

Step-by-Step Process for Estimating Economic Value of Waterborne Commerce

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The purpose of this process is to estimate economic activity, including jobs, associated with traffic moving on the (shallow draft) inland waterways system. Along with information on traffic patterns, the economic analysis results are used to produce reader-friendly documents called *profiles*. The analysis is designed to produce two types of profiles: those focused on particular commodities or commodity groups at a regional level, including the nation as a whole; and those focused on regions (states, sub-state groups of counties, and multi-state) which encompass the full range of commodities originating and terminating within the region. The analysis uses the IMPLAN economic impact system.

This description refers to the analysis of coal at the national level, as an example.

Steps in the process:

1. Obtain traffic volume data in tons
 - a. From Corps of Engineers records
 - b. Three most recent years available
 - c. Four-digit commodity code(Note: five-digit commodity data may be preferable and will be investigated for future analysis. Also, some traffic data is masked to avoid disclosure of proprietary information. This hinders the analysis only for smaller regions or for commodities with few shippers / receivers).

2. Compute average traffic volumes over three year period
 - a. Four-digit commodity code
 - b. Tons originating within the region of interest
 - c. Tons terminating within the region of interest

3. Obtain unit prices of commodities - producer prices
 - a. Four-digit commodity code
 - b. Use government sources, as available
 - i. EIA
 - ii. USDA
 - iii. USGS
 - c. For unpublished commodities, consult with industry sources.
 - d. Obtain most current prices available (2004 or 2005) as well as for the year 2001. The economic impact model operates on 2001 data.
4. Multiply unit prices by commodity tonnage to obtain the value of waterborne commerce originating and terminating within the region of interest.
5. Adjust for imports to, and exports from, the region of interest, using US Customs data and knowledge of persons involved with the transport of the subject commodities.
6. Associate each commodity transported with the appropriate IMPLAN industry.
7. For commerce (value of traffic) originating within the region
 - a. The value of the commodities originating is a measure of *production*. This is the key to estimating economic activity, including jobs, associated with production.
 - b. Example for coal: 180,000,000 annual tons; value using 2001 producer price (70% of delivered price) = \$3,110 million. Enter \$3,110 million for IMPLAN Industry 20 – Coal Mining.
8. For commerce (value of traffic) terminating within the region of interest
 - a. The value of terminating traffic (net of exports) is a measure of demand for the commodity. For most commodities, this demand comes from industries which use them as inputs. For example, the demand for coal is due to its role in the production of electricity, iron & steel and other commodities.
 - b. There is a need to estimate production related to commodities consumed.

- c. Identify industries which are key consumers of each commodity received
 - i. Use data contained in the IMPLAN modeling system
 - ii. Estimate *portion consumed* by key producing industries
 - iii. Example, for Coal the consuming industries are:

Industry 20	Coal Mining	= 9.8% of coal demand
Industry 30	Power Generation	= 64.2% of coal demand
Industry 203	Iron & Steel Mills	= 7.3% of coal demand
Industry 498	St & Loc Govt Elec Utilities	= 9.6% of coal demand
Total		= 90.9% of coal demand
 - d. Through a series of computations involving coefficients and row and column totals from the input-output table, compute the ratio of consuming industry output to subject commodity input (Column C of Table 1).
 - e. Evaluate these ratios and eliminate consuming industries whose ratios exceed 50 or for which the relationships are counter-intuitive or are believed to be non-existent for the subject commodities when transported by water.
 - f. Column E of Table 1 shows the computation of direct output for industries which consume coal, based on consumption of \$3,012 million worth of coal. The amount consumed has been adjusted to reflect exported waterborne coal.
9. Use the value of coal shipped (\$3,110 million) and the values of commodities produced using coal received (Column E of Table 1, excluding the omitted value for Sector 20) to run the IMPLAN software with a national model. Use the Direct Effects estimates from this analysis, inflated to current (2005) dollars, for the profile.
10. Adjust the inputs to avoid double counting when estimating Total Effects. Subtract the sum of the values in Column C of Table 1 (\$2,443 million) for the Coal Industry and rerun the IMPLAN model. Use the Total Effects values from this analysis, inflated to current (2005) dollars, for the profile.
11. The IMPLAN model provides results for each of the 505 industries in the national economy as well as aggregated results for economic sectors. The model also provides rough estimates of taxes associated with the computed economic activity.

Table 1 – Distribution of Received Coal Among Consuming Sectors

A	B	C	D	E	F
Consuming Industry	Industry Share of Commodity Demand	Value of Commodity Received by Each Consuming Industry (\$ million)*	Industry Output / Commodity Input Ratio	Computed Output in Directly Linked Consuming Industries (\$ million)	Comments
20 Coal Mining	9.8%	295	10.42	N/A	Not used; waterborne coal not likely to be sold to companies within Coal Sector
30 Power Generation	64.2%	1,934	13.56	26,225	Okay
203 Iron / Steel Mills	7.3%	220	25.44	5,597	Okay
498 St / Loc Govt Elec Utilities	9.6%	289	13.05	3,771	Okay
Subtotal**	90.9%	2,443**			

* Based on \$3,012 million in value of coal received

**Does not include Industry 20 Coal Mining