

Date of LCMR Status Report: June 30, 1996  
LCMR WORK PROGRAM 1993  
Title: WORK PROGRAM

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**I. Project Title:** LAKE/GROUND WATER INTERACTION STUDY at WHITE BEAR LAKE

Project Manager: John Linc Stine  
Agency Affiliation: Department of Natural Resources, Division of Waters  
Address: 500 Lafayette Road, St. Paul, MN 55155  
Phone: (612) 296-0440

**A. Legal Citation:** M.L. 94, Chpt. 580, Sect. 7F

**Budget Amount:** \$175,000 **Balance:** \$ -0-

**Appropriation language:** Subd. 11(f). This appropriation is from the future resources fund to develop an enhanced water budgeting computer model (\$100,000) and to install ground water level observation wells around White Bear Lake (\$75,000). This authorization is effective immediately after enactment and is effective until June 30, 1996.

**B. LMIC Compatible Data:** All data on ground water levels, lake levels, and climatology will be compatible with established standards and will be provided in digital form to LMIC.

**C. Status of Match Requirement:** N/A

**II. Project Summary:** There are over 50 large, developed lakes throughout Minnesota that are sustained primarily by ground water movement. Such lakes lack sufficient land drainage area (watershed) to sustain lake levels; White Bear Lake is representative of such lakes.

This project will enhance the technical analysis of the influence of ground water on these lakes in order to improve decision-making when changes to lake levels or ground water levels are considered. For example, the expanded pumping of high capacity, municipal wells in the White Bear Lake area may have the potential to induce additional seepage from the lake to ground water.

This project will expand an existing computer model (WATBUD), developed by DNR, by adding a dynamic component for seepage (to or from ground water). Currently the WATBUD model computes seepage from the lake basin as an unchanging value in the water budget equation.

The addition of 10-15 ground water level observation wells around White Bear Lake will provide detailed ground water level data needed to calibrate the computer model. The model, once revised, will provide improved predictive analysis of potential impacts to lake and ground water levels as hydrologic factors change. The resulting information will be directly transferrable to the 50 ground water sustained lakes, mentioned above.

The two primary benefits of this project are: 1) the development of an enhanced computer model to answer difficult lake level and ground water level fluctuation problems for Minnesota lakes, and 2) all observation well data will contribute to the Twin Cities regional aquifer modeling efforts.





<b>Timeline:</b>	3/94	6/94	1/95	6/95	1/96	6/96
Prepare contracts, advertise, and award		*****				
Install wells				*****		
Observe ground water levels						*****

f. **Status:** Well locations have been identified, and location agreements are in initial stages of development. Five water level observation wells have been installed with continuous data recorders. Additional observation well location agreements and an agreement for access to an unused Ramsey County lake augmentation well have been obtained. Ob well data are being collected and input to the revised WATBUD model for analysis. Details of proposed observation wells near White Bear Lake and retrofitting of the unused Ramsey County lake augmentation well (for use as a Mt. Simon-Hinckley observation well) are being finalized so that construction can be completed by April 1996. A Mt. Simon-Hinckley observation well is being constructed by retrofitting the former Ramsey County well.

V. **Evaluation:** This project will be evaluated by state agency professionals, local government officials, and affected citizens and interest groups. Development of an enhanced WATBUD computer model and installation of additional observation wells will indicate success of this project.

VI. **Context with field:** This project will develop the computer model to understand lake level to ground water relationships for Minnesota lakes. The model would allow for transferability of this research for predicting changes in ground water recharge and lake levels.

VII. **Benefits:** Preparation of a predictive model of the lake levels on a large, complex lake--ground water system will advance the transferral of such models to other similar lakes in Minnesota. The additional observation wells will assist in this modeling effort and will also assist in providing data for Twin Cities regional aquifer modeling efforts.

VIII. **Dissemination:** Regular meetings of the WBL Partnership will disseminate information and shape the project throughout its course. All aspects of this project will be shared with water and resource management professionals, local units of government, residents of the White Bear Lake area, and interested groups. The lake/ground water study will be summarized by DNR, and presentations will be given specifically for the participants of this project and other interested groups.

All water resource data collected for this program will be shared with agencies and local governments to ensure entry into appropriate databases. Findings and conclusions of the project will be summarized in a project completion report prepared by DNR (with input from project participants). This project completion report will be distributed to all participants, as well as appropriate public libraries, and local units of government responsible for lake management activities.

**IX. Time:** This project will be completed by June 30, 1996.

**X. Cooperation:** The following individuals will be invited to periodic meetings of the WBL Partnership (coordinated by DNR), the citizen group that will participate in and be informed about project activities. Meetings of this group will be open to the public.

1. Robert Herr, a resident of the WBL area and representative of the Lake Area Association (concerned lakeshore residents).
2. Mary Hauser, Washington County Commissioner, or a delegated representative.
3. Duane McCarty, Ramsey County Commissioner, or a delegated representative.
4. President, Rice Creek Watershed District, or a delegated representative.
5. Jim Johnston, Administrator, Vadnais Lakes Area Watershed Management Ordinance.
6. Bruce Sandstrom, Acting Regional Supervisor, Minnesota Board of Water and Soil Resources.
7. Mark Tomasek, Hydrologist, Minnesota Pollution Control Agency.
8. Gary Oberts, Water Resources Planner, Metropolitan Council.
9. Mark Sather, Administrator, City of White Bear Lake.
10. Chairperson, White Bear Lake Conservation District.
11. Dave Schuler, Water Chemist. St. Paul Water Utility.

**XI. Use of Classified State Employees:** Employees of the DNR Division of Waters within the classified service, who possess unique experience and skills relevant to this project, will perform work on this project. LCMR funds will be used to support their work, and detailed cost-coding of timesheets will be the basis for payments from LCMR funds. The DNR Division of Waters' general fund activities will be maintained or increased through temporary employee hires, etc., for backfill from the general fund.

**1. Type and Estimated Amount of Classified Salaries**

Classification	Total Project/Commitment (Hours)	Est. Cost
Hydrologist 1	250	4,800.
Hydrologist Supervisor	500	14,200.
Hydrologist 3	1000	25,000.
Research Scientist 3	250	8,000.
Principal Engineer	500	16,000.
Hydrologist 5	200	7,000.
	2700 Hours	75,000.

**2. Unique Qualifications.** The above-noted DNR staff have expertise in the specific computer modeling skills necessary to perform Objective A. Several were involved in the organization of the existing WATBUD model and are the only staff knowledgeable in its capabilities, design, etc. Other of the staff have unique experience in ground water observation well design and construction (Objective B) to meet the WATBUD modeling needs of Objective A.

3. **Expense to State.** Contracting for the necessary expertise to perform this project from the private sector would range in cost from \$50-\$100 per hour. The average hourly cost to the state by using classified employees is approximately \$25-\$35 per hour (including fringe). Hiring unclassified employees to perform the project work would not be effective due to the need for specialized expertise and the training requirements.
4. **Supplemental Nature of Appropriation.** The LCMR funding allows the DNR to accelerate the development of the WATBUD model. If this funding were unavailable the DNR would not modify the WATBUD model except as time and workload allows over a period of 4-8 years, rather than the 2 years afforded by this funding.
5. **Use of General Fund Budget Savings.** This project will result in \$75,000 of savings to the DNR Division of Waters General Fund (due to salary payments to classified state employees). The Division will use the savings to employ a 90% Hydrologist I and several interns to provide support to existing programs normally served by the classified professional staff (i.e., ground water and surface water modeling, analysis, etc.).

**XII. Reporting Requirements:** Semi-annual status reports will be submitted not later than July 1, 1994, Jan. 1, 1995, July 1, 1995, Jan. 1, 1996, and a final status report by June 30, 1996.