

Wisconsin Department of Natural Resources SWIMS Project Summary

General Project Information

Project ID: WCR_04_CMP11 ATTAINS
Name: Cedar Lake and Half Moon Lake TMDL Implementation Evaluation Monitoring - WCR 4_11
Type: TMDL/303d Projects
Subtype: Determine Pollutants or Impairments
Status: FINAL_RPT
Start Date: 07/01/2010
End Date: 06/30/2011
Purpose: WCR is working in partnership with ACOE ERDC Spring Valley to conduct limnological assessment and research on the two TMDL implementation projects for Cedar Lake St. Croix County and Half Moon Lake City of Eau Claire.

Half Moon Lake

The Half Moon Lake TMDL set a water quality goal and implementation actions needed to achieve the water quality goal. Implementation actions that have been implemented include MS4 WPDES Stormwater Permit for the City of Eau Claire to address watershed nutrient loading to the lake, relocation of the water ski show team and year one of a three year herbicide treatment plan to control curly leaf pondweed. CLP will be treated in 2010 and 2011 and funding is being developed to complete a whole lake alum treatment in 2011. ACOE has primary responsibility for project implementation and WDNR has committed to provided assistance conducting field work and data analysis.

Monitoring has been conducted on Half Moon Lake in 2008 and 2009 as part of an effort to examine water quality response to control of curly-leaf pondweed and Eurasian watermilfoil via herbicide treatment and reduction in internal P loading from sediment. Five to six stations are being sampled at 1-m intervals between the lake surface and sediment at biweekly intervals between May and September for in situ temperature, dissolved oxygen, pH, conductivity, light penetration, Secchi transparency, total P, soluble reactive P, and viable chlorophyll. Findings indicated that Secchi transparency was low (~ 1.0 to 1.5 m in 2008 and < 1.0 m in 2009) and that high light attenuation was related to high algal biomass (40 to 50 ug/L in 2008 and 50 to 100 ug/L as chlorophyll in 2009). Chlorophyll concentrations were also positively related to total P concentration, suggesting incorporation of P and conversion to biomass. The trophic state index for chlorophyll ranged between 53 and 77, indicating highly eutrophic conditions. Water quality monitoring is scheduled to continue in 2010 to 2015 or longer.

Aquatic plant biomass and population assessments is conducted multiple times per growing seasons. ACOE and WDNR staff conduct pre and post treatment biomass studies, herbicide degradation residual monitoring, and pre and post treatment aquatic plant population assessments. WDNR staff provide up to 20 hrs per week supporting this monitoring and assessment project.

Cedar Lake

The Cedar Lake TMDL implementation included reducing watershed phosphorus nutrient loading and control of internal loading through seasonal aeration. Monitoring has indicated that water quality goals have not been achieved. WDNR working in partnership with ACOE ERDC Spring Valley, the Cedar Lake Protection Rehabilitation District, Polk County Land and Water Department, University of Minnesota and the Science Museum of Minnesota will be completing this project over the next 3 years.

The objectives of this research are to identify and estimate 1) annual and summer external phosphorus (P) loading, 2) internal P loading from sediments under differing eH and pH conditions and the bioavailable sediment P pool, 3) horizontal water and P exchanges between littoral and pelagic zones, 4) vertical P transport from the hypolimnion to the epilimnion, 5) sedimentation of P, and 6) in-lake water quality trends. These data are being used to construct a P budget for the lake, identify importance P sources and sinks for algal growth, and develop external P loading reduction scenarios that can be used in conjunction with watershed models to manage the lake for improved water quality. The data collection is taking place over a 2 year period starting in 2009. WDNR provides up to 20 hrs per week to complete this monitoring.

Objective: These projects are necessary to achieve the water quality goals set forth in the TMDL for both lakes. The results of both studies can be used statewide to set water quality improvement objectives for similar projects. The Cedar Lake project results are expected to assist in developing water quality improvement actions on approximately 200 other polymictic lakes statewide. The Half Moon Lake results will be critical in developing management recommendations for lakes with expansive curly leaf pondweed populations and complex internal phosphorus loading.

Comments: Project Category 2: 303(d) Impaired Waters List
Project Category 3: Continuation of FY2010 Special Projects

Outcome: These are milestones that will be reported on in the Division Quarterly Report. Please estimate dates in a manner that encourages success.
1) Each lake has multiple monitoring strategies being employed through out the growing season. Cedar Lake has 9-12 monitoring locations with several sites being instrumented within the lake collecting continuous in lake monitoring, and 2 gage sites for flow and nutrient loading in the watershed. Some sites are monitored continuously, weekly and biweekly. Cedar Lake monitoring will be completed in calendar year 2010 with modeling and reporting to be completed by 2013. Half Moon Lake will be monitored for the next several years as herbicide treatments and the alum treatment is completed. Data are entered into the databases as the results are available.

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Study Design:

QA Measures:

People

| Name | Role | Status | Start Date | End Date | Organization | Comments |
|------------------|-------------|--------|------------|------------|---------------|----------|
| Sorge, Patrick W | COORDINATOR | ACTIVE | 07/01/2010 | 06/30/2011 | Wisconsin DNR | |
| TROMBLY, NEIL R | TEAM_MEMBER | ACTIVE | 07/01/2010 | 06/30/2011 | Wisconsin DNR | |

Project Statuses

| Date | Reported By | Status | Comments |
|------------|-----------------|--------------------------|--|
| 03/04/2010 | Patrick Sorge | Proposed | |
| 12/07/2010 | MOLLI MACDONALD | Progress: 0-25% Complete | There are no stations or field work events. Note from Sorge October 2010: "I can add the stations after we collect the first cores. I'm not sure the locations for the sediment samples will align with existing deep hole station in the lake. This is partnership project with the ACOE. We are providing the LTE support to conduct a variety of field work task. The lab work is being analyzed by ACOE ERDC Lab in Spring Valley (i.e.. Bill James Lab). At this point we are not capturing the chemistry or field data into our data management system." Need January status update. |
| 08/03/2011 | MOLLI MACDONALD | Active | From Buzz Sorge: Monitoring is being completed as proposed |
| 10/03/2013 | Patrick Sorge | Complete | Project has been completed as proposed assistance was provided to ACOE (Bill James) to complete limnological monitoring on Cedar and Half Moon Lakes. Aquatic Plant assessments have been completed two times per summer in June and August. Data analysis has been completed. |
| 10/04/2013 | RUTH PERSON | Complete | Field work scheduled within the project timeline has been completed. Cedar Lake final report is draft and Half Moon Lake Monitoring summaries have been completed but not published by Bill James. |
| 05/14/2014 | Patrick Sorge | Complete | Project completed as work planned. The Cedar Lake Assessment Report has been completed. Annual monitoring reports have been completed for Half Moon Lake and monitoring will be on going for the next several yeas. |

Project Status Detail

Answer Set: DEFAULT

Question

1. Number of Sample Sites (Enter the station IDs if you know them).

Answer

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| Question | Answer |
|--|--------|
| 2. Number of Sample Events (Indicate how many trips into the field you anticipate for this project). | |
| 3. Proposed Dates for Sample Collection | |
| 4. List applicable databases and who will enter data? | |
| 5. Did you receive competitive projects funding during FY 2010? | |
| 6. If yes to question 5, did you complete the projects including data entry and reports as necessary? If not, why not? | |
| 7. Reviewer Notes: Identify questions or issues with project (use during review period) | |

Actions

| Action | Detailed Description | Start | End Date | Status |
|---------------------------|---|------------|------------|----------|
| TMDL Actions in Wisconsin | The Half Moon Lake TMDL set a water quality goal and implementation actions needed to achieve the water quality goal. Implementation actions that have been implemented include MS4 WPDES Stormwater Permit for the City of Eau Claire to address watershed nutrient loading to the lake, relocation of the water ski show team and year one of a three year herbicide treatment plan to control curly leaf pondweed. | 07/01/2010 | 06/30/2011 | PROPOSED |

Monitoring Stations

| Station ID | Name | Comments |
|------------|------|----------|
|------------|------|----------|

Assessment Units

| WBIC | Segment | Local Name | Official Name |
|------|---------|------------|---------------|
|------|---------|------------|---------------|

Lab Account Codes

| Account Code | Description | Start Date | End Date |
|--------------|-------------|------------|----------|
|--------------|-------------|------------|----------|

Forms

| Form Code | Form Name |
|-----------|-----------|
|-----------|-----------|

Methods

| Method Code | Description |
|-------------|-------------|
|-------------|-------------|

Fieldwork Events

| Start Date | Status | Field ID | Station ID | Station Name |
|------------|--------|----------|------------|--------------|
|------------|--------|----------|------------|--------------|

Documents

| Title | Description | Author | Published | Comments |
|-------|-------------|--------|-----------|----------|
|-------|-------------|--------|-----------|----------|

Budget

| | | |
|--|-------------------------------|-----------------------------|
| Budget Description: Budget for Cedar Lake and Half Moon Lake TMDL Implementation Evaluation Monitoring - WCR 4_11 | Start Date: 07/01/2010 | End Date: 06/30/2011 |
|--|-------------------------------|-----------------------------|

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| Code | Description | Quantity | Units | Unit Cost | Total Cost | Comments |
|--------------|-----------------------------------|----------|-------|-----------|--------------------|----------|
| FTE | FTE Hours | 40 | Hours | \$0.00 | \$0.00 | |
| LTE SAL | LTE Salary | 800 | Hours | \$15.00 | \$12,000.00 | |
| LTE FR | LTE Fringe | | | | \$2,964.00 | |
| LTE IND | LTE Indirect | | | | \$2,419.68 | |
| LTE TOT | LTE Total Cost | | | | \$17,383.68 | |
| SUPPLY | Supplies | | | | \$0.00 | |
| MILEAGE | Mileage | 5000 | Miles | \$0.40 | \$2,000.00 | |
| MEAL | Meals | 30 | Meals | \$9.00 | \$270.00 | |
| LODGE | Lodging | | | | \$0.00 | |
| TRAVEL | Travel Total | | | | \$2,270.00 | |
| BUG | Bug Contracts | | | | \$0.00 | |
| OTHER | Other Contracts | | | | \$0.00 | |
| EQUIP | Equipment | | | | \$0.00 | |
| USGS | USGS Costs | | | | \$0.00 | |
| TOTAL | Total Cost (excludes SLOH) | | | | \$19,653.68 | |

| Test Code | Description | Test Group | # Planned | Unit Cost | Total Cost |
|-----------|-------------|------------|-----------|-----------|------------|
|-----------|-------------|------------|-----------|-----------|------------|

Total SLOH Lab Costs: \$0.00

Total Budget: \$19,653.68

Combined Budgets: \$19,653.68

Combined SLOH: \$0.00

Combined Total: \$19,653.68

Funding

| Organization | Source | Type | Amount | Start Date | End Date |
|--------------|--------|------|--------|------------|----------|
|--------------|--------|------|--------|------------|----------|