reference handbook

Fiscal Year 1981

For Use with the Principles, Standards, and Procedures for Water Resources Planning (Level C).

U.S. Water Resources Council

To Assist in the Implementation of the Water Resources Council's Principles, Standards, and Procedures For Water and Related Land Resources Planning (Level C)

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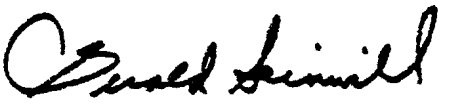
i. Foreword

The Principles, Standards, and Procedures of the U.S. Water Resources Council state that certain information, data, guidance, or coordination will be provided by the Council. This reference handbook has been compiled by the WRC staff with the assistance of Member agencies to aid planners in formulating and evaluating water resources management and development plans.

This handbook is intended as an annual publication so that current data will be available to planners. For example, this issue contains material relating to the environmental quality evaluation procedures which have recently been developed. More specific guidelines for estimating values of nonstructural measures for municipal and industrial water and approved regional models for estimating recreation demand will be developed by the agencies with coordination by the WRC. Additional sections may be added in response to the suggestions and requests of Member agencies.



Gerald Seinwill
Acting Director

October 1980

ii. Introduction

The information contained in this handbook is provided primarily to assist planners in complying with the WRC Principles, Standards, and Procedures.

Work to develop the Principles, Standards, and Procedures under the Water Resources Planning Act of 1965 (P.L. 89-80) was begun by WRC in 1968 culminating in the President's approval of the "Principles and Standards for Planning Water and Related Land Resources" (September 10, 1973; 39 FR 24778-24862) which became effective on October 25, 1973. The Standards were amended August 14, 1974 (39 FR 29242). Subsequently, procedures within the framework of the Principles and Standards were developed by covered Federal agencies.

The President's Water policy Reform Message of June 6, 1978 and the memorandum of July 12, 1978 titled "Improvements in the Planning and Evaluation of Federal Water Resources Programs and Projects" provided the impetus and direction for WRC's development of a single, consistent set of Procedures and revisions to the Principles and Standards. WRC is carrying out the President's directive in a three-phase program.

In Phase I the Procedures for Evaluation of National Economic Development (NED) Benefits and Costs in Water Resources Planning (Level C) were developed and published as a final rule (18 CFR 713) in the December 14, 1979 Federal Register. Copies are available from the U.S. Government Printing office at $2.50. Two additional subparts to the NED evaluation procedures, Subpart J - Transportation, Deep-draft Navigation and Subpart L - Commercial Fishing were developed and published as a final rule on September 29, 1980 (45 FR 64448-64). Two subparts to the Other Social Effects (18 CFR 716), Subpart A - Introduction and Subpart E - Structural Failure, were also published as a final rule on September 29, 1980 (45 FR 64464-66).

The 1973 Principles and Standards were revised during 1979 to reflect the full integration of water conservation into planning and review and to require the preparation of a primarily nonstructural plan as one alternative wherever structural program or project alternatives are considered. These changes were incorporated into the 1980 P&S and the definition of nonstructural measures was clarified as "complete or partial alternatives to traditional measures for addressing water resources problems and opportunities."

In Phase II, the Principles and Standards (18 CFR 711) were also revised for clarity and conciseness and integration of the requirements of Urban and Community Impact Analysis and the CEQ NEPA regulations, then published as a rule on September 29, 1980 (45 FR 64366-400). A summary of the revisions is included herein. Environmental Quality Evaluation

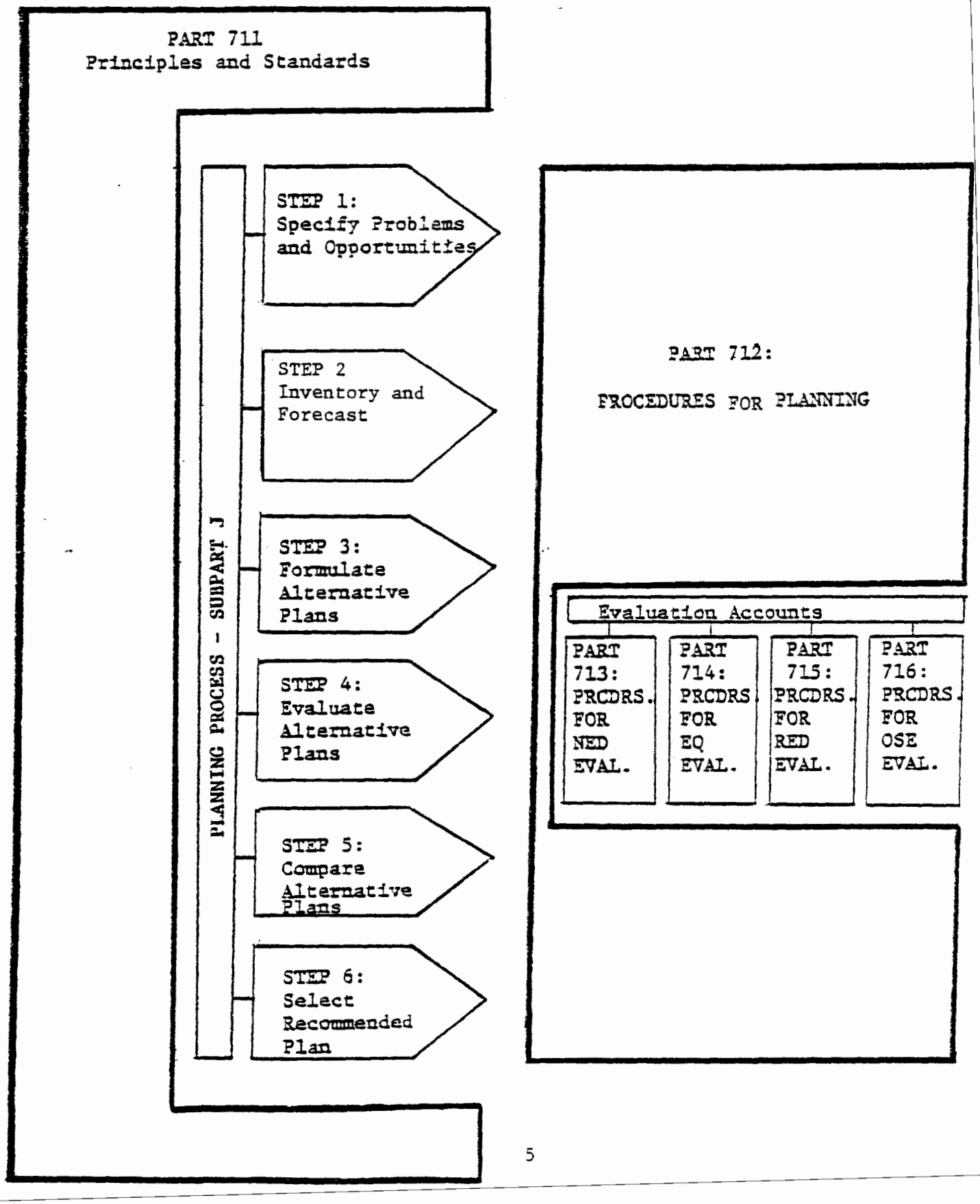
Procedures (18 CFR 714) were also published as a final rule on September 29, 1980 (Part III 45 FR 64402-46). Reprints of all the September 29, 1980 rules will be available from the U.S. Government Printing office and/or affected agencies in mid-December, 1980.

Environmental Quality Measurement Methods, procedures for evaluation of regional economic development (RED) effects, and procedures for evaluation of the remaining subparts of Other Social Effects (OSE), all for Level C, are scheduled for preparation during Phase III. Also, Principles, Standards, and Procedures for Water and Related Land Resources Planning - Level B will be developed for publication in 1982.

Procedures for Planning - Level C (Part 712) will be developed for publication in 1983. See Figure 711.101-1 in this introduction for a description of the relationships among the Principles, Standards, and Procedures.

The following pages contain a summary of the 1979 and 1980 revisions of the Principles and Standards. A list of the agencies and activities explicitly covered by the Principles, Standards, and Procedures is in Section 711.1 (45 FR 64388).

Relationships between Principles and Standards and Procedures
(Level C Planning)



iii. Summary of 1979 Revisions to the 1973 Principles and Standards (Federal Register, Vol. 44, No. 242, Friday, December 14, 1979, pages 72978 - 72990)

A. Water conservation was fully integrated into project and program planning. Demand reduction and improved efficiency in use were placed on a par with supply augmentation.

B. At least one primarily nonstructural plan became a requirement whenever structural project or program alternatives are considered.

C. The range of alternative plans to be considered was expanded to include alternatives which may be implemented by Federal, State, or local entities.

D. The net benefits rule was revised to place national economic development (NED) and environmental quality (EQ) on a comparable basis.

E. Several revisions to the Standards were made to ensure that benefits and costs are estimated with the best current techniques. Changes included:

1. Increased emphasis on willingness to pay for water and power;
2. Expansion of the scope of power benefits to include more efficient use of power;
3. A change in the definition of alternative cost of power to focus on resource cost rather than financial cost; and
4. Increased emphasis on estimation of willingness to pay for outdoor recreation.

C. Revised definitions and new terms.

1. Coequal objectives. The national objectives - protection and enhancement of national economic development (NED) and protection and enhancement of environmental quality (EQ) - are defined as coequal objectives.

2. Specification of the national objectives in a given planning setting. The specification is to be stated in terms of problems and opportunities related to the national objectives rather than components of objectives.

3. More specific definition of the EQ objective and account. Beneficial effects in the EQ account are favorable changes in the ecological, aesthetic, and cultural attributes of natural and cultural resources. Effects in the NED and EQ accounts are to be mutually exclusive.

4. Regional economic development (RED) account rather than regional development (RD) account. Only regional income and employment are to be shown in the RED account.

5. Other social effects (OSE) account rather than social well-being (SW-B) account. The title and definition of the account have been revised to emphasize a focus on plan effects from perspectives not reflected in the other three accounts.

Summary of Additional Changes Incorporated in the 1980 Principles and Standards

(Federal Register, Vol. 45, No. 190, Monday, September 29, 1980, pages 64366 - 6440)

Changes in Pursuit of Clarity and Conciseness

A. Applicability.

1. Principles for Level C Implementation Studies are presented in the preamble to 18 CFR Part 711 (see 45 FR 64385 - 64388).

2. An integrated statement of Principles and Standards for Level C planning is presented as 18 CFR Part 711 (see 45 FR 64388 - 64400).

B. Reorganization.

The Principles and Standards have been reorganized so that topics are parallel to the logic of the planning process.

1. Subpart A covers purpose, scope, authority, and applicability.

2. Subparts B-I define the elements involved in plan formulation and evaluation.

3. Subpart J outlines the planning process.

6. Candidate plans. Alternative plans that could be recommended or selected are referred to as candidate plans. Requirements regarding cost allocation and the four accounts pertain only to candidate plans.

Integration of NEPA and implementation Regulations established by the Council on Environmental Quality (CEQ)

A. Identification of adverse environmental impacts.

The 1973 version of the Principle and Standards (P&S) required a listing of environmental effects, but did not require their identification under separate beneficial and adverse headings. The new rules require that each environmental effect be identified as being either beneficial or adverse. This is consistent with the CEQ regulations which require a listing the adverse impacts.

B. General compatability with the CEQ regulations.

Several items have been emphasized to clarify compatability between the NEPA process and the P&S. These items include public participation, interdisciplinary planning, scoping, consultation, documentation, alternative plans, and display of irreversible and irretrievable effects. In combination the four accounts (Subpart F in the P&S) encompass the human environment as defined in the CEQ regulations (40 CFR 1508.14).

Integration of Urban and Community Impact Analysis

Principles and Standards have been revised to require a reporting of urban and community impacts. These impacts, which are identified in Executive Order 12074 and OMB Circular A-116, include income, employment, and population distribution, fiscal condition, and the quality of urban and community life.

Other Changes

A. Groundwater and instream flow.

Groundwater and instream flow were not discussed in the 1973 P&S or in the December 1979 Revisions. The 1980 P&S require consideration of problems and opportunities related to groundwater and instream flow.

B. Nonstructural measures.

The 1980 P&S require that nonstructural measures be considered for all problems and opportunities. This requirement is in the general provisions regarding alternative plans and is in addition to the requirement regarding a primarily nonstructural plan established in 1979.

C. Cost allocation among purposes.

The 1973 P&S provided for costs to be allocated between objectives and among components of objectives. The 1980 P&S require that financial costs be allocated among purposes served by a plan. The new rule includes options which can be used to avoid an inequitably small allocation of costs to purposes primarily serving the EQ objective.

iv. Corrections and Revisions to the NED Procedures

The Federal Register of April 11, 1980 (44 FR 24864) contained three corrections to the NED Procedures published on December 14, 1979.

The plus and minus signs on Table 713.313-1 at 44 FR 72927 were corrected. "Foregone real estate taxes" were deleted as a cost item on line 3 of column 2 at 44 FR 72974 (Paragraph 713.2009(h)(1)). Paragraph 713.409(c) 44 FR 72929 was amended by deleting the word "even" in the second sentence.

The criteria by which the WRC will designate planning regions eligible for unemployed or underemployed labor benefits were outlined in a revision to paragraph 713.1203(b). These criteria are listed in Section VII of this Handbook as well as at 44 FR 24863 (April 11, 1980).

I. Discount Rates

A. The interest rate to be used by Federal agencies in the formulation and evaluation of plans for water and related land resources for the period October 1, 1980 through and including September 30, 1981 is 7-3/8%.

The rate has been computed in accordance with Chapter IV, D "The Discount Rate" in the "Standards for Planning Water and Related Land Resources" of the Water Resources Council, as amended (39 FR 29242), and to be used in plan formulation and evaluation of water and related land resources projects for the purpose of discounting future benefits and computing costs, or otherwise converting benefits and costs to a common time basis.

Discount Rates and Their Authorities 1957-1980

Fiscal Year	B.B.C. A-47	S.D. 97	WRC 1968 Reg.	Prin. & Stand.	WRDA 1974 Sec. 80	WRC 1974 Notice
1957	2.500					
1958	2.500					
1959	2.500					
1960	2.500					
1961	2.625					
1962	2.625	2.625				
1963		2.875				
1964		3.000				
1965		3.125				
1966		3.125				
1967		3.125				
1968		3.250				
1969		3.250	4.625			
1970			4.875			
1971			5.125			
1972			5.375			
1973			5.500			
1974			5.625	6.875	5.625	5.625
1975					5.875	5.875
1976					6.125	6.125
1977						6.375
1978						6.625
1979						6.875
1980						7.125
1981						7.375

Effective dates of the indicated documents:

Budget Bureau Circular A-47	(December 31, 1952 - May 15, 1962)
Senate Document 97	(May 15, 1962 - December 24, 1968)
Water Resources Council	(December 24, 1968 - October 25, 1973)
Principles and Standards	(October 25, 1973 - March 7, 1974)
WRDA of 1974 (Section 80)	(March 7, 1974 - Continuing)
Water Resources Council (1974)	(August 14, 1974 - Continuing)

B. Conversion Factors for Selected Discount Rates

i%	Present Value of Annuity of $1 50 years	100 years
5.625	16.62554	17.70390
5.875	16.04106	16.96483
6.000	15.76186	16.61755
6.125	15.49091	16.28376
6.375	14.97253	15.65380
6.625	14.48359	15.06963
6.875	14.02195	14.52661
7.125	13.58565	14.02069
7.375	13.17288	13.54831
7.625	12.78201	13.54831
10.000	9.91481	9.99927

C. Present Value of an Annuity of $1. At 7.375%

$$PV = \sum_{t=1}^{n} \frac{1}{(1+i)^t} = \frac{1-(1+i)^{-n}}{i}$$

where: n = years of growth

t = year

i = interest rate (.07375 in this example)

Year (t)	PV, $1. Ann., 7 3/8%	Year (t)	PV, $1. Ann., 7 3/8%
1	.93132	15	8.89605
2	1.79866	16	9.21635
3	2.60644	17	9.51464
4	3.35873	18	9.79245
5	4.05936	19	10.05118
6	4.71186	20	10.29213
7	5.31954	25	11.27025
8	5.88549	30	11.95555
9	6.41256	35	12.43568
10	6.90343	40	12.77208
11	7.36059	45	13.00776
12	7.78634	50	13.17288
13	8.18286	75	13.49408
14	8.55213	100	13.54831

D. Formula For the Present Value of A Compound Growth Series.

This formula applies in those cases where there is a benefit at the end of the first planning period that grows at a constant rate during successive planning periods. Although the initial benefit is not realized until the end of the first period, it and all successive benefits are discounted back to the beginning of the first period. If an initial benefit of B_1 grows at j percent for each of t = 1, 2, . . ., n years and the applicable interest rate is i percent, then the present value of the stream of benefits is:

$$PV = \sum_{t=1}^{n} B_1 \left[\frac{(1+j)^{t-1}}{(1+i)^t} \right]$$

which simplifies to

$$= B_1 \left[\frac{(1+i)^n - (1+j)^n}{(i-j)(1+i)^n} \right]$$

where again

B_1 = initial benefit

j = growth rate of benefits

i = interest rate

n = years of growth

Example: Assume benefits at end of first year are $235,000, i - 7 3/8%, j = 2%, n = 50 years, then

$$PV = \$235,000 \left[\frac{(1.07375)^{50} - (1.02)^{50}}{(.07375 - .02)\ (1.07375)^{50}} \right]$$

$$= \$4,036,710$$

E. Interest Rates Determined by the Department of the Treasury in accord with Provisions of the Water Supply Act of 1958 (Section 301(b)).

Note: These rates are limited in application to calculation of interest during construction and repayment of construction costs allocated to water supply purposes under Title III of Public Law 85-500, the Water Supply Act of 1958 (Section 301(b)).

Fiscal Year	Rate	Fiscal Year	Rate
1959	2.670%	1970	3.342%
1960	2.699	1971	3.463
1961	2.632	1972	3.502
1962	2.742	1973	3.649
1963	2.936	1974	4.012
1964	3.046	1975	4.371
1965	3.137	1976	5.116
1966	3.222	1977	5.683
1967	3.225	1978	6.063
1968	3.253	1979	6.595
1969	3.256	1980	7.250
		1981	8.605

F. Interest Rates Determined by the Department of the Treasury relating to Hydropower Purposes under Secretarial Order RA 6120.2 Paragraph 11(b) of the Secretary of Energy and Departmental Manual 730 DM 3 superseding Secretarial Order 2929 of the Secretary of the Interior.

Note: These rates are limited in application to calculation of interest during construction and repayment of construction costs allocated to hydropower purposes. Thus, the principal to be repaid should include interest compounded over the period of construction.

Fiscal Year	Rate	Fiscal Year	Rate
1973	5.500%	1977	7.000%
1974	5.625	1978	7.000
1975	6.125	1979	7.500
1976	6.625	1980	8.000
		1981	8.500

II. Agricultural Price Standards

A.

Purpose

The orderly development and use of water and related land resources requires that the Council and its Member Agencies utilize a consistent set of economic standards and criteria in formulation and evaluation of development plans. Agricultural price standards provide the price base for evaluating the agricultural effects of alternative plans for the development and management of water and related land resources.

Authority

The authority for these guidelines is set forth in the Water Resources Planning Act (P.L. 89-80) and by the Water Resources Council's Principles and Standards for Planning Water and Related Land Resources, as published in the Federal Register, September 10, 1973. These Principles and Standards state in part:

> "When prices are used in evaluation they should reflect the real exchange values expected to prevail over the period of analysis. For this purpose, relative price relationships and the general level of prices prevailing during the planning study will be assumed to hold generally for the future, except where specific studies and considerations indicate otherwise." (FR-24783)

> "The prices of goods and services used for evaluation should reflect the real exchange values expected to prevail over the period of analysis. For this purpose, relative price relationships and the general level of prices for outputs and inputs prevailing during or immediately preceding the period of planning generally will be used as representing the price relationships expected over the life of the plan. Exceptions to the general rule will occur when the output or input of the plan affects prices, abnormal weather or other factors have temporarily affected prices, or governmental or other institutional arrangements have temporarily affected prices. The Water Resources Council will publish periodically data on prices of agricultural and other goods and services that can be furnished efficiently for all planning activities. Included in the publications may be a special analysis of price problems and simulated prices for recreation and other project outputs or effects for which market prices are not readily available." (FR-24821)

Conceptual Basis for Normalized Agricultural Prices and Costs

The project evaluation process should yield valid estimates of the aggregate beneficial or adverse effect on "real income" of those affected by projects and programs under consideration. Such an estimation requires that the effects of alternative projects and programs are measured at a common general price level. A prime objective, therefore, is a set of relative price relationships representative of the period of analysis over which costs are incurred and benefits accrue. Since the Principles and Standards suggest that current price relationships should generally be used, it is important that current price relationships are not distorted by short-term abnormalities. Since the agricultural prices and costs are generally influenced by highly variable factors, such as weather, insect infestations, sudden demand changes and the like, it is desirable to correct for the effects of these factors by the use of a normalizing procedure such as the one described in the next section.

Computational Procedures

The estimates of current (1979) normalized prices shown in the following tables are weighted averages of actual season average prices over the five-year period 1975-79.

Three assumptions provide the basic conceptual foundation for calculating normalized prices to use in project evaluation: (1) The appropriate set of commodity and input prices are reflected in a weighted average of actual season average prices observed in the preceding five years, 1975-79; (2) weights used in calculating the five-year weighted average placed greater emphasis on more recent prices and less emphasis on earlier prices, and (3) each individual year weight is equal to or greater than zero and less than one, and the sum of these weights equals one.

The weight coefficients used in these calculations were estimated by a polynominal distribution lag regression technique that incorporated the above features.1/ A unique set of weights was estimated for each commodity from a thirty year time series of prices for that commodity, 1950-79.

1/ The theoretical rationale for applying polynominal distributed lag procedure is presented in Robert D. Niehaus, "'Normalized' Prices for Project Evaluation," Agricultural Economics Research, Vol. 28, No. 2, Economic Research Service, USDA, Washington, D.C., April 1976.

Research is presently underway to validate the procedure for next year's normalized prices in light of the inflationary situation of the last several years. This research will also examine potential modifications in the procedure, such as removal of cyclical influences in livestock prices, addition of other commodities such as pasture, and a more timely computation of current prices as compared to last year's prices.

The estimated weights varied from commodity to commodity. Essentially, the weights gave more emphasis to the recent prices and reduced to earlier prices. The average weights by commodity groups are given in Table 1.

Normalized price procedure is directed toward correcting short-term fluctuations only. It is not designed to offset institutional price-setting arrangements, since these are not generally applicable to U.S. agricultural prices at the present time. Also, this procedure is not intended to assess the effects of a resource development plan on prices.

State prices--The State normalized prices were obtained by multiplying the national normalized prices by the average ratio of the State price to the national commodity price for the period 1977-79.

Use of Current Normalized Prices in Planning

Current normalized prices are to be used in all economic evaluations covered by the Principles and Standards, such as (1) evaluation of beneficial or adverse effects of alternative projects and programs under consideration, and (2) appraisals of economic impacts where such impacts are expressed in terms of value of production or income. The latter point may require price adjustment in the OBERS Projections2/ in which agricultural output is valued at 1967 prices.

Special circumstances will require further price estimation, such as: (1) pricing of commodities not included in the price tables; (2) determination of price differentials within States; (3) determination of price differentials to reflect product quality differences from the average represented by published price data; and (4) adjustments to reflect the impacts of project or program actions on market prices. These and other special price problems should be approached in such a manner as to achieve consistency with the published estimation of current normalized prices.

Commodities not covered in price tables--In circumstances, where price data for one or more specific commodities are needed, they may be developed by using a three-year average (mean) for each of the desired commodities. Normalized prices derived by this procedure should be based on data for the years 1977-79, to be consistent with normalized commodity prices presented in this guideline.

2/ U.S. Water Resources Council, OBERS Projections, U.S. Government Printing Office, Washington, D.C. 20402. Catalogue No. Y,3 W29; 20B2/972; Stock Nos. 5245-0013 through 0019, April 1974 and Supplement Agricultural Projections, Stock No. 052-045-0020-7, May 1975.

Table 1. Average Price Estimation Weights by Category

Category[1/]	Weight for 1975	1976	1977	1978	1979
Grains	.030	.077	.161	.284	.447
Fruits	.083	.153	.212	.259	.293
Vegetables	.051	.114	.189	.275	.372
Oil-bearing Crops	.042	.103	.182	.279	.395
Other Crops	.048	.108	.184	.276	.384
Livestock Products	.023	.089	.177	.288	.422
Input Indexes	.011	.039	.131	.293	.526

[1/] The categories are defined as:

Grains - wheat, rye, rice, corn, oats, barley, sorghum

Fruits - apples, oranges, grapefruit

Vegetables - dry beans, potatoes, sweet potatoes

Oil-bearing crops - cottonseed, soybeans, peanuts, flaxseed

Other crops - tobacco, cotton, sugar beets, sugarcane, hay

Livestock products - steers and heifers, feeder steers (8 market average), cows for slaughter, calves, sheep, lambs, hogs, milk, cream, broilers, turkeys, eggs, wool

Input indexes - feed, feeder livestock, seed, fertilizer, agricultural chemicals, fuels and energy, farm and motor supplies, autos and trucks, tractors and self-propelled machinery, other machinery, building and fencing, wage rates

Forest product prices are not included in these tables. Information on current (not normalized) prices for forest products can be obtained from the latest issue of The Demand and Price Situation for Forest Products, Forest Service, U.S. Department of Agriculture. The user should be cautioned that in order to be consistent with the agricultural prices in this report, the stumpage prices should be adjusted to reflect value added from harvesting.

Price differentials within States--Current normalized prices for a specific area within a State may be derived by computing the average local area-to-State price ratio for the 1977-79 period and multiplying by the State normalized price.

Price differential to reflect product quality--Published data do not provide, in most instances, a basis for deriving price estimates for particular quality attributes of a given agricultural product. Procedures for estimating such price differentials will vary from one set of circumstances to another. Since a standard procedure cannot be specified, each analyst confronted by such a problem must develop his own procedures. The basis used for estimating such price differentials should be fully documented in review reports.

Price impacts--As specified in the Principles and Standards, whenever implementation of a plan is expected to influence price significantly, the use of a price about midway between those expected with and without implementation may be justified. Special consideration should be given to price adjustments where a program induced shift from a deficit to a surplus production area is expected, or vice versa.

Additional Information

Additional information on the statistical procedures employed in these price standards may be obtained from the Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture, 500 12th Street, S.W., Washington, D.C. 20250.

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

OCT 8 1980

SUBJECT: Current Normalized Prices

TO: Gerald D. Seinwell, Acting Director
U.S. Water Resources Council
2120 L. Street, N.W.
Washington, D. C. 20037

As requested, we are transmitting herewith an updated set of normalized prices for water resource planning.

In developing the updated standards, we followed the procedures used previously. These procedures were approved by the Water Resources Council in 1976.

NED BAYLEY
Acting Assistant Secretary
for Natural Resources and
the Environment

Enclosure

STATES: CURRENT NORMALIZED PRICES FOR PRINCIPAL COMMODITIES

09/09/80

STATE	COMMODITIES										
	WHEAT ALL 1/	RYE 1/	RICE 1/	CORN FOR GRAIN 1/	OATS 1/	BARLEY 1/	SORGHUM GRAIN 1/	HAY, ALL BALED	DRY BEANS	SUGAR BEETS 2/	SUGAR CANE SUGAR 2/
	BUSHEL	BUSHEL	CWT.	BUSHEL	BUSHEL	BUSHEL	CWT.	TON	CWT.	TON	TON
MAINE	0.0	0.0	0.0	0.0	1.02	0.0	0.0	57.77	0.0	0.0	0.0
NEW HAMPSHIRE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	69.33	0.0	0.0	0.0
VERMONT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	65.38	0.0	0.0	0.0
MASSACHUSETTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.94	0.0	0.0	0.0
RHODE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.14	0.0	0.0	0.0
CONNECTICUT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	73.14	0.0	0.0	0.0
NEW YORK	3.12	2.40	0.0	2.49	1.50	1.69	0.0	60.98	20.90	0.0	0.0
NEW JERSEY	3.13	2.58	0.0	2.53	1.45	1.89	0.0	72.18	0.0	0.0	0.0
PENNSYLVANIA	3.42	2.30	0.0	2.63	1.51	2.17	0.0	65.57	0.0	0.0	0.0
DELAWARE	3.13	2.38	0.0	2.43	0.0	1.94	0.0	72.80	0.0	0.0	0.0
MARYLAND	3.14	2.38	0.0	2.43	1.50	1.94	0.0	71.95	21.09	0.0	0.0
MICHIGAN	3.15	1.87	0.0	2.20	1.34	2.80	0.0	49.44	16.96	23.49	0.0
WISCONSIN	2.89	1.95	0.0	2.17	1.17	1.86	0.0	42.06	0.0	0.0	0.0
MINNESOTA	3.16	2.10	0.0	2.02	1.13	1.97	0.0	43.78	17.05	22.86	0.0
OHIO	3.23	2.18	0.0	2.27	1.44	2.05	0.0	55.27	0.0	24.39	0.0
INDIANA	3.16	2.38	0.0	2.30	1.57	1.72	3.50	56.79	0.0	0.0	0.0
ILLINOIS	3.13	2.18	0.0	2.36	1.24	1.94	3.45	54.56	0.0	0.0	0.0
IOWA	2.80	2.38	0.0	2.18	1.23	0.0	3.44	46.18	0.0	0.0	0.0
MISSOURI	3.10	2.05	7.79	2.25	1.28	1.84	3.42	48.90	0.0	0.0	0.0
NORTH DAKOTA	3.12	1.85	0.0	2.04	1.08	1.94	0.0	39.94	18.60	23.88	0.0
SOUTH DAKOTA	3.12	1.87	0.0	1.93	1.13	1.97	2.97	33.68	0.0	0.0	0.0
NEBRASKA	2.97	1.87	0.0	2.18	1.14	1.78	3.50	36.87	20.24	29.56	0.0
KANSAS	3.01	1.87	0.0	2.32	1.37	1.88	3.56	46.33	20.46	23.42	0.0
VIRGINIA	3.18	4.41	0.0	2.52	1.49	2.00	3.52	67.67	0.0	0.0	0.0
WEST VIRGINIA	3.16	0.0	0.0	2.34	1.27	2.13	0.0	50.27	0.0	0.0	0.0
NORTH CAROLINA	3.02	2.66	0.0	2.54	1.38	1.91	3.88	66.86	0.0	0.0	0.0
KENTUCKY	3.12	2.38	0.0	2.48	1.96	1.80	3.50	49.96	0.0	0.0	0.0
TENNESSEE	3.12	2.25	0.0	2.49	1.75	2.11	3.93	49.97	0.0	0.0	0.0

SOUTH CAROLINA	3.11	2.56	0.0	2.40	1.28	1.90	3.81	58.27	0.0	0.0	0.0
GEORGIA	3.09	1.98	0.0	2.48	1.36	1.96	3.95	57.80	0.0	0.0	0.0
FLORIDA	3.09	0.0	0.0	2.24	1.40	0.0	0.0	60.70	0.0	0.0	19.15
ALABAMA	3.08	0.0	0.0	2.52	1.48	0.0	4.21	56.13	0.0	0.0	0.0
MISSISSIPPI	3.08	0.0	8.67	2.67	1.51	0.0	3.80	48.11	0.0	0.0	0.0
ARKANSAS	2.98	0.0	8.52	2.47	1.78	0.0	4.43	50.49	0.0	0.0	0.0
LOUISIANA	3.10	0.0	8.82	2.48	1.63	0.0	3.79	46.19	0.0	0.0	17.48
OKLAHOMA	3.19	2.40	0.0	2.51	1.56	1.98	3.86	56.15	0.0	0.0	0.0
TEXAS	3.13	2.43	9.99	2.56	1.38	2.03	4.12	53.42	0.0	25.83	12.62
MONTANA	3.05	0.0	0.0	2.42	1.30	1.97	0.0	51.91	20.97	31.82	0.0
IDAHO	3.18	0.0	0.0	2.43	1.60	2.06	0.0	46.81	20.25	28.68	0.0
WYOMING	2.92	1.87	0.0	2.32	1.35	2.53	0.0	50.63	21.30	31.45	0.0
COLORADO	2.93	1.57	0.0	2.23	1.22	2.49	3.43	54.16	21.70	29.07	0.0
NEW MEXICO	3.06	0.0	0.0	2.45	0.0	2.12	4.13	64.65	0.0	27.13	0.0
ARIZONA	3.25	0.0	0.0	2.70	0.0	2.57	4.91	69.60	0.0	26.65	0.0
UTAH	3.16	0.0	0.0	2.79	1.56	2.22	0.0	54.69	22.35	30.03	0.0
NEVADA	3.50	0.0	0.0	0.0	1.46	2.43	0.0	63.76	0.0	0.0	0.0
WASHINGTON	3.49	1.90	0.0	2.74	1.52	2.21	0.0	57.98	21.98	28.75	0.0
OREGON	3.48	2.00	0.0	2.80	1.37	2.22	0.0	57.92	0.0	26.40	0.0
CALIFORNIA	3.52	0.0	12.34	2.88	1.70	2.58	4.83	69.09	26.94	28.17	0.0
ALASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HAWAII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

1/ INCLUDES ALLOWANCE FOR LOANS OUTSTANDING AND PURCHASES BY THE GOVERNMENT VALUED AT AVERAGE LOAN AND PURCHASE RATE. DOES NOT INCLUDE PRICE SUPPORT PAYMENTS.

2/ DOES NOT INCLUDE PAYMENTS UNDER THE SUGAR ACT.

-CONTINUED

STATES: CURRENT NORMALIZED PRICES FOR PRINCIPAL COMMODITIES-CONTINUED

STATE	COMMODITIES										
	COTTON, LINT UPLAND 3/	TOBACCO	COTTON SEED	SOYBEANS FOR BEANS	PEANUTS HARVESTED FOR NUTS	FLAXSEED	APPLES COMMERCIAL 4/	ORANGES ALL	GRAPEFRUIT ALL 5/	POTATOES	SWEET-POTATOES
	POUND	POUND	TON	BUSHEL	POUND	BUSHEL	POUND	BOX	BOX	CWT.	CWT.
MAINE	0.0	0.0	0.0	0.0	0.0	0.0	0.132	0.0	0.0	3.98	0.0
NEW HAMPSHIRE	0.0	0.0	0.0	0.0	0.0	0.0	0.136	0.0	0.0	6.03	0.0
VERMONT	0.0	0.0	0.0	0.0	0.0	0.0	0.133	0.0	0.0	6.48	0.0
MASSACHUSETTS	0.0	5.649	0.0	0.0	0.0	0.0	0.139	0.0	0.0	6.01	0.0
RHODE ISLAND	0.0	0.0	0.0	0.0	0.0	0.0	0.136	0.0	0.0	4.41	0.0
CONNECTICUT	0.0	4.547	0.0	0.0	0.0	0.0	0.132	0.0	0.0	4.80	0.0
NEW YORK	0.0	0.0	0.0	5.81	0.0	0.0	0.097	0.0	0.0	4.38	0.0
NEW JERSEY	0.0	0.0	0.0	6.35	0.0	0.0	0.109	0.0	0.0	4.05	13.95
PENNSYLVANIA	0.0	0.675	0.0	6.02	0.0	0.0	0.093	0.0	0.0	4.89	0.0
DELAWARE	0.0	0.0	0.0	6.18	0.0	0.0	0.100	0.0	0.0	4.17	0.0
MARYLAND	0.0	1.238	0.0	6.22	0.0	0.0	0.107	0.0	0.0	4.15	8.61
MICHIGAN	0.0	0.0	0.0	6.15	0.0	0.0	0.086	0.0	0.0	4.48	0.0
WISCONSIN	0.0	0.986	0.0	5.85	0.0	0.0	0.121	0.0	0.0	4.15	0.0
MINNESOTA	0.0	0.0	0.0	6.02	0.0	5.64	0.147	0.0	0.0	2.84	0.0
OHIO	0.0	1.254	0.0	6.29	0.0	0.0	0.145	0.0	0.0	4.51	0.0
INDIANA	0.0	1.333	0.0	6.25	0.0	0.0	0.124	0.0	0.0	4.34	0.0
ILLINOIS	0.0	0.0	0.0	6.42	0.0	0.0	0.111	0.0	0.0	3.07	0.0
IOWA	0.0	0.0	0.0	6.24	0.0	0.0	0.121	0.0	0.0	4.10	0.0
MISSOURI	0.602	1.295	96.17	6.24	0.0	0.0	0.143	0.0	0.0	0.0	0.0
NORTH DAKOTA	0.0	0.0	0.0	5.75	0.0	5.74	0.0	0.0	0.0	2.80	0.0
SOUTH DAKOTA	0.0	0.0	0.0	5.64	0.0	5.77	0.0	0.0	0.0	3.08	0.0
NEBRASKA	0.0	0.0	0.0	6.00	0.0	0.0	0.0	0.0	0.0	3.99	0.0
KANSAS	0.0	0.0	0.0	6.03	0.0	0.0	0.096	0.0	0.0	0.0	0.0
VIRGINIA	0.587	1.306	100.33	6.49	0.208	0.0	0.089	0.0	0.0	4.45	8.27
WEST VIRGINIA	0.0	1.273	0.0	0.0	0.0	0.0	0.096	0.0	0.0	5.63	0.0
NORTH CAROLINA	0.618	1.326	100.79	6.43	0.207	0.0	0.084	0.0	0.0	6.00	7.44
KENTUCKY	0.556	1.343	107.48	6.53	0.0	0.0	0.114	0.0	0.0	0.0	0.0
TENNESSEE	0.591	1.337	106.27	6.43	0.0	0.0	0.128	0.0	0.0	7.71	10.05
SOUTH CAROLINA	0.624	1.200	98.77	6.38	0.205	0.0	0.125	0.0	0.0	0.0	12.21
GEORGIA	0.599	1.362	89.87	6.32	0.206	0.0	0.106	0.0	0.0	0.0	13.16
FLORIDA	0.590	1.412	108.46	6.57	0.207	0.0	0.0	3.99	2.83	6.09	0.0
ALABAMA	0.589	1.273	96.89	6.24	0.213	0.0	0.0	0.0	0.0	8.67	13.23

MISSISSIPPI	0.602	0.0	111.52	6.53	0.210	0.0	0.0	0.0	0.0	6.40	9.57
ARKANSAS	0.607	0.0	109.29	6.56	0.0	0.0	0.110	0.0	0.0	0.0	10.12
LOUISIANA	0.599	1.725	107.42	6.35	0.0	0.0	0.0	0.0	0.0	5.77	6.40
OKLAHOMA	0.566	0.0	98.21	5.80	0.206	0.0	0.0	0.0	0.0	0.0	0.0
TEXAS	0.555	0.0	97.26	5.88	0.201	6.11	0.0	2.85	1.94	7.13	14.10
MONTANA	0.0	0.0	0.0	0.0	0.0	5.31	0.0	0.0	0.0	4.35	0.0
IDAHO	0.0	0.0	0.0	0.0	0.0	0.0	0.144	0.0	0.0	3.41	0.0
WYOMING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.58	0.0
COLORADO	0.0	0.0	0.0	0.0	0.0	0.0	0.094	0.0	0.0	2.89	0.0
NEW MEXICO	0.625	0.0	101.72	0.0	0.229	0.0	0.105	0.0	0.0	3.96	0.0
ARIZONA	0.632	0.0	108.94	0.0	0.0	0.0	0.0	4.19	1.96	5.95	0.0
UTAH	0.0	0.0	0.0	0.0	0.0	0.0	0.104	0.0	0.0	3.75	0.0
NEVADA	0.657	0.0	101.64	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WASHINGTON	0.0	0.0	0.0	0.0	0.0	0.0	0.107	0.0	0.0	2.71	0.0
OREGON	0.0	0.0	0.0	0.0	0.0	0.0	0.094	0.0	0.0	2.94	0.0
CALIFORNIA	0.643	0.0	108.49	0.0	0.0	0.0	0.095	4.67	2.56	5.84	13.59
ALASKA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HAWAII	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

3/ PRICES BASED ON A 480 POUND NET WEIGHT BALE.

4/ BOTH FRESH AND PROCESSED SALE PRICES (EQUIVALENT PACKINGHOUSE-DOOR RETURNS FOR WASHINGTON AND OREGON, EQUIVALENT FIRST DELIVERY POINT FOR CALIFORNIA AND "AS SOLD" FOR OTHER STATES).

5/ EQUIVALENT PACKINGHOUSE-DOOR RETURNS PER BOX FOR ALL USES.

STATES: CURRENT NORMALIZED PRICES FOR PRINCIPAL COMMODITIES-CONTINUED

STATE	COMMODITIES										
	STEERS AND HEIFERS	CALVES	SHEEP	LAMBS	HOGS	MILK 6/	CREAM (FAT) 6/	COMMERCIAL BROILERS	TURKEYS	EGGS	WOOL
	CWT.	CWT.	CWT.	CWT.	CWT.	CWT.	POUND	POUND	POUND	DOZ	POUND
MAINE	44.26	54.45	32.21	75.79	42.26	11.79	0.0	0.247	0.607	0.660	0.732
NEW HAMPSHIRE	42.50	55.42	33.88	78.81	42.26	11.62	0.0	0.0	0.655	0.689	0.758
VERMONT	43.26	56.26	33.36	75.79	42.26	11.32	0.0	0.0	0.632	0.785	0.753
MASSACHUSETTS	44.39	56.65	37.15	80.21	42.26	11.69	0.0	0.0	0.626	0.703	0.757
RHODE ISLAND	45.18	57.82	43.15	81.72	42.26	11.69	0.0	0.0	0.647	0.698	0.776
CONNECTICUT	46.03	58.09	36.06	80.21	42.26	11.62	0.0	0.247	0.655	0.731	0.735
NEW YORK	46.19	61.96	17.59	59.33	42.32	10.70	0.0	0.273	0.431	0.517	0.753
NEW JERSEY	50.16	62.07	27.91	50.93	41.47	11.25	0.0	0.273	0.590	0.605	0.731
PENNSYLVANIA	52.37	70.10	21.29	63.35	43.08	11.38	1.061	0.270	0.451	0.532	0.746
DELAWARE	49.57	61.65	18.95	56.51	43.06	11.42	0.0	0.253	0.431	0.702	0.724
MARYLAND	49.64	60.87	16.64	54.84	42.81	11.42	0.0	0.253	0.429	0.701	0.734
MICHIGAN	52.09	62.75	20.85	59.79	43.95	10.69	1.062	0.281	0.429	0.490	0.664
WISCONSIN	49.82	68.60	15.42	55.99	42.34	10.37	0.0	0.267	0.420	0.504	0.665
MINNESOTA	51.08	60.49	20.41	60.91	42.86	9.96	1.178	0.295	0.390	0.453	0.655
OHIO	51.86	63.83	21.11	58.29	43.67	10.84	1.072	0.250	0.432	0.489	0.662
INDIANA	51.80	58.58	17.09	53.52	43.28	10.96	1.072	0.255	0.385	0.553	0.623
ILLINOIS	52.19	58.55	18.34	54.16	42.84	10.55	1.178	0.0	0.433	0.559	0.671
IOWA	52.92	59.97	15.72	58.98	43.00	10.22	1.245	0.382	0.395	0.419	0.677
MISSOURI	53.01	59.64	17.31	58.20	42.73	10.37	0.896	0.254	0.397	0.503	0.680
NORTH DAKOTA	54.86	63.35	17.47	59.29	41.66	9.68	0.947	0.0	0.414	0.365	0.724
SOUTH DAKOTA	54.27	66.27	18.19	61.59	43.09	9.95	1.183	0.0	0.390	0.379	0.747
NEBRASKA	53.84	63.68	17.92	60.32	43.06	10.43	0.835	0.421	0.423	0.411	0.684
KANSAS	53.88	63.75	18.44	58.05	43.25	10.74	0.766	0.380	0.397	0.452	0.686
VIRGINIA	48.14	61.26	18.74	56.30	42.52	11.19	1.002	0.244	0.396	0.658	0.798
WEST VIRGINIA	46.66	57.45	18.61	55.18	41.12	10.90	1.002	0.286	0.383	0.648	0.796
NORTH CAROLINA	47.23	57.21	20.55	44.64	42.96	11.67	0.0	0.251	0.412	0.651	0.725
KENTUCKY	51.40	58.98	13.66	52.75	42.54	10.46	0.0	0.243	0.399	0.513	0.652
TENNESSEE	52.16	60.19	14.69	48.01	42.69	10.82	0.0	0.243	0.392	0.569	0.726
SOUTH CAROLINA	49.57	56.68	21.57	51.37	41.94	12.17	0.0	0.242	0.384	0.568	0.662
GEORGIA	48.97	56.81	21.57	53.70	40.50	11.58	0.0	0.256	0.389	0.638	0.683
FLORIDA	51.52	60.55	20.03	46.70	41.12	13.16	0.0	0.244	0.0	0.461	0.621
ALABAMA	48.84	55.18	21.57	53.70	42.59	11.91	0.0	0.241	0.394	0.635	0.673

MISSISSIPPI	51.63	61.28	21.57	53.70	43.21	11.28	0.0	0.264	0.0	0.656	0.683
ARKANSAS	52.64	60.13	18.03	60.59	43.42	11.14	0.0	0.253	0.399	0.577	0.652
LOUISIANA	52.53	60.73	22.43	58.02	41.22	11.77	0.0	0.260	0.394	0.666	0.603
OKLAHOMA	55.56	62.18	14.77	57.25	42.57	11.17	0.860	0.255	0.403	0.619	0.660
TEXAS	52.98	60.35	24.69	62.52	40.79	11.78	0.0	0.273	0.400	0.634	0.839
MONTANA	56.12	67.93	18.06	61.51	40.84	10.84	0.971	0.0	0.0	0.582	0.799
IDAHO	53.03	61.57	17.14	55.67	40.93	10.34	0.860	0.0	0.0	0.511	0.696
WYOMING	57.37	70.04	23.82	62.80	41.10	10.68	1.002	0.0	0.0	0.545	0.757
COLORADO	53.81	66.07	19.85	60.90	42.76	11.44	1.178	0.0	0.433	0.530	0.732
NEW MEXICO	55.39	61.53	20.64	63.80	42.81	11.75	0.0	0.0	0.0	0.594	0.753
ARIZONA	53.86	62.23	16.61	59.76	45.77	11.21	0.0	0.0	0.0	0.463	0.599
UTAH	52.48	61.56	15.55	57.50	41.67	10.42	0.0	0.0	0.447	0.460	0.707
NEVADA	52.65	61.50	16.67	55.52	44.08	10.55	1.178	0.0	0.0	0.496	0.689
WASHINGTON	52.53	57.70	12.18	56.99	43.71	10.71	0.931	0.304	0.422	0.497	0.701
OREGON	50.89	55.23	15.78	57.70	42.65	10.91	0.931	0.309	0.419	0.534	0.750
CALIFORNIA	53.69	53.92	16.34	58.82	45.37	10.45	0.931	0.286	0.404	0.495	0.733
ALASKA	60.93	42.97	32.78	58.61	69.36	17.64	0.0	0.0	0.0	1.021	0.850
HAWAII	44.26	50.50	0.0	0.0	63.79	16.28	0.0	0.425	0.0	0.710	0.0

6/ SOLD TO PLANTS AND DEALERS.

UNITED STATES: PRICES RECEIVED BY FARMERS FOR PRINCIPAL COMMODITIES AND CURRENT NORMALIZED PRICES

09/09/80

COMMODITY	UNIT	U.S. SEASON AVERAGE PRICES					CURRENT NORMALIZED PRICE
		1975	1976	1977	1978	1979 1/	
		DOL.	DOL.	DOL.	DOL.	DOL.	DOL.
FOOD GRAINS							
WHEAT, ALL 2/	BU.	3.56	2.73	2.33	2.98	3.820	3.136
RYE 2/	BU.	2.36	2.47	2.05	1.98	2.050	2.041
RICE 2/	CWT.	8.35	7.02	9.49	8.16	11.000	9.081
FEED GRAINS AND HAY							
CORN FOR GRAIN 2/	BU.	2.54	2.15	2.02	2.25	2.410	2.269
OATS 2/	BU.	1.46	1.56	1.10	1.200	1.360	1.278
BARLEY 2/	BU.	2.42	2.25	1.78	1.920	2.310	2.137
SORGHUM GRAIN 2/	CWT.	4.23	3.63	3.25	3.610	4.160	3.760
HAY, ALL (BALED)	TON	52.20	60.30	53.80	49.600	59.700	55.523
DRY BEANS	CWT.	21.10	15.50	20.20	17.30	23.000	20.041
SUGARBEETS 3/	TON	27.60	21.00	24.20	25.90	32.300	26.641
SUGARCANE FOR SUGAR 3/	TON	19.60	13.70	18.50	19.20	23.300	18.100
COTTON, LINT (UPLAND) 4/	LB.	0.513	0.638	0.521	0.581	0.623	0.595
TOBACCO	LB.	1.016	1.122	1.185	1.325	1.405	1.334
OIL-BEARING CROPS							
COTTONSEED	TON	97.00	103.00	70.30	114.00	122.000	103.127
SOYBEANS FOR BEANS	BU.	4.92	6.81	5.88	6.660	6.190	6.295
PEANUTS HARVESTED FOR NUTS	LB.	0.196	0.200	0.210	0.211	0.207	0.207
FLAXSEED	BU.	6.57	7.08	4.54	5.740	5.960	5.740
FRUITS							
APPLES, COMMERCIAL CROP 5/	LB.	0.065	0.091	0.105	0.104	0.107	0.101
ORANGES, ALL 6/	BOX	2.80	2.80	3.34	5.450	6.440	4.094
GRAPEFRUIT, ALL 6/	BOX	2.51	2.21	2.35	2.54	3.260	2.644
VEGETABLES							
POTATOES	CWT.	4.48	3.59	3.55	3.38	3.470	3.596
SWEETPOTATOES	CWT.	8.58	7.48	10.50	10.50	8.630	9.343

		U.S. AVERAGE ANNUAL PRICES					
LIVESTOCK							
STEERS AND HEIFERS	CWT.	36.30	36.50	37.30	51.70	69.800	53.253
FEEDER STEERS-8 MKTS	CWT.	32.00	37.08	38.35	57.71	75.100	57.706
COWS FOR SLAUGHTER	CWT.	19.80	24.50	24.30	35.80	50.000	35.444
CALVES	CWT.	27.20	34.20	36.90	59.10	88.800	61.334
SHEEP	CWT.	11.20	13.20	13.40	21.70	26.300	20.648
LAMBS	CWT.	42.10	46.90	51.30	62.70	66.700	59.891
HOGS	CWT.	46.10	43.30	39.40	46.40	41.800	42.871
DAIRY PRODUCTS							
MILK 7/	CWT.	8.75	9.66	9.72	10.60	12.000	10.751
CREAM, (FAT) 7/	LB.	0.703	0.834	0.920	1.020	1.190	1.077
POULTRY AND EGGS							
BROILERS, COMMERCIAL	LB.	0.263	0.236	0.236	0.263	0.259	0.256
TURKEYS	LB.	0.348	0.317	0.355	0.436	0.411	0.405
EGGS	DOZ.	0.525	0.584	0.556	0.522	0.583	0.557
WOOL	LB.	0.447	0.657	0.720	0.745	0.863	0.745

1/ PRELIMINARY
2/ INCLUDES ALLOWANCE FOR LOANS OUTSTANDING AND PURCHASES BY THE GOVERNMENT VALUED AT THE AVERAGE LOAN AND PURCHASE RATE, BY STATES. DOES NOT INCLUDE PRICE SUPPORT PAYMENTS.
3/ DOES NOT INCLUDE PAYMENTS UNDER THE SUGAR ACT.
4/ PRICES BASED ON 480 POUND NET WEIGHT BALE.
5/ BOTH FRESH AND PROCESSED SALE PRICES (EQUIVALENT PACKINGHOUSE-DOOR RETURNS FOR WASHINGTON AND OREGON, EQUIVALENT FIRST DELIVERY POINT FOR CALIFORNIA AND "AS SOLD" FOR OTHER STATES).
6/ EQUIVALENT PACKINGHOUSE-DOOR RETURNS PER BOX FOR ALL USES.
7/ SOLD TO PLANTS AND DEALERS.

UNITED STATES: INDEXES OF PRICES RECEIVED BY FARMERS, PRICES PAID BY FARMERS AND PRICES FOR CONSTRUCTION COST ITEMS AND CURRENT NORMALIZED INDEXES 09/09/80

ITEM		INDEX NUMBERS					CURRENT NORMALIZED INDEX
		1975	1976	1977	1978	1979 1/	
PRICES RECEIVED BY FARMERS							
ALL FARM PRODUCTS	1967=100:	185	186	183	210	241	215
ALL CROPS	1967=100:	201	197	192	203	223	209
LIVESTOCK AND LIVESTOCK PRODUCTS	1967=100:	172	177	175	217	257	222
PRICES PAID BY FARMERS							
ALL COMMODITIES BOUGHT FOR USE IN PRODUCTION	1967=100:	182	193	200	217	248	223
FEED	1967=100:	187	191	186	183	204	193
LIVESTOCK	1967=100:	134	154	158	221	293	229
SEED	1967=100:	245	241	261	273	286	275
FERTILIZER	1967=100:	217	185	181	180	196	188
AGRICULTURAL CHEMICALS	1967=100:	160	174	157	147	150	150
FUELS AND ENERGY	1967=100:	177	187	202	212	276	249
FARM AND MOTOR SUPPLIES	1967=100:	168	164	165	171	189	181
AUTOS AND TRUCKS	1967=100:	191	212	234	248	273	261
TRACTORS AND SELF-PROP. MACHINERY	1967=100:	195	217	238	259	289	274
OTHER MACHINERY	1967=100:	197	225	246	266	293	280
BUILDING AND FENCING MATERIALS	1967=100:	206	215	229	248	272	250
WAGE RATES FOR HIRED FARM LABOR	1967=100:	192	210	226	242	265	244
CONSTRUCTION COSTS							
COMPOSITE INDEX (U.S. DEPT. OF COMMERCE)	1967=100:	190	200	218	244	277	246
ENR CONSTRUCTION COST	1967=100:	206	223	240	258	280	259
WHOLESALE LUMBER PRICE (U.S. DEPT. OF LABOR)	1967=100:	192	233	276	322	354	313

1/ PRELIMINARY

III. Guidelines for Estimating the Values of Nonstructural Measures and Management Strategies for Municipal and Industrial Water

The Procedures developed by the Water Resources Council and published in the Federal Register in December 1979 asks the planners to identify the deficit between future water supplies and use when estimating the National Economic Development benefits for municipal and industrial water supply. One of the options available in addressing such deficits is to reduce projected water use by implementation of nonstructural or conservation measures that are not part of the without-project condition. (Section 713.115)

The identification of the value of conservation and other nonstructural measures may be a problem. Section 713.125 of the Procedures states that the "Water Resources Council (WRC) can coordinate development of interagency guidelines for estimating nonstructural measures and management strategies. These guidelines will give examples of conservation strategies, pricing methods, and drought management measures."

Models for estimating the values of nonstructural measures and mangement strategies for municipal and industrial water supply are now being developed by the affected agencies. WRC plans to officially request these models and strategies for inclusion in future editions of this handbook. Until these guidelines are completed the requirement to formulate and evaluate nonstructural and conservation options remains in force.

IV. Floodplain Management Guidelines For Urban Flood Damage

Section 713.505(b) of the Urban Flood Damage chapter of the Manual of Procedures lists several assumptions inherent in the definition of the without-project condition. Two of these assumptions refer to the adoption, enforcement, or certification of laws, ordinances, regulations, guidelines, or executive orders. Planners may wish to refer directly to these when formulating and evaluating management and development plans which have urban flood hazard reduction features.

Individual copies of the following documents are available from:

Federal Emergency Management Agency
415 - 7th Street, SW.
Washington, DC 20410
Phone: 755-9096 or 800-424-8872

1. Flood Disaster Protection Act of 1973 (P.L. 93-234) as amended.

2. 24 CFR 1910.3 and 1910.5 appeared in the Federal Register Part II on Tuesday, October 26, 1976. They have been recodified as 44 CFR 59 because the Federal Insurance Administration has been reassigned to FEMA from HUD.

3. Floodplain Management Guidelines have been developed by the Water Resources Council to interpret Executive Order 11988 Floodplain Management (43 FR 6030), May 24, 1977. These guidelines may also be used for Executive Order 11990 Protection of Wetlands where the wetlands in question are in a floodplain.

Another useful document which offers a conceptual framework and description of terminology and tools for floodplain management is "A Unified National Program for Floodplain Management" adopted by the Water Resources Council in January of 1979. The document is available from the U.S. Government Printing Office (GPO Stock No. 052 0045 0058-4).

V. Approved Regional Models for Estimating Recreation Demand

The Water Resources Council Procedures (Section 713.917) define regional use estimating models as "statistical models that relate use to the relevant determinants based on data from existing recreation sites in a region. The use of regional models is encouraged to economize on resources required for site-specific studies." This does not preclude the use of household surveys, authomobile registration and roadside surveys as a source for data in addition to that obtained from existing recreation sites.

The WRC will compile a list of approved models which will appear in future editions of this handbook. Agencies are encouraged to develop regional recreation models for estimating future recreation demand. A copy or a detailed summary of proposed models should be submitted for comment and approval to:

Policy Analysis Division
U.S. Water Resources Council
2120 L Street, NW
Washington, D. C. 20037

VI. Unit Day Values for Recreation

The Procedures developed by the Water Resources Council and published in the Federal Register in December 1979 provides three methods for evaluation of the beneficial and adverse effects of project recreation on national economic development (NED). These three approaches (travel cost, contingent valuation, and unit day values) are set forth in Subpart K of the Procedures. In addition, Appendices 1-3 to Subpart K contain detailed explanations of the three evaluation methods. To reflect changes in price levels since 1978 unit day values have been updated to current levels. The approved unit day values for FY 1981 are:

General recreation	$1.40	-	$4.10
Specialized recreation	$5.50	-	$16.30

Where evidence indicates a value outside the published range, either the travel cost or contingent valuation method is required for the evaluation of recreation benefits. The tables included in Appendix 3 are intended as guidance to planners in the selection of unit day values for particular recreation activities.

Tables 2, and 3 illustrate a method of assigning a point rating to a particular activity. The five criteria and associated measurement standards are designed to reflect quality, relative scarcity, ease of access, and aesthetic features. Table K-3-2 can be used for general recreation such as picnicking, camping, hiking, riding, cycling, fishing and hunting. Table K-3-3 can be used for specialized recreation such as big game hunting, wilderness pack trips, white water canoeing, and other relatively unique experiences.

Table K-3-1 converts the point ratings to dollar values and were applicable for fiscal year 1980. They should not be used for future years. Table K-3-1 (revised for FY 81) shown below may be used to convert points to a dollar value if the point assignment method is used to select a unit day value. The option to use this table or to submit an alternate methodology for approval to the WRC is left to the discretion of the individual agency. Studies are underway in response to questions regarding the dollar values given to determine a long range methodology which will more accurately establish unit day values for recreation activity categories.

Revised Table K-3 1 (FY 1981) - Conversion of Points to Dollar Values

Activity Categories	POINT VALUES										
	0	10	20	30	40	50	60	70	80	90	100
General Recreation (Points from Table K-3 2)	1.40	1.60	1.80	2.10	2.50	2.90	3.20	3.40	3.60	3.90	4.10
General Fishing & Hunting (Points from Table K-3 2)	2.00	2.20	2.40	2.60	2.90	3.20	3.50	3.70	3.90	4.00	4.10
Specialized Fishing & Hunting (Points from Table K-3 3)	9.50	9.80	10.00	10.30	10.50	11.50	12.50	13.40	14.40	15.40	16.30
Specialized Recreation Other than Fishing & Hunting (Points from Table K-3 3)	5.50	5.90	6.40	6.80	7.30	8.20	9.10	10.90	12.70	14.50	16.30

Note: See 44 FR 72963-64 (published December 14, 1979) for Table K-3-2 and K-3-3.

VII. Areas Eligible for NED Benefits from Employment of Previously Unemployed Labor Resources

A. Criteria For Designation

The Economic Development Administration has ceased publication of Qualified Areas which was cited as a reference to designated areas in Subpart N, Unemployed or Underemployed Labor Resources, Section 713.1203(b), of the WRC Manual of Procedures.

As a result, the WRC published Standards for the designation of "substantial and persistent" unemployment areas based on the criteria that were formerly used by EDA in designating qualified areas under subsection 1 of Title IV of the Public Works and Economic Development Act of 1965 (Pub. L. 89-136, as amended). These Standards appeared in the April 11, 1980 Federal Register and state that an area can be considered to have substantial and persistent unemployment when

(1) The Secretary of Labor finds that the current rate of unemployment, as determined by appropriate annual statistics for the most recent 12 consecutive months, is 6 percent or more and has averaged at least 6 percent for the qualifying time periods specified in paragraph (2) and

(2) The Secretary of Labor finds that the annual average rate of unemployment has been at least: (i) 50 percent above the national average for three of the preceding four calender years, or (ii) 75 percent above the national average for two of the preceding three calender years, or (iii) 100 percent above the national average for one of the preceding two calender years.

The eligibility determinations were based on the following national unemployment rates for the relevant time periods provided by the Bureau of Labor Statistics:

1976	1977	1978	1979
7.7	7.0	6.0	5.8

For further information relating to the designation of these areas contact David Campbell or Douglas McDonald of the WRC staff at (202) 254-6453.

B. Directory of Eligible Areas

The following areas satisfy the Water Resources Council's Standards for qualification as areas of "substantial and persistent unemployment."

State: ALABAMA*

Hale County
Greene County

State: ALASKA

Angoon Division
Annete Island Area (Reservation)
Bethel Division
Bristol Bay Borough Division
Bristol Bay Division
Craig Area (Reservation)
Fairbanks Division
Haines Division
Hoonah Area (Reservation)
Hydaburg Area (Reservation)
Kake Area (Reservation)
Kenai Cook Inlet Division
Klawock Area (Reservation)
Kobuk Division
Kuskokwim Division
Matanuska - Susitna Borough Division
Seward Division
Skagway - Yakutat Division
Southeast Fairbanks Division
Unalaska Native Village (Reservation)
Wade Hampton Division
Wrangell - Petersburg Division
Yukon - Koyukuku Division

State: ARIZONA

Ak Chin Reservation
(Part of Pinal County)

Apache County
Camp Verde Reservation
(Part of Yauapai County)
Cochise County
Cocopah Reservation
(Part of Yuma County)

Colorado River Reservation
(Parts of Yuma County, Arizona and Riverside and San Bernardino Counties, California)
Fort Apache Reservation
(Parts of Apache, Gila and Navajo Counties)
Fort McDowell Reservation
(Part of Maricopa County)
Gila Bend Indian Reservation
(Part of Maricopa County)

Gila County
Gila River Reservation
(Parts of Maricopa and Pinal Counties)
Havasupai Reservation
(Part of Coconino County)
Hopi Reservation
(Parts of Coconino and Navajo Counties)
Hualapai Reservation
(Parts of Coconino and Navajo Counties)
Kaibab Reservation
(Parts of Coconino and Mohave Counties)
Navajo County
Navajo Reservation
(Parts of Apache, Coconino and Navajo Counties, Arizona and San Juan County, Utah and San Juan and McKinley Counties, New Mexico)
Papago Reservation
(Parts of Maricopa, Pima and Pinal Counties)
Salt River Reservation
(Part of Maricopa County)
San Carlos Reservation
(Parts of Gila, Graham and Pinal Counties)
San Xavier Reservation
(Part of Pina County)
Santa Cruz County
Yauapai Reservation
(Part of Yavapai County)

State: ARKANSAS
Lee County
Phillips County
St. Francis County

State: CALIFORNIA
Alpine County
Big Pine Reservation
(Part of Inyo County)
Bishop Reservation
Butte County
Calaveras County
Del Norte County
El Dorado County
Fort Mohave Reservation
(Parts of Mohave County, Arizona, San Bernardino County, California and Clark County, Nevada)
Fort Yuma Reservation
(Parts of Yuman County, Arizona and Imperial County, California)
Hoopa Valley Reservation
(Part of Humboldt County)
Humboldt County
Imperial County
Kings County
Lake County
Lassen County
Lone Pine Reservation
(Part of Inyo County)
Mariposa County
Mendocino County
Merced County
Mono County
Morongo Reservation
Nevada County
Pala Reservation
Plumas County
Rincon Reservation
San Benito County
San Juaquin County
(Stockton SMSA, Stockton/San Juaquin Manp. CSRI)
Shasta County
Sierra County
Siskiyou County
Stanislaus County (Modesto SMSA)
Sutter County
Tehama County
Trinity County
Tuolumne County
Yuba County

State: COLORADO

Archuleta County
Conejos County
Ouray County
San Juan County
San Miguel County
Southern Ute Reservation
(Parts of Archuleta and LaPlata Counties)
Ute Mountain Reservation
(Parts of LaPlata and Montezuma Counties, Colorado and San Juan County, Utah and San Juan County, New Mexico)

State: CONNECTICUT:

No Qualifying Areas

State: DELAWARE

No Qualifying Areas

State: FLORIDA

Big Cypress Reservation
(Part of Hendry County)
Brighton Reservation
(Part of Glades County)
Franklin County
Glades County
Hernando County
Hollywood Reservation
(Part of Broward County)
Miccosukee Indian Lands
St. Lucie County
Polk County (Lakeland-Winter Haven SMSA)

State: GEORGIA
Burke County
Chattahoochee County

State: HAWAII

No Qualifying Areas

State: IDAHO

Adams County
Boise County
Bonner County
Camas County
Clearwater County
Coeur D'Alene Reservation
Fort Hall Reservation
(Parts of Bingham-
Caribou and Power
Counties
Nez Perce Reservation
(Parts of Clearwater,
Idaho, Lewis, and
Nez Perce Counties)
Valley County

State: ILLINOIS*
Alexander County
Calhoun County
Clay County
Franklin County
Gallatin County
Hamilton County
Hardin County
Pope County
Pulaski County
Saline County
Union County
White County
Williamson County

State: INDIANA
Crawford County
Ohio County
Scott County

State: IOWA
Sac and Fox Reservation

State: KANSAS

Kickapoo Reservation

State: KENTUCKY
Edmonson County
Lee County
Letcher County
Magoffin County

State: LOUISIANA
Allen Parish
Coushatta Indian Trust Land
(Part of Allen Parish)
East Carroll Parish
Vernon Parish
West Carroll Parish

State: MAINE
Aroostook County
Indian Township Reservation
(Part of Washington County)
Penobscot Indian Reservation
(Part of Penobscot County)
Pleasant Point Indian Reservation
(Part of Washington County)
Somerset County
Waldo County
Washington County

State: MARYLAND
Allegany County
Dorchester County
Garrett County
Somerset County
Worcester County

State: MASSACHUSETTS

No Qualifying Areas

State: MICHIGAN

Alcona County
Alger County
Alpena County
Antrim County
Arenac County
Baraga County
Benzie County
Charlevoix County
Cheboygan County
Chippewa County
Clare County
Crawford County
Delta County
Gladwin County
Gogebic County
Gratiot County
Houghton County
Huron County
Isabella Reservation

Iosco County
Iron County
Kalkaska Count
Keweenaw County
Lake County
Luce County
Mackinac County
Manistee County
Missaukee County
Montealm County
Montmorency County
Newaygo County
Oceana County
Ogemaw County
Ontonagon County
Oscoda County
Presque Isle County
Roscommon County
Sanilac County
Schoolcraft County
Wexford County

State: MINNESOTA

Aitken County
Clearwater County
Fond Du Lac Reservation
(Parts of Carlton and St Louis Counties)
Grand Portage Reservation
(Part of Cook County)
Leech Lake Reservation
(Parts of Beltrami, Cass, Crow Wing, Hubbard, and Itasca Counties)
Lower Sioux Reservation
Mille Lac Reservation
(Parts of Aitken, Mille Lacs, and Pine Counties)
Nett Lake Reservation
(Parts of Koochiching and St. Louis Counties)
Prarie Island Reservation
Red Lake County
Red Lake Reservation
(Parts of Beltrami, Clearwater, Koochiching, Lake of the Woods, Marshall, Pennington, Red Lake, and Roseau Counties)
Shakopee - Mdewakanton Reservation
White Earth Reservation
(Parts of Becker, Clearwater, and Mahnomen Counties)

State: MISSISSIPPI

Attala County
Choctaw Reservation
(Parts of Attala, Jones, Kemper Leake, Newton, Neshoba, and Scott Counties)
Jefferson County
Montgomery County
Sharkey County
Tate County
Wilkinson County

State: MISSOURI
Washington County

State: MONTANA
Blackfeet Reservation
(Parts of Glacier and Pondera Counties)
Crow Reservation
(Parts of Big Horn and Yellowstone Counties)
Flathead Reservation
(Parts of Flathead, Lake, Missoula, and Sanders Counties)
Fort Belknap Reservation
(Part of Phillips County)
Fort Peck Reservation
(Parts of Daniels, Roosevelt, Sheridan, and Valley Counties)
Lincoln County
Northern Cheyenne Reservation
(Parts of Big Horn and Rosebud Counties)
Rocky Boys Reservation
(Parts of Chouteau and Hill Counties)

State: NEBRASKA
Omaha-Winnebago Reservation
(Parts of Burt, Cuming, Dixon and Thurston Counties)
Santee Sioux Reservation
(Part of Knox County)

State: NEVADA
Duck Valley Reservation
(Parts of Elko County, Nevada and Owyhee County, Idaho)
Duckwater Reservation
Elko Reservation
Ely Colony
Fallon Reservation and Colony
(Part of Churchill County)

Fort McDermitt Reservation
(Parts of Humboldt County,
Nevada and Malheur County,
Oregon)
Moapa River Reservation
(Part of Clark County)
Pyramid Lake Reservation
(Part of Oashoe County)
Reno-Sparks Reservation
(Part of Washoe County)
South Fork - Odgers Reservation
Walker River Reservation
White Pine County
Washoe Nation Lands
(Parts of Alpine County,
California and Douglas County
and Carson City, Nevada)
Yerrington Reservation and Colony

State: NEW HAMPSHIRE

No qualifying areas

State: NEW JERSEY
Atlantic County (Atlantic City SMSA)
Cape May County
Cumberland County (Vineland-Millville - Bridgeton SMSA)
Hudson County (Jersey City SMSA)
Passaic County (Patterson - Clifton - Passaic SMSA)

State: NEW MEXICO

Acoma Pueblo
(Part of Valencia County)
Alamo Reservation
Albuquerque Indian Land Area
Canoncito Reservation
(Bernalillo-Valencia and
Sandoval Counties)
Cochita Pueblo
Guadalupe County
Isleta Pueblo
(Parts of Bernalillo and
Valencia Counties)
Jemez Reservation
(Part of Sandoval County)
Jicarillo Reservation
(Parts of Rio Arriba and
Sandoval Counties)
Laguna Pueblo
(Parts of Bernalillo
Sandoval and Valencia
Counties

Mescalero Reservation
(Part of Otero County)
Mora Coounty
Nambe Pueblo
(Part of Santa Fe County)
Picuris Pueblo
(Part of Taos County)
Pojoaque Pueblo
(Part of Santa Fe County)
Ramah Reservation
(Parts of Mckinley and
Valencia Counties)
Rio Arriba County
San Felipe Pueblo
San Ildefonso Pueblo
(Part of Santa Fe County)
San Juan Pueblo
(Part of Rio Arriba County)
Sandia Pueblo
Santa Ana Pueblo
Santa Clara Pueblo
(Parts of Sandoval, Santa Fe and
Rio Arriba Counties)
Santo Domingo Reservation
(Parts of Rio Arriba,
Sandoval, Santa Fe County)
San Miguel County
Taos County
Taos Pueblo
(Part of Taos County)
Tesuque Pueblo
(Part of Santa Fe County)
Zia Pueblo
Zuni Pueblo
(Parts of McKinley and
Valencia Counties)

State: NEW YORK

Allegany Reservation
(Part of Cattaraugus County)
Cataraugus Reservation
(Parts of Cattaraugus, Chautauqua,
and Erie Counties)
Clinton County
Essex County
Franklin County
Fulton County
Greene County
Hamilton County
Jefferson County
Kings County

Montgomery County
New York County
St. Lawrence County
Warren County

State: NORTH CAROLINA

East Cherokee Reservation
(Parts of Graham, Jackson, and
Swain Counties)
Tyrrell County

State: NORTH DAKOTA

Bismarck Indian Land
Fort Berthold Reservation
(Parts of Dunn, McKenzie,
McLean, Mercer and
Mountrail Counties)
Fort Totten (Devils Lake) Reservation
(Parts of Benson, Eddy and Ramsey
Counties)
Standing Rock Reservation
(Parts of Sioux County,
North Dakota and Corson
and Walworth Counties,
South Dakota)
Turtle Mountain Reservation
(Part of Rolette County)

State: OHIO
Adams County
Scioto County

State: OKLAHOMA
Cheyenne - Arapaho Indian Lands
Chickasaw Indian Lands
Coal County
Kiowa-Comanche and Apache Indian Lands
Latimer County
Osage Indian Lands
Otoe - Missouria Tribal Trust Lands Area
Pittsburg County
Ponca Indian Lands
Seminole Indian Lands
Tonkawa Tribal Trust Area
Wichita-Caddo-Delaware Indian Lands

State: OREGON

Burns Paiute Reservation
Hood River County
Josephine County
Umatilla Reservation
(Part of Umatilla County)

Warm Springs Reservation
(Parts of Clackamas, Jefferson, Linn, Marion, and Wasco Counties)
Wheeler County

State: PENNSYLVANIA *
Bedford County
Cambria County
Cameron County
Clinton County
Columbia County
Huntingdon County
Wyoming County

State: RHODE ISLAND

No qualifying areas

State: SOUTH CAROLINA

Catawba Reservation

State: SOUTH DAKOTA

Buffalo County
Cheyenne River Reservation
(Parts of Dewey, Haakon, Meade, Perkins, Stanley, and Ziebach Counties)
Crow Creek-Lower Brule Reservation
(Parts of Brule, Buffalo, Hyde, Hughes, Lyman and Stanley Counties)
Pine Ridge Reservation
(Parts of Bennett, Shannon and Washabaugh Counties, South Dakota and Sheridan County, Nebraska)
Rosebud Reservation
(Parts of Gregory, Mellette, Todd and Tripp Counties)
Shannon County
Sisseton Reservation
(Parts of Marshall and Roberts Counties, South Dakota and Richland and Sargent Counties, North Dakota)
Yankton Reservation
(Parts of Bon Homme and Charles Mix Counties)

State: TENNESSEE

Campbell County
Cocke County
Fentress County
Hancock County
Jackson County
Lake County
Monroe County
Scott County
Stewart County

State: TEXAS

Alabama-Coushatta Reservation
Cameron County (Brownsville-
Harlinger-San Benito SMSA)
Dimmit County
Hidalgo County (McAllen-Pherr-Edinburg SMSA)
Loving County
Maverick County
Starr County
Tigua Reservation
Val Verde County
Webb County (Laredo SMSA)
Zapata County
Zavala County

State: UTAH

Goshute Reservation
(Parts of Juab County, Utah and
White Pine County, Nevada)
Unitah-Ouray Reservation
(Parts of Duchesne, Unitah,
and Wasatch Counties)
Wasatch County

State: VERMONT
Grand Isle County
Essex County

State: VIRGINIA
Buchanan County
Dickenson County
Lancaster County
Northampton County
Northumberland County
Pamunkey Reservation
Smyth County
South Boston City
Williamsburg City

State: WASHINGTON*

Chelan County
Clallam County
Columbia County
Colville Reservation
(Parts of Ferry and
Okanogan Counties)
Ferry County
Grant County
Kittitas County
Klickitat County
Lummi Reservation
(Part of Whatcom County)
Makah Reservation
(Part of Clallam County)
Muckleshoot Reservation
Okanaogan County
Pend Oreille County
Quileute Reservation
Quinnult Reservation
Skagit County
Skokomish Reservation
Spokane Reservation
Squaxin Reservation
Stevens County
Swinomish Reservation
(Part of Skagit County)
Tulalip Reservation
Yakima Rervation
(Parts of Klickitat and Yakima
Counties)

State: WEST VIRGINIA

Braxton County
Calhoun County
Clay County
Lewis County
Lincoln County
McDowell County
Nicholas County
Ritchie County
Webster County

State: WISCONSIN
Bad River Reservation
(Part of Ashland County)
Forest County
Lac Courte Oreilles Reservation
(Part of Sawyer County)

Lac du Flambeau Reservation
(Parts of Iron and Vilas Counties)
Menominee County
Oneida Reservation
(Parts of Brown and Outagamie Counties)
Red Cliff Reservation
(Part of Bayfield County)
Saint Croix Reservation
(Part of Burnett County)

State: WYOMING
Wind River Reservation
(Parts of Freemont and Hot Springs Counties)

*An asterisk indicates that planners should check with WRC for possible deletions and additions to the list of eligible areas in the corresponding State due to data availability problems. The eligibility of areas in all States will be evaluated after calendar year 1980 unemployment data is made available to WRC and a revised listing will be sent to planners.

VIII. OBERS Projections, Regional Economic Activity in the U.S.

The 1972 OBERS projections were printed in 7 volumes in April 1974 and are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Volume I: Concepts, Methodology and Summary Date, #5245-00013 - $3.05

Volume II: BEA Economic Areas, #5245-00014 - $2.50

Volume III: Water Resources Regions and Subareas, #5245-00015 - $3.10

Volume IV: States, #5245-00016 - $1.90

Volume V: Standard Metropolitan Statistical Areas, #5245-00017 - $2.75

Volume VI: Non-SMSA Portions of BEA Economic Areas, #5245-00018 - $2.50

Volume VII: Non-SMSA Portions of Water Resources Subareas, #5245-00019 - $2.75

Supplement: Agricultural Projections 1975, #5245-00020-7

The 1978 OBERS Projections are scheduled to be issued in early 1981. An advance summary of currently available State-level projections is included below.

UNITED STATES DEPARTMENT OF COMMERCE
Bureau of Economic Analysis
Washington, D.C. 20230

October 14, 1980

MEMORANDUM TO Regional Projections Users

FROM: Kenneth Johnson, Chief KJ
Projections Branch
Regional Economic Analysis Division

Re: BEA Regional Economic Projections -- State Summaries

We have completed the preparation of new State-level projections of economic activity. The results will be published formally in an upcoming issue of the Survey of Current Business. They also will be presented in detail in a document prepared by the Government Printing Office (GPO). Projections for economic areas, SMSA's, and other substate county groupings will also be published in GPO documents.

Since many projections users have indicated an immediate need for these projections, I am enclosing an advance summary of the results for each State. Table 1 presents data on the absolute levels of total earnings, employment, population, and personal income historically (1969 and 1978) and projected (1985 and 2000). Table 2 presents percent shares of the U.S. for total earnings, employment, and population, and per capita income (in absolutes and relative to the Nation) for these same years.

It will not be possible to provide you with advance data showing the underlying detail (57 industrial sectors for earnings and employment, age and sex for population, and additional years of data) in this format. The bulk of the statistical materials involved and the number of users on our distribution lists preclude this as a viable option. You will, however, receive copies of press releases and similiar materials announcing (1) the Survey of Current Business article, (2) the availability of related documents from GPO, and (3) the availability of computer tape copies of the results when they are ready for distribution.

In the interim, I hope that the enclosed material will be useful in your planning efforts. If you require further information please feel free to write or call (202) 523-0958 for assistance from the staff of the Projections Branch.

BEA REGIONAL ECONOMIC PROJECTIONS

	TOTAL EARNINGS (MILLIONS OF 1972 DOLLARS)				TOTAL EMPLOYMENT (THOUSANDS)				TOTAL POPULATION (THOUSANDS)				TOTAL PERSONAL INCOME (MILLIONS OF 1972 DOLLARS)			
	1969	1978	1985	2000	1969	1978	1985	2000	1969	1978	1985	2000	1969	1978	1985	2000
CT	11844	13424	17049	24981	1350	1502	1667	1802	3000	3099	3232	3541	15735	18416	23022	33601
ME	2665	3391	4503	7463	419	491	558	666	992	1091	1138	1317	3357	4589	5999	9914
MA	20320	22982	28766	40761	2546	2748	2977	3069	5650	5774	5809	6037	25532	30510	37898	53746
NH	2106	2997	4185	7102	316	415	495	597	724	871	970	1174	2892	4285	5847	9839
RI	3035	3366	4314	6806	416	445	490	552	932	935	955	1060	3837	4640	5885	9186
VT	1312	1627	2180	3480	193	228	261	299	437	487	522	586	1607	2142	2851	4550
DE	2115	2650	3477	5566	252	283	321	374	540	583	614	706	2604	3313	4310	6852
DC	6216	7547	9021	12545	647	654	693	707	762	674	641	633	3730	4310	5048	6883
MD	12728	15872	19751	29145	1576	1801	1986	2147	3868	4143	4239	4574	17424	23054	29131	43342
NJ	25391	30127	38644	57445	2913	3248	3640	3970	7095	7327	7615	8329	34949	42865	54267	80311
NY	73404	74037	88767	117118	8048	7784	8193	8004	18105	17748	17316	16559	88535	97373	115323	152170
PA	39687	46444	58440	83428	4951	5217	5655	5854	11741	11750	11728	11851	48240	60660	75150	106891
IL	43275	51968	66360	96021	4972	5338	5877	6221	11039	11243	11544	12264	52632	66477	84038	120891
IN	17798	22088	29143	45388	2189	2482	2785	3098	5143	5374	5680	6199	20985	27598	36181	55990
MI	33027	41876	54229	83011	3481	3989	4523	5103	8781	9189	9553	10368	39325	51990	66423	99818
OH	37896	44882	58088	86155	4463	4870	5432	5833	10563	10749	11054	11622	45090	56304	72242	106703
WI	14084	18348	23997	36436	1849	2215	2516	2777	4378	4679	4928	5366	17360	23494	30512	46526
IA	8677	11412	14390	21609	1204	1424	1552	1688	2805	2896	2959	3196	10907	15165	19144	28854
KS	6448	8923	11717	18463	955	1146	1287	1456	2236	2348	2467	2707	8766	12281	15774	24270
MN	12449	16934	22626	36687	1588	1989	2289	2662	3758	4008	4302	4984	15094	21120	28016	45141
MO	15379	19130	24549	36526	2057	2297	2533	2712	4640	4860	5001	5256	17921	23609	30227	44658
NE	4578	5963	7529	11496	665	795	866	955	1474	1565	1618	1746	5776	7873	9962	15249
ND	1664	2466	3061	4785	263	327	353	387	621	652	673	727	2068	3230	4086	6393
SD	1678	2267	2934	4503	289	340	368	397	668	690	707	751	2184	3027	3897	5942
AL	8526	12244	16403	26796	1304	1584	1802	2073	3440	3742	3935	4251	10477	15779	21220	34622
AR	4281	6657	8699	14282	725	931	1052	1237	1913	2186	2274	2514	5553	8920	11659	19131
FL	19150	29129	40229	69629	2642	3808	4557	5673	6641	8594	10191	12683	25789	43420	62512	111660
GA	13502	18475	24450	40273	1984	2429	2736	3171	4551	5084	5438	6251	15923	22976	30700	51309
KY	8273	11824	17005	29187	1213	1484	1763	2112	3198	3498	3792	4279	10362	15404	21725	36859
LA	9339	14016	19566	33469	1346	1699	2006	2428	3619	3966	4297	4901	11610	17815	24577	41827
MS	4753	6845	9375	16727	812	1008	1163	1445	2220	2404	2557	2981	5838	8944	12178	21733
NC	14479	19847	26438	43896	2288	2748	3098	3620	5031	5577	5978	6871	17018	24686	33184	55773
SC	6716	9650	12934	22305	1094	1378	1567	1898	2570	2918	3146	3672	7979	12238	16496	28876
TN	10738	15304	21317	36189	1618	2029	2412	2909	3897	4357	4761	5649	12667	19061	26423	45243
VA	13815	19430	26039	42632	1980	2421	2785	3273	4614	5148	5566	6432	17728	26497	35301	57567
WV	4388	6314	9292	15186	602	722	885	1024	1746	1860	2023	2129	5398	8218	11692	18570
AZ	5213	8729	12133	21036	672	1057	1279	1595	1737	2354	2794	3442	6498	11588	16801	29906
NM	2629	4111	5639	9402	370	521	612	730	1011	1212	1346	1537	3221	5332	7323	12263
OK	6801	9894	13698	22364	998	1268	1471	1726	2535	2880	3124	3557	8795	13684	18509	29997
TX	33260	52730	73985	128361	4620	6235	7418	9252	11045	13014	14812	18130	40871	67202	93966	162804
CO	6934	11361	16635	29824	931	1360	1718	2206	2166	2670	3178	4042	8642	14449	20979	37339
ID	1969	3205	4405	7587	288	418	488	594	707	878	1000	1194	2390	4138	5705	9776
MT	1923	2719	3642	6137	276	361	406	473	694	785	829	926	2457	3617	4756	7812
UT	2888	4668	6915	12809	408	585	737	957	1047	1307	1556	1904	3464	5748	8437	15372
WY	993	1972	3032	5268	148	227	294	367	329	424	537	669	1266	2453	3728	6415
CA	76192	102375	134313	212112	8458	10796	12475	14662	19711	22294	24456	28443	93591	132519	173414	272683
NV	2000	3417	5215	10158	232	395	535	774	480	663	873	1348	2306	4148	6428	12968
OR	6590	10277	14451	25900	854	1175	1436	1869	2062	2444	2850	3652	8101	13157	18461	33002
WA	12003	16511	22891	36172	1431	1763	2138	2504	3343	3774	4288	4933	14759	21517	29668	46859
AK	1387	2810	3679	6881	140	210	259	375	296	403	473	674	1406	2913	3952	7636
HI	2943	3932	5247	8601	379	478	558	667	743	885	1005	1229	3501	4993	6731	11184
US	679459	879168	1155351	1810100	85416	101118	114965	130943	201298	218051	232346	259845	834161	1139744	1491758	2336905

BEA REGIONAL ECONOMIC PROJECTIONS

	SHARE OF TOTAL EARNINGS (PERCENT)				SH. OF TOT. EMPLOYMENT (PERCENT)				SH. OF TOT. POPULATION (PERCENT)				PERCAPITA INCOME (1972 DOLLARS)				PERCAPITA INC. RELATIVE (U.S.=100)			
	1969	1978	1985	2000	1969	1978	1985	2000	1969	1978	1985	2000	1969	1978	1985	2000	1969	1978	1985	2000
CT	1.7	1.5	1.5	1.4	1.6	1.5	1.4	1.4	1.5	1.4	1.4	1.4	5245	5943	7122	9490	127	114	111	106
ME	.4	.4	.4	.4	.5	.5	.5	.5	.5	.5	.5	.5	3384	4205	5271	7525	82	80	82	84
MA	3.0	2.6	2.5	2.3	3.0	2.7	2.6	2.3	2.8	2.6	2.5	2.3	4519	5284	6524	8902	109	101	102	99
NH	.3	.3	.4	.4	.4	.4	.4	.5	.4	.4	.4	.5	3995	4919	6028	8379	96	94	94	93
RI	.4	.4	.4	.4	.5	.4	.4	.4	.5	.4	.4	.4	4117	4964	6163	8663	99	95	96	96
VT	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	.2	3677	4401	5460	7767	89	84	85	86
DE	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	4822	5687	7021	9702	116	109	109	108
DC	.9	.9	.8	.7	.8	.6	.6	.5	.4	.3	.3	.2	4895	6399	7870	10878	118	122	123	121
MD	1.9	1.8	1.7	1.6	1.8	1.8	1.7	1.6	1.9	1.9	1.8	1.8	4505	5565	6872	9475	109	106	107	105
NJ	3.7	3.4	3.3	3.2	3.4	3.2	3.2	3.0	3.5	3.4	3.3	3.2	4926	5850	7127	9643	119	112	111	107
NY	10.8	8.4	7.7	6.5	9.4	7.7	7.1	6.1	9.0	8.1	7.5	6.4	4890	5486	6660	9189	118	105	104	102
PA	5.8	5.3	5.1	4.6	5.8	5.2	4.9	4.5	5.8	5.4	5.0	4.6	4109	5163	6408	9019	99	99	100	100
IL	6.4	5.9	5.7	5.3	5.8	5.3	5.1	4.8	5.5	5.2	5.0	4.7	4768	5913	7280	9858	115	113	113	110
IN	2.6	2.5	2.5	2.5	2.6	2.5	2.4	2.4	2.6	2.5	2.4	2.4	4080	5135	6370	9032	98	98	99	100
MI	4.9	4.8	4.7	4.6	4.1	3.9	3.9	3.9	4.4	4.2	4.1	4.0	4478	5658	6953	9627	108	108	108	107
OH	5.6	5.1	5.0	4.8	5.2	4.8	4.7	4.5	5.2	4.9	4.8	4.5	4269	5238	6535	9181	103	100	102	102
WI	2.1	2.1	2.1	2.0	2.2	2.2	2.2	2.1	2.2	2.1	2.1	2.1	3965	5021	6192	8671	96	96	96	96
IA	1.3	1.3	1.2	1.2	1.4	1.4	1.3	1.3	1.4	1.3	1.3	1.2	3888	5237	6470	9029	94	100	101	100
KS	.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	3920	5231	6394	8967	95	100	100	100
MN	1.8	1.9	2.0	2.0	1.9	2.0	2.0	2.0	1.9	1.8	1.9	1.9	4017	5269	6513	9058	97	101	101	101
MO	2.3	2.2	2.1	2.0	2.4	2.3	2.2	2.1	2.3	2.2	2.2	2.0	3862	4858	6045	8496	93	93	94	94
NE	.7	.7	.7	.6	.8	.8	.8	.7	.7	.7	.7	.7	3919	5029	6158	8734	95	96	96	97
ND	.2	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	.3	3330	4955	6070	8789	80	95	95	98
SD	.2	.3	.3	.2	.3	.3	.3	.3	.3	.3	.3	.3	3269	4390	5509	7909	79	84	86	88
AL	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.7	1.7	1.7	1.6	3046	4217	5392	8144	73	81	84	91
AR	.6	.8	.8	.8	.8	.9	.9	.9	1.0	1.0	1.0	1.0	2903	4081	5128	7610	70	78	80	85
FL	2.8	3.3	3.5	3.8	3.1	3.8	4.0	4.3	3.3	3.9	4.4	4.9	3883	5052	6134	8804	94	97	96	98
GA	2.0	2.1	2.1	2.2	2.3	2.4	2.4	2.4	2.3	2.3	2.3	2.4	3499	4519	5645	8208	84	86	88	91
KY	1.2	1.3	1.5	1.6	1.4	1.5	1.5	1.6	1.6	1.6	1.6	1.6	3240	4403	5728	8614	78	84	89	96
LA	1.4	1.6	1.7	1.8	1.6	1.7	1.7	1.9	1.8	1.8	1.8	1.9	3208	4492	5719	8534	77	86	89	95
MS	.7	.8	.8	.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	2630	3721	4763	7291	63	71	74	81
NC	2.1	2.3	2.3	2.4	2.7	2.7	2.7	2.8	2.5	2.6	2.6	2.6	3383	4426	5551	8117	82	85	86	90
SC	1.0	1.1	1.1	1.2	1.3	1.4	1.4	1.4	1.3	1.3	1.4	1.4	3105	4195	5243	7864	75	80	82	87
TN	1.6	1.7	1.8	2.0	1.9	2.0	2.1	2.2	1.9	2.0	2.0	2.2	3250	4374	5550	8009	78	84	86	89
VA	2.0	2.2	2.3	2.4	2.3	2.4	2.4	2.5	2.3	2.4	2.4	2.5	3842	5147	6342	8950	93	98	99	100
WV	.6	.7	.8	.8	.7	.7	.8	.8	.9	.9	.9	.8	3092	4419	5780	8723	75	85	90	97
AZ	.8	1.0	1.1	1.2	.8	1.0	1.1	1.2	.9	1.1	1.2	1.3	3741	4923	6014	8688	90	94	94	97
NM	.4	.5	.5	.5	.4	.5	.5	.6	.5	.6	.6	.6	3186	4399	5440	7980	77	84	85	89
OK	1.0	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	3470	4751	5925	8434	84	91	92	94
TX	4.9	6.0	6.4	7.1	5.4	6.2	6.5	7.1	5.5	6.0	6.4	7.0	3700	5164	6344	8980	89	99	99	100
CO	1.0	1.3	1.4	1.6	1.1	1.3	1.5	1.7	1.1	1.2	1.4	1.6	3990	5411	6600	9238	96	104	103	103
ID	.3	.4	.4	.4	.3	.4	.4	.5	.4	.4	.4	.5	3381	4716	5705	8188	82	90	89	91
MT	.3	.3	.3	.3	.3	.4	.4	.4	.3	.4	.4	.4	3540	4610	5739	8441	85	88	89	94
UT	.4	.5	.6	.7	.5	.6	.6	.7	.5	.6	.7	.7	3308	4396	5422	8073	80	84	84	90
WY	.1	.2	.3	.3	.2	.2	.3	.3	.2	.2	.2	.3	3849	5791	6943	9593	93	111	108	107
CA	11.2	11.6	11.6	11.7	9.9	10.7	10.9	11.2	9.8	10.2	10.5	10.9	4748	5944	7091	9587	115	114	110	107
NV	.3	.4	.5	.6	.3	.4	.5	.6	.2	.3	.4	.5	4805	6252	7359	9621	116	120	115	107
OR	1.0	1.2	1.3	1.4	1.0	1.2	1.2	1.4	1.0	1.1	1.2	1.4	3929	5384	6477	9037	95	103	101	100
WA	1.8	1.9	2.0	2.0	1.7	1.7	1.9	1.9	1.7	1.7	1.8	1.9	4415	5702	6918	9498	107	109	108	106
AK	.2	.3	.3	.4	.2	.2	.2	.3	.1	.2	.2	.3	4751	7233	8346	11337	115	138	130	126
HI	.4	.4	.5	.5	.4	.5	.5	.5	.4	.4	.4	.5	4712	5643	6699	9098	114	108	104	101
US	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	4144	5227	6420	8993	100	100	100	100

IX. Regional Multipliers

Copies of Industry Specific Gross Output Multipliers for BEA Economic Areas (WRC's Guideline 5, January 1977) are available from the U.S. Government Printing Office, Washington, DC 20402 (#052-045-00048-7 - $2.50).

This document, prepared for WRC by the Department of Commerce, supplies input-output type multipliers for Bureau of Economic Analysis (BEA) Economic Areas to enable water resource planners to estimate the indirect and induced changes in regional gross output which may be attributed to direct changes produced by a water resource project or program.

The report contains input-output type multipliers for 56 industrial sectors for each of 173 BEA economic areas of the U.S. The user is required independently to estimate the initial final demand changes by industry, typically in terms of regional exports due to the project or program under study. The user then selects the appropriate industrial sector multiplier for the study region from the report. The product of the initial change and the multiplier provides an estimate of the total (i.e., direct, indirect, and induced) change in gross output in the region which is attributed to a particular element of the project or program. The sum of such calculations for all elements is the estimate of regional change due to the water development project. Procedures are provided for converting this regional total gross output change into a change in earnings and employment.

For further information on the use of these multipliers contact Douglas McDonald of the Water Resources Council staff at (202) 254-6453.

X. Beach Erosion Control and Hurricane Protection

Procedures have not yet been developed for evaluation of benefits associated with beach erosion control and hurricane protection. However, in some cases the benefit evaluation procedures outlined in the recreation section of the Procedures may be appropriate when considering development or management plans affecing beach erosion. Similarly, planners may find that the procedures outlined in the Urban Flood and Agricultural Flood sections of the Procedures are appropriate when considering development or management plans for protection against hurricanes.

Other procedures for the evaluation of these benefits may be used as long as the steps taken are fully documented and consistent with the general measurement standards outlined in 711.61(b).

XI. WRC Assessment Subareas (ASA) and Subregions (ASR)

Subparts D, E, and F (which describe NED evaluation procedures relating to agriculture) contain references to WRC assessment subareas (ASA).

The Second National Water Assessment prepared by the WRC used the 21 water resources regions of the Nation and the 106 hydrologic subregions (ASR), which are small drainage areas within the major regions. The subregion is the basic information-collecting subdivision but some socioeconomic information had to be compiled by political (county) boundaries. These adjusted subregions follow the subregional hydrologic boundaries as closely as possible and are defined as assessment subareas (ASA).

Individual copies of maps outlining these aggregated subareas (ASA) are available from:

Kerie Hitt
Assessment Division
Water Resources Council
2120 L Street, NW.
Washington, DC 20037
Telephone: (202) 254-6352

Note: An order form for obtaining WRC publications relating to the Second National Water Assessment is attached.

THE NATION's WATER RESOURCES, 1975-2000

The Second National Water Assessment by the U.S. Water Resources Council

olume	GPO Stock Number	Price	Title
1	052-045-00051-7	$ 5.00	Summary
2	052-045-00082-7	11.00	Water Quantity, Quality & Related Land Considerations
3	052-045-00052-5	4.00	Analytical Data Summary
3	052-045-00053-3	4.75	Appx. I, Social, Economic & Environmental Data
3	052-045-00054-1	5.00	Appx. II, Annual Water Supply & Use Analysis
3	052-045-00055-0	7.00	Appx. III, Monthly Water Supply & Use Analysis
3	052-045-00056-8	7.00	Appx. IV, Dry Conditions Water Supply & Use Analysis
3	052-045-0005[illegible]	6.00	Appx. V, Streamflow Conditions
4	052-045-00059-2	4.25	Region 1, New England
4	052-045-00060-6	4.00	Region 2, Mid-Atlantic
4	052-045-00061-4	3.75	Region 3, South Atlantic-Gulf
4	052-045-00062-2	3.75	Region 4, Great Lakes
4	052-045-00063-1	2.75	Region 5, Ohio
4	052-045-00064-9	2.50	Region 6, Tennessee
4	052-045-00065-7	4.75	Region 7, Upper Mississippi
4	052-045-00066-5	4.25	Region 8, Lower Mississippi
4	052-045-00067-3	4.00	Region 9, Souris-Red-Rainy
4	052-045-00068-1	2.75	Region 10, Missouri
4	052-045-00069-0	2.75	Region 11, Arkansas-White-Red
4	052-045-00070-3	3.75	Region 12, Texas-Gulf
4	052-045-00071-1	3.75	Region 13, Rio Grande
4	052-045-00072-0	2.50	Region 14, Upper Colorado
4	052-045-00073-8	2.75	Region 15, Lower Colorado
4	052-045-00074-6	3.75	Region 16, Great Basin
4	052-045-00075-4	2.75	Region 17, Pacific Northwest
4	052-045-00076-2	3.75	Region 18, California
4	052-045-00077-1	3.75	Region 19, Alaska
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XII. Environmental Quality Measurement Methods

The U.S. Water Resources Council is undertaking a 3-year effort to define those environmental quality measurement methods which will be required when analyzing the environmental impact of Level C plans under the Principles and Standards (45 F.R. 64366, September 29, 1980). This effort will result in a set of measurement methods which will allow a systematic and consistent implementation of the Environmental Quality Evaluation Procedures (EQEP) (45 FR. 64402, September 29, 1980). The EQEP provides a broad framework for analyzing environmental impacts.

Under the EQEP, "the EQ account is that part of the NEPA human environment that identifies beneficial and adverse effects on significant EQ resources and attributes," "an EQ resource is a natural or cultural form, process, system, or other phenomenon that--

(1) Is related to land, water, atmosphere, plants, animals, or historic of cultural objects, sites, buildings, structures, or districts; and (2) has one of more EQ attributes (ecological, cultural, aesthetic);" and "EQ attributes are the ecological, cultural, and aesthetic properties of natural and cultural resources that sustain and enrich human life."

The U.S. Water Resources Council invites your participation and cooperation within the above frame of reference by forwarding to the address below copies of those measurement methods which you feel should be candidates for consideration during this work effort.

Mail to: David Shepard
Project Leader, Environmental Quality
U.S. Water Resources Council
2120 L Street, NW.
Washington, DC 20037
Phone: 202 254-6453

XIII. Sources Of Information For Environmental Planning

This section describes a limited number of the agencies and organizations that coordinate the collection and distribution of information related to the evaluation of environmental impacts. The listing is by no means a comprehensive one and the absence of a particular information source should not be considered a reflection of its usefulness or applicability to environmental planning and management. The sources included here are generally involved in the management of a broad range of comprehensive information services and provide nationwide coverage. In most cases they can direct users to other appropriate sources when they do not have the capability to handle a particular request. WRC would appreciate receiving comments on the usefulness of the sources listed below as well as suggestions on which sources to include in future editions of this Handbook. These should be sent to:

Mr. David Shepard
U.S. Water Resources Council
2120 L Street, N.W.
Washington, D.C. 20037
Telephone: (202) 254-6453

1. Department of the Interior Sources and Services:

The U.S. Department of the Interior maintains several information services and offices of specialized technical expertise that are particularly relevant to environmental impact evaluation in water resources planning. These and over 1000 other sources of information within Interior, including

over 60 data bases, are described in detail in the Department's Information Sources and Services Directory, a copy of which can be obtained by writing to:

U.S. Department of the Interior
Office of Library and Information Services
Field Library Services and Special Projects Division
Washington, D.C. 20240
Telephone: (202) 343-5815

A few of the information and technical services that users are likely to find helpful are:

A. U.S. Department of the Interior
Office of Water Research and Technology
Water Resources Scientific Information Center (WRSIC)
Washington, D.C. 20240
Telephone: (202) 343-8435, FTS: 343-8435

Custom-tailored computerized literature searches of the WRSIC data base in response to specific inquiries on existence, location, and availability of documents are performed by the Center. Selected Water Resources Abstracts, a semi-monthly journal published for WRSIC by NTIS, includes abstracts of current and earlier pertinent monographs, journal articles, reports, and other publication formats. These documents cover the water-related aspects of the life, physical, and social sciences as well as related engineering and legal aspects of the characteristics, conservation, control, use, or management of water. Information on current research projects collected from Principal Investigators of WRSIC is also available through the Smithsonian Science Information Exchange (SSIE).

B. U.S. Geological Survey
WATSTORE (Automatic Data Section)
437 National Center
Reston, Virginia 22092
Telephone: (703) 860-6879, FTS: 928-6879

This office has primary responsibility for all automatic data processing activities within the Water Resources Division of U.S.G.S. Hydrologic data on streamflow, river stages, reservoir storage, water temperature, sediment concentrations and discharges, ground water levels, specific conductance, etc., are available in the form of printed tables, graphs, statistical analyses, and digital plots, as well as computer-compatible tapes and cards. The system is referenced by State, county, and latitude-longitude.

C. U.S. Geological Survey
NAWDEX Program Office
421 National Center
Reston, Virginia 22092
Telephone: (703) 860-6031, FTS: 928-6031

Data search and referral services are currently provided through this office by NAWDEX, the National Water Data Exchange. A computerized Water Data Sources Directory identifies and describes the data collection activities of more than 300 water-oriented organizations in Federal, State, and local governments and the private and academic sectors. Types of hydrologic data covered include surface water, groundwater, water quality, biological, and sediment data. NAWDEX has established a nationwide network of local assistance centers at its district offices for local users' access to these services in 45 States and Puerto Rico.

D. U.S. Geological Survey
Office of Water Data Coordination
417 National Center
Reston, Virginia 22092
Telephone: (703) 860-6931, FTS: 928-6931

This office maintains a computerized file of information on water data acquisition activities throughout the U.S. and its territories and possessions called the Catalog of Information on Water Data. All activities pertaining to water-data acquisition, water quality, groundwater, and surface water are covered. The catalog itself serves to describe the availability of data in these areas and does not contain any actual measurements, which must be obtained from the reporting agencies and organizations.

E. U.S. Fish and Wildlife Service
Office of Biological Services
Washington, D.C. 20204
Telephone: (202) 343-4126, FTS: 343-4126

This office provides an environmental strike force capability which will respond to requests for specialized technical assistance on environmental issues relating to the location, quantity, condition, and ecological importance of habitats critical to the survival of the Nation's fish and wildlife resources. It plans and monitors the gathering, analysis, and dissemination of information that will aid decisionmakers in the and resolution of problems associated with major land and water use changes.

F. U.S. Fish and Wildlife Service
Office of Biological Services
National Stream Alteration Team
Route #1
Columbia, Missouri 65201
Telephone: (314) 442-2271 X3271, FTS 276-3271

The National Stream Alteration Team provides technical assistance in assessing the environmental impacts on streams and riparian habitat of such operations as dredging, mining in streams, and reservoir construction. Literature searches through both commercial on-line data bases and hard copy indexes to the scientific literature are available on request. Technical assistance and other information services are available primarily to Federal and State agencies.

2. National Oceanic and Atmospheric Administration Sources and Services:

A. Environmental Data Information Service (EDIS)
National Oceanic and Atmospheric Administration
2001 Wisconsin Avenue, N.W.
Washington, D.C. 20235
Telephone: (202) 234-6500

NOAA's EDIS maintains a set of computer-searchable interdisciplinary files of environmental data, known as the Environmental Data Index (ENDEX), at the National Oceanographic Data Center. These files can be searched by geographic area, type of data, institution holding the data, projects, etc. Descriptions of data collection efforts, detailed inventories of commonly used files, and descriptions of data files can be obtained through ENDEX. Data catalogs from large NOAA environmental data collection projects can be identified.

One of the ENDEX data bases that users are likely to find particularly helpful is the Environmental Data Base Directory (EDBD), which is a computerized inventory of environmental data bases located at Federal, State,

and local government agencies, educational and research institutions, and private industry in the U.S. and Canada. At present, 12,000 environmental data files are described.

Requests for services should include requester's identification, address, phone number, and as much information as possible on geographic areas of interest, types of data needed, data format, time periods, etc.

B. Environmental Science Information Center (ESIC)
User Services Branch, D822
NOAA Library and Information Services Division
6009 Executive Boulevard
Rockville, Maryland 20852
Telephone: (301) 443-8330

ESIC manages NOAA's library and information services and coordinates its participation in the national network of scientific information centers and libraries. Searches of nearly 100 data bases of abstracted or indexed published literature are provided to help identify relevant articles or reports and assist the user in locating the most useful materials. A complete list of ESIC data bases is available on request.

3. Environmental Protection Agency Sources and Services:

A. EPA Information Clearinghouse
401 M Street, S.W.
Washington, D.C. 20460
Telephone: (202) 755-9112

The Clearinghouse manages an indexed inventory describing all EPA environmental data bases. It does not provide raw data, but can describe the availability of water and other data collected by EPA and make referrals to appropriate agency contacts who can access the data. The Clearinghouse will be operational in early 1981.

B. Storage and Retrieval System (STORET)
Environmental Protection Agency
WH 553
401 M Street, S.W.
Washington, D.C. 20460
Telephone: (202) 426-7792

The STORET system is a computerized file of water quality data consisting of 65 million observations covering 400 parameters at 400,000 sampling sites. Continuing users are encouraged to attend the free training seminars offered at 10 regional EPA offices so that they can access STORET data on a self-serve basis. Data is available in both hard-copy and computer-compatible formats and a limited number of standard statistical manipulations can be performed. STORET services are generally made available only to Federal, State, and local governments and their contractors.

4. Other Sources and Services:

A. Smithsonian Science Information Exchange (SSIE)
1730 M Street, N.W.
Washington, D.C. 20036
Telephone: (202) 381-5511

SSIE collects and distributes summaries of research in progress supported

by the Federal Government. It also handles some research supported by major foundations and fund-raising organizations, universities, State and local governments plus a limited number of industrial and non-U.S. organizations. Output consists of a summary of work being performed, researcher, location of research, and sponsoring organization.

B. Current Research Information System (CRIS)
National Agricultural Library
5th Floor
Beltsville, Maryland 20705
Telephone: (301) 344-3850

CRIS is an automated system for storing and retrieving information on research projects of the U.S. Department of Agriculture and the State Agricultural Experiment Stations. The data base consists of in excess of 34,000 resumes of current or recently completed projects sponsored or conducted by 55 State agricultural experiment stations, 30 forestry schools and other cooperating institutions, and 6 agencies in USDA. Resumes are updated annually. Summaries include title, location, organization doing research, investigation, objectives, progress and approach.

C. National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, Virginia 22161
Telephone: (703) 557-4142

NTIS maintains a computer-based bibliographic data file on government funded publications on research, development and engineering as well as machine processible data and related software. NTIS collects and sells copies of specialized technical information. Over 1,000,000 titles on

file in 1978 with 70,000 added annually.

D. Environmental Data Center (EDC)
392 Madison Avenue
New York, New York 10017
Telephone: (212) 949-9494

EDC provides comprehensive summaries of environmental information including journal articles, books, technical reports, conference proceedings, and patents through its Environmental Index (ENVIRONLINE). Selected information from the Federal File contains 70,000 entries from 1970 to present with 10,000 entries added annually.

E. Bio Science Information Service (BIOSIS)
2100 Arch Street
Philadelphia, Pennsylvania 19103
Telephone: (215) 568-4016

BIOSIS maintains a data base of international research in the life sciences. Source material includes primary journals, symposia theses, monographs, and technical reports. Subject categories include: agriculture and agricultural engineering, environment, food science, life science, and medicine. Files contain 2.5 million entries with 250,000 added each year.

F. U.S. Water Resources Council
2120 L Street, N.W.
Washington, D.C. 20037
Telephone: (202) 254-6453

The Council periodically publishes a Water Resources Coordination Directory which provides a description of water-related Federal, regional,

State, and local agencies and their areas of interest and jurisdiction. It is prepared by the Council to facilitate communication among the various organizations and individuals that share an interest in water and related land resources.

G. National Wildlife Federation
1412 16th Street, N.W.
Washington, D.C. 20036
Telephone: (202) 797-6800

The National Wildlife Federation publishes a list of Federal departments and agencies; State and territorial agencies; citizen groups; interstate commissions and organizations; and directories and periodicals concerned with natural resource use and management in its Conservation Directory.

XIV. Agency Environmental Training Courses

Since the Environmental Quality Evaluation Procedures are new (Federal Register, September 29, 1980), the Water Resources Council is providing for this issue a selected list of environmental training courses of individual agencies which may be pertinent to the field planner. These are made available to other agencies on a space available basis. If your agency has similar courses suitable for the field planner and would like to use the Reference Handbook as a vehicle for information dissemination, please forward your information (name of course, location, dates, short course description, and name, address and telephone number of contact), to the address below. However, because of limited space in the Handbook, only selected courses will be included. If you wish to make your training catalog available to planners in other agencies, please provide us with the name, address, and telephone number of the contact and we will publish that information in the next edition of the Handbook.

Information concerning the availability of agency training courses should be mailed to:

David Shepard
Policy Analysis Division
Water Resources Council
2120 L Street, NW.
Washington, DC 20037

A. U.S. Army Corps of Engineers' Training Courses

Following are several selected Army Corps of Engineers' training courses which are available to other agencies. For further information contact the Registrar at:

U.S. Army Engineers Division, Huntsville
Attention: HNDTD
P.O. Box 1600
Huntsville, AL 35807
Telephone: (205) 453-0490
FTS: 872-1666 (leave message only)

ENVIRONMENTAL APPLICATIONS OF GEOLOGY AND HYDROLOGY

Study of the fundamentals of hydrology and geology and evaluation of the constraints imposed by their principles upon land use. The influence of topography, energy, mineral, soil and water resources upon the environment and geologic and hydrologic hazards are also considered.

Fiscal Year 1981 Dates	Location
June 1-5, 1981	Huntsville, Alabama

FLOOD CONTROL PLANNING

This course is intended to provide an understanding of the issues, tools and techniques prevalent in the flood control planning process. Emphasis will be placed on the planning and operational models used in Corps of Engineers planning studies. Topics to be discussed include: The hydrologic and economic analyses required by current planning guidelines, "optimal sizing" of system components, spatial analysis techniques for planning studies, nonstructural methods, evaluation and selection of computer models for planning, and strategies for flood control system formulation.

Fiscal Year 1981 Dates	Location
May 4-15, 1981	Davis, California

URBAN ENVIRONMENT

Course will include study sessions on environmental urban planning; developing open space and nonstructural solutions for floodways; planning and designing recreational facilities at urban projects; minimizing impacts on air and water quality and cultural resources; planning for the preservation and enhancement of natural habitats on project lands; and gaining public support for proposed projects in urban areas. A field survey of Corps urban flood control, navigation, shore protection, and recreational

development projects that have impacted on the urban environment or successfully responded to environmental concerns and constraints will be included.

Fiscal Year 1981 Dates	Location
May 4-13, 1981	Los Angeles, California

APPLICATION OF WATER QUALITY AND ECOLOGICAL MODELS

This course is designed to provide attendees with the "how to" required to apply and evaluate results from water quality and ecological models. Its includes:

a. Overview of reservoir and stream water quality and aquatic ecology.
b. Introduction to modeling.
c. Review of available mathematical models (includes stream and one- and two-dimensional reservoir models--not limited to CE models).
d. Model assumptions and limitations.
e. Model structure (physical--water budgets, temperature, light, hydrodynamics, suspended solids; chemical--dissolved oxygen, biochemical oxygen demand, carbon, phosphorus, nitrogen, PH, alkalinity, etc.; biological--algae, zooplankton, benthos, fish, coliforms).
f. Data preparation and analysis (minimum data requirements, site characteristics, model updates, initial conditions, coefficient selection).
g. Calibration procedures.
h. Output interpretation.
i. Case studies.

This course is designed for people working in water quality and/or environmental areas who are (or will be) involved with actual "hands on" use of mathematical models or are involved with the review and evaluation of model applications. Some basic knowledge of the fundamentals of reservoir and stream water quality is required.

Fiscal Year 1981 Dates	Location
May 4-15, 1981	Cincannati, Ohio

WETLANDS SCIENCE AND TECHNOLOGY

A basic or introductory course in wetlands science and technology for regulatory functions, water resources planning and environmental resources personnel. Subjects to be covered are:

a. Wetlands identification, classification and delineation.
b. Wetlands ecology, functions and values.
c. Wetlands rating and evaluation.

d. Impact of engineering construction on wetland areas.
e. Planning and design for preservation of wetlands values.
f. Field examination of representative regional wetlands types.
g. Review of statutory and administrative wetlands policies and programs.

Fiscal Year 1981 Dates	Location
July 27-31, 1981	Alaska
August 3-7, 1981	S. Cent. Interior
August 10-14, 1981	N. Cent. Interior
August 24-28, 1981	West Coast
August 31-September 4, 1981	Gulf
September 14-18, 1981	North Atlantic
September 21-25, 1981	South Atlantic

WETLANDS SPECIALIST

Field identification of wetland types; several classification systems are used including that of the USFWS. Field and lab identification of about 100 coastal and inland wetland plants. Identification of associated soils and fauna. Field techniques of mapping. Evaluation of wetlands by type and specifically by site. Conducting environmental assessments, reporting and testifying on wetlands. Development and management of wetlands. The course is designed for biologists and allied disciplines who work in planning or regulatory functions and require credible expertise in wetlands determinations and evaluations. A background in botany, vertebrate zoology, and/or plant/animal ecology is required. This is an extremely intensive course; nominees should be in excellent physical health, be able to walk ten miles and be prepared to work long hours.

Fiscal Year 1981 Dates	Location
July 26-August 8, 1981	Wallops Island, Virginia
August 9-22, 1981	Wallops Island, Virginia

WETLANDS ECOLOGY

Field identification of wetland types and the important, dominant and indicator plants and animals of the wetlands. The environmental parameters that establish type and form of wetlands--salinities, soils, hydrology, seral stage and exposure. The utility and functions of wetlands. Corps regulatory jurisdiction and project responsibilities. Effects of dredging and filling and Corps projects on wetlands. Predictive ecology. Wetlands development and management. The management of the Corps wetlands missions. Legally defensible decisions in wetlands. Interagency agreements and coordination.

This course is more extensive, less intensive, specialized and arduous than the Wetlands Specialist course. This course is designed for generalists in the environmental sciences, and supervisory personnel who currently have, or may have, a responsibility in the wetlands area but now have a limited

background in the subject. Starting or generalist scientists; supervisors; lawyers; researchers; and research managers are the targeted stratum for the course. Applicants should be in good health and willing to work long hours.

Fiscal Year 1981 Dates	Location
August 23 - September 5, 1981	Wallops Island, Virginia

WETLANDS-EXECUTIVE LEVEL

This course consists of a review of existing and emerging Federal laws, regulations and executive orders; judicial interpretations and their programmatic impact; related state programs and their implication for Corps regulatory and civil works programs; interface with other Federal agencies; physical makeup and functions of wetlands with brief field exposure; national perspective of wetlands resources presented by prominent representatives of the scientific and environmental communities; and open discussion of issues and problems.

Fiscal Year 1981 Dates	Location
April 13-14, 1981	To be announced
April 15-16, 1981	To be announced

B. U.S. Fish and Wildlife Service's Training Courses

The following are several selected U.S. Fish and Wildlife Service training courses which are available to other agencies. For further information, contact the individual named on the course description sheet.

HABITAT EVALUATION PROCEDURES (HEP)

In 1976, the U.S. Fish and Wildlife Service (FWS) published a methodology for use in evaluating fish and wildlife habitat, entitled the Habitat Evaluation Procedures (HEP). This methodology has been reviewed and updated over the past four years. A one-week training course is being offered to instruct users in the application of HEP. A schedule of confirmed training dates is listed below. Attendance is limited, and interested persons should contact the HEP Coordinator in their FWS Regional Office as soon as possible to reserve a space in a training course.

FY 81 Dates	FWS Region	Location
October 6-10	3	Indianapolis, Indiana
October 20-24	5	Portsmouth, New Hampshire
November 17-21	4	Jackson, Mississippi
December 1-5	6	Denver, Colorado
January 12-16	1	Portland, Oregon
January 26-30	4	Asheville, North Carolina
February 9-13	6	Lincoln, Nebraska
March 2-6	Alaska	Anchorage
March 16-20	2	Phoenix, Arizona
April 6-10	3	St. Louis, Missouri
April 27 - May 1	2	Albuquerque, New Mexico
May 18-22	5	Harrisburg, Pennsylvania
June 1-5	1	Sacramento, California
August 3-7	5	Annapolis, Maryland

For further information about any of these sessions, please contact the HEP Coordination in that Region.

FWS Region	Coordinator	Phone
1	Mac McKie	(FTS) 429-6150 or (503) 231-6150
2	Dean Watkins	(FTS) 474-2914 or (505) 766-2914
3	Jerry Decker	(FTS) 725-3536 or (612) 725-3536
4	Bruce Bell	(FTS) 242-6343 or (404) 221-6343
5	Robin Burr	(FTS) 829-9217 or (617) 965-5100
6	Grady Towns	(FTS) 234-5586 or (303) 234-5586
Alaska	Greg Konkel	(FTS operator) 399-0150; ask for (907) 276-3800

INSTREAM FLOW COURSES

To confirm course dates and to obtain other course information for the following instream flow courses, contact:

Center for Conferences and Institutes
Colorado State University
Fort Collins, CO 80522
Attention: Craig Sommer
Telephone: (303) 491-6222 (commercial only)

INSTREAM FLOW FIELD TECHNIQUES SHORT COURSE

Course objectives are (1) develop an understanding of the sampling involved in study site selection and transect placement; (2) develop operational skills in differential leveling, profile leveling; distance measurement, and velocity and discharge measurement; (3) develop an appreciation for quality control in data collection, and skills in using various trouble-shooting techniques to correct errors; and (4) develop an understanding of the states of flow, and how to work around such problems as rapidly varied and unsteady flow situations.

Fiscal Year 1981 Dates	Location
October 6-10, 1980	Tulsa, Oklahoma
February 1981	Atlanta, Georgia
April 1981	Denver, Colorado
May 1981	Anchorage, Alaska
July 1981	Boston, Massachusetts
August 1981	Portland, Oregon

INSTREAM FLOW STRATEGIES/NEGOTIATIONS SHORT COURSE

Course objectives are (1) analyze water law relating directly to stream flow protection; (2) identify and evaluate strategies for protecting instream flows; (3) enhaance participant's abilities in strategy selection and design; (4) introduce the basic principles of negotiation; and (5) develop skills in presenting and defending instream flow recommendations.

Fiscal Year 1981 Dates	Location
October 27-31, 1980	Anchorage, Alaska
November 17-21, 1980	Boston, Massachusetts
January 1981	Atlanta, Georgia
January 1981	Denver, Colorado
March 1981	Seattle, Washington
July 1981	Minneapolis, Minnesota
August 1981	Fort Worth, Texas

INSTREAM FLOW COMPUTER ANALYSIS COURSE

Course objectives are (1) to develop operational level skills in the use of the PHABSIM computer modelling system; (2) provide an understanding of Job Control language and the use of procedure files; (3) develop skills in use of interactive data entry and file modification programs; and (4) develop skills in the calibration and quality control in the use of hydraulic simulation models.

Fiscal Year 1981 Dates	Location
December 15-19, 1980	Fort Collins, Colorado
February 1981	
May 1981	
August 1981	

Additional courses will be scheduled according to demand.

XV. Agency Contacts

The following persons will be advised of developments relating to this Handbook that affect their agencies and will pass this information on to planners.

1. Dick Porter/WPRS
   (202) 343-5501

2. Art Flechinger/SCS
   (202) 447-7829

3. Dave Hottenstein/COE, DAEN-CWP-P
   (202) 272-0134

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federal register

Friday
December 14, 1979

Part X

Water Resources Council

Principles and Standards for Planning Water and Related Land Resources

WATER RESOURCES COUNCIL

Principles and Standards for Planning Water and Related Land Resources

1. Notice is hereby given by the Water Resources Council that the Principles and Standards for Planning Water and Related Land Resources have been revised pursuant to the President's memorandum to the Chairman and Members of Water Resources Council, subject: Improvements in the Planning and Evaluation of Federal Water Resources Programs and Projects, dated July 12, 1978.

2. In accordance with that memorandum, the Principles and Standards have been revised to accomplish the full integration of water conservation into project and program planning and review as a means of achieving both the national economic development (NED) and environmental quality (EQ) objectives, and to require the preparation and inclusion of a primarily nonstructural plan as one alternative whenever structural project or program alternatives are considered. Additional changes were made to the Standards to assure consistency with the procedures for national economic development benefit and cost evaluation.

3. Only those sections of the Principles and Standards that have been revised or modified are published as part of this notice. The revised sections or parts of sections are italicized in this publication and referenced to the September 10, 1973 (38 FR 24778) Principles and Standards. Where no changes have been made, the words "No change" appear in parentheses after the title of the section.

4. The Council published on May 24, 1979, "Proposed Revisions to the Principles and Standards for Planning Water and Related Land Resources" (48 FR 30247) and invited public comment on the proposal. Comments were received through oral statement at the public meetings held on the proposal and through written submittal to the Council during the 60-day comment period.

5. Indicated below are the areas, listed by subject, where changes were made in the proposed revisions to the Principles and Standards as published on May 24, 1979:

a. Consideration and comparison of alternatives: conservation contrasted with storage.

b. Plan selection: discussion of net benefits.

c. Hydropower: measurement of benefits where utilities practice long run marginal cost pricing.

d. Water supply: measurement of benefits where communities practice long run marginal cost pricing.

e. Formulation of alternative plans: examples of nonstructural alternatives.

6. The Water Resources Council prepared an environmental assessment of the revisions to the Principles and Standards. Copies of this assessment may be obtained from the Director, U.S. Water Resources Council, 2120 L Street, NW., Washington, DC 20037.

7. These revisions shall be used for the planning of water resources projects covered in Section I.B of the Standards. The revisions apply to all levels of planning if such projects or plans are subject to the Principles and Standards. They shall be applicable to: (a) Projects and plans which may be approved by agency administrators, (b) projects and plans requiring congressional authorization, and (c) authorized projects or separable project features of such projects not yet under construction for which agencies currently prepare post-authorization planning documents. For the purpose of implementing these revisions, a project shall be considered under construction when funds have been appropriated by the Congress or budgeted by the President for land acquisition or physical construction activity. Projects for which post-authorization planning documents are not required shall be considered under construction when authorized for construction.

8. In reference to Level C studies, the Secretary of each Department shall retain the discretion to review those projects not under construction and, where deemed reasonable, may exempt a project from complying with these revisions or may partially exempt a project and direct expedited additional planning to more fully meet specific revisions. This discretionary authority applies to those projects not yet authorized for which preauthorization planning is now complete or will be completed by the end of FY 1980 and those authorized projects requiring post-authorization planning if such planning is now complete or will be complete by the end of FY 1980. Preauthorization or post-authorization planning shall be considered complete when the appropriate planning documents have been approved by the responsible agency's field office. Such Secretarial review is to ensure that adequate and reasonable discretion exists to prevent undue loss of time or expediture of public funds in those cases where additional planning is not considered necessary. This discretionary authority shall not be exercised after July 31, 1981. Authorized projects exempted from complying with the Principles and Standards shall also be exempted from complying with the adopted revisions.

9. The Council is presently undertaking further review and revision of the Principles and Standards with the objective of publishing the Principles and Standards as a proposed rule. This effort will include: (a) Revision for clarity and conciseness, (b) revision to incorporate the requirements of Urban and Community Impact Analysis and (c) revisions to integrate the requirements of the National Environmental Policy Act.

10. Pursuant to Section 103 of the Water Resources Planning Act (Pub. L. 89-80) the President approved the Principles as they appear herein. Pursuant to E.O. 11747 (38 FR 30993, November 7, 1973), the Chairman of the Water Resources Council approved the Standards as they appear herein.

11. These revisions to the Principles and Standards are effective immediately.

Leo M. Eisel,
Director.

Revisions to the Principles for Planning Water and Related Land Resources

I. Purpose and Scope (No change)

II. Objectives (No change)

III. Other Beneficial and Adverse Effects (No change)

IV. General Evaluation Principles

A. General Setting (No change)

B. Measurement of Beneficial and Adverse Effects (No change)

C. Price Relationships (No change)

D. The Discount or Interest Rate (No change)

E. Consideration and Comparison of Alternatives

A range of possible alternatives capable of application by various levels of government and nongovernmental interests should be *systematically evaluated in terms of their contributions to the national economic development and environmental quality objectives.*

Water conservation shall be fully integrated into project and program planning and review as a means of achieving both the national economic development and environmental quality objectives. Water conservation consists of actions that will (a) reduce the demand for water; (b) improve efficiency in use and reduce losses and waste; and (c) improve land management practices to conserve water. A clear contrast is drawn between the above conservation

elements and storage facilities for new supplies.

In addition, at least one primarily nonstructural plan will be prepared and included as one alternative whenever structural project or program alternatives are considered. This alternative and other plans should incorporate a combination of nonstructural or demand-reducing measures which could feasibly (in light of the national economic development and environmental quality objectives) be employed or adopted to achieve the overall project purpose.

Alternative plans should not be limited to those the Federal Government could implement directly under present authorities. Therefore the cooperative role of local, State, regional, and Federal organizations in implementing alternatives will be stressed. Plans, or increments thereto, will not be recommended for Federal development that, although they have beneficial effects on the objectives, would physically or economically preclude alternative non-Federal plans which would likely be undertaken in the absence of the Federal plan and which would more effectively contribute to the objectives when comparably evaluated according to these principles.

F. Period of Analysis (No change)

G. Scheduling (No change)

H. Risk and Uncertainty (No change)

I. Sensitivity Analysis (No change)

J. Updating Plans (No change)

V. Plan Formulation

Plans will be directed to the improvement in the quality of life by *contributing to the* meeting *of* current and projected needs and problems as identified by the desires of people in such a manner that improved contributions are made to society's preferences for national economic development and environmental quality. These plans should be formulated to reflect national, regional, State, and local needs or problems consistent with the above two objectives.

Planning of water and land resources is a part of broader public and private planning to meet regional and local needs and to alleviate problems. Therefore, planning for water and land resources should be carefully related to other regional or local planning activities and should include active participation of all interests.

Plans for water and land resources will focus upon the specified components of the objectives desired for the designated region, river basin, State, or local planning setting. These are expressed in terms of projected needs and problems identified in each planning setting.

The planning process includes the following major steps:

(1) Specify components of the objectives relevant to the planning setting;

(2) Evaluate resource capabilities and expected conditions without any plan;

(3) Formulate alternative plans to achieve varying levels of contributions to the specified components of the objectives, *including preparation of at least one primarily nonstructural alternative;*

(4) Analyze the differences among alternative plans which reflect different emphasis among the specified components of the objectives;

(5) Review and reconsider, if necessary, the specified components for the planning setting and formulate additional alternative plans as appropriate; and

(6) Select a recommended plan from among the alternative plans based upon an evaluation of the trade offs between the objectives of national economic development and environmental quality and considering, where appropriate, the effects of the plans on regional development and social well-being.

A. Specification of Components of the Objectives

At the outset and throughout the planning process, the responsible planning organization will consult appropriate Federal, regional, State, and local groups to ascertain the components of the objectives that are significantly related to the use and management of the resources in the planning setting. These will be expressed in terms of needs and problems.

The components selected for use in formulating alternative plans should be of concern to the Nation, and the components should be those that can reasonably be expected to be substantially influenced through the management and development alternatives *which may be implemented by Federal, State, or local entities.* The components of objectives for which plans are formulated can be expected to change over time and between areas of the Nation as preferences and possibilities change and differ. These changes will be reflected in the Water Resources Council's Standards.

The objectives for which plans are formulated can also be expected to change over time as preferences and possibilities change. Changes in objectives will be accommodated only through revision of these principles.

The specified components will be defined so that meaningful alternative levels of achievement are identified. This will facilitate the formulation of alternative plans in cases where there may be technical, legislative, or administrative constraints to full achievement of objectives.

B. Evaluation of Conditions Without a Plan (No change)

C. Formulation of Alternative Plans

The planning process involves an evaluation of alternative means, including both structural and nonstructural measures, to achieve desired effects.

Based upon identified needs and problems, alternative plans will be prepared and evaluated in the context of their contributions to the objectives. This involves comparisons between objectives, and it will be necessary to formulate alternative plans that reflect different relative emphasis between the objectives for the planning setting.

The number of alternative plans to be developed for each planning effort will depend upon complementarities or conflicts among specified components of the objectives, resource capabilities, technical possibilities, and the extent to which the design of additional alternative plans can be expected to contribute significantly to the choice of a recommended plan. Because planning staffs are limited, emphasis should be placed on examination of those alternative waters and land-use plans which may have appreciable effects on objectives.

With respect to the number of alternative plans there will be a continuing dialog among the Water Resources Council, river basin commissions, and other planning groups, emphasizing on the one hand the need for national guidelines and overview of objectives for which alternative plans are formulated, and on the other the special insights into local planning situations that field level teams may develop.

Appropriate methods and techniques for estimating beneficial and adverse effects will be used to provide reliable estimates of the consequences and feasibility of each alternative plan.

One alternative plan will be formulated in which optimum contributions are made to the national economic development objective. Additionally, during the planning process at least one alternative plan will be formulated which emphasizes the contributions to the environmental quality objective. *In addition, a primarily nonstructural plan shall be*

prepared and included whenever structural project or program alternatives are considered. Other alternative plans reflecting significant physical, technological, legal or public policy constraints or reflecting significant trade-offs between the national economic development and environmental quality objectives may be formulated so as not to overlook a best overall plan. (The rest of this section remains unchanged.)

D. Analysis of Alternative Plans (No change)

E. Reconsideration of Specified Components of the Objectives (No change)

F. Plan Selection

From its analysis of alternative plans, the planning organization will select a recommended plan. The plan selected will reflect the relative importance attached to different objectives and the extent to which the two objectives can be achieved by carrying out the plan.

The recommended plan should be formulated so that beneficial and adverse effects toward objectives reflect, to the best of current understanding and knowledge, the priorities and preferences expressed by the public at all levels to be affected by the plan. A recommended plan *(when considered individually on the basis of with-project and without-project comparison) must be justified on the basis that combined beneficial NED and EQ effects outweigh combined adverse NED and EQ effects. Therefore, a plan lacking net NED benefits may be recommended when EQ benefits are sufficiently large, even though the latter are not stated in dollar terms.* A Departmental Secretary or head of an independent agency may make an exception to the net benefits rule if he/she determines that circumstances unique to the plan formulation process warrant such exception.

In addition to the recommended plan with supporting analysis, other significant alternative plans embodying different priorities between the objectives *and in consideration of water conservation and nonstructural planning requirements* will be presented in the planning report. Included with the presentation of alternative plans will be an analysis of trade offs among them. The trade offs will be set forth in explicit terms, including the basis for choosing the recommended plan from among the alternative plans.

VI. System of Accounts (No change)

VII. Cost Allocation, Reimbursement, and Cost Sharing (No change)

VIII. National Program for Federal and Federally Assisted Activities (No change)

IX. Implementation of Principles (No change)

X. Application and Effect

These Principles for Planning Water and Land Resources shall be implemented by the Water Resources Council and shall be applied by river basin commissions, other Federal-State organizations, and each of the Federal departments and agencies. The Office of Management and Budget, the Council on Environmental Quality, and other organizations in the Executive Office of the President will use these Principles in their review of proposed project, basin, or regional plans.

The Policies, Standards, and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources, approved by the President, May 15, 1962, printed as Senate Document 97, 87th Congress, 2d Session, together with Supplement No. 1 thereto, June 6, 1964, "Evaluation Standards for Primary Outdoor Recreation Benefits," and the amendment of December 24, 1968, 18 CFR Sec. 704.39, "Discount Rate," are revoked. *(September 5, 1973).*

These revisions to the Principles shall take effect immediately upon their publication by the Chairman of the Water Resources Council in the **Federal Register.**

Approved:

Jimmy Carter.

November 27, 1979.

Revisions to the Standards for Planning Water and Related Land Resources

I. Purpose and Scope (No change)

II. Objectives

A. Introduction. (The following completely replaces the existing section.)

The Principles for Planning Water and Land Resources define the objectives of national economic development and environmental quality. These objectives provide the basis for the formulation of State, region, and river basin plans for the use of water and land resources to *contribute to meeting* forseeable short- and long-term needs and have been explicitly stated or implied in numerous congressional enactments and Executive actions. The most notable of these actions in water and related areas are summarized below.

In the Flood Control Act of 1936, the Congress declared that benefits to whomsoever they may accrue of Federal projects should exceed costs. Interpretation of this statute has resulted in development of various analytical procedures to evaluate the benefits and costs of proposed projects. These procedures have centered around a national economic efficiency analysis and were first published as "Proposed Practices for Economic Analysis of River Basin Projects" in May 1950 and revised in May 1958. Budget Bureau Circular No. A–47 was issued on December 31, 1952, informing the agencies of considerations which would guide the Bureau of the Budget in its evaluations of projects and requiring uniform data that would permit comparisons among projects.

On October 6, 1961, the President requested the Secretaries of Interior, Agriculture, Army, and Health, Education, and Welfare to review existing evaluation standards and to recommend improvements. Their report, "Policies, Standards, and Procedures in the Formulation, Evaluation, and Review of Plans for Use and Development of Water and Related Land Resources," was approved by the President on May 15, 1962, and published as Senate Document No. 97, 87th Congress, 2d Session. This document replaced Budget Bureau Circular No. A–47 and in turn has been superseded by the "Principles for Planning Water and Land Resources," upon their approval by the President, and by these "Standards for Planning Water and Land Resources."

On July 12, 1978, the President directed that the Principles and Standards for Planning Water and Related Land Resources, (P&S), (38 FR 24778, September 10, 1973), be scrupulously adhered to in the planning, review and implementation of Federal water resources projects. Moreover, the President directed that the September 10, 1973 P&S be modified to accomplish the full integration of water conservation into project and program planning and review as a component of both the economic development and environmental quality objectives and to require the preparation and inclusion of a primarily nonstructural plan as one alternative whenever structural projects or program alternatives are considered. The revisions to the "Principles for Planning Water and Land Resources" and these revisions to the "Standards for Planning Water and Land Resources" become effective immediately.

By enacting laws and taking actions enumerated below and others, the Congress and the President have broadened the objectives to be considered in water and land resources planning.

The two objectives as defined in the principles and set forth in more detail in these standards provide a flexible planning framework that is responsive to and can accommodate changing national needs and priorities.

The statement of the objectives and specification of their components in these standards is without implication concerning priorities to be given to them in the process of plan formulation and evaluation. These standards, nonetheless, do recognize and make provision for a systematic approach by which the general public and decisionmakers can assess the relative merits of achieving alternative levels of satisfaction to the two objectives where there may be conflict, competition, or complementarity between them. This will provide the type of information needed to improve the public decisionmaking process.

B. Major Congressional *and Presidential* Directives

Many laws that give new or more definitive directions to Federal participation in planning for water and land resources have been passed in recent years. Some major enactments are:

The Federal Water Project Recreation Act of 1965 (Pub. L. 89–72), provides for full consideration of opportunities for recreation and fish and wildlife enhancement in Federal projects under specified cost allocation and cost-sharing provisions.

The Water Resources Planning Act of 1965 (Pub. L. 89–80), establishes a comprehensive planning approach to the conservation, development and use of water and related land resources. The Act emphasizes joint Federal-State cooperation in planning and consideration of the views of all public and private interests. Section 103 of the Act provides that "The Council shall establish, after such consultation with other interested entities, both Federal and non-Federal, as the Council may find appropriate, and with the approval of the President, principles, standards, and procedures for Federal participants in the preparation of comprehensive regional or river basin plans and for the formulation and evaluation of Federal water and related land resources projects."

The Act further provides in section 102(b) that "the Council shall • • • maintain a continuing study of the relation of regional or river basin plans and programs to the requirements of larger regions of the Nation and of the adequacy of administrative and statutory means for the coordination of the water and related land resources policies and programs of the several Federal agencies; it shall appraise the adequacy of existing and proposed polices and programs to meet such requirements; and it shall make recommendations to the President with respect to Federal policies and programs."

The Act also provides in Section 301(b) that "The Council, with the approval of the President, shall prescribe such rules, establish such procedures, and make such arrangements and provisions relating to the performance of its functions under this title, and the use of funds available therefor, as may be necessary in order to assure (1) coordination of the program authorized by this title with related Federal planning assistance programs, including the program authorized under section 701 of the Housing Act of 1954 and (2) appropriate utilization of other Federal agencies administering programs which may contribute to achieving the purpose of this Act."

The Water Resources Planning Act, as amended, is attached as Appendix A.

The Public Works and Economic Development Act of 1965 (Pub. L. 89–136) establishes national policy to use Federal assistance in planning and constructing public works to create new employment opportunities in areas suffering substantial and persistent unemployment and underemployment. The Act provides for establishing Federal-State regional commissions for regions that have lagged behind the Nation in economic development.

The Water Quality Act of 1965 (Pub. L. 89–234) and subsequent amendments provides for establishing water quality standards for interstate waters. These water quality standards provide requirements and goals that must be incorporated into planning procedures.

In authorizing the Northeastern Water Supply Study in 1965 (Pub. L. 89–298), Congress recognized that assuring adequate supplies of water for the great metropolitan centers of the United States has become a problem of such magnitude that the welfare and prosperity of this country require the Federal Government to assist in solution of water supply problems.

The Clean Water Restoraton Act of 1966 (Pub. L. 89–753) provides assistance for developing comprehensive water quality control and abatement plans for river basins.

The Department of Transportation Act of 1966 (Pub. L. 89–670) provides standards for evaluating navigation projects and provides for the Secretary of Transportation to be a member of the Water Resources Council.

The Wild and Scenic Rivers Act of 1968 (Pub. L. 90–542) provides that in planning for the use and development of water and related land resources consideration shall be given to potential wild, scenic, and recreational river areas in river basin and project plan reports, and comparisons are to be made with development alternatives which would be precluded by preserving these areas.

The National Flood Insurance Act of 1968 (title XIII, Pub. L. 90–448, *as amended*) provides that States, to remain elegible for flood insurance, must adopt acceptable arrangements for land use regulation in flood-prone areas. This provision, together with *Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands, both issued May 24, 1977,* places increased emphasis on land use regulations and administrative policies as a means of reducing flood damages *and protecting the natural and beneficial values of floodplains and wetlands.* Planning policies must include adequate provision for these *laws* and directives in an integrated program of floodplain management. (The rest of this section remains unchanged.)

C. Relationships of Program Measures to Objectives (No change)

D. Objectives

1. National economic development. The national economic development objective is enhanced by increasing the value of the Nation's output of goods and services and improving national economic efficiency.

National economic development reflects increases in the Nation's productive output, an output which is partly reflected in a national product and income accounting framework designed to measure the continuing flows of goods and services into direct consumption or investment.

In addition, national economic development is affected by beneficial and adverse externalities stemming from normal economic production and consumption, imperfect market conditions, and changes in productivity of resource inputs due to investment. National economic development is also affected by the availability of public goods which are not accounted for in the national product and income accounting framework. Thus, the concept of national economic development is

broader than that of national income and is used to measure the impact of governmental investment on the total national output. The gross national product and national income accounts do not give a complete accounting of the value of the output of final goods and services resulting from governmental investments because only government expenditures are included. This is especially true in those situations where governmental investment is required to overcome imperfections in the private market. Therefore, national economic development as defined in these standards is only partially reflected in the gross national product and national income accounting framework.

A similar situation prevails where a private investment results in the production of final public goods or externalities that are not exchanged in the market.

Components of the national economic development objective include:

a. The value of increased outputs of goods and services resulting from a plan. *Development and management* of water and land resources result in increased *or more efficient* production of goods and services which can be measured in terms of their value to the user. Increases in crop yields, expanding recreational use, and peaking capacity for power systems are examples of direct increases in the Nation's output which result from water and related land resources *development and management.* Moreover, such *development and management* often results in a change in the productivity of natural resources and the productivity of labor and capital used with these resources. Increased earnings from changes in land use, reduced disruption of economic activity due to droughts, floods and fluctuating water supplies, and removal of constraints on production through increased water supplies *or improved water management* are examples of direct increases in productivity from water and land development that contribute to national output. *Development and management* of water and land resources may result in increased production from the employment of otherwise unemployed or underemployed resources, as well as contributions to increased output due to cost savings resulting in the release of resources for employment elsewhere.

b. The value of output resulting from external economies. In addition to the value of goods and services derived by users of outputs of a plan, there may be external gains to other individuals or groups.

2. Environmental Quality (No change)

E. Effects on Objectives (No change)

F. Beneficial Effects on National Economic Development

Beneficial effects in the national economic development account are the increases of the value of the output of goods and services and improvements in national economic efficiency.

1. General measurement concepts. There are two basic sources of increased output of goods and services that contribute toward enhancing national economic development. First, additional resources may be employed using normal production techniques, as, for example, in the application of irrigation water and other associated resources to land for the production of agricultural commodities or in the use of electric power and other associated resources for the production of aluminum. Second, resource productivity changes may be induced by the plan, resulting in more efficient production techniques to be used to achieve a higher level of output from the same resources or the same level of a specific output with fewer resources or the employment of otherwise unemployed or underemployed resources than would be achieved without the plan. In the latter case, the release of productive resources which can be employed elsewhere in the economy for the production of other goods and services ultimately results in an increase in national output as a consequence of a plan. *For example, reduced consumptive use of water in irrigation through improved water management may make that saved water available to irrigate additional acreage, provide for municipal use, or satisfy in-stream flow needs for fish and wildlife without construction of additional supplies.* These two sources of increased output may apply to situations in which the plan results in the production of final consumer goods or intermediate producer goods utilized by direct users; and they may also apply in situations in which firms are indirectly affected through economic interdependence with firms which utilize the intermediate producer goods from the plan.

For convenience of measurement and analysis, beneficial effects on national economic development are classified as follows:

a. The Value of increased outputs of goods and services from a plan;

b. The value of output resulting from external economies caused by a plan.

In each case, with and without analysis must be applied to ascertain that with a plan there is a net increase in the production of goods and services, regardless of source, over those that would be obtained in the absence of the plan.

The general measurement standard for increases in the national output of goods and services will be the total value of the increase, where total value is defined as the willingness of users to pay for each increment of output from a plan. Such a value would be obtained if the "seller" of the output was able to apply a flexible unit price and charge each user (consumer) an individual price to capture the full value of the output to the user. This concept is illustrated in figure 1.

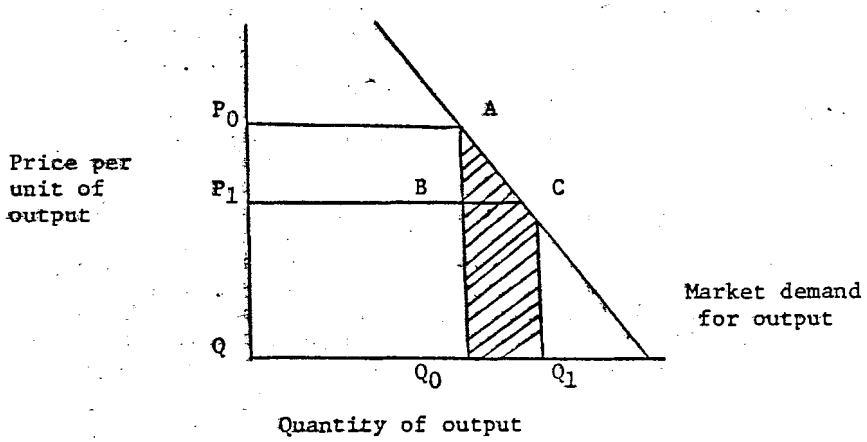

Figure 1. --Total value or willingness to pay for increased output.

Assuming the normal demand-output relationship, additional plan output will be taken by users as the unit price of output falls. If, as a result of the plan, output is increased by an amount $Q_1 - Q_0$, the total value of this additional output to the user is measured by the entire shaded area on the chart. This is a larger amount than would be reflected by the market value. It is the sum of market price times increased quantity (represented by the rectangle CBQ_0Q_1) plus the consumer surplus for that increase (represented by the triangle ABC).

Since, in most instances, it is not possible for the planner to measure the actual demand situation, three alternative techniques can be used to obtain an estimate of the total value of the output of the plan-willingness to pay *based upon market price or simulated market price*, change in net income, and the most likely alternative.

If the additional output from a plan is not expected to have a significant effect on price, actual or simulated market prices will closely approximate the total value of the output. This is true because there would be no consumer's surplus. If the additional output is expected to significantly influence market price (as in figure 1), a price midway between that expected with and without the plan may be used to estimate the total value. This would approximate the willingness to pay, including consumer surpluses, in most cases.

When outputs of a plan are intermediate goods or services, the net income of the (producer) user may be increased. Where changes in net income of each individual user can be estimated, a close approximation of the total value of the output of the plan (including consumer surpluses) will be obtained.

The cost of the most likely alternative means of obtaining the desired output can be used to approximate total value when the willingness to pay or change in net income methods cannot be used. The cost of the most likely alternative means will generally misstate the total value of the output of a plan. This is because it merely indicates what society must pay by the next most likely alternative to accure the output, rather than estimating the real value of the output of a plan to the users. This assumes, of course, that society would in fact undertake the alternative means. Because the planner may not be able to determine whether alternative means would be undertaken in the absence of the project, this procedure for benefit estimation must be used cautiously. *In determining the most likely alternative, the planner must give adequate consideration to nonstructural alternatives and conservation measures as well as structural alternatives.*

Application of these general measurement standards will necessarily vary, depending upon the source by which output is increased (that is, via direct increases in production or through subsequent employment of released resources), upon the type of good or service produced (whether the output is an intermediate or final good, and upon the type and nature of available alternatives. General measurement methods for each type of situation as well as an indication of the water and land resource plan outputs to which these standards are applicable are presented below.

a. Direct output increases. Direct outputs of water and land resource plans may be in the form of either final consumer goods or intermediate goods. An effective direct or derived demand must exist for the final and intermediate goods, respectively, to include the *value of* increased output as a contribution to national economic development.

Certain consumer goods and services may result directly from water projects and be used with no additional production resulting therefrom. Recreation, municipal water, and electric power for residential use are examples of this type of good or service. Most goods and services produced by using water are not directly consumed, however, but are intermediate products that serve as inputs for producers of final goods or producers of other intermediate goods. The development of irrigation water for use in producing food and fiber of supplying electric power and water for industry are examples.

The value of increased output resulting directly from plans that produce final consumer goods or services is properly measured as the willingness to pay by final users for such output. When a competitive market price is not directly available, and the increased output will not be large enought to affect prices, total value of output may be estimated by simulated market prices or the use of the cost of the most likely alternative means of producing such final output. Examples of types of outputs to which *these* methods may be applied include:

a. Community and residential water supply;

b. Electric power provided for community and residential use; and

c. Recreation enhancement.

(The rest of this section remains unchanged.)

2. Measurement of the Value to Users of Increased Outputs.

a. Water supply. Plans for water supply are generally designed to satisfy requirements for water as a final good to domestic and municipal users and as an intermediate good to agricultural and industrial users. *Plan elements which* satisfy requirements in these uses generally require, either separately or in combination, an increase in water quantity, and improvement in water quality, and an improvement in the reliability of both quantity and quality.

Where it is necessary to use alternative costs for approximation of total value for water supply, as provided herein, the alternative selected must be a likely and realistic alternative directly responsive to achievement of this particular category, namely the additional output or *more efficient use* of water as an input to industrial, agricultural, and muncipal uses or as a final good for community and individual uses. *Moreover, the alternative must be a viable one in terms of engineering.* It must be more than a hypothetical project. It must be a real alternative that could and would likely be undertaken in the absence of the proposed program, for instance, the reuse of recycling of existing water supplies or the use of available groundwater, including the inprovement of its quality, if necessary.

Although water supply can often be considered as a final good, there usually does not exist a market *that directly equates* users' valuation of water supply for community and individual use *with the full marginal cost of water supply. This is because water is seldom priced at its marginal cost. Where a water utility is practicing long run marginal cost pricing the users' willingness to pay*

for additional supplies is verified if the utility is willing to contract for additional water supplies at the cost of providing those supplies. In this case an appropriate estimate of the benefits can be derived from the marginal water rates charged. Industrial self supply is also an example of a situation in which the beneficicary may by paying the full marginal costs of water supply and where such costs can be the basis for estimating benefits. Estimates of willingness to pay may also be derived by econometric methods applied to appropriate water use and price data. Where direct estimates of willingness to pay are not available, the value of added water supplies shall be derived using the cost of the altnerative that would provide essentially a comparable water supply service, in both quantity and quality, that would in fact be utilized in the absence of the water supply provided by the plan.

The total value of water to the producers using increased supplies is reflected in the change in their net income with a plan for the provision of water supply compared with their net incomes without the plan. It is recognized that for many planning studies it is not possible to either specifically identify net income changes accruing to firms using water supply for productive purposes or always possible to determine what part of the municipal supply is used for productive pursuits or for general community or individual uses as set forth below. In these cases, total value to the users can be approximated by use of the cost of the alternative that would be employed to achieve the same production that would be utilized in the absence of the water supply provided by a plan.

(The rest of this section remains unchanged.)

b. Flood control, land stabilization, drainage, and related activities. A number of activities such as flood *damage reduction* floodplain management, drainage, *reduction* of sedimentation, land stabilization, and erosion control, contribute to the objectives through improving the productivity, use, and attractiveness of the Nation's land resources. From the viewpoint of their contribution to national economic development, the effect of these activities on the output of goods and services is manifested by increasing the productivity of land or by reducing the costs of using the land resources, thereby releasing resources for production of goods and services elsewhere. These activities affect land resources in the following manner:

(1) Prevention or reduction of inundation arising from stream overflow, overland waterflow, high lake stages, and high tides, *by protecting the natural streamflow of the floodway;*

(2) Prevention or reduction of soil erosion, including sheet erosion, gullying, floodplain scouring, streambank cutting, shore or beach erosion, and prevention of sedimentation;

(3) *Improvement of drainage and protection of wetlands; and*

(4) *Modification of limitations on land resources.*

There are essentially three types of effects on *land* use that may occur as a benefit from including these activities in a plan. The first is an increase in the productivity of land without a change in land use. The second is a shift of land resources to a more intensive use. The third is a shift of land resources to less intensive use. In each case, the general method of calculating benefits is applicable. The distinction is made only to facilitate the application of the general method in different settings and as a means of providing criteria for the use of alternative techniques for estimating net income changes for the three classes of land utilization under the with and without analysis.

The general method to be applied in measuring effects for these and any other activities that result in a change in net productivity or a reduction in the cost of using land resources involves the measurement of the difference in net income accruing to users of land resources benefiting from such activities compared with what these users would earn in the absence of such a plan. This generally defines and establishes the limit of the willingness of users to pay for a plan that results in a change in productivity or reduction in the cost of using land resources.

Willingness to pay of the users, which is the basis for approximating the value of output from these activities, whether it be in the form of increased production of intermediate or final goods or release of resources, may be obtained by the following approaches.

(a) Productivity increase. In this situation, analysis with and without the plan indicates that the current and future enterprises employing given land resources are essentially the same with the plan as they would be without the plan. Further, it is more profitable for the given enterprise to continue to use the given land resource even without the beneficial effect of the plan than to locate at the next most efficient location. Net income change can then be measured as the difference in net income accruing to the enterprise on the specified land resource without the plan compared with what that enterprise would receive as net income with the plan on the same land resource.

(b) Changes in land use. Two situations are covered by changes in land use. These are:

(i) The situation in which the landowner benefiting from the change in land use would only utilize the land resource affected by such activity once the plan has become operative. In other words, it would not be as profitable for the benefiting landowner to utilize the affected land resource unless improved through one of the activities in this category as compared with the next most efficient location. Without such a plan the improved enterprise would occur at an alternative location. Net income change to the landowner will be measured as the difference in net income from the enterprise at an alternative location that would be utilized without the plan compared with the net income received from the enterprise at a new location which is improved or enhanced as a result of the plan.

(ii) The situation in which enterprises that would otherwise employ a given land resource would be precluded from using the given land resources with implementation of the plan. Other enterprises less prone to incur flood damages or other adverse consequences would be allowed to use the given land resources.

Beneficial effects to the enterprises from activities in this category would be evaluated by measuring the net income change for the enterprise precluded from using the given land resources with the plan as compared with the without situation, plus the net income change for the enterprise that would be allowed to use the given land resource with the plan as compared with the without situation.

(c) Estimates of damage prevention and other measures. In the above cases, where it is not possible to directly employ net income changes to derive benefits, the estimate of actual or prospective damages to the physical properties of the enterprises involved can be employed as an approximation of net income change.

(The last two paragraphs of this section are deleted.)

c. Power. With respect to the computation of beneficial and adverse effects of increases in output *or more efficient use* of electric power it is emphasized that where appropriate, these should be viewed and evaluated as increments to planned or existing systems. Power supplied for general community and residential use can be considered as a final consumer good. Its value as a final good is generally

reflected by the satisfaction of individual residents or in terms of improved community services and facilities. Electric power provided to industrial, commercial, and agricultural uses is viewed as an energy input to the production of goods and services from these activities resulting in an increase in the output, reduction in the cost of production, or a combination thereof. The total value of electric power to the producers using such power is reflected in their *marginal* willingness to pay. *However, there usually does not exist a market that directly equates users' valuation of electric power with the full marginal cost of its supply. This is because electric power is seldom priced at its marginal cost. Where an electric utility is practicing long run marginal cost pricing, the users' willingness to pay for additional supplies is verified if the utility is willing to contract for additional water supplies at the cost of providing those supplies. In this case an appropriate estimate of the benefits can be derived from the marginal rates charged.*

Industrial self supply is also an example of a situation in which the beneficiary may be paying the full marginal costs of supply of electric power and where such costs can be the basis for estimating benefits. Estimates of willingness to pay may also be derived by econometric methods applied to appropriate data concerning the use of electric power and its price. Where direct estimates of willingness to pay are not available, the value of additional electric power will be measured instead by taking account of the resource cost of the most likely alternative. The alternative selected must be a viable one in terms of engineering.

The costs should include any required provisions for protection of the environment. However, since the addition of a hydroelectric project to an electric system in lieu of an alternative power source usually will either increase or decrease the unit cost of producing power by existing generating facilities of the system, this cost differential must be taken into account in determining the power value of the hydroelectric project.

Normally, electric power is evaluated in terms of two components—capacity and energy. The capacity value is derived from a determination of the fixed costs of the selected alternative source of supply. The energy value is determined from those costs of the alternative which relate to and vary with the energy output of the alternative plan. These capacity and energy components of power value are usually expressed in terms of dollars per kilowatt per year of dependable capacity and mills per kilowatt-hour of average annual energy.

d. Transportation (Navigation) (No change).

e. Recreation.

(The following completely replaces the existing section.)

Outdoor recreational activities include water-dependent activities such as swimming, boating, water-skiing, and fishing and water-enhanced activities such as camping, hiking, picnicking, hunting, birdwatching, wildlife photography, sightseeing, and other activities. A portion of the public recreational demands are accommodated by the existence and development of Federal lands, waters, and multi-purpose water projects which include specific provisions for enhancing recreation activities consistent with the requirements of the Federal Water Project Recreation Act of 1965 (Pub. L. 89-72). This act provides that full consideration shall be given to the opportunities which multi-purpose and other Federal water projects afford for outdoor recreation and for fish and wildlife enhancement.

For the most part, outdoor recreation is produced publicly and distributed in the absence of a viable market mechanism. While the private provision of recreation opportunities has been increasing in recent years, analysis of recreation needs is conducted in the absence of any substantial amount of feedback from effectively functioning markets to guide the evaluation of publicly produced recreation goods and services. Under these conditions—and based on a with and without analysis—the increase in recreation provided by a plan, since it represents a direct consumption good, may be measured or valued on the basis of simulated willingness to pay. In computing the projected recreation demand, however, the analysis should take explicit account of competition from recreation opportunities within the area of influence of the proposed plan.

There are in existence a number of methods, or approaches, to approximating demand and what people are willing to pay for outdoor recreation. *Among these are the travel cost approach, the willingness to pay or contingent valuation survey approach, and the unit day value approach. These methods are summarized below.*

(1) *Travel cost method. Using marginal travel costs (i.e. variable costs of automobile operation and opportunity cost of leisure time spent in travel and on the site) taken as a measure of what people are willing to pay for water-oriented recreation and how price affects use, the relationship between price and per capita attendance can be established for recreation sites and market areas. This relationship, the conventional demand curve having a negative slope, sums up the response of users' demand to alternative prices of the recreational product (or experience). The area under this demand curve to the left of the capacity constraint plus any user fees measures total willingness to pay for recreation opportunities at the site.*

(2) *Contingent valuation method. Annual willingness to pay can be obtained directly from potential visitors by a survey which establishes a simulated market. Users are allowed to bid on the annual use of the site until the maximum willingness to pay is established. This method may be applied where lack of data, insufficient variability in travel costs, or unique characteristics of the site make use of the travel cost method inappropriate.*

(3) *Unit day value method. Where use of a demand estimating technique such as travel cost or contingent valuation methods is not cost effective because of the small size of the project, a single value per recreation day may be chosen from a range of values. These ranges will reflect availability of general or specialized recreation opportunities, location of the site relative to alternative opportunities, and characteristics of the user population. Specialized recreation involves activities for which opportunities are limited, intensity of use is low, and often may involve a large personal expense by the user. General recreation embraces the majority of recreation activities associated with water projects, including swimming, picnicking, boating, and most warm water fishing.*

f. Commercial fishing and trapping (No change).

g. Other program outputs (No change).

3. Measurement of increases in output resulting from external economies.

Technological external economies are the beneficial effects on individuals, groups, or industries that may or may not benefit from the direct output of the project. They result from a plan if an increase in the output of final consumer goods or intermediate goods takes place beyond that which would be obtained in the absence of the plan and over and above direct outputs of the plan. This increased output may result from firms which are *subject to the incidental, unintended, and uncompensated effects* of the plan taking advantage of more efficient production techniques and

thereby releasing resources for use in producing other goods and services.

The change in net income of the economically related firms will be used as an indicator of the value of this type of national economic development effect. Changes in the total value of consumer goods due to externalities because of a plan can be accounted for by using measurement techniques like those described above. (The rest of this section is deleted.)

4. Special beneficial effects from use of unemployed or underemployed labor resources (No change).

G. Adverse Effects on National Economic Development

Achievement of beneficial effects on national economic development, and/or environmental quality, requires resources to be diverted from alternative uses. The adverse effects on national economic development are the economic value that these resources would have in their alternative uses. Generally, market prices provide a valid measure of the values of goods and services foregone in alternative uses. *Where market prices are not available, surrogate values may be used as set forth in the Manual of Procedures for Evaluating Benefits and Costs of Federal Water Resources Projects published by the Water Resources Council.* Both public and private costs associated with the plan will be measured to indicate the total adverse effect on national economic development incurred to realize the desired objectives.

1. *Sources of adverse effects.* Water and land resource plans result in adverse effects to national economic development in two ways.

a. Resources required or displaced to produce final or intermediate goods and services. In situations where a physical structure is necessary to obtain the desired objective, the adverse effects on national economic development include all explicit cash expenditures for goods and services necessary to construct and operate a project throughout a given period of analysis *plus any uncompensated economic losses to the public sector based on applicable surrogate values. The cash expenditures* consist of actual expenditures for construction; transfers from other projects, such as costs for reservoir storage; development costs; and interest during construction. If the output of the plan is an intermediate good or service, the associated costs incurred by the intermediate product user in converting it into a marketable form will be measured. These associated costs are borne by the user of the plan output but nevertheless, represent resource requirements necessary to convert the project output into a product demand by society. Examples are production costs incurred by users of plan outputs, and costs to other producers or to processors that arise in conjunction with the physical flow of the output of the plan. Associated costs should be deducted from the value of gross outputs to obtain net beneficial effects to be compared with the national economic development adverse effects of a plan. These adverse effects occur as a result of certain resources being released and subsequently unemployed as a result of the implementation of the plan.

In situations where nonstructural measures are used to obtain the desired objective, the adverse effects on national economic development will include *the uncompensated economic losses to the public sector plus* payments *for such things as the purchase of easements* or rights-of-way and costs incurred for management arrangements or to implement and enforce necessary zoning. In some cases, actual cash expenditures will not be involved as when local communities are required to furnish lands, easements, and rights-of-way.

b. Decreases in output resulting from external diseconomies (No change).

c. Cost adjustments (No change).

2. Measurement of adverse effects.

a. Resources required for or displaced by the plan.

Resource requirements of the plan are the sum of (*1*) the market values of *private sector* goods and services used for installations; interest during construction; operation, maintenance, and replacement; and induced costs as *well as (2) the surrogate value of uncompensated economic losses to the public sector.*

Installation costs are the market values of goods and services necessary to implement a plan and place it in operation, including management and organizational arrangements, technical services, land, easements, rights-of-way, and water rights; initial and deferred cosntruction; capital outlays to relocate facilities or to prevent or mitigate damages; transfers of installation costs from other projects; and all other expenditures for investigating, surveying, planning, designing, and installing a plan after its authorization.

Operation, maintenance, and replacement costs are the market values of goods and services needed to operate an installed plan and to make repairs and replacements necessary to maintain the physical features in sound operating condition during their economic life.

b. Decreases in output resulting from external diseconomies (No change).

H. Beneficial and Adverse Effects on Environmental Quality (No change.)

III. Other Beneficial and Adverse Effects (No change)

IV. General Evaluation Standards

Introduction (No change)

A. General Setting (No change)

B. Measurement of Beneficial and Adverse Effects (No change)

C. Price Relationships (No change)

D. The Discount Rate (No change)

E. Consideration and Comparison of Alternatives (The following completely replaces the current section.)

A range of possible alternatives capable of application by various levels of government and nongovernmental interests should be systematically evaluated in terms of their contributions to national economic development and environmental quality objectives. A comprehensive range of alternatives should be evaluated toward balancing water availability over time against competing purposes.

Water conservation shall be fully integrated into project and program planning and review as a means of achieving both the national economic development and environmental quality objectives. Water conservation consists of actions that will (a) reduce the demand for water; (b) improve efficiency in use and reduce losses and waste; and (c) improve land management practices to conserve water. A clear contrast is drawn between the above conservation elements and storage facilities for new supplies.

In addition, a primarily nonstructural plan will be prepared and included as one alternative whenever structural project or program alternatives are considered. This alternative plan should incorporate a combination of nonstructural or demand-reducing measures which would feasibly (in light of the national economic development and environmental quality objectives) be employed or adopted to achieve the overall project purpose.

Nonstructural measures are complete or partial alternatives to the traditional structural measures in addressing water resources problems and needs. The ideal nonstructural alternative is the least cost, implementable modification in public policy, management practice alteration, regulatory change or pricing policy modification which would bring marginal benefits and marginal costs for each project output into equality. The two objectives of national economic

development and environmental quality are to serve as the basis for the measurement of costs and benefits.

The assessment of nonstructural measures as alternatives to traditional structural measures should be considered for all water resources planning purposes including water supply, flood control, power, transportation, recreation, fish and wildlife, and other purposes. Nonstructural measures may require less capital investment and may produce less adverse impacts than traditional structural measures.

A nonstructural measure (or measures) may in some cases offer a complete alternative to a traditional structural measure (or measures). In other cases, a nonstructural measure (or measures) may be combined with fewer and/or smaller traditional structural measures to produce a complete alternative. It may at times be necessary to combine structural and nonstructural measures to formulate alternative plans for attainment of the planning objectives.

A "primarily nonstructural plan" is an alternative plan which makes maximum feasible use of nonstructural measures as a means of addressing water resources problems and needs. The determination of maximum feasible use will be based upon the maximum possible use of nonstructural measures which contribute to the National Economic Development objective and/or the Environmental Quality objective and which meet the tests of acceptability, effectiveness, efficiency and completeness.

Alternatives should not be limited to those the Federal Government could implement directly under present authorities. Therefore the cooperative role of local, State, regional, and Federal organizations in implementing alternatives will be stressed. Plans, or increments thereto, will not be recommended for Federal development that, although they have beneficial effects on the objectives, would physically or economically preclude alternative non-Federal plans which would likely be undertaken in the absence of the Federal plan and which would more effectively contribute to the objectives when comparably evaluated according to these principles.

The alternative non-Federal plan that would likely be physically displaced or economically precluded with development of the Federal plan, or increments thereto, will be evaluated for purposes of this determination on a comparable basis with the proposed Federal plan with respect to their beneficial and adverse effects on the objectives, including the treatment of national economic development effects and the discount rate used in the evaluation. Taxes foregone on the proposed Federal plan and taxes paid on the non-Federal alternative will be excluded in such comparisons for the evaluation of the national economic development objective.

F. Period of Analysis (No change)

G. Scheduling

Plans should be scheduled for implementation in relation to needs so that desired beneficial effects are achieved effectively. Beneficial and adverse effects occurring according to different patterns in time are affected differently by the discount process when plans are scheduled for implementation at alternative future times. Therefore, plan formulation should analyze the alternative schedules of implementation to identify the schedule that would result in the most desirable mix of contributions to the objectives when the beneficial and adverse effects of a plan are appropriately discounted.

While beneficial and adverse effects toward the objectives will accrue over different time frames for the alternative implementation schedules, the *discounted* equivalent of such beneficial and adverse effects to be considered in the comparison of the alternative implementation schedules should represent the present value of the beneficial and adverse effects toward the objectives for each alternative implementation schedule at a common point in time.

H. Risk and Uncertainty (No change)

I. Sensitivity Analysis (No change)

J. Updating Plans (No change)

V. Plan Formulation

A. Introduction

As set forth in principles, plans will *contribute to* meeting current and projected needs and problems as identified by the desires of people in such a manner that improved contributions are made to society's preferences for national economic development and environmental quality.

1. Major steps in plan formulation. Plan formulation is a series of steps starting with the identification of needs and problems and culminating in a recommended plan of action. The process involves an orderly and systematic approach to making determinations and decisions at each step so that the interested public and decisionmakers in the planning organization can be fully aware of the basic assumptions employed, the data and information analyzed, the reasons and rationales used, and the full range of implications of each alternative plan of action. This process should be described in enough detail in the report of the study so that it may be replicated by others. The plan formulation process consists of the following major steps:

1. Specify components of the objectives relevant to the planning setting; *The specific level of future needs will give consideration to firm and household response to existing laws and policies including conservation measures;*

2. Evaluate resource capabilities and expected conditions without any plan;

3. Formulate alternative plans to achieve varying levels of contributions to the specified components of the objectives, *including preparation of one primarily nonstructural alternative;*

4. Analyze the differences among alternative plans to show tradeoffs among the specified components of the objectives'

5. Review and reconsider, if necessary the specified components for the planning setting and formulate additional alternative plans as appropriate' and

6. Select a recommended plan from among the alternatives based upon an evaluation of the tradeoffs between the objectives of national economic development and environmental quality. (The rest of this section remains unchanged.)

2. Levels of Planning (No change)

B. Specification of components

Introduction (No change)

1. National economic development. For the national economic development objective, the components will usually be expressed at two levels.

a. The first level directly relates to the objective in the sense of the specification of the actual outputs of goods and services desired. Hence, the first level of specified components of this objective will generally be depicted in terms of increased outputs of goods and services or their more efficient production such as the following:

Increased or more efficient output of food and fiber;

2. Increased or more efficient output or recreational services, *and efficient use of facilities;*

(3) Increased or more efficient production *and use* of energy;

(4) Increased or more efficient production *and use* of transportation services;

(5) Increased productivity of land for residential, agricultural, commercial, and industrial activities;

(6) Increased or more efficient *production and use* of necessary public services such as municipal and domestic water supply; and

(7) Increased or more efficient industrial output.

b. The second level of specification of the components of the national economic development objective follows from the translation of the first level specification of needs for goods and services into specific needs for water and land resources. In the context of the above, the second level specification of components would be established in terms such as the following:

(1) Water and land for *use in* irrigation;

(2) *Expanded opportunities for diversified* water and land related recreation *activities;*

(3) *Balancing energy use with production capacity;*

(4) Inland navigation or deep draft harbor *facilities in the context of total transportation needs;*

(5) *Reduction of flood hazard;*

(6) *Balancing water use with supply for domestic, industrial and municipal purposes; and*

(7) *Instream flow needs.*

(The rest of the section remains unchanged.)

2. Environmental quality. (No change)

3. Participation. (No change)

4. Projected conditions. (No change)

5. Sensitivity tests. (No Change)

6. Preferences. The specification of the components of the objectives must reflect the specific effects that are desired by groups and individuals of the planning area as well as the specific components declared to be in the national interest by the Congress or by the executive branch through the Water Resources Council. In this way the components of objectives will reflect local, State, and national preferences and priorities as well as the extent of complementarity and conflict among components.

In this regard, the identification and detailing of the components of the objectives should be viewed as the process of making explicit the range of preferences and desires of those affected by resource development in terms of reference that can form the basis for the formulation of plans. Rather than a single level of achievement being set forth for any specified component, a range of possible levels should be set forth so that the relevant preferences can be seen for a given component. It should be anticipated that the initial specification of components will be modified (expanded or reduced) during subsequent steps in plan formulation to reflect the capability of alternative plans to *contribute to satisfaction of* component needs and to reflect technical, legislative, or administrative constraints.

C. Evaluation of Resource Capabilities

In very broad terms, the first step of specification of the components of objectives can be viewed as establishing the boundaries of demand (needs or problems) in the context of each objective. In the next step, evaluation of resource capabilities, the initial evaluation is made of the supply (availability) of the resources that can be employed to satisfy the current and future levels of demand. *Also considered are conservation measures that can alter future demand.*

Resources of the planning area shall be evaluated in terms of their ability to meet the current and projected demands identified for each component under two sets of conditions:

(1) Capability of resources without any planned action; and

(2) Capability of water and land productivity enhanced through management plans. An analysis of the capability of resources to meet the projected demands without any planned action will reveal the extent and magnitude of unsatisfied component needs and indicate the requirement for some specific plan of action to contribute to their satisfaction. To the extent that the water and land resources without any planned action are unable to meet current and projected needs or to the extent that resource management enables the needs to be met more efficiently, there is an evident justification for formulating alternative plans *to balance water available and water demanded for alternative uses.*

In this formulation step, the first task is to undertake a selective inventory of the quantity and characteristics of water and land resources of the planning area and an appraisal of opportunities for further use of these resources. Problems limiting the use of resources should also be identified.

The resources inventory should include data on all physical factors appropriate to the investigation. Examples of the type of information needed include:

1. Hydrologic data such as rainfall and runoff characteristics, frequencies of high and low flows, *the conjunctive relationship* of ground water *with surface water including,* natural lakes, marshes, and estuaries. (The rest of this section remains unchanged.)

D. Formulation of Alternative Plans

In the first two steps in the plan formulation process, the components of the objectives were specified in terms of needs and problems, the resource capability within the planning areas were evaluated, and the broad outlines of management, development, and other actions were identified. The next step is to undertake the actual design and scaling of alternative plans.

Ideally, in the presence of a situation where there are few or no constraints on planning and where the components of the objectives are essentially complementary (the satisfaction of one component need does not preclude the satisfaction of the other component needs), the formulation of a single plan would be sufficient. The only test required would be that the plan was the most efficient plan to satisfy the specified level of component needs. Although in only a few instances will this situation occur, the case does help to establish the guidelines and criteria to judge the range of alternative plans that could be formulated and the tests to be applied in formulating any given plan.

The requirement for the formulation of alternative plans derives from the basic characteristics of the approach when more than one objective is involved. First, instead of the component needs of the two objectives being complementary, it is more likely they will be in conflict—the satisfaction of one will reduce the satisfaction of others. Second, given uncertainty with respect to future economic and demographic changes and the general uncertainty with respect to future preferences for the environmental quality objective, a single specified level of achievement or need satisfaction for any given component is not likely to be acceptable through time. Other factors contributing to the necessity for formulation of alternative plans include limited resources, technical planning constraints, and legal and administrative constraints.

In formulating plans to meet the components of the two objectives, both structural and nonstructural measures shall be considered. A nonstructural measure (or measures) may in some cases offer a complete alternative to a traditional structural measure (or measures). In other cases, a nonstructural measure (or measures) may be combined with structural measures to formulate alternative plans that attain the planning objectives.

Suggestions as to the determination of the general nature and types of alternative plans which should be formulated and the number of

alternatives which should be developed with each general type are given below.

A first requirement is to determine the general types of alternatives to be developed under alternative assumptions concerning the level and magnitude of component needs in the future. Given alternative assumptions concerning future economic and demographic trends for the planning setting and the total range of component needs related thereto, a set of alternative plans should be prepared for each major assumption concerning the future. In those planning situations where there does not exist a strong linkage between water and land development and major shifts in economic and demographic trends, the Council's baseline projections will generally be used as a single set of assumptions about the future level of component needs required. Where the linkage is sufficiently strong so that water and land development may materially alter future economic or demographic trends, this relation should be reflected in alternative assumptions. Where the planning area may be unusually susceptible to other factors that could easily change in the future, it will be appropriate to establish a basis for a different set of alternative plans based on alternative assumptions concerning future change. In this instance, a sensitivity check should be made to ascertain the extent to which component needs will vary significantly given different assumptions concerning the future. If no significant variation is found, only one set of alternative plans will have to be developed.

Within a given set of assumptions concerning future change and the component needs associated thereto, the number and types of alternative plans to be developed will be determined by applying the following:

1. On a first approximation basis array component needs that are essentially complementary—that is, the satisfaction of one of these component needs does not preclude satisfaction of the other component needs or does not result in materially adding to the cost of satisfying the other component needs in the array; and

2. From the above approximation, it should be possible to group component needs and the elements of a plan to satisfy those needs that are essentially in harmony, each set representing the nucleus for an alternative plan.

At this step, relevant alternative means of meeting each of the component needs to be included in an alternative plan should be identified. All relevant means should be considered. An analysis should be made for each alternative means, including an identification of the beneficial and adverse consequences to other component needs. The assembly of information on alternative means of contributing to meeting the component needs will provide a basis for selecting the most effective means, or combination of means of *contributing to satisfaction of* all component needs.

The significance of this step is threefold: (1) It provides information on the effectiveness of alternative means of *contributing to satisfaction of* a component need; (2) it provides information on the extent of complementarity or conflict among component needs in relation to a particular means; and (3) it provides a basis for selecting alternative means for *contributing to satisfaction of* a component need in the formulation of an alternative plan.

At this point, it should be possible to formulate alternative plans built upon the set of complementary component needs and plan elements. These essentially are the building blocks for the formulation of alternative plans. In formulating a given alternative plan, initial consideration will be given to its orientation toward *contributing to* the component needs for one of the objectives. Further additions should be made for the component needs of the other objective, provided that their addition to a given plan does not significantly diminish the contributions of the overall plan to that objective toward which the plan is oriented. An analysis of the alternative plan, in terms of beneficial and adverse effects, will reveal the extent of any shortfalls against the other objective. The process is then repeated until sufficient numbers of alternative plans have been formulated so that there is at least one plan that generally satisfies each specified component need of the objectives. This does not mean that there must be a plan for each objective that excludes plan elements that significantly contribute to the component needs of the other objective nor does it mean that a given alternative plan cannot appropriately satisfy the component needs of both objectives. Additional alternative plans may be required where there are possible conflicts among the component needs within a given objective.

A precise number of alternative plans cannot be specified in advance but will be governed by the relevancy of the objectives to a given planning setting, the extent of component needs and their complementarity, the available alternative means, and the overall resource capabilities of the area under study.

A comprehensive range of alternative projects, programs and policies which, over time, can balance water demanded for alternative purposes with water availability should be evaluated. An evaluation of alternatives should be considered in water resources planning to serve needs including: Water supply for municipal, industrial, and agricultural uses; recreation; hydroelectric power; navigation; flood hazard reduction; fish and wildlife; and others. Both nonstructural and structural alternatives should be considered. Structural alternatives may serve a single need or multiple needs and include dams, reservoirs, levees, channels, dikes (and drainage).

Nonstructural alternatives for municipal and industrial water supply include, but are not limited to:

(a) *Reducing the level and/or altering the time pattern of demand by metering, leak detection and repair rate structure changes, regulations on use such as plumbing codes, education programs, drought contingency planning;*

(b) *Modifying management of existing water development and supplies by recycling, reuse, pressure reduction; and*

(c) *Increasing upstream watershed management and conjunctive use of ground and surface waters.*

Nonstructural alternatives for irrigation water supply include, but are not limited to:

(a) *Reducing the level and/or altering the time pattern of use through irrigation scheduling, modified water rate structures, leak detection and repair, recycling, and reuse;*

(b) *Modifying management of existing water development and supplies by tailway recovery and phreatophyte control.*

Nonstructural alternatives for recreation and fish and wildlife include, but are not limited to, enhanced management of existing sites, and capacity management to distribute users of existing sites.

Nonstructural alternatives for hydroelectric power include, but are not limited to:

Reducing the level and/or time pattern of demand by time of day pricing, utility sponsored loans for insulation, appliance efficiency standards, educational programs, inter-regional power transfers, and increased transmission efficiency.

Nonstructural alternatives for navigation include, but are not limited to, lockage charges to reduce congestion, improved scheduling of lock arrivals, use of switch boats for locking through tows.