St. Croix Basin Team recommended projects
Stillwater Bridge Mitigation Funds

Project title	Agency	Priority Ranking	Number of Votes	Funding Request
Lake St. Croix inflow monitoring at Stillwater, MN	USGS	1	18	$60,000
Nutrient loading from Wisconsin to Lake St. Croix	USGS	2	16	$123,442
Support for Basin Team Coordinator position	Science Museum of MN (SMM)	3	15	$40,000
Lake St. Croix continuous water quality monitoring	USGS	4	14	$41,558
The State of the Lake report (assessing Lake St. Croix)	Science Museum of MN (SMM)	5	13	$50,000
Watershed modeling of hydrologic impacts from increased urbanization	Science Museum of MN (SMM)	6	10	$55,000
LiDAR (funding approved by Basin Team) Amount to be taken from one of the six listed projects approved for funding.	St. Croix County	7	Basin Team Rep Voted Approval	30,000

St. Croix Basin Team Project Updates

Project Title	Purpose and Scope	Progress to Date
Lake St. Croix inflow monitoring at Stillwater, MN	An index-velocity gaging station was installed at Stillwater in September 2011 to provide direct estimates of discharge and nutrient loading to Lake St. Croix through 2013. We are requesting funds to continue index-velocity gaging at Stillwater for three additional years (2014-2016). Continuation of the index-velocity gage would provide more accurate discharge data for calculating phosphorus loads to Lake St. Croix than the current alternative of using dam releases at St. Croix Falls. Continuous direct estimates of mainstem discharge from the index-velocity gage are critical to current and future lake water quality modeling and management.	Not much to report - we don't have a signed agreement yet. Buzz has both detailed proposals as of last week. Jeff Ziegeweid will coordinate with him next week to make sure the funding moves through WI DNR. Status is as follows: The Stillwater gage is installed and collecting data, and communication upgrades are planned once ice is off the river. Plans are being made to deploy the water quality sondes in pools three and four in late May, after the spring runoff season. Sondes will be in the river through October 2014, collecting observations every 15 minutes.
Streamflow and nutrient load calculations for major Wisconsin tributaries to Lake St. Croix	The proposed work includes collecting samples for nutrients (total Phosphorus (P), dissolved P, Nitrate+Nitrite, Ammonia, Kjeldahl Nitrogen) and suspended solids during both base flow and storm-event conditions in order to compute daily nutrient and suspended solids loads when combined with continuous discharge data from the Willow and Kinnickinnic Rivers and daily flow estimates for the Apple River provided by the dam operator (checked by USGS staff). The requested funding would cover two (2) years of sampling and load computation, followed by one (1) year of funding to perform statistical analyses of the data and describe the results in a report.	We are just now getting the funding agreements in place, so at this point no project funds have been spent. Having said that, we are proceeding with the St Croix Tribs loading project as planned. Building upon phosphorus-only loading work we started in 2012 that was funded by USGS and the Wisconsin DNR, this year we have expanded our water sampling to include suspended sediment and nitrogen loading. This work continues at the Kinnickinnic River, Willow River, and Apple River where we have continuous record stream gages at the first two, while discharge is provided by Xcel Energy at Apple River. Baseflow water samples are collected one per month year-round at

		each site, and high water/storm samples will be collected this spring/summer/fall at all rivers. With the substantial snowpack we currently have in the Upper and Lower St Croix River Basin, we could have considerable high flow from runoff this spring. Next week I will begin the process of calculating phosphorus loads for the three rivers for the 2013 water year (Oct 1, 2012 - Sept 30, 2013). That process should be completed and through the USGS data review process in March, and the loads will be available after that. That should be everything at this point in time, and obviously as the spring approaches things will be getting busier!
Support for Basin Team Coordinator position	A primary goal identified in the St. Croix Basin Water Resources Planning Team's 2011 strategic plan was to support Basin Team activities to ensure effective operation of the Team and communication of its mission and goals including the goal to protect water quality of the St. Croix River and Lake St. Croix. The Team stressed the importance of continued funding for the Team's Coordinator Position which would provide interagency communication about relevant meetings, activities including modeling and monitoring, action items, and initiatives including Lake St. Croix TMDL Implementation, and to respond to public notices concerning projects or permits with the potential to degrade the water quality of Lake St. Croix including expected development in Western Wisconsin related to the new crossing.	**September - November 2013:** developed the agenda, secured a guest speaker, organized the annual river inspection tour, set up the meeting space and attended the Basin Team's quarterly meeting September 12; coordinated communication with Basin Team members through emails and phone calls; tracked the agenda and minutes of the Highway 64 Corridor Community Task Force (Stillwater Bridge Mitigation Projects); attended the Conference Planning meetings on September 17 and November 5, the Implementation Team meeting October 30, and the annual Research Rendezvous October 15; participated in conference calls; did background research on the Namekagon stream gage and Wood River sediment issue; reviewed the NPDES public notices for both states; and wrote a letter of appreciation on behalf of the

		Basin Team for a retiring USGS Staff member. **December 2013:** set up the meeting space and attended the quarterly meeting of the Basin Team December 12 and transcribed the minutes of the meeting; coordinated communications with Basin Team members through emails and phone calls; tracked the work of the Highway 64 Corridor Community Task Force; attended the Implementation Team meeting December 18; and reviewed the NPDES public notices for both states. **January 2014:** attended the Basin Team's Emerging Threats Subcommittee meeting 1/23/14, the Implementation Subcommittee meeting 1/29, the Monitoring Subcommittee meeting 1/30, and the Highway 64 Communities Stormwater and Wastewater Collaborative meeting 1/9; wrote a letter of support for an Aquatic Invasive Species grant proposal; transcribed the minutes of the 12/18/13 Implementation meeting; reviewed the annual conference brochure for editorial changes; reviewed the NPDES public notices for both states; reviewed the Ogilvie, MN wastewater treatment plant permit; and coordinated communications with Basin Team members through emails and phone calls. **February 2014:** attended the Basin Team's Implementation Subcommittee meeting 2/26 and the Highway 64 Communities Stormwater and Wastewater Collaborative meeting 2/13;

		transcribed the minutes of the 1/29 Implementation meeting; attended the St. Croix Forestry and Water Quality Conference 2/27 and moderated a session; reviewed the NPDES public notices for both states; and coordinated communications with Basin Team members through emails and phone calls. **Status of Agreement:** The WDNR and the Science Museum of Minnesota have a signed agreement covering the Coordinator's funding. The Science Museum serves as the fiscal agent and reimburses the Coordinator on a monthly basis. The WDNR has not yet reimbursed the Science Museum for the annual cost of the program, as of 3/7/14.
Lake St. Croix continuous water quality monitoring	Previous nutrient-loading models for Lake St Croix assumed that oxygen-rich environments were present throughout the lake. Recent monitoring has revealed periods of no oxygen (anoxia) in deep areas of Bayport, Troy Beach, Black Bass, and Kinnickinnic pools (Fig. 1). In 2012, these anoxic conditions produced significant nutrient releases from sediments in the lower three pools. A dynamic water-quality model that incorporates this internal nutrient loading and simulates algal responses is being developed. The proposed continuous monitoring of dissolved oxygen, temperature, and algal abundance in surface and deep waters in the two lower pools would provide data necessary for model validation.	Not much to report - we don't have a signed agreement yet. Buzz has both detailed proposals as of last week. Jeff Ziegeweid will coordinate with him next week to make sure the funding moves through WI DNR. Status is as follows: The Stillwater gage is installed and collecting data, and communication upgrades are planned once ice is off the river. Plans are being made to deploy the water quality sondes in pools three and four in late May, after the spring runoff season. Sondes will be in the river through October 2014, collecting observations every 15 minutes.

The State of the Lake report (assessing Lake St. Croix)	The "State of the Lake Report—Assessing Lake St. Croix" will entail a comprehensive analysis of the ecological status and trends of the lake since 1999. This effort will build upon an existing database that integrates water quality data from several monitoring agencies, while extending seasonal trend analyses of physical, chemical, and biological variables to several tributary and lake sites. With the guidance of the Basin Team's Monitoring and Assessment Committee, the State of the Lake Report will develop and standardize an assessment protocol that will serve as a template for a State of the Basin report.	The first task of this project will be the recalculation of historical flow estimates for the inflow and outflow of Lake St. Croix. Installation of USGS gages on the St. Croix River at Stillwater, MN (river mile 23.3) in 2011 and at Prescott, WI (river mile 0.3) in 2007 have enabled improved estimates of the relationship between those sites and the USGS gage site at St. Croix Falls, WI (river mile 52.0). Initial analysis, published in Magdalene et al. (2013), indicated 6% improved estimation overall, from 92% to 98% accuracy, and the need for an adjustment to the baseflow vs. stormflow relationship observed at St. Croix Falls. These efforts are expected to take six months, and will culminate in a 2014 USGS Scientific Investigation Report. The WDNR contract was received January 31, 2013 at the St. Croix Watershed Research Station, and has since been routed through the Science Museum of Minnesota administrative offices. The invoice for the first year's work will be billed as soon as possible, to enable Magdalene to begin work.
Watershed modeling of phosphorus reductions from agricultural best management practices	We will apply the Soil and Water Assessment Tool (SWAT) model of the St. Croix basin to target implementation of agricultural best management practices (BMPs) to help compensate for increased nutrient loads to Lake St. Croix from bridge-related development. These BMPs include, but are not restricted to, no-till cropping of corn and soybeans, vegetated filter strips, grassed waterways, and	With funding from the National Park Service, a SWAT model of the St. Croix was initially built with SWAT2009, which has been superseded by SWAT2012. Hence the initial model has been re-built and re-calibrated in SWAT2012. Model construction and calibration has been a joint effort between the St. Croix Watershed Research Station and Texas A&M University, one of the principal

	reduced soil-test phosphorus. Changes in phosphorus load from each model subbasin will be mapped to allow spatial targeting of implementation. Nonpoint sources are the largest contributors of phosphorus to Lake St. Croix, and reductions from agriculture will be necessary to achieve the existing Total Maximum Daily Load (TMDL) goals, especially in light complications due to bridge-related development.	architects of the SWAT model framework. The workplan for this project has been submitted to the Wisconsin Department of Natural Resources (WDNR) for review. Project initiation is awaiting contract execution and release of funding by the WDNR.
LiDAR mapping St. Croix county	St. Croix county has some of the most significant nutrient loading watersheds in the St. Croix Basin. LiDAR (Light Detection and Ranging) elevation data will increase the accuracy of watershed modeling results and improve phosphorous reduction strategies. LiDAR data would be a vital component and would serve as the basis for: stormwater planning, bluff land mitigation and restoration, surface modeling, land development, view shed analysis, and transportation mapping. LiDAR mapping would be made available to Federal, State and local agencies. LiDAR data would allow resource management agencies to efficiently plan, accurately model, and respond more quickly to resource management issues.	St. Croix County is complete with all the preliminary logistics of the LiDAR project. The money has been secured, the vendor has been chosen and the contracts signed. At this point we are waiting for spring to arrive and the conditions favorable for the flight to take place. The data collection will be leaf off conditions. Once the flight and photography is complete, we expect deliverables to St. Croix County by fall 2014.

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