSC has tracked states' ideas on effective approaches for addressing this source since the initial survey in 2000. When the 2005 Compendium of States' Mercury Activities was published four states (Massachusetts, Maine, New Hampshire, and New York) reported regulating mercury releases from dental facilities. In the 2011 survey, 30 states have mandatory (12 states) or voluntary (18 states) programs to address mercury releases from dental amalgam. Additional results from the 2011 survey also indicate that:

- Dental association outreach, mailings and newsletter articles, and workshops and training are the three most important components of a successful program (see Table 1 below).
- Local authorities in 13 states regulate releases and/or have more stringent regulations than the state (see Table 2 on pages 72-73 for a summary of state responses to the survey).

Table 1: Components for Successful Dental Programs

Program Component	Percent 'very significant' or 'significant' (all states)
State Dental Association Outreach	48
General Mailings and Articles in Newsletters	45
Workshops/Training	43
Compliance Visits	36
Technical Assistance Visits	24
Cost Assistance for Amalgam Separator Purchase	17

State activity increased when QSC began research and information sharing activities in 2007. These activities included:

- *Dental Mercury Amalgam Waste Management White Paper* (April 2008). This paper examined issues related to management of dental mercury waste (including common features of dental amalgam programs), lessons learned from existing local and state programs, and recommendations for future action. The state programs reviewed in the paper began as voluntary memorandums of understanding (MOU) with state dental associations, or as a result of regional initiatives. Many dentists participated in the MOUs. The MOUs enhanced awareness of the environmental impacts of dental mercury and provided options for reducing these impacts among dental health care providers. The QSC found it necessary, even with this enhanced awareness, to proceed with mandatory programs.
- *Case Studies of Five Dental Mercury Amalgam Separator Programs (May 2008)* that described the programs in Massachusetts, Maine, Minnesota/Metropolitan Council Environmental Services, New York, and Washington.
- A webinar on dental mercury programs and state and local efforts to reduce loading of mercury amalgam to water systems via use of amalgam separators and best management practices (BMPs) for over 60 state and local government representatives. The information on BMPs described activities dentists can pursue to decrease the amount of mercury released from their dental practice. These include installation or use of:
  - Amalgam separators, which capture most mercury particles before dental water is discharged to the sewer.
  - Chair-side traps, which capture large mercury particles.
  - Non-chlorine based cleaners, which can dissolve and release mercury in the pipes.
- A letter to the U. S. EPA requesting that they work with the states to address dental mercury amalgam (December 2008).
- ECOS adopted a revised resolution "Implementing a National Version for Mercury" (Resolution Number 07-1, Approved March 20, 2007) on March 24, 2010. The resolution urged U.S. EPA to "include dental facilities under the Health Care Sector for rulemaking in its Effluent Guidelines Program Plan and require adoption of best management practices that reduce mercury discharges to protect the environment." The QSC also sent a letter to its docket for U.S. EPA's annual review of an effluent guidelines. The QSC strongly recommended that U.S. EPA pursue effluent guideline rulemaking for dental facilities and focus on best management practices, including the use of amalgam separators.

The American Dental Association (ADA), U.S. EPA, and Congress were also active during 2007 and 2008 in looking for ways to reduce amalgam mercury in wastewater.

- ADA added the use of amalgam separators to its voluntary BMPs for dental offices (October 2007).
- U.S. EPA signed an MOU on December 29, 2008, with the ADA and National Association of Clean Water Agencies (NACWA) to establish and monitor the effectiveness of a Voluntary Dental Amalgam Discharge Reduction Program. The purpose of the MOU was "to promote the use of BMPs adopted by the ADA," including the use of amalgam separators (December 2008). While the QSC was not a signatory to the MOU, at the QSC's request, U.S. EPA subsequently established an effective process to update the states and provide opportunities for QSC input regarding the MOU. The national MOU has, similar to state experiences, raised awareness about this source of mercury in the environment. Never the less the QSC has encouraged U.S. EPA to go from the MOU (a voluntary program) to a mandatory program (effluent guidelines) based on state success with similar programs.)
- ECOS testimony at the U.S. House of Representatives Oversight and Government Reform Committee Domestic Policy Subcommittee hearing to assess U.S. EPA's efforts to measure and reduce mercury pollution from dentist offices (May 2010) contained two key recommendations:
  - U.S. EPA should set and implement voluntary goals via the MOU, specifying that dental offices should install and use amalgam separators within five years.
  - Dentists should be required to implement BMPs through effluent guidelines rulemaking which include installation and use of separators. The experiences gained from implementing the MOU would inform the success of the regulatory program.
- U.S. EPA notified ECOS that it would initiate an effluent guideline rulemaking for dental facilities to reduce mercury discharges (September 2010). QSC has continued to engage with U.S. EPA on the rulemaking. U.S. EPA expected to propose a rule in 2011 and take final action in 2012. The proposed rule has not yet been released.

Table 2:Summary of State Responses to Survey

State	Mandatory Program to Address Dental Mercury	Voluntary Program to Address Dental Mercury	No Program to Address Dental Mercury	Require Amalgam Separators	Require BMP	Allow Settling Tanks in Place of Separator	Local Governments More Stringent than State
Total Number of States	12	18	12	11	10	22	13
Alabama			✓				
Alaska		✓				✓	
Arizona		✓					✓
Arkansas		✓				✓	✓
California			✓			✓	✓
Colorado			✓			✓	✓
Connecticut	✓			✓	✓		
Delaware			✓				
Florida		✓				✓	
Hawaii			✓			✓	
Idaho			✓				✓
Illinois		✓					
Indiana		✓				✓	
Iowa			✓				✓
Kansas		✓				✓	✓
Kentucky		✓				✓	
Louisiana	✓				✓	✓	
Maine	✓			✓			
Maryland		✓				✓	
Massachusetts	✓			✓	✓		✓
Michigan	✓			✓	✓	✓	✓
Minnesota*	✓	✓*					✓
Missouri			✓			✓	
Montana		✓				✓	
Nebraska		✓				✓	
New Hampshire	✓			✓			

Table 2:Summary of State Responses to Survey

State	Mandatory Program to Address Dental Mercury	Voluntary Program to Address Dental Mercury	No Program to Address Dental Mercury	Require Amalgam Separators	Require BMP	Allow Settling Tanks in Place of Separator	Local Governments More Stringent than State
New Jersey	✓			✓	✓		
New Mexico			✓				
New York	✓			✓	✓		
North Carolina			✓				
North Dakota		✓				✓	
Ohio		✓				✓	✓
Oklahoma		✓				✓	
Oregon	✓			✓	✓		
Rhode Island	✓			✓	✓		
South Carolina		✓				✓	
Texas			✓			✓	✓
Utah			✓			✓	
Vermont	✓			✓	✓		
Washington	✓			✓	✓		✓
West Virginia		✓					
Wisconsin		✓				✓	

*The State of Minnesota has a voluntary program in association with the Minnesota Dental Association. Metropolitan Council Environmental Services, the waste water treatment authority for Minneapolis/St. Paul metropolitan area, requires the use of amalgam separators.

Caine, Alexis, Disch, Sarah, Twaroski, Reindl, John, and Case, C. Randy; Substance Flow Analysis of Mercury Intentionally Used in Products in the United States; *Journal of Industrial Ecology Volume 11, Number 3, pp. 61-75 July 2007.*

Quicksilver Caucus. 2005 Compendium of States' Mercury Activities. October 2005. Available at: http://www.ecos.org/section/committees/cross_media/quick_silver/2005_mercury_compendium

Quicksilver Caucus. Dental Mercury Amalgam Waste Management White Paper. April 2008. Available at: http://www.ecos.org/files/3148_image_Corrected_Final_Dental_Amalgam_White_Paper_April_2008.pdf

Quicksilver Caucus. Case Studies of Five Dental Mercury Amalgam Separator Programs. May 2008. Available at: http://www.ecos.org/files/3193_file_case_studies_dental_amalgam_paper_052808.pdf

Quicksilver Caucus. Correspondence to United States Environmental Protection Agency urging development of national strategy for managing dental mercury amalgam. December 2008. Available at: http://www.ecos.org/files/3406_file_QSC_Letter_to_US_EPA_on_Dental_Amalgam_12_16_08.pdf

Environmental Council of the States. Resolution 07-1. Implementing a National Version for Mercury. Renewed March 24, 2010. Available at: http://www.ecos.org/files/4026_file_Resolution_07_1_2010_version.doc

American Dental Association. Best Management Practices for Amalgam Waste. October 2007. Available at: www.ada.org/sections/publicResources/.../topics_amalgamwaste.pdf

U.S. EPA, American Dental Association, National Association of Clean Water Agencies. Memorandum of Understanding on Reducing Dental Amalgam Discharges. December 2008. Available at: http://water.epa.gov/scitech/wastetech/guide/dental/upload/2008_12_31_guide_dental_mou.pdf

U.S. House. 2010. Oversight and Government Committee, Domestic Policy Subcommittee. Testimony of R. Steven Brown, Executive Director of Environmental Council of the States: Hearing on Assessing EPA's Efforts to Measure and Reduce Mercury Pollution from Dentist Offices. 111th Congress, 26 May. Available at: http://www.ecos.org/files/4095_file_ECOS_Testimony_to_House_OGR_DP_on_Amalgam.pdf U.S. EPA.

Correspondence to Environmental Council of the States. October 2010. Available at: http://www.ecos.org/files/4498_file_Silva_Letter_to_ECOS_on_Amalgam_EGs.pdf

For many years, vehicle manufacturers installed hood and trunk convenience-light switches, vanity-light switches, and anti-lock braking system (ABS) and airbag sensor modules that each contained one gram or more of mercury. An estimated 217 million switches were installed in vehicles sold in the U.S. market until these components were discontinued at the end of the 2002 model year. Mercury switches are present in many 2002 and older domestic and imported vehicles that still operate on the nation's roads. This mercury becomes a problem when vehicles are retired from use. It is released during vehicle shredding and the steel recycling/smelting processes.

States Initiate Action to Remove Switches

States have been working with other stakeholders to address vehicle mercury switches since 1995. The 2005 Compendium summarizes state actions to address mercury switches through mid-2005. Several states adopted legislation after the publication of that document. As of late 2005, five states (Arkansas, Maine, New Jersey, Rhode Island, and Texas) had adopted legislation requiring vehicle manufacturers to implement vehicle switch education and collection programs; all but Texas included switch recovery incentive payments in their legislation. In addition, North Carolina adopted legislation requiring a manufacturers' switch collection program operated within a state salvage yard program funded by a title transfer fee. Around 25 additional states were addressing switches in some way without legislation mandating a switch removal program or an education and collection program.

Table 1
Overview of State Approaches to Incentives in 2005

Legislated Programs

- *Paid by Automakers* – Arkansas, Maine, New Jersey, and Rhode Island
- *Paid by State* –North Carolina
- *No Incentive* – Texas

Voluntary Programs

Paid by the State – Washington (January 2006)

In late 2005 and early 2006, the QSC conducted three webinars for states on these legislated and non-legislated programs, to educate states on actions that had been taken to encourage or require removal of mercury switches from vehicles. In early 2006, Washington signed a Memorandum of Understanding (MOU) with End of Life Vehicle Solutions or ELVS (a non-profit corporation formed by vehicle manufactures to collect and manage mercury switches) to operate an education and collection program in

cooperation with the state auto recyclers association. The Washington Legislature appropriated funds for switch recovery incentive payments to be paid through the Washington Department of Ecology.

By August 2006, eight more states (Illinois, Indiana, Iowa, Louisiana, Massachusetts, South Carolina, Utah, and Vermont) enacted legislation and several additional states implemented voluntary programs. Among these eight legislated programs, six included switch recovery incentive payments paid by automakers or the state, or provided tax credits. Illinois and Massachusetts laws also included triggers that activated a switch recovery incentive payment by automakers if certain recovery targets were not met.

Maryland adopted vehicle mercury switch legislation in 2009 requiring vehicle manufacturers to implement education, collection, and switch recovery incentive payments. This is the only state legislation enacted after the NVMSRP MOU was signed in August 2006.

Automakers and Federal Leadership to Recover Switches

In 2005, automakers established the non-profit corporation End of Life Vehicle Solutions (ELVS) to manage switch outreach, collection, and recycling activities in legislated states. In early 2006, the U.S. EPA convened a second stakeholder dialogue for the purpose of developing and implementing a national voluntary switch removal program. The stakeholders announced an agreement in principle in mid-March 2006, and signed an MOU implementing the program in August 2006. The MOU established approaches and responsibilities for:

- Conducting outreach and education.
- Operating a switch collection and recycling program.
- Establishing reporting requirements and a national database.

It also established other provisions, including:

- Short term and long term switch recovery goals. The short term goal was to collect four million switches in the first three years of the program. The long term goal was to achieve a national switch recovery rate of 80 to 90 percent (measured on a yearly basis), recognizing that recovery rates will be ramping up during the first three years of the program.
- A three year Implementation Fund to promote salvage yard and scrap processor participation and switch recovery. Automakers and the steel industry each contributed $2 million to this fund. The fund initially paid $1 per switch in states where no other incentive was being paid.

- A base program that would operate in all states, with stakeholders taking responsibility for additional program components such as those required by state laws.

The MOU anticipated a strong federal Electric Arc Furnace (EAF) Rule that would drive participation and recovery as the program matured. The MOU is in effect through the end of 2017 and the parties may agree to continue the program beyond that date.

Implementing the National Voluntary Program

When the national program was initiated under the MOU, automakers took the lead, through ELVS, to enroll yards and establish the national switch collection infrastructure state by state over the first year of the program. The QSC established a state contacts group and began holding monthly conference calls in late 2006. The focus of the group was to help states implement the program and facilitate communication among the state agency staff responsible for the program.

During the first year of the national program, the automakers purchased ten years of state by state vehicle registration data from Polk (a key source of data on vehicles) , and the parties to the MOU developed vehicle and switch retirement models that forecast the number of switches available for recovery each year on a national and state by state basis. This model has been used to estimate national and state by state recovery rates starting in 2007. The model was adjusted once in early 2009 to account for the recession and incorporate new information on theft and exports. In early 2012, actual registration data for 2007-2011 was purchased from Polk and past retirement forecasts are being compared to actual vehicle retirement data from Polk. Table 2 delineates the number of switches available each year and the number recovered through 2011.

Table 2
Switch Recovery (millions)

Year	Available	Recovered
2007	4.6	0.7
2008	4.3	0.9
2009	4.1	0.9
2010	3.8	0.6
2011	3.5	0.7
2012	3.2	
2013	3.0	
2014	2.7	
2015	2.4	
2016	2.2	
2017	1.9	
Total	35.7	

In September 2007, U.S. EPA proposed a federal EAF Area Source Rule, and issued the final rule on December 28, 2007. The rule contains two compliance

options incorporating switch removal: either a site-specific option or an option for participation in a program approved by U.S. EPA. The national program, known as the National Vehicle Mercury Switch Recovery Program (NVMSRP), and the Maine program were identified as U.S. EPA-approved programs in the final rule.

In mid-2008, the Implementation Fund Coordinating Committee voted to increase the payment per switch from $1 to $4 effective August 1, 2008, to provide increased incentive for salvage yards to participate in the program and recover more switches. Switch recovery increased significantly in the following months but the Implementation Fund was depleted in mid-July 2009 and funding has not been renewed.

In January 2009, QSC released the "National Vehicle Mercury Switch Recovery Program: Status Report for State and Local Agencies," a two year analysis of the NVMSRP with recommendations for changes to the program and the MOU. The report:

- Identified state program elements that contributed to successful programs.
- Provided an overview of state/local programs and regulations related to EAF facilities subject to the EAF Area Source Rule promulgated in December 2007. This report provided detailed program analysis and recommendations from the state (QSC) representatives on the NVMSRP National Steering Committee to the full Committee in advance of the in-person program evaluation meetings in March 2009 and March 2010. The report is available on the ECOS website at http://www.ecos.org/files/3461_file_NVMSRP_Status_Report_Jan_09_Revised_Final.pdf.

At NVMSRP Steering Committee meetings held in March 2009, the parties evaluated the program after two years, and discussed program and MOU modifications to strengthen the program and increase the switch recovery rate. Following this meeting, the National Steering Committee did not adopt any MOU or program changes for the following reasons:

- Financial Difficulties Interrupt National Switch Recovery Program – In July 2009, General Motors (GM) declared bankruptcy and stopped making payments to ELVS. Based on vehicle market share and use of switches, GM provided just over 50% of ELVS support and this caused significant stress to ELVS and the entire switch collection and recycling infrastructure that ELVS had developed. Many state environmental agencies wrote to GM and U.S. Treasury Department officials working on the GM bankruptcy, urging resumption of payments to

ELVS in order to maintain the national program. GM, at this time known as Motors Liquidation Corporation (MLC), resumed payments to ELVS in late 2009, just as ELVS was preparing to limit switch collection and recycling to legislated states.

- NVMSRP Supported through Resolution of GM Bankruptcy – During 2010 and 2011, MLC and many of the legislated states negotiated and settled environmental claims related to switch recovery program requirements. In August 2011, MLC made a contribution of New GM stock to the states that had filed claims, in the value of approximately $2.8 million, reflecting the estimated need to recover switches through approximately 2022. The states transferred the stock to ELVS in support of the program for their own states as well as ELVS operations in general. In early 2011, GM/MLC's corporate successor in the bankruptcy process, New GM, committed to a voluntary contribution of $4.5 million to ELVS. This contribution came about in part because many state environmental agencies also corresponded with New GM in 2009, urging them to continue their support of ELVS as a vehicle manufacturer, in order to maintain a viable national switch collection and recycling program.
- U.S. EPA Reconsiders EAF Rule – In March 2010, U.S .EPA announced a voluntary reconsideration of the EAF Rule. U.S. EPA initially committed to the publication of a final rule by June 30, 2012, but now expects to publish a proposed rule in the second half of 2012.

At NVMSRP Steering Committee meetings held in March 2010, the parties evaluated the program after three years and again discussed program and MOU modifications to strengthen the program and increase the switch recovery rate. Since U.S. EPA announced its voluntary reconsideration of the EAF Rule, the parties have not negotiated any program or MOU changes since it is not known what U.S. EPA may propose or adopt and how a revised rule would affect the responsibilities of the parties or the status of the NVMSRP as a compliance option.

R.L Polk company provides data about the population of vehicles on the road after Juky 2006 which may have switchesas of

ECOS and QSC Support for a National Program

The NVSMRP MOU and 50 state participants have built the national infrastructure for vehicle mercury switch collection, recycling and recordkeeping. However, the national program has not met the switch recovery goals for several reasons. As of December 31, 2011, about 3.9 million vehicle mercury switches had been collected through the NVMSRP since January 2007. An estimated 19.66 million switches were available for recovery during this time period, for a four year recovery rate of about 19.8 percent. As noted in Table 3, ECOS Resolutions in support of a national vehicle mercury switch recovery program specifically call for monetary and non-monetary incentives or drivers for switch recovery, including regulatory drivers, such as a strong EAF Area Source Rule that is effective throughout the supply chain.

Table 3: History of ECOS Resolutions

Resolution 04-7: **NEED FOR NATIONWIDE MERCURY SWITCH REMOVAL STRATEGY THAT PROVIDES FLEXIBILITY TO THE STATES** (October 6, 2004)	
	Endorses the development of a national program and identifies the four program elements necessary for ECOS support: Information Dissemination and Education to all dismantlers (and anyone else in possession of end-of-life vehicles prior to crushing, shredding, or melting). Collection and Management system for collecting switches from dismantlers and transporting them to mercury retorters—without cost to dismantlers—and arrangements made with the retorters to accept and recycle them. Switch-Removal Strategies with monetary and non-monetary incentives to ensure shared responsibility for the identification, removal, and proper management of all reasonably accessible mercury switches from end-of-life vehicles. Measures of Success to ensure the effectiveness of programs in achieving the highest possible switch removal
Resolution 06-7: **ENDORSEMENT OF NATIONAL MERCURY SWITCH REMOVAL PROGRAM MEMORANDUM OF AGREEMENT THAT REDUCES MERCURY IN THE ENVIRONMENT AND PROVIDES FLEXIBILITY TO THE STATES** (August 11, 2006)	
	Endorses the NVMSRP MOU and identifies how it includes the program elements necessary for ECOS support

Table 3: History of ECOS Resolutions — continued			
Resolution 06-7: **ENDORSEMENT OF NATIONAL MERCURY SWITCH REMOVAL PROGRAM MEMORANDUM OF AGREEMENT THAT REDUCES MERCURY IN THE ENVIRONMENT AND PROVIDES FLEXIBILITY TO THE STATES** (Renewed as Amended September 17, 2007)			
	In advance of EPA's EAF Area Source rule, requests that EPA adopt EAF rule "provisions to monitor and verify effectiveness of the NVMSRP and alternative switch removal plans through written documentation and audits of program participation and switch recovery by suppliers recordkeeping, mercury emissions testing/monitoring requirements, and other appropriate measures by the regulated facility."		
Resolutions 06-7 and 12-8: **ENDORSEMENT OF NATIONAL MERCURY SWITCH REMOVAL PROGRAM MEMORANDUM OF AGREEMENT THAT REDUCES MERCURY IN THE ENVIRONMENT AND PROVIDES FLEXIBILITY TO THE STATES** (Renewed as Revised March 23, 2009 and Revised as Resolution 12-8 August 28, 2012)			
	Requests that U.S. EPA adopt approaches to improve the effectiveness of the program and the EAF rule, including but not limited to, enhancements to the program elements, and EAF Rule provisions that augment the existing rule's recordkeeping and reporting, mercury emissions testing, monitoring and verification requirements, and other measures that ensure reduced mercury emissions from these facilities. Requests that U.S. EPA not include the NVMSRP as a primary compliance option in rulemaking for the integrated steel industry, since it is not achieving sufficient switch recovery rates.		
Resolution Number 10-9: **REVIEW AND RECONSIDERATION OF ENDORSEMENT OF THE NATIONAL VEHICLE MERCURY SWITCH RECOVERY PROGRAM MEMORANDUM OF UNDERSTANDING (MOU)** (August 30, 2010)			
	Recognizes that NVMSRP no longer includes all program elements identified in Resolutions 04-7 and 06-7; calls on parties to make program and MOU changes; calls on U.S. EPA to issue revised EAF Area Source Rule by June 30, 2012, to provide additional program drivers and regulatory framework for enhanced switch recovery.		

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PART II: Information About Individual State Mercury Programs

This section of the compendium includes specific information about the sources of mercury and mercury activities in each of the 42 states participating in the 2011 Survey.

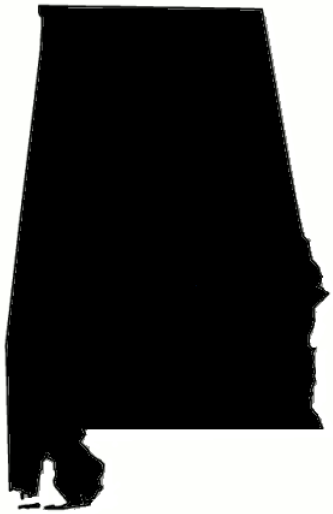
Air Emissions Information -- The 2011 survey of states did not ask states to provide information on air emission sources within their state since not all state programs maintain an inventory. This information is from the United States Environmental Protection Agency's (U.S. EPA) 2008 National Emissions Inventory (NEI) database. Please note that since the NEI database is developed and maintained by U.S. EPA, information in it may differ from each state's specific mercury emission inventory. This is due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by the Northeast States for Coordinated Air Use Management (NESCAUM) for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury.

State Mercury Activity – The information about each of the 42 responding states' mercury activities is a direct summary of its survey response. It reflects their answers to the survey questions. The activities shown for each state are those they included information about in their responses. Please note that state mercury programs are not federal mandates, they are created by each state. This means that each state's program activities address their specific mercury issues.

Web Address Information – The QSC team that compiled this section tested the links found on each state's pages. However, over time these links may change. If a link doesn't work, please communicate with that state's contact person. If you are not able to reach that person you can find information for each state environmental program on the Environmental Council of the States web site (www.ecos.org) by clicking on "States."

Alabama's Mercury Actions

Alabama Department of Environmental Management
http://www.adem.state.al.us/default.cnt
Contact: Marilyn Elliott
Phone: 334.271.7710 Email: mge@adem.state.al.us

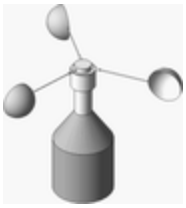


U.S. EPA Approved TMDLs

- Plans to develop a statewide TMDL
- A multimedia approach will be used to develop the TMDL.

Monitoring

- Air emissions from stacks
- Wastewater effluent
- Water column
- Fish tissue



Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Areas of Coordination with the Medical Community

Other information:

The department coordinates with the medical community (i.e. ADPH) regarding fish consumption advisories and waste management requirements, particularly as they apply to remediation projects and site assessments. Also in years past, the department provided assistance to ADPH as they were developing guidance for their county health departments to remove mercury thermometers and other devices from their offices.

Fish Consumption Advisories

- Waterbody-specific advisories

Dental Program

- No program to address dental mercury

Alabama 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion- Electric Generation - Coal	3466
Industrial Processes - Ferrous Metals	521
Industrial Processes - Cement Manufacturing	341
Industrial Processes - Chemical Manufacturing	340
Industrial Processes - Pulp & Paper	86
Miscellaneous Non-Industrial—Not Elsewhere Classified	73
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	66
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	37
Mobile - Locomotives	32
Industrial Processes - Not Elsewhere Classified	29
Industrial Processes - Petroleum Refineries	20
Mobile - On-Road Gasoline Light Duty Vehicles	14
Industrial Processes - Non-ferrous Metals	12
Industrial Processes - Storage and Transfer	12

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

Emissions Inventory

Alabama's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Research

- http//www.adem.state.al.us/programs/waterforms/surfacewatermonitoring.pdf

Alaska's Mercury Actions

Alaska Department of Environmental Conservation
http://www.akcontaminants.org/
Contact: Kristin Ryan
Phone: 907.269.7644 Email: Kristin.Ryan@alaska.gov

U.S. EPA Approved TMDLs

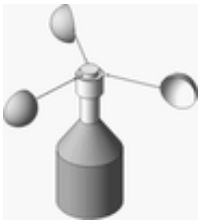
- Yes, waterbody-specific
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Legacy sources

Status of Mercury Reduction Plans

- Intend to develop mercury reduction plan or strategy in the future

Monitoring

- Air emissions from stacks
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife
- Landfill



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Alaska 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Residential - Oil	39
Fuel Combustion - Electric Generation - Coal	24
Industrial Processes - Petroleum Refineries	13

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Mercury Research
• http://www.dec.alaska.gov/eh/vet/fish.htm

Arizona's Mercury Actions

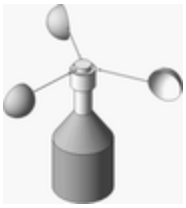
Arizona Department of Environmental Quality
http://www.azdeq.gov/
Contact: Linda Taunt
Phone: 602.771.4416 Email: lc1@azdeq.gov

U.S. EPA Approved TMDLs

- Yes, waterbody-specific
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Monitoring

- Air emissions from stacks
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue



Status of Mercury Reduction Plans

- Mercury reduction plan or strategy under development

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Other information:

- The Arizona Department of Environmental Quality coordinates with the Department of Health Services who may interface with the medical community.

Fish Consumption Advisories

- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury
- Local government more stringent than state

Arizona 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion- Electric Generation - Coal	1074
Miscellaneous Non-Industrial - Not Elsewhere Classified	65
Mobile - Locomotives	46
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	32
Industrial Processes - Cement Manufacturing	31
Industrial Processes - Non-ferrous Metals	28
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	21
Mobile - On-Road Gasoline Light Duty Vehicles	14

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Emissions Inventory

Arizona's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from air emission sources

Arkansas' Mercury Actions

Arkansas Department of Environmental Quality
http://www.adeq.state.ar.us/
Contact: J. Ryan Benefield
Phone: 501.682.0960 Email: Benefield@adeq.state.ar.us

U.S. EPA Approved TMDLs

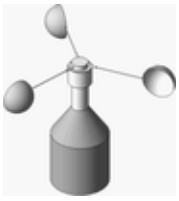
- Yes, waterbody-specific
- A multimedia approach was not used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition
  - Legacy sources
  - Wastewater treatment plant discharges

Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Monitoring

- Wastewater effluent
- Wastewater sludge
- Water column
- Fish tissue



Fish Consumption Advisories

- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators
- Local government more stringent than state

Arkansas 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	779
Waste Disposal	357
Industrial Processes - Ferrous Metals	308
Fuel Comb - Industrial Boilers, Internal Combustion Engines - Coal	200
Industrial Processes - Cement Manufacturing	134
Miscellaneous Non-Industrial -Not Elsewhere Classified	43
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	39
Mobile - Locomotives	35
Industrial Processes - Pulp & Paper	21
Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.	

Emissions Inventory

Arkansas' mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

California's Mercury Actions

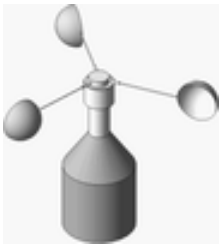
California Department of Toxic Substances Control
http://www.dtsc.ca.gov/
Contact: Andre Algazi
Phone: 916.324.3114 Email: aalgazi@dtsc.ca.gov

U.S. EPA Approved TMDLs

- Yes, waterbody-specific and watershed or basin
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition
  - Legacy sources
  - Wastewater treatment plant discharges
  - Active mining

Monitoring

- Air emissions from stacks
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife



Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Areas of Coordination with the Medical Community

- Dental issues

Fish Consumption Advisories

- Waterbody-specific advisories

Dental Program

- No program to address dental mercury
- Allow settling tanks in place of separators
- Local government more stringent than state

California 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Industrial Processes - Cement Manufacturing	2119
Fuel Combustion - Electric Generation - Other	732
Mobile - On-Road Diesel Heavy Duty Vehicles	701
Mobile - Non-Road Equipment - Diesel	563
Industrial Processes - Not Elsewhere Classified	481
Waste Disposal	333
Industrial Processes - Ferrous Metals	250
Industrial Processes - Oil & Gas Production	141
Fires - Agricultural Field Burning	94
Industrial Processes - Petroleum Refineries	89
Miscellaneous Non-Industrial -Not Elsewhere Classified	86
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	80
Mobile - Locomotives	75
Industrial Processes - Storage and Transfer	52
Mobile - Non-Road Equipment - Gasoline	46

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

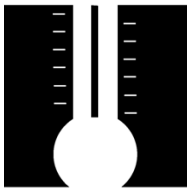
Emissions Inventory

California's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Limits on mercury content in products
- Sales ban, use ban or Phase out:
  - Cosmetics
  - Measuring devices
  - Medical devices
  - Switches and relays
  - Thermometers
  - Thermostats
- Exemption process

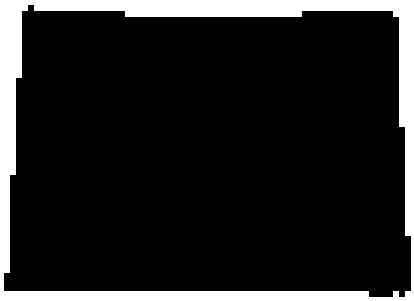


Mercury Research

- http://www.oehha.ca.gov
- http://www.swrcb.ca.gov, search for "mercury"

Colorado's Mercury Actions

Colorado Department of Public Health and Environment
http://www.cdphe.state.co.us/hm/mercury/index.htm
Contact: Greg Fabisiak
Phone: 303.692.2903 Email: greg.fabisiak@state.co.us



U.S. EPA Approved TMDLs

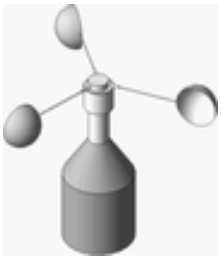
- Yes, waterbody-specific
- A multimedia approach was not used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Ambient air
- Atmospheric deposition (other than NADP participation)
- Wastewater effluent
- Wastewater sludge
- Water column
- Fish tissue



Fish Consumption Advisories

- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- No program to address dental mercury
- Allow settling tanks in place of separators
- Local government more stringent than state

Colorado 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Industrial Processes - Ferrous Metals	721
Fuel Combustion - Electric Generation - Coal	679
Industrial Processes - Not Elsewhere Classified	84
Industrial Processes - Cement Manufacturing	81
Mobile - Locomotives	30
Miscellaneous Non-Industrial - Not Elsewhere Classified	23
Industrial Processes - Non-ferrous Metals	13
Mobile - On-Road Gasoline Light Duty Vehicles	11
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	10

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

Emissions Inventory

Colorado's mercury emissions inventory :

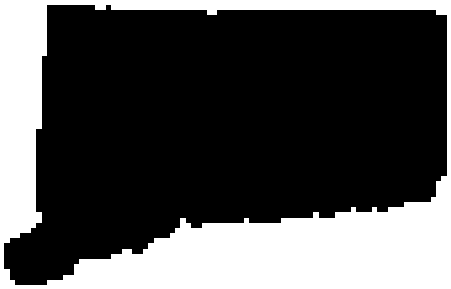
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Research

- http://www.cdphe.state.co.us/wq/FishCon/index.html

Connecticut's Mercury Actions

Connecticut Department of Energy and Environmental Protection
http://www.ct.gov/dep/cwp/view.asp?a=2690&Q=322430&depNav_GID=1651
Contact: Robert Hannon
Phone: 860.424.3245 Email: robert.hannon@ct.gov



U.S. EPA Approved TMDLs

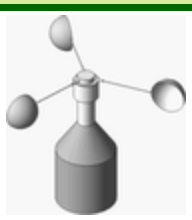
- Yes, multistate
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition
  - Wastewater treatment plant discharges

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Indoor air
  (for the purposes of evaluating spill cleanup)
- Wastewater sludge
- Fish tissue



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs

Connecticut
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Residential - Oil	232
Waste Disposal	58
Miscellaneous Non-Industrial - Not Elsewhere Classified	50

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Mercury Research

- A comprehensive lake study was completed in 1995.
- In 2005, a 3 year contract was executed with the University of Connecticut to conduct a new statewide lake study (program re-evaluation every 10 years).
- The Department initiated a routine monitoring program in 2006. The program monitors 20 different "wadeable" streams per year. Fish tissues will be sampled on site for each of the streams. This will be a continuous, random monitoring program.

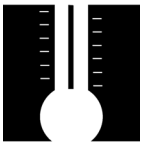
Emissions Inventory

Connecticut's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Labeling requirements
- Limits on mercury content in products
- Sales ban, use ban or Phase out:
  - Cosmetics
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other
- Exemption process



Delaware's Mercury Actions

Delaware Department of Natural Resources and Environmental Control
http://www.dnrec.delaware.gov/Pages/Portal.aspx
Contact: Robert J. Zimmerman
Phone: 302.739.9000 Email: Robert.Zimmerman@state.de.us

Fish Consumption Advisories

- Waterbody-specific advisories

Dental Program

- No program to address dental mercury

Mercury Research

- Measuring Hg methylation rates in the sediments of the Delaware River

U.S. EPA Approved TMDLs

- Plans to develop a waterbody-specific TMDL
- A multimedia approach will be used to develop the TMDLs.

Monitoring

- Water column
- Waterbody sediment
- Fish tissue
- Landfill

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Delaware
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Industrial Processes - Ferrous Metals	163
Fuel Combustion - Electric Generation - Coal	122
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	74
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Other	38
Fuel Combustion - Electric Generation - Natural Gas	28

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

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Florida's Mercury Actions

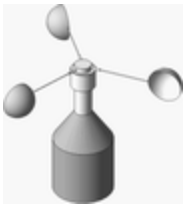
Florida Department of Environmental Protection
http://www.dep.state.fl.us/waste/categories/mercury/
Contact: Don Axelrad
Phone: 850.245.8072 Email: Don.Axelrad@dep.state.fl.us

U.S. EPA Approved TMDLs

- Plans to develop a statewide TMDL
- A multimedia approach will be used to develop the TMDLs.

Monitoring

- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife



Status of Mercury Reduction Plans

- Mercury reduction plan or strategy under development

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Cultural/ritualistic uses
- Waste management requirements

Fish Consumption Advisories

- Statewide freshwater advisories
- Statewide coastal advisories
- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Florida 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion- Electric Generation - Coal	1270
Fuel Combustion - Electric Generation - Other	567
Industrial Processes - Cement Manufacturing	443
Miscellaneous Non-Industrial -Not Elsewhere Classified	214
Industrial Processes - Ferrous Metals	129
Industrial Processes - Not Elsewhere Classified	80
Industrial Processes - Storage and Transfer	71
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	50
Waste Disposal	46
Mobile - On-Road Gasoline Light Duty Vehicles	46
Fuel Combustion - Electric Generation - Oil	37
Fuel Combustion - Electric Generation - Biomass	27
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Other	20
Mobile - Locomotives	17
Fuel Combustion - Electric Generation - Natural Gas	12

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Emissions Inventory

Florida's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Research

- http://www.dep.state.fl.us/water/sas/mercury/index.htm

Hawaii's Mercury Actions

Hawaii Department of Health
http://hawaii.gov/health
Contact: Barbara Brooks
Phone: 808.586.4249 Email: barbara.brooks@doh.hawaii.gov

Fish Consumption Advisories

- Statewide advisories

Mercury Research

- Mercury biomonitoring in women of childbearing age

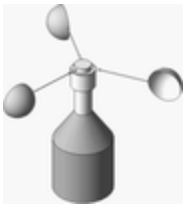
Emissions Inventory

Hawaii's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Monitoring

- Air emissions from stacks
- Ambient air
- Indoor air
  (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Fish tissue



Areas of Coordination with the Medical Community

- Fish consumption advisories

Dental Program

- No program to address dental mercury
- Allow settling tanks in place of separators

Hawaii
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Electric Generation - Other	90
Miscellaneous Non-Industrial -Not Elsewhere Classified	17

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Idaho's Mercury Actions

Idaho Department of Environmental Quality
http://www.deq.idaho.gov/waste-mgmt-remediation/hazardous-waste/mercury.aspx
Contact: Kari L. Kostka
Phone: 208.373.0199 Email: kari.kostka@deq.idaho.gov

Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned
- In the state of Idaho, very little mercury monitoring and management is driven by governing rules. Several programs are underway simply to prevent higher clean-up costs and often because they are the right thing to do. Idaho is accomplishing much with regard to mercury and without regulations or funding mandating action.

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

U.S. EPA Approved TMDLs

- Yes, watershed or basin
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Emissions Inventory

Idaho's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Idaho
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Industrial Processes - Chemical Manufacturing	613
Miscellaneous Non-Industrial—Not Elsewhere Classified	48
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	40
Mobile - Locomotives	19
Industrial Processes - Not Elsewhere Classified	15
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	14

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Monitoring

- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Fish tissue

Dental Program

- No program to address dental mercury
- Local government more stringent than state

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

- In 2005, the Idaho Department of Environmental Quality (DEQ) launched the Idaho Chemical Roundup, a statewide program providing schools assistance and training on proper chemical management and disposal. Through the Idaho Chemical Roundup and along with the Idaho Division of Building Safety, DEQ is committed to helping schools manage chemical wastes and prevent pollution. Upon facility inspection by the Division of Building Safely, educational opportunities emerge allowing staff and students to learn about the importance of best management practices for laboratory chemicals and wastes. EPA mini-grants have also made it possible for schools and/or districts to submit proposals to undergo Chemical Roundup. Once funding is secured, DEQ provides compliance assistance to ensure proper handling and disposal of hazardous materials.

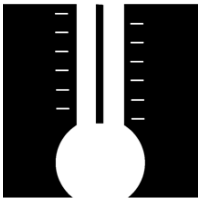
- The Idaho DEQ has classified mercury as the highest priority toxin in need of elimination from schools. The Idaho DEQ encourages schools to sign-up for the voluntary Mercury-Free Zone Program which requires mercury inventorying, clear labeling of mercury, purchasing non-mercury product substitutes, conducting mercury education with students and faculty, and requires the recycling of existing mercury within the school. By taking the Mercury-Free Zone pledge, schools also urge students and their families to conduct environmentally sound practices in their everyday lives to prevent mercury exposure and the release of mercury and other toxins into Idaho's environment.

- Throughout the state, Idaho DEQ technical staff and others are often invited to present to schools, property managers, and similar audiences on the dangers of hazardous wastes and mercury in households and schools. Several times each year, these presentations detail what products and materials need special attention and how to handle them when found. Typically, the focus is geared toward mercury but other hazardous chemicals may be discussed.

Mercury Containing Products

- The Idaho Department of Environmental Quality (DEQ) has participated in the voluntary National Vehicle Mercury Switch Recovery Program (NVMSRP) since 2007. Out of 118 invitations sent to auto salvage yards, 60 agreed to voluntarily participate in removing mercury switches from salvaged vehicles. To date, 8,173 mercury switches have been recovered removing 17.98 pounds of mercury from Idaho's environment.

- Several Idaho counties have established permanent household hazardous waste collection sites. Other cities and counties have sponsored mobile drop-off sites and drop-off events or even specifically, mercury drop-off events. On such occasions, The Idaho DEQ provides technical assistance to ensure hazardous chemicals and materials are handled and disposed of properly .



Mercury Research

- http://www.deq.idaho.gov/water-quality/surface-water/mercury.aspx

- The Idaho Fish Consumption Advisory Program (IFCAP), created in 2001 under the Idaho Department of Health and Welfare, informs Idahoans about possible contamination of lakes and streams - contamination that may affect fish and the humans who eat the fish. By testing fish samples for contaminants, IFCAP is able to advise the public about safe consumption of fish from Idaho water bodies. When contaminant levels are unsafe, IFCAP may recommend that people limit or avoid eating certain species of fish caught in certain places and does so by issuing a Fish Consumption Advisory.

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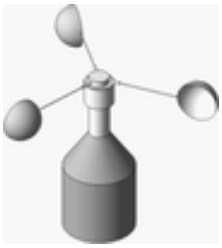
Illinois' Mercury Actions

Illinois Environmental Protection Agency
http://www.epa.state.il.us/mercury/
Contact: Becky Jayne
Phone: 217.524.9642 Email: Becky.Jayne@illinois.gov

Monitoring

- Air emissions from stacks
- Ambient air
- Atmospheric deposition
  (other than NADP participation)
- Indoor air
  (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Fish tissue
- Landfill



Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Areas of Coordination with the Medical Community

- Dental issues
- Fish consumption advisories

Dental Program

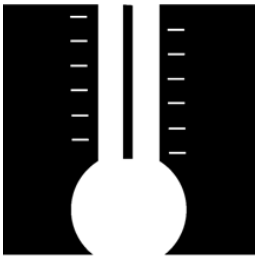
- Voluntary program to address dental mercury

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Cosmetics
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other
- Exemption process



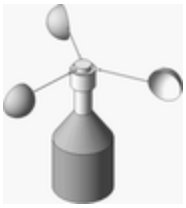
Illinois 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	1739
Industrial Processes - Ferrous Metals	286
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	245
Fuel Combustion - Electric Generation - Natural Gas	234
Industrial Processes - Non-ferrous Metals	181
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	154
Waste Disposal	142
Industrial Processes - Chemical Manufacturing	141
Miscellaneous Non-Industrial -Not Elsewhere Classified	133
Industrial Processes - Not Elsewhere Classified	114
Industrial Processes - Petroleum Refineries	101
Mobile - Locomotives	83
Industrial Processes - Cement Manufacturing	52
Fuel Combustion - Commercial/Institutional - Natural Gas	49
Mobile - On-Road Gasoline Light Duty Vehicles	24
Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.	

Indiana's Mercury Actions

Indiana Department of Environmental Management
http://www.in.gov/idem
Contact: Brian Wolff
Phone: 317.234.3499 Email: bwolff@idem.in.gov

Monitoring

- Air emissions from stacks
- Wastewater effluent
- Wastewater sludge
- Waterbody sediment
- Fish tissue
- Landfill

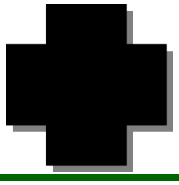


Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Areas of Coordination with the Medical Community

- Pollution prevention
- Dental issues
- Waste management requirements



Fish Consumption Advisories

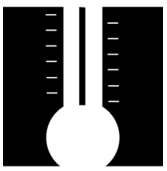
- Statewide freshwater advisories
- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Novelty items/toys
  - Thermometers



Indiana 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	2454
Industrial Processes - Cement Manufacturing	514
Industrial Processes - Ferrous Metals	435
Industrial Processes - Non-ferrous Metals	125
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	121
Miscellaneous Non-Industrial -Not Elsewhere Classified	98
Waste Disposal	91
Mobile - Locomotives	42
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	31
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	23
Fuel Combustion - Commercial/ Institutional - Oil	17
Mobile - On-Road Gasoline Light Duty Vehicles	16
Fuel Combustion - Residential - Oil	12

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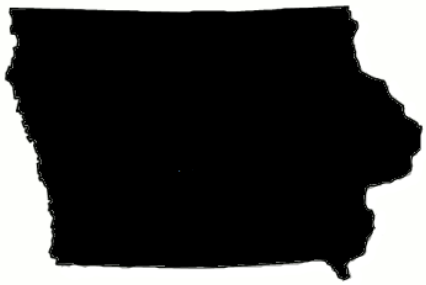
Emissions Inventory

Indiana's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

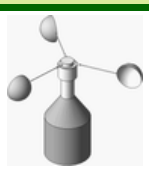
Iowa's Mercury Actions

Iowa Department of Natural Resources
http://www.iowadnr.gov/
Contact: Theresa Stiner
Phone: 515.281.8646 Email: Theresa.Stiner@dnr.iowa.gov



Monitoring

- Air emissions from stacks
- Water column
- Fish tissue



Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Dental Program

- No program to address dental mercury
- Local government more stringent than state

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Other

Iowa
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Electric Generation - Coal	1937
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	455
Industrial Processes - Ferrous Metals	179
Industrial Processes - Cement Manufacturing	100
Mobile - Locomotives	49
Miscellaneous Non-Industrial -Not Elsewhere Classified	49
Fuel Combustion - Commercial/Institutional - Coal	41
Fuel Combustion - Industrial Boilers, ICEs - Other	20

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

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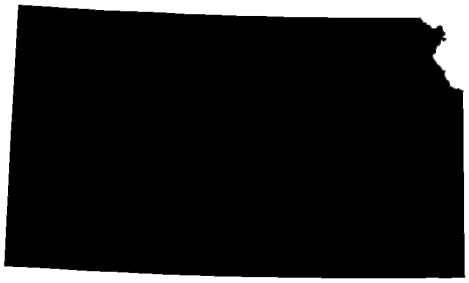
Kansas' Mercury Actions

Kansas Department of Health and Environment
http://www.kdheks.gov/mercury/index.html
Contact: Jessica Willard
Phone: 785.296.1611 Email: jwillard@kdheks.gov



U.S. EPA Approved TMDLs

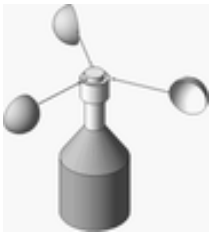
- Yes, waterbody-specific
- A multimedia approach was used when developing the TMDLs.

Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Monitoring

- Atmospheric deposition (other than NADP participation)
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Landfill



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators
- Local government more stringent than state

Kansas 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	1284
Industrial Processes - Cement Manufacturing	664
Industrial Processes - Ferrous Metals	76
Mobile - Locomotives	67
Miscellaneous Non-Industrial -Not Elsewhere Classified	47
Industrial Processes - Petroleum Refineries	46

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

Emissions Inventory

Kansas' mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Research

- http://www.kdheks.gov/befs/fish_tissue_monitoring.htm

Kentucky's Mercury Actions

Kentucky Department for Environmental Protection
http://dep.ky.gov/Pages/default.aspx
Contact: Larry Taylor
Phone: 502.564.2150 Email: Larryc.taylor@ky.gov

Status of Mercury Reduction Plans

- Intend to develop mercury reduction plan or strategy in the future

Fish Consumption Advisories

- Statewide freshwater advisories

Emissions Inventory

Kentucky's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Monitoring

- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Landfill

Areas of Coordination with the Medical Community

- Fish consumption advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Kentucky
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Electric Generation - Coal	1573
Industrial Processes - Ferrous Metals	403
Industrial Processes - Storage and Transfer	107
Industrial Processes - Not Elsewhere Classified	91
Miscellaneous Non-Industrial -Not Elsewhere Classified	55
Industrial Processes - Cement Manufacturing	36
Mobile - Locomotives	30
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	16
Mobile - On-Road Gasoline Light Duty Vehicles	11

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

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Louisiana's Mercury Actions

Louisiana Department of Environmental Quality
http://www.deq.louisiana.gov/portal/
Contact: Chris M. Piehler
Phone: 225.219.3611 Email: chris.piehler@la.gov

U.S. EPA Approved TMDLs

- Yes, waterbody-specific, watershed or basin, and plans to develop a multistate
- A multimedia approach was not used when developing the TMDLs.
- Addresses the following sources:
  - Wastewater treatment plant discharges

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Ambient air
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue

Fish Consumption Advisories

- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- Mandatory program to address dental mercury
- Require BMPs
- Allow settling tanks in place of separators

Louisiana 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion- Electric Generation - Coal	1798
Industrial Processes - Chemical Manufacturing	1094
Industrial Processes - Petroleum Refineries	566
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	116
Industrial Processes - Pulp & Paper	73
Industrial Processes - Ferrous Metals	63
Miscellaneous Non-Industrial -Not Elsewhere Classified	57
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Other	53
Waste Disposal	45
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	37
Industrial Processes - Not Elsewhere Classified	26
Mobile - Locomotives	21
Fuel Combustion - Electric Generation - Natural Gas	20
Mobile - On-Road Gasoline Light Duty Vehicles	10

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

Mercury Research

- http://www.deq.louisiana.gov/portal/Default.aspx?tabid=287

Emissions Inventory

Louisiana's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Labeling requirements
- Limits on mercury content in products
- Sales ban, use ban or phase out:
  - Cosmetics
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other
- Exemption process

Maine's Mercury Actions

Maine Department of Environmental Protection
http://www.maine.gov/dep/
Contact: Julie Churchill
Phone: 207.287.7881 Email: julie.m.churchill@maine.gov

U.S. EPA Approved TMDLs

- Yes, multistate and plans to develop a multistate
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Atmospheric deposition (other than NADP participation)
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife

Fish Consumption Advisories

- Statewide freshwater advisories
- Statewide coastal advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

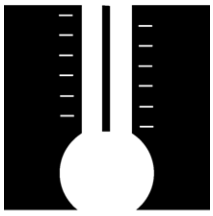
- Mandatory program to address dental mercury
- Require amalgam separators

Maine 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Residential - Oil	116
Fuel Combustion - Commercial/Institutional - Oil	49
Fuel Combustion - Electric Generation - Biomass	38
Miscellaneous Non-Industrial - Not Elsewhere Classified	35
Waste Disposal	33
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	29
Industrial Processes - Cement Manufacturing	27
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	16
Fuel Combustion- Electric Generation - Natural Gas	15
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	10
Fuel Combustion - Commercial/Institutional - Biomass	10

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Mercury Containing Products

- Labeling requirements
- Sales ban, use ban or phase out:
  - Measuring devices
  - Medical devices
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other
- Exemption process



Mercury Research

- http://www.maine.gov/dep/blwq/docmonitoring/tmdl/2007/hg.htm

Maryland's Mercury Actions

Maryland Department of the Environment
http://www.mde.state.md.us/programs/land/recyclingandoperationsprogram/mercury/pages/programs/landprograms/recycling/mercury/index.aspx
Contact: Jeffrey Fretwell
Phone: 410.537.3537 Email: jfretwell@mde.state.md.us

U.S. EPA Approved TMDLs

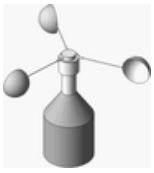
- Yes, waterbody-specific
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Ambient air
- Atmospheric deposition (other than NADP participation)
- Wastewater effluent
- Wastewater sludge
- Fish tissue
- Landfill



Fish Consumption Advisories

- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Thermostats
  - Other

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Maryland 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Industrial Processes - Cement Manufacturing	501
Fuel Combustion - Electric Generation - Coal	252
Waste Disposal	150
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	109
Miscellaneous Non-Industrial - Not Elsewhere Classified	76
Fuel Combustion - Residential - Oil	55
Fuel Combustion - Commercial/Institutional - Oil	23
Mobile - On-Road Gasoline Light Duty Vehicles	13

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Emissions Inventory

Maryland's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Research

- http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/Mercury/Documents/
- www.mde.state.md.us/assets/document/Mercury%20Report%202002.pdf
- http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/Mercury/Documents/
- www.mde.state.md.us/assets/document/Mercury%20Report%202004%20-%20FINAL.pdf
- http://www.mde.maryland.gov/programs/water/tmdl/approvedfinaltmdls/pages/programs/waterprograms/tmdl/approvedfinaltmdl/index.aspx

Massachusetts' Mercury Actions

Massachusetts Department of Environmental Protection
http://www.mass.gov/dep/toxics/stypes/hgres.htm
Contact: C. Mark Smith
Phone: 617.292.5509 Email: c.mark.smith@state.ma.us

U.S. EPA Approved TMDLs

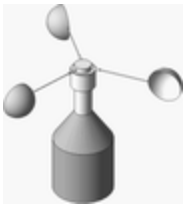
- Yes, multistate
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition
  - Wastewater treatment plant discharges

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Atmospheric deposition (other than NADP participation)
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs
- Local government more stringent than state

Massachusetts
2008 National Emissions Inventory –
Top Source Categories

Emission Source	Pounds
Fuel Combustion - Residential - Oil	281
Miscellaneous Non-Industrial - Not Elsewhere Classified	237
Waste Disposal	191
Fuel Combustion - Electric Generation - Coal	158
Mobile - On-Road Gasoline Light Duty Vehicles	13

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

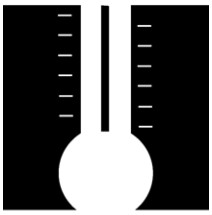
Emissions Inventory

Massachusetts' mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Labeling requirements
- Sales ban, use ban or phase out:
  - Measuring devices
  - Medical devices
  - Switches and relays
  - Thermostats
  - Other
- Exemption process



Mercury Research

- http://www.mass.gov/dep/toxics/stypes/hgres.htm#monitoring

Michigan's Mercury Actions

Michigan Department of Environmental Quality
www.michigan.gov/deq and click on "environmental spotlight"
Contact: Joy Taylor Morgan
Phone: 517.335.6974 Email: taylorj1@michigan.gov

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Fish Consumption Advisories

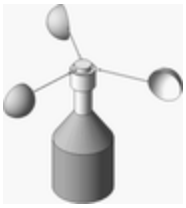
- Statewide freshwater advisories
- Waterbody-specific advisories

U.S. EPA Approved TMDLs

- Plans to develop a statewide TMDL
- A multimedia approach will be used when developing the TMDL.
- Addresses the following sources:
  - Atmospheric deposition

Monitoring

- Air emissions from stacks
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Landfill



Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Cultural/ritualistic uses

Other information:
The Michigan Department of Community Health works with Poison Control Centers on elemental mercury spills.

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs
- Allow settling tanks in place of separators
- Local government more stringent than state

Michigan's Mercury Actions: continued

Michigan 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	2277
Industrial Processes - Cement Manufacturing	599
Industrial Processes - Ferrous Metals	353
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	325
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	220
Fuel Combustion - Electric Generation - Other	218
Miscellaneous Non-Industrial - Not Elsewhere Classified	125
Waste Disposal	117
Fuel Combustion - Commercial/Institutional - Coal	103
Fuel Combustion - Electric Generation - Biomass	41
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	34
Fuel Combustion - Residential - Oil	24
Mobile - On-Road Gasoline Light Duty Vehicles	22
Mobile - Locomotives	13
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	12

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

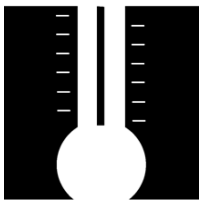
Emissions Inventory

Michigan's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Measuring devices
  - Medical devices
  - Thermometers
  - Thermostats



Mercury Research

- Fish eater biomonitoring and some air monitoring by the University of Michigan - www.michigan.gov/deq

Minnesota's Mercury Actions

Minnesota Pollution Control Agency
http://www.pca.state.mn.us/index.php/topics/mercury/mercury.html
Contact: Rebecca Walter
Phone: 651.757.2807 Email: rebecca.walter@state.mn.us

U.S. EPA Approved TMDLs

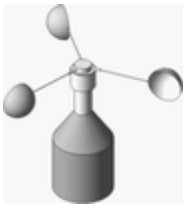
- Yes, statewide
- A multimedia approach was used when developing the TMDL.
- Addresses the following sources:
  - Atmospheric deposition
  - Wastewater treatment plant discharges
  - Active mining

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Fish tissue
- Wildlife
- Landfill



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Cultural/ritualistic uses
- Waste management requirements

Other information:
Medical collaboration to reduce mercury from laboratories within lab reagents as well as in the dental community.

Dental Program

- Mandatory program to address dental mercury in Minneapolis/St. Paul area
- Voluntary program to address mercury
- Local government more stringent than state

Minnesota 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion- Electric Generation - Coal	1303
Industrial Processes - Ferrous Metals	756
Waste Disposal	475
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	140
Industrial Processes - Storage and Transfer	140
Industrial Processes - Not Elsewhere Classified	136
Mobile - Locomotives	34
Miscellaneous Non-Industrial - Not Elsewhere Classified	33
Fuel Combustion - Residential - Oil	28
Solvent - Consumer & Commercial Solvent Use	23
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	15
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	15
Industrial Processes - Mining	14
Fuel Combustion - Electric Generation - Biomass	14
Mobile - On-Road Gasoline Light Duty Vehicles	13

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Emissions Inventory

Minnesota's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Cosmetics
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other

Mercury Research

- http://www.briloon.org/mercuryconnections/greatlakes

Missouri's Mercury Actions

Missouri Department of Natural Resources
www.dnr.mo.gov
Contact: Scott Totten
Phone: 573.522.3326 Email: scott.totten@dnr.mo.gov

U.S. EPA Approved TMDLs

- Plans to develop a statewide TMDL
- A multimedia approach will be used when developing the TMDL.
- Addresses the following sources:
  - Atmospheric deposition

Status of Mercury Reduction Plans

- Intend to develop mercury reduction plan or strategy in the future

Monitoring

- Atmospheric deposition (other than NADP participation)
- Indoor air (for the purposes of evaluating spill cleanup)
- Fish tissue

Dental Program

- No program to address dental mercury
- Allow settling tanks in place of separators

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Emissions Inventory

Missouri's mercury emissions inventory :

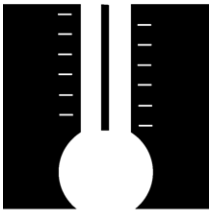
- Estimates for the amount of mercury released to the environment from air emission sources

Missouri
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Electric Generation - Coal	2370
Industrial Processes - Cement Manufacturing	330
Industrial Processes - Non-ferrous Metals	153
Industrial Processes - Not Elsewhere Classified	66
Mobile - Locomotives	65
Waste Disposal	47
Industrial Processes - Storage and Transfer	25
Miscellaneous Non-Industrial - Not Elsewhere Classified	20
Mobile - On-Road Gasoline Light Duty Vehicles	15

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

Mercury Containing Products



The Missouri Mercury Collection Program began as a thermometer swap or exchange program funded by a $15,000 grant from the U.S. Environmental Protection Agency (EPA). The program quickly grew into a statewide collection of devices, mercury contaminated debris, and elemental mercury conducted by the Environmental Emergency Response Section of the Missouri Department of Natural Resources (DNR).

The first mercury "roundup" was conducted in February 2009 at 86 drop- off locations around the state. Approximately 226 pounds of elemental mercury were recovered along with hundreds of pounds of devices and debris (thermometers, switches, other medical devices). This roundup peaked public interest and more devices and debris were offered by the public, so additional events were conducted. For the year, 450 pounds of elemental mercury were collected and shipped for recycling.

Because the roundup events were so successful, DNR continued the program in 2010. The DNR's five regional offices became the only drop-off sites to help keep costs down. Over a four-month period, events were held at each regional office. 320 pounds of elemental mercury were collected, as well as 305 pounds of mercury containing devices and debris.

Another roundup was conducted at our regional offices in the spring of 2011. Approximately 150 pounds of devices and debris and 75 pounds of elemental mercury were collected.

DNR plans to continue this program through our regional offices again in the spring of 2012. As of June 30th, 2011, this program has helped recover 780 pounds of elemental mercury and 955 pounds of mercury contaminated debris.

While the mercury roundup has provided a safe and reliable way for citizens, doctors and school officials to dispose of their mercury containing devices and debris, DNR continues to respond to mercury releases in private homes, schools, and healthcare facilities.

Montana's Mercury Actions

Montana Department of Environmental Quality
http://www.fwp.mt.gov/fwpDoc.jsp?id=28187
Contact: Bonnie Lovelace
Phone: 406.444.1760 Email: blovelace2@mt.gov

U.S. EPA Approved TMDLs

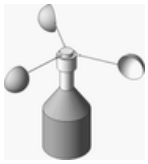
- Yes, waterbody-specific
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Legacy sources

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Water column
- Waterbody sediment
- Fish tissue
- Coal-fired Utilities



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Mercury Containing Products

- Labeling requirements
- Sales ban, use ban or phase out:
  - Thermostats

Montana 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	237
Mobile - Locomotives	45
Industrial Processes - Petroleum Refineries	43
Industrial Processes - Cement Manufacturing	25
Miscellaneous Non-Industrial - Not Elsewhere Classified	14
Fuel Combustion - Electric Generation - Other	12

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

Emissions Inventory

Montana's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources (coal-fired utilities)

Mercury Research

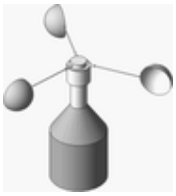
- http://www.fwp.mt.gov/fwpDoc.jsp?id=28187

Nebraska's Mercury Actions

Nebraska Department of Environmental Quality
http://www.dhhs.ne.gov/mercury
Contact: Melissa Ellis
Phone: 402.471.6624 Email: melissa.ellis@nebraska.gov

Monitoring

- Ambient air
- Atmospheric deposition (other than NADP participation)
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Fish tissue



Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Waste management requirements

Fish Consumption Advisories

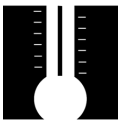
- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Thermometers



Nebraska 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	1353
Industrial Processes - Ferrous Metals	163
Mobile - Locomotives	139
Industrial Processes - Cement Manufacturing	41
Waste Disposal	40
Miscellaneous Non-Industrial - Not Elsewhere Classified	24
Industrial Processes - Not Elsewhere Classified	14

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.

Emissions Inventory

Nebraska's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Research

- http://www.deq.state.ne.us/publica.nsf/pages/WAS057
- 2009 Waste Characterization Study: One element of the study was to determine the amount of mercury containing wastes being disposed of in municipal solid waste landfills.

New Hampshire's Mercury Actions

New Hampshire Department of Environmental Services
http://des.nh.gov/
Contact: Stephanie D'Agostino
Phone: 603.271.6398 Email: stephanie.dagostino@des.nh.gov

U.S. EPA Approved TMDLs

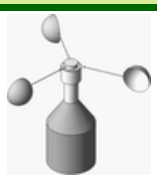
- Yes, multistate
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Wastewater sludge
- Fish tissue



Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Other information:
Toxics reduction and sustainability issues

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators

New Hampshire 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	235
Fuel Combustion - Residential - Oil	82
Miscellaneous Non-Industrial - Not Elsewhere Classified	18
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	15
Fuel Combustion - Electric Generation - Biomass	10

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Emissions Inventory

New Hampshire's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Notification requirements
- Sales ban, use ban or phase out:
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
- Exemption process

New Jersey's Mercury Actions

New Jersey Department of Environmental Protection
http://www.state.nj.us/dep/dsr/mercury/
Contact: Robin Heston
Phone: 609.984.4643 Email: robin.heston@dep.state.nj.us

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Fish Consumption Advisories

- Statewide freshwater advisories
- Statewide coastal advisories
- Waterbody-specific advisories

U.S. EPA Approved TMDLs

- Yes, statewide
- A multimedia approach was not used when developing the TMDL.
- Addresses the following sources:
  - Atmospheric deposition

Monitoring

- Air emissions from stacks
- Ambient air
- Atmospheric deposition (other than NADP participation)
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife
- Landfill

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Dental issues

Other information:
Provide data for epidemiological studies

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs

New Jersey
2008 National Emissions Inventory –
Top Source Categories

Emission Source	Pounds
Waste Disposal	150
Industrial Processes - Not Elsewhere Classified	132
Fuel Combustion - Residential - Oil	127
Miscellaneous Non-Industrial - Not Elsewhere Classified	105
Industrial Processes - Ferrous Metals	93
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	69
Fuel Combustion - Electric Generation - Coal	40
Mobile - On-Road Gasoline Light Duty Vehicles	17

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

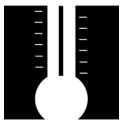
Emissions Inventory

New Jersey's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Thermometers

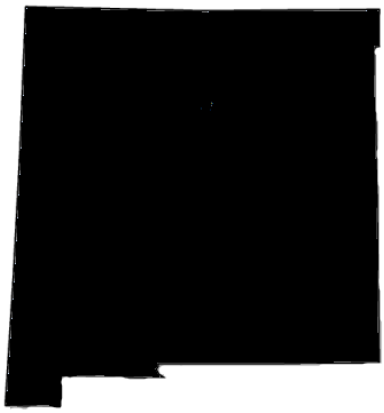


Mercury Research

- http://www.state.nj.us/dep/dsr/mercury/

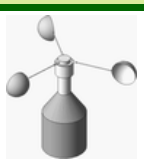
New Mexico's Mercury Actions

New Mexico Environment Department
http://www.nmenv.state.nm.us/
Contact: Richard Goodyear
Phone: 505.476.4305 Email: richard.goodyear@state.nm.us



Monitoring

- Water column
- Fish tissue
- Wet deposition (MDN) (4/21/09 through 9/30/12)



Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Dental Program

- No program to address dental mercury

Fish Consumption Advisories

- Waterbody-specific advisories

New Mexico 2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Mobile - Locomotives	47
Miscellaneous Non-Industrial - Not Elsewhere Classified	23
Industrial Processes - Cement Manufacturing	10

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New York's Mercury Actions

New York State Department of Environmental Conservation
http://www.dec.ny.gov/chemical/285.html
Contact: Peter M. Pettit
Phone: 518.402.8706 Email: pmpettit@gw.dec.state.ny.us

U.S. EPA Approved TMDLs

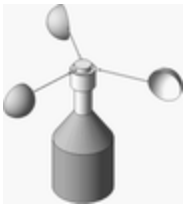
- Yes, multistate
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Air emissions from stacks
- Ambient air
- Atmospheric deposition (other than NADP participation)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife
- Landfill



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs

New York 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Residential - Oil	584
Fuel Combustion - Electric Generation - Coal	343
Waste Disposal	233
Industrial Processes - Cement Manufacturing	184
Miscellaneous Non-Industrial - Not Elsewhere Classified	176
Industrial Processes - Ferrous Metals	144
Fuel Combustion - Residential - Natural Gas	103
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	95
Fuel Combustion - Electric Generation - Oil	61
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	48
Mobile - On-Road Gasoline Light Duty Vehicles	32
Mobile - Locomotives	28
Fuel Combustion - Commercial/Institutional - Natural Gas	23
Industrial Processes - Not Elsewhere Classified	14
Fuel Combustion - Electric Generation - Natural Gas	12

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

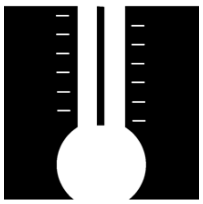
Emissions Inventory

New York's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Labeling requirements
- Sales ban, use ban or phase out:
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
- Exemption process



Mercury Research

- http://www.dec.ny.gov/chemical/285.html

North Carolina's Mercury Actions

North Carolina Department of Environment and Natural Resources
http://ncdenr.gov/web/wq/ps/mtu/tmdl/tmdls/mercury
Contact: Steve Schliesser
Phone: 919.707.8701 Email: Steve.Schliesser@ncdenr.gov

U.S. EPA Approved TMDLs

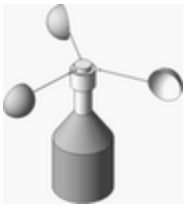
- Plans to develop a statewide TMDL
- A multimedia approach will be used when developing the TMDL.

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Ambient air
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Landfill



Fish Consumption Advisories

- Statewide freshwater advisories
- Statewide coastal advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- No program to address dental mercury

Mercury Research

- http://ncdenr.gov/web/wq/ps/mtu/tmdl/tmdls/mercury

North Carolina 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	1580
Industrial Processes - Chemical Manufacturing	302
Waste Disposal	170
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	148
Industrial Processes - Non-ferrous Metals	139
Miscellaneous Non-Industrial - Not Elsewhere Classified	117
Industrial Processes - Ferrous Metals	61
Fuel Combustion - Residential - Oil	56
Industrial Processes - Not Elsewhere Classified	34
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	29
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	24
Mobile - On-Road Gasoline Light Duty Vehicles	24
Mobile - Locomotives	20

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

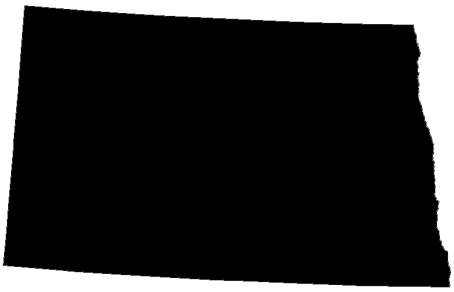
Emissions Inventory

North Carolina's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from air emission sources

North Dakota's Mercury Actions

North Dakota Department of Health
http://www.ndhealth.gov/
Contact: Mike Ell
Phone: 701.328.5214 Email: mell@nd.gov



Monitoring

- Fish tissue
- Landfill

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Waste management requirements

Dental Program

- Voluntary program to address mercury
- Allow settling tanks in place of separators

Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Mercury Research

- http://pubs.usgs.gov/sir/2007/5219/

North Dakota 2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Electric Generation - Coal	3024
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	49
Mobile - Locomotives	29
Miscellaneous Non-Industrial - Not Elsewhere Classified	14

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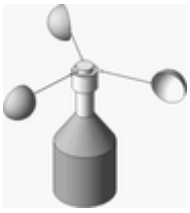
Ohio's Mercury Actions

Ohio Environmental Protection Agency
http://epa.ohio.gov/ocapp/p2/mercury_pbt/mercury.aspx
Contact: Bill Narotski
Phone: 614.728.1264 Email: bill.narotski@epa.state.oh.us

Monitoring

- Air emissions from stacks
- Atmospheric deposition (other than NADP participation)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue



Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Areas of Coordination with the Medical Community

- Pollution prevention
- Dental issues
- Waste management requirements

Fish Consumption Advisories

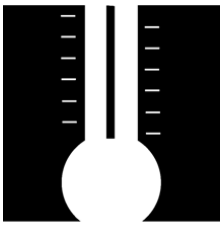
- Statewide freshwater advisories
- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators
- Local government more stringent than state

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Measuring devices
  - Novelty items/toys
  - Switches and relays
  - Other
- Exemption process



Ohio 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	3218
Industrial Processes - Ferrous Metals	836
Industrial Processes - Not Elsewhere Classified	291
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	198
Miscellaneous Non-Industrial - Not Elsewhere Classified	190
Waste Disposal	187
Fuel Combustion - Electric Generation - Natural Gas	89
Mobile - Locomotives	69
Industrial Processes - Chemical Manufacturing	68
Fuel Combustion - Commercial/Institutional - Oil	55
Industrial Processes - Pulp & Paper	48
Industrial Processes - Storage and Transfer	47
Fuel Combustion - Residential - Oil	45
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	44
Industrial Processes - Cement Manufacturing	41

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Oklahoma's Mercury Actions

Oklahoma Department of Environmental Quality
http://www.deq.state.ok.us/
Contact: Jay Wright
Phone: 405.702.1017 Email: jay.wright@deq.ok.gov

Monitoring

- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Water column
- Fish tissue

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Oklahoma 2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Electric Generation - Coal	1211
Industrial Processes - Ferrous Metals	128
Industrial Processes - Chemical Manufacturing	96
Industrial Processes - Petroleum Refineries	90
Miscellaneous Non-Industrial - Not Elsewhere Classified	52
Industrial Processes - Cement Manufacturing	36
Mobile - Locomotives	36
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	13
Mobile - On-Road Gasoline Light Duty Vehicles	11
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	11

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

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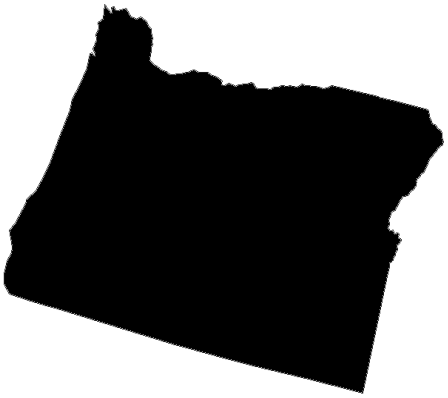
Oregon's Mercury Actions



Oregon Department of Environmental Quality
http://www.deq.state.or.us/lq/mercury.htm
Contact: Kevin Masterson
Phone: 503.229.5615 Email: masterson.kevin@deq.state.or.us

U.S. EPA Approved TMDLs

- Yes, watershed or basin
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition
  - Legacy sources
  - Wastewater treatment plant discharges
  - Active mining

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Water column
- Waterbody sediment
- Fish tissue

Fish Consumption Advisories

- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues

Other information:
The Oregon DEQ collaborate with the Oregon Health Authority on fish consumption advisories and with the Oregon Dental Association on dental amalgam issues

Dental Program

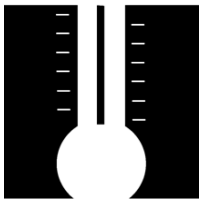
- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs

Oregon 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Industrial Processes - Cement Manufacturing	1508
Fuel Combustion - Electric Generation - Coal	133
Miscellaneous Non-Industrial - Not Elsewhere Classified	53
Industrial Processes - Ferrous Metals	48
Fuel Combustion - Electric Generation - Natural Gas	30
Mobile - Locomotives	20
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	17
Fuel Combustion - Residential - Oil	12
Waste Disposal	11

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Mercury Containing Products

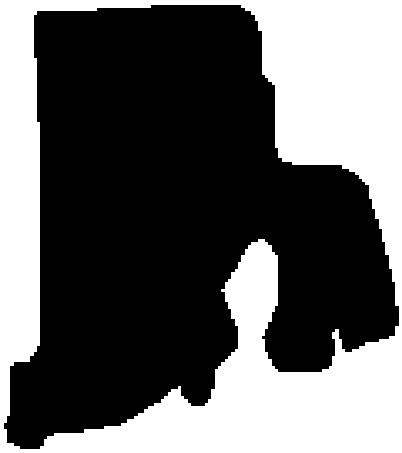
- Sales ban, use ban or phase out:
  - Novelty items/toys
  - Thermometers



Mercury Research

- http://www.deq.state.or.us/lab/wqm/wbmercurystudy.htm

Rhode Island's Mercury Actions



Rhode Island Department of Environmental Management
www.dem.ri.gov/topics/mercury.htm
Contact: Beverly Migliore
Phone: 401.222.4700 x7503 Email: beverly.migliore@dem.ri.gov

U.S. EPA Approved TMDLs

- Yes, multistate
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Wastewater effluent
- Wildlife

Fish Consumption Advisories

- Statewide freshwater advisories
- Statewide coastal advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs

Rhode Island 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Waste Disposal	78
Fuel Combustion - Residential - Oil	51
Miscellaneous Non-Industrial - Not Elsewhere Classified	13

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Mercury Containing Products

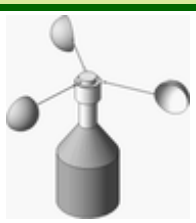
- Labeling requirements
- Limits on mercury content in products
- Sales ban, use ban or phase out:
  - Cosmetics
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other
- Exemption process

South Carolina's Mercury Actions

South Carolina Department of Health and Environmental Control
http://www.scdhec.gov/environment/admin/Mercury/htm/index.htm
Contact: Michelle Wilson
Phone: 803.896.8955 Email: wilsonmd@dhec.sc.gov

Monitoring

- Ambient air
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife



Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues

Fish Consumption Advisories

- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury
- Allow settling tanks in place of separators

Mercury Research

- The South Carolina Department of Health and Environmental Control (DHEC) recently completed a blood mercury study for some clients of two health districts. DHEC is also conducting a small pond fish study.

South Carolina 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Industrial Processes - Ferrous Metals	963
Fuel Combustion - Electric Generation - Coal	631
Industrial Processes - Cement Manufacturing	237
Waste Disposal	82
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	73
Miscellaneous Non-Industrial - Not Elsewhere Classified	56
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	42
Industrial Processes - Pulp & Paper	33
Industrial Processes - Not Elsewhere Classified	17
Fuel Combustion - Electric Generation - Biomass	16
Mobile - Locomotives	16
Mobile - On-Road Gasoline Light Duty Vehicles	11
Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.	

Emissions Inventory

South Carolina's mercury emissions inventory :

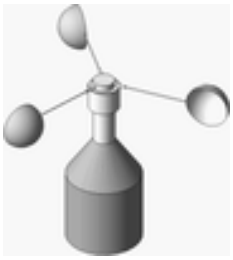
- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from air emission sources

Texas' Mercury Actions

Texas Commission on Environmental Quality
http://www.tceq.state.tx.us/
Contact: Minor Hibbs
Phone: 512.239.6590 Email: Minor.Hibbs@tceq,texas.gov

Monitoring

- Air emissions from stacks
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife
- Landfill



Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Dental Program

- No program to address dental mercury
- Allow settling tanks in place of separators
- Local government more stringent than state

Fish Consumption Advisories

- Statewide coastal advisories
- Waterbody-specific advisories

Mercury Research

- http://www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/085.pdf

Emissions Inventory

Texas' mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Texas 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	7226
Industrial Processes - Non-ferrous Metals	2294
Industrial Processes - Ferrous Metals	1172
Waste Disposal	499
Industrial Processes - Cement Manufacturing	345
Industrial Processes - Petroleum Refineries	271
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Other	200
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	192
Miscellaneous Non-Industrial - Not Elsewhere Classified	191
Industrial Processes - Not Elsewhere Classified	149
Industrial Processes - Chemical Manufacturing	101
Fuel Combustion - Electric Generation - Natural Gas	80
Mobile - On-Road Gasoline Light Duty Vehicles	58
Fuel Combustion - Commercial/Institutional - Other	18
Industrial Processes - Pulp & Paper	17
Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.	

Utah's Mercury Actions

Utah Department of Environmental Quality
www.mercury.utah.gov
Contact: Renette Anderson
Phone: 801.536.4478 Email: renetteanderson@utah.gov

U.S. EPA Approved TMDLs

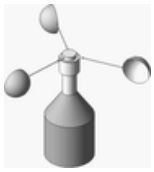
- Plans to develop a waterbody-specific TMDL
- A multimedia approach will be used when developing the TMDL.
- Addresses the following sources:
  - Atmospheric deposition
  - Active mining

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy under development

Monitoring

- Ambient air
- Indoor air (for the purposes of evaluating spill cleanup)
- Waterbody sediment
- Fish tissue
- Wildlife
- Landfill



Fish Consumption Advisories

- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Cultural/ritualistic uses
- Waste management requirements

Dental Program

- No program to address dental mercury
- Allow settling tanks in place of separators

Utah 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	404
Industrial Processes - Ferrous Metals	313
Industrial Processes - Cement Manufacturing	213
Waste Disposal	57
Miscellaneous Non-Industrial - Not Elsewhere Classified	33
Industrial Processes - Petroleum Refineries	21
Mobile - Locomotives	16
Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions.	

Mercury Research

- www.deq.utah.gov/issues/mercury/upcoming-meetings.htm

Vermont's Mercury Actions

Vermont Department of Environmental Conservation
http://www.mercvt.org
Contact: Gary Gulka
Phone: 802.241.3626 Email: gary.gulka@state.vt.us

U.S. EPA Approved TMDLs

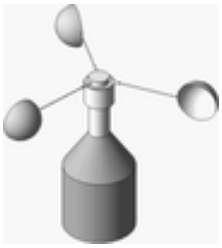
- Yes, multistate
- A multimedia approach was used when developing the TMDLs.
- Addresses the following sources:
  - Atmospheric deposition
  - Wastewater treatment plant discharges

Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Monitoring

- Ambient air
- Atmospheric deposition (other than NADP participation)
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Wildlife
- Landfill



Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Waste management requirements

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs

Vermont
2008 National Emissions Inventory – Top Source Categories

Emission Source	Pounds
Fuel Combustion - Residential - Oil	44
Miscellaneous Non-Industrial - Not Elsewhere Classified	17

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

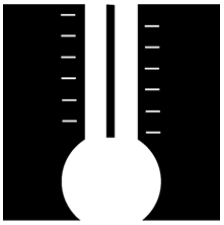
Emissions Inventory

Vermont's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from air emission sources

Mercury Containing Products

- Labeling requirements
- Sales ban, use ban or phase out:
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other
- Exemption process



Mercury Research

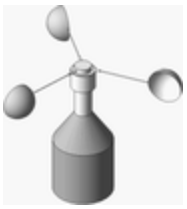
- http://www.vtwaterquality.org//wqd_mgtplan/stressor_toxics.htm

Washington's Mercury Actions

Washington Department of Ecology
http://www.ecy.wa.gov/mercury/
Contact: Maria Victoria Peeler
Phone: 360.407.6704 Email: peel461@ecy.wa.gov

Monitoring

- Air emissions from stacks
- Wastewater effluent
- Wastewater sludge
- Water column
- Waterbody sediment
- Fish tissue
- Landfill



Status of Mercury Reduction Plans

- Mercury reduction plan or strategy in place

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Pollution prevention
- Dental issues
- Cultural/ritualistic uses
- Waste management requirements
- Education and Outreach

Fish Consumption Advisories

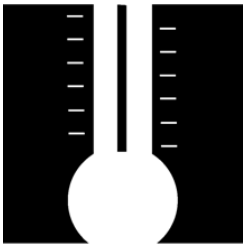
- Statewide freshwater advisories
- Statewide coastal advisories

Dental Program

- Mandatory program to address dental mercury
- Require amalgam separators
- Require BMPs
- Local government more stringent than state

Mercury Containing Products

- Labeling requirements
- Sales ban, use ban or phase out:
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other



Washington 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	313
Industrial Processes - Cement Manufacturing	102
Miscellaneous Non-Industrial - Not Elsewhere Classified	87
Industrial Processes - Ferrous Metals	69
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	39
Mobile - Locomotives	32
Industrial Processes - Pulp & Paper	27
Fuel Combustion - Residential - Oil	22
Mobile - On-Road Gasoline Light Duty Vehicles	13
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Other	11
Waste Disposal	10
Industrial Processes - Petroleum Refineries	10

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Mercury Research

- http://www.ecy.wa.gov/science/index.html

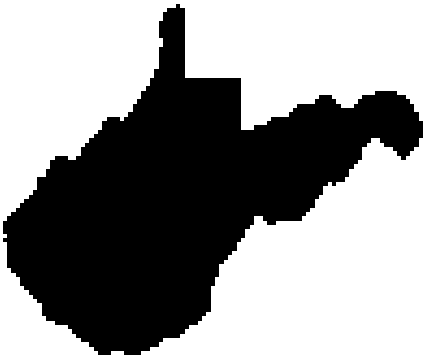
Emissions Inventory

Washington's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- Estimates for the amount of mercury released to the environment from air emission sources

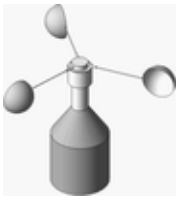
West Virginia's Mercury Actions

West Virginia Department of Environmental Protection
http://www.dep.wv.gov/Pages/default.aspx
Contact: Patrick Campbell
Phone: 304.926.0499 x1046 Email: patrick.v.campbell@wv.gov



Monitoring

- Air emissions from stacks
- Indoor air (for the purposes of evaluating spill cleanup)
- Wastewater effluent
- Wastewater sludge
- Water column
- Fish tissue
- Landfill



Status of Mercury Reduction Plans

- No mercury reduction plan or strategy exists or is planned

Areas of Coordination with the Medical Community

- Fish consumption advisories

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Dental Program

- Voluntary program to address dental mercury

Emissions Inventory

West Virginia's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from air emission sources

West Virginia 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	1871
Industrial Processes - Chemical Manufacturing	161
Industrial Processes - Cement Manufacturing	134
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	104
Industrial Processes - Ferrous Metals	49
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Other	35
Miscellaneous Non-Industrial - Not Elsewhere Classified	29
Industrial Processes - Petroleum Refineries	28
Waste Disposal	26
Mobile - Locomotives	21
Fuel Combustion - Residential - Oil	10

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Wisconsin's Mercury Actions

Wisconsin Department of Natural Resources
http://dnr.wi.gov/
Contact: Martin Burkholder
Phone: 608.264.8855 Email: martin.burkholder@wisconsin.gov

Status of Mercury Reduction Plans

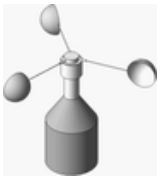
- No mercury reduction plan or strategy exists or is planned.
- Wisconsin continues to devote staff resources to address mercury although it no longer has an active mercury team as identified in the 2005 Mercury Compendium. The state is not formally implementing the mercury action plan that was developed by the mercury team although state statutes, regulations, and policies related to the action plan continue to exist.

Fish Consumption Advisories

- Statewide freshwater advisories
- Waterbody-specific advisories

Monitoring

- Air emissions from stacks
- Ambient air
- Atmospheric deposition (other than NADP participation)
- Wastewater effluent
- Waterbody sediment
- Fish tissue
- Wildlife
- Landfill



Dental Program

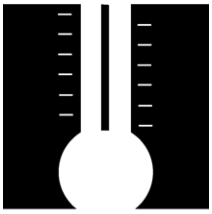
- Voluntary program to address mercury
- Allow settling tanks in place of separators
- Local government more restrictive

Areas of Coordination with the Medical Community

- Fish consumption advisories
- Dental issues
- Waste management requirements

Mercury Containing Products

- Sales ban, use ban or phase out:
  - Cosmetics
  - Measuring devices
  - Medical devices
  - Novelty items/toys
  - Switches and relays
  - Thermometers
  - Thermostats
  - Other
- Exemption process



- Wisconsin Act 44 established a ban on the sale of certain mercury containing devices beginning in November 1, 2010.

- The mercury containing devices include fever thermometers unless prescribed by a practitioner, manometers of the type used in milking machines on dairy farms, thermostats, instruments or measuring devices (unless required under federal law or the only mercury-added component is a button cell battery).

- The measuring devices include: barometer, esophageal dilator, flowmeter, hydrometer, hygrometer/psychrometer, other manometers, pyrometer, sphygmomameter, mercury switches and relays, household items, unless the only component is a button cell battery, such as toys or games, jewelry, clothing or shoes, over-the-counter pharmaceuticals for human use, cosmetics, toiletries, and fragrance products.

Mercury Research

- http://dnr.wi.gov/air/aq/monitor/specialstudies.htm

- The Wisconsin Department of Natural Resources monitored ambient air quality at a chlor-alkali facility in Port Edwards, Wisconsin from December 1, 2008, through March 31, 2011, to determine if concentrations of mercury would exceed state standards of one ug/m3 averaged over a 30-day period (NR446) while the facility converted from mercury cell technology to membrane cell technology. The monitoring began about 6 months prior to the start of the conversion project and ended about 11 months after the conversion was complete. The results showed that at no time during monitoring, and consequently, no time during the conversion process, was the daily average ambient mercury concentration greater than the NR446 standard level. In addition, while monitoring detected some elevated values, monthly average concentrations approached the global background concentration for mercury observed at rural and remote sites.

Wisconsin's Mercury Actions: continued

Wisconsin 2008 National Emissions Inventory – Top Source Categories	
Emission Source	**Pounds**
Fuel Combustion - Electric Generation - Coal	1431
Industrial Processes - Chemical Manufacturing	1080
Miscellaneous Non-Industrial - Not Elsewhere Classified	226
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	136
Industrial Processes - Ferrous Metals	95
Waste Disposal	57
Fuel Combustion - Residential - Oil	41
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	28
Industrial Processes - Not Elsewhere Classified	23
Mobile - Locomotives	23
Fuel Combustion - Electric Generation - Biomass	23
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	20
Fuel Combustion - Commercial/Institutional - Oil	19
Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	17
Mobile - On-Road Gasoline Light Duty Vehicles	13

Please note that the NEI database is the federal database developed by U.S. EPA and may differ from each state's specific mercury emission inventory due to a variety of factors including, but not limited to differences in: emission factors applied; availability of stack test data; and/or methods used in the state versus U.S. EPA to estimate area sources including product-related emissions. Additionally, state data in a study done by NESCAUM for the State of New York suggests that emission values for oil combustion, in particular residential fuel combustion (for heating), may be considerably overestimated. (see *Determination of Sulfur and Toxic Metals Content of Distillates and Residual Oil in the State of New York* at http://www.nescaum.org/topics/mercury)

Emissions Inventory

Wisconsin's mercury emissions inventory :

- Estimates for the amount of mercury released to the environment from water pollution sources
- Estimates for the amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- Estimates for the amount of mercury released to the environment from air emission sources (coal-fired EGUs)

Additional Information: State Web Pages

State	Webpages With Additional Information
Alabama	**Research Webpage:** http://www.adem.state.al.us/programs/water/waterforms/SurfaceWaterMonitoring.pdf
Alaska	**Main Mercury Webpage:** http://www.akcontaminants.org/ **Research Webpage:** http://www.dec.alaska.gov/eh/vet/fish.htm
Arizona	**Na**
Arkansas	**Na**
California	**Research Webpage:** http://www.oehha.ca.gov http://www.swrcb.ca.gov (search for "mercury") **Regional or Multistate or Binational Initiative Webpage:** http://www.newmoa.org/prevention/mercury/imerc.cfm **Mercury Emissions Webpage:** http://www.arb.ca.gov/homepage.htm http://www.swrcb.ca.gov/ssi/serp.shtml?q=mercury&cx=001779225245372747843%3Attksqsdjfn4&cof=FORID%3A10&ie=UTF-8&submit.x=17&submit.y=8#910
Colorado	**Main Mercury Webpage:** http://www.cdphe.state.co.us/hm/mercury/index.htm **Research Webpage:** http://www.cdphe.state.co.us/wq/FishCon/index.html **Published Mercury Release Information for Instate Sources Since 2000:** http://www.epa.gov/compliance/data/systems/icis/ **Mercury Emissions Webpages:** http://www.epa.gov/tri/tridata/preliminarydataset/basic/index.html
Connecticut	**Main Mercury Webpage:** http://www.ct.gov/dep/cwp/view.asp?a=2690&Q=322430&depNav_GID=1651 **Regional or Multistate or Binational Initiative Webpages:** http://www.epa.gov/region1/eco/mercury/pdfs/Mercury_Action_Plan.pdf http://www.negc.org/main/ http://www.newmoa.org/prevention/mercury/imerc.cfm http://www.neiwpcc.org/mercury/index.asp **Published Mercury Release Information for Instate Sources Since 2000:** http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322188&DepNav_GID=1619
Delaware	**Na**
Florida	**Main Mercury Webpages:** http://www.dep.state.fl.us/waste/categories/mercury/ http://www.dep.state.fl.us/water/tmdl/merctmdl.htm **Research Webpage:** http://www.dep.state.fl.us/water/sas/mercury/index.htm **Mercury Emissions Webpage:** http://www.dep.state.fl.us/waste/ash/wte.htm

Additional Information: State Web Pages

State	Webpages With Additional Information
Hawaii	**Regional or Multistate or Binational Initiative Webpages:** http://www.productstewardship.us/ http://www.wsppn.org/
Idaho	**Main Mercury Webpages:** http://www.deq.idaho.gov/waste-mgmt-remediation/hazardous-waste/mercury.aspx **Research Webpage:** http://www.deq.idaho.gov/water-quality/surface-water/mercury.aspx **Mercury Emissions Webpage:** http://iaspub.epa.gov/triexplorer/tri_release.chemical
Illinois	**Main Mercury Webpage:** http://www.epa.state.il.us/mercury/ **Regional or Multistate or Binational Initiative Webpage:** http://www.epa.gov/bns/ http://www.glc.org/glad/ [Subject to change due to changes in U.S. EPA Region V funding of GLAD effective late 2012.] http://www.glrc.us/ http://www.newmoa.org/prevention/mercury/imerc.cfm **Published Mercury Release Information for Instate Sources Since 2000:** http://www.epa.gov/compliance/data/systems/icis/
Indiana	**Main Mercury Webpage:** http://www.in.gov/idem **Regional or Multistate or Binational Initiative Webpage:** http://www.epa.gov/bns/ http://www.glc.org/glad/ [Subject to change due to changes in U.S. EPA Region V funding of GLAD effective late 2012.] http://www.glrc.us/
Iowa	**Mercury Emissions Webpage:** http://www.epa.gov/airdata/
Kansas	**Main Mercury Webpage:** http://www.kdheks.gov/mercury/index.html **Published Mercury Release Information for Instate Sources Since 2000:** http://www.kansastag.gov/kdem_default.asp
Kentucky	**Regional or Multistate or Binational Initiative Webpage:** NVMSRP: http://www.epa.gov/mercury/switch.htm
Louisiana	**Main Mercury Webpages:** http://www.deq.louisiana.gov/portal/ http://www.deq.louisiana.gov/portal/Default.aspx?tabid=287 **Research Webpage:** http://www.deq.louisiana.gov/portal/Default.aspx?tabid=28 **Regional or Multistate or Binational Initiative Webpage:** http://www.gulfofmexicoalliance.org/index.php http://www.newmoa.org/prevention/mercury/imerc.cfm

Additional Information: State Web Pages

State	Webpages With Additional Information
Louisiana (Continued)	**Mercury Emissions Webpages:** http://www.deq.louisiana.gov/portal/Portals/0/surveillance/mercury/MercuryReport_ECopy.pdf
Maine	**Regional or Multistate or Binational Initiative Webpage:** http://www.epa.gov/region1/eco/mercury/pdfs/Mercury_Action_Plan.pdf http://www.negc.org/main/ http://www.newmoa.org/prevention/mercury/imerc.cfm http://www.neiwpcc.org/mercury/index.asp
Maryland	**Main Mercury Webpages:** http://www.mde.state.md.us/programs/land/Pages/Programs/landPrograms/index.aspx http://www.mde.state.md.us/programs/land/recyclingandoperationsprogram/mercury/pages/programs/landprograms/recycling/mercury/index.aspx **Research Webpages:** http://www.mde.state.md.us/assets/document/Mercury%20Report%202002.pdf http://www.mde.state.md.us/assets/document/Mercury%20Report%202004%20-%20FINAL.pdf http://www.mde.maryland.gov/programs/water/tmdl/approvedfinaltmdls/pages/programs/waterprograms/tmdl/approvedfinaltmdl/index.aspx **Regional or Multistate or Binational Initiative Webpages:** http://www.epa.gov/hg/switch.htm http://www.ecos.org/section/committees/cross_media/quick_silver
Massachusetts	**Main Mercury Webpage:** http://www.mass.gov/dep/toxics/stypes/hgres.htm **Research Webpage:** http://www.mass.gov/dep/toxics/stypes/hgres.htm#monitoring **Regional or Multistate or Binational Initiative Webpages:** http://www.newmoa.org/prevention/mercury/imerc.cfm http://www.epa.gov/region1/eco/mercury/pdfs/Mercury_Action_Plan.pdf http://negc.org/main/?do=page&id=40 http://www.neiwpcc.org/mercury/index.asp **Mercury Emissions Webpages:** http://www.mass.gov/dep/toxics/stypes/hgexsum.htm http://www.nescaum.org/documents/inventory-of-anthropogenic-mercury-emissions-in-the-northeast/ http://www.nescaum.org/ http://www.nescaum.org/documents/select-trace-elemental-composition-of-fuel-oil-used-in-the-northeastern-us/
Michigan	**Main Mercury Webpages:** http://www.michigan.gov/deq http://www.michigan.gov/mercury

Additional Information: State Web Pages

State	Webpages With Additional Information
Michigan (Continued)	**Regional or Multistate or Binational Initiative Webpage:** http://www.glc.org/glad/ [Subject to change due to changes in U.S. EPA Region V funding of GLAD effective late 2012.] http://www.glrc.us/ http://www.epa.gov/bns/ http://www.newmoa.org/prevention/mercury/imerc.cfm **Published Mercury Release Information for Instate Sources Since 2000:** http://www.michigan.gov/deq/ **Mercury Emissions Webpage:** http://www.michigan.gov/deqair
Minnesota	**Main Mercury Webpage:** http://www.pca.state.mn.us/index.php/topics/mercury/mercury.html **Research Webpage:** http://www.briloon.org/mercuryconnections/greatlakes **Regional or Multistate or Binational Initiative Webpage:** http://www.ecos.org/section/committees/cross_media/quick_silver http://www.epa.gov/bns/ http://www.glc.org/glad/ May change in late 2012 http://www.glrc.us/ http://www.newmoa.org/prevention/mercury/imerc.cfm **Mercury Emissions Webpage:** http://www.pca.state.mn.us/index.php/view-document.html?gid=11481
Missouri	**Main Mercury Webpages:** http://www.dnr.mo.gov/ http://www.dnr.mo.gov/env/mercury.htm
Montana	**Main Mercury Webpage:** http://fwp.mt.gov/?id=28187 **Research Webpage:** http://www.fwp.mt.gov/fwpDoc.jsp?id=28187
Nebraska	**Main Mercury Webpage:** http://dhhs.ne.gov/publichealth/Pages/mercury_index.aspx **Research Webpage:** http://www.deq.state.ne.us/publica.nsf/pages/WAS057 **Regional or Multistate or Binational Initiative Webpages:** http://www.productstewardship.us/ http://www.nebraskapoison.com/
New Hampshire	**Main Mercury Webpage:** http://des.nh.gov/organization/commissioner/p2au/pps/ms/mrpptp/index.htm **Regional or Multistate or Binational Initiative Webpage:** http://www.epa.gov/region1/eco/mercury/pdfs/Mercury_Action_Plan.pdf http://negc.org/main/?do=page&id=40 http://www.newmoa.org/prevention/mercury/imerc.cfm http://www.neiwpcc.org/mercury/index.asp

Additional Information: State Web Pages

State	Webpages With Additional Information
New Jersey	**Main Mercury Webpage:** http://www.state.nj.us/dep/dsr/mercury/ **Research Webpage:** http://www.state.nj.us/dep/dsr/mercury/ **Regional or Multistate or Binational Initiative Webpages:** http://www.neiwpcc.org/ http://newmoa.org/prevention/mercury/imerc.cfm http://nadp.sws.uiuc.edu/ **Published Mercury Release Information for Instate Sources Since 2000:** http://www.nj.gov/dep/dsr/trends/pdfs/mercury.pdf **Mercury Emissions Webpage:** http://www.state.nj.us/dep/dsr/trends/
New Mexico	**Na**
New York	**Main Mercury Webpage:** http://www.dec.ny.gov/chemical/285.html **Research Webpage:** http://www.dec.ny.gov/chemical/285.html **Regional or Multistate or Binational Initiative Webpage:** http://www.epa.gov/bns/ http://www.glc.org/glad/ [Subject to change due to changes in U.S. EPA Region V funding of GLAD effective late 2012.] http://www.glrc.us/ http://www.newmoa.org/prevention/mercury/imerc.cfm **Published Mercury Release Information for Instate Sources Since 2000:** http://www.briloon.org/mercuryconnections/greatlakes **Mercury Emissions Webpage:** http://www.dec.ny.gov/chemical/8519.html
North Carolina	**Main Mercury Webpages:** http://ncdenr.gov/web/wq/ps/mtu/tmdl/tmdls/ http://ncdenr.gov/web/wq/ps/mtu/tmdl/tmdls/mercury http://daq.state.nc.us/quick/mercury/ http://daq.state.nc.us/news/leg/hg/ http://daq.state.nc.us/news/pr/2012/mercury_07132012.shtml http://portal.ncdenr.org/web/wm/hw/programs/mecuryswitch **Research Webpage:** http://ncdenr.gov/web/wq/ps/mtu/tmdl/tmdls/mercury **Regional or Multistate or Binational Initiative Webpage:** http://www.newmoa.org/prevention/mercury/imerc.cfm **Mercury Emissions Webpage:** http://daq.state.nc.us/news/leg/hg/
North Dakota	**Research Webpage:** http://pubs.usgs.gov/sir/2007/5219/

Additional Information: State Web Pages

State	Webpages With Additional Information
Ohio	**Main Mercury Webpage:** http://epa.ohio.gov/ocapp/p2/mercury_pbt/mercury.aspx **Regional or Multistate or Binational Initiative Webpage:** http://www.epa.gov/bns/ http://www.glc.org/glad/ [Subject to change due to changes in U.S. EPA Region V funding of GLAD effective late 2012.] http://glrc.us/documents/MercuryPhaseDownStrategy06-19-2008.pdf
Oklahoma	**Published Mercury Release Information for Instate Sources Since 2000:** http://www.deq.state.ok.us/pubs/CSD/TRI06.pdf
Oregon	**Main Mercury Webpage:** http://www.deq.state.or.us/lq/mercury.htm **Regional or Multistate or Binational Initiative Webpage:** http://yosemite.epa.gov/R10/HOMEPAGE.NSF/abedd4842d006a6e88256f5f00697f3e/f60e8f81c53471ed88256eef00747a17/$FILE/R10MercuryStrategy2008.pdf
Rhode Island	**Main Mercury Webpage:** http://www.dem.ri.gov/topics/mercury.htm **Regional or Multistate or Binational Initiative Webpages:** http://www.epa.gov/region1/eco/mercury/pdfs/Mercury_Action_Plan.pdf http://www.negc.org/main/ http://www.newmoa.org/prevention/mercury/imerc.cfm http://www.neiwpcc.org/mercury/index.asp
South Carolina	**Main Mercury Webpage:** http://www.scdhec.gov/environment/admin/Mercury/htm/index.htm **Regional or Multistate or Binational Initiative Webpage:** http://www.ecos.org/section/committees/cross_media/quick_silver **Published Mercury Release Information for Instate Sources Since 2000:** http://www.scdhec.gov/environment/admin/Mercury/htm/initiative.htm **Mercury Emissions Webpage:** http://www.scdhec.gov/environment/admin/Mercury/htm/initiative.htm
Texas	**Research Webpage:** http://www.tceq.texas.gov/assets/public/comm_exec/pubs/sfr/085.pdf **Regional or Multistate or Binational Initiative Webpage:** http://gulfofmexicoalliance.org/issues/water_quality.php
Utah	**Main Mercury Webpages:** http://www.mercury.utah.gov/ http://www.deq.utah.gov/Business_Assistance/Hospitals/index.htm **Research Webpage:** www.deq.utah.gov/issues/mercury/upcoming-meetings.htm **Regional or Multistate or Binational Initiative Webpage:** http://www.ecos.org/section/committees/cross_media/quick_silver **Mercury Emissions Webpage:** http://www.airquality.utah.gov/Planning/Emission-Inventory/2008_State/2008_Statewide_HAPs_FormB.pdf

Additional Information: State Web Pages

State	Webpages With Additional Information
Vermont	**Main Mercury Webpage:** http://www.mercvt.org/ **Research Webpage:** http://www.vtwaterquality.org//wqd_mgtplan/stressor_toxics.htm **Regional or Multistate or Binational Initiative Webpages:** http://www.epa.gov/region1/eco/mercury/pdfs/Mercury_Action_Plan.pdf http://www.negc.org/main/ http://www.newmoa.org/prevention/mercury/imerc.cfm http://www.neiwpcc.org/mercury/index.asp
Washington	**Main Mercury Webpages:** http://www.ecy.wa.gov/mercury/ http://www.doh.wa.gov/CommunityandEnvironment/Contaminants/Mercury.aspx **Research Webpage:** http://www.ecy.wa.gov/science/index.html **Regional or Multistate or Binational Initiative Webpage:** http://www.newmoa.org/prevention/mercury/imerc.cfm **Published Mercury Release Information for Instate Sources Since 2000:** http://www.ecy.wa.gov/science/index.html http://www.manta.com/mb_45_E5138000_48/blast_furnaces_and_steel_mills/washington **Mercury Emissions Webpage:** http://www.ecy.wa.gov/mercury/mercury_measures.html
West Virginia	**Na**
Wisconsin	**Main Mercury Webpages:** http://dnr.wi.gov/topic/Mercury/ (Available in December 2012) **Research and Monitoring Webpage:** http://dnr.wi.gov/topic/AirQuality/Monitor.html#tabx3 **Regional or Multistate or Binational Initiative Webpages** http://www.epa.gov/bns/ http://www.glrc.us/ http://www.glc.org/glad/ [Subject to change due to changes in U.S. EPA Region V funding of GLAD effective late 2012.] **State Utility Rule Webpage:** http://dnr.wi.gov/topic/AirQuality/Toxics.html

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Appendices

This section of the compendium includes the Appendices referenced in Part I — National Overview. They are:

Appendix S-A: Air Emission Sources Identified By States in 2011 Survey
Appendix S-B: NEI Sector Emissions
Appendix S-C: NEI State Table
Appendix S-D: TRI Data Summary for Mercury and Mercury Compounds
Appendix R & M-A: Mercury Research Activities by State
Appendix R &M-B: Mercury Fish Advisories
Appendix P-A: Reduction of Mercury Use in Products
Appendix SD: Survey Documents

* 2011 Compendium Survey Letter
* 2011 Survey Supplemental Instructions
* 2011 Survey Questionnaire
* Summary Results: 2011 Survey

Appendix: S-A

Air Emission Sources Identified By States in 2011 Survey (Number of States)			
Source Category	Source present in state	More stringent statewide requirements for this source than U.S. EPA	Statewide requirements for monitoring/ measuring releases
Coal-fired electric power plants	35	15	17
Electric arc furnaces	25	5	3
Industrial/commercial boilers	39	6	6
Biomass boilers	33	5	5
Commercial sources (manufacturing/industrial)	34	6	6
Dismantlers, shredders	32	7	4
Foundries	27	5	4
Integrated steel facilities	13	2	3
Sewage sludge incinerators	21	7	9
Chloralkali plants	5	1	1
Hazardous waste incinerators	17	2	4
Municipal solid waste incinerators/Combustors	25	9	11
Medical waste incinerators	20	7	10
Gold mining	9	2	3
Other mining	27	3	4
Crematoria	38	4	4
Oil refining	21	2	2
Primary aluminum production	9	4	2
Secondary aluminum production	22	3	2
Cement kilns	26	4	7
Home heating	34	1	1
Mobile sources	33	2	1
Wastewater treatment plant sludge	38	5	17
Wastewater treatment plant effluent	37	5	21
Broken mercury-containing products/spills	38	3	8

NEI Sector Emissions

	NEI Sector Data was generated using the sector summaries tool at http://www.epa.gov/ttn/chief/net/2008inventory.html, accessed on May 4, 2012. Note that NEI Sectors are based solely on Source Classification Code (SCC) and do not match the Hg sectors presented in Figure 1 and Table 1 in the Sources Section of this report, which focus on regulatory categories and categories of interest to the international community. See Section 2.6 of the 2008 National Emissions Inventory Technical Support Document (http://www.epa.gov/ttn/chief/net/2008neiv2/2008_neiv2_tsd_draft.pdf,) for more information on how these sectors developed for Hg emissions.	**EMISSIONS (pounds/year)**
1	Fuel Combustion - Electric Generation - Coal	58,493
2	Industrial Processes - Ferrous Metals	11,105
3	Industrial Processes - Cement Manufacturing	9,658
4	Industrial Processes - Non-ferrous Metals	6,658
5	Waste Disposal	4,278
6	Industrial Processes - Chemical Manufacturing (includes chloralkalai)	4,201
7	Miscellaneous Non-Industrial Not elsewhere classified	3,659
8	Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Coal	3,528
9	Industrial Processes – Not elsewhere classified	2,666
10	Fuel Combustion - Residential - Oil	2,368
11	Fuel Combustion - Electric Generation - Other (some MSWC included)	2,118
12	Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Natural Gas	1,519
13	Mobile - Locomotives	1,485
14	Industrial Processes - Petroleum Refineries	1,407
15	Industrial Processes - Storage and Transfer	1,085
16	Fuel Combustion - Electric Generation - Natural Gas	970
17	Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Biomass	726
18	Mobile - On-Road Diesel Heavy Duty Vehicles	706
19	Mobile - On-Road Gasoline Light Duty Vehicles	611
20	Industrial Processes - Pulp & Paper	601
21	Mobile - Non-Road Equipment - Diesel	569

Appendix: S-B

NEI Sector Emissions		
NEI Sector Data were generated using the sector summaries tool at http://www.epa.gov/ttn/chief/net/2008inventory.html, accessed on May 4, 2012. Note that NEI Sectors are based solely on Source Classification Code (SCC) and do not match the Hg sectors presented in Figure 1 and Table 1 in the Sources Section of this report, which focus on regulatory categories and categories of interest to the international community. See Section 2.6 of the 2008 National Emissions Inventory Technical Support Document (http://www.epa.gov/ttn/chief/net/2008neiv2/2008_neiv2_tsd_draft.pdf,) for more information on how these sectors were developed for Hg emissions.		**EMISSIONS (pounds/year)**
22	Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Oil	550
23	Fuel Combustion - Industrial Boilers, Internal Combustion Engines - Other	499
24	Fuel Combustion - Commercial/Institutional - Oil	392
25	Fuel Combustion - Commercial/Institutional - Coal	328
26	Fuel Combustion - Electric Generation - Biomass	212
27	Fuel Combustion - Electric Generation - Oil	190
28	Industrial Processes - Oil & Gas Production	141
29	Fuel Combustion - Residential - Wood	122
30	Fuel Combustion - Residential - Natural Gas	117
31	Fuel Combustion - Commercial/Institutional - Natural Gas	105
32	Fires - Agricultural Field Burning	94
33	Mobile - Non-Road Equipment - Gasoline	72
34	Fuel Combustion - Commercial/Institutional - Biomass	63
35	Industrial Processes - Mining	40
36	Mobile - Commercial Marine Vessels	31
37	Fuel Combustion - Residential - Other	27
38	Fuel Combustion - Commercial/Institutional - Other	23
39	Solvent - Consumer & Commercial Solvent Use	23
40	Mobile - On-Road Gasoline Heavy Duty Vehicles	22
41	Mobile - On-Road Diesel Light Duty Vehicles	10
42	Bulk Gasoline Terminals	8
43	Solvent - Industrial Surface Coating & Solvent Use	3

TOP TEN NATIONAL MERCURY EMISSION SOURCE CATEGORIES

Coal-fired EGUs are the largest in-state emission source in 32 states and ranked in the top three sources in a total of 42 states participating in the 2011 Compendium Survey. Industrial process-ferrous metals, which includes Electric Arc Furnaces (EAFs), and miscellaneous non-industrial sources, which includes a variety of smaller area and non-point sources, both ranked in the top three sources in 22 states. Cement manufacturing ranked in the top three source categories in 19 states. Despite the large reductions in emissions associated with waste disposal, this category still ranked in the top three source categories in 11 states. Residential fuel combustion ranked in the top three source categories in 10 states but as more current data suggests emissions from this source category may be significantly overestimated.

The table on the following pages summarizes the responses of the 42 participating states.

Top Ten National Mercury Emission Source Categories by State *					
State	*Emission Categories A-E*				
	(A) Fuel combustion - electric generation - coal	(B) Industrial processes - ferrous metals (includes EAF)	(C) Industrial processes - cement manufacturing	(D) Industrial processes - non-ferrous metals (includes gold mining)	(E) Waste disposal (includes waste incineration)
Alabama	3466	521	341	12	1
Alaska	24			0	6
Arizona	1074		31	28	0
Arkansas	779	308	134	2	357
California	0	250	2119	1	333
Colorado	679	721	81	13	
Connecticut	5				58
Delaware	122	163		0	0
Florida	1270	129	443	0	46
Hawaii	3				0
Idaho			7	2	1
Illinois	1739	286	52	181	142
Indiana	2454	435	514	125	91
Iowa	1937	179	100		0
Kanas	1284	76	664		0
Kentucky	1573	403	36	1	3
Louisiana	1798	63			45
Maine			27		33
Maryland	252	0	501		150
Massachusetts	158				191
Michigan	2277	353	599	0	117
Minnesota	1303	756		1	475
Missouri	2370		330	153	47

Top Ten National Mercury Emission Source Categories by State *					
State	*Emission Categories F-J*				
	(F) Industrial processes - chemical manu-facturing (includes chloralkalai)	(G) Miscellane-ous non-Industrial (includes area, non-point sources)	(H) Fuel combus-tion - indus-trial boilers - coal	(I) Industrial processes – not else-where classified	(J) Fuel com-bustion res-idential - oil
Alabama	340	73	37	29	1
Alaska		9	1	1	39
Arizona		65	32	0	0
Arkansas	0	43	200	0	0
California	38	86	3	481	8
Colorado		23	10	84	0
Connecticut		50		0	232
Delaware	0	3	74	0	0
Florida	4	214	50	80	2
Hawaii		17	0		0
Idaho	613	48	14	15	7
Illinois	141	133	245	114	4
Indiana	5	98	121	7	12
Iowa	1	49	455	3	5
Kanas	0	47		1	0
Kentucky		55	16	91	7
Louisiana	1094	57	4	26	0
Maine		35	16	5	116
Maryland		76	109	1	55
Massachusetts		237	6	0	281
Michigan		125	325	10	24
Minnesota	0	33	140	136	28
Missouri	6	20	8	66	4

Appendix: S-C

Top Ten National Mercury Emission Source Categories by State *					
State	*Emission Categories A-E*				
	(A) Fuel combustion - electric generation - coal	(B) Industrial processes - ferrous metals (includes EAF)	(C) Industrial processes - cement manufacturing	(D) Industrial processes - non-ferrous metals (includes gold mining)	(E) Waste disposal (includes waste incineration)
Montana	237		25		0
Nebraska	1353	163	41		40
New Hampshire	235			0	5
New Jersey	40	93			150
New Mexico	8		10		0
New York	343	144	184		233
North Carolina	1580	61		139	170
North Dakota	3024				7
Ohio	3218	836	41	3	187
Oklahoma	1211	128	36		9
Oregon	133	48	1508		11
Rhode Island					78
South Carolina	631	963	237	4	82
South Dakota	192		9	40	
Tennessee	2258	258	204	169	98
Texas	7226	1172	345	2294	499
Utah	404	313	213	6	57
Vermont					
Virginia	855	874	9		77
Washington	313	69	102	1	10
West Virginia	1871	49	134	0	26
Wisconsin	1431	95		3	57
National Total	**58978**	**11105**	**9689**	**6658**	**4278**

*Additional information about and data from the United States Environmental Protection Agency's 2008 National Emissions Inventory (NEI) can be found at http://www.epa.gov/ttn/chief/net/2008inventory.html

Top Ten National Mercury Emission Source Categories by State *					
State	*Emission Categories F-J*				
	(F) Industrial processes - chemical manu-facturing (includes chloralkalai)	(G) Miscellane-ous non-Industrial (includes area, non-point sources)	(H) Fuel combus-tion - indus-trial boilers - coal	(I) Industrial processes – not else-where classified	(J) Fuel com-bustion residential - oil
Montana	1	14	2		3
Nebraska		24	4	14	2
New Hampshire		18		0	82
New Jersey	2	105	127	132	
New Mexico		23		0	0
New York	2	176	48	14	584
North Carolina	302	117	148	34	56
North Dakota		14	49	1	8
Ohio	68	190	198	291	45
Oklahoma	96	52	13	4	0
Oregon		53		0	12
Rhode Island		13		0	51
South Carolina	0	56	42	17	9
South Dakota		14			4
Tennessee	46	77	124	1	7
Texas	101	191	4	149	0
Utah		33	2	3	1
Vermont		17		0	44
Virginia	0	98	58	194	100
Washington	0	87		1	22
West Virginia	161	29	104	5	10
Wisconsin	1080	226	136	23	41
National Total	**4201**	**3714**	**3569**	**2667**	**2368**

*Additional information about and data from the United States Environmental Protection Agency's 2008 National Emissions Inventory (NEI) can be found at http://www.epa.gov/ttn/chief/net/2008inventory.html

Appendix: S-D

Toxic Release Inventory Data Summary for Elemental Mercury or Mercury Compounds: Key Sectors

The Tables in this appendix present summary data on mercury from the TRI database as provided by the U.S. Office of Toxic Substances, email communication, 2012 (U.S. EPA Office of Toxic Release Inventory Program email communication).

In these Tables the mercury emissions and other waste management quantities reported to U.S. EPA's TRI jump considerably higher after 1999 for many sectors. This is due to the change in the reporting threshold from 25,000 pounds (for manufacturing or processing mercury or mercury compounds) and 10,000 pounds (for otherwise using mercury or mercury compounds) annually to 10 pounds annually, beginning with the year 2000. The lowering of the TRI reporting threshold brought into TRI reporting many facilities that release mercury into the environment, whether as elemental mercury in its neutral form or as a compound that contains mercury compounds, that prior to 2000 did not have to report.

For the year 2000 and thereafter, the TRI data indicate a general and significant downward trend in overall air emissions for several source sectors, while some others increased. The reported air emissions in 2010 compared to 2002 were down: 24% for EGU; 85% for chloralkali plants; 78% for gold mining; 42% for cement kilns; and 91% from hazardous waste treatment and disposal. In contrast, reported air emissions from the EAF and integrated steel facilities were up by 78% in 2010 vs. 2002. Although this may reflect a real increase it is also possible that it may be due to improved emissions estimates attributable to increased awareness and data regarding emissions from this sector, which may have occurred over this period.

On a total mass basis, disposal of mercury to land dwarfs releases to the air and water for the sectors considered in Tables A-D. The largest source of mercury disposal to land over the 2002-2010 timeframe was the gold mining sector, which reported 3.5 - 4.6 million pounds of mercury, predominantly in the form of compounds, released to land per year. In this case, the material disposed of is in the form of solids derived from rock processed during the gold mining process. These solid mercury compound wastes are likely to be quite stable.

Please note that some facilities may fall into multiple sector categories so the data in these tables includes some double counting and thus the values for each media do not match the summary TRI data in Table 3 in the Sources section of the report.

Citation

U.S. EPA Office of Toxic Release Inventory Programs, email communication, 2012. TRI Data for State Mercury Compendium.xlsx file Data were downloaded by U.S. EPA from TRI on January 27, 2012

Table D:1: TRI Data Mercury Air Emissions Summary

Key Sectors	Air					
MACT Category	NAICS Code	1999	2002	2005	2008	2010
Coal-fired Electric Power Plants	221112, limited to coal, including those co-fired with oil	432	88,208	95,614	90,050	66,670
Oil-fired Electric Power Plants	221112, limited to oil, except those co-fired with coal	0	370	414	233	655
Industrial/Commercial Boilers & Commercial Sources	31-33	13,670	43,397	37,042	29,734	29,420
Chloralkali Plants	325181	10,642	9,903	7,221	3,038	1,517
Hazardous Waste Treatment and Dispos-al*	562211	62	1,155	339	1,382	102
Solid Waste Combus-tors and Incinerators*	562213	0	0	0	26	18
Cement Kilns	327310	335	12,453	10,687	9,214	7,263
Electric Arc Furnaces andIntegrated Steel Facilities	331111	0	4,923	6,291	6,038	8,748
Gold Mining	212221	12,159	8,842	4,777	4,496	1,916
Other Mining	212111 - 212113, 212221, 212222, 212231, 212234, 212299	70	593	494	256	383
Foundries	3315	0	766	460	215	132
Oil Refining	324110	1	1,764	1,753	2,026	1,967
Primary Aluminum Production	331312	0	619	979	136	132
Secondary Aluminum Production	3313, except 331312	0	1,464	1,508	1,233	1,222

* Regarding facilities in NAICS 5622 ("Waste Treatment and Disposal"), only those facilities categorized by: either by NAICS 562211; 562212; 562213; or 562219 and that are regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. 6921 et. seq. are subject to TRI reporting.

Table D-2: TRI Mercury Data Water Releases Summary

Key Sectors	Water					
MACT Category	NAICS Code	1999	2002	2005	2008	2010
Coal-fired Electric Power Plants	221112, limited to coal, including those co-fired with oil	0	322	198	966	760
Oil-fired Electric Power Plants	221112, limited to oil, except those co-fired with coal	0	18	15	0	0
Industrial/Commercial Boilers & Commercial Sources	31-33	168	590	435	2,119	606
Chloralkali Plants	325181	125	117	96	101	40
Hazardous Waste Treatment and Disposal*	562211	0	1	12	1	2
Solid Waste Combustors and Incinerators*	56221	0	0	0	0	0
Cement Kilns	327310	0	0	1	0	0
Electric Arc Furnaces and Integrated Steel Facilities	331111	0	19	22	27	24
Gold Mining	212221	4	19	1	0	5
Other Mining	212111, 212112, 212113, 212221, 212222, 212231, 212234, 212299	5	8	5	15	3
Foundries	3315	0	0	1	0	0
Oil Refining	324110	5	102	96	159	100
Primary Aluminum Production	331312	0	0	0	0	0
Secondary Aluminum Production	3313, except 331312	0	7	2	21	27

* Regarding facilities in NAICS 5622 ("Waste Treatment and Disposal"), only those facilities categorized by: either by NAICS 562211; 562212; 562213; or 562219 and that are regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. 6921 et. seq. are subject to TRI reporting.

Table D-3: TRI Mercury Data – Releases/Disposal to Land Summary

Key Sectors	Land					
MACT Category	NAICS Code	1999	2002	2005	2008	2010
Coal-fired Electric Power Plants	221112, limited to coal, including those co-fired with oil	1,725	39,286	35,716	40,539	54,613
Oil-fired Electric Power Plants	221112, limited to oil, except those co-fired with coal	0	187	236	655	7
Industrial/Commercial Boilers & Commercial Sources	31-33	8,122	29,288	22,438	13,262	25,461
Chloralkali Plants	325181	998	993	256	191	223
Hazardous Waste Treatment and Disposal*	562211	455,856	41,315	328,454	353,412	61,496
Solid Waste Combustors and Incinerators*	562213	0	0	0	0	0
Cement Kilns	327310	0	1,487	1,363	246	159
Electric Arc Furnaces and Integrated Steel Facilities	331111	1,400	384	128	202	792
Gold Mining	212221	2,539,001	4,573,325	3,574,170	5,452,047	4,228,916
Other Mining	212111, 212112, 212113, 212221, 212222, 212231, 212234, 212299	58,005	136,819	94,821	125,292	164,890
Foundries	3315	0	115	50	40	3
Oil Refining	324110	5	82	126	252	65
Primary Aluminum Production	331312	0	357	374	301	223
Secondary Aluminum Production	3313, except 331312	0	3,871	3,556	3,367	3,410

* Regarding facilities in NAICS 5622 ("Waste Treatment and Disposal"), only those facilities categorized by: either by NAICS 562211; 562212; 562213; or 562219 and that are regulated under the Resource Conservation and Recovery Act, subtitle C, 42 U.S.C. 6921 et. seq. are subject to TRI reporting.

Appendix: R&M-A

Mercury Research Activities by State			
State	Conducted Research in 2005	Conducted Research in 2011	Web Page
Total Number of States	28	29	
Alabama	NA	✓	http//www.adem.state.al.us/programs/waterforms/surfacewatermonitoring.pdf
Alaska	NA	✓	http://www.dec.alaska.gov/eh/vet/fish.htm
Arizona	✓	No	NA
Arkansas	✓	No	NA
California	✓	✓	http://www.oehha.ca.gov; http://www.swrcb.ca.gov, search for "mercury"
Colorado	✓	✓	http://www.cdphe.state.co.us/wq/FishCon/index.html
Connecticut	✓	✓	NA
Delaware	✓	✓	NA
Florida	✓	✓	http://www.ct.gov/dep/cwp/view.asp?a=2690&Q=322430&depNav_GID=1651
Hawaii	✓	✓	NA
Idaho	NA	✓	http://www.deq.idaho.gov/water-quality/surface-water/mercury.aspx
Illinois	ü\ü	No	NA
Indiana	NA	No	NA
Iowa	NA	No	NA
Kansas	NA	✓	NA
Kentucky	NA	No	NA
Louisiana	✓	✓	http://www.deq.louisiana.gov/portal/Default.aspx?tabid=28
Maine	✓	✓	NA

Mercury Research Activities by State			
State	Conducted Research in 2005	Conducted Research in 2011	Web Page
Maryland	✓	✓	http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/Mercury/Documents/www.mde.state.md.us/assets/document/Mercury%20Report%202002.pdf http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/Mercury/Documents/www.mde.state.md.us/assets/document/Mercury%20Report%202004%20-%20FINAL.pdf; http://www.mde.maryland.gov/programs/water/tmdl/approvedfinaltmdls/pages/programs/waterprograms/tmdl/approvedfinaltmdl/index.aspx
Massachusetts	✓	✓	http://www.mass.gov/dep/toxics/stypes/
Michigan	✓	✓	http://www.michigan.gov/deqair
Minnesota	✓	✓	http://www.briloon.org/
Mississippi	✓	**NA**	NA
Missouri	✓	**No**	NA
Montana	**NA**	✓	http://www.fwp.mt.gov/fwpDoc.jsp?
Nebraska	**NA**	✓	http://www.deq.state.ne.us/publica.nsf/pages/WAS057
New Hampshire	✓	**No**	NA
New Jersey	✓	✓	http://www.state.nj.us/dep/dsr/mercury/
New Mexico	**NA**	**No**	NA
New York	✓	✓	http://www.dec.ny.gov/chemical/285.html

Mercury Research Activities by State			
State	Conducted Research in 2005	Conducted Research in 2011	Web Page
North Carolina	✓	✓	http://ncdenr.gov/web/wq/ps/mtu/
North Dakota	✓	✓	http://pubs.usgs.gov/sir/2007/5219/
Ohio	NA	No	NA
Oklahoma	NA	No	NA
Oregon	✓	✓	http://www.deq.state.or.us/lab/wqm/
Rhode Island	NA	No	NA
South Carolina	NA	✓	NA
Texas	NA	✓	http://www.tceq.texas.gov/assets/
Utah	NA	✓	www.deq.utah.gov/issues/mercury/
Vermont	✓	✓	http://www.vtwaterquality.org//
Washington	✓	✓	http://www.ecy.wa.gov/science/
West Virginia	NA	No	NA
Wisconsin	✓	✓	http://dnr.wi.gov/air/aq/monitor/

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Appendix: R&M-B

Mercury Fish Advisories
Summary of Types, Coverage, and Activity in 2010**

State	Bayou Square Miles	Canal Miles	Costal Square Miles	Costal Square Miles	Great Lakes Miles	Lake Acres	Multi-class
Alabama			253.6			29,330.2	
Alaska							
Arkansas	93.1					3,659.6	32.1
Arizona						18,112.7	
California			241.0			67,910.7	
Colorado						37,740.7	
Connecticut						1,377.9	
Delaware				14.2		142.3	
Florida		390.9	5,161.2			880,236.7	1,113.6
Georgia			255.2	6.7		28,821.5	
Hawaii							
Iowa						310.6	
Idaho						212,754.3	
Illinois						9,370.8	
Indiana		2.1				34,140.8	
Kansas							
Kentucky						69,213.9	
Louisiana	8,083.6	11.5	1,784.2			79,356.3	
Massachusetts		4.5	1,115.9			14,659.1	5.3
Maryland			777.5			14,260.4	
Maine			2,064.3				
Michigan					2,348.4	129,148.5	
Minnesota						1,333,061.0	
Missouri						1,687.7	
Mississippi			219.9			35,324.0	

** Data in this table are from the United States Environmental Protection Agencies 2010 Fish Advisory Database
***More recent advisories may have been issued but not yet entered into the U.S. EPA database

Mercury Fish Advisories
Summary of Types, Coverage, and Activity in 2010**

State	Regional Miles	River Miles	Wetland Acres	State-wide	First Advisory Issued	Most Recent Advisory Issued ***
Alabama		907.6		No	1993	2010
Alaska		2,904.6		Yes	2001	2009
Arkansas		260.0		No	1994	1999
Arizona				No	1995	2009
California	9,243.6	539.7		No	1993	2010
Colorado				No	1993	2009
Connecticut				Yes	1994	2002
Delaware		31.1		No	1999	2007
Florida		2,934.0		Yes	1993	2009
Georgia		3,042.0		No	1993	2008
Hawaii				Yes	2003	2003
Iowa		149.8		Yes	2006	2008
Idaho		536.2		Yes	1994	2010
Illinois		2,659.5		Yes	1993	2010
Indiana		1,395.0		No	1993	2010
Kansas		25.0		No	1994	1994
Kentucky		681.6		No	1994	2008
Louisiana		773.3		No	1993	2009
Massachusetts		189.1		Yes	1993	2009
Maryland		5,324.8		Yes	2001	2009
Maine				Yes	1994	1994
Michigan		675.3		Yes	1988	2010
Minnesota		3,511.4		Yes	1993	2010
Missouri		1,080.3		No	1998	2008
Mississippi		263.6		Yes	1995	2001

** Data in this table are from the United States Environmental Protection Agencies 2010 Fish Advisory Database
***More recent advisories may have been issued but not yet entered into the U.S. EPA database

Appendix: R&M-B

Mercury Fish Advisories
Summary of Types, Coverage, and Activity in 2010**

State	Bayou Square Miles	Canal Miles	Costal Square Miles	Costal Square Miles	Great Lakes Miles	Lake Acres	Multi-class
Montana						662,672.8	
North Carolina			1,876.8			23,935.6	
North Dakota						49,566.0	
Nebraska		19.2				13,323.2	
New Hampshire			45.4			1,635.6	
New Jersey						12,074.1	
New Mexico						31,041.1	
Nevada						125,230.2	
New York						136,182.0	
Ohio						30,412.5	
Oklahoma						30,498.0	
Oregon						16,691.8	
Pennsylvania						6,820.2	
Rhode Island			247.2			1,541.7	
South Carolina			476.0	54.0		1,750.1	188.8
South Dakota						10,312.4	
Tennessee						46,364.6	
Texas			2,185.5	17.1		371,245.6	
Utah						2,627.5	266.0
Vermont						1,350.4	
Virginia		18.0				7,347.5	
Washington						2,193.0	
Wisconsin					174.6	253,965.1	
West Virginia						4,232.4	
Wyoming						48,846.6	

** Data in this table are from the United States Environmental Protection Agencies 2010 Fish Advisory Database
***More recent advisories may have been issued but not yet entered into the U.S. EPA database

Mercury Fish Advisories
Summary of Types, Coverage, and Activity in 2010**

State	Regional Miles	River Miles	Wetland Acres	State-wide	First Advisory Issued	Most Recent Advisory Issued ***
Montana		150.8		Yes	1993	2007
North Carolina				No	2000	2009
North Dakota		10.0		No	1993	2003
Nebraska		204.3		Yes	1994	2010
New Hampshire				Yes	1994	2008
New Jersey		390.5		No	1995	2010
New Mexico		83.5		No	1993	2010
Nevada		2,006.2		Yes	1993	2010
New York		222.5		Yes	1993	2010
Ohio		2,896.6		Yes	1993	2010
Oklahoma				Yes	1993	2010
Oregon		461.0		Yes	1993	2008
Pennsylvania		455.7		No	1993	2010
Rhode Island		18.6		Yes	1993	2004
South Carolina		1,871.1	27,379.7	No	1993	2009
South Dakota				No	2000	2008
Tennessee		466.1		No	1993	2010
Texas		321.0		No	1980	2010
Utah		189.3		No	2005	2009
Vermont				Yes	1995	2003
Virginia		1,043.2		No	1974	2009
Washington		21.2		Yes	1997	2007
Wisconsin		3,998.5		Yes	1993	2010
West Virginia		521.8		Yes	2005	2008
Wyoming				Yes	2008	2008

** Data in this table are from the United States Environmental Protection Agencies 2010 Fish Advisory Database
***More recent advisories may have been issued but not yet entered into the U.S. EPA database

Appendix: P-A

Reduction of Mercury Use in Products

The Interstate Mercury Education and Reduction Clearinghouse (IMERC) notification data show there has been a significant reduction of mercury used in products since states first adopted legislation and regulations targeting this source. There was a 46% reduction in mercury used in products from 2001 to 2007, the most recent data available. Several manufacturers of mercury-containing products ceased sales in all states at least in part as a result of state bans. For example, in 2011, range manufacturers stopped making gas ranges with mercury flame sensors, and communication radio manufacturers ceased making radios with mercury switches. Mercury thermometers and thermostats are close to being phased out nationwide.

States recognize there are some uses of mercury in products that cannot be avoided and have a formal process for applying for an exemption. Most states require the applicant to demonstrate that the mercury product or component is more beneficial to human health and the environment than mercury-free alternatives or that technically feasible mercury-free alternatives do not exist at a reasonable cost. Typically, manufacturers or a trade association representing manufacturers, apply for the exemption. In addition, there must be a system to collect the mercury-containing product at the end of its useful life. States that have provisions in their laws for issuing exemptions are California, Connecticut, Illinois, Louisiana, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Wisconsin, and Vermont. IMERC provides technical assistance and facilitates the review of exemption applications in these states. Three states (California, Maine, and Rhode Island) require payment of fees to review the exemption application. Examples of exemptions granted include mercury compounds used in testing and laboratories, pressure transducers, and semi-conductor test equipment. At this time, there are no technically feasible alternatives for these three product categories.

Specific exemptions are listed in the laws of 20 states (California, Connecticut, Illinois, Indiana, Iowa, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, New Hampshire, New York, North Carolina, Ohio, Oregon, Rhode Island, Vermont, Washington, and Wisconsin). The two most common exemptions are for button cell batteries, and mercury-containing products required by federal law or federal contract. Some states also have exemptions that are fairly narrow in scope. For instance, Connecticut specifically exempts from their laws products that contain mercury containing lamps for backlighting that are not easily removed by a purchaser.

Appendix: 2011Survey Documents

This appendix includes the following materials:

* 2011 Compendium Survey Letter
* 2011 Survey Supplemental Instructions
* 2011 Survey Questionnaire
* Summary Results: 2011 Survey

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The Association of State Drinking Water Administrators; The Association of Clean Water Administrators;
The Association of State and Territorial Solid Waste Management Officials; The Environmental Council of the States;
The National Association of Clean Air Agencies; The National Pollution Prevention Roundtable

QUICKSILVER CAUCUS ... QUICKSILVER CAUCUS ... **QUICKSILVER CAUCUS**... QUICKSILVER CAUCUS ... **QUICKSILVER CAUCUS** QUICKSILVER CAUCUS ... **QUICKSILVER CAUCUS** ...

September 30, 2011

Dear Commissioner:

We are writing to request your assistance on an important effort by the Quicksilver Caucus (QSC) to complete a 2011 Compendium of State Mercury Activities. The Compendium will be based on information collected through an electronic survey and will provide a valuable source of information for ongoing state initiatives, national efforts by the United States Environmental Protection Agency (US EPA) and the current negotiations on a global mercury agreement through the United Nations Environment Program. This Compendium will also serve to highlight state leadership related to the mercury issue and is an important deliverable under the current QSC work plan.

As you may know the QSC is a coalition of state environmental association[1] leaders, coordinated through the Environmental Council of States (ECOS), working to reduce mercury pollution in all environmental media. Active participation by many states in the QSC has been critical to our group's effective collaboration to develop and implement approaches to reduce sources of mercury pollution, share information, leverage state expertise, build state capacity and provide input to the US EPA, United States State Department, researchers and other groups.

The 2011 Compendium of State Mercury Activities will update prior Compendium reports completed in 2001 and 2005 to reflect the significant progress the states have made addressing mercury in the environment. We need your help to complete this project. Specifically, the QSC asks that you and your staff complete the survey of your state's efforts to manage mercury at the following web address https://www.surveymk.com/s/2011StateMercurySurvey. (See Enclosure A for a paper version.) The final Compendium report will present an aggregated summary of all responses received as well as individual state summaries based on the survey responses.

The questions in the survey build upon those addressed in prior Compendium reports and were developed by the QSC Compendium Team, coordinated by ECOS, with extensive state input. Information is being requested on mercury pollution sources and control efforts, monitoring, state total maximum daily load (TMDLs) activities for mercury, outreach, pollution prevention and recycling. Additionally, in order to address individual state programs that may not have been fully covered in the survey, as well as to better showcase these efforts, each state is encouraged to submit an optional, brief summary of key state mercury program activities and accomplishments

[1] QSC member organizations include the Environmental Council of the States (ECOS), the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), the National Association of Clean Air Agencies (NACAA), the Association of Clean Water Administrators (ACWA), the Association of State Drinking Water Administrators (ASDWA) and the National Pollution Prevention Roundtable (NPPR).

for inclusion in the Compendium. (See Enclosure B: *Information and Survey Instructions* Section V *Supplemental*.)

We ask that you complete and submit the survey and optional state summary by Monday, October 31, 2011. The survey Instructions for completing and submitting the survey and state summaries are included in Enclosure A. The QSC Compendium Team will also be available to address questions and provide technical assistance regarding the survey through weekly teleconference sessions. Scheduling and access information for these sessions is included in Enclosure A. The QSC anticipates completing the Compendium report in early 2012.

It would also be very helpful if you could confirm your Agency's intention to participate in this survey by October 11, 2011 as well as either confirming (See Enclosure B for list of current contacts.) or identifying an individual to serve as the primary contact to work with the QSC Compendium Team. This individual will also be listed as the state contact in the final Compendium report. Please send this information to Mary Blakeslee (maryb@ecos.org).

Thank you for your time and effort on this! Should you have questions please do not hesitate to contact us.

Sincerely,

C. Mark Smith PhD, MS
Chair, Quicksilver Caucus
Deputy Director, Office of Research and Standards
Massachusetts Department of Environmental Protection
c.mark.smith@state.ma.us
617-292-5509

Peggy Harris, PE
Chair, Quicksilver Caucus Compendium Team
Chief, Intergovernmental Policy
Office of Policy
California Department of Toxic Substances Control
pharris@dtsc.ca.gov
916- 324-7663

cc: QSC Members
State Compendium Contacts

Enclosures
A. *Paper Version of 2011 Survey*
B. *Supplemental Information and Survey Instructions*
C. *List of Primary Contacts for 2011 Compendium Survey*

2011 Compendium of State Mercury Activities Survey

Introduction to the 2011 Survey of State Mercury Activities

BACKGROUND -- The Quicksilver Caucus (QSC) is a coalition of state environmental association leaders working to reduce mercury pollution in all environmental media. QSC member organizations include the Environmental Council of the States (ECOS), the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), the National Association of Clean Air Agencies (NACAA), the Association of Clean Water Administrators (ACWA), the Association of State Drinking Water Administrators (ASDWA) and the National Pollution Prevention Roundtable (NPPR). Active participation by many states in the QSC has been critical to our group's effective collaboration to develop and implement approaches to reduce sources of mercury pollution, share information, leverage state expertise, build state capacity, and to provide input to the United States Environmental Protection Agency (US EPA), US State Department, researchers and other groups.

In 2000 the QSC conducted its first survey and was able to document the nature and extent of mercury activities in 26 states. In 2005, the QSC conducted its second survey and was able to document the nature and extent of mercury activities in 45 states. The primary purpose of both these efforts was to create a document that shared and highlighted voluntary and regulatory approaches states were taking to address mercury in the environment.

PURPOSE OF 2011 SURVEY is to create an updated document that shares and highlights voluntary and regulatory approaches states have taken to address mercury in the environment since 2005. The 2011 Compendium of State Mercury Activities will highlight state leadership and successes on the mercury issue and is an important deliverable under the current QSC work plan. It will also provide an important source of information for ongoing state initiatives, national efforts by US EPA and the current negotiations on a global mercury agreement through the United Nations Environment Program. The document will present an aggregated summary of all responses received as well as individual state summaries based on the survey.

Supplemental Information and Instructions for Completing the 2011 Survey --...

PLEASE NOTE – There can only be ONE electronic submission per state.

Supplemental Information

1. **PRE SURVEY ACTION** – *the person receiving the survey documents should immediately send an email with the name, email address, and phone number of the State's Primary Contact to: Mary Blakeslee (maryb@ecos.org).*

2. **TECHNICAL ASSISTANCE CONFERENCE CALLS**– The QSC Compendium Team will be available to answer questions about the survey if needed on Wednesday mornings during October. If states have questions, they should follow the schedule below:

- On Tuesday, October 4, October 11, October 11, October 18, and October 25 – email Mary Blakeslee (maryb@ecos.org) no later than 12:00 Noon (EDT). Please note if Mary does not receive any emails there will be no call on Wednesday.
- On Wednesday, October 5, October 12, October 19, and October 26 – Please join C-Team Conference Call 11:30 AM (EDT) – Number and Code are 888-205-5513 and 756558#

Supplemental Information and Instructions for Completing the 2011 Survey --...

General Instructions and Additional Information

Here is some additional information you should know so that you can complete the web-based Quicksilver Caucus Mercury Survey.

GENERAL INSTRUCTIONS

1. **PLEASE NOTE -- There can only be ONE electronic submission per state.**
2. **REMEMBER**

   - DO NOT press **DONE** until entire survey is completed, reviewed, and edited.
   - Once you press **DONE**, then you will not be able to access the electronic survey form again.
   - Please do your best to fill out every question but if it is not possible to answer a question you may leave it blank.

Key Roles and Responsibilities

PRIMARY CONTACT-- Each state has or will designate an individual to work with the Quicksilver Caucus Compendium Team throughout the completion of the survey and final review of the submitted data. This individual will:

1. Coordinate collection of survey information from participants within his or her state.
2. Communicate with the QSC Compendium Team on questions or issues.
3. Complete and submit **A SINGLE** electronic survey for the state.
4. Review and correct information on a *PDF* copy post submission.
5. If questions arise in completing the survey make sure to contact Mary Blakeslee (maryb@ecos.org) by noon (EDT) on Tuesdays and participate in the conference call with the Compendium Team on Wednesdays at 11:30 (EDT)

PARTICIPANTS -- All state staff working with the Primary Contact to provide data and information about the state's mercury activities. These individuals will use a *PDF* document to submit responses to the questions to the Primary Contact. The Primary Contact will enter the data into the electronic tool and then submit it.

FORMAT ***for entering website addresses*** on paper or electronic version enter http://www.mercury activities.gov/other designation/other designation.htm

Primary Contact for 2011 Compendium of State Mercury Activities Survey

2011 Compendium of State Mercury Activities Survey

***1. Please provide the contact and organization information for the person serving as your state's primary contact for the 2011 Compendium of State Mercury Activities Survey.**

Name	
Email address	
Phone number	
State name	
Department or Agency name	
Program (Air, Water, Hazardous Waste, Solid Waste, Pollution Prevention, Public Health, Other--Specify)	

State Strategies or Plans

The questions are seeking information to update the status of State Mercury Strategies or Plans.

2. Please indicate the status of mercury reduction plans or strategies in your state. (Select one.)

- ◯ Mercury reduction plan or strategy in place
- ◯ Mercury reduction plan or strategy under development
- ◯ Intend to develop mercury reduction plan or strategy in the future
- ◯ No mercury reduction plan or strategy exists or is planned

3. Does your state participate in a regional or multistate or binational initiative to address mercury pollution?

- ◯ Yes
- ◯ No

4. If your state participates in a regional or multistate or binational initiative, please provide a web address (if one exists) that provides information about this initiative.

State Perspectives

The questions are seeking information on the effectiveness of regulatory and non-regulatory tools or approaches; the challenges facing states; an assessment of the likelihood states will address emerging issues; and the importance of state/federal coordination in several areas.

The questions in this section should be answered by the Primary Contact or someone with Department/Agency-wide knowledge of mercury activities.

5. Please identify the importance of each approach or activity listed below for the reduction or management of mercury in your state. (Select one item per row.)

	Very Important	Important	Not Important	Don't Know	Don't Use
State and federal coordination	◯	◯	◯	◯	◯
State to state information exchange	◯	◯	◯	◯	◯
Coordinated efforts between media programs (such as air and water)	◯	◯	◯	◯	◯

6. Please identify the significance of each item listed below as a challenge to mercury reduction or management in your state. (Please select one item per row.)

	Very Significant	Significant	Not Significant	Don't Know
Lack of legislative or regulatory mandate	◯	◯	◯	◯
Lack of state human resources	◯	◯	◯	◯
Lack of technical expertise or equipment	◯	◯	◯	◯
Lack of US EPA financial or technical support to states	◯	◯	◯	◯
Lack of federal and state coordination	◯	◯	◯	◯
Lack of long term funding	◯	◯	◯	◯
Other (Please specify in Q-7)	◯	◯	◯	◯

7. If selected "other" to Q-6 "item posing a challenge", specify here.

Research Activities

The questions are seeking information to let other states know about the research activities in your state.

8. Does your state currently conduct or has your state recently completed, any research/studies related to mercury?

◯ Yes ◯ No

9. If you answered "yes" to Q-8 "research activities", provide the address for a website that describes these activities or briefly describe here.

EXAMPLE FORMAT for entering website addresses on paper or electronic version enter is http://www.mercury activities.gov/other designation/other designation.htm

Outreach Activities

The questions are seeking information to let other states know about selected outreach activities in your state.

10. Does your state have a main webpage related to mercury?

◯ Yes ◯ No

11. If you answered "yes" to Q-10 "main webpage", please provide an address for the website(s) here.

Main Webpage Address

Additional Webpage Address

12. Does your state collaborate with the medical community on the following: (Select all that apply.)

- ☐ Fish consumption advisories
- ☐ Pollution prevention
- ☐ Dental issues
- ☐ Cultural/ritualistic uses
- ☐ Waste management requirements
- ☐ None
- ☐ Other (Please specify in Q-13)

13. If you selected "other" in Q-12 "collaboration with medical community", briefly describe here.

Monitoring Activities

The questions are seeking information to let other states know about the mercury monitoring activities in your state.

14. Does your state conduct mercury monitoring on any of the categories below? (Select all that apply.)

- [ ] Air emissions from stacks
- [ ] Ambient air
- [ ] Atmospheric deposition (other than NADP participation)
- [ ] Indoor air (for the purposes of evaluating spill cleanup)
- [ ] Wastewater effluent
- [ ] Wastewater sludge
- [ ] Water column
- [ ] Waterbody sediment
- [ ] Fish tissue
- [ ] Wildlife
- [ ] Landfill
- [ ] None

15. If you indicated that your state conducts "fish tissue monitoring" in Q-14, identify the purpose(s) of your state's program. (Select all that apply.)

- [ ] Determine need for establishing, revising, or removing fish consumption advisories
- [ ] Evaluate long term trends
- [ ] Evaluate changes in fish tissue mercury as a result of implementing mercury reduction programs
- [ ] Other (Please briefly describe in Q-16)

16. If you selected "other" in Q-15, please describe here.

17. What types of fish consumption advisories for mercury does your state have? (Please select all that apply.)

- [ ] Statewide freshwater advisories
- [ ] Statewide coastal advisories
- [ ] Waterbody-specific advisories

Total Maximum Daily Load (TMDL) Activities

The questions are seeking information to let other states know about the TMDL activities in your state and create a summary of state TMDL programs and activities.

18. Does your state have any US EPA-approved TMDLs for mercury? (Select all that apply.)

- [ ] No
- [ ] Yes, Waterbody-specific
- [ ] Yes, Statewide
- [ ] Yes, Multistate
- [ ] Yes, Watershed or basin

19. Please specify the primary sources of mercury addressed in your state's TMDLs. (Select all that apply.)

- ☐ Atmospheric deposition
- ☐ Legacy sources
- ☐ Wastewater treatment plant discharges
- ☐ Stormwater discharges
- ☐ Active mining
- ☐ Solid or hazardous waste sites

20. If your state has not developed a mercury TMDL, are you in the process of or do you have plans to develop one?

- ☐ No
- ☐ Yes, Waterbody-specific
- ☐ Yes, Statewide
- ☐ Yes, Multistate
- ☐ Yes, Watershed or basin

21. Has your state pursued a watershed management plan in lieu of a TMDL to address atmospheric deposition of mercury?

- ◯ Yes
- ◯ No

22. Does your state take a multimedia approach when developing mercury TMDLs or watershed plans?

- ◯ Yes
- ◯ No

Dental Activities

The questions are seeking information to let other states know about the dental activities in your state and to create a national summary of state programs and activities.

23. Please describe whether your state's program for managing dental mercury is mandatory, voluntary, or both.

PRIMARY CONTACTS select mandatory or voluntary or both for each row from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter M for mandatory, V for voluntary, or B for both in each row.

	State Program Type
Statewide program to address dental mercury	
State requires or recommends dentists install amalgam separators	
State requires or recommends use of American Dental Association's (ADA) best management practices	
State requires or recommends best management practices that are different from ADA	
State requires or recommends installation of amalgam separators at dental offices on septic systems	

24. Does your state allow dentists to use collection tanks instead of separators to capture amalgam waste?

- ◯ Yes
- ◯ No

25. Provide your best estimate of the percentage of dentists in your state that have installed amalgam separators or collection tanks to collect mercury. (Please select one.)

- ◯ 01 to 20%
- ◯ 21 to 40%
- ◯ 41 to 60%
- ◯ 61 to 80%
- ◯ 81 to 100%
- ◯ Unknown

26. Are there POTWs in your state that have requirements beyond the state's?

- ◯ Yes
- ◯ No

27. Please indicate the significance of the following activities in promoting proper management of dental amalgam in your state.

	Very Signifcant	Significant	Not Signficant	Don't Know/Don't Use
Cost assistance for purchasing amalgam separators	◯	◯	◯	◯
State dental association outreach	◯	◯	◯	◯
General mailings and articles	◯	◯	◯	◯
Workshops and/or training	◯	◯	◯	◯
Technical assistance visits at dental offices	◯	◯	◯	◯
Compliance visits at dental offices	◯	◯	◯	◯
Amalgam separator removal efficiency review	◯	◯	◯	◯

Mercury Containing Products

28. Does your state ban any mercury containing products based on the quantity or concentration (e.g., ppm) of mercury in products, rather than just the presence of mercury in the product?

◯ Yes ◯ No

29. Please identify your state's requirements for the mercury containing product categories listed below.

PRIMARY CONTACTS select options from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter:

- **MP for Mandatory program**
- **VP for Voluntary program**
- **PSM for Plans to start a mandatory program**
- **PSV for Plans to start a voluntary program**
- **NP for No plan**

	Labeling Requirements	Sales/Distribution Ban	Household Disposal Ban
Bearings, rings or seals			
Cosmetics			
Electrodes			
Lighting			
Measuring devices			
Medical devices			
Mercury compounds, formulated products, or reagents			
Pharmaceuticals			
Switches and relays			
Thermometers			
Thermostats			
Toys/novelty items			
Wheel balancers/weights			
Vaccines			

30. Please identify your state's requirements for the mercury containing product categories listed below.

PRIMARY CONTACTS select options from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter under "Collection Program":

- **MP for Mandatory program**
- **VP for Voluntary program**
- **PSM for Plans to start a mandatory program**
- **PSV for Plans to start a voluntary program**
- **NP for No plan**

Enter Y for yes, or N for no, or PS for plan to establish an incentive program under "Financial Incentive"

	Collection Program	Financial Incentive
Bearings, rings or seals		
Cosmetics		
Electrodes		
Lighting		
Measuring devices		
Medical devices		
Mercury compounds, formulated products, or reagents		
Pharmaceuticals		
Switches and relays		
Thermometers		
Thermostats		
Toys/novelty items		
Wheel balancers/weights		
Vaccines		

31. If your state has a mercury collection program, please indicate who funds the program. (Select all that apply.)

- ☐ Local governments
- ☐ State
- ☐ Federal
- ☐ Manufacturer
- ☐ Users
- ☐ Waste processors

32. Does your state have a process for granting exemptions from product phase-outs or bans/limits?

- ◯ Yes
- ◯ No

In-State Mercury Sources

33. Do you have an inventory of mercury sources/uses in your state? (Select all that apply.)

- ☐ None
- ☐ Yes, estimates for amount of mercury released to the environment from air emission sources
- ☐ Yes, estimates for amount of mercury released to the environment from water pollution sources
- ☐ Yes, estimates for amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.
- ☐ Yes, inventory of amount of mercury used in products and processes

34. If available, please enter up to three web addresses that summarize mercury inventory data for your state.

EXAMPLE FORMAT for entering website addresses on paper or electronic version enter is http://www.mercury activities.gov/other designation/other designation.htm

Web Address 1	
Web Address 2	
Web Address 3	

35. Please provide information about anthropogenic (manmade) sources of *AIR* mercury releases to the environment in your state.

PRIMARY CONTACTS select Yes or No for each item from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter Y for yes and N for no in each box in the row.

	Source Present in State	Do you have more stringent statewide requirements for this source than US EPA?	Do you have statewide reqirements for monitoring/measuring releases?
Coal-fired electric power plants			
Electric arc furnaces			
Industrial/commercial boilers			
Biomass boilers			
Commercial sources (manufacturing/industrial)			
Dismantlers, shredders			
Foundries			
Integrated steel facilities			
Sewage sludge incinerators			
Chlor-alkali plants			
Hazardous waste incinerators			
Municipal solid waste incinerators/combustors			
Medical waste incinerators			
Gold mining			
Other mining			
Crematoria			
Oil refining			
Primary aluminum production			
Secondary aluminum production			
Cement kilns			
Home heating			
Mobile sources			

36. Please provide information about anthropogenic (manmade) sources of *WATER AND SOLID WASTE-RELATED* mercury releases to the environment in your state.

PRIMARY CONTACTS select Yes or No for each item from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter Y for yes and N for no in each box in the row.

	Source Present in State	Do you have more stringent statewide requirements for this source than US EPA?	Do you have statewide reqirements for monitoring/measuring releases?
Wastewater treatment plant sludge			
Wastewater treatment plant effluent			
Broken mercury-containing products & spills			

37. Have you published mercury release information for your instate sources since 2000?

◯ Yes ◯ No

38. If you answered "yes" to question 37 "published release data", enter address of website where it can be found.

EXAMPLE FORMAT for entering website addresses on paper or electronic version enter is http://www.mercury activities.gov/other designation/other designation.htm

39. BEFORE YOU CLICK ON "DONE"

Have you answered all the questions you plan to answer before submitting the survey and reviewed and edited your answers? If you haven't, select NO and return to the beginning of the document. If yes, proceed to click DONE.

◯ NO, I need to review and revise my answers ◯ Yes, I am ready to click

DONE

Optional State Summary and Thank You

OPTIONAL STATE SUMMARY

Please see Enclosure B: Supplemental Informaiton and Survey Instructions sent with the September 30, 2011 transmittal letter for instructions on length, style, and formating requirements.

THANK YOU

The Quicksilver Caucus thanks you for taking the time to coordinate and complete this survey. Once we have received all responses, we will send a PDF copy of your submission to annotate corrections and changes.

Online HTML Editor

Quicksilver Caucus 2011 Survey of State Mercury
Supplemental Information and Survey Instructions

Supplemental Information

A. PRE SURVEY ACTION – *THE PERSON RECEIVING THE SURVEY DOCUMENTS SHOULD IMMEDIATELY SEND AN EMAIL with the name, email address, and phone number of the State's Primary Contact TO: Mary Blakeslee (maryb@ecos.org).*

B. TECHNICAL ASSISTANCE CONFERENCE CALLS – The QSC Compendium Team will be available to answer questions about the survey if needed on Wednesday mornings during October. If states have questions, they should follow the schedule below:

1. On Tuesday, October 4, October 11, October 11, October 18, and October 25 – email Mary Blakeslee (maryb@ecos.org) no later than 12:00 Noon (EDT). Please note if Mary does not receive any emails there will be no call on Wednesday.
2. On Wednesday, October 5, October 12, October 19, and October 26 – Please join C-Team Conference Call 11:30 AM (EDT) – Number and Code are 888-205-5513 and 756558#

General Instructions and Additional Information

Here is some additional information you should know so that you can complete the web-based Quicksilver Caucus Mercury Survey.

A. GENERAL INSTRUCTIONS

1. **PLEASE NOTE -- There can only be ONE electronic submission per state.**
2. **REMEMBER**
   - DO NOT press **DONE** until entire survey is completed, reviewed, and edited.
   - Once you press **DONE**, then you will not be able to access the electronic survey form again.
   - Please do your best to fill out every question but if it is not possible to answer a question you may leave it blank.

Key Roles and Responsibilities

A. PRIMARY CONTACT -- Each state has or will designate an individual to work with the Quicksilver Caucus Compendium Team throughout the completion of the survey and final review of the submitted data. This individual will:

- Coordinate collection of survey information from participants within his or her state.
- Communicate with the QSC Compendium Team on questions or issues.
- Complete and submit **A SINGLE** electronic survey for the state.
- Review and correct information on a *PDF* copy post submission.

- If questions arise in completing the survey make sure to contact Mary Blakeslee (maryb@ecos.org) by noon (EDT) on Tuesdays and participate in the conference call with the Compendium Team on Wednesdays at 11:30 (EDT)

B. PARTICIPANTS -- All state staff working with the Primary Contact to provide data and information about the state's mercury activities. These individuals will use a *PDF* document to submit responses to the questions to the Primary Contact. The Primary Contact will enter the data into the electronic tool and then submit it.

C. ***FORMAT for entering website addresses*** on paper or electronic version enter is http://www.mercury activities.gov/other designation/other designation.htm

Instructions For Completing The Electronic Submission

A. THE PRIMARY CONTACT:

1. ***MUST*** use the **same computer** to enter data into the electronic survey document
2. ***CAN*** edit their electronic survey document until they have pressed **DONE** to complete the survey.
3. ***MUST NOT*** press **DONE** until they have completed, reviewed, and edited the entire survey.
4. ***MUST NOT*** clear cookies until the survey is completed and submitted.
5. ***MUST*** enter all contact information before completing the rest of the electronic survey.
6. ***CAN VIEW*** a summary of their data upon completion of the survey prior to submitting it and make corrections.

B. THE PARTICIPANTS will complete and submit a *PDF* document to their Primary Contact.

Instructions for Optional State Summaries of Mercury Program Activities and Accomplishments

Although the final Compendium report will include brief summaries of each state's responses to the Survey, in order to address initiatives and results that may not have been fully covered in the survey responses, each state is encouraged to submit a short summary of their key activities and accomplishments on the mercury issue. This is an optional submission. Summaries will be included in an Appendix to the final report, should be no more than 1 – 2 pages in length and should focus on issues, activities and accomplishments not fully captured in the Survey. Because of limited resources to edit and reformat submissions, the summary **MUST** follow the guidelines provided below regarding length, style, formatting and content. Submissions will be published as submitted and should be made by October 31, 2011 to Mary Blakeslee (maryb@ecso.org).

A. Length, Style and Formatting Requirements

- Length: 1 to 2 pages

- Title: (your state) Mercury Program Activities and Accomplishment Highlights; 12 point bold
- Program: Microsoft Word
- Font: Palatino Linotype
- Font size: Body text: 12 point; Section headings: 12 point, bold
- Spacing: 1.0
- Margins: 1 inch all sides

B. CONTENT – The summary should focus on issues, activities and accomplishments not fully captured in the Compendium Survey. Please organize the information included using the following section headings, as appropriate.

1. State Mercury Strategies or Plans
2. Mercury Research and Monitoring
3. Mercury Total Maximum Daily Load Activities
4. Outreach and Education Efforts
5. Dental Sector Activities
6. Mercury Containing Products
7. In State Mercury Sources
8. Other Efforts and Issues

2011 Compendium of State Mercury Activities Survey

1. Please provide the contact and organization information for the person serving as your state's primary contact for the 2011 Compendium of State Mercury Activities Survey.

		Response Percent	Response Count
Name		100.0%	42
Email address		100.0%	42
Phone number		100.0%	42
State name		100.0%	42
Department or Agency name		100.0%	42
Program (Air, Water, Hazardous Waste, Solid Waste, Pollution Prevention, Public Health, Other- - Specify)		100.0%	42
		answered question	42
		skipped question	0

2. Please indicate the status of mercury reduction plans or strategies in your state. (Select one.)

		Response Percent	Response Count
Mercury reduction plan or strategy in place		**51.2%**	**21**
Mercury reduction plan or strategy under development		9.8%	4
Intend to develop mercury reduction plan or strategy in the future		7.3%	3
No mercury reduction plan or strategy exists or is planned		31.7%	13
		answered question	**41**
		skipped question	**1**

3. Does your state participate in a regional or multistate or binational initiative to address mercury pollution?

		Response Percent	Response Count
Yes		**65.9%**	**27**
No		34.1%	14
		answered question	**41**
		skipped question	**1**

4. If your state participates in a regional or multistate or binational initiative, please provide a web address (if one exists) that provides information about this initiative.

	Response Count
	27
answered question	**27**
skipped question	**15**

5. Please identify the importance of each approach or activity listed below for the reduction or management of mercury in your state. (Select one item per row.)

	Very Important	Important	Not Important	Don't Know	Don't Use	Rating Average	Response Count
State and federal coordination	41.5% (17)	**48.8% (20)**	2.4% (1)	2.4% (1)	4.9% (2)	1.80	41
State to state information exchange	**43.9% (18)**	41.5% (17)	4.9% (2)	4.9% (2)	4.9% (2)	1.85	41
Coordinated efforts between media programs (such as air and water)	**65.9% (27)**	29.3% (12)	2.4% (1)	0.0% (0)	2.4% (1)	1.44	41
					answered question		**42**
					skipped question		**0**

6. Please identify the significance of each item listed below as a challenge to mercury reduction or management in your state. (Please select one item per row.)

	Very Significant	Significant	Not Significant	Don't Know	Rating Average	Response Count
Lack of legislative or regulatory mandate	28.2% (11)	**38.5% (15)**	33.3% (13)	0.0% (0)	2.05	39
Lack of state human resources	30.8% (12)	**46.2% (18)**	20.5% (8)	2.6% (1)	1.95	39
Lack of technical expertise or equipment	5.1% (2)	35.9% (14)	**56.4% (22)**	2.6% (1)	2.56	39
Lack of US EPA financial or technical support to states	28.2% (11)	**56.4% (22)**	15.4% (6)	0.0% (0)	1.87	39
Lack of federal and state coordination	7.7% (3)	41.0% (16)	**48.7% (19)**	2.6% (1)	2.46	39
Lack of long term funding	**57.5% (23)**	27.5% (11)	10.0% (4)	5.0% (2)	1.63	40
Other (Please specify in Q-7)	**50.0% (4)**	25.0% (2)	0.0% (0)	25.0% (2)	2.00	8
				answered question		**40**
				skipped question		**2**

7. If selected "other" to Q-6 "item posing a challenge", specify here.

	Response Count
	5
answered question	**5**
skipped question	**37**

8. Does your state currently conduct or has your state recently completed, any research/studies related to mercury?

		Response Percent	Response Count
Yes		**69.0%**	**29**
No		31.0%	13
		answered question	**42**
		skipped question	**0**

9. If you answered "yes" to Q-8 "research activities", provide the address for a website that describes these activities or briefly describe here.

EXAMPLE FORMAT for entering website addresses on paper or electronic version enter is http://www.mercury activities.gov/other designation/other designation.htm

	Response Count
	29
answered question	**29**
skipped question	**13**

10. Does your state have a main webpage related to mercury?

		Response Percent	Response Count
Yes		**65.0%**	**26**
No		35.0%	14
		answered question	**40**
		skipped question	**2**

11. If you answered "yes" to Q-10 "main webpage", please provide an address for the website(s) here.

	Response Percent	Response Count
Main Webpage Address	**96.4%**	**27**
Additional Webpage Address	35.7%	10
	answered question	**28**
	skipped question	**14**

12. Does your state collaborate with the medical community on the following: (Select all that apply.)

	Response Percent	Response Count
Fish consumption advisories	**76.2%**	**32**
Pollution prevention	59.5%	25
Dental issues	66.7%	28
Cultural/ritualistic uses	11.9%	5
Waste management requirements	54.8%	23
None	11.9%	5
Other (Please specify in Q-13)	16.7%	7
	answered question	**42**
	skipped question	**0**

13. If you selected "other" in Q-12 "collaboration with medical community", briefly describe here.

	Response Count
	8
answered question	**8**
skipped question	**34**

14. Does your state conduct mercury monitoring on any of the categories below? (Select all that apply.)

	Response Percent	Response Count
Air emissions from stacks	54.8%	23
Ambient air	31.0%	13
Atmospheric deposition (other than NADP participation)	31.0%	13
Indoor air (for the purposes of evaluating spill cleanup)	38.1%	16
Wastewater effluent	71.4%	30
Wastewater sludge	69.0%	29
Water column	71.4%	30
Waterbody sediment	57.1%	24
Fish tissue	**97.6%**	**41**
Wildlife	33.3%	14
Landfill	45.2%	19
None	0.0%	0
answered question		**42**
skipped question		**0**

15. If you indicated that your state conducts "fish tissue monitoring" in Q-14, identify the purpose(s) of your state's program. (Select all that apply.)

	Response Percent	Response Count
Determine need for establishing, revising, or removing fish consumption advisories	**95.1%**	**39**
Evaluate long term trends	80.5%	33
Evaluate changes in fish tissue mercury as a result of implementing mercury reduction programs	61.0%	25
Other (Please briefly describe in Q-16)	14.6%	6
	answered question	**41**
	skipped question	**1**

16. If you selected "other" in Q-15, please describe here.

	Response Count
	7
	answered question	**7**
	skipped question	**35**

17. What types of fish consumption advisories for mercury does your state have? (Please select all that apply.)

	Response Percent	Response Count
Statewide freshwater advisories	65.9%	27
Statewide coastal advisories	17.1%	7
Waterbody-specific advisories	**95.1%**	**39**
	answered question	**41**
	skipped question	**1**

18. Does your state have any US EPA-approved TMDLs for mercury? (Select all that apply.)

	Response Percent	Response Count
No	**52.4%**	**22**
Yes, Waterbody-specific	21.4%	9
Yes, Statewide	4.8%	2
Yes, Multistate	16.7%	7
Yes, Watershed or basin	9.5%	4
	answered question	**42**
	skipped question	**0**

19. Please specify the primary sources of mercury addressed in your state's TMDLs. (Select all that apply.)

	Response Percent	Response Count
Atmospheric deposition	**82.6%**	**19**
Legacy sources	21.7%	5
Wastewater treatment plant discharges	34.8%	8
Stormwater discharges	21.7%	5
Active mining	17.4%	4
Solid or hazardous waste sites	0.0%	0
	answered question	**23**
	skipped question	**19**

20. If your state has not developed a mercury TMDL, are you in the process of or do you have plans to develop one?

	Response Percent	Response Count
No	**65.4%**	**17**
Yes, Waterbody-specific	7.7%	2
Yes, Statewide	19.2%	5
Yes, Multistate	7.7%	2
Yes, Watershed or basin	0.0%	0
	answered question	**26**
	skipped question	**16**

21. Has your state pursued a watershed management plan in lieu of a TMDL to address atmospheric deposition of mercury?

	Response Percent	Response Count
Yes	0.0%	0
No	**100.0%**	**40**
	answered question	**40**
	skipped question	**2**

22. Does your state take a multimedia approach when developing mercury TMDLs or watershed plans?

	Response Percent	Response Count
Yes	**69.4%**	**25**
No	30.6%	11
	answered question	**36**
	skipped question	**6**

23. Please describe whether your state's program for managing dental mercury is mandatory voluntary, or both.

PRIMARY CONTACTS select mandatory or voluntary or both for each row from the dropdown m

STATE PARTICIPANTS using a PDF document, enter M for mandatory, V for voluntary, or B for b each row.

State Program Type

	Mandatory	Voluntary	Both	R
Statewide program to address dental mercury	43.3% (13)	**56.7% (17)**	0.0% (0)	
State requires or recommends dentists install amalgam separators	31.4% (11)	**65.7% (23)**	2.9% (1)	
State requires or recommends use of American Dental Association's (ADA) best management practices	19.4% (6)	**80.6% (25)**	0.0% (0)	
State requires or recommends best management practices that are different from ADA	33.3% (9)	**63.0% (17)**	3.7% (1)	
State requires or recommends installation of amalgam separators at dental offices on septic systems	41.4% (12)	**58.6% (17)**	0.0% (0)	
			answered question	
			skipped question	

24. Does your state allow dentists to use collection tanks instead of separators to capture amalgam waste?

	Response Percent	Response Count
Yes	**64.7%**	**22**
No	35.3%	12
	answered question	**34**
	skipped question	**8**

25. Provide your best estimate of the percentage of dentists in your state that have installed amalgam separators or collection tanks to collect mercury. (Please select one.)

	Response Percent	Response Count
01 to 20%	17.9%	7
21 to 40%	7.7%	3
41 to 60%	0.0%	0
61 to 80%	5.1%	2
81 to 100%	23.1%	9
Unknown	**46.2%**	**18**
	answered question	**39**
	skipped question	**3**

26. Are there POTWs in your state that have requirements beyond the state's?

	Response Percent	Response Count
Yes	34.2%	13
No	**65.8%**	**25**
	answered question	**38**
	skipped question	**4**

27. Please indicate the significance of the following activities in promoting proper management of dental amalgam in your state.

	Very Signifcant	Significant	Not Signficant	Don't Know/Don't Use	Rating Average	Response Count
Cost assistance for purchasing amalgam separators	5.1% (2)	12.8% (5)	23.1% (9)	**59.0% (23)**	3.36	39
State dental association outreach	**43.6% (17)**	25.6% (10)	7.7% (3)	23.1% (9)	2.10	39
General mailings and articles	7.7% (3)	**41.0% (16)**	15.4% (6)	35.9% (14)	2.79	39
Workshops and/or training	7.7% (3)	**41.0% (16)**	17.9% (7)	33.3% (13)	2.77	39
Technical assistance visits at dental offices	5.3% (2)	21.1% (8)	23.7% (9)	**50.0% (19)**	3.18	38
Compliance visits at dental offices	7.7% (3)	30.8% (12)	20.5% (8)	**41.0% (16)**	2.95	39
Amalgam separator removal efficiency review	10.3% (4)	15.4% (6)	23.1% (9)	**51.3% (20)**	3.15	39
				answered question		**39**
				skipped question		**3**

28. Does your state ban any mercury containing products based on the quantity or concentration (e.g., ppm) of mercury in products, rather than just the presence of mercury in the product?

	Response Percent	Response Count
Yes	20.0%	7
No	**80.0%**	**28**
	answered question	**35**
	skipped question	**7**

29. Please identify your state's requirements for the mercury containing product categories lis

PRIMARY CONTACTS select options from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter:

- **MP for Mandatory program**
- **VP for Voluntary program**
- **PSM for Plans to start a mandatory program**
- **PSV for Plans to start a voluntary program**
- **NP for No plan**

Labeling Requirements

	Mandatory program	Voluntary program	Plans for starting a mandatory program	Plans for starting a voluntary program
Bearings, rings or seals	16.7% (6)	0.0% (0)	0.0% (0)	0.0% (0)
Cosmetics	5.6% (2)	0.0% (0)	0.0% (0)	0.0% (0)
Electrodes	23.7% (9)	0.0% (0)	0.0% (0)	0.0% (0)
Lighting	31.6% (12)	0.0% (0)	0.0% (0)	0.0% (0)
Measuring devices	26.3% (10)	0.0% (0)	0.0% (0)	0.0% (0)
Medical devices	28.9% (11)	0.0% (0)	0.0% (0)	0.0% (0)
Mercury compounds, formulated products, or reagents	21.1% (8)	0.0% (0)	0.0% (0)	0.0% (0)
Pharmaceuticals	8.1% (3)	0.0% (0)	0.0% (0)	0.0% (0)
Switches and relays	29.7% (11)	0.0% (0)	0.0% (0)	0.0% (0)
Thermometers	28.9% (11)	0.0% (0)	0.0% (0)	0.0% (0)
Thermostats	28.9% (11)	0.0% (0)	0.0% (0)	0.0% (0)
Toys/novelty items	16.7% (6)	0.0% (0)	0.0% (0)	0.0% (0)
Wheel balancers/weights	18.9% (7)	0.0% (0)	0.0% (0)	0.0% (0)

Vaccines	5.4% (2)	0.0% (0)	0.0% (0)	0.0% (0)

Sales/Distribution Ban

	Mandatory program	Voluntary program	Plans for starting a mandatory program	Plans for starting a voluntary program
Bearings, rings or seals	10.8% (4)	0.0% (0)	0.0% (0)	0.0% (0)
Cosmetics	18.4% (7)	0.0% (0)	0.0% (0)	0.0% (0)
Electrodes	10.8% (4)	0.0% (0)	0.0% (0)	0.0% (0)
Lighting	10.8% (4)	0.0% (0)	0.0% (0)	2.7% (1)
Measuring devices	39.5% (15)	2.6% (1)	0.0% (0)	0.0% (0)
Medical devices	34.2% (13)	0.0% (0)	0.0% (0)	0.0% (0)
Mercury compounds, formulated products, or reagents	13.5% (5)	0.0% (0)	0.0% (0)	0.0% (0)
Pharmaceuticals	7.9% (3)	0.0% (0)	0.0% (0)	0.0% (0)
Switches and relays	35.1% (13)	2.7% (1)	0.0% (0)	0.0% (0)
Thermometers	**50.0% (19)**	2.6% (1)	0.0% (0)	0.0% (0)
Thermostats	47.4% (18)	2.6% (1)	0.0% (0)	0.0% (0)
Toys/novelty items	31.6% (12)	0.0% (0)	0.0% (0)	0.0% (0)
Wheel balancers/weights	18.9% (7)	0.0% (0)	2.7% (1)	0.0% (0)
Vaccines	10.8% (4)	0.0% (0)	0.0% (0)	0.0% (0)

Household Disposal Ban

	Mandatory program	Voluntary program	Plans for starting a mandatory program	Plans for starting a voluntary program
Bearings, rings or seals	15.8% (6)	7.9% (3)	0.0% (0)	0.0% (0)
Cosmetics	0.0% (0)	8.1% (3)	0.0% (0)	0.0% (0)
Electrodes	15.8% (6)	10.5% (4)	0.0% (0)	0.0% (0)
Lighting	21.1% (8)	10.5% (4)	0.0% (0)	2.6% (1)

Measuring devices	18.4% (7)	13.2% (5)	0.0% (0)	0.0% (0)
Medical devices	18.4% (7)	13.2% (5)	0.0% (0)	0.0% (0)
Mercury compounds, formulated products, or reagents	7.9% (3)	10.5% (4)	0.0% (0)	0.0% (0)
Pharmaceuticals	5.3% (2)	15.8% (6)	0.0% (0)	0.0% (0)
Switches and relays	18.4% (7)	13.2% (5)	0.0% (0)	2.6% (1)
Thermometers	20.5% (8)	15.4% (6)	0.0% (0)	2.6% (1)
Thermostats	21.1% (8)	13.2% (5)	0.0% (0)	2.6% (1)
Toys/novelty items	15.8% (6)	10.5% (4)	0.0% (0)	0.0% (0)
Wheel balancers/weights	18.4% (7)	10.5% (4)	0.0% (0)	2.6% (1)
Vaccines	0.0% (0)	10.8% (4)	0.0% (0)	0.0% (0)

30. Please identify your state's requirements for the mercury containing product categories lis

PRIMARY CONTACTS select options from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter under "Collection Program":

- **MP for Mandatory program**
- **VP for Voluntary program**
- **PSM for Plans to start a mandatory program**
- **PSV for Plans to start a voluntary program**
- **NP for No plan**

Enter Y for yes, or N for no, or PS for plan to establish an incentive program under "

Collection Program

	Manditory program	Voluntary program	Plans to start a mandatory program	Plans to start a voluntary program
Bearings, rings or seals	10.5% (4)	13.2% (5)	0.0% (0)	0.0% (0)
Cosmetics	0.0% (0)	10.5% (4)	0.0% (0)	0.0% (0)
Electrodes	7.9% (3)	13.2% (5)	0.0% (0)	0.0% (0)
Lighting	15.4% (6)	**46.2% (18)**	0.0% (0)	0.0% (0)
Measuring devices	13.2% (5)	36.8% (14)	0.0% (0)	0.0% (0)
Medical devices	13.2% (5)	31.6% (12)	0.0% (0)	0.0% (0)
Mercury compounds, formulated products, or reagents	0.0% (0)	23.7% (9)	0.0% (0)	0.0% (0)
Pharmaceuticals	0.0% (0)	39.5% (15)	0.0% (0)	2.6% (1)
Switches and relays	30.0% (12)	**42.5% (17)**	0.0% (0)	0.0% (0)
Thermometers	13.2% (5)	**50.0% (19)**	0.0% (0)	0.0% (0)
Thermostats	28.9% (11)	**42.1% (16)**	2.6% (1)	0.0% (0)
Toys/novelty items	5.3% (2)	23.7% (9)	0.0% (0)	0.0% (0)

Wheel balancers/weights	10.5% (4)	23.7% (9)	0.0% (0)	0.0% (0)
Vaccines	0.0% (0)	18.4% (7)	0.0% (0)	2.6% (1)

Financial Incentive

	Yes	No	Plans to
Bearings, rings or seals	0.0% (0)	**100.0% (38)**	
Cosmetics	0.0% (0)	**100.0% (38)**	
Electrodes	0.0% (0)	**100.0% (38)**	
Lighting	7.7% (3)	**89.7% (35)**	
Measuring devices	0.0% (0)	**100.0% (38)**	
Medical devices	2.6% (1)	**97.4% (37)**	
Mercury compounds, formulated products, or reagents	2.6% (1)	**97.4% (37)**	
Pharmaceuticals	0.0% (0)	**100.0% (38)**	
Switches and relays	25.0% (10)	**75.0% (30)**	
Thermometers	5.3% (2)	**94.7% (36)**	
Thermostats	10.5% (4)	**78.9% (30)**	
Toys/novelty items	0.0% (0)	**100.0% (38)**	
Wheel balancers/weights	0.0% (0)	**100.0% (38)**	
Vaccines	0.0% (0)	**100.0% (37)**	

31. If your state has a mercury collection program, please indicate who funds the program. (Select all that apply.)

	Response Percent	Response Count
Local governments	48.6%	18
State	**75.7%**	**28**
Federal	27.0%	10
Manufacturer	51.4%	19
Users	21.6%	8
Waste processors	16.2%	6
	answered question	**37**
	skipped question	**5**

32. Does your state have a process for granting exemptions from product phase-outs or bans/limits?

	Response Percent	Response Count
Yes	40.5%	15
No	**59.5%**	**22**
	answered question	**37**
	skipped question	**5**

33. Do you have an inventory of mercury sources/uses in your state? (Select all that apply.)

	Response Percent	Response Count
None	17.1%	7
Yes, estimates for amount of mercury released to the environment from air emission sources	**80.5%**	**33**
Yes, estimates for amount of mercury released to the environment from water pollution sources	31.7%	13
Yes, estimates for amount of mercury released to the environment from solid wastes such as sludge reuse, broken products, etc.	17.1%	7
Yes, inventory of amount of mercury used in products and processes	14.6%	6
	answered question	**41**
	skipped question	**1**

34. If available, please enter up to three web addresses that summarize mercury inventory data for your state.

EXAMPLE FORMAT for entering website addresses on paper or electronic version enter is http://www.mercury activities.gov/other designation/other designation.htm

		Response Percent	Response Count
Web Address 1		**100.0%**	**18**
Web Address 2		27.8%	5
Web Address 3		11.1%	2
	answered question		**18**
	skipped question		**24**

35. Please provide information about anthropogenic (manmade) sources of *AIR* mercury releases to the environment in your state.

PRIMARY CONTACTS select Yes or No for each item from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter Y for yes and N for no in each box in the row.

Source Present in State

	Yes	No	Response Count
Coal-fired electric power plants	**89.7% (35)**	10.3% (4)	39
Electric arc furnaces	**64.1% (25)**	35.9% (14)	39
Industrial/commercial boilers	**100.0% (39)**	0.0% (0)	39
Biomass boilers	**84.6% (33)**	15.4% (6)	39
Commercial sources (manufacturing/industrial)	**87.2% (34)**	12.8% (5)	39
Dismantlers, shredders	**84.2% (32)**	15.8% (6)	38
Foundries	**69.2% (27)**	30.8% (12)	39
Integrated steel facilities	30.8% (12)	**69.2% (27)**	39
Sewage sludge incinerators	**53.8% (21)**	46.2% (18)	39
Chlor-alkali plants	12.8% (5)	**87.2% (34)**	39
Hazardous waste incinerators	43.6% (17)	**56.4% (22)**	39
Municipal solid waste incinerators/combustors	**64.1% (25)**	35.9% (14)	39
Medical waste incinerators	**51.3% (20)**	48.7% (19)	39
Gold mining	23.1% (9)	**76.9% (30)**	39
Other mining	**69.2% (27)**	30.8% (12)	39
Crematoria	**97.4% (38)**	2.6% (1)	39

Oil refining	**53.8% (21)**	46.2% (18)	39
Primary aluminum production	23.1% (9)	**76.9% (30)**	39
Secondary aluminum production	**56.4% (22)**	43.6% (17)	39
Cement kilns	**66.7% (26)**	33.3% (13)	39
Home heating	**89.5% (34)**	10.5% (4)	38
Mobile sources	**86.8% (33)**	13.2% (5)	38

Do you have more stringent statewide requirements for this source than US EPA?

	Yes	No	Response Count
Coal-fired electric power plants	38.5% (15)	**61.5% (24)**	39
Electric arc furnaces	14.3% (5)	**85.7% (30)**	35
Industrial/commercial boilers	15.8% (6)	**84.2% (32)**	38
Biomass boilers	13.5% (5)	**86.5% (32)**	37
Commercial sources (manufacturing/industrial)	16.7% (6)	**83.3% (30)**	36
Dismantlers, shredders	18.9% (7)	**81.1% (30)**	37
Foundries	14.3% (5)	**85.7% (30)**	35
Integrated steel facilities	5.9% (2)	**94.1% (32)**	34
Sewage sludge incinerators	18.9% (7)	**81.1% (30)**	37
Chlor-alkali plants	3.1% (1)	**96.9% (31)**	32
Hazardous waste incinerators	5.7% (2)	**94.3% (33)**	35
Municipal solid waste incinerators/combustors	25.0% (9)	**75.0% (27)**	36
Medical waste incinerators	19.4% (7)	**80.6% (29)**	36
Gold mining	6.1% (2)	**93.9% (31)**	33
Other mining	8.3% (3)	**91.7% (33)**	36
Crematoria	10.3% (4)	**89.7% (35)**	39

Oil refining	5.7% (2)	**94.3% (33)**	35
Primary aluminum production	12.1% (4)	**87.9% (29)**	33
Secondary aluminum production	9.1% (3)	**90.9% (30)**	33
Cement kilns	11.1% (4)	**88.9% (32)**	36
Home heating	2.7% (1)	**97.3% (36)**	37
Mobile sources	5.3% (2)	**94.7% (36)**	38

Do you have statewide reqirements for monitoring/measuring releases?

	Yes	No	Response Count
Coal-fired electric power plants	43.6% (17)	**56.4% (22)**	39
Electric arc furnaces	8.6% (3)	**91.4% (32)**	35
Industrial/commercial boilers	15.4% (6)	**84.6% (33)**	39
Biomass boilers	12.8% (5)	**87.2% (34)**	39
Commercial sources (manufacturing/industrial)	15.8% (6)	**84.2% (32)**	38
Dismantlers, shredders	11.1% (4)	**88.9% (32)**	36
Foundries	11.4% (4)	**88.6% (31)**	35
Integrated steel facilities	8.8% (3)	**91.2% (31)**	34
Sewage sludge incinerators	23.7% (9)	**76.3% (29)**	38
Chlor-alkali plants	3.1% (1)	**96.9% (31)**	32
Hazardous waste incinerators	11.4% (4)	**88.6% (31)**	35
Municipal solid waste incinerators/combustors	30.6% (11)	**69.4% (25)**	36
Medical waste incinerators	27.0% (10)	**73.0% (27)**	37
Gold mining	8.8% (3)	**91.2% (31)**	34
Other mining	11.1% (4)	**88.9% (32)**	36

Crematoria	10.3% (4)	**89.7% (35)**	39
Oil refining	5.6% (2)	**94.4% (34)**	36
Primary aluminum production	5.9% (2)	**94.1% (32)**	34
Secondary aluminum production	5.9% (2)	**94.1% (32)**	34
Cement kilns	19.4% (7)	**80.6% (29)**	36
Home heating	2.6% (1)	**97.4% (38)**	39
Mobile sources	2.6% (1)	**97.4% (38)**	39
		answered question	**40**
		skipped question	**2**

36. Please provide information about anthropogenic (manmade) sources of *WATER AND SOLID WASTE-RELATED* mercury releases to the environment in your state.

PRIMARY CONTACTS select Yes or No for each item from the dropdown menu.

STATE PARTICIPANTS using a PDF document, enter Y for yes and N for no in each box in the row.

Source Present in State

	Yes	No	Response Count
Wastewater treatment plant sludge	**97.4% (38)**	2.6% (1)	39
Wastewater treatment plant effluent	**92.5% (37)**	7.5% (3)	40
Broken mercury-containing products & spills	**94.9% (37)**	5.1% (2)	39

Do you have more stringent statewide requirements for this source than US EPA?

	Yes	No	Response Count
Wastewater treatment plant sludge	13.2% (5)	**86.8% (33)**	38
Wastewater treatment plant effluent	13.2% (5)	**86.8% (33)**	38
Broken mercury-containing products & spills	8.3% (3)	**91.7% (33)**	36

Do you have statewide reqirements for monitoring/measuring releases?

	Yes	No	Response Count
Wastewater treatment plant sludge	44.7% (17)	**55.3% (21)**	38
Wastewater treatment plant effluent	**53.8% (21)**	46.2% (18)	39
Broken mercury-containing products & spills	22.2% (8)	**77.8% (28)**	36

answered question	41
skipped question	1

37. Have you published mercury release information for your instate sources since 2000?

	Response Percent	Response Count
Yes	40.0%	16
No	**60.0%**	**24**
answered question		**40**
skipped question		**2**

38. If you answered "yes" to question 37 "published release data", enter address of website where it can be found.

EXAMPLE FORMAT for entering website addresses on paper or electronic version enter is http://www.mercury activities.gov/other designation/other designation.htm

	Response Count
	13
answered question	**13**
skipped question	**29**

39. BEFORE YOU CLICK ON "DONE"

Have you answered all the questions you plan to answer before submitting the survey and reviewed and edited your answers? If you haven't, select NO and return to the beginning of the document. If yes, proceed to click DONE.

	Response Percent	Response Count
NO, I need to review and revise my answers	0.0%	0
Yes, I am ready to click DONE	**100.0%**	**40**
answered question		**40**
skipped question		**2**