

**Environment and Natural Resources Trust Fund
2016 Request for Proposals (RFP)**

Project Title:

ENRTF ID: 084-B

Mercury in Minnesota Ducks, Potential for Consumption Advisories

Category: B. Water Resources

Total Project Budget: \$ 358,403

Proposed Project Time Period for the Funding Requested: 3.5 years, July 2016 to August 2019

Summary:

There is potential that ducks reared in mercury-contaminated areas of Minnesota are contaminated. We propose to determine the extent of contamination, and suggest the appropriateness of consumption advisories for Minnesotans.

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Sponsoring Organization: U of MN

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Web Address

Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Overlap of mercury based fish consumption advisories and duck breeding densities of Minnesota

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____ %



PROJECT TITLE: Mercury in Minnesota Ducks, Potential for Consumption Advisories

I. PROJECT STATEMENT

Mercury continues to be a concern in Minnesota. Contamination of Minnesota fish with mercury has resulted in numerous fish consumption advisories. While mercury is continually monitored in fish, only one study of ducks in Minnesota has ever been conducted. The results of this study were reported in 1993 by the MPCA, and recommended looking at a larger age class of ducks and differentiating between locally reared ducks and immigrants from Canada and the Dakotas. By comparing the fish consumption advisories with breeding duck populations, there appears to be a population of ducks that may be at risk of accumulating high levels of mercury (see map). We propose to sample a variety of ducks from hunters from the area of western Minnesota where this overlap takes place, and in the Northeastern Minnesota with the highest levels of mercury in fish and concentrate on fish eating ducks (mergansers). Ducks will be collected at popular hunting spots in these locations to maximize the number of specimens collected. Hunters will be offered "free duck cleaning" to entice them to participate in the study, and we will reach out to local Ducks Unlimited chapters for volunteer participation.

Local ducks will be differentiated from immigrants by the presence or absence of pinfeathers. All ducks will be identified, aged, sexed and weighed. Our goal is to collect 100 specimens from hunters each year for three years. Livers and in some cases breast meat will be sampled and analyzed for mercury. Other studies have shown a correlation between liver and meat concentrations, so a small portion will sample both to confirm this relationship. Based on results of this study, recommendations will be made as to whether or not duck consumption advisories are warranted. The benchmark for consumption will follow that of Idaho, who has issued duck consumption advisories for ducks in Great Salt Lake due to mercury contamination.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Determine the levels of mercury in Minnesota ducks

Budget: \$261,260

We propose to collect livers and in some cases breast tissue from approximately 100 ducks each fall from hunters in West Central Minnesota where ducks breed, and high fish mercury levels exist. We also propose to collect the same from mergansers (a fish eating duck) from Northeastern Minnesota, where the highest fish mercury levels exist. This sampling will occur for three consecutive falls. Each duck will be aged (length of primary feathers), sexed (morphology), weighed and immigration status determined (presence/absence of pinfeathers).

Outcome	Completion Date
1. Determine the scale of mercury contamination in Minnesota Ducks	June, 2017
2. Compare mercury levels in liver and breast meat	June, 2018
3. Compare mercury levels in local vs. immigrant ducks	June, 2018
4. Compare mercury levels among species of ducks	June, 2019

Activity 2: Determine the exposure of Minnesota hunters to mercury from eating contaminated ducks

Budget: \$87,087

Given results from the Federal Harvest Information Program (HIP), and results from Activity 1 we will estimate the consumption of mercury from eating ducks by Minnesota hunters. These levels will be compared to consumption advisories for ducks in Idaho, and fish in Minnesota to make a recommendation on the relevance of a duck consumption advisory for Minnesota

Outcome	Completion Date
1. Determine the average number of ducks harvested by Minnesota hunters using HIP	June, 2017
2. Determine the exposure of the average and range of Minnesota hunters to mercury from	June, 2018



Environment and Natural Resources Trust Fund (ENRTF)

2016 Main Proposal

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<i>ducks</i>	
<i>3. Make a recommendation on the necessity of a duck consumption advisory for Minnesota</i>	<i>June, 2019</i>

Activity 3: Dissemination and Outreach

Budget: \$10,056

Results from this project will enable state agencies (MPCA, MDH, MDNR), to put into perspective the exposure of Minnesota hunters to mercury from duck consumption. Should the recommendation be in favor of duck consumption advisories, the project will help guide that process and establish limits. The results will be disseminated to the greater scientific community through presentations at scientific conferences and publication in the peer reviewed literature.

Outcome	Completion Date
<i>1. Present results at the scientific conferences (continual as data is available)</i>	<i>June, 2019</i>
<i>2. Publish results in the peer reviewed literature (continual as data is available)</i>	<i>June, 2019</i>
<i>3. Post data to the University of Minnesota data repository (continual as data is available)</i>	<i>June, 2019</i>
<i>4. Present results to interested parties at a seminar to be held at the University of Minnesota</i>	<i>June, 2019</i>

III. PROJECT STRATEGY

A. Project Team/Partners

Dr. Matt F. Simcik is an Associate Professor in the Division of Environmental Health Sciences in the School of Public Health at the University of Minnesota. He is an expert in the fate and transport of contaminants, especially atmospheric transport. He will lead the project, and be responsible for the atmospheric sampling. He will receive funding from the Trust Fund for his effort.

Dr. Jeff Jeremiason is an Associate Professor in the Department of Chemistry and Environmental Studies at Gustavus Adolphus College. He is an expert in the fate, transport and analysis of mercury. He will receive funding from the Trust Fund for his effort.

B. Project Impact and Long-Term Strategy

This project will determine the relative importance of ducks to mercury exposure to Minnesota citizens. The results of this study will determine whether or not duck consumption advisories are warranted. Should they be warranted, results from this study will be instrumental in establishing those consumption guidelines.

C. Timeline Requirements

This project will require three years to complete. Each fall during duck hunting season (9 weekends for a 60 day season), project personnel will be stationed at select locations near duck hunting areas in order to maximize collection of specimens. During the rest of the year mercury will be analyzed in the samples and the results interpreted and disseminated to the relevant audiences.

2016 Detailed Project Budget

Project Title: *Mercury in Minnesota Ducks, Potential for Consumption Advisories*

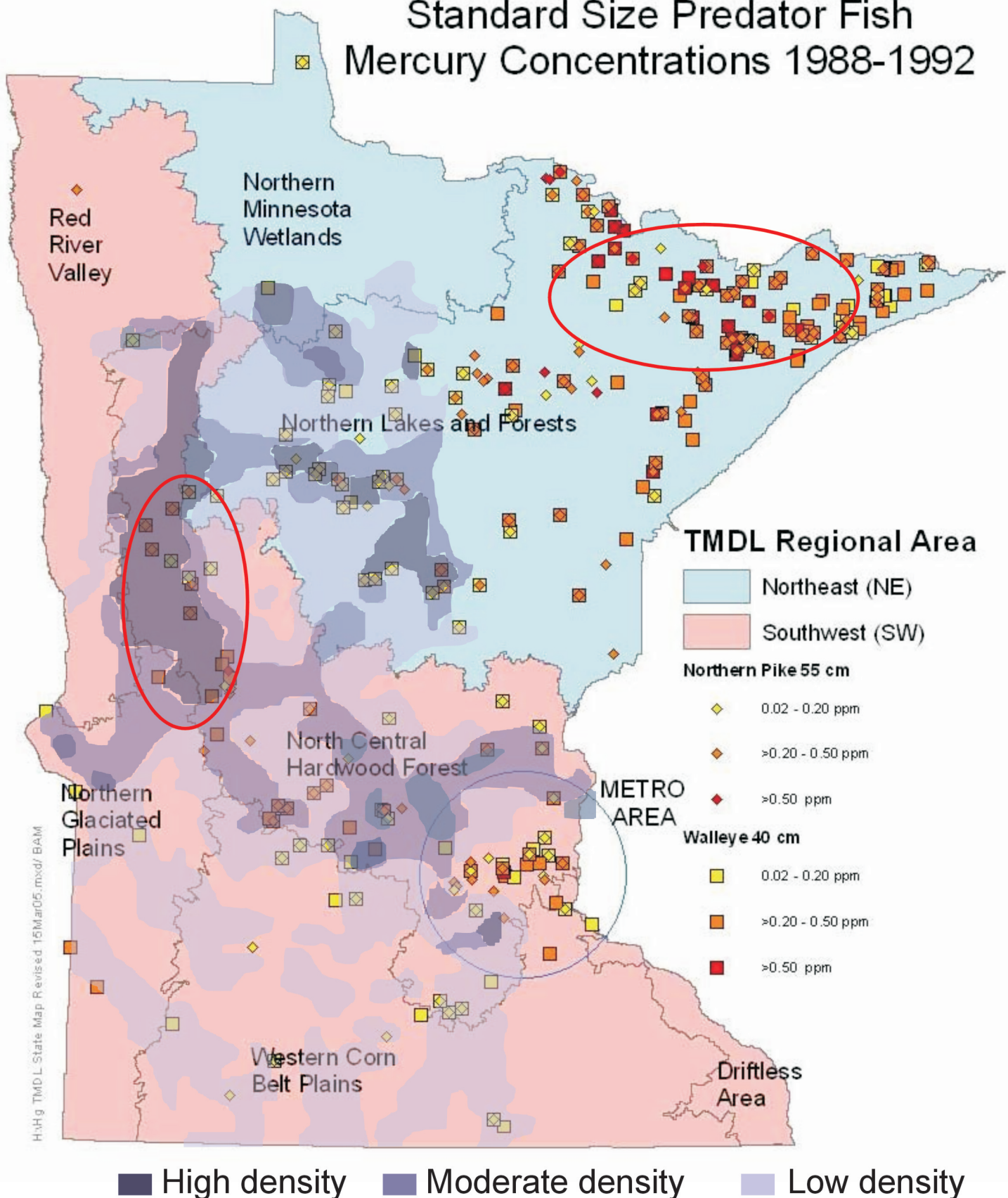
IV. TOTAL ENRTF REQUEST BUDGET 3 years

BUDGET ITEM (See "Guidance on Allowable Expenses", p. 13)	AMOUNT
Personnel:	
Matt F. Simcik, Project Manager (20% salary +Fringe)	\$ 74,457
Jeff D. Jeremiason, Mercury Analysis (10% salary +Fringe)	\$ 26,808
Research Assttant to be named (50% time: salary + Tuition and Fringe)	\$ 125,566
Research Technician (1 technician 8 hrs/week @ 50 weeks @ \$20.00/hour base)	\$ 26,622
Undergratuade Research Assistant	
[Summer for ten weeks]	\$ 16,485
[Summer housing for Undergraduate Research Assistant @ \$280/mo]	\$ 2,100
Student Worker (\$10/hr x 10hrs/day x 18 days x 3 years x 4 students)	\$ 21,600
Equipment/Tools/Supplies:	
Mercury analysis supplies	\$ 19,500
Centifuge tubes	\$ 405
Pluckers (\$700 x 4)	\$ 2,800
Balances (\$300 x 4)	\$ 1,200
Coolers (\$350 x 4)	\$ 1,400
Shelters (\$1500 x 4)	\$ 6,000
misc. field supplies	\$ 2,500
Travel: travel to and from duck collection locations, lodging and per diem	\$ 30,960
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =	\$ 358,403

V. OTHER FUNDS (This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State \$ To Be Applied To Project During Project Period:	NA	
Other State \$ To Be Applied To Project During Project Period:	NA	
In-kind Services To Be Applied To Project During Project Period: <i>Indirect costs contributed in-kind by the University of Minnesota</i>	\$ 164,986	Secured
Funding History:	NA	
Remaining \$ From Current ENRTF Appropriation:	NA	

Standard Size Predator Fish Mercury Concentrations 1988-1992



Project Manager Qualifications and Organization Description

Dr. Matt Simcik (University of Minnesota)

Associate Professor, Environmental Health Sciences, School of Public Health, University of Minnesota

B.S., Chemistry, 1992, Michigan State University

M.S., Civil Engineering, 1994, University of Minnesota

Ph.D., Environmental Sciences, 1998, Rutgers, The State University of New Jersey

Dr. Simcik is an expert in environmental chemistry. He will direct the sampling, sample custody and data interpretation. He will supervise the graduate Research Assistant. He has been analyzing trace organic contaminants in various environmental media for 20 years.

Dr. Jeff Jeremiason (Gustavus Adolphus College)

Associate Professor, Chemistry and Environmental Studies, Gustavus Adolphus College

B.A. Chemistry, Augustana College

M.S. Civil Engineering, University of Minnesota

Ph.D. Civil Engineering, University of Minnesota

Dr. Jeremiason is an expert in environmental chemistry. He will direct the mercury analysis at Gustavus Adolphus College, and supervise the undergraduate researchers.

Organization Description

The University of Minnesota is one of the largest, most comprehensive, and most prestigious public universities in the United States (http://www1.umn.edu/twincities/01_about.php). The laboratories and offices of the PI and co-PIs contain all of the necessary fixed and moveable equipment and facilities needed for the proposed studies.