

Wisconsin Department of Natural Resources  
SWIMS Project Summary

General Project Information

**Project ID:** LPL-057 (2007-01)

**Name:** DANE COUNTY: Lake Mendota Storm Event Monitoring (USGS) Phosphorus Budget

**Type:** Lakes Grant

**Subtype:** Large Scale Lake Planning

**Status:** COMPLETE

**Start Date:** 4/1/1991

**End Date:** 12/31/1996

**Purpose:** Storm-event monitoring to determine present phosphorus loadings and a phosphorus budget for Lake Mendota. Phosphorus loading will be determined through continuous flow gauging stations located at the Yahara River at the Windsor Golf Course, the SpringHarbor storm sewer in the City of Madison, and Pheasant Branch Creek in the City of Middleton. Samples collected year-round by USGS personnel at the Yahara River station and at least one of the other two stations to be analyzed for total P and totalreactive P. Phosphorus loading from the third site will be estimated if funding constraints prevent actual sampling. Monitoring and information will be coordinated with DNR Bureau of Research and UW, which are currently conducting in-lake studies ofLake Mendota. USGS is providing 50% matching funds, local funding support is being provided by the cities of Madison and Middleton. Dane County's contribution will exceed \$3,333. Information will be disseminated to the public by entire report mailings,summary report mailings. Project results will be reposted at the Dane County Regional Planning Commission and DNR-Southern District.

**Objective:**

**Comments:**

**Outcome:**

**Study Design:**

**QA Measures:**

People						
Name	Role	Status	Start Date	End Date	Organization	Comments
DANE COUNTY,	GRANT_RECIPIENT	ACTIVE	4/1/1991	12/31/1996	DANE COUNTY	

Project Statuses			
Date	Reported By	Status	Comments

Actions				
Action	Detailed Description	Start Date	End Date	Status
Nutrient Budget Development	10099557	4/1/1991		PROPOSED
Monitor Water Quality or Sediment		4/1/1991	12/31/1996	PROPOSED

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Grant Awarded	Storm-event monitoring to determine present phosphorus loadings and a phosphorus budget for Lake Mendota. Phosphorus loading will be determined through continuous flow gauging stations located at the Yahara River at the Windsor Golf Course, the SpringHarbor storm sewer in the City of Madison, and Pheasant Branch Creek in the City of Middleton. Samples collected year-round by USGS personnel at the Yahara River station and at least one of the other two stations to be analyzed for total P and totalreactive P. Phosphorus loading from the third site will be estimated if funding constraints prevent actual sampling. Monitoring and information will be coordinated with DNR Bureau of Research and UW, which are currently conducting in-lake studies ofLake Mendota. USGS is providing 50% matching funds, local funding support is being provided by the cities of Madison and Middleton. Dane County's contribution will exceed \$3,333. Information will be disseminated to the public by entire report mailings,summary report mailings. Project results will be repositied at the Dane County Regional Planning Commission and DNR-Southern District.	4/1/1991		COMPLETE
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Monitoring Stations

Station ID	Name	Comments
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Assessment Units

WBIC	Segment	Local Name	Official Name
798300	3	Yahara River	Yahara River
805400	1	Mendota Lake	Lake Mendota

Lab Account Codes

Account Code	Description	Start Date	End Date
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Forms

Form Code	Form Name
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Methods

Method Code	Method Description
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Fieldwork Events

Start Date	Status	Field ID	Station ID	Station Name
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Documents

Title	Description	Author	Published	Comments
Phosphorus loads to surface waters: A simple model to account for spatial pattern	Surface waters are sensitive to disturbances in their watersheds, especially those disturbances that lead	P.A. Soranno, S.L. Hubler, S.R. Carpenter, R.C. Lathrop	6/22/1994	

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of land use [Lake Mendota]	<p>to increased sediment erosion and nutrient transport. Land use planning to sustain surface water quality for most watersheds should account for effects of both agriculture and urbanization on nutrient transport. We developed a simple model to predict nonpoint-source phosphorus (P) loading to surface waters using land use, topography and stream networks from geographic information system (GIS) databases commonly available to natural resource managers and researchers. We estimated areas of the watershed that strongly contribute to P loading by simulating overland flow, and modeled annual P loading by fitting three parameters to stream monitoring data. We calibrated the model using P loading data from two years of contrasting annual precipitation from Lake Mendota, WI, a typical eutrophic northern temperate lake whose watershed is dominated by agriculture and urban lands. Land use scenarios were developed to predict annual P loading from presettlement and future land use. At the annual scale, as much as half of the Lake Mendota watershed did not contribute significantly to P loading. The greatest contribution to loading comes from a riparian corridor that varies in width from 0.1 km to about 6 km surrounding surface waters that feed into Lake Mendota. The apparent width of this corridor varies directly with precipitation. We estimate that loading from pre-settlement land use was one sixth of the loading from present land use. The future scenario, representing an 80% increase in existing urban land (from 9 to 16% of total watershed area, which would take 30 years to achieve at current land use trends) caused only modest increases in annual P loading, but could have significant effects on water quality. If the watershed was converted to 100% urban land, P loading to the lake would double and potential effects on water quality would be severe. Changes in P loading respond most strongly to land use</p>			
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changes that included conversions of undisturbed vegetated lands to either urban or agricultural land uses, especially in riparian areas. Variability in total annual rainfall leads to variability in the riparian area that affects loading. This uncertainty has implications for policies intended to control nonpoint nutrient inputs.

Budget

Combined Budgets:

Combined WSLH:

Combined Total: \$0.00

Funding

Organization	Source	Type	Amount	Start Date	End Date
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