



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

Final Report

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

Executive Summary

This project represents the first phase of a larger multi-year study undertaken to develop an economic impact analysis of the Great Lakes and St. Lawrence Seaway (GLSLS) system and, further, to develop an economic index to track the activities and performance of the system over time. The goal of an economic impact study is to determine the effect of a given economic activity, or group of activities, on the overall economy of a region of interest, be it a city, county, state, nation, or some chosen combination of areas. The larger project intends to evaluate the impacts associated with the existence of current Great Lakes and St. Lawrence Seaway facilities and to develop a procedure through which such impact analysis can be regularly updated in subsequent periods.

Economic impact studies of maritime ports have been completed by different organizations over the years. These have included impact analyses applied to specific ports within a relatively localized geographic area, and also studies which have extended such analysis to take into account activities that take place across broader regions, such as multiple counties or states. A recent study undertaken for the Great Lakes and St. Lawrence Seaway system in particular was produced by Martin Associates in 2001. Although each study tends to differ somewhat in their application, many have made use of input-output (IO) modeling, which has become a standard tool for economic impact analysis. The IO models used in these studies have ranged from those developed as generic models to models developed specifically for maritime analysis. Generic models, which have been used as a basis for a wide range of economic impact studies, include the IMPLAN model of the Minnesota Implan Group, Inc. (MIG) and that of Regional Economic Models, Inc. (REMI). Models that have been developed specifically for studying the impact of ports or maritime activities include the MARAD Port Economic Impact Kit (developed by A. Strauss-Weider, Inc. and Rutgers University for the Maritime Administration of the U.S. Department of Transportation), the Rural Inland Waterways Economic Impact Kit (developed by the Institute for Regional Advancement at the University of Arkansas at Little Rock), and privately constructed models (such as those developed and used by the consulting firm Martin Associates).

The goals of this initial phase of the project have included: 1) definition of the particular region to be modeled; 2) determination of data needs; 3) model assessment and selection, based on alternatives from those listed above, and 4) a preliminary impact analysis. All of these goals have been met to some extent and the following report provides details and discussion of the process and outcomes.

In beginning Phase I, it was noted that the US Army Corps of Engineers (USACE) provides data on overall tons of freight moving on this system and a partial breakdown by area. However, there is no corresponding information on the potential economic benefits of this

activity. Important benefits such as employment generated, contribution to regional incomes, and tax revenues should all be of interest to stakeholders in these activities, as well as to policy makers and the public in general. This outlines a primary goal of the larger project – to estimate the economic value of the Great Lakes and St. Lawrence Seaway system to different regions of interest, including individual port communities, states, the larger GLSLS region, and the nation. Completion of the larger project will include reporting results in terms familiar to and useful for a range of stakeholders, including port authorities, government agencies, policy makers, and the general public.

In this project, the GLSLS area to be analyzed will follow the 2001 Martin Associates' report. This focuses on sixteen port regions in the eight states bordering the Great Lakes and St. Lawrence Seaway – Minnesota, Wisconsin, Michigan, Illinois, Indiana, Ohio, Pennsylvania, and New York. For the purposes of this study, port regions are defined as the counties containing the particular ports considered in the analysis.

The economic impact analysis will be done using input-output (IO) modeling, which depends on inter-sectoral linkages that exist across a region's economy. The inter-industry transactions table used by the model represents links between industries in the economy. The IO model is also driven by final demand, which represents sales to end users of finished goods and services. This includes exports, government purchases, changes in inventory, investment, and household purchases. Another important aspect of the model is value added, or the value that an industry adds to the goods and services it uses as intermediate inputs in order to produce output. This includes wages and salaries, profit-type income, interest, dividends, rents, capital consumption allowances, and taxes. Value added also measures each industry's contribution to gross regional product for the area being modeled (GDP, gross state product, etc.).

Input-output modeling involves a data driven mathematical derivation that expresses total output in a region as a function of final demand. This in turn allows for any change in economic activity to be analyzed for its impact on a region's total output and employment. In doing so, this translates the direct economic effects of an event into the total economic effects on the modeled economy and takes into account "ripple effects", which define the model's multipliers. The overall impact will be broken down into three stages: 1) The *direct effect* is the initial change in economic activity that affects demand in the economy. This influences directly affected industry's production decisions, and therefore its employment, value added, and demand for inputs from other firms. 2) The *indirect effect* accounts for any additional impact due to changes in demand on industries providing inputs to the directly impacted sectors, which causes additional effects on their suppliers as well. 3) The *induced effect* accounts for the resulting changes in employment and incomes causing additional changes in demand for consumer goods and services, affecting additional industries such as those in the retail, grocery, and leisure and hospitality sectors. Summing over the direct, indirect, and induced effects will give the total impact on a region's economy resulting from some economic event of interest, which in this case is port and maritime activity. Reported results typically include impacts on both employment and output in each sector, as well as taxes, value added, and more.

The data needs involved in undertaking such analyses are defined by the chosen model's input requirements and will include measures of output and/or employment, but may also include other elements, such as information on different cargo types that have gone through the region of interest. This includes tonnages as well as mode of transit into and out of each port. The

determination of data accessibility has involved working with the University of Toledo's Great Lakes Maritime Information Clearinghouse to determine which data are publicly available and which will need to be obtained through surveys. In addition to informing the economic impact analysis procedure, many of the data needs necessary for future construction of a tracking index have also been identified.

Despite the MARAD Port Kit being designed specifically for port impact analysis, the version made available to the researchers at the start of this project turned out to be somewhat outdated, relying on 1992/1998 RIMSII multipliers and SIC coding of industries, instead of the more modern NAICS coding. This led to consideration of potential alternatives, including the IMPLAN model from MIG, Inc.; the R/ECON model developed by Rutgers University; and the latest RIMSII from the U.S. Department of Commerce Bureau of Economic Analysis. Some consideration was also given to other commercially available models and also to the possibility of building a model from scratch to conduct the study. After careful consideration of the alternatives, however, a newly available revised version of the MARAD Port Kit seems to be the best option. Upon contacting the original model builders to see about unlocking the underlying database, it was discovered that an updated model is soon to be released and that this version will report results based on NAICS industry sectors.

It is important to remember that much of the project activity in this initial phase of the project will have implications for methodology employed in later phases (detailed economic impacts and the construction of a Great Lakes maritime industries index). Planning for these future project phases also influenced the preference for the MARAD model over the IMPLAN model and others. Additional salient features recommending the MARAD Port Kit include data input requirements as well as the means by which results are reported of in terms of direct and indirect/induced effects by industry sector for the economic components of output, employment, income. Finally, and of perhaps most interest, the MARAD model also provides direct effects by industry, and total effects by industry, which are being reviewed for possible use as inputs into other IO models.

In summary, this initial phase of the project has generated the following results: 1) A determination of the particular ports and areas to be used in the broader economic impact analysis. 2) A decision to use the updated and revised MARAD Port Kit model, as developed by Rutgers University, to conduct the next phase. 3) A determination of the data needs for use in the MARAD Port Kit, where the actual data collection will be conducted with the assistance of Dr. Lindquist's team through the Great Lakes Maritime Research Information Clearinghouse at the University of Toledo. 4) A plan to conduct an initial detailed case using the port of Duluth/Superior as the beta test for the larger study, which will then focus on the sixteen Great Lakes Ports listed above. Dr. Doorn will tentatively have the initial case ready for review by the steering committee in April 2010.

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

1. Introduction

The Economic Impact of the Great Lakes and St. Lawrence Seaway System (GLSLS) was proposed to evaluate the impacts associated with the existence of current Great Lakes and St. Lawrence Seaway facilities. The overall project includes building an economic impact model and estimating the impact of Great Lakes and the St. Lawrence Seaway maritime activities, based on ports and industries in the eight-state region. Initially, the IMPLAN model was proposed as a means to derive the benefits stemming from the port system to the extended communities as well as throughout each state and the U.S. in general. Phase I of the project provided an opportunity to review the appropriateness of the IMPLAN model, and to investigate other models in order to select the optimal model. The impact is intended to look at which industries are directly impacted by the port systems and transportation sectors that extend from them, as well as the secondary economic effects stemming from the direct employment, output and value added measures. The effects will be reported as direct, indirect, and induced economic effects. Secondary impacts will be reported as indirect and induced effects. (It has been suggested that this evaluation could also potentially be extended to include the value projected for future activities.) It was recognized that this impact report will be of interest to all Great Lakes region stakeholders as well as for questions of national transportation policy. It was also noted that the proposed reported impacts can be used to inform affected industries, St. Lawrence Seaway corporations, maritime industries involved with the Great Lakes ports, and government agencies that develop and maintain the Seaway infrastructure.

The activities completed in Phase I of this project include 1) definition of the particular region to be modeled; 2) determination of data needs; 3) model assessment and selection, and 4) a preliminary impact analysis. All of these goals have been met to some extent and the following report provides details and discussion of the process and outcomes.

Input-Output (IO) Impacts

The goal of an economic impact study is to determine the effect of a given economic activity, or group of activities, on the overall economy of a region of interest, be it a city, county, state, nation, or some chosen combination of areas. The economic variables of interest in such analyses are measures of employment, industrial output, incomes, value added, and tax revenues. In undertaking such an analysis, a common methodology employs input-output modeling, which depends on inter-sectoral linkages that exist across a region's economy. The linkage of industry sectors can be understood as similar to the process undertaken by an individual firm or industry when undertaking new production due to a change in demand for its output, or when undertaking production for the first time. The overall impact of this new production is often expressed as three stages of impact—direct, indirect, and induced impacts. The direct impact accounts for the

initial change in spending/demand that causes the change in economic activity by the party of interest. This change in demand causes the direct impact by affecting the initial industry's production decisions, affecting its overall employment, cost of production, value added, and demand for inputs from other firms. This initial direct impact further causes secondary effects on the economy, which include an indirect impact, and an induced impact. The indirect impact accounts for the change in demand that affects the production decisions of other industries which provide the inputs to the industry which experienced the initial change, causing additional effects on their suppliers as well. This continues to ripple through the economy, affecting additional sectors in the process. Finally, the induced impact accounts for the fact that changes in employment due to the direct and indirect impacts cause additional changes in demand for consumer goods and services that further ripple through the region's economy, affecting additional industries such as those in the retail, grocery, and leisure and hospitality sectors. Summing over the direct, indirect, and induced impacts gives us the total impact on a region's economy that results from some initial economic activity that is undertaken.

Relevant Previous Modeling

Economic impact studies of maritime ports have been completed by different organizations over the years. These have included impact analyses applied to specific ports within a relatively localized geographic area, and also studies which have extended such analysis to take into account activities that take place across broader regions, such as multiple counties or states. Although each study tends to differ somewhat in their application, many have made use of the above described input-output modeling, which has become a standard tool for economic impact analysis. The particular models used in these studies have ranged from those developed as generic models to models developed specifically for maritime analysis. Generic models, which have been used as a basis for a wide range of economic impact studies include the IMPLAN model of the Minnesota Implan Group, Inc. (MIG) and that of Regional Economic Models, Inc. (REMI). Models that have been developed specifically for studying the impact of ports or maritime activities include the MARAD Port Economic Impact Kit (developed by the Maritime Administration of the U.S. Department of Transportation), the Rural Inland Waterways Economic Impact Kit (developed by the Institute for Regional Advancement at the University of Arkansas at Little Rock), and privately constructed models (such as those developed and used by the consulting firm Martin Associates for the many port economic impact studies they have produced over the years).

Research Objectives

This initial phase of the larger study of the economic impact of the GLSLS System is concentrated on four research objectives designed to determine data requirements for the larger project and address organizational data-related challenges to the impact modeling. This work includes a review of primary and secondary data streams, evaluation of access to necessary data, and the selection of variables for the Great Lakes maritime industry impact. The first of the four objectives is to define the particular region to be modeled. The second objective is to determine the data needs for the impact. The third objective is the model assessment and selection. And the

fourth objective is to provide a preliminary impact analysis. This final objective was designed to be an overview of Great Lakes maritime impact, based on standard IO data construction. The impact is to be modeled for the economy of the Great Lakes Region.

2. Research Methodology and Scope

Regional Structure

The largest possible region for study includes counties in eight states bordering the GLSLS. Researchers determined which counties in these states are significant to the region as far as containing affected industries. This includes some counties that do not directly border the GLSLS, and also includes counties that border the Great Lakes and are present on the USACE port list.

TABLE 1. COUNTIES BORDERING THE GREAT LAKES, BY STATE

IL	Lake Cook	
IN	Lake Porter La Porte	
MI	Bay Benzie Berrien Charlevoix Delta Leelanau Mackinac Manistee Mason Menominee Monroe Muskegon Ottawa Schoolcraft Wayne	
MN	Cook Lake St. Louis	
NY	Chautauqua Erie Jefferson Oswego	
OH	Ashtabula Cuyahoga Erie Lake	Lorain
PA	Lucas Erie	

WI

Ashland
Brown
Door
Douglas
Mantiwoc
Marinette
Milwaukee
Ozaukee
Sheboygan

The above list describes the largest possible region of interest and reflects data from the USACE Port File. However, in order to provide consistency with previous impact modeling (i.e. Martin and Associates), a regional structure of sixteen counties was used in the impact modeled. These port regions for the GLSLS impact defined by counties includes:

TABLE 2. PORT REGIONS FOR THE GLSLS IMPACT

PORT:	COUNTY:
Buffalo, NY	Erie
Oswego, NY	Oswego
Ogdensburg, NY	St. Lawrence
Milwaukee, WI	Milwaukee
Green Bay, WI	Brown
Duluth, MN/Superior, WI	Douglas, WI
Duluth, MN/Superior, WI	St. Louis, MN
Gary, IN	Lake
Burns Harbor, IN	Porter
Erie, PA	Erie
Detroit, MI	Wayne
Toledo, OH	Lucas
Lorain, OH	Lorain
Conneaut, OH	Ashtabula
Cleveland, OH	Cuyahoga
Ashtabula, OH	Ashtabula
Chicago, IL	Cook

Source: Martin Associates; BBER

In order to produce an up-to-date preliminary economic impact of the Great Lakes and the St. Lawrence Seaway (GLSLS) system, it was assumed that the impact analysis would be based on existing industry data organized by NAICS code, available for each of the regional study areas being included in the analysis. The initial assumption about the appropriateness of the IMPLAN model came under closer review, and several additional input-output models were reviewed, to insure the best possible outcome. To use any one of a number of input-output models for our impact, we needed to determine the existing port industries to be included in the

impact. This involved determining which companies are present in the region of analysis, their degree of dependency/use of the port system, and where they fit in the industry structure.

Baseline Data Values for Initial Impact Assessment

Researchers used the University of Toledo's Great Lakes Maritime Information Clearinghouse to assist with the data requirements for industry employment by NAICS. Of special interest has been data such as CES/LAUS, BEA RIMS; Census County Business Patterns; Census Annual Survey of Manufactures; and Census of Agriculture. However, after vigorously pursuing data sources, state and county level data at the necessary industry detail were found to be incomplete and insufficient, primarily due to disclosure issues. The data requirements for the input model direct effects were therefore pursued through such additional sources as the U.S. Army Corps of Engineers' Navigation Data Center and Waterborne Commerce Statistics Center; local port data sources (business directories, chambers of commerce, etc.); Great Lakes Maritime Data Clearinghouse; and IMPLAN data.

Extent of Port Dependency on Industries

The economic impact model is driven by the direct effect of port-related industries identified in the MARAD model. In general, these industries are described as the following:

“Any regional economic activity that is directly needed for the movement of waterborne cargo and passengers. This definition includes activities that take place on the vessel, at the terminal, and during the inland movement of the cargo and passengers. . . . The port industry definition as it pertains to cargo movement includes documentation, financing, brokering and other essential services that are directly required for the movement of waterborne cargo.”

(MARAD Port Kit Handbook, p. 7)

This kit contains a set of default expenditure patterns associated with the different types of maritime cargo and passenger flows, meant to offer a starting point for estimating economic impacts. These default values represent national averages.

The MARAD Port Kit has the capability of specifying and assessing the economic impacts associated with the industry sector activities of containerized cargo handling, breakbulk cargo handling, liquid bulk cargo handling, dry bulk cargo handling, auto and vehicle transport, project cargo handling, ferry operations, and cruise passenger movements.

The industry sectoring of the MARAD model also defines the activities of Waterside Services such as Government Requirements, Loading/Discharging, Suppliers, Bunkers, In-Transit Storage, Cargo Packing, and Inland Movement.

3. Models Reviewed

IMPLAN Model

Our review of the IMPLAN model and its appropriateness for the GLSLS impact included the following considerations: There are two components to the IMPLAN system, the software and databases. The databases provide all information to create regional IMPLAN models. The software performs the calculations and provides an interface for the user to make final demand changes. Comprehensive and detailed data coverage of the IMPLAN study areas by state, county or zip code, and the ability to incorporate user-supplied data at each stage of the model building process, provides a high degree of flexibility both in terms of geographic coverage and model formulation and the definition of specific models for baseline, construction, operations, and tax impact, with adjusted production functions to reflect the economy of the study region.

IMPLAN data files use federal government data sources including:

- US Bureau of Economic Analysis Benchmark I/O Accounts of the US
- US Bureau of Economic Analysis Output Estimates
- US Bureau of Economic Analysis REIS Program
- US Bureau of Labor Statistics County Employment and Wages (CEW) Program
- US Bureau of Labor Statistics Consumer Expenditure Survey
- US Census Bureau County Business Patterns
- US Census Bureau Decennial Census and Population Surveys
- US Census Bureau Economic Censuses and Surveys
- US Department of Agriculture Crop and Livestock Statistics

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices and inter-institutional transfers. Impacts for models in the port analyses would use the most recent IMPLAN data available which is for the year 2007. Through the use of the modeling software's built-in deflators, the impact can be reported in 2008 dollars.

The following cautions are suggested assumptions for accepting this impact model:

- IMPLAN input-output is a production based model.
- Local or export based purchases that represent transfers from other potential local purchases are not counted.
- The numbers (from U.S. Department of Commerce secondary data) treat both full and part time individuals as being employed.
- Assumptions need to be made concerning the nature of the local economies before impacts can be interpreted.

Because of aggregation in the IMPLAN model's industry sectoring, this model was found to be less than ideal for studying and reporting maritime impacts.

MARAD Model

The MARAD Port Kit, released October 2000, is based on the R/ECON input-output model developed by the Rutgers Economic Advisory Service of the Center for Urban Policy Research at Rutgers University in New Jersey, which is further based on the Regional Input-Output Modeling System (RIMS II) developed by the U.S. Bureau of Economic Analysis (BEA).

It was recognized that the industry specifics of the MARAD model could be crucial to determine the direct impacts, which require knowledge of data pertaining to the employment levels and transactions undertaken by the existing port-related industries, in the time period of interest, for the intended impact analysis.

4. Preliminary Impact Analysis Using the IMPLAN Model

Model Inputs

As work went forward on identification of relevant ports by counties, as well as work on identification of a relevant port industries list, IMPLAN data and CEW (ES202) employment data files for building county-level models were provided by The Great Lakes Maritime Clearing House. Dun and Bradstreet firm level data was discussed and tested. Data were reviewed with “related maritime industries” through the University of Toledo GISAG databases.

Working in this way, an attempt was made to prepare the necessary information to make model adjustments to the IMPLAN data. The IMPLAN model could then be run to obtain the preliminary economic impact assessment of the Great Lakes port system.

The appropriate IMPLAN model was constructed with the correct areas defined by the port-related counties listed above. The next step was to enter information on the direct impacts of the system to complete a preliminary impact analysis. These data proved to be much more difficult to obtain in any meaningful form than had been expected.

The intention as initially proposed was to get data on employment in port related industries for each of the ports. This needs to be done at the industry subsector level (four to six digit NAICS codes) to have any real meaning. Unfortunately, employment at the county level was not easily obtainable at this level. We had initially expected to be able to gather it from the Bureau of Labor Statistics QCEW program, which reports county employment on a quarterly and annual basis at the industry level. For the industry subsectors of interest, however, there is very little data available, primarily due to disclosure issues. Even at the supersector level (two-digit NAICS code), which includes many non-maritime related activities, the employment data is not available for some counties.

Given that the researchers on this project have access to firm level data that includes employment through the Dun and Bradstreet database, this was also reviewed for the necessary inputs. However, after cross-checking the Dun and Bradstreet data it was discovered to be less than comprehensive as well. For example, when comparing the list of companies from the Duluth Port Authority’s service provider directory to the database, many of these providers did not show up. This made getting good employment figures from this source as unlikely as it was from the publicly available BLS QCEW data. As a result, researchers contacted the BLS about having them put together aggregated data in a form that would avoid disclosure problems. Unfortunately, even after several attempts, the request was not granted.

In addition to these difficulties in getting industry level employment figures, researchers also ran into obstacles putting together lists of port-related establishments. Unfortunately, an assumption that there could be a master list available through USACE or MARAD proved not to be true. It was also hoped that Port Authorities at each location might have an industry list easily available. However, this also did not prove to be true in enough cases. Although some Port Authorities can provide directories of port-related establishments, many others do not make those available. In addition, those that are available are not easily cross-checked to see how comprehensive they are.

The result of these efforts to collect inputs for the direct effects for modeling impacts therefore proved to be much more involved than initially expected, even for the preliminary attempt as proposed for Phase I.

Modeling

Although the MARAD Port Kit model initially seemed our best option, since it is port specific, there proved to be problems with outdated underlying data. The model made available to researchers is the version from 2000. This turns out to be outdated, since it is based on 1992/1998 RIMSII multipliers and SIC industry codes, instead of the more modern NAICS industrial sector definitions.

This persuaded us that IMPLAN could be considered the best alternative to the MARAD model available, with the most current underlying data. However, preliminary analysis using IMPLAN also proved problematic: Researchers need to input direct effect employment or output data, which, as mentioned above, proved very difficult to get at the county level. Also, industry sectors of interest for the GLSLS impacts were too aggregated. However, to test the IMPLAN model we ran the model using the incomplete data from Dun and Bradstreet, with the following results. Of course the results from this are therefore incomplete,

The modeling of indirect jobs shows the employment impact among suppliers and other jobs dependent on the direct employment:

TABLE 3. GLSLS IMPACT: EMPLOYMENT, INDIRECT JOBS, 2007

GLSLS Impact: Employment, Top 50 Indirect Job Sectors, 2007

<i>Industry</i>	<i>Direct</i>	<i>Indirect</i>
Couriers and messengers	0	734
Employment services	0	713
US Postal Service	0	545
Scenic and sightseeing transportation and support activities for transportation	17,215	449
Warehousing and storage	4,281	364
Real estate establishments	0	283
Services to buildings and dwellings	0	270
Transport by truck	0	112
Dry-cleaning and laundry services	0	109
Food services and drinking places	0	106
Maint & repair construct of nonresident struc	0	105
Investigation and security services	0	105
Management of companies and enterprises	0	94
Insurance carriers	0	75
Management- scientific- and technical consult	0	73
Wholesale trade businesses	0	73
Business support services	0	72

Accounting- tax preparation- bookkeeping- and	0	71
Office administrative services	0	70
Waste management and remediation services	0	63
Securities- commodity contracts- investments-	0	58
Legal services	0	52
Promoters of performing arts and sports and a	0	51
Monetary authorities and depository credit in	0	43
Advertising and related services	0	37
Architectural- engineering- and related servi	0	35
Other state and local government enterprises	0	35
Hotels and motels- including casino hotels	0	31
Insurance agencies- brokerages- and related a	0	31
Computer systems design services	0	29
Travel arrangement and reservation services	0	28
Other support services	0	27
Personal and household goods repair and maint	0	25
Electronic and precision equipment repair and	0	24
Automotive repair and maintenance- except car	0	22
Telecommunications	0	21
Civic- social- professional- and similar orga	0	19
Scientific research and development services	0	18
Commercial and industrial machinery and equip	0	18
Electric power generation- transmission- and	0	17
General and consumer goods rental except vide	0	17
Nondepository credit intermediation and related	0	17
Environmental and other technical consulting	0	12
Extraction of oil and natural gas	0	12
Motor vehicle parts manufacturing	0	11
Other aircraft parts and auxiliary equipment	0	11
Coating- engraving- heat treating and allied	0	10
All other miscellaneous professional- scienti	0	10
Other computer related services- including fa	0	10
Printing	0	10
...		
And another 247 jobs in various other sectors		247
<hr/> Total	21,845	5,476
Source: IMPLAN		

5. Recommendations

Given the results from testing the two models as described above, researchers decided to attempt to update the MARAD Port Kit. When the original model builders were contacted (A. Strauss-Weider and Rutgers) to see about unlocking the underlying database, it was found that updated versions are available and a new model is scheduled to come out soon based on NAICS coding.

Discussions with the researchers building the new MARAD model brought forward the consideration of the various possible builds of the model that would be most appropriate for our impact study: If we were to use only the basic model, then estimations would transpire in terms of national averages and produce not very representative impacts for the specific regions and industries of our impact study. It would be more appropriate to use the basic model plus the eight Great Lakes states, plus the sixteen ports in the study. However, if we want individual port impacts, the minimum build of the model would be the basic model plus the sixteen ports. The researchers building the new MARAD model would include the relevant R/ECON model if the port impact researchers desire to determine impacts of other events, or if we want to adjust RPCs or other components.¹

Currently, the direct effects embedded in the MARAD model have the most promise for providing reliable, comprehensive, and specific data inputs from which to model indirect and induced impacts. As part of Phase II of this project, the researchers have proposed looking into the use of these data inputs in combination with the IMPLAN model (newly released software version 3.0 and 2008 data are expected to be released in November of 2009). Work will continue when models are released.

In summary, this initial phase of the project has generated the following results: 1) A determination of the particular ports and areas to be used in the broader economic impact analysis. 2) A decision to use the updated and revised MARAD Port Kit model, as developed by Rutgers University, to conduct the next phase. 3) A determination of the data needs for use in the MARAD Port Kit, where the actual data collection will be conducted with the assistance of Dr. Lindquist's team through the Great Lakes Maritime Research Information Clearinghouse at the University of Toledo. 4) A plan to conduct an initial detailed case using the port of Duluth/Superior as the beta test for the larger study, which will then focus on the sixteen Great Lakes Ports listed above. Dr. Doorn will tentatively have the initial case ready for review by the steering committee in April 2010.

¹ Michael L. Lahr, of the Center for Urban Policy Research, Rutgers University responded to our questions. He noted that the builds of possible interest include:

- MARAD only w/R/ECON I-O
- US & Great Lakes Region (basic)
- basic w/8 States
- basic w/16 Ports
- basic w/8 states & 16 ports

He also noted that this will include a free update to NAICS, which would be made available after MARAD approves the revised software, expected sometime early in 2010. Rutgers does not charge for the MARAD interface, since it is public domain. But the data sets and underlying R/ECON I-O model are the property of Rutgers University, and maintaining the software and data system forces Rutgers to incur costs.

6. References

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