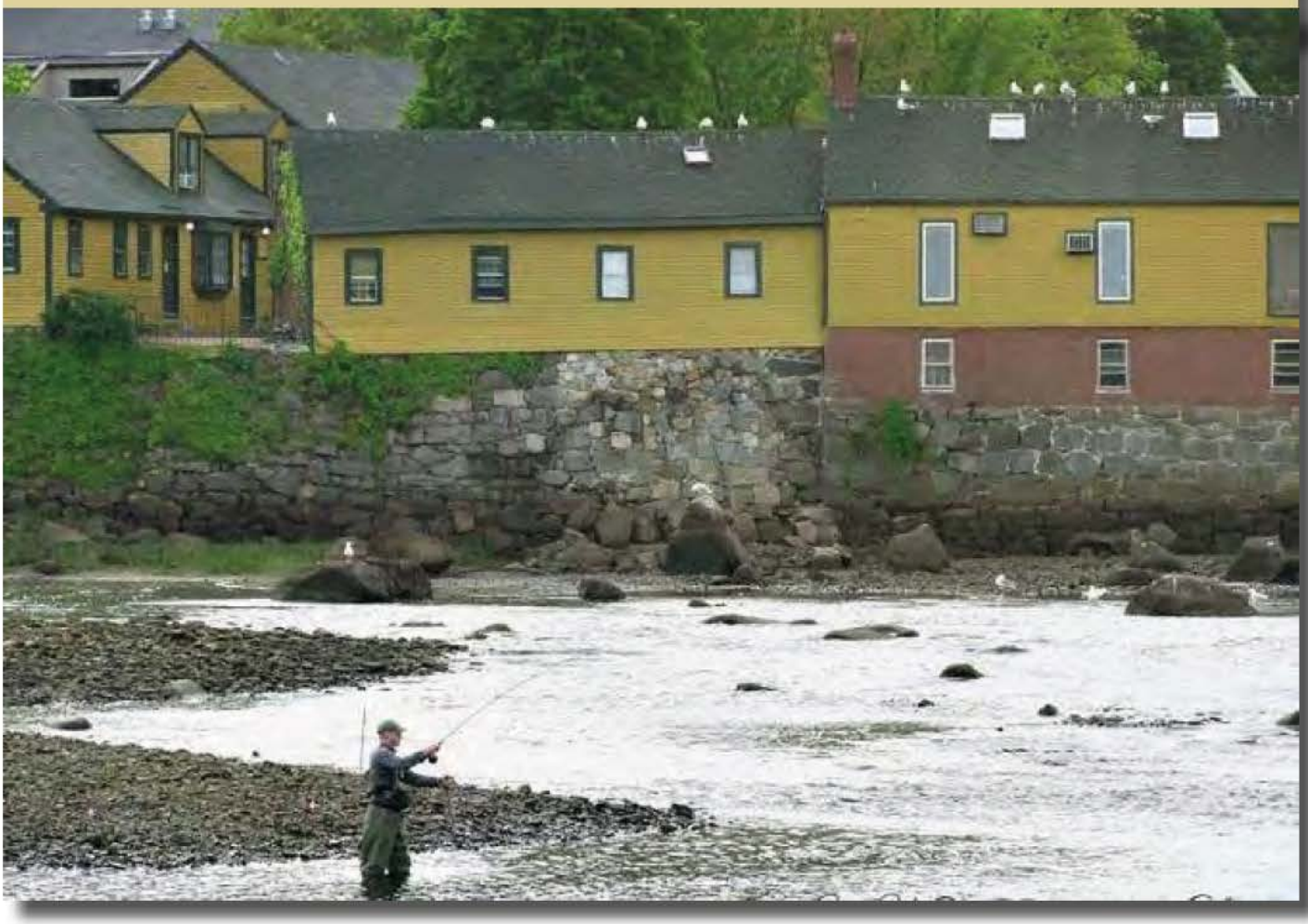
Nonpoint Source Management 2014 Annual Report



New Hampshire
Department of Environmental Services
June 2015

NHDES

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Nonpoint Source Management 2014 Annual Report

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June 2015

Front Cover: *Fisherman at Great Dam in Exeter.*

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New Hampshire's NPS Program At a Glance - 2014

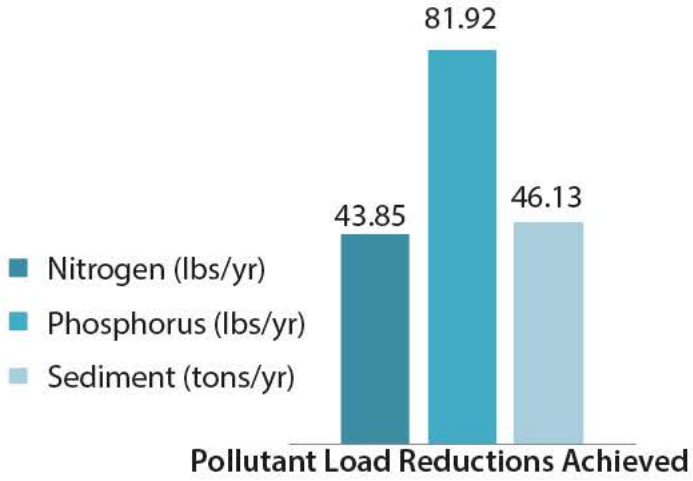
Projects Completed in FFY 2014

319 dollars invested: $507,121

Total cost (including match): $1,017,025

Base Projects: 4
- 1 Coastal Watershed
- 2 Merrimack Watershed
- 1 Statewide Initiative

Restoration Projects: 8
- 5 Coastal Watershed
- 1 Connecticut Watershed
- 2 Merrimack Watershed



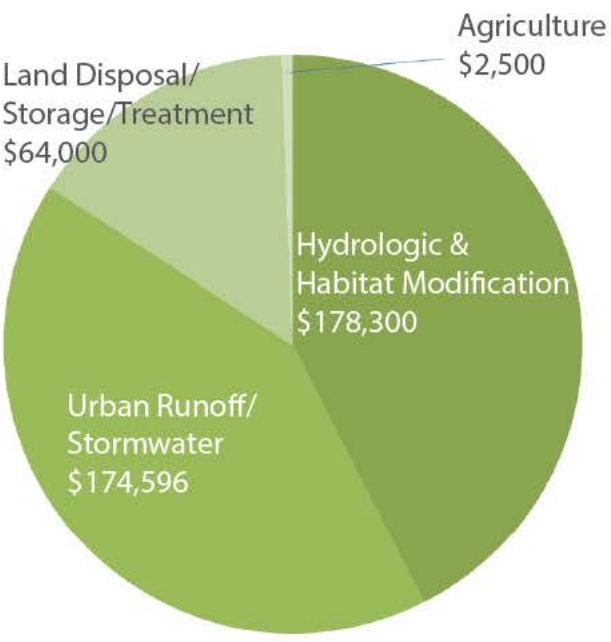
Projects Awarded in FFY 2014

319 dollars awarded: $419,396

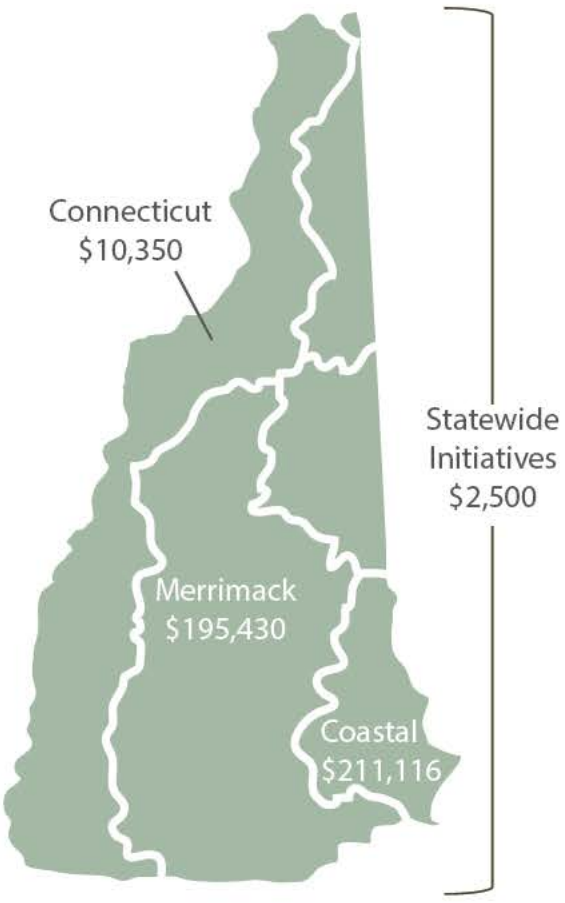
Program/Planning Projects: 2
- 1 Merrimack Watershed
- 1 Statewide Initiative

Implementation Projects: 7
- 4 Coastal Watershed
- 2 Merrimack Watershed
- 1 Connecticut Watershed

$ By NPS Category



$ By Watershed



Introduction

Reflecting in an annual report on a year of work with partners that number in the hundreds is always challenging. In 2014, the New Hampshire Nonpoint Source Program set the bar high, continued the launch of two major new programs, and made real progress addressing stormwater issues, particularly in the Great Bay watershed.

As required by the federal Clean Water Act, this report describes the activities and accomplishments achieved in New Hampshire to protect and restore waterbodies with funding appropriated under Section 319 of the Act during the time period October 1, 2013 thru September 30, 2014 (FFY 2014.) In FFY 2014, the New Hampshire Department of Environmental Services (NHDES) was awarded $1,150,387 by the U.S. Environmental Protection Agency (EPA), a 2% increase over the prior year. Funding was distributed via our Performance Partnership Grant and a separate categorical grant.

During the year, nine grants totaling $419,396 were awarded to watershed organizations and municipalities to develop and implement watershed-based plans. These partnerships are integral to the success of the New Hampshire Nonpoint Source Program.

Warren Brook in-stream restoration, Alstead, NH

The report also highlights the ten projects that were completed during FFY 2014 with the assistance of Section 319 funds awarded by NHDES to local organizations. Of special note are two projects in the Coastal Watershed: Phase 2 implementation of the Berry Brook Watershed Restoration Plan and Phase 2 implementation of the Cocheco River Watershed Restoration Plan which demonstrate how urban retrofits can be done almost anywhere in the urbanized seacoast; and, that it is possible to achieve seemingly unreachable goals. In Berry Brook, the effective impervious cover exceeded 30% prior to the project, which is significantly higher than the 10% target, above which aquatic life use support begins to deteriorate. Completed in 2014, the project disconnected more than 21 acres of impervious area, bringing the effective impervious area in the watershed down to 18% and making significant progress toward the 10% goal.

Developing watershed-based plans can be quite costly for watershed organizations and funding for plan development has become more limited under changes to Section 319 guidance in 2013. In spite of this, plans were completed in the Mad River (Farmington), McQuesten Brook, and Rust Pond watersheds. To provide more resources for watershed-based plan development, NHDES made such work a top priority for funding in the Section 604(b) water quality planning grants program RFP issued in 2014. In 2012, this biennial RFP resulted in a soon-to-be-released plan for Pearly Pond in Rindge; and in 2014, 604(b) will fund

two additional plans – one for the Mad River in Campton, and one for Pleasant Lake in Deerfield.

NHDES is pleased to report that in 2014, New Hampshire's updated Nonpoint Source Management Program Plan was approved by EPA. The Program Plan contains specific milestones over the next five years that cover six major NPS pollutant categories. Progress on these milestones will be reported to EPA as part of our NPS Management Annual Report.

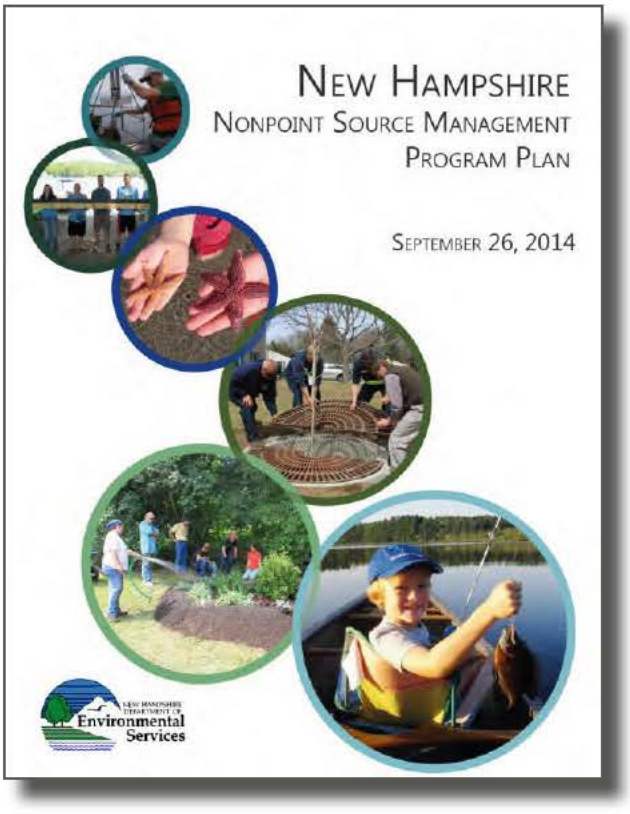
There is a lot to digest in this year's Annual Report, and much more is behind each and every highlight, particularly the contributions by watershed organizations, municipal officials and our state and federal agency partners. We cannot properly describe our gratitude to all of these people for the work they do on a daily basis, without which the progress described in this report could not have been made.

New Hampshire Nonpoint Source Section 319 Grant Expenditures thru 09/30/14*

Grant	Award Amount	Project Period	Expenditures	319 Project Obligations
C9-98132411-FY10	$754,295	3/1/10 – 9/30/15	$446,972	$302,041
C9-98132412-FY11	$752,940	8/22/11 – 9/30/16	$474,451	$238,299
C9-98132413-FY12	$449,356[1]	7/1/12 – 9/30/17	$331,563	$107,031
C9-98132414-FY13	$531,049	3/1/13 – 9/30/18	$122,663	$287,819
C9-98132415-FY14	$575,194	10/1/13 –9/30/18	$ 3,340	$496,363

[1]Reduction in outside projects in 319 grant was offset by increase in PPG funded projects
*Source NHDES Ledger System

Nonpoint Source Management Program Plan Approval



On September 30, 2014, EPA approved the New Hampshire Nonpoint Source Management Program Plan dated September 26, 2014. The updated plan reflects the input of over 450 stakeholders and serves as the Program's road map for communication, outreach, planning and implementation projects during years 2015 through 2019. The Program Plan establishes a schedule to complete specific, short-term objectives with measureable milestones that help in attaining long-term goals for protecting and restoring New Hampshire's waters and watersheds from NPS pollution. Progress on implementing these objectives will be reported annually.

New Hampshire's 2014 Nonpoint Source Management Program Plan can be viewed on the NHDES website at http://des.nh.gov/organization/divisions/water/wmb/was/nps-plan.htm.

Soak Up the Rain

The Soak Up the Rain (SOAK) program completed a successful field season in 2014. True to its name, the program and its partners literally soaked up nearly 115,000 gallons of stormwater, preventing an estimated 11,000 pounds of sediment, 3 pounds of phosphorus, and 6 pounds of nitrogen from washing into the state's lakes, streams and coastal waters.

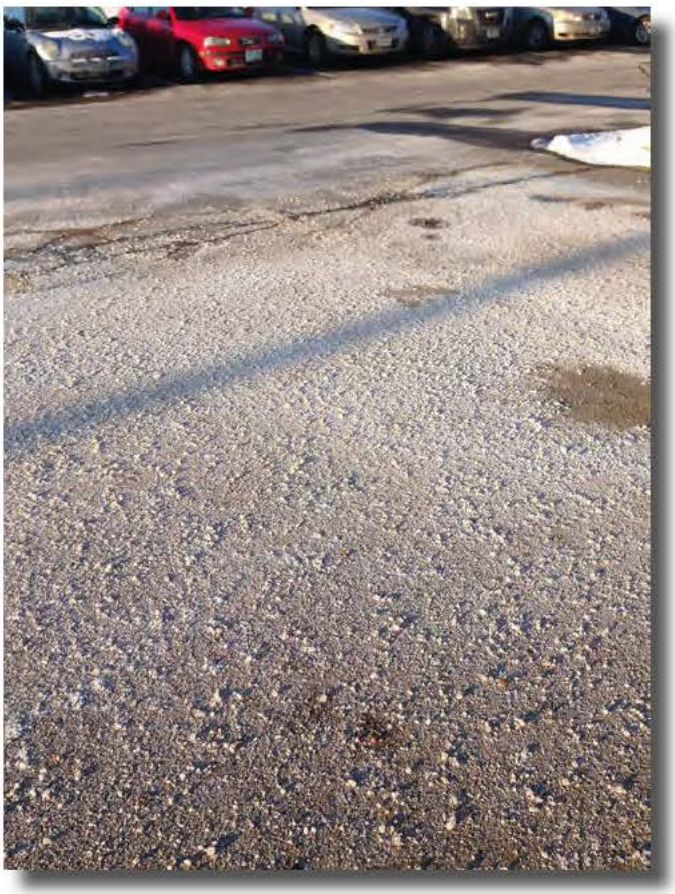
The SOAK program partnered with the Great Bay Stewards, Silver Lake Land Trust, Green Mountain Conservation Group, Massabesic Audubon and the Towns of Washington and Hampton to complete five projects, including the installation of water bars, infiltration trenches, dry wells and rain gardens. In addition, dozens of site visits were conducted in the Great Bay watershed and around the Silver Lake shoreline in Harrisville and Nelson to determine candidate sites for future projects.

In the spring, the SOAK program website and Soak NH Facebook page were launched. The website serves as a central location for program information and resources. As projects are completed, the website is updated with stories and photos. A rain barrel on the home page fills up as projects are installed and begin to soak up stormwater. A map shows the locations of installations. Since the launch in May, the website has had over 1,000 users and over 8,300 page views.

Campers at Camp Robin Hood on Lake Ossipee receive instructions from Jillian McCarthy and Lisa Loosigian, SOAK program staff before beginning installation of water bars and infiltration steps to address erosion problems.

In the summer, NHDES was awarded a Project of Special Merit grant from the National Oceanic and Atmospheric Administration (NOAA) to enhance the SOAK program in New Hampshire's coastal zone communities. The grant includes working with the Great Bay Stewards to develop a sustainability plan for their local program to help build organizational capacity, evaluate program barriers and successes, and develop strategies to solicit future program participation, partners and funding. The plan can serve as a resource for other communities and organizations considering starting a Soak Up the Rain program. The grant also includes working with UNH Cooperative Extension to develop a Soak Up the Rain training program for professional landscapers to learn how to incorporate water quality practices, such as rain garden and dry wells, into their landscaping services.

New Hampshire Launches First-in-the-Nation Commercial Salt Applicator Certification Program



DES hopes to reduce excess salt application, as in the photo above, through the "Green SnowPro" training and the Certified Applicator program.

The need for NHDES to look more closely at commercial contributions to road salt from winter parking lot applications at stores, businesses and schools arose from four impaired watersheds in the southern part of the state, along the Interstate 93 corridor, where salt reduction in the range of 25% to 45% is needed to meet water quality standards. Road salt, or sodium chloride, is toxic to aquatic life in fresh water when concentrations average 230 mg/l over a four-day period or 860 mg/l over a one-hour period. After a detailed study, NHDES found that as much as 50% of salt loading in impaired urban watersheds comes from commercial parking lots and driveways.

It is also known that chloride impairments are not limited to the I-93 corridor. Currently, there are 47 documented chloride impairments in New Hampshire. Since there is not sufficient chloride data to determine the impairment status of all waters, NHDES performed a statistical analysis of impaired watersheds to determine thresholds above which waters are likely to be impaired. Based on the analysis, a salt loading rate of 200 tons/square mile/year will likely cause violations of water quality standards at some time during the year. Analysis of land cover data showed that this threshold was likely to be met in watersheds where greater than 15% of the land cover is impervious. From this, it can be inferred that there are chloride impairments in New Hampshire that have not yet been documented with water quality data, and that these impairments are most likely in the southeastern portion of the state which is more highly urbanized. In less urbanized areas, chloride impairments are more likely to be found in the watersheds of smaller streams with limited dilution capacity and a high proportion of roads, driveways and parking lots.

Working with the New Hampshire Department of Transportation (NHDOT), EPA, and the Federal Highway Administration, the NHDES Nonpoint Source Program established the I-93 Salt Reduction Working Group in 2006. The work group included representatives from the towns of Derry, Londonderry, Salem, and Windham; two regional planning commissions; environmental groups; and private sector salt applicators. One of the first issues raised by both public and private sector winter maintenance professionals was the need to address liability concerns for commercial salt applicators. For many years, municipal public works departments and NHDOT have trained their employees on proper salt application, have adopted winter maintenance policies and been exempt from liability under state law if they follow those policies. However, this same level of protection did not exist for those operators who maintain commercial and institutional parking lots and driveways. Stakeholders felt that commercial applicators were induced to use more salt, rather than less, due to concerns over liability for slip and fall claims. NHDES heard this message and conveyed the details to the Legislature. This resulted in the passage of a commercial salt applicator certification program with limited liability protection for claims arising from winter conditions.

This first law of its kind in the nation became effective for the 2013/2014 winter, during which 230 commercial salt applicators became certified by NHDES. Certification requirements entail completing a full day "Green SnowPro" salt applicator training and passing an exam. The training is provided by the University of New Hampshire Technology Transfer Center. The goal of the training is to teach salt applicators how to maintain safe surfaces while using salt efficiently to avoid excess applications that can run off and pollute nearby water bodies. The course focuses on the chemical properties of salt, application rates and techniques, environmental impacts, and the proper calibration of equipment. Certified applicators are required to keep event-based records of salt use, which are kept for their own benefit in case of damage claims, and must report annually on salt use and pavement treated. Over time, NPS Program staff will use this data to measure the effectiveness of the program. In addition to protecting salt applicators, the new law also provides limited liability protection to property owners who hire certified salt applicators to maintain their parking lots. To date, 384 salt applicators have been certified through Green SnowPro.

In addition, the NHDES NPS Program identified Chlorides and Road Maintenance as a distinct chapter in the 2014 Nonpoint Source Management Program Plan. This chapter includes specific milestones associated with the new certification program and the development of watershed based plans in priority watersheds with known chloride impairments.

Education and Outreach

In 2014, NHDES was involved in numerous efforts with partners to educate others on nonpoint source pollution causes and impacts and to promote the Watershed Assistance Grants program.

BMPalooza Tour

In October, NHDES, and its Nonpoint Source project partners from four different watersheds, hosted representatives from EPA in the biennial BMPalooza Tour. Attendees were provided with an opportunity to inspect installed Best Management Practices (BMPs), discuss future implementation projects and, most importantly, meet our valued project partners who provided tours at the following project sites:

Cobbetts Pond, Cobbetts Pond Improvement Association – *attendees were provided with an overview of residential scale stormwater BMPs in the Cobbetts Pond watershed. Attendees inspect the Cobbetts Pond shoreline.*

Furnace Brook Watershed, Town of New Ipswich and FB Environmental - *attendees were shown several BMP installations in the Furnace Brook Watershed. Whitney Baker from FB Environmental describes a BMP that was installed along Appleton Road.*

Warren Brook Watershed, Town of Alstead, Cold River Local Advisory Committee and Headwaters Hydrology – *Post-flooding restoration work for Warren Brook that included a newly created floodplain, floodplain culvert and creative in-stream restoration features. Sean Sweeney from Headwaters Hydrology describes the work completed along a restored section of Warren Brook.*

Holt, Bowers and Harris Ponds, Pennichuck Corporation and Comprehensive Environmental, Inc. (CEI) – *A tour of BMP practices that are helping protect the drinking water supply for the Nashua area. CEI Engineer, Ben Lundsted, points out the improvements surrounding the water supply ponds on Pennichuck Brook.*

In addition to informing state and EPA staff on the details of highlighted projects, this biennial event provided recognition to project partners for all of the significant work they do. The attendees came away from the tour feeling energized, rejuvenated and highly encouraged by the tremendous successes achieved in New Hampshire watersheds through the strong partnerships forged with the Section 319 Watershed Assistance Grants program.

Natural Resources Outreach Coalition 2.0

In 2014, NHDES continued working with the Natural Resource Outreach Coalition (NROC), a collaboration of natural resource and planning professionals which assists coastal communities with protecting natural resources while accommodating growth. NROC's current approach provides tools for adapting to climate change and addressing the Great Bay nitrogen impairment. New efforts included using existing resources to provide hands-on responses to community requests for assistance. NHDES assisted with the general coordination of NROC efforts as well as provided assistance with special programs. This included the development of and presentation at a workshop for Newmarket town staff, boards and residents. NHDES presented on what it means to be a new MS4 municipality and how to prepare for the new permit requirements. NHDES and UNH Cooperative Extension staff also provided assistance to the Newington Conservation Commission to help them develop a proposal to apply for future Section 319 funding to reduce nitrogen impacts to Great Bay from septic systems.

MS4 Stormwater Coalitions

NHDES supported the MS4 Regional Stormwater Coalitions in Manchester, Nashua, and the Seacoast regions as they prepared for the release of the new MS4 permit. Scheduled meetings in all three regions provided an excellent opportunity to convey valuable stormwater and Section 319 grant-related information to a broad municipal audience. NHDES addressed numerous topics including the state revolving loan and grant funds, draft Nonpoint Source Management Plan, Soak up the Rain program, Green SnowPro program and voluntary salt application certification, Coastal Resilience Technical Assistance Grant, and the new law regarding nitrogen and phosphorus content in fertilizer.

NHDES staff instructs Goffstown employees and interns on how to use water quality monitoring equipment

In addition to providing information at the regional meetings, NHDES piloted a confirmation water quality monitoring approach for impaired waters in the town of Goffstown. The Volunteer Lake Assessment Program (VLAP) then provided instructions, recommendations and hands-on training in Goffstown, Derry, Amherst, Plaistow and Bedford. NHDES plans to conduct annual confirmation monitoring throughout the state, rotating through the HUC 12s over the next ten years.

General Events, Project Assistance, and Outreach Efforts

In addition to the above activities, DES provided general outreach assistance to grantees and participated in several events to educate the public on nonpoint source pollution and to promote Watershed Assistance Grants. These included:

- Speaking at the 2014 NH Water and Watershed Conference: Sustainability of New Hampshire's Water Resources, Plymouth State University;
- Providing a display at Discover Wild NH Day sponsored by NH Fish and Game;
- Hands-on activity with the Enviroscape watershed model at the Drinking Water Festival, Manchester Water Works, Milford Conservation Commission, and the Newmarket schools;
- Presentation on "Working with Government on Natural Resource Protection" and facilitating "The Watershed Game" at UNH Cooperative Extension and Great Bay Community College;
- Promoting the Soak up the Rain program at Science Café, Portsmouth Brewery; and
- Giving an hour long interview on Portsmouth Community Radio explaining how DES addresses stormwater through outreach and education.

UNH Cooperative Extension and NHDES facilitate the Watershed Game with Natural Resource Stewards class.

DES staff, Lisa Loosigian, describes the concept of stormwater runoff to children at Discover Wild NH day.

604(b) Water Quality Planning

The biennial RFP for Clean Water Act Section 604(b) projects was revamped in 2012 to better align with the Clean Water Act language, which requires funds to be allocated to regional planning entities for water quality planning activities including:

1. Identifying the most cost effective and locally acceptable facility and nonpoint source measures to meet and maintain water quality standards;
2. Developing an implementation plan to obtain State and local financial and regulatory commitments to implement water quality plans;
3. Determining the nature, extent and causes of water quality problems in the state; and
4. Determining those publicly owned treatment works which should be constructed, taking into account the relative degree of effluent reduction attained and the consideration of alternatives to such construction.

With the change in Section 319 guidelines limiting funding available for the development of watershed-based plans, NHDES prioritized number 2 above to better align our programs and support the development of watershed-based plans.

The biennial RFP for Clean Water Act Section 604(b) water quality planning projects was released in 2014. Two of the five projects selected will result in the development of watershed-based plans, while the other three funded projects will further water quality planning in the Great Bay watershed. See table below for a list of the specific projects and funding amounts.

Clean Water Act Section 604(b) water quality planning projects

Organization	Project Name	604(b) Funding Amount
Southern NH Planning Commission	Pleasant Lake Watershed Restoration Plan	$50,000
Rockingham Planning Commission	Regional Stormwater Tracking and Accounting Tool for Municipal AOC and MS4 Programs	$12,000
North Country Council	Mad River Fluvial Geomorphic Assessment and Restoration Plan	$30,000
Rockingham Planning Commission	Implementation of WQ Improvement Tasks in the Lamprey and Piscassic River Watersheds	$7,500
Strafford Regional Planning Commission	Septic System Database for Durham	$43,183
	Total FY14 and FY15	$141,883

Highlights and Overview of Completed Projects

Coastal Watershed

Berry Brook Watershed Restoration, Phase 2 - Low Impact Development retrofits in an Urban Environment

City of Dover

2007/2008/2010/ 2011 Restoration

Grant Amount: $172,315

Local Match: $235,440

Sediment Reduction: 6.82 tons/yr

Phosphorus Reduction: 49.7 lbs/yr

Nitrogen Reduction: 332.5 lbs/yr

Berry Brook Watershed Restoration, Phase 2 - Low Impact Development Retrofits in an Urban Environment

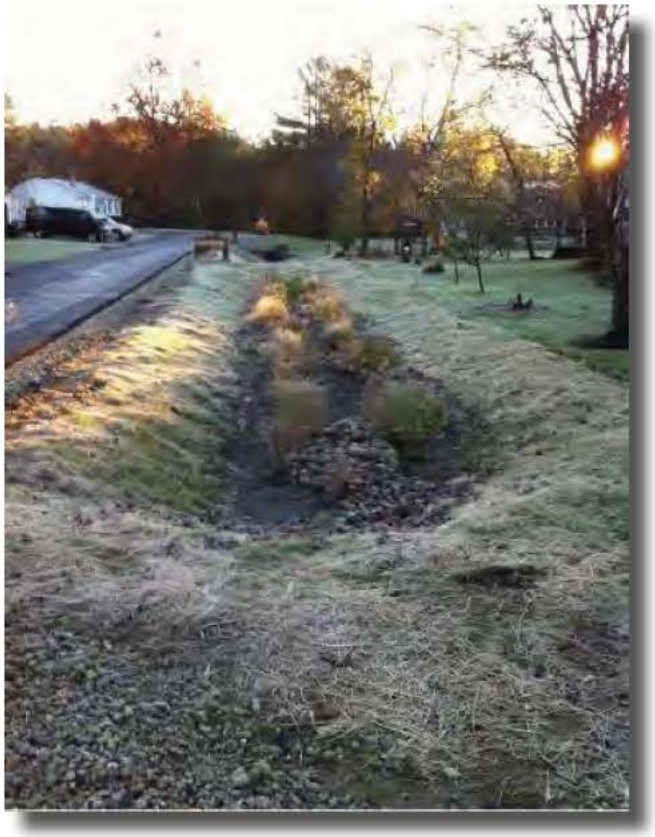
Project Background: For many years, Berry Brook, a tributary to the Cocheco River, located in the City of Dover, was neglected. Historically, portions of its headwaters were piped underground and in its lower reaches, stormwater runoff resulted in flooding and habitat loss. Committed to addressing these problems, the City of Dover completed the Berry Brook Watershed Management Plan in 2008. Restoration goals include stream continuity and habitat improvements, treatment of stormwater runoff to remove pollutants, and reduction of stormwater volume discharged to the brook. This project is the second phase of a multi-year effort to implement the Berry Brook Watershed Management Plan. Previously, in Phase 1, five stormwater BMP installations were implemented, leading to a reduction in 0.5 acres of impervious cover (IC). In addition to the City, project partners include the Cocheco River Watershed Coalition (CRWC), UNH Stormwater Center, NH Fish and Game and American Rivers.

Construction crews build a gravel wetland to treat nine acres of impervious cover in the Berry Brook headwaters.

Problem: The Berry Brook watershed is nearly built-out with 29.7% impervious cover. Berry Brook is listed on the state's 303(d) List as impaired for Aquatic Life Use and Primary Contact Recreation as a result of urbanization and stormwater runoff.

Project Objectives: In setting a restoration goal and measuring progress on the plan, the IC approach is being applied. Under this approach, IC disconnection goals are used as a surrogate for specific pollutant load-reduction targets. Disconnection of IC refers to the practice of directing runoff from IC such that it does not flow directly into the stormwater system, but instead is diverted to stormwater treatment practices where the runoff is filtered and infiltrated into the native soils. This management approach will decrease pollutant loads and stormwater volumes being discharged to the brook. The goal under the Berry Brook Watershed Management Plan is to reduce the overall IC to 10% or 18.6 acres. To achieve this, approximately 66% or 36.6 acres of the existing IC needs to be disconnected.

For Phase 2, project objectives included construction of Low Impact Development (LID) stormwater management strategies at several locations spanning almost the entire upper watershed. In addition to calculation of disconnected IC, verification of success will include pre- and post-BMP installation water quality monitoring for load reduction.



This bioretention unit uses natural processes to filter pollutants and infiltrate stormwater from road runoff.

Project Outcomes: Seven BMPs were constructed: five bioretention or bioswale systems, a subsurface gravel wetland, and a swale connecting to a surface wetland detention area. Combined, these installations effectively resulted in an IC reduction of 21.4 acres and reduced annual pollutant loading of sediment by 6.82 tons, phosphorous by 49.7 pounds and total nitrogen by 332.5 pounds. The project also involved significant outreach through volunteer planting days, brook cleanups, school programs and working with the Department of Public Works staff to illustrate the importance of LID in controlling water quality and quantity. Additionally, with funding from the NH Aquatic Resource Mitigation Fund, over one thousand feet of Berry Brook's headwaters were day-lighted, with stream flows released to a constructed, natural design stream channel.

Next Steps: The overall watershed IC is now 33.2 acres (17.8%). In order to reach the 10% IC goal, it is estimated that a further reduction of 14.7 acres is needed. Phase 3 of the project is currently underway with Section 319 FFY 2013 funds. It is anticipated that following the completion of Phase 3, the IC reduction target will be met and Berry Brook will be able to meet water quality standards, resulting in another Section 319 Nonpoint Source Success Story.

Coastal Watershed

Cocheco River Watershed Restoration, Phase 2 - Rochester LID

Cocheco River Watershed Coalition

2011 Restoration

Grant Amount: $51,500

Local Match: $35,240

Sediment Reduction: 0.07 tons/year

Phosphorus Reduction: 0.6 pounds/year

Nitrogen Reduction: 5.3 pounds/year

Cocheco River Watershed Restoration, Phase 2 - Rochester LID

Project Background: The Cocheco River - Willow Brook restoration work conducted through this project emerged from goals set in the 2006 Cocheco River Watershed Restoration & Implementation Plan that include:

- Restore Willow Brook to its natural stream functions;
- Reduce volume of stormwater discharge;
- Improve treatment of stormwater discharge to remove pollutants;
- Promote Low Impact Development (LID); and
- Education and assistance to encourage civic engagement to meet these goals.

Restoration of the impaired brook to meet New Hampshire water quality standards is the long-term goal for the Cocheco River - Willow Brook initiative. This was the second phase in a multi-phase project to achieve the goal. For this phase of the project, the Cocheco River Watershed Coalition (CRWC) partnered with the City of Rochester Department of Public Works (DPW) and the University of New Hampshire Stormwater Center (UNHSC) to identify and implement stormwater solutions to attain project goals.

Problem: The Cocheco River, part of the Piscataqua watershed, flows from northwest to southeast, diagonally across the City of Rochester. Willow Brook drains approximately one third of Rochester's land area and joins the Cocheco River downstream of the city. The 2,515 acre watershed of Willow Brook is densely developed with pockets of undeveloped wetland.

Rochester grew dramatically during the nineteenth century when manufacturing and textile mills lined the Cocheco River. As a result of an increasing population, densely developed residential neighborhoods grew around the mills. Along with the development, drainage systems were installed to carry away stormwater. The older systems used the "pipe it straight into the stream" approach, carrying with it polluted runoff. Since that time, the public has learned about the adverse impacts of stormwater runoff and Rochester city officials have realized that there are better ways to approach stormwater management that will reduce runoff and improve water quality.

Willow Brook is on the New Hampshire State 303(d) list as impaired for Aquatic Life Use (low dissolved oxygen) and Primary and Secondary Contact Recreation (bacteria). Its direct receiving water, the Cocheco River, is impaired for Aquatic Life Use and Primary Contact Recreation. Sources are listed as unknown, but are likely to be nonpoint source pollutants from stormwater runoff as a result of being a highly impervious urban watershed.

Project Objectives: The main project objectives include stormwater management through construction of innovative practices, public education, and progress toward city-wide adoption of LID stormwater management.

This project uses the IC method to address water quality impairments. The IC method uses impervious cover reduction as a surrogate for pollutant load reductions. The IC method is helpful in addressing stormwater impact in impaired streams where no specific pollutant can be identified as the cause of the impairment. The Willow Brook watershed encompasses 2,515 acres of mixed land use including residential, commercial and institutional. Impervious surfaces cover approximately 16% of the watershed or 402 acres. The overall restoration goal for Willow Brook is to reduce the watershed IC to 10% or 252 acres. To reach this goal, a reduction of 150 acres of IC is needed.

Lori Chase (on left), CRWC, and volunteers install plantings for the Congress Street bioretention area.

Project Outcomes: The results of this project built on successes achieved during Phase 1. The following three LID stormwater best management practices were installed on residential, municipal and institutional properties. Construction design and oversight was provided by the UNHSC.

- **Residential**: In order to demonstrate stormwater management in an urban residential setting, two bioretention systems were installed to treat runoff at a duplex residence on a small lot built by Southeast NH Habitat for Humanity, two city blocks from Willow Brook. The UNHSC developed the plans and provided construction oversight. The new homeowners chose the plantings and volunteers helped build and plant the BMPs.

- **Municipal**: The City DPW retrofitted an old municipal parking lot located two hundred yards from the Cocheco River at the intersection of Charles, Congress and Portland Streets to drain into a bioretention system. The site is highly visible as this broad intersection borders an urban residential neighborhood and the central business district.

- **Institutional**: An additional opportunity arose to demonstrate LID in an institutional setting. Two 550-gallon cisterns were installed at the Monarch School of New England, a private school for significantly disabled children, on Eastern Avenue that had recently installed other BMPs to protect Willow Brook. The school provided new rain gutters and diverters. Existing gardens, greenhouse and drip irrigation connect readily to the systems.

Education events were held, including a residential rain garden workshop at a local garden center and a presentation of the Piscataqua Region Estuaries Project, 2013 State of Our Estuaries report. To encourage commitment to ongoing and future implementation of LID BMPs, the project partners prepared and distributed an attractive LID technical memo. The purpose and opportunities of the stormwater initiative were presented in a 4-page graphic brochure with clear understandable language for residents at all levels of community decision-making. There have been many individual tours of the site by key community members, the crowning of which being local resident and U.S Congresswoman, Carol Shea Porter. This project resulted in the disconnection of an additional 0.30 acres of IC, bringing the total to date to 1.1 acres, with 148.9 acres remaining.

Coastal Watershed

Exeter River - Evaluating the Impacts of Dam Removal for the Great Dam

Town of Exeter

2008/2010 Restoration

Grant Amount: $69,500

Local Match: $82,956

Exeter River - Evaluating the Impacts of Dam Removal for the Great Dam

Project Background: The lower Exeter River from the Great Dam and upstream 7.5 miles has been listed on the state's 303(d) list since 2006 as impaired for Aquatic Life Use due to low dissolved oxygen levels. A previous Section 319 project, 2009 Exeter River Geomorphic Assessment and Watershed-Based Plan, identified the Great Dam as a potential contributor to water quality impairments upstream of the dam. A recommendation was made to evaluate dam removal as a way to improve water quality as well as fish passage. In addition to concerns related to the water quality impairment, the Great Dam does not meet state dam safety standards. As a result of these issues, the Town of Exeter, which owns and operates the dam, received this grant, along with funding from the Gulf of Maine Council on the Marine Environment through NOAA, to evaluate the impacts of dam removal and alternative actions.

Problem: The Lower Exeter River is impaired for Aquatic Life Use due to low dissolved oxygen and dam safety issues.

Project Objectives: To evaluate the potential impacts of dam removal, and other alternatives, to water quality, safety, fish passage, historic resources, recreation, sediment transport, adjacent infrastructure and other related issues.

Project Outcomes: This project included significant public participation from many local stakeholders including municipal officials, local volunteers, representatives from state and federal agencies, consulting engineers and natural resource professionals, local businesses, and residents. The project resulted in the creation of the Exeter River Great Dam Removal Feasibility and Impact Study (Feasibility Study). In addition to complete dam removal, the Feasibility Study looked at eight alternatives. The results demonstrated that full dam removal would result in improved flushing rates and lower residence times in the river which would likely improve dissolved oxygen levels upstream of the dam. The study also found that removal of the dam would benefit migratory fish populations by allowing unimpeded passage of fish going upstream to spawn. The town of Exeter will take the results of this study and work with the project partners to develop and implement a process for making a decision about the dam's future.

Great Dam in Exeter.

Mad River Restoration, Phase I - Implementation of Preliminary Assessment and Conceptual Restoration Plan

Project Background: A 2009 evaluation by the Cocheco River Watershed Coalition and Headwaters Hydrology titled "Preliminary Assessment and Conceptual River Restoration Plans for the Mad River between NH Route 11 and Tappan Street" (the Assessment) documented that the Mad River at this location is experiencing severe geomorphic instability due to hydromodification. This instability in the river corridor is resulting in mass bank failures, high powered erosive river flows, property damage and destruction of aquatic habitat. According to the assessment, the river has experienced direct and indirect human impacts including channel dredging and straightening, removal of riparian vegetation, construction of riverbank revetments, flow constrictions and impediments to aquatic organism passage (the last two issues are the result of an abandoned water main across the river). The Town of Farmington is partnering with the Cocheco River Watershed Coalition and local landowners to address issues identified in the assessment. This project implements the first phase, Design and Permitting, of the assessment's recommendations. Another Section 319 grant funded project to complete Phase 2 construction is underway.

Bank erosion at the Mad River Restoration Site in the vicinity of St. Peter Church, Farmington

Problem: The project site is located just west of the Tappan Street Bridge in the vicinity of St. Peter Church where there is significant erosion along 250 feet of riverbank. The erosion causes sediment loading to the river during high flows and bank loss at the site threatens safety and private property.

Coastal Watershed

Mad River Restoration, Phase I - Implementation of Preliminary Assessment and Conceptual Restoration Plan

Town of Farmington

2012/2013 Restoration

Grant Amount: $22,280

Local Match: $0
*total required match will be obtained from over-match of other projects

Stormwater runoff from the church parking lot exacerbates the bank erosion as it flows unmanaged over the paved surfaces and down the unstable embankment.

Additionally, aquatic organism passage and river flow are compromised at this site as a result of an abandoned municipal water main. The water main is exposed on the riverbed and is encased in concrete. The pipe and concrete control the riverbed elevation and have created an artificial pool with backwater extending about 150 feet upstream during low flow conditions. The low flow water level drops approximately 22 inches from the pool above the water main to a scour pool immediately below the water main. The height of this drop likely prevents the passage of most Eastern Brook Trout, especially the smaller size classes. Further, backwater created by the water main may be contributing to bedload deposition along the right bank above the crossing where a gravel point bar has formed.

Project Objectives: The goal of the project is to restore and stabilize approximately 250 feet of severely eroding river bank and remove a fish passage and river flow barrier from the river (an abandoned water main). Two phases are planned: This project implements Phase 1 - design and permitting. Phase 2 will implement restoration construction at the site including stabilization of the riverbank at St. Peter Church, stormwater management for the church parking lot, and removal of the abandoned water main.

Project Outcomes: The project outcomes for Phase 1 have been met which include the development of construction ready designs, approval of NHDES Wetlands permit, landowner permissions and selection of a consulting and engineer team of Headwaters Hydrology, LLC and Pathways Consulting, LLC.

Middle Exeter River Watershed Management Plan Implementation, Phase I - Rowell Road West

Project Background: The Brentwood Conservation Commission and the Rockingham County Conservation District teamed up to partner on a water quality improvement project along the Exeter River. This project targeted two site specific restoration actions that were identified in the Exeter River Geomorphic Assessment and Watershed-Based Plan: Middle Exeter River (2010) to address stormwater runoff.

Problem: Rowell Road-West runs along the Exeter River. The unpaved, public road had become over-widened due to road management practices, recreational access, and public parking patterns. Impacts to the river from the road and unmanaged foot traffic to the river, included bank erosion and damage, sediment inputs from erosion and concentrated stormwater runoff at opposite ends of the unpaved road.

Project Objectives: The main goal of this project was to reduce sediment loads to the river, thereby improving the aquatic habitat and water quality for this reach of the Exeter River that is popular with anglers and other recreationalists.

To achieve this goal, the project focused on the following objectives:

- Reduce stormwater runoff from the road;
- Prevent riverbank erosion by providing focused river access;
- Stabilize severely eroding riverbank; and
- Conduct outreach to landowners.

Volunteers install 300 plantings to stabilize 75 feet of the eroding riverbank.

Coastal Watershed

Middle Exeter River Watershed Management Plan Implementat, Phase I - Rowell Road West

Town of Brentwood

2008/2009/2010 Restoration

Grant Amount: $49,152

Local Match: $48,481

Phosphorus Reduction: 11.2 pounds/year

Nitrogen Reduction: 45.62 pounds/year

Sediment Reduction: 8.67 tons/year

Project Outcomes: With labor from the Brentwood Department of Public Works as well as volunteers, the following accomplishments were achieved:

- Installation of vegetated treatment swales, a stormwater treatment wetland and improved stormwater collection including two catch basins;
- Installation of a grassed filter strip and buffer plantings along approximately 700 feet of the shoulder of Rowell Road;
- Repairs and stabilization to damaged portions of the riverbank;
- Repairs to culverts;
- Construction of a canoe launch with infiltration stairs for foot traffic; and
- Distribution of approximately 1,500 educational brochures. The brochures, titled Help Our River: Save Our Bay, provided practical measures for residents to reduce nutrient loads in stormwater runoff.

The town was also able to secure a conservation easement under a separate grant to ensure connectivity of the riparian buffer as well as to protect the project improvements.

Hodgson Brook Watershed Restoration, Phase 2 - Pease Tradeport Retrofit Survey and BMPs

Project Background: This project is the second phase of implementation for a multi-year restoration approach to reduce impervious cover (IC) in the Hodgson Brook watershed. Because of the highly urbanized nature of the watershed and the number of impairments, IC reduction is being used as a surrogate for individual pollutant load reduction goals. During Phase 1, IC was delineated and quantified and an IC reduction goal was set at ten percent for the lower portion of the watershed. It is anticipated that once the IC goal is met, the brook will meet water quality standards. IC reduction in the Upper Hodgson Brook watershed will be looked at in future phases of the project.

Phase 2 builds on highly successful first round implementation efforts where local partnerships were established and multiple BMPs were installed to disconnect IC in the Coakley Road area. For this project, IC reduction efforts targeted the Pannaway Manor section of the lower watershed. Additionally, because the brook is also impaired for chloride, efforts were made to identify and implement local approaches for achieving chloride reductions.

Problem: Hodgson Brook is a seven-mile stream that flows through the heart of Portsmouth. Impervious surfaces cover 32% of the total watershed area. Stormwater flows across these surfaces, picking up sediment and pollutants, which then discharge directly into Hodgson Brook. This has led to high levels of pollutants and sediments and increased streamflows in the

Volunteers install a residential rain garden to treat roof and driveway runoff in the Pannaway Manor neighborhood in Portsmouth

Coastal Watershed

Hodgson Brook Watershed Restoration, Phase 2 - Pease Tradeport Retrofit Survey and BMPs

Blue Ocean Society for Marine Conservation

2009/2010 Restoration

Grant Amount: $104,574

Local Match: $87,826

Phosphorus Reduction: 3.44 pounds/year

Nitrogen Reduction: 28.85 pounds/year

Sediment Reduction: 1.7 tons/year

brook. As a result, the brook was listed on the NHDES 2008 305(b)/303(d) Surface Water Quality Assessment as failing to meet the Aquatic Life Designated Use (benthic macroinvertebrates and dissolved oxygen), Secondary Contact Recreation (pathogens—E.coli) and chloride.

Project Objectives: The main project objective is to manage stormwater and reduce effective IC by promoting understanding and capacity building and implementing best management practices to reduce stormwater flows and contaminated runoff to Hodgson Brook.

Impervious Cover (IC) Target (acres)	
Hodgson Brook - Lower Watershed	649.9
Impervious Cover Beginning	183.4
10% IC Target	65.0
Total IC to be Reduced	118.4

Project Outcomes:

- Installation of three bioretention units to treat road and parking lot runoff. Provided training in residential rain garden design and construction. Installed five residential rain gardens in the Pannaway Manor neighborhood and distributed 74 rain barrels. As a result of these activities, IC was reduced by 2.09 acres;
- Trained over 35 winter maintenance professionals in salt application BMP methods through the Green SnoPro program;
- Conducted outreach through radio interviews, newspaper articles and press events;
- Held eight Hodgson Brook Advisory Board meetings to develop strategies for future projects;
- Held two trash day cleanups in and around the brook;
- Developed a stormwater flow approach to promote better understanding of existing stormwater management and identified locations for future BMP installations;
- Continued Volunteer River Assessment Monitoring to measure in-stream conditions;
- Used tracking spreadsheet to quantify IC and pollutant load reductions; and
- Communicated project results to stakeholders including the City of Portsmouth, Pease Development Authority and University of New Hampshire.

Lower Warren Brook Restoration, Phase 2 - Design, Permitting, and Bidding

Project Background: On October 9, 2005, heavy rain caused water and mobile debris carried within Warren Brook to build up behind culverts under Route 123 until it washed away Cooper Hill Road, sending a destructive wall of water downstream into Alstead and the Cold River. Seven people died in the flooding and several homes and other buildings were swept into the raging waters. The emergency repairs and stabilization of Warren Brook in 2006 under the NRCS Emergency Watershed Protection Program only included the reshaping of the channel and lining the banks with riprap. The stabilization work completed by NRCS did not reduce the degree of channel incision, nor did it reconnect Warren Brook with its floodplains as recommended in the 2007 Restoration Master Plan for the Cold River, Warren Brook, and Bowers Brook (Restoration Plan.) In 2010, an approximately 900-foot section of Warren Brook was restored using natural channel design techniques recommended in the Restoration Plan. Phase 2 is to continue with restoration efforts in the watershed.

Problem: The Lower Warren Brook project reach has experienced significant bank erosion, channel incision, and a nearly complete disconnection from floodplain habitat, resulting in significant threats to property, stream quality and the biota that exist within the brook. Warren Book fails to support the Aquatic Life Designated Use due to hydromodification changes that occurred as a result of the 2005 flooding and the emergency repair methods that were constructed. Another negative impact to Warren Brook, resulting from the catastrophic flooding in 2005, was the rapid incision and straightening of the channel that effectively shortened the

Connecticut River Watershed

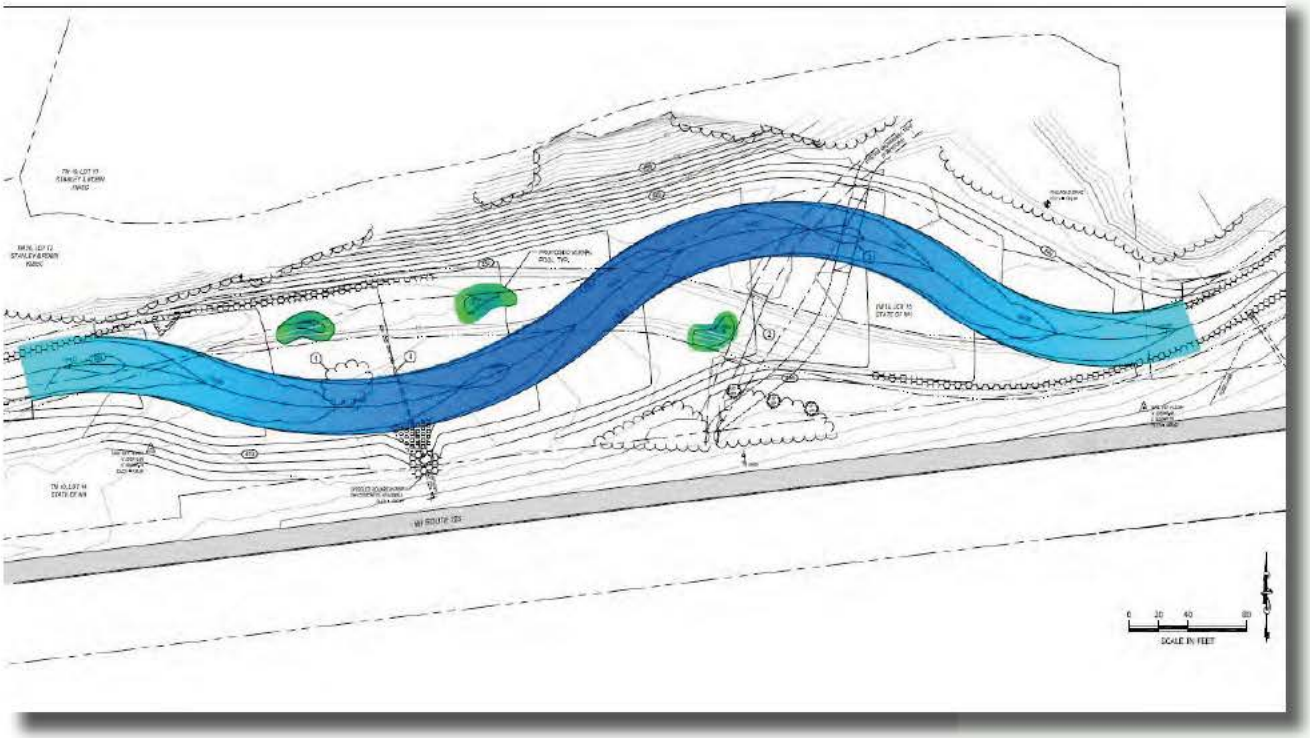
Lower Warren Brook Restoration, Phase 2 - Design, Permitting, and Bidding

Town of Alstead

2008 Restoration

Grant Amount: $20,000 (original award $87,400)

Local Match: $20,970



Lower Warren Brook Restoration Project Design illustrating the former, straightened channel overlaid with the proposed, longer, and more meandering stream channel (blue) with floodplain and vernal pools (green).

length of Warren Brook and increased its slope. This has caused the channel of Warren Brook to carry more sediment, trigger bank erosion from what were once stable and well vegetated stream banks, and has eliminated the ability of the brook to deposit sediment upon its floodplains due to the lack of meanders or bends.

Project Objectives: The ultimate goal in implementing the Restoration Plan is to restore form and function to Warren Brook with access to floodplain. The continuing erosion, channel widening and encroachment through private properties threatens safety and the structural integrity of adjacent businesses and homes. The objectives and associated tasks for this project entailed design and permitting (data review, landowner coordination, wetland delineation, hydraulic modeling and construction design), bidding, construction, oversight and reporting for the Lower Warren Brook reach identified in the Restoration Plan.

Project Outcomes: After approval of this project in 2012, a significant rainfall event occurred in June of the following year. Approximately six inches of rain fell in five hours which resulted in flash flooding and damage to the previously restored section of the brook. The flooding in 2013 triggered channel incision and floodplain scour and revealed a buried concrete structure (old dam) within the project area that the Restoration Plan had not taken into account. The discovery of this structure resulted in elevated construction bids that were beyond the available budget secured by project partners. As a result, this project needed to be redesigned to incorporate removal of the buried dam remnants.

Headwaters Hydrology, professional land and water resources consultant, was selected by the Town of Alstead to manage the project. The tasks of existing data review, landowner coordination, wetland delineation, field survey, base map creation, hydraulic modeling, final designs and construction plan preparations, permitting, bidding and drafting of contract documents have all been completed to date. Permission letters from the two private land owners within the project area have also been secured and the New Hampshire legislature passed Senate Bill 57 in the 2013 session which specifically approves the project on the state-owned properties in the project area.

Although this project was closed, prior to completion, the $20,000 expended under this phase funded all of the project tasks, except for actual construction. The unspent balance will be applied toward a future Section 319 grant that will restore long-term stability and high quality aquatic and riparian habitats by realigning 810 linear feet of the brook to a meandering channel, constructing terraces bordering the brook, installing rock and wood in-stream structures, removing riprap and planting willow and dogwood live stakes. The floodplain habitat will also be diversified through the creation of vernal pools where the former channel existed. Project partners expect that within five to ten years after construction has been completed, visitors to this restored reach of Warren Brook will not be able to distinguish this restored reach from an undisturbed stream habitat in New Hampshire. The NHDES Watershed Assistance Section looks forward to the construction phase of this project and our continued partnership with the Town of Alstead, the Local River Advisory Committee and Headwaters Hydrology.

Lake Winnipesaukee Watershed Management Plan Phase I - Center Harbor

Merrimack River Watershed

Lake Winnipesaukee Watershed Management Plan Phase I - Center Harbor

Lakes Region Planning Commission

2010 Restoration
2011 PPG Base

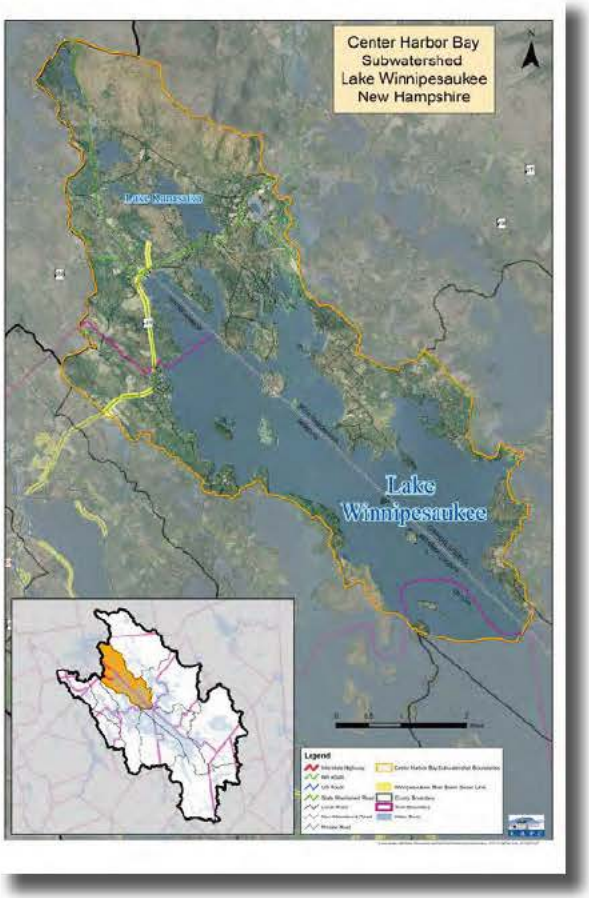
Grant Amount: $55,000 (project incomplete - $15,300 spent)

Local Match: $18,891

Project Background: The completion of a watershed management plan for the Center Harbor Bay subwatershed is an essential next step in the process of creating a public, web-based watershed management plan for Lake Winnipesaukee. Following the completion of the subwatershed management plan for Meredith, Paugus and Saunders Bays in the fall of 2010, Center Harbor was the next subwatershed targeted for development of a watershed management plan.

Problem: Center Harbor shares the declining trend in water quality as a result of in-lake phosphorus concentrations, similar to those in all of Lake Winnipesaukee, that have increased from a summer median value of 4.9 ppb to 6.0 ppb over the last 25 years. Specific nonpoint source pollutants of concern in the Center Harbor Bay subwatershed are associated with stormwater runoff and the sediments and nutrients transported with it. Sources for these pollutants have been identified by local officials and watershed stakeholders as local and state roads, commercial and residential properties, application of fertilizers, sand and salt during the winter months, and aging septic systems along First Neck and NH Route 25.

Project Objectives: As with all Watershed Assistance Grant projects, it takes a dedicated, organized and consistent grant recipient and/or project team to develop and implement a watershed-based plan. At the time of entering into this agreement, the Lakes Region Planning Commission had committed to the project schedule and secured a commitment from the Lake Winnipesaukee Watershed Association for the technical support required for watershed modeling, water quality goal setting and assimilative capacity determinations. The following ten objectives, and 31 associated tasks, were committed to as part of this grant project:



Map of Center Harbor subwatershed.

1. Site Specific Project Plan development and approval;

2. Tier 2 high quality water criteria attainment determination for Center

Harbor;

3. Establish water quality goal for phosphorus within Center Harbor;
4. Identify current and future pollution sources;
5. Estimate pollution reductions needed to maintain the water quality goal under projected future build-out;
6. Determine actions needed to reduce pollution source loads in order to maintain the water quality goal;
7. Post Center Harbor Watershed Management Plan at www.winnipesaukeegateway.org;
8. Provide opportunities for participatory involvement for watershed residents as plan is developed;
9. Education and outreach of watershed stakeholders; and
10. Project administration and reporting.

Project Outcomes: Unfortunately, just under half of the 31 tasks were completed between 2011 and 2014. Significant and timely progress was made at the outset of the project once the Grant Agreement was approved and the following outcomes were achieved:

1. Approved Site Specific Project Plan;
2. Calculation of the current water quality criteria for phosphorus and Tier 2 confirmation;
3. A water quality goal for phosphorus was developed and approved by the water quality advisory and project steering committees;
4. STEPL modeling results and modeling report for Center Harbor Bay Subwatershed; and
5. Various outreach efforts including a riparian buffer workshop, expansion of the Wi-CAN network blog and integration of the residential runoff tool on www.winnipesaukeegateway.org.

However, the momentum achieved during the first year slowed over time due to personnel changes, resignations of key team members at critical junctures, and the eventual absence of a project manager.

In 2013, an extension of the project end date from December 31, 2013 to December 31, 2014 was granted in order to provide new staff time to get acquainted with the project and the scope of work yet to be completed. In February, 2014 and shortly after the STEPL modeling report was delivered by the Lake Winnipesaukee Watershed Association (LWWA), the new project manager at the LRPC resigned. One month later, a key technical project member resigned from the LWWA Board of Directors and the project team. With that resignation, the ability to conduct the on-the-ground survey work for BMP identification and prioritization was lost. Concurrent with this setback, the Director of the LRPC retired and, with that, support for completing remaining tasks dissolved. In April 2014, NHDES closed out the project with $39,700 of the grant award unspent.

Although this project did not deliver the results anticipated, it did complete a large portion of the water quality criteria determination, goal setting and STEPL modeling required for the development of a watershed-based plan. Future efforts to develop a plan for Center Harbor will benefit greatly from these work products and NHDES looks forward to an opportunity to collaborate on this effort in the future.

McQuesten Brook Watershed Restoration Phase 1, Geomorphic Assessment and Development of Restoration Plan

Merrimack River Watershed

McQuesten Brook Watershed Restoration Phase I, Geomorphic Assessment and Development of Restoration Plan

New Hampshire Rivers Council

2011 Restoration

Grant Amount: $17,000

Local Match: $46,031

Project Background: The McQuesten Brook headwaters emerge from a culvert under South Main Street in Manchester. The waters then merge with the outlet of McQuesten Pond before flowing under Second Street, Eastman Ave, and Wathen Road in the Town of Bedford, eventually emptying into the Merrimack River. McQuesten Brook represents a unique water resource located within a highly-developed watershed. Despite more than a third of the 563-acre watershed being covered with impervious surfaces, the brook's base flow conditions and favorable in-stream temperatures have sustained a robust population of rare eastern native brook trout.

Recognizing the importance of this unique urban natural resource, the New Hampshire Rivers Council (NHRC) engaged partners and sought financial support to protect and restore the McQuesten Brook watershed. This project completed the first phase by conducting a geomorphic assessment of the brook and developing a Watershed Restoration Plan. The plan will serve as the guide for future protection and restoration efforts. In addition to a Section 319 grant, funding was provided by the New Hampshire Fish and Game Department, the New Hampshire Rivers Council and the Samuel P. Hunt Foundation.

Problem: McQuesten Brook is on the list of impaired waters for failing to meet the designated uses of aquatic life support due to low dissolved oxygen concentration and saturation, and elevated concentrations of Chlorides. McQuesten Pond, a dammed tributary to McQuesten Brook, has low dissolved oxygen levels, elevated concentrations of Chlorophyll-a and is listed as impaired for failure to meet the designated uses of Aquatic Life and Primary Contact Recreation.

McQuesten Brook, Manchester faces various threats to aquatic life, including undersized culverts and unregistered dams.

McQuesten Brook and its eastern native brook trout population face several significant challenges including:

- Warm stormwater runoff and pollutants from the surrounding impervious surfaces that contribute to low dissolved oxygen levels in the brook;
- Multiple roadway crossings, undersized culverts and stream constrictions affecting aquatic species movement through the watershed; and
- Several dams that promote warm waters and serve as barriers to fish.

Project Objectives: Restore the McQuesten Brook watershed to a healthy and fully-functioning system capable of supporting aquatic life, including the eastern native brook trout, while providing floodwater storage and recreational uses. Creating a geomorphic assessment and watershed restoration plan for McQuesten Brook is a major stepping stone for achieving that goal.

McQuesten Pond and one of the three unregistered dams slated for removal and subsequent stream restoration.

Project Outcomes: One of the first steps that NHRC took was to create a steering committee comprised of multiple interests in the watershed. Known as the "McTeam," its initial members included the NHRC, NHDES, New Hampshire Fish and Game Department, Manchester Urban Ponds Restoration Program, City of Manchester, Town of Bedford, River Network, Trout Unlimited Merrimack Valley Chapter, Manchester Fly Fishers Association, business owners and private residents. Through the combination of efforts put forth by the project stakeholder team, along with the technical expertise provided by Comprehensive Environmental Inc. (CEI) and Headwaters Hydrology, the McQuesten Brook Geomorphic Assessment and Watershed Restoration Plan was published in October 2013. The plan can be viewed and downloaded here: http://nhrivers.org/mcquesten-brook/.

Volunteers show off the results of their efforts following the annual McQuesten Brook Cleanup Day.

The completed "a-i" plan identifies the actions and resources needed to restore the brook and lays out a foundation for obtaining future grant funds to complete the work. Other phases of the project utilizing Section 319 funding are already underway, including culvert replacements (project number RI-14-M-06) and dam removals (project number RI-13-M-03). Subsequent phases of watershed restoration plan implementation will focus on reduction and/or disconnection of impervious cover, installation of stormwater BMPs and continued education and outreach.

Success to date has been a result of the partnership's approach of beginning implementation while in the planning process. Annual watershed cleanup days have created visibility and public awareness, which have begun to foster a sense of community. Since its inception, the McTeam has expanded to include Anheuser-Busch and Ducks Unlimited. Working in a hidden urban watershed area can be challenging. Many people were not aware of the Brook's existence or did not perceive its value. NHRC has worked to build awareness and will continue to do so through social media, e-newsletters, meetings, door-to-door campaigns, cleanup days and other public events. The McTeam believes that when the stream barriers are removed and the culverts project is completed, there will be more physical evidence of progress in the area and that future phases of the plan's implementation will begin with more citizen and business support ultimately generating another Nonpoint Source Success Story.

Rust Pond, North Inlet and Route 28 Boat Launch, Phase I - Watershed Management Plan and Stormwater BMPs

Merrimack River Watershed

Rust Pond, North Inlet and Route 28 Boat Launch, Phase I - Watershed Management Plan and Stormwater BMPs

Rust Pond Association

2010 Restoration

Grant Amount: $50,000

Local Match: $37,995

TSS Reduction: 0.43 tons/yr

Project Background: Rust Pond is a 210-acre waterbody located in Wolfeboro. The pond's 1,651-acre watershed is situated in portions of Wolfeboro and New Durham. The Rust Pond Association has been an active participant in the New Hampshire Volunteer Lake Assessment Program (VLAP) for many years. Sediment loads from the North Inlet subwatershed have reduced water depths at the north end of the pond to the point where recreational use of some docks has become either impossible or significantly impaired. In 2007, NHDES completed the Rust Pond and Watershed Diagnostic Study (Study) to assess in-lake conditions and watershed characteristics influencing water quality trends within the pond.

Problem: The Study identified two locations, the North Inlet and the Route 28 boat launch, as contributors of excess sediment to the pond. Sediment loads from North Inlet subwatershed have reduced water depths at the north end of the pond to the point where recreational use for navigation of surface waters has become impaired, which resulted in the placement of Rust Pond on the 2012 303(d) List. The Study determined that the primary factors causing the impairment were sediment loads from land uses, channel erosion and incision from upstream hydromodification, and associated streambank destabilization. The sediment delta at this location is estimated to contain 740 to 1,100 cubic yards of deposited material that has been transported into the pond from North Inlet. As a result of the bank instability and incision that is ongoing within North Inlet, the rate of deposition within Rust Pond in recent years is estimated to be two orders of magnitude greater than what would be expected under current land use conditions. In addition, runoff from Route 28 onto the unstabilized boat launch surface results in additional erosion and sediment to the pond.

Project Objectives: Provide subwatershed assessments for the North Inlet and the Route 28 boat launch. Outline necessary actions to reduce impacts of hydromodification including reducing sediment loading, and stormwater runoff rates and volumes to acceptable levels so that Rust Pond can be used for secondary contact recreation and is removed from the impaired waterbody list.

Project Outcomes: The subwatershed-based plan developed by Geosyntec, and titled North Inlet and Route 28 Boat Launch Subwatershed Assessment, included modeled sediment loading budgets under several watershed development scenarios. The model also estimated additional sediment loads due to erosion in portions of the North Inlet tributary streambank itself.

Based upon the modeling results, a water quality goal for North Inlet of Rust Pond was determined by the consulting team and the project stakeholders, including NHDES, the Rust Pond Association and the Town of Wolfeboro. The water quality goal established for sediment loading in North Inlet is to maintain the current loading estimate of 10.0 tons/year. This goal assumes

that projected sediment loading increases due to future development will be prevented or offset via the implementation of recommended stormwater BMPs outlined in the subwatershed-based plan.

Conceptual designs and supporting hydrologic calculations were developed for selected BMP options in the North Inlet subwatershed. These BMPs were designed with sediment load reductions in mind and stormwater infiltration that would reduce the flashy nature of runoff directed into the North Inlet tributary. Property owner permission for construction of several stormwater management BMPs could not be obtained in time to allow for permitting and construction within the grant timeframe. As a result, the Town and NHDES agreed that final design, permitting and construction would focus on stabilization of the eroding portion of the North Inlet streambank and the removal of an abandoned beaver dam that had exacerbated lateral migration of the channel and accelerated erosion of the outside bank. Construction in this area was successfully completed in November, 2013 by the Town of Wolfeboro Department of Public Works. This is predicted to create equilibrium over time within the North Inlet tributary relative to sediment transport, stream flows and channel dimension.

Beginning Construction at North Inlet tributary to Rust Pond.

Public education and outreach activities associated with this project included the development of an educational brochure and a Field Guide to the Aquatic Plants of Rust Pond. In addition, a public workshop was held to present the watershed-based plan and information relative to siting, designing and installation of Low Impact Development techniques for residential properties.

The ultimate measure of success and long-term goal for Rust Pond and North Inlet will be verification that the sediment loading goal is being met, and that the North Inlet tributary is functioning in a manner appropriate to existing land use conditions within the watershed as a result of the implementation of recommended BMPs. Once verified, project partners will seek additional funding to assist with the dredging of the sediment delta within North Inlet, and thus return the pond to conditions that fully support recreational boating.

Lake Wentworth and Crescent Lake Watershed Management Plan

Merrimack River Watershed

Lake Wentworth and Crescent Lake Watershed Management Plan

Town of Wolfeboro

2009/2011 PPG Base

Grant Amount: $67,800

Local Match: $73,907

Project Background: The Lake Wentworth and Crescent Lake watershed is located in the towns of Wolfeboro (86.1%), Brookfield (11.3%), Ossipee (0.3%) and New Durham (2.3%). The watershed is over 35 square miles with fourteen streams draining directly into Lake Wentworth. These tributaries account for 76% of the water entering the lake, which means that land use and other factors impacting the health of the tributaries are critical to the overall water quality of Lake Wentworth and ultimately Crescent Lake. Yearly water quality monitoring by the Lakes Lay Monitoring Program, as well as private testing, have documented declining water quality trends for chlorophyll-a , increasing total phosphorus concentrations, and decreasing transparency.

The idea to develop a watershed based plan was initiated in 2009 by two members of the Lake Wentworth Foundation who saw the need to develop a scientifically-based plan to protect these lakes for future generations. Since then, many enthusiastic individuals and organizations have stepped up to support this effort through the formation of a steering committee and an active outreach campaign. Participants include the Town of Wolfeboro, Lake Wentworth Association, University of New Hampshire, and the Lake Wentworth Foundation (LWF).

Problem: Over the past several years, there has been an increase in the amount of algae in both Lake Wentworth and Crescent Lake, and low levels of oxygen at depths greater than 40 feet. Threats to water quality include excess sediment and nutrients from existing and future development, aging septic systems, and stormwater runoff from roads throughout the watershed, and general lack of environmental awareness.

Project Objectives: The primary goal of the project is to develop a comprehensive management plan for the watershed of Lake Wentworth and Crescent Lake. The final watershed plan explores the connection between identified threats in the watershed and signs of stress in the lakes. The plan includes:

- Quantified primary sources of phosphorus loading using existing data and a watershed and lake response model;
- Prioritized sources for further action;

A door-to-door septic survey was conducted in 2011. (photo credit : FB Environmental)

- An educational effort to make property owners and lake users aware of the sources and consequences of non-point source pollution;
- Preliminary BMP designs to address sources;
- Review of planning and zoning ordinances with an eye towards water quality protection; and,
- Methods for tracking progress during implementation of the plan recommendations.

Project Outcomes: A comprehensive watershed plan has been created with short and long-term goals for improving the water quality of Lake Wentworth and Crescent Lake over the next ten years (2013-2023). The long-term goal is to protect the water quality of Lake Wentworth and Crescent Lake through a 15% reduction in median in-lake total phosphorus (TP). The plan provides a roadmap for improving the water quality of Lake Wentworth and Crescent Lake, and provides a mechanism for acquiring grants and other funding to pay for the actions needed to achieve the water quality goal. In addition, it sets the stage for ongoing dialogue among key stakeholders in many facets of the community, and promotes coordinated municipal land use changes to address stormwater runoff. The success of this plan is dependent upon on-going leadership, group commitment, and a concerted effort of volunteers.

Looking Ahead

At the time of writing this report, the longtime supervisor of the Watershed Assistance Section, Eric Williams, has left New Hampshire to start a new journey with the State of Oregon Watershed Enhancement Board. After over 20 years managing New Hampshire's Nonpoint Source Program, Eric's guidance, ingenuity, and friendship will be greatly missed. We anticipate that 2015 will be a year of transition as the program settles in to new leadership; however, the 2014 Nonpoint Source Management Program Plan articulates well the specific actions, outcomes, and measurable results we will be working on over the next five years.

We look forward to a greatly expanded Soak Up the Rain program, with a presence in more watersheds and many more homeowners engaged in stormwater management as part of a broader recognition that sustainability begins at home. During the off-season, the SOAK program will be working on program and process improvements as well as designs for new project installations scheduled for the spring of 2015.

Pollutant tracking and accounting will take center stage in the Great Bay watershed as we work with communities to find common methods to measure change, both increases and decreases, to pollutant loading over time. With more attention on wastewater and stormwater discharge permits, there will continue to be a need to document and account for changes in pollutant loading from nonpoint sources as well.

New Hampshire's revised MS4 permit is likely to become effective in 2015, further incenting municipalities to invest in green infrastructure. The multiple benefits of pollutant load reduction, flood prevention and aesthetic improvement will become clearer. The Nonpoint Source Program will continue to provide leadership through assistance to municipal stormwater coalitions, implementing demonstration projects through the Great Bay Municipal Bioretention Program, aka "Biopalooza," and methodically implementing watershed-based plans, such as the one for Berry Brook in Dover.

The NHDES Watershed Assistance Section staff pause for a photo during their last strategy meeting with Eric.

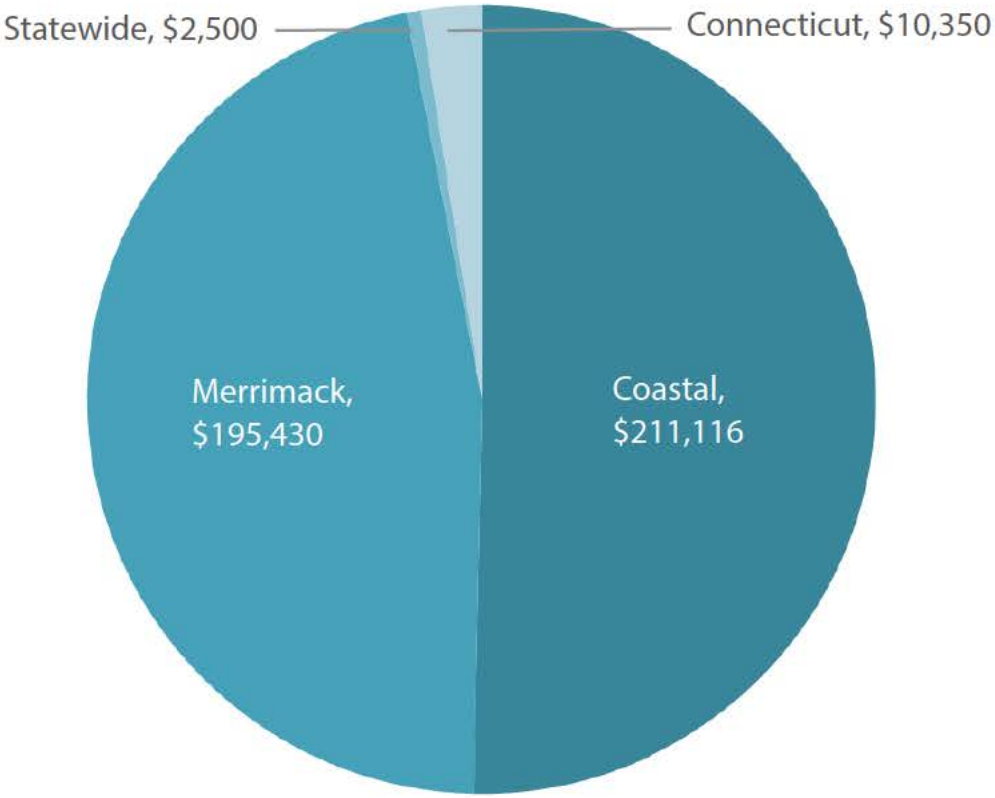
In 2015, it is expected that Berry Brook will have the distinction of being the first urban watershed in the state to reduce effective impervious cover from around 30% to below 10%. With further documentation of water quality improvement, we expect another New Hampshire watershed restoration success story. Similar progress in urban watershed restoration has been made and will continue in the Cobbetts Pond and Nutt Pond watersheds, both of which are showing water quality improvement as a result of sustained, long-term BMP implementation.

More progress toward addressing chloride impairments will be made through the Green SnowPro program by continuing efforts to boost the professional status of salt applicators through training, certifications, annual symposia and extended outreach to local Chambers of Commerce and businesses. Finally, we will continue to address hydromodification impairments through barrier removal projects as well as geomorphic restoration projects along New Hampshire's rivers.

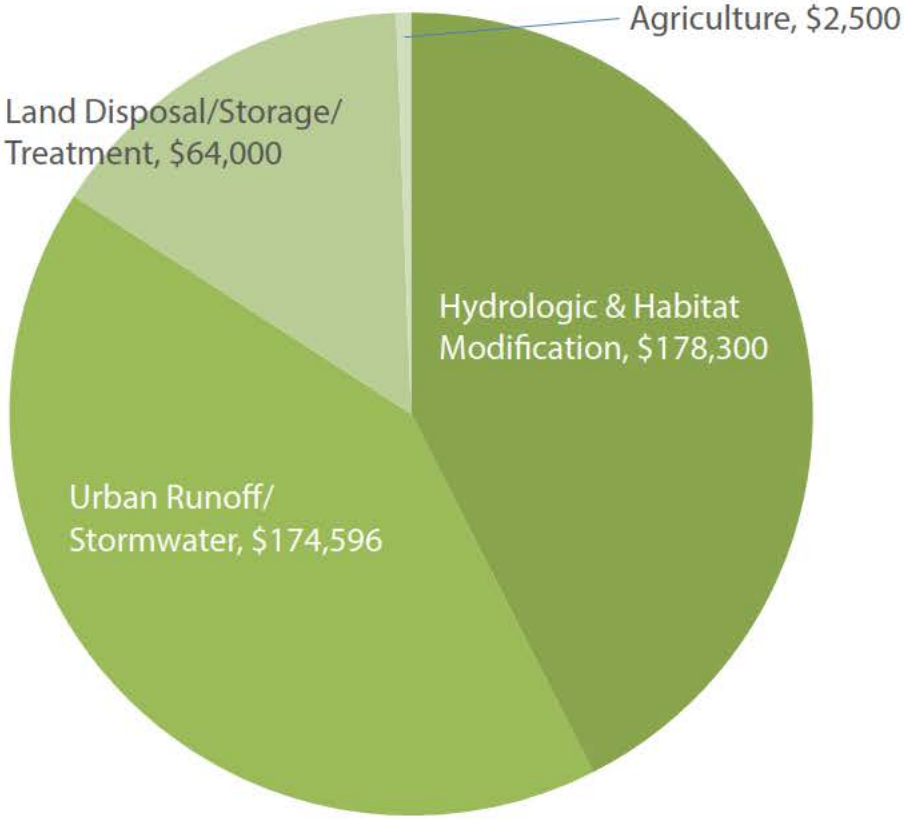
Appendix A. DES Section 319 Watershed Assistance Grants Awarded in FFY 2014

DES Section 319 Watershed Assistance Grants Awarded in FFY 2014						
Grantee	Project Name	Project No.	NPS Category	Watershed	Source of Funds (FFY)	Grant Award
Town of Farmington	Mad River Restoration, Phase 2	HI-13-C-06	Hydro-modification	Coastal	2014 Sec. 319 Project Implementation	$38,500
University of New Hampshire	Updating the Best Management Practices for Biosolids Applications	P-14-SW-12	Agriculture	Statewide	2014 Sec. 319 Program	$2,500
Silver Lake Land Trust	Silver Lake Watershed Management Plan Implementation, Phase 2, Soak up the Rain Silver Lake	HI-14-CT-11	Urban Runoff/ Stormwater	Connecticut	2014 Sec. 319 Program	$10,350
Lake Winnipesaukee Watershed Association	Moultonborough Bay Inlet Watershed Restoration Plan Development and Phase 1 Implementation	RP-14-M-04	Urban Runoff/ Stormwater	Merrimack	2014 Sec 319 Program/2010 Sec. 319 Restoration	$55,630
Belknap County Conservation District	Gunstock Brook MPSB Watershed Management Plan Implementation, Phase 1, Geomorphology-based restoration at Route 11B	RI-14-M-08	Hydro-modification	Merrimack	2014 Sec. 319 Project Implementation	$69,800
Rockingham Country Conservation District	Great Bay Watershed Management Plan Implementation, Phase 1, Permeable Reactive Barrier Demonstration Project	RI-14-C-09	On-Site Wastewater Treatment	Coastal	2014 Sec. 319 Project Implementation	$64,000
UNH - Office of Sponsored Research	Great Bay Waterbody/ Watershed Nonpoint Source Study, Phase 1, UNH BMPs to Reduce Nitrogen	RI-14-C-05	Urban Runoff/ Stormwater	Coastal	2014 Sec. 319 Project Implementation	$93,616
New Hampshire Rivers Council	McQuesten Brook Geomorphic and Watershed Restoration Plan, Phase 3, Culvert Replacement and Removal.	RI-14-M-06	Hydro-modification	Merrimack	2010 Sec. 319 Restoration	$70,000
Great Bay Stewards, Inc.	Soak up the Rain Great Bay	RI-14-C-10	Urban Runoff/ Stormwater	Coastal	2014 Sec. 319 Project Implementation	$15,000
					Total Awarded:	$419,396

Appendix B. Distribution of Section 319 Grant Dollars Awarded in FFY 2014 by Watershed



Appendix C. Distribution of Section 319 Grant Dollars Awarded in FFY 2014 by NPS Category



Appendix D. DES Section 319 Projects Completed in FFY 2014

DES Section 319 Projects Completed in FFY 2014							
Grantee	Project Name	FFY Source of Funds	Grant #	Date Completed	Watershed	319 Funds	Total Cost Inc. Match
UNH Stormwater Center	On-Call Consulting Engineers for small-scale BMP designs	2010 Incremental	B-11-OC-01	7/24/2014	Statewide	$25,000	$25,000
Town of Wolfeboro	Rust Pond Watershed Mgt. Plan Implementation, Phase 1	2010 Incremental	R-10-M-07	7/9/2014	Merrimack	$50,000	$87,995
Town of Farmington	Mad River Restoration - Phase 1	2012/2013 Incremental	HI-13-C-05	7/2/2014	Coastal	$22,280	$22,280
Lakes Region Planning Commission	Lake Winnipesaukee Watershed Mgt. Plan - Center Harbor (project terminated before completion)	2010/2011 Incremental and Base	B-11-M-02	4/17/2014	Merrimack	$15,300	$34,191
NH Rivers Council	McQuesten Brook Watershed Restoration Plan, Phase 1	2011 Incremental	R-11-M-01	4/14/2014	Merrimack	$17,000	$63,031
Cocheco River Watershed Coalition	Cocheco River Watershed Restoration Plan Implemetation - Phase 2	2011 Incremental	R-11-C-04	2/20/2014	Coastal	$51,500	$86,740
City of Dover	Berry Brook Watershed Restoration Plan Implementation - Phase 2	2007/2008/ 2010/2011 Incremental	R-11-C-02	2/14/2014	Coastal	$172,315	$407,755
Town of Brentwood	Middle Exeter River Watershed Mgt.Plan Implementation, Phase 1	2008/20009/ 2010 Incremental	B-11-C-04	1/28/2014	Coastal	$49,152	$97,633
Blue Ocean Society for Marine Conservation	Watershed Restoration Plan Implementation, Hodgson Brook, Phase 2	2009/2010 Incremental	R-11-C-05	1/6/2014	Coastal	$104,574	$192,400
Town of Alstead	Lower Warren Brook Restoration (project terminated before completion)	2008 Incremental	R-08-CT-05	12/9/2013	Connecticut	$20,000	$40,970
Town of Wolfeboro	Lake Wentworth and Crescent Lake Watershed Management Plan	2009/2011 Base	B-11-M-03	12/9/2013	Merrimack	$67,800	$141,707
Town of Exeter	Exeter River Restoration- Great Dam Removal Evaluation	2008/2009 Incremental	R-06-C-09	11/14/2013	Coastal	$69,500	$152,456
					Total	$507,121	$1,017,025

Appendix E. 2014 Estimated Pollutant Load Reductions Achieved

2014 Estimated Pollutant Load Reductions Achieved									
Grantee	Project Name	FFY Source of Funds	319 Funds	Total Cost	N (lbs/yr)	P (lbs/yr)	Sediment (tons/yr)	Model/ Method	Notes
Acton Wakefield Watersheds Alliance	Salmon Falls Headwaters Watershed - Watershed Based Plan Implementation Project - Phase 2	2009, 2010, and 2012 Base	$87,026	$209,893	0	75.28	44.54	Region 5 Model and Simple Method	More reductions completed and reported last year
Blue Ocean Society for Marine Conservation	Watershed Restoration Plan for Hodgson Brook Phase 2 - Pease Tradeport Retrofit Survey and Pannaway Manor and Great Bay Community College Best Management Practices	2009 and 2010 Restoration	$104,574	$174,325	0.95	0.04	0.01	Simple Method	More reductions completed and reported last year
UNH Stormwater Center	Great Bay Municipal Bioretention Program	2012 Base	$134,000	$223,378	38	5.8	1.16	Simple Method	Project still in progress
Cocheco River Watershed Coalition	Cocheco River Watershed Restoration Plan Implementation, Phase 2 - Rochester LID Projects	2011 Restoration	$51,500	$86,740	4.9	0.8	0.07	Simple Method	
Town of Wolfeboro	Rust Pond, North Inlet and Route 28 Boat Launch Watershed Management Plan and Stormwater BMP Projects, Phase 1	2010 Restoration	$50,000	$87,994	0	0	0.35	Region 5 Model	
				Totals:	43.85	81.92	46.13		

FLOW
FOR LOVE OF WATER

PROTECTING THE COMMON WATERS OF THE GREAT LAKES BASIN THROUGH PUBLIC TRUST SOLUTIONS

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August 28, 2015

Michigan Office of the Great Lakes
Michigan Department of Environmental Quality
Michigan Department of Natural Resources
Michigan Department of Agriculture and Rural Development
P.O. Box 30473-7973
Lansing, Michigan 48909

Re: FLOW (Flow for Love of Water) Comments on Draft Michigan 30-Year Water Strategy Plan

Dear Office of the Great Lakes,

FLOW commends the Office of the Great Lakes for steering the draft Water Strategy Plan for Michigan stewardship of its most precious and abundant resource: water. We were impressed with the thoughtfulness of the report and big picture focus. We therefore center our comments primarily on the vision that "sustaining Michigan's water heritage" will support a healthy environment, healthy citizens, vibrant communities, and sustainable economies.

FLOW (For Love of Water) is a Great Lakes law and policy nonprofit organization whose sole mission is to find solutions to the pressing concerns, threats, and continuing harms to the integrity and sustainability of the waters, ecosystem, and protected public trust in the common waters of the Great Lakes Basin.[1] FLOW believes that protecting and properly managing each arc of the hydrological cycle as a single connected system of groundwater, lakes, streams, wetlands, Great Lakes and hydrosphere offers a common and unifying framework to evaluate, address find successful solutions for the water challenges we face in this century. .

Culture of Stewardship

The ability to achieve Michigan's vision for its water resources depends on a strategic, collaborative ecosystem-based plan that monitors the health and condition of our water resources, invests in water-related infrastructure, uses

[1] FLOW (For Love of Water) www.flowforwater.org (hereinafter "FLOW").

> water more thoughtfully and efficiently to grow sustainable economies, reconnects communities to water, and fosters a water ethic and culture of stewardship.[2]

Ecosystems Approach

> The forthcoming Water Strategy takes an ecosystem approach, focused on the fact that Michiganders are a part of the ecosystem in which we live and therefore have an effect on the health of our water resources. The Strategy recognizes the core values identified with water are four fold: economic, environmental, social and cultural. All are equally important. Communities across Michigan recognize the value of water quality improvement activities supported through state and federal investments. According to Brookings Institution and Grand Valley State University, restoring water quality and shorelines respectively result in a 3-to-1 and 6.6-to-1 return on investment in the form of increased property values and local economic development and improved ecosystem health and quality of life.[3]

In this second decade of the 21st century, it is more evident than ever that the Great Lakes face unprecedented systemic threats that have fallen outside the reach of current laws and policies. These threats include climate change, extreme weather, and fluctuations in flows and levels, phosphorous-loading and harmful algal blooms, invasive species such as quagga mussels and Asian carp, persistent plastic and toxins, and ultimately, the soaring demand for a finite water supply in the basin and beyond for drinking water, food, energy, and development that contradicts the fundamental understanding of water as part of a common shared water system and not an asset on a balance sheet. These are the challenges we face today and for the next decades, these are the challenges to which we must continue to respond.

At FLOW we continue to study and evaluate underlying frameworks that assure promote stewardship, protection, and sustainability of our water, environment, health, and economy: If we can protect water as a commons, recognizing rights of public and private use in a shared public water resource, and apply basic principles or benchmarks for evaluating strategies and actions across the spectrum of public and private sectors, we will make good decisions that achieve the vision, goals, and strategy for the benefit and long-term stewardship of Michigan's water heritage.

An important overarching framework and set of principles to achieving the Water Plan's vision and strategy can be found in the ancient body of law known as the public trust doctrine. Under

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[2]Draft Sustaining Michigan's Water Heritage, Michigan 30-Year Water Strategy Plan (Hereinafter "Water Plan"), Introduction, p. 1.
[3]Id., p.. 1-2.

United States Supreme Court[1] and Michigan law, the waters of the Great Lakes,[2] and our inland lakes[3] and streams are held by the state in trust for the benefit of its citizens. In essence, this public trust would foster the "culture of stewardship" and protect and sustain the integrity of our water and related ecosystem. At the same time the trust provides backstop or benchmark principles in which proper and lawful private and public use of water to support the needs of our quality of life, health, communities, and economy can occur side by side without losing track of the larger vision of the Water Plan.

Finally, new studies and models are discovering that our ecosystem, quality of life, and economy affect and are all affected, either negatively, positively or both, by the water cycle. In short, we live in a hydrosphere, and everything we do or everything that happens depends on the integrity of the hydrosphere. As Jacques Cousteau once said, "The water cycle and life cycle are one."

Specific Comments for Draft Water Plan:

Michigan's Public Trust in Waters of the Great Lakes, Lakes and Streams, and Tributary Groundwater.

Michigan's over 3,000 miles of coastline below the ordinary high water mark is part of or touches the waters of the Great Lakes. Thousands of more miles of shorelines touch on our rivers and lakes. The Great Lakes and their connecting and tributary waters are held in perpetual solemn public trust for the citizens of Michigan, who are the trust's legal beneficiaries.[1] Water is held by the State in trust, and while the state can allow for both public and private use, the State cannot subordinate or transfer its title or sovereign control to protect and manage this public trust.[2] The state has broad common law and sovereign authority to govern the public trust as a background principle. And as noted above, state statutes grant specific authority for use, occupancy and protection of our Great Lakes and waters from unlawful subordination or impairment,[3] and require information and planning to achieve protection and application of these

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[1]Illinois Central Rail Road v Illinois, 146 U.S. 387 (1892). Like air and wildlife, water is always moving and has been considered a commons in western common and civil law since the Justinian Code. J. Inst. 2.1.1; *Arnold v Mundy*, 6 N.J.L. 1 (1821); *Illinois Central Railroad v Illinois*, 146 US 387 (1892); James M. Olson, *All Aboard: Navigating the Course for Universal Adoption of the Public Trust Doctrine*, 15 VT. J. ENV. L. 148-151 (2014).

[2]Obrecht v National Gypsum Co, 361 Mich 399 (1960); People v Broedell, 361 ich (1961); Great Lakes Submerged Lands Act, NREPA< MCL 324.32501 et seq.; Michigan Water Law, NREPA, MCL 324.32701 et seq.; NREPA, Inland Lakes and Streams Act, MCL 324.30101 et seq.

[3]

[1] People ex rel Director of Conservation v Broedell, 365 Mich 201, 205 (1961).

[2] Illinois Central R Rd v Illinois, 146 US 387 (1892).

[3] MCL 324.32501 et seq. ("GLSLA").

basic principles.[4] The same is true for our inland lakes and streams, as well as our single hydrologically connected or tributary groundwater that feeds these lakes, streams, and the Great Lakes – a recognition of the water cycle noted above.

The public trust protects the waters and aquatic resources like fish and paramount public use and enjoyment of these waters for navigation, fishing, swimming, boating, drinking water and sustenance, such as food and health. As trustee and the "sworn guardians" of these waters and uses, the state has broad authority to protect these uses, remedy harms to these uses and water resources, and manage them through planning and implementation of strategies, programs, and specific governance or legal frameworks.[5] No one person is above the public trust in our navigable and tributary waters that feed these navigable waters and public uses and enjoyment. In this way, these waters can be broadly managed and protected through laws and regulations of the waters, bottomlands, water resources and land uses that threaten or adversely affect them, and at the same time allow for reasonable private and public use so long as the trust and waters are not materially harmed or interfered with from one generation to the next.

Finally the public trust provides the state, communities and citizens with a background principle for all property and water law that cannot be violated. Under state and U.S. Supreme Court decisions, the common law public trust in these waters and related aquatic resources can never be surrendered.[6]

2. Increasing Demand and Decreasing Sources for Water

a. Recent Events and Developments

Approximately 1 billion people are without enough safe freshwater.[1] World population will grow by another 2 billion people by 2050, with potentially another billion without safe drinking water. Demand for water will outstrip freshwater supplies by as much as 30 to 40 percent in 2040.[2] The demand for food production and stress and impacts from climate change will exacerbate the crisis.

Droughts like California or in other areas of the west are not only having a devastating effect on drinking water, development, farming, energy extraction, but a dramatic impact on water law and

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[4] People v Broedell, *supra* note 2.

[5] Obrecht v National Gypsum Co., supra, 105 NW2d 143, 149.

[6] Id., Illinois Central R Rd, supra.

[1] Study by Denmark's Aarus University, Vermont Law School and US Center for Naval Analyses. www.rt.com/news/17628-world-water-crisis-2040; Water.org www.water.org/water-crisis/one-billion-affected/; "Water Crisis," "Agricultural Crisis," Environmental Crisis," "Increase in Tension," www.worldwatercouncil.org/library/archives/water-crisis/.

[2] *Id.*, rt.com/news/ "world-water-crisis-2040."

policies.[3] Droughts in other parts of the world cannot be ignored,[4] both because of climate change impacts, shifting food production demands for soil and water, and pressures for foreign land and farming investment, which would include investment expectations in the right to use water through acquired ownership or control of land. Everything is on the table, and this raises uncertainty about the federal authority and role in water allocation in the United States. Moreover, these droughts, which are expected to be more frequent because of increasing temperatures and more frequent hot and variable weather and precipitation events,[5] the demand for drinking water, public water supplies, energy production and extraction, and farming and food has or will exhaust traditional water sources, such as snow melt, reservoirs, and groundwater.

In short, while California and other states at least initially seek to solve this devastating water crisis internally through increased conservation and water management strategies,[6] the increasing intensity and duration of droughts of this nature will undoubtedly trigger unprecedented political pressure for a national water policy that would allocate or divert water from one region of the United States to another.

b. Comment and Recommendations

Because of the magnitude and forecasted magnitude of more frequent and variable droughts around the world, not only should the Water Plan recommend application of the precautionary principle, it should incorporate into the report the growing uncertainty of the political climate along with droughts and water scarcity in other parts of North America and the world. Another drought in the U.S. such as Texas in the past several years in addition to California's extreme water shortages and management crisis could push political levers in the U.S. toward a national

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[3] "Drought is Only One Explanation for California's Water Crisis," World Resources Institute, March 27, 2014 (Climate change worsens complex, vulnerable water management systems and laws already vulnerable to slight changes in state and Colorado River water supplies. In the future or long-term, California will have to reduce growth and demand for water [FLOW Comments' author's note "or import it]). Governor Brown has launched $ 687 million plan to conserve and recycle water.

[4] Keith Schneider, "Water Challenges Asia's Rising Powers," YALE GLOBAL, July 12, 2011. http://yaleglobal.yale.edu/content/water-challenges-asia-powers-part-I.

[5] Intergovernmental Panel on Climate Change (IPCC), Fifth Assessment, Summary for Policy Makers, Working Group III, SMP 1.3, SMP 2.2, April 13, 2014.; see also *4 Degrees: Turn Down the Heat, supra* note 22.

[6] A. Maddocks, P. Rieg, and F. Gasert, *"Drought Is Only One Explanation for California's Water Crisis,"* World Resources Institute (April 8, 2014) < http://www.wri.org/blog/2014/03/drought-only-one-explanation-california%E2%80%99s-water-crisis>; *see also* California Sustainable Groundwater Management Act. Senate Bill 1168, Assembly Bill 1739, Senate Bill 1319 are a package of bills that allows state government to intervene to require future groundwater plans, allocate groundwater between users, and regulate, limit or suspend groundwater removals. See Randy Christensen and Oliver M. Brandes, *California's Oranges and B.C.'s Apples: Lessons for B.C. from California Groundwater Reform.* Victoria, Canada: POLIS Project on Ecological Governance, University Victoria/Ecojustice. <http://poliswaterproject.org/sites/default/files/OrangesApples_FINALWeb_0.pdf>.

water allocation policy that could result in undermining Michigan water law and the diversion ban and consumptive use provisions that we rely on for protecting Michigan's water resources.

By adding a public trust framework as background or backstop principles, Michigan, in the case of NAFTA or trade law claims, would strengthen their position because the public trust inherently adheres to the common nature and control of the water by the provinces and states, limits or qualifies diversions, and limits if not prevents a private claimant from asserting an expectation of a property or legal interest that would provide standing or is even protected by international trade law. Hence, public trust principles as a benchmark add protection and authority to safeguard the waters of Michigan from unforeseen demands from outside and protect our public and private uses, food production, tourism, and economy.[7]

3. Recent Developments in Hydrological Science and Modeling

A number of new studies, technique or models have identified greater understanding and knowledge about the overall relationship seemingly complex relationship between climate change, human activities, and the water or hydrologic cycle. These studies and models look at not only groundwater and surface water as a singular hydrologic system, but look further to the entire hydrologic cycle, which is itself a single hydrologic system of which groundwater and surface water represent the visible and meaningful arc for life, human uses and activities on the earth.[8] Because surface water and groundwater diversions and consumptive uses are inextricably intertwined with global and local effects and impacts on water, soil, energy, food, development from climate change and other human factors, more and more is being studied, modeled, and understood by new scientific and meta-data analytics techniques.[9]

In turn science and analytics are finding better ways to evaluate the relationships of local effects and global or macro-information, which allow them to better identify more accurately trends regarding groundwater and surface uses, impacts, and sources through the record of data and effects of human intervention or human-induced effects from urban and rural development, farming, energy production, and mineral and energy extraction on the hydrologic cycle. And the more that is understood about groundwater and surface water as a singular system within the

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[7] Scott S. Slater, *"State Water Resource Administration in the Free Trade Agreement Era: As Strong As Ever,"* 53 WAYNE L. REV. 649, 653-655 (2007).

[8] See generally, scientific methods and simulations for agriculture, water, and climate change effects, Bruno Basso, David Hyndman, Anthony Kendall et al., *Can Impacts of Climate Change and Agriculture Adaptation Strategies Be Accurately Quantified if Crop Models Are Annually Re-Initialized,* PLOS ONE/DOI:10:1371/journal.pone.0127333, June 4, 2015; Brasso, Kendall, and Hyndman, *The Future of Agriculture Over the Ogallala Aquifer: Solutions to Grow Crops More Efficiently with Limited Water,* Department of Geological Sciences (Received 21 Jun 2013, Accepted 26 Oct 2013) (AGU Publications, 10.1002/2013EF000107); U.S. and Canada Report on Relevant and Available Groundwater Science to Meet GLWQA Commitment, Feb. 23, 2015, http://binational.net/2015/02/23/groundwater-science/ .

[9] Baseline Magazine, *"Circle of Blue Turns Business Intelligence and Analytics Systems to Aid the White House and Other Organizations Achieve Better Management of Water Resources,"* (April 30, 2014) http://www.baselinemag.com/analytics-big-data.

hydrologic cycle, the more that can be studied and understood about the systemic threats to water. Since water is so essential to life and human progress or survival, it becomes the limiting factor or lens through which other uses and factors can be viewed and understood. And as this understanding, data, and knowledge increases over the hydrological cycle, new adjustments or approaches can be established in law, policies, guidelines, and adaptation strategies to better respond and mitigate or solve systemic threats such as described at the outset that plague or challenge the Michigan's waters and ecosystem.

These studies which focus on the single hydrologic nature of groundwater, surface water, wetlands, springs and climate change have begun to show that farming practices, energy production, land use, urban or sprawling development, clearing of forests and vegetation, and numerous other human activities result in direct effects on the hydrology of groundwater, streams, lakes, wetlands, and large bodies of navigable waters. These effects in turn cause direct and cumulative impacts to wildlife habitat, plants, and ecosystems, in some instances with significant losses, damage and costs.

b. Comments and Recommendations

The Water Plan calls for an ecosystem approach. New developments in groundwater and watershed science, including research that looks at the hydrological system and water cycle, expand the methodology and framework to the water cycle or hydrologic cycle as a whole. This new approach demonstrates how human actions and natural forces within the water cycle can impact flows and levels or cause harm to "arcs" of the water cycle such as the single hydrologic connection of groundwater and surface water. Groundwater and surface water forms a foundation for a policy framework that looks at the hydrological science and water cycle as a whole, as suggested in the conclusion and elsewhere in this report. In other words, it is recommended that the commons and public trust principles framework should be used in conjunction with science to better determine effects to water levels, flows and impacts on water, watersheds, and ecosystems.

4. The Water, Energy, Food, and Land Use "Nexus"

a. Recent Developments

Water is no longer just an afterthought in national and global conversations about energy, food, and climate.[10] And that's because water is viewed as a vital resource subject to greater scarcity,

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[10] The removal of high-volumes of groundwater from a watershed that is part of a single hydrologic system can cause substantial harm to other water bodies. See e.g. the trial court and Court of Appeals findings in *Michigan Citizens for Water Conservation v Nestlé Waters North America*, 709 NW 2d 174 (Mich App 2005), that the defendant's high-capacity wells that pumped near or at 400 gallons per minute caused substantial reductions in flows and levels to a headwater stream, two

variability, and unpredictability. In the next 15 years, a U.N. report warns the world could suffer a 40 percent shortfall in water by 2030 unless countries dramatically change their use of the resource.[2] Just this year, 2015 marked the first time water crises claimed the top spot in the World Economic Forum's 10th global risk report. Clearly the status quo can no longer stand. As the U.S. Department of Energy recently observed: "We cannot assume the future is like the past in terms of climate, technology, and the evolving decision landscape."[3]

Here in the Great Lakes and Michigan, there is a growing recognition that water is inextricably linked to everything we do, elevating the "nexus" connection at all decision-making levels.[4] The U.N.'s Food and Agriculture Organization (FAO) defines nexus as an approach that "helps us to better understand the complex and dynamic interrelationships between water, energy and food, so that we can use and manage our limited resources sustainably. It forces us to think of the impacts a decision in one sector can have not only on that sector, but on others. Anticipating potential trade-offs and synergies, we can then design, appraise and prioritise response options that are viable across different sectors."[5]

Diversions and "consumptive uses"[6] of water and climate change affect groundwater, and agriculture, food production, and energy extraction, production, and transport all affect groundwater and connected lakes and streams. To better understand the water-energy-food nexus, comprehensive studies of new emerging consumptive uses are critical so that decision-makers at all levels can implement adequate measures and standards that protect water quality and prevent against cumulative water loss to aquifers and watersheds within the basin. This section explores the following three consumptive uses and their impacts on water resources: (1) high-volume hydraulic fracturing for oil and gas and water resource impacts, (2) agriculture and virtual water and (3) thermoelectric energy and climate change.

b. Comment and Recommendations

Understanding the complex scientific relationships between water, energy, and food is the first fundamental step toward making meaningful policy changes to protect every arc of the hydrologic cycle. This approach can be combined with the recommendation to establish a study based on recent developments in hydrological science discussed in these Comments and the overarching commons and public trust framework that would help overall Michigan Water Plan strategies and decision-making more closely aligned with sustainability, ecosystem, and stewardship goals.

Issues that should be given more attention in the Water Strategy Plan as competing demands and for better planing and implementation of strategies include full understanding all risks and benefits related to the Plan's goals associated with such activities as:

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lakes, and nearby wetlands, which constituted an unreasonable use and transfer of water beyond the watershed.

High-Volume Hydraulic Fracturing and Water Resource Impacts: Unchecked water use for fracking operations leaves the Great Lakes Basin vulnerable to significant water scarcity and water quality. Water withdrawals for high-volume fracturing or other high-volume consumptive uses should be studied and regulated to obtain better hydrologic data regarding hydrologic effects and impacts on local creeks, springs, streams, and lakes, or the wells by competing water users such as farms, golf courses, and snow-making for ski areas. In addition, standards and criteria should require collection and disclosure of hydrologic data from before, during, and after the high-volume removal of water.

It is also recommended that the high-volume water wells for fracturing should not be permitted where there are likely local effects on flows and levels or impacts on water quality and ecosystems.

Finally, high-volume groundwater removals should take into account competing needs and uses from adjacent owners and communities, including adequate water for hydrologically connected streams, lakes, and wetlands, and take into account effects of climate change within and outside the basin.[11]

Agricultural and Virtual Water: Landowners have the right to reasonable use of groundwater or riparian surface water that move over or through the landscape or soil, while the body of water or aquifer is collectively held by the state as sovereign.[12]

Given the overall water and food crisis and the magnified effects from climate change, including hydrologic and ecological impacts at the local or watershed level, it is recommended that the Water Plan establish a virtual water measurement and analysis component, in cooperation with the states and provinces, to assure that intensified food production and associated consumptive use and export of virtual water is fully accounted for and made part of a review process. As Professors Scanlan and Kehl point out, virtual water from exports is not accounted for, in total loss of water to the Basin or in terms of overall impacts. This is crucial for Michigan's farms and agriculture industry to make sure that sustainability goals and stewardship

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[11] The removal of high-volumes of groundwater from a watershed that is part of a single hydrologic system can cause substantial harm to other water bodies. See e.g. the trial court and Court of Appeals findings in *Michigan Citizens for Water Conservation v Nestlé Waters North America*, 709 NW 2d 174 (Mich App 2005), that the defendant's high-capacity wells that pumped near or at 400 gallons per minute caused substantial reductions in flows and levels to a headwater stream, two lakes, and nearby wetlands, which constituted an unreasonable use and transfer of water beyond the watershed.

[12] E.g. *Arnold v Mundy*, 6 N.J.L. 1 (1821).

goals are not compromised by increased demand for water from other countries or foreign interests. It is not every case that this is so, but Michigan must understand its own domestic water and food needs, and assure for their sustainability and protection before moving rapidly into such unchartered demands on water resources.

Under public trust law, states have the authority to consider the effects or impacts on public trust waters resulting from the loss of virtual water on groundwater, wetlands, lakes and streams.

Thermoelectric Generation and the Great Lakes: Climate change is all about water. Protecting Michigan's water and sustaining the economy may require an adaptive approach to address climate change. Addressing climate change and protecting the Michigan's water and ecosystems will require an interconnection between energy strategy and water strategy, so that energy targets are consistent with protecting waters from excessive losses or climate change impacts.

Accordingly, the Water Plan could call for an increase and improve data collection and establish targets to address climate change effects. These waters are recognized as national treasures and the states, including Michigan, have a "shared duty to protect, conserve, and restore"[13] these waters and their ecosystem for current and future generations. There is a public trust in the states[14] and a right of public navigation and fishing, also considered a trust,[15] in the waters and water resources are subject to this trust.

***Water-Energy-Food Nexus*:** The Water Plan could also recommend establishing an advisory board or team to study and integrate the competing needs of the water, energy, and food, and community "nexus" to advise the state on how to protect itself from competing or conflicting demands for water, energy, and food, water being the baseline or benchmark for decision making to protect. the integrity and health of our water, water resources, and ecosystems.

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[13] Compact Sec. 1.3(1).

[14] James Olson, *All Aboard, supra*, at 144-148.

[15] *Id.*, at 164-166

5. Governance, Law and Policy

a. Recent Developments in Water Law and Policy

There have been a number of significant developments in water law and public trust law, which along with a proper concern for common law limitations that limit uses of water by landowners or others outside a watershed or the basin, offer a supplemental basis for evaluating and protecting the waters of Michigan and the Great Lakes from diversions, withdrawals, consumptive uses, or other removals. In some instances, these recent developments could be used to strengthen the position of states and provinces in defending actions regarding denial or strict regulation of diversions and consumptive uses. In others, these developments may have weakened common law traditional limitations on water transfers off-tract or out of watersheds that protect flows, levels, water quality, and preferred traditional uses of water in connection with riparian or land overlying an aquifer. This section examines new developments in (1) riparian law and (2) groundwater law.

Riparian Law

The off-tract limitation or limit on diversions of groundwater that was removed from hydraulically connected lakes and streams may have been relaxed in *Michigan Citizens for Water Conservation (MCWC) v. Nestlé Waters*,[16] a case that influenced debate over Annex 2001 and later the diversion ban and the treatment of bottled water as a consumptive use, and consumptive uses and other provisions in the Compact. In the *MCWC v. Nestlé* case, the Michigan Court of Appeals ignored the "off-tract" or "out of watershed limitation" in Michigan Supreme Court cases in favor of a new "reasonable use balancing test."[17] Unlike the state Supreme Court's decisions, the Court of Appeals adopted the balancing test without regard to the status of the intermediate or end-user of the water. In short, Nestlé was not a riparian owner and admittedly diverted the millions of gallons out of the watershed for bottling and sale to a significant extent out of the Great Basin. Accordingly, the underlying right of a landowner to use water in connection with his or her land may have been expanded to include anyone, anywhere, at any time. However, it is not clear if the case applies to direct removals or diversions from a lake or stream under riparian law, because a subsequent Michigan Court of Appeals decision that applied *MCWC v. Nestlé* to Michigan's famed Au Sable River was vacated.[18]

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[16] *Michigan Citizens for Water Conservation v. Nestlé Waters North American Inc.* 709 N.W. 2d 174 (Mich. Ct. App. 2005), reh'g denied, 739 N.W.2d 332 (Mich. 2007).

[17] *Kennedy v. Niles Water Supply Co.*, 173 Mich. 474. 139 N.W. 241, (Mich. 1913); *Dumont v. Kellogg*, 29 Mich. 420 18 Am. Rep. 102 (1874); *Schenk v. City of Ann Arbor*, 196 Mich. 75; 163 NW 109 (1917).

[18] *Anglers of the AuSable v Department of Environmental Quality*, 793 NW 2d. 596 (2010), vacated on rehearing (the vacated court of appeals decision reinstated the trial court opinion and erased the suggestion that the "reasonable use balancing test" in *Nestlé* applied to riparian waters).

This could mean, although it is only arguable, that if a foreign landowner or water user like Nestlé is denied a right to withdraw and divert or export more water in containers in the future, the company could argue that its newly expanded right to use and sell water anywhere gives it an argument that it has standing to maintain a private investor claim in a private tribunal under NAFTA or other trade law.[19] However, this is countered by the Michigan Supreme Court cases,[20] the provisions in state law when adopting the Compact and water withdrawal legislation that preserve common law limitations like the watershed restriction and the fact that the Compact itself declares that water is "held in trust."[21] Nonetheless, the development in Nestlé must be closely watched, or a more uniform effort taken by the states and provinces, should the trend emerge there to maintain and reclaim, if necessary, by statute the watershed limitation. By doing this, Michigan can put itself on better footing. This would assure the state that it will have the final say on authorizing transfers of water for sale or diversion out of watersheds, and be in a stronger position to enforce laws and limits like the Compact, now or in the future.

Groundwater Law

It also appears that groundwater law took a similar turn in Michigan and Ohio. The *MCWC v. Nestlé* case may not apply to riparian lands or lakes and streams, but it does apply to groundwater. Again, however, a Supreme Court decision in *Schenk v. City of Ann Arbor* ruled that the city could not pump and divert groundwater off-tract to service its residents if it disrupted or interfered with a neighbors well or measurably diminished the flows or levels of a lake, stream, or wetland.[22]

In Ohio, the Supreme Court adopted the RESTATEMENT OF TORTS, 2d, Sec. 858, for groundwater law. Under Section 858 of the RESTATEMENT, 2d, the diversion or export limitation has been erased in favor of a broad balancing of a number of factors involving interference, harm, and the relative public and private benefit of a withdrawal and diversion or use regardless of whether the use is on-tract or off-tract.[23]

The importance of these changes is that a shift in the underlying common law may make it more difficult for farmers, communities, landowners, or businesses who rely on levels and flows of water in a watershed to defend against claims from outside a watershed or Michigan.

b. Comments and Recommendations

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[19] The implications and recommendation in connection with these issues are addressed in Section 7, *infra.*

[20] *Kennedy v. Niles Water Supply*, *supra* note 110; *Dumont v. Kellogg*, *supra* note 110; *Schenk v. City of Ann Arbor*, *supra*, note 17.

[21] Compact, Sec. 1.3(1)(b).

[22] *Schenk v City of Ann Arbor*, *supra.*

[23] *Cline v American Aggregates Corp.*, 474 N.E.2d. 324 (Ohio 1984).

For the reasons noted above on comments concerning riparian law, it is important to understand the implications and law and policy response that may be required to minimize the risk of claims against a state for denying or restricting an off-tract or out-of-watershed diversion or export of groundwater. For example, the Great Lakes Compact diversion ban may restrict it if the container or volume is greater than 5.7 gallons or 20 liters, but it does not mean the investor or landowner could not claim a broader right to use water to support a claim with a trade law tribunal, if the claimant acquired land in a state that allowed sale of groundwater off-tract, which of course is occurring, such as in *the MCWC v Nestlé* groundwater/riparian hybrid case discussed above. Michigan based on water as a public resource can control the taking or removal of groundwater for export elsewhere, because of the tract or out-of-watershed or impairment of flows and levels of a lake or stream. This limitation should be carefully studied, understood, and applied uniformly where possible; this will supplement the state's background common law or constitutionally to defend against private investor claims under trade laws..

6. Public Trust Law

a. Recent Developments in Public Trust Law

In the past ten years, public trust law has matured in the states as a comprehensive framework and background principle for water management and protection of flows, levels, ecosystems and protection and accommodation or balancing of public and private uses. Over this same time period, there has been increasing recognition and discussion in the literature and courts of the United States and Canada.[24]

First, there is a strong recognition, as in science and the Agreement and Compact, that groundwater, surface water, lakes, and streams are a single hydrologic system. There is also some beginning recognition of the relationship of the entire water or hydrologic cycle, the activities that affect it, and the flows, levels, and quality of traditionally recognized public trust waters that are "navigable."

The extension of public trust protection to groundwater is not surprising given the hydrological connection to public trust lakes or streams. In Wisconsin, the Supreme

[24] The sound application and principles of the public trust doctrine apply to the Great Lakes in the eight states and provinces under the analogous paramount trust to protect the public right to navigation, fishing and boating in Canada. Olson, *All Aboard, supra,* at 147-166; see also Barlow and Olson, *Report on the Public Trust Principles to the IJC, supra.* There is actually a fifth development in the Great Lakes states, but it is not within the scope of these comments on diversions, consumptives use, and other human land or water uses and activities. Consistent with previous cases, *Illinois Central Railroad v Illinois*, 146 U.S. 387 (1892), Michigan reaffirmed the public trust in the Great Lakes and ruled that the right of access, as distinct from more possessory use interests, for walking along beach to public trust waters included the beach up to the natural ordinary high water mark as determined by physical characteristics that distinguished a beach from permanent characteristics of upland. *Glass v. Goeckel*, 703 N.W.2d 58, 64–65, 73–74 (Mich. 2005). *See also Merrill v. Ohio Dep't of Natural Resources*, 955 N.E.2d 935 (Ohio 2011).

Court held that the public trust in a navigable lake required the DNR to consider the effects of a nearby high-capacity municipal groundwater well.[25]

Second, in 2000, the Hawaii Supreme Court first declared the groundwater component of a canal or channel to be subject to the public trust doctrine both under the common law and state constitution. The court reaffirmed its decision in a more detailed factual application of public trust principles in a 2012 case.[26] In a more recent decision in 2014, the court held that a local land use planning board, like the DNR in the Wisconsin case, must consider the effects and impacts on connected public trust waters as part of its review of a request for a special use permit for a major land development.[27]

Third, Vermont enacted a new groundwater law, supported by farmers and residents who were concerned about water exports or diversions from the state, that declared groundwater protected by the public trust doctrine. In its first test case, a lower court ruled that the traditional public trust principles applied to surface and groundwater, and that state agencies had a legal duty to consider the effects and impacts before it could approve permits that were alleged to involve effects to groundwater or lakes and streams.[28]

Fourth, courts in Arizona and California have also imposed a legal duty on a state agency to protect groundwater as part of a state's public trust water resources. Arizona found a public trust in all waters of the state, including groundwater, based on the hydrologic connection, recognition of a "trust" in natural resources or water in the state constitution, then applied public trust principles to restrict a diversion of water.[29] The courts in California have found a public trust in all navigable and tributary waters, holding that all allocations and appropriation rights to use or divert water are subject to the principles of public trust law.[30] The court noted three basic principles: "(1) prevents any party from acquiring a vested right in a manner harmful to the interests protected by the public trust; (2) The Legislature [acting through an authorized agency] has the power to grant usufructuary licenses...; and (3) the state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses wherever feasible."[31] It is only logical that traditional public trust law would restrict

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[25] *In re* 'Iao Ground Water Mgmt. Area High-Level Source Water Use Permit Applications, 287 P.3d 129, 190 (Haw. 2012).

[26] *Kelly v. 1250 Oceanside Partners*, 111 Hawaii 205. 140 P.3d 985, (Haw. 2006).

[27] *Kauai Springs Inc. v. Planning Comm. of the County of Kaua'i*, 324 P.2d 951 (Haw. 2014).

[28] See VT. STAT. ANN.tit.10, Sec. 1390(5) (2008); *In re Omya*, No. 96-10Vtec, at 3-5. .

[29] ARIZ. REV.STAT.ANN. Sec. 37-11130 (1992).

[30] *Light v. State Water Resources Control Bd*, 226 Cal. App. 4th 1463 (2014); CAL.CONST.art.X,Sec. 4.

[31] *Id.* at 226 Cal. App. at 1480-1482; *Audubon v. Superior Court*, 33 Cal. 3d. 419, 434, 437 (1983) extended the geographical scope of the doctrine to nonnavigable streams that feed navigable waterways, and it expanded the purpose of the doctrine to the preservation of water's function as natural habitat." *Id.* "An important purpose of the public trust over bodies of water is to protect habitat for wildlife." *Id.*

activities within a watershed or tributary stream that impair public trust uses or ecosystems connected with navigable waters, like the Great Lakes.

These four developments of public trust law summarized above all involve protecting water resources, including tributary streams and lakes and groundwater connected to or part of navigable public trust waters.[32] Accordingly, for purposes of these Comments and the draft Water Plan, the public trust doctrine developments provide significant new approaches or backgrounds to protecting and managing water resources.

Another important aspect of public trust law in the United States involves the application of public trust principles in law review articles and papers.[33] In the past ten years, there have been hundreds of legal and academic articles analyzing, explaining, and arguing for new applications of the public trust doctrine principles.[34] Only a few of them have been mentioned here.

b. Comment and Recommendation – Governance Based on Overarching Public Trust Principles

These public trust developments provide an evolving framework from which to address water, related land use, quality of life, and sustainability goals or strategies. As noted at the outset, the draft Water Plan is nearly silent on the public trust or developments in water law generally, yet these principles offer one of the strongest most powerful the background or backstops for all of Michigan's goals and strategies. For example, as noted in the next section, these principles provide a basis for exercising property power or police power regulations or other limitations to protect our water from claims by outside interest as demand and competition intensifies in the coming decades.

7. International Trade Law and Developments under NAFTA

a. Recent Developments

Since 2000 private investor claims under NAFTA and other trade laws have more than tripled.[35] While the legal policy and approach behind the diversion ban and consumptive

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[32] Jack Tuholske, *Trusting the Public Trust: Application of the Public Trust Doctrine to Groundwater Resources*, 9 Vt. J. Env. L. 189 (2008).

[33] For a complete review of cases and law review articles and papers on public trust law in the U.S. and internationally, see Michael C. Blumm and Mary Christina Wood, *The Public Trust Doctrine in Environmental and Natural Resources Law* (Carolina Academic Press 2014) (a textbook for a law school or university curriculum)

[34] One need only run a search on Westlawnext, LexisNexis, or simply google "public trust" or "public trust" & "water" or "climate change" or "public trust" & "parklands" to pull up long lists of articles, cases, reports, and papers.

[35] See *NAFTA Chapter 11 Investor-State Disputes (to October 1, 2010)*, Scott Sinclair, Trade and Investment Research Project, Canadian Centre for Policy Alternatives/Centre Canadien de

use regulations is generally sound and defensible, as noted by the Draft 10-Year Report, the increase and success of a few of these private investor claims for money damages for discrimination or expropriation of water use rights create uncertain, confusion an concern. The countries reserved sovereign power in the NAFTA and water is not mentioned. Moreover, the countries signed a side agreement that water "in its natural state" is not covered by NAFTA.[36] However, issues and concerns remain because of increased demand for water in North America from drought, increased food and energy production, and climate effects. The side agreement contains a provision that insulates water in its natural state "unless water, in any form, has entered into commerce or produced, it is not covered by the provisions of any trade agreement, including NAFTA."[37] The question of when and what triggers the moment in time when water "enters commerce" or is "produced" has not been answered, and the answer has been clouded by shifts in groundwater law that relax or erase common law restrictions on water from watersheds.[38] When water is "produced," it is "withdrawn by human or mechanical means."[39] A "product" may not be subject to diversion bans or other state limitations. If water is withdrawn and placed in a container and intended for a consumer, it could be argued that it is a "product" the moment it is withdrawn from the water source. Thus, these factors that are potentially outside the control of Michigan have raised enough questions and disputes, utmost caution is required.

Private investment claims under Chapter 11, NAFTA, are different than nation against nation challenges to regulations that violate fair treatment and free trade provisions. Although a challenge between nations as to the authority and power to maintain and enforce laws to protect health, exhaustible natural resources, and the environment, a private investor may file notice and pursue an individual claim in a essentially private tribunal for damages. These claims, especially if they are settled because of threat of high damages or uncertainty in result, have a chilling effect on otherwise reserved sovereignty over natural resources and water. For example, when Newfoundland rejected AbitibiBowaters claim to water rights that were tied to the termination of its timber contract, the company filed a NAFTA claim for $467.5 million, and rather than risk a ruling, the federal government settled for $122 million.[40]

b. Comments and Recommendations

Politiques Alternatives; *Table of Foreign Investor-State Cases and Claims under NAFTA and Other U.S. 'Trade Laws,'* Public Citizen, April 2015.

[36] Declaration on Water Resources and NAFTA, signed by Canada, Mexico and United States, Dec. 2, 1992, 32 I.L.M. 289 (1993); *see* Olson, *All Aboard*, *supra*, at 187 and accompanying footnotes.

[37] *Id.*

[38] See James M. Olson, *All Aboard, supra,*, at 187.

[39] Compact, Sec. 1.2, definition of "product."

[40] Public Citizen, *Table of Foreign Investor-State Cases, supra;* AbitibiBowater Inc., p. 19; The Toronto Star. *"Ottawa pays Abitibi $130M to settle claim."* (August 25, 2010); Kathryn Leger. *"AbitibiBowaterwins NAFTA case vs. Ottawa."* THE GAZETTE (MONTREAL), (August 27, 2010)

The point is straightforward: There have been new arguments and an increase in claims under NAFTA that strongly suggest that states should explore what other supplemental or "backstop" defenses can be expressly articulated as declarations of law and policy to prohibit or minimize the risk of potential investor-state claims.[41]

Two ways to do this are (1) to expressly declare and serve notice to all that the Great Lakes and tributary navigable waters are subject to and protected by the sovereign authority and power reserved to the states and provinces under the public trust or trust in the public's right to navigation and fishing, or other related public resources and other public interests and uses; and (2) to establish a baseline on principles that restrict diversions or exports under the common law of riparian and groundwater as described and recommended above.[42]

Conclusion and Summary

The foregoing comments supplement the recommendations in the Draft Water Strategy Plan. They are intended to address background information and principles that affect the analysis and recommendations of the current draft plan. The analysis, comments and recommendations center primarily on a unifying framework for inspiring stewardship and cooperative common governance of water based on public trust principles to better understand and prepare for uncertainties from increases in global, national and regional demand for water and water scarcity, new scientific models for holistic or integrative approaches to protecting the entire water cycle or hydrosphere through effects on the arc of waters that flow on, in, over the earth, and the energy, food, land use and population "nexus. However, most all of these comments and recommendations touch on or promote the other recommendations in the Water Strategy Plan, such as vibrant waterfronts and coast lines, protecting water-based recreation, protecting investments in water infrastructure, and water-based economies.

FLOW wishes to thank the Michigan OGL, DEQ, DNR, and the DARD for their work in preparing the draft Water Strategy Plan and the opportunity to submit comments. Should you or others have questions or want to meet concerning these comments, please do not hesitate to contact us.

Sincerely yours,

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[41] M.A. Salman, *International Trade Law Disputes: New Breed of Claims, Claimants, and Settlement Institutions*, International Water Resources Association, 31 Water International pp. 2-11 (March 2006), with David Johnson, *Water and Exports under NAFTA, Law and Government Division*, 8 March 1999, PRB 99-5E <http://publications.gc.ca/collections/Collection-R/LoPBdP/BP/prb995-e.htm>, who lays out the government position and arguments about water as a "good" or "product" under international trade laws, including NAFTA.

[42] See Sec. 5, Water Law Recent Developments and Comments and Recommendations.

FLOW (Flow for Love of Water)

By:

James Olson
President and Founder

Elizabeth Kirkwood
Executive Director

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2. The United Nations World Water Development Report. *Water For a Sustainable World*. 2015 http://unesdoc.unesco.org/images/0023/002318/231823E.pdf

3. U.S. Department of Energy. *The Water-Energy Nexus: Challenges and Opportunities.* (June 2014) http://energy.gov/sites/prod/files/2014/07/f17/Water%20Energy%20Nexus%20Full%20Report%20July%202014.pdf; *see also* http://waterinthewest.stanford.edu/sites/default/files/Water-Energy_Lit_Review.pdf

4. See Great Lakes Commission, *Integrating Energy and Water Resources Decision Making in the Great Lakes Basin: An Examination of Future Power Generation Scenarios and Water Resource Impacts.* October 2011. http://glc.org/files/projects/glew/GLEW-Phase-I-Report-FINAL-2011-11.pdf; *see also* Michigan Office of Great Lakes. *Sustaining Michigan Water Heritage: A Strategy for the Next Generation.* (Draft June 5, 2015). http://www.michigan.gov/documents/deq/deq-ogl-Draft_Water_Strategy_and_Appendices__06-04-2015_491266_7.pdf

5. Food and Agriculture Organization of the U.N., *The Water Energy Food Nexus: A New Approach in Support of Food Security and Sustainable Agriculture.* (June 2014) http://www.fao.org/nr/water/docs/FAO_nexus_concept.pdf

6. Compact, Sec. 1.2. The withdrawal of water for agriculture is a classic consumptive use. So is use of water in traditional or historical oil and gas development within the basin.

From:	Mangus, Amy
To:	mi-waterstrategy
Cc:	Karll, Kelly C; Evan Pratt; Chuck Hersey
Subject:	SEMCOG Water Strategy Comments
Date:	Wednesday, August 26, 2015 2:47:32 PM
Attachments:	SEMCOG Water Strategy Comments.pdf

Thank you for your consideration of the attached comments.

Amy Mangus, Manager
SEMCOG Plan Implementation
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August 26, 2015

Jon Allan, Director
Office of the Great Lakes
Michigan Department of Environmental Quality
P.O. Box 30473-7973
Lansing, Michigan 48909

RE: State of Michigan Water Strategy Comments

Dear Mr. Allan,

The State of Michigan Water Strategy can play a significant role in protecting and restoring our water resources in Michigan. We specifically appreciate the connection and encourage continued linkage between the economic, social, and environmental benefits that a healthy water system provides to our state.

SEMCOG is a regional planning partnership of over 165 governmental units serving 4.7 million people in the seven-county region of Southeast Michigan striving to enhance the region's quality of life. SEMCOG is also the designated water quality planning agency for Southeast Michigan. The goal of these comments is to assist in the final development of a Water Strategy that will lead to effective implementation throughout the state and region.

With the region's current priorities in mind, SEMCOG convened a regional group of infrastructure and stormwater experts to develop a comprehensive set of comments for your consideration. At the same time, we have reviewed and support those comments submitted by other agencies within our region in addition to those comments submitted by the Michigan Water Environment Association.

Thank you for the opportunity to provide comment. We would welcome the opportunity to meet with you to review and discuss any of the recommendations contained in the attached comments.

Sincerely,

Kathleen Lomako, AICP, CAE
Executive Director

State of Michigan Water Strategy Comments
August 26, 2015

Overall Comments

- A vision is an important element to guide the Water Strategy. We suggest that the vision be unique to Michigan that includes linking the economic and social vitality associated with being the Great Lakes State. For example, "Michigan capitalizes on its unique water resources to support economic prosperity, provide recreation and cultural opportunities for residents, and protect water resources for future generations".

- The individual recommendations should focus on actions that are specific and help implementation activities. For example, rather than a recommendation to develop tools and guidance related to shoreline and riparian ecology, a specific recommendation that would assist local implementation would be "increase tree canopy along riparian corridors" and "support local efforts to prioritize restoration of shoreline and riparian ecology".

- Additionally, the document should identify priority actions that can be taken in the next 24-36 months. The actions should be specific as to timeframe and participants. By way of example, one of the Goals under the Water Strategy is: *"Michigan invests in infrastructure and supports funding to maintain clean water and healthy ecosystems."* (Chapter 6). The recommendations, however, are very general, such as: *"Establish sustainable mechanisms to achieve Water Strategy goals including water infrastructure management."* Keeping the long-term Goal is fine, but we strongly encourage replacing the generic recommendations with specific, priority actions. In this case, we recommend a priority action of, "***The Executive Branch and departments will assist and support municipal efforts to introduce legislation authorizing the formation of stormwater utilities and the collection of stormwater management fees. Time frame for action is Calendar Years 2015 and 2016."***

- It appears that some significant water-related issues could use additional discussion in the strategy, including: combined sewer overflows, sanitary sewer overflows, habitat protection and restoration, terrestrial invasive species, utilizing technology such as GIS to aid in decision making, the importance of maintenance (e.g., green infrastructure maintenance, maintaining habitat restoration areas) and the inter-related connections of all the infrastructure (water, sanitary, storm, transportation) to water quality. There are many challenges and opportunities associated with both urban and agricultural watersheds. These priority issues, such as the role of stormwater runoff in both types of watersheds, needs to be better emphasized and should be discussed earlier in the strategy.

- The 30 year vision outlined in the Water Strategy is achievable only if it includes an implementation framework. The state strategic planning process provides an available tool for developing this framework. We recommend that state agencies update their strategic plans to include performance goals and objectives, key outcomes, and agency-

specific priorities consistent with the vision and priorities of the Water Strategy. The plans should cover a planning period of two to five years with regular updates, and identify metrics for measuring and reporting progress toward achieving the identified goals and outcomes. The strategic plans also can serve as the foundation for intra-departmental work plans and individual performance measures for management and staff.

Chapter Comments

Chapter 1: Protect and Restore Aquatic Ecosystems

- While the section does discuss stormwater runoff, a more concrete description of the issue would be helpful. For example,
    - *In addition, other hydrologic modifications like storm water infrastructure and extensive impervious surfaces contribute to less infiltration and increased surface water runoff and flow, resulting in increasingly "flashy" streams. The excess surface water runoff combined with the sediment and nutrient loading leads to water quality degradation such as decreased dissolved oxygen and sediment deposition within the stream channels. These changes in the water quality lead to a decline in the benthic population on which the fish population is dependent. Additionally, the loss of infiltration with the extensive impervious cover can reduce vital recharge of aquifers and reduce base flow to streams. In rural areas, infiltration to deeper depths is interrupted by tile drains designed to conduct water away from fields. These changes can pollute receiving waters, impact aquatic life that depends on groundwater-fed streams during summer months, and affect human groundwater use.*

Reduce occurrence and Impacts of Harmful and Nuisance Algal Blooms

- The strategy should discuss the impacts of algae blooms in general and the recreational problems that occur and not focus entirely on the harmful part of algae blooms.
- Support funding alternatives to address sediment removal / maintenance needs of existing stormwater infrastructure and best management practices (since deposited sediment in stormwater BMPs and pipes can be a source of nutrient releases).
- Reference what has been done already to monitor drinking water intakes from the Huron to Erie corridor. This should include a recommendation here or in the monitoring section to recommend monitoring of intakes, as well as recommending enhanced monitoring of priority subwatersheds tributary to Lake Erie.

Integrate Water Knowledge into Local Land-Use Planning

- The "Integrate water knowledge into local land use planning" needs to discuss broader issues such as stormwater and green infrastructure, not just wet weather extremes.
    - Develop a list of "concrete" zoning ordinance recommendations that lead to a reduction in stormwater runoff volume and pollutant loading.

Build Resiliency into Riparian Systems

- There should be more concrete recommendations under riparian systems, such as increase tree canopy. Riparian system should also discuss the important role they play in linking

the water resource system and green infrastructure network and a recommendation on public ownership for multiple uses. (e.g., biking, kayak access). Minimize mowing and removal of riparian vegetation.

- Prioritize riparian corridor enhancements by aligning multiple outcomes of communities and counties. Define where recreation is most desired and focus on those areas for riparian corridor enhancements (in addition to runoff management, etc). Identify/prioritize areas along riparian corridors for increasing tree canopy.
- Promote invasive species control for riparian invasives such as *Phragmites australis and Japanese Knotweed.*

Restore Hydrologic Connectivity

- Prioritize the dams that are viable for specific purposes vs. those dams that are no longer viable. Work with and encourage local stakeholders to develop an inventory of priority dam removal.

Manage Groundwater Withdrawals

- Determine if this is the section where groundwater withdrawals, as well as, diversions are discussed. The importance of the Great Lakes Compact should be included.

Improve Water Management in Urban Landscapes

- Under urban landscapes, include a recommendation to increase tree canopy in urban areas where it is less than 20 percent. Include a discussion on the connection increasing tree canopy and the improvement in water quality and opportunities in downtowns, waterfront areas, and as a part of economic development (people will visit more and spend more in areas with good tree canopy, etc.,)
- Discuss the importance of green infrastructure and a recommendation focused on constructing green infrastructure equivalent to 10% of the total impervious cover that manages at least the 90^{th} percentile non-exceedance event. This will lead to significant reductions in stormwater volume and pollution loadings.
- Update the road recommendation to be more specific focusing on developing local, county and state policies, standards, and guidelines to integrate GI into transportation infrastructure.
- Collaborate across transportation agencies to support state, county and local roadway planning approaches that integrate local water resource goals.
- Support development of consistent approaches for alternative street design standards.

Improve Water Management in Rural Landscapes

- Develop a coordinated approach across state agencies, MDA, MDOT, MDEQ, MDNR, etc. to identify and prioritize wetland restoration opportunities within agricultural areas.
- Develop a funding mechanism that achieves multiple outcomes: runoff management for the local farmers; runoff management for the local water resources; wetland restoration and reconfiguration of tile drains, (tile drain management), etc.
- Under agricultural, discuss CAFOs and have recommendations that discuss tile drain management, use of filter strips/constructed wetlands, and the need to partner between the agricultural communities and others on implementation.

- Habitat restoration/terrestrial invasive species should be discussed.
- Need to discuss the important role coastal wetlands play. Align u/s runoff management with priority coastal wetlands.
- Seems overly focused on Lake Erie. That's the only area where a phosphorus reduction is recommended?
- Discuss the importance of preservation of high quality, unique areas (e.g., St. Johns Marsh, Delta area, Coastal wetlands, cold water streams)
- Public lands and green infrastructure should include a maintenance plan.

Chapter 2: Ensure Clean and Safe Water

The 3rd paragraph in introduction shouldn't imply that the solutions are only regulatory. The strategy should acknowledge the important role incentives play in clean water.

Protect Drinking Water Supplies

- This section should focus on all the sources of drinking water across the state, not just groundwater. But within the groundwater discussion, there should be some data about numbers of municipal drinking water wells that serve X population across the state. The description is very focused on problems. It would be helpful to start off with a discussion about the how much of the population in Michigan relies on municipal wells vs private wells and also how much of the population relies on the Great Lakes. The first paragraph isn't entirely clear on this data.
- Nitrate is a discussion in this section, but not listed in the overall description in 2nd paragraph of all the challenges.
- Need to include discussion about well-head protection programs for municipal areas and recommending actions that can minimize contamination within those sensitive areas.
- In addition to groundwater supplies, the important role of surface water and drinking water should be discussed. It should also include a discussion of monitoring of these intakes as well as a recommendation on coordinated spill prevention and response.

Properly maintain on-site waste water systems

- Identify existing and needed sewerage disposal facilities for septic system contractors to ensure adequate coverage across the state. Use incentives and innovative solutions to provide needed coverage across the state.

Clean up Legacy Contamination

- Discuss the thought process resulting from a generic recommendation like "cleaning up contaminated sites "absent any big picture context. For example, over emphasis on clean up may very well lead to under emphasis on investment in actions that prevent the perpetuation of new contaminated sites or other investments that produce more bang for buck in reducing risks. Recommendations worded like this are incongruous with the bigger picture, systematic approach sought in the strategy. We suggest a careful review of each recommendation to assure the overall context is clear . and consistent with a systems approach that focuses on investing where benefits are greatest in proportion to costs, both short term and long term.
- Discuss prioritizing clean up in areas with highest recreational opportunities, economic opportunities, etc. Include information on the legacy contamination impacts to

groundwater and surface water, including data on the number of sites. Include a discussion on the importance of cleaning up contamination in riparian areas along newly formed water trails.

- Aren't there any recommendations about alternative funding sources and aligning priorities to obligate other sources of funding, etc.?

Prevent Environmental Impacts from Emerging Contaminants

- Include a recommendation regarding public education campaign about collecting and disposing of these chemicals at local hazardous waste collection sites.

Other topics that should be included in this chapter include:

- This chapter should include some discussion about CSOs/SSOs
- The 2nd paragraph of this chapter talks about runoff as a challenge, but no where else in the chapter are there any related recommendations…so consider the following:
  - Use of vacant property and certain public property to filter stormwater
  - Stormwater as a major pollutant source
- Include public education campaign OVERALL about the importance of clean safe water, etc.
  This chapter should have information focusing on the high quality natural resources in the state and the importance of preserving these resources in order to have clean and safe water.
- Habitat restoration/terrestrial invasive species should be discussed. if this topic is expanded on in the first chapter, then this chapter could include a reference to the first chapter with a brief discussion about the connection to clean and safe water.

Chapter 3: Create Vibrant Waterfronts

- This chapter is an essential component of the Water Strategy. As such, additional background information regarding recent initiatives and recommendations should be included. For example, consider including information and recommendations aligning economic development strategies to include waterfront development and blue economy initiative. Give examples of the positive programs happening in the state.
- Include information on how state funding such as the Coastal Zone Management program can focus on waterfront issues and planning.
- Align the state water strategy goals with organizations that can help smaller coastal communities. Michigan Municipal League; County Associations; township associations; local economic development organizations, and regional councils.
- While algae blooms, invasive species, etc., should be discussed elsewhere in this strategy, a connection to these issues should be made in this section. In the past, there has been significant economic issues related to algae blooms, etc., as part of waterfront industries.

Chapter 4: Support Water Based Recreation

- Include a discussion about the need to align local water based recreation priorities with environmental priorities. For example, align priorities for wetland and habitat restoration in areas targeted for certain recreation activities. This allows for strategic investment of limited resources.

- Also, include information on the link of the knowledge based workforce/ attracting/retaining the workforce and water based recreation.
- Include recommendation to design water based recreation to meet the widest range of people as possible.
- Discuss the value of Pure Michigan and the need to market our assets nationally, regionally and locally.
- The Michigan Natural Resources Trust fund should include public access to water as a priority in funding acquisition projects and the inclusion of water based recreation as a priority for development projects.
- Inventory of recreational water based recreational opportunities available through community recreation plan development.
- Include the importance of being able to link water based recreation areas by multiple modes, such as ensuring these areas are available by transit and nonmotoried transportation systems.
- Include the access recommendation that is stated in the Public Land Strategy that there should be public access every 5 miles as well as every mile in the Southeast Michigan region. It should also acknowledge increase access for kayak use.
- Both riparian and aquatic invasive species can degrade water-based recreation. Riparian invasives can prevent access to water for recreation and aquatic invasives can reduce the quality of the experience.

Chapter 5: Promote Water Based Economies

- Include more background on the economic value of water based recreation with recent studies. Also, discuss local initiatives that have been successful in Michigan and Michigan's leadership role in Water Trails across the country (and that we have 2 water trails that have received national water trails designation).
- Include recommendations highlighting the need for water based events, as well as innovative partnerships.

Chapter 6: Invest in Water Infrastructure

Introductory Section

The introductory section seems to imply that water infrastructure is focused on drinking water conveyance with the early discussion about water rates. However, the graphic for the chapter shows a storm drain. This section should highlight that water infrastructure includes any infrastructure that collects, treats, conveys, transports, discharges water, wastewater and stormwater to include all the pipes and appurtenances along with the transportation network that isn't conventionally considered a water conveyance mechanism.

It may be helpful to include a graphic depicting the water infrastructure cycle. The graphic could depict a typical surface water source/water treatment plant conveyed to a business or residential area followed by discharge to the sanitary system and conveyed to the WWTP followed by discharge back into the Great Lakes. Additionally, the graphic should show the stormwater conveyance from properties to local creeks and to the Great Lakes. All of these systems are part of the "water infrastructure".

Overall, the chapter should have a strong focus on the investment need for water infrastructure, including water, sanitary, transportation network and stormwater management. Green infrastructure should be reflected as a method to extend the life of the hard infrastructure systems and supports long-term cost benefits. Additionally a discussion about the importance of aligning infrastructure improvements to take place together rather than independently will lead to significant long-term cost savings. For example, roadway projects should also include other needed infrastructure upgrades such as water, sanitary and stormwater.

Improve Understanding of True Cost of Water

- The first paragraph of this section should clearly reflect that the cost on a water bill reflects, not just delivery, but also collection, treatment and maintenance. So much discussion about a "free" resource overwhelms the intent of the paragraph to highlight the need to pay for the collection, treatment and delivery through an elaborate system and network of pumps, pipes and treatment systems.
- Reference the types of municipal water supplies groundwater vs. surface water in the second paragraph. The second sentence in this paragraph seems out of place with the intent to highlight costs associated with "commodities and services".
- Again, reference water utilities to include water, wastewater and stormwater.
- There is too much discussion about a "commodity price or charge" for water when it isn't a recommendation and the chapter itself dismisses it as an alternative. Recommend shortening the description on this option and focusing more on the need to supporting efforts to define the true cost of service (water/wastewater/stormwater) in addition to exploring new approaches to financing stormwater management.
- This entire chapter lacks any discussion about fracking and the associated effects of permanently removing significant quantities of water from the overall water cycle. Additionally, the conveyance of hydrocarbons via pipelines and the interconnectedness to our water systems is an important component. The challenges associated with radioactive fracking waste and potential impacts to Michigan's water resources should be clearly delineated with recommendations for consistent approaches for local transparency, safety, emergency response and accountability.
- The 1st recommendation talks about linking water to other amenities, but the entire section does not have any discussion about the other amenities.
- The 2nd recommendation is very vague. There should be reference to supporting a true cost of service approach for all water infrastructure in addition to making reference to evaluating and supporting development of alternative financing approaches for stormwater management infrastructure.
- The 3rd recommendation seems inconsistent with the lengthy discussion about implementing a "commodity charge" on water. Another reason to minimize that discussion in the section.

Invest in Water Infrastructure

- Include a more holistic discussion of water infrastructure, to include water, sanitary and stormwater.
- Talk about an "integrated systems approach" early on and describe what that means.

- Highlight the challenges of dealing with stormwater infrastructure and financing either in this section or the previous section in order to adequately recommend "evaluate and support alternative financing approaches and legislative options to dedicate a funding stream for stormwater management infrastructure"

Develop an enterprise budget

- Since this section is clearly focusing on water, sanitary and stormwater infrastructure, this should also be reflected in the earlier sections.

Chapter 7: Monitor Water Quality

Introductory Section

The introduction should describe clearly what it means to monitor water quality and water quantity. With all of the discussion about drinking water previously, the average reader may infer the discussion to be focused on drinking water.

What is typically monitored from a water quality vs. water quantity standpoint? Describe in general terms the types of water quality parameters that are monitored to support recreational and economic development opportunities. Differentiate between monitoring the resource vs. state permit programs that require monitoring discharges/outfalls. Describe how these approaches are interconnected and support the overall goals.

Build Integrated Outcome-Based Monitoring

Include discussion about the types of federal, state and local monitoring programs. Also include discussion about the importance of watershed groups and local volunteer monitoring programs. Highlight how local volunteer programs can support and meet the intent of state programs and this outcome-based approach.

Integrated means including the overall approach and accompanying pieces to achieve the state goal of being fishable, swimmable, etc. This section needs to describe the varying pieces and partners collaborating to achieving the overall goals. Linking this integrated approach to the Water Strategy's introductory focus of an "ecosystems" based approach. Ecosystem-based from a monitoring standpoint should include discussion about achieving water quality standards, but specifically identifying those goals from a biological standpoint and how to get there. Aligning the biology achievable goals for fish/macro, etc. with the parameters that need to be monitored can then better define the action items for achieving that goal.

As an example of an ecosystem-based approach, consider describing the connection between runoff reduction to reduced pollutant loading and stream flashiness and how that directly benefits the stream biology. In this example, outlining how stream quality scores and flashiness are linked helps to define the goal. Monitoring parameters can include the stream flow and macroinvertebrate populations. The action items are defined by the quantity of impervious cover that should be managed within green infrastructure. This supports a needed discussion about establishing runoff reduction targets by subwaterhseds that will lead to achieving water quality standards. EPA funded and MDEQ supported the Water Quality Target Setting process that recommends specific runoff reduction targets needed in subwatersheds to work towards the

resource achieving water quality standards. It is an opportune time to highlight these connections.

A potential recommendation from this study could include, "Support efforts to establish runoff reduction targets within priority subwatersheds across the state leading to collaborative partnerships to implement stormwater management measures."

Chapter 8: Build Governance Tools

- This chapter includes a philosophy that should be reflected throughout the previous chapters…highlighting that it isn't a topdown regulatory state approach that will achieve success, but rather this integrated approach from different entities, etc. This also should focus on the interconnectedness of the system and that it needs to be managed as such.
- Specifically, governance tools should include a discussion on:
    - Need for innovative partnerships And how the state can and must play a role in enabling them.
    - Prioritize state funding for activities to implement recommendations (e.g., meeting gaps in public access).
    - Prioritize state funding and technical assistance to strategically support alignment of local efforts looking at a holistic approach (i.e., where local communities/organizations desire recreation or desire focused attention on a particular stream/water resource, state agencies should identify where state funding can work towards these desired outcomes. Where are there wetland restoration opportunities? Where is state property located that may be utilized for particular purposes?, etc.,).
    - Promote coordination between watershed planning groups and transportation agencies that leads to a process of incorporating stormwater management into transportation projects.

Chapter 9: Inspire Stewardship

The Water Strategy should include the need for continued and coordinated public education campaign. This should go beyond K-12 education. It should also support efforts of watershed councils and watershed organizations that inspire stewardship locally.

From:	Laura Haynes
To:	mi-waterstrategy
Subject:	Sen. Pavlov comments
Date:	Thursday, August 27, 2015 11:06:17 AM
Attachments:	Water Strategy Comments.pdf

Attached, you will find comments from Sen. Phil Pavlov regarding the 30-year water strategy.

Please let me know if you have any questions.

Thank you,

Laura Haynes
Director of Constituent Relations and Community Resources
Senator Phil Pavlov
Michigan's 25th Senate District

517-373-5074
LHaynes@senate.michigan.gov

From:	Anne Woiwode
To:	mi-waterstrategy
Cc:	Gail Philbin; Melissa Damaschke; Erma Leaphart; Nancy Shiffler
Subject:	Sierra Club comments on Water Strategy
Date:	Friday, August 28, 2015 2:24:08 PM
Attachments:	SierraClubCommentsonMichiganDEQ.docx (1).docx

To the Office of the Great Lakes:

Attached please find the comments of the Sierra Club on "Sustaining Michigan Water Heritage, A Strategy for the Next Generation". These are the compiled comments of the Michigan Chapter and the Great Lakes Program of the Sierra Club.

I've copied the principals engaged in preparing the comments so that if there are questions we can respond to them.

Thank you for accepting our comments.

Anne Woiwode, Conservation Director
Sierra Club Michigan Chapter

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Sierra Club Comments on
"Sustaining Michigan Water Heritage, A Strategy for the Next Generation"

Submitted by the Sierra Club Michigan Chapter and the Sierra Club Great Lakes Program

August 28, 2015

"Sustaining Michigan Water Heritage, A Strategy for the Next Generation" **(**Strategy) provides a broad sweep of water related issues in Michigan, and the objective of setting out a thirty year horizon on these issues is a positive. Sierra Club offers these comments and recommendations seeking to improve and strengthen the Strategy, in particular in those areas where clearer, enforceable measures are needed to achieve the goals. On the whole, we are disappointed that the Water Strategy speaks to what government "can" and "should" do versus what it WILL do to protect waters within the Great Lakes Basin.

We respect and agree that all of the people of Michigan have a role to play in protecting and restoring our water quality, and Sierra Club has been among the organizations actively engaging our members and allies in water testing and storm water reduction for many years. However, the State of Michigan must take the leadership role, starting with creating a stronger vision statement, and establishing or adopting specific verifiable goals and data driven solutions. For example, enforcement regarding citizen complaints on some categories of water quality permits have been noticeably reduced in the past few years, making it appear there are fewer violations and problems than in fact exist.

In addition, the emphasis on voluntary measures should not take away from the state's duty to ensure that regulations are protective of water quality and health, that they are based on the current scientific information rather than just balancing stakeholders' positions, and that protective standards and permits are enforceable and, in fact, are enforced. This is the State of Michigan's primary obligation to its citizens in any Water Strategy - yet it seems to be significantly deemphasized over past statewide water plans.

Sierra Club is concerned that the Strategy takes a step back from the 2009 "Michigan Great Lakes Plan" (https://www.michigan.gov/documents/deq/MI-GLPlan_262388_7.pdf) with no explanation as to why this is being done. The 30 year horizon of the Strategy suggests that the goal is to create forward motion that is not subject to political whims, yet the Strategy makes no mention of the extensive work done under the Granholm administration towards this same goal. We ask that the Office of the Great Lakes compare the recommendations of the MI Great Lakes Plan with those of the Strategy and, in responding to comments, document and identify the differences.

In addition, we are perplexed that certain vital pieces of information are missing from the Strategy. For example, while there is a reference to researching technologies to treat ballast waters, there is no legislative or policy objective laid out based on extensive information that already exists.

Below Sierra Club offers more detailed comments on the Water Strategy by section. Please let us know if there are questions. Sierra Club is also willing to participate as a stakeholder in additional review and forums on the Water Strategy if invited.

GOAL 1: Michigan's aquatic ecosystems are healthy and functional

Reducing blue-green algae blooms: Sierra Club agrees wholeheartedly that it is essential to develop a Strategy to tackle blue-green algae. Michigan agricultural crop and livestock operation runoff contributes to the cyanobacteria growth that poisoned the Lake Erie drinking water of more than 400,000 people in southern Michigan and Toledo last summer, and that is threatening western Lake Erie again this year. Similar conditions are of concern in Saginaw Bay and other parts of the Great Lakes as well. However, the tools and actions cited in the Strategy that are intended to address this threat fall far short of addressing this dangerous and growing problem.

Research and data going back as far as thirteen years[1] has repeatedly demonstrated that agricultural practices along waterways, including buffer strips, grass strips, constructed wetlands, cover crops, and no-till, are inadequate in removing dissolved reactive phosphorus (DRP) from surface water, especially in heavily tiled fields. These are among the activities in the Michigan Agricultural Environmental Assurance Program (MAEAP) "suite of practices" the report promotes. They are good practices for certain issues, but not if the goal is to "achieve 40% phosphorus reduction in the western Lake Erie basin," because DRP will continue to enter waterways despite the use of these practices.

The state has repeatedly passed up opportunities to take substantive steps to address the problem, and unfortunately the Strategy again ignores these effective steps. Just this year, the Michigan Department of Environmental Quality (DEQ) declined to make a change to its concentrated animal feeding operations (CAFO) water quality permit that would have taken a significant step towards reducing phosphorus runoff. The DEQ could have replicated a recent decision made in Ohio to completely ban the application of CAFO wastes to frozen or snow-covered ground, which would virtually eliminate one of the most common sources of substantial agricultural discharges into waterways that feed into our Great Lakes. Despite extensive, well-documented comments submitted to DEQ regarding the proposed renewal for the CAFO NPDES General Permit, the DEQ decided instead that spreading wastes on snow-covered or frozen ground would be a voluntary option for CAFO operators. This decision reflects the failed status quo here, where Michigan state agencies ask for rather than require that permitted agricultural operations implement measures to protect our water quality. The Lake Erie water crisis of last summer points clearly to the failure of "voluntary" standards, and the Strategy should demonstrate that the state is capable of learning from such failures by enacting enforceable, proven requirements.

Refine and improve the water withdrawal assessment process: Sierra Club supports the acknowledgement in the Strategy that the Water Withdrawal Assessment Tool (WWAT) needs improvement, because the current iteration is flawed. Groundwater is the primary source of drinking water for the majority of Michigan residents. Additionally, groundwater keeps streams wet during times of low flow and keeps many of our streams cold enough to support coldwater fish such as trout (and our comments apply to Goal 2 as well).

In particular, the WWAT needs to address the short-term, high volume withdrawals used for oil and gas operations. The model does not adequately address these impacts. Hydraulic fracturing uses very large quantities of water to fracture wells. Oil and gas wells drilled in Michigan have used upwards of 20 million gallons for one well. In most cases, the water used to fracture the well is withdrawn from the ground near the hydraulic fracturing site. Back-flow from these wells can result in 30 to 75% of this water being returned to the surface. The use of deep injection wells to dispose of this water renders this water as a total loss to the hydrologic system. Data collected on the impact of water withdrawals is necessary to effectively update the WWAT model, and deficiencies in or loss of that data raise concerns about the validity of the tool (see related comments regarding monitoring).

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[1] Environmentally Concerned Citizens of South Central Michigan (ECCSCM), www.nocafos.org , have documented the repeated failure of these practices to prevent pollution from concentrated animal feeding operations (CAFO) from entering surface waters. Additional study references are available on request.

GOAL 2: Michigan's Water Resources are Clean and Safe

Sierra Club supports the general direction of the recommendations under this goal, and the definitive language of the "measures of success" is encouraging. We commend the recommendation to pass legislation to phase out the sale and use of microbeads as a solid and needed addition to current laws. The recommendation to "establish priorities and address emerging pollutants of concern" is also a solid goal. However we note that simultaneously the DEQ is proposing to weaken Michigan air toxics regulations. Michigan's unparalleled connection to and dependence on water, and our historic challenges addressing contamination of waters, argues for our state to implement protections based on precautionary principles. The continued existence of unresolved massive contamination sites in our state, and the stunning return of the algal blooms in Lake Erie should be a wakeup call that vigilance is critical when it comes to preventing pollution in Michigan.

It should be remembered that the first solid understanding of the presence and threat of air toxics occurred in Michigan as PCBs were discovered in Siskiwit Lake on Isle Royale, and that our lack of knowledge is no guarantee that a pollution does not exist. How the state identifies emerging pollutants is an important question, and the openness of Michigan agencies to responding to these will be a critical measure of success for the Strategy.

There are some specific additions and improvements Sierra Club urges be addressed in this section, and we note this is not an exhaustive list. Specifically, the state should adopt and enforce the updated EPA standards for protection of human health and the environment, for example the new standards for exposure to dioxane. The state should increase restrictions and monitoring of injection wells for oil and gas production waste, including presence of TENORMS.

GOAL 3: Michigan communities use water as a strategic asset for community and economic development.

GOAL 4: Michigan's water resources support quality natural resources, recreation and cultural opportunities.

These two goals go hand in hand and should not be considered separately. The recognition that Michigan's extraordinary water resources are an asset to all communities is one of the most important changes in attitude during the past several decades. Protection of these natural resources, and assuring that any economic development or recreational uses must work to assure the protection of these assets needs to be clearly articulated in the Strategy. These goals can be a positive, as long as it is recognized that water quality and ecosystem protection and restoration are an essential measure and need to come first; that access for the public for recreation, fishing, and other purposes should not be reduced in order to promote commercial developments; and that green infrastructure goes hand-in-glove with any proposals of this kind. Even though Goal 4 includes some of these ideas, these need to be integrated.

In developing commercial or recreational uses of our waters, Michigan must also assure that degradation of native ecosystems does not occur, and that restoration of those riparian and aquatic ecosystems is the top priority. For example, the state of Michigan has opened up the possibility of commercial development of fish farming both on the Great Lakes and in the Au Sable River, and in fact issued a permit for a commercial operation in the Au Sable that threatens Michigan's top, self-sustaining blue ribbon trout fishery. The Strategy must clearly articulate that not all uses of our waterways are on par with each other, and reject the argument that there is a "balancing of interests" when the net result is the degradation of unique and irreplaceable resources. Whether the damage occurs in a single action or

through incremental degradation, Michigan must adopt and enforce a position that non-degradation of our precious waterways is always the top priority.

Among the specific objectives for protecting our waterways, Michigan needs to assure reduction of mercury in the Great Lakes and inland fisheries by adopting of a strong, effective Clean Power Plan State Implementation Plan. Addressing climate disruption through this and many other measures is also essential in the goal of assuring our rivers, lakes and streams are healthy. As noted above, the State's proposal to reduce the number of air toxics regulated may result in introduction of dangerous materials into even the most remote waters – again.

The recommendations discuss monitoring beaches for contaminants, which is a good goal. However, as we have seen in Lake Erie's algal blooms, even when a situation begins to emergy it can take years of not decades to take steps to counteract it. Monitoring alone is insufficient if there is not a commitment to act to address the problems in a preventative fashion. Of particular concern for recreational uses of water is addressing nutrients, pathogens and biological contaminants and invasives in ways that are enforceable. Western Lake Erie is the canary in the mine of threats to Saginaw Bay, Green Bay and inland waterways from bacteria and other pathogens.

GOAL 5: Michigan has a strategic focus on water technology and innovation to grow sustainable water-based economies.

Sierra Club applauds the in depth discussion of water conservation and developing a conservation and reuse strategy. In addition to meshing with our commitments to the other Great Lakes and Provinces regarding sound policies for water conservation, this is an increasingly important priority in a world where climate disruption threatens water resources everywhere. However, we are concerned that the Strategy again focuses on voluntary action primarily. As climate change increasingly affects available water resources throughout North America, the state and Great Lakes Region need to assure that we have in place proactive, enforceable strategies for preventing water diversions and addressing water quantity, and that these measures are continually updated and sufficient to protect the waters here. The repeated efforts by Waukeshaw, WI, to seek a diversion out of the Great Lakes basin should be seen as the leading edge of what will be increasing urgent and politically powerful demands to undermine Michigan's wise policies to keep our water here and ask people to come here to use it, rather than divert it away.

GOAL 6: Michigan invests in infrastructure and supports funding to maintain clean water and healthy aquatic ecosystems.

The long term challenges of failure to invest in our infrastructure are among the most pressing issues facing many communities, and this goal is a good one. However, a concern of Sierra Club is what is unaddressed here: that access to water for drinking, washing, etc. is guaranteed in Michigan as a human right. Michigan has been the home to gross injustices as a result of the "cost of service" for water utilities being imposed on communities and individuals who were unable to afford it, not because they did something wrong but as a result of the loss of customers from those systems, for example in Highland Park. The Strategy needs to assure that Michigan policies address the questions of equity, of ensuring that water utilities continue to be publicly owned, and that the price of meeting the basic water needs for families is affordable.

GOAL 7: Michigan has integrated outcome-based monitoring systems that support critical water-based decisions.

Sierra Club strongly endorses the concept that Michigan needs a plan and funding for comprehensive monitoring of groundwater and surface water quality and quantity. The best argument for the need is contained right here in this document--the state's plan to reduce phosphorus runoff by 40% in the western

Lake Erie basin as described in Goal #1 relies on buffer strips and other practices that won't address the problem of dissolved phosphorus runoff. Leaders who rely on academic models that don't accurately reflect what happens on the ground are misled into thinking this will be money well spent. Evidence that these practices won't achieve the desired result is found in data gathered by ECCSCM through regular and meticulous edge-of-field testing around 41 sites in 19 Michigan townships in the western Lake Erie basin where CAFOS apply manure. In 2013 and 2014, 100% of samples (70 of 70) were above the safe level for aquatic species of .1 mg/L, and 96% (67 of 70) exceeded Michigan's water quality standard for point sources of 1 mg/L.

This is evidence gathered in one small part of the state by unpaid volunteers who care about their community and the health of the land and water. They see that a huge problem exists that is being ignored by the people in charge and decided to take matters into their own hands. The state needs to take a cue from them. Stop relying on academics to tell them what's happening on the ground and find the money to do regular edge-of-field testing near CAFOs all over the state to find out what's working and what's not. Otherwise the 40% reduction goal will remain just that--a goal, not an achievement.

Monitoring Tools are Essential: The State of Michigan appears to lack an emphasis on the most critical tools for determining the success or failure in achieving the proposed goals for the Strategy. Two years ago, Sierra Club learned that the Department of Natural Resources (DNR) had discontinued or cut back substantially on their 5-year basin reviews or assessments as a result of budget cuts and staffing cuts. These 5-year basin reviews focused on fisheries, looking at fish community and populations, macroinvertebrates, other wildlife, riparian habitat, land use and land covers, paying particular attention to changes in land use or cover in the most recent 5 year period such perviousness. If the state has discontinued these 5-year basin reviews, the ability to monitor changes in these waterways resulting from permits affecting both water quantity and quality has been lost. Without a systematic assessment process, there won't be any way to effectively analyze trends in changes to surface water quality. Watershed monitoring is occurring in some areas, but rather than the DEQ and DNR systematically identifying the most important waterways to monitor and assuring programs are in place (e.g. the Michigan reaches of the Maumee River basin and the Detroit River) the program is tied to voluntary actions. A well-developed and effectively implemented plan for monitoring Michigan's waterways that are particularly of concern to the health of the Great Lakes and key areas of our state and region should be a priority.

Goal 8: Michigan has the governance tools to address water challenges and provide clean water and healthy aquatic ecosystems.

This goal acknowledges that institutional barriers and gaps can undermine even the best of intentions for achieving actual environmental protection. We note that the focus is on agencies and policies that are focused on water. Integrated systems need to also recognize that air pollution, toxics, energy policies and other arenas can and do have an effect on water quality and quantity. As noted above, there is a need to also address contradictions across agencies vested with authority in these media and issues. For example, inadequate enforcement of air quality standards impacts water quality goals.

The emphasis on private foundations to support this work is troubling in several respects. The costs of addressing environmental challenges need to be borne by those who are benefiting from the activity that potentially compromises environmental quality. The Strategy needs to state clearly that funding programs to protect the water quality and quantity of Michigan needs to be a high priority for the state, and should neither depend on the largesse of private foundations, nor be undercut because those who benefit refuse to pay the costs. Michigan will not be able to sustain this Strategy or any other environmental programs if they are built increasingly on voluntary compliance and voluntary funding. And this premise ultimately shifts the burden to those who are the victims of improper environmental controls, who pay with their health and well-being, as well as the loss of ecosystem function and value.

The suggestion that there should be great collaboration and inclusiveness in water policies is good, especially when the importance of not undercutting the state's authority to maintain our legal authorities under the federal and state laws is clearly articulated. But the world is run by those who show up, and too often the people most in need of representation in the processes are unable to "show up". The increasing use of stakeholder processes where only a select group of invited people are at the table closes the door to those who are often the most at risk and in most need of having their voices heard. Open, public, transparent processes are critical at every level and the Strategy should prioritize this as an outcome for every step of the process.

Regarding the proposed measure of success that "by 2030, achieve a 40% reduction in number of designated uses or impaired waters," this measure is not explained and raises questions about 40% of what? Does this relate to river miles, or a change in 40% of the segments, or some other measure? One on-going criticism of Michigan's assessment of its progress in bringing our waterways back to fishable, swimmable, etc., is that waterways that have been designated agricultural drains have effectively been written off when it comes to cleaning them up. Many other waterways have "insufficient information" or have had no assessments completed according to DEQ's reporting the EPA. It will be impossible to use this merit to measure success if it is not future defined.

GOAL 9: Michigan citizens are stewards of clean water and healthy aquatic ecosystems.

Sierra Club strongly supports the encouragement of an engaged and informed citizenry who are participants in shaping policies and ensuring they are implemented. We are among the organizations that actively participate in a variety of stewardship work and educational efforts, and support the Strategy encouraging these types of activities. Sierra Club would strongly suggest expanding this section to also acknowledge the importance of the active participation of citizen in supporting the development of laws, policies and other tools for protecting our waters. The state needs to facilitate that through open, transparent and accessible decision making processes that are not simply limited to select stakeholders from the beginning. In addition, the Strategy should acknowledge the importance of agency enforcement of those policies, and, in some cases, citizens taking steps to enforce Michigan's environmental laws. While state agencies have the primary responsibility to enforce laws, citizens in our state are also given clear authority to act when our government agencies are either unable or unwilling to act.

WRC
WATER RESOURCES COMMISSIONER
Jim Nash

August 25, 2015

Mr. Jon Allan
Director, Office of Great Lakes
P.O. Box 30473
Lansing, MI
48909-7973

Re: Comment on Draft - Michigan Water Strategy

Dear Mr. Allan:

Thank you for the opportunity to comment on the Draft Water Strategy. It is clear that a great deal of time, effort, and thought went into the preparation of the Strategy. Our first comment is to say thank you to all those who participated in crafting this document.

We share the sense of pride in our water resources so evident in the Strategy. It is that shared sense of pride that motivated our comments and suggestions, all of which are rooted in our desire to make this Strategy as useful as possible to both state and local governments.

We have worked in collaboration with others in reviewing the draft Strategy. In particular, we support the detailed comments provided by both SEMCOG and MWEA. Each of those representative membership organizations are excellent experts and bellwethers. We encourage your careful consideration of their suggested modifications.

For the most part, our comments are more overarching and thematic. To the extent you agree, we would be happy to work with you in the crafting of specific language . . . but only if it would be helpful. Otherwise, we trust you will knit together and align our suggested directional modifications based on the comments of others as well.

The Vision

We do not view the Strategy's vision as something that should be either generic or trivial. Our hope is that it is compelling, inspiring and represents the culture of thinking suggested in the Strategy. We suggest the vision be more unique to Michigan and more clearly set us apart from other states. Not just because of our extensive natural water resources, but because of how we view them in the overall context of governance. Lastly, the vision for the Strategy should announce what we intend to do.

One Public Works Drive • Building 95 West • Waterford, MI 48328-1907
Phone: 248.858.0958 • Fax: 248.858.1066 • www.oakgov.com/water

To us, the big picture context is quality of life. The state's overall, long term vitality will be determined by the quality of life it provides. And sustained investment in quality of life is inextricable from economic vitality. If the architects of the plan and the State of Michigan also hold this to be true, we urge you to make it explicit early and often.

An example of how our thought process could be reflected in a unique vision that announces what we intend to do is: "Michigan capitalizes on its unique connection to the Great Lakes and all its water asset resources to support economic prosperity which enables sustained investment in protecting those water resources." (Note: to capitalize on our water resources, we have to invest in protecting them just like any other valued asset; economic vitality enables that protection).

Stormwater Management

The OCWRC is leading a multi-agency effort to answer the question: what do we need to do to advance protection and enhancement of our water resources? We believe the science is clear and compelling: do a much better job of managing stormwater. Does the state also believe that stormwater management is the most common key to restoring water from impaired uses? We believe the state's answer is yes, but only by implication. If so, it must be explicitly stated and prominent in the Strategy. If not, ironically, the Water Strategy will reduce local governments' chances of success in addressing the problem. A whole range of the positive actions would trickle out of this powerful recognition in the Strategy. It will appropriately turn much more of the discussion and debate from "what do we need to do" to "how do we do best get it done."

It would also be helpful if the Strategy recognized that stormwater management services are akin to other utility services such as sewage treatment, and the provision of safe drinking water. Lastly, the Strategy could articulate the components of rate structures that represent the true cost of service. This would include the full cycle of asset management: capital, operation, maintenance, and replacement. The Strategy could urge their adoption in utility rate systems recognizing it as an integral feature of investing in our own economic prosperity.

Answering the "So what?" Question – Part 1

The intent that we all own the plan is fairly clear. It is also very appropriate. What is not clear is how the state's initiative to create the Strategy will be accompanied by its use of the Strategy in decision making.
However complex and/or controversial, we urge that the final strategy lead by example. It should articulate some of the ways it will be used to support the state's decision making. And it should do so for departments other than DEQ. This is critical to making the culture of thinking sought in the Strategy, well, a part of the culture of thinking. Our suggested approach to Outcomes and Measures (see below) provides a concrete structure for providing clarity of direction and purpose to a wide range of organizations, including state government.

Answering the "So what?" Question – Part 2

The Strategy can be given immediate impact and credibility through identifying a short list of important actions that must be pursued immediately. Each action should have an explanation of why it rises to the top in the context of the big picture. We urge that one of those actions be geared toward assuring the Strategy supports advancement of stormwater management. We urge the Strategy "support providing owners and operators of stormwater systems with the investment tools necessary to manage this asset because it is fundamental to achieving the vision."

Outcomes

The focus on outcomes is a great approach for a strategy document. Very appropriately, the Strategy is a product of several state departments reflecting the inter-agency collaboration needed for success. But some outcomes actually read as actions. Two examples follow:

"Surface and groundwater are managed to support sustainable human uses and ecological function."

"Policies and innovative technologies are developed and adopted to grow and promote sustainable water-based economies. "

Our primary concern is the outcomes in the draft Strategy are presented as new, unique to the Strategy, or both. We urge that the Strategy be built around the very same outcomes to which the whole state aspires in the aggregate. Presently those state outcomes are more implicit than explicit. Yet, they can be readily extracted from speeches, written materials, decisions, etc. We believe that Michigan is rightly focused on quality of life. And we believe that quality of life can be defined by a simple set of outcomes that become the focus of every action we take.

Some examples of what we believe those outcomes to be with example actions from the draft Strategy follow.

Healthy, Accessible Water Resources

- Establish a long-term Water Fund to achieve Water Strategy goals including water infrastructure management
- Prioritize investments in recreational harbors to address long-term infrastructure needs.

Economic prosperity

- Michigan has a strategic focus on water technology and innovation to grow sustainable water-based economies
- Michigan communities use water as a strategic asset for community and economic development.

Quality services

- Pass a statewide sanitary code and inspection requirements.

Healthy neighborhoods

- Develop and implement a water trails system.

Access to jobs, markets and services

- Create an integrated system for managing water at the local level to achieve water quality and quantity outcomes.

This approach would enable and guides any agency of the state, any local government or any advocacy organization in plugging in its own actions in support of an outcome. We believe that is the ultimate process for leveraging resources from multiple organizations, and leveraging them in a singular direction.

Measures

The Strategy's contribution to the state's overall outcome becomes manifest by the selection of a few high level measures. Each measure inspires a long list of very specific sub-measures designed to make selection and tracking of actions manageable and consistent - this daylights the connection between seemingly trivial actions and the big picture. For example:

Outcome: Healthy, Accessible Water Resources
Measures

- Diversity of fish populations
- Territory occupied by invasive species
- Green cover
- Population in watersheds with impaired uses

We also need targets for measures, or at least to discuss the process for setting them which entails consideration of the big picture and "bang for buck" thinking. For example: the goal "By 2030, achieve a 40% reduction in number of designated uses or impaired waters" is actually an interim target that may be very worthy. On the other hand, a systems approach begs the question, "how much does that cost and is it the best use of financial resources in pursuit of the outcomes sought?"

Thank you again very much for the opportunity to comment and your commitment to modify the draft Strategy as appropriate. Please do not hesitate to contact me with questions or concerns.

Sincerely,

Jim Nash
Oakland County Water Resources Commissioner

From: Willi Water
To: mi-waterstrategy
Subject: Stormwater
Date: Wednesday, September 23, 2015 11:27:03 AM

Hello,

Is Macomb following Oakland's lead

https://www.oakgov.com/water/Documents/Standards/manufactured_treatment_systems_standards_update_2014.pdf

From:	Gary A. Dawson
To:	mi-waterstrategy
Cc:	Linda M. Hilbert; Jeffrey A. Myrom; Thomas A. Stanko; Jessica M. Woycehoski; DOUGLAS B. ROBERTS JR
Subject:	Submittal of Consumers Energy"s Comments on Michigan"s Draft Water Strategy: Sustaining Michigan"s Water Heritage-A Strategy for the Next Generation
Date:	Friday, August 28, 2015 12:28:50 PM
Attachments:	Michigan Water Strategy_Comments of Consumers Energy.pdf

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Consumers Energy's comments on Michigan's Draft Water Strategy are attached.

Thank you,

Gary A. Dawson, Ph.D.
Director of Environmental Policy– Land and Water Management
Environmental Services Consumers Energy
O: 517-788-2432 | **C:** 517-262-5672 |Fax 517-788-2329

From:	Joseph Aragona
To:	mi-waterstrategy
Subject:	Suggestions to Michigan"s Water Strategy
Date:	Tuesday, August 25, 2015 5:38:13 PM
Attachments:	letter to office of great lakes.pdf

Director Jon Allan,

Please see the attached letter from Representative Forlini regarding the draft of Michigans water strategy.

If you have any questions or concerns, please do not hesitate to contact me.

Joseph A. Aragona
Legislative Director
Rep. Anthony G. Forlini (24)
(517) 373-5746

From:	Thomas Stephens
To:	mi-waterstrategy; dremcom@lists.d-rem.org
Cc:	Detroit Warriors; D-REM; PMA Group; D-REM Communications List
Subject:	Supplemental Comments - State Water Strategy
Date:	Saturday, October 03, 2015 8:24:58 AM

Dear Michigan Office of the Great Lakes:

I have received no response to the timely comments I filed on August 23 - not even any acknowledgment of their receipt. The State Water Strategy web site does not reflect any receipt or content of comments.

In the meantime, new test results regarding lead in the water and the bloodstreams of children in Flint have furthered revealed the true, basic nature and direction of state water policy.

I am now submitting a supplemental piece recently published (September 25) by Nick Dearden, Director of Global Justice Now, regarding the United Nations Sustainable Development Goals (SDGs), which raises parallel concerns expressed about the Draft State Water Strategy. It is extremely relevant and persuasive.

EXCERPT: "Unless you understand that the poverty of some flows from the wealth and power of others, efforts to fight poverty will not truly work."

Here is the link:
The UN Development Goals Miss the Point – It's All About Power

MORE EXCERPTS: "The real problem is that this wish-list comes with no historical background of how we got here, and no political strategy for how we get out. As such it relies on a mixture of more market and more technically competent governments. There's no sign that the economic model itself is broken – just that it needs some tuning.

Take one obvious gap: trans-national corporations. They aren't mentioned in the SDGs, yet the power of corporations is fundamental to the staggering levels of inequality which afflict the world, and are at the centre of an economic model quite prepared to burn the planet in its drive for ever more profit. It is impossible to realise the targets of the SDGs without tackling corporate power.

Nor is there any acknowledgment of colonial history, of slavery, of racism, of desperately unfair terms of trade, of structural adjustment policies which flushed dozens of countries' economies down the drain only 30 years ago ***[or of Michigan Emergency Management policies on the cutting edge of depriving our most vulnerable People of political agency, health and the means for life itself - TS]***. Far from critiquing the control of the market, the SDGs exhort world leaders to "remove market distortions" and "ensure the proper functioning of food commodity markets." ... ***[the same underlying flaw in the draft state water strategy document, as discussed at length in my***

original comments]

In short, power doesn't exist in the SDGs. The chapter on inequality nowhere mentions that the problem of poverty is inseparable from the problem of super-wealth; that exploitation and the monopolisation of resources by the few is the *cause* of poverty. Of course this lack of analysis isn't accidental. In the world of fighting poverty, of 'development,' corporations and the super-rich are no longer problems, but partners."

Thank you for your time and attention to this matter.

Tom Stephens
jail4banksters@yahoo.com

In Detroit, democracy and the rule of law were suspended by a brutal white supremacist, neoliberalizing corporate patriarchal takeover. For the barely concealed purpose of imposing the terrible costs and burdens of the Wall Street crash of 2008 on the most powerless and vulnerable among us.

http://www.counterpunch.org/2014/03/19/detroit-lives/

If you're going to kick authority in the teeth, you might as well use two feet. - Keith Richards

http://www.telegraph.co.uk/culture/music/music-news/10522722/Keith-Richards-21-of-his-best-quotes.html?frame=2768039

From: Thomas Stephens <thomasstephens2043@sbcglobal.net>
To: "Mi-waterstrategy@michigan.gov" <Mi-waterstrategy@michigan.gov>
Cc: Detroit Warriors <commons-pwb-forum@lists.sierraclub.org>; D-REM <d-rem@lists.d-rem.org>; PMA Group <pmadetroit@googlegroups.com>; D-REM Communications List <dremcom@lists.d-rem.org>
Sent: Sunday, August 23, 2015 9:44 AM
Subject: [DREMcom] Final Comments on Draft State Water Strategy

"*… access to safe drinkable water is a basic and universal human right, since it is essential to human survival and, as such, is a condition for the exercise of other human rights*."
–Pope Francis, Laudato Si' (P. 23 ¶ 30)

Sustaining Michigan's Water Heritage, A Strategy for the Next Generation

DRAFT

4 June 2015

Lake Carriers' Association Review

21 July 2015

Lake Carriers' Association (LCA) appreciates the opportunity to review and comment on the document, "Sustaining Michigan's Water Heritage." Overall, the document is well written, comprehensive, detailed, thoughtfully presented, and implementable. LCA does have specific comments as they relate to commercial shipping, the supporting infrastructure, investment priorities, and related discussions on policy. They are as follows:

1. Page 7, Create Vibrant Waterfronts, Goal 3, "Michigan communities use water as a strategic asset for community and economic development." Key recommendation, "Support investments in commercial harbors and ports and address long-term maritime infrastructure needs."

   LCA fully supports commercial harbor and port investments as a key component in the economic vitality of the State of Michigan and local communities. Maintaining existing harbors keeps products flowing such as iron ore to Detroit and coal to Monroe with significant reductions in transportation costs over other modes of transportation, minimizes the environmental impacts, and alleviates major impacts to the state's aging roads and bridges. Improving harbors such as Escanaba, including deepening its channels, increases its economic efficiency and viability for growth. Our only caution is that development must always recognize that commercial vessels can only navigate in waters free of obstructions, so docks, floating finger piers, and the like must not interfere with waterborne commerce.

2. Pages 14 and 15, last paragraph, reference to riparian erosion and sedimentation problems due to, among others, the lack of riparian buffers and deforestation.

   LCA believes that upstream riparian management of soils is an essential tool not only to the quantitative reduction of sediments downstream impacting commercial and recreational navigation interests, but also in the environmental quality of the sediment that if managed properly can reduce and eventually eliminate the need for the costly option for storage of dredged materials in confined disposal facilities, and open the door to more environmentally sound beneficial uses of the dredged material.

3. Page 15, second paragraph, "Taking a broad approach starting upstream and working downstream to the mouth of the river can have comprehensive impacts on aquatic ecosystems, international shipping, and river recreation."

Initiatives that begin as high up in the watershed as possible and continue downstream focusing on minimizing stream bank erosion due to anthropogenic modifications to the watershed and that seek to restore to the greatest extent possible the environmental integrity of ecosystems are paramount to healthy streams, rivers, harbors, and lakes. This approach not only facilitates environmental healing, but also minimizes downstream degradation where pollutants concentrate when sediments drop out of suspension. It reduces overall sediment loads, thus decreasing the frequency of dredging of waterways and harbors and the very costly construction, with a large local partner financial cost share, of new confined disposal facilities. Also, the positive impacts are not just limited to "international shipping" but to all shipping, foreign and domestic, on the Great Lakes.

4. Page 27, first paragraph, "Michigan's waterfronts supported industries such as shipbuilding, power production, lumber yards, tanneries and chemical production . . . As industries abandoned the waterfront . . ."

   In our opinion, it was not a question of industries "abandoning" the waterfront, it was that many were driven out of business by unfair trade. Still, many remain as integral drivers of local economies. A 2011 study by Michigan Sea Grant showed that the Great Lakes shipping industry is a key factor in directly supporting over 525,000 Michigan jobs, including those in manufacturing, construction, power production, and mining. It should be stressed that vibrant waterfronts can and do include commercial ports and operations such as in Detroit, Sault Ste. Marie, and Marquette.

5. Page 28, Create Sustainable Commercial Ports and Harbors, last sentence, "However, the maintenance of channels, ports and harbors is only partially the responsibility of the state and federal government and therefore needs to be incorporated into the business models of maritime companies."

   It is in fact the responsibility of the United States Army Corps of Engineers (the Corps) to provide safe, reliable, efficient, and environmentally sustainable waterborne transportation systems (channels, harbors, and waterways) for movement of commerce, national security needs, and recreation in federally authorized projects. What is lacking is the dedication of sufficient funds by the Corps to Great Lakes ports' dredging and maintenance. The Harbor Maintenance Tax (HMT) is a federal tax already imposed on shippers based on the value of the goods being shipped through ports. The tax is placed in the Harbor Maintenance Trust Fund (HMTF) which is used for projects such as maintenance dredging of federal navigational channels. HMT revenues are about $1.6 billion per year with expenditures from the HMTF averaging only $850-900 million per year. Currently the HMTF has nearly $10 billion in unexpended funds. In the Great Lakes, there is a $220 million backlog in dredging. The real issue is to get the funds already paid by the shippers to the outstanding projects in the harbors and waterways of the Great Lakes. The Water Resources Reform and Development Act (WRRDA) of 2014 directs the federal government to incrementally increase expenditures from the HMTF until they reach 100 percent of receipts by 2025.

6. Page 29, last section, Recommendation, "Prioritize investments around strategic economic assets of commercial harbors and long-term sustainable infrastructure."

   LCA wholeheartedly supports this recommendation as it promotes asset stewardship, a balance of the economic gains with the environmental benefits of waterborne transportation, and a compatibility with the regional approach of the Great Lakes Navigation System (GLNS).

7. Page 42, first paragraph, first sentence, "The state's infrastructure – roads, commercial ports, drinking water systems, sewer systems, energy plants, transmission systems and recreational facilities – form the backbone of the economy."

   In addition to "commercial ports" and the rest of the list should be added "waterways" as these include the connecting channels of the St. Marys, St. Clair, and Detroit rivers as vital components of the State of Michigan's infrastructure, for instance.

8. Page 64, Goal 3, Number 3, Recommendation, "Prioritize investments around strategic economic assets of commercial harbors and long-term, sustainable infrastructure." Implementation Metric, "By 2020, increase the percentage of commercial traffic and other economic activity at Michigan's commercial ports over a baseline established in 2015." Lead Actor, "MDOT, MDNR, MDEQ's Office of the Great Lakes, Governor's Office of Public-Private Partnerships, commercial maritime interests, local planning professionals."

   LCA agrees wholeheartedly with the recommendation, but believes the implementation metric should define the baseline by some quantitative measure such as tonnage. The lead actor list should also include industry as they are responsible for the products brought into and shipped from each port and how the cargo is moved (i.e., water, rail, or road).

9. Page 71, Goal 4, Number 3, "Invest in innovative and technological advancements to lower the cost and frequency of dredging."

   "Best practices" and "proven technology and methods" should be added. For instance, in Cleveland, Ohio, the port authority has installed on a trial basis bed-load interceptors upstream of the navigation channel. The port is intending to sell the captured material, mostly sands and larger grained silts, for beneficial reuse in construction and composting. In Green Bay, Wisconsin, the port authority has worked with the Corps to rebuild the Cat Islands, which will take significant amounts of dredged material through the next 30-50 years and will also minimize the movement of sediment in the outer harbor, minimizing dredging in the channel. For the lead actor, the state and local communities should be added because the Corps dredging mission does not mandate anything

beyond traditional removal from the navigation channel. Also add the Technical Committee of the Great Lakes Dredging Team (GLDT). Michigan is represented on the GLDT by the Michigan Department of Transportation and Michigan Department of Environmental Quality.

10. Page 72, Goal 5, Recommendation 6, fourth bullet, "Researching treatment technologies to prevent introduction and spread of invasive species by ballast water."

    Ballast water treatment technologies are currently mandated and regulated by the International Maritime Organization, United States Coast Guard, and United States Environmental Protection Agency. The commercial maritime industry has established best management practices that since 2006 have halted the introduction of new aquatic invasive species into the Great Lakes. Spreading of invasive species throughout the GLNS by the domestic fleet, which is mostly confined upstream of the Welland Canal, has not been shown in this time period. Prevention efforts are extremely important at the state and local level and should focus on recreational boaters, fishers, and the other 62 vectors of introduction and spread identified by the U.S. Geological Survey.

11. Page 148, fourth paragraph, Inland Lakes and Streams.

    Please include in the definition, for clarification, that Part 301 includes "the St. Marys, St. Clair, and Detroit rivers. Inland lake or stream does not include the Great Lakes, Lake St. Clair, or a lake or pond that has a surface area of less than 5 acres."

From: Spratling, Diamond (DEQ)
To: mi-waterstrategy
Subject: The Water Strategy Review
Date: Tuesday, August 04, 2015 9:55:44 AM

Hello, my name is Diamond Spratling. I am currently a sophomore at Bowling Green State University. I am also finishing up my internship at the Michigan Department of Environmental Quality. I would just like to say that I really enjoyed reading The Water Strategy Report. This report really opened my eyes to what could potentially be a new Michigan. Prior to reading this report, I hadn't even had an interest in water conservation, let alone the numerous ways Michigan could benefit from it. Throughout my time at the DEQ, I got to work on a project that pertained to both The Water Strategy and The Blue Economy. I must say, that was by far the most exciting and interesting project I worked on all summer. I am excited to see what Michigan will do next and I would love to be a part of the next steps.

Diamond Spratling
Office of Environmental Assistance, Intern
Michigan Department of Environmental Quality
SpratlingD@michigan.gov
Ph: (517)-284-6886
Mon- Tues. 8 a.m- 5 p.m

Tip of the Mitt Watershed Council
426 Bay St., Petoskey, MI 49770
231.347.1181 www.watershedcouncil.org

August 28, 2015

Mr. Jon Allan
Michigan Department of Environmental Quality
Office of the Great Lakes
P.O. Box 30473
Lansing, MI 48909-7973

Dear Director Allan:
Thank you for the opportunity to comment on the recent release of "Sustaining Michigan's Water Heritage: A Strategy for the Next Generation." I am writing on behalf of Tip of the Mitt Watershed Council and more than 2,300 individual, business, and lake association members.

The draft Water Strategy, "Sustaining Michigan's Water Heritage: A Strategy for the Next Generation," is a good step towards protection and restoration of Michigan's most valuable resource – our waters – as well as the long-term support of our citizens, communities, and economy. We commend the Governor and Office of the Great Lakes for initiating and developing the Water Strategy. Implementation of the recommendations put forth in the Strategy would result in substantial improvements to the health of the Great Lakes ecosystem, Michigan's citizens, and our economy.

In the following sections, we provide recommendations that would strengthen Michigan's Water Strategy.

Overall Comments

Coordination: It must be noted that the Great Lakes are, in fact, a global treasure and, therefore, protection and restoration must be considered in the context of all who share the resource. While the Strategy is Michigan-specific, coordination with the other Great Lakes states, Canadian provinces, and Native American Tribes and First Nations is necessary to fully sustain our water heritage. It would be good to acknowledge this.

Funding: A substantial national and state commitment of financial resources will be required to implement the recommendations put forth in the Strategy. Therefore, the Water Strategy should include specific funding levels, as well as existing and new funding resources for each issue area's recommendations. Additionally, the Strategy should encourage full allocation of appropriated funding for existing programs.

Accountability: Successful protection and restoration of the Great Lakes requires accountability, coordination, and fiscal responsibility. The roles and responsibilities of involved parties need to be fully defined or outlined.

Leadership: In addition to outlining the roles and responsibilities of lead actors, it would improve the overall implementation performance if a central leadership position or authority was identified to provide more direction to the efforts of all the parties. We worry that there is no implementation step identifying the overall leader, in charge of implementing the plan. There needs to be an agency or office assigned and articulated as such. We understand the challenges of writing and implementing a 30-year plan as numerous governors, legislatures, and agency personnel will ultimately take part. However, let us take notice of lessons learned from similar efforts. The Comprehensive Everglades Restoration Program is a 30-year program, signed into law when Clinton was President and Jeb Bush was Governor of Florida. This program, started in 2000, is still going strong at its halfway point, 15 years old. One key reason for its success is the fact that lead agencies were identified as "orchestra leaders", making sure the plan did not sit on a shelf. (See http://www.saj.usace.army.mil/Portals/44/docs/FactSheets/CERP_FS_August2015.pdf).

Flexibility: Strategy goals must evolve with the advent of new stresses, technology, and scientific knowledge. It needs to be recognized by all that the Strategy is a living document, subject to the dynamic nature of the Great Lakes, and needs to maintain flexibility to adequately address and incorporate emerging threats, issues, technologies, and advancements in science.

Transparency: We recommend requiring Annual Reports to be developed for the Water Strategy, in addition to a "taking stock" exercise every 5 years. Annual reports should include information on progress made, successes, and obstacles or challenges faced with implementation of the recommendations. This will keep the document in the public's eye, and will show decision makers the important progress being made.

Wetlands: Oddly, there is very little reference to wetlands within the Water Strategy. Wetlands are some of our most valuable resources – they provide homes for wildlife, maintain water quality, and protect us from floods. They are places of beauty that contribute greatly to the overall health of our environment and our quality of life. Although the functions and values that wetlands provide make them our most valuable landforms, the United States and Canada have lost alarming amounts of wetland habitat. Michigan has lost 50% of its original wetlands. The percentage of Michigan's coastal wetlands that have been lost is even greater, at 70%. In total, over 5,600,000 acres of wetlands have been damaged or destroyed in Michigan. As we continue to lose wetlands in Michigan, it has becoming increasingly important for the State of Michigan to protect and wisely manage our wetland resources. This needs to be reflected in a 30-year vision for our waters. Therefore, in addition to Michigan's lakes, streams, and groundwater, wetlands need to be referenced and emphasized within the Strategy.

Table 2 Comments

GOAL 1.

- #1. The implementation metric for #1 should also articulate some state-specific metric of measurement, taken from the Michigan Aquatic Invasive Species Plan. In addition to ecological separation of the Great Lakes and Mississippi River Basins, we suggest including an additional recommendation: "By 2020, establish and fully fund a statewide Rapid Response Team, to address reports of new invasive species."

- #2. If the implementation metric is to be a pilot project with Ontario, the Canadian Province needs to be identified as a Lead Actor.

- #4. A comprehensive strategy to prevent nuisance and harmful algal blooms must include mandatory measures for agricultural. The current framework of relying solely on voluntary actions by farmers has proved ineffective to adequately address agricultural pollutants. To ultimately protect the health of the lakes and citizens, it is time to consider more strict and accountable requirements for agriculture. This should include, at a minimum, a full ban on winter application of manure and municipal sewer sludge on frozen fields.

- #7. The State should go beyond developing a harmful algal toxin assessment criteria and develop a statewide drinking water advisory, or action level target, for harmful algal toxins.

- #8. Non-governmental organizations (NGOs) should be included among the Lead Actors for this recommendation. NGOs have been many steps ahead of state and local governments, and ahead of communities, at large, on the issue of climate change. NGOs can provide valuable information to those entities, to help implement this recommendation.

- #10. NGOs should be included among the Lead Actors. Many NGOs throughout the State, including the Watershed Council, have developed materials on shoreline and riparian ecology that can be utilized to encourage landowners to protect and fully benefit from their riparian area.

  In addition, the State needs to promote statewide policies and regulations that protect and enhance the riparian zone. We have recently seen a rollback in environmental protections by the State Legislature. If we truly want to leverage Michigan's most treasured natural resource and ensure its long-term sustainability, then we need our elected officials to better protect lakes, rivers, and wetlands that are pillars of the state's $17-billion tourism industry.

- #13. In addition to refining and improving the water withdrawal assessment process, the legislative exemption for water withdrawals associated with oil and gas development needs to be removed from state law. Part 327, Great Lakes

Preservation Act, prohibits new or increased large quantity water withdrawals that cause an adverse resource impact. When the water withdrawal legislation was originally enacted in 2006 and revised in 2008, Michigan's oil and gas industry was using techniques that did not require large quantity withdrawals of water. As a result, a withdrawal associated with oil and gas production is exempt from Part 327. (MCL324.32727(1)(a)) However, recent hydraulic fracturing techniques use significantly greater quantities of water than traditional methods – as high as 21 million gallons per well. Given the changing technology and potential impact upon groundwater resources of the state from these withdrawals, the exemption granted for activities authorized under Part 615 needs to be removed from Part 327.

- We suggest inclusion of another recommendation for Goal 1: Uphold the Great Lakes-St. Lawrence River Basin Water Resources Compact (Compact) by ensuring that Great Lakes water diversion applications meet every standard and requirement of the Compact, during Compact Council Regional Reviews. We are expecting the City of Waukesha Diversion application to be approved by the Wisconsin Department of Natural Resources and submitted to the Compact Council. As the first request for a diversion of Great Lakes water outside the Basin under the Great Lakes Compact, the review and decision-making on the Waukesha diversion application will establish a valuable precedent, setting the standard for future diversions. It is imperative that the review and final decision be made on the standards put forth in the Compact.

- #16. We enthusiastically applaud the inclusion of this recommendation.

- #17. We suggest an additional recommendation to establish stormwater plans to protect high quality waters. The Watershed Council works with the cities of Petoskey and Harbor Springs, for example, in addition to numerous other cities and townships in our 4-county service area, to create stormwater management plans. This is very important and supplements work accomplished by numerous 319 grants to address non-point source pollution in our high quality water region.

- #18. A similar implementation step is needed to protect high quality watersheds that are under constant pressure from development. Development needs to be conducted in an environmentally responsible manner that prevents degradation to water quality and ecosystem health. Engaging landowners about healthy waters is a key investment for the state as it prevents spending thousands of more dollars to restore waters if they become impaired.

GOAL 2.

- #1. We enthusiastically applaud the inclusion of mapping local groundwater conditions. This is greatly needed.

- #2. EXCELLENT pick up here! We recently started researching information on geothermal, and shared our concerns with a member of the Water Use Advisory Council. This is an area that needs to be more publicized, because we have seen circumstances in Northern Michigan where geothermal systems are being constructed without any permit application or evaluation of impacts to water resources. (*ALSO NOTE: The implementation metric section, under 2020, has a typo that says: "for comland-usemunity water systems…"*)

- #4. First, we are not sure what this step actually means. The implementation metric refers to a "pipeline strategy" that we think means the recommendations put forth in July 2015 by the Michigan Petroleum Pipeline Task Force. If this is what is being referenced, the Water Strategy should identify it as such. Additionally, the Lead Actors need to include federal government agencies and pipeline operators with infrastructure within the state. You cannot have a solid emergency plan regarding pipelines without including key federal actors responsible for emergency management and response, such as U.S. Environmental Protection Agency (EPA), U.S. Coast Guard (USCG), and the Pipeline and Hazardous Materials Safety Administration (PHMSA), or the pipeline operators themselves.

  In addition to implementation of the "pipeline strategy," there are a number of actions the State could take to reduce the risk associated with oil transportation and improve preparedness to respond to pipeline emergencies.

  Examples include:
  - Enact legislation that amends Michigan Public Act 16 of 1929 and strengthens the review process for new oil pipelines by requiring a full environmental review of proposed routes, placing emphasis on minimizing pipeline water crossings.
  - Require that the Michigan Department of Environmental Quality (MDEQ) conduct a pipeline water crossing survey to assess the risks of existing pipelines running under the state's rivers, streams, and lakes.
  - Require approval of all spill response plans by MDEQ, subject to certain standards and open to public review and comment.
  - Further accelerate the replacement of bare steel and cast iron pipe within the State.
  - Prohibit transportation of crude oil and petroleum products in barges or tankers in Michigan waters.
  - Prohibit construction of new pipelines in the Great Lakes.

- #5. YES!!!! This is sorely needed – see MSU's recently released study showing we have underestimated the impacts of septic systems on our lakes and streams: http://msutoday.msu.edu/news/2015/septic-tanks-arent-keeping-poo-out-of-rivers-and-lakes/ . Lead Actors need to be more than the Legislature. At a minimum, local Health Departments should be named, in addition to the MDEQ.

- #6. The statewide code should require regular inspection and maintenance of all on-site wastewater systems, with proof of such submitted periodically to the county or township. The state should design and export a simple, standard record-keeping procedure required in the code. Additionally, Lead Actors need to be more than the Legislature. At a minimum, local Health Departments should be named, in addition to the MDEQ.

- #10: Community collection programs to properly dispose of unwanted and unused pharmaceuticals and personal care products can place a significant financial burden on local community entities. Long-term funding needs to be secured and allocated to ensure communities can continue collection programs and properly dispose of such contaminants, into the future.

GOAL 3.

- #3. The implementation metric should be quantitative, identifying how many communities by a certain year. The recommendation needs numbers and timelines attached to them so that progress can be tracked against schedules.

GOAL 4.

- #4. Include local governments as Lead Actors here.

- #5. Include local governments, Lake Associations, and NGOs as Lead Actors. Also, any public access site should include the establishment and maintenance of optimal greenbelts. Many state boat launches exhibit erosion and over-maintenance such as mowing and removal of native vegetation near the shoreline. This can have potential negative effects on aquatic systems. The presence of a healthy greenbelt helps to drastically reduce the impact of boat launch pollutants. In addition, this allows the state to lead by example, educating the public on greenbelts which can promote their use.

GOAL 5.

- #1. In addition to the Michigan Economic Development Corporation (MEDC) as a Lead Actor; we suggest including academia as well as the Michigan Department of Natural Resources (MDNR) as Lead Actors.

- #2. This recommendation should acknowledge the Compact, specifically, and emphasize how important this is to our ability to enforce the Compact standards in federal court.

- #4. We enthusiastically applaud this recommendation!

- #5. We recommend encouraging entrepreneurs who think outside the box to handle wastewater management. A good example is Big Fish Environmental (see: www.bigfishenvironmental.com.) In 2007, Big Fish became the first (and only) facility in Michigan to produce bio-solids that meet the Class A Pathogen Reduction criteria to be considered *Exceptional Quality* by the U.S. Environmental Protection Agency. Companies like Big Fish should be supported and encouraged!

GOAL 7.

- #1. We think the Compact should also be acknowledged on this step.

- #2 and #3. YES!!

GOAL 8.

- #2. We are very supportive of a Water Fellows Program.

- #3. It is past time to update the Drain Code!!

- #4. The State needs to amend Part 303, Michigan's Wetland Protection Act, to ensure the state program is consistent with Section 404 of the Clean Water Act. In 1984, the State of Michigan was given approval to administer Section 404. This means that the MDEQ was approved to administer a state dredge and fill permitting program, in lieu of the federal Section 404 program administered by the U.S. Army Corps of Engineers (USACE) and EPA. To keep the authority to administer Section 404, a state must maintain a program that is equivalent to the federal program administered by the EPA. This is required so that every state meets minimum water quality standards, and to maintain a level playing field for business and development interests.

  Michigan has not maintained a program equivalent to the federal program. The EPA conducted a comprehensive review of the state program and found numerous deficiencies. EPA identified corrective actions for the state to take, in order to address those deficiencies and keep administering Section 404. A new law, PA 98 enacted in July of 2013, was supposed to fix the deficiencies. But after changes by the Legislature, this law failed to correct all of the deficiencies, as it was intended to do in its original form, and introduced new inconsistencies with federal law. EPA has identified more than 20 provisions within the new law that are not consistent with, or are weaker than, federal law. In order to retain full authority under the Clean Water Act to continue to manage Michigan's own water resources, Part 303 must be amended to be consistent with federal law.

- #5. A leader needs to be identified for the Water Team. Additionally, the document needs to identify the tools and resources available and/or needed to achieve the 30-year vision.

Table 3 Comments

Continuing to advocate for Great Lakes Restoration Initiative funding and other federal programs that support the Great Lakes should be a priority within the Water Strategy Implementation Plan. Over the last six years, the Great Lakes Restoration Initiative has invested more than $1.9 billion in the Great Lakes states of Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York, and has been widely credited with accelerating the restoration of one of the world's most important water bodies. It supported more than 2,000 projects, which have restored more than 110,000 acres of fish and wildlife habitat, opened up fish access to more than 1,900 miles of rivers, and helped farmers implement conservation programs on more than 280,000 acres of rural working lands. The Great Lakes Restoration Initiative has also funded important work on toxic hotspots around the region and as a result enough cleanup work has been completed to delist five of these formerly contaminated sites—in the previous two decades before the GLRI, only one site had been delisted. State advocacy for this highly successful and unparalled program must remain a priority.

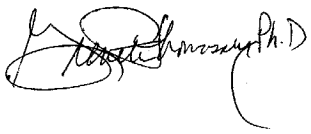
Conclusion

Protecting and restoring the Great Lakes is critical to Michigan's future. Michigan's 10 million residents depend on the Great Lakes for drinking water, recreation, and to support our economy. The Great Lakes keep our lights burning and assimilate our wastes. They cradle our fish and wildlife and provide endless hours of recreation. They temper our weather, allowing for a cornucopia of specialty crops. They define our state and our lives.

The state's economy, quality of life, scenic beauty and ecological health are irrevocably intertwined with the health and productivity of the Great Lakes. It is with this understanding that we again commend the Administration for taking on the charge of developing a Water Strategy, and we look forward to working jointly with all partners to sustain Michigan's water heritage for future generations.

Thanks again for the opportunity to comment. If you have any questions regarding these comments, please feel free to contact me at 231-347-1181 or grenetta@watershedcouncil.org.

Sincerely,



Grenetta Thomassey
Program Director

From:	Haefner, Ralph
To:	mi-waterstrategy
Cc:	Allan, Jon (DEQ); Creal, William (DEQ); Jim Morris
Subject:	USGS comments on Michigan's Draft Water Strategy
Date:	Tuesday, August 25, 2015 10:51:19 AM
Attachments:	USGS MI Response to Draft Water Strategy-signed.pdf

Thanks for the opportunity to comment on Michigan's Draft Water Strategy. Please find our comments in the attached letter.

I look forward to seeing how USGS and MDEQ can work together on these important water issues.

Ralph.

~~~~~~

Ralph J. Haefner, Deputy Center Director
U.S. Geological Survey
Michigan-Ohio Water Science Center
6520 Mercantile Way, Suite 5
Lansing, MI 48911-5991
Office: (517) 887-8927
Mobile: (517) 599-4954
Fax: (517) 887-8937
http://mi.water.usgs.gov/

~~~~~~

United States Department of the Interior
U.S. GEOLOGICAL SURVEY
Michigan-Ohio Water Science Center
6520 Mercantile Way, Suite 5
Lansing, MI 48911

August 25, 2015

Office of the Great Lakes, DEQ
P.O. Box 30473-7973
Lansing, Michigan 48909

Thank you for the opportunity to comment on Michigan's Draft Water Strategy "*Sustaining Michigan's Water Heritage: A Strategy for the Next Generation.*" A few of our staff members reviewed the document and two of us attended one of the Water Strategy Community Conversations hosted by Jon Allen. We offered some limited input at the meeting, and this letter provides some additional comments.

As you may know, the U.S. Geological Survey Water Mission Area has many overlapping goals with the State of Michigan related to water resources and the Draft Water Strategy. Specifically, our mission is to serve the Nation by providing reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

During our recent strategic science planning process, our staff and partners (including the MDEQ and other state agencies) identified several water-related focus areas for the Michigan-Ohio Water Science Center. These include the myriad of Great Lakes issues related to water use and availability; surface-water flows; surface-water and groundwater quality (including water-quality issues related to nutrients and sediment, HABs, green infrastructure and urban best management practices, and agricultural best management practices); environment and human health; mining; and oil and gas development. Clearly, we should take this opportunity to further coordinate our work with regards to the Water Strategy and the mission and strategic science planning of the U.S. Geological Survey.

That being said, we would like to offer the following comments:

1. We like how the strategy puts the onus on all Michiganders to be the stewards of their water resources (for example, Chapter 9 "Inspire Stewardship for Clean Water" and "Improve Water literacy").

2. Throughout the nine chapters, the U.S. Geological Survey recognizes many opportunities for collaboration with MDEQ and other state agencies. Our data-collection and research efforts have touched on almost all of the topics within the Water Strategy and we would welcome discussion on how we could lead or otherwise be involved in future efforts, including

Chapter 1: HABs, restoring hydrologic connectivity, WWAT, and the WUAC.

Chapter 2: Mapping of local groundwater resources, evaluation of on-site wastewater treatment systems, and research with contaminants of emerging concern.

Chapter 4: Beaches.

Chapter 5: Water-research capabilities and green infrastructure.

Chapter 6: Funding. Although our funding model includes some appropriated funds for work related to the National Streamflow Information Program, the National Groundwater Monitoring Network, and other programs, the U.S. Geological Survey also can provide matching funds from our Cooperative Water Program to leverage state funding.

Chapter 7: Monitor water quality including natural and man-made contaminants, nutrients, and microbial health. Monitor water quantity including stocks and flows of surface water and groundwater. Some key strengths of the U.S. Geological Survey related to monitoring include quality assurance and quality control, archiving, and providing access to the data through our National Water Information System (NWIS) database available on the Internet at http://waterdata.usgs.gov/nwis.

Chapter 8: The Interdepartmental Water Team described on the bottom of page 54 could include scientists from the U.S. Geological Survey plus other water managers, professionals, and trade groups.

Chapter 9: Stewardship, outreach, and education.

And throughout Table 2 (starting page 58), we recognize many data-collection and research topics that we are uniquely qualified to undertake and (or) partner with the MDEQ.

3. Some specific recommendations…
    a. On page 4, you list "Monitor Water Quality." Could that be expanded to "Monitor Water Quantity and Quality?" Seems like Chapter 7 should include quantity since quantity is an outcome of the chapter.
    b. Under Recommendations on page 14, consider adding something about droughts, as in "Incorporate planning for wet-weather extremes, droughts, and increased variability…"
    c. On page 31, perhaps you could include something about predictive beach models to complement real-time monitoring and source tracking in the Recommendation. The USGS has successfully developed predictive models in other areas of the country.
    d. In Chapter 6, you might include "Cooperative Programs" and (or) "Federal match" in the "Federal" box on line 2 of Figure 2 on page 46.
    e. As noted on page 50, Clean Michigan Initiative (CMI) funds are not adequate to support monitoring efforts and are scheduled to end in 2017. We need to plan to make other funding source(s) available for stream-flow monitoring and microbial health.

On a side note, U.S. Geological Survey hydrologists are working on a document summarizing our water-quality data collection at Michigan streams that was funded through CMI.

f. We feel that there should be mention of the Great Lakes Compact in Chapter 8 to state something like… *"The state should vigorously support the Great Lakes Compact and Agreement by active participation in the Great Lakes-St. Lawrence River Regional Body and Great Lakes- St. Lawrence River Compact Council including financial support of these entities entrusted to govern the Compact and Agreement."*

4. In a few instances, the Strategy focuses specifically on Michigan's waters without regards to neighboring states or Canada. For example, on page 48, the term "Michigan's water" is used. We all recognize that the Great Lakes (and water in general) are a shared resource and we cannot take on this responsibility or this water strategy alone. Our recommendation is to expand Michigan's waters to include those waters shared by Great Lakes states and Canada.

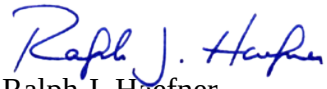
5. Similarly, the Water Strategy (and the State of Michigan) should look to adjoining states and Federal agencies to help accomplish the stated goals. We agree that, as described on page 35, *"Collaboration among industry, regulators, economic developers and academia directing water research and development is the right place to start;"* however, we also recommend including entities in neighboring states, Federal agencies, and Canada.

6. In several instances, you emphasize that research should be done by academia (for example, under "Recommendations" on pages 25, 35, 39, and several instances in table 2), but we feel that you are missing an opportunity to involve internationally recognized researchers employed by federal agencies such as the U.S. Geological Survey and others.

In closing, we welcome existing and future opportunities to collaborate with the State of Michigan. The Water Strategy is an impressive vision for the future of the State of Michigan and of the Great Lakes.

You and your staff should feel free to contact us if there are any questions or discussions related to the Water Strategy or water-resources issues in general. We look forward to seeing how the U.S. Geological Survey can be an integral part of Michigan's Water Strategy as it is implemented.

Sincerely,



Ralph J. Haefner
Deputy Center Director
rhaefner@usgs.gov
(517) 887-8927

From: Barbara Stevenson
To: mi-waterstrategy
Subject: Water afford ability plan
Date: Thursday, July 30, 2015 12:18:47 AM

Detroit and other cities such as Flint have conducted water shut offs that jeopardize the lives of citizens! There are many people whose incomes are less than $10,000 a year and these people are disabled or elderly and they will not see an increase in their income . There is a well thought out Water Affordability plan that can offer alternatives to those low income consumers . In addition the city of Philadelphia is in the process of adopting such a plan . We urge the State of Michigan to respect peoples right to water to survive, and to adjust this plan for the future to address the needs of all citizens to have clean water! Barbara Stevenson , Detroit 48214

Sent from my iPhone

From: Patricia Becker
To: mi-waterstrategy
Subject: Water for all
Date: Friday, August 07, 2015 10:45:31 AM

Water should be infrastructure. It should be paid for out of tax money and not billed to individual customers. That's the long-term solution to this problem.

Patty Becker

Patricia C. (Patty) Becker
APB Associates/Southeast Michigan Census Council (SEMCC)
28300 Franklin Rd, Southfield, MI 48034
office: 248-354-6520
[redacted]
pbecker@umich.edu

From:	Arthur
To:	mi-waterstrategy
Subject:	Water for all
Date:	Thursday, July 30, 2015 2:45:56 PM

Please make sure your water plan includes provisions for Water For ALL regardless of income level!

Thank you,

Arthur Liebhaber
Royal Oak, MI

From: Myra MacDonald
To: mi-waterstrategy
Subject: Water for all
Date: Wednesday, August 12, 2015 12:55:00 PM

Dear Strategists,

Potable, quality water in a country like the United States should be the right of every citizen. We are each other's keepers and we will all eventually suffer if we deprive low income people of their right to water. It is unacceptable that people who cannot afford to pay for water are deprived of it. Please find ways to fund the water supply so that everyone has access to water!

Myra S. MacDonald
[redacted]

Darkness cannot drive out darkness, only light can do that. Hate cannot drive out hate, only love can do that.

From: [redacted]
To: mi-waterstrategy
Subject: Water for Detroit Residents
Date: Friday, August 07, 2015 10:04:48 AM

Please make sure all Detroit residents, rich and poor, have water. It's a basic need for all.

Jean Klarich

MICHIGAN SEA GRANT COLLEGE PROGRAM
UNIVERSITY OF MICHIGAN ■ MICHIGAN STATE UNIVERSITY

Sea Grant Michigan

Dedicated to the sustainable use of Great Lakes resources.

www.miseagrant.umich.edu

August 28, 2015

Michigan Department of Environmental Quality
Michigan Office of the Great Lakes
525 West Allegan Street
P.O. Box 30473
Lansing, MI 48909-7973
800-662-9278

Dear Michigan Office of the Great Lakes:

I am writing to express my support for your work to create and implement a comprehensive strategy for Michigan's water resources. Many of the goals found within *Sustaining Michigan Water Heritage, A Strategy for the Next Generation* align with goals Michigan Sea Grant has worked toward for nearly 40 years.

Michigan Sea Grant promotes better understanding, conservation, and use of Michigan's coastal resources by funding research, education, and outreach projects. These are designed to foster science-based decisions about the use and conservation of Great Lakes resources and provide access to science-based information about Michigan's coasts and the Great Lakes. These efforts mesh with the strategy's vision that "Michigan's water resources support a healthy environment, healthy citizens, vibrant communities, and sustainable economies."

For example, Michigan Sea Grant's recent and long-term efforts to provide science-based information about aquaculture, offer place-based learning opportunities, promote sustainable small harbors, and establish a clean marina program all support specific goals found in the strategy.

Michigan Sea Grant's work to develop a sustainable aquaculture industry in the state directly aligns with recommendations that the state focus on water technologies and innovation to grow sustainable water-based economies (Goal 5). Our program recently funded an integrated assessment to develop a strategic plan for the industry, with input from culturists, ecologists, and the public. We were successful in a recent application to fund a new extension educator who will focus work on aquaculture in the state, and we have additional funding to help support interns, develop curricula at community colleges, promote seafood at our annual Michigan Seafood Summit, educate the public in a series of meetings, and develop scientific underpinnings to help the state make decisions on which directions aquaculture should take.

University of Michigan
520. E. Liberty St. Suite 310
Ann Abor, MI 48104-2210
734-763-5834

I personally have been involved in the panel of experts to evaluate net-pen aquaculture, which is targeted to help the Quality of Life Agencies use best available science in their decisions about permitting net pens in the Great Lakes. We applaud the focus on aquaculture in the water strategy and believe aquaculture expansion could be a great addition to the Michigan economy, especially in rural areas of the state still needing employment. We also realize that this expansion must be done in an ecologically sensitive manner and strive to help maintain that focus throughout the industry.

The Great Lakes Education Program (GLEP) has provided classroom and vessel-based education for K-12 students in southeast Michigan since 1991. More than 85,000 students and 15,000 adults have participated — many experiencing the Great Lakes for the first time. Designed and run by Michigan Sea Grant, this long-term effort speaks to recommendations to integrate water literacy and place-based education into Michigan curriculum standards (Goal 9). The program includes classroom lessons and an entire day in the field — half a day on a Michigan Sea Grant educational vessel and half on shore learning about coastal ecology.

Additionally, since 2001, GLEP cruises have been open to the public during the summer providing individuals, families, and educators an opportunity to learn about the Great Lakes by experiencing them firsthand. Surveys from these tours show that 95% of people feel greater responsibility for the lakes after participation.

Michigan Sea Grant shares the goal that communities recognize and manage their waterfronts as strategic assets for economic development and stewardship of natural resources. We are currently working with state partners, including your department, as well as MDNR and MSHDA on the Sustainable Small Harbors project, and making strides toward implementing the recommendations outlined in Goals 3 and 4 of the strategy. We look forward to continuing the work initiated in this unique partnership. Michigan Sea Grant supports the state in developing a water fund to finance water infrastructure management, including harbor maintenance, as described in Goal 6.

Water trail initiatives (Goal 4) and the Clean Marina Program (Goals 2 and 3) provide additional opportunities for the state and Michigan Sea Grant to continue, and build upon, collaborative efforts to protect natural resources and develop a stewardship ethic among Michigan citizens.

Michigan Sea Grant supports the state's efforts to create a long-range vision for Michigan's water resources. Our program already works toward many of the strategy's goals. We see ourselves as a natural partner as the state strives to implement recommendations in the plan and look forward to assisting the state in these efforts.

Sincerely,

James Diana

Dr. James S. Diana, Director
jimd@umich.edu

University of Michigan
520. E. Liberty St. Suite 310
Ann Abor, MI 48104-2210
734-763-5834

From:	Laura Bretheim
To:	mi-waterstrategy
Cc:	David Ullrich; Simon Belisle
Subject:	Water Strategy Comments - Great Lakes and St. Lawrence Cities Initiative
Date:	Thursday, August 27, 2015 3:58:33 PM
Attachments:	MI Water Strategy Comments_GLSLCI_final.pdf

Dear Michigan Department of Environment Quality Staff,

Please see the attached comments on the Michigan Water Strategy from the Great Lakes and St. Lawrence Cities Initiative. The Cities Initiative welcomes the opportunity to comment on the draft Water Strategy, and we look forward to seeing progress on the protection and restoration of the Great Lakes in the State of Michigan as this strategy moves forward.

With questions or requests for further information, please contact Simon Belisle, Program Manager, at 312-201-4517 or simon.belisle@glslcities.org.

Thank you for your consideration,

David A. Ullrich, Executive Director
Great Lakes and St. Lawrence Cities Initiative
20 North Wacker Drive, Suite 2700
Chicago, Illinois 60606
Phone: 312.201.4516
david.ullrich@glslcities.org
www.glslcities.org

From:	Bair, Michael (DEQ)
To:	mi-waterstrategy
Subject:	Water Strategy Comments - Michael Bair
Date:	Tuesday, August 04, 2015 9:25:34 AM

Dear Water Strategy Editors,

After reviewing the strategy draft, I have come up with a few comments and suggestions. These ideas are fairly broad, but they include some of my main concerns with the draft. I hope you take the following into consideration:

Increase Access to Great Lakes by providing public access to every five miles on shorelines.

- I find this to be a good intention, but it has a high risk of failure. There are too many people that would get upset by public access being added in areas that are natural and have been untouched for generations.

Promoting Water Based Economies

- This seems risky, as marketing Michigan's advantages based off of an abundance of water would mean a possible depletion of the great lakes natural fresh water and beauty

This whole water strategy seems really great for the state! However, there is so much business/economic strategy that it is hard to see a healthy balance between conservancy and economic growth here. In the strategy, Michigan seems to be used as a bargaining chip, displaying its natural resource advantages on the forefront as a means to economic success. Both sides, economic and conservation, are presented well; but when put into action, will both be able to coexist simultaneously?

Thank you,

-Mike

From:	Hans VanSumeren
To:	mi-waterstrategy
Cc:	Marguerite Cotto; Gabriel Schneider
Subject:	Water Strategy Comments - Northwestern Michigan College
Date:	Friday, August 28, 2015 4:56:13 PM
Attachments:	Northwestern Michigan College WS Comments.pdf

Please find attached our comments regarding the draft report "Sustaining Michigan's Water Heritage - A Strategy for the Next Generation"

Thank you,

--

Hans W. Van Sumeren
Director of Great Lakes Water Studies Institute
Northwestern Michigan College
(231) 995-1793
hvansumeren@nmc.edu

From: John Gruchot
To: mi-waterstrategy
Subject: Water Strategy Comments - Ports & Harbors
Date: Friday, August 28, 2015 2:45:29 PM
Attachments: MI WaterStrategy - draft- comments.pdf

Attached is a letter transmitting comments from the St. Joseph River Harbor Authority on the State's Water Strategy.

Please contact me if you have any questions or need any clarification.

Thank you, for your efforts in developing the comprehensive document.

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Hi-
I reviewed the Michigan Water Strategy from my perspective as the Volunteer Monitoring Program Manager at Friends of the Rouge. Thank you for the opportunity. Here are my comments.

P. 6-7 Recommendations and Measures of Success

Goal 1 – If "Reduction in annual volumes of untreated sewage discharges" is a measure, there should be a corresponding Key Recommendation that states:.

- Support the funding necessary to address the remaining CSOs in the state

Goal 3 – Outcome: Economic and community development plans and efforts fully leverage water assets to create great places to live, work and play **while protecting the ecosystem**.

Goal 4 – Need a corresponding Recommendation for "90% of the population has convenient access to swimmable and fishable water" AND realistically, boatable is more possible than swimmable since the urban watersheds where most of the population lives are nowhere near swimmable.

- Fund the research and projects necessary to reduce E. coli in waterbodies.

p. 13 Recommendations

- Support research to develop a comprehensive understanding of the cause of HABs in Michigan's waters (this is mentioned as the biggest challenge to the recommendations should address this)

p. 14 Recommendations

- Encourage planning across municipal boundaries, sharing of information and services

p. 15 Recommendations – add to

- "Remove or improve dams that are no longer safe or ecologically, economically or socially viable to protect public safety and create healthy connected aquatic systems" **while avoiding opening dams that will invite invasive species movement upstream**.

p. 17 Recommendations - add

- Support research to assess the effectiveness of green infrastructure and require grant-funded projects to use the same measure of success so that projects can be evaluated and compared.

p. 18 Recommendations

- Fully fund measures that combine conservation and farmland preservation
- Prohibit farms from releasing runoff from manure and discourage concentrated animal housing.

p. 31 Recommendation

- Address untreated CSOs and fund solutions.

p. 32 Recommendation

- Address site specific legacy issues

p.33 Recommendation
Define public access and address concerns about fragile environments, problems with aggressive use of water resources, etc.

Designate Water Trails – recommendation

- Provide support for agencies developing water trails

p.36 Recommendations
add to end- with an emphasis on business that improves water quality and does not harm it.

p. 38 last paragraph
Aquaculture especially in the Great Lakes will impair the lakes, increase phosphorous and potentially spread disease to native fish populations. The Great Lakes are held in the public trust and should not be used for private aquaculture. Aquaculture contributes to the phosphorous problem.

p.45 Recommendations

- "Establish sustainable funding mechanisms to achieve Water Strategy goals including infrastructure management **especially for CSOs**.

p. 48 second to last paragraph
add: Monitoring is being conducted by many organizations using volunteers and maintaining high data quality standards, especially those being certified through MiCorps. The data is very useful to state agencies and these programs need to be supported and continue.

p. 49 Recommendation
add – and integrate volunteer monitoring data

four goals – make five goals and add

- Continue to support MiCorps and groups collecting useful data and integrate data into models

p. 54 Recommendation
add – Make sure state departments work together i.e. AOCs and stormwater management

p. 58
Recommendations 4-6 all need to address CSOs

p. 59 11 "Remove or improve dams that are no longer safe or ecologically, economically or socially viable to protect public safety and create healthy, connected aquatic systems **without encouraging the upstream movement of invasive species.**

p. 60
14 – add - the development of an evaluation tool for green infrastructure
15 – add- and encourage green infrastructure

p. 65 1 Recommendation – add for business that improves or does not impair water quality
Implementation Metric – Ensure any aquaculture does not damage waterbodies.

p. 67 Goal 7 1 Implementation metric – add and includes volunteer monitoring data

Thank you for the opportunity to comment on the State of Michigan's Water Strategy, Sustaining Michigan's Water Heritage, A Strategy for the Next Generation.
The Water Strategy is a strong document that confirms that one of Michigan's greatest assets is clean and abundant water. This priority needs to be embraced and institutionalized by the Governor, the legislature, the state agencies, watershed councils, and local governments. These partners are vital to the success of this strategy.

The overall goals, outcomes, and recommendations will help partners work toward a shared over-arching direction. HRWC is a partner in implementing the water strategy and will take a leadership role on many recommendations. As a partner on this Strategy though, we need the state agencies, legislature, and Governor to lead on several foundational role mentioned below.

1. Implementation – While tables 1 and 2 are fairly comprehensive, a discussion on the strategy's implementation is still unclear. Will the state facilitate meetings with partners on each goal to define short and long-term goals and divide responsibilities? Or is implementation of each goal left to disparate actions with a hope that together the actions will meet the overall goal? HRWC recommends annual meetings of stakeholders for each goal.

2. Roles -- Many of the recommendations require implementation at federal, state, watershed, and local levels. HRWC is a key partner at the watershed level but detail on non-governmental participation is lacking and watershed council roles are unclear. In Goal 8 on governance, the strategy should clarify partners to the strategy and their roles. The strategy should identify watershed councils as a key partner.

Inter-agency coordination and communication is also vital for the implementation, yet any description of how this will happen is lacking.

3. Enabling legislation-- Many of the goals require local government action such as stormwater improvements, asset management, and land use protections. Legislation is needed that allows local units of government more freedom to pursue these actions such as a statewide sanitary code, septic inspection regulations, and enabling legislation to support stormwater utilities. How will these be initiated, prioritized, and realized?

4. Funding--Funding from state and federal governments is vital to the success of this strategy. Thus, a greater emphasis on the importance of the continuation or development of the Clean Water Nonpoint Source funds and a Clean Michigan Initiative-like bond are

needed. Michiganders reliably demonstrate their commitment to invest in our state's water and natural resources to protect a shared heritage and quality of life.

5. The plan needs a strategy for evaluation. Measures vary widely on specificity and appropriateness.

Specific comments on Table 2. The Water Strategy Implementation Plan:

Goal 1 #10
HRWC has worked extensively with local governments and conservancies to enact ordinances and purchase land to protect buffers, riparian landscapes, and high quality natural lands that are critical to the protection of our water resources. Greater emphasis needs to be placed on conservation/protection strategies for natural lands, even those not located immediately in riparian zones. A statewide riparian buffer protection zone of 50 ft would be very effective at protecting aquatic ecosystems.

Goal 1 #11
HRWC advocates for dam removal and was successful in removing the Mill Pond Dam in Dexter, MI. HRWC will continue to advocate for strategic dam removal as an effective tool for river and stream restoration. Additional funding for the planning, deconstruction and restoration phases and technical support is needed from the State.

Goal 1 #13
More accurate data is needed to better calculate environmental flows for rivers. HRWC is working through MiCorps to develop volunteer monitoring procedures to measure flow. More flow monitoring is needed as is volunteer monitoring flow protocols.

Goal 1 #14
HRWC fully supports the use of green infrastructure across urban areas as a means of distributed stormwater runoff capture and treatment. HRWC has worked with local municipalities and regional organizations to help identify and plan for green infrastructure opportunities. HRWC also supports and works toward the conservation of existing green infrastructure across our watershed with planning assistance and land conservation strategies. Promoting green infrastructure is not sufficient. Phase II stormwater plans should be required to identify how green infrastructure and other stormwater infiltration strategies will be used to reduce impairments caused by excessive runoff, and the results should be measured and reported to DEQ.

Goal 1, #16

We believe the synergistic and innovative partnerships and planning needed to implement multiple goals of the Water Strategy are happening at the watershed level, and we are fortunate to have some outstanding watershed council and river restoration organizational models throughout the state. We urge that this recommendation be a top priority of the plan: *Enhance financial and technical support of local stakeholder efforts to develop and*

implement watershed management plans to restore impaired waters, protect high quality waters, and develop and utilize water resource assets.

Goal 1 #18 and elsewhere
The Water Strategy needs to have clear and enforceable actions to curtail agricultural runoff and phosphorus. Numerous studies conclude that the harmful algae blooms in Lake Erie are driven by excessive phosphorus levels and that the vast majority of excess originates from agricultural watersheds. Agricultural management practices should be directly tied to water quality improvements, and accountability is sorely needed. Agriculture impacts and strategic goals need more emphasis.

Goal 2 #1
Water budgets are commonly used as a tool to manage surface and groundwater use and ecological function. Water budgets need to be calculated for current and projected populations across major sectors. Many recommendations are based on the assumption that we know how much water we have as surface water and ground water. Yet this exercise has not been conducted in any meaningful way and is a necessary foundation for making water resource decisions, especially with a changing climate.

Goal 2 #3-7
These recommendations address key issues of concern to HRWC. In the Huron River Watershed, HRWC worked with local and county governments to pass point of sale septic inspection requirements. This needs to be implemented statewide. A statewide sanitary code is vital and needs to be passed in the first year. Finally, HRWC has developed materials directed at homeowners with septic systems in conjunction with County health departments. Funding and coordination is needed to get these materials distributed more widely.

Goal 2 #10
HRWC is advocating for a ban of coal tar based sealants and high PAH sealants. Michigan needs to revise water quality standards to better account for these established and potential carcinogens. HRWC is using the USGS data and working with local municipalities to pass local ordinances in hopes to gain enough momentum to pass a statewide ban. Minnesota, Washington, and New York have passed a statewide ban.

Goal 3 and Goal 4
HRWC is leading a river revitalization and water trail effort on the Huron. A statewide user survey and economic impact analysis will help make a stronger case for investments. Additionally, designated funding for water trail investments and recreation such as licenses and fees should be enacted. Finally education on water safety and instruction needs to be expanded for non-motorized watercraft as water trail use increases.

Goal 3
There is too much emphasis and text on harbors relative to other strategies.

Goal 5 #2

In addition to voluntary targets, hard requirements and goals need to be implemented and enforced. Voluntary measures will not get us to our goals. We also need mandatory measures and incentives.

Goal 5 #4
HRWC strongly supports a water conservation and reuse strategy and is working in the watershed to develop best practices and educational materials for homeowners. Major sectors should have set goals and minimum requirements rather than voluntary targets.

Goal 6
Many Michigan municipalities have dangerously old and unreliable water infrastructure. The recent SAW grant investments were a good start, but replacing and repairing aging infrastructure should be given more emphasis and funding focus. Local municipalities need enabling legislation for stormwater utilities. Stormwater utilities are widely used throughout the county to fund much needed stormwater infrastructure improvements. In the Huron River Watershed, the City of Ann Arbor has a stormwater utility and has accomplished substantially more projects and secured more matching funds for stormwater projects than any other community. The City of Ann Arbor fears a future lawsuit given the Lansing v. Bolt and Jackson County v. City of Jackson legal decisions. As the legal opinions are clear on a lack of justification for stormwater utilities, utility rules need to be clarified to allow other communities to feel safe in establishing a utility to pay for needed infrastructure improvements, green infrastructure and other stormwater management strategies. HRWC's conversations with state elected officials in SE Michigan indicate there's a foundation for bipartisan support.

Goal 7
HRWC's monitoring program is in its 20th year and growing. The Huron is hailed by scientists as the best studied river in Michigan. Funds are hard to find for consistent, long-term, and high quality monitoring data. Funding and central coordination through the MiCorps program is key to the success of this goal.

Additionally, the Pall Gelman spill in our watershed highlights the lack of knowledge and data on groundwater supplies and movement. Groundwater data needs greater emphasis.

Finally, monitoring should be considered integral to outcome-based management. Monitoring needs greater emphasis in stormwater rules and should be part of all conservation, remediation and restoration strategies.

Goal 8
This goal needs to be clearer on the governance roles of the federal, state, regional, watershed, and local partners. A chart detailing these roles and responsibilities would be helpful, including watershed councils as an appropriate governance structure. Right now this goal seems like a catch-all for extra issues. Clear roles of partners and lead agencies would be helpful with a clear statement to leverage and support watershed-based organizations to advance the goals and outcomes of the Water Strategy.

Goal 9

This goal is very important to the success of the strategy and HRWC prides itself on strong citizen engagement and stewardship. A coordinated and funded public education and outreach program on water literacy is needed, not solely focused on K-12 education. Under recommendation #2, the State already implements and adheres to the US EPA's survey tool method to assess behaviors and attitudes, the SIDMA/SIPES protocol. HRWC uses this protocol on our education and outreach efforts. Finally, HRWC has been coordinating the MiCorps project with the Great Lakes Commission. This program has had great success in engaging citizens in lakes and stream monitoring while producing extensive water quality and quantity data. Through the tenure of the program there have been strong ideas to expand and deepen the program such as expanded monitoring parameters (flow as referenced earlier), a more robust conference, and better database and analysis tools.

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In general, the Michigan Section of the American Water Works Association (MI-AWWA) is very supportive of the recommendations in the draft Water Strategy. Protecting our state's water resources should be a priority at the federal, state and local level and is critical to the economic vitality of Michigan and to the sustainability of our aquatic ecosystems. We applaud the OGL for its efforts in developing the strategy, and recognize that this is a long term strategy that will require significant effort to implement. Implementation of the strategy will require legislative action, allocation of state resources and targeted initiatives using a variety of funding strategies, including public-private partnerships. MI-AWWA would welcome the opportunity to be more engaged in the efforts to move the strategy into the next phase of plan development for each of the goals, and in particular with drinking water and source water protection. We urge the OGL to continue the momentum that has been started with this, and the Great Lakes Compact, to modify and develop new policy to help attain the goals. We also offer the following comments:

Chapter 2 – The protection of drinking water supplies is critical to both public and private water supplies. We support uniform state-wide codes addressing potential threats to these supplies including privately owned on – site water and wastewater supplies and geothermal wells.

Chapter 6 The Strategy should include evaluation and upgrades, where necessary, of our drinking water plants and our clean water (wastewater) plants. Many of these plants are using 100 year-old technology and are doing so in 50-year old, or older, facilities. There will be significant funding challenges for communities as these upgrades occur. The cost of this treatment should be considered a user fee and not a tax.

One of the recommendations in Chapter 6 refers to education of our citizens so they understand the importance of treating our drinking water and our wastewater and the value of water in general. AWWA has many resources (see www.AWWA.org) to assist in public education efforts and is also a member of The Value of Water Coalition (see www.thevalue ofwater.org), which also has many available educational resources.

Water should be safe, affordable, and available to everyone. One of the recommendations is to "evaluate current community practices regarding providing water to financially distressed citizens..." Utilities set rates based on the actual cost to treat, transport, and maintain facilities. Utilities with rate structures based on the

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ability to pay will not be sustainable. This is an issue that is larger than individual communities and should be addressed at the state-wide level. State programs that assist the financially distressed may need to be expanded for water service.

Chapter 6 also discusses the "monthly water bill". Many water utilities invoice at some other frequency, and as such, the word "monthly" should be deleted.

Chapter 8 discusses the need to retain regulatory tools to protect the state's water resources. There is a recommendation to retain full authority under the Clean Water Act but there is no mention of the Safe Drinking Water Act. The authority to regulate drinking water systems, and protect source water, and other Federal environmental protection programs should be retained at the State level. The use of fees only to fund regulatory programs may not be sustainable.

Chapter 8 also has no mention of the Great Lakes Compact or work with surrounding governments within the basin. The Compact is a governance tool that protects diversion of water from the Great Lakes and must be protected.

In appendix 2c, it was noted that there is no representation from The American Water Works Association on the Water Cabinet. Human consumption of "clean" water underscores the entire purpose of this strategy and we hope that the Michigan Section of the American Water Works Association can be an engaged stakeholder as the strategy moves forward.

In appendix 3, there is no mention of WIFIA (Water Infrastructure Finance and Innovation Act). This Federal Loan program was signed into law in 2014 and offers low interest loans to utilities directly from the U.S. Treasury via EPA.

In appendix 3 there is no mention of the Great Lakes Compact. Again, this authority was created to prevent unpermitted water diversions from the Great Lakes Basin, and is a critical tool in governance of Michigan's water resources.

Thank you for the opportunity to comment.

Sincerely,
Michigan Section – American Water Works Association

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August 27, 2015

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Comments on Michigan's Draft Water Strategy
From Michigan Trout Unlimited

Michigan Trout Unlimited is a Michigan Non-Profit, serving ~7,500 members in Michigan (19 local chapters covering the entire state); whose mission is the conserve, protect and restore Michigan's coldwater fisheries and their watersheds.

We would like to commend the Office of the Great Lakes on their Draft Water Strategy. The topic of water management in Michigan is complex and multi-faceted to say the least. The draft report covers the breadth of relevant issues reasonably well given its length. The report is logically organized and reads well. We also commend you for the process you undertook in its development. You hosted lots of public listening sessions, and it's apparent in the report that you heard people during them. You've also held numerous public outreach events to present the draft. All of this is great public process, and is greatly appreciated.

Our comments will address specific points we feel should be addressed in revision of the Water Strategy, but will also include feedback as to the points in the strategy that we will contribute to in the future. You have done so much "right" with the report, that for brevity here, we will only focus on what we think need more consideration or inclusion – not all of the elements you have done successfully (those are numerous). If you have any questions on these, or need clarification, please do not hesitate to contact us, through our representative, Dr. Bryan Burroughs (Executive Director)(bryanburroughs@michigantu.org), who has attended your past events related to this report. Thank you for considering these comments and thank you for your good work towards Michigan's future.

Comments

I. Protect & Restore Aquatic Ecosystems
   A. AIS.
      1. Recommendation #1, add to Implementation Metrics, that ballast water treatment reform policy is implemented that is adequate to ensure the GL's are not continuously ecologically disrupted by AIS from this vector. The Chicago Area Waterways is a top threat, but Ballast Water has been the vector that has led to our damaging disruptions thus far, and is still not fully controlled.
      2. Recommendation #3, this is fine and good, but documenting the impacts from AIS is far less important than preventing them. Do not let investment here detract from efforts needed to prevent them.

3. Dreissenid mussels have devastated the function of the Great Lakes. With the onset of Zequanox development, we finally may have the first promising prospect to managing them. The state should fully invest itself into the development and effective implementation of that tool. Research into its use should be pursued. Mass production scale up will be an issue, as well as deployment of it. Current deployment is not adequate. If we can manage to spread microbeads all over the lakes – we can figure out how to spread Zequanox all over them as well. Investment here could be profoundly important to the productivity of the GL's.

B. Harmful algal blooms.
    a. Recommendations # 4 -7 pertain to HAB's, and there impacts for safe drinking water. These recommendations are likely more appropriately placed under Goal 2. – Clean and Safe waters. Not sure they fully pertain to healthy and functional aquatic ecosystems. Some do – as they pertain to non-toxic ones that have ecological effects on the lakes like anoxia, but the toxic ones are often an issue more relevant to clean and safe waters.

C. Riparian Areas. Recommendation #10. Stops short of regulation or zoning use as a tool. The development of the guidance suggested is useful in education, but should also be incorporated into permitting rules, zoning restrictions, etc. The State Natural Rivers Program was an example of such, and has been reduced greatly in funding and staffing/operation and has been suffering due to it. Promoting expansion of this program would be a good additional recommendation.

D. Dam Removal.
    a. Recommendation #11. Dams are our greatest impairment of watershed function, and removal of them our greatest tool to improve it. As this recommendation is in the ecosystem health and function goal – the inclusion of "improving" them for "protecting public safety", should be moved to the Goal 6 – Infrastructure. For stream ecosystems – removal of them is the benefit – not repairing and maintaining them.
    b. Implementation Metric: this focus on "address all at risk of failure" should be moved to Goal 6 – Infrastructure. For this Goal #1, the important implementation metrics should include things like; 1. Complete a comprehensive state database of all dams, including information about their attributes that allow prioritization ranking of the ones where removal would do greatest benefit to aquatic health and function (this has not been done). It should also include a metric on the progress towards removal of the damaging ones, (e.g., 10% of them should be removed by 2025).
    c. Another Implementation Metric, would be increase dedicated funding to dams (Governor Snyder created the state dam grant program a few years ago, initially at ~2.5 million per year from General Fund. It has shrunk to ~250 -350,000$ annually, which is good, but does not move quickly to the number of these that need to be addressed.)
    d. One other topic relevant to dams and their impacts on aquatic ecosystem health and function, is their continued use for hydroelectricity generation. While this is

renewable, it is not "Green Energy", and is profoundly damaging to natural stream ecosystem function. In relation to this we believe a recommendation such as the following would be valuable: "By 2017, no new sources of hydroelectric generation will qualify towards meeting the State's mandatory renewable energy portfolio standard". We believe that "hydrokinetic" turbines will be a sector that seeks to develop. These will cause almost all of the same impacts to stream ecosystem health and function as dams, and will also slow the momentum for small dam removal (as those old small dams are often targeted as sites for installation of these new turbines).

e. This dam removal recommendation area is one that Trout Unlimited will be committed to pursuing continuously with the State. Dam removals rank as our #1 or #2 most important proactive tools to ensure coldwater fish sustainability.

E. Road Stream Crossings; Recommendation #12.
   a. TU is active in this realm, and is committed to continuing to be.
   b. The implementation metric is based on an increase over a baseline. If this was meant to be an increase in annual numbers of these, clarify to state "annual". We suggest it might also be good to quantify the goal for increasing it (e.g., a 20% increase annually, by 2020). But, with NGO's and LUG's being the lead actor, its important to note that we are limited by two things in how many of these can be done annually – 1. Staffing capacity to identify, coordinate, manage and engineer/design them, and 2.) available funding to pay for them (pots of funding are currently satiated by demand annually.) So a plan to increase the number, needs to have a plan for how to overcome those limiting factors.
   c. Currently, there is a new state owned database for road stream crossings. Many inventories of these crossings have been done for select watersheds, but much or most of the watersheds in the state, have not. Ideas for other implementation metrics could include; 1. Covering road stream crossing inventories as part of watershed management plans, 2. Promoting or funding inventories of all Michigan watersheds, 3. Creating a prioritization scheme for these, based on both the river miles connected, quality of habitat connected by them, and sedimentation prevented by them – to help ensure the best ones are being done, 4. Increase state funding programs to pay for these (only state funding for them right now – is DNR Aquatic Habitat Grant – which is paid for by anglers).

F. Water Use. Recommendation # 13. TU is committed to engagement on this issue. The implementation metric for this could use improvement. Its too meager to only have as a goal, the development of priorities to the WUAC recommendations, and an implementation plan for them (that's been done now by DEQ already). We suggest that ALL of the WUAC's recommendations are things that need to be done. The metric should be something like, "By 2020, successful execution of the WUAC Rec's implementation plan (provide a weblink directly to that new document, and the WUAC rec's document), and by 2025 or 2030 – implementation of all the WUAC recommendations." Please also do revisions in the text (page 16) to more concretely link to the WUAC report and recommendations, and consider

paraphrasing some of the conclusions of it rather than just eluding to or referencing its existence.

G. Recommendation #15 – road planning for flooding. Should this be placed under Infrastructure? What's the connection with this to aquatic health and function?

H. Recommendation #16. This is great. However, traditional watershed management planning often did not cover topics like dam inventories or road stream crossing replacements – they were heavily focused on sedimentation issues. In the future, it would be good to see this tool develop out to be a source for people to complete these other inventories and projects, and contribute to recommendations #11 and 12.

I. Protection of High Quality Aquatic Environments.
    a. Throughout the plan, there is a heavy focus on restoring or fixing past ailments. What's missing is a strategy to ensure how we can adequately protect, or keep our highest quality environments that way. We'd like to see the strategy have a recommendation for how we can keep our best functioning waters in that state. Many of these are under near constant threats from various development proposals, new industry uses (e.g., agriculture expansion, mineral extraction, aquaculture expansion, climate changes, etc.). Maybe a simple step towards that would be to call for an effort to identify MI's highest quality aquatic ecosystems, and to promote development of means to ensure they stay that way (perhaps a committee or panel effort could be called to identify these waters as a first step?).

J. Aquaculture
    a. Aquaculture expansion was not mentioned explicitly in this document. That industry is trying to lead an effort of massive expansion of it in this state, both on the Great Lakes, and on inland waters. This offers some opportunities, but also myriad threats to the very things this strategy is aiming to ensure. It offers threats such as nutrient enrichment/phosphorus pollution, effects on HAB's, AIS introductions, diseases to impact all aquatic biota (e.g., the brook trout, lake trout and sturgeon used as measures of success in this document), effects on clean and safe waters (via antibiotics, hormones, etc.), and genetic dilution of wild fish stocks necessary for water-based recreation and world class fisheries (like steelhead) through escapement issues. We realize the State is in a process of contemplating this issue, but to omit it from this report, while it's on the brink of fruition and contemplation now, seems an unproductive omission. We'd hope that coverage of this issue is possible in the revision, and perhaps a general recommendation on it is possible, (e.g., "Development of water-dependent economies, such as aquaculture, will be guided by regulations that ensure its establishment is sustainable, and not at the detriment of Aquatic Ecosystems, clean and safe waters, vibrant waterfronts, water-based recreation, or other water-based economies or the goals for those as proposed by this water strategy.)

K. Drains and drain tiling
    a. The report explains a lot of concerns about designated drains, and drain tiling that has occurred and is occurring today, appropriately within this section on Aquatic

ecosystem health and function. However, recommendations do not appear to flow from that within this section. Goal 8, Recommendation #3, is the mention about reviewing Drain Codes – and we support that and would wish to participate in it.

b. Drain Code reform is critical. Our Drain Code places drainage of water from the landscape as the primary objective of those waters, rather than as a critical one within a necessary set of multiple uses for those waters. Maintaining their functions for drainage should and can be in concert with mutual uses, and no longer needs to be done at the exclusion of all other uses. Goal 8, Rec #3 could just as easily be placed here under Goal 1 to emphasize this.

c. Drain tiling is occurring at seemingly unprecedented rate in Michigan. This report spells out what the consequences will be for that, but other than offering voluntary collaborations as the follow up, offers no recommendations to address it. At the very least, given the severity of this activity, there should be a recommendation for required permitting of it. At the very least, we need to know where these are occurring so we can understand their future impacts, and later know where to look and revisit with solutions to fix them (if the impacts on the rivers will even be reversible). Right now there is legislative effort to ensure no permitting is required – and the state has no account of the spread of this activity. This really needs to be addressed with a recommendation for permitting. You did a great job bringing the threat to the forefront in this report, we need a leadership recommendation to address it.

L. Aquatic Diseases

a. Much like AIS, or "emerging contaminants", aquatic disease management should be explicitly discussed. BKD, VHS and other disease concerns pop up, and threaten the health and function of our aquatic ecosystem, and the benefits they provide to us. Aquaculture expansion in Michigan, will pose severe new aquatic disease issues. Wildlife has been dealing with Bovine TB, EHD, Chronic wasting disease, avian flu, and others. Much like Bovine TB, aquaculture expansion will introduce new disease management challenges which will cause losses and require significant resources to manage, and will likely come at the cost of both ecosystem health and function, but also water-based recreation goals in this report. Please consider the need to address this specifically.

M. Wetlands. This key aquatic resource, and its management needs does not prominently figure into this draft of the strategy. As their benefits touch so many of the goals of the strategy, it likely deserves more explicit attention.

N. Measures of Success

a. In Table 1. There are specific measures of success listed, that are not found in the subsequent tables on all recommendations. For goal 1, they include mentions of several fish metrics.

b. Brook trout. We support this measure, and know that is it is inline with federal agencies use of brook trout as a species indicator of concern. However, please consider adding mention of steelhead as well – as it is another fish indicator that

can also reflect the health and productivity of the Great Lakes, as well as stream systems (and their connectivity as one whole system), and is a critical element to water-based recreation.

c. Sturgeon – rehabilitation of 10% of streams targeted for rehabilitation by the management plan for them, seems like an unambitious goal for a 30 year vision? Wouldn't that mean the sturgeon restoration plan was a 300 year plan?

d. Lake trout naturally reproducing and supporting wild-fish based fisheries in Lake Michigan, Huron and Superior. This is an admirable goal, but 40 plus years of restoration efforts has not gained ground on this in Lakes Michigan or Huron. Protection of them in Lake Superior should be a priority, but 40 years of lack of success in the other lakes, may indicate that those lakes have been irrevocably changed by invasive species to states that just do not support wild lake trout. At the same time, lack of prevention of AIS has now led to more changes that threaten collapse of chinook salmon fisheries. What's important here, is that we ensure AIS do not keep removing our valuable fisheries, and that we ensure some kind of high value salmonids are present in robust numbers. Continued lake trout restoration is admirable, but if too much focus is given to recreating the past, we will not be focused on ensuring a productive future for the Great Lakes. Lamprey management is another example, in focusing on them, we may not have invested properly in preventing dreissenid mussels, or begun work on Asian carp soon enough. The goal should be a stabilized, highly productive, attractive, and valuable sport fishery in those lakes.

II. <u>Ensure Safe & Clean Water</u>

a. We greatly appreciate the leadership recommendation on phasing out microbeads.

b. The one category of "emerging" contaminants that perhaps was not clearly addressed, are things like hormones and or antibiotics. These are being found in increasing distribution in the Great Lakes, through venues like municipal wastewater discharges that are not equipped to treat the water for things like birth control hormones, and other disposed of pharmaceuticals. In public waters, these can find their way back into drinking water supplies, with potentially disturbing consequences for human health, as well as for fish and aquatic organisms. If commercial aquaculture expands, there routine use of antibiotics in fish feed, and occasionally growth hormones, will similarly, be introducing these chemicals into public waters. Public waste water treatment facilities need to adapt to the treatment of these chemicals, and aquaculture should be restricted from using them when they will be discharged to public waters. They can have both human health, and was well fish & wildlife consequences, that may not be fully understood here yet, but have been better studied elsewhere in the world already.

III. <u>Create Vibrant Waterfronts</u>

a. Goal 3, Recommendation #4, appears more appropriate for Goal 5 – Water-based Economies than for this goal on vibrant waterfronts. Often, the more "commercial" or "industrial" the waterfront remains, the less aesthetically pleasing and less vibrant it appears for tourism based stimulus or skilled worker business attraction, and the less

potent it is for the community to use it as a centerpiece asset for a renaissance or revitalization.

IV. Support Water-based Recreation

a. The Mercury reduction recommendations is good, but could also be placed under Goal 2 – clean and safe waters. As in reality, fish with higher mercury levels may be healthy and function fine to create attractive fishing opportunities for those people not heavily focused in consumption of them. Reduction of mercury is as much about keeping people safe while eating them, as it about creating world-renowned fishing opportunities.

b. Despite this goal having an outcome of "waters of the state are world renowned for water –based recreational pursuits such as hunting, fishing, boating and swimming", the recommendations under it are focused on swimming, GL boating harbors, fish consumption health and marketing water trails for boating and paddling. The glaring omission, is recommendations focused on ensuring world-renowned hunting and fishing opportunities. We appreciate the reference to water access goals of the state land plan, and those are appropriately reflected here. However, this report needs to address a plan for expanding or better capitalizing on fishing and hunting here.

    i. We recognize that DEQ OGL would largely yield to and reference other plans of the DNR for fishing recreation, at least on the biological side of that management scenario. However, here, as it relates to promoting these recreation pursuits, this report can help provide support to DNR management. One arena that the DNR is not robust in currently, is using socio-economic science and tools, with a staff proficient in them, to fully document and understand the market desires, or demands of the public (in-state, out-of-state, and globally) for their fishing experiences, with commensurate management changes to cater to them optimally, and market those opportunities effectively. Fishing, as a water-based recreational pursuit of key significance in MI, will not be maintained, or increased, unless fish management using much more recreation management based practices and socio-economic science are employed.

    ii. It would be a good to have recommendations based on fisheries, and some text dialogue about it in the strategy report.

    iii. A recommendation could be based on the Great Lakes fisheries, "Ensure that multiple productive, stable, attractive, and high valuable fisheries are maintained or created on the Great Lakes."

    iv. A recommendation could be to "fully document the angling market for all of Michigan fisheries, integrate these demands into sport fisheries management plans and objectives, develop marketing strategies to increase recreational fishing in MI by 15% by 2025, and at least semiannually evaluate/monitor key metrics for this sector (licenses, trips, angler days, expenditures, satisfaction, etc. etc.) to assess effectiveness of management efforts. [Today – most of our key fisheries have no existing management plans, or explicit objectives for their

management direction – and little information exists on the preferences or attitudes of the users of them – that's a problem for us managing that recreation!]

c. Water-based recreation as an economy – and threatened by others.
    i. Water-based recreation is treated in this strategy as separate from water-based economies. In reality, they are water-based economies. Michigan's tourism sector is its 2nd or 3rd largest depending on the measures used. While not all of the tourism is water-based, much of it is either directly or indirectly. The Michigan Tourism Council has some very important strategic documents that illustrate that industry's recognition of water-related issues as the most important set of issue threatening their economy (as self-identified in polling from within the industry). Water-based recreation is not solely important as just a quality of life attribute, but it is an incredible economic base.
    ii. This economic sector is highly sustainable, and it is complimentary to and dependent on ecosystem health and quality. This report mentions "achieving its water vision in a way that builds economic capacity while sustaining ecological integrity of this crucial resource for future generations." Water-based recreation, and the water-based or water-dependent tourism sector are ideal economic sectors in achieving this, as they benefit from ecological integrity, and often pay for restoration (recreational anglers pay for fisheries management, habitat restoration, dam removals, culverts, etc – while creating billions in economic expenditures in this state annually). There should be some discussion of how these recreational pursuits are indeed also economies (and often other economies developing can jeopardize them).

V. <u>Promote Water-based Economies</u>. The key lacking piece of this goal and its discussion in the report, is the water-dependent tourism economy. Almost of all of the recommendations are focused on innovations, or efficiencies for sectors that use water, but leave impacts from their use of it on other aspects – ecological, social, and cultural. The MI Tourism Council has very useful and enlightening strategic documents for their expansion (#2 or 3 largest economic sector in MI), and also the aquatic threats they perceive threatening this sector. All too often, this economy is overlooked. It is also too common, for any other form of economic development being proposed, to jeopardize or diminish the base of the water-dependent tourism economy, without full consideration of the possible economic losses.

a. We strongly request a recommendation or implementation metric be included, that in light of expanding water-based economies, says that we will have no net loss of water-dependent tourism economy as a result of impacts from new water-based economies.
b. An example; large scale commercial aquaculture expansion on the Au Sable River, will if disease such as whirling disease proliferate, or nutrients lead to expected noxious algal growth, diminished insect hatches, diminished trout densities, etc., lead to lower property values and local and state taxes, diminished recreational fishing, loss of revenue to local hotels and lodges, restaurants, retail shops, and professional fishing guides. This economic risk is in trade for 1-2 new jobs at the aquaculture facility. This

will play out with Great Lakes net penning similarly. In efforts to grow water-based economies – we cannot jeopardize or lose more than we gain. This concept is so critical to our future use of water resources – and its mentioned in this report's introduction – but not explicitly addressed in these sections on water-based recreation and economies.

c. Goal 5, Recommendation #1, Implementation Metric – refine to better define water-dependent companies and investments, to include water-dependent tourism companies, existing and new. Please omit specific mention of "specifically tracking aquaculture technology and related opportunities". This report really covered no ground work to be choosing favorites among water-based economies, especially aquaculture – which poses serious and significant risks to other water-based economies. If Michigan wants to see aquaculture develop – it should be through land-based recirculating system setups – not flow-through riverine ones or GL netpens. The state should be developing stringent regulations on aquaculture, consistent across its forms, which would prevent impacts, while incentivizing sustainable and responsible forms. This report in no way develops or addresses aquaculture in any way robust enough to warrant an implementation metric specifically calling for special stewardship of aquaculture industry – we enthusiastically urge you to omit it here.

VI. Invest in Water Infrastructure. Dam repairs at unsafe dams, for public safety, better fits here on infrastructure – than with dam removals for aquatic health and function.

VII. Monitor Water Quality.

a. Recommendation #1. We agree, and this recommendation should build into it, monitoring metrics for all of those purposes mentioned. Large undertaking. TU would be committed to supporting that effort.

b. Recommendation #2 and 3. TU is committed to supporting these. Better understanding of our groundwater systems will be the key to both better protecting groundwater dependent systems (e.g., coldwater fisheries), but also minimizing user conflict and allowing greater use of groundwater. It'll be expensive, but we must start in understanding that resource better.

VIII. Build Governance Tools. Goal 8, Recommendation #3, we wholeheartedly support that and would wish to participate in it. Drain Code reform is critical. Our Drain Code places drainage of water from the landscape as the primary objective of those waters, rather than as a critical one within a necessary set of uses for those waters. Maintaining their functions for drainage should and can be in concert with mutual uses, and no longer needs to be done at the exclusion of all other uses. In some rivers in Michigan, designated drain maintenance is now intruding on public trust rights and uses, and property uses of some in some cases. There have been too many abuses of the drain code, and its time to universally modernize and professionalize how we manage drains.

IX. Inspire Stewardship for Clean Water

a. Goal 9, Recommendation #1, we support this, have some national experience doing this, and would be willing to help support this effort.

b. Recommendation #3, this recommendation on increasing volunteerism and stewardship is great, our organization is built upon that foundation. However, the recommendation,

the implementation metric, and the lead actors, are all written or structured as though it's going to be about the State doing the programs and direct engagement of volunteers and stewards (e.g., MICorps expansion?). The State agencies have relatively little experience engaging with new volunteers directly, and using and working with them effectively (even within MICorps, most of the individuals participating are doing so through a coordinating NGO). However, Michigan boasts one of the most diverse, extensive, and passionate portfolios of volunteer-led conservation non-profits in the country (and likely the world). Those groups have been monitoring, restoring, advocating and funding conservation works in MI for a very long time. They are also always working to recruit and engage new volunteers and stewards from the public. In the tenor of the Water Strategy, this plan has to be Our plan, with all Michiganders pulling for it. In light of that, we think this recommendation and implementation could be reworked to reflect the State working to promote volunteerism through existing conservation NGO's, working in partnership with those existing volunteer groups to help grow them and see them more productive towards all of the relevant goals in the strategy. The way this is written now is missing some really great opportunities for true synergy. We would be glad to meet further to help revise this ideally if you decide to.

c. MITU has a developed system of restoration work, advocacy, but also an entire existing program for aquatic resource assessment. We are committed to working towards Goal 9, and would love to develop specific implementation goals with the State towards this.

From:	Grenetta Thomassey
To:	mi-waterstrategy
Subject:	Water Strategy Comments
Date:	Friday, August 28, 2015 3:14:33 PM
Attachments:	TOMWC comments on Michigan Water Strategy.pdf

Thanks for the opportunity to comment on the Water Strategy! Grenetta

Grenetta Thomassey, PhD
Program Director
Tip of the Mitt Watershed Council
231.347.1181 ext. 118
231.838.5193 cell

From: Randy Roost
To: mi-waterstrategy
Subject: Water Strategy Comments
Date: Friday, August 28, 2015 7:57:28 AM
Attachments: Water Strategy Comments 8-28-2015.pdf

The Michigan Section of the American Water Works Association would like to submit the attached comments with regards to the Draft Michigan Water Strategy, "Sustaining Michigan Water Heritage, A Strategy for the Next Generation".

The Michigan Section is very supportive of the recommendations made in the draft language and to the overall prioritization of the protection of the state's water resources.

We also hope that in the future that the Michigan Section – AWWA and its almost 1,600 members can become more engaged in the development of the final strategy or in programs and initiatives that develop as a result of the strategy's implementation.

Thank you for the opportunity to provide comments and if you have any questions or would like further assistance from the Michigan Section – AWWA, please do not hesitate to contact us.

Respectfully Submitted,

Randall Roost, MBA
Chair, Michigan Section - AWWA
Ph (517) 702-6114
rwr@lbwl.com

The Michigan Section, American Water Works Association (AWWA) was formed in 1938. Our mission is to serve our member's needs by enhancing the knowledge, skills and technology necessary to manage water supplies to assure a safe, adequate, reliable and cost effective supply of drinking water, by promoting laws and regulations which protect public health and by promoting customer confidence in drinking water. We are a 1,600 volunteer member driven organization, managed through the strategic planning process. The Section strives to be responsive to the needs and desires of membership and actively solicits membership input to determine priorities and develop new policies, procedures and products. New programs and services are considered when there is the opportunity to serve the needs of the membership.

From: McElhinney, Cary
To: mi-waterstrategy
Subject: Water Strategy Comments
Date: Thursday, August 27, 2015 6:11:20 PM

- The Michigan DEQ and other applicable organizations, water utilities, etc. should consider leveraging the USEPA WaterSense program by becoming voluntary partners with WaterSense and utilizing the resources and consistent messaging WaterSense has to offer for robust water conservation and efficiency programs: http://www.epa.gov/watersense/
- Be sure to explore supply-side water efficiency in municipal water and not just demand reduction. Water loss control and other non-revenue water programs can enhance utility supply concerns as well as revenue issues.

Cary McElhinney
WaterSense Coordinator
(312)886-4313

August 28, 2015

VIA ELECTRONIC MAIL TO: Mi-waterstrategy@michigan.gov

Office of the Great Lakes
Department of Environmental Quality
P.O. Box 30473
Lansing, Michigan 48909-7973

Re: Michigan's Draft Water Strategy

Dear Sir or Madam:

Please accept these comments submitted on behalf of the Great Lakes Environmental Law Center ("GLELC")[1] regarding the Michigan Draft Water Strategy. Although commenters generally support the draft, they have a few concerns. Written comments received on or before August 26, 2015, will be considered in the final action of the Michigan Department of Environmental Quality ("MDEQ"). Accordingly, these comments are timely submitted.

I. The strategy overemphasizes water as a tool for economic and business development throughout.

The introduction to the draft strategy lays out four core values identified with water: economic, environmental, social, and cultural, stating that all are equally important.[2] While the economic impact of any proposed environmental action plan is certainly very important to the plan's overall viability and ability to be implemented, the environmental impact should be the primary concern of an environmental plan of action.

Environmental and economic goals certainly can coexist and work towards the same end, but they can and frequently do conflict. Programs or policies which benefit the environment frequently come at an economic cost in terms of tax expenditures and increased burden to businesses. In such situations, the state should err on the side of protecting the environment. For example, the proposed strategy lists several points on how to use water for economic gain, suggesting that water-based recreation as an

[1] 1 A non-profit organization, based in Detroit, Michigan, dedicated to protecting the environmental
[2] Draft Water Strategy, Mich Dep't of Envtl Quality, p 1 (June 4, 2015), available at http://www.michigan.gov/documents/deq/deq-ogl-Draft_Water_Strategy_and_Appendices__06-04-2015_491266_7.pdf.

important tool for economic development.[3] This can, on occasion, be at odds with the goal of protecting our water resources. For example, power boat wakes can negatively affect shorelines and wetlands through erosion of natural shorelines.[4]

By weighing the core values of the economy and environment equally, the plan may encourage a way of thinking in which environmental action is only taken if it is helpful without coming at an economic cost. The plan should urge citizens and business, in the spirit of the stewardship which the plan advocates, that our environmental goals come with some cost, and we should be willing to make that sacrifice as part of our duty to future generations.

The strategy also urges that the State of Michigan "accelerate water technologies to solve water problems using an entrepreneurial business-led initiative."[5] While businesses and entrepreneurs should certainly be encouraged to take and active roll in developing these new technologies, the state should lead the initiative by drawing on our world-class universities. As the draft itself points out, while allowing business and industry to exploit the environment may have led to Michigan's economic boom, it was very costly for the environment.[6] By taking a lead roll, the State of Michigan can ensure that environmental concerns are placed before profitability.

II. The strategy should engage in a real discussion on guaranteeing low-income Michiganders access to drinking water.

The strategy spends a significant amount of time focusing on the health and safety of Michigan's drinking water, both through municipal systems and private wells. While much attention is rightfully given to ensuring the water is pure and safe to drink, little attention is given to ensuring that the most vulnerable Michiganders have access to it. While the draft states that "clean, safe water is fundamental to Michigan's economy," which it most certainly is, we urge the strategy to more importantly recognize access to drinking water as a fundamental human right, rather than an economic tool.

Detroit's controversial water shut-offs to low income residents is mentioned only in passing, stating that they have put a sharper focus on rates, affordability, and funding legacy infrastructure.[7] While this is certainly true, the draft fails to further elaborate on the true nature and seriousness of the problem. The draft's brief solution is to "evaluate current community practices regarding providing water to financially distressed customers to ensure all citizens have affordable access to water for drinking and sanitation."[8] This recommendation is slipped in among several other recommendations regarding infrastructure funding and future investment strategy, and does not go beyond

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[3] *Id.* at 7

[4] *Common Problems: Erosion,* Minnesota Department of Natural Resources, (August 28, 2015 3:01 pm) http://www.dnr.state.mn.us/restoreyourshore/sl/shoreline html

[5] *Id.*

[6] *Id.* at 3

[7] *Id.* at 7

[8] *Id.* at 44

conducting an evaluation of existing policy, and possibly implementing changes at a later date. The strategy should go beyond simple evaluations and lay out firm steps and actionable recommendations, along with ways to measure success as it has with many of its other recommendations.

III. The impact of global warming must be addressed.

The very first goal of the strategy is to create healthy and functioning aquatic ecosystems, and lays out a number of specific goals and recommendations to accomplish these goals.[9] One of the biggest specific concerns addressed in the strategy is how to reduce harmful algae blooms, which have economic, environmental, and health impacts.[10] As global temperatures continue to rise, these harmful algae blooms are predicted to become more frequent and more problematic,[11] yet this fact is not mentioned in the strategy.

Throughout the entire proposal, the terms "global warming" and "climate change" are not mentioned at all. The affect of rising temperatures on algae blooms is just one example of the damaging effects global warming will have on Michigan's aquatic ecosystems in the coming decades. It is a problem that must be addressed in this strategy, if only to plan for the future, if not to propose solutions and ways of combatting this very real, and very pressing issue.

IV. The strategy must do more to address the imminent and serious threat of nutrient pollution.

As the plan recognizes, nutrient runoff can have a very serious ecological impacts on lakes and streams.[12] According to the Environmental Protection Agency, nutrient pollution is one of the nation's most serious environmental issues.[13] Excess nutrients in water can cause a variety of health and ecological problems, including contributing to the growth of toxic algae blooms.[14] Excess nutrients in drinking water can pose a direct threat to the health of young children, while the chemicals used to treat for nutrient pollution can lead to further health problems in adults.[15]

Nutrient pollution can also have a devastating effect on water quality and wildlife.[16] Algae blooms, fueled by these excess nutrients, deplete oxygen levels in

[9] *Id.* at 6
[10] *Id.*
[11] *Impacts of Climate Change on the Occurrence f Harmful Algal Blooms*, United States Environmental Protection Agency (August 28, 2015, 2:44 pm), http://www2.epa.gov/sites/production/files/documents/climatehabs.pdf
[12] Draft Water Strategy at 10
[13] *The Facts About Nutrient Pollution*, United States Environmental Protection Agency (August 28, 2015, 2:44 pm), http://midwestadvocates.org/assets/resources/nutrient_pollution_factsheet.pdf
[14] *Id.*
[15] *Id.*
[16] *Id.*

water, suffocating fish and shellfish.[17] Toxins produced by the algae blooms can kill animals, fish, and pets.[18]

Nutrient pollution also directly impacts the economy, costing Americans roughly $1 billion annually, mostly due to losses from fishing and recreation.[19] Nutrient pollution cases have caused tens of millions of dollars in damage to commercial fisheries, and algae blooms negatively impact the value of waterfront properties.[20] Costs of cleanup can potentially run into the billions of dollars, and can shut entire towns off from access to drinking water, as was recently demonstrated in Toledo and parts of south-east Michigan which rely on the Toledo municipal water system.[21]

The bulk of nutrient pollution comes from agricultural sources.[22] While much of it of it comes from livestock waste, a significant amount comes from excessive use of fertilizers, both of which was into streams and lakes when it rains.[23] The strategy should include steps to encourage, if not require farmers to take affirmative steps to help lessen their nutrient pollution output. By applying the correct amount of fertilizer, at the right time of year, and through the proper method, farmers can significantly reduce the amount of fertilizers which runs into bodies of water.[24] By planting trees, bushes, and grasses around fields, farmers can create a buffer to absorb nutrients before they reach nearby streams and lakes as pollution.[25] It is also important for farmers to keep their livestock away from rivers and streams, as their waste washes down stream, releasing nutrients into and polluting the water.[26]

V. The strategy fails to address the closure of the Mackinac Straights pipeline.

The strategy supports Attorney General Schuette's calls to close the Mackinac Straights Pipeline,[27] a call which is echoed by the commenters. Every day, 500,000 barrels of oil flow through this sensitive area. Attorney General Schuette has called the pipeline "the most acute potential threat" to the great lakes, and advocates for aggressive action.[28]

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[17] *Id.*
[18] *Id.*
[19] *Id.*
[20] *Id.*
[21] *Id.*
[22] *The Sources and Solutions: Agriculture*, United States Environmental Protection Agency (August 28, 2015, 2:44 pm), http://www2.epa.gov/nutrientpollution/sources-and-solutions-agriculture
[23] *Id.*
[24] *Id.*
[25] *Id.*
[26] *Id.*
[27] Draft Water Strategy at 66
[28] Jim Lynch, *Schuette: Days Numbered for Mackinac Straits' Pipelines*, The Detroit News (August 28, 2015, 2:49 pm)
http://www.detroitnews.com/story/news/politics/2015/07/14/schuette-pipelines-straits-mackinac/30128275/

Enbridge, the company which runs the pipeline, has failed to adequately disclose their own safety test results or the methods used.[29] They have also failed to consider the effect that Aquatic Invasive Species, such as zebra mussels, may have on the safety and stability of their pipeline.[30] This same company is responsible for the spilling of 840,000 gallons of heavy crude oil into the Kalamazoo River in 2010.[31] A similar spill in the Straights of Mackinac would prove disastrous. The strategy should propose a concrete timeline with distinct milestones for retirement of this antiquated technology.

VI. Conclusion

GLELC appreciates your consideration in this matter and hopes that DEQ will take the above items into account before taking final action on the Draft Water Strategy. GLELC expects that the agency will continue to give precedence to public concern and will continue to ensure the ecological integrity of our state's waters.

Sincerely,

/s/ Kyle Bredell
Student Attorney
Great Lakes Environmental Law Center
khbredell@gmail.com

Stephanie Karisny
Staff Attorney
Great Lakes Environmental Law Center
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[29] *Id.*
[30] *Id.*
[31] *Id.*

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THE SENATE
STATE OF MICHIGAN

COMMITTEES
EDUCATION, CHAIR
FAMILIES, SENIORS, AND HUMAN SERVICES, VICE CHAIR
NATURAL RESOURCES, VICE CHAIR
TRANSPORTATION
APPROPRIATIONS SUBCOMMITTEE
K-12, SCHOOL AID, EDUCATION, VICE CHAIR

August 27, 2015

Director Jon Allen
Office of the Great Lakes
P.O. Box 30473-7973
Lansing, Michigan 48909

RE: 30 year water strategy

Director Allen:

Thank you for providing the opportunity to comment on the Office of the Great Lakes' proposed 30-year water strategy. I appreciate the efforts that have been made to craft this draft strategy and the sincere interest that we all must take in protecting our Great Lakes.

As a Michigan legislator, I am duty bound by our state's constitution to protect our natural resources from pollution, impairment and destruction:

The conservation and development of the natural resources of the state are hereby declared to be of paramount public concern in the interest of the health, safety and general welfare of the people. The legislature shall provide for the protection of the air, water and other natural resources of the state from pollution, impairment and destruction.

With this charge in mind, let me offer the following commentary for inclusion in your thoughts as you review the draft further:

As the strategy introduction states: "Water defines Michigan." We are charged with a great responsibility to keep our Great Lakes, inland lakes, rivers and streams clean. As you indicate, we must do what we can to protect the Great Lakes basin by guarding against invasive species, protecting habitat, ensuring recreational access and improving drinking water quality, but that all hinges on keeping our lakes free from a needless risk of nuclear waste contamination.

The draft strategy lays out a large focus on keeping the water clean. It speaks of safe water being "fundamental to Michigan's economy and to ensuring high-quality places to live, work and play." As a leader in the basin, Michigan has a stewardship role in getting all states and

provinces to stand behind strong laws like our radioactive waste siting laws to avoid long-term permanent disposal of nuclear waste.

Consider Michigan's current laws regarding siting of radioactive waste facilities:

333.26210 Final siting criteria; establishment; minimum requirement.

Sec. 10.

The authority shall establish final siting criteria that at a minimum excludes a candidate site that is any of the following:

(a) Located in a 500-year floodplain.

(b) Located over a sole source aquifer.

(c) Located 1 mile or less from a fault where tectonic movement has occurred within the 10,000 years preceding the effective date of this act.

(d) Not sufficiently large to assure that an isolation distance of 3,000 feet or more from the disposal unit and adjacent property lines is available.

(e) Has wetlands within the boundaries of the candidate site as defined in part 303 (wetland protection) of the natural resources and environmental protection act, Act No. 451 of the Public Acts of 1994, being sections 324.30301 to 324.30323 of the Michigan Compiled Laws.

(f) An environmental area or a high risk area as defined in part 323 (shorelands protection and management) of Act No. 451 of the Public Acts of 1994, being sections 324.32301 to 324.32315 of the Michigan Compiled Laws.

(g) A floodway designated under part 31 (water resources protection) of Act No. 451 of the Public Acts of 1994, being sections 324.3101 to 324.3119 of the Michigan Compiled Laws.

(h) Located where the hydrogeology beneath the site discharges groundwater to the land surface within 3,000 feet of the boundaries of the candidate site.

(i) Located within 10 miles of Lake Michigan, Lake Superior, Lake Huron, Lake Erie, Saint Marys river, Detroit river, St. Clair river, or lake St. Clair. This subdivision shall not apply to a site that is located at or adjacent to a nuclear power generating facility.

We must make sure that these same criteria are used to protect all parts of our basin and that all states and provinces take a similarly protective approach to our lakes. The fact that the proposed long-term nuclear waste facility lies within a half mile to the Great Lakes is deeply troubling to me and clearly violates the science-based buffer zone of ten miles that is contained in Michigan law.

The draft strategy also speaks to the issue of improper waste disposal and governance issues—let me say that both of these principles seem to be compromised by a failure to strongly advocate against the OPG proposal that will needlessly store nuclear waste near the world's most distinctive and critical sources of fresh water.

The Council of Great Lakes Governors is currently scrutinizing a proposed diversion of Great Lakes water to support use by the city of Waukesha in Wisconsin and we should be jointly taking a similarly critical view of the OPG proposal. If we all took such a view, my thought is that this proposal would and does put at risk the integrity of the health of the basin and the people and resources that depend on the lakes.

Thank you again for providing the opportunity to comment on this plan. I hope we can continue to work together to keep our waters clean.

Sincerely,

Phil Pavlov
State Senator
25th District

From:	Kendra Everett
To:	mi-waterstrategy
Cc:	Marty Fittante; Kara Butters; Pallone, Maggie (DEQ); Howes, Sarah (DEQ)
Subject:	Water Strategy Comments
Date:	Friday, August 28, 2015 5:10:08 PM
Attachments:	Comments on DEQ Water Strategy 8-28-15.pdf

Please see the attached comments from Senators Booher and Casperson on the DEQ Water Strategy. Thanks,

Kendra Everett
Sen. Tom Casperson
517-373-7840

From:	Bill Hickey
To:	mi-waterstrategy
Subject:	Water Strategy Draft
Date:	Friday, August 21, 2015 6:17:36 AM

Dear Sir or Madame,

I live in Detroit. My neighbors cannot pay their water bills. Their water is being turned off. They are forced to borrow water from neighbors or move. There is not enough money in plans to aid such families. Payment plans are unaffordable. I believe that water is a human right. No one should be without it because they can't afford to pay for it. Our State's water strategy must include this principle, as well as establish a strong mandate for water affordability plans. The poor pay a higher percentage of their meager income for water than do our richer citizens and businesses whose water rates go down the more they use. This is not fair or right. We need a commitment to water affordability plans in our State Water Strategy.

Thank you.

William Hickey
14910 Lamphere St.
Detroit, MI 48223
(313) 472-5295