Regional Economic System

User Guide

U.S. Army Corps of Engineers
Institute for Water Resources

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INTRODUCTION

The U.S Army Corps of Engineers (USACE) Institute for Water Resources has developed the Regional ECONomic System (RECONS), which provides accurate and defensible estimates of regional and national job creation and/or retention and other economic measures, including economic output, labor income, and gross regional product. RECONS has been used as a means to document the performance of USACE investment spending as directed by the American Recovery and Reinvestment Act (ARRA). It also allows the USACE to evaluate project and program expenditures associated with the annual Civil Works (CW) budgets of the eight business lines managed by the USACE. In addition, RECONS offers users the ability to evaluate "stemming-from effects" of USACE programs and infrastructure. Stemming-from effects are the economic contribution of industries and activities that are dependent on or benefit from USACE programs and infrastructure.

This document describes the process for using RECONS to evaluate the economic impacts and contribution of direct investments, Federal spending, and stemming-from effects. Generally, there are three components within RECONS:

- Civil Works Federal Spending
- Stemming-From Effects of USACE Programs and Infrastructure
- USACE ARRA Projects

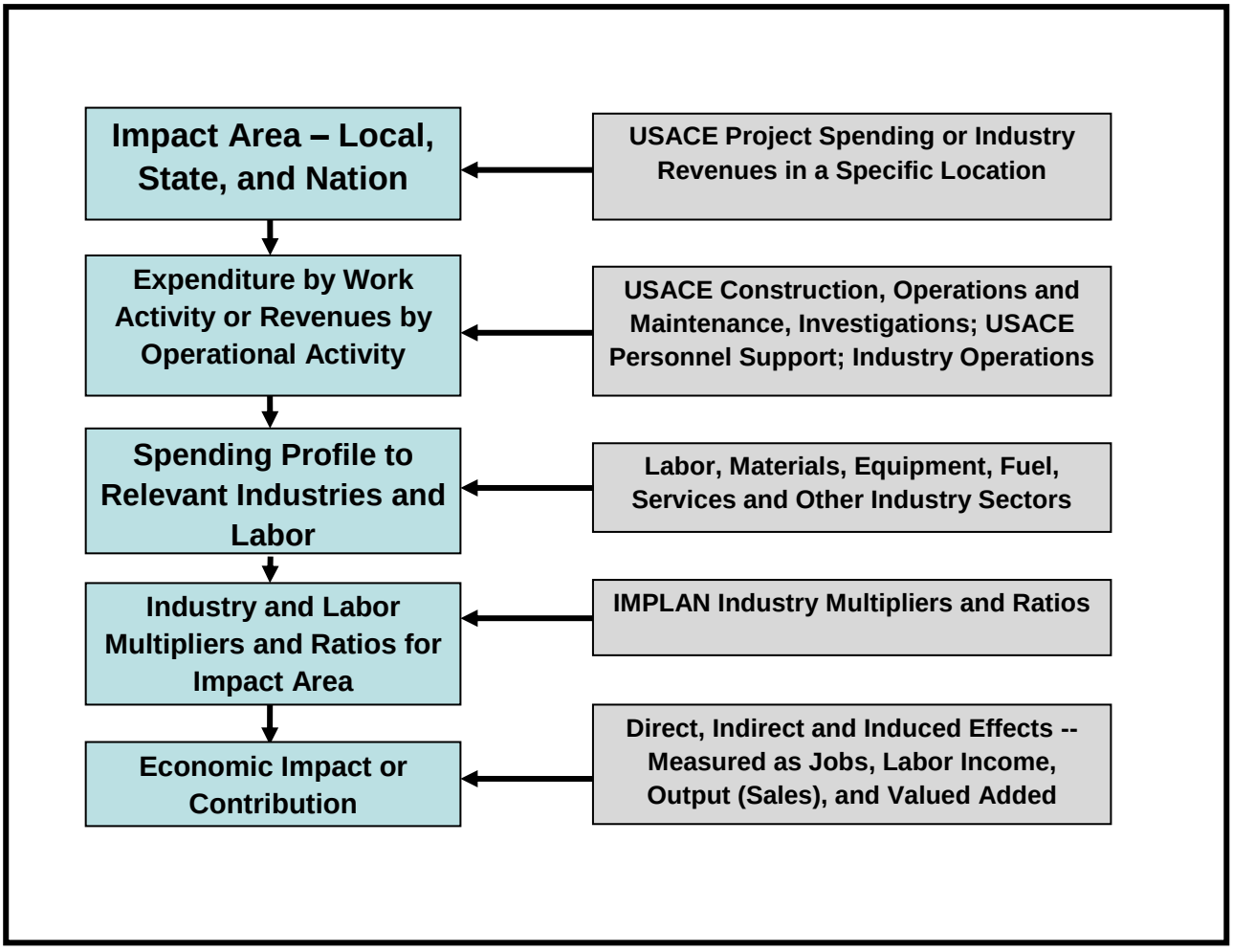
These three RECONS components are further described in this document along with the modules within the components and their associated screenshots. The economic impacts of these projects, activities, spending or revenues are estimated with the same fundamental approach through RECONS. The basic mechanics of RECONS and some of the terminology is provided in the subsequent section to further introduce and provide an understanding of the RECONS approach. Additional definitions and terminology are provided in the Glossary in Appendix A.

THE RECONS APPROACH

RECONS was designed, in part, to measure the economic impact or contribution of direct expenditures by USACE on CW expenditures. Economic impact (contribution) analysis estimates the change (impact) or existence (contribution) in economic activity (economic output, labor income, value added, and employment) associated with new or already occurring economic stimulus to an economy. RECONS estimates economic impacts or contribution of these activities to the economy by utilizing input-output (IO) modeling techniques to calculate the multiplier effects that USACE expenditures or industry revenues create through backward linkages to the industries, businesses, and households supplying the goods, services, and labor. This section outlines the approach used in RECONS to estimate these economic impacts and contribution to local, state, and national impact areas.

An overview of the RECONS approach is provided in the diagram below. This approach applies to all three components of RECONS. Each of these steps will be generally described in this section.

Figure 1: Flow Diagram of RECONS Approach



Impact Areas

RECONS uses multipliers and ratios from the IMPLAN model that are based on county, state, and national-level data. As such, impact areas are based on these geographies and groupings of counties and states. RECONS provides the ability to evaluate economic impacts simultaneously for three general levels of geography:

1. Local
2. State or multi-state
3. Nation

Local impact areas were determined during the model development stage based on USACE project locations, port locations, inland waterway locations, recreation locations, etc. However, projects or activities that are implemented on a larger-scale, such as a river stretch or state-wide program, were researched to identify the appropriate larger-scale local impact area. Local impact areas in RECONS are defined at the county or multi-county level of geography. In general, USACE project locations or industry activities were identified as occurring in an impact area that is defined as:

- Metropolitan (at least 50,000 people)
- Micropolitan (10,000 to 50,000 people)
- Rural (less than 10,000 people)
- Large scale (occurs in multiple locations)

The Office of Management and Budget (OMB) describes metropolitan and micropolitan areas. If the project or industry activity occurred in a metropolitan or micropolitan county, as defined by the OMB, the multi-county metropolitan statistical area (MSA) or micropolitan statistical areas (micro-SA) was identified as the impact area. The MSA must contain an urban cluster of greater than 50,000 people, while a micro-SA contains a cluster of between 10,000 and 50,000 people.[1] Any project or industry activity that did not fall in a metropolitan or micropolitan area-county and was not identified as a large-scale region was defined as a rural impact area (i.e., counties

[1] The US Census defines the OMB definitions as the following. The 2000 standards provide that each core-based statistical area, including both metropolitan and micropolitan statistical areas, must contain at least one urban area of 10,000 or more in population. Each metropolitan statistical area must have at least one urbanized area of 50,000 or more inhabitants. Each micropolitan statistical area must have at least one urban cluster of at least 10,000 but less than 50,000 population. Under the standards, the county (or counties) in which at least 50 percent of the population resides within urban areas of 10,000 or more in population, or that contain at least 5,000 people residing within a single urban area of 10,000 or more in population, is identified as a "central county" (counties). Additional "outlying counties" are included in the CBSA if they meet specified requirements of commuting to or from the central counties. Counties or equivalent entities form the geographic "building blocks" for metropolitan and micropolitan statistical areas throughout the United States and Puerto Rico. Information is provided by the U.S. Census Bureau on MSA and micro-SA at the following website: http://www.census.gov/population/metro/data/def.html.

with less than 10,000 people). Additional counties were added to the rural impact areas based on an approach called Functional Economic Areas, as developed by the U.S. Department of Agriculture (USDA) Forest Service (METI Corp n.d.; Retzlaff 2008), as further described in the Methods Manual.

Large-scale local impact areas required research to identify the appropriate impact area. Linear projects, such as river stretches, include adjacent counties as well as counties within any MSAs or micro-SAs. For example, if a river stretch included a metropolitan area, such as Pittsburgh, all counties along the river on both sides were included in the impact area as well as those counties comprising the Pittsburgh MSA (7-county region).
State or multi-state regions were associated with each local impact area. If a local impact area comprised counties in two different states (for example, the Kansas City MSA), both states were included in the state impact area.

When the RECONS user either does not know the exact location of a project or if a specific impact area is not available in RECONS, generic multipliers have been developed from the impact areas in RECONS. The multipliers typically vary by the rural or urban nature of the economy, so the generic multipliers were analyzed and developed based on the types of local impact areas (i.e., metropolitan, micropolitan, rural, and large-scale) by averaging relevant multipliers and ratios (direct, indirect, and induced) for each industry sector for each type of impact (employment, labor income, value added, output). The average Local Purchase Coefficients (LPCs) for each industry and type of impact area were also estimated for each type of impact area and industry (see discussion below on LPCs). The RECONS user can therefore estimate impacts of a work activity based in a generic local metropolitan (greater than 50,000 people); micropolitan (between 10,000 and 50,000 people); rural; (less than 10,000 people); or large-scale impact area.

Types of Work Activities or Operations

Work activities for CW and ARRA Federal spending include the types of USACE projects or activities that support USACE infrastructure, programs, and business lines. Work activities associated with each of the USACE CW business lines were researched and identified, as well as work activities that are currently associated with multiple business lines or are general enough that they could be included in all business lines. Information on work activities was obtained from USACE documents, web searches, and interviews with USACE experts and a number of key vendors. A detailed description of the work activities, the spending profiles, and interviews conducted on which these profiles and categories were developed is provided in the Federal Spending Methods Manual, Resource Guide for Work Activities and Spending Profiles (Appendix A).

Additionally, industry revenues or costs associated with the RECONS stemming-from effects component were also identified and described. Additional detail on the industry or operational expenditures or revenues is provided in the Stemming-From Effects Methods Manual.

The work activity classification system serves two purposes:

1. To organize and arrange the USACE CW federal work activities in a manner that is easily identifiable to RECONS users.
2. To create a mapping structure whereby USACE work activities map directly to one or multiple IMPLAN sectors.

As an example, Table 2 provides the work activities and definitions associated with the RECONS CW budget component for the navigation business line (dredging activities were handled separately).

Table 1: Navigation Work Activities List with Definitions

Work Activity	Work Activity Definition
Construction and Repair of Concrete / Wooden Breakwaters and Jetties	Concrete or wooden breakwater and seawall construction or repair. Examples include construction of rubblemounds, breakwaters, breakwater extensions, and the purchase of concrete and other materials for repairs to historic wooden structures.
Construction and Repair of Large Stone Breakwaters and Jetties	Breakwater and seawall construction or repair. Examples include construction of rubblemounds, breakwaters, breakwater extensions, and the purchase and placement of jetty stone.
Lock Construction of On-Site Features	New construction and major rehabilitation of locks (using either wet or dry construction practices, such as cofferdams). Examples include foundation and drainage work, construction of guide walls and partial height monoliths, and construction and rehabilitation of access roads and bridges.
Lock or Dam Gate Fabrication and Installation	Fabrication or installation of lock or dam gates. Examples include the fabrication, transportation, and installation of lock gates, culvert valves, new miter gates, and lift gates.
New Construction or Major Repair of Navigation or Multi-Purpose Dams	New construction or major rehabilitation of dams and related structures. Examples include drainage, foundation work, earthworks, seepage control, stilling basins, spillways, stoplogs, outlet works, intake structure, power intake works, water supply systems, pumping plants, access roads, and bridges.
Repair and Maintenance of Locks	Repair and maintenance of locks. Examples include rehabilitation of lockport controlling works, fabrication of new culvert valve machinery, tainter gate shell placement, lock culvert valve machinery repairs, and replacement of mechanical/electrical equipment.
Repair and Maintenance of Navigation or Multi-Purpose Dams	Repairs and maintenance to multi-purpose dams. Examples include valves, associated mechanical/electrical equipment, and other related systems.
Structural Activities for Channel Maintenance (does not include	Activities undertaken to stabilize banks (such as rehabilitation of canal walls) and activities to control erosion

Work Activity	Work Activity Definition
dredging)	near navigation areas.
Placement Area Construction and Rehabilitation	Carrying out the construction or rehabilitation of placement areas, including activities to increase dredged material placement capacity to reduce future maintenance costs.

Additionally, within the RECONS Civil Works component, the user can choose *CW budget work activities*. These CW budget work activities and associated spending profiles were constructed for each of the business lines and appropriation accounts to provide a more general approach to estimate economic impacts of CW Federal spending. The CW budget work activities were developed based on an analysis of the ARRA *national* work activities specified by business line and appropriation account as well as an assessment of the USACE labor and overhead expenditures, also analyzed by business line and appropriation account. The ARRA budget line items, identified by business lines and appropriation accounts, were queried to develop an aggregate industry profile associated with all national work activities in the grouping.

The resulting spending profile then embedded the appropriate percentage of USACE labor and overhead as obtained from the USACE Financial Management System /Operations and Maintenance Business Information Link (CEFMS/OMBIL) data. CEFMS is the database that houses the USACE financial data, and OMBIL is a software tool that was utilized to query the financial data in CEFMS. These spending profiles were based on the ARRA national work activities, again sorted by business line and appropriation account. An example is provided for the Hydropower Construction Appropriation Profile in **Error! Reference source not found.**. The RECONS user is able to customize this profile as needed. Additional information is available in the Federal Spending Methods Manual.

Table 2: Hydropower Construction Profile for CW Budget

IMPLAN Sector	Spending Category Name	Percent
222	Turbine equipment and parts	9.2
266	Power, Distribution, and Specialty Transformer Equipment	18.3
268	Switchgear and Switchboard Apparatus Equipment	12.1
36	Construction of Other New Nonresidential Structures	6.4
369	Architectural, Engineering, and Related Services	2.0
375	Planning, Environmental, Engineering and Design Studies and Services	7.8
39	Repair and Maintenance Construction Activities	16.8
5001	Private Sector Labor or Staff Augmentation	12.9
439	USACE Wages and Benefits	9.7
386	USACE Overhead	4.8
	Total	**100.0**

If the RECONS user has reason to believe that a specific work activity has not been provided in RECONS, it is suggested that the user try and find a work activity in RECONS similar to the one

desired. For example, the building of a confined disposal facility is not included as a work activity. However, this activity is likely to be generally heavy new construction and therefore, a construction work activity could be chosen, such as General New Construction (under the All category) as a proxy for this CDF construction activity.

The stemming-from effects module doesn't identify work activities, but does identify economic activities or industries important for each of the stemming from effects modules. Currently there are 4 stemming-from effects modules: inland waterway industries; port industries (by container-type and commodity); recreation; and FUSRAP. Each of the modules is focused on its own type of activity.

For example, with recreation, the stemming-from effects module is focused on identifying visitor spending and estimating the economic impacts of visitor spending to local economies. The RECONS users are able to identify or customize the type of visitors at USACE projects (for example, local, day-users, camper, or overnight). Each of these types of users or visitor segments has a unique spending pattern and profile.

The port and inland waterway modules are focused on identifying the revenues to the waterway shipping and support industries, which are estimated based on types and volumes of cargo, commodities, the modal share of land transportation, and commodity cost per ton of shipment. In many cases, the RECONS user is provided with default values, but would need to enter certain volumes and tons of cargo and commodities to provide a spending profile to estimate economic impacts to these waterway industries.

For the FUSRAP module, RECONS users would need to identify the types of construction or operational activities and the annual budget or revenues to estimate these effects on the local, state, and national impact areas.

Spending Profiles

All work activities and operational or industry expenditures or revenues map to at least one IMPLAN sector and in some cases map to multiple sectors, depending on the complexity of the activity. These expenditures or revenue items or components of items are referred to as a spending profile. Work activities that map to more than one IMPLAN sector are denoted as "multi-sector" spending profiles, with a number of cost components or expenditure items identified. A large infrastructure construction work activity would have several items within a spending profile, while a contract to provide security services at a facility may have only one item. For the more complex projects, sub-groupings (e.g., materials separated into steel, concrete, glass; or services into architecture/engineering, security, business services) were added, as appropriate, to best match expenditures consistent with IMPLAN industry categories.

If a work activity is associated with a multi-sector spending profile, RECONS will allocate the expenditures or revenues among the various sectors based on research undertaken for the development of the model (see the Federal Spending Methods Manual and Appendix A). The user should enter spending or revenues based on an annual estimates; the user may need to tailor spending to fit with the annual requirements of RECONS. For example, a construction budget

may be expected to be spent over a number of years. The user has the option to estimate an annual portion of that budget and run that amount through RECONS or run the entire amount through RECONS and divide the estimate impact figures by the number of years. For example, a $10 million dollar project that is expected to occur over 2 years would generate 120 annual jobs (if it all occurred in one year) or 60 jobs each year over the two-year period.

The IMPLAN model currently contains 440 sectors, which were based on the U.S. Department of Commerce Bureau of Economic Analysis's latest Benchmark Input-Output Study (2002). This sector scheme is consistent with the 6-digit North American Industry Classification System (NAICS) code for manufacturing, although the service sectors, including the retail sectors, are more aggregated (i.e., a number of retail sectors are aggregated and represented in a smaller number of retail sectors in IMPLAN and RECONS). The 440 industry numbers and names are provided in Appendix B.

The spending profiles are based on an evaluation of how similar the work activities align with the industries and their activities, as defined by the IMPLAN model. If the work activities aligned well with an IMPLAN sector, the spending profile was mapped to only one IMPLAN sector. The NAICS was consulted for relevant industry sectors as well as IMPLAN's bridge to the NAICS codes. For the Civil Works and ARRA RECONS components, the Federal Spending Methods Manual and Resource Guide for Work Activities and Spending Profiles (Appendix A) identify and define the typical work activities for each business line, describe the associated spending profile, and provide a rationale for each spending profile.

Generally, the multi-sector spending profile table presents: (1) the cost components or expenditure item; (2) the associated IMPLAN industry number; and (3) the estimated LPC (local, state, and national) of those cost components (see Local Purchase Coefficient description in the following section). It should be noted that the cost component or expenditure item in the spending profile does not necessarily reflect the name of the IMPLAN industry sector. The name of the IMPLAN industry sector associated with this number is shown in the "review economic impacts" screen in the economic impacts by industry tab. Is should also be noted that the items in the spending profile and the associated values do not necessarily match exactly to the industries in the direct economic impacts because margins are applied between these two screens, as described below.

Margins represent the difference between producer and purchaser prices and need to be accounted for when manufactured products, materials, or structures are purchased. A margin is applied to the direct effect, allocating the spending among the manufacturing, retail trade, wholesale trade, and transportation sectors. In general, IMPLAN's margins are utilized within RECONS, although a number of industry sector margins were modified to more accurately estimate the economic impacts of purchasing work activities. Additional discussion on margins is provided in the USACE Federal Spending Methods Manual.

Within many of the multi-sector spending profiles in RECONS CW component, labor is part of the spending profile. Unless identified as "USACE labor," labor in the spending profiles is associated with the private sector. Private sector labor coefficients were estimated to provide direct and induced effects of the labor income or payroll effects. This estimation was necessary

since "labor" or payroll expenditures in IMPLAN contain only value added payroll and capital consumption allowance, and there are there are no intermediate purchases.

If one examines the multiplier reports for these sectors it is evident that there is no indirect or direct ratios, only payroll driven induced effects, which are estimated through varying household income expenditures. As such, analysis was undertaken to estimate direct and induced effects of private-sector labor (there is no indirect effect for a direct labor expenditure) of compensation for the types of impact areas (i.e., MSA, micro-SA, rural, large-scale and state, nation). These private-sector labor response coefficients were based on: household income levels of $35,000 to $50,000, which was associated with the average income for a worker in the construction industry (IMPLAN Sector 36); and the direct employment ratio of employee compensation to employment from IMPLAN Sector 36, Other New Non-Residential Construction, for each type of impact area (MSA, micro-SA, rural, large-scale and state, and nation). Direct value added and economic output for labor expenditures was assumed to be equal to the employee compensation. Average labor response coefficients for each type of region were computed and are shown in Table 4; the sector number to which these response coefficients are associated is 5001, which is not related to an IMPLAN sector.

Table 3: Private Sector Labor Response Coefficients for $1 Million in Wages

Type of Impact area	Direct	Induced			
	Employment (Number of Jobs)	Employment (Number of Jobs)	Labor Income	Value Added	Output
Metropolitan	24.2	6.61	$280,159	$505,916	$852,362
Micropolitan	35.8	5.12	$153,659	$288,451	$490,970
Rural	42.9	3.58	$97,119	$204,194	$345,804
State/Multi-State/Large-scale	27.1	7.77	$310,097	$551,598	$960,371
Nation	24.9	11.7	$554,792	$972,984	$1,831,594

In contrast to the private sector labor response coefficients, all USACE labor is estimated through IMPLAN Sector 439—Federal Government, Non-Military Employee Compensation. Employee Compensation includes both wages/salaries and benefits. For consistency with IMPLAN's employee compensation approach, the USACE payroll costs should include both direct labor (or wage costs) as well as benefits. Based on analysis of CEFMS/OMBIL data, approximately 67% of the in-house labor expense is associated with direct labor costs and benefits, while the remaining 33% is overhead and burden costs.

USACE overhead expenditures for the business lines are also included in RECONS. The USACE cost of doing business includes overhead, facility burden, and other operational expenditures for buildings, equipment, and facilities. These expenditures are mapped to IMPLAN Sector 386, Business Support Services. Any USACE labor expenditures either for ARRA or for the CW spending assumes a default spending profile of 67% wages, salaries, and benefits and 33% overhead and burden, which was based on the CEFMS/OMBIL Resources Codes within the In-house Labor Account.

Local Purchase Coefficients

The spending profiles in RECONS identify the Local Purchase Coefficient (LPC) for the expenditure or revenue items or components. This LPC is also referred to as the geographic capture rate. The LPC is the portion of USACE spending (sales to industries) captured by industries and employees located within the impact area. In many cases, IMPLAN's Trade Flows Regional Purchase Coefficients (RPCs) are utilized as a proxy to estimate the LPCs. However, in some cases, the USACE or contractor experts were able to provide better LPC estimates than the LPCs provided by the IMPLAN model, and the LPC was customized for these specific industry sectors. For example, according to USACE navigation experts, the LPC for labor on a lock construction project could include 20% labor from the local region (general laborers and likely locally residing employees), 50% labor pool from the state (includes the local), and 50% highly specialized labor coming from outside the region. A detailed description of the rationale regarding the selection of IMPLAN sectors and their LPCs or customized LPCs is provided for each work activity in the Federal Spending Methods Manual, Appendix A.

In RECONS, the "local capture" is the Federal spending that has been allocated to the IMPLAN sector multiplied by the LPC. For example, in a multi-sector spending profile, if 40% of a $1 million project is allocated to the "commercial and industrial machinery and equipment repair and maintenance" sector, and the LPC for the local region for this industry is 75%, the local capture for this sector would be $300,000 ($1 million x 0.4 x 0.75). This local capture amount is also equal to the direct output in RECONS.

In most cases, IMPLAN National Trade Flows Model (RPCs) is used to provide the LPCs in RECONS. The IMPLAN Trade Flows Model utilizes a doubly constrained gravity model using IMPLAN's county-level estimates of commodity demand and supply. In general terms, the import and export flows between regions are thought to be proportional to the "mass," "attractiveness," or "size" of an economy and inversely proportional to the "distance" or cost of moving goods and services between them.

There are three main databases used in the Trade Flows Model: the Oak Ridge National Laboratory county-to-county distances by mode of transportation, the Commodity Flows Survey ton-miles data by commodity, and the IMPLAN commodity supply and demand by county. The industry RPCs from IMPLAN are adjusted based on the foreign export and import data from the U.S. Department of Commerce's Foreign Trade Statistics series. National foreign exports and imports vectors are distributed to states and counties on the basis of the total industry output. The Bureau of Economic Analysis provides a concordance table to map the Foreign Trade

Statistics to the IMPLAN sectors. Further description of Trade Flows Model is provided by the Minnesota IMPLAN Group.

Within the CW budget spending profiles (described previously), the LPC for USACE labor was customized to reflect general locations of USACE employees, which was based on discussions with the USACE Chief of Operations. The default LPC for USACE wages and benefits in the CW budget spending profile is 75% for the local impact area and 100% within the state and national impact area.

Industry Multipliers and Ratios

Once the work activities and operational revenues and expenses have been allocated to spending profiles with specific IMPLAN industries, RECONS applies IMPLAN's ratios and multipliers to the direct output or local capture to estimate the direct and secondary effects for all of the RECONS results measures. *RECONS, like IMPLAN, estimates its output measures in annual averages.* These impact measures or economic indicators include:

Economic Output: In RECONS, annual sales or revenues are equivalent to annual economic output or the value of production by industry. Output can be measured either by total value of purchases by intermediate and final consumers or by intermediate outlays plus value added.

Employment: A job is the annual average of monthly jobs in that industry (this is the same definition used by Quarterly Census of Employment and Wages, Bureau of Labor Statistics, and Bureau of Economic Analysis nationally). A job can be full-time, part-time or overtime, and includes proprietors (i.e., self-employed persons).[2]

Labor Income: Labor income represents all forms of annual employment earnings; it is the sum of employee compensation and proprietor (self-employed) income.

Value Added or Gross Regional Product: Value added consists of employee compensation, proprietary income, other property type income (which includes industry profits), and indirect business taxes. Value-added is an estimate of the gross regional or state product.

RECONS provides the impact measures above for direct and secondary (i.e., multiplier) effects. The secondary effects include both indirect and induced effects. The types of effects are defined as follows:

Direct Effect: In the impact area in which a project or economic activity is located, direct output (i.e., sales or revenues) effect represents that proportion of the spending or sales in each industry that flows to material and service providers in the impact area. For

[2] IMPLAN provides a spreadsheet to convert part-time and full-time jobs into full-time equivalents jobs. Please see:
http://implan.com/v4/index.php?option=com_multicategories&view=article&id=628:628&Itemid=10

employment, labor income, and Gross Regional Product measures, the direct effect represents the jobs, labor income, and gross regional product associated with the directly affected industry.

Indirect Effect: The indirect effects include the backward-linked industry suppliers for goods and services that support the directly affected industries, supporting indirect jobs, labor income, value added, and economic output. For example, if construction activity is the direct effect, indirect business supporting construction would include architectural and engineering, lumber suppliers, trucking, steel manufacturers, among others; these are considered backward-linked industries supporting the construction activity.

Induced Effect: The induced effect occurs from household expenditures or consumer spending associated with the direct and indirect workers spending their earnings within the impact area, supporting induced economic output, jobs, labor income, and gross regional product.

RECONS, like IMPLAN, uses sales, economic output, or revenues as the basis on which the ratios or multipliers are estimated. Although the USACE has "costs" or "expenditures" on projects, these are revenues or sales to the various industries receiving this Federal spending. This is also the case in the stemming-from effects modules of RECONS. For example, inland waterway shipment costs for commodities are costs for industries shipping these commodities (e.g., power plants, coal producers), but are revenues or sales for the shipping industry and shipping support sectors. Therefore, RECONS is set up to map these expenditures to the correct industries in RECONS, receiving these sales, revenues, and/or spending.

The ratios and multipliers for each industry were obtained for each impact area from IMPLAN and the county, multi-county, state, multi-state, and national IMPLAN models. Ratios and multipliers per $1 million in direct spending or sales were obtained for every impact measure reported, including number of jobs, labor income, economic output (sales), and value added for every local, state (or multi-state), and national impact area.[3]

Economic Impacts or Contribution

The results of the RECONS impact analysis provides information on the impact measures and types of effects, as described in the previous section. Impact measures include: direct effects, including output, employment, labor income, and value added; the secondary (multiplier) effects for these output measures; as well as the total economic effects (the sum of the direct and the secondary effects). Each "review economic impacts" screen has options to review a summary of the impacts or review the impacts by industry for each of the geographies (local, state, and national impact areas). The overall summary of economic impacts includes local capture and the

[3] IMPLAN derives its data, ratios, and multipliers from the U.S. Department of Commerce Bureau of Economic Analysis Regional Economic Accounts; U.S. Department of Labor, Bureau of Labor Statics Census on Employment and Wages; U.S. Census Bureau County Business Patterns; and the Leontief inversion of the IMPLAN data matrices (i.e., the input-output methodology).

other direct effects (jobs, labor income, and GRP) and the total effects. Again, the total effects include both the direct and secondary effects.

The RECONS user would describe the overall summary economic impacts as follows:

Of the $XX (total expenditure or sales from top of screen) in Federal spending or industry revenues in year XX, XX (local capture figure) was captured within the local (or state or national) impact area resulting in total economic output or sales within the region of XX (total output). In year XX, this project or economic activity retained or created XX average annual jobs in the directly affected industries, with an associated XX (direct labor income) in labor income and XX (direct GRP) in GRP. An additional XX (total jobs minus direct jobs) jobs were supported by this economic activity in year XX, resulting in XX (total jobs) total jobs supported within the impact area. This project or economic activity supported total labor income of XX (total labor income) and GRP of XX (total GRP) in the impact area.

The economic impacts by industry are depicted for each of the impact areas: local, state, and nation. The directly affected industries are listed in these screens and their associated direct effects (output, jobs, labor income, and GRP). The industry names and numbers in this screen are those of the IMPLAN model. The expenditure or revenue item or cost component in the spending profile screen can usually be identified by the industry number, which appears in both the spending profile and the review economic impacts by industry screen.

The *economic impacts by industry* tab includes the "spending" by industry, which shows how much was allocated to the industry or labor prior to the application of the LPC.[4] Within the economic impacts by industry tabs, all of the effects associated with the listed industries are direct effects. For example, if output, jobs, labor income, and GRP are listed next to a construction sector, these are all associated with that specific industry. The secondary or multiplier effects are listed below the directly affected industries in these tabs. Again, the indirect and induced effects are presented together in the secondary effects row. The final total row sums the direct and secondary effects. It should be noted that there may be spending associated with some industries with no resulting impacts or effects. This implies that the specific industry does not exist within the local impact area. However, the state and national impact area should show economic impacts associated with this industry.

Again, USACE labor is specified separately from private-sector labor. USACE wages and benefits use IMPLAN industry sector 439, while private sector (noted "labor" in RECONS) applies response coefficients to estimate impacts, as described above.

[4] It should be noted that the industries or cost components listed in the spending profile screen may not exactly match the industries listed in the economic impact results screen, as margins for purchased goods, materials, and supplies are applied by RECONS between these screens, allocating expenditures, spending, or revenues among manufacturing, trade, and transportation sectors consistent with IMPLAN's approach, as described above.

USACE CIVIL WORKS PROGRAM

The USACE CW component in RECONS comprises three main modules:

- create and analyze a new CW budget project
- review previously conducted CW budget project and
- conduct a new analysis of an existing CW budget project.

Under the first module, Create and Analyze a New CW Budget Project, RECONS allows the user to specify the project location and work activity to estimate jobs, income, Gross Regional Product, and economic output associated with USACE Federal spending for the local, state, and national impact areas. If the user does not know the specific location where expenditures would occur or if the specific location is not available in RECONS, the user can choose the generic type of model to estimate economic impacts. Both the project location and generic models are described in this module.

The second module under the CW Program is Review Previously Conducted CW budget projects. Any projects run under the first model can be viewed at a later time under this module. The final module, Conduct a New Analysis of an Existing CW Budget Project, allows the user to run a new analysis of existing CW budget spending on a project. RECONS includes the total USACE CW budget spending between 2009 and 2012 for projects by business line and appropriation account (i.e., construction, operations and maintenance, investigations). These modules are further described below.

Create and Analyze a New Civil Works Budget Project

RECONS allows the user to specify the project location and work activity under this module to estimate jobs, income, GRP, and economic output associated with USACE Federal spending for the local, state, and national impact areas. If the user does not know the specific location where expenditures would occur or if the specific location is not available in RECONS, the user can choose the generic type of model (see previous description). Both of these approaches are provided in this module.

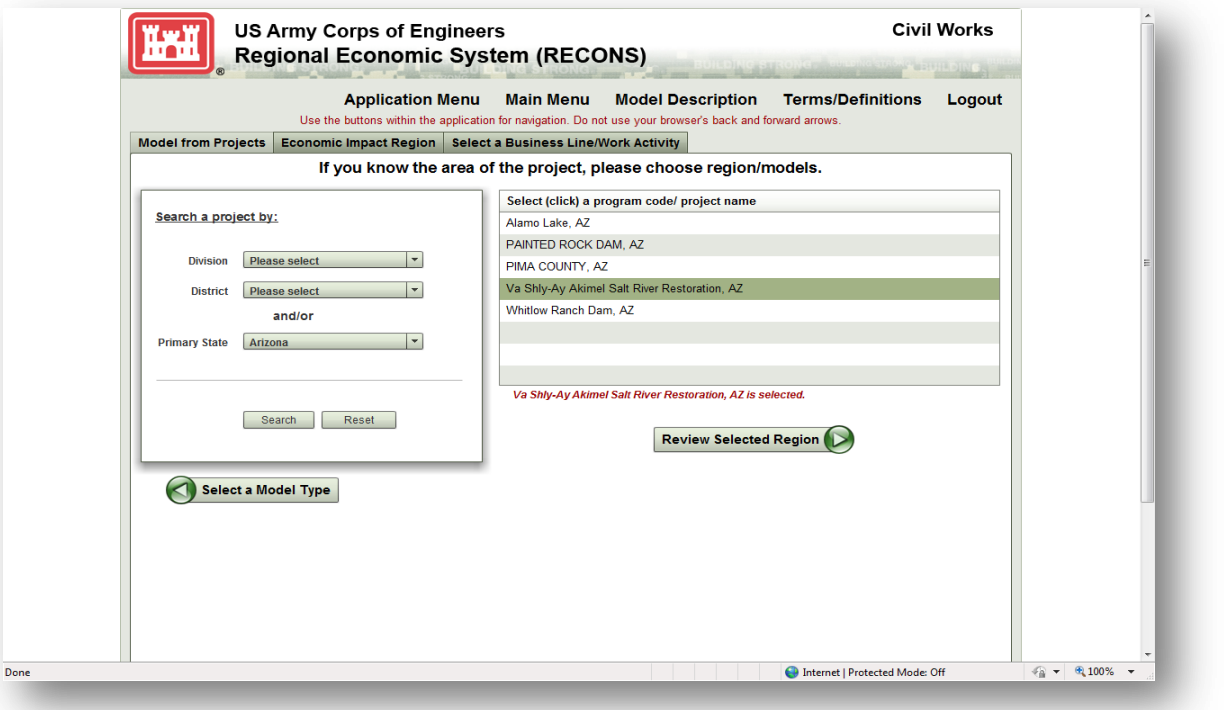
Model from Projects

This module allows the user to estimate economic impacts of work activities at a USACE project location. If the user does not know the project location or the project location is not provided in RECONS, the user should go to the Generic Models section, which follows. The majority of the work activities within this module would apply to Federal spending on contracted work. However, there are two work activities that can be used to estimate the economic impacts of USACE payroll and overhead to support projects. These work activities are further described under screen three.

Inputs, analysis, and description of the New Civil Works Budget Project Module – Model from Project are described below.

Screen 1: Model from Projects

The user should select the division, district, and/or state to search for the appropriate project name. The search should result in a number of project names displayed on the right side of the screen. The user should select the desired project name. Select "review selected region" to proceed to the following screen.



Screen 2: Confirm Economic Impact Area

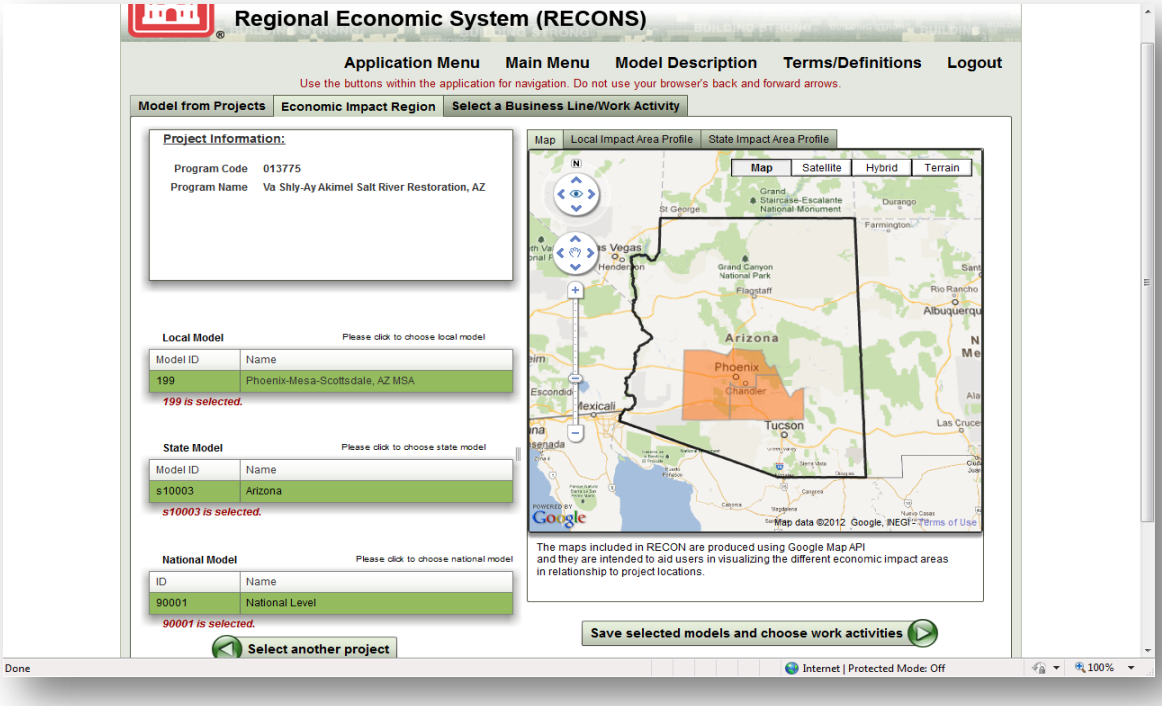
The project name that was chosen on the previous screen is automatically associated with the local and state impact area in RECONS.[5] The project name is identified at the top left of the screen. The impact model that is associated with this project name is listed under the Local Model box. If the model is a county, the county name would be displayed. If the model is in a metropolitan or micropolitan area, the name of the micropolitan or metropolitan area would be displayed.[6] When the user double clicks on the Local Model name, the map will zoom in on this location and the cursor will show the names of the counties included in the Local Model impact area. Similarly, the state or multi-state impact area is also listed, and if the user double clicks on this name, the map will zoom into the chosen state or multi-state region. Regardless of if the user wants to view the map, he or she needs to double click on the local, state, and national model name to select these models for analysis.

[5] Local, state, and national multipliers associated with these impact areas have been obtained from the IMPLAN model for use in RECONS.

[6] The metropolitan statistical areas (MSAs) and micropolitan statistical areas are multi-county regions defined by the Office of Management and Budget (see additional information under RECONS Approach).

This screen also allows the user to view demographic and economic profile information associated with the "Local Impact Area Profile" and "State Impact Area Profile." At the top of the map, there are tabs for the local and state impact model profiles. Within each tab, RECONS identifies the population, the number of households, the employment rate, the geographic area, and number of counties. Forecasted estimates for these demographic indicators are also provided based on estimates from ESRI. The employment rate is the percentage of the labor force that is currently employed; the remaining percentage is the unemployment rate. The geographic area is the number of square miles in the impact area. Additionally, economic information is provided for the local and state impact models for the top 19 employing industries. This information includes economic output (i.e., sales), jobs, labor income, and value added. Again, this is demographic and socioeconomic information provided for the entire local or state impact area, depending on what area has been specified.

The choice of an impact area cannot be changed in this screen, as they are automatically associated with the project name and its associated county, metropolitan, micropolitan or large-scale impact area. Select "save selected models and choose work activities" to proceed to the next screen.



Screen 3: Select a Business Line and Work Activity

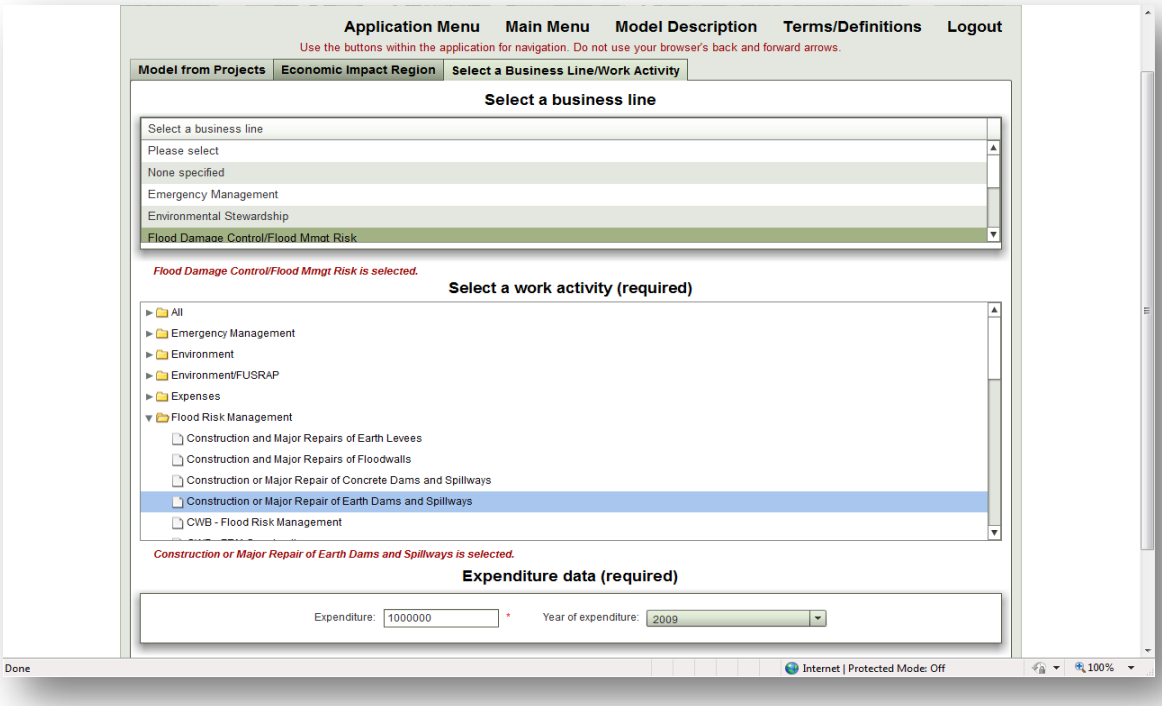
In this screen, the user must select the business line and work activity. The business line does not affect the type of work activity that can be chosen. However, both must be selected. Once the business line has been selected, the user must select a work activity. To view all of the work activities within each of the categories, the user can click on the arrow to the left of the category title. The "All" category has work activities that apply to all business lines and are more general in nature, while the work activities under each of the business lines list activities that are more specific to associated business line.

In addition, the "All" category also includes USACE Administration and USACE Labor work activities. All other work activities aside from these USACE work activities assume that the private sector is undertaking this work. If the user would like to estimate jobs and income from USACE personnel supporting projects, then one of these two work activities can be chosen. USACE Labor includes USACE payroll or salaries and benefits, while USACE Admin includes both salaries, payroll, and benefits as well as overhead expenses. The user would need to choose one of these options to estimate the economic impacts of USACE labor and/or administration. This module allows the user to estimate these USACE impacts at the project level, with an associated economic impact area.

Within each of the business line categories under the "select work activities" part of the screen, there are work activities that are titled with "CWB;" these are compiled work activities and spending profiles that have been developed to capture broader Federal spending at the national level by business lines and appropriation accounts for the entire annual CW budget. These CWB spending profiles were developed based on an assessment of the ARRA national work activities as well as the USACE labor and overhead expenditures by business line and appropriation account. The user can choose to run, for example, all navigation spending or navigation by the appropriations accounts (e.g., construction, investigations, and operations and maintenance). As such, ideally, these CWB profiles should be used on a larger geography, such as the state or national level; therefore just these larger regions should be used to describe these impacts.[7] Additional description is provided in the USACE Federal Spending Methodology Manual.

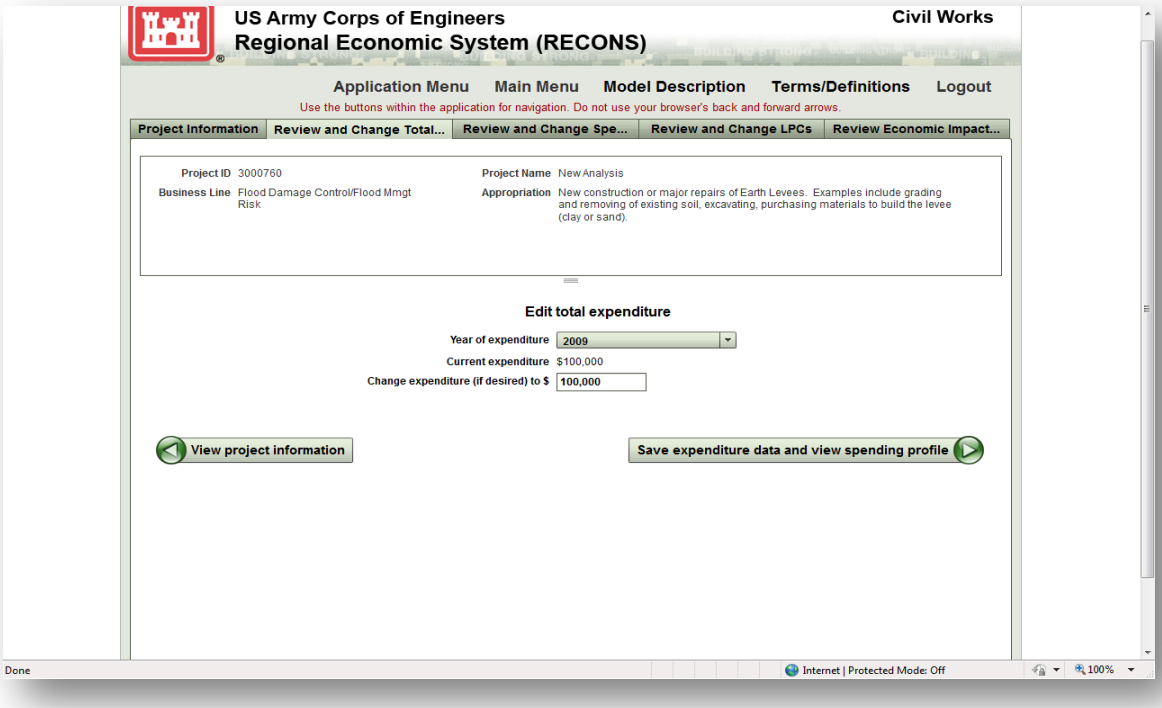
Once the work activity has been chosen, the user should enter the annual spending and the date in which the activity or spending is expected to occur. It should be noted that the user will not be able to return to this screen to change the work activity. If the user would like to change the work activity, he or she would need to start the Civil Works Program module from the Application Menu.

[7] As described previously, if RECONS does not provide a work activity that the user would like to assess, the user should try and find a similar work activity provided in RECONS and not use the CWB work activities as these are based on USACE spending at a national level. For example, if there is a work activity such as construction of a confined disposal facility that is not specifically provided as a work activity in RECONS, the user should choose a work activity that would most closely align with this activity. This type of construction would fall under General New Construction which is aligned with IMPLAN Sector 36, Other New Non-residential Construction.



Screen 4: Review and Change Total Expenditure

Under this screen, the user will be prompted to change the expenditure and year of expenditure if desired. The user will be able to return to this screen to adjust this amount if needed.



Screen 5: Review and Change Spending Profile

The work activity identified in Screen 3 is associated on a default spending pattern that maps the expenditures to various industries and sectors associated with the IMPLAN model. The IMPLAN model currently contains 440 sectors, which is based on the U.S. Department of Commerce Bureau of Economic Analysis's latest Benchmark Input-Output Study.

The industry number relates to the IMPLAN industry sector to which the portion of the expenditure is applied. The expenditure item or category lists the type of expenditures that are typical for this project; this item is not necessarily the name of the IMPLAN sector.

Some projects can easily be mapped to one type of industry in IMPLAN, such as building recreational facilities, which would be mapped to a new construction sector in IMPLAN. However, other projects that are more specialized in nature, such as New Construction of Earth Levees were mapped to multiple industries.

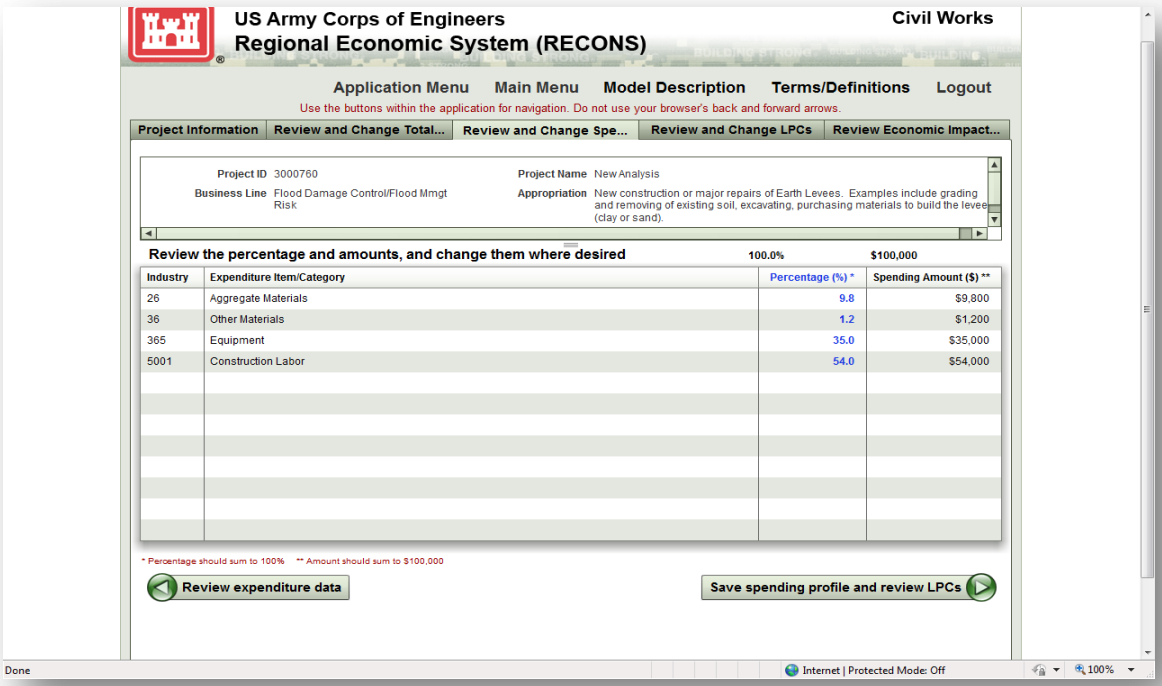
Additional description is provided in the Methodology Manual and its appendices. When spending profiles include the purchase of manufactured products, RECONS uses IMPLAN's margins to allocate these expenditures to relevant manufacturing, transportation, and trade sectors.

For example, margins for the aggregate materials industry would be applied behind the scenes in RECONS allocating expenditures to transportation, wholesale trades, and the mining and quarrying of sand and gravel; the user will be able to view these sectors in the Economic Impact Results by Industry tab (screen screen shot 7b). Again, additional detail is provided in the Federal Spending Methodology Manual.

"Construction labor" is private sector labor and it is mapped to labor response coefficients that were created for this model (See RECONS Approach). The spending profile can be changed to adjust the allocations among the industries and categories that are present, although additional industries cannot be added.

However, changing the profile (i.e., adjusting the percentages) should only be done if the user has specific information regarding the allocation of expenditures for this specific project. All percentages should add to 100%. The determination of the spending profile and descriptions of the private sector labor response coefficients are provided in the Methodology Manual and Appendix A.

Select "save spending profile and review LPCs" to proceed to screen 6.



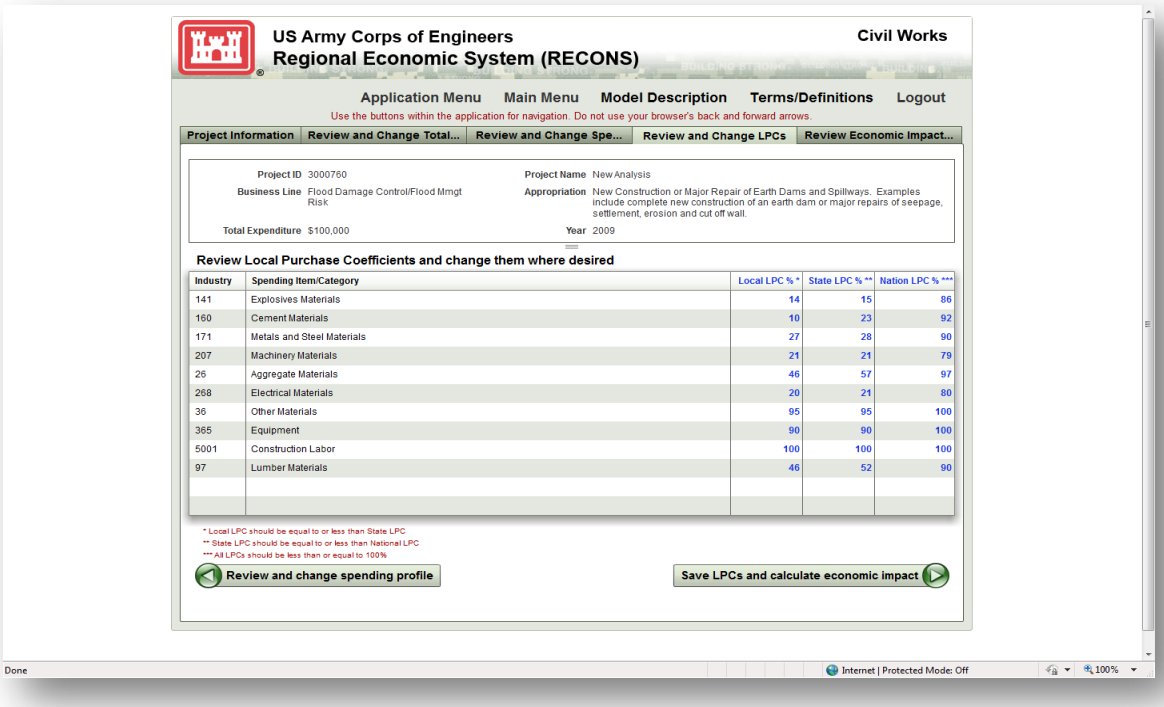
Screen 6: Review and Change LPCs

Under screen 6, the user can view the Local, State and National LPCs applied to the industries and sectors within the analysis. The LPC (also known as the geographic capture rate) is the portion (i.e., percentage) of USACE spending or industry revenues captured by industries located within the local, state, or national impact area. The purchase coefficients generally increase as the geographic area increases as more economic activity can be captured within a greater geographic region. Therefore, the state impact area has purchase coefficients that are higher than or equal to the local purchase coefficients, and the national purchase coefficients are higher than or equal to those of the state purchase coefficients[8].

The user has the ability to change these purchase coefficients if the user has information on where the USACE expenditures or industry revenues are captured. Note, the user should avoid changing this information unless better and specific information is known about the capture of these expenditures or revenues. For example, although a company may be located within an area or region, its regional- or head-quarters may be located outside the impact area, to which a portion of the spending or revenues would be allocated. As noted above, the national LPC must be greater than or equal to the state LPC, which needs to be greater than or equal to the local LPC.

[8] The purchase coefficients are based on IMPLAN's national trade flows model, which utilizes a doubly constrained gravity model of county level estimates of commodity demand and supply, while adjusting for foreign imports and exports. See additional description in the RECONS Approach on the IMPLAN Trade Flows Model.

The user must select “save LPCs and calculate economic impact” at the bottom of the screen to proceed to the following screen.



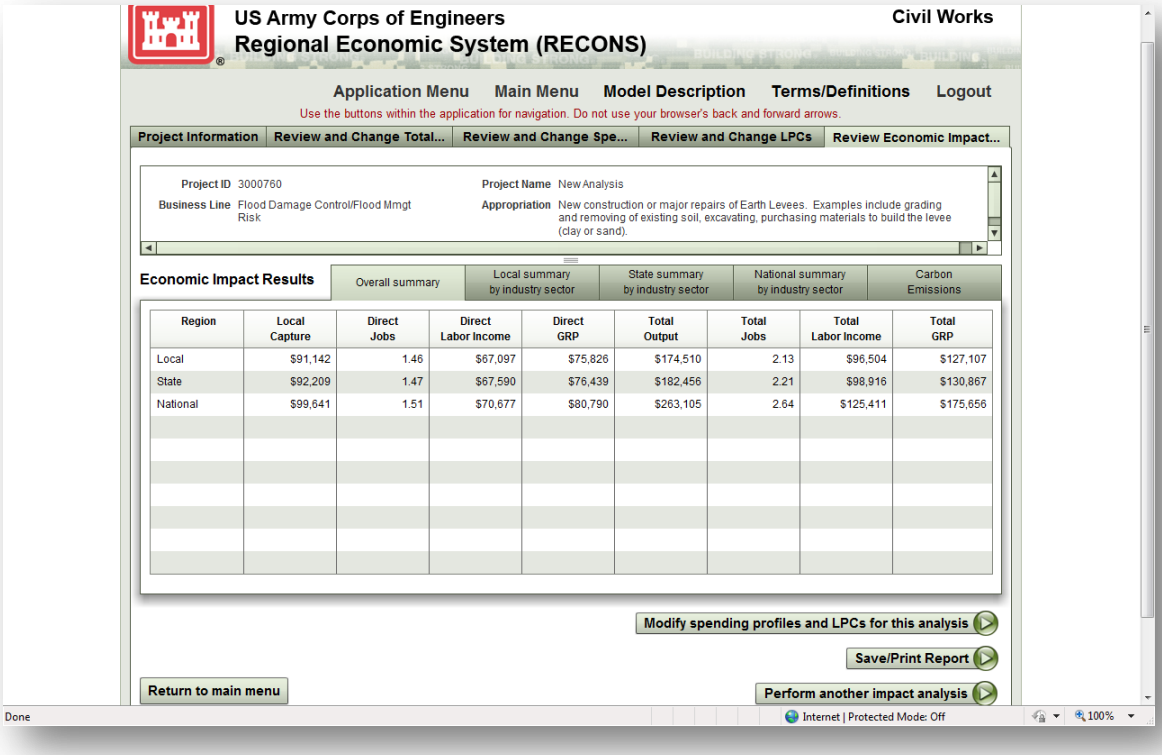
Screen 7: Review Economic Impact Results

Under screen seven, the user is able to view results of the impact analysis. The analysis information is provided at top of the screen. The values provided in the results are in the year that the project or activity was identified by the user as occurring.

The overall summary provides a snapshot of the local, state, and national economic impacts. Again, these impacts are provided in annual units. The first column identifies the impact area or region of analysis. The second column titled “local capture” is an estimate of the total expenditures or revenue captured within the impact area. This is calculated by applying the local, state, or nation LPC to the spending or expenditures for each of the industries and aggregating the local capture across all industries. The “local capture” is equal to the direct economic output, which is the “locally captured” portion of Federal spending (or sales or revenues to the industries) allocated to the specific industries within the spending profile. Other direct effects, including jobs, labor income, and Gross Regional Product (also known as value added), are also provided on this summary screen. These direct effects are estimated through IMPLAN’s economic output ratios.

Again, direct effects are associated with the particular industries affected, those industries identified in the spending profile. The *total* economic output, *total* jobs, *total* labor income, and *total* Gross Regional Product are the direct effects as well as the multiplier effects associated

with this economic activity. The multiplier effects include indirect and induced effects, as described in the RECONS Approach and below within this screen.



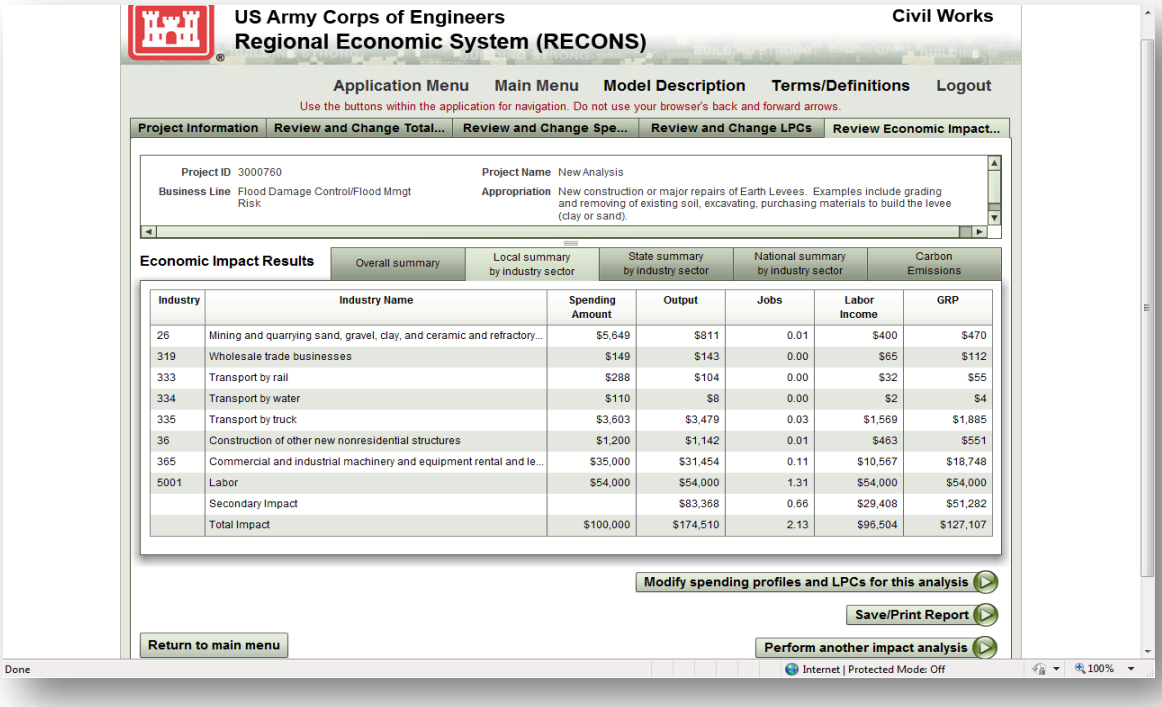
This screen also includes results tabs for local, state, and national summary by industry sector (see screen shot below). All of the directly affected industries and their associated direct effects (economic output, employment, labor income, and value-added) are shown on this page. Additionally, the spending amount is also shown associated with the directly affected industry; this is the amount of Federal spending that was allocated to this industry in the spending profile prior to the application of LPCs.

In the case of the screen shot in this module (see screen 6), there are 3 industries within the spending profile as well as private sector labor (see screen shot below). These industries are all associated with direct effects in terms of economic output, labor income, jobs, and gross regional product. As described above, any purchases of materials, supplies, or equipment would utilize IMPLAN's margins. In this case, expenditures allocated to the "aggregate materials" industry are further allocated or disaggregated to transportation sectors, wholesale trade, and the mining and quarrying of sand and gravel (see screen shot below) to account for these margins. The resulting directly affected industries are depicted in the economic impacts by industry tabs within this screen.

The secondary impacts are a summary of the multiplier effects, which include both indirect and induced effects. Indirect impacts include industries that support the directly affected industries, and induced effects occur when workers associated with the direct and indirect industries spend their salaries in the impact area, creating additional jobs, income, and gross regional product.

Total impacts for each of the impact areas are also depicted, which is the sum of the direct and secondary effects. These match with the overall summary figures. Additional description and interpretation of these economic impact results are provided in the RECONS Approach, Economic Impacts or Contribution.

Data on CO_2 intensities are provided in RECONS and include the total carbon emissions divided by a measure of output (i.e., gross output in real dollars). Data on direct energy-related CO_2 emissions of each industry as well as government and households is provided by the U.S. Energy Information Administration and U.S. Environmental Protection Agency. Multiplying the CO_2 intensity for different sectors by the output produced by USACE spending provides an estimate of carbon emissions. The total carbon emissions produced includes both the direct energy-related and process emissions generated in the sector, and the indirect energy-related emissions associated with the production of the inputs that the sector acquires. Since data shows that the CO_2 emissions for different sectors varies considerably over time, the information on carbon intensities will be updated at the same time the IMPLAN data used in the RECONS is updated.



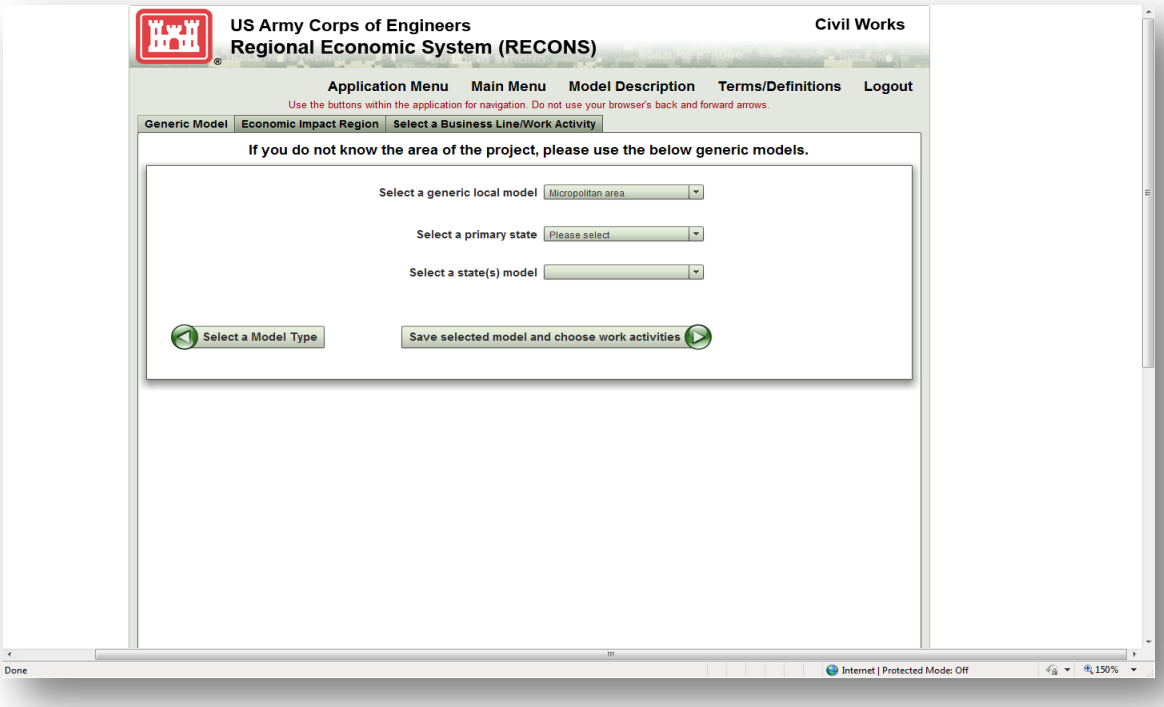
When finished, the user has the choice of saving and/or printing a report from the current analysis, modifying spending profiles and LPCs for this project, or performing another impact analysis.

Generic Models

When the RECONS user either does not know the exact location of a project or if a specific impact area is not available in RECONS, generic multipliers have been developed from the impact areas in RECONS. The multipliers typically vary by the rural or urban nature of the economy, so the generic multipliers were analyzed and developed based on the types of local impact areas (i.e., metropolitan, micropolitan, rural, and large-scale) by averaging relevant multipliers and ratios (direct, indirect, and induced) for each industry sector for each type of impact (employment, labor income, value added, output). The average Local Purchase Coefficients (LPCs) for each industry and type of impact area were also developed. The RECONS user can therefore estimate impacts of a work activity based in a generic local metropolitan; micropolitan; rural; or large-scale impact area.

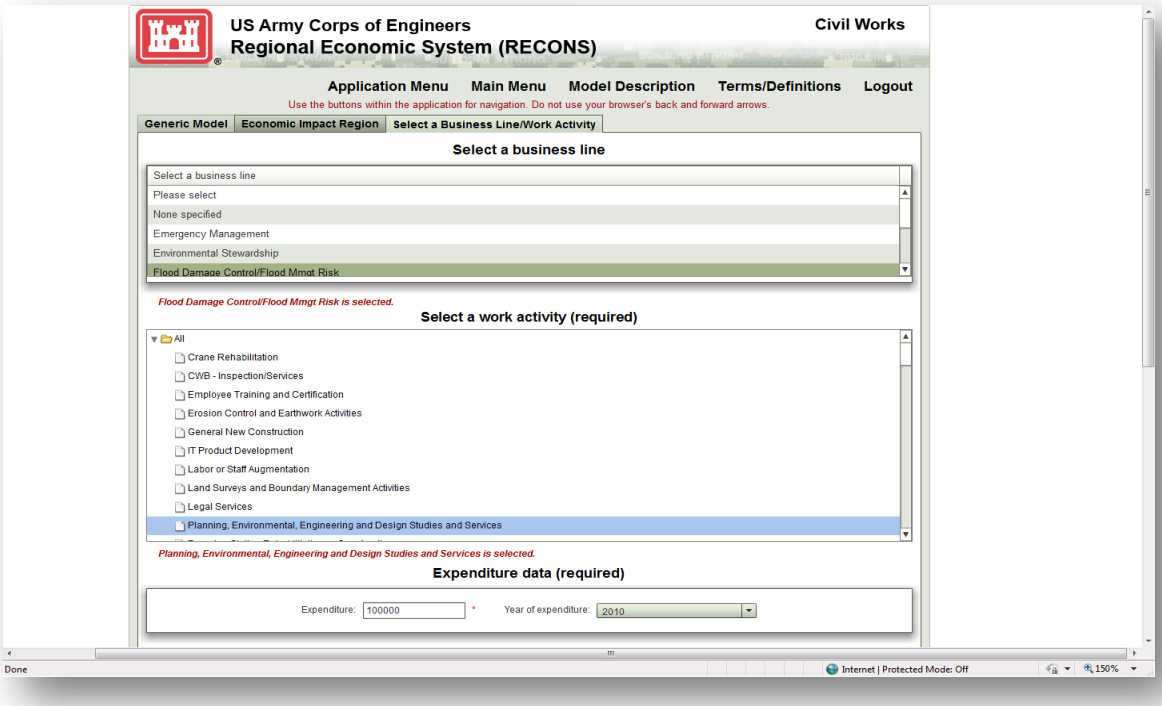
Screen 1: Choose a Generic Model

On screen one, the RECONS user has the ability to choose a generic micropolitan, metropolitan, rural, or large-scale area. Additionally, the user can also choose a primary state. RECONS then provides the user with the state and multi-state models that include the primary state. The RECONS user does not have to choose a state; there will be not state economic impact results if a state is not selected.



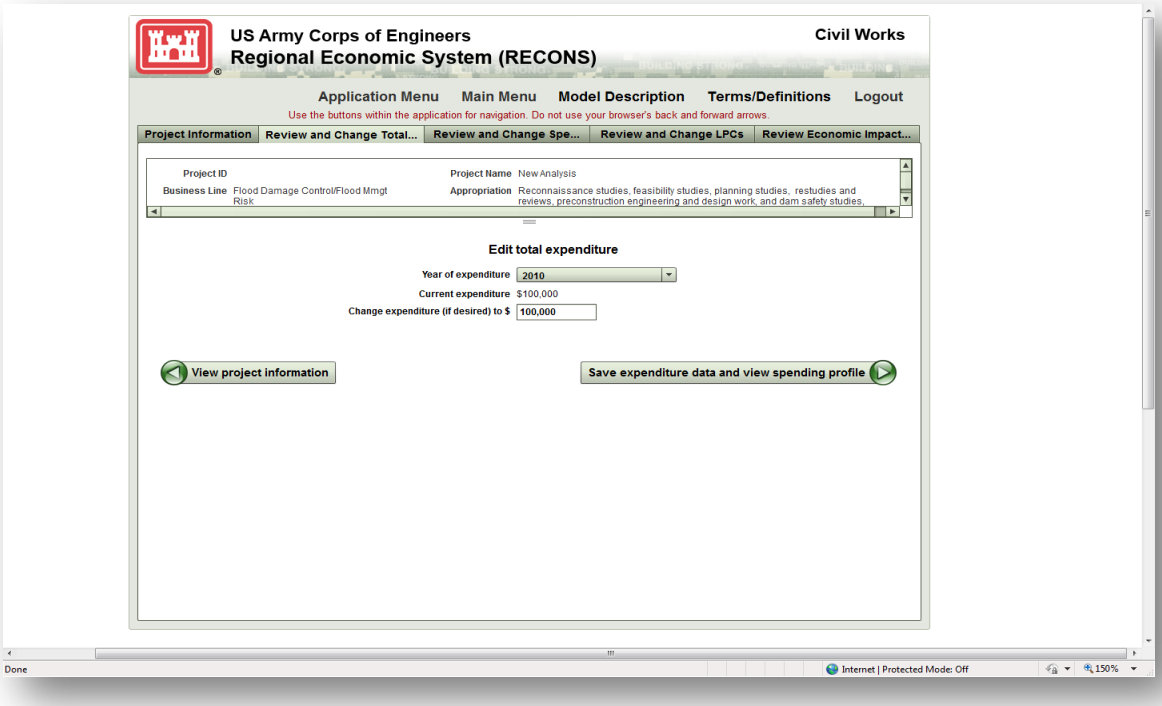
Screen 2: Select a Business Line and Work Activity

Screen 2, similar to screen 3 in the, the RECONS user should choose the business line and work activity. See the description under Screen 3 for Conduct and Analyze a New CWB Project.



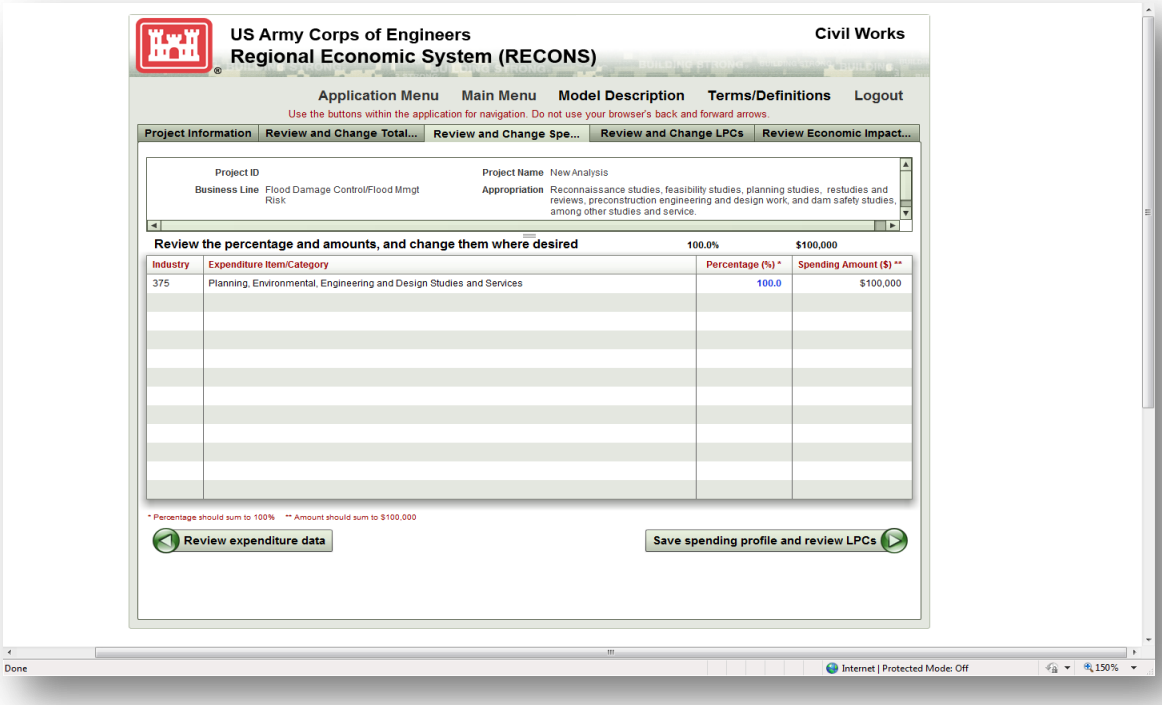
Screen 3: Review and Change Total Expenditure

Under this screen, the user will be prompted to change the expenditure and year of expenditure if desired. The user will be able to return to this screen to adjust this amount if needed.



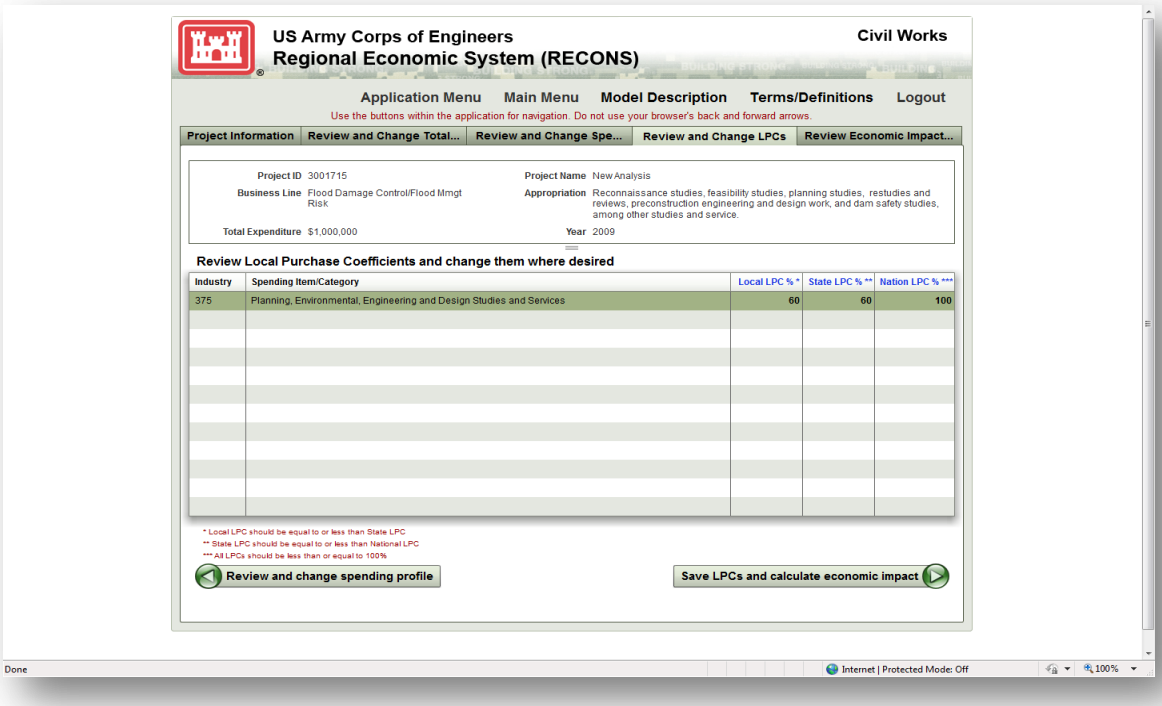
Screen 4: Review and Change Spending Profile

The work activity identified in Screen 2 is associated with a default spending pattern that maps the expenditures to one or more industries and sectors associated with the IMPLAN model. Please see the description for screen 5 under Conduct and Analyze a New CW Project – Model from Project. Select "save spending profile and review LPCs" to proceed to screen 5.



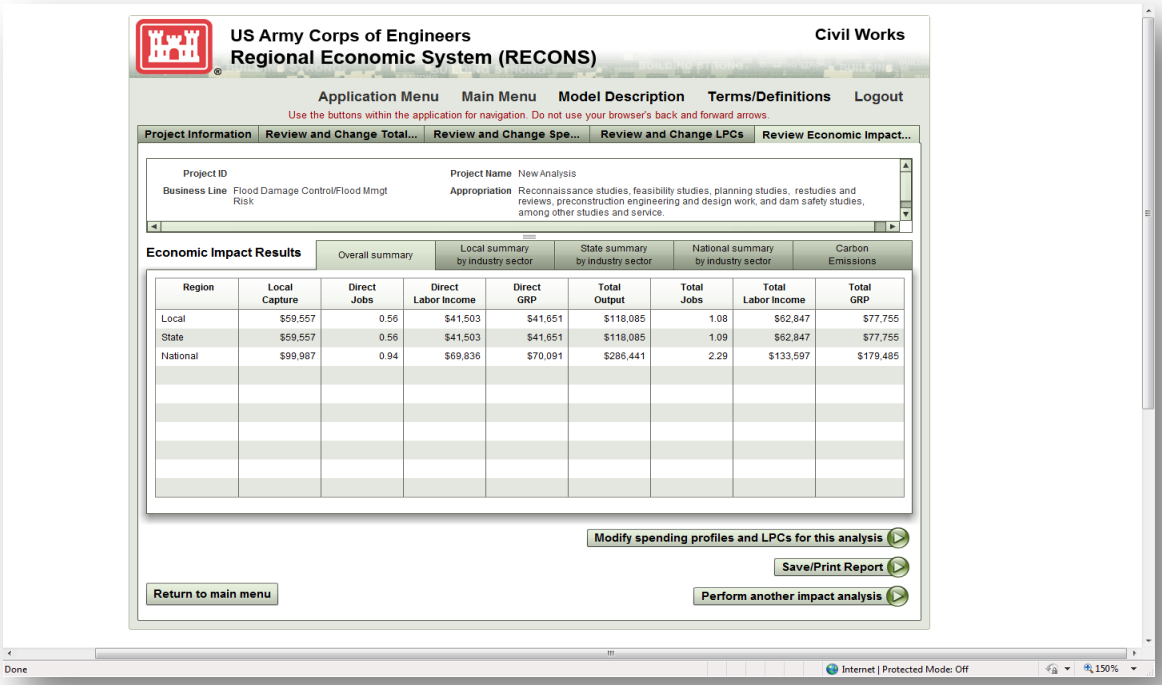
Screen 5: Review and Change LPCs

Under this screen, the user can view the Local, State and National LPCs applied to the industries and sectors within the analysis. The LPC is the percentage of USACE spending or industry revenues captured by industries located within the local, state, or national impact area. Please see the description for screen 6 under Conduct and Analyze a New CW Project – Model from Project. Select "save LPCs profile and calculate economic impact" to proceed to screen 6.

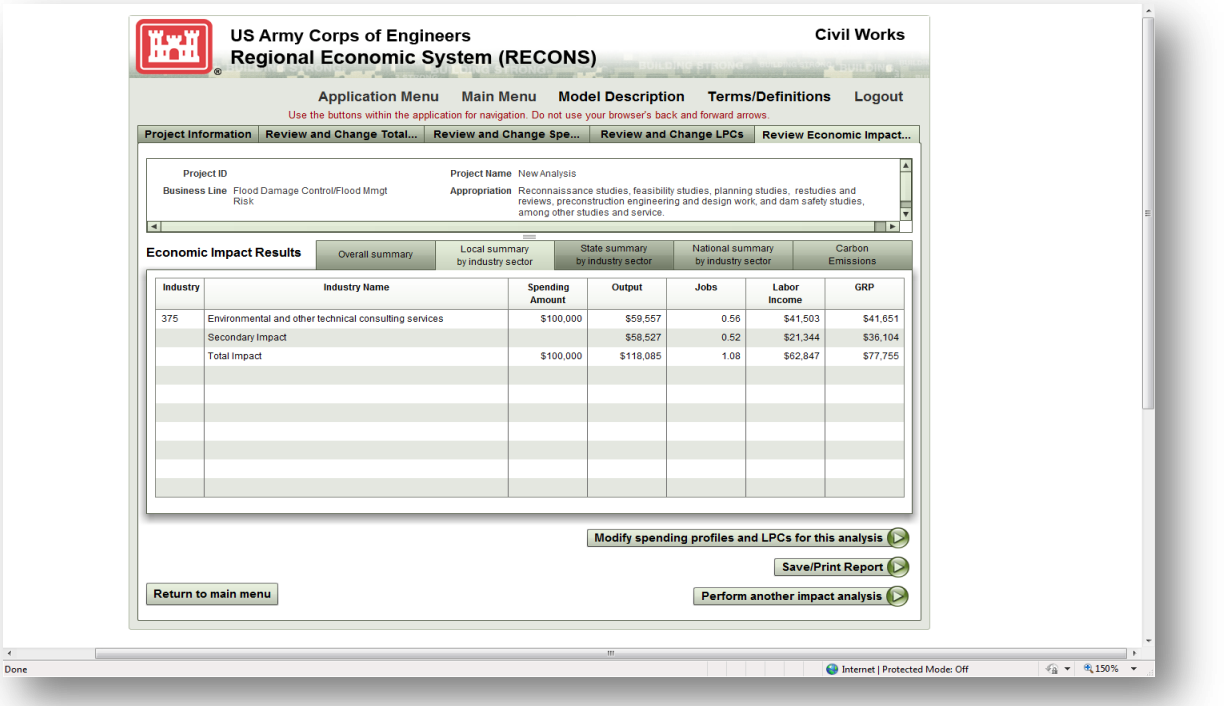


Screen 6: Review Economic Impact Results

Under screen 6, the user is able to view results of the impact analysis. The values provided in the results are in the year that the project or activity was identified by the user as occurring. Please see the description for screen 7 under Conduct and Analyze a New CW Project – Model from Project.



This screen also includes results tabs for local, state, and national summary by industry sector (see screen shot below). Again, this screen is described in the previous Conduct and Analyze a New CW Project -- Model from Project module.

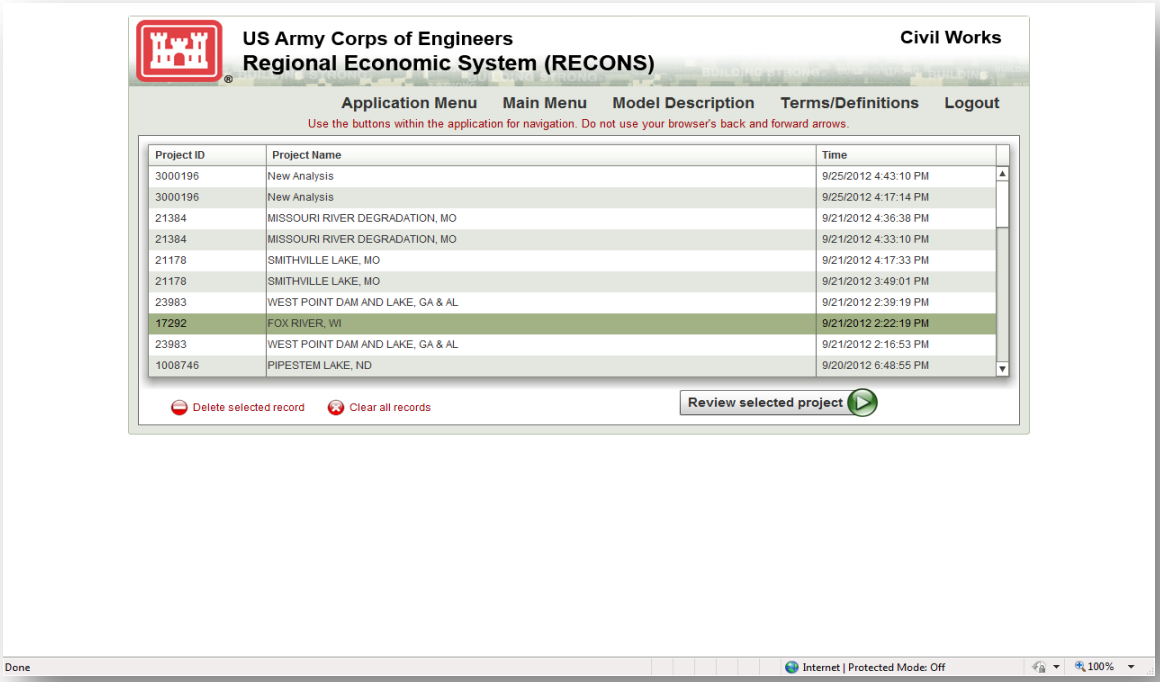


When finished, the user has the choice of saving and/or printing a report from the current analysis, modifying spending profiles and LPCs for this project, or performing another impact analysis.

Review a Previously Conducted CWB Project

This module allows the user to view all CW budget economic impact analyses that the user has undertaken in the past through the "Create and Analyze a New CW Budget Project." This first screen, shown below, allows the user to view all of the analyses by project name and time and data analyzed, from which the user would choose a row. The user then moves through the screens just as if the user were accessing this project analysis again. The user is able to modify the expenditures, date, spending profile allocations, and LPCs. However, the user is unable to select a different work activity. Please see the description in "Create and Analyze a New CW Budget Project" for descriptions of each of the screens in this module.

Screen 1: Select a Project



Conduct a New Analysis of an Existing CWB Project

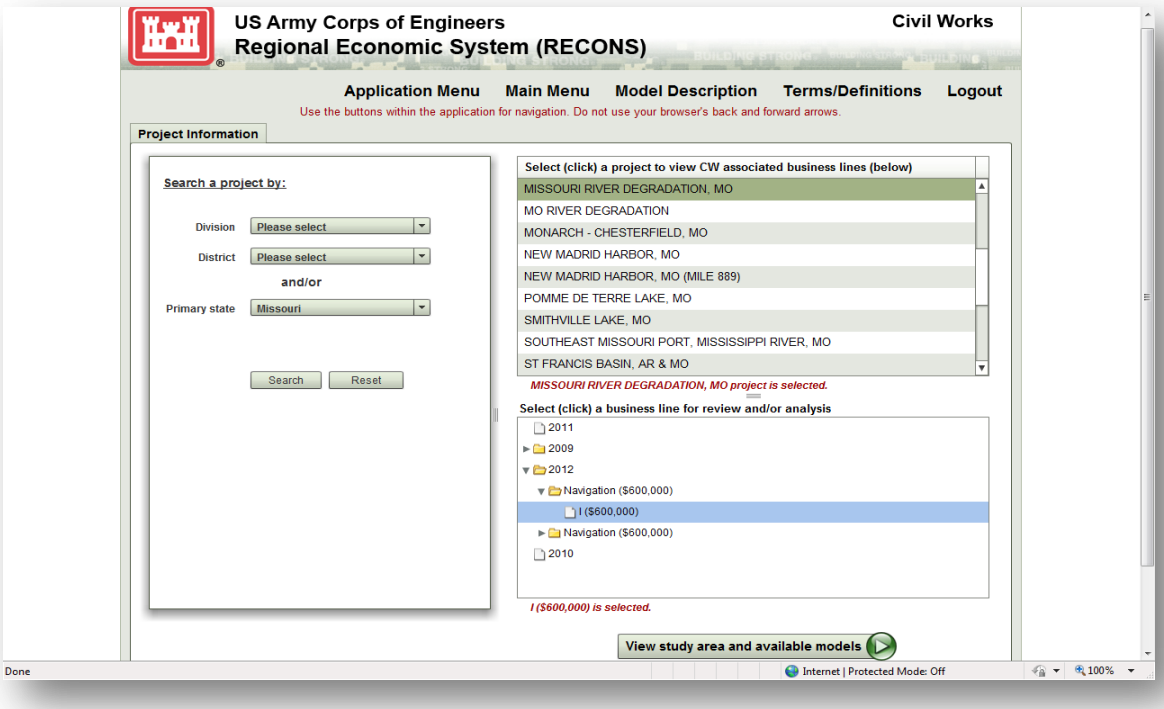
This CW Budget module allows the user to run a new analysis of existing CW budget spending at a project location. RECONS includes the total USACE CW annual budget spending between 2009 and 2012 for project locations by business line and appropriation account (i.e., construction, operations and maintenance, investigations). When the RECONS user chooses the project name and associated location, the business line and appropriation account associated with these project locations are shown in RECONS. The CW budget spending profiles, as described in the RECONS Approach section by business line and appropriation account are available. Again, these are default spending profiles that were based on business line and appropriation account work activities at the *national* level. As such, if RECONS users have better information regarding the Federal spending at this location, modifying or adjusting these spending profiles is recommended. Additionally, users can modify the budget allocation and the year of analysis in this analysis if the user has better information regarding the allocation of Federal costs across the industries.

Screen 1: Select a Project and Business Line

On screen 1, the users must search for projects based on the division, district and/or the primary state in which the project is located. Then select "search," and a list of relevant projects will be shown. The user needs to select the project on which the economic analysis would be undertaken. Once the project has been selected, a list of the CW budget years, business lines, and appropriations accounts with the associated spending amount will be shown. RECONS has been preloaded with the CW budget appropriations by project, business line, and appropriations accounts for years 2009 through 2012. Select the relevant year by clicking on the arrow to the left of the year. If the user would like to use the spending profile for the CW budget for given

business line, which includes all work activities within the business lines (for all of the construction, operations and maintenance, and investigations appropriation accounts), the user should just select the business line. However, the user can also choose to run the business line construction, operations and maintenance, or investigations spending profile by choosing the spending listed under the business lines (by clicking on the arrow to the right of the business line). The appropriations accounts are identified as: C – construction; OM – operations and maintenances; and I – investigations. However, if there were no appropriations under an appropriation account at a certain project location, you would not have the option of running that spending profile. For example, in 2012, a navigation investigation appropriation occurred for the Missouri River Degradation project, but not construction or operations and maintenance appropriations. In this case, for 2012, the user could run either the navigation CW spending profile (for all appropriation accounts) or the navigation investigations CW spending profile (which in this case, are the same) for this project.

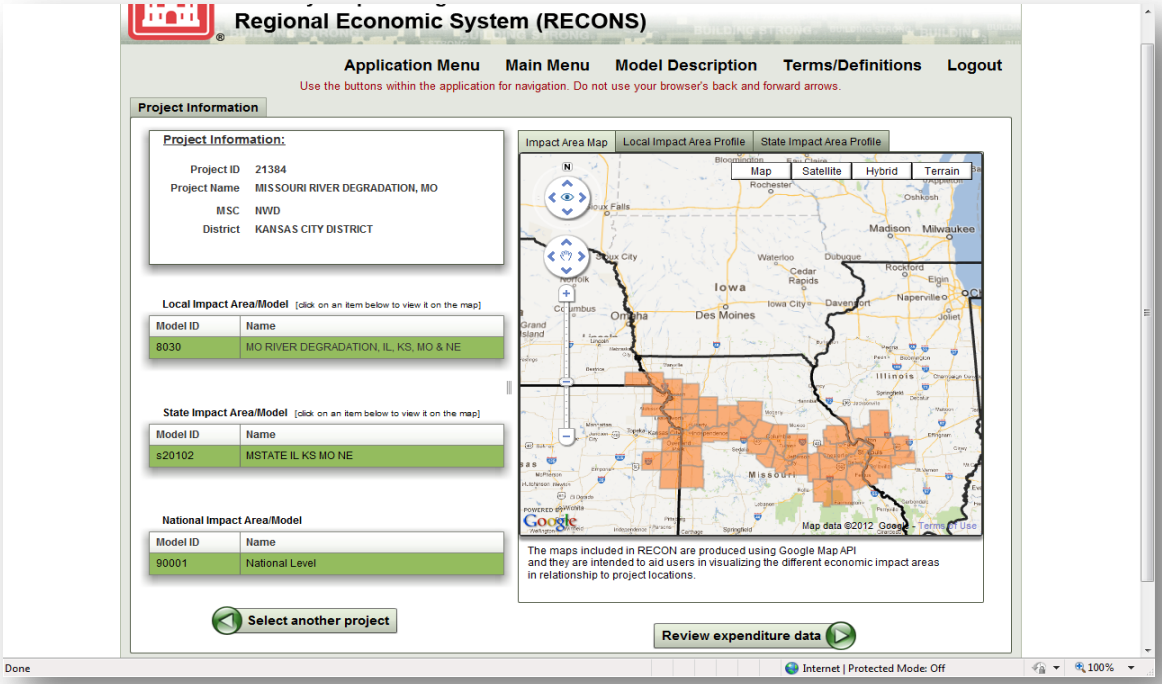
If the user has better knowledge regarding the business line spending at the project level, these more generic business line and appropriation account spending profiles can be modified. If the user knows that a number of work activities or funding are occurring at a project location, the user should consider using the Create and Analyze a New CW Project to estimate multiple work activities. The user would need to run each work activity separately and aggregate the economic impacts. Select "view study area and available models" to proceed to the next screen.



Screen 2: Confirm Impact Area

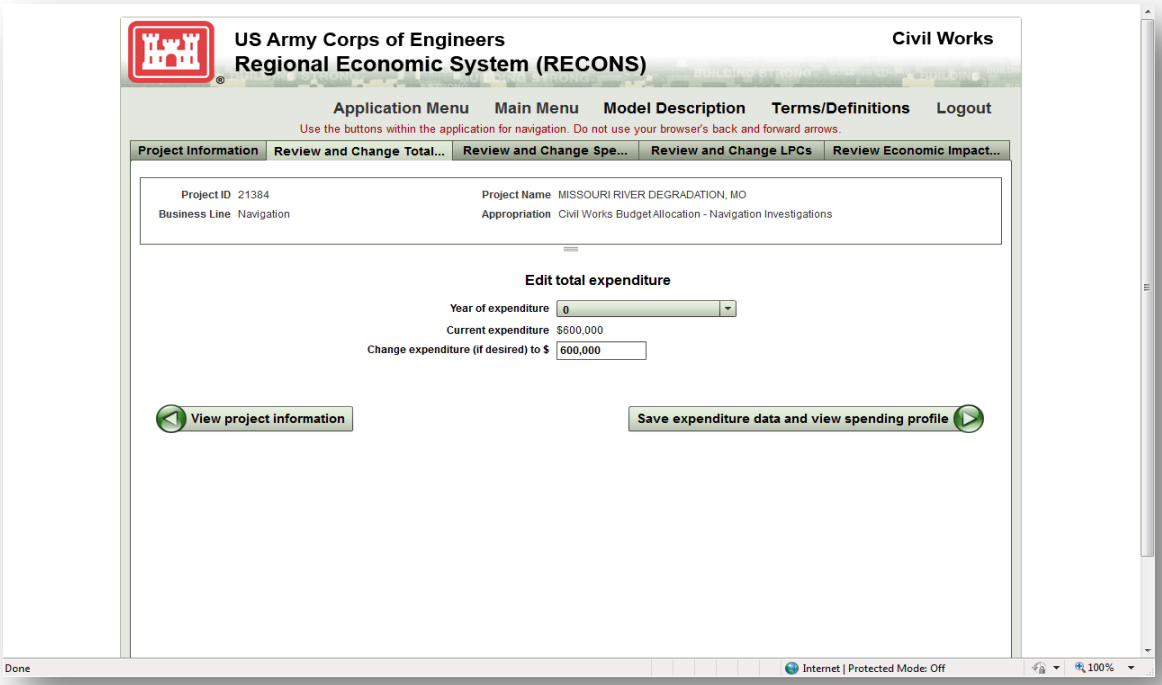
The project name that was chosen on the previous screen is automatically associated with the local and state impact area. Local, state, and national multipliers associated with these impact areas have been obtained from the IMPLAN model for use in RECONS. Please see the description of screen 2 under Create and Analyze a New CW Project – Model for Project. The choice of an impact area cannot be changed in this screen, as they are automatically associated

with the project name and its associated county, metropolitan, micropolitan or large-scale impact area. Select the "review expenditures" button to proceed to the next screen.



Screen 3: Review and Change Total Expenditure

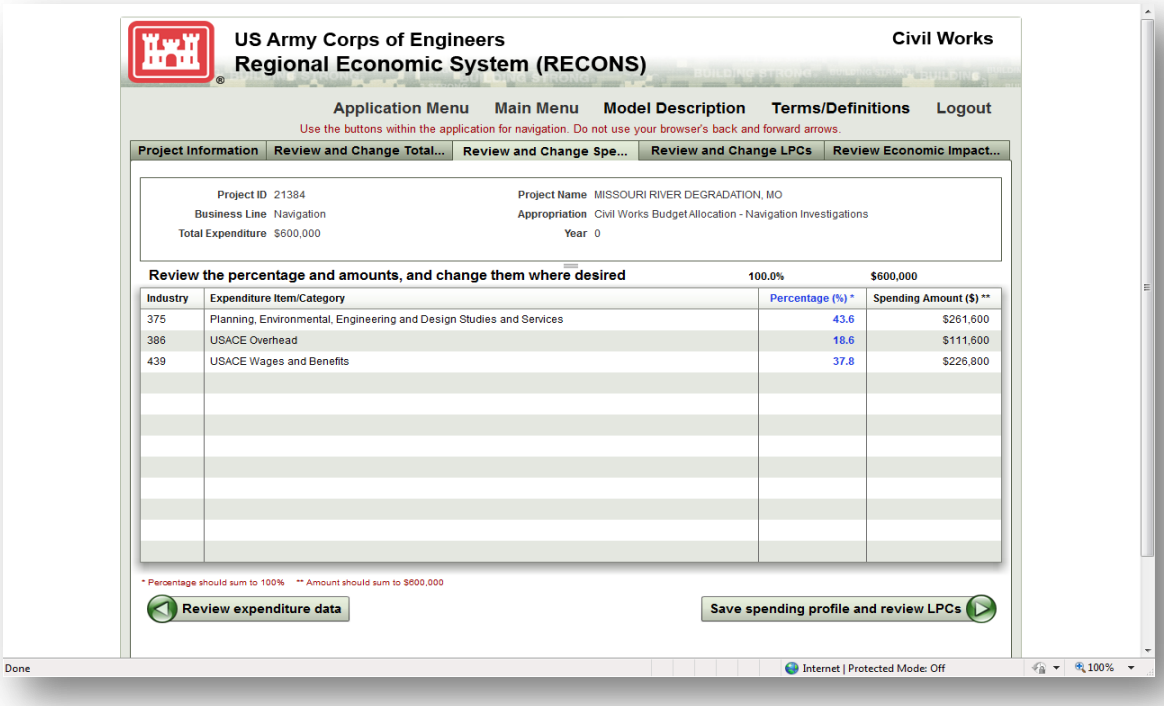
Under this screen, the user will be prompted to change the expenditure and year of expenditure if desired. The user will be able to return to this screen to adjust this amount if needed.



Screen 4: Review and Change Spending Profile

The business line and/or appropriation account identified in Screen 1 is associated with a default CW budget spending pattern that maps the expenditures to one or more industries and sectors associated with the IMPLAN model. Please see the description of screen 5 under Create and Analyze a New CW Project – Model for Project.

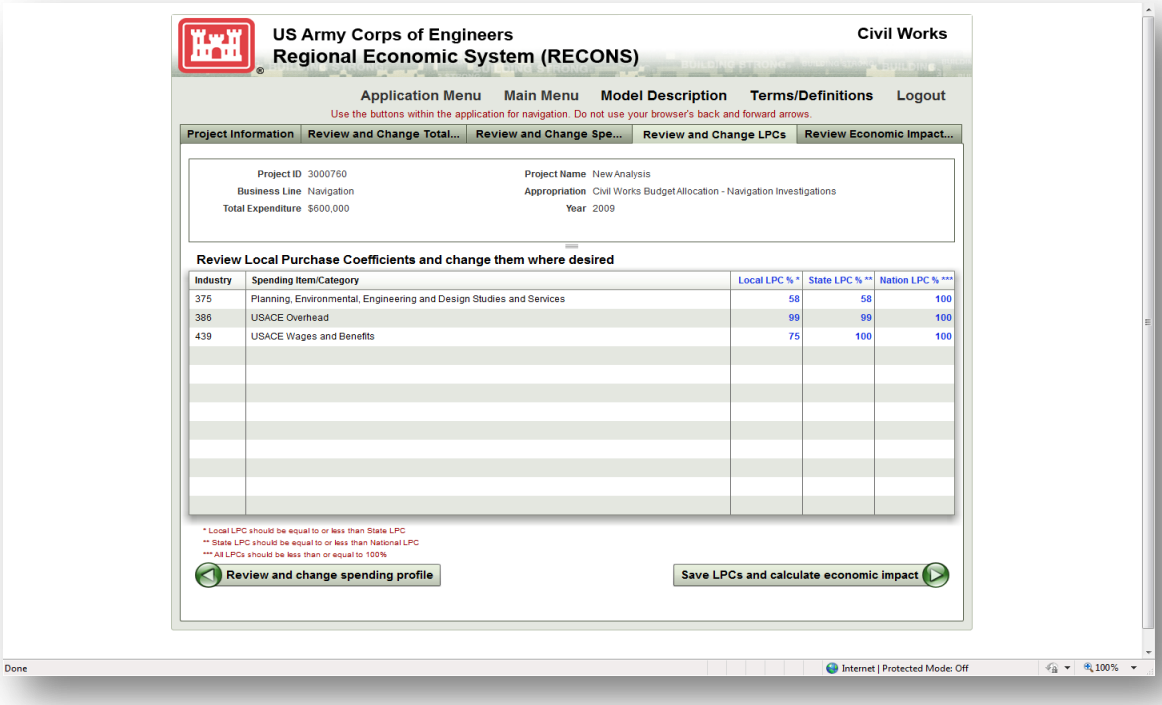
The CW spending profiles have been developed based on the ARRA national work activities sorted by business line and appropriation account. These activities have been adjusted to include the proportion of USACE labor and overhead again analyzed by business line and appropriation account at the national level. The spending profile can be changed to adjust the allocations among the industries and categories that are present, although additional industries cannot be added. However, changing the profile (i.e., adjusting the percentages) should only be done if the user has specific information regarding the allocation of expenditures for this specific project. All percentages should add to 100%. Additional description regarding the CW budget spending profiles, USACE wages and benefits, USACE overhead, and private sector labor response coefficients are provided in the RECONS Approach and in more detail in the USACE Federal Spending Methodology Manual and Appendix A. Select "save spending profile and review LPCs" to proceed to screen 5.



Screen 5: Review and Change LPCs

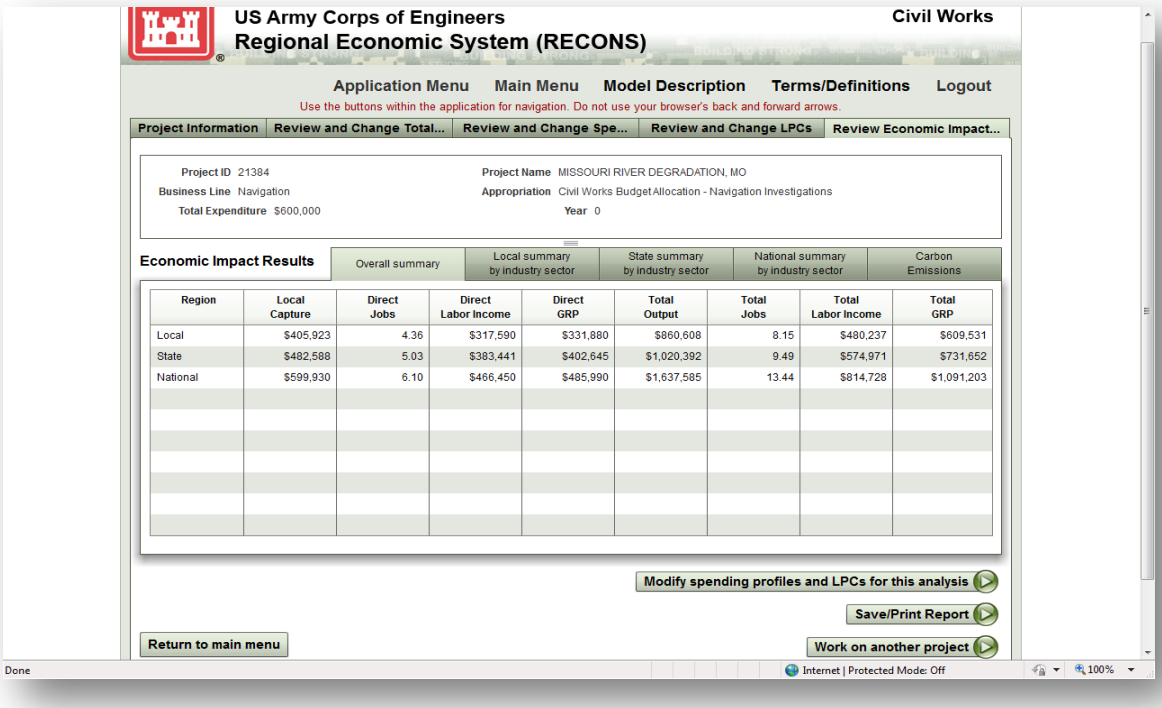
Under this screen, the user can view the Local, State and National LPCs applied to the industries and sectors within the analysis. Please see a description of screen 6 under Create and Analyze a New CW Project – Model from Project. For the CWB spending profiles, the LPCs for USACE labor and benefits have default values of 75% for the local impact area and 100% for the state and national impact area. This assumption implies that 75% of the USACE employment associated with this spending resides at the local impact area location (project location), while all of the USACE employees associated with this spending reside within the state and nation. LPCs

for USACE overhead have been based on IMPLAN's RPCs. If the user has knowledge about where the overhead expenditures are occurring (USACE office locations), the user can adjust the LPCs on this screen. For example, if the project is at a remote location and the main office supporting this project is not in the same state, the user may wish to reduce the USACE Overhead LPC for the local impact and state impact area. All other LPCs are the same as those described in the Federal Spending Methods Manual and Appendix A; most of the LPCs rely of IMPLAN's Trade Flows Model. The user must select "save LPCs and calculate economic impact" at the bottom of the screen to proceed to the following screen.

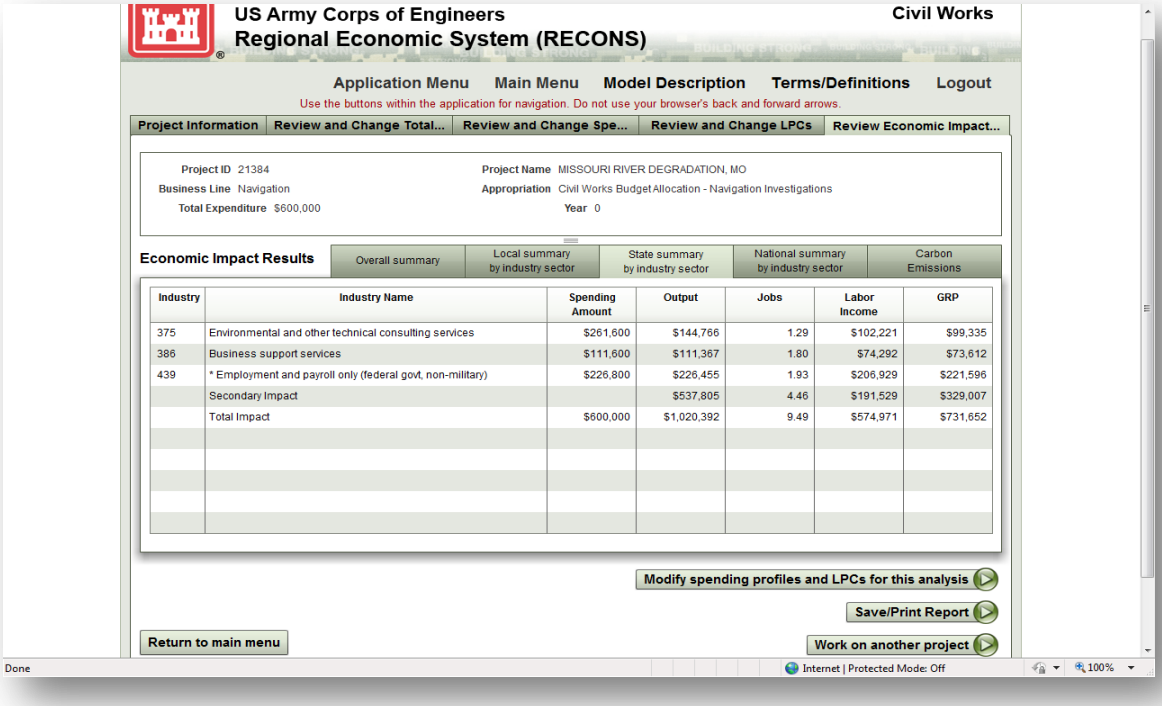


Screen 6: Review Economic Impacts

Under screen 6, the user is able to view results of the impact analysis. The values provided in the results are in the year that the CW budget allocation was identified by the user as occurring. Please see a description of screen 7 under Create and Analyze a New CW Project – Model from Project.



This screen also includes results tabs for local, state, and national summary by industry sector (see screen shot below).



STEMMING-FROM EFFECTS OF USACE PROGRAMS AND INFRASTUCTURE

The Civil Works Program in the first component of RECONS as well as the ARRA project spending in the last RECONS component is focused on the economic impacts associated with USACE Federal spending in support of USACE programs, infrastructure, business lines, as well as USACE employment and overhead. Stemming-from effects are focused on the economic impacts and contribution that result from the existence of USACE infrastructure and programs. For example, navigation channels support waterway and port industries enabling the shipment of goods. USCAE recreation projects support visitation and visitor spending that supports local and regional economies. Remediated FUSRAP sites enable economic activities at those sites, supporting jobs and income in local and regional economies.

This section will describe the Stemming-From Effects RECONS component and its five associated RECONS modules:

- Coastal and Great Lakes Ports – By Container Shipments
- Coastal and Great Lakes Ports – By Commodity Shipments
- FUSRAP Sites
- Inland Waterway Shipments
- Recreation Projects

Coastal and Great Lakes Ports – By Container Shipments

The objective of the USACE's Navigation Business Line is to provide safe, reliable, and efficient waterborne transportation systems. The USACE accomplishes this mission through a combination of capital improvements and the operation and maintenance of existing facilities and waterways. There are stemming-from effects associated with the USACE navigation program and infrastructure.

- The first effect is the economic contribution of the ***port industries*** that transport or store products or goods that are moved through a port maintained by USACE (e.g., through dredging or channel improvements). These are industries such as cargo handling, storage and warehousing, barges, trucking, rail, etc.

- The second type of stemming-from effect includes industries that benefit from the port and waterway infrastructure and utilize the port industries and services to ship or store their products (***port-dependent industries***). These are industries such as automobile wholesalers, petroleum refineries or wholesalers, agricultural product manufacturers or wholesalers, all of whom are located near a port to utilize port services to transport, move, process, and/or store their goods and products perhaps in a more efficient and cost-effective manner than would be in another location.

This RECONS module is focused on the stemming-from effects associated with the *port industries.*[9] These port industries' stemming-from effects can be estimated by RECONS users

[9] Stemming-from effects of port-dependent industries have not yet been included in RECONS.

providing information on cargo types and volumes or by commodities. This module estimates economic impacts by the type and volume of cargo shipped. The following module, Coastal and Great Lands Ports – By Commodity Shipments, estimates economic impacts by the volume of commodities and cargo shipped. The RECONS users need to enter these volumes by either container-type or commodity. The stemming-from effects of inland waterway industries are provided in the Inland Waterways Shipments module.

Stemming-from effects associated with USACE navigation programs and infrastructure associated with ports are a function of how much cargo is moving in and out of the port. This RECONS Coastal and Great Lakes ports modules use data provided by the U.S. Department of Transportation Maritime Administration (MARAD) (U.S. Department of Transportation, 2000), which developed Port Kit more than a decade ago to estimate the economic impacts for coastal and Great Lakes ports. Pork Kit and RECONS make the link between cargo tonnage and spending at a port and the employment and income generated by industries using those facilities.[10]

Review Previously Conducted Port Analysis

This module allows the user to review and change previously conducted Coastal and Great Lakes Ports – By Container Type stemming-from effects analysis. RECONS automatically saves each "New Port Analysis" that is completed. The RECONS user needs to choose the analysis to review be selecting the appropriate row in the first screen, and RECONS provides the impact area, year, type of analysis, and date that the analysis was undertaken. The user has the option to review and change the cargo volumes (RECONS estimates the associated costs), the inland transportation modal split, and the LPCs, and re-run the economic impact analysis, if needed. All screens are similar to those described in the New Port Analysis module; please refer to the following description for more information on this module.

Conduct New Port Analysis

The RECONS port module estimates the economic contribution of cargo shipments within ports for various types of cargo, including:

- Automobiles are handled at many ports and are usually carried on specialized roll-on/roll-off ships.

- Break bulk cargo is typically material stacked on wooden pallets and lifted into and out of the hold of a vessel by cranes on the dock or aboard the ship itself. The volume of

[10] Currently, there are efforts underway to update Port Kit with updated economic information that reflects changes in wages, expenditures, and cargo handling technology. Port Kit is currently aligned with RIMS II industries, on which input-output multipliers are estimated by the U.S. Bureau of Economic Analysis. RECONS used the currently available version of Port Kit as a basis for developing the spending profiles industry allocations per ton of commodity shipped. Costs and values were inflated and shown in current prices. When the new version is available, RECONS will be updated with new spending profiles.

break bulk cargo has declined dramatically worldwide as containerization has grown. A safe and secure way to secure break bulk and freight in containers is by using Dunnage Bags.

- Dry bulk cargo, such as salt, oil, tallow, and Scrap metal, is usually defined as commodities that are neither on pallets nor in containers. Bulk cargoes are not handled as individual pieces, the way heavy-lift and project cargoes are. Alumina, grain, gypsum, logs and wood chips, for instance, are bulk cargoes.

- Liquid bulk cargo includes products such as oil, chemical, or liquefied petroleum gas.

- Containers are the largest and fastest growing cargo category at most ports worldwide. Containerized cargo includes everything from auto parts, machinery and manufacturing components to shoes and toys to frozen meat and seafood.

- Project cargo and the heavy lift cargo include items like manufacturing equipment, air conditioners, factory components, generators, wind turbines, military equipment, and almost any other oversized or overweight cargo which is too big or too heavy to fit into a container.

The shipping of this cargo is supported by various port industries, such as port services, fuel services, cargo handling and packing, and warehousing and storage services. Inland modes of transportation are also supported by port cargo shipments and are provided in the RECONS module, including rail, air, barge, pipeline, and short and long-distance trucking. Port kit provides the default expenditures for the port service and inland transportation per ton of cargo shipped. The inland modal shares are provided by the Freight Analysis Framework (FAF); these are default values provided for each type of cargo and can be modified with better information from the port. The cargo type and volumes need to be provided by the RECONS user. The screens for the Coastal and Great Lakes Ports – By Container Type are described for this module.

Screen 1: Develop Spending Profile

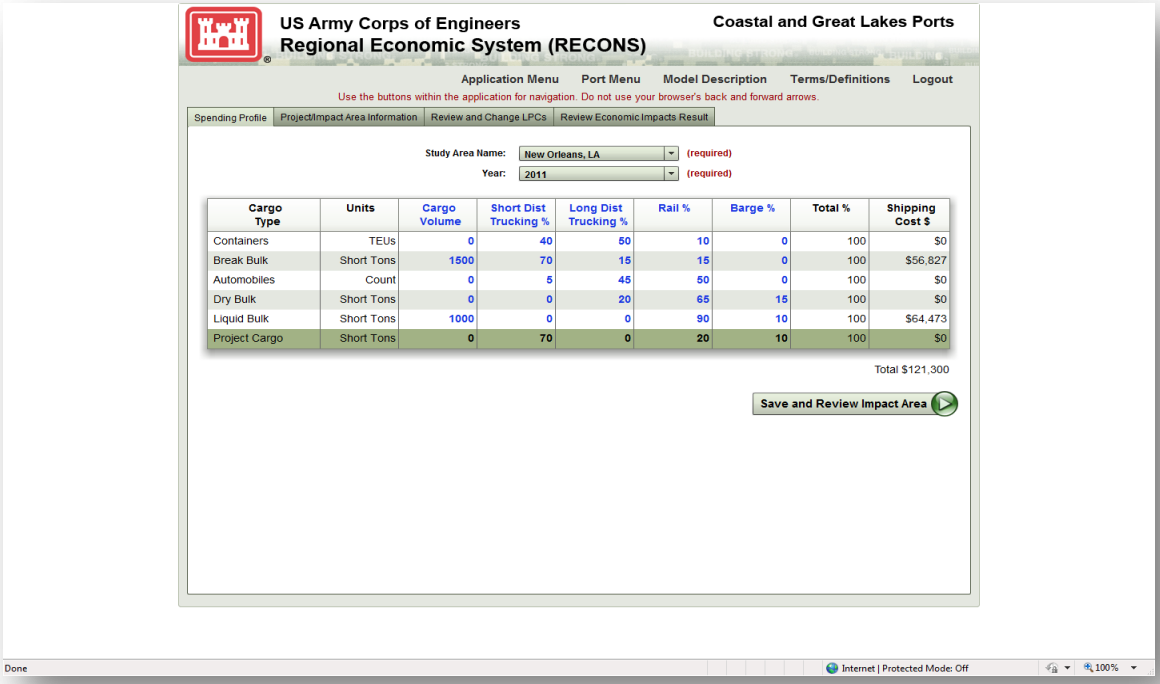
In screen 1, the RECONS user must identify the study area or impact area name. RECONS includes 123 principal coastal and Great Lakes ports, as identified by the Navigation Data Center.[11] Each of the ports was identified with an impact area, primarily a metropolitan or micropolitan area, as described in the following screen. The RECONS user also needs to select the year that the shipping activity is or has occurred; RECONS, like IMPLAN estimates, impacts on an annual basis. If possible, annual shipment volumes should be entered into RECONS.

The RECONS user needs to identify the short tons, number, or TEUs[12] of cargo shipped. If the user knows the volume of commodity shipped, he or she can use the Coastal and Great Lakes

[11] The inland waterway ports were excluded from the list as they were included in the Inland Waterway Shipments RECONS module.

[12] The twenty-foot equivalent unit (or TEU) is an inexact unit of cargo capacity often used to describe the capacity of container ships and container terminals. It is based on the volume of a

Ports – By Commodity Module, described below. The default costs and allocation among industries were based on values provided by Pork Kit. RECONS provides default allocation of the inland modal shares (rail, truck, barge) based on the Freight Analysis Framework. Under screen 1, the RECONS user can adjust the default inland modal split among short distance trucking, long distance trucking, rail and barge if the user has specific information about the inland modes of transportation of the cargo shipment. Select "save and review economic impact area" to move to the following screen.



Screen 2: Confirm Impact Area

The impact areas associated with the ports are identified as county or multi-county MSAs or micro-SAs in which the port lies. In some cases, multiple ports lie within a single MSA. Only one port can be analyzed at a time; however, ports that lie in the same MSA will have the same multipliers as the geography is the same. The use of MSA's for defining labor markets is a standard practice for identifying economic impact regions. See further description in the Federal Spending Methods Manual.

The port name that was chosen on the previous screen is automatically associated with the local impact area. Local, state, and national multipliers associated with these impact areas have been obtained from the IMPLAN model for use in RECONS. The port name, MSA, or micro-SA name is identified at the top left of the screen. When the user double clicks on the Local Model name, the map will zoom in on this location and the cursor over the map will show the names of the counties included in the Local Model impact area. Similarly, the state or multi-state impact

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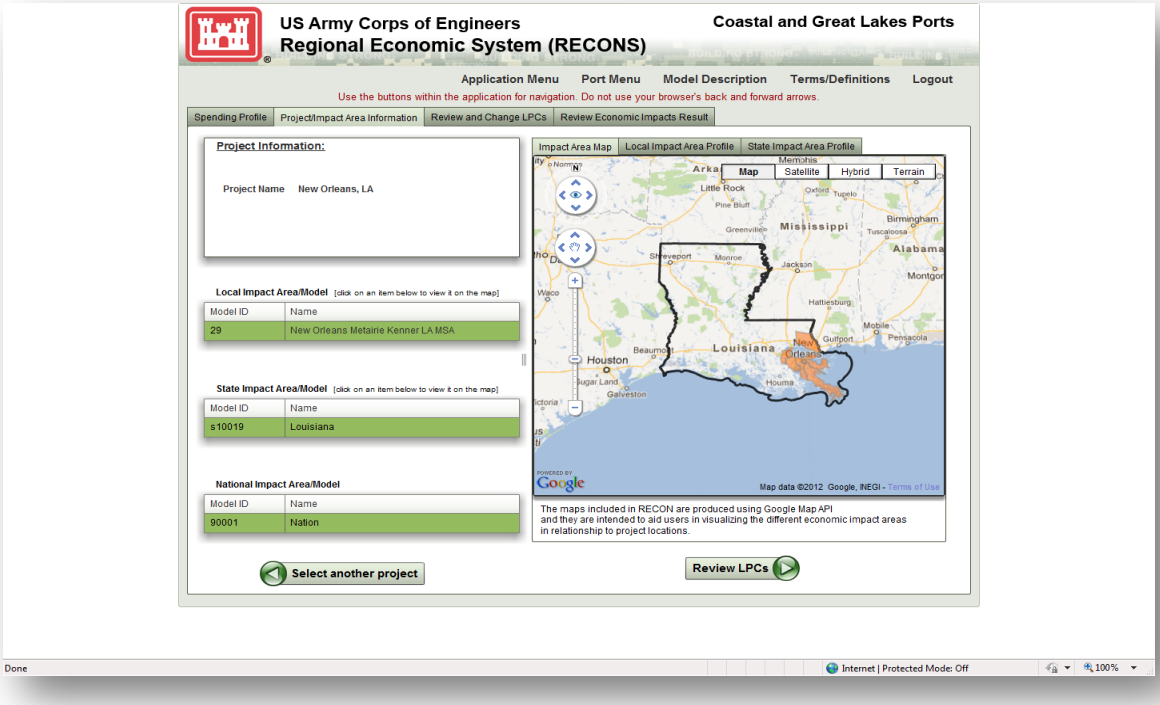
20-foot-long (6.1 m) intermodal container, a standard-sized metal box which can be easily transferred between different modes of transportation, such as ships, trains and trucks.

area is also listed, and if the user double clicks on this name, the map will zoom into the chosen state. Regardless of if the user wants to view the map, he or she needs to double click on the local, state, and national model name to select these models for analysis.

This screen also allows the user to view demographic and economic profile information associated with the "Local Impact Area Profile" and "State Impact Area Profile," as described in screen 2 of the Create and Analyze New CW Project – Model From Project.

The choice of an impact area cannot be changed in this screen, as they are automatically associated with the project name and its associated county, metropolitan, or micropolitan impact area. The user can opt to "select another project" to return to the previous screen to choose another port location. Select "Review LPCs" button to proceed to the next screen.



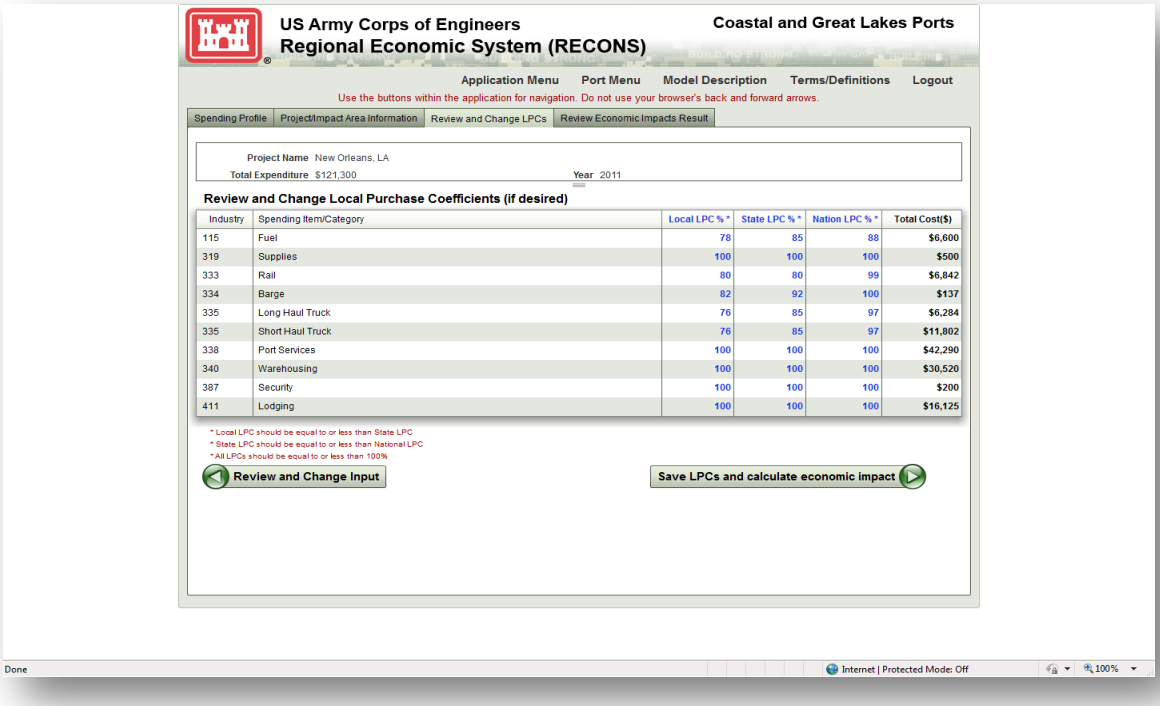
Screen 3: Review and Change LPCs

Under screen 3, the user is able to view the spending profile and the associated local, state, and national LPCs provided by RECONS. The IMPLAN industry number is provided in the left-hand column, while the spending item/category is next to the IMPLAN sector. This item or category is not necessarily the IMPLAN industry name, but the item in the port industry spending profile, based on Pork Kit information. The user cannot adjust the spending profile at this point. However, the user can adjust the inland transportation portion of the spending profile on the first screen.

The LPCs (also known as the geographic capture rate) are also shown on this screen, which are the portion (i.e., percentage) of industry revenues captured by industries located within the local, state, or national impact area. The LPCs generally increase as the geographic area increases as more economic activity can be captured within a greater geographic region. See additional description of LPCs in the RECONS Approach section.

The user has the ability to change these LPCs if the user has information on the portion of industry revenues (shipping costs) captured within the local impact area. Note, the user should avoid changing this information unless better and specific information is known about the capture of these expenditures or revenues or location of these companies. For example, although a company may be located within the region, its regional or headquarters may be located outside the impact area, to which a portion of the spending or revenues would be allocated. As noted above, the national LPC must be greater than or equal to the state LPC, which needs to be greater than or equal to the local LPC.

Select "save LPCs and calculate economic impact" at the bottom of the screen to proceed to the following screen.

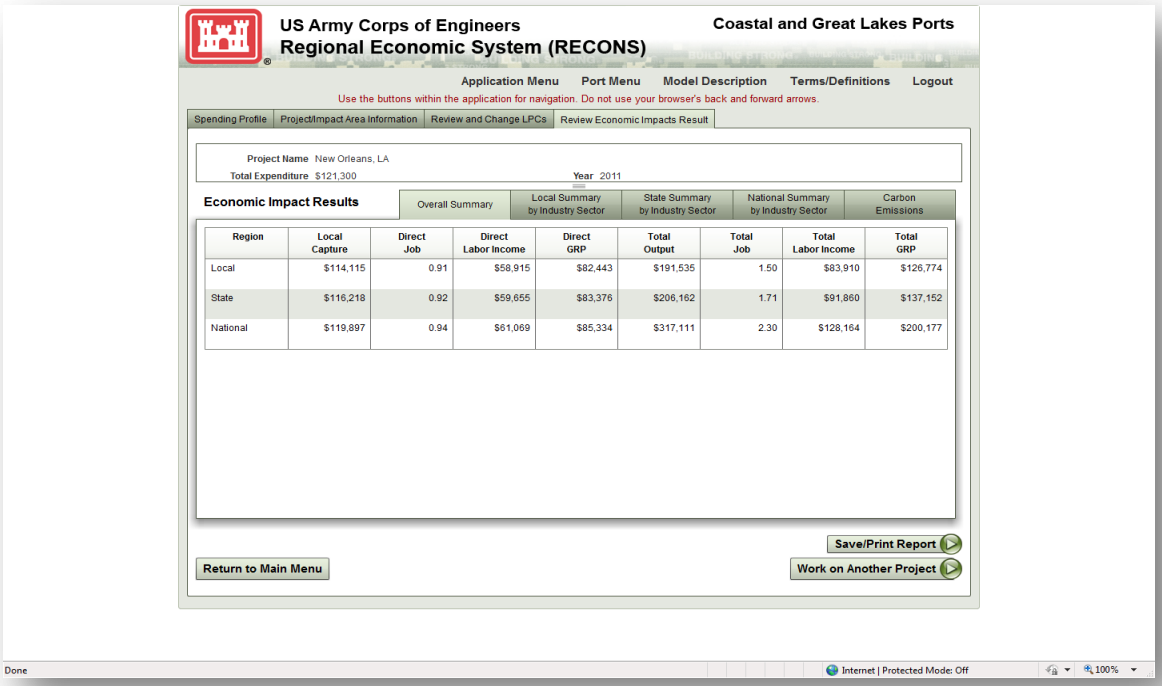


Screen 4: Review Economic Impact Result

Under screen 4, the user is able to view results of the impact analysis. The port name is provided at top of the screen, the total expenditure, and the year of the shipping activity. The resulting economic impact values are provided in the year that the activity was identified by the user as occurring.

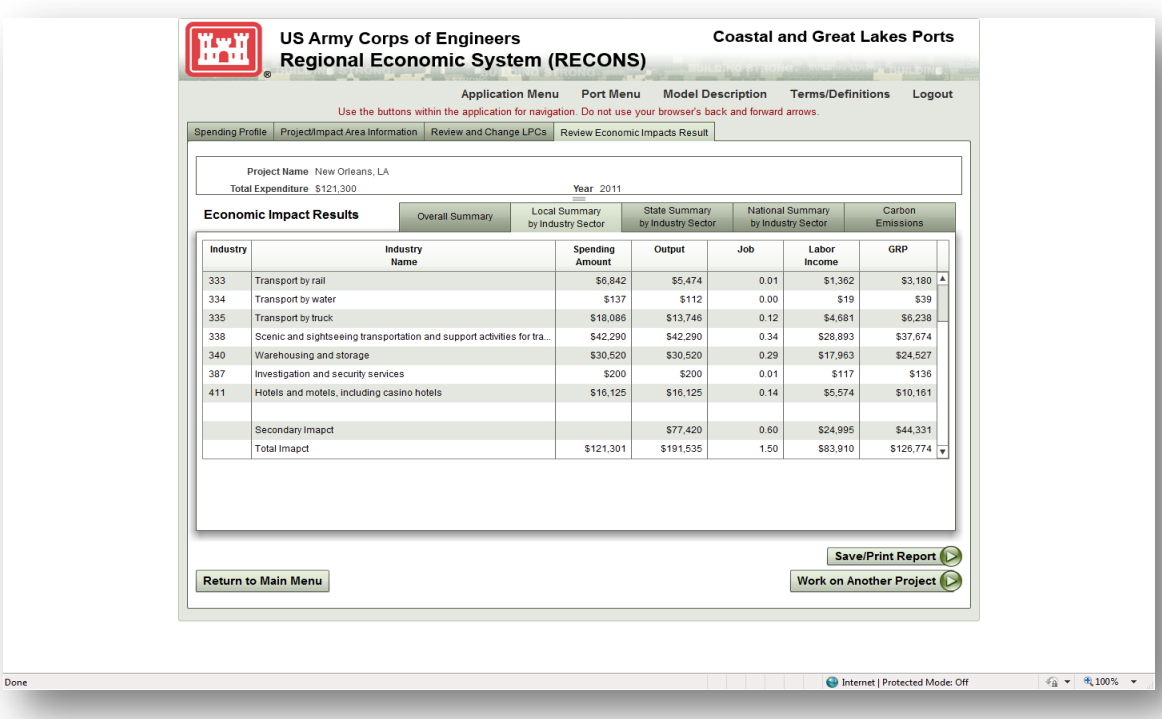
The overall summary provides a snapshot of the local, state, and national economic impacts. The first column identifies the impact area or region of analysis. The second column titled "local capture" is an estimate of the port industry revenue (direct effect) captured within the impact area. This is calculated by applying the local, state, or nation LPC to the direct revenue estimate by industry. The "local capture" is equal to the direct economic output, which is the total sales or revenues allocated to the specific industry (e.g., waterway shipping or shipping support industries). Other direct effects, including jobs, labor income, and Gross Regional Product (also known as value added), are also provided on this summary screen. Again, direct effects are associated with the particular industry affected. The total economic output, total jobs, total labor

income, and total Gross Regional Product are the direct effects as well as the multiplier effects associated with this economic activity. The multiplier effects include indirect and induced effects, as described below.



On this screen, there are tabs for the local, state, and national summary by industry sector. Each of the summary tabs by industry includes the identification of the industries affected and their associated direct impacts. All industries listed on these screens are directly affected industries. For example, if warehousing and storage industry is listed in these tabs, the local capture would be this industry sales captured in the impact area (i.e., multiplied by the local LPC).

Additionally, the direct jobs, labor income, and gross regional product are shown associated with this warehousing and storage industry. The secondary impacts are a summary of the multiplier effects for all directly affected industries, which include both indirect and induced effects. Indirect impacts include industries that support the directly affected industry, and induced effects occur when workers associated with the direct and indirect industries spend their salaries in the impact area, creating additional jobs and income. Information on carbon emissions is also provided and described in the Create and Analyze New Civil Works Budget Project, Screen 7 Review Economic Impact Results. When finished, the user has the choice of saving and/or printing a report from the current analysis, work on another port analysis project, or returning to the main menu.



Coastal and Great Lands Ports – By Commodity Shipments

Many of the screens and analysis under the Ports Commodity Shipments module is the same as the previous Port Container Shipments module. The exception is that the user is able to identify the shipments per container as well as by the type of commodity. Therefore, there is one additional screen (screen 1) in the beginning of the module to allow the user to specify the volumes or units of shipment by commodity. Additionally, the user is also able to view the economic impact results by commodity.

Review Previously Conducted Port Analysis

This module allows you to review and change previously conducted Coastal and Great Lakes Ports – By Commodity Shipments stemming-from effects analysis. RECONS automatically saves each New Port Analysis that is completed. The RECONS user needs to choose the analysis to review, and RECONS provides the impact area, year, type of analysis, and date that the analysis was undertaken. The user should click on the previous analyses, and press the "review selected project" to proceed to the following screens. The user has the option to review and change the inland transportation modal split and the LPCs, and rerun the economic impact analysis, if needed. All screens are similar to those described in the New Port Analysis module; please refer to the following Conduct New Ports Analysis description for more information.

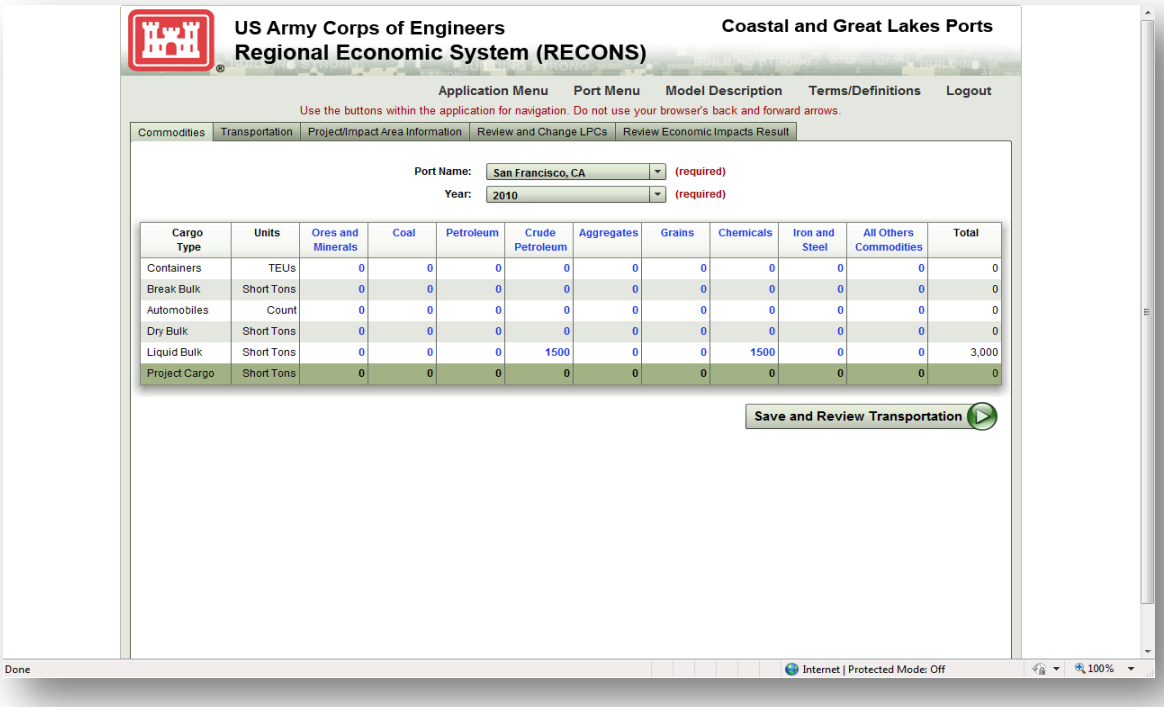
Conduct New Port Analysis

This module, as described above, allows the RECONS user to estimate economic impacts associated with commodities shipped in the coastal or Great Lakes ports.

Screen 1: Identify Commodities

In screen 1, the RECONS user needs to identify the study area or impact area name. As described in the Coastal and Great Lakes Ports – By Container Shipments module, RECONS includes 123 principal coastal and Great Lakes ports, as identified by the Navigation Data Center. Each of the ports was identified with an impact area, primarily a metropolitan or micropolitan area, as described previously. The RECONS user needs to select the year that the shipping activity is or has occurred.

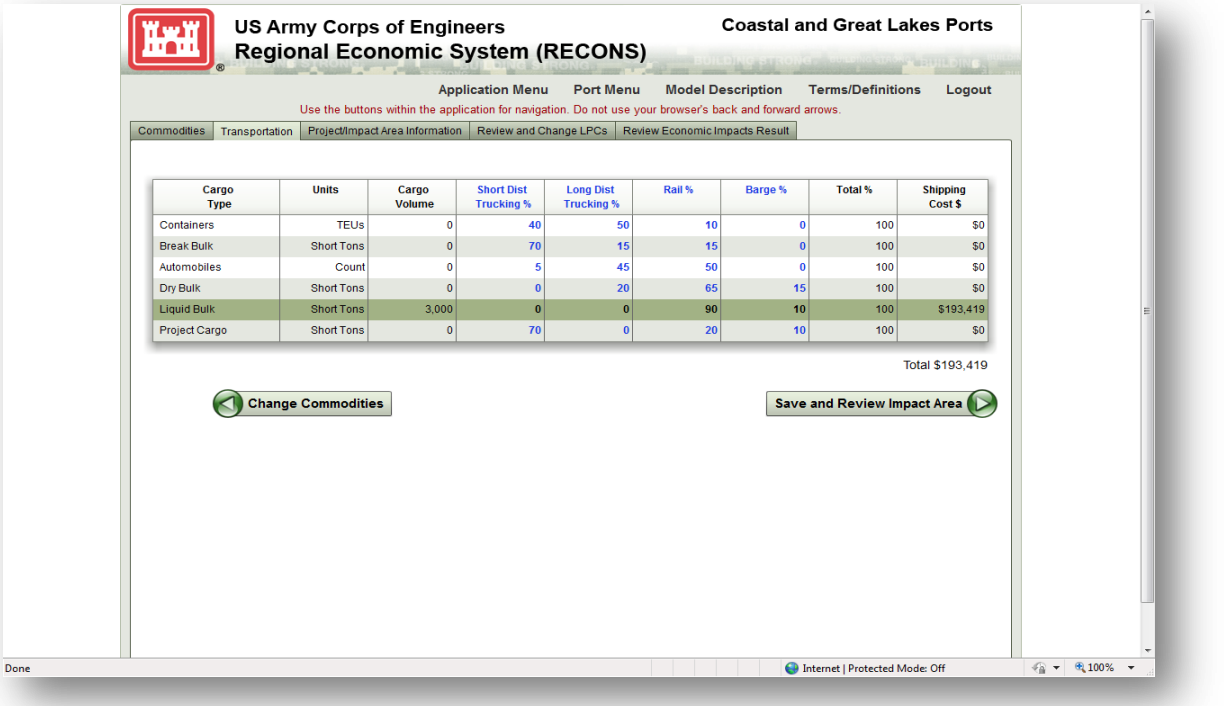
Under screen 1, the RECONS user needs to identify the short tons, number, or TEUs[13] of cargo shipped by commodity. If the user does not know the volume shipped by commodity, he or she can use the Coastal and Great Lakes Port Analysis – by Cargo Type Module. Similar to the Coastal and Great Lakes Ports – By Container Shipments module, the default costs and allocation among industries were based on analysis by Pork Kit. Once the volume and type of cargo has been specified, the RECONS user should select "save and review transportation" to proceed to the next screen.



[13] The twenty-foot equivalent unit (or TEU) is an inexact unit of cargo capacity often used to describe the capacity of container ships and container terminals. It is based on the volume of a 20-foot-long (6.1 m) intermodal container, a standard-sized metal box which can be easily transferred between different modes of transportation, such as ships, trains and trucks.

Screen 2: Identify Inland Transportation Modes

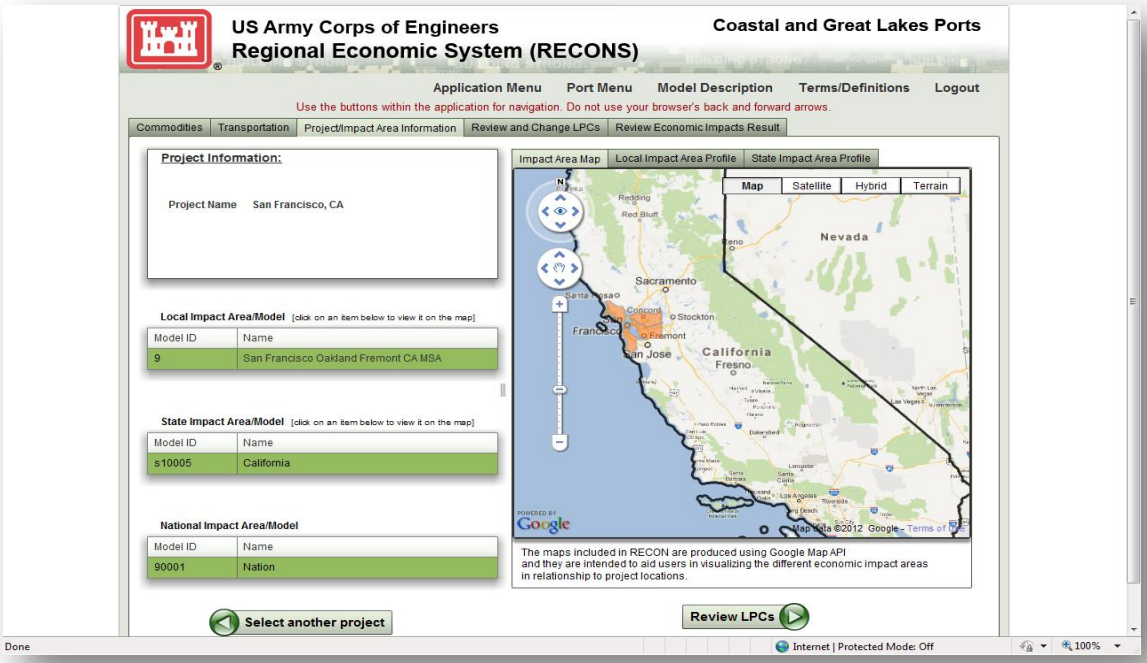
In this screen, RECONS provides default allocations of the inland modal shares based on the Freight Analysis Framework. Under screen 2, the RECONS user can adjust the default inland modal split among short distance trucking, long distance trucking, rail and barge if the user has specific information about the inland modes of transportation of the cargo shipments. The cargo volumes cannot be modified in this screen; the user must return to screen one to modify the volumes of commodities shipped. Select "save and review economic impact area" to move to the following screen.



Screen 3: Confirm Impact Area

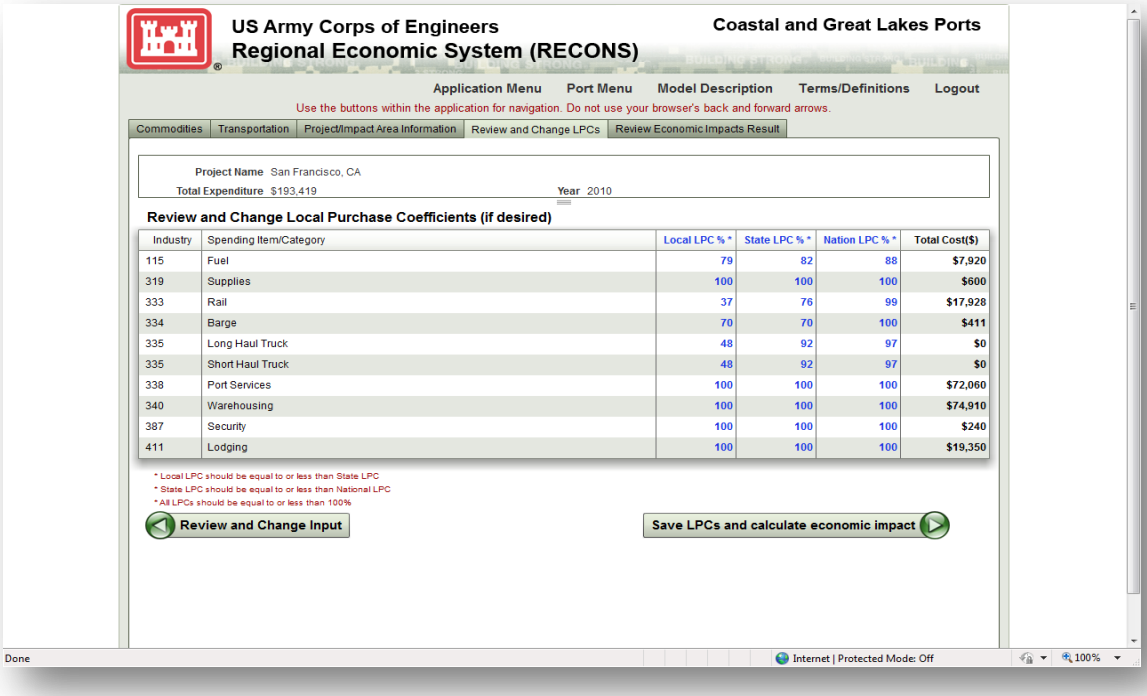
The impact areas associated with the ports are largely identified as county or multi-county Metropolitan Statistical Area (MSA) or micropolitan statistical area in which the port lies, as described in the Coastal and Great Lakes Ports – By Container Shipments module. All of the features on this screen are described in screen 2 of the Coastal and Great Lakes Ports – By Container Shipments module.

The choice of an impact area cannot be changed in this screen, as they are automatically associated with the project name and its associated county, metropolitan, micropolitan or large-scale impact area. The user can opt to "select another project" to return to the previous screen to choose another port location. Select "Review LPCs" to proceed to the next screen.



Screen 4: Review and Change LPCs

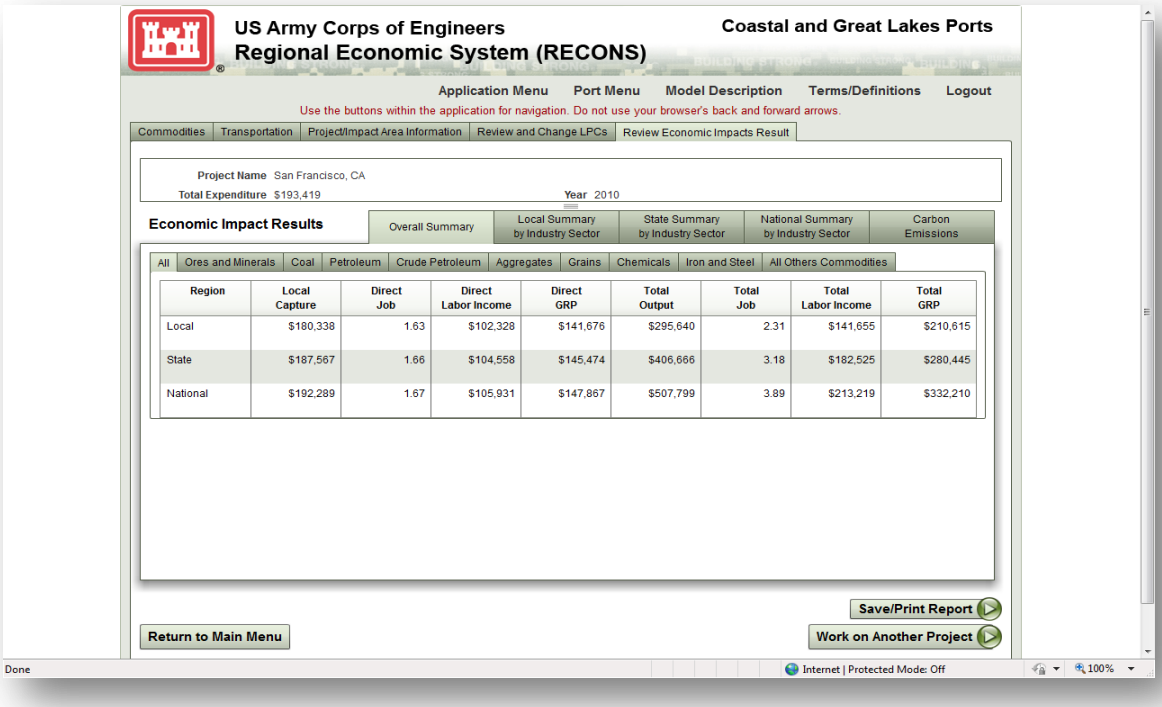
Under screen 4, the user is able to view the spending profile and the associated local, state, and national LPCs provided by RECONS. All of the features on this screen are described in screen 3 of the Coastal and Great Lakes Ports – By Container Shipments module. The user should select "save LPCs and calculate economic impact" at the bottom of the screen to proceed to the following screen.



Screen 5: Review Economic Impact Result

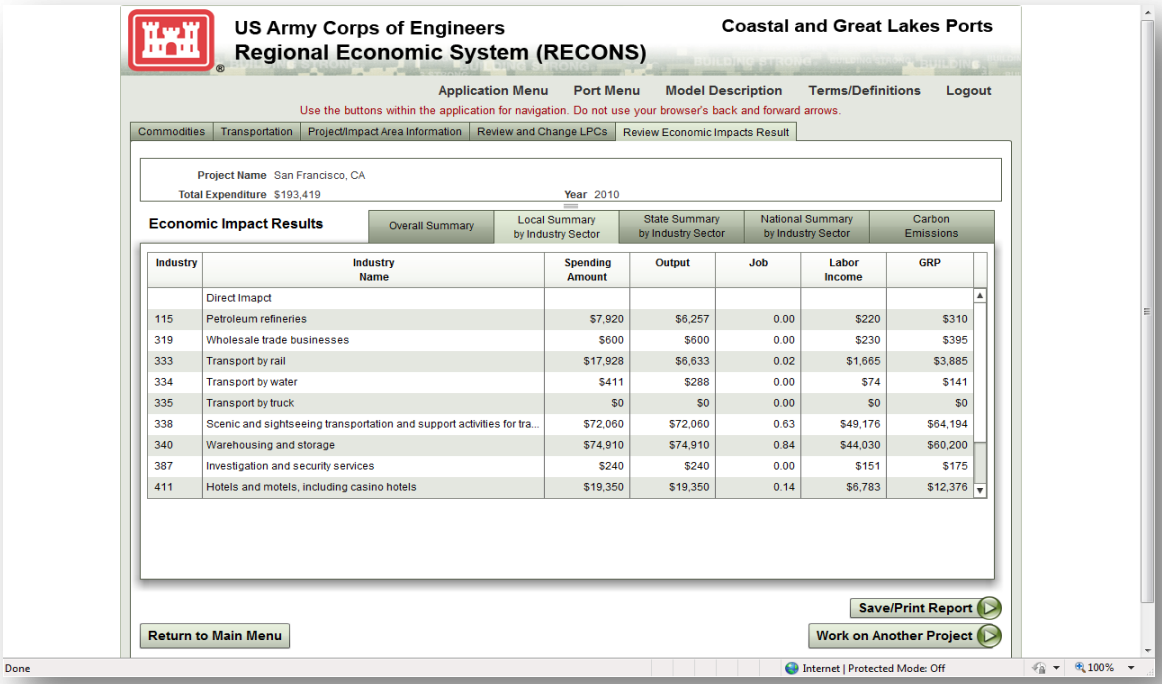
Under screen five, the user is able to view results of the impact analysis. Most of the features on this screen are described in screen 4 of the Coastal and Great Lakes Ports – By Container Shipments module.

The overall summary provides a snapshot of the local, state, and national economic impacts. This summary screen also allows the user to view the overall impacts (i.e., direct and total impacts) by commodities. Alternatively, the RECONS users can choose "all commodities" to view the economic impacts for all commodities. The first column identifies the impact area or region of analysis.



There are tabs for the local, state, and national summary by industry sector. Under the results by industry, the RECONS user is not able to view the results by commodity. These summaries by industry include all commodity shipments.

When finished, the user has the choice of saving and/or printing a report from the current analysis, work on another port analysis project, or returning to the main menu.



Formally Utilized Sites Remedial Action Program (FUSRAP) Sites

FUSRAP Stemming-From Effects occur after the remedial action has been implemented at a FUSRAP site. In the case of the FUSRAP program, the stemming-from effects are those that are associated with economic activity that is sustained, enabled, or generated by the completion of the FUSRAP project. Due to the hazard of people being exposed to radiological residues from past atomic projects, many of the FUSRAP sites have had limited use without remediation. However, after the USACE remediates the site, it is available for reuse or redevelopment, providing economic stemming-from effects associated with this program. There are two aspects for the FUSRAP program evaluated by RECONS:

- Construction and (re)development of the site; and
- Operational activities once construction or development (or without development) has occurred.

Once the FUSRAP site has been remediated by USACE, it may need construction and other development activities prior to the use or reuse of the site. For example, if a waste disposal site is to be located on a remediated FUSRAP site, the construction of the landfill, installing the linings, monitoring wells, and other development activities would need to occur prior to the operation of the landfill. Since these construction costs will vary by the site and potential use, the USACE user should identify the appropriate type of construction in RECONS. The user will need to know the approximate cost of the construction activity, identify the type of construction, and RECONS estimates the jobs, income, and sales associated with this development activity in the local region, state, and nation.

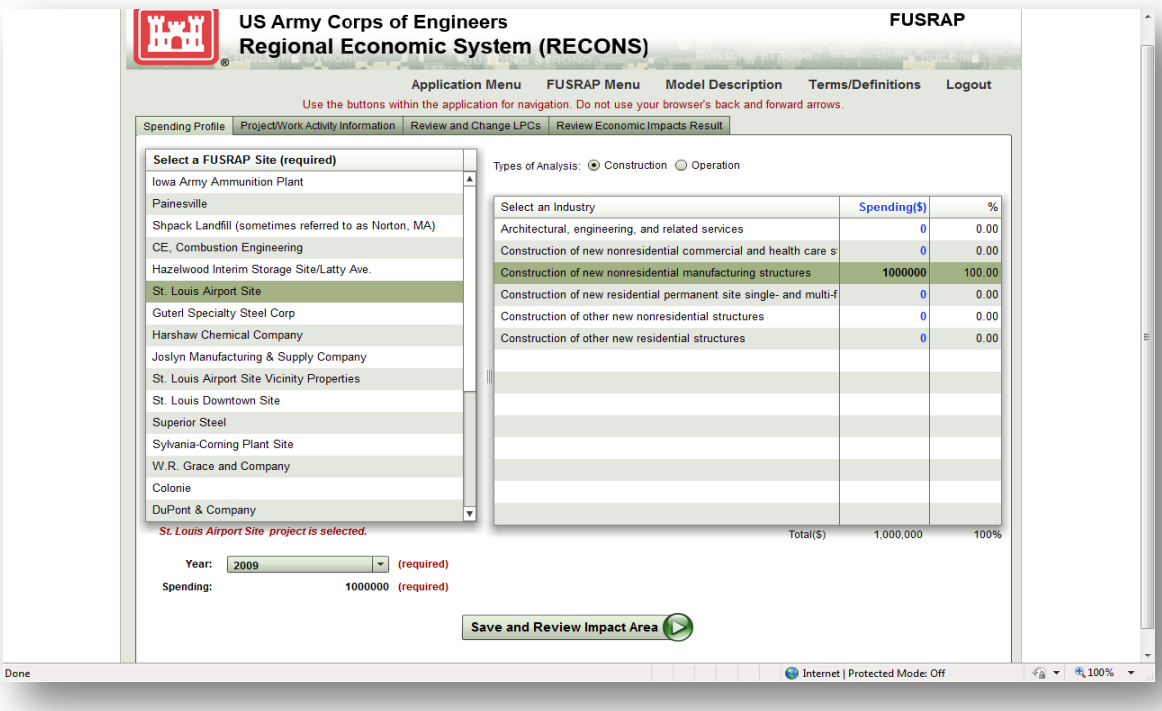
The second stemming-from effect is operational activities associated with the site. RECONS provides a number of options to evaluate the potential operations at FUSRAP sites. These options were identified from information collected from a number of sources, including

identifying previous uses of the current FUSRAP sites being remediated, identifying the uses and operational activities of already completed (and relevant) FUSRAP sites, and interviews with FUSRAP project managers. The USACE user will be able to choose from the list of potential operational activities for the site and will need to enter expected annual sales or revenue into the RECONS module (associated with the operational activity), and RECONS will estimate the economic contribution for this operational activity. Inputs, analysis, and description of the FUSRAP screens are described below.

Screen 1: Spending Profile -- Choose FUSRAP Site and Type of Effect

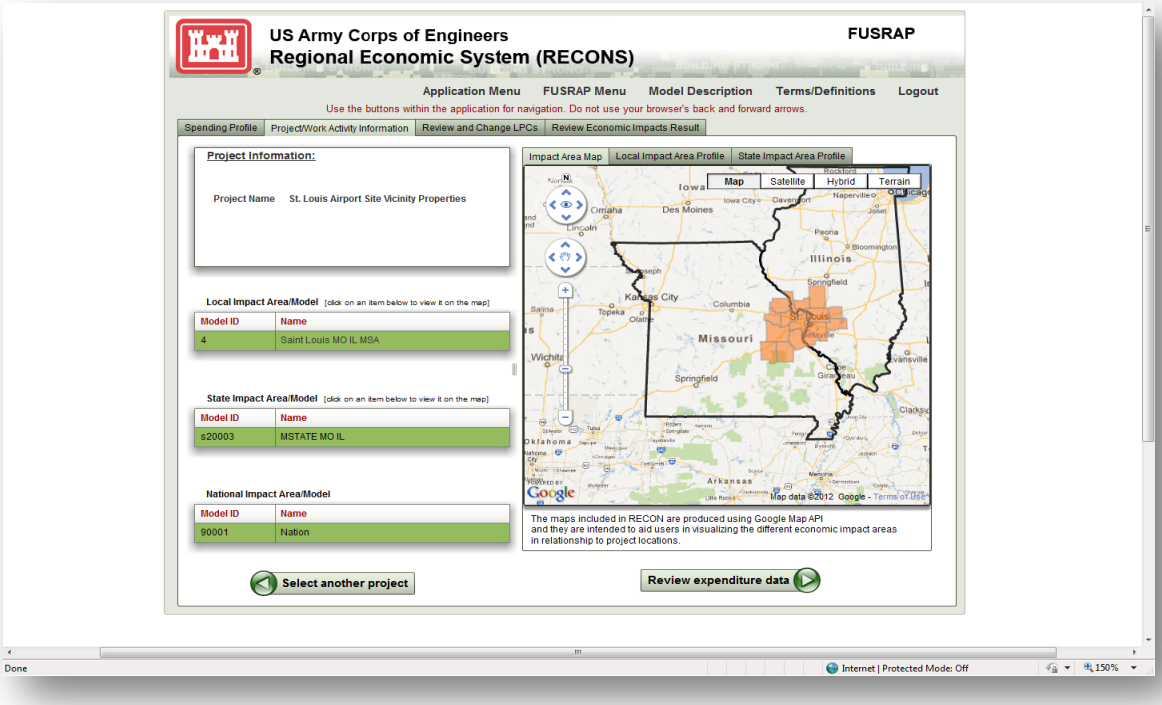
On the left side of the screen, the user is prompted to identify the FUSRAP site from the list displayed on the screen. The user is able to choose the type of economic effects: "construction" or "operation." Construction is the default, with the types of construction activities identified in the box on the right side of the screen. The user should enter into the "spending" column the annual construction spending expected to occur under each type of construction activity, as provided in the list. The entire construction budget could be entered into the spending column, even if it were to occur over several years. However, RECONS estimates the impacts as if they were to occur in one year. For example, a $10 million dollar project that is expected to occur over 2 years would generate 120 annual jobs (in one year) or 60 jobs each year over the two-year period. The user can also choose "operation" on this screen, and the screen lists the types of industries that are likely to occur on remediated FUSRAP sites, such as farming activities, waste disposal, or weapons manufacturing. When "operation" is chosen, the user should enter the annual sales or revenues expected from the operational activity associated with the FUSRAP site.

Finally, at the bottom of the screen, the year should be specified. This is the year in which the construction or industry sales are expected to occur. Once these choices have been made, the user should select "save and review impact area" to proceed to the following screen.



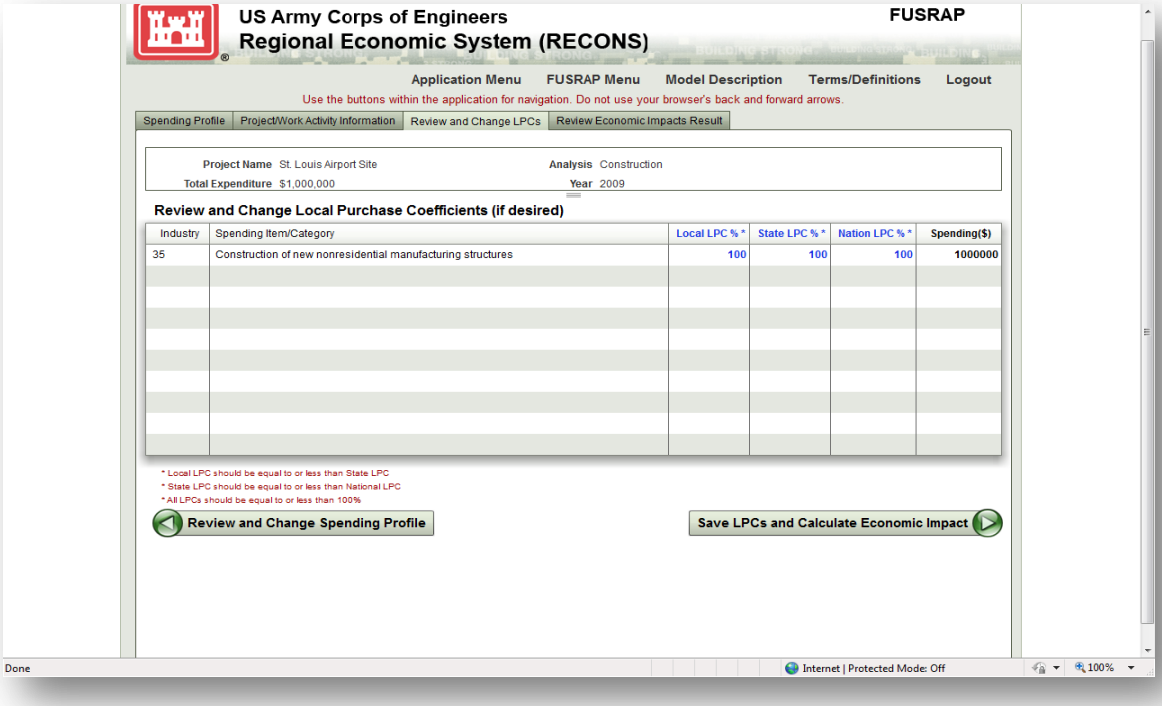
Screen 2: Project/Impact Area Information

The FUSRAP site that the user chose in screen 1 is automatically associated with a "local" metropolitan or micropolitan area, based on the location of the FUSRAP site. The impact area identification and screen is the same as screen 2 in the Create and Analyze New CW Budget Project – Model from Project module. The choice of an impact areas cannot be changed in this screen, as they are automatically associated with the FUSRAP location and its metropolitan or micropolitan area. Select "Review Expenditure Data" to proceed to the next screen.



Screen 3: Review and Change LPCs

Under screen three, the user is able to view the local, state, and national purchase coefficients provided by RECONS. The review and change LPC screen is the same as screen 6 in the Create and Analyze New CW Budget Project – Model from Project module. Select "Save LPCs and Calculate Economic Impact" at the bottom of the screen to proceed to the following screen.



Screen 4: Review Economic Impact Result

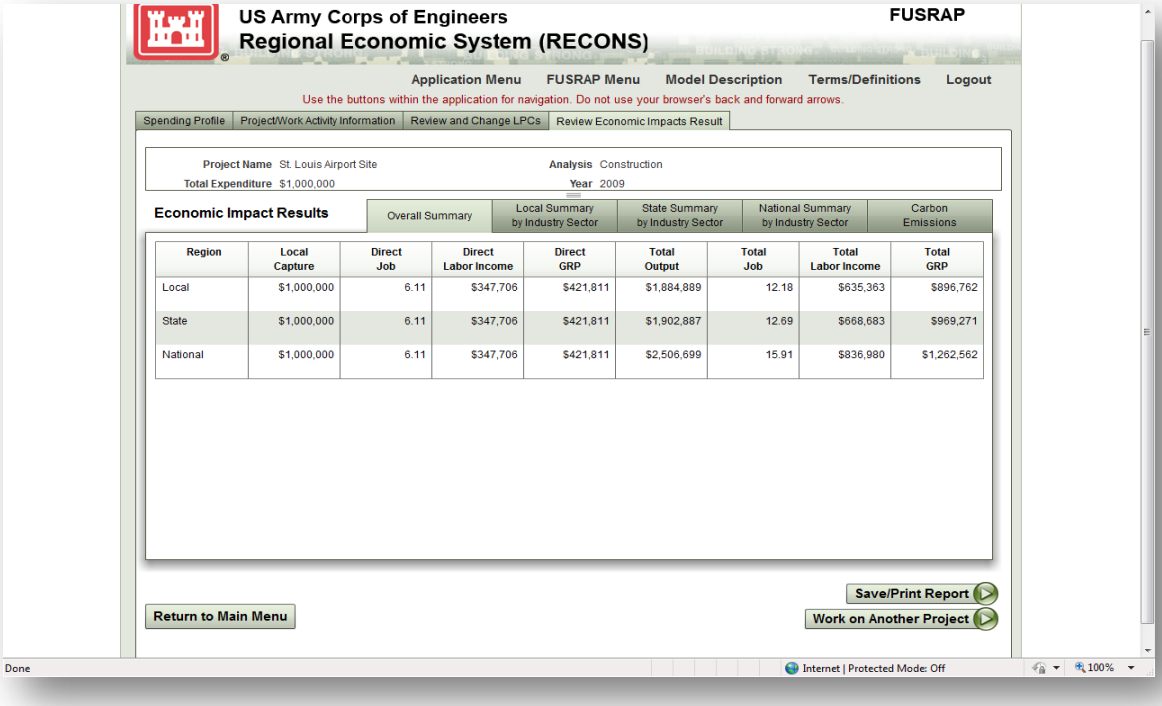
Under screen four, the user is able to view results of the impact analysis. The project information is provided at top of the screen, including the FUSRAP site name, the activity (either construction or operations), the expenditures (these can be construction spending or industry revenues), and year of the expenditures or revenues. The resulting values are provided in the year that the activity or construction was identified by the user as occurring.

The overall summary provides a snapshot of the local, state, and national economic impacts. The first column identifies the impact area or region of analysis. The second column titled "local capture" is an estimate of the expenditures or revenue captured within the impact area. This is calculated by applying the local, state, or nation LPC to the spending or revenue estimate. The "local capture" is equal to the direct economic output, which is the total sales or revenues allocated to the specific industry (e.g., construction or operating industry). Other direct effects, including jobs, labor income, and Gross Regional Product (also known as value added), are also provided on this summary screen. Again, direct effects are associated with the particular industry affected, which the user can view on the Summary By Industry Sector tabs. The total economic output, total jobs, total labor income, and total Gross Regional Product are the direct effects as well as the multiplier effects associated with this economic activity. The multiplier effects include indirect and induced effects, as described below.

There are tabs for the local, state, and national summary by industry sector, which includes the identification of the industry affected and its associated direct impacts. For example, if spending in the construction industry is the direct impact, the local capture would be the sales or economic output associated with this construction spending in the impact area. Additionally, the direct jobs, labor income, and gross regional product are all associated with directly affected industry, which in this case is the construction sector.

The secondary impacts are a summary of the multiplier effects, which include both indirect and induced effects associated with all of the directly affected industries. Indirect impacts include industries that support the directly affected industry, and induced effects occur when workers associated with the direct and indirect industries spend their salaries in the impact area, creating additional jobs and income. Information on carbon emissions is also provided and described in the Create and Analyze New Civil Works Budget Project, Screen 7 Review Economic Impact Results.

When finished, the user has the choice of saving and/or printing a report from the current analysis, returning to work on another FUSRAP project, or returning to the main menu.

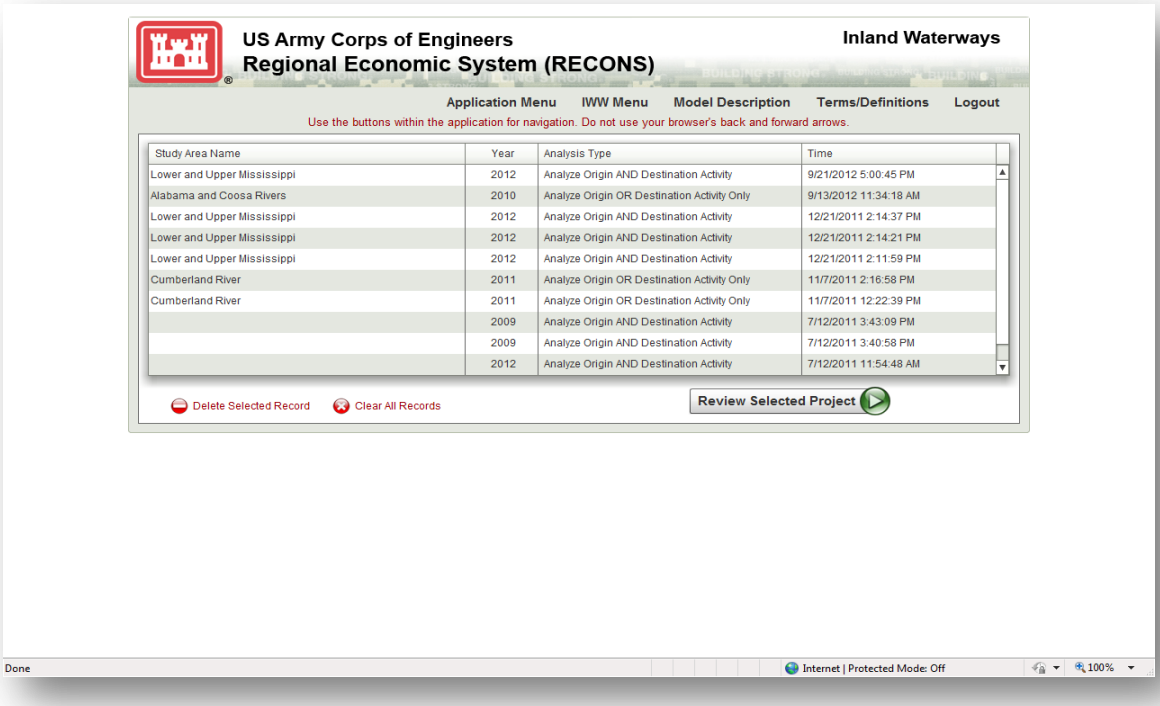


Inland Waterway (IWW) Shipments

Review Previously Conducted IWW Analysis

This module allows the user to review and change previously conducted inland waterway stemming-from effects analysis. RECONS automatically saves each "New Inland Waterway Analysis" that is completed. The RECONS user needs to choose the analysis to review, and RECONS provides the impact area, year, type of analysis, and date that the analysis was

undertaken. The user should click on the previous analyses, and select "review selected project" to proceed to the following screens. The user has the option to review and change the spending profile and the LPCs, and rerun the economic impact analysis, if needed. All screens are similar to those described in the New Inland Waterway Analysis module; please refer to the following description for more information on this module.



Conduct New IWW Analysis

Under this RECONS module, the stemming-from effects are estimated associated with USACE programs and infrastructure. The USACE navigation business line supports infrastructure and maintenance on inland waterways, enabling waterway shipping and transportation, supporting waterway industries. The focus of this module is to estimate the economic impacts or contribution of the shipping industries and their support sectors based on the volume of commodities being shipped on specific waterways.

Similar to the port activities, the inland waterway industries and activities include waterway transportation, tow boats, assessorial activities, and transportation legs to and from the waterway. Assessorial activities include cargo handling, loading and unloading, terminal operations, and other related support activities. These are the industries that operate on or are directly associated with moving cargo on inland waterways. Rail and trucking transportation industries also support the movement of cargo to and from waterway shipping.

There are also industries that utilize the services of the waterways – paying the waterway industries to ship their goods on the inland waterways. The economic contribution of these waterway-dependent industries, similar to the port-dependent industries, is not analyzed in this module. Additional modules will be included in RECONS for these navigation stemming-from effects.

The RECONS inland waterways module, similar to the ports module, utilizes sample cargo shipper costs per ton of commodity shipped for estimating economic contribution of water ways. The shipping and loading rates or costs per ton are sales or revenues to the inland waterway industries providing these services. These waterway shipper rates for line haul and cargo handling and loading are routinely collected by USACE for input into the USACE Navigation Investment Model (NIM) and include costs and volumes for loading at the ultimate origin, haul to the waterside (by truck, rail, conveyor, pipe), trans-loading onto the barge, barge line-haul, unloading, and trans-loading to another mode, if applicable (Langdon, 2010). These sample rates are currently available for the Ohio River System (ORS), which includes the Ohio River and its tributaries. If the ORS movement also moves on non-ORS segments, these costs are also included. Current rate data from other waterway systems is yet to be collected.

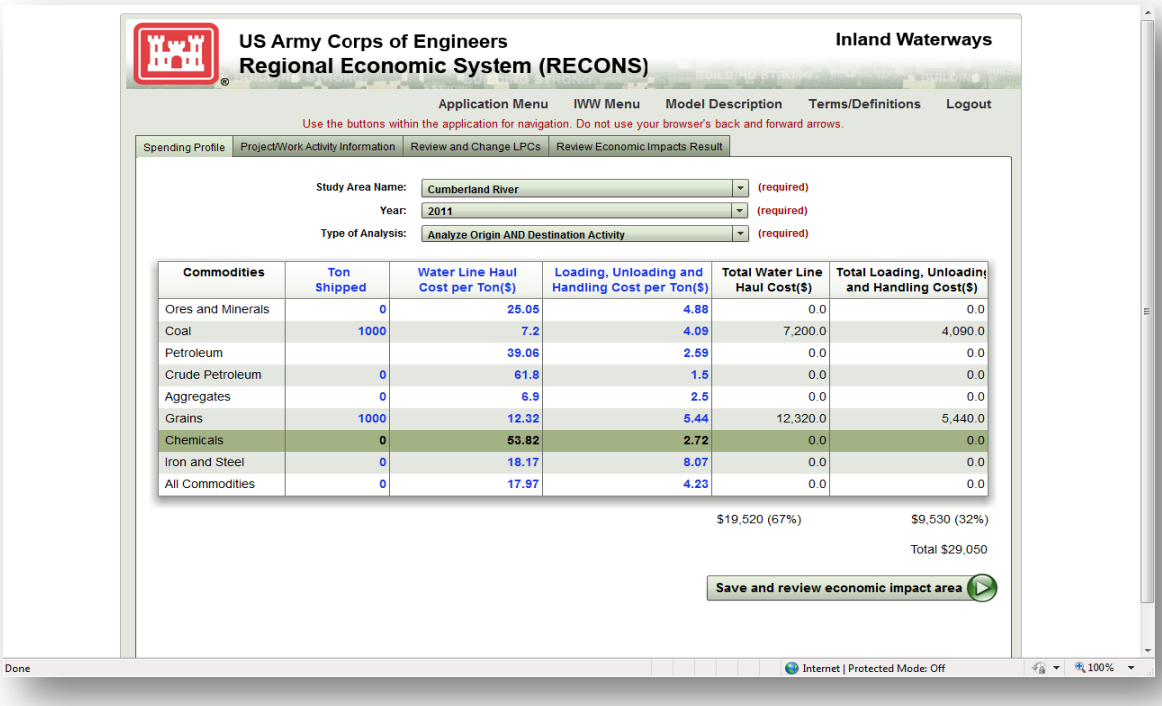
The ORS shipper rates were utilized to estimate impacts to waterborne transportation and support industries by the eight different commodities (and one generic category that covers all commodities). Transportation legs have been excluded from this module as the location of their economic effects is often difficult to identify (e.g., the transportation moves outside of the inland waterway region). The data has also been parsed, such that the user can choose to analyze only an origin or destination shipment or an origin and destination shipment. For example, an origin and destination shipment would include handling and loading at both the origin and destinations, as well as the waterway line haul.

Screen 1: Develop Spending Profile

In screen 1, the RECONS user needs to identify the study area or impact area name. A number of options are available to users. Users can choose a specific inland waterway, if it is available. Additionally, users could choose a generic micropolitan (10,000 to 50,000 people), metropolitan area (over 50,000 people), rural area (less than 10,000), or large-as well. The analysis is based on origin and/or destination activity, and the user needs to identify whether he or she would like to run the analysis on the origin and destination or one or the other; this will influence the choice or the waterway.

The RECONS user also needs to identify the tons of commodities shipped. If the user knows the type of commodity, he or she can enter it into the correct row; if not, the user can use the "All Commodities" row, which is a weighted average of all of the commodities. The default costs per ton were estimated for both the waterway line-haul and the assessorial (i.e., terminal, loading, and other support activities) based on rate sample data obtained from experts at the Navigation Planning Center for the Ohio River System. Costs are based on 2004 river movements and have been inflated to 2012 dollars.

The RECONS user can adjust the default costs per ton for waterway line-haul and loading and handling if the user has better information. Without specific information from shipping industries, the user should use these default costs. Select "save and review economic impact area" to proceed to the following screen.



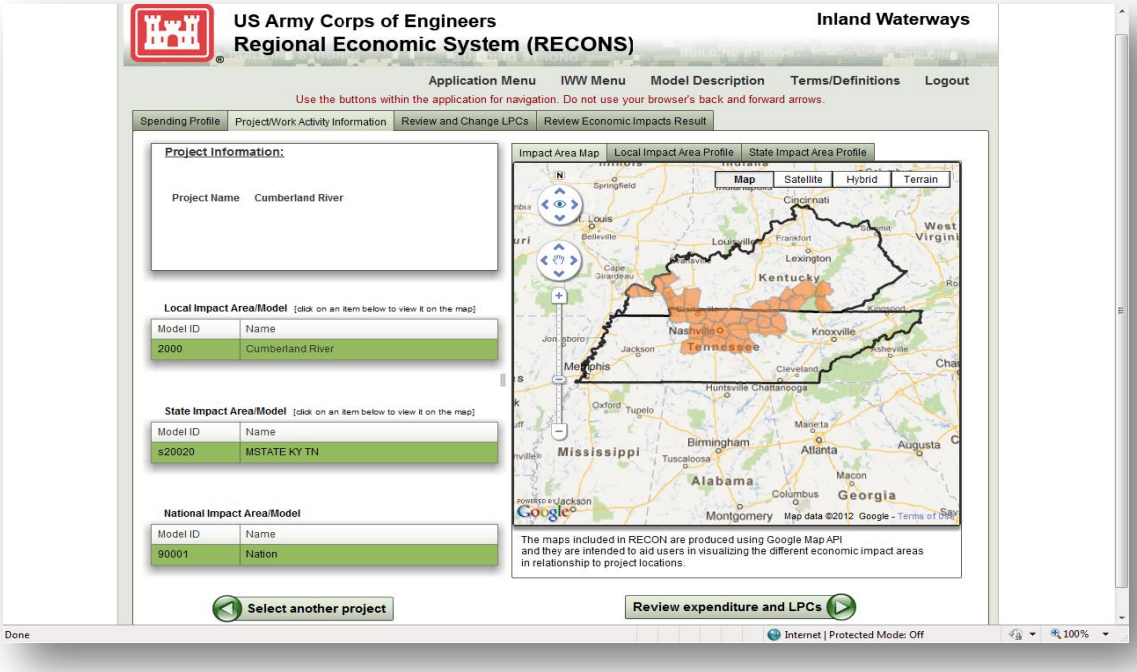
Screen 2: Confirm Impact Area

The inland waterway name or state that was chosen on the previous screen is automatically associated with the local and state impact area. Local, state, and national multipliers associated with these impact areas have been obtained from the IMPLAN model for use in RECONS. The user also has the option to identify a generic micropolitan, metropolitan, rural, or large-scale region upon which to run the inland waterway users economic impacts.

The inland waterway name, state, or generic model is identified at the top left of the screen. Large river stretches have been included for many of the inland waterways. Their impact areas include counties adjacent to the river as well as additional metropolitan and micropolitan counties. Adjacent counties were included to have one contiguous geography, since the concept of regional modeling is based on the impact area being a functional economic area. When the user double clicks on the Local Model name, the map will zoom in on this location and the cursor over the map will show the names of the counties included in the Local Model impact area. Similarly, the state or multi-state impact area is also listed, and if the user double clicks on this name, the map will zoom into the chosen state. Regardless of if the user wants to view the map, he or she needs to double click on the local, state, and national model name to select these models for analysis.

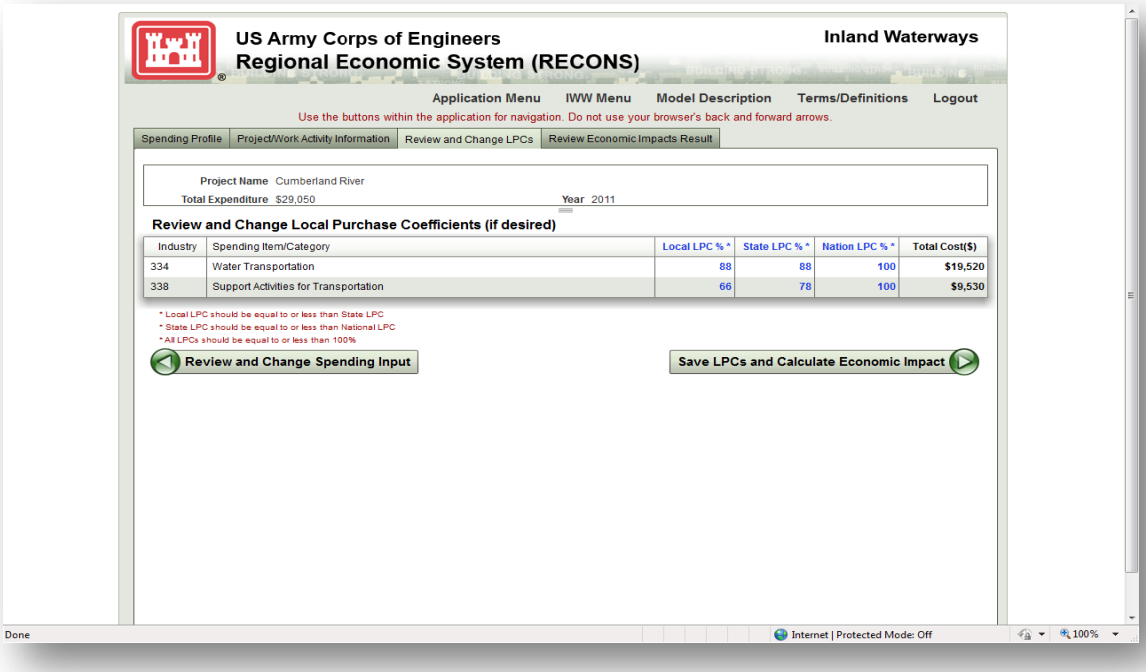
This screen also allows the user to view demographic and economic profile information associated with the "Local Impact Area Profile" and "State Impact Area Profile," as described in screen 2 of the Create and Analyze a New CW Budget Project – Model from Project module.
The choice of an impact area cannot be changed in this screen, as they are automatically associated with the project name and its associated county, metropolitan, micropolitan or large-scale impact area. The user can opt to "select another project" to return to the previous screen to

choose another inland waterway, state, or generic model. Select "Review Expenditures" button to proceed to the next screen.



Screen 3: Review and Change LPCs

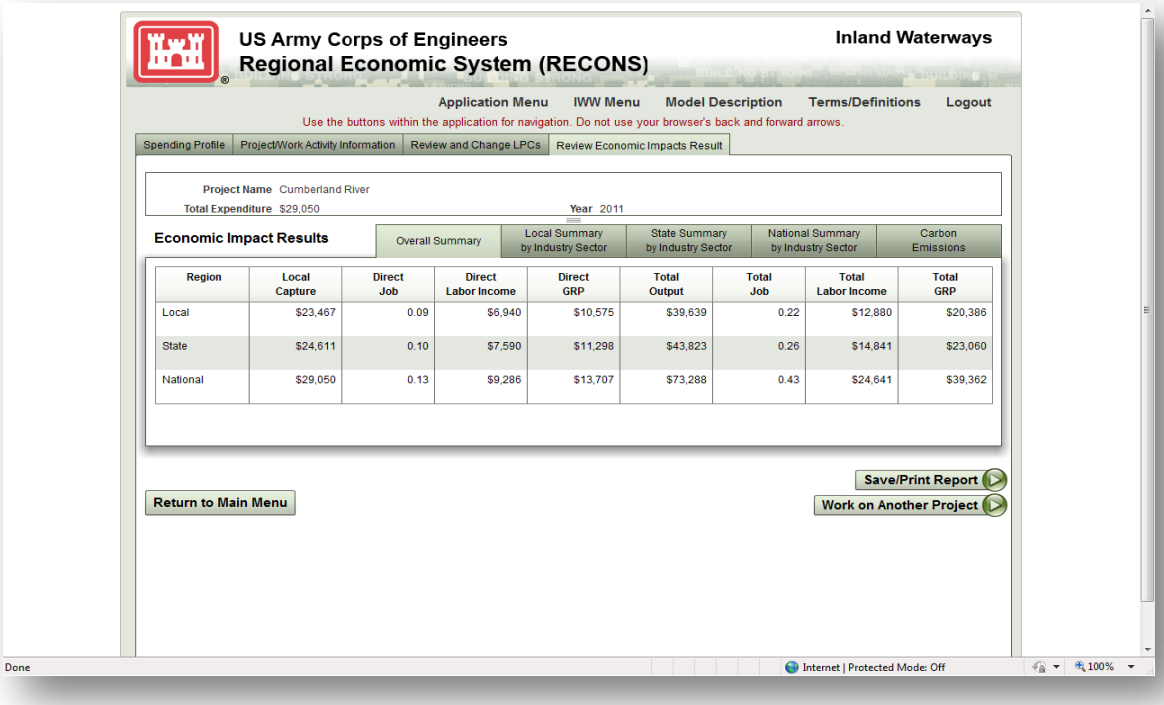
Under screen three, the user is able to view the local, state, and national purchase coefficients provided by RECONS. Please see the description of screen 6 under the Create and Analysis a New CW Budget Project module. Select "Save LPCs and Calculate Economic Impact" at the bottom of the screen to proceed to the following screen.



Screen 4: Review Economic Impact Result

Under screen four, the user is able to view results of the impact analysis. The impact area information is provided at top of the screen, including the impact area name, the total shipping and handling costs for all commodities, and year of the shipping activity. The resulting economic impact values are provided in the year that the activity was identified by the user as occurring.

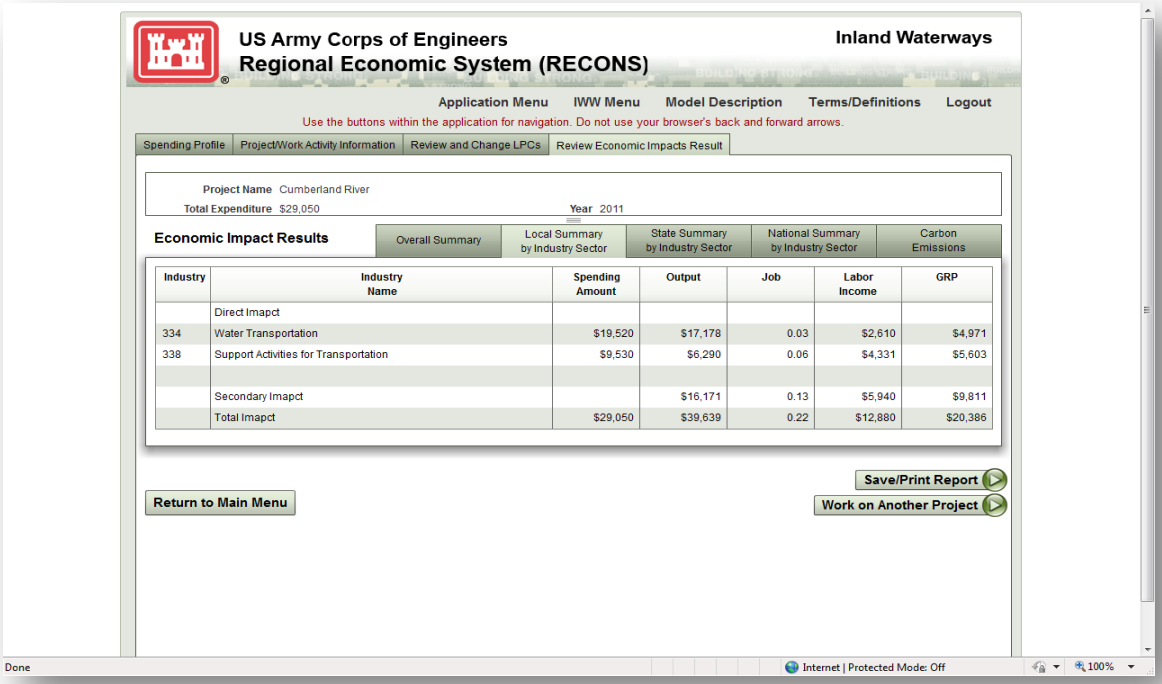
The overall summary provides a snapshot of the local, state, and national economic impacts. The first column identifies the impact area or region of analysis. The second column titled "local capture" is an estimate of the shipping industry revenue captured within the impact area. This is calculated by applying the local, state, or nation LPC to the revenue estimate. The "local capture" is equal to the direct economic output, which is the total sales or revenues allocated to the specific industry (e.g., waterway shipping or shipping support industries). Other direct effects, including jobs, labor income, and Gross Regional Product (also known as value added), are also provided on this summary screen. Again, direct effects are associated with the waterway and waterway support industries affected. The total economic output, total jobs, total labor income, and total Gross Regional Product are the direct effects as well as the multiplier effects associated with this economic activity. The multiplier effects include indirect and induced effects, as described below.



There are tabs for the local, state, and national summary by industry sector, which includes the identification of the industry affected and its associated direct impacts. For the directly affected industries, in this case, the waterway transportation and waterway support sectors, industry revenues or sales are a direct impact and the local capture would be this industry sales captured in the impact area (i.e., multiplied by the local LPC). Additionally, the direct jobs, labor income, and gross regional product are all associated with the waterway shipping or shipping support

sectors. The secondary impacts are a summary of the multiplier effects, which include both indirect and induced effects, associated with both the directly affected industries. Indirect impacts include industries that support the directly affected industry, and induced effects occur when workers associated with the direct and indirect industries spend their salaries in the impact area, creating additional jobs and income.

When finished, the user has the choice of saving and/or printing a report from the current analysis, work on another inland water way project, or returning to the main menu.



Recreation

Stemming-from effects of the USACE recreation programs are measured by the spending and associated economic activity generated by visitors to USACE lakes, reservoirs, and other recreation areas. The Recreation Economic Assessment System (REAS) model was designed to estimate these impacts. The RECONS recreation module can be used to estimate economic significance or impacts of existing recreation use or to estimate impacts of a change in use. For the recreation module, "economic significance analysis" estimates the economic impacts of all visitor spending, while "economic impact analysis" impact analyses will focus on spending by visitors from outside the local region.

The RECONS recreation module can be used for the following:

- To estimate impacts of current visitors, the user selects a USACE project. The number of visits to the project have been retrieved from the OMBIL database, and the visitor segment mix, average party sizes, and spending averages for the region are from surveys conducted by Engineer Research and Development Center (ERDC), all of which has been loaded into RECONS model. The user may edit any of the input data if they have better local information and impact results will reflect these changes. Economic impact and

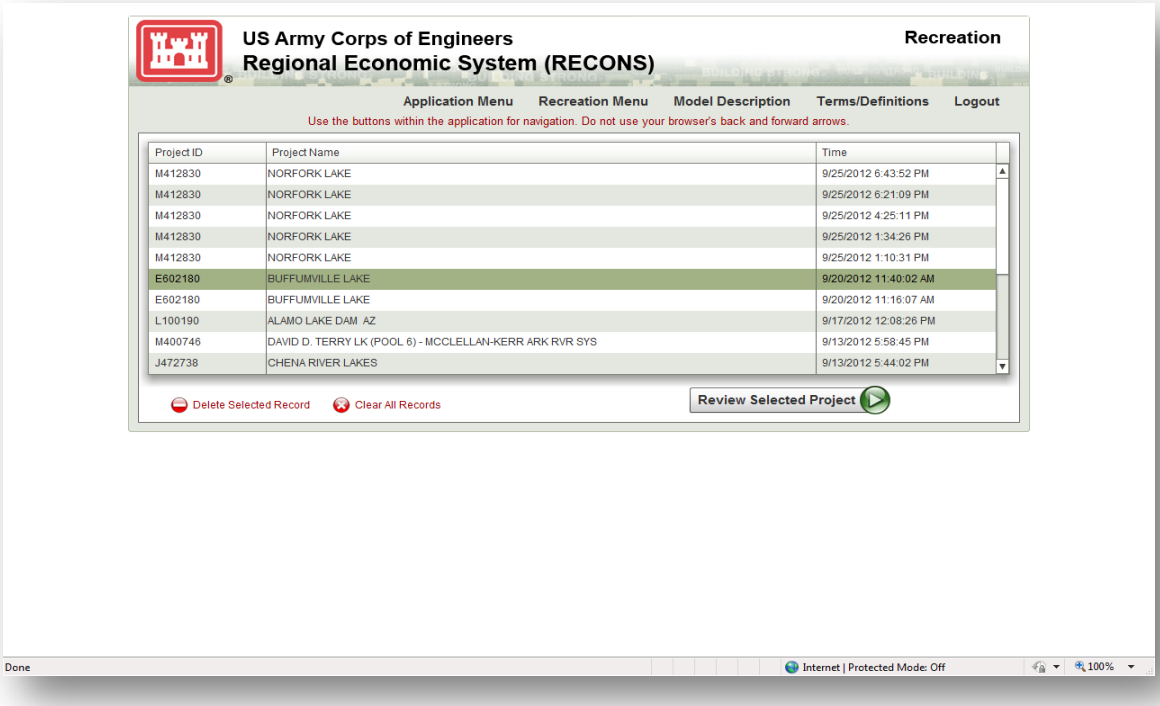
contribution can be estimated with the information provided in the RECONS recreation module.

- The RECONS user can edit the visitor numbers or visitor types or segment resulting from a proposed action being evaluated. When estimating impacts of a change in visits, users may choose the default segment mix and spending profiles for the project or edit these.
- A separate boating module is included to estimate impacts of boats stored at marinas and the boats launched at USACE boat launch sites. Users must first enter the project where the marina or launch site is located. Next, they enter the number of boats of different types and sizes that are stored at the marina or launched. A default distribution of boats by size class is retrieved along with national average spending profiles. As with the visitor spending routine, users may edit any of the input data. This boating module is described in the subsequent section.

These options follow the same basic steps, which are described in this section.

Review a Previously Conducted Recreation Analysis

This module allows the user to view all recreation analyses that the user has undertaken in the past through the "Conduct a New Recreation Analysis." This first screen, shown below, allows the user to view all of the analyses by project name and time and data analyzed, from which the user would choose a row. The user then moves through the screens just as if the user were accessing this project analysis again. The visitation data and spending profiles that were used in the previous analysis are populated in the resulting screens, and the user is able to change these values and rerun the recreation analysis. Please see the description in "Conduct a New Recreation Analysis" for descriptions of each of the screens in this module. This module does not cover the boating projects, only the general recreation visitor spending analysis.

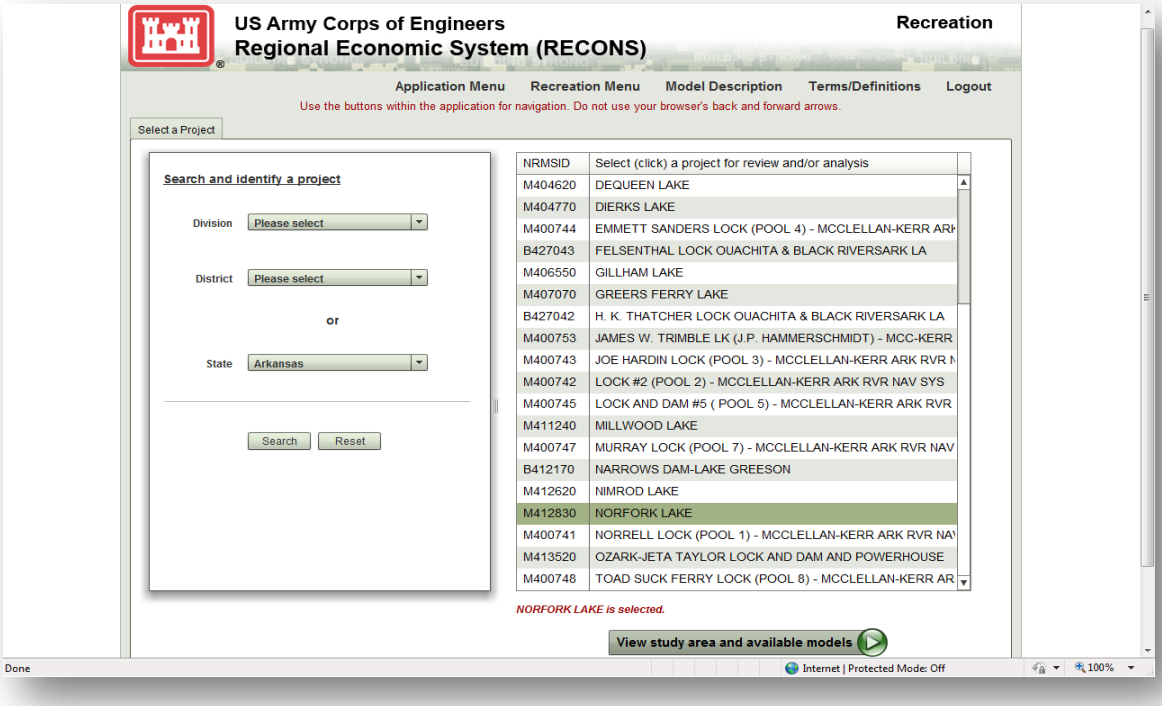


Conduct a New Recreation Analysis

The current recreation spending information used in RECONS is 2009 data. A new spending profile is currently being developed based on data collected on a 2012 VIS follow-up web-based survey. The new spending information will be uploaded into RECONS in October 2013.

Screen 1: Select a Recreation Project

Under screen 1, RECONS users need to identify a USACE recreation project and can search for projects through identifying the division, district, or state. Select the recreation project to analyze, and then continue to the next screen by selecting "view study area and available models."



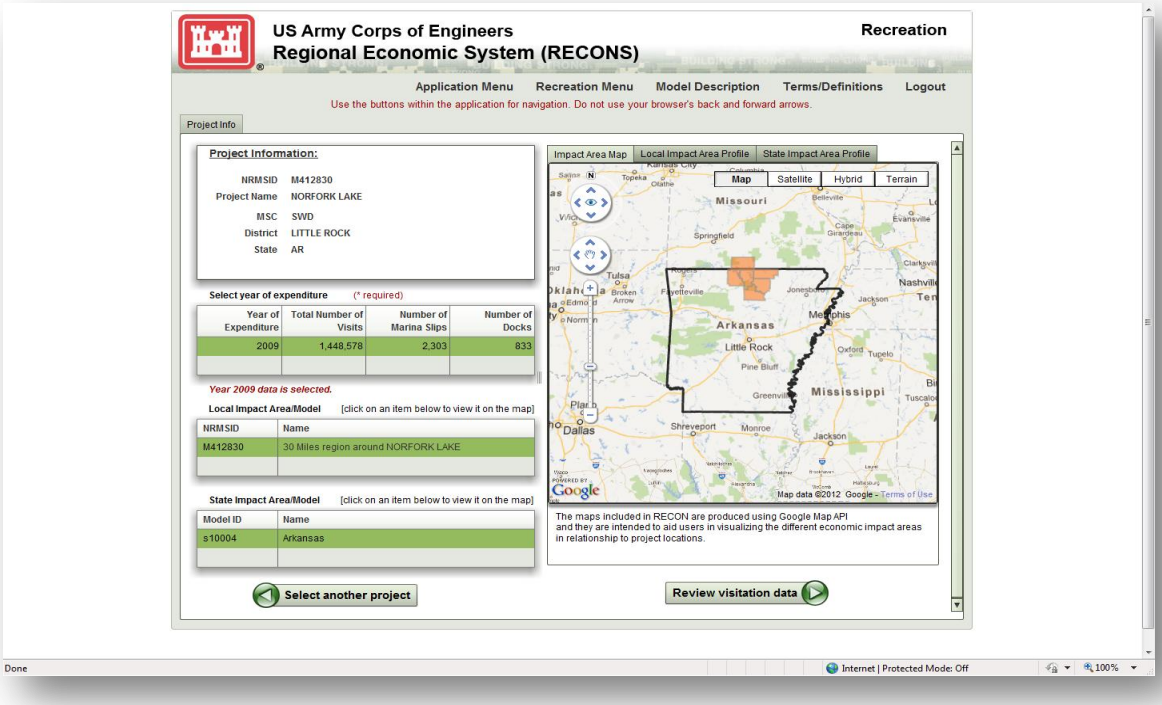
Screen 2: Review Impact Area

The recreation project that was chosen on the previous screen is automatically associated with the local and state impact area. Most visitor spending directly associated with visits to USACE projects occurs within 30 miles of the project. The local impact area typically includes the counties within a 30-mile radius of the project. State and multi-state impact areas are identified with a recreation project based on the location of the counties in the local impact area. If the local impact area includes counties in two states a 2-state impact area will be included. Local, state, and national multipliers associated with these impact areas have been obtained from the IMPLAN model for use in RECONS.

The recreation project name, the division and district, and state are identified at the top left of the screen. The user needs to select (click) the year of expenditure on which to run the analysis. When the user double clicks on the Local Model name, the map will zoom in on this location and the cursor over the map will show the names of the counties included in the Local Model impact area. Similarly, the state or multi-state impact area is also listed, and when the user double clicks

on this name, the map will zoom into the chosen state. Regardless of if the user wants to view the map, he or she needs to double click on the local and state model names to select these impact areas for analysis.

This screen also allows the user to view demographic and economic profile information associated with the "Local Impact Area Profile" and "State Impact Area Profile," as described in screen 2 of the Create and Analyze a New CW Budget Project – Model from Project module.
The choice of a local impact area cannot be changed in this screen, as they are automatically associated with the recreation project and its associated county or counties. The user can opt to "select another project" to return to the previous screen to choose another recreation project. Select "review visitation data" to proceed to the next screen.



Screen 3: Review and Change Visitation Data

Visitor spending and the resulting economic impacts and contribution are dependent on the number and types of visitors as well as from where the visitors come. Visitor segments spend their money in different ways, and recreation projects attract different mixes of visitors.[14] USACE recreation visitor data is typically estimated in person visitors or trips to the project. In this screen, the user can modify the number of person trips or visits for each of the eight visitor segments.

[14] The number of recreation visits for each project was obtained from the U.S. Army Corps of Engineers Financial Management System/Operations and Maintenance Business Information Link (CEFMS/OMBIL) databases for FY2009. As more recent recreation data becomes available, it will be added into RECONS.

Since spending in the RECONS recreation module is measured on a party day/night basis, RECONS converts person visits or trips are converted to party visits. Visits (in person visits) were converted to visitor parties by dividing by an average party size for each segment. For campers, the average party size was obtained from the USACE's campground reservation database and varies for each project (Kasul et. al 2010). For all other visitors, the average party size for each project was estimated as a weighted average of persons per vehicle for each vehicle counter location and season, which is currently 2.08 people per trip for each project as estimated with data from the Visitation Estimation Reporting System (VERS). The VERS program is a tool for estimating recreation visits, visitor hours, and activities at USACE recreation areas; the data is driven by Operations & Maintenance Business Information Link (OMBIL).
Eight segments were used to capture differences in spending:

- Local visitors – visitors living within 30 miles of the project
- Non-local visitors on day trips – visitors from beyond 30 miles not staying overnight in the area
- Campers – visitors staying in USACE campgrounds
- Other overnight visitors – visitors staying overnight in motels, campgrounds or private homes within 30 miles of the project

To capture differences in spending of boaters and non-boaters, each of the above segments is identified as a boating and non-boating visitor segment, yielding eight general recreation visitor segments.[15] The percent of visitors from the local region (within 30 miles) was estimated for each project based on the size of the population within 30 miles of the project compared to populations within 60 miles and 90 miles. Visitation was based on the relative likelihood of visitors traveling from different distances to visit a particular project.[16] Segment parameters at a number of specific recreation projects were set to fit the local visitor percentages (i.e., Norfork, Bull Shoals and Table Rock Lakes), as estimated in a recent visitor survey (Kasul et. al 2010).

The percent of visitors boating at all projects was obtained from the CEFMS/OMBIL database and is assumed to be the same across all segments (i.e., local, non-local day, campers, and other overnight visitors). The percent of camping visitors at the project was estimated from USACE camp reservation data obtained from the National Recreation Reservation System (NRRS) maintained by the U.S. Army Corps of Engineers. The number of camping party trips at each project was converted to camping person visits by multiplying it by the camping party size. Camping person visits were then divided into overall visits to estimate the camping share of overall visits.

Subtracting local visitors and campers from total visits leaves non-local day and overnight visitors. These visits were divided between day trips, not involving an overnight stay, and

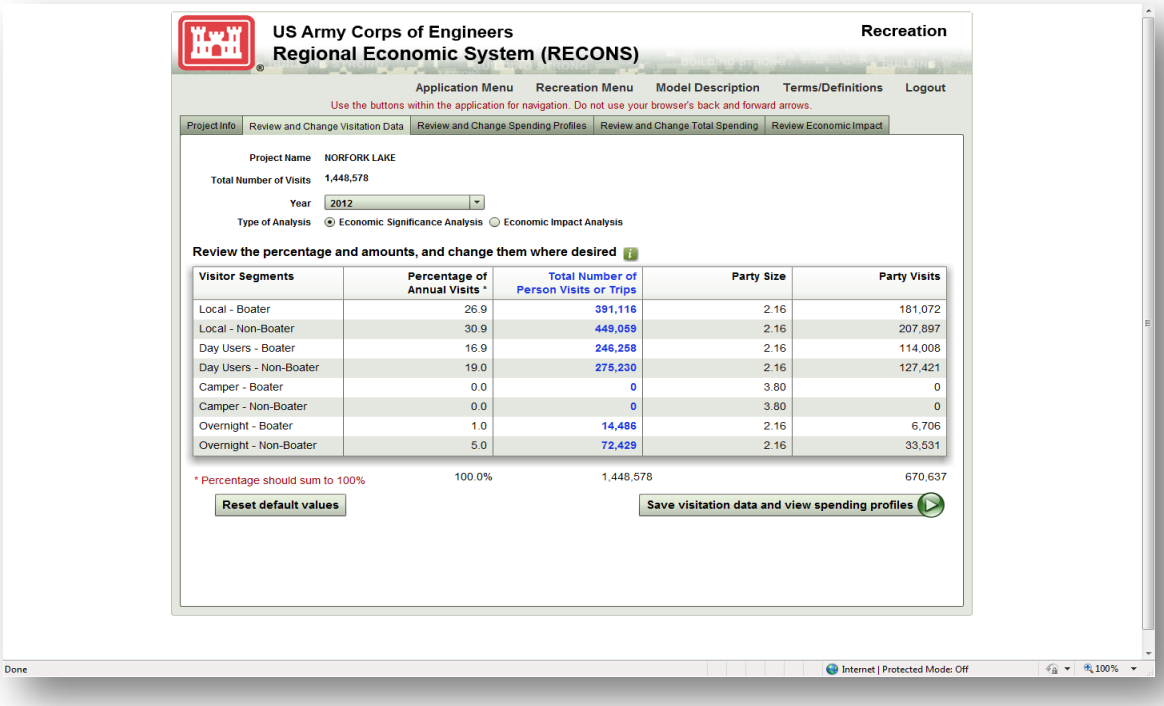
[15] The visitor segment mix for a given project was estimated based on CEFMS/OMBIL data, USACE campground reservation data, and models to estimate the local and other overnight percentages.

[16] Based on survey conducted by ERDC by Drs. Stynes and Kasul, the analysis assumed visit propensity for visitors living 30 to 60 miles is 0.20 times the visit propensity for visitors within 30 miles. Visit propensity for visitors traveling between 60 and 90 miles is 0.05 times the visit propensity of those living within 30 miles.

visitors staying overnight within 30 miles of the project. The percent of non-local visitors staying overnight in the area was estimated for each project based on sales in the lodging sector within 30 miles of the project location. Hotel sales within 30 miles of each project was estimated from ESRI Business Analyst databases.

RECONS users may choose an economic significance (contribution) analysis or economic impact analysis. The local visitor segments have been added to the RECONS recreation module so that users may include (significance analysis) or omit (impact analysis) spending by local residents when estimating the effects. Local visitors are excluded from the spending and impact estimates by setting the number of local visitors to zero so they are not counted in the spending or impact estimates. This assumes that spending of local visitors does not yield a net impact for the local region. Local visitor segments may be included when estimating the economic contribution or significance of all visitor spending. Again, significance or contribution analysis measures cover all visitor spending, while impact analyses focuses on visitor spending by visitors from outside the local region.

RECONS users need to directly enter the number of visits by each segment. If the user does not have information on the visitor segments, he or she can use the default percentages for the visitor segments to allocate the visits across visitor segments. Users may adjust the segment mix based on local information, when available. As the USACE completes future visitor surveys, the models for estimating segment mixes will be readjusted to reflect the updated information.
The result of screen 3 is an estimate of the number of party visits for each visitor segment. Select "save visitation data and review spending profile" to proceed to the following screen.



Screen 4: Review and Change Spending Profile

National average spending profiles for each visitor segment have been estimated and are embedded in the RECONS database. The spending profiles were estimated from surveys of

USACE visitors (Kasul, et. al, 2010, and Chang, et. al 2003), supplemented with recreation spending data from studies at similar types of recreation facilities (White and Stynes, 2010). The spending profiles estimate spending for the eight visitor segments within 30 miles of the project on a per party visit basis. Profiles are also available for visitor spending within state and national impact areas. Visitor spending is categorized into ten types of expenditure categories, as shown in Table 13.

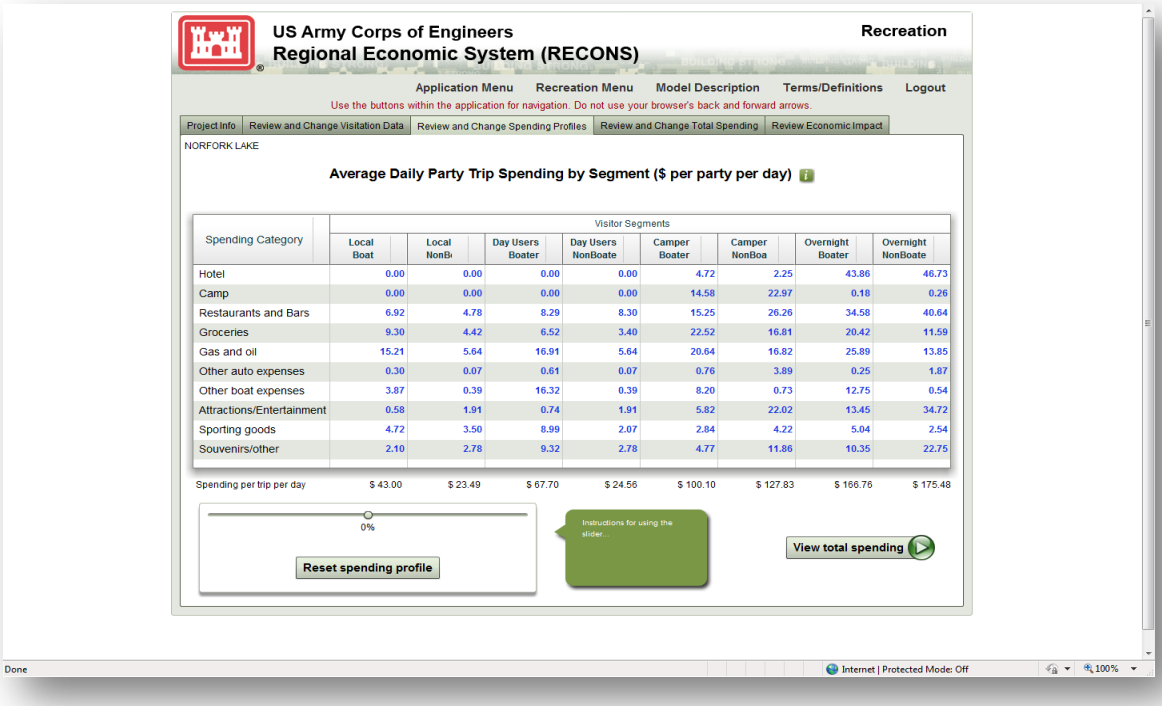
Table 4: Visitor Spending in Local Area by Segment ($/party/day, 2009 dollars)

Category	Visitor Segment							
	Local Boat	Local Non-Boater	Day/ Boater	Day/ Non-Boater	Camping/ Boater	Camp/ Non-Boater	Overnight/ Boater	Overnight / Non-Boater
Motel, Hotel Cabin or B&B	0.00	0.00	0.00	0.00	4.72	2.25	43.87	46.74
Camping Fees	0.00	0.00	0.00	0.00	14.58	22.97	0.18	0.26
Restaurants & Bars	6.93	4.78	8.30	8.30	15.25	26.27	34.58	40.65
Groceries, Take-out Food/Drinks	9.30	4.42	6.52	3.40	22.52	16.81	20.42	11.59
Gas & Oil	15.21	5.64	16.91	5.64	20.64	16.82	25.90	13.86
Other Auto Expenses	0.31	0.07	0.61	0.07	0.77	3.90	0.26	1.88
Other Boat Expenses	3.87	0.39	16.32	0.39	8.20	0.74	12.75	0.55
Recreation Fees	0.58	1.91	0.74	1.91	5.82	22.03	13.46	34.73
Sporting Goods	4.72	3.50	9.00	2.08	2.84	4.22	5.04	2.55
Souvenirs and Other Expenses	2.10	2.79	9.33	2.79	4.78	11.86	10.35	22.75
Total	43.03	23.52	67.74	24.59	100.13	127.87	166.82	175.56
Note: Spending is within 30 miles of the lake or project.								

The RECONS user can adjust the national spending profiles to the local area, based on choosing three general profiles for the local impact area -- high, average, and low. The high spending profile is 30 percent higher than the average, while the low profiles are 30 percent less than the average.[17] The user may also adjust spending profiles by a given percent through the use of the slider or edit the spending profiles directly. RECONS users can increase or decrease expenditure items comprising this profile based on the spending opportunities (i.e., types and amounts) available in the local impact area. For example, if an area provides many opportunities for visitors to spend money (e.g., retail, lodging, services, meals) users can, using the spending opportunity slider, increase the expenditures. Similarly they can reduce amounts of expenditures for areas with few spending opportunities. .

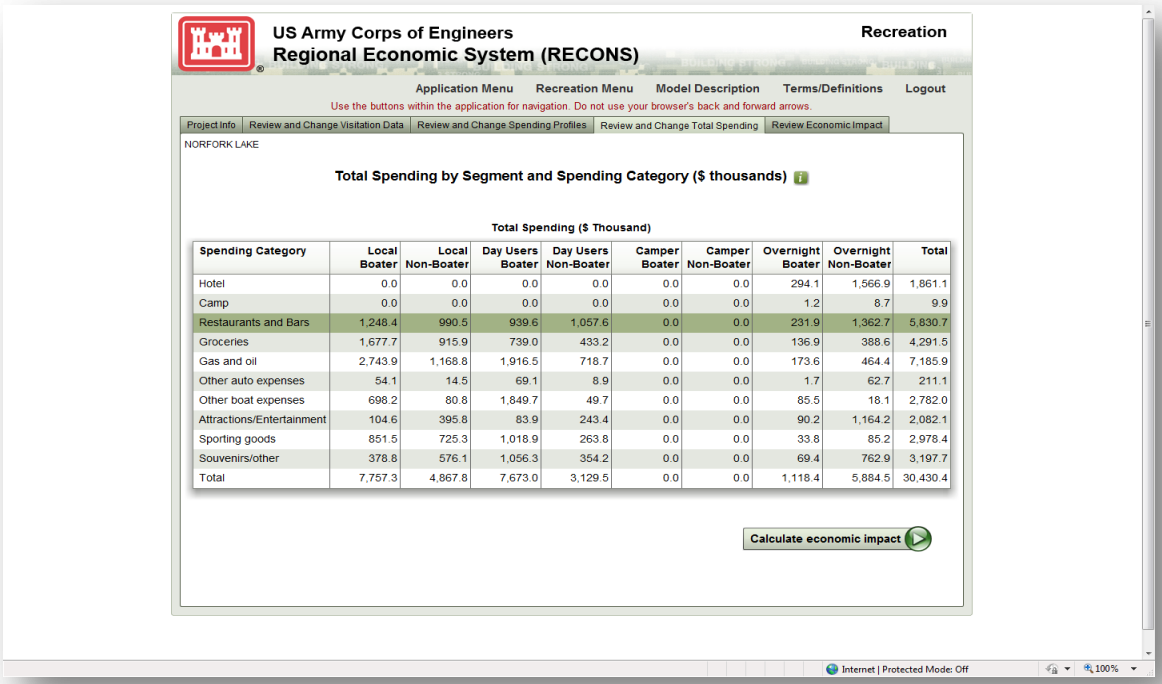
[17] Some judgment was required to develop spending profiles for USACE visitors from the available data. Some of the USACE surveys are dated and some are based on small samples. The surveys at Table Rock, Norfork and Bull Shoals are more recent and involve larger samples, but they illustrate some of the variations in the segment mix and spending across distinct projects that are difficult to fully capture in a general model.

Users may edit and adjust the spending profiles based on local knowledge or unique characteristics of a particular area or intended application. Consumer price indices for 2000 to 2009 for each spending category are used to price adjust spending profiles to a given year, depending on the year in which the visitation is occurring and/or being analyzed. Spending profiles have been provided in 2009 dollars; however, the economic impact results are provided in the year in which the user specified the recreation activity occurring.



Screen 5: Review Total Expenditures

This screen shows the total expenditures, in thousands of dollars, for the visitor segments by the expenditure category. The expenditure category is listed in the left column. These totals are calculated by multiplying the spending profile per party visits times the number of visits in each visitor segment. The total expenditures by the spending category is the final demand vector to which the IMPLAN `ratios and multipliers are applied. This screen does not allow the user to change these final expenditures; however, the user can navigate to the previous two screens to change the number of visitor (party trips) and spending profile per party trip, which will change the total expenditures on this screen. Select "calculate economic impact" to proceed to the following screen.

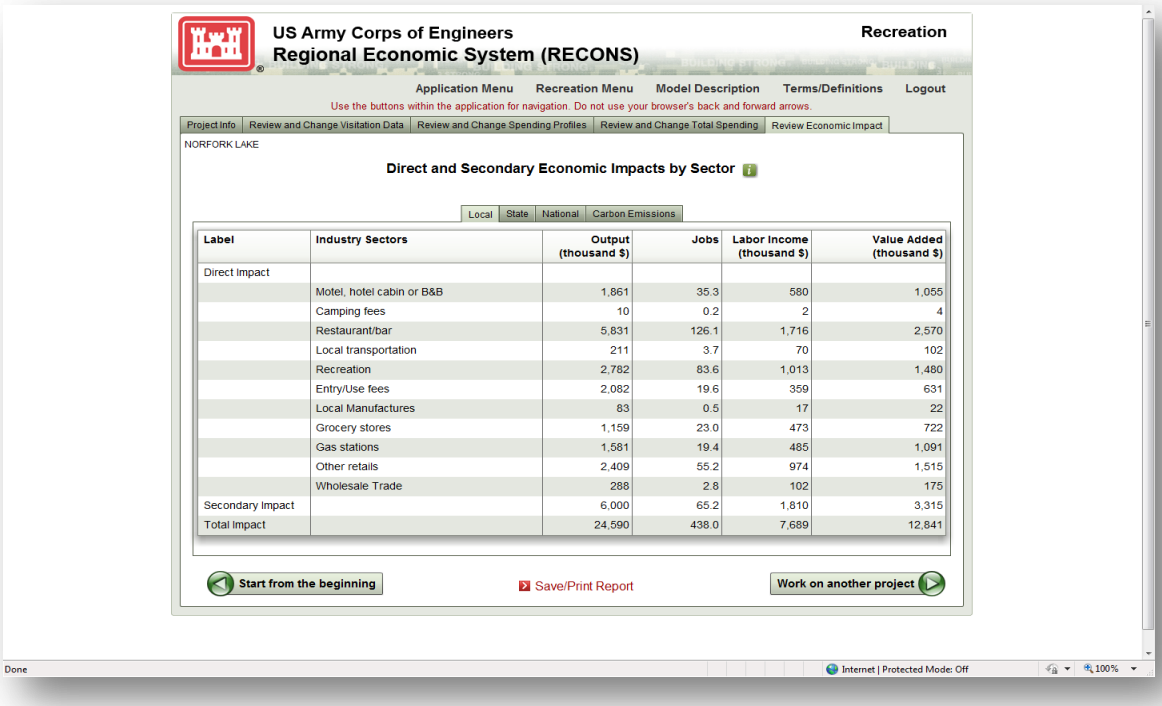


Spending Category	Local Boater	Local Non-Boater	Day Users Boater	Day Users Non-Boater	Camper Boater	Camper Non-Boater	Overnight Boater	Overnight Non-Boater	Total
Hotel	0.0	0.0	0.0	0.0	0.0	0.0	294.1	1,566.9	1,861.1
Camp	0.0	0.0	0.0	0.0	0.0	0.0	1.2	8.7	9.9
Restaurants and Bars	1,248.4	990.5	939.6	1,057.6	0.0	0.0	231.9	1,362.7	5,830.7
Groceries	1,677.7	915.9	739.0	433.2	0.0	0.0	136.9	388.6	4,291.5
Gas and oil	2,743.9	1,168.8	1,916.5	718.7	0.0	0.0	173.6	464.4	7,185.9
Other auto expenses	54.1	14.5	69.1	8.9	0.0	0.0	1.7	62.7	211.1
Other boat expenses	698.2	80.8	1,849.7	49.7	0.0	0.0	85.5	18.1	2,782.0
Attractions/Entertainment	104.6	395.8	83.9	243.4	0.0	0.0	90.2	1,164.2	2,082.1
Sporting goods	851.5	725.3	1,018.9	263.8	0.0	0.0	33.8	85.2	2,978.4
Souvenirs/other	378.8	576.1	1,056.3	354.2	0.0	0.0	69.4	762.9	3,197.7
Total	7,757.3	4,867.8	7,673.0	3,129.5	0.0	0.0	1,118.4	5,884.5	30,430.4

Screen 6: Review Economic Impacts

Screen 6 presents a summary of the economic impact or significance analysis. There are tabs for the local, state, and national summaries, which include the identification of the sectors directly affected and the associated direct impacts. Each of the expenditure categories are shown in this screen as these are the directly affected industries and sectors. IMPLAN's trade flows estimates are used for the LPCs for all industries except service sectors (i.e., lodging, retail), which are set at 100 percent. The secondary impacts are a summary of the multiplier effects, which include both indirect and induced effects, associated with all of the directly affected industries. Indirect impacts include industries that support the directly affected sectors, and induced effects occur when workers associated with the direct and indirect industries spend their salaries in the impact area, creating additional jobs and income. Information on carbon emissions is also provided and described in the Create and Analyze New Civil Works Budget Project, Screen 7 Review Economic Impact Results.

When finished, the user has the choice of saving and/or printing a report from the current analysis, work on another recreation project, or starting from the beginning for this recreation project.



Create and Analyze a Boating Project

The boating module estimates boater spending and the associated economic impacts in terms of jobs, sales, income and value added.[18] Economic impacts may be estimated for either a marina or a boating access/launch site located in USACE recreation projects. The primary input required is the number of different types of boats of various sizes (e.g., under 20 feet, 20 feet to 30 feet, and over 30 feet). The model employs estimates derived from previous studies and economic models including: (1) the average number of days, as well as different size and types of boats are used; (2) annual craft spending on storage, insurance and other craft-related expenses; and (3) the average spending per day on boating trips for meals, fuel, and other items. When more current local spending and boating activity estimates are available (i.e., local or state boating surveys), the averages built into the model can be modified to better reflect the local situation. The averages were derived from the National Marina Economics and Florida Boating Economics Models developed by the Recreation Marine Research Center at Michigan State University. The use and spending averages will all be updated in October 2013 based on the U.S. Coast Guard's National Boating Survey and the USACE's web-based VIS Survey.

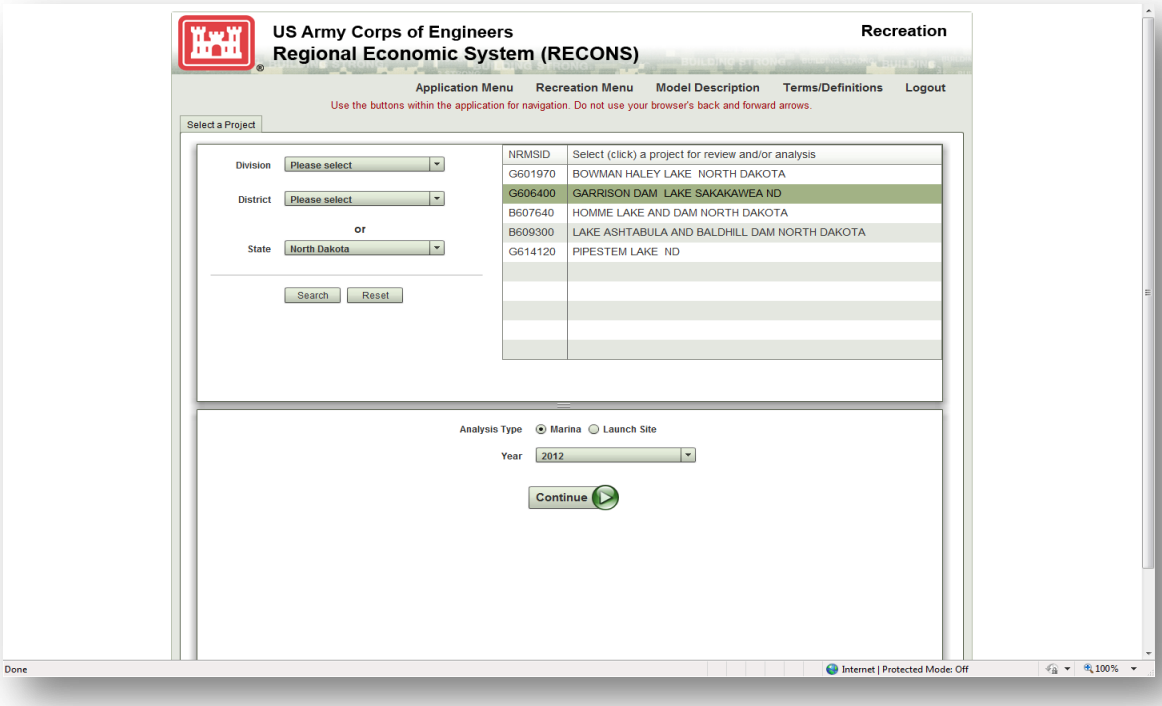
Screen 1: Select a Boating Project and Type of Analysis

The first screen allows the user to search for a USACE recreation area on which to analyze the economic impacts associated with either marina use or number of boat launches. There are two types of analysis in this module:

[18] The Marina and Boat Launch model is based on models developed by Recreation Marine Research Center at Michigan State University (www.floridaboatingeconomics.com).

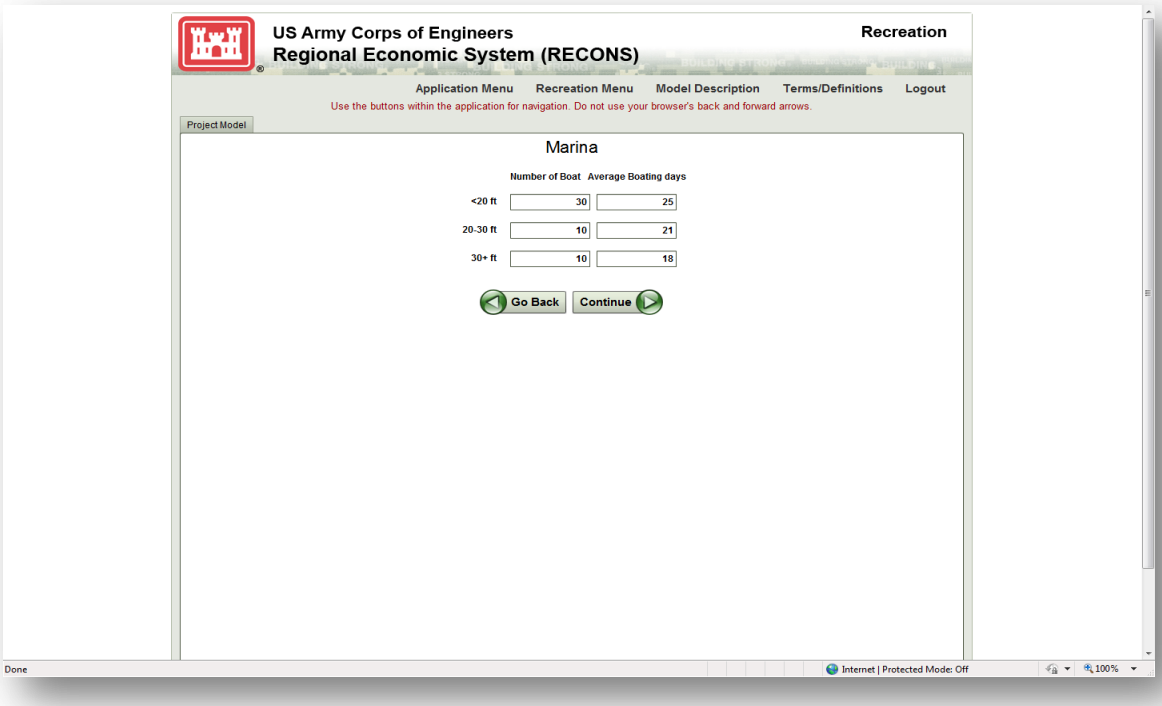
- A marina analysis provides options for 3 different-sized boats as well as the number boating trips per year to estimate their economic impacts to the region. This includes boats kept in seasonal slips and moorings, dry stack storage, and those that rent transient slips. This model produces estimates of boating days by the boats stored in a marina, trip and craft spending by marina stored marina boats, and the associated direct and indirect economic impacts.
- The launch analysis specifies the number of launches for two different-sized boats. Choose this option to estimate the economic impacts of boating trips on which boats are tailered to launch sites. This is limited to power boats because they are the predominate type of boats launched from access/launch sites. The model produces information including the average spending per launch, total annual trip spending by boaters who launch at a site, and the economic impacts of this annual trip spending.

The user needs to search for a recreation project based on either the USACE district and division or by state. The user must select the project name from the list on the right side of the screen. The user also needs to select the type of analysis (marina or launches) and the year in which the boating activity takes place. Throughout this module, the user can always return to this screen to restart or undertake another analysis. Select "continue" to proceed to the following screen.



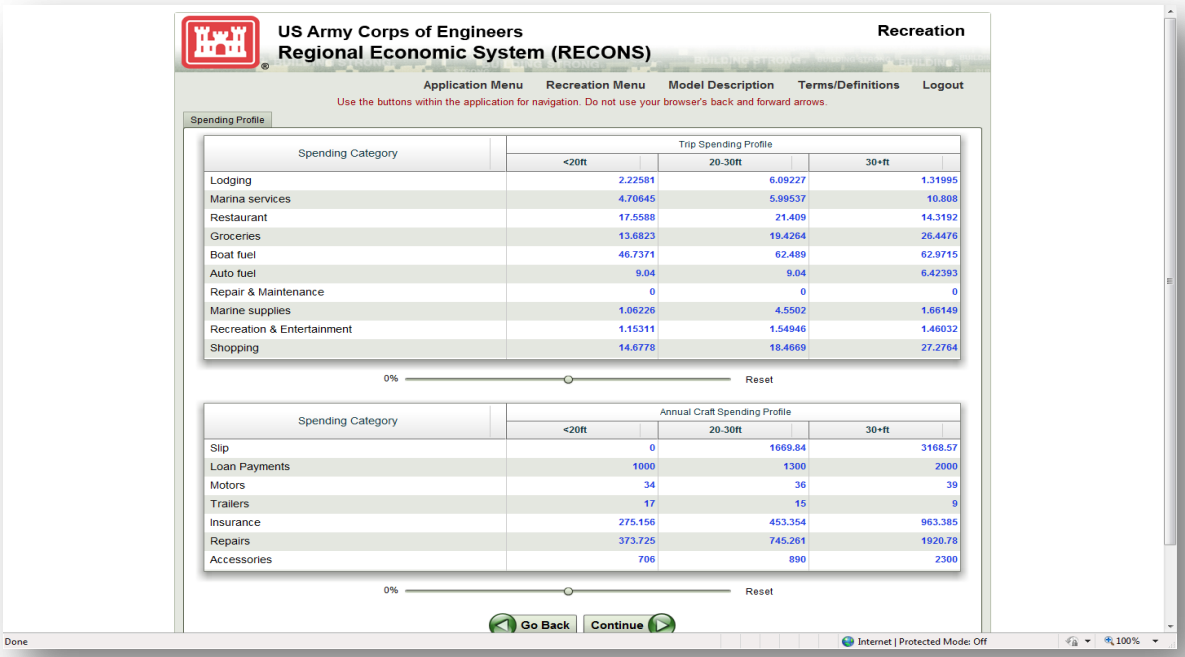
Screen 2: Enter Boat Information

Under screen 2, the user must enter the number boats for three different-sized boats: less than 20 foot boats; 20 to 30 foot boats; and 30 foot or more boats (default numbers of boats are not provided). On this screen, there is a default average number of boating days per year, which the user can also modify with better information. Across all USACE recreation projects, the default average boating days are the same, which are based on a collection of previous recreation boating surveys. Again, RECONS will calculate impacts based on annual estimates; however, both changes in expected number of boats or total number of boats can be entered to estimate the impacts on an annual basis.



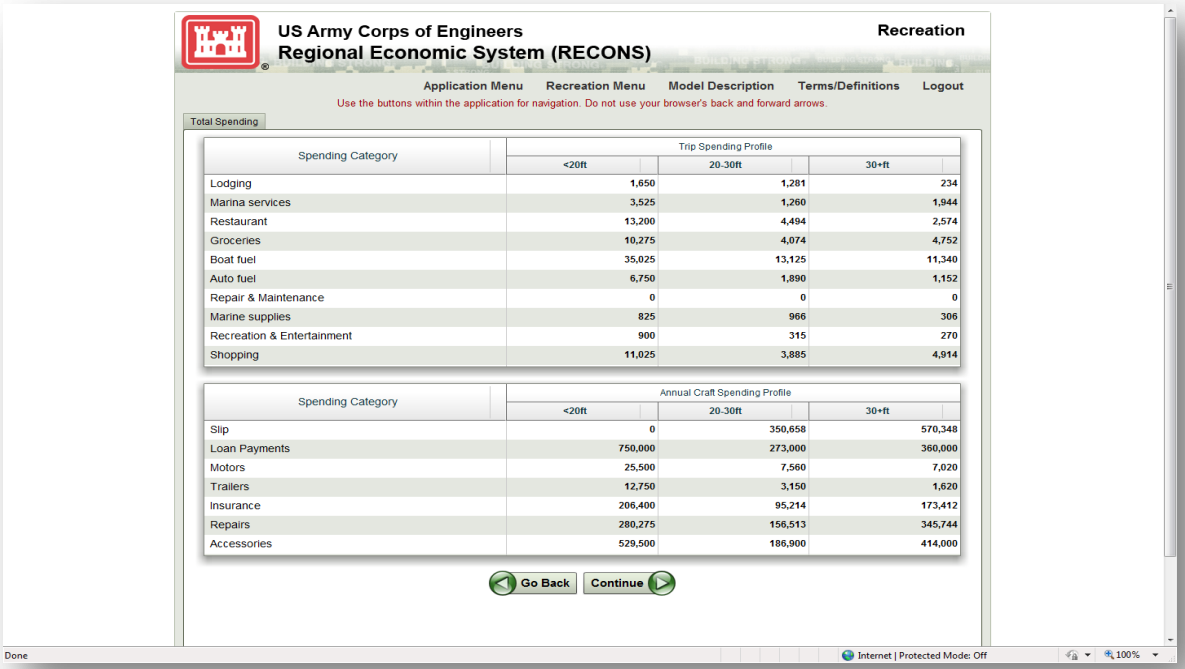
Screen 3: Edit Spending Profile

Screen 3 shows the both the boat trip spending (per boating trip) as well as the annual craft spending. All figures are in 2009 dollars on this screen. These are default values based on the collections of previous recreation boating survey. The spending profile for boating trip spending and annual spending is provide for each size of boat (less than 20feet, from 20 to 30 feet, and over 30 feet). A slider is available for both spending profiles to adjust the spending up or down by up to 30% in increments of 10%. The RECONS user would adjust this spending through the slider if the user has information regarding the general expenditures of boaters. The user can also adjust the items in the spending profile individually with information regarding specific expenditures. If little information is known about boating expenditures, the RECONS user should use the default spending profile.



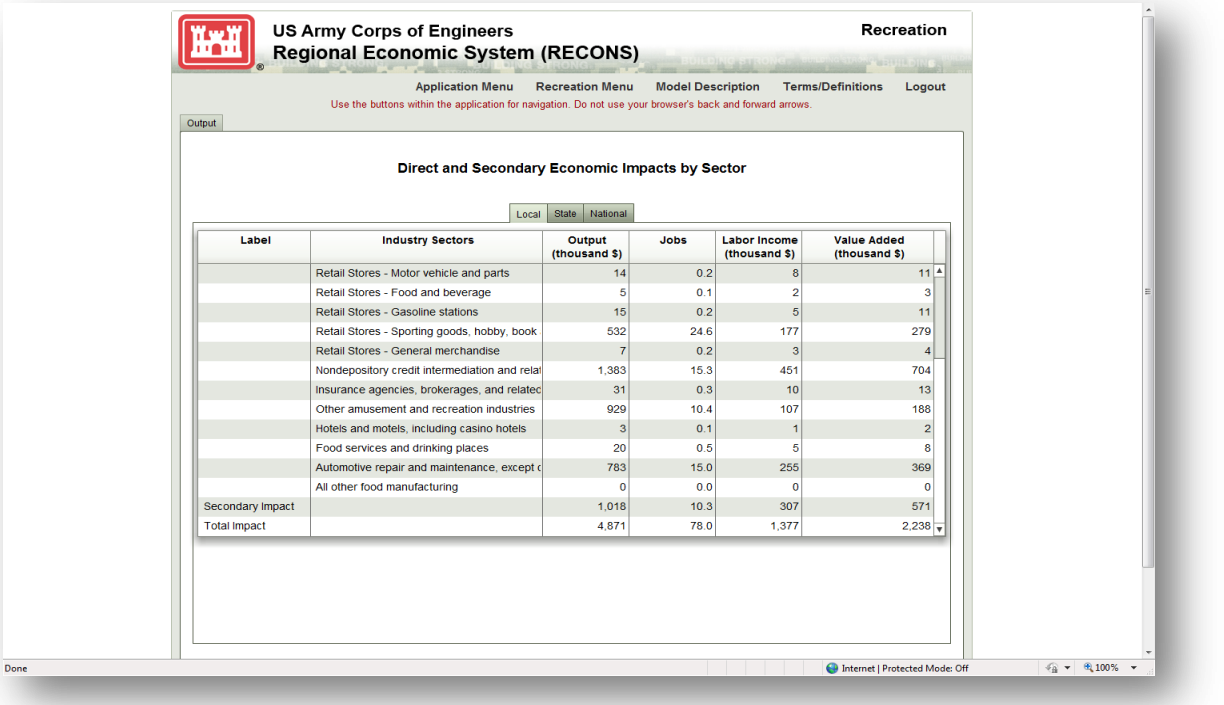
Screen 4: Total Spending

Under the top part of screen 4, the spending profile is provided for each type of category (e.g., lodging, marina services, etc.). The bottom of the screen provides annual craft spending by each of the spending categories based on user inputs. These categories are then mapped to IMPLAN sectors for the impact analysis.



Screen 5: Economic Impact Results

Under screen 5, the economic impacts of the total trip and annual craft spending are estimated. There are tabs for the local, state, and national summary by categories in the spending profile, which includes the identification of the sector affected and its associated direct impacts. For example, in looking at the Other Amusements and Recreation Industries sector, the direct impact is the portion of the output captured within impact area (i.e., multiplied by the local LPC). Additionally, the direct jobs, labor income, and gross regional product as shown in the sector row are all associated with this sector. The secondary impacts are a summary of the multiplier effects associated with all of the direct impacts, which include both indirect and induced effects. Indirect impacts include industries that support the directly affected sectors, and induced effects occur when workers associated with the direct and indirect industries spend their salaries in the impact area, creating additional jobs and income. When finished, the user has the choice of saving and/or printing a report from the current analysis, work on another boating project, or starting from the beginning for this recreation project.



Label	Industry Sectors	Output (thousand $)	Jobs	Labor Income (thousand $)	Value Added (thousand $)
	Retail Stores - Motor vehicle and parts	14	0.2	8	11
	Retail Stores - Food and beverage	5	0.1	2	3
	Retail Stores - Gasoline stations	15	0.2	5	11
	Retail Stores - Sporting goods, hobby, book	532	24.6	177	279
	Retail Stores - General merchandise	7	0.2	3	4
	Nondepository credit intermediation and relat	1,383	15.3	451	704
	Insurance agencies, brokerages, and relatec	31	0.3	10	13
	Other amusement and recreation industries	929	10.4	107	188
	Hotels and motels, including casino hotels	3	0.1	1	2
	Food services and drinking places	20	0.5	5	8
	Automotive repair and maintenance, except c	783	15.0	255	369
	All other food manufacturing	0	0.0	0	0
Secondary Impact		1,018	10.3	307	571
Total Impact		4,871	78.0	1,377	2,238

USACE ARRA PROJECTS

The RECONS tool has been designed to estimate the economic impacts of the CW spending as part of the American Recovery and Reinvestment Act (ARRA) of 2009. The ARRA supplemental funding to USACE's FY2010 budget was significant, adding $4.6 billion to the Congressional appropriated budget for USACE of $5.1 billion. ARRA funding has financed and continues to finance a large and diverse group of infrastructure construction and rehabilitation projects as well as environmental related projects in almost all of the eight USACE business lines.

Descriptions of the ARRA budget line items were analyzed and categorized into work activities for each of the USACE business lines. General work activities that are associated with multiple business lines were also identified. Additional information on the ARRA work activities was obtained from USACE documents, web searches, and interviews with USACE experts and a number of key vendors. A detailed description of the work activities, the spending profiles, and interviews conducted on which these profiles and categories were developed is provided in the Federal Spending Methods Manual, Resource Guide for Work Activities and Spending Profiles (Appendix A of the Methodology Manual). All ARRA budget line items were identified with a work activity. If the ARRA work description was vague and the type of work activity difficult to ascertain, district interviews were conducted to determine the type of work being undertaken under that ARRA budget line item. In five cases, the ARRA budget line item was associated with multiple work activities; these were adjusted manually.

The ARRA legislation mandates that the majority of the ARRA Federal Spending be contracted to private industry and not be undertaken by USACE employees. However, there is small amount of ARRA appropriation allocated for management, oversight, supervision, and administration that provides for limited USACE staffing and other costs (Glyer, February 17, 2010). It was estimated that from three to five percent of the ARRA budget line items were associated with USACE labor in support of ARRA projects (Chang and Lichy, 2010). As a result, three percent of all business line ARRA projects, except Regulatory, was allocated to USACE labor and overhead.[19] Consistent with the CW labor spending, approximately 67% of the in-house labor expense is associated with direct labor costs and benefits, while the remaining 33% is overhead and burden costs. Again, wages, salaries, and benefits expenditures are associated with IMPLAN Sector 439, Federal Non-Military Government Employee Compensation. USACE overhead expenditures include the cost of doing business, including overhead, facility burden, and other operational expenditures for buildings, equipment, and facilities. These expenditures were associated with IMPLAN Sector 386, Business Support Services. This sector supports the operations and maintenance of business and facilities. Additional details on the USACE labor and overhead approach are provided in the Federal Spending Methodology Manual.

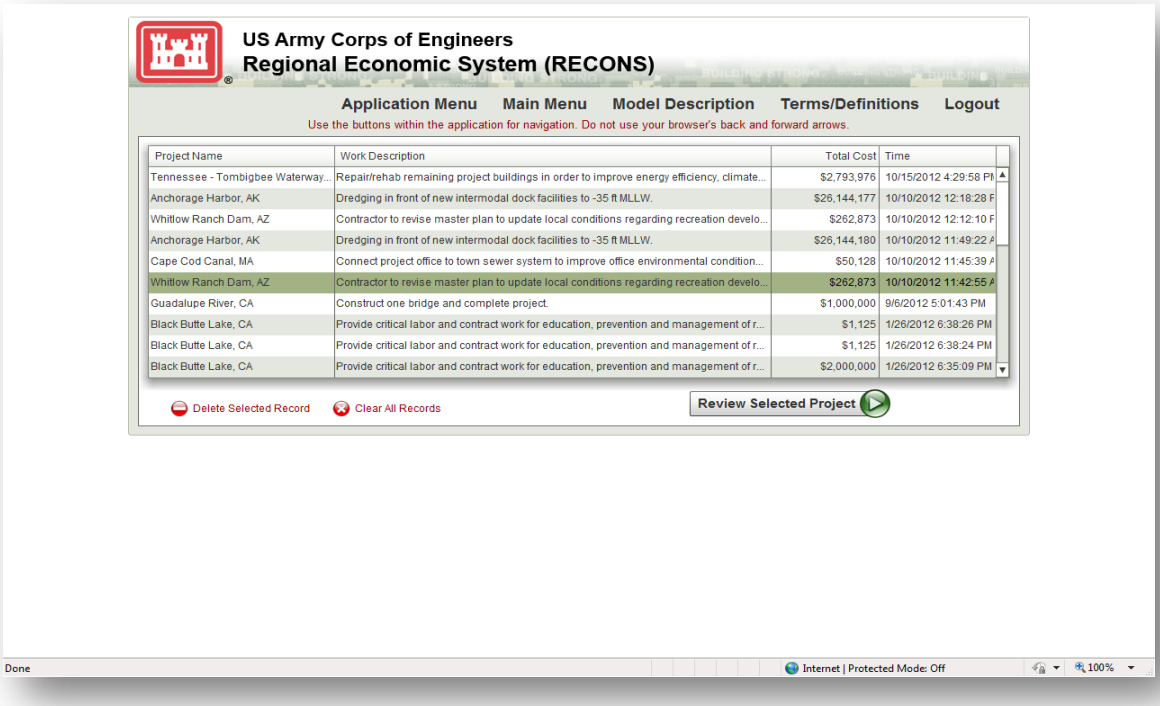
To analyze the economic impacts of ARRA budget line item spending, the RECONS user should use the "New Analysis of a USACE Project Expenditure" module, which will include the ARRA budget line expenditures by project location, business line, and work activity. Once these

[19] The Expenses and Regulatory appropriation account is only associated with USACE labor and overhead and allocated only to the national impact area.

analyses have been assessed, they can be reviewed in the "Review Previously Conducted ARRA Analyses." Additionally, the "New Analysis of USACE Operational and Administrative Expenditures" allows the RECONS user to estimate the economic impacts of USACE labor and overhead expenditures at the project location or the district or division office location.

Review Previously Conducted ARRA Analyses

This module allows the user to view all ARRA budget line item economic analyses that the user has undertaken in the past through the "New Analysis of USACE ARRA Expenditure." See module described in subsequent section. The first screen, shown below, allows the user to view all of the analyses by project name and time and data analyzed, from which the user would choose a row. The user then moves through the screens just as if the user were accessing this project analysis again. Please see the description in "New Analysis of USACE ARRA Expenditure" for descriptions of each of the screens in this module.



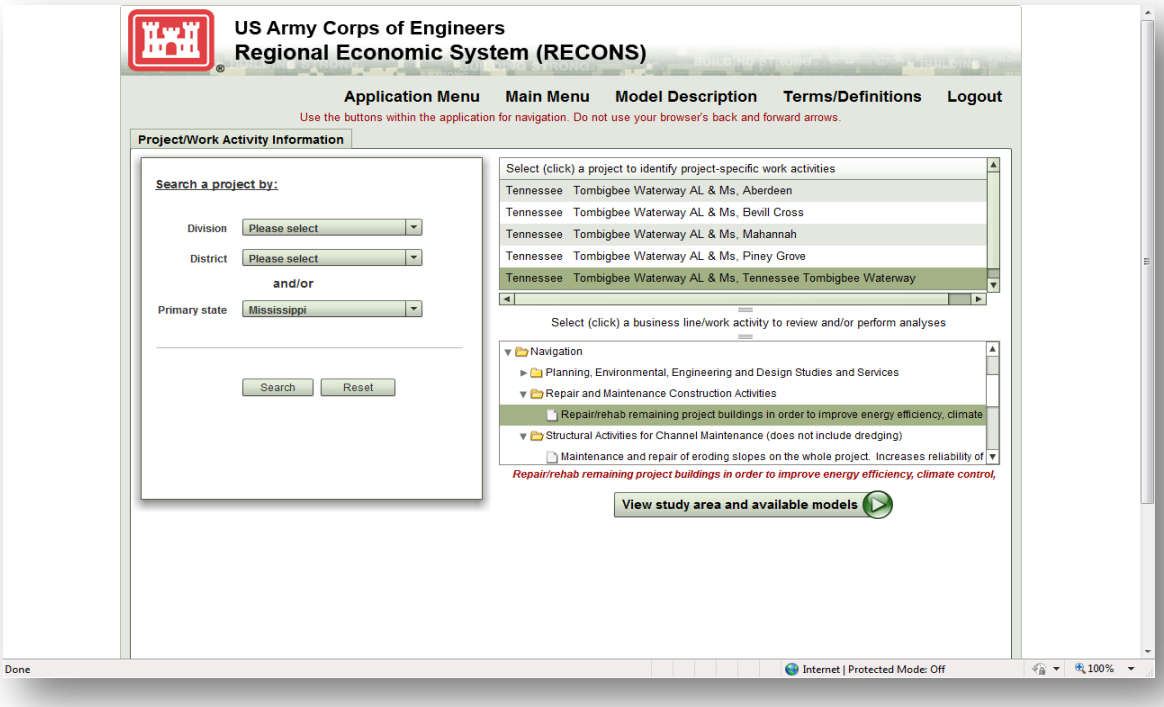
New Analysis of a USACE ARRA Expenditures

Screen 1: Select a Project and Budget Line Item

In screen 1, the user is provided with the various ARRA budget line items by project and work activity. The user can search for the relevant project by either selecting the district and division or the state. Once these locations are identified, RECONS provides the user with all of the USACE projects for ARRA budget line item; these projects are listed in the upper right-hand side of screen 1. Once the project has been selected, RECONS will provide the list of ARRA budget line items by business line and work activity. If only one business line is shown with a specific project selected, this would imply that there was only ARRA budget line items associated with the one business line. The user can navigate in this lower right-hand part of

screen 1 to search the various ARRA budget line items. Use the arrows to the left of the business line to show the various work activities for the ARRA budget line items. Use the arrows to the left of the work activities to show the specific ARRA budget line item descriptions that were grouped within this USACE work activity.

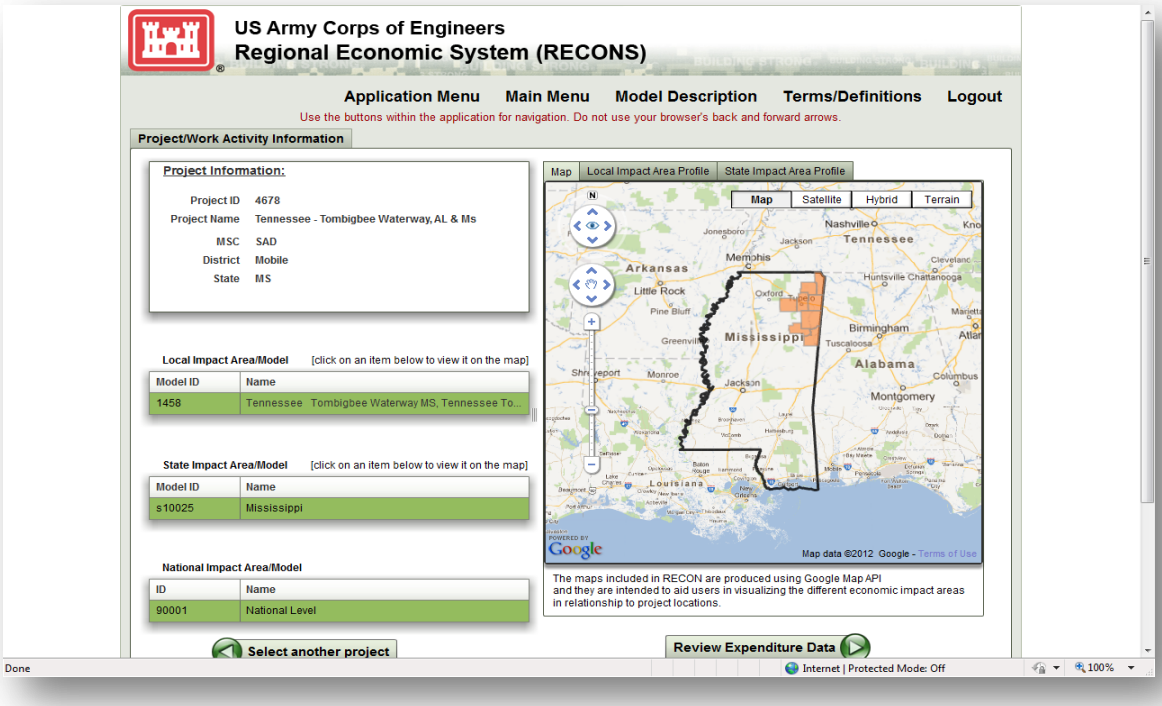
For each ARRA budget line item, there is the main work activity as well as the USACE labor and overhead support of this ARRA project. A portion (3%) of each of the ARRA budget line items were allocated to USACE labor and overhead in support and management of the ARRA project, based on interviews with USACE financial experts, who indicated that from three to five percent USACE labor is likely to occur in support of ARRA projects (Chang and Lichy, 2010). USACE labor and overhead associated with each of the ARRA budget line items is listed by business line. The RECONS user can view the USACE labor and overhead expenditure for each of the ARRA budget line items by the business line. To run the full economic impact of the ARRA budget line item, the user should estimate the economic impacts of the ARRA budget line item main work activity as well as the proportion of the ARRA budget line item allocated to USACE labor and overhead and aggregate these two results. Select the ARRA budget line item to estimate the economic impacts by clicking on the description of the ARRA budget line item.



Screen 2: Confirm Economic Impact Area

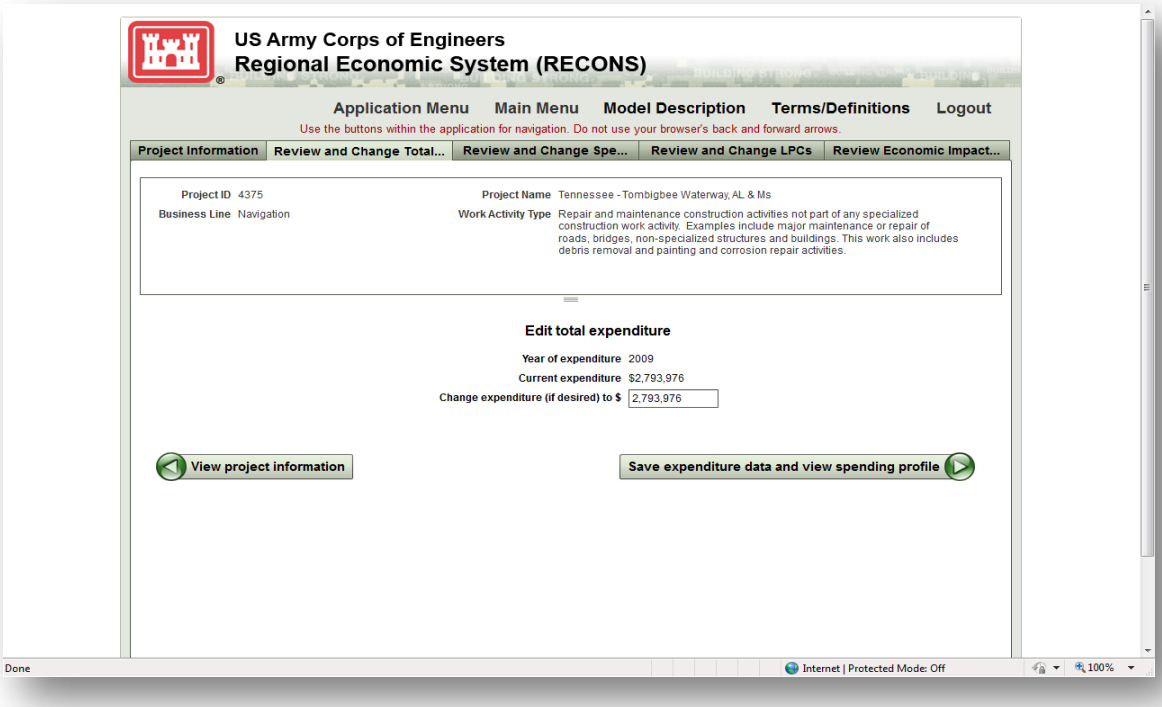
The project name that was chosen on the previous screen is automatically associated with the local and state impact area. Please see the description of screen 2 of the Create and Analysis a New CW Budget Project – Model from Project module for more information on the impact areas.

The choice of an impact area cannot be changed in this screen, as they are automatically associated with the project name and its associated county, metropolitan, micropolitan or large-scale impact area. Select "review expenditure data" to proceed to the following screen.



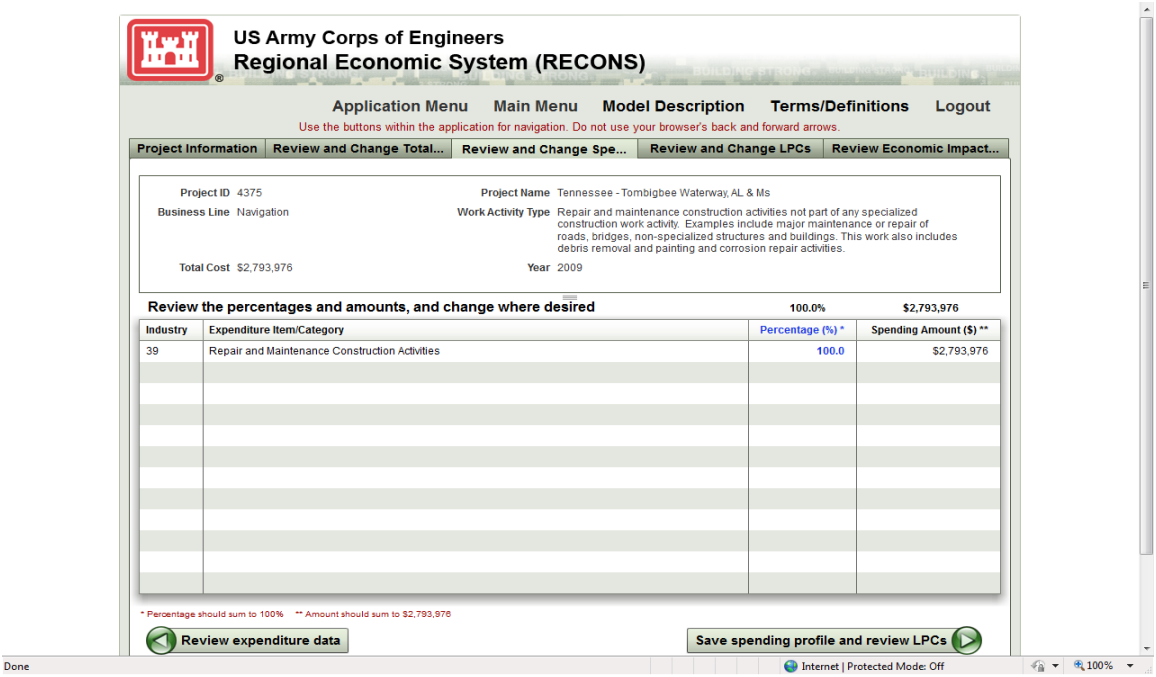
Screen 3: Review and Change Total Expenditure

Under this screen, the user will be prompted to change the expenditure if desired. The user will be able to return to this screen to adjust this amount if needed. The default ARRA budget line expenditure is 3% lower than the total ARRA allocation for the specific budget line item since 3% of the expenditure was allocated to USACE labor and overhead to administer the project.



Screen 4: Review and Change Spending Profile

The work activity identified in Screen 2 is associated on a default spending pattern that maps the expenditures to various industries and sectors associated with the IMPLAN model. Please see screen 5 of the Create and Analyze New CW Budget –model from Project module for additional description of the spending profile. Select "save spending profile and review LPCs" to proceed to screen 6.

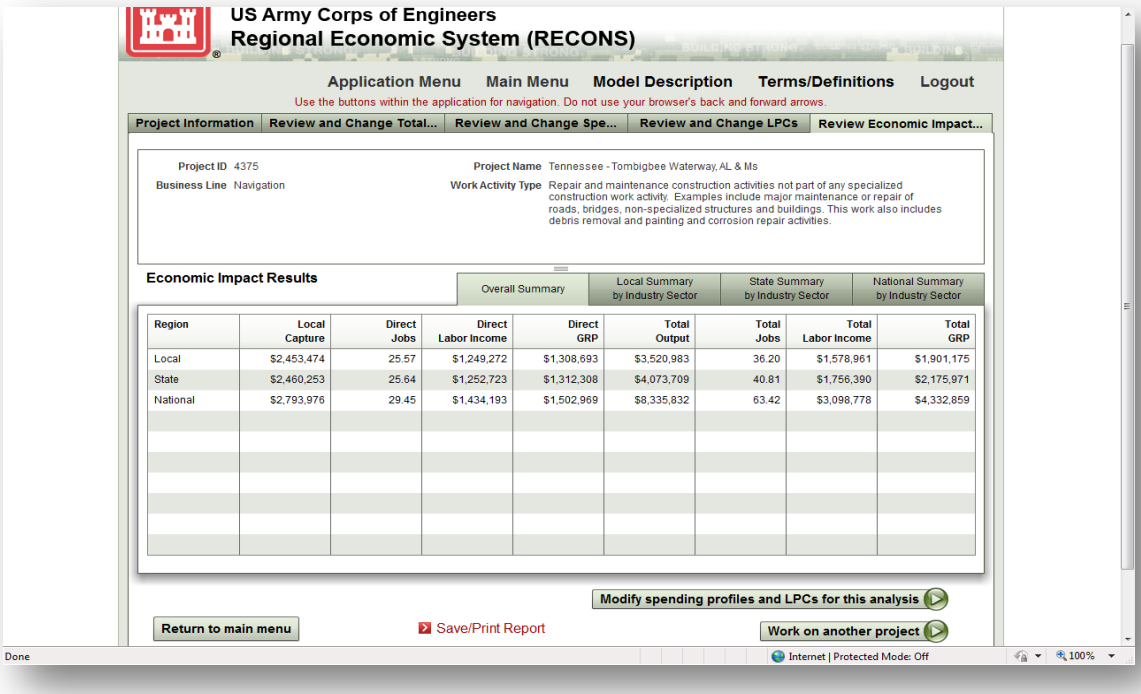


Screen 5: Review and Change LPCs

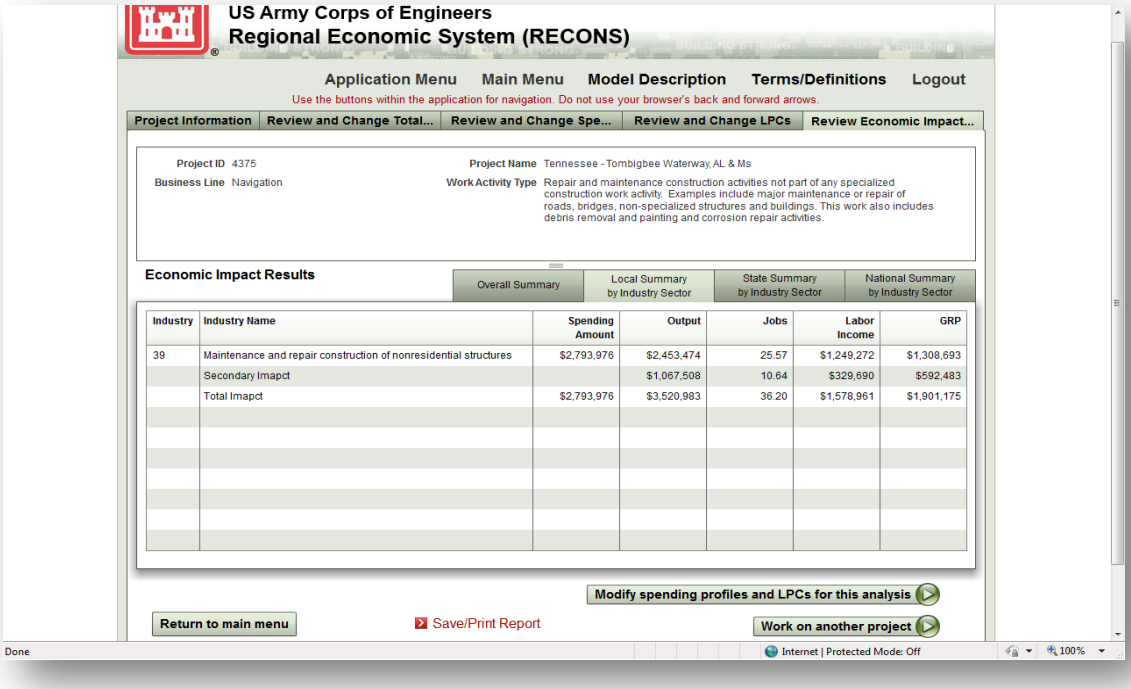
Under this screen, the user can view the Local, State and National LPCs applied to the industries and sectors within the analysis. The LPC (also known as the geographic capture rate) is the portion (i.e., percentage) of USACE spending or industry revenues captured by industries located within the local, state, or national impact area. Please see the description for screen 6 under Conduct and Analyze a New CW Project – Model from Project. Select "save LPCs profile and calculate economic impact" to proceed to screen 6.

Screen 6: Review Economic Impact Results

Under screen 6, the user is able to view results of the impact analysis. The analysis information is provided at top of the screen. The values provided in the results are in the year that the project or activity was identified by the user as occurring. Please see a description of screen 7 under Create and Analyze a New CW Project – Model from Project.



This screen also allows the user to view the results by industry for the local, state, and national impact areas. The industries identified on this screen (industry 39) are the directly affected industries.



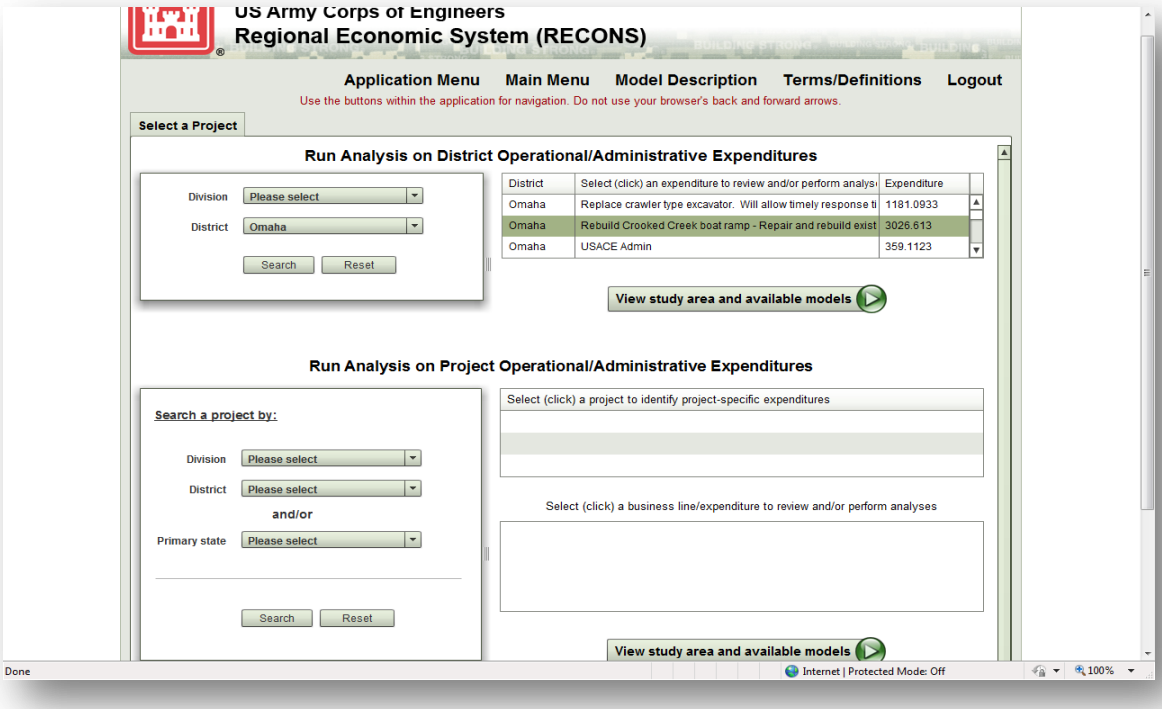
When finished, the user has the choice of saving and/or printing a report from the current analysis, modifying spending profiles and LPCs for this project, or performing another impact analysis.

New Analysis of a USACE Labor and Overhead Expenditures

This module allows the RECONS user to estimate the economic impacts of USACE labor and overhead expenditures at the project or the district or division office location. Default labor and overhead expenditures for the ARRA budget line items have been provided; these expenditures can be modified to characterize USACE labor and overhead expenditures for USACE support in general or for specific business lines or projects.

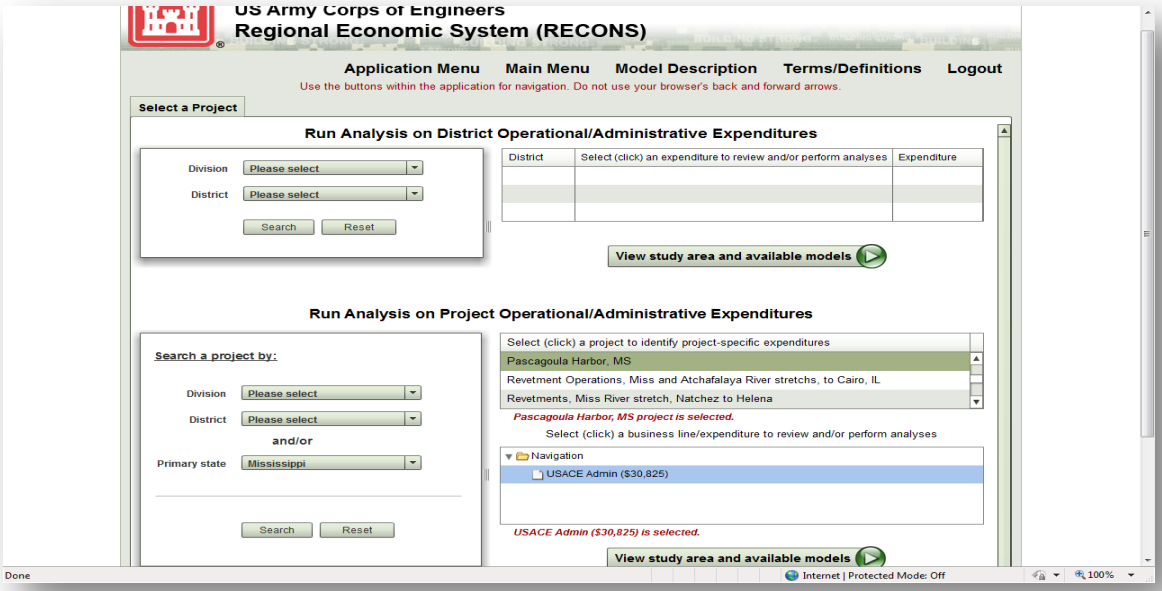
Screen 1: Select a Project

The first screen allows the user to choose to estimate impacts at the division or district office location or the project location. The RECONS user should chose the location based on where the USACE personnel primarily work and live. If the user would like to estimate the USACE economic impacts in support of a project, but the USACE personnel are located in a district location supporting the project, the district should be selected. For the division or district analysis, the user chooses the division, district, or state and searches for the relevant location. The USACE labor and overhead allocation of the ARRA budget line items to the district or division location have been provided. Under this analysis, all economic impact areas are associated with the division or district office location and not the project location. The user is also able to modify the expenditures to run any USACE labor and overhead expenditures for the district or division office location.



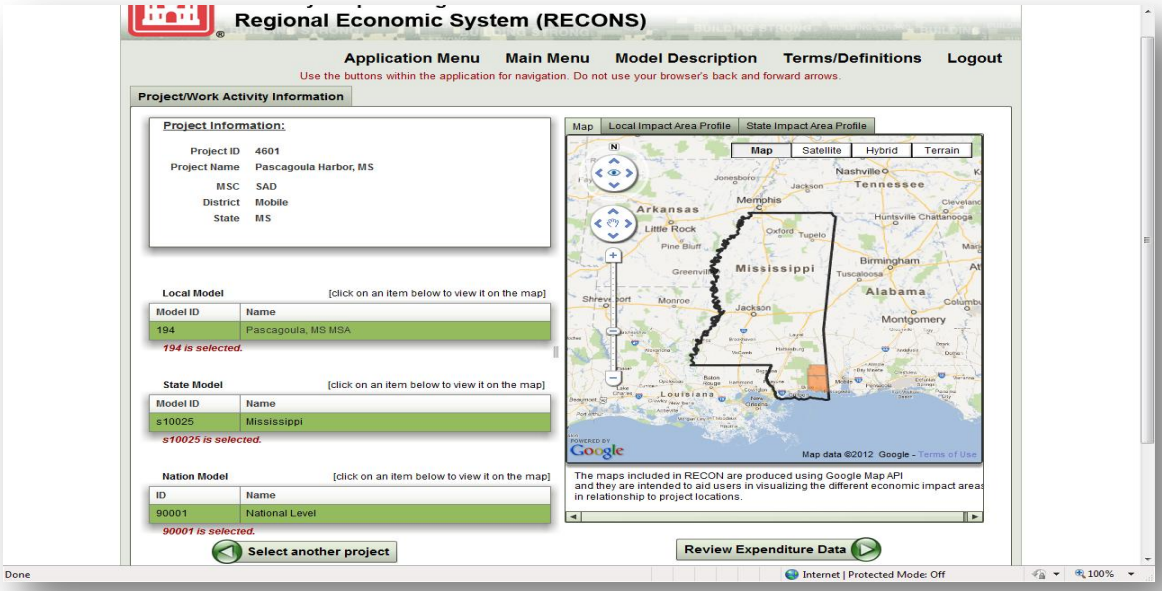
For the Project level analysis, the user is able to search for all ARRA projects by selecting the division, district or state. The projects are then listed for the ARRA budget line items. Once the relevant project is selected, the business lines and the associated USACE administrative expenditure are shown. The user should select one of the USACE labor and overhead expenditures upon which the economic impacts will be estimated. Again, the user can always modify the expenditure amount. However, the project location cannot be changed once the user

selects the project and associated USACE administrative expenditure. The user should select "view study are and available models" to continue to the following screen.



Screen 2: Confirm Economic Impact Area

The project name or district of division location that was chosen on the previous screen is automatically associated with a local and state impact area. Please see the description of screen 2 of the Create and Analysis a New CW Budget Project – Model from Project module for more information on the impact areas. The choice of an impact area cannot be changed in this screen, as they are automatically associated with the project name and its associated county, metropolitan, micropolitan or large-scale impact area. Select the "R\review expenditure data" to proceed to the next screen.



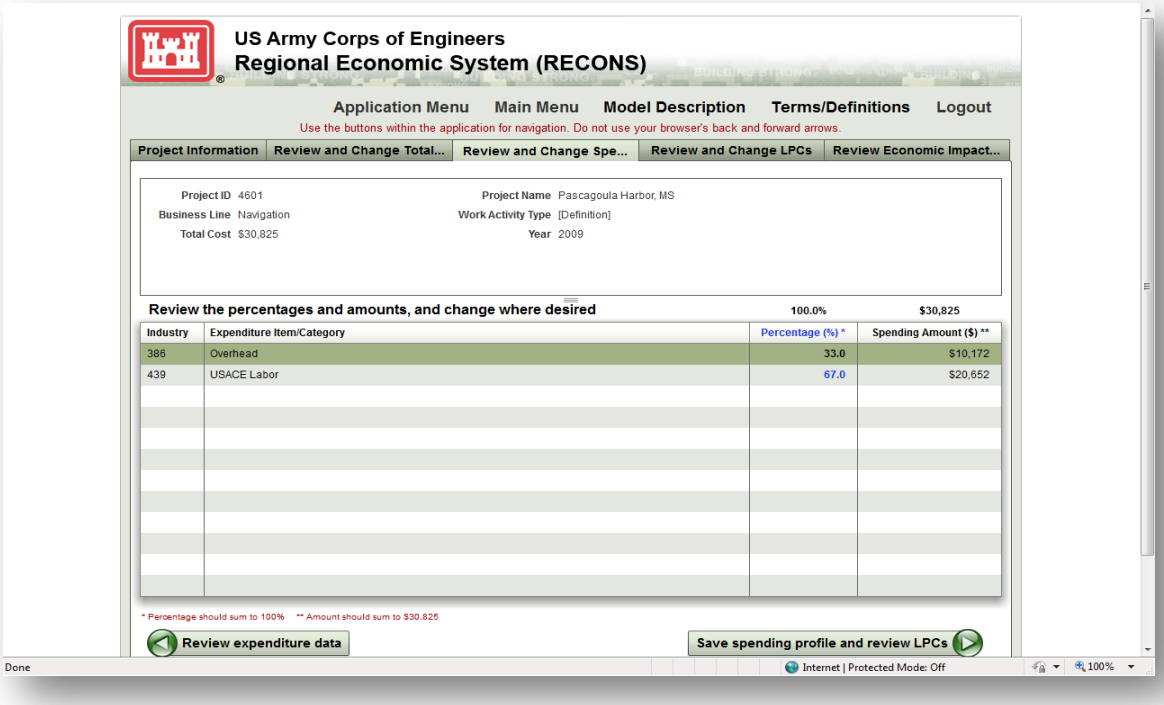
Screen 3: Review and Change Total Expenditure

Under this screen, the user will be prompted to change the expenditure if desired. The user will be able to return to this screen to adjust this amount if needed. Again, the default expenditure in this screen is the USACE administration or labor and overhead associated with the specific ARRA budget line expenditure, which was estimated to be 3% of the total ARRA budget line item allocation. Select "save expenditure data and view spending profile" to proceed to the following screen.

Screen 4: Review and Change Spending Profile

This RECONS module is associated with just one "work activity" – USACE labor and overhead or USACE administrative expenditures. USACE labor expenditures under this module assumes a default spending profile of 67% wages, salaries, and benefits and 33% overhead and burden, which was based on the CEFMS/OMBIL Resources Codes within the In-house Labor Account. The default spending profile maps the all USACE labor through IMPLAN Sector 439—Federal Government, Non-Military Employee Compensation. Employee Compensation includes both wages/salaries and benefits. For consistency with IMPLAN's employee compensation approach, the USACE payroll costs should include both direct labor or wage costs as well as benefits.

USACE overhead expenditures include overhead, facility burden, and other operational expenditures for buildings, equipment, and facilities. These expenditures are mapped to IMPLAN Sector 386, Business Support Services. The RECONS user is able to modify this profile under this screen with better information on the allocation of expenditures between wages, salaries, and benefits and overhead. Select "save spending profile and review LPCs" to proceed to screen 5.



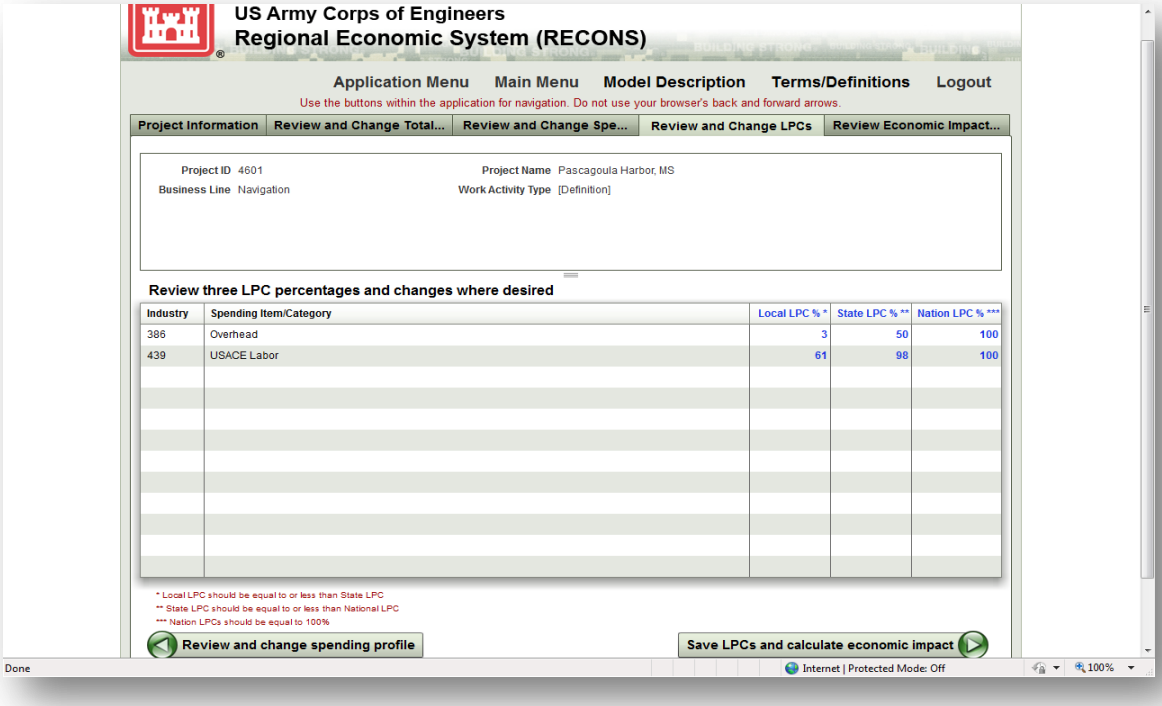
Screen 5: Review and Change LPCs

Under screen 5, the user is able to view the spending profile and the associated local, state, and national LPCs provided by RECONS for the relevant sectors 438 and 385. The LPC is the portion (i.e., percentage) of Federal spending captured by people or industries located within the local, state, or national impact area.

The LPCs in this module are based on IMPLAN's national trade flows model, which utilizes a doubly constrained gravity model of county level estimates of commodity demand and supply. Additional information is provided in the RECONS Approach section.

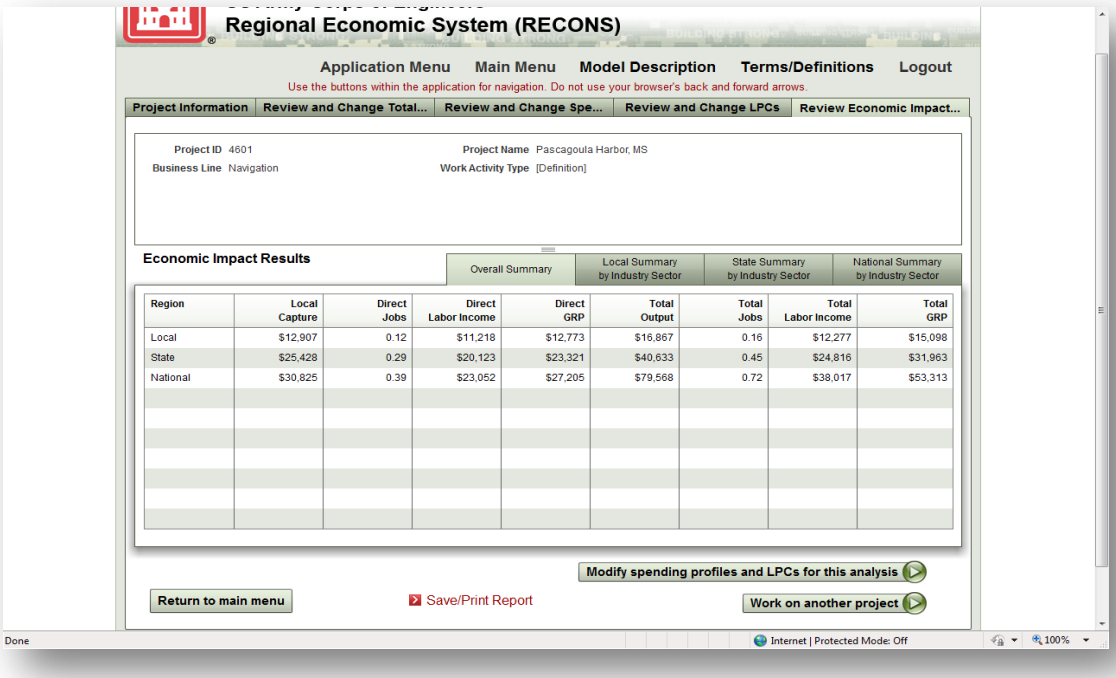
The user has the ability to change these LPCs if the user has information on the labor and overhead spending captured within the local and state impact area. If the user knows that all of the USACE personnel or employees live within the local impact area model, then the user can adjust the local and state LPCs for USACE labor to 100% if they are not already specified as such.

As noted above, the national LPC must be greater than or equal to the state LPC, which needs to be greater than or equal to the local LPC. Please see the description for screen 6 under Conduct and Analyze a New CW Project – Model from Project for additional description of this screen. Select "save LPCs profile and calculate economic impact" to proceed to screen 6.

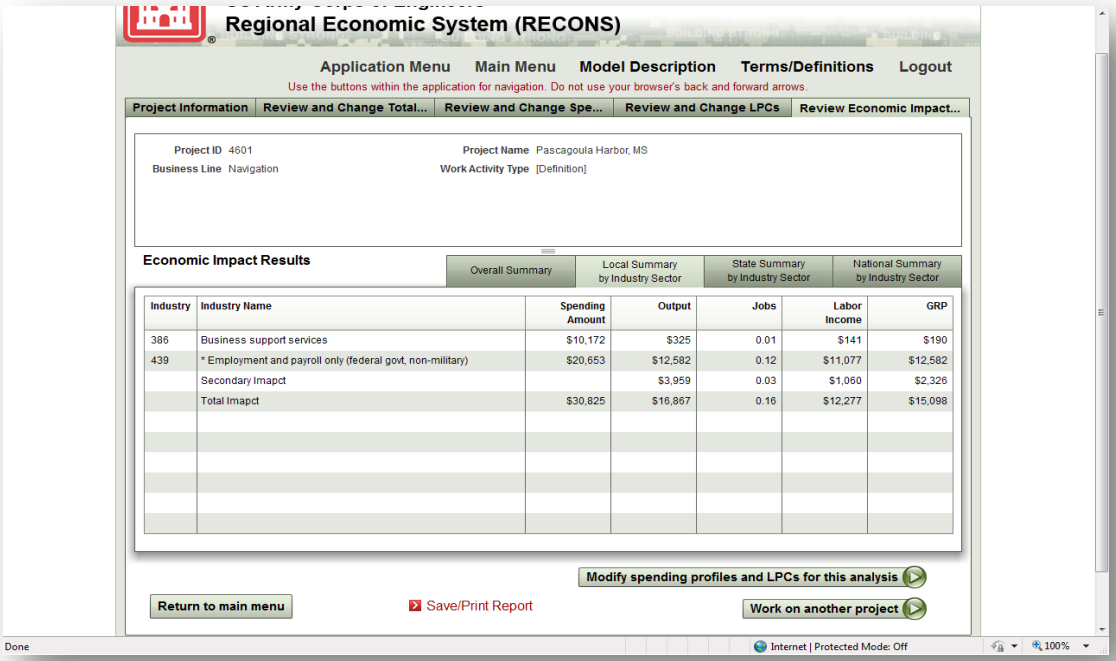


Screen 6: Review Economic Impact Results

Under screen 6, the user is able to view results of the impact analysis. The analysis information is provided at the top of the screen. The values provided in the results are in the year that the project or activity was identified by the user as occurring. Please see a description of screen 7 under Create and Analyze a New CW Project – Model from Project.



This screen also allows the user to view the results by industry for the local, state, and national impact areas. The industries identified on this screen (industry 39) are the directly affected industries.



When finished, the user has the choice of saving and/or printing a report from the current analysis, modifying spending profiles and LPCs for this project, or performing another impact analysis.

APPENDIX A: GLOSSARY

Table 5. Glossary

ARRA	The American Recovery and Reinvestment Act of 2009, abbreviated ARRA (Pub.L. 111-5) and commonly referred to as the Stimulus or The Recovery Act, is an economic stimulus package enacted by the 111th United States Congress in February 2009 and signed into law on February 17, 2009, by President Barack Obama. The ARRA had three goals: create new jobs and save existing ones; spur economic activity and invest in long-term growth; and foster unprecedented levels of accountability and transparency in government spending.
ARRA Budget Line Items	ARRA budget line items refer to ARRA spending by line item as distinguished by business line, appropriations account, and description of activity.
Appropriation Accounts	The funding for the Civil Works program of the U.S. Army Corps of Engineers (USACE) is distributed among appropriation accounts as follows: Operation and Maintenance, Construction, Mississippi River and Tributaries, Regulatory Program, Expenses, Formerly Utilized Sites Remedial Action Program, Investigations, Flood Control and Coastal Emergencies, and the Office of the Assistant Secretary of the Army for Civil Works. The ARRA budget line items were associated with three appropriation accounts: Construction, Operations and Maintenance, and Investigations.
Backward-linked Industries	Backward-linked industries are industries and sectors that supply goods and services to the directly affected industry. For example, if construction activity is the direct effect, backward-linked industries supporting construction (the direct effect) would include architectural and engineering, lumber suppliers, trucking, steel manufacturers, among others.
Capture Amount or Local Capture	In RECONS, the local capture or capture is equal to the Federal spending allocated to the particular sector multiplied by the local purchase coefficient (LPC). The local capture is the portion of direct Federal spending or industry revenues that are captured by industries or employees within the local, state, or national impact areas. It is also equal to the direct output- which is equal to total output less the secondary effects.
CEFMS/OMBIL	U.S. Army Corps of Engineers Financial Management System /Operations and Maintenance Business Information Link (CEFMS/OMBIL) is used to describe the process that the USACE undertook to access the data in their Financial Management System. The OMBIL tool was utilized to query the financial data in CEFMS.
Direct Effect	The work activity expenditures made by the USACE under each business line. In the impact area in which a project is located, direct effects represent that proportion of the expenditure in each industry that flows to material and service providers in the region. For employment and labor income measures, the direct effect represents the jobs and labor income associated with the work activity.
Direct Ratios	Direct ratios allocate the amount of expenditure or spending associated with

	the direct effects of employment, labor income, and gross regional product. For example, for $1 million in construction spending, there are 24 construction jobs (direct), $300,000 in direct labor income, and $600,000 in direct gross regional product generated. These ratios are provided by data from the IMPLAN models.
Economic Contribution (Significance) & Economic Impact	Economic impact and contribution estimate the change (impact) or existence (contribution) in economic activity (output, labor income, value added, and employment) associated with the new or already occurring economic stimulus to an economy.
Economic Output	Economic Output or total industry output is the value of production by industry for a given time period. Output can be measured either by total value of purchases by intermediate and final consumers or by intermediate outlays plus value added. It is also known as gross revenues or sales.
Employee Compensation	Employee Compensation is the total payroll cost of the employee paid by the employer. This includes wage and salary, all benefits (e.g., health, retirement, etc) and employer paid payroll taxes (e.g. employer side of social security, unemployment taxes, etc).
Employment	A job is the annual average of monthly jobs in that industry (this is the same definition used by Quarterly Census of Employment and Wages, Bureau of Labor Statistics, and Bureau of Economic Analysis nationally). A job can be full-time, part-time or overtime, and includes proprietors. RECONS output reports the total part-time and full-time jobs (full-time jobs can also include over-time).
Employment Rate	Employment rate is shown in the economic impact area demographic profile information. The employment rate is the proportion of the labor force that is currently employed. The remaining proportion is the unemployment rate, which is the proportion of the labor force currently seeking employment.
FUSRAP	Formally Utilized Sites Remedial Action Program (FUSRAP). In 1997, Congress directed the USACE to conduct assessment, remedial action, and site closure activities for FUSRAP sites. The Department of Energy's (DOE) Office of Legacy Management (LM) retains responsibility for determining eligibility for site cleanup under FUSRAP and for long-term surveillance and maintenance (LTSM).
Geographic Capture Rate	The geographic capture rate or the Local Purchase Coefficient (LPC) is the portion of industry sales satisfied with industries located within the impact area. In most cases, IMPLAN's trade flows Regional Purchase Coefficients (RPCs) are utilized to estimate this proportion. However, in some cases, the geographic capture rate was customized with expert information.
Gross Regional Product	Gross Regional Product, which is also known as value added, is equal to the sum of employee compensation, proprietor income, other property type income, and indirect business taxes. GRP is also defined as gross industry output (i.e., sales or gross revenues) less the cost of intermediate inputs (i.e., the consumption of goods and services purchased from other US industries or imported).

IMPLAN	A software and database program that estimates input-output models based on data and assumptions of social accounting and multipliers.
Impact Area	The impact area is identified as local, state, or nation. The impact area is a county, multi-county, state, multi-state, and national geographic region, upon which IMPLAN models were created and industry multipliers were extracted for use in RECONS. The local impact area was identified as a metropolitan, micropolitan, rural, or large-scale region, and in most cases are associated with a county or multiple counties. If the project or industry activity occurred in a metropolitan or micropolitan county, as defined by the Office of Management and Budget (OMB), the multi-county metropolitan statistical area (MSA) or micropolitan statistical areas (micro-SA) was identified as the impact area.
Indirect Effect	The indirect effects include the backward-linked industry suppliers for any goods and services used by the directly affected activities.
Induced Effect	The induced effect occurs from household expenditures or consumer spending associated with workers' earnings from both direct and indirect labor income.
Input-output analysis	An economic model that allows the assessment of change in overall economic activity as a result of some corresponding change in one or several activities.
Labor Income	Labor income represents all forms of employment earnings. In IMPLAN's regional economic model, it is the sum of employee compensation and proprietor income.
Labor Response Coefficients	Labor response coefficients were estimated to determine the private sector labor impact on local and regional economies. These multipliers were estimated in IMPLAN for each of the 4 types of impact regions (metropolitan, micropolitan, rural, and large-scale, multi-state, or state). The household income level of $35,000 to $50,000 was utilized for these estimates based on the average income for a worker in the construction industry. Direct ratios were estimated from the construction industry (IMPLAN sector 36). The labor response coefficients, as defined in this Manual, represent multipliers or ratios of direct and induced effects per $1 million in private sector employee compensation. In RECONS, these response coefficients are referred to as Sector 5001.
Large-scale area	Large-scale local impact areas required research to identify the appropriate impact area. Linear projects, such as river stretches, include adjacent counties as well as counties within any MSAs or micro-SAs. For example, if a river stretch included a metropolitan area, such as Pittsburgh, all counties along the river on both sides were included in the impact area as well as those counties comprising the Pittsburgh MSA (7-county region).
Local Purchase Coefficient	The Local Purchase Coefficient or the geographic capture rate is the portion of USACE spending on industries (sales) captured by industries located within the impact area.
Margins	Margins represents the difference between producer and purchaser prices in a retail or wholesale environment, and generally provides an allocation of spending to the appropriate manufacturing, retail and wholesale trade

	sectors, and transportation industries. Margins are used to convert purchaser prices to producer prices. Margins are different depending on the type of consumer. Household margins include transportation, wholesale, and the full retail margins. Industry or Federal government margins may differ from household margins since, for example, the government may pay little or no retail margins as it has more buying power. In IMPLAN there are five different margin types depending on the consumer: household; industry; investment; Federal government; and state and local government. Each of the different types of consumers, on average, pay a different margin because of differences in buying power. RECONS uses industry margins since the work activities are generally meant for industry contracting situations. USACE support and administration of projects does not require a margin adjustment.
Method of Accomplishment	The method of accomplishment (MOA) code is a field within the USACE Financial Management System /Operations and Maintenance Business Information Link (CEFMS/OMBIL) databases which identifies in-house labor (I2), in-house other resources (I1), contract inside government (C1), and contract outside government (C2).
Metropolitan Statistical Area	A metropolitan statistical area (MSA) contains an urban cluster of greater than 50,000 people.[20]
Micropolitan Statistical Area	A micropolitan statistical area (micro-SA) contains a cluster of between 10,000 and 50,000 people.
Multiplier	A factor that quantifies the change in total economic activity as compared to the injection of capital investments or revenues. Multiplier effects include indirect and induced effects.
Regional Purchase Coefficients	Ratios (from 0 to 1) that represent the portion of regional production value used to satisfy local demand.
Rural Impact Area	Any project or industry activity that did not fall in a metropolitan or micropolitan area-county and was not identified as a large-scale region was defined as a rural impact area (i.e., counties with less than 10,000 people).

[20] The US Census defines the OMB definitions as the following. The 2000 standards provide that each core-based statistical area, including both metropolitan and micropolitan statistical areas, must contain at least one urban area of 10,000 or more in population. Each metropolitan statistical area must have at least one urbanized area of 50,000 or more inhabitants. Each micropolitan statistical area must have at least one urban cluster of at least 10,000 but less than 50,000 population. Under the standards, the county (or counties) in which at least 50 percent of the population resides within urban areas of 10,000 or more in population, or that contain at least 5,000 people residing within a single urban area of 10,000 or more in population, is identified as a "central county" (counties). Additional "outlying counties" are included in the CBSA if they meet specified requirements of commuting to or from the central counties. Counties or equivalent entities form the geographic "building blocks" for metropolitan and micropolitan statistical areas throughout the United States and Puerto Rico. Information is provided by the U.S. Census Bureau on MSA and micro-SA at the following website: http://www.census.gov/population/metro/data/def.html.

	Additional counties were added to the rural impact areas based on an approach called Functional Economic Areas, as developed by the U.S. Department of Agriculture (USDA) Forest Service (METI Corp n.d.; Retzlaff 2008), as further described in the Federal Spending Methods Manual.
Sales or Revenues	In RECONS, sales or revenues is equivalent to economic output the value of production by industry for a given time period. Output can be measured either by total value of purchases by intermediate and final consumers or by intermediate outlays plus value added. It is also known as gross revenues or sales.
Secondary Effects	Secondary effects refer to the indirect and induced multiplier effects, including output, jobs, income, and gross regional product. Induced effects of the labor response coefficients are also included in the secondary effects.
Spending Profile	The spending profile in RECONS is used to map the industry revenues or Federal spending to industry sectors consistent with IMPLAN's sector scheme. In many cases, spending profiles were developed for work activities. See additional information in the RECONS Approach section and the Federal Spending Methods Manual and Appendix A.
Trade Flows	The IMPLAN National Trade Flows Model utilizes a doubly constrained gravity model using IMPLAN's county-level estimates of commodity demand and supply. The Trade Flows model provides IMPLAN estimates of the Regional Purchase coefficients (RPCs). In the RECONS, the RPC is also referred to as the geographic capture rate.
Value-Added Components	These are payments made by industry to workers, which also include interest, profits, and indirect business taxes. In IMPLAN, value added component consist of employee compensation, proprietary income, other property type income, and indirect business taxes. Value-added is an estimate of the Gross Regional or State Product.
Work Activity	Work activities were identified for USACE CW spending for all business lines. Spending profiles were developed for each identified work activity.

APPENDIX B: IMPLAN INDUSTRY SECTORS

The following table shows the IMPLAN industry sector, IMPLAN industry description, and the North American Industry Classification System (NAICS) definitions for the 2007 system. However, construction is based on Census structure types rather than NAICs codes (see table below for a list or construction types in each IMPLAN construction sector). Please see the U.S. Census NAICS site to search on the relevant NAICS industry for further details and descriptions regarding the relevant industries and sectors in each of the IMPLAN sectors (see: http://www.census.gov/eos/www/naics/).

Table 5: IMPLAN Sectors, Descriptions, and Associated NAICS Codes

IMPLAN Sector	IMPLAN Description	2007 NAICS
1	Oilseed farming	11111-2
2	Grain farming	11113-6, 11119
3	Vegetable and melon farming	1112
4	Fruit farming	11131-2,111331-4, 111336*, 111339
5	Tree nut farming	111335, 111336*
6	Greenhouse, nursery, and floriculture production	1114
7	Tobacco farming	11191
8	Cotton farming	11192
9	Sugarcane and sugar beet farming	11193, 111991
10	All other crop farming	11194, 111992, 111998
11	Cattle ranching and farming	11211, 11213
12	Dairy cattle and milk production	11212
13	Poultry and egg production	1123
14	Animal production, except cattle and poultry and eggs	1122, 1124-5, 1129
15	Forest nurseries, forest products, and timber tracts	1131-2
16	Logging	1133
17	Fishing	1141
18	Hunting and trapping	1142
19	Support activities for agriculture and forestry	115
20	Oil and gas extraction	211
21	Coal mining	2121
22	Iron ore mining	21221
23	Copper, nickel, lead, and zinc mining	21223
24	Gold, silver, and other metal ore mining	21222, 21229
25	Stone mining and quarrying	21231
26	Sand, gravel, clay, and ceramic and refractory minerals mining and quarrying	21232

27	Other nonmetallic mineral mining and quarrying	21239
28	Drilling oil and gas wells	213111
29	Support activities for oil and gas operations	213112
30	Support activities for other mining	213113-5
31	Electric power generation, transmission, and distribution	2211
32	Natural gas distribution	2212
33	Water, sewage and other systems	2213
34	Construction of new nonresidential commercial and health care structures	23*
35	Construction of new nonresidential manufacturing structures	23*
36	Construction of other new nonresidential structures	23*
37	Construction of new residential permanent site single- and multi-family structures	23*
38	Construction of other new residential structures	23*
39	Maintenance and repair construction of nonresidential maintenance and repair	23*
40	Maintenance and repair construction of residential structures	23*
41	Dog and cat food manufacturing	311111
42	Other animal food manufacturing	311119
43	Flour milling and malt manufacturing	31121
44	Wet corn milling	311221
45	Soybean and other oilseed processing	311222-3
46	Fats and oils refining and blending	311225
47	Breakfast cereal manufacturing	311230
48	Sugar cane mills and refining	311311-2
49	Beet sugar manufacturing	311313
50	Chocolate and confectionery manufacturing from cacao beans	31132
51	Confectionery manufacturing from purchased chocolate	31133
52	Nonchocolate confectionery manufacturing	31134
53	Frozen food manufacturing	31141
54	Fruit and vegetable canning, pickling, and drying	31142
55	Fluid milk and butter manufacturing	311511-2
56	Cheese manufacturing	311513
57	Dry, condensed, and evaporated dairy product manufacturing	311514
58	Ice cream and frozen dessert manufacturing	311520
59	Animal (except poultry) slaughtering, rendering, and processing	311611-3
60	Poultry processing	311615
61	Seafood product preparation and packaging	3117
62	Bread and bakery product manufacturing	31181
63	Cookie, cracker, and pasta manufacturing	31182

64	Tortilla manufacturing	31183
65	Snack food manufacturing	31191
66	Coffee and tea manufacturing	31192
67	Flavoring syrup and concentrate manufacturing	31193
68	Seasoning and dressing manufacturing	31194
69	All other food manufacturing	31199
70	Soft drink and ice manufacturing	31211
71	Breweries	31212
72	Wineries	31213
73	Distilleries	31214
74	Tobacco product manufacturing	3122
75	Fiber, yarn, and thread mills	3131
76	Broadwoven fabric mills	31321
77	Narrow fabric mills and schiffli machine embroidery	31322
78	Nonwoven fabric mills	31323
79	Knit fabric mills	31324
80	Textile and fabric finishing mills	31331
81	Fabric coating mills	31332
82	Carpet and rug mills	31411
83	Curtain and linen mills	31412
84	Textile bag and canvas mills	31491
85	All other textile product mills	31499
86	Apparel knitting mills	31511, 31519
87	Cut and sew apparel contractors	31521
88	Men's and boys' cut and sew apparel manufacturing	31522
89	Women's and girls' cut and sew apparel manufacturing	31523
90	Other cut and sew apparel manufacturing	31529
91	Apparel accessories and other apparel manufacturing	3159
92	Leather and hide tanning and finishing	3161
93	Footwear manufacturing	3162
94	Other leather and allied product manufacturing	3169
95	Sawmills and wood preservation	3211
96	Veneer and plywood manufacturing	321211-2
97	Engineered wood member and truss manufacturing	321213-4
98	Reconstituted wood product manufacturing	321219
99	Wood windows and doors and millwork	32191
100	Wood container and pallet manufacturing	32192
101	Manufactured home (mobile home) manufacturing	321991
102	Prefabricated wood building manufacturing	321992
103	All other miscellaneous wood product manufacturing	321999
104	Pulp mills	32211

105	Paper mills	32212
106	Paperboard Mills	32213
107	Paperboard container manufacturing	32221
108	Coated and laminated paper, packaging paper and plastics film manufacturing	322221-2
109	All other paper bag and coated and treated paper manufacturing	322223-6
110	Stationery product manufacturing	32223
111	Sanitary paper product manufacturing	322291
112	All other converted paper product manufacturing	322299
113	Printing	32311
114	Support activities for printing	32312
115	Petroleum refineries	32411
116	Asphalt paving mixture and block manufacturing	324121
117	Asphalt shingle and coating materials manufacturing	324122
118	Petroleum lubricating oil and grease manufacturing	324191
119	All other petroleum and coal products manufacturing	324199
120	Petrochemical manufacturing	32511
121	Industrial gas manufacturing	32512
122	Synthetic dye and pigment manufacturing	32513
123	Alkalies and chlorine manufacturing	325181
124	Carbon black manufacturing	325182
125	All other basic inorganic chemical manufacturing	325188
126	Other basic organic chemical manufacturing	32519
127	Plastics material and resin manufacturing	325211
128	Synthetic rubber manufacturing	325212
129	Artificial and synthetic fibers and filaments manufacturing	32522
130	Fertilizer manufacturing	325311-4
131	Pesticide and other agricultural chemical manufacturing	325320
132	Medicinal and botanical manufacturing	325411
133	Pharmaceutical preparation manufacturing	325412
134	In-vitro diagnostic substance manufacturing	325413
135	Biological product (except diagnostic) manufacturing	325414
136	Paint and coating manufacturing	32551
137	Adhesive manufacturing	32552
138	Soap and cleaning compound manufacturing	32561
139	Toilet preparation manufacturing	32562
140	Printing ink manufacturing	32591
141	All other chemical product and preparation manufacturing	32592, 32599
142	Plastics packaging materials and unlaminated film and sheet manufacturing	32611

143	Unlaminated plastics profile shape manufacturing	326121
144	Plastics pipe and pipe fitting manufacturing	326122
145	Laminated plastics plate, sheet (except packaging), and shape manufacturing	32613
146	Polystyrene foam product manufacturing	32614
147	Urethane and other foam product (except polystyrene) manufacturing	32615
148	Plastics bottle manufacturing	32616
149	Other plastics product manufacturing	32619
150	Tire manufacturing	32621
151	Rubber and plastics hoses and belting manufacturing	32622
152	Other rubber product manufacturing	32629
153	Pottery, ceramics, and plumbing fixture manufacturing	32711
154	Brick, tile, and other structural clay product manufacturing	327121-3
155	Clay and nonclay refractory manufacturing	327124-5
156	Flat glass manufacturing	327211
157	Other pressed and blown glass and glassware manufacturing	327212
158	Glass container manufacturing	327213
159	Glass product manufacturing made of purchased glass	327215
160	Cement manufacturing	32731
161	Ready-mix concrete manufacturing	32732
162	Concrete pipe, brick, and block manufacturing	32733
163	Other concrete product manufacturing	32739
164	Lime and gypsum product manufacturing	3274
165	Abrasive product manufacturing	32791
166	Cut stone and stone product manufacturing	327991
167	Ground or treated mineral and earth manufacturing	327992
168	Mineral wool manufacturing	327993
169	Miscellaneous nonmetallic mineral products	327999
170	Iron and steel mills and ferroalloy manufacturing	3311
171	Steel product manufacturing from purchased steel	33121, 33122
172	Alumina refining and primary aluminum production	331311-2
173	Secondary smelting and alloying of aluminum	331314
174	Aluminum product manufacturing from purchased aluminum	331315, 331316, 331319
175	Primary smelting and refining of copper	331411
176	Primary smelting and refining of nonferrous metal (except copper and aluminum)	331419
177	Copper rolling, drawing, extruding and alloying	33142
178	Nonferrous metal (except copper and aluminum) rolling, drawing, extruding and alloying	33149
179	Ferrous metal foundries	33151

180	Nonferrous metal foundries	33152
181	All other forging, stamping, and sintering	332111-2, 332117
182	Custom roll forming	332114
183	Crown and closure manufacturing and metal stamping	332115-6
184	Cutlery, utensil, pot, and pan manufacturing	332211, 332214
185	Handtool manufacturing	332212-3
186	Plate work and fabricated structural product manufacturing	33231
187	Ornamental and architectural metal products manufacturing	33232
188	Power boiler and heat exchanger manufacturing	33241
189	Metal tank (heavy gauge) manufacturing	33242
190	Metal can, box, and other metal container (light gauge) manufacturing	33243
191	Ammunition manufacturing	332992-3
192	Arms, ordnance, and accessories manufacturing	332994-5
193	Hardware manufacturing	3325
194	Spring and wire product manufacturing	3326
195	Machine shops	33271
196	Turned product and screw, nut, and bolt manufacturing	33272
197	Coating, engraving, heat treating and allied activities	3328
198	Valve and fittings other than plumbing	332911-2, 332919
199	Plumbing fixture fitting and trim manufacturing	332913
200	Ball and roller bearing manufacturing	332991
201	Fabricated pipe and pipe fitting manufacturing	332996
202	Other fabricated metal manufacturing	332997-9
203	Farm machinery and equipment manufacturing	333111
204	Lawn and garden equipment manufacturing	333112
205	Construction machinery manufacturing	33312
206	Mining and oil and gas field machinery manufacturing	33313
207	Other industrial machinery manufacturing	33321, 333291-4, 333298
208	Plastics and rubber industry machinery manufacturing	33322
209	Semiconductor machinery manufacturing	333295
210	Vending, commercial, industrial, and office machinery manufacturing	333311-3
211	Optical instrument and lens manufacturing	333314
212	Photographic and photocopying equipment manufacturing	333315
213	Other commercial and service industry machinery manufacturing	333319
214	Air purification and ventilation equipment manufacturing	333411-2
215	Heating equipment (except warm air furnaces) manufacturing	333414
216	Air conditioning, refrigeration, and warm air heating equipment manufacturing	333415

217	Industrial mold manufacturing	333511
218	Metal cutting and forming machine tool manufacturing	333512-3
219	Special tool, die, jig, and fixture manufacturing	333514
220	Cutting tool and machine tool accessory manufacturing	333515
221	Rolling mill and other metalworking machinery manufacturing	333516, 333518
222	Turbine and turbine generator set units manufacturing	333611
223	Speed changer, industrial high-speed drive, and gear manufacturing	333612
224	Mechanical power transmission equipment manufacturing	333613
225	Other engine equipment manufacturing	333618
226	Pump and pumping equipment manufacturing	333911, 333913
227	Air and gas compressor manufacturing	333912
228	Material handling equipment manufacturing	333921-4
229	Power-driven handtool manufacturing	333991
230	Other general purpose machinery manufacturing	333992, 333997, 333999
231	Packaging machinery manufacturing	333993
232	Industrial process furnace and oven manufacturing	333994
233	Fluid power process machinery	333995-6
234	Electronic computer manufacturing	334111
235	Computer storage device manufacturing	334112
236	Computer terminals and other computer peripheral equipment manufacturing	334113, 334119
237	Telephone apparatus manufacturing	33421
238	Broadcast and wireless communications equipment	33422
239	Other communications equipment manufacturing	33429
240	Audio and video equipment manufacturing	3343
241	Electron tube manufacturing	334411
242	Bare printed circuit board manufacturing	334412
243	Semiconductor and related device manufacturing	334413
244	Electronic capacitor, resistor, coil, transformer, and other inductor manufacturing	334414-6
245	Electronic connector manufacturing	334417
246	Printed circuit assembly (electronic assembly) manufacturing	334418
247	Other electronic component manufacturing	334419
248	Electromedical and electrotherapeutic apparatus manufacturing	334510
249	Search, detection, and navigation instruments manufacturing	334511
250	Automatic environmental control manufacturing	334512
251	Industrial process variable instruments manufacturing	334513
252	Totalizing fluid meters and counting devices manufacturing	334514

253	Electricity and signal testing instruments manufacturing	334515
254	Analytical laboratory instrument manufacturing	334516
255	Irradiation apparatus manufacturing	334517
256	Watch, clock, and other measuring and controlling device manufacturing	334518-9
257	Software, audio, and video media reproducing	334611-2
258	Magnetic and optical recording media manufacturing	334613
259	Electric lamp bulb and part manufacturing	33511
260	Lighting fixture manufacturing	33512
261	Small electrical appliance manufacturing	33521
262	Household cooking appliance manufacturing	335221
263	Household refrigerator and home freezer manufacturing	335222
264	Household laundry equipment manufacturing	335224
265	Other major household appliance manufacturing	335228
266	Power, distribution, and specialty transformer manufacturing	335311
267	Motor and generator manufacturing	335312
268	Switchgear and switchboard apparatus manufacturing	335313
269	Relay and industrial control manufacturing	335314
270	Storage battery manufacturing	335911
271	Primary battery manufacturing	335912
272	Communication and energy wire and cable manufacturing	33592
273	Wiring device manufacturing	33593
274	Carbon and graphite product manufacturing	335991
275	All other miscellaneous electrical equipment and component manufacturing	335999
276	Automobile manufacturing	336111
277	Light truck and utility vehicle manufacturing	336112
278	Heavy duty truck manufacturing	336120
279	Motor vehicle body manufacturing	336211
280	Truck trailer manufacturing	336212
281	Motor home manufacturing	336213
282	Travel trailer and camper manufacturing	336214
283	Motor vehicle parts manufacturing	3363
284	Aircraft manufacturing	336411
285	Aircraft engine and engine parts manufacturing	336412
286	Other aircraft parts and auxiliary equipment manufacturing	336413
287	Guided missile and space vehicle manufacturing	336414
288	Propulsion units and parts for space vehicles and guided missiles	336415, 336419
289	Railroad rolling stock manufacturing	3365
290	Ship building and repairing	336611

291	Boat building	336612
292	Motorcycle, bicycle, and parts manufacturing	336991
293	Military armored vehicle, tank, and tank component manufacturing	336992
294	All other transportation equipment manufacturing	336999
295	Wood kitchen cabinet and countertop manufacturing	33711
296	Upholstered household furniture manufacturing	337121
297	Nonupholstered wood household furniture manufacturing	337122
298	Metal and other household furniture (except wood) manufacturing[1]	337124-5
299	Institutional furniture manufacturing	337127
300	Wood television, radio, and sewing machine cabinet manufacturing[1]	337129
301	Office furniture and custom architectural woodwork and millwork manufacturing[1]	337211, 337212, 337214
302	Showcase, partition, shelving, and locker manufacturing	337215
303	Mattress manufacturing	33791
304	Blind and shade manufacturing	33792
305	Surgical and medical instrument manufacturing	339112
306	Surgical appliance and supplies manufacturing	339113
307	Dental equipment and supplies manufacturing	339114
308	Ophthalmic goods manufacturing	339115
309	Dental laboratories	339116
310	Jewelry and silverware manufacturing	33991
311	Sporting and athletic goods manufacturing	33992
312	Doll, toy, and game manufacturing	33993
313	Office supplies (except paper) manufacturing	33994
314	Sign manufacturing	33995
315	Gasket, packing, and sealing device manufacturing	339991
316	Musical instrument manufacturing	339992
317	All other miscellaneous manufacturing	339993, 339995, 339999
318	Broom, brush, and mop manufacturing	339994
319	Wholesale trade	42
320	Retail - Motor vehicle and parts	441
321	Retail - Furniture and home furnishings	442
322	Retail - Electronics and appliances	443
323	Retail - Building material and garden supply	444
324	Retail - Food and beverage	445
325	Retail - Health and personal care	446
326	Retail - Gasoline stations	447
327	Retail - Clothing and clothing accessories	448

328	Retail - Sporting goods, hobby, book and music	451
329	Retail - General merchandise	452
330	Retail - Miscellaneous	453
331	Retail - Nonstore	454
332	Air transportation	481
333	Rail transportation	482
334	Water transportation	483
335	Truck transportation	484
336	Transit and ground passenger transportation	485
337	Pipeline transportation	486
338	Scenic and sightseeing transportation and support activities for transportation	487, 488
339	Couriers and messengers	492
340	Warehousing and storage	493
341	Newspaper publishers	51111
342	Periodical publishers	51112
343	Book publishers	51113
344	Directory, mailing list, and other publishers	51114, 51119
345	Software publishers	51121
346	Motion picture and video industries	5121
347	Sound recording industries	5122
348	Radio and television broadcasting	5151
349	Cable and other subscription programming	5152
350	Internet publishing and broadcasting	51913
351	Telecommunications	517
352	Data processing, hosting, and related services	518
353	Other information services	51911-2
354	Monetary authorities and depository credit intermediation	521, 5221
355	Nondepository credit intermediation and related activities	5222-3
356	Securities, commodity contracts, investments, and related activities	523
357	Insurance carriers	5241
358	Insurance agencies, brokerages, and related activities	5242
359	Funds, trusts, and other financial vehicles	525
360	Real estate	531
361	Imputed rental value for owner-occupied dwellings	n.a.
362	Automotive equipment rental and leasing	5321
363	General and consumer goods rental except video tapes and discs	53221-2, 53229, 5323
364	Video tape and disc rental	53223
365	Commercial and industrial machinery and equipment rental	5324

	and leasing	
366	Lessors of nonfinancial intangible assets	533
367	Legal services	5411
368	Accounting, tax preparation, bookkeeping, and payroll services	5412
369	Architectural, engineering, and related services	5413
370	Specialized design services	5414
371	Custom computer programming services	541511
372	Computer systems design services	541512
373	Other computer related services, including facilities management	541513, 541519
374	Management, scientific, and technical consulting services	54161, 5613*
375	Environmental and other technical consulting services	54162, 54169
376	Scientific research and development services	5417
377	Advertising and related services	5418
378	Photographic services	54192
379	Veterinary services	54194
380	All other miscellaneous professional, scientific, and technical services	54191, 54193, 54199
381	Management of companies and enterprises	55
382	Employment services	5613*
383	Travel arrangement and reservation services	5615
384	Office administrative services	5611
385	Facilities support services	5612
386	Business support services	5614
387	Investigation and security services	5616
388	Services to buildings and dwellings	5617
389	Other support services	5619
390	Waste management and remediation services	562
391	Elementary and secondary schools	6111
392	Junior colleges, colleges, universities, and professional schools	6112-3
393	Other educational services	6114-7
394	Offices of physicians, dentists, and other health practitioners	6211-3
395	Home health care services	6216
396	Medical and diagnostic labs and outpatient and other ambulatory care services	6214-5, 6219
397	Hospitals	622
398	Nursing and residential care facilities	623
399	Child day care services	6244
400	Individual and family services	6241
401	Community food, housing, and other relief services, including	6242-3

	rehabilitation services	
402	Performing arts companies	7111
403	Spectator sports	7112
404	Promoters of performing arts and sports and agents for public figures	7113-4
405	Independent artists, writers, and performers	7115
406	Museums, historical sites, zoos, and parks	712
407	Fitness and recreational sports centers	71394
408	Bowling centers	71395
409	Amusement parks, arcades, and gambling industries	7131-2
410	Other amusement and recreation industries	71391-3, 71399
411	Hotels and motels, including casino hotels	72111-2
412	Other accommodations	72119, 7212-3
413	Food services and drinking places	722
414	Automotive repair and maintenance, except car washes	81111-2, 811191, 811198
415	Car washes	811192
416	Electronic and precision equipment repair and maintenance	8112
417	Commercial and industrial machinery and equipment repair and maintenance	8113
418	Personal and household goods repair and maintenance	8114
419	Personal care services	8121
420	Death care services	8122
421	Dry-cleaning and laundry services	8123
422	Other personal services	8129
423	Religious organizations	8131
424	Grantmaking, giving, and social advocacy organizations	8132, 8133
425	Civic, social, professional, and similar organizations	8134, 8139
426	Private households	814
427	Postal service	491
428	Federal electric utilities	n.a.
429	Other Federal Government enterprises	n.a.
430	State and local government passenger transit	n.a.
431	State and local government electric utilities	n.a.
432	Other state and local government enterprises	n.a.
433	*Not an industry (Used and secondhand goods)	n.a.
434	*Not an industry (Scrap)	n.a.
435	*Not an industry (Rest of the world adjustment)	n.a.
436	*Not an industry (Noncomparable imports)	n.a.
437	Employment and payroll for SL Government Non-Education	n.a.
438	Employment and payroll for SL Government Education	n.a.

439	Employment and payroll for Federal Non-Military	n.a.
440	Employment and payroll for Federal Military	n.a.

Table 6: IMPLAN Construction Sectors

IMPLAN Code	IMPLAN Description	Census Description Short
34	Construction of new nonresidential commercial and health care structures	All other commercial buildings
34	Construction of new nonresidential commercial and health care structures	Amusement, social, & rec buildings
34	Construction of new nonresidential commercial and health care structures	Commercial warehouses
34	Construction of new nonresidential commercial and health care structures	Educational buildings
34	Construction of new nonresidential commercial and health care structures	Farm buildings, nonresidential
34	Construction of new nonresidential commercial and health care structures	Health care & institutional buildings
34	Construction of new nonresidential commercial and health care structures	Hotels & motels
34	Construction of new nonresidential commercial and health care structures	Office buildings
34	Construction of new nonresidential commercial and health care structures	Other building construction
34	Construction of new nonresidential commercial and health care structures	Public safety buildings
34	Construction of new nonresidential commercial and health care structures	Religious buildings
35	Construction of new nonresidential manufacturing structures	Mfg & light industrial buildings
35	Construction of new nonresidential manufacturing structures	Mfg & light industrial warehouses
36	Construction of other new nonresidential structures	Airport runways & related work
36	Construction of other new nonresidential structures	Billboards
36	Construction of other new nonresidential structures	Blast furnaces, petrol ref, chem comp
36	Construction of other new nonresidential structures	Bridges, tunnels, & elevated highways
36	Construction of other new nonresidential structures	Conservation & development construction
36	Construction of other new nonresidential structures	Dam & reservoir construction
36	Construction of other new nonresidential	Dry/solid waste disposal

	structures	
36	Construction of other new nonresidential structures	Fencing
36	Construction of other new nonresidential structures	Harbor & port facilities
36	Construction of other new nonresidential structures	Heavy military construction
36	Construction of other new nonresidential structures	Highways, streets, & related work
36	Construction of other new nonresidential structures	Marine construction
36	Construction of other new nonresidential structures	Mass transit construction
36	Construction of other new nonresidential structures	Oilfields
36	Construction of other new nonresidential structures	Other nonbuilding construction
36	Construction of other new nonresidential structures	Outdoor swimming pools
36	Construction of other new nonresidential structures	Pipeline constr other than sewer & water
36	Construction of other new nonresidential structures	Power & communication trans lines
36	Construction of other new nonresidential structures	Power plants
36	Construction of other new nonresidential structures	Private driveways & parking areas
36	Construction of other new nonresidential structures	Recreational facilities
36	Construction of other new nonresidential structures	Sewage & water treatment plants
36	Construction of other new nonresidential structures	Sewers, water mains, & related fac
36	Construction of other new nonresidential structures	Ships
36	Construction of other new nonresidential structures	Tank storage facilities other than water
36	Construction of other new nonresidential structures	Water storage facilities
37	Construction of new residential permanent site single- and multi-family structures	All other residential buildings
37	Construction of new residential permanent site single- and multi-family structures	Apartment buildings, condos, & coops
37	Construction of new residential permanent site single- and multi-family structures	Single-family houses

38	Construction of other new residential structures	Group quarters (e.g., dormitories, barracks)
38	Construction of other new residential structures	New residential additions and alterations, nonfarm
39	Maintenance and repair construction of nonresidential structures	Airport runways & related work
39	Maintenance and repair construction of nonresidential structures	All other commercial buildings
39	Maintenance and repair construction of nonresidential structures	Amusement, social, & rec buildings
39	Maintenance and repair construction of nonresidential structures	Billboards
39	Maintenance and repair construction of nonresidential structures	Blast furnaces, petrol ref, chem comp
39	Maintenance and repair construction of nonresidential structures	Bridges, tunnels, & elevated highways
39	Maintenance and repair construction of nonresidential structures	Commercial warehouses
39	Maintenance and repair construction of nonresidential structures	Conservation & development construction
39	Maintenance and repair construction of nonresidential structures	Dam & reservoir construction
39	Maintenance and repair construction of nonresidential structures	Dry/solid waste disposal
39	Maintenance and repair construction of nonresidential structures	Educational buildings
39	Maintenance and repair construction of nonresidential structures	Farm buildings, nonresidential
39	Maintenance and repair construction of nonresidential structures	Fencing
39	Maintenance and repair construction of nonresidential structures	Harbor & port facilities
39	Maintenance and repair construction of nonresidential structures	Health care & institutional buildings
39	Maintenance and repair construction of nonresidential structures	Heavy military construction
39	Maintenance and repair construction of nonresidential structures	Highways, streets, & related work
39	Maintenance and repair construction of nonresidential structures	Hotels & motels
39	Maintenance and repair construction of nonresidential structures	Marine construction
39	Maintenance and repair construction of nonresidential structures	Mass transit construction
39	Maintenance and repair construction of	Mfg & light industrial

	nonresidential structures	buildings
39	Maintenance and repair construction of nonresidential structures	Mfg & light industrial warehouses
39	Maintenance and repair construction of nonresidential structures	Office buildings
39	Maintenance and repair construction of nonresidential structures	Oilfields
39	Maintenance and repair construction of nonresidential structures	Other building construction
39	Maintenance and repair construction of nonresidential structures	Other nonbuilding construction
39	Maintenance and repair construction of nonresidential structures	Outdoor swimming pools
39	Maintenance and repair construction of nonresidential structures	Pipeline constr other than sewer & water
39	Maintenance and repair construction of nonresidential structures	Power & communication trans lines
39	Maintenance and repair construction of nonresidential structures	Power plants
39	Maintenance and repair construction of nonresidential structures	Private driveways & parking areas
39	Maintenance and repair construction of nonresidential structures	Public safety buildings
39	Maintenance and repair construction of nonresidential structures	Recreational facilities
39	Maintenance and repair construction of nonresidential structures	Religious buildings
39	Maintenance and repair construction of nonresidential structures	Sewage & water treatment plants
39	Maintenance and repair construction of nonresidential structures	Sewers, water mains, & related fac
39	Maintenance and repair construction of nonresidential structures	Ships
39	Maintenance and repair construction of nonresidential structures	Tank storage facilities other than water
39	Maintenance and repair construction of nonresidential structures	Water storage facilities
40	Maintenance and repair construction of residential structures	Apartment buildings, condos, & coops
40	Maintenance and repair construction of residential structures	Single-family houses