

Review of Guidance and Procedures for Regional Economic Development and Other Social Effects

Table of Contents

	<u>Page</u>
I. Introduction and Background	2
II. Decision Making in Collaborative Planning	4
III. Review of Guidance and Procedures	5
A. Regional Economic Development	
1. Background and Introduction	
2. Framework	
3. Measurement	
4. Suggested Procedures	
a. Input-Output Modeling	
b. Recreation Economic Assessment System	
c. Other Methods	
B. Other Social Effects	
1. Introduction and Background	
2. Frameworks	
3. Measurement	
4. Suggested Procedures	
a. Recommended OSE List of Categories of Effects	
IV. Future Efforts	19
V. Supplemental Information	21
A. RIMS II, REAS	
B. OSE complete text of factor lists	
C. OSE Data Sources	
D. Bibliography	

I. Introduction and Background

This document is the product of a limited effort to address other social effects and regional economic development as required by EC 1105-2-409, Planning in a Collaborative Environment (EC 409). It is designed to:

- 1) Research and document procedures to measure and assess Regional Economic Development (RED) and Other Social Effects (OSE) and recommend potential approaches.
- 2) Identify future research needs and develop a plan of action to conduct the required research.

Other documents in development--Collaborative Planning Handbook, RED Handbook and OSE Handbook--will include greater technical detail and provide information on additional tools, techniques and models for decision making with the four accounts, RED and OSE respectively. Other efforts are mentioned in Section IV Future Efforts.

The four evaluation accounts, National Economic Development (NED), Environmental Quality (EQ), Regional Economic Development (RED) and Other Social Effects (OSE), have consistently appeared, in various forms and nomenclatures, in federal guidance for many years. What has varied is their "status"—whether required—and importance—whether considered in formulation and plan selection.

- *OSE and RED and their use in planning are not new.*

ER1105-2-100 (ER 100) and the Principles and Guidelines for Water and related Land Resources Implementation Studies, March 10, 1983 (P&G) both contain the statement "Other plans which reduce net NED benefits in order to further address other Federal State, local and international concerns not fully addressed by the NED plan should also be formulated." However, guidance and plan selection criteria did not support the effects in the RED or OSE accounts as of primary importance to plan selection so such plans were marginalized and not the basis of plan formulation, selection or recommendation. In nearly all cases, this meant that such plans were not even developed or few resources were expended on them.

Other key statements in ER100 reinforce this position:

- "The national economic development account is required. Other information that is required by law or that will have a material bearing on the decision-making process should be included in the other accounts, or in some other appropriate format used to organize information on effects." (figure 1-1, ER1105-2-100)
- "Display of the regional economic development and other social effects account is discretionary." (ER 1105-2-100, 2-3 d. (4))

- *EC 409 emphasizes the importance of the RED and OSE accounts.*

EC 409 brings the OSE and RED into the decision making process:

- “Any alternative plan that has net beneficial effects across the four P&G accounts may be recommended, i.e., a non-NED plan may be the recommended plan.”

This is further reinforced by a clear statement on the importance of considering the full spectrum of plan effects, i.e., not a Corps of Engineers centric view:

- “Highest budget priority will be given to collaborative planning activities that embrace the full range of the national Federal interest.”

- *Federal investment should embrace the full Federal interest.*

These are significant changes in the orientation of Corps’ planning and have ramification to the Corps’ civil works plan formulation and evaluation process (see Section II). These changes also greatly increase the emphasis and potential application of the RED and OSE accounts.

The RED and OSE accounts and factors will vary in importance for projects. The full list of RED and OSE factors should be reviewed by the project analyst and it is recommended that the full list be displayed in a table in the study documentation. This will confirm that all factors were considered, even if most are not applicable. An initial screening of factors is needed early in the study process to determine the potential for RED/OSE factors to be significant for the project, for specific alternatives or for plan selection. The factor may be significant and/or there may be a significant impact.

- *Early assessment of significance will focus resources on selected factors.*

Significance is derived from institutional, public or technical recognition (ER 100, 2-4. m. (1)) “Institutional recognition means its importance is recognized and acknowledged in the laws, plans and policies of government and private groups. Technical recognition of a resource or an effect is based upon scientific or other technical criteria that establish its significance. Public recognition means some segment of the general public considers the resource or effect to be important.”

Significance will be a key factor in integrating RED/OSE into the evaluation process. Significance of many factors is not static. It is contextual, e.g., increased income (RED) may be of greater importance to a population in an area experiencing economic distress and limited opportunities. There is an abundance of literature on RED and OSE, particularly human costs of disasters. It cannot be applied indiscriminately but provides a road map for how to think about RED and OSE factors.

- *Significance must be established in a region specific, cultural context.*

II. Decision Making in Collaborative Planning

The main intent of EC 409 is to encourage the full and explicit consideration of significant plan effects. Collaborative planning offers the opportunity to combine the efforts of various Federal and non-Federal entities to shape the planning process based on their respective missions and interests. Implicit in the collaboration process is the equal consideration of all potential significant effects of the plans under evaluation. In evaluating a “national interest plan” in a collaborative setting, the full range of effects across the four accounts should be evaluated. The EC, however, requires the identification of the NED Plan as part of the formulation process to provide sufficient documentation of the plan selection procedure and to explicitly display the trade-offs between the selected plan and the NED Plan.

➤ *How is the best plan identified?*

One of the perceived difficult tasks associated with the implementation of EC 409 is how to identify the plan that provides the maximum “net beneficial effects” across the four evaluation accounts (NED, EQ, RED and OSE). The large number and diversity of parameters that can be considered under each of the accounts and the diversity of metrics to assess the effects augment the challenges associated with this task. Clearly displaying and documenting the significant effects provides the rationale required to recommend a deviation from the NED Plan. In most cases, a trade-off analysis will be required to inform and support the decision making process. Additional guidance and manuals to be developed in subsequent phases of this effort will address evaluation and the use of RED and OSE in decision making.

➤ *A recommended plan cannot provide benefits only in the RED and OSE accounts.*

The evaluation of the various accounts will be consistent with the scope of the study and in proportion to the extent they are expected to affect the plan selection. RED and OSE effects are generally evaluated at some level in National Environmental Policy Act (NEPA) documentation for all studies.

In addition to quantifying RED effects and indicating the OSE effect, i.e., positive/negative or beneficial/adverse and measuring the quantity or quality of effect, contributions to the planning objectives and evaluation criteria (effectiveness, efficiency, completeness, acceptability) should be discussed.

- Effectiveness -The extent to which the alternative plans contribute to achieving the planning objective.
- Efficiency - The extent to which the alternative plan is the most cost effective means of achieving the objectives.

- Completeness - The extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of planning objectives, including actions by other Federal and non-Federal entities.
- Acceptability - The extent to which the alternative plans are acceptable in terms of applicable laws, regulations and public policies.

The Planning Manual, IWR Report 96-R-21, Table 34 is an example of displaying RED and OSE effects.

- *The vision of EC 409 is more effective and inclusive water resources planning and implementation.*

III. Review of Guidance and Procedures

A. Regional Economic Development

- *“The regional economic development account registers changes in the distribution of regional economic activity that result from each alternative plan.”*

1. Introduction and Background

This section is a discussion of current guidance on regional economic development benefits contained in ER1105-2-100, past approaches used in the Corps, and other Federal agency approaches. A separate Plan of Action outlines research needed to develop final, analytically comprehensive procedures for RED. These actions are addressed briefly in Section IV of this document.

- *There are many techniques for performing RED analysis.*

There are seemingly limitless meanings and models for RED. This document addresses RED protocols developed or used by the Corps at various times (ER 100; and Regional Development Impacts, 1985). In addition, two other protocols are included: Department of Commerce (DOC) Regional Input-Output Modeling System (RIMS II) and the Recreation Economic Assessment System (REAS). The framework of each of these items is discussed later in this document. Other commonly used approaches, such as IMPLAN, will be included in the RED Handbook which is under development.

Many universities have regional centers for economic development and produce models “customized” to the region. These centers may have valuable current and historic data available and often are available to perform RED analysis. Some RED categories of effects may overlap the OSE account.

The RED account has waxed and waned in interest in Corps planning over the last 30 years. The advent of cost sharing saw an interest in RED expressed by sponsors but it did not receive emphasis in studies. The current guidance on planning for Corps projects, ER 100, Appendix D (Economic and Social), Amendment 1, 30 June 2004, has only brief references to RED. P&G includes comments on the use of the RED account; the RED categories of effects—regional income and regional employment—discussion of measurement standards and detailed discussion by category of effect.

Measurement of RED effects is generally to be quantitative within available and accepted methods. It is important to be aware of the critical differences between NED and RED effects.

- *It is important to separate NED and RED effects to avoid double counting.*

2. Frameworks

ER 100 and the P&G contain identical basic definitions of RED. The primary difference is the lack of definition and discussion of the components of RED in ER 100. Current guidance does not restrict RED considerations to the list of effects provided, although virtually all RED effects will be contained under either regional income or regional employment. The list reflects items commonly of importance to communities and which are most likely to be affected by projects. Other categories or a more detailed evaluation of RED effects may be included in planning reports if they are relevant to a specific project. There is no distinction made by business lines, i.e., navigation versus flood control, although certain effects are more closely correlated with some business lines than others.

- *RED effects are generally regional income or employment.*

The review document developed by IWR in 1985 provides the most detailed description of a range of methodologies. The major task to be accomplished in the report was “to introduce three alternative quantitative methodologies”. These methodologies were applied to navigation projects but the theories are applicable across business lines. Although dated, much of the discussion is still useful and the format is easy to use. A handbook of contemporary techniques for RED is being developed.

In the 1970's, the Bureau of Economic Analysis (BEA) developed a method for estimating regional Input-Output (I-O) multipliers known as RIMS. RIMS was enhanced in the 1980's; a handbook produced and the name changed to RIMS II to differentiate it from the original version. RIMS II is based on an accounting framework called an I-O table. For each industry, an I-O table shows the distribution of the inputs purchased and the outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's

regional economic accounts, which are used to adjust the national I-O table in order to reflect a region's industrial structure and trading patterns. RIMS II multipliers can be estimated for any region composed of one or more counties and for any industry or group of industries in the national I-O table.

- *Input-output analysis is a standard method for RED analysis but requires significant resources.*

To effectively use the multipliers for impact analysis, users must provide geographically and industrially detailed information on the initial changes in output, earnings, or employment that are associated with the project under study. The multipliers can then be used to estimate the total impact of the project on regional output, earnings, or employment. BEA can help to measure economic impacts in an area of interest. RIMS II is widely used to analyze the economic impact of projects and events on state and local areas.

The *Recreation Economic Assessment System* is a model for conducting regional estimates of the impact of recreational visitor spending. REAS was developed by the state of Michigan and modified by the Engineering Research and Development Center (ERDC) for application in the Corps. It is designed to provide a simple, accurate way of applying appropriate multipliers to spending and visitation data. It includes direct effects, aggregate secondary effects and marginal effects. Multipliers are sector specific. REAS is specifically designed to assess RED effects to the region, versus NED analysis which focuses on the value of an experience to the individual visitor.

3. Measurement.

Current guidance offers the following on measurement and metrics for RED effects:

“The positive effects of a plan on a region’s income are equal to the sum of the NED benefits that accrue to that region, plus transfers of income to the region from outside the region.

The positive effects of a plan on regional employment are directly parallel to the positive effects on regional income . . .

To the extent practical, planning reports should provide reasonable estimates of the composition of increased employment according to relevant service, trade, and industrial sectors, including a separate estimate for agriculture.

The relationship between the affected regional economies and the national economy should be recognized. Since the NED account registers all effects on the national economy, any differences

between the regional and national economic effects of a plan take the form of transfers from the rest of the nation.

Effects that cannot be satisfactorily quantified or described with available methods, data and information or that will not have a material bearing on the decision making process may be excluded from the RED account.”

In the next portion of this document, 4. Suggested Procedure, recommended RED measurement techniques are provided. Other methods may be used if well documented and defensible. Current guidance suggests exploring innovative methods. Model certification must be considered when choosing analytical techniques. A certified model with input data specific to the region will be required when the model certification process has been fully implemented.

Some parameters may be of interest in more than one account, e.g., income may be an RED and OSE consideration, albeit from different perspectives. It is vital to separate NED and RED effects on income and employment. In all cases, the analyst must bear in mind that with and without analysis will be applied to the RED account in order to appropriately determine project impacts. A manual on RED will be developed and will include a full range of measurement techniques.

➤ *With and without analysis are key to reliable RED evaluation.*

Local sponsors, states and other organizations often have a strong interest in the RED account and expect a project study to yield specific information about local and regional fiscal impacts. It may be possible to develop this, and other data of local interest, as part of the RED analysis with little additional effort. It is important that study participants understand the boundaries of RED analysis and its use in alternative evaluation.

➤ *The team must clearly understand the use and limits of the RED account.*

One aspect of measurement deserves a special mention—data. Data needs for RED analysis, particularly input-output modeling, may be daunting—costly and difficult to obtain. BEA offers advice and options for dealing with this in RIMS II or local university resources may be helpful in providing data.

4. Suggested Procedures

The RED account displays changes in the distribution of regional economic activity as a result of each alternative plan. Regional income and employment are the measures of economic activity most commonly used. The regional economic impact of recreation is a subset of these categories which is calculated separately as illustrated below. The definition of the region is the area within

which income and employment effects are significant. The absolute level of effects is of less importance than the relative impact on the region.

- *Both positive and negative effects must be identified.*

Key parameters for RED analysis are:

- NED and RED must be clearly defined and differentiated.
- Effects on regional employment are expected to be parallel to effects on regional income and should be calculated and displayed so the two are consistent.
- Negative income and employment impacts should not be overlooked.

a. Input-Output modeling Effective planning for public-and private-sector projects and programs at the State and local levels requires a systematic analysis of the economic impacts of these projects and programs on affected regions. In turn, systematic analysis of economic impacts must account for the inter-industry relationships within regions because these relationships largely determine how regional economies are likely to respond to project changes. Regional input-output (I-O) multipliers, which account for inter-industry relationships within regions, are useful tools for conducting regional economic impact analysis.

I-O modeling is a complex procedure. ER-100 specifies that “Evaluations of regional effects are to be carried out using nationally consistent projections of income, employment, output and population.” This has led to the use of RIMS II, developed and supported by the DOC, BEA as a respected, standardized methodology for I-O analysis. Use of RIMS II requires significant data input on project induced changes in earnings and employment. This level of effort and sophistication will not be needed on all studies. RED estimates for smaller studies may be pursued in conjunction with regional universities. The proposed methodology will be reviewed early in the study process and clearly displayed and explained in the report.

RIMS II is based on an accounting framework called an I-O table. For each industry, an I-O table shows the industrial distribution of inputs purchased and outputs sold. A typical I-O table in RIMS II is derived mainly from two data sources: BEA's national I-O table, which shows the input and output structure of nearly 500 U.S. industries, and BEA's regional economic accounts, which are used to adjust the national I-O table to show a region's industrial structure and trading patterns.

Using RIMS II for impact analysis has specific advantages. RIMS II multipliers can be estimated for any region composed of one or more counties and for any industry, or group of industries, in the national I-O table. The accessibility of the main data sources for RIMS II keeps the cost of estimating regional multipliers

relatively low. Empirical tests show that estimates based on relatively expensive surveys and RIMS II-based estimates are similar in magnitude.

BEA's RIMS multipliers can be a cost-effective way for analysts to estimate the economic impacts of changes in a regional economy. However, it is important to keep in mind that, like all economic impact models, RIMS provides approximate order-of-magnitude estimates of impacts. RIMS multipliers are best suited for estimating the impacts of small changes on a regional economy. For some applications, users may want to supplement RIMS estimates with information they gather from the region undergoing the potential change. Examples of case studies where it is appropriate to use RIMS multipliers appear in the [RIMS II User Handbook](#).

To effectively use the multipliers for impact analysis, users must provide geographically and industrially detailed information on the initial changes in output, earnings, or employment that are associated with the project under study. The multipliers can then be used to estimate the total impact of the project or program on regional output, earnings, and employment.

RIMS II is widely used in both the public and private sector. It is often used by state governments for transportation analyses. The ongoing development and support of the BEA, including a user handbook, make it the preferred choice for a large RED analysis.

For more detail on RIMS II, see Section V, Supplemental Information A, or the BEA web site <http://www.bea.gov/regional/rims>.

b. Recreation Economic Assessment System The *Recreation Economic Assessment System* is a model for conducting regional estimates of the impact of recreational visitor spending. REAS was developed by Michigan State University's Park, Recreation and Tourism Resources Department. It was modified by ERDC (in conjunction with one of the original developers) for application in the Corps. It is designed to provide a simple, accurate way of applying appropriate multipliers to spending and visitation data. It includes direct effects, aggregate secondary effects and marginal effects. Multipliers are sector specific. REAS is specifically designed to assess RED effects to the region, versus NED analysis which focuses on the value of the recreational experience to the individual visitor. It calculates tax impacts for the region which is usually a key interest of regional officials and publics.

➤ *Recreation spending may be an important factor in RED evaluation.*

Features of REAS include:

- Automated calculation, saving, printing, and charting.
- Summary report- Model automates converting results into a short report.

- Detailed estimates of direct effects for sales, jobs, income and value added.
- Aggregate estimates for all secondary effects.
- Marginal effects- Report impacts per thousand dollars of visitor spending and per 1,000 person-trips.
- Tax effects of direct sales and income.
- Charts for spending and visitation data.
- Built-in spending profiles- Model provides sets of spending profiles from past surveys.
- Sector-specific multipliers- model provides four sets of "generic" multipliers for 12 sectors that were estimated from IMPLAN.
- Model handles margins and local productions for purchases on goods.

REAS is a corporately supported and maintained Corps of Engineers tool. This methodology is also used by the National Park Service and the Forest Service. The REAS model is available on the Natural Resources Management Gateway <http://corpslakes.usace.army.mil/employees/economic>

c. Other Methods

Other well known and respected I/O models are IMPLAN, EIFS, REIM, and Port Kit. These will be addressed in detail in the RED handbook.

IMPLAN is a generic I/O modeling system which includes software and data. It is available privately and requires training to use successfully.

www.implan.com

EIFS is a generic economic base model which provides general regional economic impacts. It was originally developed to assess the impacts of base closures. It is available through Clark-Atlanta University.

REIM is a privately owned system. You can pay for access to run scenarios but limited information is provided on how the system actually performs the analysis.

www.remi.com

Port Kit is a product of the Maritime Administration. It is designed to perform impact analyses for small to medium ports. It is available for purchase from the National Technical Information Service at a nominal cost.

- *A RED handbook is in development.*

B. Other Social Effects

- *“The other social effects account registers plan effects from perspectives that are relevant to the planning process, but are not reflected in the other three accounts.”*

1. Introduction and Background

This section includes information on current guidance in ER-100, past approaches used in the Corps and other Federal agency approaches for determining OSE. A Plan of Action that outlines research needed to develop final, analytically comprehensive procedures for OSE has been developed as a separate document. Its content is summarized in part IV of this document.

➤ *There are many ways of defining OSE effects.*

There are seemingly limitless lists and nomenclatures for OSE. This document includes three OSE protocols developed or used by the Corps at various times (ER 100; P&G; and Social Effects Indicators developed by the Waterways Experiment Station (WES)). In addition, two other protocols are included: National Oceanic and Atmospheric Administration (NOAA) Human Dimensions of Coastal Restoration and a think piece on the Human Costs of Flooding. The framework of each of these five items is discussed later in this document.

Other robust sources (see bibliography) which may be drawn upon are:

- Department of Interior (DOI), Bureau of Land Management
- Council on Environmental Quality update of the NEPA handbook, social indicators
- U.S. Department of Agriculture (DA), Forest Service
- HAZUS-MH (FEMA) www.fema.gov/plan/prevent/hazus/index.shtml
- Environmental Protection Agency (EPA), particularly the Brownfields Initiative and Science Advisory Board on valuing environmental services
- NOAA's social science initiative and the vast wealth of academic research. Dr. David Loomis of the University of Massachusetts has a well established program with extensive work on Federal government actions. He has been instrumental in NOAA's work.

Similar to the RED account the OSE account has also waxed and waned in significance in Corps planning over the last 30 years. The current guidance on OSE in planning for Corps projects is contained in ER 100, Appendix D, Amendment 1, 30 June 2004. Included are comments on the use of the OSE account; the OSE categories of effects--urban and community impacts; life, health and safety; displacement; long-term productivity and energy requirement and energy conservation—discussion of measurement standards and detailed discussion by category of effect.

➤ *OSE effects often are described qualitatively rather than quantitatively.*

Measurement of OSE effects is generally to be qualitative (beneficial/adverse, positive/negative). Quantitative or numerical data is encouraged within available and accepted methods.

2. Frameworks

Current guidance and P&G include very similar categories of effects. The primary differences are the lack in P&G of the categories of educational, cultural and recreational opportunities and emergency preparedness. It appears that the current guidance was based very closely on the 1978 WES document; there are many instances of identical nomenclature. Current guidance does not restrict OSE considerations to the list of effects provided. The list reflects items commonly of importance to communities and which are most likely to be affected by projects. Other categories of OSE effects may be included in planning reports if they are relevant to a specific project. There is no distinction by business lines although certain effects are more closely correlated with certain business lines than others. Generally, the list is slanted toward economic (income, employment) issues of individual/community concern. There is potential for consideration of a wider range of social effects.

The list developed by WES in 1978 provides the most detailed list of overall OSE categories. The two major objectives of this document were to provide: “(1) a comprehensive listing of variables relevant to the social well-being objective of water-resources planning; and (2) descriptions of measurement of the variables deemed most salient for social well-being impact assessment of water and related land-management studies.” This report was prepared during the brief time that Principles and Standards was the primary planning guidance and the OSE account was termed the social well-being account. The account is defined by categories, subcategories and variables in increasing level of detail (for complete list refer to Section V Supplemental Information C – OSE Data Sources). The list is more detailed than P&G or current guidance. It has a discussion of each variable which includes definition and measurement of baseline conditions; predictions of future conditions for the variable; prediction of impacts—what to measure and how to measure it; data sources and references. Although dated, much of the discussion is still useful and the format is easy to use. An electronically based update of this document is being considered as a future work product.

- *OSE (commonly titled Human Dimensions) is currently of great interest in many agencies and the academic community.*

The think piece on the Human Cost of Flooding is a basic prototype for placing a dollar value on the trauma associated with flooding. It was designed for use as a category of NED benefit (Note: This approach has not been approved as a NED benefit by HQUSACE, it is provided only as an example of potential factors which may be appropriate for some projects.). The methodology could be adapted to a variety of natural disasters. The approach relies on vetted measures developed by the American Medical Association (impairment classification) and the Veteran’s Administration (impairment payment scale).

The remaining framework considered was developed by NOAA's Coastal Ocean Program as part of their Decision Making Analysis Series. The framework is included in the document Science Based Restoration Monitoring of Coastal Habitats, Volume 2, Tools for Monitoring Coastal Habitats, chapter 14, Human Dimensions of Coastal Restoration. This document is focused on monitoring of coastal restoration projects. Monitoring occurs long after project planning but many of the OSE factors of interest are the same as those evaluated in the project planning process. (See Supplemental Information B. for a full list of the factors included.) The goals of monitoring (from this NOAA document--ensure that restoration is successful, further the science, and increase the efficiency of future restoration efforts) also contribute to better project planning. The inclusion of human dimensions in restoration monitoring reflects NOAA's emphasis on social science as an integral part of and important tool for coastal work. As the Corps' environmental restoration mission matures, this topic is increasing in importance. The document was developed using a peer review process and the human dimensions chapter is co-authored by a leading academic expert. It includes extensive, current bibliographies by topic as well as an associated experts list.

- *NOAA's Human Dimensions work can be found at www.csc.noaa.gov/socialscience and humandimensions.gov (site in development).*

3. Measurement

Current guidance offers the following on measurement and metrics for OSE effects:

“With emphasis on their incidence or occurrence, beneficial effects on social well-being are contributions to the equitable distribution of real income and employment and to other social opportunities. Since they are integrally related to the basic values and goals of society, these effects are usually not subject to monetary evaluation. The normal market exchange process, however, produces monetary values which can be utilized to aid in measuring distributional impacts of plans on real incomes.

In evaluating well-being effects the obtaining of detailed breakdowns and analytically useful correlations relating to various indicators, index numbers, and similar comparative statistical indicators, as well as dollar values where possible, presents many complex definitional, data and measurement problems. Consequently, planning studies should explicitly recognize the limitations of present methods and explore innovative approaches to the identification and measurement of the social well-being effects. Such procedures should be carefully documented in the report.”

In the following Recommended OSE List of Categories of Effects, a measurement technique is listed for each of the effects. Other methods may be used if well documented and defensible. Current guidance suggests exploring innovative methods--“planning studies should explicitly recognize the limitations of present methods and explore innovative approaches to the identification and measurement of the social well-being effects.” Some parameters may be of interest in more than one account, e.g., income may be an RED and OSE consideration, albeit from different perspectives. In all cases, the analyst must bear in mind that with and without analysis will be applied to the OSE account in order to appropriately determine project impacts. A manual on OSE will be developed as a future effort and will include a full range of measurement techniques.

- *Census data and the use of indices may help in performing an efficient OSE analysis.*

One aspect of measurement deserves a special mention—scale. Some parameters of OSE may be difficult to assess or monitor for individual or small scale projects. The NOAA publication on Human dimensions of Coastal Restoration identifies parameters most likely to be suitable for assessment regardless of project size or scope and those more likely to be meaningful at the river basin or watershed levels.

- *See Section V. Supplemental Information C. for a list of OSE data sources.*

4. Suggested Procedures

The following table shows the OSE categories of effects contained in the current guidance (ER 100 on the left). The categories of effects that are also included in the lists from P&G, WES and NOAA are marked with an x under those sources. Some discretion was used to interpret the nomenclature in the various lists. (For a complete display of the effects included in WES and NOAA lists, see Section V Supplemental Information B.)

OSE Categories of Effects

Planning Guidance Notebook (ER 1105-2-100)	P&G	WES	NOAA
<ul style="list-style-type: none"> • Urban and community impacts 	x	x	
Real income	x	x	
Employment distribution (especially share to minorities)	x	x	
Population distribution	x	x	
Population composition	x	x	
Fiscal condition of State and local sponsor	x	x	x
Educational, cultural and recreational opportunities		x	x
<ul style="list-style-type: none"> • Life, health and safety 	x	x	x
Reducing risk of flood, drought and other disasters	x	x	x
Reducing the number of disease-carrying insects and other pathological factors		x	x
Reducing concentration/exposure to water and air pollution	x	x	x
Providing a year-round choice of food that contributes to the improvement of national nutrition			
Estimate of number of lives saved (only with strong historic record)	x	x	
<ul style="list-style-type: none"> • Displacement 	x	x	
People, businesses and farms	x	x	
<ul style="list-style-type: none"> • Long-term productivity 	x		x
Maintenance and enhancement of productivity of resources such as agricultural land.	x		x
<ul style="list-style-type: none"> • Energy requirements and energy conservation 	x		

	P&G	WES	NOAA
<ul style="list-style-type: none"> • Emergency preparedness (not listed as one of the major categories in the introductory list) 		X	
Protecting major components of the		X	
National water transportation system		X	
Flexible reserves of water supplies		X	
Critical power supplies		X	
Reserve food production potential		X	X
Conservation of scarce fuels			
Dispersal of population and industry		X	
International treaty requirements		X	

a. Recommended OSE List of Categories of Effects The following list is recommended for use in screening OSE factors in implementation of EC 409. It represents a broad range of interests which are likely to be relevant to water resources planning. Other factors may be added if of particular significance for a specific project.

- *The public, as well as the team, may have important input on which factors will be of importance.*

Income and Employment

Measure positive or negative; quantitative

- Income Opportunities
 - Personal Income
 - Income dispersion
 - Income stability
- Labor Force Characteristics
 - Economic activity of the population
 - Employment distribution (especially to minorities)
 - Labor/job stability
 - Occupational distribution
- Fiscal Condition of State, regional and local government

Life, Health and Safety

Measure positive or negative; qualitative

- Personal Health and Safety
 - Risk of injury
 - Morbidity, especially exposure to water and air pollution
 - Mortality

- Population segment differences in health and safety
- Safety of Property
 - Risk of property damage
 - Effects of damage on quality of life
 - Population segment differences in risk to property
- Institutional Protection
 - Adequacy of medical facilities and personnel
 - Adequacy of emergency protection
 - Population segment differences in access to institutional protection

Educational, Cultural and Recreational Opportunities

Measure quantitative/qualitative

- Educational Opportunities
 - School enrollment
 - Protection of educational facilities
- Recreational and Cultural Opportunities
 - Recreational and cultural participation
 - Diversity of recreational and cultural opportunities
 - Adequacy of recreation areas and cultural opportunities

Emergency Preparedness

Measure quantitative

- Water Transportation Needs
 - Waterway Accessibility of Major Distributive Centers
 - Efficiency of the Water Transportation System
 - Water Transportation Protection
- Water Supply Needs
 - Quality of Water Supply
 - Quantity of Water Supply
 - Diversion Potential of Water Supply
- Power Supply Needs
 - Overload Capacities of Power Supply
 - Efficiency of Water-Related Energy Sources
- Protection of Infrastructure
- International Treaty Requirements
 - Compliance with Water-related Treaty Requirements

Community

Measure positive or negative; qualitative

- Community Ties
 - Strength of Community Identification
 - Community Values
- Community Homogeneity or Diversity
 - Socioeconomic Diversity
 - Ethnic Diversity

- Age Diversity
- Displacement
 - People, businesses and farms
- Housing and Social Institutions
 - Housing Supply
 - Neighborhood Quality
 - Residential Stability
 - Social Institutional Stability
 - Housing Costs
- Other Community Services
 - Adequacy of Water Supply and Utility Service
 - Adequacy of Transportation Infrastructure
 - Adequacy of Other Community Services

Population Characteristics

Measure quantitative

- Population Growth
 - Population Size
 - Population Density
 - Net Migration
 - Internal Migration

Aesthetics

Measure qualitative

- Resources
 - Visual Unity
 - Visual Compatibility
 - View shed
 - Fragility/Scarcity
 - Naturalness
- Social
 - Preferences
 - Community Values

➤ For further reading <http://papers.ssrn.com> (Social Science Research Network)

IV. Future Efforts

If Collaborative Planning is to be used to its fullest potential--to implement true integrated water resources planning--it is critical that appropriate research be done to provide the field with reliable and credible tools.

The implementation of EC 409 has three phases: Phase 1 began with issuing the EC in July 05 and will conclude with publication of this document in mid 2006; Phase 2 consists of research and dialogue for the remaining months of the EC's

viability; Phase 3 is development of final guidance and technical manuals incorporating research results and field experiences.

A separate Plan of Action (POA) addresses research needed to develop final, analytically comprehensive procedures for RED and OSE. Two categories of items are addressed in the POA--short term needs and long term needs. The short term needs build on existing information and can be completed in less than a year while the long term needs include the development of tools which will require significant investments of time, effort and coordination or fundamental policy issues on which a dialogue needs to begin.

Items included in the draft POA are: Collaborative Planning Handbook; RED Techniques Manual; Outreach and Training on Collaborative Planning; OSE Manual; OSE and RED by business lines; OSE, RED, EIS—Consistency and Integration; Theoretical Underpinning of OSE; Decision Making Tools for Collaborative Planning; Shared Vision Planning—field user version; Place Vulnerability—the Importance of Socioeconomics; Quality of Life as an Alternative to Willingness to Pay. Descriptions and other details on these items are found in the POA.

V. Supplemental Information

A. RIMS II, REAS

RIMS

In the 1970's, the Bureau of Economic Analysis (BEA) developed a method for estimating regional I-O multipliers known as RIMS (Regional Industrial Multiplier System), which was based on the work of Garnick and Drake. In the 1980's, BEA completed an enhancement of RIMS, known as RIMS II (Regional Input-Output Modeling System), and published a handbook for RIMS II users. In 1992, BEA published a second edition of the handbook in which the multipliers were based on more recent data and improved methodology. In 1997, BEA published a third edition of the handbook that provides more detail on the use of the multipliers and the data sources and methods for estimating them.

RIMS II uses BEA's benchmark and annual I-O tables for the nation. Since a particular region may not contain all the industries found at the national level, some direct input requirements cannot be supplied by that region's industries. Input requirements that are not produced in a study region are identified using BEA's regional economic accounts.

The RIMS II method for estimating regional I-O multipliers can be viewed as a three-step process. In the first step, the producer portion of the national I-O table is made region-specific by using six-digit NAICS location quotients (LQ's). The LQ's estimate the extent to which input requirements are supplied by firms within the region. RIMS II uses LQ's based on two types of data: BEA's personal income data (by place of residence) are used to calculate LQ's in the service industries; and BEA's wage-and-salary data (by place of work) are used to calculate LQ's in the nonservice industries.

In the second step, the household row and the household column from the national I-O table are made region-specific. The household row coefficients, which are derived from the value-added row of the national I-O table, are adjusted to reflect regional earnings leakages resulting from individuals working in the region but residing outside the region. The household column coefficients, which are based on the personal consumption expenditure column of the national I-O table, are adjusted to account for regional consumption leakages stemming from personal taxes and savings.

In the last step, the Leontief inversion approach is used to estimate multipliers. This inversion approach produces output, earnings, and employment multipliers, which can be used to trace the impacts of changes in final demand on directly and indirectly affected industries.

Empirical tests indicate that RIMS II yields multipliers that are not substantially different in magnitude from those generated by regional I-O models based on relatively expensive surveys. For example, a comparison of 224 industry-specific

multipliers from survey-based tables for Texas, Washington, and West Virginia indicates that the RIMS II average multipliers overestimate the average multipliers from the survey-based tables by approximately 5 percent. For the majority of individual industry-specific multipliers, the difference between RIMS II and survey-based multipliers is less than 10 percent. In addition, RIMS II and survey multipliers show statistically similar distributions of affected industries.

REAS

The following tables are samples from a standard REAS analysis.

<u>Sector/Spending category</u>
Motel, hotel cabin or B&B
Camping fees
Restaurants & bars
Groceries, take-out food/drinks
Gas & oil
Other auto expenses
Other boat expenses
Entertainment and recreation fees
Sporting goods
Souvenirs and other expenses
Other services
Other merchandise
Retail Trade
<u>Wholesale Trade</u>

<u>Economic measure</u>
Output/Sales (\$ Millions)
Personal Income (\$ Millions)
Value Added (\$ Millions)
Jobs

Back to Multiplier Page

Multiplier Lookup Table

<p>Group 1: Rural Smaller rural regions with low population (below 30,000). Low sales multipliers and high job to sales ratios Representative regions: DWORSHAK DAM & RESERVOIR, NIMROD LAKE, BLUE MOUNTAIN LAKE</p>
<p>Group 2: Small Metro</p>

Larger rural regions or small metro areas with population up to 500,000. Regions with smaller populations that serve as population centers of the surrounding areas may fit into this category.

Low to medium sales multipliers and medium to high job to sales ratios.

Representative regions: LAKE OUACHITA, MILFORD LAKE, (WOLF CREEK DAM)
LAKE CUMBERLAND

Group 3: Large Metro

Medium to larger metro areas with population up to 1,000,000. Regions with smaller populations that serve as population centers of the surrounding areas may fit into this category.

Medium to high sales multipliers and medium to low job to sales ratios.

Representative regions: LEWISVILLE LAKE, LAKE SIDNEY LANIER, J PERCY
PRIEST DAM AND RESERVOIR

B. OSE Factor Lists

1. Refer to Planning Guidance Notebook, ER 1105-2-100

2. Refer to Principles and Guidelines

3. Miscellaneous Paper Y-78-2, Profile and Measurement of Social Well-Being Indicators for Use in the Evaluation of Water and Related Land Management Planning, Patricia K. Guseman and Katheryn T. Dietrich, Texas A&M University, June 1978

Contract monitored by Environmental Laboratory, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Real Income Distribution

- Income Opportunities
 - Personal Income
 - Income dispersion
 - Income stability
 - Sources of income
- Labor Force Characteristics
 - Economic activity of the population
 - Labor force diversity
 - Labor/job stability
 - Occupational distribution
 - Accessibility of work
- Income Expenditures
 - Major consumer expenditures
 - Discretionary Income
 - Taxes
- Subjective Satisfaction
 - Satisfaction with life quality
 - Job satisfaction
 - Satisfaction with family income

Life, Health, and Safety

- Personal Health and Safety
 - Risk of injury
 - Morbidity
 - Mortality
 - Population segment differences in health and safety
- Safety of Property
 - Risk of property damage
 - Effects of damage on quality of life
 - Population segment differences in risk to property
- Institutional Protection
 - Adequacy of medical facilities and personnel

- Quality of medical care
- Adequacy of protection against crime
- Adequacy of emergency protection
- Population segment differences in access to institutional protection

Educational, Cultural and Recreational Opportunities and Other Community Services

- Educational Opportunities
 - School enrollment
 - Educational achievement
 - Adequacy of educational services
 - Diversity of educational services
 - Satisfaction with educational opportunities
- Recreational and Cultural Opportunities
 - Recreational and cultural participation
 - Diversity of recreational and cultural opportunities
 - Adequacy of recreation areas and cultural opportunities
 - Satisfaction with recreational and cultural opportunities
 - Population segment differences in access to recreational and cultural opportunities
- Other Community Services
 - Adequacy of Water Supply and Utility Service
 - Adequacy of Public Transportation
 - Adequacy of Other Community Services

Emergency Preparedness

- Water Transportation Needs
 - Waterway Accessibility of Major Distributive Centers
 - Efficiency of the Water Transportation System
 - Water Transportation Protection
- Water Supply Needs
 - Quality of Water Supply
 - Quantity of Water Supply
 - Diversion Potential of Water Supply
- Power Supply Needs
 - Overload Capacities of Power Supply
 - Efficiency of Water-Related Energy Sources
- Reserve Food Production Potential
 - Food Reserve Potential
- Dispersal of Population and Industry
 - Dispersion of Water Supply Sources
 - Dispersion of Waterways
- International Treaty Requirements
 - Compliance with Water-related Treaty Requirements

Community Cohesion

- Community Ties
 - Strength of Community Identification
 - Community Participation Process
 - Community Values
- Community Homogeneity or Diversity
 - Socioeconomic Diversity
 - Ethnic Diversity
 - Age Diversity

Other Population Characteristics

- Population Growth
 - Population Size
 - Population Density
 - Dispersion Around Population Centers
 - Net Migration
 - Internal Migration
- Housing and Social Institutions
 - Housing Supply
 - Neighborhood Quality
 - Residential Stability
 - Social Institutional Stability
 - Housing Costs

Population Characteristics

- Population Growth
 - Population Size
 - Population Density
 - Net Migration
 - Internal Migration

Aesthetics

- Resources
 - Visual Unity
 - Visual Compatibility
 - View shed
 - Fragility/Scarcity
 - Naturalness
- Social
 - Preferences
 - Community Values

4. Think Piece-- Human Costs of Flooding

(could be updated and broadened to encompass a variety of natural disasters)

16 Sept 05 fax from George Antle to Bob Pietrowsky

- Context
 - Affects individuals as state of shock
 - Affects population as loss of community
 - Indicators of ability to deal with impacts—age; income level
 - Indicators of severity of impact—time to clean up; flood damage vs. household income

- Categories of Effects
 - Miss work
 - Worry
 - Anxiety
 - Evacuation
 - Health problems
 - Mental attitude
 - Concern for family members
 - Professional medical help
 - How long to return home
 - How long to resume usual life
 - Fear of bad weather
 - House looted
 - Degree of neighborliness

- Measure
 - AMA impairment classification
 - Veteran's Affairs payment scale based on degree of impairment
 - Categorize individual trauma on AMA classification
 - Monetize by relating to VA payment scale

- Philosophy
 - Trauma reduces economic capability
 - "Willingness to pay" to avoid trauma is an NED benefit
 - AMA scale can be linked to VA payments
 - VA scale is proxy of nation's "willingness to pay" to impairments
 - Cumulative effects?
 - Community impacts?
 - How long do effects persist? (i.e., icon that brings back experience when reminded of it).

5. NOAA Coastal Ocean Program, Decision Making Analysis Series, no. 23, Volume 2

Science Based Restoration Monitoring of Coastal Habitats, Volume 2, Tools for Monitoring Coastal Habitats

- Community Related
 - Presence in Community Master Plan
 - Component of Town Meetings

- Attendance at Town Meetings
 - Community Communications
 - Volunteerism (number of persons)
 - NGO Activity
 - Town Use of Restored Coastal Area
 - Town Portion of Cost Sharing
 - Corporate Sponsorship
 - Zoning Changes
 - Tax Incentives
 - Community Member Attitudes
- Property Damage Related
 - Flood Zone Map
 - Number of Losses
 - Disaster Relief Costs
 - Direct Cost of Damage Income Level
 - Insurance Losses
 - Uninsured Losses
 - Reduced Insurance Costs
 - Expenditures on Non-Restoration Projects (i.e. coastal armament)
- Education Related
 - Number of Interpretive Centers
 - Number of Interpretive Programs
 - Number of Research Projects
 - Number of Students Trained
 - Cost of Research Projects
 - School Field Trips
 - Classroom Activities
 - Association With Museums
 - Informal Education: Media coverage, websites, brochures, kiosks, workshops and public forums
- Human Health Related
 - Health Advisories
 - Fish Advisories
 - Shellfish Advisories
 - Drinking Water Advisories
 - Number, Area and Duration of Beach Closures
 - Incidence of Disease
 - Level of Compliance With Water Quality Standards
 - Level of Reduction in BioToxins
 - Number of Hazardous Sources
 - Number and Area of Algal Blooms
 - Duration of Algal Blooms
 - Number of Hypoxia Events

- Number of Water-Borne Illnesses
- Level of Food Safety
- Commercial Fishing Related
 - Number of Commercial Dock Facilities
 - Total Profits
 - Number of Jobs
 - Total Value of Harvest
 - Sustainability of fishery
 - Cultural/Historical Heritage Preservation
- Other Social Values
 - Property Values
 - Appraised Value
 - Market Value
 - Viewscape quality
 - Acres of Land Preserved/Open Space
 - Preserved Natural/Historic/Cultural Values
 - Level of Existence Value
 - Level of Bequest Value
 - Level of Option Value
 - Historic Designation
 - Tribal Designation

Measure

- **Coastal Recreation, Tourism and Access Related Goals**

Increase Number of Recreational Opportunities (pg 16)

Increase the Level of Recreation Activity (pg 16)

Increase the Quality of Recreational Opportunities (pg 17)

Improve Tourism/Ecotourism (pg 17)

Enhance Access to Coastal Resources (pg 17)

- **General Social and Non-market Values Related Goals**

Enhance Community Investment (pg 23)

Enhance Educational Opportunities

(pg 29)

Protect or Improve Human Health (pg 30)

Protect Traditional/Cultural/Historic Values (pg 36)

Enhance Non-Market Values (pg 41)

Improve Aesthetic Values (pg 41)

- **Market-based Goals**

Improve General Market Activity (pg 43)

Reduce Property Damage (pg 46)

Enhance Property Value (pg 46)

Enhance Transportation and Commerce (pg 51)

Improve Commercial Fisheries/Shellfisheries (pg 54)

Non-consumptive users (birders, beach users,
divers/snorkelers, boaters, hikers)
Recreational Fishing Catch Indicators
Catch rates
Average size per fish
Availability of preferred target species
Number of trophy fish caught
Annual Recreation Visitor Days
Consumptive days (hunting, fishing, shellfishing, trapping)
Non-consumptive days (birding, beach use,
diving/snorkeling, boating, hiking)
Watchable Fish and Wildlife Counts
Economic Indicators
Economic Expenditures
Economic Impacts
Employment Impacts

C. OSE Data Sources

The following table provides a list of social effects variables and potential data sources. The social scientist performing the assessment should explore and adjust according to the unique conditions of each work effort.

Social Effects Assessment Variables and Data Sources

Variable Category	Variables of Interest	Data Sources
Community Social Profile Variables		
Population	Total population	U.S. Census
	Population % change	
Age	Median age	U.S. Census
	% 65 and above	
Education	% HS grads (age 25+)	U.S. Census
	% College grads (age 25 +)	
Race and Ethnicity	% White	U.S. Census
	% Black	
	% Other	
	% Persons of Hispanic/Latino origin	
Employment and Industry	Major industries	U.S. Census
	Unemployment rate	
Income and Poverty Status	Median H/H income	U.S. Census
	Persons below poverty %	
Housing Mix and Value	Housing units	U.S. Census
	Homeownership rate	
	Housing units in multi-unit structures %	
	Median value of owner occupied housing units	
Civic Infrastructure	Voter turn out in local elections/bond issues	Newspapers; county government
	Rankings on \$ expenditures per student, student achievement tests, acres of parks per capita	County government
Post Event Social Effects Variables		

Variable Category	Variables of Interest	Data Sources
Storm-Related Deaths	Number of deaths reported as storm related expressed as a per capita rate	National Weather Service, Office of Hydrology, Flood Loss Data Base http://www.nws.noaa.gov/oh/hic National Hurricane Center, Tropical Prediction Center http://www.nhc.noaa.gov/
Storm-Related Injuries	Number of injuries reported as being storm related expressed as a per capita rate	Newspaper accounts
Disruption/Evacuation	Numbers of persons evacuated	Newspaper accounts
Family Disturbances	Number of police calls for family disturbances occurring by month for the year following the event, and for the 12 months prior to the event	Police department records
	Caseload of family counseling and mediation centers for the year following the event, and for the year prior to the event	Inquiries to community counseling and mediation centers
Unemployment Claims	Number of claims occurring in each month of the 12-month period following the event expressed as a rate, and for the 12 months prior to the event expressed as a rate	State/ county employment office, workman's compensation data base
Crime	Numbers of crimes by type occurring in each month of the 12-month period following the event expressed as a rate,	Police department records

Variable Category	Variables of Interest	Data Sources
	and for the 12 months prior to the event expressed as a rate	
Divorce	Number of petitions for divorce occurring in the year following the event, and for the year prior to the event, expressed as per capita rates	County court house records
Recovery Period Social Effects Variables		
Population Changes Experienced	Changes 2000–2005 Population change, total %, % 65+, % white, black – totals, and broken down by census tracts/zip codes	U.S. Census 2005 data
Employment Changes Experienced	Employment rate over time, plotted monthly. Unemployment claims by month.	State/ county employment office
	Number of businesses; major employers	Chamber of Commerce
Income and Property Values	2000–2005 % of persons living in poverty	Census; state records
	Volume and sales prices of residential property by month	Real Estate MLS
Civic Infrastructure Changes	Number and type of public and NFP organizations	Directories (e.g., Chamber; telephone)
	Community vision and outlook for future	Newspapers, county web sites
	Community improvement efforts underway	Newspapers, county web sites
	Community participation rates in elections	Newspaper, county web sites

D. Bibliography

RED References

- **"The Variation of Estimated Impacts from Five Regional Input-Output Models,"** Brucker, Sharon M., Steven E. Hastings, and William R. Latham III, *International Regional Science Review* 13 (1990): 119-39.
- **"Differential Regional Multiplier Models,"** Garnick, Daniel H. *Journal of Regional Science* 10 (February 1970): 35-47; and Ronald L. Drake, "A Short-Cut to Estimates of Regional Input-Output Multipliers," *International Regional Science Review* 1 (Fall 1976): 1-17.
- **"Regional Economic Development Benefits: Issues, Findings and Suggested Actions"** Robinson, Dennis P., unpublished document, Institute for Water Resources, Alexandria, VA.
- **Regional Input-Output Modeling System (RIMS II): Estimation, Evaluation, and Application of a Disaggregated Regional Impact Model** U.S. Department of Commerce, Bureau of Economic Analysis, (Washington, DC: U.S. Government Printing Office, 1981). Available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161; order no. PB-82-168-865; price \$26.
- **The Detailed Input-Output Structure of the U.S. Economy, Volume II** U.S. Department of Commerce, Bureau of Economic Analysis, (Washington, DC: U.S. Government Printing Office, November 1994); and U.S. Department of Commerce, Bureau of Economic Analysis, *State Personal Income, 1929-93* (Washington, DC: U.S. Government Printing Office, June 1995).

OSE and Evaluation References

- **Community and Quality of Life: Data Needs for Informed Decision Making** National Academy Press 2002
Combination of theory and application with chapters focused on each. Oriented to transportation. Well organized for focus on various parameters—emphasizes livability.
- **Environmental Valuation in Europe series** editors Clive Spash and Claudia Carter 2000 *Concerted Action*, European Commission coordinated by Cambridge Research for the Environment
Series of 12 pamphlet type (20 pages) documents on key topics in environmental valuation. Excellent introduction to philosophy, issues and analytical approaches. Selected topics—natural capital, conceptualizing

sustainability, environmental quality and the value of life, value transfer, concepts of value.

- **HAZUS-MH (FEMA)** is a useful geographically based tool to assess damages, including OSE. Available at www.fema.gov/plan/prevent/hazus/index.shtm
- **Human Links to Coastal Disasters** The H. John Heinz Center for Science, Economics and the Environment 2002
- **Linking Human Benefits to Barrier Island Restoration in Louisiana** Pontchartrain Institute for Environmental Science
Oct. 2004 Workshop
- **Measuring Ecosystem Service Benefits: The Use of Landscape Analysis to Evaluate Environmental Trades and Compensation** Jim Boyd and Lisa Wainger April 03 Resources for the Future Discussion Paper
<http://rff.org/>
- **Miscellaneous Paper Y-78-2** Waterways Experiment Station June 1978
Part of Water Resources Assessment Methodology to assist in environmental impact assessment. Addresses Social Well Being account.
List of variables (tiered by category, subcategory and variable), ways to measure, how to predict.
- **Multi-Criteria Decision Analysis: Comprehensive Decision Analysis Tool for Risk Management of Contaminated Sediments** I Llnkov, S. Sahay, G Kiker, T. Bridges, T.P. Seager, D.A. Belluck, A. Meyer draft, submitted to Risk Analysis, February 2005
- **National Ocean Economics Project**
- **No Adverse Impacts: Partnering for Sustainable Flood Plain Management** Association of State Flood Plain Managers Conference 2005
See National Nonstructural/Flood Proofing Committee web site for presentations
Topics—partnering, environmental sustainability, no adverse impacts, watershed approach, innovation and restoration and conservation as opportunities for flood plain management. Historic preservation and flood proofing example.
- **People Power: The Social Side of Watershed Restoration**
http://www.fs.fed.us/wildlandwaters/newsletters/wildlandwaters_spring06.pdf
- **Perspectives on Biodiversity: Valuing its Role in an Ever Changing World** National Research Council 1999

Economics and environmental integrated.
Somewhat academic but thorough, concise discussion of a wide range of factors related to biodiversity.

- **Science Based Restoration Monitoring of Coastal Habitats volume one**
Terry McTigue NOAA (Chapter 14 Human Dimensions of Coastal Restoration) 2005
Series responding to the Estuaries and Clean Water Act of 2000 (PL 160-457) Lots of information. Matrix of goals, parameters to monitor—many also applicable to initial project evaluation. Bibliography, glossary, list of human dimensions experts.
- **Spatial Trends in Coastal Socioeconomics** Percy Pacheco and Peter Wiley NOAA 2005
Web site <http://stics.noaa.gov>
Time series, geo-referenced demographic data 1969-2001. Includes data analysis and display tools.
- **Sources of Information for Social Profiling** IWR report 77-9, Dec. 1977 (done by U. of Kansas, Cynthia Flynn and Rosemary Schmidt)
Addresses Social Impact Analysis for EISs re NEPA requirements. Lists variables, indicators, priority (importance of variable), source and time and cost to collect. Sources may be out of date, but variable list is useful.
- For further reading <http://papers.ssrn.com> (Social Science Research Network)
- **A Step By Step Guide to Conducting a Social Profile for Watershed Planning** University of Illinois, Department of Natural Resources and Environmental Science. 2006..
<http://www.watershedplanning.uiuc.edu/index.html>
- **Valuing Ecosystem Services: Toward Better Environmental Decision-Making** National Academies of Science November 2004
Multi agency sponsored study. Identifies methods for assigning value to ecosystem services—tangible and intangible. Stress collaboration between ecologists and economists.