



St. Croix Basin Water
Resources Planning Status
Report
2003

August 22, 2003

Partners

Minnesota Department of Natural Resources (MDNR)
Minnesota Pollution Control Agency (MPCA)
St. Croix National Scenic Riverway-National Park Service (SACN NPS)
Wisconsin Department of Natural Resources (WDNR)

Cooperating Members

Board of Water and Soil Resources (BWSR)
Metropolitan Council Environmental Services (MCES)
Minnesota Department of Agriculture (MDA)
St. Croix Chippewa Indians of Wisconsin
St. Croix County
United States Geological Survey (USGS)
University of Minnesota (UMN)
University of Wisconsin Extension (UW)
Washington County
St. Croix Watershed Research Station (Science Museum of Minnesota)

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St. Croix Basin Water Resources Planning Status Report 2003

Executive Summary

Rapid population growth with the accompanying land use changes is impacting the water resources of the St. Croix Basin. State, federal and local units of government and other organizations are working cooperatively to address water quality protection and resolve impairments in the St. Croix River Basin. The St. Croix Basin Water Resources Planning Team (Basin Team), created by a *Memorandum of Understanding* among units of government, gathered in 1994 to develop water resource goals and a plan to accomplish these goals. The Basin Team established four goals:

Water Resources Goals of the St. Croix Basin Water Resources Planning Team

- Protect and improve the quality of the surface and groundwater resources of the St. Croix Basin.
- Provide a forum for water resources managers to integrate local, state, and federal policy.
- Increase public participation and knowledge in water resource planning and management.
- Develop and implement water resource management projects.

During a scoping session, issues pertaining to the degradation of the water resources of the St. Croix River were identified as Issue Statements and prioritized. A report entitled *St. Croix Basin Water Resource Planning Status Report 2001* (Planning Status Report 2001) was prepared by the Basin Team to document and direct activities for water resource protection. The Planning Status Report 2001 describes the history of water resource management in the St. Croix Basin, examines the water resources of the Basin, lists other plans developed for the Basin, guides water resource decision making, and provides a vehicle to create a unified plan between the two states of Wisconsin and Minnesota.

The *St. Croix Basin Water Resources Planning Status Report 2003* documents the work of the Basin Team since the completion of the Planning Status Report 2001. Both Planning Status Reports can be found at www.pca.state.mn.us/water/basins/stcroix/. The purpose of the Planning Status Report 2003 is to document the efforts of the Basin Team in integrative interagency planning and management activities that protect and improve the quality of the surface and ground water resources of the St. Croix River Basin in Minnesota and Wisconsin.

The Basin Team that prepares the planning status reports does not have direct regulatory authority. Therefore these documents are created to guide and facilitate water resources protection and improvement in the St. Croix Basin. The Planning Status Reports are intended for four uses:

- Directing water resources decision making;
- Serving as a source of information for funding opportunities;
- Serving as a vehicle to create a unified plan between the two states of Wisconsin and Minnesota;
- Serving as an internal agency document.

The Planning Status Report 2003 contains four chapters. Chapter 1 is an introduction presenting the background of the St. Croix Basin Team. Chapter 2 details a list of Basin Team accomplishments and activities in the Basin during the 2001 – 2003 period. Chapter 3 describes the subcommittee work on the top five Issue Statements (water resources issues of concern), which include:

1. Nutrients
2. Urban stormwater runoff
3. Monitoring program
4. Public involvement and stewardship
5. Resolve differences in water quality standards between the two states

Chapter 4 describes the Basin Team Coordinator's function and the future direction of the Basin Team. Several letters of support for the Basin Team's activities were received from the signatories of the cooperative agreement. Copies of these letters are included in the Appendix.

St. Croix Basin Water Resources Planning Team Membership

Partners: signature agencies in the Memorandum of Understanding

Minnesota Department of Natural Resources (MDNR)
Minnesota Pollution Control Agency (MPCA)
St. Croix National Scenic Riverway-National Park Service (SACN NPS)
Wisconsin Department of Natural Resources (WDNR)

Cooperating Members

Board of Water and Soil Resources (BWSR)
Metropolitan Council Environmental Services (MCES)
Minnesota Department of Agriculture (MDA)
St. Croix Chippewa Indians of Wisconsin
St. Croix County
St. Croix Watershed Research Station (Science Museum of Minnesota)
United States Geological Survey (USGS)
University of Minnesota (UMN)
University of Wisconsin Extension (UW)
Washington County

St. Croix Basin Water Resources Planning Status Report 2003

Chapter 1: Introduction

Chapter 1.1: Background

In the early 1990s, local, state, and federal water resources managers were becoming increasingly concerned about the impacts of development and recreational use on water quality in the St. Croix River. Research provided evidence that nutrient loading from the St. Croix River mainstem and tributaries was increasing the rate of eutrophication in Lake St. Croix (Gracyk 1986, Troelstrup et al., 1993). The St. Croix River corridor is protected under the National Wild and Scenic Rivers Act (1968, 1972); however, the federal government has no control over the quality of the water flowing into the riverway. State and federal governments needed to work together to protect the St. Croix Basin from recreational and land use impacts. In 1993, a cooperative agreement was signed by the National Park Service, the Minnesota Department of Natural Resources, the Wisconsin Department of Natural Resources, and the Minnesota Pollution Control Agency. The Cooperative Agreement states (see Planning Status Report 2001 Appendix 1 for a complete copy):

- I. A St. Croix Basin Water Resources Planning Team (Basin Team) shall be formed to bring together periodically the parties responsible for the formulation and implementation of a joint basin water resources management plan.
- II. The membership shall consist of an appointed representative from the National Park Service; two representatives from the State of Minnesota, including one from the Department of Natural Resources (MDNR) and one from the Minnesota Pollution Control Agency (MPCA); and two representatives from the State of Wisconsin Department of Natural Resources (WDNR), including one from each of the two districts comprising Wisconsin's portion of the St. Croix River Basin. These agencies are the signature groups of the Cooperative Agreement determined by the Memorandum of Understanding. The MDNR, WDNR, MPCA and NPS regulate policy in the St. Croix Basin.
- III. The Minnesota-Wisconsin Boundary Area Commission (MWBAC) shall act as a facilitator of the joint planning effort for the St. Croix River Basin Team, within the funds and staff resources available to it. Editor's note: On October 1, 2001, the Minnesota-Wisconsin Boundary Area Commission (office closed since funding was not re-authorized by Wisconsin. With no funding from Wisconsin, matching funds from Minnesota were also withdrawn.
- IV. The objectives of this Basin Team shall be:
 - a. To formulate a consolidated and uniform plan for the St. Croix River Basin covering the respective jurisdictions of the parties to this agreement with respect to identifying, monitoring and controlling adverse threats and impacts to the quality of the waters of the basin;
 - b. To cooperate fully with the U.S. Geological Survey in the design and implementation of the National Water Quality Assessment Program Upper Mississippi River study as it relates to the St. Croix River Basin;
 - c. To develop a Plan of Study for a basin plan by September of 1993 and formulate a completed plan by June of 1995. Editor's note: These dates subsequently were revised for a Basin Planning Status Report, instead of a Basin Plan, that was completed in 2001;
 - d. To coordinate implementation of said monitoring and measures on a priority watershed basis within the basin;

- e. To act as a forum for local government and public involvement in basin water quality management planning; and
- f. To periodically review and update said plan.

From this Cooperative Agreement (Memorandum of Understanding) the St. Croix Basin Water Resources Planning Team was created to oversee the development of a basin plan and act as a forum for interagency interaction and local government and public involvement.

The original Basin Team has grown to include several cooperating member organizations with varying levels of participation.

Organizations of the St. Croix Basin Water Resources Planning Team
Signatory Agencies in Memorandum of Understanding
Minnesota Department of Natural Resources (MDNR) Minnesota Pollution Control Agency (MPCA) St. Croix National Scenic Riverway, National Park Service, (SACN, NPS) Wisconsin Department of Natural Resources (WDNR)
Cooperating Members
Board of Water and Soil Resources (BWSR) Metropolitan Council Environmental Services (MCES) Minnesota Department of Agriculture (MDA) St. Croix Chippewa Indians of Wisconsin St. Croix County St. Croix Watershed Research Station (SCWRS, Science Museum of Minnesota) United States Geological Survey (USGS) University of Minnesota (UMN) University of Wisconsin Extension (UW) Washington County

Chapter 1.2: Water Resources Goals

The St. Croix Basin Team gathered in 1994 to develop water resources goals and a plan to accomplish these goals. The Basin Team established four goals:

Water Resources Goals of the St. Croix Basin Water Resources Planning Team
<ul style="list-style-type: none"> • Protect and improve the quality of the surface and groundwater resources of the St. Croix. • Provide a forum for water resources managers to integrate local, state, and federal policy. • Increase public participation and knowledge in water resources planning and management. ▪ Develop and implement water resources management projects.

The plan to achieve these four goals was divided into four phases.

Phase I: Plan of Study - Through a scoping session, the St. Croix Basin Team identified key surface and groundwater issues that form the basis for the Basin Team's activities. These issues are presented as Issue Statements in Chapter 5.0 of the Basin Planning Status Report 2001. Phase I was completed in December 1993 as a foundation for Phase II. The original issues were recently reviewed and ranked in order of importance (6/20/01) for the Basin Team to address (Table 1).

Table 1: Issue Statements (water resources issues) identified by the St. Croix Basin Water Resources Planning Team

Issue Statements (water resources issues) identified by the St. Croix Basin Water Resources Planning Team in Phase I of Plan of Study (revised 6/20/01)	Updated Ranking 6/20/01
1. Establish nutrient and sediment budgets for point and nonpoint sources	1
*2. Address the impact of urban stormwater runoff	2
3. Address the need for long term monitoring	2
4. Increase public participation and knowledge in water quality management	2
5. Resolve differences in water quality standards between the two states	3
6. Forecast the future changes in land and water resources	4
7. Address the impact of rural nonpoint runoff (other than nutrients, sediment, and stormwater)	5
8. Evaluate sediment contamination	6
9. Assess the impact of impoundments	7
10. Assess the condition of the groundwater and suggest a protection strategy; list identified areas of higher sensitivity	8
11. Assess the impact from recreational use	9
12. Develop a common protection strategy for rare and endangered species and natural communities and their habitat	10
13. Assess the impact of water-dependent commercial agricultural operations	11

Phase II: Data Acquisition for Setting Goals - In this phase, a draft plan was created describing a list of environmental studies necessary to address the Issue Statements (water resources issues) identified through the scoping session. These studies are necessary to set water quality goals for the Basin. The plan also identified the agencies that will conduct the studies, the funds needed, and the approximate timelines (generally within two years). The Phase II document was completed in 1995 and the Phase II recommendations were incorporated into each of the Issue Statements presented in the Planning Status Report 2001. Environmental studies are ongoing. The studies discussed in the Planning Status Reports 2001 and 2003 are not meant to be an inclusive list of all the studies completed or in progress in the St. Croix Basin. Rather, this list includes those studies specifically targeted towards the issues identified by the Basin Team.

Phase III: Setting Objectives to Reach Water Quality Goals - In this phase, water quality goals will be developed using the information obtained in Phase II. Examples of such goals might be: (1) What level of water quality in the St. Croix is acceptable to the public? (2) How much phosphorus control is needed to protect Lake St. Croix; or (2) How much mercury reduction is needed and over what timeline to eliminate fish consumption advisories in the St. Croix River? Phase III is in process. Development of nutrient and sediment goals for the St. Croix Basin is discussed in Chapter 3: Progress on Issue Statement 1: Nutrients.

Phase IV: Project Development and Implementation - In this phase, specific water resources management projects will be developed and implemented as resources are available. Interagency partnerships with local governmental units will be used to focus financial resources and expertise on the issues of concern. It is hoped that a number of local projects can be strategically sequenced and integrated so that small successes can aggregate into an overall resolution of the environmental issues that need to be addressed on a basin-wide scale. Phase IV is in process and incorporated into the Issue Statements.

Biennial Reviews - Work plans will be developed on a biennial timeline with the intention of involving the public in reviewing progress, updating the plan and redirecting resources as appropriate to address current issues. The work plans will serve as acknowledgments of commitments from the participating agencies. Issue Statements, as presented in the Planning Status Report 2001, will be reviewed every two years by the Basin Team. The Planning Status Report 2003 focuses on Issue Statements 1 - 5.

State Basin Plans - Each state has its own basin planning process, which recognizes that waterways within the Basin have intrinsic values within the state where they exist. Waterways identified as having impacts on the main stem of the St. Croix River will receive priority attention, but not to the exclusion of more localized activities on other tributaries and lakes.

Chapter 1.3: Water Resources Planning Status Reports

State, federal and local units of government are working cooperatively to protect and improve water quality in the St. Croix River Basin. Rapid population growth with the accompanying land use changes is posing a clear and imminent threat to the water resources. The St. Croix Basin Water Resources Planning Status Reports (Planning Status Reports) are a cooperative project among state and federal agencies. The *St. Croix Basin Water Resources Planning Status Report 2001* describes the history of water resources management in the St. Croix Basin, examines the water resources of the Basin, lists other plans developed for the Basin, directs water resources decision making, and provides a vehicle to create a unified plan between the two states of Wisconsin and Minnesota. The *St. Croix Basin Water Resources Planning Status Report 2003* documents the work of the Basin Team since the completion of the Planning Status Report 2001. Both Planning Status Reports can be found at www.pca.state.mn.us/water/basins/stcroix/.

The St. Croix Basin Water Resources Planning Team (Basin Team) that prepares the planning status reports does not have direct regulatory authority. Therefore, these documents are created to guide and facilitate water resources protection and improvement in the St. Croix Basin. The Planning Status Reports are intended for four uses: a) a guide for water resources decision making, b) a source of information for funding opportunities, c) a vehicle to create a unified plan between the two states of Wisconsin and Minnesota, and d) an internal agency document.

Chapter 1.4: Planning Status Report 2003

Purpose of the St. Croix Basin Water Resources Planning Status Report 2003

The purpose of the St. Croix Basin Water Resources Planning Status Report 2003 is to update the Planning Status Report 2001 by documenting the efforts by the Basin Team to integrate interagency planning and management to protect and improve the quality of the surface and ground water resources of the St. Croix River Basin in Minnesota and Wisconsin.

The purpose of the St. Croix Basin Water Resources Planning Status Report 2003 is two-fold:

- Update the St. Croix Basin Water Resources Planning Status Report 2001.
- Document the activities and accomplishments of the St. Croix Basin Water Resources Planning Team during the 2001 – 2003 period by 1) detailing a list of Basin Team accomplishments and activities in the Basin, and 2) summarizing the work of Basin Team subcommittees addressing five key water resources issues.

The listing of Basin Team accomplishments and activities during the 2001 – 2003 period is presented in Chapter 2: St. Croix Basin Team Activities and Accomplishments. Through an interactive decision-making process, the Basin Team has identified fourteen key issues of concern for water resources protection and improvement in the St. Croix Basin. These key issues are presented as Issue Statements in the Planning Status Report 2001. The Issue Statements are ranked in order of priority. The Basin Team has chosen to focus on the top five Issue Statements and has established subcommittees to address these key issues, which include:

1. Nutrients
- *2. Urban stormwater runoff
3. Monitoring program
4. Public involvement and stewardship
5. Resolve differences in water quality standards between the Minnesota and Wisconsin

* In the Planning Status Report 2001, Issue Statement #2 stated "Secure funding for the Basin Team Coordinator". Although this issue remains an important objective, the Basin Team decided it would be listed separately from the water resources issues. To maintain a numerical sequence, the other water resources Issue Statements were re-numbered to thirteen.

Summaries of the 2001 – 2003 activities and accomplishments of the Basin Team subcommittees related to these top five Issue Statements are presented in Chapter 3: Progress on Issue Statements.

An update to the status of the Basin Team Coordinator funding is presented in Chapter 4: Future Work Plan.

Chapter 2: St. Croix Basin Team Activities and Accomplishments

Chapter 2 identifies the significant activities and accomplishments of the St. Croix Basin Team partner agencies and activities in the Basin since publication of the Planning Status Report 2001. Total project dollars contributed to the study of the St. Croix since 1994 now exceed \$1,628,400. These dollars can be directly or indirectly attributed to the Basin Team's efforts, but do not include the freshwater mussel conservation efforts, exotics control programs, the NAWQA program, or the salary dollars for the involvement of the Basin Team members.

Year 2001

- The Basin Team sponsored the Second Annual Nutrient and Sediment Conference in Trollhaugen, Wisconsin. 141 people attended the conference.
- The USGS, with NPS funding totaling \$20,000, completed a study titled *Fecal Coliform and Escherichia Coli Bacteria in the St. Croix National Scenic Riverway*.
- The Basin Team continued to work with Minnesota Planning and the Environmental Quality Board on the 10-year program for unifying water management in Minnesota.
- A \$15,000 grant was awarded through the National Park Service Challenge Grant Program to continue the position of the Basin Team Coordinator. This grant, combined with contributions from the WDNR and in-kind contributions from the MWBAC supported the Basin Team Coordinator through April 19th, 2002.
- A Basin Team Stewardship subcommittee was formed to discuss the idea of a St. Croix Basin Stewardship Center utilizing the Stillwater Visitor's Center or another possibility.
- The St. Croix Tribe Environmental Office has expanded its programs the last couple years as grant revenue has increased. Recycling has increased through the Solid Waste Program. The Wisconsin Department of Natural Resources stocked fish, conducted wild rice studies, and developed a lake shore protection strategy and a Conservation Reserve Program. A water quality monitoring program was initiated. To establish a baseline, two to three years of data will be collected, covering numerous variables.
- The Twin Cities Nonpoint Education for Municipal Officials (NEMO) Program was awarded \$193,000 by MCES to hire a NEMO Coordinator and help implement Twin Cities NEMO projects, including those in Washington County within the St. Croix Basin.
- On October 1, 2001, the Minnesota-Wisconsin Boundary Area Commission (MWBAC) office closed. Since funding from Wisconsin was not re-authorized funds from Minnesota were withdrawn. The commission was created by both state legislatures in 1965 and consisted of 10 members, five appointed by each governor, and a staff of five. Editor's note: The coordination and functions provided by the MWBAC are sorely missed. Some of the functions previously provided by the MWBAC specific to the St. Croix River include:
 - The MWBAC provided staff services to the Upper and Lower St. Croix Management Commissions, which coordinate management of the St. Croix National Scenic Riverway.
 - The MWBAC coordinated a bi-annual Recreational Boating Survey of the St. Croix River.
 - The MWBAC served as a fiscal agent for the interagency cooperative zebra mussel response work on the St. Croix River.
 - The MWBAC established the Interstate Law Consistency Task Force.
 - The MWBAC coordinated the Lake St. Croix Volunteer Monitoring Program.
 - The MWBAC was extensively involved in river stewardship, including coordination of the annual Nutrient and Sediment Conference and publication of the St. Croix River Stewards Journal.
- The St. Croix Watershed Research Station received \$50,000 funding from the NPS for a study to look at historic point source discharges in the Basin.
- The Carnelian-Marine Watershed District completed a shoreland reclamation project with funding provided under the Clean Water Act (CWA) Section 319. During the spring and

summer of 2001, best management practices (BMPs) were implemented on 24 properties along the shores of Big Carnelian and Big Marine Lakes in Washington County.

Year 2002

- The Basin Team sponsored the Third Annual Nutrient and Sediment Conference in Dresser, Wisconsin. 125 people attended the conference. The total cost was \$4626 (not including in-kind contributions) and total receipts were \$5275.
- The WDNR's St. Croix Basin integrated plan was distributed to partner agencies and interested members of the public in March. The plan was used as a guide for WDNR's biennial work planning effort in the spring of 2003, and it documents WDNR's core work efforts by the agency and partners. It was also used as a reference on the health of the Basin. A local lake protection group is using it as a guide to create a similar plan for their watershed.
- The USGS published a report titled: *Nutrient and Suspended-Sediment Concentrations and Loads and Benthic-Invertebrate Data for Tributaries to the St. Croix River, Wisconsin and Minnesota, 1996-1999* (Water-Resources Investigations Report 01-4162). The study was funded by the NPS and the USGS.
- The Metropolitan Council released a new regional growth forecast for 2030 for the 7-county Twin Cities Metropolitan Area which includes portions of the Lower St. Croix Basin. The forecast indicated that the region will grow by almost one million people between 2000 and 2030. The population of the Lower St. Croix region will absorb a higher proportion of the growth than other regions.
- The St. Croix Watershed Research Station submitted a Soil and Water Assessment Tool (SWAT) modeling proposal for the Basin to the Legislative Commission on Minnesota Resources (LCMR) and received a favorable review.
- The USGS is funding a new station on the Kinnickinnic River to continually monitor flow conditions.
- Chisago County, in cooperation with the MPCA, began a two-year Total Maximum Daily Load (TMDL) study to address violations of fecal coliform bacteria water quality standards in the North Branch of the Sunrise River.
- Funding for the Basin Team Coordinator position was exhausted on April 19, 2002. However, Metropolitan Council Environmental Services (MCES) approved the expenditure of remaining funds (\$18,700) from an existing grant to the NPS for the Basin Coordinator position. When the coordinator position resumes in November on a part-time basis, the MCES funding will support the position for 2 – 2 1/2 years. At the end of 2002, MPCA approved another \$12,000 for the coordinator position to assist with preparation of the Planning Status Report 2003.
- The St. Croix Watershed Research Station joined the Basin Team as a participating member. The St. Croix Watershed Research Station prepared a report entitled *Diatom Analysis of Lake St. Croix Sediments for Recent and Historical Phosphorus Reconstruction* based on the partial results of a sediment coring study that began in 1999. The Research Station is also working on other components of the sediment coring that will determine a phosphorus mass balance and sedimentation history of Lake St. Croix. MCES and MPCA funded the Lake St. Croix sediment coring study, which will be completed in 2003, including a final study report.
- The National Park Service created a new aquatic ecologist position for the Midwest Region. The aquatic ecologist will be housed at the St. Croix Watershed Research Station.
- The USGS released a new report titled *Elemental Chemistry of Streambed Sediments of the St. Croix River Basin 2000* (Water Resources Investigations Report 02-4087). This report was funded by the NPS for \$50,000.
- The MPCA and MCES prepared letters of support for the Basin Planning Status Report 2001.

- WDNR provided \$5000 to hire a coordinator for the Basin Team's 2002 Nutrient and Sediment Conference in Dresser, Wisconsin.
- The WDNR is negotiating the purchase of land for a new state park in Polk County, located at the crossing of the Ice Age and Interstate Trails, close to Luck, Wisconsin.
- The WDNR continued to meet with Xcel Energy to discuss a run-of -the- river status for the St. Croix Falls Dam.
- WDNR non-point source regulations were implemented.
- Minnesota passed legislation to limit the phosphorus content of lawn fertilizer. Effective January 1, 2004, lawn fertilizer will be limited to zero percent in the seven-county Twin Cities Metropolitan Area and three percent in the rest of the state, except for Crow Wing County which will also be limited to zero percent.
- Through a \$15,000 grant from the NPS, the USGS conducted a trends study of the flow and water quality data obtained at the St. Croix Falls and Danbury gauging stations during the period of record: from 1914 to 2002 at Danbury and 1902 to 2001 at St. Croix Falls.
- The MPCA published a 2002 Clean Water Act Section 303(d) List of Impaired Waters. In the Minnesota portion of the St. Croix River Basin, there are 21 rivers and streams, and 37 lakes that are listed with one or more impairments related to fecal coliform bacteria contamination, impaired biota, excess nutrients (eutrophication), and mercury or PCBs in the water and/or fish tissue. The Minnesota total maximum daily load (TMDL) list was approved by the U.S. EPA in January 2003.
- A Diagnostic Feasibility Study and Implementation Plan was completed for Square Lake in Washington County, Minnesota. The project was funded by the Minnesota Clean Water Partnership (CWP) which is administered by the MPCA. The entire project cost \$112,000; of which \$56,000 came from the CWP program
- The Stillwater Visitor's Center, part of the St. Croix National Scenic Riverway, closed at the end of September 2002.

Year 2003

- The USGS revised and reprinted the report titled *Nutrient and Suspended-Sediment Concentrations and Loads and Benthic-Invertebrate Data for Tributaries to the St. Croix River, Wisconsin and Minnesota, 1996-1999* (Water-Resources Investigations Report 01-4162).
- The Basin Team sponsored the Fourth Annual Nutrient and Sediment Conference in Dresser, Wisconsin. 91 people attended the conference. The total cost was \$5811 (not including in-kind contributions) and total receipts were \$7664.
- The WDNR provided their approval for the communities of Roberts and Hammond, Wisconsin, to evaluate the option of building a new waste water treatment facility.
- WDNR provided \$20,000 for SWAT modeling in the Basin.
- All state government agencies experienced budget cuts due to state funding deficits, jeopardizing monitoring and educational programs. The 2002 election results also brought new state agency commissioners.
- The USGS published the results of a Lake St. Croix Bathtub modeling study in a report titled *Response of the St. Croix River Pools, Wisconsin and Minnesota, to Various Phosphorus-Loading Scenarios* (Water-Resources Investigations Report 02-4181).
- The University of Minnesota initiated a habitat assessment and classification project for the Riverway, funded by a \$95,000 NPS grant.
- Wisconsin Department of Agriculture, Trade, and Consumer Protection initiated a pesticide impact study related to Riverway mussels, funded in part by a \$30,000 grant from the NPS and EPA.
- USGS initiated a groundwater modeling project for the Riverway, funded in part by an \$80,000 grant from the NPS.

- The WDNR, NPS, MDNR prepared a letter of support for the Basin Planning Status Report 2001.

Multiple-Year Efforts

- 1994 – 2003: The Basin Team Core group met on a quarterly basis to communicate on issues of mutual interest and direct the work of the subcommittees. The subcommittees met on a monthly to quarterly basis depending on the nature of the issue. More details on the subcommittee work can be found in the chapters in this report.
- 1994 – 2003: Many Basin Team members attended and/or presented at the annual St. Croix Watershed Research Station's St. Croix Basin Research Rendezvous, a forum for presentations of ongoing research and monitoring in the St. Croix Basin and identification of new opportunities for study and collaboration.
- 1995 – 2003: Letters supporting the Basin Team's voluntary program of 'no net increase in nutrients' were sent to the MPCA and WDNR as point source NPDES permits were re-issued in the St. Croix Basin.
- 1995 – 2003: NPS, USFWS, WDNR, and MDNR funded and/or conducted studies of freshwater mussels in the St. Croix River in support of the issue of fresh-water mussel conservation raised by the Basin Team in 1994.
- 1996 – 2001: The Basin Team Standards Subcommittee was formed to review difference between Wisconsin and Minnesota classifications of the St. Croix River and to determine a common protection strategy. Further details are covered in Chapter 3: Progress on Issue Statement 5.
- 1997 – 2003: The Nutrient Subcommittee is studying the impact of nutrients in the Basin. Further details are covered in Chapter 3: Progress on Issue Statement 1.
- 1999 – 2003: The Urban Stormwater Subcommittee was formed to develop a document on urban stormwater management in Wisconsin and Minnesota. Further details of the work are covered in Chapter 3: Progress on Issue Statement 2.
- 1999 – 2002: The Basin Team coordinated a volunteer monitoring program on Lake St. Croix. Other than 2 MCES water quality monitoring sites at Prescott and Stillwater, the Lake St. Croix program was the only regular monitoring on the Lower St. Croix River. Due to state agency budget cuts, no monitoring was conducted during the summer of 2003.
- 2000 – 2002: Members of the Basin Team attended Project NEMO workshops for the implementation of this program in Washington County and possibly St. Croix County.
- 2001 – 2003: A Basin Team Monitoring Subcommittee was formed to develop a long term monitoring plan for the St. Croix Basin. Further details of the work are covered in Chapter 3: Progress on Issue Statement 3.

Chapter 3: Progress on Water Resource Issue Statements

This chapter of the St. Croix Basin Water Resources Planning Status Report 2003 addresses the issues identified in the Planning Status Report 2001 as posing the greatest concern to the water resources of the St. Croix Basin. These issues were identified by the St. Croix Water Resources Planning Team through a scoping session and have directed the research and activities of the Basin Team during the 2001 to 2003 period.

The following is a list of Issue Statements (water resources issues) ranked in order of priority that are addressed in the Planning Status Report 2003:

- **Issue Statement 1: Nutrients**..... page 16

Through a scoping session of interested citizens and agency personnel, nutrient and sediment loading was determined as the top issue impacting water quality in the St. Croix River. To address this issue, the St. Croix Basin Team formed a Nutrient Technical Subcommittee in 1997 (commonly referred to as the Nutrient Subcommittee). The Subcommittee secured funding and agency personnel to support a plan for monitoring, modeling, and goal setting with several objectives.

- **Issue Statement 2: Urban stormwater runoff**..... page 31

A subcommittee was formed in 1999 to recommend a strategy for identifying and prioritizing areas where stormwater planning and management will be necessary to protect the water resources in the St. Croix Basin. This subcommittee was called the Urban Stormwater Runoff Subcommittee, commonly referred to as the Stormwater Subcommittee.

- **Issue Statement 3: Monitoring**..... Page 44

Recording long term trends is critical to maintaining the ecological health of the St. Croix Basin. In light of the rapid rate of development in the St. Croix Basin, long term monitoring becomes even more imperative. Funding is secured for various short term research projects, but the monitoring is not continued upon completion of the project. Several state agencies have long term monitoring at three to five stations with periodic adjustments in frequency and the number of analyses brought about by changes in funding levels. The Monitoring Subcommittee was created in 2001 to assess the long term monitoring needs of the St. Croix Basin.

- **Issue Statement 4: Public involvement and stewardship**..... page 49

One of the four goals of the St. Croix Basin Team is to increase public participation and knowledge in water quality management. In order to stimulate active early commitment to watershed management concepts and build public stewardship and support for the various basin planning processes, the cooperating agencies promotes involvement by volunteer groups and individuals in organized programs. Public and involvement and stewardship has been ongoing with the Basin Team since its inception in 1994. Officially, a Stewardship Subcommittee was created 2001.

- **Issue Statement 5: Resolve differences in water quality standards between Minnesota and Wisconsin** page 52

Stream classification systems by Minnesota and Wisconsin use the federal Clean Water Act for overall guidance. Both states use these classifications in their application of water quality standards and anti-degradation policies. In addition to some differences in classification, the two states may use different criteria for maintaining "anti-degradation." These differences could lead to inconsistencies between the two states in protection of the St. Croix River. The Standards Subcommittee was commissioned in 1996 to address the differences in standards between the two states.

For each Issue Statement, presented in order of priority, a progress report has been prepared, describing the significant activities and accomplishments pertinent to that issue. The progress report on each issue is described in the following format:

- **Background:** This section provides a history and supporting information of the water resource issue addressed in the report.
- **Outcome:** This section states the desired result of the subcommittee's activities.
- **Recommendations:** This section lists the recommendations suggested by the subcommittee.
- **Activities and Accomplishments:** This section lists what the Subcommittee and Basin Team have accomplished towards the water resource issue.
- **Related Information** (where relevant): This section provides references to some additional information available on the water resource issue.

Progress on ISSUE STATEMENT 1: Nutrients

Background

Through a scoping session of interested citizens and agency personnel, nutrient and sediment loading was determined as the top issue impacting water quality in the St. Croix River. To address this issue, the St. Croix Basin Team formed a Nutrient Technical Subcommittee in 1997 (commonly referred to as the Nutrient Subcommittee). The Subcommittee secured funding and agency personnel to support a plan for monitoring, modeling, and goal setting with the following objectives (for the complete report see www.pca.state.mn.us/water/basins/stcroix/):

Objective 1: Monitor nutrients and other parameters to determine baseline water quality data in the main stem of the St. Croix River and its major tributaries.

Objective 2: Determine the relative nutrient loading from individual tributaries, in order to develop tributary nutrient management goals and allow prioritization of water quality management projects.

Objective 3: Benchmark what is perceived as acceptable water quality in the reservoir above St. Croix Falls and in Lake St. Croix (using citizen perception monitoring).

Objective 4: Develop a main stem St. Croix nutrient model to predict outcomes of various nutrient management scenarios.

Objective 5: Use information obtained from Objectives 1 through 4 to partner with citizens and local, state, and federal agencies to develop tributary, lake, and watershed nutrient management goals and the strategies to achieve those goals.

Nutrient and Sediment Management Goal Setting

In 2003 the Nutrient Subcommittee began a year long series of meetings to assess the available nutrient data and modeling from various nutrient studies. Statements and discussions were recorded to prepare a goal setting document for management use. The following pages present the documents and summaries prepared for and during these meetings. The information is presented as a work in progress. A preliminary review of the goal setting process may be presented at the St. Croix Watershed Research Station's Research Rendezvous October 21, 2003. The results of the work sessions will be presented at the 2004 Nutrient and Sediment Conference in Trollhaugen, February 12, 2004.

Work Sessions for Summarizing and Integrating the St. Croix Basin Information Available for Establishing Lake St. Croix Nutrient and Sediment Goals.

The following work sessions review the available data sets and extract the messages useful for basin-wide nutrient and sediment goal setting. As of July 31, 2003, Work Sessions 1 – 5 have taken place.

► **Work Session #1: St. Croix Tributary Information, U.S. Geological Society (USGS)**

To introduce the series of work sessions, a discussion was held based on the presentation *St. Croix Goal Setting Process* developed by the MPCA. The discussion centered on the following questions:

- What is the purpose / function of our goal setting process?
- What is the Nutrient Subcommittee's role in the goal setting process?

Preliminary Goal Statement: Through a series of work sessions based on the review of recent nutrient and sediment research in the St. Croix Basin, the Nutrient Technical Subcommittee will accomplish five goals:

- Develop corroborating evidence related to nutrient control in the St. Croix Basin;
- Assess the ability to manage nutrient loading from nonpoint and point sources of nutrients in the Basin;
- Development management nutrient goals for the main stem and suggest areas of concern in the tributaries;
- Develop management scenarios to reach management nutrient goals;
- Develop a Power Point presentation / fact sheet summarizing these outcomes.
 - Focus these presentations towards a general audience with technical backup.

The following studies prepared from USGS nutrient monitoring were summarized.

1. St Croix National Scenic Riverway, Wisconsin – Flood-Plain Delineation and Water-Quality Data (Lawrence, 1982). This report provides water quality data from 1975-1981 (table 2). A water quality monitoring network was established to provide data to determine the present water quality of the St. Croix Riverway.

Table 2: Summary of chemical analysis of river water from the St. Croix National Scenic Riverway (October 1975 to December 1981)

Site	Measurement	Dissolved solids (residue at 180°)	Total Nitrogen (mg/l)	Total Phosphorus (mg/l)
St. Croix near Dairyland, WI	Mean	---	.49	.03
Namekagon River near Hayward, WI	Mean	91	.42	.02
Namekagon River near Trego, WI	Mean	99	.52	.03
St. Croix River near Danbury, WI	Mean	85	.54	.03
Yellow River near Danbury, WI	Mean	---	.8	.07
Clam River near Webster, WI	Mean	---	.92	.06
Kettle River near Cloverdale, MN	Mean	---	1.0	.06
Snake River near Pine City, MN	Mean	149	1.3	.09
St. Croix River at St. Croix Falls, WI	Mean	116	.83	.04
Apple River near Somerset, WI	Mean	151	1.2	.06
St. Croix River at Stillwater, MN	Mean	129	1.2	---

2. Water Quality in the St Croix National Scenic Riverway, Wisconsin (Graczyk, 1986). The USGS conducted a water quality study of the St. Croix National Scenic Riverway during the period 1975 – 1983. Table 3 provides annual yields. Table 4 provides loading information.

Table 3: Annual yields for suspended sediment, total phosphorus, total nitrogen, and dissolved solids at the St. Croix National Scenic Riverway monitoring stations from 1976 – 1983.

Site	Suspended – sediment yield (ton/mi ²)	Total phosphorus yield (lb/ mi ²)	Total nitrogen (lb/ mi ²)	Dissolved – solids yield(ton/mi ²)
St. Croix River near Dairyland, WI	3.8	43	1000	---
Namekagon River near Hayward, WI	3.4	40	970	110
Namekagon River near Trego, WI	2.1	59	1100	76
St. Croix River near Danbury, WI	6.9	62	760	52
Yellow River near Danbury, WI	2.8	100	980	---
Clam River near Webster, WI	7.8	69	1330	---
Kettle River near Cloverdale, MN	13.3	88	1330	---
Site	Suspended – sediment yield (ton/mi ²)	Total phosphorus yield (lb/ mi ²)	Total nitrogen (lb/ mi ²)	Dissolved – solids yield(ton/mi ²)
Snake River near Pine City, MN	1.9	69	1040	34
Apple River near Somerset, WI	---	83	1900	105
St. Croix River at St. Croix Falls, WI	4	144	1220	73

Table 4: Water resources analysis for the St. Croix River at St. Croix Falls, WI, from 1974 – 1981.

Constituents	Mean load ton/yr
Suspended sediment	39,000
Total phosphorus	210
Nitrate-nitrite	1,100
Ammonia	330

3. Water Quality in the Upper Mississippi River Basin: Minnesota, Wisconsin, South Dakota, Iowa, and North Dakota, 1995-98 (Stark et al. 2001). In 1991 the U.S. Geological Survey (USGS) implemented a National-Water Assessment (NAWQA) program to assess the nation's waters. The St. Croix River, the Upper Mississippi River and the Minnesota River basins were included in the Upper Mississippi River Study Unit. The NAWQA study included three land uses: forested, agriculture and urban. The major influences from land use changes affecting nutrients and sediment loading in the St. Croix were identified:

- Discharge from wastewater treatment facilities
- Runoff from agricultural and urban areas
- Stream modifications and artificial drainage
- Destruction of riparian cover along stream banks
- Contaminants in precipitation and the atmosphere

In general, land use changes from human disturbance and high population densities have the greatest effect on water quality, hydrology, and aquatic biology. In urban areas of the NAWQA study unit, contamination resulted from urban runoff, discharge from industrial and wastewater treatment facilities and toxic substances released to groundwater from industrial activities and nonpoint sources. In agricultural areas the artificial drainage systems and the input of point and nonpoint contaminants impact water quality. Stressors from urban and agricultural areas impact eutrophication and habitat.

Nitrate and phosphorus yields were compared among the three land uses in the NAWQA study and documented in Table 5. The forested streams were in the St. Croix Basin; the agriculture streams were in the Minnesota River Basin in Minnesota; the urban streams were in the Twin Cities (St. Paul and Minneapolis) of Minnesota.

Table 5. Nitrate and phosphorus yields in pounds per square mile per year in forest, agriculture, and urban streams, 1996-1998.

Land Use	STREAM	NITRATE	PHOSPHORUS
Forested (streams in the St. Croix Basin)	Namekagon River	260	Below analytical reporting limits
	St. Croix River	160	50
Agriculture (streams in the Minnesota River Basin)	North Fork Crow River	1400	190
	Little Cobb River	15,000	330
Urban (streams in the Twin Cities)	Shingle Creek	400	130
	Nine Mile Creek	510	140

Wastewater treatment facilities supply the major point source loading of phosphorus. During high flow conditions, non-point sources contribute the highest amounts of phosphorus. During low flow conditions point sources contribute the highest amount of phosphorus.

In the St. Croix Basin there are less land cover disturbances in the forested areas than the urban and agricultural areas. Most of the area originally logged of white pine is now covered with second-growth forests. The water quality impacts are less in forested areas. The water quality impacts that do occur result from the development of small towns and farms, logging practices, fertilizer runoff, and recreational use of the riverway. The land use practices that affect nutrient and sediment loading result in the following:

- Discharges of wastewater effluent
- Faulty septic systems
- Disturbances to small streams from forestry practices
- Drainage of wetlands

In agricultural lands wetlands have been drained, channels straightened, ditches excavated, and sometimes farmed right up to the river's edge. These practices increase erosion and runoff of nutrients and chemicals. Nitrate yields were greatest in agricultural streams. Phosphorus concentrations sometimes exceeded the goal of 0.1 mg/l recommended by the USEPA to prevent eutrophication. Suspended sediment concentrations were higher in streams with fine grained surficial deposits that were artificially drained. Alterations to the stream channel, changes in the riparian cover, and tile drainage have resulted in changes in stream morphology, hydrology, and stream habitat.

Changes have occurred in the aquatic plant and animal communities in agricultural areas. Increases in algal abundance and primary production occur from increases in nutrient loading. Composition in algal communities changes to a higher percentage of blue-green algae which is less suitable for invertebrate communities. Agricultural streams had less diverse invertebrate communities possibly due to the disturbances and contaminants from agricultural practices.

Land use changes in urban areas have impacted water quality. Dissolved oxygen concentrations in most urban streams were greater than the minimum 5 mg/L aquatic-life criterion determined by the USEPA. Nitrate and phosphorus concentrations were less than agricultural streams. The St. Croix River did show an increase in nitrate concentrations and a decrease in total ammonia concentrations near the Twin Cities between the years 1984-93.

Water flowing primarily through the Lower St. Croix has greater alkalinity and concentrations of suspended sediment. These impacts result from the clay-rich, calcareous (calcium carbonate) glacial deposits. Water flowing primarily through the Upper St. Croix drains through siliceous (rich in silica), sandy glacial deposits resulting in lower alkalinity and lower concentrations of suspended sediment.

During the NAWQA study (1995 – 1998), snow melt and rain falling on frozen or saturated soils caused the greatest runoff to occur during the months of March through July. Mean annual runoff in the St. Croix River is greater than 14 inches in the headwaters. The average flow of the St. Croix River at St. Croix Falls, Wisconsin, is 4770 ft³ per second. At its mouth in Prescott, Wisconsin, the mean discharge is about 5000 ft³ per second (Waters 1977).

4. *Water Quality Assessment of part of the Upper Mississippi River Basin, Minnesota and Wisconsin – Nitrogen and Phosphorus in Streams, Streambed Sediment, and Ground Water, 1971-94* (Kroening and Andrews, 1997). This report provides a summary of prior studies and doesn't contain any new data.

5. *Nutrients and Suspended Sediment in Snowmelt Runoff from part of the Upper Mississippi River Basin, Minnesota and Wisconsin, 1997* (Fallon and McNellis, 2000). This report provides estimated nutrient and sediment loads from snowmelt. Conditions during fall of 1996 and spring 1997 lead to flood conditions during the spring snowmelt study. Twenty sites were sampled on the St. Croix River. Percentages of land use (forested, agriculture, urban, wetland, water, or other, which includes rangeland) and surficial geology were computed for each site. During the study, snowmelt concentrations of suspended sediment peaked on the rising limb of the hydrograph. Agricultural streams and areas with low permeable soils transported the greatest proportions of loads during snowmelt, followed by forested areas. Urban areas contributed the lowest proportions of loads from nutrients and sediment. During 1997 agricultural and forested streams delivered proportionately more of their loads during snowmelt than during other periods.

The following sites were sampled on the St. Croix: 1) St. Croix River near Woodland Corner, WI., 2) Namekagon River at Leonards, WI., 3) Namekagon River near Woodland Corner, WI., 4) St. Croix River near Danbury, WI., 5) Yellow River near Danbury, WI., 6) Crooked Creek near Hinkley, MN., 7) Clam River near Webster, WI., 8) Kettle River below Sandstone, MN., 9) Snake River near Pine City, MN., 10) Wood River at State Highway 70 near Grantsburg, WI., 11) Sunrise River at Sunrise, MN., 12) Trade River near Trade River, WI., 13) St. Croix River at St. Croix Falls, WI., 14) St. Croix tributary near Osceola, WI., 15) Apple River near Range, WI., 16) Apple River near Somerset, WI., 17) Browns Creek at Stillwater, MN., 18) Willow River at Burkhardt, WI., 19) Kinnickinnic River near River Falls, WI., 20) St. Croix River at Prescott.

6. *Nutrient and Suspended Sediment Concentrations and Loads and Benthic Invertebrate Data for Tributaries to the St. Croix River, Wisconsin and Minnesota, 1997-1999* (Lenz et al. 2001; revised 2003). This study involved intensive tributary monitoring on the St. Croix during 1998 and summaries of two prior studies. The first study, in 1997, was a synoptic study included in the NAWQA program. This study surveyed nutrient and suspended sediment concentrations during snowmelt. In 1998, synoptic studies measured nutrients and sediment on 11 tributaries during snowmelt, base-flow, and storm-runoff periods. In the third study extensive water quality sampling was done monthly and during high flow events in water year 1999. Incorporating the results of the three studies, nutrient and sediment loads and yields were determined for the tributaries. Land use for each drainage basin was calculated (Table 6). The land use percentages in Table 6 are in relationship to each individual watershed and not the total St. Croix Basin. For example, 0.5% of the Apple River watershed is in urban land use, not 0.5% of the St. Croix Basin. Due to the great variability in rain events in the region in 1999,

annual yields in the northern forested basins were higher than those from the southern, agricultural areas (contrary to common knowledge). Lack of a significant spring snowmelt runoff lead to lower than average spring flows and lower than normal spring loads. The northern portion of the Basin had higher intensity rain events with higher erosivity causing high runoff. The southern portion of the basin had longer duration, smaller storms causing limited runoff. The environmental factors found to best predict yields were soil characteristics (clay, permeability of soil, and K factor from universal soil loss equation), basin slope and area, and the percentages of wetland and urban areas in the basins.

The Sunrise River had the highest total phosphorus and sediment annual yield of the tributaries studied. The highest total phosphorus and sediment annual loads were found in Kettle River. Significant sediment contributions came from Sand Creek, Snake River, Upper Tamarack River. Significant phosphorus contributions were made from Snake, Apple, Upper Tamarack, and Kinnickinnic Rivers. The snowmelt runoff study (Fallon and McNellis, 2000) indicated the Sunrise, Kinnickinnic, Apple, Willow, Kettle, Snake, Trade, Wood, Sand, Crooked, and Lower Tamarack Rivers to be the significant contributors to the St. Croix Basin loading.

Table 6. Land use by selected tributaries in the St. Croix Basin 1999.

Basin	Urban	Agr	Forest	Open Water	Forested wetland	Non-forested wetland	Barren Land
Apple	0.5%	62.7%	24.4%	5.2%	5.2%	1.9%	0.1%
Brown	4.2%	82.3%	5.8%	4.3%	2.9%	0.0%	0.5%
Carnel	0.0%	86.0%	11.2%	2.7%	0.0%	0.0%	0.0%
Clam	0.3%	32.1%	54.6%	3.1%	7.1%	2.8%	0.0%
Crook	0.0%	17.5%	69.2%	1.4%	7.6%	4.3%	0.0%
Kettle	0.5%	26.8%	52.5%	1.7%	12.9%	5.4%	0.1%
Kinnickinnic	2.3%	92.9%	4.6%	0.2%	0.0%	0.0%	0.0%
Low tam	0.0%	3.7%	74.7%	0.1%	16.4%	5.1%	0.0%
Namekagon	0.7%	1.8%	77.9%	6.3%	12.3%	0.1%	1.0%
Sand	0.0%	23.2%	62.0%	0.1%	3.3%	11.4%	0.0%
Silver	0.4%	90.2%	1.7%	7.2%	0.0%	0.0%	0.6%
Snake	0.4%	40.4%	41.7%	1.2%	10.8%	5.6%	0.0%
Sunrise	2.6%	58.1%	8.3%	5.3%	17.7%	8.0%	0.1%
Trade	0.5%	47.2%	37.5%	2.6%	4.3%	8.0%	0.0%
Up tam	0.0%	2.4%	74.8%	0.3%	19.6%	2.9%	0.0%
Valley	1.9%	86.1%	9.9%	0.6%	0.0%	0.0%	1.5%
Willow	0.8%	89.3%	8.0%	0.9%	0.3%	0.7%	0.0%
Wood	0.4%	55.2%	37.7%	4.5%	1.3%	0.9%	0.0%
Yellow	0.8%	20.4%	58.5%	8.8%	7.0%	2.8%	1.9%

A study of the benthic invertebrates was also included in this study. Biotic indexes for Valley Creek and Willow River showed them to be slightly impaired from organic pollution. Biotic indexes showed Kettle River to be impacted with a low diversity. The other St. Croix tributaries were found to have good to excellent water quality.

In addition to those studies reviewed in Work Session 1, another nutrient study completed by the USGS will be useful in the nutrient discussion.

- ***Nutrient Sources Within the Upper Mississippi River Basin, Minnesota and Wisconsin, 1991-1993***, Sharon Kroening, United States Geological Survey, 1998.

Understanding the source of nutrients within a basin can assist in the management of surface and groundwater. This study summarizes the amount of nitrogen and phosphorus in each basin (Lower Mississippi River Basin, St. Croix River Basin, Upper Mississippi River Basin, and the Minnesota River Basin) of the Upper Mississippi River Basin during the years of 1991-1993. The Minnesota and Wisconsin Agricultural Statistics Services provided the data on the production per study area by land use. The total amount of phosphorus and nitrogen from the sources studied (fertilizer, livestock manure, municipal wastewater, atmospheric deposition, and legume residue) in the St. Croix Basin are 8 tons of nitrogen and 0.9 tons of phosphorus per year per square mile. Table 7 shows the amounts of nitrogen and phosphorus by source in the St. Croix River Basin.

Table 7. Amounts of phosphorus and nitrogen in the St. Croix Basin in tons per year per square mile.

Source	Nitrogen tons/year/mi ²	Phosphorus tons/year/mi ²
Fertilizer	2.5 (July 1990-June 1991 estimate)	0.45
Livestock manure	2.09 (1992 estimate)	0.45
Legume residues	1.5 (1993 estimate)	-
Atmospheric deposition	1.99 (1993 estimate)	-
Municipal wastewater	0.02 (1993 estimate)	0.007
Yield in stream at basin outlet	0.78 (1991-93 average)	0.03

In Work Session 1 the Nutrient Subcommittee focused on extracting the key elements of the tributary study conducted by the USGS and basin team participants titled ***Nutrient and Suspended Sediment Concentrations and Loads and Benthic-Invertebrate Data for Tributaries to the St. Croix River, Wisconsin and Minnesota***. Water year 1999, the year the monitoring was conducted, was a year in which significant fluctuations in rainfall and flow rates occurred. The northern, forested regions of the Basin had heavy flash rain events. The southern, more agricultural regions had little rainfall and few events. Thus, the year for calibrations (1999) had to have adjustments through the use of regressions and estimator equations based on data from 1998, a more typical rain year. Ideally, three years of nutrient and flow monitoring would provide a more systematic basis for a nutrient budget for the Basin.

Discussion of the data

The nutrient loading in the tributaries tends to be correlated with runoff events so non-point sources are very significant. Big rainfall events yield higher nutrient and sediment concentrations and loads. Although this study didn't separate point from non-point sources within tributary watersheds, there aren't many point sources in the watersheds. From a statistical standpoint, the variability in the data is too large to allow for a reasonable trend analysis.

Several significant statements were summarized from the studies:

- Permeability, land use, and precipitation are the key variables in phosphorus and sediment loading in the tributaries. A high degree of the variability in the amount of runoff is based on land use variables.

- Land use and rainfall events in the tributary watersheds significantly affect phosphorus and sediment loading.
- The tributary study provides information on the percentage of land use coverage in the St. Croix Basin even though it wasn't presented in the final report. The percentages of land use determined for this study are relevant to individual watersheds but are not representative of the entire Basin. This study recognizes that certain watersheds have certain amounts of loading; watershed and soil characteristics such as land use and permeability are significant variables affecting phosphorus and sediment loading.
- The loads are dependent on runoff events (seasonal) and how concentrations and flow are estimated. Since the year used for calibrations (1999) was adjusted using data from 1998, a more typical rain year, caution is advised in how this information is interpreted. Note: Because of the rain events, the graph on page 29 of USGS report 01-4162 changes every year. Due to the permeability of the soil on the western side of the Basin, these watersheds were able to absorb more of the rainfall and consequently the phosphorus and sediment. In the northern watersheds, which had significant rain events, the low permeability of the soil (clay soils) yields higher loading.
- This study points out the value of long-term monitoring. The data can be used to determine areas of "concern" based on a confidence scale; however, one year of data may not be sufficient to determine which tributaries to target.
- Despite the limitation of this study, it is a good data source for the whole basin.

► **Work Session #2: St. Croix Bathtub Modeling Information, USGS**

Work Session #2 reviewed the report *Response of the St. Croix River Pools, Wisconsin and Minnesota, to Various Phosphorus-Loading Scenarios* (Robertson and Lenz 2003) prepared by the USGS. The information on nutrient loading to the St. Croix Basin is needed by the Nutrient Subcommittee to make decisions in regards to nutrient management. Data collected from 1999, in addition to other studies were used in the model to provide a better understanding to the sensitivity and anticipated trophic response of the system to changes in phosphorus loading from point and non-point sources.

Adjustments were made to the 1999 flow data to compensate for the variability in the rainfall intensity throughout the area. Flow regimes were developed for 1999 as the typical year, data from 1988 was used as a dry year and 1996 as the wet year. Phosphorus loadings were estimated for 1999, a dry year, and wet year. Estimated responses of various basins in the St. Croix River Pools were calibrated.

Several significant conclusions based on the model results were contained in the study:

- Lake St. Croix is eutrophic because of high nutrient loading.
- Models predict water quality will respond to changes in phosphorus loading in Lake St. Croix. Increases in phosphorus loading should cause smaller increases in phosphorus concentrations in Lake St. Croix, increases in chlorophyll *a* concentrations, algal bloom frequency will increase, and slightly decreasing water clarity.
- Phosphorus concentrations should be slightly lower in dry years due to reduced phosphorus loadings from tributaries. Chlorophyll *a* concentrations should be higher in dry years than in wet years because of the increased water-residence time.

About a 50% reduction in phosphorus loading is required for the Lake St. Croix pools to be classified as mesotrophic with respect to phosphorus and chlorophyll *a* concentrations; a larger reduction is needed for Lake Mallalieu. Color-producing organic compounds (bog stain) will continue to be a major factor limiting water clarity in Lake St. Croix.

► **Work Session #3: St. Croix River Flow Information, USGS**

This study analyzed the data from stream flow gauging stations located near Danbury and St. Croix Falls. Nutrient, suspended sediment, and major ion concentrations were generally lower and less variable upstream at the Danbury site, where flows have remained relatively stable, than at the St. Croix Falls site where flows have high temporal variations. Human populations remained relatively stable above the Danbury site and increased between St. Croix Falls and Danbury, starting in the 1960s on the Wisconsin side and in the 1940s on the Minnesota side of the Basin.

► **Work Session #4: "Recent" Lake St. Croix Information, National Park Service and Basin Team Coordinator; Draft Power Point Presentation on Goal Setting Sessions, MPCA.**

Section 1: Water Quality Trends and Patterns in the Lower St. Croix River

Statistical analyses were completed on data collected since 1975 by the Metropolitan Council and the Minnesota Pollution Control Agency. The data were collected at three sites: Stillwater, Hudson, and Prescott. The objectives of this study were stated as the following:

- Identify the long-term trends in water quality across several sites
- Examine seasonal variation in water chemistry
- Identify patterns in algal data
- Explore the relationship between chlorophyll *a*, algal composition, and environmental variables

Based on this analysis, total phosphorus, phosphates, total ammonia, total kjeldahl nitrogen, total suspended sediment, and turbidity appear to have decreased since 1975. The decrease in phosphorus concentrations appeared to be greater at Hudson, followed by Prescott and Stillwater. Over the same time period, the concentration of nitrate/nitrite nitrogen appears to have increased. The largest increase in nitrate/nitrite was at Prescott, followed by Stillwater and Hudson.

A seasonal analysis provided further details. A seasonal analysis indicated that dissolved oxygen lows commonly occurred during August. Total phosphorus, phosphates, and nitrate/nitrite experienced lows during snowmelt. Chlorophyll *a*, total suspended solids, volatile suspended solids, and total nitrates tend to increase throughout the growing season. Seasonal patterns were similar among sites for nutrients and less similar for solids. Decadal total phosphorus averages were similar for year round vs. May-September data. Trend magnitudes are similar for flow-adjusted vs. raw data. Seasonal patterns in total phosphorus are unpredictable for both high-flow and low-flow years. Seasonal patterns in chlorophyll *a* are different for high-flow vs. low-flow years. Patterns are more predictable during low-flow years. Chlorophyll *a* peaks are generally higher and more sustained during low-flow years. Patterns in dissolved oxygen percent saturation are less clear than dissolved concentrations.

The data between two sites were compared. An analysis of algal samples was completed from samples taken at Stillwater and Prescott. Algal density differs between sites. Stillwater had higher concentrations of phytoplankton than Prescott. Prescott had higher periphyton densities than Stillwater. Phytoplankton composition differed between the sites. Stillwater had more chlorophytes, diatoms, and cryptophytes. Prescott had more cyanophytes and bloom-forming taxa. Since 1991, Stillwater has had a decrease in chlorophyll *a* concentrations. Prescott has experienced an increase in cell density, chlorophytes, and diatoms.

Some algal and chemistry relationships were determined. Chlorophyll *a* concentrations greater than 30 ug/l occurred only when total phosphorus was greater than 50 ug/l, the temperature was

greater than 20° C, and residence time was greater than 17 days. Chlorophyll *a*, diatom and cyanophyte abundance is best explained by the variables temperature, residence time, and nitrogen chemistry. Phytoplankton composition and the primary variables affecting it differ between Stillwater and Prescott. Chlorophyll *a* vs. total phosphorus relationships:

- The relationship is weak using individual data points
- The relationship is stronger using annual means of year-round or summer data.

There were several conclusions determined from the water quality trend study comparing Stillwater, Hudson, and Prescott:

- Long-term trends are consistent among sites in direction (from the top of the lake at Stillwater to Prescott), but different in magnitude.
- Seasonal patterns exist for nutrients and other chemistry.
- Algal density and composition differ between sites at Stillwater and Prescott.
- Chlorophyll *a* is correlated with temperature, residence time, and nitrogen chemistry (not phosphorus). Phosphorus and chlorophyll *a* concentrations in individual samples do not display a significant correlation.
- Relative abundance of key algal groups is also related to temperature, residence time, and nitrogen chemistry.
- Total phosphorus explains significant variations in chlorophyll *a* at Stillwater but not Prescott or lake-wide. Chlorophyll *a* responses to total phosphorus is likely site-specific.

Some significant points from the discussion of the water quality trend study

Total phosphorus has dropped significantly since 1975; what are some possible reasons?

- Legislation such as the Clean Water Act (1972, 1977) and state phosphorus detergent bans (1970s, 1980s) have had an impact.
- The changes in farming units or practices may have an impact, possibly from the use of Best Management Practices (BMPs) or numbers of farms / units per farm
- Phosphorus is effectively stored in the lake.
- Science has developed better sampling / analysis techniques so detection thresholds have changed.
- Flow has not changed significantly so it is doubtful that flow is the variable causing the phosphorus decreases. Flow adjusted and not-flow adjusted analysis tends to show the same results in total phosphorus.

Several questions arose from the discussion of the study.

- How do flow rates influence the algal community?
- How do warm weather conditions (when temperature is not a factor) influence algal growth?
- What factors are related to the higher observed chlorophyll concentrations (e.g. 30 ug/l) and what bearing could this have on making management decisions?
- Concentrations of inorganic solids appear to be important to the decrease in suspended sediment. What does this imply? Do land conservation methods now tend to keep the soil on the land (decrease in erosion rates)?
- What are the conditions under which phosphorus concentrations may impact the system?
- Under what conditions and to what extent does bog stain interfere with nutrient/chlorophyll/transparency relationships?

Section 2: Volunteer Monitoring on Lake St. Croix from 1999 – 2002

Volunteers monitored six sites on Lake St. Croix from 1999 – 2002 during the summer season. The variables monitored were Secchi depth, a physical suitability rating, total phosphorus, total

chlorophyll a , and viable chlorophyll a . Water samples were taken the same time as the physical assessment was made.

The objectives of the study were two-fold:

- To develop citizen involvement in water quality protection to increase the level of stewardship in the St. Croix Basin.
- To explore the relationship between users' perception of the physical appearance and recreational suitability of the water, and chlorophyll a concentrations. The physical appearance / chlorophyll a relationship can establish an assessment benchmark that provides a common point of reference for citizens and water quality managers during the goal setting phase of the nutrient study.

The results showed viable chlorophyll a concentrations varied between 13.78 ug/L downstream to 23.9 ug/L upstream. Physical ratings were between 1.5 – 2.3. Recreational suitability ratings were between 1.2 – 2.3. Secchi depth measurements varied between 3.5 feet – 5.3 feet.

Physical Condition Rating Scale

- 1 = crystal clear
- 2 = not quite clear, a little algae present/ visible
- 3 = definite algal green, yellow, or brown color apparent
- 4 = high algal levels with limited clarity and/or mild odor apparent
- 5 = severely high algal levels with one or more:

Recreational Suitability Rating

- 1 = beautiful, could not be better
- 2 = very minor aesthetic problems, excellent for swimming and boating
- 3 = swimming and aesthetic enjoyment slightly impaired because of algae level
- 4 = desire to swim and levels of enjoyment substantially reduced because of algae level
- 5 = swimming and aesthetic enjoyment of the water nearly impossible because of algae

The volunteer monitoring analysis demonstrated that at six sites, frequent lake users / residents on Lake St. Croix perceived the lake was suitable for recreation and had fairly good water quality. The Secchi readings were only 3.5 - 5 feet, yet the assessment was favorable; the tea color of the water may have impaired the ability to see algae.

Section 3: Power Point Presentation on Goal Setting

Work has begun on the first draft of a presentation to be prepared by the Nutrient Subcommittee for the public. The first draft included the value of the St. Croix as a resource, its physical characteristics, water use, water quality education, sources of nutrients, the goal setting process, and water quality goals and objectives.

► Work Session #5: "Historical" Lake St. Croix Information, St. Croix Watershed Research Station and the University of Minnesota.

Sediment and Nutrient Loadings and System Response

The focus of this study is to determine the water quality conditions before monitoring began and to provide a chronology of changes in the basin: sediment and nutrient loadings, system responses, and biotic signals. The whole-lake sediment accumulation rates show a slow increase after settlement. The change quickens after 1930. The sedimentation rates peak within the period 1950 – 1960 (130,000 tons/year), exhibiting an 8-fold increase since pre-settlement. Present-day rates, at 60,000 ton/year manifest a 4-fold increase since pre-settlement conditions.

Sediment accumulation rates differ spatially. The downstream sub-basins receive more sediment than the Hudson sub-basin at times, suggesting that a significant amount of sediment is coming

from the tributaries of the lake. The following is a list of the tons of sediment received by each sub-basin for the period 1800-2000: ** (see note below)

- Stillwater: ~ 270,000 metric tons
- Hudson: ~ 120,000
- Afton: ~ 140,000
- Prescott: ~ 150,000
- Sub-basins Prescott and Afton had the highest areal sedimentation of Lake St. Croix in the mid-1900s

*****Note that the 1800-2000 data show relative importance but it is, in fact, an arbitrary time period; therefore, we cannot make quantitative assessments of sediment distribution using these particular numbers.**

A key point in this study in regards to nutrient management concerns is that the phosphorus load to the lake begins to increase only after 1940. The phosphorus load peaks within the 1980-2000 period at 460 tons / year, which is a 2.7 fold increase over presettlement conditions.

Summary of results from the sediment accumulation study:

- Sediment accumulation increased sharply after 1930
- Sediment accumulation peaked in 1950 – 1960 at 8 times pre-settlement levels
- Present day level of sedimentation is 4 times pre-settlement levels
- At times, downstream sub-basins were receiving the bulk of the sediment accumulation due to side-valley tributary contributions. Local events had a large impact on sediment accumulation; they masked whole-watershed processes.

Biotic Response

Since pre-settlement conditions, there has been a 5.5-fold increase in the amount of biogenic silica (deposited by diatoms) in the sediment. Adding phosphorus to the lake causes diatom productivity to increase at around a 1:2 (phosphorus: biomass) ratio. The phosphorus to biomass ratio is not a 1:1 ratio because of the recycling of phosphorus going on in the lake. Phosphorus supports multiple generations of diatoms during its residence in the lake. In addition to the increase in the amount of biogenic silica found in the sediment, the diatom community structure has changed radically since ~ 1930. The abundance of all diatom groups has increased from 20 to 50 fold. The relative abundance of benthic diatoms has decreased and the abundance of planktonic diatoms has increased. Pigments from blue-green algae increase sharply around 1960. There are planktonic species living in Lake St. Croix that weren't there 100 yrs ago.

Discussion points

- The percentage of inorganic phosphorus in the sediment increased at the time of the 1950 peak in sediment accumulation. At the same time, the percentage was about 8% organic.
- This study does not include the quantities of sediment 'dumped' on the deltas, such as Valley Creek and the Kinnickinnic River. This portion of the sediment accumulation may be studied at a later date.
- Sources of sedimentation: The lower tributaries were contributing the majority of the whole lake's sediment within the period 1940-1960. Since a key point is the changes that occurred around 1940-1950, logging practices in the late 1800s don't appear to be a major source of sediment accumulation in this Basin. It is important to remember that the dam built in 1905 at Taylors Falls may be impeding the sediment flowing from the upper St. Croix.
 - It is important to remember that dams were built on several tributaries impacting sediment accumulation rates downstream (e.g. Lake Malilieu, Willow River).

- A key issue is that the concentration of phosphorus in the lake water is twice pre-European settlement.
- The Research Station is studying the size of the particles now; when this information is complete it can be determined if the particle size has increased or decreased, whether the particles are capturing more or less phosphorus, and how tightly charged is the phosphorus to the sediment.
- The trend study on flow from Work Session 4 compared to this study does not present a contradiction in the phosphorus loading to Lake St. Croix. The sediment cores are a larger scale study and don't provide short-term measurements.
- Goal setting: There appears to be a constant flow of phosphorus in this system. Can we say that if the phosphorus is decreased in the system, given the flow and residence time, we can realistically return this lake to the ecological conditions (diatoms) of presettlement?

► **Work Session #6: Nutrient Criteria Information, MPCA.**

This session will consider the use of the EPA's final nutrient criteria guidance for rivers and streams, and the ecoregion-based analysis conducted by Heiskary for the Upper Mississippi River/Lake Pepin Phosphorus Study with respect to the St. Croix.

► **Work Session #7: St. Croix Basin Landuse Information, St. Croix Watershed Research Station**

This session will consider the key messages to be gleaned from the St. Croix Basin land use study conducted by researchers at the University of Minnesota and the point source phosphorus study conducted by the SCWRS.

Report to be summarized: (Published by University of Minnesota) "Historical Trends Affecting Accumulation of Sediment and Phosphorus in Lake Pepin" (Mulla, et. al., 2000) and presentation to St. Croix Basin Team (Mulla, Sept. 2002)

► **Work Session #8: Integration of St. Croix Basin Information**

This session will work to summarize all the parts above. Are there common themes, messages, conclusions, etc. suggested by all of the goal-setting information (above) that we have compiled? How do we want to present our findings? What type of educational materials do we need to include?

Outcome

- Establish nutrient budgets for tributaries and main stem
- Develop management scenarios
- Develop management nutrient goals for the mainstem
- Assess the ability to manage nutrient loading from nonpoint and point sources of nutrients in the Basin.
- Details of process to reach goals
- Partition nonpoint source nutrient load by land use and assess potential nutrient loading reductions by land use type.
- Determine a long-term nutrient monitoring program

Recommendations

- Assess the current condition of the St. Croix River and tributaries
- Model the data to determine tributary and point source loading into Lake St. Croix
- Develop nutrient goals for the basin and management scenarios through a basin-wide involvement with point source, non-point source, tribal nations, public, local, state, and federal agency personnel and organizations.
- Develop a long-term monitoring program and parameters
- Develop and incorporate volunteer monitoring into the program
- Identify nutrient loading reduction potential by watershed and land use
- Develop basin nutrient loading reduction strategies

Activities and Accomplishments

1995

- In 1995, the Basin Team began responding to public notices of intent to issue or reissue National Pollutant Discharge Elimination System (NPDES) permits for wastewater treatment facilities. An interagency letter was created that documented nutrient loading concerns in the St. Croix Basin and asked for no net increase of phosphorus loading (see Planning Status Report 2001). Since current state rules do not allow for basin-wide achievement of the no-net-increase approach by regulatory actions, the Basin Team letter asked for voluntary measures to ensure that degradation wouldn't occur while the needed studies and planning were underway to develop a basin-wide nutrient budget.

1997

- The St. Croix Basin Water Resources Planning Team created a subcommittee to address Issue Statement 1: Establish nutrient and sediment budgets for point and non-point sources. The subcommittee is referred to as the St. Croix Basin Nutrient Technical Subcommittee, or commonly called the Nutrient Subcommittee.
- Working with the Basin Team's Nutrient Subcommittee, the National Park Service secured \$50,000 to evaluate sediment and nutrient loading from St. Croix River tributaries. The USGS carried out the project.

1998

- The Nutrient Subcommittee developed a main stem, tributary monitoring, and point source study by securing funding and time from agency personnel. Monitoring of the St. Croix River mainstem and tributaries was conducted by the USGS from October 1, 1998 to September 30, 1999. Funding supported only one year of monitoring. NPS secures \$100,000 to expand the sediment and nutrient loading study through the USGS. Other agencies contribute personnel and laboratory time. The total cost of the study is estimated at \$400,000.

1999

- Data is collected from the main stem, tributaries, and point sources.
- \$57,000 is secured for the USGS to analyze the data and write a report on the nutrient monitoring. The WDNR provided most of this funding.

- In conjunction with agency monitoring of the tributaries and Lake St. Croix, a volunteer monitoring program began in 1999. Volunteers residing near six sites in Lake St. Croix took water quality samples and secchi disc transparency measurements, and completed a physical assessment every other week during the summer. The volunteer monitoring program was put on hold the summer of 2003 due to cuts in the state agency budgets.

2000

- To provide a forum to present, share, and engage the public in the nutrient study, the St. Croix Basin Team began, in 2000, a yearly conference titled *Protecting the St. Croix: Reducing and Managing Nutrients and Sediments*. Four annual conferences have been held thus far. Planning for a 2004 conference is underway.
- Analysis of the data from the nutrient study begins. The USGS is funded to analyze and write a report on the tributary data. Collection of the data for Bathtub modeling is begun.

2001

- St. Croix nutrient management scenarios for Bathtub modeling are developed.
- WDNR secured \$32,000 to run Bathtub modeling and for a report on the nutrient study data.
- An open forum is held for interested stake holders. The forum provides an opportunity for the nutrient Subcommittee to review the nutrient study and answer questions.

2002

- The USGS published a report titled: *Nutrient and Suspended-Sediment Concentrations and Loads and Benthic-Invertebrate Data for Tributaries to the St. Croix River, Wisconsin and Minnesota, 1996-1999* (Water-Resources Investigations Report 01-4162). The study was funded by the NPS and the USGS.
- The St. Croix Watershed Research Station receives favorable review by the LCMR to develop Soil and Water Assessment Tool (SWAT) modeling for the St. Croix Basin. The proposal is titled Technical Assistance Program for Watersheds (TAPS). \$60,000 was approved from the WDNR to contribute towards the TAPS proposal submitted to LCMR.

2003

- The water quality data from the 1998 – 1999 monitoring study were used in a Bathtub model to predict the impact on Lake St. Croix from various nutrient management scenarios within the Basin. The USGS published the results of the Bathtub modeling in a report titled *Response of the St. Croix River Pools, Wisconsin and Minnesota, to Various Phosphorus-Loading Scenarios* (Water-Resources Investigations Report 02-4181).
- Parallel to the Basin Team nutrient study, the St. Croix Watershed Research Station (the Science Museum of Minnesota) was funded by state agencies to complete a sediment study to determine conditions in Lake St. Croix prior to European settlement. The St. Croix Watershed Research Station prepared a report titled *Post-European eutrophication in the Lower St. Croix River, Minnesota-Wisconsin, USA* (Edlund et al., 2003).
- The TAPS proposal to the LCMR is put on hold due to state budgetary concerns.
- The nutrient Subcommittee begins its series of goal setting meetings based on all the data available on nutrients and sediment in the St. Croix Basin.

Progress on ISSUE STATEMENT 2: Urban stormwater runoff

A subcommittee was formed to recommend a strategy for identifying and prioritizing areas where stormwater planning and management will be necessary to protect the water resources in the St. Croix Basin. This subcommittee was called the Urban Stormwater Runoff Subcommittee, commonly referred to as the Stormwater Subcommittee. Stormwater has the potential of being one of the last uncontrolled sources of pollution to the St. Croix watershed. Both urban and rural areas can contribute very large loads of pollutants to the watershed.

Outcome

- Determine management scenarios and best management practices
- Documentation of existing conditions
- List of goals for management scenarios
- Details of process to reach goals
- Recommend a strategy for identifying and prioritizing areas where stormwater planning and management will be necessary to protect the water resources in the St. Croix Basin from stormwater impacts.

Recommendations

- Evaluate impact on water quality from stormwater runoff
- Identify current stormwater practices

Activities and Accomplishments

1998

- The document titled *Guidance for Watershed Stewardship Lower St. Croix River, A Stream Protection Strategy* is prepared from Tom Schueler, 1995, *Site Planning for Urban Stream Protection*, Center for Watershed Protection, Ellicott City, Maryland.

1999

- The Urban Stormwater Runoff Subcommittee (i.e., Stormwater Subcommittee) is officially formed.

2002

- The Stormwater Subcommittee begins a series of meetings to address stormwater issues and Phase II of the EPA's Storm Water Regulations. The MPCA adopts the Phase II storm water regulations. The WDNR plans to adopt the regulations in 2003.

2003

- The Stormwater Subcommittee begins a survey of state and local agencies involved in stormwater issues and existing regulatory frameworks. Preliminary results are included in the following pages of this document.

Metropolitan Council Environmental Services (MCES)

Agency Metropolitan Council Environmental Services	Contact Kent Johnson	Phone number 651-602-8117	Email Kent.johnson@metc.state.mn.us
Position: Manager, Environmental Monitoring and Assessment Section			
Address: Mears Park Centre, 230 East Fifth Street, St. Paul, MN 55101			
Role in stormwater management: circle all that apply			
Education	Regulatory	Funding	Technical Compliance
Brief description of organization: Metropolitan Council Environmental Services (MCES) owns and operates 8 wastewater treatment plants in the Twin Cities Metropolitan Area (TCMA), and provides support for nonpoint source planning and management of TCMA streams, rivers, and lakes.			
Describe the role of your organization in regards to storm water management:			
<p><u>Water Quality Monitoring:</u> In support of the Metropolitan Council's commitment to sustaining water quality in the TCMA, through the <i>Regional Blueprint</i> and <i>Water Resources Management Policy Plan</i>, MCES staff in the Environmental Monitoring and Assessment (EMA) Section monitor the quality of regional rivers, streams, lakes, and wastewater treatment plants. The monitoring information obtained through the MCES Water Quality Program is used to identify water quality problems, and to inform planning and management efforts that improve and protect TCMA water resources. The information also provides a means of measuring progress toward achieving these goals. These objectives support the Metropolitan Council's goal of achieving <u>Smart Growth</u> for the TCMA.</p> <p><u>Target Pollutant Load Development:</u> To achieve water quality goals adopted in the Metropolitan Council's <i>Regional Blueprint</i> and <i>Water Resources Management Policy Plan</i>, MCES staff in the EMA and Water Resources Assessment (WRA) Sections are conducting a program of watershed monitoring, modeling, and data analysis to support the development of target pollutant loading goals for TCMA watersheds.</p> <p><u>Water Resources Planning:</u> MCES staff in the WRA Section provide environmental reviews of city comprehensive plans, watershed district and watershed management organization watershed plans, and environmental impact statements (EISs) and environmental assessment worksheets (EAWs), including the aspects of these plans that relate to storm water impacts and the adequacy of proposed management efforts to address these impacts. MCES also provides technical assistance to local watershed management organizations and municipalities for their water management planning activities. MCES has two watershed coordinators who act as the Council's liaisons to watershed management organizations.</p> <p><u>Nonpoint Source Pollution Control Research:</u> MCES staff in the WRA Section engage in a continuous program of research and study concerning the control and prevention of water pollution. This program includes nonpoint source pollution studies, performance evaluation studies of best management practices (BMPs), BMP design guidance, and developing public education information about controlling nonpoint source pollution.</p> <p><u>Storm Water Management:</u> Since 1993, MCES has funded a \$16.5 million dollar grant program (Metro Environment Partnership) for local and regional storm water management and educational projects.</p> <p><u>Environmental Education:</u> MCES's nationally-recognized environmental education program has reached millions of citizens and increased the understanding of the actions needed to improve water quality. Some key results include:</p> <ul style="list-style-type: none"> • A collaboration of over 50 organizations well-positioned to support the educational requirements of the Phase II NPDES Storm Water Permit Program; • Multi-media campaigns; • Volunteer water monitoring programs for streams and lakes; • A nationally-replicated traveling "watershed" exhibit; • Videos and CD-ROMs; • Museum exhibits; • A storm water best management practice manual for small sites; • Education for local officials; • Restoration of stream banks, wetlands, and grasslands. 			
What current stormwater regulations are in place in your area of responsibility?			
<p>The Metropolitan Council is mandated by state law (MN Statute 473.157) to establish target pollutant loads for TCMA watersheds (see <u>Target Pollutant Load Development</u> above). Minnesota Statute 473.157, Water Resources Plan states: "To help achieve federal and state water quality standards, provide effective water pollution control, and help reduce unnecessary investments in advanced water treatment, the Metropolitan Council shall adopt a water resources plan that includes management objectives and target pollution loads for watersheds in the Metropolitan Area...".</p> <p>MCES wastewater treatment plants are subject to the industrial storm water management provisions of the Phase I NPDES Storm Water Permit Program. As such, MCES facilities have NPDES storm water permits that require appropriate storm water management practices.</p>			

Public education: with regard to the general public, who is your contact to answer questions

Linda Henning: Environmental Education Coordinator
Metropolitan Council Environmental Services
Mears Park Centre
230 East Fifth Street
St. Paul, MN 55101
651-602-1279
linda.henning@metc.state.mn.us

Tim O'Donnell: Communication Coordinator for Environmental Services
Metropolitan Council Environmental Services
Mears Park Centre
230 East Fifth Street
St. Paul, MN 55101
651-602-1269
tim.odonnell@metc.state.mn.us

Kent Johnson: Manager, Environmental Monitoring and Assessment Section
Metropolitan Council Environmental Services
Mears Park Centre
230 East Fifth Street
St. Paul, MN 55101
651-602-8117
kent.johnson@metc.state.mn.us

What would you like to have included in a document regarding storm water management prepared by the St. Croix Basin Urban Storm Water Runoff Subcommittee? (This section includes a summary of several meetings of the Stormwater Subcommittee.)

A compilation of current storm water monitoring efforts in the basin, including an evaluation of any storm water impacts on water quality.

Based on monitoring information and other criteria, identification and prioritization of areas where storm water planning and management efforts are needed to protect the water resources of the basin from storm water impacts.

A compilation of current and anticipated local, state, and federal storm water ordinances, rules, and regulations that apply within the basin.

A compilation of storm water best management practices (BMPs); a listing of sites that have implemented BMPs correctly.

A compilation of possible funding sources and mechanisms for storm water planning and management efforts in the basin, including state and federal grants, local taxes and fees (watershed districts and storm water utilities), etc.

A storm water education plan for the basin, including local governmental officials (NEMO) and the general public.

A list of technical and educational contacts that can provide support for storm water planning and management efforts in the basin (i.e., Available for local officials and the general public)

Long term goals for the St. Croix Basin: i.e., recommend similar standards / goals for both Wisconsin and Minnesota.

Reference section that includes information to find information: i.e., websites for agencies, NEMO, etc.

Websites:

Center for Watershed Protection - [cwp.org](http://www.cwp.org)

Minnesota Pollution Control Agency - <http://www.pca.state.mn.us/index.cfm>

Wisconsin Department of Natural Resources - <http://www.dnr.state.wi.us/>

Wisconsin Storm-water Construction Program -
<http://www.dnr.state.wi.us/org/water/wm/nps/stormwater/const.htm> (Site is not up-to-date with Phase II rules)

North Dakota Storm-water Construction Program -
<http://www.health.state.nd.us/wq/Storm/Construction/ConstructionHome.htm>

Iowa Storm-water Construction Program -
<http://www.state.ia.us/epd/wastewtr/stormwtr/stormwtr.htm> (General permit #2 is the construction permit)

Low Impact Development Center: www.lowimpactdevelopment.org

Non-point Education for Municipal Officials: "Linking town hall to technology" - <http://nemo.uconn.edu/>

Minnesota Erosion Control Association: <http://www.mnerosion.org/Default.htm>

Stormwater Education Material Available from the EPA : These materials will help communities reach out to a wide variety of audiences, including homeowners, construction site operators, and businesses. Local officials can use the CD to customize these materials with their agency's name, address, and phone number so citizens will know where to turn for more information.

A Stormwater Month collection of materials can be found at <http://www.epa.gov/npdes/stormwater>. You can also order the Stormwater Month CD by contacting Nikos Singelis at npdesbox-request@epa.gov. It includes all the files you'll need to customize these publications, as well as a complete reference library for the NPDES stormwater program, including regulations, guidance documents, and more. Finally, hard copies of individual products may be requested in limited quantities. The following is a brief description of some of the Stormwater Month Materials:

1. New! After the Storm: A Citizen's Guide to Understanding Stormwater - Provides a broad overview of stormwater pollution, including runoff from residential and commercial properties, farms, construction sites, automotive facilities, forestry operations, and others.
2. New! Make Your Home the Solution to Stormwater Pollution - This short brochure is targeted directly to homeowners and provides tips on a wide variety of simple things that homeowner's can do to prevent stormwater pollution.
3. New! Stormwater and the Construction Industry Poster - Great for construction sites of all sizes! This poster can be printed on 11x17 paper. Side one of this informative poster illustrates proper installation of common sediment and erosion control practices (best management practices). Side two describes the process for developing and implementing a stormwater pollution prevention plan and obtaining permit coverage. The complete 30x40 poster is also available.
4. New Educational Material! Kid's Stormwater Stickers
5. New! Water-Efficient Landscaping. - This booklet describes the benefits of water-efficient, low-impact landscaping. It includes examples of successful projects, programs, and contacts.
6. New! Door Hanger: "Stormwater Pollution Found In Your Area!"
7. New! Cleaning Up Polluted Runoff with the Clean Water State Revolving Fund

MDA

Chapter 3: Progress on Issue statement 2: Urban stormwater runoff

Minnesota Department of Agriculture (MDA)

Agency Minnesota Department of Agriculture	Contact Jerry Spetzman	Phone number 651-297-7269	Email Jerome.Spezman@State.MN.US
Address: 90 West Plato Boulevard, St. Paul, MN 55107			
Position: Water Quality Advisor			
Role in stormwater management: circle all that apply			
Education	Regulatory	Funding	Technical Compliance
Brief description of organization: Our mission is to work toward a diverse agricultural industry that is profitable and environmentally sound; to protect public health and safety regarding food and agricultural products; and to ensure orderly commerce in agricultural and food products			
Describe the role of your organization in regards to storm water management: We have regulatory authority over agricultural fertilizers and pesticides – this includes lawn care fertilizer and weed control.			
What current stormwater regulations are in place in your area of responsibility The new lawn phosphorus fertilizer law, the fertilizer law, the pesticide control law, FIFRA, as they relate to storm water management.			
Public education: with regard to the general public, who is your contact to answer questions Various program staff answers questions related to their individual programs.			
What would you like to have included in a document regarding storm water management prepared by the St. Croix Basin Urban Storm Water Runoff Subcommittee? Information on the new lawn phosphorus fertilizer law.			

MDNR

Chapter 3: Progress on Issue statement 2: Urban stormwater runoff

Minnesota Department of Natural Resources (MDNR)

Agency Minnesota Department of Natural Resources	Contact Molly Shodeen	Phone number 651-772-7915	Email molly.shodeen@dnr.state.mn.us
Address 1200 Warner Road, St. Paul, MN 55106			
Position			
Role in stormwater management: circle all that apply			
Education	Regulatory	Funding	Technical Compliance
Brief description of organization "Our mission is to work with citizens to protect and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates sustainable quality of life". The MDNR water's mission: "Helping people ensure the future of our water resources."			
Describe the role of your organization in regards to storm water management:			
<u>Water quality monitoring:</u> Fisheries does a little bit, but not anything regularly.			
<u>Target pollutant load development:</u> Not applicable: ecological services works with some dischargers to the Mississippi River for fisheries concerns.			
<u>Water resources planning:</u> We review plans and provide input when or where possible depending on time constraints.			
<u>Nonpoint source control:</u> We encourage use of buffers but cannot mandate.			
<u>Stormwater management:</u> Review by area hydrologists of plans, EAW's to look at stormwater management practices.			
<u>Environmental education:</u> Brochures, tables at events, speaking to lake associations, etc., speaking to planning commissions, counties, cities.			
What current stormwater regulations are in place in your area of responsibility			
Public education: with regard to the general public, who is your contact to answer questions			
The area hydrologist for each area is the contact. Phone numbers vary and are available at the DNR website or from central office; Waters – 651-296-4800, DNR information center – 651-296-6157 (Metro area) or (888) MINN-DNR (elsewhere).			
What would you like to have included in a document regarding storm water management prepared by the St. Croix Basin Urban Storm Water Runoff Subcommittee?			

MPCA

Chapter 3: Progress on Issue statement 2: Urban stormwater runoff

Minnesota Pollution Control Agency (MPCA)

Agency Minnesota Pollution Control Agency	Contact Brian Gove	Phone number 651-296-7036	Email Brian.Gove@state.mn.us
Address 520 Lafayette Road N., St. Paul, MN 55155			
Position Pollution Control Specialist - Senior			
<p>Role in stormwater management: circle all that apply</p> <p>Education Regulatory Funding Technical Compliance</p> <p>MPCA has developed a model stormwater ordinance. The following provisions are considered essential parts of the MPCA ordinance: [changed font of # 1&2]</p> <p>1. Adequate developer's storm water controls financial security requirements (\$3,000/acre range). Inadequate developer financial security is a common problem with rural communities that are in the early stages of residential growth. This often leads to a failure to correct inadequate storm water controls, potentially escalating the damage that can occur with each new storm event and the cost of repairing the resulting downstream damage (e.g., removing silt from wetlands, private property, etc.). A minimum developer's financial security in the \$3,000 per acre range is based on MPCA storm water permit enforcement experience and the requirements of some Twin Cities area municipalities experiencing rapid growth.</p> <p>2. Vegetated buffers with slope extensions (100 feet for rivers and streams, 40 feet for wetlands). Wider, vegetated buffer strips tend to remove greater amounts of pollutants. A minimum width of 100 feet combined with a slope modifier is believed to be reasonable.</p> <p>3. The 2-year, 10-year and 100-year 24-hour storm event discharge rates from storm water retention structures should not exceed the predevelopment runoff discharge rates for the same storm events. Storm water holding basins with outlet structures designed to only release its water at the 100-year discharge rate release water at too high a rate during the more frequent smaller rainfall events. These high release rates increase the potential for downstream scouring velocities and channel erosion to occur. Storm water discharge rates from storm water treatment basins should not increase over what the predevelopment 2-year, 10-year and 100-year peak 24-hour storm discharge rates were, based on the last 10 years of how that land was used.</p> <p>4. The storm water pollution control plan's protections for a development should be included in the grading plan. This is a common-sense communications item that is too often neglected. A storm water pollution control plan is written, approved and then placed in a filing cabinet. The contractor receives a copy of the grading plan, but not a copy of the storm water pollution control plan. Mistakes such as destroying existing buffer strips result. The best control plan in the world is useless, unless it is communicated to the contractor. Incorporating the control plan's earthwork related elements in the grading plan is a common sense solution to this problem.</p> <p>5. If either a trout stream or a state outstanding resource value water is involved, the volume released from storm water treatment units to that water should not exceed that expected from storm events up to the predevelopment 10-year, 24-hour storm. Trout waters and outstanding resource value waters are by nature high quality waters worthy of special protection. The clearest example of volume impacts is in trout streams. Trout waters are cool water streams. Storm water stored in storm water retention ponds heats up under the influence of the sun. Under Minnesota Rule 7050.0222, subpart 2 the temperature water quality standard for trout waters is, "no material increase." Large volumes of warm water entering trout streams from these ponds have a definite negative impact on the stream's aquatic ecosystem and violate Minnesota water quality standards. If the frequency of such events can be significantly reduced, the ecosystem will have time to recover to a healthy level and stay there for a few years before the next event occurs.</p>			
Brief description of organization State level environmental regulatory agency and permitting authority for industrial and commercial activities that impact air, land and water.			
<p>Describe the role of your organization in regards to storm water management:</p> <p><u>Stormwater Program</u></p> <p>The Minnesota Pollution Control Agency's (MPCA) Storm Water Program seeks to reduce water quality impairment and damage to water resources caused by runoff from construction sites, industrial facilities and municipal separate storm sewer systems (MS4s). In 1987, the federal Clean Water Act required implementation of a two-phase national program for storm water runoff. Phase I focused on large construction sites, 11 categories of industrial facilities, and major metropolitan MS4s. Phase II is now being implemented in Minnesota with the adoption of new, broadened regulations that also address smaller construction sites, small municipalities (populations of less than 100,000) that were temporarily exempted based on their industrial activity, and MS4s. Phase II is designed to further reduce adverse impacts to water quality and puts controls on runoff that has the greatest likelihood of causing continued environmental degradation.</p> <p><u>CWA Sec. 303(d) Impaired Waters (TMDLs)</u></p> <p>The federal Clean Water Act (CWA) requires states to adopt water quality standards to protect the quality of the nation's waters. These standards define the level of quality that must be maintained to allow waters to continue to be used for</p>			

MPCA

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drinking, fishing, swimming, irrigation, industrial purposes or to support their use by fish and wildlife communities. When it is demonstrated that water quality standards cannot be met, the water body is placed on a list of impaired waters as required by Section 303(d) of the CWA. The MPCA is required to conduct a study for each of the impaired waters to identify the point and non-point pollution sources affecting the waters, to determine the Total Maximum Daily Load (TMDL) for each important pollutant, and to determine how much each pollutant source must reduce its contribution to assure the water quality standard is met.

Urban stormwater runoff is frequently an important source of pollution affecting lakes impaired by excessive nutrients related to eutrophication, streams with high solids or turbidity levels that adversely affect stream biota and habitat, and streams in which the biological community has been impaired by a combination of point sources, non-point sources and physical alteration of the streambed or riparian area. Impaired waters in Minnesota will receive greater emphasis in future efforts to identify and correct water quality impacts related to stormwater runoff. The 303(d) list of lakes and streams in the St. Croix Basin whose uses are impaired by excessive nutrients, turbidity or whose biological communities have been impaired by a combination of factors can be accessed at the following website:
<http://www.pca.state.mn.us/water/tmdl.html>

What current stormwater regulations are in place in your area of responsibility

The storm water regulations are part of the National Pollutant Discharge Elimination System (NPDES) permit program. Permitting authority for Minnesota's NPDES program is delegated to the MPCA by the U.S. Environmental Protection Agency (EPA). The three permit types, construction, industrial and MS4, have distinct requirements that went into effect on March 10, 2003. Permits are issued by the MPCA and inspections are conducted to determine compliance with the erosion and sedimentation control practices required by the stormwater permit. Enforcement action may be taken for failure to obtain a permit or for non-compliance with permit requirements.

Public education: with regard to the general public, who is your contact to answer questions

Information on the types of activities required to obtain MPCA storm water permits is available on factsheets that may be accessed on the MPCA storm water website (<http://www.pca.state.mn.us/water/stormwater/index.html>). Factsheets and other information can also be obtained by contacting the MPCA Customer Assistance Center at 800-646-6247 or 651-297-2274. Information for storm water permittees may also be obtained by contacting 651-657-3864.

What would you like to have included in a document regarding storm water management prepared by the St. Croix Basin Urban Storm Water Runoff Subcommittee?

Storm water contacts within the St. Croix Basin and region (city, county, WMO) and the roles/authority of those contacts.

NPS

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N a t i o n a l P a r k S e r v i c e (N P S)

Agency National Park Service, St. Croix National Scenic Riverway	Contact Randy Ferrin	Phone number 715-483-3284 Ext. 636	Email Randy_Ferrin@NPS.gov
Address National Park Service, POBox 708, St. Croix Falls, WI. 54024			
Position Chief, Resource Management Division			
Role in stormwater management: circle all that apply			
Education	Regulatory	Funding	Technical
			Compliance
Brief description of organization Above Stillwater, MN the NPS is the primary agency responsible for management of the St. Croix National Scenic Riverway, a unit of the National Park System. The NPS owns land along the river as well as scenic and riverfront easements that protect the scenic quality of the Riverway. Below Stillwater, the NPS sits on the Lower St. Croix Management Commission, and represents the Secretary of the Interior when responding to federal permits, such as a Corps of Engineers permit.			
Describe the role of your organization in regards to storm water management:			
<u>Water quality monitoring:</u> The NPS sporadically monitors water quality, dependent on funding and personnel. For special programs like the 1999 interagency monitoring program, the NPS played an active role in monitoring three sites on the flowage at St. Croix Falls. Most importantly, the NPS seeks and obtains funding to support the monitoring efforts of other agencies, primarily the USGS.			
<u>Target pollutant load development:</u> The NPS role is limited to commenting on the states' process.			
Water resources planning: The NPS has a water resource plan in place for the St. Croix National Scenic Riverway, and plays an active role in the St. Croix Basin Water Resources Planning Team. The NPS plan and the participation in the Basin Team has facilitated the funding of numerous water resource studies through the NPS Water Resources Division.			
Nonpoint source control: The NPS is responsible for controlling nonpoint pollutants from its own lands and observing and reporting nonpoint runoff from adjacent lands.			
Stormwater management: The NPS is responsible for controlling stormwater from its own lands. This involves constructing and maintaining landings and access roads in a manner that prevents erosion. Beyond our boundaries, our role is limited to observing and reporting stormwater problems that affect the Riverway, and responding to state and federal permits that might affect the Riverway.			
<u>Environmental education:</u> The NPS has an environmental education division that has as one of its focuses water quality protection.			
What current stormwater regulations are in place in your area of responsibility			
Our most significant regulatory role is in Section 7(a) of the Wild and Scenic Rivers Act. That section prohibits any federal agency from permitting, funding, licensing, or otherwise allowing a water resource project that might have a direct and adverse impact on the outstandingly remarkable values for which the St. Croix was included in the National Wild and Scenic River System. For example, any project that requires a Corps of Engineers permit must meet the test of not having a direct and adverse impact on the ORVs of the St. Croix. If the NPS evaluation determines a project will have a direct and adverse impact, the NPS requests the Corps to not issue a permit for the project, and the Corps must comply. The most significant example of the role of Section 7(a) was the original new Stillwater Bridge project. As for stormwater management, if a project was proposed that required a federal permit, and the NPS concluded that stormwater flow related to the project would have a direct and adverse impact on the St. Croix, the NPS would request denial of the permit.			
Public education: with regard to the general public, who is your contact to answer questions			
Randy Ferrin, 715-483-3284 extension 636 randy_ferrin@nps.gov NPS PO Box 708 St. Croix Falls, WI. 54024			
What would you like to have included in a document regarding storm water management prepared by the St. Croix Basin Urban Storm Water Runoff Subcommittee?			
Who should a member of the public call if they see a stormwater problem?			

St. Croix County Land and Water Conservation Department

Agency St. Croix County Land and Water Conservation Department	Contact Peter Kling	Phone number 715-684-2874	Email pkling@co.saint-croix.wi.us
Address 1960 8 th Ave. Suite 141, Baldwin, WI 54002			
Position Land Specialist			
Role in stormwater management: circle all that apply			
Education	<input type="checkbox"/> Regulatory	<input type="checkbox"/> Funding	<input type="checkbox"/> Technical
			<input type="checkbox"/> Compliance
Brief description of organization			
Provide technical assistance for farmland preservation, priority watershed projects, stormwater and erosion control plan review/inspection for rural subdivisions, and nutrient/facility management plan review and inspection for large dairy operations. Our primary clients are rural landowners and those working in rural areas of St. Croix County. We have no jurisdictional authority within incorporated areas.			
Describe the role of your organization in regards to storm water management:			
<u>Water quality monitoring:</u> We support other agencies such as DNR or USGS in collecting data and as grant managers for some monitoring programs. We also are in the process of coordinating a St. Croix County River Volunteer Monitoring Program. Local conservation organizations and other interested individuals will be trained and teamed up with schools and other youth groups to collect stream/river data at various points along the Kinnickinnic, Willow, Apple, Rush, Eau Galle Rivers.			
<u>Target pollutant load development:</u> Through the priority watershed program, we have identified pollutant loads and established pollutant load reductions for the Willow, South Fork of the Hay, and Kinnickinnic Rivers as well as Bass, Perch, Squaw, and Pine Lakes.			
<u>Water resources planning:</u> The St. Croix County Land and Water Resource Management Plan was written by our office with input from other agencies as well as a citizen advisory committee and approved by the state in spring 2000. The plan gives us direction and acts as a basis for different funding sources. Our three priorities are 1) protect and improve groundwater, 2) protect and enhance surface waters and wetlands, and 3) protect and restore fish and wildlife habitats.			
<u>Nonpoint source control:</u> The priority watershed programs are completely aimed at nonpoint source control. We provide technical assistance and up to 70% cost-share for the installation of BMP's. The Lakes Cluster project includes Bass, Perch, Squaw, and Pine Lakes and has funding through 2008. The Kinnickinnic River includes the entire watershed and has funding through 2010. The South Fork of the Hay River project funding is approved biannually.			
<u>Stormwater management:</u> Our authority to review and approve stormwater and erosion control plans comes from the St. Croix County Subdivision Ordinance (Chapter 18). We do work in cooperation with DNR and honor any additional requirements/regulations they may place on a stormwater and erosion control plan.			
<u>Environmental education:</u> We have a part-time Information and Education coordinator who organizes school talks, field trips, volunteer stream/river monitoring program, and other conservation outreach programs.			
What current stormwater regulations are in place in your area of responsibility			
The St. Croix County Subdivision Ordinance, Chapter 18, includes the county stormwater regulations. DNR Chapters 151 and 216 are state regulations that must be followed as well but we do not enforce them. We will be rewriting the county subdivision ordinance in the next year or two and will update our stormwater regulations at that time.			
Public education: with regard to the general public, who is your contact to answer questions			
Peter Kling 1960 8 th Ave., Suite 141 Baldwin, WI 54002 715-684-2874 ext. 131 (office) 715-760-1991 (mobile) pkling@co.saint-croix.wi.us			
What would you like to have included in a document regarding storm water management prepared by the St. Croix Basin Urban Storm Water Runoff Subcommittee?			
I would like to make sure the stormwater BMP compilation includes the list, location, and contact for stormwater practices that have been installed in the area and are performing well. It would be a kind of demonstration project list. Hopefully the information and education component could be tied to these locations by holding field days. It always helps to see things that work in real life.			

WDNR

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Wisconsin Department of Natural Resources (WDNR)

Agency Wisconsin Department of Natural Resources	Contact Ruth M. King Jim Devlin John Jereczek (municipality, industry)	Phone number King: 715-635-4142 Devlin: 715-684-2914 Jereczek: 715-392-0805	Email Ruth.King@dnr.state.wi.us james.devlin@dnr.state.wi.us john.jereczek@dnr.state.wi.us
Address WDNR Annex 810 W. Maple St. Spooner, WI 54801			
Position Nonpoint Source Coordinator/Stormwater			
Role in stormwater management: circle all that apply			
Education	Regulatory	Funding	Technical Appliance
Brief description of organization State Government Natural Resource Agency			
Describe the role of your organization in regards to storm water management:			
<p>Enforcement of NR216 (administrative code governing stormwater); we receive Notices of Intent to discharge stormwater and issue both general and individual permits (WPDES). We review stormwater management plans and do site inspections (construction site erosion control, industrial, municipal).</p> <p>Stormwater Funding: WDNR has some money available for existing priority watershed projects, but this source is dwindling. There will be no more new Priority Watersheds. The money is being rolled over into Target Runoff Management (TRM) grants. Municipalities don't have to have that 1,000 population per square mile to qualify for a TRM.</p> <p>Types of Nonpoint Grants available:</p> <ol style="list-style-type: none"> 1) Urban Planning; needs to be an urban BMP, needs to have the 1,000 people per square mile (urban area). Will pay for planning projects. 2) Urban construction; same as the above, only doesn't cover the planning phase. \$150,000 cap per project. 70% cost sharing on BMP's, with a limit of 50% for land acquisition or easements. 3) TRM; you don't have to be an "urban area" to qualify for TRM. You can submit an agricultural or "urban" project. 70% cost sharing up to \$150,000 and 50% on land acquisition or easements as well. 			
What current regulations are in place in your region (area of responsibility) for stormwater management:			
<p>Limited to construction site Notice of Intent (NOI) However, municipalities over 10,000 pop. are now required under EPA phase II to be permitted. Various industries must be permitted as well. A several tier system is used to determine what level of coverage they need..</p> <p>For land-disturbing activities over 5 acres (1 acre in March 2003) the owner/developer is required to submit an NOI and fee. They are required to have a stormwater management plan and an erosion control plan, but they are not required to submit them unless we specifically request them. DNR has 14 working days to review the NOI: if after that time we don't respond with concerns or requests, the permittee can begin construction. Most applicants submit an erosion control plan of sorts (usually they are not the greatest). NR216 requires that permittees inspect and maintain their erosion control w/in 24 hrs of a 0.5" rain event. We inspect sites and work w/permittees when erosion control measures are not adequate, if the plan is not being followed, or if BMP's are not being maintained.</p> <p>Commenst: Prior to March 10, 2003 sites that had 5 or more acres of soil disturbance were required to obtain coverage. Revisions of NR 216 has yet to go before the legislature. Currently, permittees who have 1-5 acre sites are told that if they want to be in accordance with federal law, they can file a Notice of Intent with us.</p> <p>Regulating the stormwater program is timely with only a limited staff available. Large sites and sites that may be more environmentally sensitive have priority. The WDNR has been working with County Land [margin??]Conservation Depts. and County Zoning, and cooperating with DNR water mgt. specialists who issue chapter 30 permits for grading.</p>			
Public education: with regard to the general public, who is your contact to answer questions Ruth M. King, Jim Devlin, John Jereczek			
What would you like to have included in a document regarding storm water management prepared by the St. Croix Basin Urban Storm Water Runoff Subcommittee? I would like to see examples of new technology being used for erosion control and post-construction storm water management.			

BSWR

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Minnesota Board of Soil and Water Resources (BSWR)

Regulatory	Annual	Education	Plan Review/ h Asst.	Compliance Inspection
Lower St. Croix Watershed Management Organization (no phone)				
none	None	none	None	None
South Washington County Watershed District (651-714-3729)				
Comprehensive rules	\$2.4M	Comprehensive	FT administrator, engineering consultant	Cities required to meet standards
Valley Branch Watershed District (651-733-9791)				
Comprehensive	\$1.8M	Comprehensive	FT administrator/engineer, all water-related projects reviewed	Cities must comply with district requirements.
Middle St. Croix Watershed Management Organization (651-436-8953)				
None	\$30K	Small program (\$1-2K/year)	Some plan review by Washington Co. Soil & Water Conservation District	None
Brown's Creek Watershed District (651-275-1136)				
Comprehensive rules	\$1M	Comprehensive program	Contracts with Washington Conservation District	Review & inspect projects
Carnelian-Marine Watershed District (651-770-8448)				
Some regulation	\$2-300K mostly lake-related	Some review/assistance related to lakes		Some inspection
Marine on St. Croix Watershed Management Organization (651-433-3636)				
none	\$20K	Small program (\$1-2K/yr)	None	None
Comfort Lake Forest Lake Watershed District (651-779-5054)				
none	\$200K	Small program	Some	None
<p>Comments:</p> <p>A comprehensive regulatory program covers stormwater management, erosion control, plat approval, volume control, rate control, wetland protection, etc.</p> <p>Counties have no stormwater programs. Chisago County has a water plan that addresses stormwater. Pine County has a draft water plan prepared by the Pine Soil & Water Conservation District. County water planning may be phased out due to budget cuts. Other Minnesota counties in the Upper St. Croix Basin do not have water planning.</p> <p>Cities may have some ordinances or permitting requirements related to water and stormwater. May have to contact a sampling to get an idea of the range of involvement.</p> <p>May think of these as a possible source of information about a specific issue at the local level.</p>				

stormwater runoff

Related Information

For a review of regulatory issues for stormwater runoff visit the Wisconsin Department of Natural Resources and the Minnesota Pollution Control Agency's websites

- Wisconsin Department of Natural Resources: www.dnr.state.wi.us/org/water/wm/nps/stormwater
- Minnesota Pollution Control Agency: www.pca.state.mn.us/water/stormwater

The following list provides information on water resource protection from stormwater runoff.

- *Guidance for Watershed Stewardship Lower St. Croix River, A Stream Protection Strategy.* Based on information provided by the Center for Watershed Protection, *A Stream Protection Strategy* is an excellent example of how communities can insure water resource protection through local land use planning. This document can be found in Appendix 5 of the St. Croix Basin Water Resources Planning Status Report 2001 and on the MPCA website www.pca.state.mn.us/water/basins/stcroix/
- *Managing Stormwater in Wisconsin: A Local Partnership Protects the Kinnickinnic River.* This document provides an example of local stormwater protection management. This document can be located at <http://www.lambcom.net/kiaptuwish/stormwater/stormwater>.
- *City of River Falls, Wisconsin: Stormwater Management Ordinance.* This document provides an example of a model local stormwater ordinance and can be found at www.rfcity.org/engineering/Ordinances .
- *Storm Water Program – Minnesota Pollution Control Agency.* For educational and regulatory information on stormwater runoff in Minnesota visit the MPCA website www.pca.state.mn.us/water/stormwater .
 - The MPCA model ordinance is based on the existing Minnesota municipal ordinances, advice from agency staff, and information from other organizations or available on the Internet. It is intended to help communities developing storm water ordinances avoid problems that growing communities encounter. The ordinance is periodically updated as significant information becomes available (see the following survey results from the MPCA for more details).
- *Wisconsin Department of Natural Resources – Runoff Management.* For educational and regulatory information on stormwater runoff in Wisconsin visit the WDNR website www.dnr.state.wi.us/org/water/wm/nps/stormwater/const .

Progress on ISSUE STATEMENT 3: Monitoring

Background

Long term monitoring has been a concern for the St. Croix Basin. In 1953, the MPCA began collecting samples at Taylors Falls, Stillwater and Prescott for limited chemical analysis. Since that time, from three to five stations have monitored each year with periodic adjustments in frequency and the number of analyses brought about by changes in funding levels. Currently, the MPCA routinely monitors "milestone" sites at Danbury, Stillwater and Hudson. In 1976 the MCES started monitoring two sites: Stillwater and Prescott. The WDNR also has some long term data at Danbury and St. Croix Falls. The USGS NAWQA program will begin again in 2004 and will include the St. Croix Basin. Several localized monitoring programs have begun on the St. Croix River and the tributaries. The St. Croix Chippewa Tribe of Wisconsin has developed a monitoring program for their general geographical location. Local volunteer monitoring programs are starting around the Basin, such as the Sunrise River coordinated by the PICKM group (Pine, Isanti, Chisago, Kanabec, and Mille Lacs County local agencies) and the Lake St. Croix Volunteer Monitoring program as part of the nutrient study (see Issue Statement 1). A coordinated effort of all the monitoring and the initiation of new volunteer programs need to be incorporated into Basin planning.

In light of the rapid rate of development in the St. Croix Basin, long term monitoring becomes even more imperative. For this reason, a Monitoring Subcommittee was commissioned by the Basin Team in 2001. Funding is secured for various short term research projects, but the monitoring is not continued upon completion of the project. As evident from the Nutrient Study, recording long term trends is critical to maintaining the ecological health of the St. Croix Basin. A sediment core study recently completed by the St. Croix Basin Watershed Research Station (Edlund et al. 2001) provides a tool from which we can compare current land use impacts on the water resources to pre-European settlement conditions.

Outcome

- Develop and implement a long term monitoring program including volunteer monitoring and goals to be achieved
- Secure funding for a long term monitoring program

Recommendations

- Create a list of variables to be monitored and why
 - Ammonia
 - Sediment (turbidity, suspended sediments)
 - Biomonitoring : IBI (insects, fish)
 - Heavy metals (lead, mercury)
 - Pathogens
 - Nutrients
 - Fish tissue (for fish advisory)
 - NAWQA study variables: recommend study be continued

- Endangered species
- Land use changes / variables
- Integrate the St. Croix Chippewa tribe monitoring plan
- Coordinate existing volunteer monitoring in the Basin; initiate new programs
- Develop a basin-wide monitoring program

Activities and Accomplishments

- Interagency tributary and mainstem nutrient study
- Volunteer monitoring program on Lake St. Croix
- Coordinating monitoring program with Washington County in Minnesota
- *Index of Biotic Integrity Guidance for Coolwater Rivers and Stream of the St. Croix River Basin* by Scott Niemela and Michael Feist, MPCA.
- In 2001 an agenda was prepared for a monitoring subcommittee:
 - Assemble the subcommittee members; determine who else should be included.
 - Assemble a preliminary "St Croix River Basin Long-Term Water-Quality Monitoring Rollcall". This will be a list of all long-term water-quality related monitoring programs currently occurring in the basin (at least 10 years of data or a program that is set-up to have 10 or more years of data). The list will include the agency doing the sampling, what is sampled, and the length of record. Table 3 provides the results of the summary.
 - Discuss and list various agencies views, needs, and goals of long-term monitoring in the St Croix Basin.
 - Determine the focus/direction and some goals of this subcommittee.

Table 8: Monitoring Subcommittee Agency Summary

Monitoring Subcommittee Agency Summary	
I. What water-quality related monitoring does your agency perform that has been going on for 10 or more years (or is planned to last more than 10 years)? Please give agency, what is monitored, and time period monitoring has been/is occurring.	
1. USGS Rice Lake	<ul style="list-style-type: none"> • Stream flow monitoring: St Croix River at St Croix Falls and Danbury, Snake River, Kettle River, Apple River • USGS Water Quality: field parameters, nutrients, major ions, alkalinity, organic carbon on St Croix River at Danbury and St Croix Falls • USGS groundwater level network • USGS-MN-NAWQA AND NETWORK SW QUANTITY
2. MWBAC	<p>MWBAC would like to get a long term trends monitoring program started looking at macroinvertebrate community structure and how this varies spatially and temporally for different sub-watersheds.</p> <ul style="list-style-type: none"> • Temporal variations in community structure between: <ol style="list-style-type: none"> a) mid March b) Late April/early May c) July d) October. If time and funding is limited the July samples could be eliminated. • Spatial variations in community structure: <ol style="list-style-type: none"> a) from headwaters to mouth b) Riffles, runs, stream margins and snags, and fine sediments c) Pools may eventually be looked at.
3. BWSR	<p>BWSR provides grants to local units of governments (counties, SWCD's, watershed districts) to conduct monitoring.</p> <ul style="list-style-type: none"> • Monitoring has been done and is going on in: <ul style="list-style-type: none"> - Snake River Watershed - Chisago County - Anoka County - Washington County <p>MPCA or USGS usually helps assist the local units in developing a monitoring program to meet all protocols.</p>
4. Volunteer monitoring on Lake St. Croix:	<p>MWBAC has had a volunteer monitoring program on Lake St. Croix for 4 years at 6 sites.</p> <ul style="list-style-type: none"> • Variables: <ul style="list-style-type: none"> Observational data: <ol style="list-style-type: none"> 1. Physical condition rating 2. Recreational condition rating 3. Wind 4. Water Surface 5. Cloud Cover 6. Lake level 7. Secchi depth 8. Air temperature 9. Water temperature Chemistry <ol style="list-style-type: none"> 1. Phosphorus total 2. Chlorophyll a total 3. Chlorophyll a viable 4. Pheophytin a • Monitoring locations on Lake St. Croix <ol style="list-style-type: none"> a. SCU 1 (21.5 river mile) b. SCU 2 (20.5 river mile) c. SCM 3 (16.5 river mile) d. SCM 4 (15.75 river mile) e. SCM 5 (14.5 river mile) f. SCL 6 (11.5 river mile) g. SCLL 7 (1.1 river mile)
5. WDNR:	Danbury, St. Croix Falls, Hudson

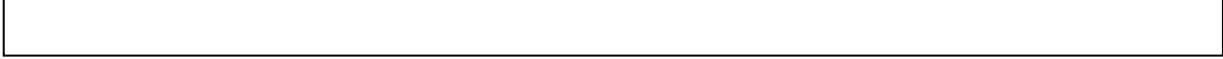
Monitoring Subcommittee Agency Summary, continued

<p>II. What are the three biggest "pros" and 3 biggest "cons" to YOUR AGENCY of long-term monitoring programs?</p>
<p>1. USGS</p> <ul style="list-style-type: none"> • Pro: USGS does nationally consistent, high quality data collection (w/QA/QC), We are leading edge in techniques and constituents • Con: USGS usually cost a little more, have limited direct federal funding <p>2. USGS Minnesota: has high quality, consistent work--long term data bases and standard qa/qc</p> <p>3. WDNR:</p> <ul style="list-style-type: none"> • Pros: <ol style="list-style-type: none"> 1. Provide critical baseline information about sensitive and intolerant species distribution and density throughout a calender year. These can act as early indicators of environmental change which could provide timely input about environmental impacts and help implement timely protection measures before critical habitat and water quality problems result in exterpatation of sensitive and intolerant species. 2. Helps differentiate between normal annual variation and those changes that are the result of anthropogenic impacts. 3. LTTM can help define the degree and extent of water quality problems. • Cons: <ol style="list-style-type: none"> 1. If the focus is water chemistry monitoring, timing of when the samples were collected in relation to runoff events and how they relate to the ascending curve of the hydrograph can result in dramatic differences in concentration and overall variability of the data and how it should be interpreted or accounted for. It is very difficult to get proper timing in relation to runoff events when collecting water chemistry samples. This may result in schedule conflicts with other priority work areas. 2. Costs are also a problem in this time of limited budgets and budget shortfalls within the WI DNR. 3. Dedicated staff for intensive monitoring programs does not exist. <p>4. BWSR:</p> <ul style="list-style-type: none"> • Pros: It is conducted by the local units who are familiar with the "hot spots" and they usually get volunteers to collect some of the samples. • Cons: It may not cover the entire sub-watershed or it may not be set up for ten years. There may also be some QA/QC concerns. <p>5. MWBAC:</p> <ul style="list-style-type: none"> • Pro- helps justify limits • Con-difficult sustaining volunteers
<p>III. Briefly summarize how your agency currently uses long-term monitoring data or plans to use the data in the future? Examples</p>
<p>1. USGS Rice Lake: Basis for a large number of studies/proposals (i.e., base data), resource protection, trends, statistical inference, forecasting, Cooperators programs, Countless unknown uses in future</p> <p>2. USGS Minnesota: national programs and meeting cooperators needs</p> <p>3. WDNR: has looked at concentrations over time and contrasted this with changes in land use or bmp installation.</p> <p>4. BWSR: the monitoring is usually conducted to establish areas of concern. The locals then focus on best management practices to improve water quality in these areas. All of the counties have "water plans" which focus on some water quality monitoring and establish some type of implementation to improve the water.</p> <p>5. MWBAC: The MWBAC started 6 citizen sites in Lake St. Croix in 1999. Samples, weather data and perceptions were collected 10 times each summer e/o Sunday/Monday.</p>

Monitoring Subcommittee Agency Summary, continued

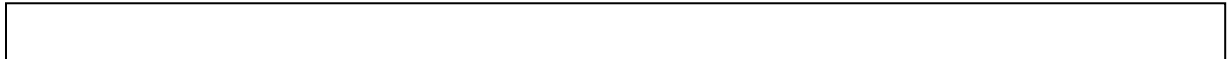
<p>IV. What are some of the biggest needs for long-term water-quality data in your agency that are currently not being met?</p>
<p>1. USGS Rice Lake: Trend analysis, understanding previous states of systems and the impacts that have occurred (and no funding).</p> <p>2. USGS Minnesota: long term funding stability</p> <p>3. WDNR should focus on documenting diurnal dissolved oxygen and temperature for its rivers and streams and determine how these limit biological potential. Lack of buffers and inadequate percentages of forested land use have resulted in impacted watershed hydrology in some watersheds which negatively impacts normal thermal regimes. If properly identified, management activities could begin to focus or prioritize watershed restoration activities in those impacted watersheds and provide an impetus for protection strategies in those watersheds that have not been as severely impacted.</p> <p>4. BWSR: Currently each county in MN gets about \$37,500 to implement water plans. This money comes from BWSR by the legislature and is filtered down to the local units. The local units determine the priorities for implementation which include water monitoring. The counties do not contribute the same amount for monitoring. Also, the assistance to establish the monitoring programs may be difficult in some areas compared to others.</p> <p>5. MWBAC: it would be good to have a little money to reimburse mileage and give a party for the volunteers.</p>
<p>V. Where does funding for long-term monitoring programs in your agency come from?</p>
<p>1. USGS Rice Creek: Federal, state, and local sources</p> <p>2. USGS Minnesota: Federal and State program</p> <p>3. WDNR: Some of this is 319 funded and some of it may be covered by other funding sources</p> <p>4. BWSR: answered above</p> <p>5. MWBAC: none</p>
<p>VI. What do you feel the monitoring subcommittee should focus on?</p>
<p>1. USGS Rice Creek: Coordinating multiple agency wants and needs to develop a plan for long-term monitoring that best utilizes the resources and abilities of the Basin Team agencies. Use this multi-agency coordination to leverage funding for long-term monitoring.</p> <p>2. USGS Minnesota: focus first on the combined objectives of the various groups</p> <p>3. WDNR: collecting data that will allow us to accurately assess the health of our streams and rivers and provide information which can help guide our management activities</p> <p>4. BWSR: There is so much monitoring being done out there. BWSR would like to see a focused monitoring plan developed for the watershed that helps the local, state, and federal agencies determine what should be monitored and how often.</p> <p>The subcommittee should also be able to assist in interpretation of the results. This seems to be the most difficult for the locals.</p> <p>It may seem like the monitoring should only be done by the local units. I do think the state and federal agencies should continue monitoring, but they should work collectively with the local units. The local units seem to have a vested interest in the results because that steers implementation of their water plans.</p> <p>5. MWBAC: nutrients</p>

Progress on ISSUE STATEMENT 4: Public involvement and stewardship



One of the four goals of the St. Croix Basin Team is to increase public participation and knowledge in water quality management. In order to stimulate active early commitment to watershed management concepts and build public stewardship and support for the various basin planning processes, the cooperating agencies promoted involvement by volunteer groups and individuals in organized programs. Public and involvement and stewardship has been ongoing with the Basin Team since its inception in 1994. Officially, a Stewardship Subcommittee was created 2001 and directed it's attention in these areas:

- Obtaining funding for a Basin Team coordinator
- Developing a yearly Nutrient and Sediment Conference
- Volunteer monitoring on Lake St. Croix
- Developing Project NEMO at the local level
- Obtaining funding for a Stewardship Initiative
- Providing a liaison with other Basin Partnerships



- To create, implement, and coordinate a program that would: 1) integrate existing efforts, 2) support an expanded volunteer monitoring program, 3) develop a permanent organization of public involvement in water resource policies, and 4) support watershed management educational activities.
- Coordinate all management efforts in the Basin, including the local level, so that main stem goals are addressed as well as local water quality goals.

Recommendations

- Target funding opportunities
- Organize a group of participants to develop a program and create goals
- Develop a list of existing activities
- Further website development
- Develop a long term plan for a goal setting process

Activities and Accomplishments

1999

- In 1999 the Basin Team hired a full-time coordinator. Part of the responsibilities of the coordinator was to attend the meetings of other water resource groups and adopt a basin-wide communication strategy. In regards to Stewardship the efforts of the coordinator were initially directed towards the Nutrient Sediment Conference, acting as the liaison with other

and stewardship

partnerships, Project NEMO, and investigating the idea of a Stewardship Center for the St. Croix Basin. (Further information about coordinator funding is included in Chapter 4, Basin Team Coordinator Funding.) In 2002, due to funding shortfalls, the coordinator hours were reduced to part time.

- The activities during the first two years of the full-time coordinator included attending meetings with other Basin Partnerships, such as the PICKM (Pine, Isanti, Chisago, Kanabac, and Mille Lac counties in Minnesota) organization, Metro Watershed Partners (<http://cgee.hamline.edu/watershed/Partners/>), and the Wisconsin Partners. The reduction in coordinator hours could no longer fund these activities.
- In coordination with the Basin Team nutrient study, the MWBAC, and Metropolitan Council Environmental Services (MCES), the Basin Team coordinator developed a volunteer monitoring program in 1999 at six sites on Lake St. Croix. For four years, volunteers monitored physical and chemical variables to obtain descriptive statistics and recent trends in seasonal concentrations and observations, in conjunction with flow data. In addition to encouraging stewardship, the correlations of concentration data with observational data will be reviewed during the nutrient goal setting process in the Basin. Due to recent state agency budget cuts, the closing of the MWBAC, and cuts in coordinator funding, the volunteer monitoring has been put on hold for the 2003 season. MCES has been contributing the equipment, the laboratory support, and time. Volunteer monitoring on Lake St. Croix has provided important monitoring data and encouraged stewardship.

2000

- The Nutrient and Sediment Conference provides an opportunity to meet and visit with St. Croix Basin organizers, agency personnel, and others interested in protecting the St. Croix Basin. The day-long event includes presentations of what urban and agricultural facilities are doing to reduce nutrient and sediment loading. State agencies can provide information to the community. In addition to education and outreach, the conference provides an opportunity for input into the goal setting process for nutrient and sediment management (See Chapter 2, Issue Statement 1, Nutrients). The attendance by year is: 2003 with 91 attendees, 2002 with 125 attendees, 2001 with 141 attendees, and 2000 with 150 attendees. In 2003, the Nutrient and Sediment Conference was supported by a grant from the WDNR. The money was used to hire a coordinator for the conference. The University of Wisconsin Extension and the St. Croixwatershed Research Station contributed time and covered some of the expenses. These contributions offset the loss of the Minnesota-Wisconsin Boundary Area Commission (MWBAC) which had played a large role in the coordination of this conference.
- Project NEMO (Non-point Education for Municipal Officials), a program created by the University of Connecticut Extension, provides education on the importance of natural resource protection in local planning. The Basin Team hopes to use Project NEMO as one of its programs to encourage local input towards water quality protection of the St. Croix Basin. The St. Croix Basin Coordinator was the NEMO contact for the St. Croix Basin Team. She attended workshops on Project NEMO and coordinated the work to develop Project NEMO in Washington County. With the cuts in the coordinator funding Project NEMO no longer has a Basin Team contact. The Wisconsin St. Croix Basin Partners has gravitated towards Project NEMO in addition to volunteer stream monitoring. The Upper St. Croix Basin has received funding to pursue these issues on behalf of the Wisconsin Partners.

2001

- In partnership with the MWBAC, the Basin Team coordinator obtained funding in 2001 from the Challenge Cost Share Program with the National Park Service. Funding from this program allowed significant progress in education and stewardship for the St. Croix Basin. The following projects were completed by the Basin Team coordinator.

and stewardship

1. Education: An implementation plan was developed for the St. Croix Basin for Project NEMO and implementation begun. Washington County, the county with the largest population in the St. Croix Basin, had an introduction meeting to Project NEMO and a technical team was named for local presentations. Work began to present Project NEMO in Chisago County, Minnesota, with rollouts expected pending funding in other counties.
 2. Stewardship: Presentations were developed and are posted on the website scwatershed.org to provide education for interested citizens and organizations. A CD ROM with Power Point presentations on water resource protection was prepared. A meeting was held to investigate the need for an integrated watershed center and ideas were shared. Volunteer monitoring on St. Croix Lake, the sink for the St. Croix Basin watershed, continued. Results are being analyzed to assess the relationships between physical assessments and chlorophyll a concentrations for nutrient management decisions.
- In June of 2001, the Stewardship Committee met to discuss the possibility of a Stewardship Center housed at the Stillwater Visitors Center. Basin Plans recently completed state a need for a coordinated stewardship effort in the St. Croix Basin. Numerous activities are occurring, but are not always shared with other towns and organizations. Through coordination these local efforts could share their interests and knowledge, prevent overlap of efforts, and support a stronger stewardship role. The possibility of adult education center on water quality was discussed, possibly through community education programs, with the coordination done at the Stewardship Center. The Center could provide a vehicle to support, coordinate, and facilitate local outreach programs, such as volunteer monitoring, throughout the Basin. One of the tools of the Stewardship Center would be an enhanced scwatershed.org website (already established). Volunteers could share information, have questions answered, and find contacts for different activities. Other organizations could post events throughout the Basin. Leadership for public involvement and stewardship of the St. Croix Basin has come from the Minnesota Wisconsin Boundary Area Commission. With the closing of the MWBAC (2001), stewardship programs and Basin partnerships are in jeopardy. With the closing of Stillwater Visitors Center the fall of 2001, the MWBAC offices, and the cut in coordinator funding, the discussion for a Stewardship Center was put on hold.

Some of the work supported by the Stewardship Initiative is still on-going. The St. Croix Valley Scenic Corridor Coalition, a non-profit organization initially organized around cell tower challenges in the St. Croix Basin, have been focused on river protection and stewardship in the Upper St. Croix.

Progress on ISSUE STATEMENT 5: Resolve differences in water quality standards between the two states

Background

Stream classification systems by Minnesota and Wisconsin use the federal Clean Water Act for overall guidance. Both states use these classifications in their application of water quality standards and anti-degradation policies. Minnesota lists the St. Croix River and the Kettle River as Outstanding Resource Value Waters. Wisconsin classifies most of the St. Croix River and all of the Namekagon River as Outstanding Resource Waters; the outstanding portion of the St. Croix River extends from the flowage dam in Douglas County to the northern boundary of the St. Croix Falls city limits and from the STH 243 bridge at Osceola to the Hudson city limits. Two segments of the St. Croix River have less restrictive Exceptional Resource Water classifications in Wisconsin: St. Croix Falls to Osceola, and Hudson to the confluence with the Mississippi River. The Exceptional classification extends from the northern boundary of the St. Croix Falls city limits to a distance one mile below the SH 243 bridge at Osceloa. In addition to some differences in classification, the two states may use different criteria for maintaining "anti-degradation." These differences could lead to inconsistencies between the two states in protection of the St. Croix River.

The Basin Team created a subcommittee in 1996 to review current standards and how they are set by each state, and recommend ways to resolve differences for consistent protection of the resources. This subcommittee is referred to as the Standards Subcommittee and was chaired by the MWBAC as part of their mission of interstate coordination.

Outcome

- A common protection strategy between states which results in equal protection of the St. Croix mainstem

Recommendations

- Identify the differences in classification description
- Review all St. Croix River plans including local watershed regulations
- List differences in plans, potential conflicts in regards to WQ standards and antidegradation policies
- Develop a plan to address these differences
- Develop a strategy between states which results in equal protection of the St. Croix.

Activities and Accomplishments

2001

- **January 8, 2001:** The Standards Subcommittee met via conference call from the Hudson Town Hall to discuss the goal of resolving inconsistencies in the designation and standards between the two states regarding Outstanding or Exceptional Resource Value Waters in

certain segments of the Lower St. Croix River. The following preliminary agreements were reached:

- (1) The inconsistencies need to be resolved;
 - (2) They may not be resolvable through rule amendments that result in identical language or provisions in both states, but could be resolved by addressing the issue in terms of common water quality goals;
 - (3) Wisconsin DNR should be given time to engage in rule-making on performance standards this winter and spring;
 - (4) Time should be allowed for U. S. EPA to provide more guidance on federal nutrient management criteria this winter and spring;
 - (5) Both states should try to resolve the St. Croix inconsistencies in the context of a larger rule-making process that will be undertaken to meet new federal guidelines; and key personnel should meet on Tuesday, May 1, 2001 [later rescheduled to June 12] to move forward on the resolution process.
- **June 12th, 2001:** Decision makers from the WDNR, MPCA, and NPS met to discuss the difference in standards between the two states. Management from the WDNR was uncertain as to the history of the Basin Team and its role in decision making. A meeting was scheduled for July 24th so that all parties could review the Basin Planning Status Report that was nearing completion. This date was later cancelled and no further discussion has occurred. The WDNR wanted time to engage in rule-making on performance standards that had already begun in Wisconsin.

In the interim, Federal regulations concerning TMDLs (total maximum daily loads) and Phase II of the Clean Water Act would be implemented within both states. Discussions about the difference in standards between the states may be addressed in this direction.

The Minnesota-Wisconsin Boundary Area Commission has been the coordinator for this work between states. With the closing of the MWBAC discussion of this issue has not been continued. The coordination and functions provided by the MWBAC will be missed.

Chapter 4.0: Future Work Plan

Past Coordinator Funding

The Basin Team funded a full time coordinator for three years from 2000 – 2002. Part-time funding has been secured for 2003 – 2004. NPS, MCES, WDNR, MPCA, and MWBAC (now closed) have provided either monetary or in-kind contributions to the coordinator position. The following lists the tasks completed thus far by the Basin Team coordinator:

- Creation of a basin-wide water quality plan with a detailed Implementation Phase
- Organized and facilitated basin team meetings and subcommittee meetings
- Coordinated the volunteer monitoring program on Lake St. Croix; analysis of the data
- Created a Basin Team brochure and poster
- Developed a website for the Basin Team (no longer on-line)
- Coordinated the yearly Basin Team nutrient conference (this task has now been taken over by a Conference Coordinator).
- Assisted in writing funding proposals for project development, such as the 2001 Challenge Grant
- Served as liaison to other organizations serving the St. Croix Basin
- Initiated a pilot project for NEMO to be located in the St. Croix Basin
- Provided comment on public notices for the reissuance of NPDES permits

Current Funding 2003 - 2004

Current funding for January 2003 – July 2004 is provided by the MPCA and the MCES, with the NPS as a funding agent. The MPCA funding ended June 30, 2003. The following is a detailed description of the current coordinator work plan.

- Update the *St. Croix Basin Water Resource Planning Status Report 2001* with a Planning Status Report 2003,
- Facilitate the work on three top priority Issue Statements as defined in the Planning Status Report 2001 and determined by the respective subcommittees, and
- Incorporate the work of subcommittees into the Planning Status Report 2003.

The goal of the Planning Status Reports are to integrate into one unit a plan to protect and improve the quality of the surface and ground water resources of the St. Croix River Basin in Minnesota, Wisconsin, and Chippewa reservation land through coordinated planning and management. First completed in 2001, the status reports are intended for four uses: a) to direct water resource decision making, b) a source of information for funding opportunities, c) as a vehicle to create a unified plan between the two states of Wisconsin and Minnesota, and d) as an internal agency document. To keep this document useful, biennial updates need to be completed.

Future Direction of the St. Croix Basin Water Resources Planning Team

The Basin Team will continue with the activities as described in Issue Statements 1 – 5. In particular, focus needs to be directed towards completing the goal setting process for nutrient management and achieving uniform standards and classifications between the states. Minimally, uniform water resource goals between the states would be a useful first step. In addition, work will begin on Issue Statement 7, forecasting future changes in land and water resources.

St. Croix Basin Water Resources Planning Status Report 2003

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Appendix

Several of the signatory and participatory partners of the St. Croix Basin Water Resources Planning Team have written letters of support for the activities and accomplishments of the St. Croix Basin Team as described in the St. Croix Basin Water Resources Planning Status Report 2001. The appendix includes a copy of the letters written by the following agencies:

- Metropolitan Council Environmental Services
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- National Park Service
- Wisconsin Department of Natural Resources