

Trust Fund 2009 Work Program

Date of Report: 11 June 2009

Date of Next Progress Report: 1 December 2009

Date of Work Program Approval:

Project Completion Date: 30 June 2011

I. PROJECT TITLE: Emergency Delivery System Development for Disinfecting Ballast Water

Project Manager: Scott Smith
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Location:

Project work will be conducted on board the ship, *M/V Indiana Harbor*, as it transits through the Great Lakes. The actual locations will be dependent upon the ship schedule. Completed Phase 2 work (funded through Great Lakes Fisheries Trust) included:

- Uptake of ballast water in Indiana Harbor, Indiana;
- Trial of mixing methods and in tank sampling during transit vessel from Lake Michigan to Lake Superior; and
- Discharge of ballast water in Superior, Wisconsin. Permits for discharge will be obtained in conjunction with ship's schedule.

A black and white map has not been included in this package, as the focus is on the ship and a map of the Great Lakes would not likely add value.

Total Trust Fund Project Budget:	Trust Fund Appropriation	\$	125,000
	Minus Amount Spent:	\$	0
	Equal Balance:	\$	125,000

Legal Citation: M.L. 2009, Chap. 143, Sec. 2, Subd. 6b

Appropriation Language: (b) Emergency Delivery System Development for Disinfecting Ballast Water. \$125,000 is from the trust fund to the commissioner of the Pollution Control Agency for an agreement with the United States Geological Survey to test the viability of treating ballast water through access ports or air vents as a means to prevent the spread of invasive species.

II. PROJECT SUMMARY AND RESULTS:

This project is **Phase III** of an overall effort to produce an Emergency Response Guide to Handling Ballast Water to Control Non-Indigenous Species. Phase I (\$25,000) was funded by NOAA and resulted in a study plan entitled "Mixing Biocides into Ships' Ballast Water: Efficiency of Novel Methods." Phase II (\$185,000) was funded by the Great Lakes Fisheries Trust and studied in-line injection, bulk dye dosing, perforated hose dosing and passive mixing methods, such as ship's motion.

Similar to Phase II, this proposal (**Phase III**) involves preparation of ballast tank mixing and sampling equipment, field work on a working ship to trial promising ballast mixing methods, and analysis/report. The active methods to be studied in Phase III are venture eductors and air lifts. The outcome will be the incorporation of these methods (if determined to be effective and practical) into a best practices guide for treating the ballast water of ships either:

- Arriving in port with high risk ballast water,
- Leaving a port that contains ballast known to be high risk for the destination port, or
- Grounded and laden with high risk, untreated ballast water.

III. PROGRESS SUMMARY AS OF

IV. OUTLINE OF PROJECT RESULTS:

Result 1: Logistics and Equipment Preparation

Description: Shipboard field trials require significant preparations because: (a) There is no opportunity to "go to back to the shop" to get broken or forgotten supplies. (b) Ship's commercial rates typically ranging between \$40,000 and \$80,000 per day. This requires equipment to be ready to go and integrated with operations such that it does not delay the ship. Equipment preparation specifically includes:

- Logistics Preparation:
 - Team Coordination: Sampling Team, Dosing Team, Ship Personnel, Ship Office Personnel
 - Finalize Test Protocol
 - Develop, Print, Bind Field Logs
 - Obtain Ballast Water Discharge Permit(s).
 - Team Travel and Accommodation Arrangements
 - Purchasing and administrative preparations
- Equipment Preparation:
 - Sampling and Measurement
 - Dye Sampling Equipment Rental and Set-up
 - Pressure Transducer Suite Set-up
 - Ship Dynamics Measurement Suite Set-up

- Mixing Equipment
 - Dye Stock and Dosing Equipment Set-up
 - Air Lift Equipment Set-up
 - Eductor Equipment Set-up
- Consumables Procurement
- Shipment and Handling of Equipment to Ship Location

Summary Budget Information for Result 1: Trust Fund Budget: \$ 39,829
Amount Spent: \$ 0
Balance: \$ 39,829

Deliverable	Completion Date	Budget
1. Logistics Preparation by Contractor	1 Dec. 2009	\$8,910
2. Equipment Preparation by Contractor	1 Dec. 2009	\$14,045
3. Equipment preparation by USGS	1 Dec. 2009	\$16,874

Result Completion Date: Estimated as 1 December 2009.

Result Status as of 1 December 2009:

Result Status as of 1 June 2010:

Result Status as of 1 December 2010:

Result Status as of 1 June 2011:

Final Report Summary:

Result 2: Field Deployment

Description: Field deployment is the efforts required to execute the actual work on board the ship. There is significant set-up and break-down effort on board the ship such that the testing methods are ready for execution when the ship actual takes on the ballast water.

Summary Budget Information for Result 1: Trust Fund Budget: \$ 57,960
Amount Spent: \$ 0
Balance: \$ 57,960

Deliverable	Completion Date	Budget
1. Staging and Transfer by Contractor	1 Dec 2009	\$5,100
2. Shipboard Efforts by Contractor	1 Dec 2009	\$19,793
3. Demobilization by Contractor	1 Dec 2009	\$4,910
4. Shipboard Efforts and Travel for USGS	1 Dec 2009	\$28,157

Result Completion Date: Estimated as 1 December 2009.

Result Status as of 1 December 2009:

Result Status as of 1 June 2010:

Result Status as of 1 December 2010:

Result Status as of 1 June 2011:

Final Report Summary:

Result 3: Data Analysis/Report

Description: Following completion of shipboard efforts, the team will analyze the data to determine the relative efficiency of the various mixing methods. Additionally, the Emergency Response Field Guide will be updated with any of the methods in this Phase III work which are promising. These specific activities include:

- Data Analysis
- Report Development
- Field Guide Update

Summary Budget Information for Result 1: Trust Fund Budget: \$ 27,211
Amount Spent: \$ 0
Balance: \$ 27,211

Deliverable	Completion Date	Budget
1. Data Analysis by Contractor	1 June 2010	\$3,880
2. Project Report by Contractor	1 June 2010	\$5,480
3. Field Guide Update by Contractor	1 June 2010	\$7,885
4. Data Analysis by USGS	1 June 2010	\$9,969

Result Completion Date: Estimated as 1 June 2010.

Result Status as of 1 December 2009:

Result Status as of 1 June 2010:

Result Status as of 1 December 2010:

Result Status as of 1 June 2011:

Final Report Summary:

V. TOTAL TRUST FUND PROJECT BUDGET: \$125,000

Personnel: \$ 33,250

Contracts: \$ 70,000

Equipment/Tools/Supplies: \$ 16,330

Travel: \$ 5,420

TOTAL TRUST FUND PROJECT BUDGET: \$125,000

Explanation of Capital Expenditures Greater Than \$3,500: NONE

VI. PROJECT STRATEGY:

A. Project Partners:

1. USGS Western Fisheries Research Center (WFRC). As the primary contract for the grant, the Center will receive no indirect costs for implementing this research. The WFRC has agreed to cost-share the indirect costs of this project by paying for these expenses out of other budgets. The indirect costs absorbed by the WFRC amount to \$42,000.
2. USGS Leetown Science Center. The center will receive \$20,000 to cover efforts to develop the air lift methods, staff time, and travel to the ship for field trials.
3. A marine engineering firm. The marine engineering firm selected by the WFRC through a competitive process will perform as a contractor and receive \$70,000. This will cover overall logistical coordination of the testing efforts, including dye dosing and sampling preparation, execution, and reporting upon completion of the effort.
4. National Park Service, Isle Royal. NPS will not receive any funding. However, NPS will be obtaining critical discharge permits, as well as supply needed on-site support efforts in the Great Lakes. Additionally, NPS will serve as the "customer" by both providing feedback real time as field efforts are progressing, and be a recipient of the results of the study.

B. Project Impact and Long-term Strategy:

Ballast water is the primary pathway for aquatic invasive species (AIS) introduction and spread to the Great Lakes and Lake Superior. At least one new invasive species is found in the Great Lakes each year. Many ballast water treatment technologies are currently undergoing research, development and various regulatory approvals. International, national and state laws are being established to mandate the use of ballast treatment; however it will be many years before effective ballast treatment devices are available or required for all vessels. Lake Superior will remain at risk for new AIS for many years unless simple cost effective emergency treatment is developed, especially for high risk vessels. High risk vessels include those that frequent Great Lakes ports with known infestations or active outbreaks of AIS. For

example, viral hemorrhagic septicemia (VHS) has not been found in Lake Superior, but ships that take up ballast water in areas where there is an outbreak of VHS and then discharge untreated ballast water into Lake Superior may pose a high risk. Development of methods to treat ballast water in high risk vessels would substantially reduce the risk of spreading VHS and other AIS to Lake Superior.

This study would build on existing efforts to reduce risks of introducing and spreading AIS through ballast water. An ongoing investigation at the Great Ships Initiative is bench testing the efficacy of active substances such as chlorine to treat ballast water. At the same time, other researchers are developing methods to identify high risk ports in the Great Lakes. This study will field test several emergency treatment methods in the absence of installed metering systems, including powered mixing devices and administering a biocide directly through the access ports. The methods must include protocols to ensure an environmentally sound discharge. The methods should also be practical for deployment on any vessel, economical, and cause minimal delays in the vessels' schedule.

C. Other Funds Proposed to be spent during the Project Period:

This project is Phase III of a planned IV to achieve final project results. At the end of each successive phase, we are advancing the best practices for emergency ballast water treatment. As such, each phase is valuable in isolation – and each phase builds upon the results of the last.

Efforts which have been completed or are in progress to complement this \$125,000 grant for Phase III:

- Phase I – Study Planning. Funding Agency NOAA - \$25,000. Completed.
- Phase II – Passive Mixing Field Trials. Funding Agency Great Lakes Fisheries Trust - \$185,000. In progress, 80% complete.
- Phase III – This proposal.
- Phase IV – Finalizing Novell Methods. Funding Agency USGS – TBD. Proposal under development.
- Significant in-kind financial contributions have been made by the NPS, and the USGS-WFRC through proposal preparation efforts and during phases I, II and III.

D. Spending History: See “C” above.

VII. DISSEMINATION:

The focus of the effort is to provide practical guidance for handling high risk ballast water to emergency responders. The outcome will be the incorporation of these methods (if determined to be effective and practical) into a best practices guide for treating the ballast water of ships either:

- Arriving in port with high risk ballast water,
- Leaving a port that contains ballast known to be high risk for the destination port, or
- Grounded and laden with high risk, untreated ballast water.

VIII. REPORTING REQUIREMENTS: Periodic work program progress reports will be submitted beginning not later than 1 December 2009. A final work program report and associated products could be submitted as soon as 1 February 2010, but no later than 1 June 2010.

IX. RESEARCH PROJECTS: N/A

Attachment A: Budget Detail for 2009 Projects - Summary and a Budget page for each partner (if applicable)											
Project Title: <i>Emergency Delivery System Development for Disinfecting Ballast Water</i>											
Project Manager Name: <i>Scott Smith.</i>											
Trust Fund Appropriation: \$125,000											
1) See list of non-eligible expenses, do not include any of these items in your budget sheet											
2) Remove any budget item lines not applicable											
2009 Trust Fund Budget	Result 1 Budget:	Amount Spent (date)	Balance (date)	Result 2 Budget:	Amount Spent (date)	Balance (date)	Result 3 Budget:	Amount Spent (date)	Balance (date)	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM	<u>Logistics and Equipment Preparation</u>			<u>Field Deployment</u>			<u>Data Analysis/Report</u>				
PERSONNEL: wages and benefits	9,575			13,706			9,969			33,250	
Noah Adams (\$62.21 per hour - Loaded rate) 40 hrs Logistics, 88 hrs Field Deployment, 80 hrs Data Analysis (Estimated \$12,940)											
Gary Rutz (\$34.41 per hour - Loaded Rate) 40 hrs Logistics, 88 hrs Field Deployment, 40 hrs Data Analysis (Estimated \$5,781)											
Marshal Hoy (\$23.12 per hour -Loaded Rate) @ 80 hrs field deployment, 80 hrs data analysis. (Estimated \$3,670)											
Scott Smith (\$63.50 per hour - Loaded Rate) 28 hrs Logistics, 6.8 hrs field deployment, 28 hrs data analysis) (Estimated \$3,999)											
Carolyn Brill, Administrative Officer (.013 FTE \$750) Logistics, (.013 FTE \$750) Field Deployment (Estimated \$1,500)											
Staci Clark, Budget Analyst (.026 FTE \$1250) Logistics, (.026 FTE \$1250) Field Deployment (Estimated \$2,500)											
Libby Pierce, Purchasing Agent (.015 FTE \$500) Logistics, (.015 FTE \$500) Field Deployment (Estimated \$1,000)											
Roy Dodson, Shop Manager (.024 \$1000) Logistics (Estimated \$1,000)											
Melonie Skinner, DOI Fiscal Analyst, (.1 FTE \$430) Logistics, (.1 FTE \$430) Field Deployment (Estimated \$860)											
Contracts											
Professional/technical sevicees from a marine engineering firm will be selected by the WFRC through a bid process	22,955			29,803			17,242			70,000	
Other contracts (with whom?, for what?) list out: personnel, equipment, etc.											
Other direct operating costs (for what? – be specific)	225			3,991						4,216	
Equipment Shipping costs to & from test site (Estimated \$225)											

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Project Manager Name: <i>Scott Smith.</i>											
Trust Fund Appropriation: \$125,000											
1) See list of non-eligible expenses, do not include any of these items in your budget sheet											
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2009 Trust Fund Budget	Result 1 Budget:	Amount Spent (date)	Balance (date)	Result 2 Budget:	Amount Spent (date)	Balance (date)	Result 3 Budget:	Amount Spent (date)	Balance (date)	TOTAL BUDGET	TOTAL BALANCE
	<u>Logistics and Equipment Preparation</u>			<u>Field Deployment</u>			<u>Data Analysis/Report</u>				
Diesel Air Compressor (rental, del, return) (Estimated \$2,891)											
High Pressure Air Line Hose (rent,del, return) (Estimated \$1,100)											
Non-capital Equipment / Tools (<i>what equipment? Give a general description and cost</i>)	7,074									7,074	
Airline manifolds (2) (Estimated \$1,370)											
Air Flow Meters (6) (Estimated \$1,700)											
Control Valves (8) (Estimated \$300)											
Pressure gages (6) (Estimated \$180)											
Airlift eductor piping (Estimated \$2,100)											
Suction Line tubing (Estimated \$1,174)											
Support brackets (Estimated \$250)											
Supplies (<i>list specific categories</i>)				5,040						5,040	
Rental of Water inductors (Estimated \$1,000)											
Purchase of 1.5 inch hose, connectors, and mounting hardware for hose (Estimated \$1,445)											
Purchase of mounting hardware for inductors (Estimated \$1,580)											
Data collection/storage devices and data storage (Estimated \$265)											
Diesel Fuel for air compresor (Estimated \$750)											
Travel expenses in Minnesota (hotel, perdiem, parking, taxie)				500						500	
Travel outside Minnesota (<i>where?, for what purpose?</i>)				4,920						4,920	
Travel for Dr. Watten from duty station (W.VA) to Superior WI (Estimated \$1,100)											
Travel from Cook to Deluth for Noah (airfair, parking, taxie) (Estimated \$1,230)											
Travel from Seattle to Deluth for Marshal (airfair, parking, taxie) (Estimated \$1,260)											
Travel from Cook to Deluth for Gary (airfair, parking, taxie) (Estimated \$1,330)											
Other (<i>Describe the activity and cost</i>) <i>be specific</i>											
COLUMN TOTAL	\$39,829	\$0	\$39,829	\$57,960	\$0	\$57,960	\$27,211	\$0	\$27,211	\$125,000	\$0

