

ATSDR ANNOUNCES A GREAT LAKES RESEARCH PROGRAM

Background

The Great Lakes basin contains a major part of the U.S. industrial and agricultural activity. The physical nature of the basin and the long retention time of the Lakes combine to make this huge freshwater resource a repository for chemical byproducts of these production activities. Through the process of bioaccumulation, these pollutants are taken up by aquatic life and become especially concentrated in Great Lakes game fish, among other wildlife. There are several persistent toxic substances which appear to be predominant in the Great Lakes: PCB's, DDT and its metabolites, dieldrin, toxaphene, mirex, mercury, benzo[a]pyrene, hexachlorobenzene, furans, dioxins, and lead. It has been demonstrated that there are associations between the consumption of contaminated Great Lakes fish and long-term adverse health effects in certain populations.

The Great Lakes Critical Programs Act of 1990 mandates a number of actions of the Environmental Protection Agency (EPA). One action is to prepare a report by 1994 that describes the impact on human health of fish consumption in the Great Lakes. In support of this directive, in fiscal year 1992 Congress appropriated \$2 million to ATSDR to support human health effects studies in the Great Lakes region. Toward this end, ATSDR will award grants for research activities; and it is anticipated that awards will be for a 12-month budget period with a proposed project duration of 1 to 3 years. Continuation of this research program beyond the first year is contingent upon the subsequent availability of funds.

Eligible Applicants

Eligible applicants are the Great Lakes States which include: Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, New York and Wisconsin; and political subdivisions thereof, which may include state universities, state colleges, state research institutions, and state and local health departments, and federally recognized Indian Tribes. This is in accordance with Section 106, Subsection 118(e) of the Great Lakes Critical Programs Act of 1990. ATSDR encourages collaborative efforts among these potential applicants.

Research Activities

It has been demonstrated that certain target groups, i.e., Native Americans, and fetuses and nursing infants of mothers who consume contaminated Great Lakes fish, have a higher risk of long-term adverse effects resulting from exposure to these contaminants. ATSDR anticipates that research proposals will focus on these high risk populations. The eligible research activities shall include but not be limited to:

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OCT 06 1993

Ms. Sarah Miller, Co-ordinator
Great Lakes United United
517 College Street, Suite 401
Toronto, Ontario M6G 4A2

Dear Ms. Miller:

This is in response to your request for additional information on the Agency for Toxic Substances and Disease Registry (ATSDR) Great Lakes Human Health Effects Research Program. In 1990, Congress amended the Great Lakes Critical Programs Act which requires a research report to Congress by September 30, 1994, that assesses the harmful human health effects of water pollutants in the Great Lakes region. In support of this directive, in fiscal year 1992 Congress appropriated \$2 million to ATSDR to support human health effects studies in the Great Lakes region.

The ATSDR Great Lakes Human Health Effects Research Program is designed to investigate and characterize the association between the consumption of contaminated Great Lakes fish and long-term harmful health effects. The objectives of this program are to (1) build upon and amplify the results from past and ongoing research, (2) develop information, databases, and/or research methodology that will provide long-term benefit to the Great Lakes human health research effort, (3) develop directions and methodology for future research on human health effects, (4) provide health information to the subjects of the research and their medical professionals, and (5) increase public awareness of the health implications of the toxic pollution problems in the Great Lakes.

Towards this end, ATSDR has developed a Great Lakes Health Effects Research Strategy (enclosure). The goal of this strategy is to identify human populations residing in the Great Lakes basin who may be at greater risk of exposure to chemical contaminants present in one or more of the Great Lakes and to help prevent any adverse health effects. This strategy is built upon the 5 traditional elements of disease prevention which include: identification, evaluation, control, dissemination, and infrastructure.

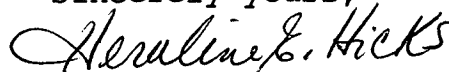
For fiscal year 1992, ATSDR funded nine research grants, eight of which are epidemiologic investigations in presumed susceptible populations, that is, pregnant females, fetuses and nursing infants, Native Americans, sport anglers, and the urban poor; and

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one study focussing on the development of more sensitive methods for detecting persistent Great Lakes contaminants like polychlorinated biphenyls, dioxins, lead, mirex, and mercury in human biologic tissues and fluids. Enclosed is a summary which includes the recipients, the titles, and a brief synopsis of their research proposals. A new program announcement to solicit additional proposals for fiscal year 1993, was published in the Federal Register on July 29, 1993.

We appreciate your interest in our program. If you have any questions please feel free to contact me at (404) 639-6306.

Sincerely yours,



Heraline E. Hicks, Ph.D.
Great Lakes Program
Coordinator

Enclosures

THE AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY
ATSDR GREAT LAKES HUMAN HEALTH EFFECTS RESEARCH PROGRAM
AWARDED GRANTS FY 1992

Principal Investigator: John Vena, Ph.D.

Institution: The Research Foundation of State
University of New York at Buffalo
State University of New York at Buffalo
Sponsored Programs Administration
Suite 211, UB Commons
520 Lee Entrance
Amherst , NY 14228

Research Title: The New York State Angler Cohort Study:
Exposure Characterization and
Reproductive and Developmental Effects

Epidemiologic study designed to characterize exposure of humans to persistent toxic chemicals (PCBs, DDT, DDE, mirex, lead, hexachlorobenzene, PCDFs, and mercury) associated with consumption of **Niagara River and Lake Ontario** fish and wildlife. These studies will also investigate human health effects which involve an established cohort, The New York State Sport Angler Cohort. This study will characterize exposure in male anglers and their wives or partners, female anglers and children born to this group.

Principal Investigator: Kelley Brix, M.D., M.P.H.

Institution: New York State Department of Health and
Health Research, Inc.
2 University Place
Albany, NY 12203

Research Title: PCB and DDE Exposure among Native
American Men from Contaminated Great
Lakes Fish and Wildlife

Epidemiologic study in an established cohort of Native Americans, the Mohawk Indian Tribe. Investigations of the association between the consumption of locally-caught fish and wildlife and body burdens of PCBs (67 congeners) and DDE in men who live along the **St. Lawrence River and its tributaries**. The investigator will also examine residential and occupational exposure to these contaminants.

Principal Investigator: Donald Waller, Ph.D.

Institution: University of Illinois at Chicago
Department of Pharmacodynamics
833 S. Wood Street
Chicago, IL 60612

Research Title: Great Lakes Fish as a Source of Maternal
and Fetal Exposure to Chlorinated
Hydrocarbons

Epidemiologic study in a new cohort of pregnant African American women who regularly consume contaminated Great Lakes fish. Analysis of body burden (PCBs, DDT, DDE, and dieldrin) will be done in order to identify populations at risk of adverse health effects. The children of these women will also be studied to determine their exposure to Great Lakes contaminants via maternal exposure. This cohort will be selected from individuals who live adjacent to Lake Michigan.

Principal Investigator: John Dellinger, Ph.D.

Institution: University of Wisconsin-Superior
Lake Superior Research Institute
1800 Grand Avenue
Superior, WI 54880

Research Title: An Assessment of a Human Population at
Risk: The Impact of Consuming
Contaminated Great Lakes Fish on Native
American Communities

Epidemiologic study to investigate fish consumption, body burden of PCBs and mercury, and neuropsychological status in 5 communities of Native Americans, the Red Cliff Indian Tribe. The cooking practices of these individuals will also be investigated to determine if this reduces the levels of Great Lakes contaminants in their food. Additionally, animal neurotoxicity testing is proposed as a model. The individuals selected for this study will live along Grand Portage, Minnesota, Keweenaw Bay and Bay Mills, Michigan, and Bad River, Wisconsin.

Investigator: Susan Schantz, Ph.D.

Institution: University of Illinois at Urbana-
Champaign

Institute for Environmental Studies
Room 352
1101 West Peabody Drive
Urbana, Il 61801-4723

Research Title: Cognitive and Motor Effects of PCB
Exposure in Older People from the
Michigan Fisheater Cohort: Emphasis on
the Role of Ortho-Substituted Congeners

Epidemiologic follow-up study of an established older cohort of
fisheaters ranging in age from 50- 79. Investigation of the role
of chronic exposure to ortho-substituted PCBs in neurobehavioral
alterations in humans. The individuals selected for these
studies will live along the lakes which border the state of
Michigan (**Lake Michigan, Lake Superior, Lake Huron, and Lake
Erie**).

Principal Investigator: Helen Daly, Ph.D.

Institution: State University of New York at Oswego
Department of Psychology and
Center for Behavioral Effects of
Environmental Toxins
Oswego, NY 13126

Research Title: Contribution of Nursing to Behavioral
Changes in Offspring of Mothers Who
Consumed Lake Ontario Fish: Two
Methodological Approaches

Epidemiologic study in an established cohort. Study to
investigate the contribution of nursing to behavioral changes in
children of mothers who consumed **Lake Ontario** fish. Levels of
PCBs (70 congeners), mirex, DDE and hexachlorobenzene will be
determined in mothers and their children. Additionally, an
animal model is proposed.

Principal Investigator: Lawrence Fischer, Ph.D.

Institution: Michigan State University
Institute for Environmental Toxicology
C-231 Holden Hall
East Lansing, MI 48824-1206

Research Title: Health Risks from Consumption of Great
Lakes Fish

Epidemiologic study to be conducted by a consortium of institutions including universities and state public health departments. Epidemiologic study to be conducted by a consortium of institutions including universities and state public health departments. Study involves two projects to investigate the effect of exposure to Great Lakes contaminants in fish (DDT, DDE, dieldrin, mirex, mercury, and lead) on reproductive function in men and women aged 18 - 34 (Project 1) and determine the extent of body burdens of mercury during pregnancy via fish consumption (Project 2). The individuals selected for these studies will live along the lakes which border the state of Michigan (**Lake Michigan, Lake Superior, Lake Huron, and Lake Erie**).

Principal Investigator: Henry Anderson, M.D.

Institution: Wisconsin Department of Health and
Social Services
Division of Health
1 West Wilson Street
P.O. Box 309
Madison, WI 53701-0309

Research Title: Consortium for the Health Assessment of
Great Lakes Sport Fish Consumption

Epidemiologic study by a consortium of 5 state health departments (Illinois, Indiana, Michigan, Ohio and Wisconsin) which will establish surveillance cohorts for prospective studies which will help ATSDR and EPA evaluate the effectiveness of remediation efforts in the Great Lakes basin. The project will characterize the impact of past dietary habits on current contaminant body burdens and estimate the disease risk attributable to ingestion of contaminants in sports fish. The establishment of this consortium will allow inter-state data sharing of information which will provide long-term benefit to the Great Lakes human

health research effort. The cohorts in this five state consortium will be selected from individuals living along **Lakes Michigan, Erie, Huron, and Superior.**

Principal Investigator: Christie Enke, Ph.D.

Institution: Michigan State University
Department of Chemistry
East Lansing, MI 48824

Research Title: Congener-Specific PCB Analysis for
Improved Toxicity Assessment

Analytical study to develop methods for the analysis of PCB compounds and other chlorinated compounds. Three approaches have been proposed to develop new methodology for toxicity assessment. These studies will improve methodology to detect very low levels of Great Lakes contaminants in human biological tissues and fluids and in environmental media, i.e. Great Lakes fish from **Lakes Michigan, Huron, and Superior.**

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GREAT LAKES HEALTH EFFECTS RESEARCH STRATEGY

Agency for Toxic Substances and Disease Registry
United States Public Health Service

MANDATE:

The Agency for Toxic Substances and Disease Registry's (ATSDR) Great Lakes Human Health Effects Research Program is mandated by the Great Lakes Critical Programs Act of 1990. The Act stipulates that, "the Environmental Protection Agency, in consultation with the Agency for Toxic Substances and Disease Registry and the Great Lakes States shall submit to the Congress a report assessing the adverse effects of water pollutants in the Great Lakes system on the health of persons in the Great Lakes States", no later than September 30, 1994. In fiscal year 1992 (FY92) Congress appropriated \$2 million in support of this directive for ATSDR, "for a study of human health impacts of contaminated fish."

GOAL:

The goal of the ATSDR Great Lakes Human Health Effects Research Program is to identify human populations residing in the Great Lakes Basin who may be at risk due to contact with chemical contaminants present in one or more of the Great Lakes and to prevent any adverse health effects.

STRATEGY:

The following strategy will be implemented in support of ATSDR's Great Lakes Human Health Effects Research Program goal. The strategy is built upon the 5 traditional elements of disease prevention:

1. Identification of patterns of morbidity and mortality (through use of surveillance systems, exposure registries, and reports from state/local health agencies),
2. Evaluation of causal factors accountable for the observed pattern of morbidity or mortality (through epidemiologic investigations and experimental research),
3. Control of the factors found or thought to be accountable for the observed morbidity or mortality (through health advisories, regulatory actions, medical interventions),

4. Dissemination of information about the identification, evaluation, and control of the observed pattern of morbidity/mortality (through informational resources such as state programs, local advisories, media, and publications),
5. Infrastructure to support the identification, evaluation, control, and dissemination elements of disease prevention (through institutional mechanisms that involve staffing, budgets, and organizational arrangements).

In order to identify human populations who may be at special risk of adverse health effects, particularly from consumption of sport fish from the Great Lakes, ATSDR will first fund research to better characterize exposure, pathways, associated body burdens, and potential human health effects from exposure to persistent toxic substances in the Great Lakes basin with special emphasis on vulnerable populations. ATSDR will also coordinate with state and local health agencies in the Great Lakes Basin to obtain any surveillance data, reports of morbidity, and advice that might be relevant to identifying populations at health risk.

Identified human populations thought to be at risk of adverse health effects will lead to evaluation of health status in select populations and toxicological studies where indicated. Adverse health effects would lead to control actions that would include communicating health advice from ATSDR to state/local agencies, possible establishment of surveillance or registries of high risk populations, and advice to regulatory agencies for their consideration. ATSDR would draw upon its Division of Health Education to coordinate the dissemination of results from its research program that pertain to identifying at risk populations in the Great Lakes Basin and actions to prevent any adverse health effects. These activities will include physician education, assistance to state and local health departments and any necessary preventive programs to protect human health. Supporting this strategy will be two Full Time Equivalents (FTEs) within the Division of Toxicology and strong organizational reliance on the advice from the Agency's Board of Scientific Counselors, through its Subcommittee on Great Lakes Human Health Effects Research.

This strategy provides an overall framework for:

- o the coordination and implementation of needed health research,
- o the utilization of findings from this program and other relevant efforts,

- o the development of integrated approaches to interdict exposures and mitigate toxicity on a basin-wide basis.

SCOPE:

A wide range of persistent toxic substances are found in the Great Lakes including PCB's DDT and its metabolites, dieldrin, toxaphene, mirex, methylmercury, benzo[a]pyrene, hexachlorobenzene, furans, dioxins, and alkylated lead. These persistent toxic substances bioaccumulate in the food chain, with humans being among the ultimate recipients. Although more research is needed, preliminary studies indicate that humans are at risk. In particular, certain populations--Native Americans, Sport Anglers, fetuses and nursing infants of mothers who consume contaminated Great Lakes fish--may have a potentially higher risk of long-term adverse effects resulting from exposure to these contaminants. Accordingly, ATSDR's research program places emphasis on the study of these high risk populations, especially as it relates to the human health effects due to consumption of contaminated fish.

As an outgrowth of this research and other relevant human health effects findings, ATSDR will coordinate with appropriate federal state and local agencies, universities and other organizations in the development and implementation of preventative programs to protect human health. Coordination with federal agencies will include the Food and Drug Administration (FDA), the Centers for Disease Control (CDC), the National Institutes of Health (NIH), and the Indian Health Service (IHS), as well as the Environmental Protection Agency (EPA). ATSDR will also continue to work closely with other organizations that have significant programs relevant to the Great Lakes basin, including the International Joint Commission, the Great Lakes Health Effects Program of Canada, the Great Lakes Protection Fund, and the Bi-National Human Health Issues Committee (Figure 1).

In addition, ATSDR will convene forums as needed, to facilitate the exchange of research findings and ideas. These forums will include publicly announced meetings of ATSDR's Subcommittee of its Board of Scientific Counselors to review its research program in terms of its progress, scope and overall direction.

Based on findings from these and other efforts, ATSDR will participate with other organizations in the pursuit of appropriate preventive strategies to interdict exposures, mitigate toxicity, and to increase public awareness regarding the health effects of persistent toxic substances in the Great Lakes basin. Specifically, results from these research efforts will be forwarded to EPA's Great Lakes National Program Office, which coordinates all United States research activities.

OBJECTIVES:

The objectives of this research program are to:

- o Build upon and extend the results from past and ongoing research;
- o Develop information databases and/or research methodology that will provide long-term benefits to the human health effects research efforts in the Great Lakes basin;
- o Provide direction for future health effects research;
- o Provide health information to state/local health officials, the concerned public, and their medical health care professionals;
- o In concert with state/local health officials increase public awareness regarding the potential health implications of toxic pollution in Great Lakes basin and;
- o Coordinate as necessary with relevant U.S. PHS research programs and activities, including those of FDA, CDC, NIH, and IHS, as well as the EPA, state and local health departments to ameliorate adverse public health impacts of persisted toxic substances in the Great Lakes basin.

These objectives listed for the Great Lakes Human Health Effects Research Program are subject to change as additional needs become evident or when new information becomes available.

APPROACH:

ATSDR intends to implement this effort through a combination of both intramural and extramural research efforts. For FY 92 ATSDR has announced a \$2 million dollar grant program with the states of the Great Lakes basin and political subdivisions thereof, to assess the potential impact on human health of fish consumption in the Great Lakes region. Eligible applicants are the Great Lakes States which include Illinois, Indiana, Michigan, Minnesota, Ohio, Pennsylvania, New York and Wisconsin; and political subdivisions thereof, which may include state universities, state colleges, state research institutions, state and local health departments, and federally recognized Indian Tribes. Collaborative efforts among these potential applicants are encouraged and it is anticipated, subject to Congressional action, that these efforts will continue and be extended in FY 93 and 94.

General areas of research to be pursued include but are not limited to:

- o characterizing exposure and determining the profiles and levels of Great Lakes contaminants in biological tissues and fluids in high risk populations;
- o identifying sensitive and specific human reproductive/developmental endpoints and correlating them with exposure to Great Lakes contaminants;
- o determining the short-and long-term risk(s) of adverse health effects in progeny which result from parental exposure to Great Lakes contaminants;
- o investigating the feasibility of establishing registries and/or surveillance cohorts in the Great Lakes region;
- o and establishing a chemical mixture database with emphasis on tissue and blood levels in order to identify new cohorts, conduct surveillance and health effects studies, and establish registries and/or surveillance cohorts.

Also during FY 92, ATSDR plans to initiate development of a technical information network on human health effects resulting from the consumption of contaminated fish in the Great Lakes region. In addition to serving as an information and communication network for ATSDR and those involved in health effects research it is anticipated that this effort will serve as a resource to state and local health departments to increase public awareness regarding potential human health implications associated with toxic pollutants in the Great Lakes basin. The peer-reviewed information database available for the persistent toxic chemicals will be further assessed through ATSDR's toxicological profiles on specific chemicals. Data gaps and research needs identified in the profiles for specific chemicals will be forwarded to ATSDR's Program of Substance Specific Applied Research.

SUMMARY:

This research program can be viewed in the context of a generic inter-related tiered model of applied research (Figure 2) intended to delineate the relationships among contaminant levels in the ambient environment, exposure pathways, tissue levels and potential human health impacts. These research activities and associated findings will be coupled to appropriate public health activities designed to prevent adverse health effects in vulnerable populations. Related activities will include public health assessment and consultations, health studies and health

education and other assistance to state and local health officials as appropriate. Collectively, these efforts will more fully characterize the potential health effects associated with exposure to persistent toxic substances in the Great Lakes basin and identify necessary actions to interdict exposures, mitigate toxicity, and increase public awareness regarding the potential health effects of these substances.

FIGURE 1

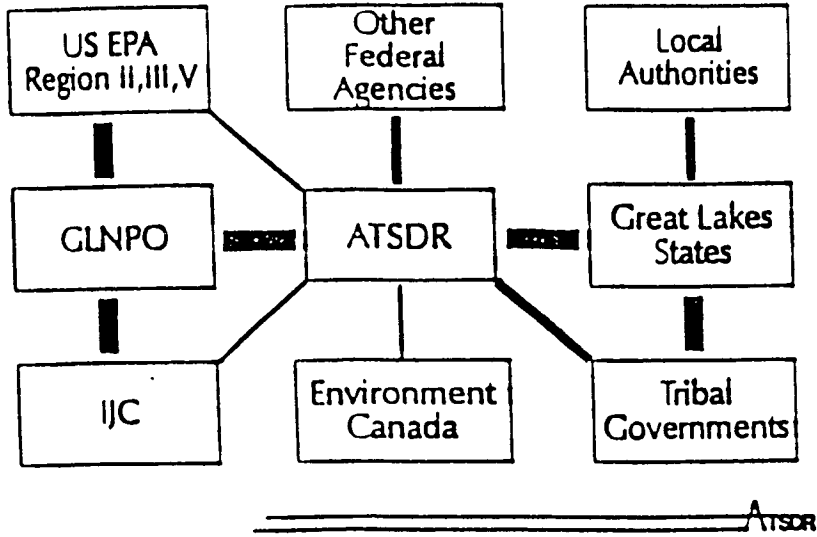


FIGURE 2

