

1997 Project Abstract

For the Period ending December 31, 1999

This project was supported by Minnesota Environment and Natural Resources Trust Fund (MS 216.15)

TITLE: Minnesota Frog Watch
PROJECT MANAGER: Tracy Fredin, Director, Center for Global Environmental Education
ORGANIZATION: Hamline University Graduate School of Education
 Center for Global Environmental Education (CGEE)
ADDRESS: 1536 Hewitt Avenue, St. Paul, MN 55104
WEB SITE: <http://cgee.hamline.edu/frogs/>
LEGAL CITATION: ML 97, Chap. 216, Sec. 15, Subd. 13 (c)
APPROPRIATION AMOUNT: \$300,000

Statement of Objectives

This project focused on three objectives: (1) developing and implementing the 'Frogs as Bio-indicators' Environmental Education Project through a combination of a wide array of educational components in various formats including a study guide, color poster, World Wide Web-based education component, learning resource kits, and teacher preparation institutes; (2) continue development and implementation of 1,000 Friends of Frogs project—an informal, state-wide frog health and distribution survey; (3) implementing the Minnesota Frog and Toad Survey that will provide accurate baseline information about the frog population in the state.

Overall Project Results

- Impacted over 500,000 Minnesotans (students, families, individuals) with this project. Impacted several thousand citizens nationwide and on a global level with additional funding from other sources.
- Since July 1997, 13,973 newsletters and frog monitoring surveys were distributed to schools, youth organizations and citizens impacting almost 140,000 people.
- Over 4,191 copies of the project's educator guide (activities aligned to state standards) were distributed to teachers in the state impacting over 125,730 students.
- Distributed 12,191 four-color poster of Toads and Frogs of Minnesota, impacting 121,910 citizens. Developed poster with the MN Department of Natural Resources.
- CGEE acted as repository for malformed frog reports. Almost 300 reports of malformed frogs were forwarded to the MPCA. At least twenty-one sites with malformed frogs were investigated by the MPCA.
- Trained 73 educators to use the projects materials and perform the surveys.
- Answered thousands of questions from a concerned citizenry on the toll-free number and electronically.
- Designed an award-winning web site with over 250,000 visits.
- Developed an exhibit with the staff of Camp Snoopy at the Mall of America and the Minnesota Zoo. With this and other presentations at conferences, an estimated additional 500,000 citizens, including students, have been impacted.
- Trained over 100 volunteers for the MN Frog and Toad Call Survey. Implemented survey with the MN DNR. Reported a population of Northern Cricket Frogs in 1998, last reported in state almost 20 years ago.
- Hosted two 'Frogs as Bio-indicators' Education summits with over 60 participants (educators, students and scientists).
- Learning resource kits have been distributed to 32 schools by the Science Museum of Minnesota, impacting an estimated 7,300 students.
- An additional component to the outreach plan was the development of an amphibian plan with non-LCMR funds, performed for over 2,500 students in 16 schools in the Metro area. With additional funding from the LCMR this plan could be used as a statewide outreach effort, integrating science with arts.

Project Results Use and Dissemination

- Staff have presented the science and education components of the project at various state and national conferences.
- There have been numerous media stories about the project and the malformity issue (some of these are included in this package) in newspapers, television and on the radio.
- Staff have been called on for their expertise by various regional, national and international programs. The director of the program is the co-chair of the education working group of Partners in Amphibian and Reptile Conservation, a non-profit organization, is involved as a member of a federal Task force on Amphibian Declines and Deformities, and the Declining Amphibian Populations Task Force education group, an international organization working on declining populations issues.
- The project has been cited in National Wildlife Federation publications, a Taiwanese High School English textbook; Green Teacher, a Canadian journal for educators; and will be cited in the "Status and Conservation of US Amphibians" to be published by the Smithsonian Press. Additional papers are being written and submitted to journals for publication.
- The web site has been an effective vehicle for disseminating the project and results of the surveys. In addition, the web has won several awards for education excellence from various organizations such as the National Science Foundation.
- Citizens in Minnesota and other states have used the science protocols from the project to establish monitoring programs.

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Date of Next Status Report: Final Report, December 31, 1999

Date of Work Plan Approval: June 23, 1997

Project Completion Date: December 31, 1999

I. PROJECT TITLE: Minnesota Frog Watch (I12)

Project Manager: Tracy Fredin, Director

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Total Biennial Project Budget:

\$ LCMR: \$300,000.00

\$ LCMR Amount Spent \$169,657.86 (Dec. 98)

\$243,841.56 (June, 99)

\$056,158.44 (Dec. 99)

\$ LCMR Balance: \$0

A. LEGAL CITATION: ML 1997, Chap. 216, Sec. 15, Subd. 13c.

APPROPRIATION LANGUAGE: (c) This appropriation is from the trust fund to the commissioner of natural resources for an agreement with the Center for Global Environmental Education (CGEE), Hamline University, for the second biennium to accelerate the Minnesota Frog Watch Environmental education and monitoring program for youth and families in formal and non-formal education settings. This appropriation is available until June 30, 2000, at which time the project must be completed and final products delivered, unless an earlier date is specified in the work program.

II. PROJECT SUMMARY AND RESULTS:

Minnesota Frog Watch combines a state-wide monitoring of frogs as indicators of environmental health, and a state-wide, multimedia, interdisciplinary environmental education project for youth and families in formal and non-formal education settings.

It is believed that the world-wide population of amphibians is declining. Amphibians function as an early warning system for environmental problems. The deformed frogs that students found in Henderson, Minnesota, in 1995 served as a wake-up call to the condition of Minnesota's frogs and environment. Another chilling message was sent by the discovery of deformed frogs in fifty-six of Minnesota's counties by the Minnesota Pollution Control Agency (MPCA) and the Thousand Friends of Frogs project this past summer. The Minnesota Frog Watch provides the opportunity to gather information about this phenomenon and help citizens think critically about it. This project engages the

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public and infuses environmental education into our schools, youth and family organizations, Science Museum of Minnesota projects, and other general public forums. It also gathers valuable scientific data about Minnesota's frog population needed by the scientific community.

Minnesota Frog Watch has three different objectives.

Objective 1: Frogs as Bio-indicator Environmental Education Project. Develop and implement the Frogs as Bio-indicator Environmental Education Project. This project will provide educational materials and experiences to over 60,000 students and their families throughout Minnesota. This project combines a wide array of educational components in various formats to provide a comprehensive and innovative education and awareness project. These components include: Frogs as Bio-indicator Study Guide, Four color educational poster to support classroom instruction, month-long education program in education, World Wide Web-based education component, learning resource kits, and teacher preparation institutes (see result 1-4).

Objective 2: A Thousand Friends of Frogs. Continue development and implementation of 1,000 Friends of Frogs project—an informal, state-wide frog monitoring project. This project involves youth and adults monitoring frog health and distribution. It provides the experiential component to the education project. This survey provides significant information based on physical observations of frogs. The data collected will be extremely useful to the MPCA, as the agency looks at amphibians as bio-indicators of water quality (see result 5).

Objective 3: Minnesota Frog and Toad Survey. Implement the Minnesota Frog and Toad Survey. In this more involved call survey, observers listen for their calls but do not physically inspect the frogs. The survey incorporates world-wide standards established by the Declining Amphibian Populations Task Force. We will be working with the MN Department of Natural Resources (DNR) to establish this program with the intent that they will continue the longitudinal study. This survey incorporates exacting scientific criteria that will provide accurate baseline information about the frog population. More training and commitment is required for participants to successfully gather data in this program (see result 6).

III. PROGRESS SUMMARY: (December 31, 1999)

Minnesota Frog Watch has built on the success of the Thousand Friends of Frogs project and continues its combination of citizen monitoring and public education/outreach. The eyes of the nation are still focused on Minnesota examining how educators and scientists work together to promote the awareness of amphibians as bio-indicators and problems associated with their decline and deformity. Through their concern for frogs, the public, educators and students are engaged in environmental education and awareness.

Since July 1997 13,973 newsletters and frog monitoring surveys have been distributed to schools, youth organizations and citizens statewide impacting almost 140,000 people. Over 2,000 copies of the original eight page educator guide were distributed, impacting almost

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65,000 students statewide. The updated educator activity guide (50 pages long) contains additional activities which were aligned with state and national science education standards has been welcomed by educators involved in the project. Since its introduction, over 2,191 copies have been distributed impacting 60,000 students. Over 7,000 additional copies of the guide have been distributed nationwide with funding from various federal and private sources. Funding from the LCMR increased the probability of receiving these grants. In addition, almost 12,000 copies of the four color poster 'Toads and Frogs of Minnesota' (developed with the MN DNR) has been distributed. The poster has also been cited by resource managers in this and other states as a valuable educational tool. This will be distributed until all 17,500 copies are being used by educators and other interested citizens. Seventy three educators attended the workshops/institutes developed to implement the E.E. projects.

New areas have been developed and other areas are being maintained on the project's web site. A revised web site will be released by the end of January, 2000. The web site has won several awards for educational excellence and has been accessed over 250,000 time by Minnesota and other citizens. Due to the success of Frog Week, the project conducts two Frog Months each year which focus on a different theme each week. Interest has again been high in this during October 1999. Some of the components of the project have been extended to year-round, i.e. answering thousands of questions from a concerned citizenry.

In addition, CGEE acted as a repository for malformity reports. Almost three hundred reports of malformed frogs were forwarded to the MPCA. Agency staff visited over 21 sites for malformities.

Presentations were made to various school groups, Minnesota-based organizations and at conferences reaching several hundreds of people in Minnesota, nationally and internationally. The project has also worked with the Minnesota Zoo and Camp Snoopy (Mall of America) to help create exhibits about frogs for the general public. All of these presentations have impacted over 500,000 members of the public, including students.

The MN Frog and Toad Survey occurred during the spring and summer of this year. While 100 volunteers were trained and each received free materials (Frog and Toad Call audiotape, poster, written materials and data sheets) for the survey during the 1999 season, staff also received more requests from people to become involved in the survey in future years. Volunteers surveyed different areas of the state for anuran populations and mailed the data to the DNR where they were entered into a database managed by the DNR non-game staff. We are working closely with DNR personnel as this project will be passed to the DNR once this season's surveys have been completed.

The resource learning kits (also known as Frog Trunks) were completed and are being distributed by the Minnesota Science Museum. The trunks were used by 32 schools, impacting an estimated 7,300 students throughout the state. In addition, the trunks have received rave reviews from other educators and resource managers from around the country. As a result of the valuable educational work performed by the project staff, they were invited to participate in the first national organizational meeting for Partners in Amphibian and Reptile Conservation (PARC). The director of MN Frog Watch is co-chair of the PARC education working group, is involved as a member of a federal Task force on Amphibian Declines and Deformities, and the Declining Amphibian Populations Task Force education group, an

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international organization working on declining populations issues.

A play, FROG CALL, developed for grades 2-6 with funding from outside this LCMR grant was used as part of the project's overall outreach plan. This play has been extremely well received by students, teachers and other individuals throughout the Metro area.

In addition, the project has been cited in National Wildlife Federation publications, a Taiwanese High School English textbook; Green Teacher, a Canadian journal for educators; and will be cited in the "Status and Conservation of US Amphibians" to be published by the Smithsonian Press. Additional papers are being written and submitted to journals for publication.

IV. OUTLINE OF PROJECT RESULTS:

Result 1: Frogs as Bio-indicator Environmental Education Project. Develop and implement Frogs as Bio-indicators Environmental Education Project that will provide educational materials and experiences to students and their families throughout Minnesota.

- Involve up to 60,000 students by December 1999
- Involve teachers, scientists, and student to develop educational materials at the frog watch curriculum conference, January 1998
Conference was held in January 1998 because it was the most convenient time for all of the participants involved in the meeting
- Revise and print Activity Guide, June 1998
- Because Conference was not held until January 1998, the activity guide will not be revised and printed until June, 1998.
- Develop and print four color poster, October 1997
Poster was completed ahead of schedule with the assistance of the MN DNR
- Distribute Poster, November 1997 ongoing
Poster was distributed ahead of schedule and will be distributed on an ongoing basis throughout the project
- Distribute Activity Guide, July 1997, ongoing
- Implement month-long education program in schools, October 1997, April 1998, April 1999
- Provide toll-free hotline to answer questions, July 1997.

Deliverable products

Teacher and youth curriculum development, January 1998 Conference was held in January 1998 because it was the most convenient time for all of the participants involved in the meeting	\$8,000
Activity guide layout, design and printing, June 1998 Conference was not held until January 1998, guide will not be revised and printed until June, 1998.	\$1,450
17,500 four color poster design layout and printing, October 1997 17,500 posters were printed ahead of schedule in October 1997	\$7,000

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Flyer development and distribution, May 1998	\$2,000
Flyer will be developed by May 1998, awaiting latest scientific updates	
Flyer development and distribution, March 1999	\$2,000
Project salary/expenses, July 1998	\$20,950
Project salary/expenses, July 1999	\$20,100
Project salary/expenses, December 1999	<u>\$10,000</u>
Total	\$71,500

Budget: \$71,500

Balance: \$0

Final Project Results (December 31, 1999)

Overall the E.E. project was extremely successful and not only met its objectives, but exceeded the numbers outlined in the grant proposal, impacting over 500,000 Minnesotans. However, if more funding had been available to the project, the amphibian play, 'Frog CALL,' could have been performed for a greater number of students statewide, and not just in the cities.

- Since July 1997 over 13,973 newsletters and frog monitoring surveys were distributed to schools, youth organizations and citizens statewide impacting almost 140,000 people. Flyers were developed by June, circulated to scientists for recommendations and distributed to the public.
- Since July 1997, over 2,000 copies of the eight-page study guide developed by the project were distributed to educators throughout the state impacting almost 60,000 students statewide.
- Since November 1998, 2,191 copies of the new 50 page study guide have been distributed to educators around the state, impacting an additional 65,730 students.
- Since 1997, two 'Frogs as Bio-indicators' Education Summits involving over 60 people (representatives from state and national organizations--scientists, educators, and students) were held to examine the implementation of amphibian education materials in schools.
- Developed four-color poster of 'Toads and Frogs of Minnesota' with the MN Department of Natural Resources. Since November 1997, the project has distributed over 12,000 posters to educators, students and interested individuals in MN. The remainder of these will be distributed by the project.
- Due to the success of Frog Week, the project conducts two Frog Months each year which focus on a different theme each week. Interest had again been high in this during April, 1999. An additional Frog Month was held during October, again with successful results. Specific components of the project have been extended to year-round, i.e. answering questions, posting frog art and students writings about frogs on the web site, etc.
- Minnesota Frog Watch acted as data reporting repository and answered thousands of questions from a concerned citizenry over the toll-free hotline and through electronic mail.
- Since January 1999, over 2,500 students and teachers in 16 schools have seen 'FROG CALL' a play about amphibian issues. This play was developed with funding from outside this LCMR grant, and has been used as part of the outreach plan of the project.

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Result 2: Frogs as Bio-indicator World Wide Web Site. Develop and implement the Frogs as Bio-indicators Environmental Education World Wide Web component. This project will be based on the style of education program that CGEE has developed over the years. These projects include the award winning MayaQuest and Journey North programs.

- Manage Frog Watch list-serve for project coordination, December 1997 ongoing through December 1999
- Develop and maintain an interactive Internet project linking experts to students, October 1997, April 1997, April 1998.
- Create and manage World Wide Web Site that the general public can access to obtain information on malformed frogs and amphibian decline, August 1997
- Purchase a digital camera and high-quality printer allowing us to create images for the web site and written publications, August 1997.

Deliverable products

Digital camera and photo quality printer, August 1997	\$1,800
Internet connection, July 1998	\$1,200
Internet connection, July 1999	\$1,200
Internet connection, December, 1999	\$0,600
Web site development/consultation, August, 1997	\$6,000
Project salary/expenses, July 1998	\$9,800
Project salary/expenses, July 1999	\$9,800
Project salary/expense, December 1999	<u>\$4,100</u>
Total	\$34,500

Budget: \$34,500

Balance: \$0

Final Project Results (December 31, 1999)

The web site will be continually updated as part of the ongoing project. This is important to maintain interest and have visitors return to the site. In addition, new products may be added to the site such as educational games which students can play to learn more about amphibians. However, this all requires additional funds.

- Created a web-based communication system and list-serv for individuals involved in the development and coordination of the project.
- The Web Site has been maintained and enhanced with various components-What's New, 'Frogs as Bio-indicators' Science Corner, Getting Involved, School and Students Reports, Frog Challenge and Minnesota Frog and Toad Survey.
Web site address: <http://cgee.hamline.edu/frogs/>
The web site is being revised and will be released to the public at the end of January 2000.
- An interactive web-based aspect to Frog Month has been developed and has been successful. The project conducts two Frog Months each year which focus on a different theme each week. Interest has again been high in this during October 1999. This was an

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addition to the original grant proposal. Experts answer questions from students concerning Minnesota's frog malformities, amphibian declines, frogs and art, frogs and reading and other general amphibian questions. Specific components of the project have been extended to year-round, i.e. answering questions, posting frog art and writings about frogs on the web site, etc.

- Since July 1997, over 150,000 people have visited the web site and accessed information concerning amphibian malformities and declines. The site has an extensive list of links to other sites where the public can obtain additional information about this issue in other states and in other countries. Teachers and students can also use this as a resource to retrieve information about the declining amphibian population crisis. A redesigned web site will be available to the general public, teachers and students by the end of January 2000. This site will be more comprehensive and easier to navigate around.
- The web site has won several awards. These include awards from KIDS Report, a National Science Foundation (NSF) project; Neartica's 'Editor's Choice Award' for excellence in education; and Web Feet: The Internet Traveler's Desk Reference, the premier subject guide to the best sites for students, researchers, and the general public.
- In addition, project staff have formed partnerships with other internet-based projects, located at UC-Berkely and the University of Washington-Seattle. These NSF projects use the Internet to teach science controversy and critical thinking. One of their teaching units is on malformed frogs and they asked project staff to consult and partner with them.
- Digital camera and color printer have been purchased and used in the production of the web site and written materials.

Result 3: Learning Resource Kits. Develop five learning resource kits with the Science Museum of Minnesota. These learning kits will be available for teachers who want to incorporate them into their classroom. The educational content of the kits will compliment the Frogs as Bio-indicators Study Guide and program and allow a teacher to further explore the concepts of bio-indicators with their students.

- Develop Frog Watch learning resource kits for use by schools and other groups, August 1998.
- Distribute Frog Watch learning resource kits for use by schools and other groups, October 1998 ongoing through December 1999.

Budget: \$18,500

Balance: \$0

Final Project Results (December 31, 1999)

The kits, also known as Frog Trunks, have proved successful. However, these should be reviewed on an ongoing basis to maintain the information available to the educators who use them.

- Five learning resources kits were developed and delivered to the Science Museum 'Museum on the Move' for distribution to schools. These have been available to schools since early November.

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- The kits were distributed to 32 schools, impacting an estimated 7,300 students statewide.

Result 4: Teacher Preparation Institute. Implement teacher preparation institutes at Hamline University. Hamline and CGEE have an impressive history of designing and implementing highly successful institutes. This is a cost-effective way to give teachers the background and support they need to incorporate the project into existing curriculum.

- Develop and plan Frog Watch Institute, October 1997
- Promote Frog Watch Institute to teachers, March 1998
- Implement a number of Frog Watch teacher workshop and institutes up to three days in length, preparing 50 teachers to implement, Frog Watch E.E. Project: Summer 1997, Fall 1997, Spring 1998, Summer 1998, Spring 1999.

Budget: \$18,500

Balance: \$0

Final Project Results (December 31, 1999)

The institutes proved successful and were availed of by educators from across the state. However, it could have been more widespread if the instructors were able to conduct workshops in other parts of the state or if the teachers were encouraged, with some additional funding, to run workshops in their own school district/area.

- Frog Watch teacher workshops and institutes have been developed and promoted to educators in Minnesota.
- Scholarships were offered to teachers to attend the workshops/institutes.
- In total, 73 educators have attended the workshops/institutes.

Result 5: A Thousand Friends of Frogs. Develop, promote, and implement 1,000 Friends of Frogs—an informal frog monitoring program through schools and organizations to youth statewide. The information from this program will be essential for the MPCA to continue their study of frog deformities throughout the state. The results from the 1996 survey have shown that deformed frogs have been located in 56 counties. This program has not only provides valuable information on an environmental problem, but it engages the citizens of the state in environmental education and the scientific method. We plan on involving over 10,000 youth from July 1997 until October 1999.

- Develop survey protocol, August 1997
- Develop and distribute flyer describing monitoring program and environmental education project, May 1998, March 1999
- Flyer will be developed by May 1998, awaiting latest scientific updates 1999 flyer developed in June, following consultations with scientists on new scientific findings
- Promote program to schools and organizations throughout state, July 1997, ongoing until September, 1999

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- Guide youth to observe and monitor frogs state-wide, July 1997, June 1998, June 1999
- Provide toll-free hotline to answer questions and take in reports, July, 1997.

Deliverable products

Protocol/Data Base research and development, August 1997	\$10,000
Flyer development and distribution, July 1997	\$5,000
Flyer development and distribution, May 1998	\$5,000
Flyer development and distribution, June 1999	\$4,200
Project salary/expenses, July 1998	\$23,700
Project salary/expenses, July 1999	\$23,700
Project salary/expense, December 1999	<u>\$11,900</u>
Total	\$83,500

Budget: \$83,500

Balance: \$0

Final Project Results (December 31, 1999)

This component was an excellent example of a scientist/student and citizen partnership in monitoring environmental quality. This issue was raised to a national and international level by students from Minnesota. Very rarely is an issue such as this raised to a prominent level by students. It assisted the MPCA directly by helping the agency scientists determine the location and distribution of the malformed frogs. This reduced the amount of time they had to spend traveling around the state. The scientists instead went to specific areas where they knew malformed frogs had already been found through examination of the citizen reports. Citizens involved with various environmental projects in Minnesota and other states have used the project's science protocols in monitoring programs.

- Distributed flyers/surveys to individuals, impacting almost 140,000 individuals. Developed new flyer for distribution in June 1999.
- Answered thousands of questions from a concerned citizenry over the toll-free hotline and through electronic mail.
- Acted as data reporting repository. Almost 300 (291) reports of malformed frogs have been forwarded to the MPCA. The gathering of the data used by the MPCA to determine which sites to visit would have been difficult and expensive for the agency. CGEE staff worked with the PCA researchers to confirm reports from the public. This is an excellent example of citizens helping a state agency gather relevant and useful information.
- Presentations were made at various state and national conferences reaching over 2,300 citizens.
- Minnesota-based organizations and schools also received presentations providing direct contact with almost 6,620 citizens.
- Developed an exhibit with the staff of Camp Snoopy at the Mall of America
- Created components of the 'Frogs' Exhibit at the Minnesota Zoo and involved with 2 learning stations of the Frog-Lab for students.
- Both exhibits and other presentations reached an estimated ½ million people.

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Result 6: Minnesota Frog and Toad Survey. Implement Minnesota Frog and Toad Survey, a scientific survey. We will be working with the DNR Nongame Wildlife Program to establish this survey with the intent that they will continue the longitudinal study. This survey incorporates exacting scientific criteria that will provide accurate baseline information about the frog population.

- Develop the current Calling Frog and Toad Survey into a state-wide scientific survey that will adequately monitor the health of frog and toad populations, October 1997
- Provide training to survey participants, January 1998, ongoing until December 1999
- Distribute frog call identification training tape to volunteers, April 1998.
- Using computer generated survey routes with existing maps. Because survey routes have been generated by computer and existing maps are being used to check accuracy, it is not necessary to perform this task.
- Compile data gathered in a data base to establish a long-term baseline for analysis of the amphibian population state-wide, September 1998, September 1999. We will purchase a portable computer to record data while in the field, November 1997.

Deliverable products

Data management, September 1998	\$1,120
Data management, September 1999	\$1,120
Travel and travel expenses, July 1998	\$1,740
Travel and travel expenses, July 1999	\$1,740
Purchase portable computer, November 1997	\$2,500
Distribute Frog Call Identification tape, April 1998	\$500
Project salary/expenses, July 1998	\$32,390
Project salary/expenses, July 1999	<u>\$32,390</u>
Total	\$73,500

Budget: \$73,500

Balance: \$ 0

Final Project Results (December 30, 1999)

The volunteers, while successful, still has a long way to go to assist in the production of a longitudinal database which will be useful in determining the status of frog and toad populations in the state. This project is planned to be carried forward by the DNR. It is hoped that CGEE staff will be involved in this in the future.

- Calling Frog and Toad Survey has been developed into a state-wide project with over 130 routes to be surveyed by volunteers.
- In 1998, one hundred and ten (110) survey participants have been trained in five sessions throughout the state.
- In 1999, 100 survey participants (about 20 new individuals) were involved in monitoring anuran populations.

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- Volunteers reported a small population of Northern Cricket Frogs in 1998, a species that had not been reported in the state for over 15 years.
- A training packet including a call identification tape, poster and reporting materials was distributed to all new survey participants. Volunteers from 1998 involved with the 1999 survey received the same materials minus the audio tape.
- Data were mailed to MN Department of Natural Resources Non-Game Wildlife Personnel for entry into an anuran populations database. This process was followed for each year.
- Follow-up contact was made with the volunteers at the end of each season to remind them to send in their survey forms.

V. DISSEMINATION:

The educational part of this program will inform Minnesotans of the results of MPCA's most recent findings about the deformed frogs, the results of the frog survey and the value of frogs as bio-indicators. Information will also be disseminated through the scientific and general media. Hamline will have a web site that focuses on this project.

Web site address: <http://cgee.hamline.edu/frogs/>

VI. CONTEXT:

A. Significance: It is believed that the world-wide population of amphibians is declining. Amphibians function as an early warning system for environmental problems. The deformed frogs that students found in Henderson, Minn., in 1995 served as a wake-up call to the condition of Minnesota's frogs and environment. The Frog Watch is an unparalleled opportunity to engage the public and infuse environmental education into our formal and non-formal education system. The Frogs as Bio-indicators Environmental Education project provides broad mix of educational options. The Activity Guide, optional on-line component and support materials will be available for schools and youth groups state-wide. The experiential component of Frog Watch adds a hands-on dimension that makes this project especially effective. There is also a need for a coordinated state-wide amphibian monitoring project to examine the amphibian population. There are two components of this monitoring system:

1. 1,000 Friends of Frogs Project--youth monitoring of frog health and distribution. This will give us excellent information based on physical observations of frogs. The data collected will be extremely useful to the MPCA, as it looks at amphibians as bio-indicators of water quality in local environments.
2. Minnesota Frog and Toad Survey--a more involved call survey, whereby observers do not physically inspect the frogs but listen for their calls; incorporates world-wide standards established by the Declining Amphibian Populations Task Force. These are very exacting scientific criteria that will provide accurate baseline information.

B. Time: The project would start the summer of 1997 and extend until December 31, 1999. This is necessary to complete the 1999 summer frog monitoring program.

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C. Budget Context: Hamline University has currently received an allocation of \$28,000 from LCMR, Legal Citation: ML 1996, Chap 407, Sec. 8 Subd. 7, as part of the \$153,000 allocation to the MPCA to study the frog phenomena. We feel this is an excellent project and are in the process of looking for additional funding sources to further its development. We have submitted a grant to Dayton Hudson Foundation for \$100,000 to support this program and are writing additional grant proposals.

	July 1995-June 1997 Prior expenditures on this project	July 1997-Dec. 1999 Proposed expenditures for this project	Dec. 1999-June 2001 Future expenditures on this project
1. LCMR	\$28,000	\$300,000	\$0
2. Other State	\$0	\$0	\$0
3. Non State Cash	\$0	\$100,000	\$250,000
Total	\$28,000	\$400,000	\$250,000

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BUDGET:

Personnel	207,500
Principle Investigator	0.25 FTE
Project Manager	0.9 FTE
Project Assistant	0.4 FTE
Administrative Assistant	0.2 FTE
Scientific Coordinator	0.5 FTE
Survey Analysis Specialist	0.1 FTE
DNR Data Entry Personnel	0.05 FTE
Research Assistant	Summer Position
Equipment	4,800
Digital Camera	(\$600)
High Quality Printer	(\$1,200)
Distribution of Training Tape	(\$500)
To complete the training and have the trained survey participants (volunteers) surveying the routes by April, 1998, the funds should be used to distribute a 'Calls of Minnesota's Frogs and Toads' training tape.	
Portable computer	(\$2,500)
Scientific advisors believe that it is more useful to data collection and analysis to purchase a portable computer to input data while in the field on surveys rather than a G.P.S. unit.	
Acquisition	0
Development	0
Other:	
Teacher Education Institute	10,000
Learning Resource Kits (5 kits)	10,000
Error--Stated as five kits in text, Page 5)	
Printing/Layout and Design	17,650
Curriculum Development Conference	8,000
Outreach/Distribution Postage	8,000
Telecommunications Development	6,480
Internet Connection	3,000
Travel Expenses	6,380
Conference Expenses (expand participation of project staff to regional and national conferences)	3,600
Supplies and Operating Expenses	14,590
Total	\$300,000

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VII. COOPERATION:

The following organizations are cooperators for various aspects of project implementation.

Minnesota Association of Environmental Education--Jim Malkowski (no costs are associated)

Minnesota Department of Natural Resources--Richard Baker (no costs are associated)

Minnesota Extension Service--Dr. Stephen Carlson (no costs are associated)

Minnesota Frog and Toad Survey--John Moriarty, Ramsey County Parks (50% time--\$44,380 over two years; based on \$44,380 yearly salary including benefits).

John will stay involved with the project even with his recent job change.

Minnesota Pollution Control Agency--Dr. Judy Helgen (no costs are associated)

Ney Frog Project--Cindy Reinitz (no costs are associated)

Science Museum of Minnesota--Pat Hamilton (no costs are associated)

University of Minnesota, Morris--Dr. David Hoppe (10% time--\$10,000 over two years; based on \$50,000 yearly salary including benefits)

VIII. LOCATION:

Ecological classification location: Entire state

XI. REPORTING REQUIREMENTS:

Periodic work program progress reports will be submitted not later than December 31, 1997, December 31, 1998. A final work program and associated products will be submitted by December 31, 1999.

X. RESEARCH PROJECTS: Not applicable