
Name of Organization: Wayne State University

Type of Organization: College or University

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Project Title: Evaluating ecosystem results of sediment remediation

Project Category: Contaminated Sediments

Rank by Organization (if applicable): 0

Total Funding Requested (\$): 49,560 **Project Duration:** 1.5 Years

Abstract:

All 42 Areas of Concern in the Great Lakes Basin have contaminated sediment based on the application of chemical guidelines. While contaminated sediment is not designated as a specific impairment in Annex 2 of the Great Lakes Water Quality Agreement (GLWQA), in-place pollutants potentially pose a challenge to restoring 11 of the 14 beneficial use impairments. Therefore, contaminated sediment is viewed as a universal obstacle in restoring uses in the 42 Areas of Concern in the Great Lakes Basin.

Between 1993 and 2000 there will have been approximately \$100 million in sediment remediation within the western Lake Erie/Detroit River basin (Rouge River - Evans Products Ditch Site and Newburgh Lake; Detroit River - Carter Industrial Site, Elizabeth Park Marina, Monguagon Creek, Black Lagoon; Huron River - Willow Run Creek; River Raisin - Ford Motor Company Site; Ottawa River - Fraleigh Creek). The primary purpose of this project is to evaluate whether or not sediment remediation (for PCBs) at the above sites has had an impact on ecosystem results (bioaccumulation of PCBs in fish, herring gull eggs, adult mayflies, etc.).

This project will bring together available research and monitoring data bases to evaluate program effectiveness based on measuring ecosystem results. First, the project will quantitatively estimate the mass of PCBs removed, treated, and/or contained as a result of the above projects. Next, the project will compile summaries of available research and monitoring programs. A binational forum will be held to integrate research, monitoring, and management in an effort which synthesizes data bases, collectively interprets results (relative to ecosystem outcomes), and collectively develops advice (recommendations) for research institutions, monitoring agencies, and management organizations. The results of this binational forum will be presented at LaMP and RAP meetings, and further distributed in a report.

Geographic Areas Affected by the Project

States:

- | | |
|--|--|
| <input type="checkbox"/> Illinois | <input type="checkbox"/> New York |
| <input type="checkbox"/> Indiana | <input type="checkbox"/> Pennsylvania |
| <input checked="" type="checkbox"/> Michigan | <input type="checkbox"/> Wisconsin |
| <input type="checkbox"/> Minnesota | <input checked="" type="checkbox"/> Ohio |

Lakes:

- | | |
|-----------------------------------|--|
| <input type="checkbox"/> Superior | <input checked="" type="checkbox"/> Erie |
| <input type="checkbox"/> Huron | <input type="checkbox"/> Ontario |
| <input type="checkbox"/> Michigan | <input type="checkbox"/> All Lakes |

Geographic Initiatives:

- | | | | | |
|--|----------------------------------|-------------------------------------|---|---|
| <input type="checkbox"/> Greater Chicago | <input type="checkbox"/> NE Ohio | <input type="checkbox"/> NW Indiana | <input checked="" type="checkbox"/> SE Michigan | <input type="checkbox"/> Lake St. Clair |
|--|----------------------------------|-------------------------------------|---|---|

Primary Affected Area of Concern: Detroit River, MI

Other Affected Areas of Concern: Maumee River, Rouge River, River Raisin

For Habitat Projects Only:

Primary Affected Biodiversity Investment Area:

Other Affected Biodiversity Investment Areas:

Problem Statement:

Contaminated sediment is a principle concern in RAPs and LaMPs. While contaminated sediment is not designated as a specific impairment in Annex 2 of the Great Lakes Water Quality Agreement (GLWQA), in-place pollutants potentially pose a challenge to restoring 11 of the 14 beneficial use impairments. Therefore, contaminated sediment is viewed as a universal obstacle in restoring uses in the 42 Areas of Concern in the Great Lakes Basin and Lake Erie.

The Sediment Priority Action Committee (SedPAC) under the IJC's Great Lakes Water Quality Board has pointed out that in many cases much more effort should be placed on forecasting and assessing ecological recovery of an Area of Concern, as well as beneficial use restoration consistent with Annex 2 of the GLWQA. Therefore, SedPAC recommended "that much greater emphasis be placed on post-project monitoring of effectiveness of sediment remediation (i.e., assessment of effectiveness relative to restoration of uses, with appropriate quality assurance/quality control)." Clearly, there are knowledge gaps in our understanding of the relationships between contaminated sediment and the 11 use impairments from the GLWQA that are potentially affected by contaminated sediment. Therefore, SedPAC further recommended that "additional research is essential to quantify the relationships between contaminated sediment and known use impairments, forecast ecological benefits, and monitor ecological recovery and beneficial use restoration in a scientifically defensible and cost effective fashion." In most Areas of Concern, the documentation of the sediment problem has not been quantitatively coupled to the ecological beneficial use impairments. Therefore, stipulating how much needs to be cleaned up, why, and what improvements can be expected to the beneficial use impairment(s) over time has not been possible. A clear understanding of these relationships and some level of quantification is critical for the development of a complete sediment management strategy. This understanding should provide adequate justification for an active cleanup program, and also represents a principle consideration in the adoption of non-intervention alternative strategies and determining "How clean is clean?" The proposed project will integrate monitoring data bases and modelling efforts to evaluate sediment program effectiveness (and other point and nonpoint source management efforts) based on measuring ecosystem results.

Proposed Work Outcome:

This project will bring together available research and monitoring data bases to evaluate program effectiveness based on measuring ecosystem results. First, the project will quantitatively estimate the mass of PCBs removed, treated, and/or contained as a result of the above projects. Next, the project will compile summaries of available research and monitoring programs. A binational forum will be held to integrate research, monitoring, and management in an effort which synthesizes data bases, collectively interprets results (relative to ecosystem outcomes), and collectively develops advice (recommendations) for research institutions, monitoring agencies (both near field and far field), and management organizations.

Research results and monitoring data (relative to PCBs) will be provided by the following institutions: Canada Dept. of

Fisheries and Oceans (W. Lake Erie fish contaminant data); University of Windsor's GLIER (modelling results and predictions from Dr. D. Haffner); U.S. Geological Survey (forage fish data base); Canadian Wildlife Service (herring gull monitoring data base); University of Windsor's GLIER (adult insect bioaccumulation data from Drs. Ciborowski and Corkum); Michigan Dept. of Environmental Quality (Detroit River fish contaminant monitoring data and sediment data); Ohio EPA (fish contaminant monitoring data); National Water Research Institute (sediment research data); U.S. EPA's LLRS (sediment and fish data sets); U.S. EPA's GLNPO (fish contaminant monitoring); Lake Erie LaMP (point and nonpoint source loadings of PCBs), and others. Management institutions involved include: Lake Erie Lamp, Detroit River RAP, the Four Party Agreement for the Detroit River, the Maumee River RAP; River Raisin RAP, Rouge River RAP, and the Greater Detroit American Heritage River Initiative. Again, the intent is to integrate research, monitoring, and management in an effort which synthesizes data bases, collectively interpret results (ecosystem outcomes), and collectively develop advice recommendations) for research institutions, monitoring agencies, and management organizations. The results of this binational forum will be presented at LaMP and RAP meetings, and other fora like the Greater Detroit American Heritage River Initiative. The final report from this project will be distributed to all interested stakeholders of the above initiatives and will be placed on selected homepages (e.g., Greater Detroit American Heritage River Initiative, International Association for Great Lakes Research, Environment Canada, U.S. EPA-GLNPO) to increase outreach. The final report will also be modified for publication in a peer-reviewed journal to further education and outreach.

Project Milestones:	Dates:
Form project management team	09/2000
Obtain commitments for data analysis	11/2000
Estimate mass of PCBs removed by site	01/2001
Compile background data set summaries	03/2001
Convene expert roundtable	05/2001
Prepare report and undertake outreach	08/2001
Publish in peer-reviewed journal	12/2001
Project End	02/2002

Project Addresses Environmental Justice

If So, Description of How:

This project addresses PCB contamination in Southeast Michigan and other areas of the Western Lake Erie watershed. As noted earlier, the project will provide a synthesis of data and information relative to the effectiveness of sediment remediation in these areas. This project will provide necessary knowledge to better address environmental justice issues in Southeast Michigan, but will not address the issue directly.

Project Addresses Education/Outreach

If So, Description of How:

The project will have a large public education and outreach component. The binational forum for the discussion of the data and information will be advertised broadly and will be open to all stakeholders. In addition, the output from this exercise will be presented at meetings of the Lake Erie LaMP, the Four Party Agreement for the Detroit River, the Detroit, Rouge, Raisin, and Maumee River RAPs, and the Greater Detroit American Heritage River Initiative. The final report will be distributed to all interested stakeholders of the above initiatives and will be placed on selected homepages (e.g., Greater Detroit American Heritage River Initiative, International Association for Great Lakes Research, Environment Canada, U.S. EPA-GLNPO) to increase outreach. The final report will also be modified for publication in a peer-reviewed journal to further education and outreach.

Project Budget:

	Federal Share Requested (\$)	Applicant's Share (\$)
Personnel:	29,000	10,000
Fringe:	2,800	0
Travel:	3,500	2,000
Equipment:	0	0
Supplies:	4,000	0
Contracts:	2,000	0
Construction:	0	0
Other:	0	0
Total Direct Costs:	41,300	12,000
Indirect Costs:	8,260	0
Total:	49,560	12,000
Projected Income:	0	0

Funding by Other Organizations (Names, Amounts, Description of Commitments):

The personnel dollars requested for this project will be used to retain the services of Dr. Tom Heidtke and a graduate student from Wayne State University. However, this project will leverage considerable support from other agencies. All research institutions, monitoring agencies, and management organizations will provide staff time to prepare the data summaries and participate in the binational forum. In addition, Dr. John Hartig will provide his time to help oversee and deliver the project, the final report, and the necessary outreach.

Description of Collaboration/Community Based Support:

This project is unique in that it cannot be accomplished without considerable collaboration. The project will be a collaborative effort among a number of research and management institutions. It will synthesize the results of many research and monitoring programs in an effort to evaluate the ecosystem results associated with contaminated sediment remediation. Research results and monitoring data (relative to PCBs) will be provided by the following institutions: Canada Dept. of Fisheries and Oceans (W. Lake Erie fish contaminant data); University of Windsor's GLIER (modelling results and predictions from Dr. D. Haffner); U.S. Geological Survey (forage fish data base); Canadian Wildlife Service (herring gull monitoring data base); University of Windsor's GLIER (adult insect bioaccumulation data from Drs. Ciborowski and Corkum); Michigan Dept. of Environmental Quality (Detroit River fish contaminant monitoring data and sediment data); Ohio EPA (fish contaminant monitoring data); National Water Research Institute (sediment research data); U.S. EPA's LLRS (sediment and fish data sets); U.S. EPA's GLNPO (fish contaminant monitoring); Lake Erie LaMP (point and nonpoint source loadings of PCBs), and others. Management institutions involved include: Lake Erie Lamp, Detroit River RAP, the Four Party Agreement for the Detroit River, the Maumee River RAP; River Raisin RAP, Rouge River RAP, and the Greater Detroit American Heritage River Initiative. The intent is to integrate research, monitoring, and management in an effort which synthesizes data bases, collectively interpret results (ecosystem outcomes), and collectively develop advice (recommendations) for research institutions, monitoring agencies, and management organizations.