

Great Lakes Protection Fund

2015 Annual Report



Background

In 1989, the governors of the Great Lakes states created the Protection Fund to help them protect and restore their shared natural resources. The Fund is the first private endowment created to benefit a specific ecosystem. It is designed to support the creative work of collaborative teams that test new ideas, take risks, and share what they have learned. It is a source of financial support for groups that value innovation and entrepreneurship, focus on tangible benefits for the Great Lakes ecosystem, and learn by doing. Seven Great Lakes states contributed \$81.0 million to the Fund's permanent endowment.

The Fund does three things. First, it invests the endowment to produce income. This income supports regional projects, member states' individual Great Lakes priorities, and operations. Second, it designs and finances regional projects. These projects identify, demonstrate, and promote regional action to enhance the health of the Great Lakes ecosystem. Third, it monitors those regional projects to ensure that they are successful, modified when necessary, or terminated if they are not creating value for the ecosystem.

From its inception through December 2015, the Fund has made a total of 263 grants and program-related investments, representing a \$74.8 million commitment to protecting and restoring the ecological health of the Great Lakes ecosystem. Additionally, the Fund has paid \$48.1 million directly to its seven member states to support their Great Lakes priorities. Over the course of the past 25 years, the Great Lakes ecosystem has benefited from the States' initial investment of \$81.0 million with an overall commitment of \$122.9 million.

Governors' Ongoing Priorities

From time to time the governors establish, modify and renew their ongoing Great Lakes priorities. Currently, the Fund's goals are responsive to the governors' stated priorities including the following:

- Ensure the sustainable use of our water resources while confirming that the States retain authority over water use and diversions of Great Lakes waters.
- Promote programs to protect human health against adverse effects of pollution in the Great Lakes ecosystem.
- Control pollution from diffuse sources into water, land and air.
- Continue to reduce the introduction of persistent bioaccumulative toxics into the Great Lakes ecosystem.
- Stop the introduction and spread of non-native aquatic invasive species.
- Enhance fish and wildlife by restoring and protecting coastal wetlands, fish and wildlife habitats.
- Restore to environmental health the Areas of Concern identified by the International Joint Commission as needing remediation.
- Standardize and enhance the methods by which information is collected, recorded and shared within the region.
- Adopt sustainable use practices that protect environmental resources and may enhance the recreational and commercial value of our Great Lakes.



Activities During 2015

In the past year, the Fund generated over \$5.3 million in investment income from the endowment. The Fund returned \$1.2 million to its member states to support their Great Lakes priorities. The Fund paid \$2.7 million to support regional projects. Audited financial statements can be found in Appendix 1.

The Fund entered 2015 with 22 active projects focused on efforts to prevent biological pollution, restore natural flow regimes, engage market forces, and provide leadership for ecosystem restoration in the Great Lakes Basin. These projects represented an investment by the Fund of \$14.9 million.

Over the course of the year, work was completed on four of these projects. These projects are identified in Appendix 2. All projects generated new and useful tools that will ultimately improve the health of the Great Lakes ecosystem. Each project provided a unique and positive mission-related return on the Fund's investment.

During 2015, the Fund developed and supported five new projects, maintaining the portfolio of active, supported work at over \$14.3 million. The new projects for 2015 include an effort to reduce mercury and other air pollutants into the Great Lakes through software-guided reductions in energy use at times when electricity is being generated by high polluting sources. This team is developing both an internet-based software product and a market scaling mechanism and will target smart devices (including energy management systems for large buildings, residential thermostats and refrigerators) that have significant untapped capacity to reduce mercury emissions. The team estimates that at least 900,000 connected appliances and management systems are currently in use in the Great Lakes basin and they believe that they can achieve a reduction of 41 tons of mercury pollution by the year 2020. Another team will execute first-ever green infrastructure public-private partnership agreements (P3s) in several Great Lakes municipalities as a demonstration of a new approach to financing and optimizing the performance of distributed green infrastructure. The P3s are expected to be large-scale (up to \$50 million) and enable aggregation of services, and optimization of performance, with the goal of making it economically feasible for governments and utilities to greatly expand green infrastructure throughout the Great Lakes region.

These projects will help to achieve the Governors' objective of controlling pollution from diffuse sources into water, land and air; and adopting sustainable use practices that protect environmental resources and may enhance the recreational and commercial value of our Great Lakes. The complete portfolio of supported work, including new projects awarded in 2015, can be found in Appendix 3.

Evaluation of the Corporation's Performance

The Fund accomplished its objectives in 2015. Regional projects were designed and funded to address key gubernatorial priorities—especially the sustainable use of Great Lakes water and stopping invasive species. Ongoing regional efforts were monitored, adjusted when required, and closed out when appropriate. Significant funds were paid directly to the member states to support their individual priorities.

Emerging Trends and Future Needs

The Governors have identified their priorities for Great Lakes Basin ecosystem protection and restoration. The Fund will continue its multi-year research agenda in support of these priorities. In the near term, the Fund is likely to focus on continued development of significant, new technological tools to help protect and restore the resources of the Great Lakes as well as new innovations to catalyze a transition to a new



era of water systems. This will likely include solutions to problems that vex our current systems including: reducing nutrient-driven harmful algae blooms, better handling of large rainstorms, being adaptable to changing economic and demographic conditions, and providing better value for the money we will invest in them.

Actions Taken by the Directors in Response to Public Comments

The Directors have sought, but not received, public comments on this report.



Members of the Corporation in 2015

Governor of Illinois

Bruce Rauner

Governor of Michigan

Rick Snyder

Governor of Minnesota

Mark Dayton

Governor of New York

Andrew Cuomo

Governor of Ohio

John Kasich

Governor of Pennsylvania

Tom Wolf

Governor of Wisconsin

Scott Walker



Board of Directors in 2015

Michael Batchelor (Fairview, PA)

Patricia Birkholz (Saugatuck, MI)

Vita DeMarchi (Syracuse, NY)

Matthew Driscoll (Syracuse, NY)

Frederick Dudderar (Duluth, MN)

Kendra Fogarty (Chicago, IL)

Patricia Glaza (Royal Oak, MI)

Peter Gove (St. Paul, MN)

Richard Hylant (Ottawa Hills, OH)

Jeffrey Logan (Mechanicsburg, PA)

Richard Meeusen (Pewaukee, WI)

Dan T. Moore (Cleveland Heights, OH)

Kevin Shafer (Milwaukee, WI)

Debra Shore (Skokie, IL)



Great Lakes Protection Fund Staff

Shannon Donley – Project Implementation Manager

Amy Elledge – Communications Manager

Mariela Lawrence – Office Administrator

Stephanie Lindloff – Project Development Manager

Drew Pfeifer – Director of Finance and Investment

Janis Post – Business Manager

David Rankin – Program Director

Russell Van Herik – Executive Director



Appendix 1

2015 Audited Financial Statements



Great Lakes Protection Fund

Financial Report
December 31, 2015



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Independent Auditor's Report

To the Board of Directors
Great Lakes Protection Fund
Chicago, Illinois

Report on the Financial Statements

We have audited the accompanying financial statements of Great Lakes Protection Fund (the Fund) which comprise the statements of financial position as of December 31, 2015 and 2014, and the related statements of activities and cash flows for the years then ended, and the related notes to the financial statements.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Great Lakes Protection Fund as of December 31, 2015 and 2014, and the changes in its net assets and its cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.

RSM US LLP

Chicago, Illinois
March 11, 2016



Great Lakes Protection Fund

Statements of Financial Position December 31, 2015 and 2014

	2015	2014
Assets		
Cash and cash equivalents	\$ 9,297,591	\$ 9,818,587
Investments	115,230,360	120,510,506
Accrued interest	98,196	96,101
Other assets	14,385	16,014
Furniture, equipment and leasehold improvements, net of accumulated depreciation of \$38,647 and \$268,333 in 2015 and 2014, respectively	30,422	3,768
	\$ 124,670,954	\$ 130,444,976
Liabilities and Net Assets		
Liabilities:		
Member state shares payable	1,148,005	1,759,547
Accrued expenses	206,318	236,851
	1,354,323	1,996,398
Net assets:		
Unrestricted	5,148,537	5,130,833
Temporarily restricted	37,168,084	42,317,735
Permanently restricted	81,000,010	81,000,010
	123,316,631	128,448,578
	\$ 124,670,954	\$ 130,444,976

See notes to financial statements.



Great Lakes Protection Fund

Statements of Activities
Years Ended December 31, 2015 and 2014

	2015				2014			
	Unrestricted	Temporarily Restricted	Permanently Restricted	Total	Unrestricted	Temporarily Restricted	Permanently Restricted	Total
Revenue:								
Investment income	\$ 17,711	\$ 5,232,391	\$ -	\$ 5,250,102	\$ 33,180	\$ 7,080,542	\$ -	\$ 7,113,722
Miscellaneous revenue	-	737	-	737	-	9,024	-	9,024
Net assets released from restrictions	5,637,380	(5,637,380)	-	-	6,119,758	(6,119,758)	-	-
	5,655,091	(404,252)	-	5,250,839	6,152,938	969,808	-	7,122,746
Expenses:								
Program grants	2,683,297	-	-	2,683,297	2,519,600	-	-	2,519,600
Other program activities	972,478	-	-	972,478	865,470	-	-	865,470
Member state shares	1,148,005	-	-	1,148,005	1,759,547	-	-	1,759,547
Investment management and advisory fees	93,993	-	-	93,993	197,591	-	-	197,591
Administrative expenses	739,614	-	-	739,614	862,807	-	-	862,807
	5,637,387	-	-	5,637,387	6,205,015	-	-	6,205,015
Increase (decrease) in net assets before other items	17,704	(404,252)	-	(386,548)	(52,077)	969,808	-	917,731
Unrealized losses relating to assets still held at end of year	-	(4,745,399)	-	(4,745,399)	-	(1,976,163)	-	(1,976,163)
Change in other postretirement benefit obligation	-	-	-	-	90,785	-	-	90,785
Increase (decrease) in net assets	17,704	(5,149,651)	-	(5,131,947)	38,708	(1,006,355)	-	(967,647)
Net assets:								
Beginning of year	5,130,833	42,317,735	81,000,010	128,448,578	5,092,125	43,324,090	81,000,010	129,416,225
End of year	\$ 5,148,537	\$ 37,168,084	\$ 81,000,010	\$ 123,316,631	\$ 5,130,833	\$ 42,317,735	\$ 81,000,010	\$ 128,448,578

See notes to financial statements.



Great Lakes Protection Fund

Statements of Cash Flows Years Ended December 31, 2015 and 2014

	2015	2014
Cash flows from operating activities:		
Increase in net assets	\$ (5,131,947)	\$ (967,647)
Depreciation and amortization	2,214	2,744
Realized gain on sales of investments	(1,211,187)	(1,743,637)
Unrealized loss on investments	4,745,399	1,976,163
Changes in:		
Accrued interest	(2,095)	4,968
Other assets	1,629	21,927
Grant commitments	-	(247,800)
Member state shares payable	(611,542)	438,557
Accrued expenses	(30,533)	(33,736)
Accrued postretirement health benefits	-	(90,785)
Net cash used in operating activities	(2,238,062)	(639,246)
Cash flows from investing activities:		
Purchases of investments	(5,208,399)	(33,602,427)
Proceeds from sales of investments	6,954,333	36,205,392
Purchases of furniture, equipment and leasehold improvements	(28,868)	-
Net cash provided by investing activities	1,717,066	2,602,965
(Decrease) increase in cash and cash equivalents	(520,996)	1,963,719
Cash and cash equivalents:		
Beginning of year	9,818,587	7,854,868
End of year	\$ 9,297,591	\$ 9,818,587

See notes to financial statements.



Great Lakes Protection Fund

Notes to Financial Statements

Note 1. Nature of Activities and Significant Accounting Policies

Great Lakes Protection Fund (the Fund) is a nonprofit organization designed to have as its members the governors of the eight states bordering on the Great Lakes. Seven of the states have joined the Fund and have made contributions, as specified in the Fund's articles of incorporation, to establish their membership in the Fund. Income earned on the contributions is used to provide grants which finance projects advancing the health of the ecosystem of the Great Lakes Basin.

Basis of accounting: Under accounting principles generally accepted in the United States of America, not-for-profit organizations report net assets in each of the three classes: permanently restricted, temporarily restricted, or unrestricted based on the existence or absence of donor-imposed restrictions.

Cash and cash equivalents: For purposes of the statements of cash flows, the Fund considers all highly liquid debt instruments purchased with a maturity of three months or less to be cash equivalents.

The Fund maintains cash accounts at financial institutions, which at times may exceed \$250,000. A significant portion of cash equivalents is invested in interest-bearing money market accounts. Such amounts are insured by the FDIC up to \$250,000 per taxpayer ID number. The Fund has not experienced any losses in such accounts. Management believes that the Fund is not exposed to any significant credit risk on cash and cash equivalents.

Investments: Investments are reflected at fair value based on quoted market prices. Realized gains on the sale of mutual funds are computed using the specific-identification method. Realized gains on the sale of other investments are computed using the first-in, first-out method. Interest is recorded on accrual basis. Dividend income is recorded on ex-dividend date. Endowment fund investment income or loss (including gains and losses on investments, interest and dividends) is recorded as increases or decreases in temporarily restricted net assets until appropriated for expenditure by the Fund. Other investment income or loss is included in the statement of activities as increases or decreases in unrestricted net assets unless the income or loss is restricted by donor or law. Changes in fair value are recorded as unrealized gains/losses in the statements of activities.

The Fund invests in various investments. Such investments are exposed to various risks such as interest rate, market and credit risk. Due to the level of risk associated with certain investments, it is at least reasonably possible that changes in the values of investments will occur in the near term and that such changes could materially affect the amounts reported in the statements of financial position.

Furniture, equipment and leasehold improvements: Furniture, equipment and leasehold improvements are stated at cost. Depreciation is recorded on a straight-line basis over the estimated useful lives of the assets ranging from three to seven years. Leasehold improvements are amortized over the lesser of useful life or lease term.

Grant commitments: Payment of grants beyond the initial installments is contingent on the satisfaction by the recipients of agreed-upon requirements. Unpaid amounts are accrued only if the contingencies have been met.

Member state shares: In accordance with the articles of incorporation, the Fund is required to disburse to the member states one-third of its realized investment income after deducting operating expenses, excluding grants. Amounts paid to the states are to be used for the furtherance of the Fund's activities and are allocated on the basis of the state's respective contribution.



Great Lakes Protection Fund

Notes to Financial Statements

Note 1. Nature of Activities and Significant Accounting Policies (Continued)

Use of estimates: The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions affecting the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements, as well as the reported amounts of revenue and expenses during the reporting period. Actual results could differ from the estimates.

Income taxes: The Fund is exempt from income taxes under Section 115(1) of the Internal Revenue Code and applicable state law.

The Fund follows the accounting guidance related to accounting for uncertainty in income taxes, which addresses the determination of whether tax benefits claimed or expected to be claimed on a tax return should be recorded in the financial statements. Under this guidance, the Fund may recognize the tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by taxing authorities, based on the technical merits of the position. Examples of tax positions include the tax-exempt status of the Fund and various positions related to the potential sources of unrelated business taxable income. The tax benefits recognized in the financial statements from such a position are measured based on the largest benefit that has a greater than 50 percent likelihood of being realized upon ultimate settlement. The guidance on accounting for uncertainty in income taxes also addresses de-recognition, classification, interest and penalties on income taxes, and accounting in interim periods. At December 31, 2015 and 2014, there were no unrecognized tax benefits identified or recorded as liabilities.

Recent Accounting Pronouncements: In January 2016, the Financial Accounting Standards Board issued Accounting Standards Update (ASU) 2016-01, *Financial Instruments—Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities*, which updates certain aspects of recognition, measurement, presentation and disclosure of financial instruments. ASU 2016-01 will be effective for the Fund for fiscal years beginning after December 15, 2018. The Fund is currently evaluating the impact of the adoption of this standard on its financial statements.

Subsequent events: The Fund has evaluated subsequent events for potential recognition and/or disclosure through March 11, 2016, the date the financial statements were available to be issued.



Great Lakes Protection Fund

Notes to Financial Statements

Note 2. Investments

Investments consist of the following:

	2015	
	Cost	Market
Mutual funds		
Domestic equity:		
Large cap index	21,896,360	37,186,373
Large cap growth	3,459,112	4,112,500
Mid cap index	5,000,000	4,948,780
Small cap index	5,000,000	4,786,178
International equity:		
International value	8,802,777	11,587,108
International growth	11,208,550	12,157,532
Real estate:		
Real estate equity index fund	5,000,000	4,973,597
Fixed income:		
Total return	19,048,920	18,002,648
Strategic income	13,500,000	12,842,746
Short-term high yield	4,819,145	4,632,898
	<u>\$ 97,734,864</u>	<u>\$ 115,230,360</u>
	2014	
	Cost	Market
Common stocks and stock equivalents - domestic equity	\$ 5,534,747	\$ 6,812,806
Mutual funds		
Domestic equity:		
Large cap index	21,896,360	37,594,862
Large cap growth	3,459,112	4,447,286
Mid cap index	5,000,000	5,090,389
Small cap index	5,000,000	5,040,599
International equity:		
International value	8,802,777	12,195,355
International growth	11,208,550	12,302,649
Fixed income:		
Total return	19,048,920	19,057,421
Strategic income	13,500,000	13,289,679
Short-term high yield	4,819,145	4,679,460
	<u>\$ 98,269,611</u>	<u>\$ 120,510,506</u>



Great Lakes Protection Fund

Notes to Financial Statements

Note 2. Investments (Continued)

Components of investment income are reported as follows:

	2015	2014
Interest and dividends	\$ 2,564,960	\$ 3,164,061
Realized gains on securities sold	1,211,187	1,743,637
Mutual fund realized gain reinvested	1,473,955	2,206,024
Total investment income included in operating revenue	5,250,102	7,113,722
Unrealized losses relating to assets still held at end of year	\$ (4,745,399)	\$ (1,976,163)

Note 3. Fair Value Disclosures

The Fund follows Accounting Standards Codification Topic, Fair Value Measurements and Disclosure, which provides the framework for measuring fair value. This Topic applies to all financial instruments that are being measured and reported on a fair value basis. As defined in the Topic, fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. In determining fair value, the Fund uses various methods including market, income, and cost approaches. Based on these approaches, the Fund often utilizes certain assumptions that market participants would use in pricing the asset or liability, including assumptions about risk and/or the risks inherent in the inputs to the valuation technique. These inputs can be readily observable, market corroborated, or generally unobservable inputs. The Fund utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs. Based on the observability of the inputs used on the valuation techniques, the Fund is required to provide the following information according to the fair value hierarchy. The fair value hierarchy ranks the quality and reliability of the information used to determine fair values.

Financial assets and liabilities carried at fair value will be classified and disclosed in one of the following three categories:

Level 1. Valuations for assets and liabilities traded in active exchange markets, such as the New York Stock Exchange. Level 1 assets primarily include listed equities, money market funds, government securities, and mutual funds. Valuations are obtained from readily available pricing sources for market transactions involving identical assets or liabilities.

Level 2. Valuations for assets and liabilities traded in less active dealer or broker markets. Valuations are obtained from third-party pricing services for identical or similar assets or liabilities. Level 2 assets primarily include equities traded in over-the-counter markets.

Level 3. Valuations for assets and liabilities that are derived from other valuation methodologies, including option pricing models, discounted cash flow models and similar techniques, and not based on market exchange, dealer, or broker-traded transactions. Level 3 valuations incorporate certain assumptions and projections in determining the fair value assigned to such assets or liabilities.



Great Lakes Protection Fund

Notes to Financial Statements

Note 3. Fair Value Disclosures (Continued)

In certain cases, the inputs used to measure fair value may fall into different levels of the fair value hierarchy. In such cases, an investment's level within the fair value hierarchy is based on the lowest level of input that is significant to the fair value measurement. The Fund's assessment of the significance of a particular input to the fair value measurement in its entirety requires judgment, and considers factors specific to the investment.

For the years ended December 31, 2015 and 2014, the application or valuation techniques applied to similar assets and liabilities has been consistent. The following is a description of the valuation methodology used for assets measured at fair value:

Investments in securities traded on a national securities exchange, or reported on the NASDAQ national market, are stated at the last reported sales price on the day of valuation. These financial instruments are classified as Level 1 in the fair value hierarchy.

The Fund assesses levels of the investments at each measurement date, and transfers between levels are recognized on the actual date of an event or change in circumstances that caused the transfer. For the years ended December 31, 2015 and 2014, there were no such instances.

All of the Fund's investments are classified as Level 1 as of December 31, 2015 and 2014.

The carrying amounts of financial instruments, including cash and cash equivalents, receivables, investments, accrued interest receivable, other assets, member state shares payable, and accrued expenses approximate fair value due to the short maturity of these instruments.

Note 4. Grants Committed

Grant activity for 2015 and 2014 is as follows:

	Grants Approved	Grants Paid	Grants Committed December 31
2015	\$ 2,313,300	\$ 2,683,297	\$ -
2014	\$ 3,650,000	\$ 2,767,400	\$ -

As of December 31, 2015, total grants approved since the Fund's inception amounted to \$74,809,115, of which \$6,701,253 related to grants for which the contingencies have not been met and, therefore, the grant expenses have not been recognized. Upon satisfaction of the contingencies by the recipients, the Fund will recognize the grant expenses and disburse the remaining payments.



Great Lakes Protection Fund

Notes to Financial Statements

Note 5. Net Assets

Unrestricted

Unrestricted net assets represent amounts that are not subject to externally-imposed purpose or time restrictions. Certain unrestricted net assets have been designated by the Board of Directors as a Sequestration Fund; representing an estimate of amounts sufficient to provide for commitments and obligations of the Fund. The balance of \$5,148,537 and \$5,130,833 in unrestricted net assets, for 2015 and 2014 respectively, represents the unspent portion of the Sequestration Fund of \$5,000,000 plus accrued interest.

Temporarily Restricted

Temporarily restricted net assets are comprised of endowment fund earnings that have not yet been appropriated for expenditure by the Fund.

Permanently Restricted

Permanently restricted net assets represent the contributions received from member states in accordance with the Fund's articles of incorporation. These amounts cannot be expended.

With the exception of Indiana, all states have made their required contributions, which were as follows:

Illinois	\$ 15,000,000
Michigan	25,000,000
Minnesota	1,500,000
New York	12,000,000
Ohio	14,000,000
Pennsylvania	1,500,000
Wisconsin	12,000,000
	<u>\$ 81,000,000</u>

There is no due date for the contribution payable by Indiana, which has not yet joined the Fund.

In accordance with its articles of incorporation, the Fund charges interest to states electing to extend the time to make the required contributions. No such interest was charged in 2015 or 2014. No interest is due from the State of Indiana until such time as it elects to join the Fund and the time to make its required contributions is determined.

Note 6. Endowment Net Assets

The Fund's endowment net assets are comprised of restricted contributions made by the member states, as well as the net effect of the realized and unrealized investment returns and losses on those investments and the operating expenses of the Fund. As the original contributions were made for the purpose of establishing a fund of assets to provide income for the Fund, the Fund's net assets are considered an endowment, as defined by accounting guidance related to financial statement presentation for not-for-profit organizations.



Great Lakes Protection Fund

Notes to Financial Statements

Note 6. Endowment Net Assets (Continued)

Interpretation of Relevant Law – The Fund has interpreted the Illinois Uniform Prudent Management of Institutional Funds Act (UPMIFA) as requiring the preservation of the fair value of the original gift as of the gift date of the donor-restricted endowment funds absent explicit donor stipulations to the contrary. As a result of this interpretation, the Fund classifies as permanently restricted net assets (a) the original value of gifts donated to the permanent endowment, (b) the original value of subsequent gifts to the permanent endowment, and (c) accumulations to the permanent endowment made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the Fund. In accordance with UPMIFA, the Fund considers the following factors in making a determination to appropriate or accumulate earnings on donor-restricted endowment funds:

- 1) The duration and preservation of the Fund;
- 2) The purpose of the Fund and the donor-restricted endowment fund;
- 3) General economic conditions;
- 4) The possible effect of inflation and deflation;
- 5) The expected total return from income and the appreciation of investments;
- 6) Other resources of the Fund; and
- 7) The investment policies of the Fund.

The changes in endowment net assets for the Fund were as follows for 2015 and 2014:

	2015		
	Temporarily Restricted	Permanently Restricted	Total
Endowment net assets, beginning of year	\$ 42,317,735	\$ 81,000,010	\$123,317,745
Investment income	5,232,391	-	5,232,391
Miscellaneous revenue	737	-	737
Unrealized loss on investments	(4,745,399)	-	(4,745,399)
Amounts appropriated for expenditure	(5,637,380)	-	(5,637,380)
Endowment net assets, end of year	<u>\$ 37,168,084</u>	<u>\$ 81,000,010</u>	<u>\$118,168,094</u>

	2014		
	Temporarily Restricted	Permanently Restricted	Total
Endowment net assets, beginning of year	\$ 43,324,090	\$ 81,000,010	\$124,324,100
Investment income	7,080,542	-	7,080,542
Miscellaneous revenue	9,024	-	9,024
Unrealized loss on investments	(1,976,163)	-	(1,976,163)
Amounts appropriated for expenditure	(6,119,758)	-	(6,119,758)
Endowment net assets, end of year	<u>\$ 42,317,735</u>	<u>\$ 81,000,010</u>	<u>\$123,317,745</u>



Great Lakes Protection Fund

Notes to Financial Statements

Note 6. Endowment Net Assets (Continued)

Return Objectives and Risk Parameters – The Fund has adopted endowment investment and spending policies that attempt to provide a predictable stream of funding to its programs while ensuring that the original value of the endowment contributions is preserved. Assets are invested in a manner intended to achieve an annualized nominal return of five to seven percent and a real return of four percent in excess of the Consumer Price Index. Actual returns in any given year may vary from this amount.

Strategies Employed for Achieving Objectives – To satisfy its long-term rate-of-return objectives, the Fund relies on a total return strategy in which returns are achieved through both capital appreciation (realized and unrealized) and current yield (interest and dividends). The Fund targets a diversified asset allocation that places a greater emphasis on equity-based investments to achieve its long-term return objectives within prudent risk constraints.

Spending Policy and How the Investment Objectives Relate to Spending Policy – The Fund has a policy of appropriating an estimate of expenditures each year as part of a formal, annual budget. Adjustments to appropriations are also approved during the year as unexpected changes arise.

Note 7. Commitments

The Fund is obligated under an office lease expiring in December 2025 with an option to extend the lease for an additional five year period.

Rent expense totaled \$190,846 and \$148,262 for 2015 and 2014, respectively.

Minimum payments required under the lease are as follows:

2016	\$ 172,775
2017	175,354
2018	177,934
2019	180,513
2020	183,093
Thereafter	954,157
	<u>\$ 1,843,826</u>

Note 8. Retirement Plan

The Fund maintains a retirement plan under the provisions of Section 401(a) of the Internal Revenue Code applicable to governmental retirement plans. The Fund makes contributions under three provisions in the plan:

- 1) Contributions equal to 10% of each employee's compensation. All employees must participate upon commencement of employment.
- 2) Matching contributions in the amount of 100 percent of the employee's deferral contributions to the Fund's 457(b) deferred compensation plan (Note 9). The Fund's matching contributions are limited to 6% of the employee's compensation for the year. All employees contributing to the Fund's 457(b) deferred compensation plan are eligible to participate.
- 3) Board-designated contributions to provide additional compensation to maintain competitiveness with comparable positions in comparable organizations. Certain employees designated by the Board of Directors are eligible to participate.

All Fund contributions on behalf of employees are 100 percent vested when made. The Fund contributed \$155,020 and \$163,363 to the retirement plan for 2015 and 2014, respectively.



Great Lakes Protection Fund

Notes to Financial Statements

Note 9. Deferred Compensation Plan

The Fund maintains a deferred compensation plan under the provisions of Section 457(b) of the Internal Revenue Code. All employees are eligible to voluntarily participate upon commencement of employment. Participants can elect to participate in the deferred compensation to the extent permitted by applicable contribution limits under Section 457(b) of the Internal Revenue Code.

The Fund makes discretionary matching contributions to the retirement plan (Note 8) in the amount of 100 percent of the employee's deferral contributions to the Fund's 457(b) deferred compensation plan. The Fund's matching contributions are limited to 6 percent of the employee's compensation for the year. All contributions made to the deferred compensation plan are employee contributions for 2015 and 2014.



Appendix 2

Projects Completed in 2015



Projects Completed in 2015

Applying Water Stewardship Tools in the Great Lakes Basin (\$449,000)

This team examined and tested a series of water stewardship tools, and analyzed how well these tools – originally developed and tested for water scarce regions- adapted to large water bodies, addressed the special concerns of water rich regions, and were compatible with the needs of Great Lakes industries. The team selected five tools for testing in pilot studies in the Great Lakes region. The team also worked closely with the Alliance for Water Stewardship (AWS) to review and pilot their draft International Water Stewardship Standard (Standard) which had been released at the time the grant was awarded in 2012.

Through their pilots the team found there to be significant value in using water stewardship tools to advance water sustainability in the region. They found the AWS Standard to be a useful and relevant water stewardship tool for this region, one that offered the greatest flexibility needed by industry working in a water rich region with a high level of governance. Through their pilots, the team was able to make substantial contributions to, and influence the development of, the final AWS Standard.

This work was the "first of its kind" for several reasons. The team was the first to look at how well these tools functioned in a water rich region such as the Great Lakes. They were also the first to pilot multiple water stewardship tools at the same facilities. The work generated a lot of interest from a large and diverse audience including Great Lakes stakeholders, as well as tool users and developers in other parts of the world. Their work contributed to the global discussion on the applicability of water stewardship tools.

Council of Great Lakes Industries

Contact: Kathryn Buckner | 734-663-1944 | kabuckner@cgli.org

Characterizing the Risk-Release Relationship for Aquatic Invasive Species in the Great Lakes (\$1,027,000)

In this project, the team was trying to answer the question, "how clean is clean enough?" regarding ships' ballast water. The team wanted to determine how the risk of invasion varies when different numbers of a species are released. This is a key barrier identified by the National Research Council of the National Academies of Sciences and the team included many of the experts from that panel. With guidance from a panel of international experts on invasion biology the team developed the experimental designs, analytic protocols, and statistical data treatments for two types of assessments: lab assays using large-scale mesocosms (housed at the Great Ships Initiative (GSI) facility in Superior, WI) and field surveys.

This work continues under a [second grant](#). These efforts provide the first direct scientific data on the risk-relationship for the Great Lakes.

Northeast-Midwest Institute

Contact: Allegra Cangelosi | 202-464-4014 | acangelo@nemw.org



Piloting a Paradigm for Adaptive Management of Great Lakes Watersheds (\$400,000)

This team was the first to look at the impact of "virtual water" on the Great Lakes watershed. Virtual water is water embedded in products during the production of goods for export. This team developed a new scientific methodology relating economic production, watershed flow depletion and ecosystem services; piloted this methodology in the Kalamazoo River watershed; and determined the relationships for water and economic development policy. This was the first comprehensive study of its kind mapping the hydro-economy of a region in significant detail.

Michigan Technological University

Contact: Alex Mayer | 906-487-3372 | asmayer@mtu.edu

Ship-Mediated Harmful Microbes: Protecting the Great Lakes Ecosystem (\$1,029,000)

With the tools this team has developed the region will be better able to respond to the threats posed by "microbial stowaways" on vessels or in Great Lakes ports. Team members produced new genetic tools for testing water samples, and used these tools to spot the VHS virus and other microbes – including a rusty bacterium that eats away at steel structures. With the Minnesota Pollution Control Agency, the Maritime Administration and carrier fleets, the team strengthened how the Coast Guard monitors ship discharge (methods are detailed in A Ballast Discharge Monitoring System for Great Lakes Relevant Ships: A Guidebook for Researchers, Ship Owners, and Agency Officials).

The team designed a Great Lakes microbe monitoring program to protect against high-threat microbes by tracking sites associated with vectors, dispersion, and impacts. Cornell researchers used this place-based method – along with the genetic tools – to determine that VHS has spread to Lake Superior.

Northeast-Midwest Institute

Contact: Allegra Cangelosi | 202-464-4014 | acangelo@nemw.org



Appendix 3

Portfolio of Projects as of December, 2015



Portfolio of Projects as of December, 2015

A Self-Scaling Market Mechanism to Reduce Indirect Electricity Pollution (\$602,000)

A team led by WattTime will reduce mercury and other air pollutants into the Great Lakes through software-guided reductions in energy use at times when electricity is being generated by high polluting sources. The team has piloted their software in California where they focused on carbon emissions. In this project, the team will build upon their existing software with the [Locational Emissions Estimation Methodology](#) (LEEM) developed by a prior Fund-supported team. LEEM signals when cleaner forms of energy are feeding the grid and will enable the team to focus on reductions in mercury emissions.

The team will approach these reductions with both an internet-based software product and a market scaling mechanism. The team believes that adding a mercury reducing feature to smart devices will allow manufacturers to differentiate themselves with virtually no up-front costs. Ultimately, mercury will be reduced (benefitting the Great Lakes ecosystem) and manufacturers who offer the service will stand out from their peers and receive a greater share of the market (benefitting them).

Smart devices, including energy management systems for large buildings, residential thermostats and refrigerators, have significant untapped capacity to reduce mercury emissions. The team estimates that at least 900,000 connected appliances and management systems are currently in use in the Great Lakes basin and they believe that they can reduce mercury pollution by two tons by the end of 2016, with a potential to reduce 41 tons of mercury pollution by the year 2020.

WattTime

Contact: Gavin McCormick | 857-540-3535 | gavin@watttime.org

Strategies to Engage Middle Adopter Farmers on Cover Crops (\$653,000)

This team, led by the National Wildlife Federation, will improve water quality in the Great Lakes by increasing adoption of conservation practices that improve soil health on agricultural lands throughout the basin. They will do this by identifying and testing strategies for engaging middle-to-late adopter farmers to implement conservation practices.

Current conservation outreach, policies and financial incentives strongly focus on innovators and early adopters, which comprises a small percentage (16%) of the farming population. This team will develop and test a series of outreach and communications strategies to engage the middle and late adopters (comprising 70% of farmers) that will address the fundamental cultural components of their decision making as it pertains to the implementation of conservation practices.

The project team is a collaboration of organizations that have had uncommon and notable success with this approach in localized areas. They seek to bring these lessons to scale in the Great Lakes basin.

National Wildlife Federation

Contact: Ryan Stockwell | 715-965-2538 | stockwellr@nwf.org



Targeting Women Absentee Farmland Owners to Test Sustainable Agricultural Leases (\$88,000)

A team led by American Farmland Trust will design a project to identify, reach and improve how women absentee farmland owners lease their lands to tenant farmers. The team expects to equip landowners with the tools needed to allow increased participation in conservation programs, accelerate adoption of water-friendly management practices, and remove lease terms that might harm waterways. Previous work supported by the Fund estimated that over 48% of land farmed in the Great Lakes Basin is leased from owners who do not live on the land. Well over half of these owners have never consulted with conservation professionals about management practices that can reduce the impact of farming operations on surface waters.

Women owners are a strategic target because they play an increasingly important role in absentee farmland ownership, either by themselves or in partnership with their spouses. Studies show that women owners need gender-specific support, education, programs and tools to increase their engagement and empower their conservation-based decision making.

The project design phase will identify obstacles to the use of sustainable agricultural leases by engaging both owners and their tenants, and explore opportunities to overcome those obstacles. This phase of the project will build the project team, identify areas to pilot their strategies, and develop a complete plan of work to test their approach.

American Farmland Trust

Contact: Ann Sorensen | 815-732-2885 | asorensen@frontier.com

Green Infrastructure – Private Capital (\$886,300)

The project will execute first-ever green infrastructure public-private partnership agreements (P3s) in several Great Lakes municipalities as a demonstration of a new approach to financing and optimizing the performance of distributed green infrastructure. The P3s are expected to be large-scale (up to \$50 million) and enable aggregation of services, and optimization of performance, with the goal of making it economically feasible for governments and utilities to greatly expand green infrastructure throughout the Great Lakes region. The team will organize a project advisory committee, identify pilot communities, create and execute business plans, and—based on actual experience—create an implementation toolkit for other communities.

The project will implement an approach developed through previous Fund-supported work—a well-received business model development tool that describes how to form, market and position aggregation services to deliver high-performing green infrastructure services.

Environmental Consulting & Technology, Inc.

Contact: Sanjiv Sinha | 734-272-0859 | ssinha@ectinc.com



Great Lakes Green Infrastructure Finance Accelerator (\$84,000)

This project design effort will explore, ground-truth and develop blueprints for financing options that facilitate private investment in the installation and operation of green infrastructure on both public and private property. Currently, Great Lakes communities have largely focused on implementing green infrastructure on public properties and with public financing. Yet, considerable opportunities to reduce the environmental impacts of storm events exist on private properties in urban areas.

The team will work with municipal decision-makers, investors, insurers, service providers and other experts to analyze and frame-up private sector green infrastructure financing approaches that are relevant to the needs and opportunities in the Great Lakes Region. This project design phase will result in an implementation phase proposal to undertake these approaches in at least two communities.

American Rivers

Contact: Gary Belan | 202-347-7550 | gbelan@americanrivers.org

An Intelligent Cyberinfrastructure for the Decentralized Sensing, Modeling and Control of Urban Stormwater (\$800,000)

This project will develop a novel, smart, stormwater control framework that, when deployed at scale, will reduce the occurrence of combined and sanitary sewer overflows thereby improving the water quality of the Great Lakes and its tributaries.

The framework will optimize the management of sump pumps, rain barrels and stormwater outlets by fusing real-time sensor data and location-specific weather forecasting with control algorithms. Customers for the computing framework are water utilities seeking to optimize the use of distributed green infrastructure assets to improve stormwater management decision-making. The framework will be pilot tested in residential neighborhoods in Milwaukee, Ann Arbor and Toledo.

University of Michigan

Contact: Dr. Branko Kerkez | 734-764-4292 | bkerkez@umich.edu

Expanding Ag Retailer Roles in Resource Management (\$759,000)

This project is designed to reduce agriculture's contribution of nutrients, sediments, pesticides, and herbicides to the Great Lakes by adding key conservation products and services to the list of offerings marketed by agriculture retailers to farmers. The project will build upon the team's successes in a prior Fund-supported project where they developed new revenue-generating conservation products and successfully activated a network of agricultural retailers in the Sandusky River watershed to sell those products and eliminate over 18,000 pounds of dissolved reactive phosphorus runoff in one year.

The team will expand their work to other nutrient-impaired priority watersheds including the Lower Fox River and Saginaw Bay. They will improve upon the innovative tools they developed in the prior project.

The IPM Institute of North America, Inc.

Contact: Dr. Thomas Green | 608-232-1410 | ipmworks@ipminstitute.org



Great Lakes Information Technology (GLInT) Fellowship Program (\$125,000)

This is a 12-month planning grant where the team will recruit advisors, host a series of workshops and prepare a business plan for a fellowship program that identifies a committed leadership team, has a launch plan and includes a sustainability strategy that identifies who will pay for the program going forward. The fellows will ideally be recruited from start-ups and technology firms, to lead projects that prototype how information technology (sensor networks, data mining, data visualization and data integration) can drive better use of and investment in the basin's water.

The team will also develop a similar business plan for the Great Lakes Information Network (GLIN), and a design to harmonize the various technology initiatives in the basin. At the end of this planning period, the team expects to launch the fellows program, begin re-engineering GLIN, and begin one or more pilot efforts in support of the Great Lakes Commission's Blue Accounting initiative.

Great Lakes Commission

Contact: Stephen Cole | 734-971-9135 | scole@glc.org

Optical Technology to Efficiently Detect Sewage Contamination for Rapid Remediation (\$1,424,000)

This project will improve the water quality of the Great Lakes and its tributaries with the development of hand-held, real-time, optical sensors that will locate and accelerate repair of sources of human sewage contamination in streams and storm sewers. The team will do this by developing a new methodology for identifying the best optical signals to predict sewage contamination in water.

Optical properties of water are largely determined by organic matter and human sewage, as a form of dissolved organic matter, has distinctive characteristics. Through extensive field sampling and laboratory analysis, the team will determine those optical signals that consistently indicate human sewage and will work closely with partner sensor manufactures to expand the capabilities of existing sensors. The team will pilot the technology in Milwaukee, Macomb County (MI) and Monroe County (NY).

U.S. Geological Survey

Contact: Steven Corsi | 608-821-3835 | srcorsi@usgs.gov

Uncovering How Clean is Clean: Great Lakes Invasive Species (\$542,000)

This work will lead to fewer successful invasions of the Great Lakes by aquatic nuisance species. The team will do this by continuing the work that they began under a previous Fund project to develop methods that will determine how the invasion risks vary with the numbers of invasive organisms released into the environment. As these methods are established, work can begin to create receiving water standards that protect the Lakes from invasions.

This project will have two components: mesocosm studies and field surveys. The mesocosm studies will use the methods developed and refined in a prior project to characterize the relationship between inoculum concentrations and colonization success using a surrogate invader, the spiny water flea. The



field survey work will focus on investigating the use of environmental DNA (eDNA) as a reliable, quick and affordable screening method to identify priority samples for analysis and will focus on Hemimysis species.

Northeast-Midwest Institute

Contact: Allegra Cangelosi | 202-464-4014 | acangelo@nemw.org

Automated Ballast Treatment Verification Project (\$823,000)

This project will reduce the likelihood of new invasive species entering the Great Lakes. The team will accomplish this by creating an automated, shipboard, rapid-testing system that will be able report, in real time, the presence of any live organisms in ballast water following treatment. If successful, this effort will eliminate one of the greatest challenges facing invasive species control—the ability to capture sufficient volumes of water to properly assess the efficacy of ballast treatment methods and compliance with ballast standards.

The team will work closely with leaders in the ballast monitoring field including university experts, state and federal agency staff, shippers, carriers, and equipment manufacturers, and will convene at least annually a regional ballast verification management workshop. The team will also maintain an informal network of stakeholders and interested parties and will promote the work at regional, national and international meetings.

Wayne State University

Contact: Dr. Jeffrey Ram | 313-577-1558 | jeffram@med.wayne.edu

A Phosphorus Soil Test Metric for Reducing Dissolved Phosphorus Loads (\$947,000)

The objectives of this project are to:

- Develop a surficial phosphorous (SurP) soil test to measure the level of phosphorous currently available in the soil
- With certified crop advisors, the fertilizer community and local farmers, create management options for taking action based on detected phosphorous levels
- Measure phosphorous inputs to tributaries in Ohio, and share the results and lessons learned with groups in Saginaw Bay, MI; Green Bay, WI; and Ontario
- Develop a SurP metric that describes the level of reactive phosphorous in the soil and the likelihood of increased phosphorous loads into nearby tributaries (this should motivate changes that lead to ecosystem improvements in the Lakes)

The talents of all members of the agricultural supply chain will be tapped to accomplish a significant goal: a fifty percent reduction of dissolved, reactive phosphorous in the Ohio Lake Erie Basin within the next ten years. The team will also deliver the tools needed to achieve similar results in Saginaw Bay, Green Bay



and Ontario. The successful reduction of phosphorous levels will drive down eutrophication in Lake Erie, reduce the outbreak of harmful algal blooms, and improve aquatic health.

Heidelberg College

Contact: David Baker | 419-448-2941 | dbaker@heidelberg.edu

Great Lakes River Mouths and the Region's Economic and Environmental Future (\$65,000)

Awarded in 2011, this is a 9-month planning grant that will seek to develop a project that creates a new regional approach to Great Lakes river mouth redevelopment founded on restoring hydrological and ecological services, creating sustainable economic activity, and managing Great Lakes river mouths as a network. The team will document how the river mouths are currently being used and explore how they may be used sustainably in the future. Specifically, the team will look at: 1) critical hydrological and ecological services provided by Great Lakes river mouths and the importance of each; 2) social drivers governing Great Lakes river mouth development; 3) key current economic and transportation uses of Great Lakes river mouths and likely future trends; 4) current development patterns and compatibility with ecological and hydrological services; and 5) examples of sustainable individual and network river mouth development found within and outside the region.

Northeast-Midwest Institute

Contact: Allegra Cangelosi | 202-464-4014 | acangelo@nemw.org

Implementation and Evaluation of Accurate Dairy Feeding (\$690,000)

Awarded in 2013, this project will reduce the dairy industry's contribution of excess nutrients, particularly phosphorus, to the Great Lakes. With an estimated three million dairy cows in the Great Lakes region, the team expects to reduce annual contributions of phosphorus by 20,000 metric tonnes per year. (To put this into perspective, the Great Lakes Water Quality Agreement of 2012 specified the combined maximum phosphorus loading target for all of the Great Lakes at 31,360 metric tonnes per year.) The team will do this by developing a novel feed management and nutritional accounting system that will intervene directly in farm feed management practices to streamline dairy operations and reduce nutrient waste. The cloud-based system will interact with feeding systems already available in the market-place. In its final form, the system will consist of a series of modules (mixing, feed inventory, animal inventory and production), and a custom analytical engine that will perform statistical analysis and reporting and provide real-time feedback to on-farm decision-makers. The team will pilot the system on ten large dairy farms in Ontario, Ohio, Wisconsin, and New York.

AgModels LLC

Contact: Michael Barry | 607-423-9417 | mcb4@cornell.edu



Implementing Real-Time Resource Use Feedback to Motivate and Empower Conservation (\$812,000)

Water and electricity users will experience a new and immediate connection to the consequences of their actions, as a result of this project which seeks to change individual activity through social accountability. The project team seeks to “engage, educate, motivate and empower” resource consumers to change their behavior in 138 residential and commercial spaces on or near the Oberlin College campus.

The team will develop, deploy and evaluate a monitoring system that provides users real-time feedback on the amount of water and electricity they use, as well as direct consequences of that use. They propose that this will reduce residential power and water use, and in turn, reduce air emissions and restore stream flows in the Plum Creek watershed, which runs through Oberlin and is part of the Black River watershed that drains into Lake Erie.

The team will install displays in student dormitories, apartment buildings, and mixed-use housing that show what is being consumed, how much it costs, and what the effect is upon air and water resources. They will also build an automated monitoring network that will assess changes in flow due to water withdrawals and discharges, as well as air quality and power sold. The team expects to provide information at the residence, neighborhood, city and watershed scales.

Oberlin College

Contact: John Petersen | 440-775-6692 | john.petersen@oberlin.edu

Real-Time Energy Impact Monitors for Residential, Industrial and Policy Use (\$557,000)

Awarded in 2013, this project will significantly reduce the emission of mercury and other toxic substances by power plants into the basin. The team will do this by refining, testing and marketing a novel technology—pioneered in a Fund-supported project—that interacts with the power grid to precisely estimate the emissions associated with current power uses and signals when cleaner forms of energy are available. Referred to as LEEM (Locational Electricity Emissions Methodology), this technology determines, in real-time, the fuel sources (e.g. coal, natural gas, nuclear, wind) that are being used to generate electricity and the emissions from those sources, and provides users the ability to reduce emissions by changing the timing of their electricity use.

In their previous work with the Fund, the team has developed a fully functional alpha version of LEEM and deployed it in two distinct products: HERO, a phone and web application for individual consumers, and PEPSO, a software program designed to optimize pump operations at water utilities. In this project the team will explore the potential for embedding the technology into ‘smart’ appliances and building systems, integrating it into the electric vehicle market, and incorporating into energy standards and programs.

Wayne State University

Contact: Carol Miller | 313-577-3790 | cmiller@eng.wayne.edu



The Great Lakes Clean Communities Network (\$690,000)

This team will develop a new collaborative approach to stormwater management in this region that will accelerate the local initiatives currently being implemented by single communities. For this project, the team will create a community of practitioners who will work together to implement stormwater projects at a larger scale than would be possible if working alone, and who will be supported by online resources. The team will pilot this approach in Grand Rapids, Michigan; Milwaukee, Wisconsin; Niagara Falls, New York; and in the Flint River watershed.

In addition to linking communities together, the project team will provide online information and guidance, as well as environmental tools and models to help communities target effective types and placement of stormwater runoff practices, estimate pollutant reductions, and map and track positive environmental impacts. The team will use a combination of marketing and rollout strategies to build a community of practitioners that will support and use the system. Ultimately, the project will create a vibrant learning community that will change the way stormwater is managed in the region.

Michigan State University

Contact: Jeremiah Asher | 517-432-5586 | asherjer@msu.edu

Watershed Ecological Sustainability Strategy – Transactions for Agricultural Ecosystem Services (\$940,000)

Awarded in 2011, the team will design and test different transaction frameworks that will tie resources and funding flows to water stewardship outcomes. Specifically the team will: 1) design and test new ways to reduce drainage assessments for those farmers keeping soil and nutrients out of the drainage network; 2) explore and test new certification schemes for farmers and/or their products to attract new payments for ecosystem services; and 3) test how watershed-based performance incentives can be added to Michigan's MAEAP program. The team will demonstrate how these different transactions can reward farmers by linking farmer payments to ecosystem improvements.

The team will build on existing water quality models (developed by team members with support from the NRCS, USACE and others) that will allow the team to predict impacts in a watershed based on actions on the land. The product from this work will be a prototype, low-cost, web-based tool that will identify the best type, placement and number of stewardship practices to meet desired ecological outcomes, and methods that link payments to those outcomes.

The Nature Conservancy

Contact: Dennis McGrath | 517-316-2251 | dmcgrath@tnc.org

Improving Water Management in the Great Lakes Basin – Phase II (\$562,000)

Building off of their planning grant, this team will identify and test the environmental and financial rationales for municipalities to pursue water conservation and green infrastructure practices, and test how this information—when combined with effective knowledge transfer techniques—can drive innovation in water management throughout the Great Lakes region. The team will approach this work from the viewpoint that water conservation, to be effective in the Great Lakes region, must include municipal



supply, storm- and wastewater, and engage a different set of stakeholders than traditional water conservation strategies.

The team will complete a detailed impact and infrastructure assessment in six pilot communities; develop of a set of management actions for each community that will reduce environmental impacts and decrease costs; track the rate at which the pilot communities implement the recommended actions and calculate the environmental and financial impacts; and create and test a series of knowledge transfer strategies that will help communities teach other communities. The team will transfer the tools created in the pilots to communities throughout the basin. New communities of practice will be created around the most promising techniques that have ecological importance and basin-wide applicability.

Great Lakes Commission

Contact: John Jackson | 716-886-0142 | jjackson@web.ca

Reducing Phosphorus Loads from Agriculture: Creating a Pay-for-Performance Program Using Field-Specific Information (\$957,000)

Awarded in 2013, this project will lead to reductions of harmful algal blooms in the Great Lakes by reducing levels of phosphorus in basin streams and rivers. The team will do this by designing and piloting a novel pay-for-performance program that will aggregate the conservation actions of farmers in a watershed and create a mechanism to reward those farmers for the amount of phosphorus they remove from surface waters. Through this work the team will create a series of organizing, modeling, negotiating, contracting, and assessment tools that will allow others to create their own "pay-for-performance" conservation program.

Building on their relationships with farmers in the pilot area, the team will facilitate the development of a farmer-led watershed council that will take on a leadership role in delivering phosphorus reductions. Working with and through the council, the team will establish field-level baseline conditions, assess the cost effectiveness of status quo conservation, and create a portfolio of possible actions for each participating farmer to take to reduce phosphorus. The team will design the structure of the pay-for-performance program that will identify what level of phosphorus removal can be attained, and will design simple contracts for each farmer/producer.

Changes in phosphorus exports from participating farms will be measured through a network of in-stream and edge-of-field sampling locations. The team will use this monitoring information to refine its water quality models, its field assessments and its producer contracts. They will use the lessons learned to prepare a detailed tool kit for others to use available water quality models, coupled with minimal monitoring, to build pay-for-performance projects elsewhere in the basin.

Winrock International Institute for Agricultural Development

Contact: Jonathan Winsten | 802-343-3037 | jwinsten@winrock.org



Using Active Management of Drain Networks to Improve the Great Lakes Ecosystem (\$355,000)

Awarded in 2013, this project will lead to reductions in nutrients and sediment in Great Lakes tributaries and coastal areas with the development and application of a novel, automated, real-time drain tile management network. Regions around the Great Lakes with the most serious nutrient issues, such as Saginaw Bay and Western Lake Erie, have some of the densest drain tile networks in the U.S. Recent research indicates that drain tiles are often the largest single source of biologically available phosphorus but that active drain management can be an important practice for controlling that phosphorus.

The team will examine techniques and potential environmental and agronomic impacts, explore the opportunities in the Great Lakes basin, identify the physical settings where a “smart drain network” can reduce nutrients, and evaluate the potential market for such services. They will explore the feasibility of combining two different technologies: an active drain tile management technology and an optimization software that allows for real-time, wireless management of networks of sensors and control structures. In its final form the system will consist of a network of real-time sensors (installed at the field and sub-watershed scales) and drain control structures that will be integrated with an optimization system and a wireless communication network.

The Nature Conservancy

Contact: Dennis McGrath | 517-316-2251 | dmcgrath@tnc.org

Vacant to Vibrant: Vacant Land as Green Infrastructure (\$902,000)

This project will lead to improved water quality in the Great Lakes by reducing stormwater runoff and the incidence of combined sewer overflows. To accomplish this, the team will establish a neighborhood-based network of small-parcel green infrastructure (GI) projects on vacant land in three Great Lakes cities. They will determine the potential for urban neighborhoods with an abundance of vacant land to serve as a GI network. This project will be the first to test the effectiveness of aggregated small parcels as a viable strategy for effective GI and stormwater management. It will also be the first to develop a simple GI portfolio that will be replicable across cities in the Great Lakes region. The team will work with local community partners in the cities of Buffalo, NY; Cleveland, OH; and Gary, IN—cities with high commercial and residential land vacancy; aging sewer/stormwater infrastructure; and a demonstrated interest and capacity for an interdisciplinary approach to green infrastructure.

This project is the result of a successful convening and planning phase which brought together experts from fourteen cities around the Great Lakes to assess the regional interest of reusing vacant urban lands as green infrastructure. The team will continue to develop this network by holding at least two regional meetings and by creating a regional community of practice—a Great Lakes Vacant Land and Green Infrastructure Collaborative that will engage stakeholders from the original fourteen cities and be expanded to include other stake holders from around the Great Lakes.

Cleveland Botanical Garden

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Great Lakes
Protection Fund

The Fund's mission is to identify, demonstrate, and promote regional action to enhance the health of the Great Lakes Ecosystem.

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glpf.org