Appendix I

Economic Analysis of GLRI Investment Data using RIMS Multiplier Analysis

Great Lakes RESTORATION

Great Lakes Commission
des Grands Lacs

REAP — Researching the Effectiveness of Agricultural Programs

Economic Analysis of GLRI Investment Data Using

RIMS II Multiplier Analysis

FINAL

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AMP Insights

Acknowledgements

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ACRONYMS

CP	Conservation Practice
GLRI	Great Lakes Restoration Initiative
I-O	Input-Output
NRCS	Natural Resources Conservation Service
PMT	Project Management Team
REAP	Researching Effectiveness of Agricultural Programs
RIMS II	Regional Input-Output Modeling System
US	United States
USDA	United States Department of Agriculture

1. Introduction

This report has been produced in support of the project known as Researching the Effectiveness of Agricultural Programs (REAP) funded under a Great Lakes Restoration Initiative (GLRI) Cooperative Agreement between the U.S. Environmental Protection Agency and the Great Lakes Commission. The objective of REAP is to evaluate the impact on long-term on-farm behavior as a result of GLRI Focus Area 3 investments with four GLRI priority watersheds; the Genesee, Lower Fox, Maumee, and Saginaw watersheds.[1] The goal of this report is to estimate the broader economic impact of GLRI funded projects in each watershed. From 2010-2016 the GLRI funded 34 projects across the four watersheds (see Table 1).

Table 1. GLRI Focus Area 3 Funding by Watershed

Watershed	Project Funds	Funds as % of Total
Genesee	$ 7,993,680	8%
Lower Fox	$ 24,320,835	25%
Maumee	$ 43,998,861	46%
Saginaw	$ 19,495,394	20%
Total	$ 95,808,771	—

Input-output (I-O) modeling is a method commonly used to model the interrelationships of economic sectors/industries and describe the multiplier effect of changes in one sector/industry across a broader economy and is frequently used to assess the potential economic impact of a new program or investment in a particular industry. Results of I-O analyses are typically expressed as multipliers that represent the additional economic impact above the direct contributions of the industry being considered.

Input-output analyses typically include measurement of three rounds of impacts:

- Direct Impacts – Increase in regional economic output/increases in regional employment
- Indirect Impacts – Increased demand for regionally produced inputs (i.e., goods and services), which in turn generates increased demand for inputs and employment.
- Induced Impacts – Individuals employed by jobs created will in turn spend some of their earnings on regionally produced goods and services.
- Feedback Loop – Regional industries for which demand of good and services increased in the first round of indirect and induced effects also will require additional inputs and labor.

In this analysis, direct economic contributions of GLRI investments were the funds spent within each watershed. These investments then supported a) indirect impacts - the purchase of supplies and services to support implementation of conservation practices (e.g., purchase of plants for a vegetative buffer or

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[1] It should be noted that the Genesee only became a GLRI priority watershed under GLRI Action Plan II, which was active from 2015-2019. As the time frame for this analysis is 2010-2016, only two years of data (i.e., 2015 and 2016) were available for the Genesee.

hedgerow planting); and b) induced impacts - personal spending by farmers receiving GLRI funding as well as any employees of industries providing supplies and services (e.g., purchase of groceries).

2.   Data and Methods

Two data sources were used for this analysis – a database compiled by the REAP Project Management Team (PMT) on the majority of GLRI Focus Area 3 investments distributed to the four priority watersheds and Regional Input-Output Modeling System (RIMS II) multipliers purchased from the U.S. Bureau of Economic Analysis.

2.1   REAP Database

The database compiled by the REAP PMT includes two tabs – one on high-level projects and one on CPs implemented as part of the high-level projects. The information on the CPs is considered to be incomplete, but still was useful for understanding how and where GLRI funds were distributed (see Table 2). Only funds associated with CP implementation could be linked to a particular sector/industry with any level of confidence — meaning approximately 58% of GLRI funding could be mapped to the appropriate sector/industry as needed to be included in the I-O analysis.

Table 2. GLRI Focus Area 3 CP Funding by Watershed[2]

Watershed	Project Funds	CP Funds	CP Funds as % of Total
Genesee	$ 7,993,680	$ 5,475,525	68%
Lower Fox	$ 24,320,835	$ 14,061,674	58%
Maumee	$ 43,998,861	$ 23,137,750	53%
Saginaw	$ 19,495,394	$ 12,134,931	62%
Total	$ 95,808,771	$ 55,319,044	58%

The Natural Resources Conservation Service (NRCS) has conducted a number of studies on the local/state economic impact of implementing conservation practices using a propriety software called IMPLAN, which is based on the input-output economic model and data-sets assembled from a variety of government sources including the US Bureau of Economic Analysis, the USDA, the US Bureau of Labor Statistics and the US Census, among others.

According to the IMPLAN website, the United States Department of Agriculture (USDA) Forest Service originally developed IMPLAN in the 1970s in order to conduct community level impact analyses. The USDA Forest Service, however, was not able to "sustain a large-scale nationwide system", so the responsibility for updating and maintaining IMPLAN datasets was given to the University of Minnesota in 1985. Since 2013, IMPLAN has been managed and sold by a privately held company under the same name (IMPLAN 2019).

In order to estimate the economic impact of conservation practices, the NRCS had to identify the industry sectors in which funds would be spent to implement a particular conservation practice (CP). For example,

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[2] Total CP funds are greater than the sum of CP funds for the four watersheds as some CPs did not identify the watershed in which they were implemented.

implementation of a riparian forest buffer would support the industry "greenhouse nursery and floriculture production" through the purchase of plants needed to create the buffer. Several of the studies conducted by NRCS on the economic impact of conservation practices included tables linking NRCS CP types to IMPLAN industrial sectors (see USDA NRCS, n.d.; n.d.).

As IMPLAN is a proprietary (and costly) software, Regional Input-Output Modeling System (RIMS II) multipliers were purchased from the U.S. Bureau of Economic Analysis and served as the underlying data for the input-output analysis conducted here. In order to make them relevant, IMPLAN sector codes were converted to RIMS II codes. GLRI funding for CP implementation was then summed by practice type and by watershed and linked to the RIMS II codes (see Figure 1).

Figure 1. Process for Preparing GLRI Data for I-O Analysis
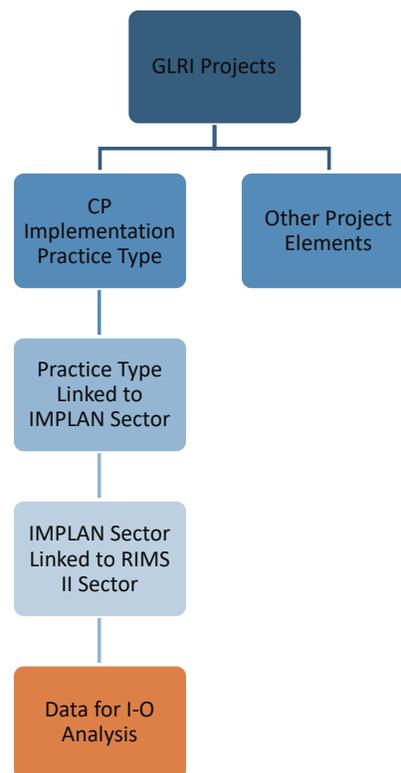
Recognizing that this represents just over half of total GLRI funding, some basic assumptions are made about how the other 42% of funds were spent and a sensitivity analysis is run to assess the degree to which these assumptions impact results (see Section 4.2).

2.2   RIMS II Multipliers

RIMS II multipliers can be purchased by region or by industry. For the purposes of this study, four regions were needed (i.e., one representing each priority watershed). A region can be defined in a variety of ways (e.g., county, metropolitan area, customized region, etc.), with RIMS II creating the appropriate multipliers for the region defined. Multipliers produced for a given region are indicative of the economic structure of that region and the interrelationships of industries within that region only. As such, it is typical to see a multiplier increase as the size of the region examined increases. This is relevant in the context of this analysis given the substantial variation in the land area within each of the four watersheds (see Table 3).

Table 3. Watershed Area

Watershed	Area (Acres)
Genesee	1,596,168
Lower Fox	414,394
Maumee	4,208,092
Saginaw	3,988,803

Unlike previous analyses done in the context of this study, where counties within a watershed were weighed in order to create an aggregate value, the purchase of multipliers for individual counties was cost prohibitive, and so a determination needed to be made as to which counties should be included to produce a representative multiplier for each watershed which could then be applied to all the CP funding in that watershed. Additionally, the rationale for not including all counties was that counties with little or no CP funding, if included in the regions, would have equal weight with highly-funded counties in the way the RIMS II multipliers for a given region were aggregated, potentially skewing the impact of the small amount of funding in that county.

In order to do this, CP funding by county was sorted from highest to lowest within each watershed (see Appendix A) and mean and median values were calculated. For watersheds with a relatively normal distribution (i.e., Lower Fox, Genesee), counties with CP funding above the mean value were included. For watersheds with a more skewed distribution (i.e., Maumee and Saginaw), counties with CP funding above the median were included. Using this methodology for choosing the RIMS II multipliers, the counties included in the calculation of the multipliers represented at least 88% of funding allocated towards CPs (see Appendix A).

3.   Allocation of GLRI Funding Data to RIMS II Industries

Individual RIMS II multipliers are produced for select industries within a region. There are 64 aggregate industries and 406 detailed industries in RIMS II. Previous NRCS reports provided the basis by which funds spent on CP implementation were partitioned amongst the industries, but a separate strategy for allocating funding to industries was needed for the approximately $40 million in GLRI project funding not allocated to CP implementation in the REAP Master Database.

3.1   CP Funding

The use of the of the NRCS IMPLAN industry tables allowed for the categorization of CP funding at the detailed industry level and the use of specific, targeted RIMS II industry multipliers. Some CPs – Forest Stand Improvement, Forage and Biomass Planting, Tree/Shrub Establishment, Cover Crop, Integrated Pest Management, Prescribed Grazing, and Nutrient Management – involve activities that are associated with multiple industries. As a result, the funding for these CPs was allocated across applicable industries using percentages previously employed in other NRCS IMPLAN analyses (see USDA NRCS, n.d.; n.d.). Additional CPs, such as Soil Testing and CPs associated with the application of chemicals, were aggregated under the term Agronomic System and the aggregated funding was split amongst multiple industries.

The dollar value of estimated GLRI expenditures for each industry was then multiplied by the industry RIMS II multiplier associated with each watershed to produce measures of the estimated economic impact of GLRI investments in CPs on total output and employment across and for each of the four priority watersheds.

3.2   Non-CP GLRI Funding

GLRI funding allocated to CP implementation accounted for 58% of total GLRI funding gathered in the REAP Master Database. The remaining 42% of funding was not categorized in such a way that the funds could be allocated to specific detailed industries within the RIMS II framework. As a result, some assumptions regarding the use of these funds to support GLRI Focus Area 3 projects had to be made. CP implementation is only one of eight project elements into which GLRI projects were categorized in the REAP Master Database. The remaining seven project elements deal primarily with outreach, capacity building, research and monitoring, and tool development.

As funding data were not broken out by project element (other than for CP implementation), a simple formula was used to allocate remaining project funds. First, reported funds used for CP implementation were subtracted from total funds for each project. Projects then were identified as having 1) only outreach or capacity building elements; 2) only monitoring, research or tool development elements; or 3) a combination of both. Funding for each project was then assigned to either outreach/capacity building, monitoring/research/tool development, or, in cases where a project included both types of elements, 50% of funds were allocated to each. Summing these results, project funds were relatively evenly distributed between outreach or capacity building elements (57%) and monitoring, research or tool development elements (43%).

As a result, three separate RIMS II analyses were performed for the non-CP GLRI funds so as to provide a sensitivity analysis of the impact of allocating the funds. The analyses were as follows: 1) 100% of non-CP GLRI Focus Area 3 funds were allocated to the RIMS II industry "support activities for agriculture and forestry"; 2) 100% of funds were allocated to the RIMS II industry "professional, scientific, and technical services"; and 3) non-CP funds were split 50%-50% between the two industries.

4.   GLRI Program Impacts

Principal model outputs of RIMS II multipliers provide information on total economic output and employment. Output is a duplicative total that estimates the value of goods and services counted multiple times within the region's economy to produce a value for the total amount of economic activity generated by new spending, such as that associated with the GLRI project spending on CPs, and represents the degree to which the original dollars spent are circulated throughout the economy.

An output multiplier also can indicate the degree to which inputs to a given industry are from inside or outside the region. A lower multiplier suggests that more of the inputs for a given industry are produced outside the region and, therefore, a higher proportion of the new spending will leak out of the regional economy. Because a multiplier is a proxy for the regionality of other inputs, the magnitude of an output multiplier may be correlated with the size of a region. The smaller a region the greater the likelihood that goods and services would be imported from outside that region, which would result in new economic value leaking out of that region as reflected by a lower RIMS II multiplier. Given the differing geographic extents of the four priority watersheds, this correlation may be important when interpreting the results of the analysis.

Employment multipliers, on the other hand, determine the increase in overall labor demand – full- and part-time jobs created and retained – that is likely to result from spending in the industry (and related industries) associated with that multiplier. Again, the size of the region considered may impact the size of employment multipliers, as the larger the region, the great the likelihood that jobs created will stay within the region.

For this analysis, the results of the RIMS II multiplier analysis are reported in nominal dollars – i.e., not adjusted for inflation. While the CP implementation funding is associated with a specific project year, the remaining project funds span multiple years, and, because assumptions would need to be made about how those funds were dispersed across years to allow for reporting in real dollars and because these assumptions could impact the magnitude of the outputs, it was decided to report outputs in nominal dollars for the whole analysis.

4.1 CP Implementation Impacts

4.1.1 Impacts on Total Output

Measured in terms of total output, the estimated overall economic impact of the $55 million in GLRI funds invested in CP implementation is $82 million. Across the four watersheds combined, the investment to output multiplier is 1.5. The greatest estimated economic impact is seen in the Maumee, a result of both higher initial investment in CPs in that watershed (see Table 4) and RIMS II multipliers of greater overall magnitude, which, as was mentioned previously, may have to do with the geographic size of the Maumee as compared to the other watersheds.

The percentage yield (i.e., the overall ratio of total economic impact to GLRI investments) is highest in the Lower Fox where the estimated total impact of over $22 million is 158% of the initial investment (i.e., $14 million). This is a result of the fact that in the Lower Fox GLRI funds were spent on CP types that fell into industries with higher multipliers.

Table 4. Estimated Economic Impact of GLRI Investments in CP Implementation[3]

Watershed	Total CP Funding ($)	Total Output ($)	Investment to Output Multiplier
Genesee	$ 5,475,525	$ 7,649,945	1.4
Lower Fox	$ 14,061,674	$ 22,199,715	1.6
Maumee	$ 23,137,564	$ 35,104,244	1.5
Saginaw	$ 12,134,931	$ 17,369,360	1.4
All Watersheds	$ 54,809,694	$ 82,323,265	1.5

The Genesee, overall, exhibits lower multiplier values than the other watersheds, indicating that goods and services demanded by industries supporting CP implementation are more likely to be produced outside the region (i.e., the Genesee watershed). Of the fourteen detailed industry RIMS II multipliers, the Genesee exhibited the lowest value for thirteen and the Maumee exhibited the highest value for nine. This result, at least to some degree, is likely related to the smaller size the Genesee as compared to some of the other watersheds.

RIMS II detailed industries with the highest total output multipliers for each watershed and the CPs associated with each industry are included in Appendix B.

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[3] Total CP funds differ from that shown in Table 4 as a result of some CPs not having an indication of the watershed tin which they were implemented. The unallocated CP funds were accounted for in Table 4, but not accounted for in Table 3.

4.1.2 Impacts on Employment

GLRI investments in CPs spanned multiple years and because there is not enough data to determine the number of jobs retained versus the actual number of new jobs created by the implementation of CPs, calculating this number using all GLRI funds invested may overestimate the employment impact as a result of double-counting jobs retained across the years of GLRI investments. To estimate a conservative number representative of total jobs created and retained for the timeframe analyzed (2010-2016), the funds invested in CP implementation were divided by seven – the number of years in the timeframe of interest – prior to calculation of the employment metric using RIMS II multipliers. The conservative estimate of jobs created and retained by GLRI investments in CPs for the 2010-2016 timeframe is 85.

The greatest number of jobs created or retained by GLRI funding allocated to CP implementation occurred in the Maumee, where 39 jobs are estimated to be created and retained (see Table 5). While this number of jobs may again be, in part, the result of the higher overall investment in CPs in this watershed, the ratio of jobs created and retained to total funding was also highest in the Maumee. This result is the product of high multiplier values in the Maumee and the concentration of funding for CPs in industries with the highest RIMS II employment multipliers. As with the results of the total output, the Genesee exhibits the lowest number of jobs created and retained and the lowest ratio of employment to funding for the four watersheds. Of the fourteen detailed industry RIMS II multipliers, the Genesee has the lowest value for twelve and the Maumee has the highest value for seven. Interpretation of these findings, however, also should take into account the size difference of the watersheds.

Table 5. Estimated Jobs Created by GLRI Investments in CP Implementation

Watershed	Total Jobs (#)	Investment to Jobs Multiplier
Genesee	7	1.3
Lower Fox	22	1.6
Maumee	39	1.7
Saginaw	17	1.4
All Watersheds	85	1.5

Note: The investment to jobs multiplier is calculated here as the ratio of the number of jobs per one million dollars of GLRI CP funds invested.

RIMS II detailed industries with the highest total job multipliers within each watershed and the CPs associated with each industry are included in Appendix B. Although each industry may encompass many CP types, the consistent ranking of job multipliers across watersheds indicates that there are some CP types that may be more universally capable of stimulating job growth.

4.2 Non-CP GLRI Funding Impacts

4.2.1 Impacts on Total Output

As mentioned previously, given that a large portion of GLRI Focus Area 3 investments could not be attributed to a specific industry, three separate RIMS II analyses were performed for the non-CP GLRI funds so as to provide a potential range of estimated total economic impact.

The estimated total economic impact, measured in terms of total output, of the $40.5 million in GLRI Focus Area 3 funds not invested in CP implementation, and for which there were data, is estimated to fall between $60 and $66 million. For this range, the high-end was arrived at using the methodology wherein

100% of the remaining GLRI funds were allocated to support services for agriculture and forestry (Ag Services) and the low-end of the range was the result of allocating 100% of the remaining GLRI funds professional, scientific, and technical services (Prof Services). Allocating 50% of the non-CP funds to each of the two industries (50%-50%) results in an average of the output impact of $63 million. Across the four watersheds, the estimated investment to output multiplier for the remaining GLRI Focus Area 3 investment is between 1.26 and 1.68.

Although the allocation of the remaining funding changed the magnitude of estimated total economic impact across the watersheds (see Figure 2), it did not change the ranking of the watersheds in regards to the percentage yield of the economic impact, with the Lower Fox experiencing the highest ratio of total output to initial GLRI investment and the Genesee yielding the least (see Table 6).

Figure 2. Estimated Total Economic Impact of Non-CP Funds Invested for Three Scenarios
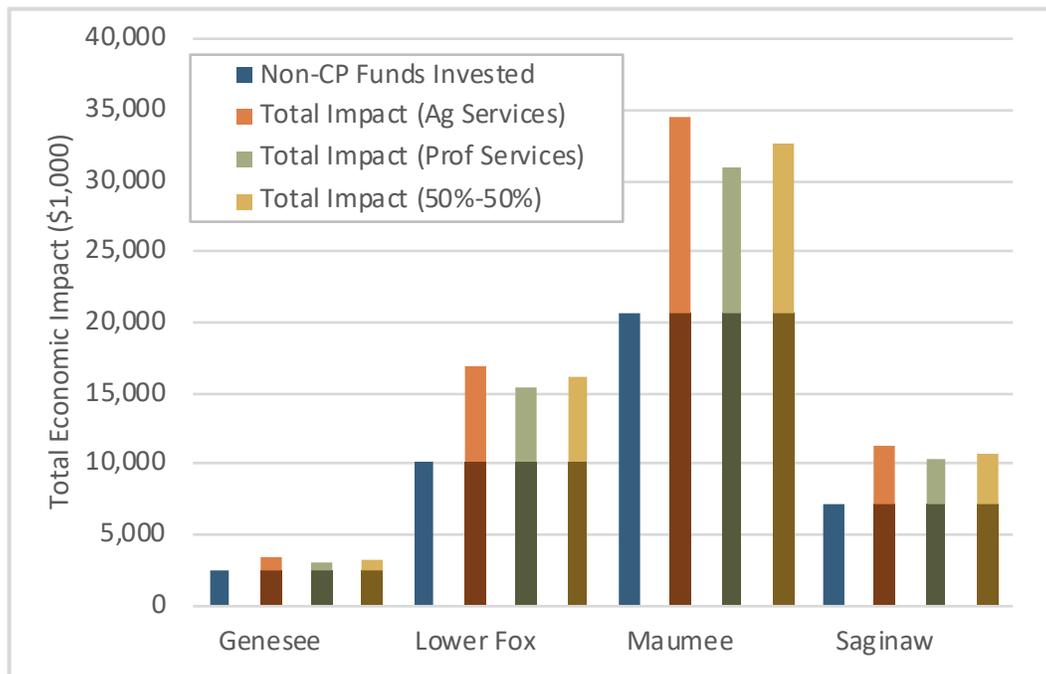
Table 6. Investment to Output Multipliers for Three Scenarios

Watershed	100% Ag Services	100% Prof Services	50%-50%
Genesee	1.44	1.26	1.35
Lower Fox	1.68	1.53	1.60
Maumee	1.67	1.49	1.58
Saginaw	1.56	1.43	1.49

Because the method by which funding was allocated to the industries was consistent across watersheds this result is directly correlated to the magnitude of the RIMS II multiplier(s), with the Lower Fox having the highest magnitude multiplier and Genesee having the lowest multiplier for both support activities for agriculture and forestry and for professional, scientific, and technical services. As with the findings from the CP implementation RIMS II analysis, these results indicate that the Genesee regional industries that provide the goods and services required by support activities to agriculture and forestry and professional,

scientific and technical service industries are more likely to be produced outside the region (i.e., the Genesee watershed).

Taking into account variation in the size of the watersheds, the fact that the Lower Fox, the smallest watershed of the four, has the highest multipliers for both support activities for agriculture and forestry and for professional, scientific, and technical services is notable. This suggests that other industries supporting and supported by these two are more likely to be located within the Lower Fox watershed than is the case in the other watersheds.

4.2.2   Impacts on Employment

Using the same method as that used in the analysis of CP funds to estimate a conservative total impact on employment, an estimated 50 to 126 full and part-time jobs are found to be created and retained by the non-CP GLRI investments.

Again, the high-end of the range is represented by the RIMS II analysis allocating 100% of the non-CP funds to support activities for agriculture and forestry, the low end of the range corresponds to the analysis that allocated that 100% of remaining funds to professional, scientific, and technical services, and splitting the funds evenly amongst the two industries produces an average of the two – i.e., 88 jobs (see Table 7).

Table 7. Estimated Jobs Created by Non-CP GLRI Investments for Three Scenarios

Watershed	Non-CP Funds	100% Ag Services	100% Prof Services	50%-50%
Genesee	$ 2,390,864	8	2	5
Lower Fox	$ 10,131,870	29	13	21
Maumee	$ 20,733,820	66	26	46
Saginaw	$ 7,233,172	23	9	16

In terms of magnitude, the Maumee watershed achieves the highest impact on employment simply as a result of the GLRI funds invested in that watershed (RIMS II multipliers for Maumee were similar to Saginaw and less than those for Lower Fox). In contrast to the total output analysis, however, in the case of the employment analysis the allocation of the funding to either support activities for agriculture and forestry or to professional, scientific, and technical services not only changed the magnitude of the outcome but also the ranking of the watersheds by impact (see Table 8).

When 100% of the non-CP GLRI funds are allocated to support services, the Genesee achieves the highest impact on employment in relation to funding level with Lower Fox achieving the lowest impact, however, when that funding is allocated instead to professional, scientific, and technical services Lower Fox achieves the highest impact and the Genesee the least. This was a result of the Genesee having the highest RIMS II employment multiplier for support services for agriculture and forestry, but the lowest for professional, scientific, and technical services. The reverse was true for the Lower Fox. Results across the watersheds are very similar when the funding was allocated equally to the two industries.

Table 8. Investment to Jobs Multiplier for Non-CP GLRI Investments for Three Scenarios

Watershed	100% Ag Services	100% Prof Services	50%-50%
Genesee	3.3	0.7	2.0
Lower Fox	2.9	1.3	2.1
Maumee	3.2	1.3	2.2
Saginaw	3.2	1.2	2.2

Note: The investment to jobs multiplier is calculated here as the ratio of the number of jobs per one million dollars of GLRI non-CP funds invested.

5. Summary and Overall Investment Impact

Overall GLRI Focus Area 3 investments of $95 million has an estimated economic impact, measured in terms of total output, of between $142 and $149 million (see Figure 3). This results in an investment to output multiplier of 1.48 to 1.55 times the original GLRI investment. The employment impact is slightly more difficult to interpret due to the potential for double-counting of jobs retained across the years included in the analysis. The methodology employed to confront this issue is intended to provide a conservative estimate of jobs created and retained. This conservative estimate ranges from 135 to 210 full- and part-time jobs created and retained by GLRI Focus Area 3 investments.

Figure 3. Estimated Total Economic Impact of GLRI Focus Area 3 Investments
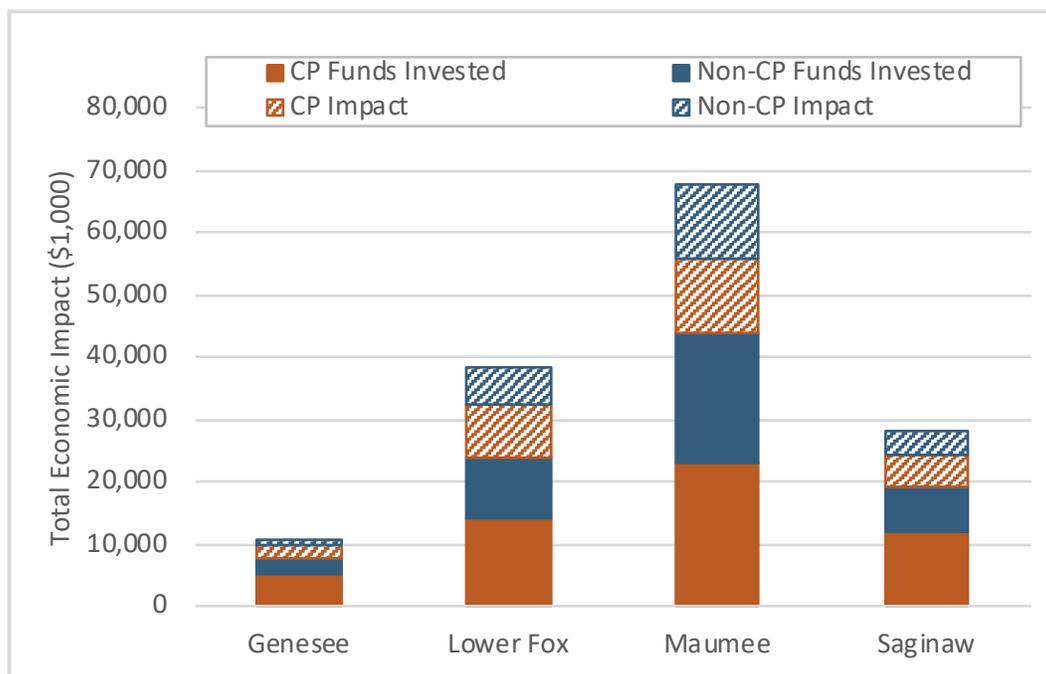
Note: For the non-CP impact shown in the graph, the third industry allocation alternative – 50% of funds allocated to support services for agriculture and forestry and 50% of funds allocated to professional, scientific, and technical services – was used as this provides the average impact of the three allocation scenarios.

Not only does this analysis indicate that the GLRI investments in Focus Area 3 projects yield substantial economic benefits, but the analysis also underscores that, if achieving positive economic impacts is an

important secondary aim of GLRI investments, the prioritization of projects could be thoughtfully approached to emphasize geographic locations and applicable industries to achieve greater economic outputs and employment.

In examining the magnitude of all industry RIMS II multipliers across the four watersheds, it is found that, while the highest magnitude multipliers are not associated with the industries that support CP implementation, the highest magnitude multipliers are associated with agricultural industries. This indicates that for all four watersheds, the industries that retain the greatest economic benefit from economic activity within the region are agricultural industries, the industry of greatest interest for GLRI investments. Interestingly, however, within the agricultural industries of the four watersheds, the highest magnitude multipliers are associated with livestock products rather than cultivated crops, a finding that may be unexpected for the Maumee and Saginaw where row-crops are predominant.

It is recognized, however, that, as with all investments, the ability to prioritize for economic impact does not factor in external conditions such as water availability, water quality or other environmental impacts, climate change, local, state or national laws, etc. Finally, this analysis further drives home a recommendation that projects funded by GLRI require tracking of project funding by the year in which it is spent and by the project element(s) on which it is spent. This would allow for a more robust analysis that reports findings in real dollars and require fewer assumptions regarding the allocation of funding by industry to analyze non-CP implementation funding.

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Appendix A

Counties within each watershed included as part of the RIMS II "region" are in bold and the percentage of CP funds in the watershed allocated to these counties is highlighted in orange.

Genesee	CP Funds	% of Total	Cumulative %
Wyoming	$ 1,604,247	30%	30%
Livingston	$ 1,347,154	25%	55%
Genesee	$ 1,172,997	22%	77%
Allegany	$ 939,909	18%	94%
Potter	$ 208,275	4%	98%
Monroe	$ 91,795	2%	100%
Ontario	—	—	—
Steuben	—	—	—
Cattaraugus	—	—	—
Orleans	—	—	—

Lower Fox	CP Funds	% of Total	Cumulative %
Brown	$ 8,075,390	58%	58%
Outagamie	$ 4,120,148	30%	88%
Calumet	$ 1,463,463	11%	98%
Manitowoc	$ 220,173	2%	100%
Winnebago	—	—	—

Saginaw	CP Funds	% of Total	Cumulative %
Genesee	$ 3,995,635	33%	33%
Shiawassee	$ 2,407,539	20%	53%
Sanilac	$ 1,365,045	11%	65%
Saginaw	$ 1,257,501	10%	75%
Midland	$ 996,622	8%	83%
Gratiot	$ 427,989	4%	87%
Huron	$ 398,405	3%	90%
Lapeer	$ 377,664	3%	93%
Ogemaw	$ 348,420	3%	96%
Tuscola	$ 207,294	2%	98%
Oakland	$ 178,432	1%	99%
Isabella	$ 22,530	0%	100%
Clare	$ 22,212	0%	100%
Bay	$ 13,395	0%	100%
Gladwin	$ 10,779	0%	100%
Montcalm	$ 815	0%	100%
Mecosta	—	—	—
Livingston	—	—	—
Roscommon	—	—	—
Osceola	—	—	—
Arenac	—	—	—
Clinton	—	—	—

Maumee	CP Funds	% of Total	Cumulative %
Hancock	$ 3,663,171	18%	18%
Defiance	$ 3,046,880	15%	33%
Hardin	$ 2,897,595	14%	48%
Allen	$ 1,613,367	8%	56%
De Kalb	$ 1,351,281	7%	62%
Putnam	$ 955,955	5%	67%
Lenawee	$ 906,844	5%	72%
Mercer	$ 749,370	4%	75%
Williams	$ 744,224	4%	79%
Adams	$ 734,007	4%	83%
Hillsdale	$ 635,373	3%	86%
Noble	$ 566,640	3%	89%
Seneca	$ 513,817	3%	91%
Henry	$ 507,045	3%	94%
Wyandot	$ 330,918	2%	96%
Auglaize	$ 219,405	1%	97%
Fulton	$ 215,922	1%	98%
Paulding	$ 186,669	1%	99%
Wood	$ 143,678	1%	99%
Wells	$ 71,393	0%	100%
Van Wert	$ 27,394	0%	100%
Shelby	$ 15,288	0%	100%
Steuben	$ 14,289	0%	100%
Allen	$ 7,425	0%	100%
Lucas	—	—	—
Branch	—	—	—

Appendix B

Table A1. RIMS II Detailed Industries and Associated CPs with the Highest Total Output Multipliers

Watershed	RIMS II Detailed Industries w/ Highest Total Output Multipliers	Multiplier Value
Genesee	Beef cattle ranching and farming	2.0591
	Greenhouse, nursery, & floriculture production	1.5972
Lower Fox	Beef cattle ranching and farming	2.1608
	Construction non-residential structures	1.726
Maumee	Beef cattle ranching and farming	2.3325
	Fabricated pipe and pipe fitting manufacturing	1.8687
Saginaw	Beef cattle ranching and farming	2.149
	Greenhouse, nursery, & floriculture production	1.7173

RIMS II Detailed Industry	CP Type
Beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming	Access Control
Greenhouse, nursery, and floriculture production	Hedgerow Planting
	Riparian Forest Buffer
	Windbreak/Shelterbelt Establishment
	Windbreak/Shelterbelt Renovation
	Tree/Shrub Establishment
Construction non-residential structures	Agrichemical Handling Facility
	Animal Mortality Facility
	Composting Facility
	Roof Runoff Structure
	Roofs and Covers
	Waste Storage Facility
	Well Decommissioning
Fabricated pipe and pipe fitting manufacturing	Blind Inlet
	Equipment Modification
	Structure for Water Control
	Subsurface Drain
	Watering Facility

Table A2. RIMS II Detailed Industries and Associated CPs with the Highest Job Multipliers

Watershed	RIMS II Detailed Industries w/ Highest Job Multipliers (per $1 million investment)	Multiplier Value
Genesee	Greenhouse, nursery, and floriculture production	23.9345
	Support activities for agriculture and forestry	22.8027
Lower Fox	Greenhouse, nursery, and floriculture production	29.7812
	Support activities for agriculture and forestry	20.376
Maumee	Greenhouse, nursery, and floriculture production	25.5447
	Support activities for agriculture and forestry	22.1416
Saginaw	Greenhouse, nursery, and floriculture production	27.2985
	Support activities for agriculture and forestry	22.2133

RIMS II Detailed Industry	CP Type
Greenhouse, nursery, and floriculture production	Hedgerow Planting
	Riparian Forest Buffer
	Windbreak/Shelterbelt Establishment
	Windbreak/Shelterbelt Renovation
	Tree/Shrub Establishment
Support activities for agriculture and forestry	Brush Management
	Buffer Strip
	Comprehensive Nutrient Mgmt Plan
	Drainage Water Management Plan
	Forest Management Plan - Written
	Integrated Pest Management Plan - Written
	Irrigation Water Management Plan - Written
	No-Till
	Nutrient Management CAP
	Residue and Tillage Management, No Till
	Soil Testing
	TA Application, TA Check-Out, TA Design
	Vegetated Treatment Area
	Waste Recycling
	Waste Separation Facility
	Waste Transfer
	Waste Treatment
	Forest Stand Improvement
	Integrated Pest Management
	Nutrient Management
	Forage and Biomass Planting
	Tree/Shrub Establishment
	Cover Crop
	Prescribed Grazing
	Agronomic System