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# Technical Note

## Using the Environmental Technical Information System in SCS Activities

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# Using the Environmental Technical Information System in SCS Activities

The Environmental Technical Information System (ETIS) and all its subsystems were developed by the U.S. Army Corps of Engineers, Construction Engineering Research Laboratory, Champaign, Illinois. The operation of ETIS is conducted by the Department of Urban and Regional Planning, Planning Information Program, University of Illinois, Urbana-Champaign.

This technical note provides a brief introduction to most ETIS programs; however, the primary purpose is to provide guidance in the use of the Economic Impact Forecast System (EIFS) program for estimating regional socioeconomic impacts for the Soil Conservation Service (SCS) program expenditures. ETIS has many programs and capabilities, including some that will not be covered in this technical note because of the volume of instructions required. Items in this paper that appear in bold print are program menu items. Those that appear in **bold and underlined** print are program menu items that are covered in detail.

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## I. Introduction to Environmental Technical Information System (ETIS)

The ETIS (Environmental Technical Information System) is a collection of menu driven computer programs that can be used in a broad range of SCS activities. It has several programs and data base systems available within it. ETIS is an interactive system, which means the user can interact with the program to enter data, examine output, and choose program options while the program is running. The system is available by accessing the mainframe computer at the University of Illinois in Urbana. A brief description of four main programs follows.

- (a) **The Environmental Impact Computer System (EICS)**--this system identifies areas potentially impacted by changes in activities and guides the investigation of these impacts in the Environmental Assessment or Environmental Impact Statement process of planning. Using information supplied by the planner, EICS creates a "need to consider" matrix of areas of likely environmental problems associated with the proposed activity. EICS highlights activities that are considered controversial by the public. The user is provided with a general description of impacts that may occur, as well as a general discussion on ways to mitigate the impacts.
- (b) **Computer-aided Environmental Legislative Data System (CELDS)**--This system is a data base of abstracted Federal and State environmental regulations and standards. This regulatory information is written in a straightforward, narrative style. Intended for use by the layperson, abstracts classified within several environmental sector categories provide quick access to current regulations that relate to the environment. The system is not designed as a replacement for the actual regulation, but provides the user with a basic look at the regulatory requirements. A reference for the full text of the regulations is provided, as well as the name and address of the agency responsible for the regulation.

(c) **SOILS System**--This system provides easy access to various parameters from the SOI-5 data base. The SOILS system contains the following programs:

- 1) **SIRS--The Soils Information Retrieval System** allows users to interactively access the SOI-5 data base by entering the desired soil series name.
- 2) **LPSIRS**--This systems will also access the SOI-5 data base; however, the output is designed for the 132 column paper.
- 3) **MPSS--The Multiple Parameter Series Search** also access the SOI-5 data base; however, data queries are made by entering user selected criteria.
- 4) **MUUFs--The Map Unit Use File System.**
- 5) **CALE--The Computer Aided Land Evaluation** system is being used for land evaluation in the SCS. This is a computer program containing the Land Evaluation System Analysis (LESA) used by SCS.

(d) **Economic Impact Forecast System (EIFS)**--This system allows planners to assess the socioeconomic impacts for a region's economy caused by a proposed change in expenditure. The system was developed primarily for the Department of the Army and the Department of the Air Force to analyze additional personnel inputs or expenditures in a region. The rest of this technical note shows how to use the EIFS program for analysis of the regional socioeconomic impacts of SCS activities.

## II. Use of the Economic Impact Forecast System (EIFS)

The Economic Impact Forecast System (EIFS) is a valuable tool for planners. It provides an assortment of information useful for calculating socioeconomic changes resulting from public project expenditures. The system shows various impacts early in the decisionmaking process so that alternatives may be considered. EIFS has statistics for all counties and parishes in the

country. This data can be aggregated to create various multicounty economic regions, which further enhances the value of the system.

Information, such as composition of the population by age, sex, race, wages, employment, and income statistics is included. In short, EIFS contains a valuable collection of socioeconomic data that may be more easily accessed than the various censuses and other related data sources that must be searched through. An effort to update and enhance the data base as information becomes available is ongoing.

The EIFS system has four main menu items:

- d Demographic data
- e Economic data
- m Models
- x Additional profiles

(a) Item **d** Demographic data includes the following data bases:

1. 1980 census data
2. 1970 census data
3. Sub-county Demographic update- Population, Housing, Wealth-1989
4. Census of Housing and Population
5. Population pyramids-1970, 80, 82, 84
6. Sub-county consumer spending patterns-1989
7. Sub-county profile

(b) Item **e** Economic data includes the following data bases:

1. Census of Governments, Government Finance-1982
2. Economic Census-1982 (Wholesale, Retail, Services, Manufacturers)
3. Census of Agriculture-1982
4. BEA employment/income timeseries (condensed and detailed versions)
5. BLS labor force timeseries-1987-1989
6. County Business Patterns-1982 or 1986

7. Export employment profile (1982 or 1986 County Business Patterns)
8. BEA regional projections-(OBERS) for selected states

These demographic and economic data bases can be used to provide Other Social Effects (OSE) account information that is valuable for decisionmakers involved in SCS projects. Section III provides selected output from some of the data bases.

(c) Item **m** Models includes:

- 1 Forecast Models
- 2 AIMS (Automated Input-Output Multiplier System)
- 3 RTV (Rational Threshold Value)
- 4 Forecast Significance of Impacts
- 5 AFROI (Air Force Region of Influence) Model

Item **1** Forecast Models provides the following forecasting models:

- 1 Standard EIFS Forecast Model
- 2 Construction
- 3 Construction of On-Base Housing
- 4 Training
- 5 AR 5-20 Economic Effects Analysis

These input-output models use an export base approach to develop multipliers. A multiplier is a measure of the recirculation of dollars in a local economy. These models calculate and use employment and income multipliers to provide estimates of regional economic impacts. The size of the multiplier is directly related to the size of the region, the diversity of its industrial and commercial base, and the size of its population. The greater the population size, the more diverse is the region's economic base and the more likely that purchased products are manufactured locally rather than imported. Therefore, money injected into the economy is recycled more often, causing greater changes in income.

The models need information about the dollar value of the project and whether expenditure entries are total or local dollar changes. Forecast model outputs consist of export

employment and income and sales multipliers as well as changes in local sales, employment, income, consumption, investment, number of school children, and government revenues and expenditures. The changes are given to total numbers and percent values. These models can be used for providing socioeconomic data for the Regional Economic Development (RED) and Other Social Effects (OSE) accounts displays in project plans and accounts.

The second menu selection from the Forecast Models menu is the Construction forecast model. It is well suited to simulating the regional socioeconomic impacts of many types of construction activities such as streets, highways, dams, and water and sewage facilities. It is the recommended multiplier system for SCS project activities. *Section IV provides an example of the input and output for the Construction forecast model.*

**Item 2 AIMS (Automated Input-Output Multiplier System)** calculates multipliers for standard industry Input/Output (IO) codes specified by the user. Like the standard EIFS model, it also calculates multipliers; however, it provides multiplier effects by specific industries. The user selects specific input/output codes from a 1977 IO table and inputs those codes for the industries in the project area. The program provides income, employment, and sales multipliers for each industry or for all specified industries, weighted by each industry's contribution to the economy for the area. CBP, BEA, and Census of Agriculture data are used in the calculation of EIFS multipliers. The analyst must convert current dollar expenditure changes into 1977 dollar equivalents for use with AIMS.

**Item 3 RTV (Regional Threshold Value)** model provides four tables for the 1969-1987 period. These tables are Business Volume (Nonfarm Income), Personal Income, Employment, and Population. The data are from the Bureau of Economic Analysis and are available by county and state for the United States. This model is designed to assist users in testing the significance of the impacts obtained from the forecast models. The RTV model provides boundaries or threshold values for several indicators (such as sales volume and income) based on historical trends. If the

impacts generated by the forecast models fall outside of the range of historical impacts for the study area, then the impact of the proposed project may be significant.

**Item 4 Forecast Significance of Impacts** model shows projections for the BEA timeseries data for total employment, total income by place of residence, and population. This model is designed to assist users in testing the significance of the impacts obtained from the forecast models by providing impact thresholds based on statistical analysis. The model graphs show a linear fit to the projected data and confidence intervals. Statistical values calculated are also shown. The user specifies the confidence level and year of projection.

(d) **Item x Additional Profiles** includes the following data bases and information:

- 1 **MARF2 - Geographic Locations and Distances**
- 2 **Minimum Requirements Multipliers (MRM)**
- 3 **Select year for which multipliers are to be calculated**
- 4 **See the Multipliers**
- 5 **State-Level Data for Sales Tax and Education Costs**
- 6 **County-Level Data for Real Estate Assessed Valuation**
- 7 **Small Area Assessment Models (SAAM)**
- 8 **Diverse Measures - Number of Area SICs compared to US**
- 9 **Zip Code Information**
- 10 **Gross State Product (State level - from BEA)**
- 11 **Mapping Polygon ID information**

**Item 7 Small Area Assessment Model (SAAM)** is based on the same theories and methodology as the EIFS Construction model; however, the SAAM model provides a mechanism to account for inter-regional feedback effects. This provides a more accurate estimation of county-level impacts than the larger region impact provided by the EIFS Construction model. The SAAM model was originally developed for assessing the impacts from Corps of Engineers water resource projects so it is well suited to estimating the impacts of SCS water resource activities. This model

requires the user to provide several inputs, most of which are available within the EIFS programs and data bases. Because of these additional data requirements, instructions for using this program are beyond the scope of this paper. Users are encouraged to explore using this model as their experience with EIFS increases and if the data needs or study area require more exacting standards.

### III. Examples of using the Economic Impact Forecast System for Other Social Effects Account Information

Tables 1 through 4 show the actual output from selected EIFS data bases from the "demographic data" main menu items. Examples of data from the economic data menu are on the following pages.

The examples are for Chester County, South Carolina.

#### Example 1--Data from demographic data, Item 1 1980 Census data

**Table 1 Population**

PolyID	FIPS	1960	1970	1980	1989e	1994p
245023	45023	30,889	29,811	30,148	31,270	3,746

**Table 2 Households**

PolyID	FIPS	1970	1980	1989e	1994p
245023	45023	8,626	9,976	10,643	10,836

**Table 3 Per-capita income**

PolyID	FIPS	1969	1979	1989e	1994p
245023	45023	2,091	5,310	9,183	11,270

**Table 4 Average Household Income**

PolyID	FIPS	1969	1979	1989e	1994p
245023	45023	7,213	16,057	27,012	33,064

**Table 11 Population by race**

30,148 . . . . Total	0 . . . . Chinese
18,455 . . . . White	1 . . . . Filipino
11,630 . . . . Black	8 . . . . Korean
27 . . . . Indian, Eskimo, Aleut	7 . . . . Asian Indian
27 . . . . Indian	2 . . . . Vietnamese
0 . . . . Eskimo	1 . . . . Hawaiian
0 . . . . Aleut	0 . . . . Guamanian
3 . . . . Asian and Pacific Islander	0 . . . . Samoan
2 . . . . Japanese	5 . . . . Other

Example of data from economic data, item 3. Census of Agriculture - 1982

**Table 1** Farms, Land in Farms, and Land Use: 1982 and 1978

Farms and land in farms	1982		1978	
Farms . . . . . Number	422		393	
Land in Farms . . . . . Acres	107,721		105,035	
Average Size of Farm . . . . . Acres	243		267	
Approximate Land Area . . . . . Acres	371,340		NR	
Proportion in Farms . . . . . Percent	27.7		---	
Value of land and buildings	1982		1978	
Average Per Farm . . . . . Dollars	141,306		144,054	
Average Per Acre . . . . . Dollars	695		462	
Land in farms according to use	1982		1978	
.....	number	%	number	%
Total Cropland . . . . . Farms	376	89.1	362	92.1
Acres	39,416	38.4	50,073	47.7
Harvested Cropland . . . . . Farms	286	67.8	80	71.2
Acres	19,580	19.1	20,718	19.7
Cropland Pasture . . . . . Farms	248	58.8	245	62.3
or Grazing                          Acres	18,215	17.7	23,789	22.6
Other Cropland . . . . . Farms	60	14.2	97	24.7
Acres	1,621	1.6	5,575	5.3
Total Woodland . . . . . Farms	329	78.0	313	79.6
Acres	46,880	45.6	42,639	40.6
Woodland Pastured . . . . . Farms	235	55.7	238	60.6
Acres	20,614	20.1	21,205	20.2
Woodland Not Pastured . . . . . Farms	178	42.2	177	45.0
Acres	26,266	25.6	21,433	20.4
Other Land . . . . . Farms	298	70.6	272	69.2
Acres	16,425	16.0	12,324	11.7
Pasture and Rangeland				
Other than Cropland . . . . . Farms	95	22.5	90	22.9
and Woodland Pastured . . . . . Acres	9,451	9.2	8,262	7.9
Land in House Lots, Ponds				
Roads, Wasteland, etc. . . . . Farms	273	64.7	251	63.9
Acres	6,974	6.8	4,062	3.9
Pastureland, All Types . . . . . Farms	345	81.8	329	83.7
Acres	48,280	47.0	53,247	50.7
Land in Federal . . . . . Farms	8	1.9	20	5.1
Farm Programs                      Acres	142	0.1	473	0.5

**Example of data from e economic data, item 4, BEA employment/income timeseries**

<b>Income: Year</b>	<b>Non-farm</b>	<b>Private</b>	<b>Government</b>	<b>Personal</b>
1969	60,171,000	53,980,000	6,191,000	73,032,000
1970	61,558,000	54,461,000	7,097,000	77,528,000
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1986	208,548,000	176,736,000	31,812,000	294,930,000
1987	223,274,000	189,376,000	33,898,000	317,540,000



**(a) Interpreting model results**

As shown above, for a project costing \$1 million, \$338,574 (\$339,000 rounded) would be spent for local services and supplies at businesses in the study area. The remaining \$661,425 is being spend outside of the study area.

- (1) **Export Income Multiplier--**The export income multiplier relates the dollars worth of income that results from a \$1 change in the study area exports. In this case the study area has an output multiplier of 1.5119 and a direct sales increase of \$289,000, which results in a \$437,000 increase in sales volume for the current year.
- (2) **Change in local sales volume--**The project causes a direct increase in local sales volume of \$289,000. The project further induces an additional increase of \$148,000 in local sales volume for the current year. The (0.092%) indicates that the proposed action increases total sales volume by 0.092 percent in the study area for the current year, compared to a "no action" scenario. Sales volume is defined as local business activity or sales. It is the sum of total retail and wholesale trade sales, total selected service receipts, and value-added by manufacturing. It includes wages and salaries, so the total economic effect of the project in the study area would be \$437,000. The effect increases as the size of the study area is increased.
- (3) **Employment--**The total income for wages and salaries is \$342,000 ( $0.342 \times \$1,000,000$ ). The project causes a direct employment increase of three jobs, while the total employment increase is 11, for the current year.
- (4) **Income--**The direct change in local wages and salaries is \$32,000 for the current year. This is the increase in earnings of the

employees in local retail, wholesale, and service establishments that are initially affected by the proposed action. The total increase in local personal income of residents in the study area is \$172,000 for the current year. The total increase in local wages and salaries earned in the study year is \$168,000 for the current year. This is the sum of the direct and secondary wages and salaries. The 0.053 percent increase is the total income increase in the study area, compared to a no action scenario.

- (5) **Population--**The project does not change the local population, number of school children, or demand for housing.
- (6) **Government expenses and receipts -** The government would receive an additional \$17,000 in taxes and revenues; however they would need to provide \$10,000 in additional services, thus the net effect is a \$7,000 increase. The project does not affect the location of any civilian or military employees.

These types of data are useful in displaying and analyzing impacts for the Regional Economic Development and Other Social Effects accounts for alternative SCS project proposals.

## V. Getting started using EIFS

The process for using EIFS begins by defining a study area, setting up your computer and modem, and by obtaining password and login information. Hands-on experience is a useful tool for familiarizing yourself with the capabilities of ETIS. It gives the user a better idea of how this system can fill your particular need. Following is a summary of how to get started using EIFS. More detailed information is available by purchasing the appropriate users manuals. A revised user manual is in the draft form.

A guest account is available for becoming familiar with the ETIs capabilities. The guest account is available for a 1-week trial period.

The guest login is: **etis**, the password is changed weekly. We suggest that the potential user review this technical note, then contact the ETIS program office at (217) 333-1369 to obtain the guest account password. Presently each state has at least one login and password. Login and password access to the CALE system was covered in National Bulletin No. 180-1-20 dated June 18, 1991. See your state IRM personnel for the login and password information.

Equipment needed to access ETIS is a computer modem, and an asynchronous communication package. Before dialing the mainframe computer at the University of Illinois, set your terminal as follows:

- (1) 300 or 1200 baud
- (2) full duplex
- (3) 7 bits, 1 stop bit
- (4) even parity
- (5) carriage return/linefeed on
- (6) scroll on

Telephone numbers for the mainframe computer are:

Commercial: (217) 333-5067 or (217) 333-5068  
Toll free: 1-800-637-0958  
For ETIS help call (217) 333-1369

After obtaining the login and configuring your equipment, you can now call and login to ETIS. Enter **etis** at the regular prompt and then select the EIFS menu item. The study area may consist of one or more counties; up to a maximum of 800 counties. Counties may be designated name of Federal Information Processing Standard (FIPS) code. At most places in the program, you may enter a ? for help if your are not sure what to enter next. Entering a ? will provide choices for the required entry. If you believe the system is useful, then proceed to obtain a permanent account and password for your office.

Costs of using the ESIS computer programs:

- (1) Subscription fee is a one time fee of \$200; however, all state office presently have a paid subscription. This includes one complete set of users manuals. Additional users manuals are available for nominal cost.

- (2) Training fee is \$150 per person for a 3-day training workshop at the University of Illinois, Urbana-Champaign. Training is optional and probably not necessary in most cases.
- (3) System use fees are \$90 per hour of connect time. Because we participated in developing the SOILS system, SCS can currently use the mainframe computer for \$70 per hour of access time.
- (4) Telecommunications costs depend upon the method used to access the mainframe computer system.

### References

Robinson, D.P., J.W. Hamilton, R.D. Webster, and M.J. Olson. Economic Impact Forecast System (EIFS) II. User's Manual Updated Edition. May 1984.

Huppertz, Claire, and Kim Bloomquist. Economic Impact Forecast System (EIFS) 4.1: User's Manual, November 1991 Draft.