



Economic Impact of the Great Lakes and St. Lawrence Seaway System (GLSLS): Phase II (*continued*)

Final Report Summary

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The goals of this project were to make use of economic impact analysis to estimate the economic value of the Great Lakes and St. Lawrence Seaway (GLSLS) system for different regions of interest. The study areas were to include individual port communities, the eight states bordering the Great Lakes, the Great Lakes and St. Lawrence Seaway System (GLSLS) region, and the nation. The intention was to report impact results in terms useful to a range of stakeholders, including port authorities, government agencies, policy makers, and the general public, industry contributions to employment, incomes, value added (contribution to GDP or GSP), and tax revenues. The economic variables of interest in such an analysis include measures of employment, industrial output, incomes, value added (contribution to GDP or GSP), and tax revenues.

Input-output (IO) modeling depends on inter-sectoral linkages across a region's economy. Summing over the direct, indirect, and induced effects of an activity gives a measure of the total impact it has on a region's economy. Typical IO models use links between hundreds of industrial sectors. However, for accuracy IO models require underlying data to be representative of the region of analysis. These models also require direct effects as inputs to the model to determine total economic impact.

Due to potential modeling costs and uncertainty as to the efficacy of alternative modeling procedures, it was determined that a pilot attempt of the project, specific to a smaller area, was desirable before purchase of a more complete model for the whole Great Lake's region. As reported previously, the project team had initially chosen the MARAD Port Kit model over the IMPLAN model for this pilot study, but after problems became apparent it was decided to also attempt the use of IMPLAN. As background on this, recall that the MARAD Port Kit seemed the best option because it provides a port-specific interface that generates direct effects from data on shipments and inland movements. It also has minimal survey requirements. Despite an ostensibly updated version recently becoming available, the MARAD funded model was only to be obtainable on a national basis, and would therefore not be appropriate for use in analysis of the GLSLS. To pursue the Great Lakes impact it would be necessary to order a regionally customized version from the Rutgers source, which would be quite expensive and potentially beyond the funding scope of this project, hence, the decision to do a pilot study to test the model first.

The selected initial pilot study region is the Twin Ports of Duluth/Superior, to which Green Bay was later added. The version of the MARAD Port Kit purchased for the pilot study contains significant updates from previous releases of the kit that were used for past economic impact analyses. In particular, all underlying regional data was updated to the latest available in the spring of 2010, when the model was obtained.

The MARAD Port Kit requires minimal input data to drive the direct effects. This includes types and amounts of cargo shipments through the ports being assessed, along with information on inland transportation mode. The model also depends on expenditure patterns associated with the maritime industry's handling of the various types of maritime cargo. Ideally these can be updated through surveys of firms in the local port industry in order to make the model more representative of local conditions, otherwise the model defaults to national averages for these expenditures. Unfortunately these **default values were not updated** in the current version of the model and instead only represent the national average expenditures associated with port activity as it took place in 2000. Significant changes may have occurred in the expenditure patterns of the industry over the ensuing period and this should be kept in mind when considering impact results derived from the model when updated data is not available.

As previously reported, test runs of the Twin Ports version of the model revealed another problem with the MARAD Port Kit. The impact report based on actual shipments through the Twin Ports gave a large negative value for wages and incomes in the region. This is clearly not correct and indicates a flaw in the model that leads other reported results to be suspect, as well. The developers at Rutgers were contacted and promised to provide a solution. New model components were eventually received, but once the model was reconfigured with the new components it turned out that the problem with negative wages had not been fixed. For this reason it was decided to also make use of the IMPLAN model for the pilot study. (Note, however, that the Green Bay version of the Port Kit did not suffer from the same negative wage and income impacts as the Twin Ports model did.)

Surveys were designed and sent out to collect the minimal data required for the MARAD Port Kit, as well as to get data to update and localize the underlying cost components of the model. In addition, the surveys included a request for employment data for potential input as direct effects into IMPLAN. For the Twin Ports the initial survey, including a cover letter from the Port Authority, went out to 24 dock/terminal operators and shipping agents in August 2010. Unfortunately we received only 7 responses and even those had little information included to aid in adjusting the national average cost data. Surveys also went out to 14 Green Bay terminals, from which only five responses came back. With such minimal survey response, even after several rounds of follow-up calls, there was insufficient information to adequately adjust the outdated national cost data.

Even had data collection in this first round been adequate to update the cost data in the Port Kit, the Twin Ports model could not have been used, as the negative wage and income problem had not been overcome. As a result, another survey was developed for additional firms and other organizations that are in any way port related in order to collect employment data for input into the IMPLAN model. With the selection primarily compiled from a list obtained from the Port Authority, this survey was sent out to 80 firms and other establishments in September 2010 and included the 17 non-respondents to the initial survey. While for the Port Kit we could have gotten by with just the data on shipments gathered from the Port Authority, the use of IMPLAN would require a response rate as close to 100% as possible to generate a good impact analysis. Unfortunately this did not happen, as only 16 additional responses were received. Follow-up calls were conducted in October and again in February to try to collect 2010 shipping season data to no avail.

Despite the poor survey response, a trial run of the IMPLAN model was done. The results are given in Table 1. Although the actual impacts from this run are certainly not sufficient in magnitude, as only limited input data from 23 of the 80 establishments surveyed was available, the multipliers from the trial run are in line with what would be expected from such an analysis. This indicates that if sufficient funding were available to successfully complete a survey of all of the firms involved, adequate results are certainly obtainable through use of the IMPLAN model.

Table 1: LIMITED SAMPLE IMPLAN RESULTS – Twin Ports 2009 Shipping Season:

| Impact Type | Output | Employment | Labor Income | Total Value Added |
|---------------------|-------------------------|-------------------|------------------------|--------------------------|
| Direct Effect | 139,323,904.00 | 449.8 | 32,096,960.00 | 46,717,568.00 |
| Indirect Effect | 20,500,352.00 | 117.3 | 5,699,376.00 | 9,230,240.00 |
| Induced Effect | 21,758,144.00 | 203.1 | 6,873,552.00 | 12,560,864.00 |
| Total Effect | \$181,582,848.00 | 770.2 | \$44,669,824.00 | \$68,508,672.00 |
| | | | | |
| Multiplier | 1.3 | 1.71 | 1.39 | 1.47 |

As mentioned, minimal requirements for use of the MARAD Port Kit are knowledge of actual shipments through a particular port. This information can be typically be gathered from the Port Authority. This was done for both the Twin Ports and for Green Bay. While running the Port Kit for the Twin Ports ran into insurmountable problems, as laid out above, that was not the case for Green Bay. Despite lack of survey results to update the cost basis underlying the model, it could still be run using the outdated national average cost data, as long as that is taken into consideration when considering the model outcomes. The Port Kit was run using shipments from the 2010 shipping season and a report was provided to the Port of Green Bay Port Authority laying out the economic impact of that port for 2010. Some highlights from the report follow:

Shipments:

- During the 2010 shipping season, the Port of Green Bay handled a total of 1,730,153 metric tons of cargo in all commodity categories compared to 1,810,311 metric tons of cargo in 2009, a decrease of approximately 4.4 percent. This included:
 - 1,674,639 metric tons of dry bulk commodities, including 251,314 metric tons of cement, 587,222 metric tons of coal, 8,856 metric tons of gypsum, 587,222 metric tons of limestone, 50,457 metric tons of petroleum coke, and 189,327 metric tons of salt.
 - 31,453 metric tons of break bulk commodities, including 25,467 metric tons of pig iron, and 5,986 metric tons of stone.
 - 24,061 metric tons of liquid asphalt.

The Port of Green Bay's 2010 Economic Impacts:

- **Distribution of Effects**
 - The direct effects of the Port's activities accounted for an estimated \$58,472,500 in Output; 506 jobs; \$18,627,500 in income; and, \$27,259,600 in Gross State Product.
 - The indirect and induced effects of the Port's activities accounted for an estimated \$24,957,800 in output; 317 jobs; \$8,033,200 in income; and \$13,237,800 in Gross State Product.
- **Total Impact**
 - In 2010, port activity produced an estimated \$83,430,300 in economic output.
 - The MARAD Port Kit estimated that there were 823 jobs directly and indirectly associated with port activities in 2010.
 - Port activities produced an estimated \$26,660,700 in income.
 - The Port of Green Bay produced an estimated \$40,497,400 in "gross state product", comprised of:
 - an estimated \$23.732 million in wages, net of taxes.

- an estimated total of \$5,786,800 in taxes, including \$890,600 in local taxes, \$802,000 in state taxes, and \$4,094,200 in federal taxes.
- an estimated \$10,978,200 in profits, dividends, rents, and other.

Conclusions:

Despite reasonable results from the Port of Green Bay impact analysis (keeping in mind that they are based on outdated cost data); it is felt that the MARAD model would not be useful to expand to analysis of additional ports. Beyond the prohibitive expense, additional reasons for this include: the cost data is too outdated; contact with MARAD indicates they also have had difficulties with the vendor in obtaining a satisfactory model; future updates of underlying data components not worthwhile pursuing without adequate funding.

Unfortunately continuation with the use of IMPLAN does not seem feasible without significant increase in funding, Reasons for this include: the survey process was even more intensive than expected for IMPLAN; severe lack of survey response, even with Port Authority involvement; implementing sufficient survey procedures would be overly expensive.

Finally, even with adequate funding continuation of the project no longer seems feasible at this. The primary reason for this is that **Martin and Associates** was contracted last year to do essentially the same thing, but on an even grander scale, since they also are including Canada in their analysis. It would be redundant to continue, even if funds were available.