

**2003 Project Abstract**  
For the Period Ending June 30, 2006

**TITLE: Accelerating and Enhancing Surface Water Monitoring**  
**PROJECT MANAGER: Daniel Helwig**  
**ORGANIZATION: Minnesota Pollution Control Agency**  
**ADDRESS: 520 Lafayette Rd N, St Paul, MN 55155**  
**WEB SITE ADDRESS: <http://www.pca.state.mn.us/index.cfm>**  
**FUND: Minnesota Environment and Natural Resources Trust Fund**  
**LEGAL CITATION: ML 2003, Ch. 128, Art. 1, Sec. 9, Subd. 07(b)**

**APPROPRIATION AMOUNT: \$740,000.00**

#### Overall Project Outcome and Results

This project was designed to enhance and accelerate surface water monitoring using a variety of methods. The condition assessment of 172 stream reaches was completed over two monitoring seasons. Monitoring was conducted in the Lower Mississippi, Cedar, Des Moines, Missouri, Red, and Rainy River Basins. This acceleration will lead to the earlier completion of the calibration of indices of biotic integrity (IBI) for all the basins in Minnesota. All data is available online. Over 10,000 lakes were analyzed using Landsat imagery for transparency over a 20 year span (at 5 year intervals). This provides a tool to extend the census of water quality data across the state and over time. Data from this project are available to the public online. MODIS imagery was used to monitor 100 large lakes for both chlorophyll and transparency. Hyperspectral and in situ data was collected at 37 sites on four river segments to develop a remote sensing tool for rivers. The Lakes and Rivers Monitoring Congress was attended by 325 participants. Fifty citizens, representing 14 groups, completed Monitoring Plan Training. Thirteen plans were developed and monitoring occurred at 153 sites on 66 streams and 80 sites on 56 lakes. With over 95 applications for the 14 openings, this pilot project showed a need for this type of training. The training materials are now available online for interested parties. Ten skills trainings, covering topics from data management to sample collection were attended by 71 groups and 300 individuals. Two editions of the Minnesota Water Watchers newsletter were developed and distributed to 3800 citizens. Healthy Lakes and Rivers Program trained 62 lake or river associations (423 individuals), with 39 Lake Management Plans developed. Volunteers in additional counties are undergoing training as a result of this successful expansion of the program.

#### Project Results Use and Dissemination

Data from the biological monitoring can be found online at: <http://www.pca.state.mn.us/data/edaWater/index.cfm>. Data from remote sensing can be found at: <http://water.umn.edu/lakebrows.html>. Training materials are available from Monitoring Plan Trainings at: [http://www.riversmn.org/resources\\_citmon.html](http://www.riversmn.org/resources_citmon.html). Monitoring Plans (13) and Lake Management Plans (39) have been used to initiate implementation activities.

Presentations on Satellite Remote Sensing were given at the National Conference on Enhancing the States' Lake Management Programs (2004), the Minnesota GIS/LIS Annual Conference (2005), the LCMR Southeastern MN Tour (2005), the North American Lake Management Society Symposium (2005), the Minnesota Water 2005 and Annual Water Resources Joint Conference (2005), and the MPCA Lakes, Streams, Wetlands, & Groundwater Team Meeting (Feb 2006). Presentations on the Monitoring Plan Trainings were given at the National Water Quality Monitoring Conference in May of 2006.

## LCMR Final Work Program Report

### 2003 LCMR Work Program

**Date of Report:** August 8, 2006 for work completed through June 30, 2006

**Date of Work Program Approval:** July 10, 2003

**Project Completion Date:** June 30, 2006

#### **I. PROJECT TITLE:** Accelerating and Enhancing Surface Water Monitoring for Lakes/Streams

**Project Manager:** Dan Helwig<sup>1</sup>

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<b>Total Biennial LCMR Project Budget:</b>	<b>LCMR Appropriation:</b>	<b>\$ 740,000.00</b>
	<b>Minus Amount Spent as of 6/30/06:</b>	<b>\$ 739,638.31</b>
	<b>Current Balance:</b>	<b>\$ 361.69</b>

**Legal Citation:** ML 2003, Art. 1, Chap. 128, Sec. 9, Subd. 07b.

**Appropriation Language:** 7 (b) Accelerating and Enhancing Surface Water Monitoring for Lakes and Streams \$370,000 the first year and \$370,000 the second year are from the trust fund to the commissioner of the pollution control agency for acceleration of agency programs and cooperative agreements with the Minnesota Lakes Association, Rivers Council of Minnesota, the Minnesota Initiative Foundation, and the University of Minnesota to accelerate monitoring efforts through assessments, citizen training and implementation grants. This appropriation is available until June 30, 2006, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

#### **II. and III. FINAL PROJECT SUMMARY:**

This project was designed to enhance and accelerate surface water monitoring using a variety of methods. The condition assessment of 172 stream reaches was completed over two monitoring seasons. Monitoring was conducted in the Lower Mississippi, Cedar, Des Moines, Missouri, Red, and Rainy River Basins. This acceleration will lead

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<sup>1</sup> Due to a change in work responsibility Gaylen Reetz will no longer be manager of the LCMR funded project. Dan Helwig, Supervisor of the Biological Monitoring Unit at the Minnesota Pollution Control Agency, will replace him as project manager. 8/19/04. Approved per email from Susan Thornton 9/2/04.

to the earlier completion of the calibration of indices of biotic integrity (IBI) for all the basins in Minnesota. All data is available online. Over 10,000 lakes were analyzed using Landsat imagery for transparency over a 20 year span (at 5 year intervals). This provides a tool to extend the census of water quality data across the state and over time. Data from this project are available to the public online. MODIS imagery was used to monitor 100 large lakes for both chlorophyll and transparency. Hyperspectral and in situ data was collected at 37 sites on four river segments to develop a remote sensing tool for rivers. The Lakes and Rivers Monitoring Congress was attended by 325 participants. Fifty citizens, representing 14 groups, completed Monitoring Plan Training. Thirteen plans were developed and monitoring occurred at 153 sites on 66 streams and 80 sites on 56 lakes. With over 95 applications for the 14 openings, this pilot project showed a need for this type of training. The training materials are now available online for interested parties. Ten skills trainings, covering topics from data management to sample collection were attended by 71 groups and 300 individuals. Two editions of the Minnesota Water Watchers newsletter were developed and distributed to 3800 citizens. Healthy Lakes and Rivers Program trained 62 lake or river associations (423 individuals), with 39 Lake Management Plans developed. Volunteers in additional counties are undergoing training as a result of this successful expansion of the program.

**IV. OUTLINE OF PROJECT RESULTS**

**Result 1: Accelerate calibration of biological index**

**Description:** MPCA will accelerate calibration of a biological index used for water quality assessments. Aquatic organisms are excellent indicators of river and stream health. Because they respond to physical, chemical, and biological stressors, they provide a composite measure of water quality throughout the year. Looking at fish and invertebrates in both impacted and relatively undisturbed stream segments within a region develops the Index of Biological Integrity (IBI). This information is then used to determine the biological condition of rivers and streams during water quality assessments.

The MPCA began IBI's in the early 1990's. IBI's have been completed for the Minnesota (partial), Red (partial), St. Croix, and Upper Mississippi River Basins. IBI's sampling has been completed for the Lake Superior Basin but the results won't be analyzed until February, 2004. Work has not begun in the Lower Mississippi, Rainy, Cedar, or Des Moines River Basins. At current staffing levels, this work will not be completed until after 2010. Proposed funding at \$800,000 would have accelerated the completion of the IBI for the state to 2005. The \$350,000 funding level recommended by LCMR would have accelerated the completion date to 2007. The current funding level at \$260,000 will accelerate the completion to 2008. This work is a prerequisite in order to conduct other biological water quality assessments in an area.

**March 04 – May 04:** Hire, train, and outfit one field sampling crew consisting of 1.3 FTE biologists, and 3 interns. (This crew will work with 2 existing crews at the MPCA).

**May 04-Sept 04:** Sample 50 sites in the lower Mississippi river basin for fish, invertebrates, habitat, and water quality chemistry

**Oct 04-April 05:** Compile and analyze data, prepare interim reports, and select sites for 05 field season

**May 05-Sept 05:** Sample 50 sites in the Rainy or Red River for fish, invertebrates, habitat, and water quality chemistry

**Oct 05-March 06:** Compile and analyze data and prepare interim report.

**March 06:** Report. Report will include a calibrated Index of Biotic Integrity for the lower Mississippi River to be used to assess conditions and a summarization and documentation of results.

<b>Summary Budget Information for Result 1: LCMR Budget</b>	<b>\$ 260,000.00</b>
<b>Amount Spent as of 3/30/06</b>	<b>\$ 260,000.00</b>
<b>Balance</b>	<b>\$ 0.00</b>
<b>Other Funds</b>	<b>\$ 242,000</b>
<b>Balance</b>	<b>\$ 0</b>

**Completion Date: March 30, 2006**

**Plan for completion of current work program and overlap of continuation work program:**

Result 1 anticipates completion of funds for the current 2003-2006 LCMR work program by September 30, 2005. At that point analysis of the data will be completed and a final report will be developed and is anticipated to be included in the March 30, 2006 update. Upon the completion of the current work program funds, the new 2005-2008 LCMR work program funds will begin (approximately October 1, 2005). Amended 4/8/05. Approved 4/12/05 per Susan Thornton phone call.

**<sup>2</sup>Final Report Summary June 30, 2006:**

Using LCMR funds, the assessment of the condition of 172 Minnesota stream reaches was completed. Fish, invertebrate, water chemistry and habitat were sampled using standard MPCA protocol. Sites were sampled in the Lower Mississippi River Basin (55), Cedar River Basin (14), Des Moines River Basin (16), Missouri River Basin (9), Red River Basin (40), and Rainy River Basin (38). Sampling results and protocols are both available online at [www.pca.state.mn.us/data/edaWater/index.cfm](http://www.pca.state.mn.us/data/edaWater/index.cfm) and [www.pca.state.mn.us/water/biomonitoring/bio-streams.html](http://www.pca.state.mn.us/water/biomonitoring/bio-streams.html), respectively. In addition to the acceleration of monitoring efforts, staff also developed:

- The use of PC Tablet field computers, greatly reducing the time needed to enter data and accelerating the speed in which data was available online.
- Developed a GIS program to automate land use ranking for each site, increasing the speed and accuracy of assessments.
- Developed an intern orientation program to help students with sampling and safety procedures.

**Result 2: Provide the capability to use remote sensing tools to assess lakes and streams.**

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<sup>2</sup> Final report will be developed for all results for the June 30, 2006 end date. This was discussed with Susan Thornton via phone on 2/20/2006.

**Description:** The University of Minnesota Water Resources Center and Remote Sensing Laboratory will use satellite remote sensing technology to assess the quality of lakes statewide and conduct research to evaluate the potential of remote sensing technology for assessing stream properties.

- **Statewide monitoring of lakes by satellite remote. (\$115,000)** — Over the past 5 years the University has developed the capability to monitor lake water clarity, an indicator of water quality, with Landsat Thematic Mapper data. The capability is based on consistently strong relationships between the spectral-radiometric responses of the Landsat TM bands and Secchi disk transparency. Lake clarity is strongly correlated with algae concentration. Each Landsat image can provide a “snapshot” of information on hundreds of lakes, allowing for cost effective evaluation of many hundreds of previously unmonitored lakes. This project will:

**\*July 03 – May 06:** Extend the existing temporal series of lake clarity classifications back to 1985 and forward to 2004, providing a 20-year record for analysis. New Landsat imagery for 2003-05 will be acquired during the summer 2005 and classified during the fall and winter of 2005.

**\*January 04 – June 06:** Conduct trend analysis using previous (1990 and 2000) and new classifications and relate lake clarity to land use/land cover.

**July 03 – December 05:** Validate statewide clarity results, including investigating the effects of humic color and sediment, to improve upon estimates of average summer clarity, using CLMP, MPCA and MDNR monitoring data.

**\*July 04 – December 05:** Develop procedures for more frequent monitoring of large lakes (> 10,000 acres) using the new MODIS sensor on NASA’s Terra and Aqua satellites. Although it has only 1000-meter spatial resolution, this system has high temporal resolution, ensuring acquisition of cloud-free imagery. Bay-to-bay differences will be classified for selected large lakes.

**\*July 03 – June 06:** Maintain MapServer GIS database for archival and dissemination of data via the Internet, including links to MDNR and MPCA databases and websites. Package classification statistics by county in tabular and GIS formats.

**\*July 04- June 06:** Summarize and document results. Conduct workshops and provide documentation needed to transfer technology to state agencies<sup>3</sup>.

\*Milestones were updated as of 4/8/05 to sync with the project end date of June 30, 2006. Approved per 4/12/05 Susan Thornton phone call.

- **Evaluation of remote sensing technology for monitoring streams. (\$65,000)** Technology similar to that available for lakes holds potential to provide initial evaluation of river and stream water quality. However, due to their dynamic nature

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<sup>3</sup> Research findings were presented at the 2005 Annual North American Lake Management Society meeting in Madison, Wisconsin. This venue provides a large audience of water resource professionals in which to share the data provided by this project. Amended 2/22/06. Approved via Susan Thornton email 2/23/06.

and spatial characteristics, rivers present a number of technical challenges not encountered with lakes. Therefore the objective of this part of the project will be to determine the degree to which key Minnesota river water characteristics can be assessed and monitored with remote sensing. Key water quality indicators that may be amenable to multispectral remote sensing include, total suspended solids, turbidity, chlorophyll. This project will:

**July 03 – December 03:** Review literature describing previous research on remote sensing of stream characteristics, and define approaches for acquisition of remote sensing and in-situ data. It is anticipated that the remote sensing data will be acquired by an aerial multispectral sensor because we will have more control over the timing and acquisition of imagery directly over the rivers. Focus may be on the Minnesota River Basin, due to the availability of data for comparisons.

**January 04 – \*June 04:** Specify sensor system, the river segments, and the river sampling and measurements plan. Contract for collection of acquisition of remote sensing imagery. Arrange for in-situ data collection in cooperation with MPCA and other agencies.

**\*August 04:** Collect remote sensing imagery and in-situ water quality data for calibration of remote sensing data in spring prior to development of full crop canopy and during July or August during the "green water" phase.

**\*September 04 – March 06:** Process and analyze remote sensing data and relate to trophic status and water quality conditions in river segments.

**\*March 06 – June 06:** Summarize and document results, including evaluation of feasibility and recommendations for future data collection.

\*Milestones were updated as of 4/8/05 to sync with project end date of June 30, 2006.

<b>Summary Budget Information for Result 2:</b>	<b>\$ 180,000.00</b>
<b>Amount Spent as of 12/30/05</b>	<b>\$ 179,998.28</b>
<b>Balance</b>	<b>\$ 1.72</b>

**Completion Date: June 30, 2006**

**Plan for completion of current work program and overlap of continuation work program:**

Result 2 anticipates utilizing funds from the current (2003-2006) work program until approximately April 2006. At that point the new (2005-2008) work program funds will begin. However, new (2005-2008) funds will be needed summer of 2005 for the collection of aerial multispectral data. This data must be collected as part of the new project, but will not undergo analysis until the current (2003-2006) work has been completed. Amended 4/8/05. Approved per Susan Thornton phone call 4/12/05.

**Final Report Summary: June 30, 2006**

The project has developed and extended the capability for using remote sensing for monitoring the condition of lakes and streams in Minnesota. Classification of lake clarity using Landsat satellite imagery has proven to be an accurate and economical method to monitor the condition of over 10,000 lakes. During the project, data from 1985, 1995, and 2005 were classified and added to previous classifications for 1990 and 2000. The five classifications over a 20-year period provide an unprecedented assessment of lakes in terms of number of lakes, number of classifications, and geographic scale. These data will be used for further analysis of the temporal and geographic patterns and trends. Initial analysis for 1990 and 2000 indicates relatively stable conditions statewide, but more meaningful analyses are now possible for individual lakes, as well as by lakeshed, watershed, county, and ecoregion. Data for all lakes and years are available at our [www.water.umn.edu](http://www.water.umn.edu) webpage that includes a web-based mapping tool that enables searches and display of results for individual lakes. In addition, we have demonstrated the potential of MODIS imagery for monitoring lake clarity and chlorophyll of large lakes (typically greater than 1000 acres). These capabilities are now available for routine, regular monitoring by the state.

The second part of the project has been to acquire and analyze hyperspectral imagery of a representative sample of major streams, including the Mississippi, Minnesota, St. Croix, Blue Earth, and Crow Rivers, to evaluate the potential for mapping key biophysical properties and indicators of water quality. Strong relationships to key indicators of water quality, including chlorophyll, suspended sediments, and transparency were found; models of spectral reflectance to the biophysical variables were derived and used to map spatial patterns and variation for the streams. This phase of the project is being continued in the 2005 LCMR continuation project with additional imagery acquired in 2005, however, the initial results are very promising and indicate excellent potential for monitoring and mapping key river properties. The biggest limitation is expected to be the cost of the remote sensing data.

The overall conclusion of the project is that lake and stream properties can be accurately monitored and mapped using contemporary remotes sensing technology. The Landsat application for monitoring lake clarity, a key indicator of water quality, is ready for routing, operational use by the state. Further research and development, as well as ready access to an appropriate sensor system, will be required to bring the capability for monitoring streams to fruition. Further detail can be found in Appendix B.

**Result 3: Enhance and expand ability of citizen volunteers to collect water quality data that will be useful for lake and stream assessments and management.**

**Description:** The Minnesota Lakes Association (MLA) and the Rivers Council of Minnesota (RCM) will work collaboratively to provide training, technical support, education, and communications for individuals and organizations statewide interested in volunteer lake and stream monitoring. Many Minnesotans are interested in water quality monitoring; however, there is a lack of training on how to plan and carry out data collection, analysis, and management. This result will train volunteers to design and execute a monitoring program on their local water body and will ensure that the volunteer data is useful for its intended purpose.

Communications between the groups involved with training to develop and enhanced volunteer monitoring programs will be facilitated through dedicated information on both the RCM and MLA web sites. A newsletter will be developed and published twice during the project period targeted to reach all volunteer monitors in Minnesota with information on acceptable monitoring procedures, monitoring resources, and reports on the project trainings.

- **Plan and Hold Lakes and Rivers Monitoring Congress (\$48,242)**

MLA and RCM will plan and hold a lake and rivers conference, which will include a series of workshops, training and plenary sessions that form the agenda of a Monitoring Congress held concurrently with the Conference. It will be targeted for 250-300 citizen volunteers, local governments, schools, and local natural resource professionals. The workshops and sessions will be designed to improve understanding of key water resource issues and enhance monitoring skills of citizen volunteers. A participant fee will be charged to cover the cost of lodging and food.

**Aug 03 – May 04:** Planning and organizing the conference will be done by RCM and MLA staff and volunteers. Between Aug. and May the conference planning work will focus on: a) program planning to develop program and identify speakers for plenary, concurrent sessions, and workshops; b) communications to publicize the event and recruit participants; and overall management of conference budget, facilities and logistics.

**April 29-May 1, 04:** Hold Lakes and Rivers Conference

- **Develop and Implement 14 New Volunteer Monitoring Program Plans**

**July- Oct 03:** RCM, MLA with support of a sub-contractor (River Network) will begin developing a Citizen Volunteer Monitoring Program Planning and Implementation training workshop including workbooks, planning materials, session agendas, participant assignments, training techniques and presentations.

**Nov 03 – March 04:** RCM and MLA will hold the first training session for 7 citizen volunteer monitoring groups. Each group will produce a monitoring plan for their targeted stream or lake through the two-day training session. Each group may send up to 3 leaders to the training. Upon completing their monitoring plan each group will be provided up to \$3000 for plan implementation

**Aug - Oct 04:** RCM and MLA will evaluate and adjust first round of training and follow-up with participants, and hold the second round of training for 7 additional new groups to volunteer monitoring

**Oct 04 – Mar 05:** RCM and MLA will evaluate and adjust the second round of this pilot program. There will be continued communication with participants and follow-up between sessions and after the plans have been written.

**\*March 05 – June 06:** Volunteer groups complete monitoring season and submit reimbursements and final reports.

**\*June 06:** Final Report Submitted

\*Milestones updated 4/8/05 to sync with project end date of June 30, 2006.

Approved 4/12/05 per Susan Thornton phone call.



- **Develop and Implement 20 Volunteer Monitoring Program Expansion or Enhancement Projects**

RCM and MLA will develop and deliver 8 training sessions designed to build specific skills for up to 20 existing Citizen Volunteer Monitoring Groups, who will develop and implement project plans to enhance or expand their current programs

**May - Aug 04:** RCM and MLA will hold 2 skills building training sessions for a total of up to 5 groups. Upon completion of their training session, each group will be provided up to \$500 to implement monitoring program enhancement or expansion project plans developed during training.

**Aug 04 – April 05:** RCM and MLA will hold 6 additional sessions for a total of up to 15 additional groups and provide up to \$500 to implement monitoring program enhancement or expansion project plans developed during the training.

**\*April 05 – September 05:** RCM and MLA, via subcontractors, will provide training, equipment, and/or laboratory analysis for volunteers. This will eliminate the pass through of funds to groups and instead provide training and necessary equipment or services for volunteers to complete monitoring (Amended 4/8/05).

<b>Summary Budget Information for Result 3: LCMR Budget</b>	<b>\$ 250,000.00</b>
<b>Amount Spent as of 3/30/06</b>	<b>\$ 249,640.03</b>
<b>Balance</b>	<b>\$ 359.97</b>

**Completion Date: June 30, 2006**

**Plan for completion of current work program and overlap of continuation work program:**

The Rivers Council of Minnesota will expend all their current work program (2003-2006) funds by June 30, 2005 with the exception of \$9,000 which will be utilized during the summer of 2005 by volunteers to complete monitoring. New (2005-2008) funds will begin July 1, 2005. Volunteers will submit final reports by December 2005.

The Minnesota Lakes Association will expend all their current work program (2003-2006) funds by approximately September 30, 2005, with the exception of outstanding monitoring plan training funds which volunteers will be utilizing. New (2005-2008) funds are anticipated to begin October 1, 2005. Volunteers will submit final reports by December 2005, with the exception of one group which will submit a final report by June 30, 2006. Amended 4/8/05. Approved 4/12/05 per Susan Thornton phone call.

Minnesota Waters (formerly known as MLA) will purchase a YSI meter/case, closing out funds on the MLA budget (see Appendix A for details) for continued trainings in the 05-07 LCMR continuation grant. The cost of the equipment is \$2,499.49. The equipment will be used in the upcoming lake sampling trainings, the sampling method portion of the "Design Your Monitoring Plan" training program, and individually with groups looking to

practice with the equipment on their own waters. Amended 6/13/06. Approved via Susan Thornton email 6/13/06.

### **Final Report Summary: June 30, 2006**

Minnesota Waters (formerly Rivers Council of Minnesota and Minnesota Lakes Association) developed trainings for hundreds and distributed educational materials to thousands of Minnesotans during this LCMR appropriation.

In 2004, Minnesota Waters hosted the Lakes and Rivers Conference. Over 325 participants attended the statewide conference which included 35 sessions and workshops. Topics covered varied, including water issues, monitoring, communication, and capacity building.

The Minnesota Water Watchers newsletter was developed and first published in the winter of 2004, with a second edition printed in the spring of 2005. Over 3,800 citizens received each edition, with topics ranging from resources and education to information on how to sample waterbodies. Both are available online at: [http://www.riversmn.org/resources\\_citmon.html](http://www.riversmn.org/resources_citmon.html).

The pilot Monitoring Plan Trainings were held in the fall of 2003 and the spring of 2004. Fourteen groups (50 individuals) attended the trainings, with thirteen of the groups completing Monitoring Plans for their specific waterbodies of interest. These plans included monitoring at 153 stream sites on 66 different streams and 80 lake sampling locations on 56 lakes. Between trainings, the process was evaluated to improve the training process. Remaining funds were the result of two groups not completely spending the implementation funds received as part of the Monitoring Plan Training. More detail on the specific groups and their outcomes are available in Appendix C and copies of the completed Monitoring Plans are included in the supporting documents.

Minnesota Waters completed 10 skills training sessions over the course of the LCMR project. Through these trainings, over 300 citizens were trained. Topics ranged from lake and macroinvertebrate sampling, to data interpretation and management. Detail on the specific sessions is available in Appendix C.

### **Result 4: Develop and begin implementation of up to 14 citizen-led lake or river management plans.**

**Description:** The Minnesota Initiative Foundation will lead up to 14 groups through their Healthy Lakes and Rivers Program (HLRP). This will build the capacity of citizen leaders from these lake associations and/or river groups to develop and implement water resource management plans for their respective watersheds. The plans for managing their water resources will include a locally shared vision, measurable goals and a process to report on their progress and outcomes. This will also provide training, technical assistance and financial support to groups as they go through the process of developing and implementing their water management plan.

LCMR funds will be used to provide training, technical assistance (follow up calls, plan review, etc.), training materials, facility rental for training events, and subcontractor costs associated with training and development of the Lake/River Management Plans for groups in Todd, Douglas, and Stearns Counties. If possible, funds will also be used to facilitate plan development in the following counties: Itasca, Aitkin, Hubbard, Beltrami, Isanti, Pine, Kanabec, Cass, and Crow Wing. Groups will be recruited by local resource managers, who will also participate and provide technical assistance in the trainings. Groups who attend the trainings and meet benchmarks will be qualified for implementation funds provided by alternate funding sources. (This shift in funds is requested as other funds became available to cover implementation funds, freeing LCMR funds to cover training costs. 8/30/04. Approved per email from Susan Thornton dated 9/2/04.)

This will expand this effort beyond the Initiative Foundation's boundaries, providing an incentive and model for other regional Initiative Foundations to engage in this type of effort.

**Aug 03 - March 04:** Two Leadership Trainings; attended by 8 leaders from 6 groups in Todd and Douglas Counties, 48 total leaders. Each training session is 8 hours.

**April 04 – July 04:** Facilitated Community Visioning sessions by each group to set goals for a lake or river management plan and draft the plan (Todd/Douglas).

**July 04 – June 05:** Implementation of priority actions in each of the lake or river management plans (Todd/Douglas).

**March 05:** Two Leadership Trainings; attended by 8 leaders from 8 groups in Stearns County, 64 total leaders. Each training session is 8 hours.

**April 05 – July 05:** Facilitated Community Visioning sessions by each group to set goals for a lake or river management plan and draft the plan (Stearns).

**July 05 – June 06:** Implementation of priority actions in each of the lake or river management plans (Stearns).

**\*June 2006: Submit final report**

\*Milestones amended 4/8/05 to sync with project end date of June 30, 2006. Approved 4/12/05 per Susan Thornton phone call.

<b>Summary Budget Information for Result 4: LCMR Budget</b>	<b>\$ 50,000.00</b>
<b>Amount Reimbursed as of 9/30/05</b>	<b>\$ 50,000.00</b>
<b>Balance</b>	<b>\$ 0.00</b>

<b>Other Funds</b>	<b>\$ 80,000</b>
<b>Balance</b>	<b>\$ 0</b>

**Completion Date: June 30, 2006**

**Final Report Summary: June 30, 2006**

The Initiative Foundation's Healthy Lakes and Rivers Partnership (HLRP) program worked to expand trainings outside of their regional boundaries through this LCMR appropriation, supporting trainings in Todd, Douglas, Crow Wing, Cass, Stearns, Aitkin, Itasca, Beltrami, Hubbard, and Isanti counties. Over 400 citizens, representing 62 lake

or river groups received HLRP training. Of these groups, 39 completed Lake Management Plans and have since initiated action steps to care for their waterbodies. With the success of this training, other counties and regional Initiative Foundation offices have been able to acquire private funding to continue the trainings in other areas of Minnesota. Example Lake Management Plans and copies of all electronically available plans (20) are available on CD (see supporting documents).

#### **V. TOTAL LCMR PROJECT BUDGET:**

**All Results: Personnel: \$ 482,269.40**

**All Results: Equipment: \$ 7,500.00**

**All Results: Development: \$ 0**

**All Results: Capital Equipment: \$ 3474.91**

**All Results: Other: \$ 246,755.69**

**TOTAL LCMR PROJECT BUDGET: \$ 740,000**

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

#### **VI. PAST, PRESENT AND FUTURE SPENDING:**

##### **A. Past Spending:**

Result 1: The MPCA spends approximately \$250,000 and 5.5 FTE each year on stream monitoring and assessment, and \$35,000 and 2 FTE on detailed lake assessments and trend analysis. Note: This does not include the time spent on general support (database management, equipment maintenance, etc.) or specific problem investigation. Result 2: The University of Minnesota has worked over the last 5 years to develop the remote sensing tool for lakes. Results 3 and 4: Three efforts are underway to provide an essential foundation for Result 3 and 4. First, the MPCA has led an effort to develop a monitoring guidance manual that will be available in July 2003. The intent of the manual is to help volunteers identify purposes for monitoring, select appropriate tests/protocols and help them determine how to store and use the data they generate. Ultimately, the manual will ensure that volunteer monitoring data is useable and will provide support to volunteers in their collection efforts. Second, a detailed inventory and needs assessment of existing monitoring programs has been conducted by RCM and MLA with support from the Bush and McKnight Foundations. Third, an in-depth study of how citizen volunteer monitoring is effectively used in Minnesota has recently been completed (spring 2003) and will aid in recommending how citizen volunteer monitoring can be used more effectively.

##### **B. Current Spending:**

MPCA's baseline efforts for stream and lake assessments will continue as outlined in "A." This initiative would augment the MPCA's current efforts, allowing those efforts to be accelerated and improved.

**C. Required Match (if applicable). None**

#### **D. Future Spending:**

#### **VII. Project Partners:**

**A. Partners Receiving LCMR Funds:** University of Minnesota; Minnesota Waters (merged organization of the Rivers Council of Minnesota and the Minnesota Lakes Association); Minnesota Initiative Foundation

**B. Project Cooperators:** Dr. Pat Brezonik and Dr. Marvin Bauer, University of MN; Angie Becker Kudelka and Bruce Johnson, Rivers Council of Minnesota; Paula West, Minnesota Lakes Association; Don Hickman, Minnesota Initiative Foundation.

**VIII. DISSEMINATION:** Reports for Result 1 are available on the MPCA website: <http://www.pca.state.mn.us/data/eda/index.cfm>. Workshops will be held to transfer information from Result 2 to state agencies and other interested parties. Information has been presented at a number of conferences (see Appendix B). Information for Result 3 is on the Minnesota Waters (RCM and MLA) website (<http://www.minnesotawaters.org/>) and a newsletter was published twice during the project period. In addition, project information was also distributed via electronic newsletters (*Thalweg*, *Lake Bulletin*, and *The Confluence*), hard copy newsletters, at training events and conferences. Result 4 was shared with other regional initiative foundations as a model.

**IX. LOCATION:** Result 1 included work in the Lower Mississippi, Cedar, Missouri, Des Moines, Rainy and Red River Basins. Result 2 remote sensing for lakes occurred statewide, while the stream work focused on limited number of rivers in Central and Southern Minnesota in an effort to evaluate potential application statewide. Result 3 was available to citizens statewide. Result 4 focused on Todd/Douglas, Beltrami, Aitkin, Itasca, Hubbard, Crow Wing/Cass, Stearns, and Isanti Counties.

**X. REPORTING REQUIREMENTS:** Periodic work program progress reports will be submitted not later than March 30, 2004; September 30, 2004; March 30, 2005; September 30, 2005 and March 30, 2006. A final work program report and associated products will be submitted in August 2006 as the project concludes June 30, 2006.

#### **XI. RESEARCH PROJECTS**

## Supporting Documents

- ❖ **Minnesota Waters**
  - **Monitoring Plans (13 hard copies)**
  - **Brochures (4)**
  - **Training manuals (2)**
  - **Newsletters (2)**
  - **Annual Reports (2)**
  - **Program Evaluation Reports (5)**
  - **Conference brochure and registration forms**
- ❖ **Initiative Foundation**
  - **Healthy Lakes and Rivers Partnership Manual**
  - **Lake Management Plans (2 hard copies, 20 on CD)**

Attachment A: Budget Detail for 2003 Proposals - Summary and a Budget page for each partner  
 Proposal Title: Accelerating and Enhancing Surface Water Monitoring-

Project Manager Name: Dan Helwig, MPCA

LCMR Requested Dollars: \$ 740,000

2003 LCMR Proposal Budget	Result 1 Budget:	Amount Spent (6/30/06)	Balance (6/30/06)	Result 2 Budget:	Amount Spent (06/30/06)	Balance (6/30/06)	Result 3 Budget:	Amount Spent (6/30/06)	Balance (6/30/06)	Result 4 Budget:	Amount Spent (6/30/06)	Balance (6/30/06)	Result 4 Budget:	Amount Spent (6/30/06)	Balance (6/30/06)	TOTAL FOR BUDGET ITEM									
	Accelerate biological index			Remote Sensing			Volunteer Training			Healthy Lakes & Rivers															
BUDGET ITEM:	Calibration of biological index			Apply Lake Satellite Remote Sensing			Lakes Training (MLA)			Streams Training (RCM)															
PERSONNEL: Staff Expenses, Wages, salaries & benefits - Be specific on who is paid \$, to do what?	\$206,926.10	1.3 FTE unclassified biologists @ \$66,000 for 2 yrs, 3 summer interns @ \$6000 ea for 2 yrs.	\$206,926.10	\$0.00	\$115,294.05	see Result 2 detail	\$115,294.05	\$0.00	\$37,819.71	\$1.72	\$14,750.00	See Result 3 detail	\$14,750.00	\$0.00	\$65,524.34	See Result 3 detail	\$65,524.34	\$0.00	\$41,953.48	See Result 4 detail	\$41,953.48	\$0.00	\$482,269.40		
Contracts																									
Professional/technical (with whom?)	\$36,593.90	RFP or master contract for Invertebrate I.d.	\$36,593.90	\$0.00				\$46,885.00	Tower View Enterprises for	\$46,885.00	\$0.00	\$22,500.00	Rivers Network for Monitoring	\$22,500.00	\$0.00	\$600.00	Larry Wannebo, training consultant	\$600.00	\$0.00				\$106,578.90		
Other contracts (with whom?) list out personnel, equipment, etc.	\$0.00	RFP or master contract for fish archiving	\$0.00	\$0.00				\$26,069.30	Training for 7 new and 10 existing groups	\$25,914.75	\$154.55	\$22,736.98	Training for up to 7 new and 10 existing	\$22,736.98	\$0.00								\$48,806.28		
Other direct operating costs (for what? - be specific)						\$13,050.00	two flights to collect low-altitude data	\$13,050.00	\$0.00	\$3,858.29	Expenses to put on training workshops	\$3,858.29	\$0.00	\$20,437.32	Volunteer Monitoring Workshop and	\$20,437.32	\$0.00	\$2,560.87	skills building workshops	\$2,560.87	\$0.00		\$39,906.48		
								\$9,740.00	Printing and postage for newsletter	\$9,740.00	\$0.00	\$500.00	web site enhancements	\$500.00	\$0.00								\$10,240.00		
Printing				\$0.00	maps & reports	\$0.00	\$0.00	\$0.00	maps & reports	\$0.00	\$0.00												\$0.00		
Communications, telephone, mail, etc.									\$5,750.00		\$5,750.00	\$0.00	\$3,672.98		\$3,672.98	\$0.00	\$1,905.05		\$1,905.05	\$0.00		\$11,328.03			
Other Supplies (list specific categories)	\$1,429.27		\$1,429.27	\$0.00	\$575.53		\$575.53	\$0.00	\$175.53		\$175.53	\$0.00											\$2,180.33		
Travel expenses in Minnesota	\$15,050.73	Statewide travel for 1 crew of 5 persons for sampling, 2-4wd suburban leases	\$15,050.73	\$0.00	\$377.64		\$377.64	\$0.00	\$128.04		\$128.04	\$0.00	\$1,097.50	statewide, 1 fte	\$1,097.50	\$0.00	\$2,003.38	statewide, 1 fte	\$2,003.38	\$0.00	\$2,980.60	project staff and subcontractor travel	\$2,980.60	\$0.00	\$21,637.89
Out of State Travel					\$814.78		\$814.78	\$0.00															\$814.78		
Tools and equipment (list categories)	\$0.00	Sampling equip. for crew, e.g. fish shockers	\$0.00	\$0.00	\$7,500.00	Landsat ETM+ images	\$7,500.00	\$0.00															\$7,500.00		
Office equipment & computers					\$3,438.00	Computer lab fees	\$3,438.00	\$0.00	\$825.00	Computer lab fees	\$825.00	\$0.00	\$1,000.00	computer	\$1,000.00	\$0.00							\$5,263.00		
Capital Equipment									\$3,474.91		\$3,269.49	\$205.42											\$3,474.91		
<b>COLUMN TOTAL</b>	<b>\$260,000.00</b>		<b>\$260,000.00</b>	<b>\$0.00</b>	<b>\$128,000.00</b>		<b>\$128,000.00</b>	<b>\$0.00</b>	<b>\$52,000.00</b>		<b>\$51,998.28</b>	<b>\$1.72</b>	<b>\$112,625.00</b>		<b>\$112,265.03</b>	<b>\$359.97</b>	<b>\$137,375.00</b>		<b>\$137,375.00</b>	<b>\$0.00</b>	<b>\$50,000.00</b>		<b>\$50,000.00</b>	<b>\$0.00</b>	<b>\$740,000.00</b>

Detailed Budget for Result 1: Accelerate Biological Index (\$260,000 total budget)  
Minnesota Pollution Control Agency

2003 LCMR Budget Detail	<sup>1,2,4</sup> Budget		Amount Spent (3/30/06)	Balance (3/30/06)	
	Accelerate Biological Index				
<b>BUDGET ITEM:</b>	Calibration of Biological Index				<b>TOTAL FOR BUDGET ITEM</b>
<b>PERSONNEL: Staff Expenses, Wages, salaries &amp; benefits – Be specific</b>	<b>\$206,926.10</b>	<b>1.3 unclassified biologists @ \$66,000 for 2 yrs, 3 summer interns @ \$6000 ea for 2 yrs.</b>	<b>\$206,926.10</b>	<b>\$0.00</b>	<b>\$206,926.10</b>
<b>Contracts</b>					
Professional/technical (with whom?)	\$36,593.90	RFP or master contract for invertebrate identification	\$36,593.90	\$0.00	\$36,593.90
Other contracts (with whom?)	\$0.00	RFP or master contract for fish archiving	\$0.00	\$0.00	\$0.00
Travel expenses in Minnesota	\$15,050.73	Statewide travel for 1 crew of 5 persons for sampling	\$15,050.73	\$0.00	\$15,050.73
Travel outside Minnesota (where?)					
<sup>3</sup> Other Supplies (misc supplies during field work)	\$1,429.27		\$1,429.27	\$0.00	\$1,429.27
<b>Tools and equipment (list categories)</b>					
Equipment	\$0.00	Sampling equipment for crew, eg. Fish shockers	\$0.00	\$0.00	\$0.00
<b>COLUMN TOTAL</b>	<b>\$260,000.00</b>		<b>\$260,000.00</b>	<b>\$0.00</b>	<b>\$260,000.00</b>

1: Funds not needed for sampling equipment. Purchased through agency funds. Shifted funds (\$5000) to personnel. Amended 4/8/05. Approved via phone call from Susan Thornton 4/12/05

4. Funds shifted to close out accounts and to match actual expenses. \$13,510.90 was shifted from personnel to professional contracts to cover invertebrate identification costs. An additional \$60 was transferred from Other supplies to contracts. Finally, \$10.73 was shifted from other supplies to travel expenses to close out the account. Discussed with Susan Thornton 6/14/06 via phone and amended.

2: Extra funds from travel shifted to: \$1,500 to Other Supplies to cover expenses accrued in the field, \$3,023 to Invertebrate Contract as final bill was higher than originally expected, and the remaining \$437 shifted to personnel to close out the account and keep staff funded for analysis in the office. The \$5,000 for fish archiving contract was shifted to personnel to keep staff on hand for analysis in the office, archiving costs picked up by MPCA funds. Amended 9/30/05.

3. Other Supplies category added 9/30/05. Was inadvertently missed on original budget. This category covers supplies purchased as needed in the field (preservatives, replacement parts, etc.)



Detailed Budget for Result 2: Remote Sensing (\$180,000 total budget)  
Contract with U of MN

2003 LCMR Proposal Budget	<sup>3,4,7</sup> Result 2 Budget:		Amount Spent (6/30/06)	Balance (6/30/06)	<sup>2,5,8</sup> Budget		Amount Spent (06/30/06)	Balance (06/30/06)	
	<i>Remote Sensing</i>								
<b>BUDGET ITEM:</b>	<i>Apply Lake Satellite Remote Sensing</i>				<i>Develop Stream Satellite Remote Sensing</i>				<b>TOTAL FOR BUDGET ITEM</b>
<b>PERSONNEL:</b>	\$115,294.05	Assistant scientist annual salary of \$38,000 for 2 yrs at 72% time & 31% benefits; graduate assistant annual salary of \$16,000 for 2 yrs at 10% plus 67.7% benefits; and 2 project directors at 0.66 mo. of summer salary each for 2 yrs plus 31.8% benefits.	\$115,294.05	\$0.00	\$37,821.43	Assistant scientist annual salary of \$38,000 for 2 yrs at 2% time & 31% benefits; graduate assistant annual salary of \$16,000 for half-time RA and 67.7% benefits; and 2 project directors @ 0.22 mo. of summer salary each for 2 yrs plus 31.8% benefits.	\$37,819.71	\$1.72	\$153,115.48
<b>Contracts</b>									
Other direct operating costs (for what? - be specific)									
Printing	\$0.00	Printing of maps and reports	\$0.00	\$0.00	\$0.00	Printing maps and reports	\$0.00	\$0.00	\$0.00
Advertising									
Communications, telephone, mail, etc.									
Office Supplies (list specific categories)									
Other Supplies (list specific categories)	\$575.53	Research supplies, maps, and software	\$575.53	\$0.00	\$175.53	Research supplies, maps, and software	\$175.53	\$0.00	\$751.06
Travel expenses in Minnesota	\$377.64	Collection of water quality data for calibration	\$377.64	\$0.00	\$128.04	Collection of water quality data for calibration	\$128.04	\$0.00	\$505.68
*Travel outside Minnesota (Madison, WI for North American Lake Management Society Conference)	\$814.78		\$814.78	\$0.00					\$814.78
<b>Tools and equipment (list categories)</b>									
Landsat images	\$7,500.00	18 Landsat ETM+ images @ \$605 per image to cover entire state	\$7,500.00	\$0.00					\$7,500.00
Computer lab fees	\$3,438.00	ERSAC computer facility fees	\$3,438.00	\$0.00	\$825.00	ERSAC computer facility fees	\$825.00	\$0.00	\$4,263.00
Aerial/low altitude sensing data					\$13,050.00	Two flights at \$6000 each to collect aerial multispectral data over rivers.	\$13,050.00	\$0.00	\$13,050.00
Office equipment & computers									\$0.00
Other Capital equipment (specific items)									\$0.00
<b>COLUMN TOTAL</b>	<b>\$128,000.00</b>		<b>\$128,000.00</b>	<b>\$0.00</b>	<b>\$52,000.00</b>		<b>\$51,998.28</b>	<b>\$1.72</b>	<b>\$180,000.00</b>

1. In the event that no graduate assistant applies or is hired for the position, funds will be shifted from 'graduate assistant' to 'assistant scientist'. Amended 4/8/05. Approved per Susan Thornton phone call 4/12/05.

3. As discussed via phone call with Susan Thornton 8/18/05, \$600 was transferred from 2a printing to 2a travel to account for increased expenses. \$0.53 was transferred from Result 2a to Result 2b (Research Supplies, Maps, and Software) to eliminate a negative balance in Result 2b.

5. Budget amended to reflect completion of stream data analysis work and the associated costs. Because work was completed early and savings were incurred for imagery, printing, and supplies, the respective categories were adjusted as follows: personnel reduced by \$12,288, printing reduced by \$75, computer lab fees reduced by \$375, and in state travel reduced by \$287. Amended 2/22/06. Approved via Susan Thornton email 2/23/06.

2. Flights from the 2004 aerial multispectral data flyovers exceeded the allotted budget. Funds were moved from "Develop Stream Satellite Remote Sensing" categories of: personnel (\$750), Printing (\$125), and Research supplies (\$175). Amended 4/8/05. Approved per Susan Thornton phone call 4/12/05.

4. Budget amended to reflect ongoing work in the lake remote sensing to complete data analysis. Primarily, personnel funds were added, while reduced costs for imagery, printing, and supplies were realized. The respective categories were adjusted as follows: increase of \$17,288 in personnel, addition of \$815 to out of state travel (see footnote 6), and reductions of \$3,390 (imagery), \$100 printing, \$306 maps and software, \$912 computer lab fees, and \$395 in state travel. Amended 2/22/06. Approved via Susan Thornton email 2/23/06.

6. Out of state travel added to the project budget. Project staff traveled to Madison Wisconsin in November 2005 to present project findings at the NALMS conference proceedings. Amended 2/22/06. Approved via Susan Thornton email 2/23/06.

7. Funds shifted from Printing (\$50), Travel (\$0.22), and Lab fees (\$150) to personnel (\$200.22) to close out all accounts. Preapproved via Susan Thornton email 3/31/06. Amended 7/28/06.

8. Funds shifted from Printing (\$50), Supplies (\$24.47), Travel (\$2.96), and Lab Fees (\$300) to Personnel (\$377.43) to close out all accounts. Preapproved via Susan Thornton email 3/31/06. Amended 7/28/06.

Detailed Budget for Result 3 RCM: Volunteer Training Streams (\$137,375 total budget)  
 Contract Rivers Council of Minnesota

2003 LCMR Budget Detail	Budget <sup>2,4</sup>	Description	Amount Spent (3/30/06)	Balance (3/30/06)	Budget <sup>3,5</sup>	Description	Amount Spent (3/30/06)	Balance (3/30/06)	Budget <sup>6</sup>	Description	Amount Spent (3/30/06)	Balance (3/30/06)	
Result 3: Volunteer Training Streams Training (RCM)	Monitoring Congress				Monitoring Program Development & Implementation				Volunteer Monitoring Program Enhancement /				
BUDGET ITEM													TOTAL FOR ITEM
PERSONNEL: Staff Expenses, Wages, salaries & benefits ? Be specific on who is paid \$, to do what?	\$16,577.60	RCM: .169 FTE @ \$30,000/yr (\$8,700) plus 19.92% benefits (\$1,733) = \$12,159.89 X 64% for this result; .04 FTE @ \$18,875/yr (\$1510) plus 20% benefits (\$302) = \$1812 X .15 for this result; .54 FTE @ \$36,300/yr (\$36,300) plus 25% benefits (\$8,853.57) = \$49,135.12 X 17% for this result.	\$16,577.60	\$0.00	\$34,221.06	RCM: .04 FTE @ \$18,875/yr (\$1510) plus 20% benefits (\$302) = \$1812 X .85 for this result; .54 FTE @ \$36,300/yr (\$36,300) plus 25% benefits (\$8,853.57) = \$49,135.12 X 60% for this result; .169 FTE @ \$30,000/yr (\$8,700) plus 19.92% benefits (\$1,733) = \$12,159.89 X 27% for this result	\$34,221.06	\$0.00	\$14,725.68	RCM: .169 FTE @ \$30,000/yr (\$8,700) plus 19.92% benefits (\$1,733) = \$12,159.89 X 9% for this result; .54 FTE @ \$36,300/yr (\$36,300) plus 25% benefits (\$8,853.57) = \$49,135.12 X 23% for this result	\$14,725.68	\$0.00	\$65,524.34
Professional/technical (with whom?)					\$17,500.00	Contract with River Network for Monitoring Design Plan program development and implementation for lakes and rivers.	\$17,500.00	\$0.00	\$5,000.00	RCM will hire contractors (to be determined) to assist in designing and conducting up to 4 skills training sessions in subresult 3C.	\$5,000.00	\$0.00	\$22,500.00
Development and Implementation of Monitoring Program and Project Plans					\$18,000.00	Up to \$3,000 per group X 6 river groups to design and implement a volunteer monitoring program.	\$18,000.00	\$0.00	\$4,736.98	7 Benthic Macroinvertebrate Training provided by RCM and a subcontractor (to be determined). Equipment provided for training and for volunteer use by subcontractor.	\$4,736.98	\$0.00	\$22,736.98
Other direct operating costs (for what? ? be specific)	\$17,152.36	Volunteer Monitoring Workshop: Rent facility, develop program, recruit speakers, and, materials	\$17,152.36	\$0.00	\$1,854.15	Expenses to conduct monitoring program plan training sessions including rent facility, develop program, and provide materials	\$1,854.15	\$0.00	\$1,430.81	Expenses to conduct skills training workshops to expand/enhance programs and develop and implement project plans (\$500 workshop X 4 workshops).	\$1,430.81	\$0.00	\$20,437.32
Printing	\$500.00	RCM web site enhancements	\$500.00	\$0.00									\$500.00
Direct Costs: Communications, telephone, mail, general office, etc.					\$2,285.35		\$2,285.35	\$0.00	\$1,387.63		\$1,387.63	\$0.00	\$3,672.98
Travel expenses in Minnesota					\$928.31		\$928.31	\$0.00	\$1,075.07		\$1,075.07	\$0.00	\$2,003.38
Travel outside Minnesota (where?)													\$0.00
Office equipment: Computer Station													\$0.00
Other Capital equipment (list specific items)													\$0.00
COLUMN TOTAL	\$34,229.96		\$34,229.96	\$0.00	\$74,788.87		\$74,788.87	\$0.00	\$28,356.17		\$28,356.17	\$0.00	\$137,375.00

1: Personnel fund shifted due to position elimination at Rivers Council of Minnesota 3/30/04. Approved per Susan Thornton email dated 4/6/04.

2: Funds shifted from meeting expense to personnel for Result 3a. More staff expense accumulating than eligible meeting expenses. 8/19/04 Approved via email from Susan Thornton dated 9/2/04.

3: Funds shifted from Monitoring Plan development to personnel in Result 3b. One group didn't complete training, funds to cover cost of additional follow-up technical support after workshop training sessions. 8/19/04 Approved via email from Susan Thornton dated 9/2/04

4: All categories closed out for Result 3a. Remaining funds (\$165.64) shifted to Result 3c personnel. Amended 4/8/05. Approved via phone call 4/12/05 per Susan Thornton

5: Categories for monitoring plan training expenses, communications, and travel for result 3b closed out. Remaining funds (\$631.42) shifted to Result 3c personnel. Amended 4/8/05. Approved 4/12/05 per Susan Thornton phone call.

6: Funds shifted from closed out categories in 3a and 3b added to result 3c personnel. Any remaining funds in 3c categories other than personnel as of 6/1/05 will be shifted to 3c personnel. Amended 4/8/05. Approved via phone call 4/12/05 with Susan Thornton.

7: In lieu of pass through funds to volunteers, benthic macroinvertebrate training will be held and volunteers will receive monitoring equipment to complete monitoring. Approved 4/12/05 per phone call with Susan Thornton

8: Funds shifted from communications (\$50.77) to personnel to close out budget categories with 6/30/05 reimbursement. Amended 6/23/05. Approved 7/7/05 via email from Susan Thornton.

9: Funds shifted from communications (\$1112.37), travel (\$174.93), meeting expenses (\$569.19), and develop of monitoring plan (\$263.02) to personnel to close out budget categories with 6/30/05 reimbursement. Amended 6/23/05. Approved via email 7/7/05 from Susan Thornton.

2003 LCMR Proposal Budget	<sup>1,5</sup> Budget	Budget Detail	Amount Spent (6/30/06)	Balance (6/30/06)	<sup>1,2,5,6</sup> Budget	Budget Detail	Amount Spent (6/30/06)	Balance (6/30/06)	<sup>1,4,6</sup> Budget	Budget Detail	Amount Spent (6/30/06)	Balance (6/30/06)	
Result 3: Volunteer Training Lakes Training (MLA)	Monitoring Congress				Monitoring Program Development & Implementation				Volunteer Monitoring Program Enhancement / Expansion				
<b>BUDGET ITEM</b>													<b>TOTAL FOR ITEM</b>
PERSONNEL: Staff Expenses, Wages, salaries & benefits ? Be specific on who is paid \$, to do what?	2,865.38	.1 FTE wages and benefits for administrative assistance for Monitoring Congress at \$23,000/year + 22% benefits.	\$2,865.38	\$0.00	\$5,942.12	\$5942.50 for administrative assistant and support staff	\$5,942.12	\$0.00	\$5,942.50	\$5942.50 for administrative assistant and support staff	\$5,942.50	\$0.00	\$14,750.00
Professional/technical (with whom?)	4,200.00	Consultant with Tower View Enterprises (\$50/hour X 84 hours)	\$4,200.00	\$0.00	\$31,235.00	Consultant with Tower View Enterprises (\$50/hr x 624.7 hr)	\$31,235.00	\$0.00	\$11,450.00	Consultant with Tower View Enterprises (\$50/hour X 229 hours)	\$11,450.00	\$0.00	\$46,885.00
Development and Implementation of Monitoring Program and Project Plans					\$21,000.00	Up to \$3,000 per group X 7 lake groups to design and implement a volunteer monitoring program.	\$20,845.45	\$154.55	\$5,069.30	\$500 per group X 10 lake groups to enhance or expand their existing monitoring program after attending skills training workshops. Remaining funds to be used to	\$5,069.30	\$0.00	\$26,069.30
Other direct operating costs (for what? ? be specific)					\$2,000.00	Expenses to conduct monitoring program plan training sessions including rent facility, develop program, and provide materials	\$2,000.00	\$0.00	\$1,858.29	Expenses to conduct skills training workshops to expand/enhance programs and develop and implement project plans (\$500 workshop X 4 workshops). Remaining funds to be used to	\$1,858.29	\$0.00	\$3,858.29
					\$4,870.00	Printing and postage for two newsletters to volunteer lake and stream monitors throughout Minnesota; MLA web site enhancements .	\$4,870.00	\$0.00	\$4,870.00	Printing and postage for two newsletters to volunteer lake and stream monitors throughout Minnesota; MLA web site enhancements .	\$4,870.00	\$0.00	\$9,740.00
Printing													
Advertising													
Direct Costs: Communications, telephone, mail, general office, etc.					\$2,875.00		\$2,875.00	\$0.00	\$2,875.00		\$2,875.00	\$0.00	\$5,750.00
Travel expenses in Minnesota					\$650.00		\$650.00	\$0.00	\$447.50		\$447.50	\$0.00	\$1,097.50
Travel outside Minnesota (where?)													
Office equipment: Computer Station					\$500.00	PC station	\$500.00	\$0.00	\$500.00	PC station	\$500.00	\$0.00	\$1,000.00
<sup>3</sup> Capital Equipment					\$770.00	Monitoring equipment for training and dissemination to volunteers	\$770.00	\$0.00	\$2,704.91	Monitoring equipment for training and dissemination to volunteers	\$2,499.49	\$205.42	\$3,474.91
<b>COLUMN TOTAL</b>	<b>7,065.38</b>		<b>\$7,065.38</b>	<b>\$0.00</b>	<b>\$69,842.12</b>		<b>\$69,687.57</b>	<b>\$154.55</b>	<b>\$35,717.50</b>		<b>\$35,512.08</b>	<b>\$205.42</b>	<b>\$112,625.00</b>

1. Funds shifted from personnel on Monitoring Congress to personnel on Monitoring Program Development and Implementation and Volunteer Monitoring Program Enhancement/Expansion Projects. Underestimated need for staff time on last two components. 8/30/04 Approved per email from Susan Thornton dated 9/2/04.  
 2. Funds shifted from 3b personnel and travel expenses (over estimates in both categories) to contracts, printing, and communications (under estimated cost), and capital expenses (equipment necessary for skills trainings in lieu of pass through funds). Amended 4/8/05. Approved per Susan Thornton phone call 4/12/05.  
 3. Funds shifted from 3b personnel to purchase monitoring equipment. Equipment will be used to train volunteers and also for volunteer use. Amended 4/8/05. Approved 4/12/05 via Susan Thornton phone call.  
 4. Funds shifted from 3c personnel and travel expenses (over estimates in both categories) to contracts, monitoring programs, printing and communications (under estimated costs), and capital expenses (equipment necessary for skills trainings in lieu of pass through funds). Amended 4/8/05. Approved per Susan Thornton phone call 4/12/05.  
 5. Funds shifted from 3b personnel and contract to 3a personnel and contract to eliminate negative balance. Amended 4/8/05. Approved per Susan Thornton phone call 4/12/05. Corrected 6/23/05. \$0.38 shifted from 3b to 3a. Approved 7/7/05 via Susan Thornton email.  
 6. Funds shifted from 3b capital expense and 3c development and implementation of skills trainings, direct operating costs, and travel to 3c capital expense to close out categories and provide funds to purchase monitoring equipment. Amended 6/13/06. Approved via Susan Thornton email 6/13/06.

Detailed Budget for Result 4: Healthy Lakes & Rivers (\$50,000 total budget)					
Contract with Initiative Foundation					
2003 LCMR Proposal Budget	1,2,3,4 Budget	Budget Detail	Amount Spent (6/30/06)	Balance (6/30/06)	
Result 4: Volunteer Training	Healthy Lakes and Rivers Training (Initiative Foundation)	Provide leadership training, skills, and technical resources to participants in the Healthy Lakes and Rivers Training to successfully develop and implement a lake or river management plan.			
<b>BUDGET ITEM</b>					<b>TOTAL FOR ITEM</b>
PERSONNEL: Staff Expenses, Wages, salaries & benefits ? Be specific on who is paid \$, to do what?	\$41,953.48	\$6585 for administrative assistant 0.20 FTE for project + 25% fringe benefits; \$12,870 for 0.15 FTE for project + 25% fringe benefits; \$26,239 for 0.50 FTE for project + 25% fringe benefits.	\$41,953.48	\$0.00	\$41,953.48
Development and Implementation of Lake and River Management Plans					
Professional/technical (with whom?)	\$600.00	Larry Wannebo; training consultant fee to conduct a two-day leadership training workshop for groups prior to writing their lake or river management plans. This will not be continued as services can be provided inhouse.	\$600.00	\$0.00	\$600.00
Equipment					
Analysis (lab + data)					
Communication of information (production, printing etc.)					
Other contracts (with whom?) list out personnel, equipment, etc.					
Space rental: NOT ALLOWED					
Other direct operating costs (for what? ? be specific)	\$2,560.87	Expenses to conduct skills building workshops : Rent facility for two days of leadership and management plan training (16 hours); training materials (\$21/person X 110-128 people)	\$2,560.87	\$0.00	\$2,560.87
Printing					
Advertising					
Direct Costs: Communications, telephone, mail, general office, etc.	\$1,905.05		\$1,905.05	\$0.00	\$1,905.05
Office Supplies (list specific categories)					
Other Supplies (list specific categories)					
Travel expenses in Minnesota (subcontractor)	\$100.00	Consultant travel for leadership training workshop;	\$100.00	\$0.00	\$100.00
Travel expenses in Minnesota (project staff)	\$2,880.60		\$2,880.60	\$0.00	\$2,880.60
Travel outside Minnesota (where?)					
Tools and equipment (list categories)					
Office equipment: Computer Station					
Other Capital equipment (list specific items)					
<b>COLUMN TOTAL</b>	<b>\$50,000.00</b>		<b>\$50,000.00</b>	<b>\$0.00</b>	<b>\$50,000.00</b>
1. Funds shifted to personnel to cover costs of training events, as addition funds were secured to pay out directly to volunteer groups for implementation. 8/30/04 Approved via email from Susan Thornton dated 9/2/04.					
2. Funds shifted from personnel (\$3000) to travel (\$2000) and expenses and direct costs (\$500 each). With expansion of the program to multiple counties, direct expenses and travel increased significantly. Amended 4/8/05. Approved per phone call from Susan Thornton 4/12/05.					
3. Funds shifted from personnel ((\$2,500) to travel (\$1,500) and direct costs (\$1,000). Due to program expansion geographically, expenses and travel have increased. From this point forward, as funds are spent down, remaining funds in all categories will be shifted as needed to cover final expenses. Amended 3/30/06. Approved per Susan Thornton email 3/31/06					
4. Funds shifted from Skills building (\$639.13) and Direct Costs (\$194.95) and Travel (\$919.40) to personnel (\$1,753.48) to close out all categories. Preapproved via Susan Thornton email 3/31/06. Ammended 7/26/06.					