

RIVER BASIN SURVEYS
 RIVER BASIN AND REGIONAL PLANS
 Type 2 (Level B) Coordinated Comprehensive Detailed Surveys - February 1978

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

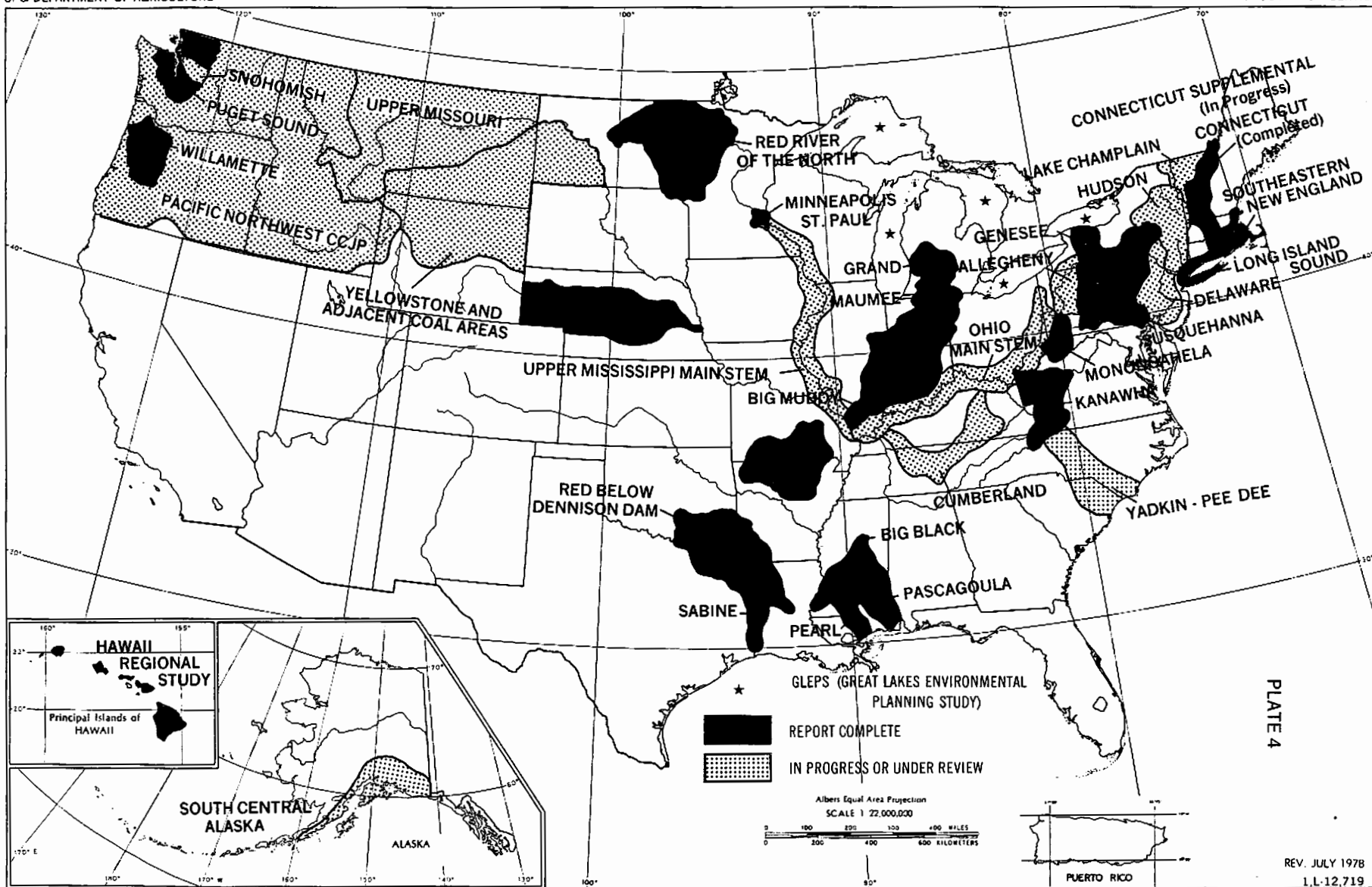


PLATE 4

REV. JULY 1978
 11-12,719

USDA SCS HYATTSVILLE, MD 21141

CHAPTER 6

FEDERAL INTERAGENCY RIVER BASIN STUDIES

The concept of interagency river basin studies probably originated with the Flood Control Act of 1936. USDA was authorized to make studies of all the river basins covered by the Corps of Engineers "308" reports in order to achieve a better balance of planned works of improvement. A specific effort at interagency planning was made by combining the separate reports of the Corps and the Bureau of Reclamation on the Missouri River basin into one plan, the Pick-Sloan Plan. It was authorized for construction by the Flood Control Act of 1944. An attempt was made to give this plan even more of an interagency character by the Young Plan which covered USDA interests and activities. It was printed in 1949 but never authorized for implementation. (See Chapter 2) However, these efforts involved only the overlapping of separate agency plans. They did not represent a real attempt at developing an interagency plan.

Arkansas-White-Red River Basin Plan

The Arkansas-White-Red River Basins plan was the first real attempt by an interagency group to prepare a coordinated, long-range comprehensive plan for the development of the water resources of a river basin. Existing agency organizations were not compatible with such a joint effort. Agency personnel were oriented to their respective programs and were not readily receptive to overlapping phases of other agency programs. Jealousies of area and program responsibilities, as well as procedures, were strongly in evidence. (218)

In spite of all the problems encountered, the Arkansas-White-Red River Basin Interagency Committee (AWRBIAAC) was able to put together a physical plan which embodied the major features of a coordinated comprehensive river basin plan. While the plan was not all that was desired, it was probably better than any which previously had been achieved by other basin planning efforts. (219)

Senator Robert S. Kerr of Oklahoma spawned the idea of the Arkansas-White-Red River Basin Study. Legislatively, it originated in a bill which he introduced in the Senate in 1949 during the first session of the 81st Congress. His bill was S-1576 and the companion bill in the House was HR-4331. (220)

The stated purpose of his bill was to establish a U. S. Commission on the AWR River Basins. He contended in hearings that the time was past for Federal natural resource departments to work separately on river basin problems. His convictions evidently were founded on the overlapping, duplication and feuding which reigned in the Missouri River Basin until the separate plans of the Corps of Engineers and Bureau of Reclamation were combined into the Pick-Sloan Plan. He proposed that a commission of

five Federal members and eight State members be formed to coordinate, control and direct the development of a comprehensive plan for the AWR area. Neither of these Bills was enacted. (221)

The provisions of the Kerr bill in modified form were included in a Senate amendment to HR-5472 which became the Flood Control Act of 1950. The modifications dropped Louisiana as a participant of the study, eliminated its area from the study area, and provided that the Federal members would constitute the full commission. This amendment was not enacted. Instead, Section 205 was included which required the Secretary of the Army to cause a comprehensive plan to be made of the AWR area under the direction of the Chief of Engineers. The plan was to be coordinated with the Departments of Agriculture and the Interior and the Federal Power Commission, other appropriate Federal agencies, and the various States. It contained a further provision that all Federal projects which had been constructed, were under construction, were authorized for construction, or that thereafter might be authorized for construction in accordance with reports completed or being completed under the provisions of the Flood Control Act of 1944, would "not be altered, changed, restricted, delayed, retarded, or otherwise impeded or interfered with by reason of this paragraph". (222)

It appeared that the Chief of Engineers could proceed to develop a single-agency plan of a comprehensive nature which could be coordinated with the various Federal agencies which had program interests in the AWR area. President Truman, however, had a different idea. After signing HR-5472 into law, he sent letters to the Departments of Army, Agriculture, the Interior, and Commerce, the Federal Security Agency and the Federal Power Commission directing that the AWR River Basin study be conducted on an interagency basis. He felt that it was important for the efforts of the various agencies to be integrated from the very beginning of the investigation. He designated the Department of the Army as the chair agency. (223)

In accordance with the President's letter, the Federal Inter-agency River Basin Committee (FIARBC) passed a resolution establishing the Arkansas-White-Red River Basins Interagency Committee (AWRBIAC) on June 12, 1950. This committee completed the necessary investigations and adopted a proposed plan for the Development of Water and Land Resources of the Arkansas-White-Red River Basins in June 1955. The plan was transmitted to the President in May 1956 and to the Congress in June 1956. (224) It was published as Senate Document No. 13, 85th Cong., 1st Sess., January 17, 1957.

The AWRBIAC consisted of a representative from each of the Departments of Army, Agriculture, the Interior, Commerce, and Labor, the Federal Power Commission, and the Federal Security Administration (Public Health Service) and one from each of the eight states. The Corps of Engineers provided the permanent chairman. Each member was responsible directly to his own agency. The committee could take action only on those matters on which there was unanimous agreement. Disagreements were

referred to the FIARBC for settlement. (225)

The AWRBIAC considered itself discharged as of June 30, 1955, after authorizing the chairman to transmit the report to the Chief of Engineers. A new charter, effective July 1, 1955, was issued by FIARBC which established a new AWRBIAC. The new committee has the same composition as the old, except that the chairman is elected annually from and by the Federal members. AWRBIAC has no action program of its own. Appropriate works of improvement continue to be installed by individual agencies, Federal and state, under their regular program authorities. The AWR Report serves as a framework plan, as a convenient reference document to each action agency, and provides some information concerning desirable coordination that needs to be effected. (226)

USDA was, and continues to be, a full time participant in all AWRBIAC activities. This ensured that agricultural interests received proper consideration in the development of the comprehensive plan. However, the constraints imposed by Sec. 205, Flood Control Act of 1950, prevented full consideration of upstream alternatives to other potential projects which were under study at the time the comprehensive plan was initiated.

Five years of interagency conflict on projects and policies prevented the committee from achieving what it had originally intended, a comprehensive plan in sufficient detail to serve as a basis for authorizing projects. (227)

Ad Hoc Water Resources Council

Both the Administration and the Congress were developing an attitude that water resource planning should be done cooperatively by representatives of the Federal, state and local governments. It was out of this background that Senate Resolution 48 of the 86th Congress was introduced on April 20, 1959. Pursuant to that resolution a Senate Select Committee on Water Resources was established. Senator Robert Kerr of Oklahoma was elected chairman. The committee made its report to the Senate on January 30, 1961. (228)(229)

The first recommendation of this committee called for the Federal government, in cooperation with states, to prepare plans for the comprehensive development and management of the water resources of all major river basins. (230)* When President Kennedy took office on January 20, 1961, he sought new means to coordinate Federal resource programs. Three weeks after the Senate Select Committee's report was filed, he sent to Congress a message on natural resources in which he adopted and expanded the recommendations of the Senate Select Committee. On July 13, 1961,

* A more detailed discussion of the Senate Select Committee is given in Chapter 9.

he forwarded his recommendations for legislation to implement the report of the Committee. The Administration bill was introduced in the Senate by Senator Anderson and 15 cosponsors on July 14, 1961, as S-2246 of the 87th Congress. (231)

Shortly after submitting the planning bill to Congress, the President requested the four Secretaries who would comprise the proposed Water Resources Council to review current policies, standards and procedures for formulation, review, and evaluation of water projects and develop new ones for uniform adoption by all Federal agencies. (232) The Secretaries concerned were: Secretary of Agriculture, Secretary of the Army, Secretary of Health, Education and Welfare, and Secretary of the Interior. The President, therefore, began to use these four Secretaries as an ad hoc Water Resources Council.

To coordinate the comprehensive planning effort initiated by President Kennedy the four Departments set up an Interdepartmental Staff Committee. This Committee was chaired by Henry Caulfield of Interior. Hollis R. Williams, Deputy Administrator for Watersheds, SCS, represented the Secretary of Agriculture. In the spring of 1963 this Committee reviewed the comprehensive river basin planning program and prepared a joint statement of principles and concepts defining the scope of the coordinated planning program which was consistent with the policies and standards approved by President Kennedy on May 15, 1962. (233) This statement, "Comprehensive River Basin Planning" (234), was used as a common basis for instructions issued by each of the Departments calling, for the first time, for initial interdepartmental coordination of budget preparation in the field and for explicit indication of proposed transfers of funds between agencies of the Departments. In addition this joint statement outlined, in general, the participation of the various Departments. (235)

The aims of the comprehensive river basin planning program of the ad hoc WRC were: (1) to achieve President Kennedy's objective of covering the entire Nation with regional framework studies by 1970; and (2) to accelerate formulation of detailed plans for some sub-basins of these regions in order to develop a backlog of plans which could be converted to construction programs as circumstances might require. (236)

The information contained in the two documents discussed above, together with guidelines from the Interdepartmental Staff Committee, provided the background and basis for SCS River Basin Memorandum 10, dated June 8, 1965, (now cancelled). The Memorandum provided instructions to USDA agencies which participated in the Type I and Type II Comprehensive River Basin Surveys.

Type I Surveys

The primary objective of USDA participation in river basin surveys is to facilitate the coordination and orderly conservation, development, utilization and management of water and related land resources.

Programs formulated by USDA for these purposes will promote economic growth and development, ensure the preservation of water and related land resources for future generations, and permit proper and efficient utilization of available resources. Components of these programs contribute to the satisfaction of current and long-term needs for resource utilization. USDA uses information developed in river basin surveys to coordinate its project-type water and related land resource conservation and development programs with those of other Federal, state and local agencies. (237)

A Type I survey is a general appraisal of the overall water and related land resource problems and development potentials of a major region. This type survey is intended to produce a framework into which projects and programs for resource development can be fitted in proper relation to each other. Such a survey is made only in sufficient detail to prepare a report describing the current and long-term problems and development potentials of each sub-basin. The report is a coordinating device. It will serve as a broad guide for subsequent, more detailed, planning of individual sub-basins and/or specific projects. Such a report will indicate which sub-basins have problems of sufficient complexity to require more detailed planning efforts and which ones do not. A Type I survey report is not an authorizing document. Hence, locations, physical dimensions, costs, benefits or other individual project data are not needed nor presented in these reports. (238)

The five major elements of a Type I survey are:

1. Studies and projections of economic development in the region;
2. Translations of such projections into needs for water and related land resource uses;
3. Appraisals of the availability of water supplies both as to quantity and quality;
4. Appraisals of the availability of land resources; and
5. A description of the characteristics of present and future problems and the general approaches that appear appropriate for their solutions. (239)

In its letter of December 12, 1963, to Kermit Gordon, the ad hoc Water Resources Council estimated that framework studies (Type I) of 18 regions encompassing the Nation (except Alaska) could be substantially completed by 1970 at a cost of about \$51 million. These studies would furnish a general appraisal of overall water and related resource development needs and a guide to further detailed planning within the regions. (240) Only one Type I study, the Ohio River Basin, had been initiated by the end of 1963.

The ad hoc WRC proposed that the coordinating committee device of the Corps of Engineers be considered as a feasible means to provide guidance for the conduct of the studies. It would provide for complete participation and continuous coordination of the activities of the concerned planning agencies in the planning effort. It would be used in

all regions except the Columbia-North Pacific and the Missouri Basin where the respective interagency committees, CBIAC and MBIAC, would coordinate or furnish guidance for the planning activities among all Federal agencies concerned and the States. It was expected that these coordination activities would be assumed later by river basin commissions after passage of proposed legislation. (241)

The concept of the framework studies was excellent. If they had been carried out as visualized by the Interdepartmental Staff Committee of the ad hoc WRC, they would have provided the framework and guidance desired.

The first Type I study was on the Ohio River Basin. There already had been so much detailed study in this basin, that it seemed impossible for the agencies to settle for the generalized approach desired. For example, the SCS proposed only to make sufficient studies to determine those sub-basins in which upstream projects could make significant contributions toward the solution of the sub-basin water and related land resource problems. Once this was done, it (SCS) expected that the more detailed Type II plans would establish the inter-program relationships with other agency programs. If other agency project-type programs were not found to be feasible in a sub-basin, then SCS would proceed with its program without the need for further coordination.

The Corps had so many projects installed, underway, proposed, or identified for planning that it requested that SCS identify all potentially feasible upstream watershed projects. This greatly intensified the detail of study required. This intensified detail was, of course, carried into other agency studies. It resulted in the accumulation of such a massive amount of data that it was impossible to give it adequate consideration in plan formulation for a major river basin.

The Ohio study procedure was adopted by other Type I study management groups. In the Missouri River Basin, a much larger region area-wise, the volume of data accumulated was staggering. These increased study intensities resulted in greatly increased expenditures. Soon the Office of Management and Budget was taking exception to program costs and curtailing new starts. As a result, framework plans were developed on only 13 of the 18 regions proposed. Two of these were designated as Level A studies which were of a reduced level of intensity from the Type I. USDA participated in a very nominal way in the Puerto Rico study which was not comprehensive in the sense of other studies.

Of the remaining five regions only two, the Rio Grande and Tennessee Regions, are not covered or partly covered by an interagency study. The Arkansas-White-Red Region is covered by the AWRBIAC study previously discussed in this chapter. The Texas-Gulf Region was covered essentially by the Texas Study Commission study and almost half of the South-Atlantic Gulf Region was covered by the Southeast River Basin Study Commission. The Hawaii Region, while not included in the original 18 regions, is being covered by a Level B study.

The Type I and Level A studies and the dates of USDA participation are as follows: (242)

<u>Study</u>	<u>Initiated</u>	<u>Completed</u>
Ohio River Basin	1963	1970
Missouri River Basin	1964	1969
Upper Mississippi R. B.	1964	1971
Columbia North Pacific	1966	1972
North Atlantic Region	1966	1972
California Region	1967	1972
Lower Colorado Region	1967	1971
Upper Colorado Region	1967	1971
Great Lakes Region	1968	1976
Souris-Red-Rainy Region	1968	1973
Great Basin Region	1969	1972
Lower Mississippi Region	1971	1975

Plate 3 shows the location and identity of each of the Regions and the status of the studies.

It is not contemplated that additional Type I or Level A studies will be made. However, if needed, they will be undertaken on a reduced scale. The National Assessment is intended to give a general appraisal of overall National needs for water-related goods and services based on correlated projections of population and economic activity in each region of the Nation. The process may be a continuing study reported every five years and would serve as a national guideline to regional framework studies which should be kept viable by updating. The framework studies or their equivalent will be updated or revised as necessary by River Basin Commissions or WRC Coordinating Committees where required, to contribute to the National Assessment. (243)

Type II and Level B Surveys

The detailed sub-basin plans or Type II studies proposed by the ad hoc WRC would provide a basis for authorization of specific projects or groups of projects. Due to budget constraints imposed by the Administration, the ad hoc WRC recommended that the detailed studies be limited to the completion of the plans for the 16 sub-basins underway in December 1963. These 16 sub-basins had been designated for Type II studies by the Interdepartmental Staff Committee of the ad hoc Water Resources Council in 1962. They were selected from a list of sub-basins which previously had been designated for Corps of Engineers planning studies by resolutions of the House and/or Senate Committees on Public Works. The ad hoc WRC estimated that these 16 studies could be completed by 1970 at a cost of approximately \$37 million. (244)

The detailed studies offered some excellent opportunities to correlate the planning procedures of the various agencies. For example, when both upstream and downstream reservoirs were included in the same system in a sub-basin, it was necessary for the hydraulic criteria and

hydrologic analyses used by the concerned agencies to be compatible. Water detained in upstream reservoirs would eventually pass through major downstream structures in the same system. Therefore, comparative release rates and times of concentration had to be considered in planning both types of structures. Likewise, it was imperative that economic evaluation criteria be coordinated. Agreement had to be reached on distribution of flood damage reduction benefits between upstream and downstream structural measures which affected the same evaluation reaches. This joint planning effort brought about a better understanding and acceptance of agency programs than had previously existed. It also made possible a proper ordering of priorities among structures and programs. However, political implications are such that this possible benefit has not been fully realized.

Of the original Type II studies, USDA funded its participation in 15. They were: (245)

Pearl River Basin	Big Black River Basin
Susquehanna River Basin	Pascagoula River Basin
Willamette River Basin	Puget Sound Basin and Adjacent Waters
Wabash River Basin	Big Muddy River Basin
Kanawha River Basin	Sabine River and Tributaries
Red River below Denison Dam	White River Basin
Genesee River Basin	Connecticut River Basin
Grand River Basin	

These basins had been authorized for Corps of Engineer study before this program was initiated. Other agencies were authorized to participate by the ad hoc WRC. Study coordination was effected through the coordinating committee device of the Corps of Engineers.

Plate 4 shows the location of these studies as well as that of the Level B studies which have been initiated since 1971.

A Regional or River Basin Plan (Level B) is a preliminary or reconnaissance level water and related land resource plan for a selected area. It is prepared to resolve complex long-range problems identified by framework studies and the National Assessment and, therefore, will vary widely in scope and detail; will focus on middle-term (15 to 25 years) needs and desires; will involve Federal, state and local interests in plan development; and will identify and recommend action plans and programs to be pursued by individual Federal, state and local entities. (246) USDA is participating in 33 such studies and 24 have been completed. (247)

The 1976 field survey of the use of River Basin Plans identified over 1,050 individual uses of data from framework plans. It also showed that these data had affected decisions for actions in over 280 instances. Uses of data from Type II or Level B plans were identified in over 400 instances and action decisions were affected in over 180 instances.

CHAPTER 7

OTHER ACTIVITIES RELATED TO THE WATERSHED PROTECTION AND FLOOD PREVENTION PROGRAMS

Flood Hazard Analyses

The basic responsibility for flood hazard information studies, at the Federal level, is assigned to the Corps of Engineers. An inter-agency Task Force on Flood Control Policy prepared a report entitled "A Unified National Program for Managing Flood Losses", published in August 1966 as House Document 465, 89th Congress. Recommendation 9(c), "Regulation of Land Use", recommends that USDA prepare preliminary flood hazard reports "for guidance in areas where assistance is needed before a full flood hazard information report can be prepared or where a full report is not scheduled". Executive Order 11296 (August 10, 1966) placed constraints on the use of Federal funds for construction and on the disposal of Federal lands where flood hazards exist. USDA Secretary's Memorandum 1606, dated November 7, 1966, assigned to SCS the responsibility to represent the Department under E.O. 11296. Executive Order 11988 (May 1977) also directs Federal agencies to determine flood hazards and to avoid developing or modifying the flood plain wherever possible.

The legislative authority for SCS to participate in and to fund flood hazard studies is provided by Section 6, P.L. 83-566. These studies are carried out as cooperative efforts with state and local governments. A description of this program is covered in Subpart C of Part 621, 40 FR, 12474, March 19, 1975. (248)

This program was initiated in Fiscal Year 1968 under the direction of the Director, River Basins Division, SCS. The first state to participate in this cooperative program was Oregon. The program moved rather slowly the first few years because of lack of information and understanding by prospective cooperating agencies, and lack of both manpower and financial resources available to SCS. However, during the past several years requests for SCS flood hazard studies and technical assistance have accelerated rapidly. The volume of such requests has been sufficient to overtax the capabilities of all involved Federal agencies in most states. (249)

There are four specific phases involved in a Flood Hazard Analyses; namely: (1) establishing eligibility, (2) initiating the study, (3) carrying out investigations and preparing the report, and (4) assisting the local government use of the study findings. (250)

Local governments are eligible for assistance in those states where cooperative flood hazard analyses have been authorized by the SCS Administrator. He authorizes the State Conservationist to initiate the

Flood Hazard Analyses Program (now called the Flood Plain Management Assistance Program) only after the responsible State Agency or the Governor requests this assistance and the State Conservationist indicates he has the manpower and capability to carry out such studies. A Joint Coordination Agreement (JCA) then is entered into by the State Conservationist and the State agency responsible for flood plain management activities. It sets forth the objectives, coordination, scope, report requirements, agency responsibilities, and general funding arrangements for the program in that State. (251)

A Plan of Study (POS) is then prepared for each specific study. (252) It is the joint responsibility of the requesting local government(s), the responsible State agency, and the SCS State Conservationist. It sets forth the responsibilities of each involved entity in carrying out the study and in interpreting and using the data in a local flood plain management program.

Flood hazard studies are carried out as detailed engineering analyses. They are performed so that the basic flood-elevation data developed will also meet the HUD Flood Insurance Study Guidelines and Specifications. (However, the first Oregon study used geomorphological procedures to outline the flood plain.) To ensure that the technical data presented in these reports are understood and used by the responsible local government(s), the State Conservationist provides continuing technical assistance to help achieve an effective local flood plain management program. (253)

SCS does not require any specific amount of cost sharing by the State or the local requesting government(s). Local governments often provide field survey assistance, maps, temporary office space, publicity, secure landowners permission for survey access, hold public meetings, share reproduction costs, and distribute the final report. Cost-sharing to date has ranged from 0 percent to 60 percent. For the 77 ongoing studies as of September 30, 1977, the average cost-sharing was 25 percent. (254)

The status of this program as of September 30, 1977, was as follows:

- 200 studies had been initiated covering 360 communities or local jurisdictions;
- 123 study reports had been published in 28 states;
- 77 studies were currently underway;
- 36 states were participating in the program.

Fiscal Year 1976 was the most productive year to date for this program. During that year SCS obligated \$1,885,000; initiated the program in four new states; started 34 additional new studies; and published 45 study reports covering 62 separate communities.

The program level from Fiscal Year 1970 through 1977 is indicated in the following table:

SCS Flood Plain Management
Assistance Program

(as of September 30, 1977)

Fiscal Year	Obligations (Dollars)
1968	\$ 3,600
1969	27,300
1970	59,000
1971	154,000
1972	357,000
1973	740,000
1974	1,015,000
1975	1,744,000
1976	1,885,000
T.Q.	493,000
1977	1,902,000
Total	<u>\$8,379,900</u>

Flood hazard study reports contain descriptive and historical data pertaining to floods and flood frequencies, maps of flood plain reaches showing flood frequency lines, and water surface profiles showing relative elevations of the flood-frequency lines at specific valley cross sections. The data are presented in such a way as to be readily interpreted and effectively used.

Flood Insurance Studies

The Housing and Urban Development Act of 1968 (P.L. 90-448, approved August 1, 1968), the Housing and Urban Development Act of 1969 (P.L. 91-152, approved December 24, 1969), and the Flood Disaster Protection Act of 1973 (P.L. 93-234, approved December 31, 1973) provide the legislative authorities for the National Flood Insurance Program. The Secretary of Housing and Urban Development (HUD) is charged with the responsibility for this program. These authorities have been further delegated to the Federal Insurance Administration, a HUD agency. (255)

Section 204, Flood Disaster Protection Act of 1973, amended Section 1360, National Flood Insurance Act of 1968. This amendment authorized the Secretary of HUD "to consult with, receive information from, and enter into agreements or other arrangements with the Secretaries of the Army, the Interior, Agriculture and Commerce, the Tennessee Valley Authority, and the heads of other Federal departments or agencies, on a reimbursement basis" in order to identify and publish information with respect to flood-prone areas. (256)

The amended Act further states that the Secretary of Agriculture, through the Soil Conservation Service, as well as other agencies engaged in the identification or delineation of flood-risk zones within the several States, shall, in consultation with the Secretary of HUD, "give the highest practicable priority in the allocation of available

manpower and other available resources to the identification and mapping of flood hazard areas and flood-risk zones," in order to assist the Secretary to meet the established deadline (August 1, 1983). (257)

This recommended priority has caused some differences between SCS and FIA. In April 1973, the FIA requested SCS to take on two major nationwide special studies on a crash basis. No other Federal agency or private contractors would undertake these two efforts. SCS was the only agency that had a technical delivery system which was adequate to meet the demands of these studies. (258)

The first study involved compiling a list of all flood-prone communities in the nation, on a county-by-county basis. It was initiated in June of 1973 and completed in September of the same year. Information on over 13,500 flood-prone communities was collected and furnished to FIA by SCS. This effort involved every SCS field office and required that time be taken from other ongoing USDA programs. (259)

The second major national crash effort for HUD was to obtain copies of community maps for the 13,500 flood-prone communities. This time-consuming job was essentially completed in October 1973. (260)

Since starting in 1969, HUD has initiated some 22 types of flood insurance studies. Individual studies are initiated after SCS furnishes a time and cost estimate to the FIA and receives a project order. At the beginning of each fiscal year SCS enters into an Inter-agency Agreement (IAA) with HUD to perform detailed studies, as mutually agreeable, on a reimbursable basis. The agreement defines the approximate dollar value for studies to be initiated that year. The dollar value amount can be adjusted by a modification of the IAA if necessary. (261)

A project order prescribes the type of study to be performed for each noted community, period of performance, and the total estimated cost of each community study. (262)

SCS is one of six Federal agencies carrying out reimbursable studies for HUD. SCS initiated its first detailed flood insurance study in West Virginia, in June 1969. As of September 30, 1977, SCS had initiated 349 detailed FIS's in 44 states and Puerto Rico. It had completed 191 of these studies and submitted them to FIA and had 158 studies in 30 states underway. (263)

The level of SCS activity and funding in this program is shown in the following table: (264)

Reimbursable HUD Flood Insurance Studies
(as of September 30, 1977)

FISCAL YEAR	PROJECT ORDERS RECEIVED	NUMBER OF STUDIES	
		INITIATED	COMPLETED
1969	\$ 9,000	1	0
1970	207,500	15	10
1971	952,300	62	36
1972	761,600	41	43
1973	1,000,000	27	25
1974	1,067,000	15	15
1975	1,220,600	35	8
1976	1,500,000	73	14
T.Q.	326,120	16	4
1977	3,232,490	64	36
TOTAL	\$10,276,610	349	191

The Federal Insurance Administration has determined that there are a total of some 21,600 communities which contain flood-prone areas. (265) As of December 31, 1977, there were 15,770 communities participating in the National Flood Insurance program. Flood insurance is available for any walled and roofed building or mobile home and its contents throughout each community. Of these, 14,186 were participating in the Emergency Program. There is a large backlog of communities with flood-prone areas which still need detailed flood hazard studies. (266)

Recreation and Fish and Wildlife

1. Recreation

The demand for outdoor recreation is greater than it has ever been in the history of this Nation. With more leisure time, more spendable income, and greater mobility, people are seeking the outdoors in ever increasing numbers. In the past 15 years interest in outdoor recreation has outstripped population trends. Both Federal and state recreation facilities already are overcrowded in most areas. This provides an opportunity for the development of local water-based recreation facilities. (267)

The Watershed Protection and Flood Prevention Act was amended by P.L. 87-703, 76 Stat. 605, 608, 609, 16 U.S.C. 1002, to provide for recreation cost-sharing in watershed projects. The law provides that the Secretary of Agriculture can bear not to exceed one-half of the costs of land, easements, and rights-of-way for the reservoir and recreation area, minimum basic facilities, and land for access to the development. The number of developments per watershed project is limited as follows: one per project containing less than 75,000 acres; two for a project containing between 75,000 and 150,000 acres; and three for a project of more than 150,000 acres. (268)

In addition to Recreation Developments, Water Resource Improvements (WRI) for recreation can be included in watershed projects. The Secretary can cost-share up to 50 percent of the construction costs allocated to recreation in a WRI. Public access must be provided at no Federal cost. There is no limitation on the number of these improvements in a watershed project except that policy restricts the P.L. 83-566 recreation costs to not more than 30 percent of the total P.L. 83-566 costs for the project.

As of April 1, 1977, 38 of the 434 watershed projects completed included recreation as a purpose, and 209 of the 751 not completed had recreation as a purpose. (269) As of January 1, 1977, there were 216 P.L. 83-566 and Authorized Flood Prevention Watershed projects with recreation developments in 39 states. There were 101 projects which had Water Resource Improvements only. The total number of Water Resource Improvements approved for installation were 210. In all there were 311 projects with Recreation Developments and/or Improvements approved for construction in 46 states. (270) It is estimated that the Public Recreation and Fish and Wildlife Developments alone will provide 17.9 million annual user-days of recreation. (271) The Improvements are estimated to provide another 3 million user-days of recreation. (272)

The 459 public developments and improvements involve only a small part of the total number of detention structures planned. As of June 30, 1976, there were already 12,703 floodwater retarding structures constructed. There is no readily available summary of the number planned and still to be constructed, but it will exceed this number. Most of the structures have or will have sediment pools which provide some recreation opportunities. Also, there are over 2 million stock ponds which provide some recreation. (273) Based on a 1959 survey, Carl Thomas, Head Biologist, SCS estimated that 20 percent of these ponds provide excellent fishing, 65 percent average, and only 15 percent poor fishing. This survey also indicated that these ponds can provide up to 64 fisherman days per acre per year.

Carl Sullivan, Executive Director, Sport Fishing Institute, stated in a speech at the 1974 National Watershed Congress that 40 percent of fishermen choose artificial impoundments and that these impoundments attract 50 percent more anglers than natural lakes.

The SCS sought answers to the questions of how popular recreation developments are and their impact on the local communities. By agreement with SCS, the Department of Recreation and Park Administration, University of Missouri, studied five watershed recreation developments in three states. Attendance figures were checked and 400 groups at these lakes were interviewed in 1970. It was found that an average benefit of \$4.26 per recreation-day resulted from these activities. Of this amount 56 percent were benefits which accrued to local communities in the form of admission fees, equipment sales, and purchases of food, fuel and supplies. The remaining benefits accrued to the region in the form of travel costs to and from the watersheds. (274)

Other recreational activities include assisting land owners and operators establish commercial enterprises and to establish, expand, or add to public recreation developments. A total of 1,577,031 acres of recreation improvement, 545,985 acres of recreation land grading, and 18,341 miles of recreation trails and walkways had been established through all SCS programs as of June 30, 1976. (275)

As of June 30, 1977, over 1,315 recreation measures had been completed in Resource Conservation and Development projects. Only 18 of these were cost-shared by the SCS. There were 83 other measures being planned or installed.

The major problems involved with recreation developments are lack of adequate management capability and financial resources to the local sponsors, and promotional ability.

2. Fish and Wildlife

The March 10, 1934 Act, "An Act to promote the conservation of wildlife, fish and game and for other purposes" (16 U.S.C. Secs. 661-664, inclusive) was amended by P.L. 85-624, 85th Congress, August 12, 1958. It is known as the Fish and Wildlife Coordination Act. Its purpose is to recognize the contribution of wildlife resources to the Nation and "to provide that wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation and rehabilitation..." (276)

The Secretary of the Interior, through the U. S. Fish and Wildlife Service, is responsible for carrying out the provisions of the Act. The basic provisions of the Act are applicable to Federal programs and to public and private agencies operating under Federal permit or license. The Act recognized that there is a difference between Federal projects and Federally assisted projects in the application of the provisions of this Act. It amended P.L. 83-566 by adding Sec. 12 to that Act.

Section 12, P.L. 83-566, directs that the Secretary of Agriculture shall notify the Secretary of the Interior when he approves the furnishing of assistance to a local organization in preparing a watershed protection and flood prevention work plan. The Secretary of the Interior then, as he desires, can "make surveys and investigations and prepare a report with recommendations concerning the conservation and development of wildlife resources and participate, under arrangements satisfactory to the Secretary of Agriculture, in the preparation of a plan of works of improvement that is acceptable to the local organization and the Secretary of Agriculture." (277)

The Act further provides that the Secretary of Agriculture shall give full consideration to the recommendations of the Secretary of the Interior. "The plan shall include such of the technically and economically feasible works of improvement for wildlife purposes recommended by the Secretary of the Interior as are acceptable to, and agreed to, by local

organizations and the Secretary of Agriculture,...." (278) It also provides that the costs of making the surveys and investigations and preparing the reports which are incurred by the Fish and Wildlife Service shall be borne by the Secretary of the Interior out of funds appropriated to his Department. (279)

The provisions of Sec. 12 are quite workable and should have resulted in a beneficial cooperative effort in the field. This has not been true in many instances. While good cooperation does occur in some states, in others the reverse is true. In some instances SCS personnel have been negligent in notifying F&WL field offices of pending studies. In other instances, the F&WL offices were notified but did not participate in field examinations and other joint meetings. As a result they were not familiar with the objectives of the sponsors and did not get the F&WL inputs into the planning process for consideration in plan formulation. Frequently, the first information on F&WL recommendations comes to the attention of sponsors in the form of comments on the draft plan.

This condition probably developed partially because Sec. 12 provides that F&WL Service has to pay for its inputs out of its own appropriations and its available resources may have permitted it only to react rather than participate. When a Federal agency is planning a Federal water resource development project, the Fish and Wildlife Coordination Act provides that that agency should transfer funds to the Fish and Wildlife Service out of appropriations made available for investigations, engineering or construction. The F&WL Service has expressed concern that SCS will not do the same on the Federally assisted projects.

Another problem which has affected the cooperative effort is that the F&WL recommendations often are not acceptable to the local organizations and the Secretary of Agriculture. This could be expected when F&WL personnel do not participate in the field examinations and project formulation meetings. Their recommendations often are not compatible with project objectives and greatly increase costs to be borne by local sponsors without providing them any additional benefits.

P.L. 85-865, 72 Stat. 1605, 16 U.S.C. 1004 (September 2, 1958), which amended P.L. 83-566, authorized cost-sharing for fish and wildlife purposes. However, it did not include the costs of land rights except in the case of public fish and wildlife developments. One of the biggest problems comes from the interpretation of mitigation of damages. The F&WL Service interpretation is that mitigation must be in kind. If this cannot be done, it often insists that damaged acreage must be replaced on a multiple basis, such as two or three acres of new land for each one damaged. Such an arrangement greatly increases local costs since land rights must be provided at local expense.

The lack of sound research on the impacts of reservoir and channel construction contributes to the misunderstandings between agency personnel. Numerous channel studies have been made but few, if any, have had base line references. For example, Bayless and Smith made a study of

several coastal streams in North Carolina between 1963 and 1965. They alleged that game fish had been reduced by 90 percent in some of these streams as a result of channelization carried out 40 years earlier. Channels of seven watershed projects included in the study were constructed between 1959 and 1966. Therefore, it would appear that some of the channels sampled either were under construction or construction had just been completed. A recheck of these channels in 1968 did not verify the wide range of yields reported by Bayless and Smith. (280) There was no base line reference for the study except other streams in the area. This study was not well received, even by the people who authorized it. A subsequent study was made which was more acceptable and did show good recovery in several streams. (281) However, here again, no base line reference existed to show actual conditions prior to channelization.

A research study on waterfowl utilization of flood prevention lakes in north-central Texas was made in 1976-1977. (282) The observation period extended from August 1976 to April 1977. The study area included 55 flood prevention lakes selected from 254 lakes in the Chambers Creek, Richland Creek and Grays Creek watersheds in Navarro, Ellis, Hill and Limestone Counties. These 254 lakes have produced nearly 7,000 acres of additional surface waters in this area.

Aerial counts were made on bi-weekly periods during the observation period. Extrapolation of the total duck numbers observed on the 55 study lakes to all 254 flood prevention lakes showed that over 19,000 ducks were present on these lakes at high periods.

An indication of the relative importance of the flood prevention lakes to waterfowl in comparison to other bodies of water in the area was obtained by observing waterfowl on water areas other than flood prevention lakes during the 16 aerial counts. These indicated that the flood prevention lakes were the most important bodies of water in the study area for waterfowl. Many large flocks of ducks frequently were seen on flood prevention lakes not included in the study. In contrast, few large concentrations of waterfowl were ever seen on the four large reservoirs in the area or on the numerous farm ponds.

A study of fish population characteristics of flood prevention lakes also was carried out in 1976-1977. (283) The study area involved 56 flood prevention lakes. Twenty-three species of fish were found in these lakes. Dominant species included largemouth bass, bluegill, redear sunfish, green sunfish, black bullheads, channel catfish, white crappie, and golden shiners.

The study indicated that flood prevention lakes can support important recreation fish populations. In general, limnological conditions were suitable and fish populations were in good condition, with a balance between populations of sport and forage species. Biological factors generally exceeded the physical and limnological factors as direct limiting factors in regulating fish production.

Of particular significance is the fact that most of the streams on which these structures are located either have intermittent flow or flow only when there is flood runoff. Consequently, the streams' value for fishery purposes under natural conditions is either nil or very low.

In spite of the difficulties involved, many fish and wildlife measures have been installed and many benefits have accrued. The edge effects and impounded water behind detention dams are quite beneficial to upland game. Field studies have shown that both wild turkey and deer populations have increased where conservation measures, including water impoundments, have been installed. As of June 30, 1976, as a result of all SCS programs, wildlife wetland management had been installed on 8,304,481 acres; wildlife upland habitat management on 90,739,727 acres; 42,561 wildlife watering facilities constructed; fish pond management applied to 806,641 ponds; 81,660 acres of commercial fish ponds constructed; 470,752 lineal feet of fish raceways constructed; and 3,839,152 lineal feet of fish stream improvements made.

The requirement for environmental impact statements on all projects has brought a more timely consideration of fish and wildlife problems into the planning process. This, together with more timely agency inputs, should greatly improve the quality of fish and wildlife measures in all water resources and other conservation program developments.

Emergency Watershed Protection

Emergency Watershed Protection was authorized by section 7 of the Flood Control Act approved June 28, 1938, as amended by section 15 of the Flood Control Act approved December 22, 1944, which was further amended by section 216 of the Flood Control Act of 1950, P.L. 81-516 (33 U.S.C. 701b-1). (284)

Section 216 reads as follows:

"The Secretary of Agriculture is hereby authorized in his discretion to undertake such emergency measures for run-off retardation and soil erosion prevention as may be needed to safeguard lives and property from floods and the products of erosion on any watershed whenever fire or other natural element of force has caused a sudden impairment of that watershed. Provided, that not to exceed \$300,000 out of any funds heretofore or hereafter appropriated for the prosecution by the Secretary of Agriculture of works of improvement or measures for run-off and water-flow retardation and soil-erosion prevention on watersheds may be expended during any one fiscal year for such emergency measures."

The administration of Emergency Watershed Protection (EWP) has been delegated to the Administrator, SCS. The objective of EWP is to carry out emergency measure installation for soil erosion prevention

and run-off retardation in watersheds that have been suddenly impaired by a natural disaster. These measures are needed to safeguard lives and property from floods and the products of erosion; i.e., to eliminate or reduce hazards created by the event. (285)

Section 216 authority may be used to provide assistance when:

1. The watershed impairment has (a) been sudden; (b) been caused by natural forces, i.e., fire, earthquake, mudslide, etc., (c) resulted in a threat, exceeding the pre-disaster condition, to human life or property from floods or the products of erosion.

2. The emergency measures must be (a) the least costly technique readily determinable that will provide immediate, adequate and safe relief from the hazard, (b) limited to the minimum that will reduce the threat to lives and property to the degree that such threat existed before the sudden impairment, and (c) beneficial to more than one beneficiary.

3. Other criteria are: (a) Section 216 funding is limited to emergency work that is scheduled to be completed within 220 consecutive calendar days after date of allotment of funds, (b) sponsors agree to provide landrights, permits, etc., that may be needed, (c) funding, other than Section 216, for alleviating the hazard(s) has been fully committed, and (d) adverse environmental impacts are to be minimized. (286)

Emergency measures which may be utilized include:

1. Establishing vegetative cover such as grass, shrubs or trees on denuded land,
2. Opening water courses where flow is dangerously restricted; replacing or constructing protective diversions, dikes or jetties,
3. Stabilizing streambanks with vegetative cover, riprap, cribbing or piling,
4. Installing land stabilization measures,
5. Constructing emergency road stabilization measures such as water bars.

Permanent or long-life measures may be installed only if they are the most expeditious way to safely obtain emergency protection. (287)

The SCS has the responsibility for administration of the program on privately owned lands. The Forest Service has the responsibility to administer, under the general program criteria and procedures established by SCS, the forestry aspects of emergency watershed protection on the National Forest System and on rangelands within the national forest boundaries, on adjacent rangelands that are administered under formal agreement, and on other forest lands. (288)

Assistance provided under Section 216 has grown tremendously since its inception. The Federal dollar amount appropriated for watershed emergency assistance has grown from \$100,000 in 1944 to \$65,000,000 in 1976. Supplemental appropriations provided by Congress for this purpose are:

Fiscal Year	Appropriation
1965	\$ 900,000
1969	4,000,000
1970	3,700,000
1973	16,500,000
1973	20,000,000
1974	22,500,000
1976	26,577,000
1976	26,432,000
1976	12,327,000
1977	12,000,000

Total obligations of these funds by SCS and FS by fiscal year are:

Year	Dollars
1960	\$ 210,932
1961	123,369
1962	30,167
1963	68,836
1964	7,362
1965	852,513
1966	31,923
1967	101,045
1968	224,497
1969	299,294
1970	5,281,477
1971	2,908,900
1972	384,565
1973	8,397,399
1974	20,167,737
1975	22,175,469
1976	10,352,559
Total	\$71,618,044

Of the above total obligations, SCS has obligated \$58,160,043 and FS \$13,458,001. (289)

This program has been quite effective in alleviating potential future damages resulting from natural disasters and in restoring watershed conditions. However, it would be much more effective if delays awaiting supplemental appropriations could be reduced. Since the law limits expenditures from existing funds to \$300,000 per fiscal year, a supplemental appropriation must be made each time needed assistance exceeds this amount. This results in delays in assistance and subjects the beneficiaries to extended potential damage. A request has been made to establish a fund for immediate use. Such an action would greatly expedite timely action when emergencies occur.

CHAPTER 8

OTHER WATER RESOURCE ACTIVITIES OF USDA

Agricultural Research Service (ARS) ^{1/}

The ARS was established under Secretary's Memorandum No. 1320, Supplement 4, November 2, 1953. Its assigned responsibility is to conduct all of the production and utilization research of the Department (except forestry research) and the inspection, disease and pest control and eradication work closely associated with this research. This included the research previously carried on by the Agricultural Research Administration. Also, all soil conservation research, except investigations required for the national soil survey, was transferred to ARS from SCS. (290)

The following research activities are of particular importance in the field of water resources:

1. U. S. Regional Salinity Laboratory.

This laboratory was established June 29, 1935 (Ch. 338, 49 Stat. 436). The law authorized the Secretary of Agriculture to conduct research into laws and principles underlying basic problems of agriculture in its broadest aspects and research relating to the conservation, development, and use of land and water resources for agricultural purposes. Representatives of the USDA and Agricultural Experiment Stations of the eleven Western States and Hawaii decided to establish a salinity laboratory to conduct research on problems connected with the sources and permanence of agriculture on saline and alkali soils. In 1951 official cooperation and collaborator representation was extended to include the 17 Western States. The name of the laboratory was changed to United States Salinity Laboratory. The 1958 appropriation act added an additional facility to enlarge the scope of this work. (291)

2. Southwestern Irrigation Field Station.

This station was established at Brawley, California, in June 1948. In fiscal year 1949 Congress made funds available for its development. The facility was dedicated November 3, 1951, to develop more effective methods of soil and water management in the irrigated valleys of the Southwest involving poor drainage and alkali problems. (292)

3. Soil and Water Conservation Research Field Station.

On December 31, 1953, this station at Coshocton, Ohio, was transferred from the SCS to the ARS. In 1960 funds were made available to expand the facility to develop hydrologic information on the effect

of conservation practices on tributary flow on the Muskingum-Wellston-Lanesville and associated soils of the Western foothills of the Appalachians. (293)

4. U. S. Water Conservation Laboratory.

The Appropriations Act of 1958 provided funds to this laboratory to establish a facility at Tempe, Arizona, to increase the efficiency of irrigation practices in the Southwest. (294)

5. USDA Sedimentation Laboratory.

This laboratory was established at Oxford, Mississippi, under the Agricultural Appropriation Act of 1958. Its mission is to conduct basic research on the hydraulics involved in the entrainment, transportation and deposition of sediments as related to the development of the small watershed program. (295)

6. Northwest Hydrology Research Watershed.

The Appropriations Act of 1960 provided funds to establish facilities at Boise, Idaho, to gain basic information on run-off characteristics, including water yields, from plateau and foothill grazing areas of the Northwest. (296)

7. Southern Great Plains Watershed Research Center.

The Appropriations Act of 1961 provided funds for research on hydrology problems in the Southern Great Plains. The Research Center was established at Chickasha, Oklahoma, in the Washita River watershed. (297)

8. North Central Hydrology Research Watershed.

The Appropriation Act of 1962 granted money to establish this watershed at Columbia, Missouri, to develop basic information on precipitation-run-off relationships, sedimentation, and channel stability problems that occur under the intensively developed agricultural areas of the North Central States. (298)

The above named research facilities are only a few of those established throughout the nation, including the Hydraulic Laboratory at St. Anthony Falls, Minnesota, which had research objectives related to water and related land resources. They are, however, representative of water resource research being done and illustrate the involvement of ARS in the USDA activities in this field.

ARS builds and maintains structures that it owns or leases as a part of a research facility or as "equipment" used in specific research studies. They may be used in research on irrigation water, water harvesting, water spreading for groundwater recharge, reservoir sedimentation, or run-off pollution control studies. It also conducts an extensive research program in hydrology and hydraulic structures.

Agricultural Stabilization and Conservation Service (ASCS)

1. The Agricultural Conservation Program (ACP).

The ASCS administers the Agricultural Conservation Program (ACP). From its beginning in 1936, the ACP has been applicable to the present 50 states, Puerto Rico and the Virgin Islands. It has been available continuously as a public financial aid to share costs with farmers and ranchers for carrying out soil, water, woodland and pollution-abatement practices. During the period 1971-1973, the program was known as the Rural Environmental Assistance Program (REAP), and in 1974 as the Rural Environmental Conservation Program (RECP). Each of these programs had basically the same goals and purposes. In 1975 the program name was changed back to ACP. (299)

The Agricultural Appropriation Act of 1950 provided that the county agricultural conservation committee could allot up to five percent of its ACP allotment to the SCS for services of its technicians in formulation and carrying out the ACP. Subsequent appropriation acts have continued this provision. (300) Technical assistance provided by SCS technicians is limited to those practices which are of a permanent nature.

The ASCS Report, Agricultural Conservation Program, Practice Accomplishments by States, 40 Year Summary, 1936 through 1975, lists 91 practices for which it provides or has provided cost-sharing assistance. Of these, only about 36 practices are directly related to water and sediment management. The total Federal cost-sharing on these practices from 1944 through 1973 amounts to about \$1,677 million. (301)

ASCS provides cost-sharing assistance to agricultural producers for soil and water conserving measures. It may cost-share with landowners on the construction of dams designed to: conserve or safely dispose of water; protect against soil erosion or flood damage; or prevent agricultural pollution of water. Since SCS provides technical services for these measures it is involved with all dams cost-shared by ASCS.

2. The Water Bank Program

The Water Bank Program was authorized by the Water Bank Act, P.L. 91-559 (84 Stat. 1468, 16 U.S.C. 1301), approved December 19, 1970. It authorized the Secretary of Agriculture to formulate and carry out a continuous program in important migratory waterfowl nesting and breeding areas, to prevent the serious loss of wetlands, and to preserve, restore and improve inland fresh water and adjacent areas as designated in the Act. (302)

The Congress found it in the public interest to provide for conserving surface waters, to preserve and improve habitat for migratory waterfowl and other wildlife resources, to reduce run-off, soil and wind erosion, and to contribute to water control. (303)

The program provides that eligible persons in selected areas having eligible wetlands in important migratory waterfowl nesting and breeding areas may enter into ten-year agreements, with provision for renewal, and receive annual payments for the conservation of water and to meet other purposes of the Act. The Secretary is constrained from entering into any agreements with owners or operators that will require Water Bank Program payments in any calendar year in excess of \$10,000,000. (304)

The Water Bank Program on specified farm, ranch or other wetlands applies to wetlands identified in a conservation plan developed in cooperation with the Soil and Water Conservation District in which the lands are located, and under terms and conditions set forth by the Secretary. (305)

As of July 1977, the cumulative progress of the program was:

(306)

- Number of states participating	14
- Number of agreements	3,981
- Designated wetland acres	121,897
- Designated adjacent acres	294,087
- Total designated acres	415,984
- Total annual payments	\$4,378,646

Economic Research Service (ERS)^{2/}

The Bureau of Agricultural Economics was the predecessor agency to ERS. In the USDA reorganization of October 13, 1953, work relating to farm management and costs, land economics and agricultural finance were transferred to ARS. The ERS was established on April 3, 1961, by Secretary's Memorandum 1446, Supplement 1. The Natural Resource Economic Division of ERS is concerned with the water resource activities of USDA.

The responsibilities of the Natural Resource Economics Division include study of resource quality, recreation, resource organization, resource law, property rights and ownership, public finance, evaluation and planning techniques, resource inventories, resource conservation, resource development, resource projections, remote sensing, RC&D studies, watershed studies, river basin studies and Water Resource Council activities. (307)

The activities and contributions of ERS in the river basin and watershed planning programs have been discussed in previous chapters. This agency also makes special evaluation studies and water and related land resource studies and prepares reports thereon. Its contributions in the preparation of evaluation procedures for river basin projects have been especially significant. Mark M. Regan, Division of Land Economics, BAE, USDA, was on the staff of the Subcommittee on Benefits and Costs which prepared the Report to FIARBC, "Proposed Practices for Economic Analysis of River Basin Projects", May 1950, known as the First Green Book. This report was revised in May 1958. Mark M. Regan and William

A. Green, Farm Economics Research Division, ARS, USDA, were members of the Subcommittee on Evaluation Standards which prepared this revision.

River Basin Planning is based on long-term projections of economic activities which place demands on water and related land resource use. These projections are developed by a joint effort of ERS and the former Office of Business Economics, Department of Commerce. They are known as OBERS projections and are updated periodically.

ERS also is deeply involved in developing information for use by the Water Resource Council in its National Water Assessment which is prepared on a periodic basis.

Farmers Home Administration (FmHA)

The lineage of FmHA goes back to the Resettlement Administration. This agency was created by Executive Order in 1935 and took over depression-era programs that had been carried on in about 40 states by Rural Rehabilitation Corporations formed under the Emergency Relief Act of 1933. On July 22, 1937, the Bankhead-Jones Farm Tenant Act was enacted. It created a new program of supervised 40-year Farm Ownership loans. Administration of the Act was given to the Resettlement Administration. Also, the Water Facilities Act, to provide loans for individual and association farm water systems in 17 western states, was enacted in 1937. Resettlement shared administration of the Act with SCS and BAE. (308)

As administrative actions were taken to carry out the Farm Tenant Act, the name of the Resettlement Administration was changed to Farm Security Administration and it was placed under USDA. This change took effect in 1938. In 1942, FSA was given full responsibility for the Water Facilities Program. (309)

In August 1946, Congress passed the Farmers Home Administration Act which took effect in 1947. It reconstituted FSA under the new name of Farmers Home Administration. This Act also gave FmHA a new authority: to insure loans made by banks, other agencies and private individuals, as well as to make direct government loans. In 1949 the first of many new additions were made to FmHA services. Due to the scope of this History, further discussion will be limited to those services which deal with water. (310)

The Water Facilities Act was amended in 1954 to apply nationwide rather than be limited to the 17 Western States. It also permitted farm area water systems to take on non-farm customers in rural communities. In 1959, FmHA began to make loans to local organizations covering the local share of cost in P.L. 83-566 Watershed Projects. The Consolidated Farmers Home Administration Act of 1961 provided a major overhauling and expansion of FmHA authorities. Among these, it opened up the water system program to the general rural population, including incorporated towns up to 2,500 and raised the loan limit for a direct FmHA loan from \$250,000 to \$500,000. In 1962 FmHA was authorized to make loans

covering local project costs for Resource Conservation and Development Projects. (311)

The second major expansion of the 1960's in programs serviced through FmHA came under acts passed by Congress in 1965. The Water Facilities loan program was transformed into a loan-and-grant program for both water and waste disposal systems. Rural towns up to 5,500 were made eligible to be included in FmHA-financed projects, and the limit on FmHA financing of a project was raised to \$4 million. In 1968 Congress abolished the statutory annual ceiling of \$450 million in the water-sewer program on FmHA insured loan authority for Farm Ownership and Community Facilities combined. It also raised the national total authorization for water-waste disposal grants from \$50 million to \$100 million a year. (312)

The Rural Development Act of 1972 (P.L. 92-419) August 20, 1972, abolished the \$4 million per project limit on FmHA financing on water and waste disposal systems, increased the national grant authorization for water and waste disposal to \$300 million a year, and raised the population limit on towns included in FmHA-financed systems to 10,000. (313)

The magnitude of FmHA involvement in water related activities is reflected by the following listing of alltime totals of numbers of loans and amounts obligated from the inception of each program through September 30, 1976: (314)

Program	Loans No.	Amount Obligated
Soil and Water Loans (Individuals)	25,399	\$ 159,912,532
Water Facilities Loans (Individuals)	18,296	29,695,363
Irrigation, Drainage, Soil Conservation Loans to Ass'ns.	569	23,300,709
Water and Waste Disposal Loans	14,574	3,372,849,014
Water and Waste Disposal Grants	5,509	646,072,267
Water Facilities Ass'n. Loans	337	7,412,466
Water and Sewer Planning Grants	1,834	22,293,387
Small Watershed Project Loans	398	119,053,324
Flood Prevention Loans	29	3,968,500
Resource Conservation and Development Loans	230	18,735,569

Forest Service

The involvement of the Forest Service in the P.L. 83-566 program, the Flood Prevention Program, and the River Basin Planning Program has been discussed in earlier chapters.

The Forest Service was established as a result of the Transfer Act of February 1, 1905. This Act transferred the forest reserves from

the Department of the Interior to the Department of Agriculture. Secretary of Agriculture James Wilson designated the new agency as the Forest Service. He also charged the Head of the Agency to "see to it that the water, wood and forage of the reserves are conserved and wisely used..." (315)

1. Watershed Management.

Watershed Management has been a basic consideration of all National Forest Management programs. The maintenance of favorable conditions of waterflows was one of the objectives stated in the 1897 Act. Public concern about floods was largely responsible for the enactment of the Weeks Act of 1911. (316) This Act authorized and directed the Secretary of Agriculture to examine, locate and recommend for purchase those forested, cut-over, and denuded lands within the watersheds of navigable streams as in his judgement may be necessary to the regulation of the flow of navigable streams or for the production of timber. Watershed protection has been a primary reason for fire control on many National Forest areas. (317)

Watershed Management is the protection, conservation and wise use of the natural resources within a drainage basin aimed at keeping the soil mantle in place and making water available in a manner which best serves human requirements. National Forest System lands are the most important watershed lands under a single jurisdiction in the United States. In the 11 Western States, more than one-half of the stream flow comes from the National Forests. In the East, National Forest lands are situated at the stream headwaters and produce high-quality water. Water from National Forests is valuable for domestic supplies, irrigation, power, industry, fish and wildlife, and recreation. It is basic to the economy of many areas. (318)

Watershed restoration and improvement consist of land-treatment and structural works and of scientific water management. These programs are designed to restore site productivity, improve land stability, and enhance the timing, amount, and quality of water produced on National Forest Systems. (319)

In order to ensure water availability for the needs of the National Forest System, the Forest Service initiated the Reservation Doctrine. This is a philosophy of the Forest Service resulting from the provisions of the Department of Agriculture Organic Act of 1944. It provides for the Forest Service to reserve for its own use, in the management of National Forests for the benefit of the public, such waters as originate in the National Forests. This reservation takes precedence over all other uses of these waters. With the current great demand in the West for water for other uses, this doctrine is being challenged.

2. Recreation Management.

The most definitive authority for management and development

of the National Forest System recreation resources is the Multiple Use-Sustained Yield Act of June 12, 1960 (16 U.S.C. 528-531). This Act proclaimed the policy that the National Forests are established and shall be administered for outdoor recreation, range, timber, watershed, wildlife, and fish purposes. (320)

Competition for water is intense on many National Forests. Water is important to proper development, maintenance, management and use of recreational areas. For example, water is needed for domestic purposes, swimming, irrigating meadows and tree plantings, stock watering, and maintaining proper conditions for wildlife. (321)

3. Wild and Scenic Rivers.

P.L. 90-542, 90th Congress, S. 119, October 2, 1968, established a National Wild and Scenic River System. It declared that it is the policy of the United States "that certain selected rivers of the Nation which...possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations". (322)

The Act provided for three river classifications. These are:

- a. Wild river areas - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.
- b. Scenic river areas - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- c. Recreational river areas - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. (323)

The Act designated eight rivers as the initial components of the system. The Secretary of Agriculture, through the Forest Service, administers four of these and shares in the administration of two others.

Initial Components

Rio Grande, N. Mex.
St. Croix, Minn. and Wisc.
Wolfe, Wisc.
Eleven Point, Mo.
Middle Fork Feather, Calif.
Middle Fork Clearwater, Id.
Middle Fork Salmon, Id.
Rogue, Ore.

Administered by (324)

USDI (BLM); USDA (FS)
USDI (NPS)
USDI (NPS)
USDA (FS)
USDA (FS)
USDA (FS)
USDA (FS)
USDA (FS); USDI (BLM)

The Act also designated 27 rivers for detailed study as potential additions to the system. USDA (FS) provides study leadership for nine of these study rivers. (325) As of September 1977, studies had been completed on two (Chattooga, Ga., N.C., S.C.; Flathead, Mont.) and they had been added to the National system; studies had been completed on three (Skagit, Wash.; Pere Marquette, Mich.; Salmon, Id.) and they had been included in draft legislation to add them to the National system; the Secretary's report and recommendations on the Saint Joe, Id., had been sent to the President through the OMB, March, 1977; the Secretary's proposed report on the Illinois, Ore., was under agency review; studies were ongoing on the Moyie and Priest, Id. (326)

P.L. 90-542 has been amended three times:

a. P.L. 92-560, January 1972, added the Lower St. Croix to the National system.

b. P.L. 93-621, December 3, 1974, designated an additional 29 rivers for study. USDA (FS) has leadership on 13 of these studies and joint leadership with USDI on three others. The joint study of the Dolores, Colo., has been completed and is included in draft legislation.

c. P.L. 94-199, December 1975, added the Middle Snake and Rapid Rivers, Id. and Ore., to the National system, administered by USDA (FS). It also designated the Lower Snake for study, USDI leadership.

4. Dams.

FS has a complex involvement with dams because of the diverse legislation which directs its actions. It has some degree of administrative control over more than 15,000 dams. Most of these are small, low-hazard structures. However, over 1,300 are of a size and height to be included in the National Dam Safety Act inventory.

Rural Electrification Administration (REA)

The REA was established as a relief organization in 1935. It changed from a construction to a lending agency for the establishment of electric power stations and lines in 1936. The REA helps in the organization of cooperatives and with their program plans. Generally, the cooperatives reach areas that commercial companies would consider unprofitable. In 1935, ten percent of the farms were receiving central power station electric service; in 1939, 20 percent; and by 1970, 98 percent. At the beginning of the 1970's, only 50,000 of some 3.15 million farms were not receiving such service. (327)

Since REA is a lending agency dealing with electric power and telephone service, it has only indirect impact on water resources. However, as of January 1, 1977, out of 244 generating units which it had financed, 20 were hydro units and 69 were steam units. (328) Each of these types is dependent upon an adequate water supply. Most steam plants take water from a river or ground water. Both are in critical supply.

Dams are an essential element of hydroelectric generating plants. They also are used to store large quantities of water for thermal electric plants. REA does not design, build or own dams. They are the responsibility of the recipient of REA loans for construction. Cooperatives get water use permits or buy up water rights for their supply. This conflicts with agricultural as well as other uses.

In 1970 REA had made \$300 million in loans. By 1977 this had increased to \$5,000 million. Due to the demand for energy, it is expected that the magnitude of the REA program will continue to increase. REA is encouraging the Cooperatives to promote conservation and multiple use of water such as using cooling water for irrigation. It has fewer water problems in the East and Southeast than in other sections of the Nation.

Soil Conservation Service (SCS)

While the major water resource programs of SCS have been discussed in previous chapters, it has several other programs which have major water resource implications.

1. Conservation Operations (C.O.) and Great Plains Programs (G.P.).

These programs basically deal with the planning and application of measures on farm and ranch lands for the conservation and effective utilization of available soil and water resources. Both programs are based on farm and ranch plans developed with the assistance of soil and water conservation districts. Cooperating landowners or operators with the Conservation Operations program finance their own measures or get such help as is available through the ACP. Cooperators in the G.P. program enter into long-term contracts with guaranteed cost-sharing for the life of the agreement. Eligible measures include those for the control and management of surface run-off and inherent high water tables. Farm and ranch ponds have been discussed in a previous chapter. As of June 30, 1976, 1,239,434 miles of terraces and 105,530 miles of diversions had been installed to control and manage surface run-off. Two other water resource practices, on-farm irrigation and drainage, merit further discussion.

a. Irrigation

Irrigation is one of the first water resource activities in which USDA became involved. The current policy of SCS regarding it is to provide technical assistance to land users to achieve effective and efficient use of irrigation waters to ensure a continued productive irrigated agriculture, to reduce soil erosion and downstream sedimentation, and to prevent or minimize degradation of water quality. "Conservation irrigation is simply using irrigated soil and irrigation water in a way that will insure high production without the waste of either water or soil. It means the use of cropping, irrigation and cultural practices that will maintain the land in permanent agriculture." (329)

A high degree of irrigation efficiency is essential to conservation irrigation. This means that a high percentage of the water applied to an irrigated field must be retained in the root zone for use by the crop. This requires a proper rate of application with respect to soil characteristics, and the timely application with respect to rate of crop usage. Deep percolation must be avoided and surface run off and resulting erosion held to a minimum.

As of June 30, 1976, SCS had provided technical assistance on the installation of surface and subsurface irrigation systems on 20,343,679 acres, and in providing irrigation water management on 25,859,136 acres. (330)

b. Drainage

On December 3, 1938, Secretary of Agriculture, H. A. Wallace, assigned to H. H. Bennett, Chief of SCS, drainage and irrigation responsibilities previously held by the Bureau of Agricultural Engineering. (331) SCS already was involved in drainage work and had been since the assignment of the Civilian Conservation Corps (CCC) in 1935. CCC drainage camps assigned to SCS were working with organized drainage enterprises and associations.

The question of SCS providing drainage assistance to soil conservation districts was settled in 1941 by Field Memorandum SCS-976. This authority was further established in April, 1946, when the Secretary concurred in a memorandum that outlined how drainage fits in with the programs of soil conservation districts.

There was no restriction on USDA drainage activities until 1956 when the ACP National Bulletin restricted cost-sharing where the primary purpose of drainage systems was to bring new land into agricultural production. SCS adopted this policy for both the Conservation Operations and watersheds programs.

Beginning in 1963 and in each succeeding year the Agricultural Appropriations Act prohibits the use of cost-sharing funds or technical assistance for the drainage of Wetland Types 3, 4, and 5, as defined in USDI's Fish and Wildlife Circular 39. The area of controversy about drainage concerns the assistance given to farmers by SCS and ASCS. The basic contention has been that two Federal agencies are in direct conflict. The USDI, through the BSFW, has been attempting to save wetland by purchase and lease and objects to the modification of any wetlands. The USDA, through its programs of technical and financial assistance, helps and encourages farmers to drain wet croplands for more efficient production. Such activities often result in drainage of some adjacent wetlands. The Water Bank Program is an exception.

SCS programs and activities aim toward the achievement of a reasonable balance between continued and efficient production of food and fiber and maintaining environmental quality. Neither should completely supersede the other. Many farmers need drainage assistance, including

major outlets, for sustained production. Since approximately one-fourth of the Nation's total cropland has an excess water problem, effective farm drainage is of critical importance to the Nation's economy.

2. Resource Conservation and Development Program (RC&D)

Resource Conservation and Development Projects are initiated and carried out by qualified local sponsors with assistance of state and USDA agencies. USDA assistance is provided under the following authorities: Soil Conservation Act of 1935 (P.L. 74-46); Title III of the Bankhead-Jones Farm Tenant Act, Sections 31 and 32c, as amended by Title I, Section 102, Food and Agriculture Act of 1962 (P.L. 87-703, 76 Stat. 607), and further amended by P.L. 89-796, 80 Stat. 1478.

RC&D Projects help people take better care of their natural resources and improve their community's economy. These projects are locally initiated, sponsored, and directed. They provide a base for people to come together to plan and carry out actions that will make their project area a better place in which to live, work and play. (332)

USDA provides technical and financial assistance to the sponsoring local groups. It also helps them seek funds and services from other Federal, state and local sources. The SCS has leadership for USDA in the RC&D Program. (333)

The local sponsors develop their own programs and goals. These include, among other things, the development of land and water resources for agricultural, municipal, and industrial use, and the implementation of such measures as sediment control, flood prevention, farm irrigation, and recreation, fish and wildlife developments. They may make use of any other available program authorities in achieving their goals. RC&D Projects usually include more than one county. (334)

As of June 30, 1976, 168 project areas had been authorized for assistance covering 704,470,000 acres. There were an additional 60 applications on hand covering 264,325,000 acres. RC&D measures completed amounted to 10,533. There is no record immediately available as to how many of these are water resource measures. (335)

3. Snow Surveys

As a result of the unprecedented Western drought of 1934, agricultural interest expressed to USDA a demand for general and specific information on water supplies that could be expected to be available during the ensuing growing season. Both the Weather Bureau and the Forest Service were considered as the USDA agency to conduct and coordinate the snow survey program. Both agencies objected and Congress selected the Bureau of Agricultural Engineering to operate the program. In the Appropriation Act of 1935 it included \$36,000 for the Bureau to initiate this activity. On July 1, 1939, the Division of Irrigation of the Bureau of Agricultural Engineering was transferred to SCS and continued to conduct