Pollutions Solutions Update

US EPA Great Lakes National Program Office
Pollution Prevention and Toxics Reduction
Grant Program Results
FY 2002

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Executive Summary

A total of fifteen (15) pollution prevention and toxics reduction grants were awarded by the Great Lakes National Program Office in FY 2002, totaling $680,620 plus $350,247 leveraged funds + $400,000 program investment. The following measurable outcomes were achieved:

- Mercury-containing products collected: 2,604 feet of fluorescent lighting at a household hazardous waste collection.
- Electronic equipment collected: 3,892 computer monitors and 3,088 CPUs from a household hazardous waste collection program (representing about **14,789 lbs of lead** *based on 3.8 lbs/CRT*.)
- Lbs of printers and other misc. equipment (not including computers and monitors) collected at a household hazardous waste collection: over 62,000.
- Lindane use eliminated in 33 medical clinics in the NYC area.

Title: Erie County Fluorescent Light, Ballast & TV Recycling Project
EPA Grant Number: GL 97595401-1
Organization: Erie County, New York

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Project Statistics:
Award Amount: $ 35,000
Dollars Leveraged: $4,515
Project Timetable: 1/1/03- 12/31/04
Lake Basin(s): Lakes Erie, Ontario
Project Type: HHW collection

Summary:
Building on the success of the Computer Recycling Program, Erie County expanded the program to include fluorescent bulbs, appliances, and television sets. The events were renamed Electronics Collection Events and scheduled the Saturday following the Household Hazardous Waste Collection event. The reasoning for this was twofold. The HHW program is very popular with residents and flyers were handed out to promote the program. In addition, in the event that a resident tried to dispose of a computer or electronic at the HHW, the item could be held until the following week. This project will reduce not only the loadings of PCBs and mercury, categorized by the U.S. EPA as Persistent Bioaccumulative and Toxic pollutants (PBTs) from entering the Great Lakes Basin, but will reduce amounts of Antimony, Lead and Cadmium as well.

Environmental Results/Products:
Erie County Fluorescent, Ballast and TV Recycling Project

Total collected over 2 years

Total Cars Participating	3,562
Monitors	3,892
CPU's	3,088
Scanners	172
Misc equip (lbs)	33,862
Printers (lbs)	28,197
TV's	572
Appliances	309
Fluorescent Bulbs (ft)	2,604
Ballasts (lbs)	82

Partners:
- New York State Energy Research and Development
- Northeast Southtowns Solid Waste Board in Erie county
- Northwest Solid Waste Management Board
- City of Buffalo
- Erie County Parks Department

- Buffalo and Erie County Public Library
- 2003 – Electronic Recycling Technologies
  Quality First Appliance
  2004 – Rochester Computer Recycling
  Quality First Appliance

Title: Dioxin Emissions Inventory Project for Lake Superior Basin
Organization: University of Wisconsin – Superior: Lake Superior Research Institute
Grant Number: GL97513101

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Project Statistics:
Award: $30,000
Leveraged funding – $4,500
Lake Basin: Superior
Project Timetable: 10/01/02 – 9/30/04
Project Type: Inventory

Summary:
The Lake Superior Lakewide Management Plan (LaMP) and Great Lakes Binational Toxics Reduction Strategy (GLBTS) rely on estimates of target pollutant emission, discharge, use and disposal to develop baseline information and report progress toward pollutant reduction targets. Most regulatory reporting requirements do not provide the level of detail for air emissions of dioxins that allow management programs to judge progress against reduction goals. In addition many of the important source categories of dioxin, such as open burning of garbage, are not reported under regulatory programs. In order to judge progress on meeting the LaMP and GLBTS reduction targets, there is a need for regionally specific and appropriate information which includes a technique for developing the estimates and inventories that can be easily repeated or updated when new information is available. Adequate estimates will require regionally appropriate assumptions, emission factors, studies, knowledge of the facilities present and their processes, and professional judgment of local regulatory personnel. This knowledge would help determine the relative importance of small incinerators, large industrial incineration, and open garbage burning (burn barrels) as dioxin source categories in the Lake Superior Basin.

The goal of this inventory project is to enable the Lake Superior Binational Program and Lakewide Management Plan to track progress and report on the dioxin reduction milestones in the Lake Superior Basin. It will also determine the most important source categories to guide agency priorities for action.

Outcomes:
Development of detailed dioxin emissions inventory for the Lake Superior basin that can be used as a baseline to assess impacts of management programs and to track progress towards achieving the LaMP reduction targets. State programs from WI, MI, and MN worked together to develop this detailed estimate that vastly improved upon estimate derived from national and regional emission inventories (RAPIDS and TRI). The improvements are a product of the grantee and co-investigators working directly with sources and municipalities (to derive areas source estimates for burn barrels among other categories).

Title: Eliminating PBTs from Products and Waste
Organization: Great Lakes United
Grant Number: GL 97523501

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Project Statistics:
Award: $40,000
Lake Basin: All
Project Timetable: 10/1/2002 – 9/30/2003
Project Type: Education and Outreach

Summary:
GLU organized a five-part online conference, "Get the Mercury Out," to discuss the current state of automotive mercury switches in North America and develop the next steps for reducing mercury pollution in this industry.

GLU identified clean production technical assistance centers in the Great Lakes states and surveyed them to discover what services they provide. The survey focused on the technical assistance centers' actions toward reducing production of PBT chemicals. The survey also asked for names of additional technical assistance providers to complete a database of clean production resources. Information from the survey was incorporated into GLU's Great Lakes Green Book.

GLU co-organized and participated in a workshop on extended producer responsibility. Participants developed plans to promote extended producer responsibility in North America.
GLU participated in the GLBTS integration and substance workgroups.

Products:
"Get the Mercury Out" web conference
Survey results from clean production technical assistance providers in the Great Lakes states
"The Great Lakes Green Book: A Citizens' Action Agenda for the Great Lakes" (some contents partially supported by this grant)
Extended producer responsibility discussion meeting
Newsletters

Title: Regional Burn Barrel Campaign
EPA Grant Number: X-97585801
Organization: Western Lake Superior Sanitary District

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Project Statistics:
Award Amount: 55,000
Dollars Leveraged: 11,800
Project Timetable: 07/01/02 - 06/30/05
Lake Basin(s): Lake Superior
Project Type: Education/Outreach

Summary: The original deliverables for this grant were: 1) Evaluation of education and outreach strategies developed by WLSSD through statistical review; 2) Reworking of existing outreach materials and strategies based on actual campaign experience; 3) Planning and hosting a Workshop for Local Officials from Lake Superior watershed states about the dangers and alternatives to the practice of garbage burning; 4) Production of a General Guide "for all jurisdictions" that incorporates a variety of outreach strategies, information about enforcement and solid waste disposal infrastructure; 5) Expansion of the WLSSD education campaign to the Lake Superior Basin; 6) Development of additional outreach and education material as needed.

Environmental Results/Products: In October 2002, 720 local officials and decision makers from around Lake Superior (targeting Michigan, Minnesota and Wisconsin watershed counties) received a written survey and associated reminder literature asking for response to questions about their knowledge and involvement with open burning issues. This survey explored whether there were local laws regulating open burning, how or if they were enforced, availability of garbage collection services and willingness to participate in new anti-burning campaigns or campaign development. The survey also sought to gauge official's awareness of the burn barrel education campaign that WLSSD began in 2001.

109 officials returned the surveys. Of those, 41% said they were involved with public information issues related to open burning. 49% of those respondents said they believed they had enough information about the issues involving the subject. Overall, less than 15% of respondents were aware of the WLSSD burn barrel awareness campaign. That result included residents from MI, where the campaign was not run. 17% of the Minnesota respondents and over 22% of the Wisconsin respondents were aware of the campaign. 56% of the respondents requested additional information about the campaign.

In late 2004, the Minnesota Office of Environmental Assistance contracted with the same survey company to conduct a state-wide telephone survey to assess attitudes and practices related to open burning among the general public. The survey was based upon the first Open Burning survey developed and conducted by WLSSD in late 1999 to assess baseline burn barrel activities and attitudes among the general public in the WLSSD service area and Northwestern Wisconsin. This survey was designed to more directly

measure the impact of the 2001 burn barrel awareness campaign. Grant funds were used to assist with the MOEA project and enabled the survey to be fully funded and include more detailed questions about burning behavior in this region of MN.

The findings of the study were based on the results compiled from 834 interviews completed with residents of 470 communities living in eighty of Minnesota's eighty-seven counties. Major metropolitan areas were excluded. State-wide, 44% of respondents said that they occasionally use a burn barrel or fire pit to dispose of household waste, including paper. In the Northeastern MN area, just over 35% admitted to burning household waste. This was the second lowest rate of the 5 different MN regions surveyed. Residents from the NE region of the state were the most likely to realize that burning of household trash was not legal in their area (69.5%) and to believe that garbage burning releases pollutants that can harm wildlife, livestock and the environment (64.7%). These residents were also most likely to believe that "Chemicals released from burning garbage can cause serious health problems in people…" (68.1%). These levels are significantly higher than the results from any other region of the state where no educational campaigns about the hazards of open burning had been conducted. This leads WLSSD and other agencies to believe that the educational campaign was effective in educating the public, but shows that additional work may be needed to convince all residents to completely stop burning.

On March 4th, 2005, a workshop was held in Duluth, MN for local officials and others interested in the issue of open burning. The workshop, titled "Open Garbage Burning: Preventable Pollution" included over 20 presenters from state and environmental agencies in MN, MI and WI. Over 80 local officials and experts from largely MN and WI gathered for the full day to attend sessions, discuss and share ideas on open burning education, waste disposal infrastructure and burning law enforcement. Based upon information gathered and connections formed at the Open Garbage Burning workshop in March, 2005, work was able to commence on a General Guide for local officials relevant to many jurisdictions. Titled "Clearing the Air: Tools for Reducing Residential Garbage Burning" this 42-page guide incorporates an update of the 1996 "Guide to Reducing Backyard Burning" produced by the Minnesota Office of Environmental Assistance.

In addition, a CD Burn Barrel Media Kit is available. This piece includes all elements of the "Bernie the Burn Barrel" education media campaign in general formats with blank areas for other agencies to easily use and add their own contact information to the materials. PDF, JPG and EPS files are included, as well as simple line and clip art for use by small communities without access to editing software.

The guide was distributed to over 800 local officials, solid waste administrators and rural extension educators around Lake Superior. Additional paper copies and the CD Media Kit can be requested from WLSSD or from the MN Office of Environmental Assistance Clearinghouse free of charge. Digital files of all materials are also available at www.wlssd.com and may be available at additional burn barrel websites in the future.

Partners:
Local municipal and tribal governments
Local fire departments and non-profit environmental organizations
Minnesota DNR
Wisconsin DNR
Minnesota PCA
MPCA Office of Environmental Assistance

Title: Mercury Thermostat Collection at Weatherization Agencies
EPA Grant Number: GL-00586101
Organization: Wisconsin Department of Administration, Division of Energy

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Project Statistics:
Award Amount: $26,500
Dollars Leveraged: $1,500
Project Timetable: 10/1/02 – 03/30/05
Lake Basin(s): Lake Michigan, Superior
Project Type: Collection

Summary: In this project, the Wisconsin state energy office promoted thermostat recycling among its low income Weatherization agencies and their subcontractors. In addition, the energy office worked with the wider HVAC wholesaler and contractor community in the state toward more comprehensive thermostat recycling. By leveraging its ongoing energy efficiency activities, the energy office was able to make significant progress in broadening and institutionalizing the participation in thermostat recycling.

Environmental Results/Products: This project increased the number of Wisconsin wholesalers participating in the TRC program by 10%.

During the period from the fall of 2002 to March 2005, Wisconsin thermostat collections varied, but overall they increased by 8% or 570 thermostats per year over a 2002 baseline. The number of thermostats collected through the TRC program from Wisconsin for the years 2002 to 2004 are: 2002: 6,800 thermostats; 2003: 5,086 thermostats; 2004: 7,373 thermostats. This result fell short of the goal of collecting 6,000 more thermostats per year in the state.

However, the project did establish some new practices that may produce more significant results in future years. For example, this project was able to integrate mercury thermostat recycling messages for the first time into Wisconsin Focus on Energy activities (web site, trainings, mailings going to virtually all HVAC contractors in the state). Focus on Energy works with most of the HVAC contractors in the state and provides each year many thousands of rebates to them for installing efficient furnaces and central air conditioners. This new partnership with a statewide energy efficiency program has the potential to achieve more than working with Weatherization agencies alone.

This project found that thermostat recycling activity among Weatherization agency subcontractors was relatively high compared to the general HVAC contractor community. However, rural agencies and contractors have higher barriers to recycling than other contractors. Since Weatherization agencies in Wisconsin now re-bid furnace installation contracts on a regular basis, contractors change. The message to recycle should be re-stated regularly and in different forums and formats for contractors. The beginning of a new contract is a good time to reach contractors with information about the need to recycle and how to do it. Establishing strong recycling habits in the contractor

community at large complements efforts to assist Weatherization contractors specifically, especially since there is exchange between these pools.

Those contractors who recycle now report no significant inconvenience in doing so. However, there are surprising gaps in recycling among both contractors and wholesalers. The project used outreach, information, and encouragement to effectively establish more participation in recycling. Relatively late in the project, implementers analyzed records from the TRC program and discovered that many Wisconsin wholesalers who joined around 2000 have never turned in a bin of thermostats. Future efforts to increase recycling participation should focus not only on non-participants, but also on nominal participants who are relatively inactive.

This project integrated mercury thermostat recycling messages for the first time into the state's major energy efficiency program. This new partnership has great potential. For example, because of this partnership, Wisconsin expects to enlist two hundred of its HVAC contractors this year to participate in the TRC program, which has just opened up to direct participation by HVAC contractors. This will make it easier for HVAC contractors, particularly rural ones, to recycle thermostats and should significantly increase the state's thermostat collection results.

Partners:
HVAC wholesalers and contractors
Wisconsin DNR

Title: Mona Lake Watershed Hazardous Waste Disposal Program
EPA Grant Number: GL975180-01
Organization: Muskegon County (MI) Health Dept.

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Project Statistics:
Award Amount: $9,120
Dollars Leveraged: $1,200
Project Timetable: 10/1/02-9/30/04
Lake Basin(s): Michigan
Project Type: Education/Outreach

Summary:
The Mona Lake Watershed Hazardous Waste Disposal Program (MLWHWDP) was developed and implemented to address the on-going problem of non-point and point source pollution of the surface waters and sediments. The MLWHWDP attempted to address directly preventing further pollution in the watershed by educating the public about the need for safe disposal of toxic wastes. Educational sessions were developed as objectives. These sessions were presented to a wide variety of groups including business and industry, stake-holders who live in the watershed, civic organizations, real estate developers and builders, homeowner associations and outlying municipal governments. Sessions covered the scope of the Mona Lake Watershed, how the waters drain into Lake Michigan, what constitutes a hazardous waste, industrial versus household disposal methods and utilization of the existing program for HHW disposal in Muskegon County. In addition, a storm drain stenciling project was re-established which involved the stake-holders.

Environmental Results/Products:
Throughout the year of this grant, there were approximately 1,000 brochures distributed. Educational sessions were held for 25-30 businesses, industries and organizations. Several of these educational sessions were held as a collaborative effort organized by the Mona Lake Project of the Muskegon Community Foundation, and included the Muskegon Conservation District, the Annis Water Resources Center and municipal governmental representatives.

The progress toward the goals was mixed. In some cases the educational sessions were heartily welcomed, and in other situations they were met with some suspicion. The immediate stake-holders were enthusiastic, particularly those people who live or use Mona Lake for recreation. It became clear as the project progressed, that there had been some similar efforts in the past that had come to naught. Because of these failures, many stake-holders were somewhat cynical, although still concerned about the possibility of making any actual change.

It appears that there is still a low level of understanding in many of the outlying rural communities in the Mona Lake Watershed about the importance of safe disposal of

hazardous wastes, and how individuals can have a direct impact on the quality of the water in their environment. Awareness increased about the importance taking personal responsibility, and not simply assuming that governmental guidelines and laws will adequately protect the watershed.

Partners:
Annis Water Resources Institute
Muskegon Conservation District
Muskegon County Department of Public Works
Mona Lake Project of the Muskegon Community Foundation
Muskegon County Health Department

Title: Mobilizing/Coordinating Industry BNS Support
Organization: Council of Great Lakes Industries
Grant Number: GL9751801-0/Phase VI

Contact:
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Project Statistics:
Award: $45,000
Lake Basin: all
Project Timetable: 10/1/2002-9/30/2003
Project Type: stakeholder network coordination

Summary:
CGLI recruited and coordinated industry participation in BTS activities, bringing new representatives to the BTS in the recycling, instrumentation and electrical equipment manufacturing, paints and coatings, and electronics sectors. In support of BTS activities, CGLI gathered data regarding release inventories, helped implement decision tree processes for sector significance determinations, researched incentives which attract industry to BTS participation, and sought substance release reduction commitments from industry stakeholders. 2002-2003 project efforts focused on Strategy Workgroup support and enhanced awareness, industry source characterization data, indicators of virtual elimination progress, and charting a course for the future of the BTS.

CGLI served as a communications link between U.S. EPA and industry stakeholders, gathering data from industry and communicating that information to the BTS workgroups as well as highlighting the activities and accomplishments of the BTS and stressing the importance of this voluntary program in its presentations to industry and multistakeholder groups.

CGLI provided its recommendations on the evaluation of “new” chemicals as candidates for action under the BTS, recommendations on the review protocol for existing BTS substances, and recommendations for a set of objectives for continuing and current GLBTS programs.

Products:

- Features and articles on BTS activities in the CGLI newsletter and constituent organizations’ newsletters and bulletins
- Presentations to industry and multistakeholder groups
- A recommended outline for a public communications plan for the BTS
- Public affairs/marketing strategy assistance on burn barrel outreach messages and materials
- Review of sector initiative opportunities
- Assessment of Level II chemical releases
- Reports to the substance workgroups on emissions inventories and use data, as well as identification of potential industry awardees for voluntary pollution reduction programs

Title: Reduction of Mercury and PCBs at Murphy Oil
EPA Grant Number: GL 97516901
Organization: City of Superior; Public Works Dept., Waste Water Div

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Project Statistics:
Award Amount: $30,000
Dollars Leveraged: $6,000
Project Timetable: 10/01/02 – 03/30/05
Lake Basin(s): Lake Superior
Project Type: Source Characterization/Development

Summary: In 2001, Murphy Oil USA Refinery in Superior, Wisconsin and the City of Superior Wastewater Division of Public Works (WDPW) entered into a voluntary partnership to develop a pollution prevention guidebook for refineries and other industries interested in reducing use of mercury and polychlorinated biphenyls (PCBs). WDPW staff, with the assistance of Murphy Oil employees, conducted an inventory of mercury at Murphy and reviewed Murphy Oil's removal activities for PCBs. This was done in an effort to work towards the elimination of mercury and PCBs at Murphy Oil and provide a case study for the guidebook. Other industries and governmental agencies interested in forming partnerships will be able to use the guidebook to learn from the partnership between Murphy and WDPW.

Superior WDPW and Murphy Oil formed a partnership in part to inventory all mercury-containing equipment at Murphy Oil and to develop a mercury phase-out plan, a mercury-free purchasing policy, and mercury spill plan. Murphy Oil agreed to work toward mercury elimination by removing or replacing mercury-containing equipment with mercury-free alternatives. Since Murphy Oil had removed PCBs from its electrical transformers before the grant was awarded, WDPW staff reviewed documentation to understand Murphy Oil's methods and timeline for PCB removal from electrical transformers.

This inventory was conducted so Murphy Oil's pollution prevention efforts could be used as a case study for a guidebook titled "Prescription for Mercury and PCB Elimination: Mercury and PCB Reduction Guidance for Oil Refineries." The guidebook provides information to oil refineries and other industries that need assistance in order to 1) enter into voluntary pollution prevention agreements with governmental agencies, and 2) conduct on-site inventories and reduction activities for mercury and PCBs.

Refer to the guidebook for tables showing the mercury- and PCB-containing equipment that has been inventoried, labeled, and in some cases, removed. The section titled "A Remedy for Mercury Use at Murphy Oil" gives information on analysis of mercury content in lab chemicals. Data analysis shows that mercury- and PCB-free alternatives can be just as effective as mercury/PCB-containing equipment.

Environmental Results/Products:
In May 2005 approximately 150 copies of the guidebook were printed and sent to most of the oil refineries and chemical companies on the mailing list of the National

Petrochemical and Refiners Association (90 refineries total). A copy of the cover letter that accompanied the guidebooks is included with this report. Several copies of the guidebook were also sent to Murphy Oil Refinery in Superior. Information on the Murphy Project can be viewed and a copy of the guidebook can be downloaded at: http://www.ci.superior.wi.us/publicwks/wastewater/MurphyProject.html.

The collaboration between Superior WDPW and Murphy Oil Refinery shows that voluntary partnerships can be an effective way of preventing pollution. This guidebook will help oil refineries and other industries develop pollution prevention programs that work for them, and encourage them to look for guidance and expertise on pollution prevention in the greater community.

This partnership was also a success because it focused on attainable initiatives and equipment replacement matched the rate of attrition. Rather than focus on larger issues such as mercury and PCBs released during coal burning and oil refining, we concentrated our efforts on removing mercury- and PCB-containing equipment. Because we focused on this attainable initiative, Murphy Oil agreed to work with us; buy-in from industry is vital to successful pollution prevention. Murphy Oil also agreed to work with us because we did not ask them to replace mercury-containing equipment that was functioning safely. It is much more cost-effective for an industry to replace equipment as it becomes obsolete rather than all at once.

Murphy Oil also demonstrated that voluntary initiatives work for pollution prevention because they removed PCB fluid from their transformers before work on this grant project started. Like many industries, Murphy Oil is conducting voluntary pollution prevention projects because it is easier to do so on their own terms before new, stricter regulations are put in place.

Partners:
Murphy Oil Company
City of Superior

Title: State Based Mercury Pollution Prevention
Organization: National Wildlife Federation Great Lakes Natural Resource Center
Grant Number: GL99542201-0

Contact:
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NWF
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Project Statistics:
Award: $45,000
Leveraged funding: $28,009
Lake Basin: Superior, Michigan, Huron, Erie
Project Timetable: 10/01/02 – 9/30/03
Project Type: Research, Information Assistance

Summary:
NWF provided data on mercury sources and emissions reduction opportunities and assisted states in formulating and demonstrating feasibility of statewide mercury phase-out plans. NWF also worked with other NGOs to plan mercury reduction projects. NWF conducted research on mercury emissions and reduction potential and presented its findings to the BTS.

Products:
NWF compiled a mercury inventory for all of the Great Lakes states based on EPA's 1999 National Emissions Inventory and Great Lakes Air Toxics Emissions Inventory. Assessed the EPA inventories and identified areas for improvement. NWF plans to use its inventory in outreach materials to states.

NWF initiated and participated in a MDEQ-sponsored stakeholder workgroup with representatives from coal-fired utilities; influenced workgroup to designate a goal of virtual elimination of mercury. Developed phase-out cost information for workgroup and supplied additional technical materials on Michigan coal-fired power plants as well as on state mercury initiatives across the country.

NWF provided information for MDEQ staff on development of mercury reduction plan. NWF coordinated with INFORM, Inc. to provide expertise to MDEQ and other organizations on mercury-free purchasing. NWF estimated feasibility and costs of 90% mercury reduction in Ohio's utility sector. Plan to develop similar estimates for remaining source sectors.

NWF led meetings to create networks of environmental, conservation, and community groups, which helped create a Cleveland-area coalition dedicated to mercury reduction. The Cleveland group is working on municipal mercury reduction projects and NWF is informing Ohio EPA staff of these projects. NWF and the Cleveland coalition will assess Ohio's pollution prevention targets, activities, and necessary measures to achieve phase-out of mercury and will plan future mercury reduction work in the state based on this assessment. This assessment will also be used in outreach to state EPA staff.

NWF Supported the creation of a coalition in Minnesota committed to statewide mercury phase-out. Supported development of strategy for this group.
With other environmental groups and MPCA, NWF supported Xcel Energy's voluntary conversion of two coal-fired power plants to natural gas and installation of controls on a third coal power plant.

NWF participated in BTS integration and mercury workgroups and led NGO participation in discussions of Level I Substance Reassessment.

NWF participated in EPA emerging pollutants workshops & meetings in coordination with input to BTS. Conducted and supervised research and created reports on mercury for presentation to the BTS workgroups.

With separate funding, NWF carried out sampling of mercury in rainwater in the Twin Cities in Minnesota and held a press conference to release this data and highlight the need and opportunities for mercury reduction in the state. In Ohio, NWF created a flyer for environmental and angler groups to distribute to the public on the need and options for mercury phase-out.

Partners:
Michigan DEQ, INFORM, Inc., Minnesota Pollution Control Agency, and environmental, conservation, and community groups in Ohio.

Title: Managing Shared Waters Initiative
EPA Grant Number: GL- 97592101-0
Organization: The Pollution Probe Foundation

Contact
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Project Statistics:
Award Amount: $ 5,000
Project Timetable: 6/20/02-6/19/03
Lake Basin(s): All

Summary:
This grant provided administrative support and planning for an international conference, *Managing Shared Waters*. The conference was held June 23-28, 2002 in Hamilton, Ontario, Canada, and focused on human and institutional capacity building for the management of costal zones, particularly in transboundary situations.

Environmental Results/Products:
The very successful NGO-led conference was attended by over 440 delegates from 38 countries and was an important and timely contribution to global efforts to solve urgent water issues. This conference provided the international community with a contemporary assessment of the capacity needs of those working towards the sustainable development of coastal zones, particularly in transboundary situations. The initiative also aimed to provide stakeholders working in both freshwater and coastal areas with tools and approaches that they can use to address the issues arising in their communities.

The *Managing Shared Waters* Initiative was successful in its effort to offer the international marine and freshwater coastal zone communities, particularly those in transboundary situations, and opportunity to pool their knowledge about capacity needs and to present their recommendations to the internationals community.

Partners:
- Coastal Zone Canada Association
- The United Nations University, International Network on Water, Environment and Health

Title: Industrial Boilers: Sector-Based Pollution Prevention
Organization: Delta Institute
Grant Number: GL97514403

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Project Statistics:
Award: $215,000
Leveraged funding: $8,721, recipient
$150,000 grant, Joyce Found.
$25,000 grant, LaSalle Bank
$400,000 program related investment, LaSalle Bank
Lake Basin: Michigan
Project Timetable: 10/1/2002-9/30/2005
Project Type: Data inventory, outreach & E2/P2 assessment

Summary:
Using state agency data and information from the National Emissions Inventory, Delta developed emissions profiles for Illinois, Michigan, Ohio, and Wisconsin to quantify and determine source sectors of emissions from industrial boiler units. They also studied U.S. DOE information to identify state financial and technical assistance programs that could be used to support energy efficiency efforts by companies using industrial boilers.

Delta identified three facilities in northwest Michigan at which to conduct audits for opportunities for energy savings and waste reduction. Delta contracted with EnVise of Madison, WI and IL WMRC to conduct these audits. They provided recommendations for improvements that would save money and energy and prevent pollution. Delta continues to work with the facilities that received audits to implement the recommendations.

Products:
Delta compiled a detailed emissions profile of toxic and criteria pollutant emissions from industrial boilers in Illinois, Michigan, Ohio, and Wisconsin. This profile identifies the major source sectors, identifies the fuel types used, and estimates the quantities of 4-dichlorobenzene, PAHs, cadmium, chromium, dioxin, lead, and mercury emitted from each fuel type in each state. It also summarizes the regulatory structure for industrial boilers for each state and describes each state's financial and technical assistance programs for businesses' energy efficiency and pollution prevention initiatives.

Delta produced facility-specific recommendations for actions that would save energy and reduce waste for three users (two privately owned companies and one set of county-owned buildings, including the county building, the road commission building, and the sheriff's department). Delta provided the users with quantitative energy and cost savings assessments.

Partners: LaSalle Bank, The Joyce Foundation, Chemico, Environmental Coatings, Inc., and City of Charlevoix facilities.

Title: Next Steps in PBT-free Purchasing in the Great Lakes Basin
EPA Grant Number: GL- 97500501-0
Organization: INFORM

Contact
PI: Alicia Culver
120 Wall Street, 16th Floor
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212-361-2400

Project Statistics:
Award Amount: $ 30,000
Dollars Leveraged: $ 16,000
Project Timetable: 9/30/02-9/29/03
Lake Basin(s): All
Project Type: Education/Policy development

Summary:
This grant promoted the virtual elimination of PBTs by helping government agencies at the state and local level phase-out their use of products containing substances prioritized for reduction in the Great Lakes Binational Toxics Strategy (GLBTS), individual Remedial Action Plans (RAPs) and Lake Wide Area Management Plans (LaMPs). This project was conceived of as a model with transferable informational resources to post on the Internet.

Environmental Results/Products: INFORM

- Developed and disseminated web-based outreach materials for purchasing officials detailing the hazards associated with products containing PBTs. And other chemicals of concern and identified environmentally friendly substitutes
- Analyzed manufacturing plants and other industrial facilities in the Great Lakes region that generate waste containing PBTs. And other persistent toxic chemicals.
- Published articles on PBT-free products in several publications
- Presented on PBT-free alternative products at several high-profile events.
- Eliminated lead-containing traffic paint on New York State contract.
- Pilot tested lead-free ammunition with the IL State Police.
- Prompted adoption of green cleaners by the IL EPA.
- Eliminated lindane use bye the 33 clinics of St. Vincent's Hospital's community Medicine Program in New York City.
- Met with High Levels purchasing officials

Title: Binational Toxics Strategy and P2 in Chicago
EPA Grant Number: GL 97519801-0
Organization: Chicago Department of Environment

Contact:
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Project Statistics:
Award Amount: $30,000
Dollars Leveraged: $37,429
Project Timetable: 1/1/03-12/31/03
Lake Basin(s): Lake Michigan
Project Type: Education/ outreach

Summary:
In accordance with the Great Lakes Binational Toxics Strategy (GLBTS) between the U.S. and Canada, the City of Chicago, through its Department of Environment (DOE), conducted surveys to determine the presence of persistent, bioaccumulative, and toxic (PBT) substances at facilities in Chicago. DOE conducted the surveys in cooperation with the U.S. Environmental Protection Agency's Great Lakes National Program Office (GLNPO) with the goal of eliminating PBTs from the environment and to make Chicago one of the cleanest cities in the country.

Environmental Results/Products
The following is a summary of the facility responses to the checklist regarding the types of GLBTS Level I or II Substances at their respective Facility.

Level I or II Substances	No. of Facilities Reporting Presence
Mercury	33
PCB	15
Cadmium	10
1,4-Dichlorobenzene	4
PAHs	2
Benzo(a)pyrene	1
Chlorobenzene	1
Mirex (aka Dechlorane)	1

Partners
U.S. Environmental Protection Agency Great Lakes National Program Office

Title: Organochlorine Pestidies in the Ambient Air and Soil of Southern Mexico
EPA Grant Number: GL975592-01-0
Organization: Environment Canada

Contact:
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Project Statistics:
Award Amount: $40,000
Dollars Leveraged: $40,040
Project Timetable: 9/15/2002 - 9/14/2005
Lake Basin(s): All
Project Type: Research/Training

Summary:
A survey of organochlorine chemicals in southern Mexico was conducted to:

- Determine the extent of atmospheric contamination and the potential of the region to act as a source of OCPs for long-range transport to the Great Lakes and elsewhere, as well as to investigate transport of organochlorines to higher altitude areas of Mexico
- Provide baseline data for considerations in establishing future atmospheric monitoring programs
- Interpret monitoring data for the Great Lakes in the International Atmospheric Deposition Network (IADN) program by comparing levels in Mexico to the Great Lakes area and other regions of North America
- Support efforts to control these chemicals through NARAPs and other international protocols.
- Provide training and experience in air sampling techniques and methods of analysis for Mexican scientists.

High volume air samples were collected at 4 sites in southern Mexico between 2002-2004. Locations were in suburban Tapachula, Chiapas (TP), the Chiapas mountains (MT), the city of Veracruz (VC) and rural Tabasco (TB). The number of samples at each site ranged from 14-20, collected at approximately 2-week intervals. Passive air samples were also taken at these sites using a "Harner type" collector which uses polyurethane foam disks. Most of the passive samplers were exposed for 3-4 months, and occasionally for 1 and 6 months. Soil samples (n=27) were collected at sites in the city of Tapachula (park, cemetery), a farm outside the city (low altitude farm), a coffee plantation in the mountains (high altitude farm) and background sites at low and high altitudes.

All samples were analyzed for a suite of organochlorine pesticides (OCPs: a-hexachlorocyclohexane (a-HCH)), g-HCH (also called lindane), cis-chlordane (CC), trans-chlordane (TC), trans-nonachlor (TN), aldrin (ALD), dieldrin (DIEL), heptachlor (HEPT), heptachlor-exo-epoxide (HEPX), endosulfan I (ENDO I), endosulfan II (ENDO II), endosulfan sulfate (ENDOSUL), and ΣDDT (p,p'-DDT, o,p'-DDT, p,p'-DDE, o,p'-

DDE, p,p'-DDD, o,p'-DDD). Some of the samples were also analyzed for total toxaphene (ΣTOX) and selected congeners. Air samples from the 4 sites and 12 of the soil samples were analyzed for ~50 PCB congeners or congener pairs. Enantiomers of the chiral compounds TC, CC and o,p'-DDT were determined in air, and o,p'-DDT enantiomers were determined in 12 of the soils. Analyses were done using capillary gas chromatography - mass spectrometry (GC-MS) in the electron capture negative ion (ECNI) mode for OCPs and the electron impact (EI) mode for PCBs, using a DB-5 column for quantitative work and chiral stationary phase columns for enantiomer separations.

OCPs at a wide range of concentrations were found in the air of southern Mexico. DDT compounds were the most abundant at all 4 sampling stations, and the Total DDT varied greatly among the stations, from several hundred pg m-3 to ng m-3 levels. Proportions of DDT compounds suggested fresh use of DDT in some locations and a mix of fresh and aged residues at other sites. Other prominent OCPs were endosulfans, toxaphene and lindane (g-HCH). OCPs that were lower in abundance were a-HCH, chlordanes and dieldrin. Racemic EFs of TC and CC were consistent with fresh chlordane usage or emission of residues from former termiticide applications. Concentrations of ΣPCB were relatively low, even at the two urban sites.

Passive air samplers are a viable alternative to high volume air sampling. In this study, air concentrations of OCPs determined by the two methods agreed within a factor of 2 and duplicate passive samples agreed within ~20-50%.

Compared to reported concentrations in the southern U.S.A. and Great Lakes - midwest regions, southern Mexico stood out as having higher ΣDDT concentrations in air. The southern U.S.A. was higher for ΣCHLOR and ΣTOX. Only in TP was the ΣTOX comparable to some southern U.S. locations. Concentrations of ENDO, dieldrin and a-HCH were similar in southern Mexico, the southern U.S.A. and the Great Lakes - midwest.

Regarding transport to the Great Lakes, it is suggested that DDT is the only OCP which may have a significant source in southern Mexico. Toxaphene and chlordane levels are higher in the southern U.S.A., and these source regions are closer to the Great Lakes than southern Mexico.

OCPs and PCBs were also found in soils of the region, but due to the small number of locations sampled, it is difficult to generalize about distributions. The ΣDDT was higher at one urban site (cemetery) than at either of the 2 farms, however ΣDDT was lower at the second urban site (park). Background sites had lower ΣDDT levels than the farms or urban sites. The ΣTOX concentrations at the 2 urban sites were equal to or higher than those at the 2 farms. The ΣENDO concentration was highest in the high altitude background soils, while the ΣPCB levels were highest at the high elevation farm and high altitude background site. The ΣCHLOR levels were low in all soils, but relatively higher at the 2 urban sites than at the farms or background locations.

During the course of this project, opportunities were provided for Mexican scientists to gain experience in techniques of air sampling and analysis. Field technicians, working under the direction of Drs. Miguel Salvador Figueroa (TP, MT), Gerardo Gold-Bouchot (TB) and Stefan Waliszewski (VC), were taught by Dr. Henry Alegria to deploy high volume and passive air samplers and then carried on to collect air samples for the project. Mr. Victor Ceja-Moreno visited Environment Canada for two months to learn laboratory methods of soil and air sample processing and GC-MS analysis from Ms. Fiona Wong.

A special symposium on POPs in Mexico, Central America and South America was held at DIOXIN-2005 (Toronto, August, 2005). Oral or poster presentations were given at this symposium by 5 Mexican scientists.

Environmental Results/Products:

A baseline dataset for levels of organochlorine pesticides and PCBs in southern Mexico was obtained. This will be useful for measuring future progress in reducing sources and levels of these chemicals in Mexico, particularly under North American Regional Actions Plans (NARAPs) and the Stockholm Convention on Persistent Organic Pollutants (POPs). This project provided a foundation for building an air monitoring program for POPs in Mexico.

It was determined that DDT was the only measured OC pesticide that may have a significant source region in southern Mexico that could possibly be transported to the Great Lakes basin. Evidence for long-range transport of OC chemicals to high altitude areas in southern Mexico was also found.

The feasibility and usefulness of passive air samplers for monitoring organochlorine substances was demonstrated.

Training and experience in air sampling techniques and methods of analysis was provided to 10 Mexican scientists or technicians.

Partners:

Environment Canada
University of Veracruz, Mexico, Veracruz City, Veracruz, Mexico
Cinvestav del IPN Unidad Mérida, Mérida, Yucatán, Mexico
California Lutheran University
University of Chiapas (UC), Tapachula, Chiapas, México

Title: Deposition and Ambient Concentrations of PBTs in the Lake Ontario Region
EPA Grant Number: GL97506501
Organization: Clarkson University

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Project Statistics:
Federal funding: $45,000
Leveraged funding: $15,533
Project Timetable: 11/02 – 1/05
Lake Basins: Lake Ontario
Project Type: Research

Summary:
This proposal was one of several, which combined, allowed completion of one year of sampling for the Lake Ontario Atmospheric Deposition Project (LOADS). LOADS was designed to provide estimates of loadings of a number of critical pollutants identified in the Lake Ontario LaMP as well as several additional chemicals. Sources of these pollutants will also be identified using advanced source-receptor models. In related projects, funded by EPA Regions 2 and 5, sampling included the collection of ambient air samples of Hg (both elemental and reactive gaseous), PCBs, DDE, Mirex, HCB and Dioxin/Furans every six days for a period of eight months at Sterling, NY on the shoreline of Lake Ontario. Wet deposition samples of Hg, PCBs, DDE, Mirex, HCB and Dioxin/Furans and direct dry deposition samples for PCBs, DDE, Mirex, HCB were also collected at the same location. For 1 week each in spring and summer samples were collected onboard the Lake Guardian. During each week on the ship, coupled air and water concentrations were measured and several wet and dry deposition samples were obtained. During sampling on the ship, intensive daily samples were obtained at the land-based site. The work will supplement the ongoing monitoring supported by Environment Canada at Point Petre, Ontario (one of the Great Lakes International Atmospheric Deposition Network (IADN) sites) and the Mercury Deposition Network (MDN). This project was one of several that allowed the full year of sampling to be completed. In the on-going project, the winter season would not have been included.

Progress Summary/Accomplishments:
All samples have been collected and analyzed. Some of the data interpretation and analysis has been completed and has been reported in prior progress reports. Numerous manuscripts are being prepared and will be sent to the project officer when they are ready for review and when they are accepted for publication. These papers will include not only the work done as part of this grant but also data from the larger LOADS study.

Publications and Presentations:
One paper has been published to date: Han, Y.J., Holsen, T.M., Hopke, P.K., Yi, S.M. Comparison between Back-trajectory Based Modeling and Lagrangian Backward

Dispersion Modeling For Locating Sources of Reactive Gaseous Mercury (2005) Environ. Sci. Tech. 39, 1715-1723

Future Activities:
Data interpretation including relationship of pollutants with meteorological data and back-trajectory analysis will be completed soon. Dry and wet deposition of each pollutant based on measurements and estimation of atmospheric loading to Lake Ontario is in progress.