

Subsequent amendments to the basic Act are as follows:

1. P.L. 85-624, 72 Stat. 563, (August 12, 1958)
  - Provided for coordination with the Secretary of the Interior on the approved fish and wildlife aspects of the proposed watershed projects (122);
2. P.L. 85-865, 72 Stat. 1605, (September 2, 1958)
  - Authorized cost-sharing for fish and wildlife purposes (123);
3. P.L. 86-468, 74 Stat. 131, (April 13, 1960)
  - Extended the provisions of P.L. 83-566 for additional works of improvement to the 11 authorized watershed improvement programs (124);
4. P.L. 86-545, 74 Stat. 254, (June 29, 1960)
  - Liberalized procedures with respect to acquisition of land, easements, and rights-of-way where condemnation of land rights is involved (125);
5. P.L. 87-170, 75 Stat. 408, (August 30, 1961)
  - Broadened the definition of "local organizations" (126);
6. P.L. 87-703, 76 Stat. 615, (September 27, 1962)
  - Provided for recreation cost-sharing, advancement of funds for sites for future construction, and advancement of funds to develop water supply for future municipal and industrial use in any multiple purpose reservoir (127);
7. P.L. 89-337, 79 Stat. 1300, (November 8, 1965)
  - Increased allowable storage capacity for flood prevention from 5,000 acre-feet to 12,500 acre-feet (128);
8. P.L. 90-361, 82 Stat. 250, (June 27, 1968)
  - Authorized the Secretary of Agriculture to contract for the construction of works of improvement upon request of the local organization (129);
9. P.L. 92-919, 86 Stat. 676, (August 30, 1972)
  - Authorized certain technical and financial assistance to public bodies for water quality management, conservation and proper utilization of land (control of agriculture-related pollution and disposal of solid wastes), municipal and industrial water supply, ground water recharge, use of other Federal funds for land rights, and long-term contracting for land treatment (assistance to individuals), and interagency coordination with EPA and HEW for those aspects of plans dealing with water quality pollution abatement and public health features (130);
10. P.L. 95-113, 91 Stat. 913, (October 1, 1977)
  - Increased authority for administrative approval of watershed work plans from \$250,000 to \$1,000,000 of P.L. 566 construction costs.

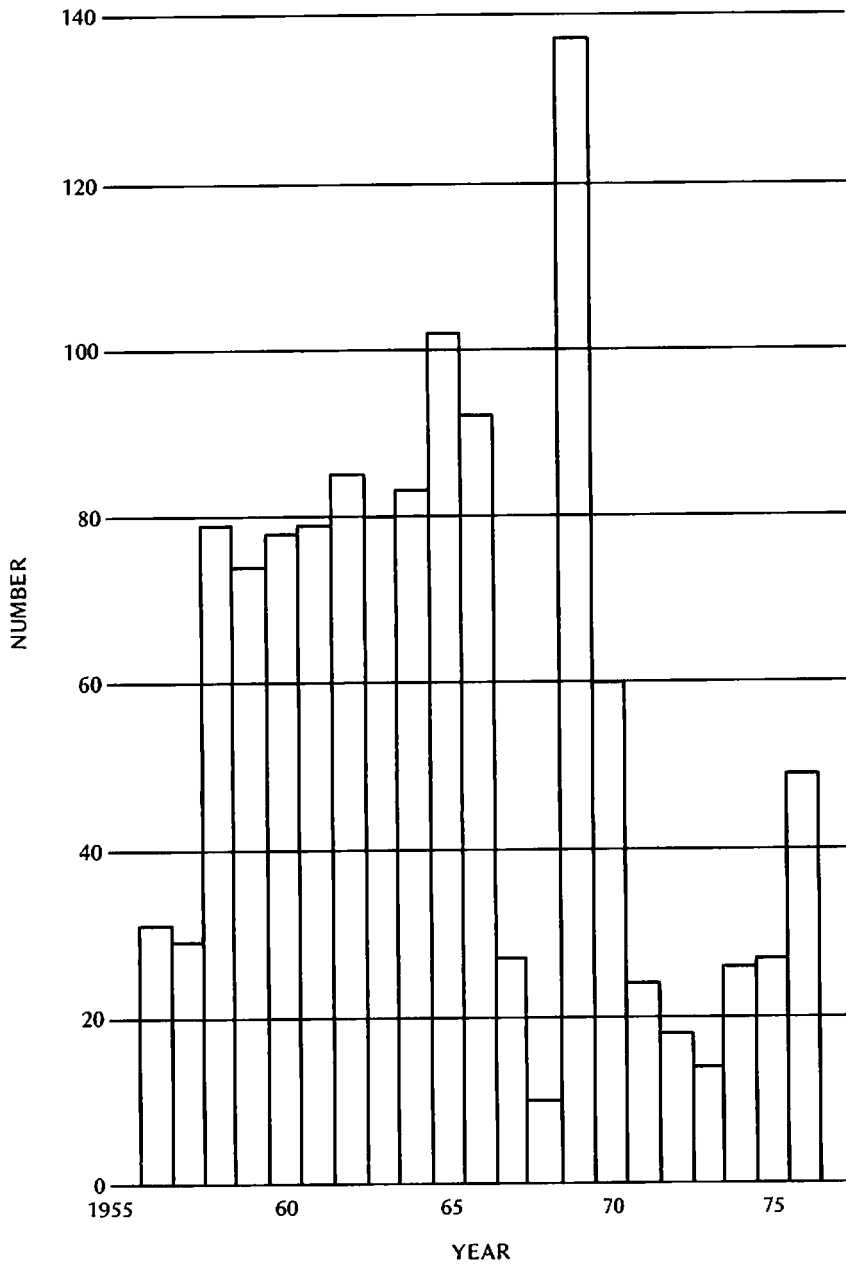
### Characteristics of the Program

The Watershed Protection and Flood Prevention Program is a Federally assisted program. All program activities are initiated by sponsoring organizations, not by the Federal government. The program also is unique in other ways:

1. Land treatment measures, those measures and practices which are installed for soil and water conservation and erosion control, are the first increment of project evaluation. This is accomplished by identifying hydrologic soil groups in the watershed. Then the hydrologist,

**WATERSHED PROTECTION  
PLANS APPROVED EACH YEAR**

**1956-1976**



**FIGURE 3**

geologist, soil scientist, district conservationist, and a Forest Service technician, when applicable, develop the soil-cover-complex conditions for various segments of the watershed for without- and with-project conditions. Run-off curve numbers are calculated and run-off is estimated for storms in the evaluation series for both without- and with-project conditions. The percent reduction in surface run-off brought about by the land treatment project measures provides the basis for estimating damage reduction benefits to be credited to these works of improvement. Damage reduction benefits resulting from structural measures are estimated from a revised damage base. (131)

2. The closely knit interdisciplinary team used in watershed planning is not commonly found in other agencies' water resource programs.

3. Floodwater retarding structures have non-regulated principal spillways and usually have vegetated emergency spillways. Often the principal spillways operate with a two-stage inlet to increase the hydraulic and economic efficiency of the structure. The low stage may operate with a very low release rate to give maximum protection to the flood plain from the smaller, more frequent storms. The high stage will operate at a much higher release rate to permit more rapid dewatering of the flood pool and reduce the volume of flood water storage required.

4. Project channels in combination with structural release rates are designed to provide the level of protection necessary for the flood plain values. For example, if high value crops, such as celery, are grown in some reaches of the flood plain it may be necessary to prevent all flooding from 10-year or less frequency storms. On the other hand, improved pastures with legumes may be able to stand shallow, low-velocity floodwaters for 48 to 72 hours without damage, and tree seedlings may stand up to seven days inundation.

The nature of watershed projects is such that desired variations can be adapted to different flood plain reaches as the existing or expected values may demand.

### Watershed Planning

Watershed project planning is a coordinated analysis of watershed problems and potential solutions by a team of technicians representing various disciplines. The principal disciplines are economics, hydrology, geology, engineering, soil science and plant technology. These may be supplemented by biologists, recreation specialists, foresters, and water quality engineers as needed. There is no defined line between the areas of responsibility of each of these disciplines. The actions and decisions of each is dependent upon and interrelated with the others. Plan formulation requires that the technicians select alternative systems of improvements which are economically feasible and compatible with the economic and social conditions of the watershed. These are presented to the sponsoring organizations and concerned people for review, consideration, and selection of a system or combination of systems which meet their objectives and are acceptable to them for implementation. (132)

There is a great need for this program. The National Inventory of Soil and Water Conservation Needs, 1967, showed that there are 8,925

USDA OBLIGATIONS  
WATERSHED PROTECTION AND  
FLOOD PREVENTION PLANNING  
ANNUAL

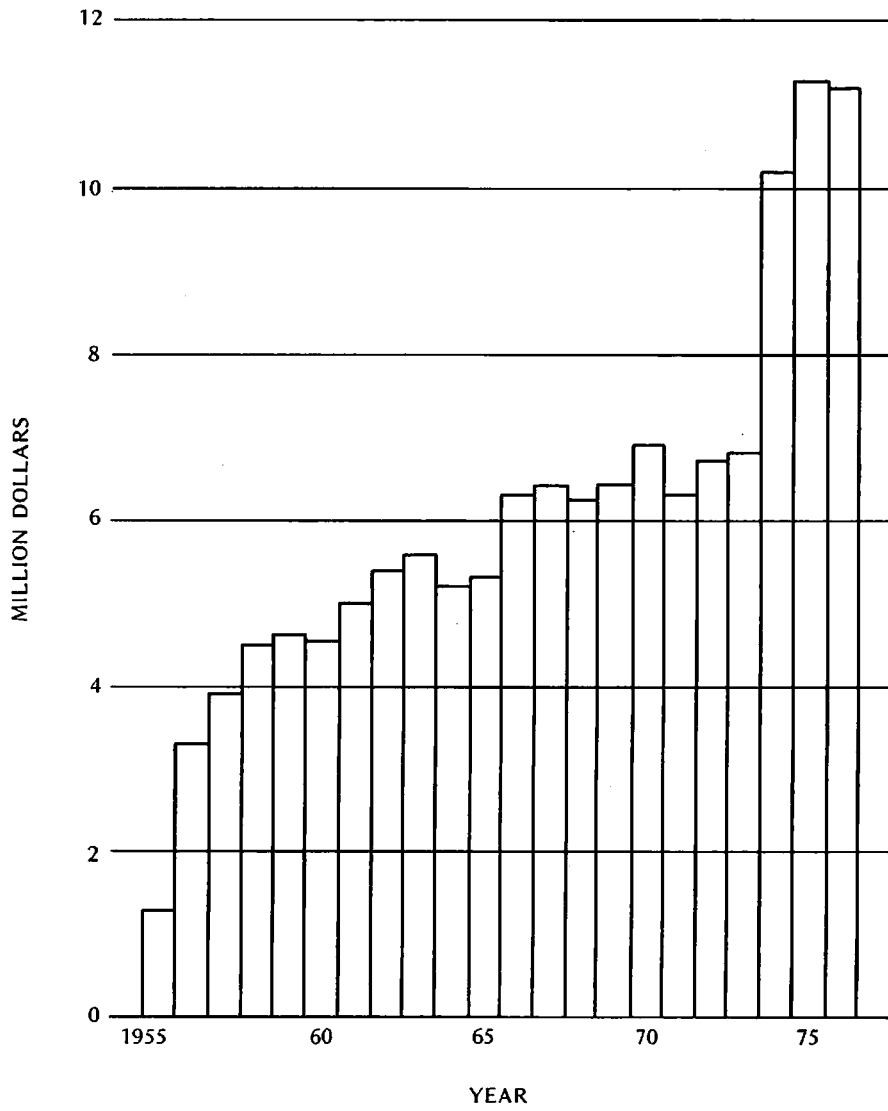


FIGURE 4

eligible watersheds for which project development is potentially feasible. (133)

The program proved to be quite popular with watershed communities having water problems. By January 1961, applications for planning assistance had been received on 1,088 watersheds. Of these, 516 had been authorized to receive planning assistance and 289 had been authorized for operations. (134) This popularity was reflected further by State legislative actions. Between 1955 and 1963, 43 State legislatures enacted laws to expedite cooperation between State and local agencies and the Department of Agriculture in watershed project activities. In all, 285 laws were enacted in the 43 States during this nine-year period. (135)

The popularity of the program has continued and there is still a demand for the services and assistance provided through it. By July 1, 1965, applications had been received for planning assistance on 2,317 watersheds. Of these, 1,111 had been approved for planning and 635 project plans had been approved for operations. As of April 1, 1977, the number of applications had reached 2,860, the number approved for planning - 1,752, and the number authorized for operations - 1,185. An analysis of these figures indicates a significant decrease in rate of accomplishment during the 12-year period, 1965 - 1977, as compared to the four-year period, 1961 - 1965. The application rate dropped from 307 to 45 per year; the approved for planning from 149 to 53 per year; and the approved for operations from 86 to 46 per year. There are a number of factors which contributed to this condition. These are described later in this chapter.

Actual planning accomplishments by years are shown in Figure 3. Annual Federal obligations are shown in Figure 4. A study of Figure 3 shows that by 1958 planning had reached a high annual rate of accomplishment and remained high through 1966. Then annual rates of approval of plans dropped significantly. This reflects the impacts of problems and new constraints.

### Constraints

The House Agriculture Subcommittee on Conservation and Credit has imposed a number of constraints on watershed work plans. Since this Sub-Committee has to pass on all plans for which the law requires Congressional approval by the Agriculture Committees, these constraints have a significant impact on watershed work plans: (136)

1. The prorated P.L. 566 construction cost per benefitted acre should not exceed \$200 per acre;

This criterion was established about 1961. At that time \$200 per acre represented the average top value of agricultural enterprise land. In the middle nineteen sixties, some exceptions were made for especially high valued agricultural areas such as orchard and vegetable land. Between 1961 and 1974, construction costs increased about 146 percent and farm real estate values increased about 163 percent. This rise in construction costs and the resulting costs per acre benefitted

has made it increasingly difficult to meet the cost per benefitted acre limitation.

2. Flood prevention or drainage must be the dominant purpose; The determination of dominant purpose poses several questions:

- Will the determination be made on cost relationships or benefit relationships?
- Will keeping flood prevention the dominant purpose limit the formulation of the plan to something less than is needed or desired to solve all water resource problems and needs?
- Will this criterion relegate small projects to single purpose flood prevention projects?
- Will sponsors of small projects be denied municipal water supply or recreation services as a result of this criterion?

3. P.L. 566 project costs should be limited to \$5,000,000; With the great increase in construction costs, this places a severe limitation on project scale and scope.

4. Single purpose recreation sites should not be included in projects;

In some instances this may deny a community a needed service.

5. The benefit-cost ratio should still be favorable when secondary, redevelopment, and incidental benefits are excluded;

This penalizes the watershed project with respect to other types of water resource development projects.

6. Projects with irrigation as a primary purpose should not be submitted to the Committee;

This criterion denies many watersheds in the Western States the services and benefits of this program.

7. Low priority is given to projects where flood prevention benefits are largely urban.

This could penalize agricultural areas adjacent to urban areas because the urban damage values would exceed the agricultural values. Also, in some instances it could deny urban areas the only opportunity for protection against floods which originate on adjacent agricultural lands.

## Problems

### 1. Moratorium:

In 1966 the administration objected to the requirement that watershed project plans be approved by Congressional Committees. This requirement was included in the 1956 amendments to P.L. 83-566 (P.L. 84-1018, 70 Stat. 1058, August 7, 1956) (See p. 25, this chapter). For several months no project plans were transmitted through the Office of Management and Budget to the Congressional Committees. A backlog of more than 50 plans developed. When the Administration finally released the watershed work plans being withheld from the committees, it also transmitted proposed legislation. This proposed legislation would amend P.L. 83-566 to provide for Congressional review but not approval. It was

transmitted to the Second Session of the 89th Congress and again on January 17, 1967, to the First Session of the 90th Congress. This legislation was not enacted. (137)

The Administration continued to send watershed work plans to the appropriate Congressional Committees. However, in each transmittal it stated that the Congress should either (1) enact the legislation proposed by the Administration, or (2) take action by the Congress as a whole on legislation authorizing individual or preferably groups of projects. If this were not done, the President gave instructions not to proceed with the accomplishment of the projects. (138)

An examination of Figure 3 shows that only 27 projects were approved for operations in 1967 and 10 in 1968. These were made possible by administrative approvals and a few plans in the hands of the Committees before the Moratorium was placed in effect.

The Moratorium had a very detrimental effect on watershed planning, especially in 1968. Neither the sponsors of watershed projects nor SCS could see much to be gained by continuing to push for plans to be completed when the Administration would not permit work to begin on them.

This problem was resolved by the change in Administration in January 1969. On April 1, 1969, Secretary Hardin, USDA, received the following memorandum, dated March 27, 1969, from the President:

"Numerous proposed watershed projects authorized under the Flood Prevention Act of 1954 have been held in abeyance since 1966 because of a Constitutional question raised by the previous Administration which has remained unresolved.

"At your instance we have undertaken a thorough review of the issues, both legal and substantive, and decided that this Administration will interpose no objection to the procedures involved in the accomplishment of watershed projects under this law.

"Will you please transmit my decision to the appropriate Committees of Congress."

This removal of objections by the White House made all 96 watershed projects being held in abeyance eligible to receive assistance. (139)

Figure 3 shows that 137 work plans were approved in 1969 and 60 in 1970. The average number approved during the period 1967 - 1970 was 58.5 per year. For the four-year period 1963 - 1966 the average was 89.25 per year. During the period 1971 - 1976 the average has been 26.3. So the Moratorium was just the beginning of problems confronting watershed planning.

## 2. National Environmental Policy Act of 1969 (NEPA):

The National Environmental Policy Act of 1969 (P.L. 91-190) included three major elements: (1) the declaration of a National environmental policy; (2) the establishment of a set of procedural requirements, including but not limited to the EIS (Environmental Impact Statement); and (3) the creation of a Council on Environmental Quality (CEQ) to advise the President and oversee the implementation of the Act. (140)

At the time this Act was passed SCS had 621 watershed projects in operation on which construction had not been completed. In addition there were an undetermined number of sub-watershed work plans in the 11 Authorized River Basin Watersheds under construction. The Act requires that an EIS be prepared when a proposed major Federal action will generate significant adverse effects on the quality of the human environment. SCS initially considered that the major Federal action had been taken when a watershed work plan was approved for operations. Therefore, no EIS would be required for individual structural elements of a project already under construction. This interpretation was not allowed to stand when CEQ issued its guidelines.

The greatest environmental controversy regarding SCS projects was directed at channel modification. Therefore, initial effort at preparing EIS's was directed at those projects containing channel modification as a measure. For other projects under construction environmental assessments were made, and, where it was determined that an EIS would not be made, an environmental impact appraisal was prepared to document the rationale for not preparing an EIS. (141) This procedure has been developing through the period 1970 - 1977 when various instructions, memorandums and other guidelines have been developing. The final rule, which covers not only those projects in operation at the time of the Act but all new projects, was published in the Federal Register Vol. 42, No. 152, Monday, August 8, 1977.

These rules require that an EIS be prepared for any of the following actions:

- a. Major Federal actions which involve channel realignment or work to increase channel capacities.
- b. Watershed projects requiring Congressional action after the effective date of these rules.
- c. All other actions which are determined to be major Federal actions significantly affecting the quality of the human environment. (142)

Between passage of the Act and April 1, 1977, the SCS had completed 201 final EIS's, 11 draft EIS's and 183 negative declarations. Of these actions 216 had been taken on P.L. 566 projects which were operational as of December 31, 1969. (143) Comparable information on actions taken on sub-watersheds of the 11 Authorized River Watersheds is not readily available.



SCS got off to a slow start in the preparation of EIS's. Policies and procedures established by NEPA required considerable interpretation to translate them into operational criteria for administrative action. This task was left largely to the discretion of each agency and administrator. SCS considered the entire watershed and its several works of improvement as a single project. Each dam or channel modification was considered as an element. In fact, individual dams or channel reaches often were set aside as a construction unit. It did not consider the construction of any individual element as a major Federal action. Rather, it considered the authorization of a project as the major Federal action. When this definition was resolved it took appropriate action. This requirement became firm when the Natural Resources Defense Council got an injunction requiring an EIS on Chicod Creek Watershed Project in 1972. This was a channel project which had been in operation since August 22, 1966.

Andrew's analysis was that SCS interpreted NEPA as a reinforcement of its previous missions and policies. Consequently, it was at least two years after NEPA's enactment before it directed any change in the range of considerations entering into its water resource planning process. Also, SCS had not requested any new funds or personnel to carry out the mandate of NEPA until this time. (144)

SCS issued Watersheds Memorandum 103, a general policy statement, May 1, 1970. Environmental Memorandum No. 1, which provided specific instructions, was issued March 19, 1971. On May 24, 1972, Watershed Protection Handbook Notice 1-19 was issued. It directed SCS personnel to perform an environmental inventory during the first pre-planning environmental reconnaissance study; to present all feasible alternatives (including objectives which differed from those of the sponsors) in the impact statement; to conduct a public information meeting on the preliminary investigation report; and to append to the final EIS copies of all substantive letters of comment submitted on the draft statement. SCS had prepared 87 detailed statements on water projects by the end of 1971. (145)

Stream channelization projects were virtually the only category of SCS actions that aroused concern about environmental impacts. (146) Therefore, in February, 1971, SCS issued Watersheds Memorandum 108. It called for a thorough re-evaluation of all planned channel modification work not yet installed to determine what changes in work plans or engineering design were needed to further national policy and goals for the enhancement of the environment. Some 401 P.L. 566 watershed projects and 52 flood prevention sub-watersheds were studied. The projects were categorized into three groups, depending on the likely impact of the remaining channel work on the environment. The findings were: (1) 44 percent were found to have either a positive effect or only a minor adverse impact; (2) another 44 percent were found to require some modifications to avoid possible adverse impacts; and (3) only 12 percent of the projects were found to need major changes. (147)

In the midst of the 108 review, SCS began a computer analysis of all planned and constructed channel work. This study covered 54 pilot

watersheds, 1057 P.L. 566 watersheds and 303 flood prevention sub-watersheds. The findings of this study were quite interesting. The total channel work planned amounted to a little over 21,000 miles. This included work on natural streams, man-made ditches, previously modified channels, and new channels. It included perennial streams, intermittent streams, and those that flow only after heavy rains. (148)

A further analysis of the study data showed that modification had been planned on just over 3,000 miles of natural, perennially flowing streams. This represented 14 percent of the total planned channel work of SCS. When this planned work was added to planned modification of man-made ditches and previously modified channels that had perennial flow or ponded water prior to the project, the total amounted to about 5,500 miles, or 26 percent. The remainder of the planned channel work included:

- 1,100 miles of clearing or removal of loose debris within present channels on streams and ditches with perennial flow;
- 7,000 miles of channels with intermittent flow, or involving new drainage mains or laterals;
- 7,000 miles of channels that flow only during periods of surface run-off; and
- 200 miles of streambank or grade stabilization work on any type channel. (149)

As of December 30, 1976, the total miles of channel modification included in SCS work plans amounted to 21,778. Of this amount 9,927 miles had been constructed as of that date. (150) These figures contradict rather strongly the charges that SCS plans to dig up 150,000 miles of streams and small rivers in the years ahead. (151)

The Natural Resources Defense Council (NRDC) has strongly opposed stream channelization. It developed and distributed Action Packet I to alert conservationists to the scope of environmental destruction it claimed was being caused by stream channelization. It mailed 2000 copies of this packet to members of conservation organizations, from whom it apparently received a gratifying response. These evidently were mailed out in late 1970 or early 1971, because in the summer of 1971 it mailed out Action Packet II. (152) This packet contained a list of 31 questions which interested persons were to ask each SCS State Conservationist about individual watershed projects in his state. The nature of the questions was such that many man-days would be required to respond on each project. (153)

The experience of SCS with NRDC was that it relied on personal opinions rather than facts. For example, its staff members often were heard to claim that channelization created a biological desert which would not recover in 40 years. In their study North, et al. found that channel modification and sewage discharge produced a moderate stress on the ecological system in Rooty Creek, Georgia. This stress had resulted in a reduction in the number of species of organisms inhabiting the stream but had not greatly affected the total production of organisms eight years

after channelization. (154) An analysis of sites both above and below the sewage outfall failed to indicate any significant effects of the sewage effluent upon benthos at downstream sites. (155) The findings of this study indicate that there is no basis for a claim that channelization alone will result in a biological desert of longstanding impacts.

In a letter dated October 3, 1972, a staff member of NRDC referred to Walter Cronkite's CBS Evening News telecast which included a brief TV newscast regarding the precedent-setting Chicod Creek lawsuit in North Carolina. The letter stressed the fact that the suit claimed the planned channel modification would destroy natural stream and valuable wetland and swamp habitat for fish and wildlife. The letter, however, failed to mention that the newscast was incomplete. The material pertaining to crop losses, high water tables, prolonged inundation of cropland, and health hazards due to overflow of septic tanks resulting from saturated soil conditions had been edited out of the telecast material. These were the impacts of existing watershed conditions on the farmers of the watershed. (156)

There was another significant study carried on during this time. The Council on Environmental Quality (CEQ) contracted with Arthur D. Little, Inc., to study channel modification work in 42 projects of the SCS, Corps of Engineers, Tennessee Valley Authority, and the Bureau of Reclamation. The Philadelphia Academy of Natural Sciences also participated in this study. The 1,000-page draft report of that study did not find channelization as destructive as claimed. It was severely criticized by a number of people and organizations whose positions on channel modification didn't match the tentative conclusions of A. D. Little. (157)

The reaction to the A. D. Little draft report of March 31, 1972, led to an extension of the study period and effort. The final report was documented in three volumes and 1,375 pages and was summarized in Congressional Hearings on March 22, 1973. It was submitted to CEQ on March 31, 1973. The study team found that 48.8 percent of the 2,300 miles of channel alterations examined in the field involved only rehabilitation and restoration of old drainage ditches. Recognizing the several antecedent or pre-project conditions and the external factors influencing stream systems and environmental quality, the study concluded that:

- the issue of wetland drainage was of minor to no significance on 26 of the 42 projects and uncertain on five others;
- the issue of bottomland hardwood losses was of minor to no significance on 28 of the 42 projects and uncertain on seven others;
- the issue of cutoff oxbows or meanders was of no significance on 35 of the 42 projects;
- the issue of water table changes and lost stream recharge capacity was of minor to no significance on 29 of the 42 projects and uncertain on all others;
- the issue of erosion and sedimentation was of minor or no significance on 24 of the projects, and uncertain on 15 others;

- the issue of downstream effects from upstream channel work was of minor to no significance on 31 of the 42 projects and uncertain on seven others.

Thus, the research data suggested that about 36 of the 42 projects offered no real basis for the kind of environmental policy action which popular expression of the issue had seemed to call for. (158)

The changes in SCS guidelines between 1972 and 1974 represented a major shift in posture toward implementation of NEPA's procedures. CEQ testified in 1974 that the impact statements produced by the Corps of Engineers were the best among Federal agencies, and those of SCS were among the most improved. (159) The demands on the time of watershed planning personnel to meet the requirements for preparing environmental impact statements for new and old plans, for making channel studies, and for responding to channelization correspondence were staggering.

### 3. The Uniform Relocation Assistance and Real Property Policies Act of 1970 - P.L. 91-646:

This Act provided for financial assistance to all individuals, families, and businesses which had to be relocated as a result of the construction of any works of improvement in a water resource development project. Implementation of the Act began in February and March 1971. All existing work plans that contained any works of improvement not yet completed had to be reviewed. If the provisions of this Act were applicable, the work plan had to be amended to comply with the Act. This action demanded time from both watershed planning and construction personnel.

This Act has resulted in the obligation of the following funds:

(160)

<u>Year</u>	<u>P.L. 566</u>	<u>F.P.</u>	<u>RC&amp;D</u>	<u>Total</u>
1971	-	-	-	-
1972	320,000	14,500	-	334,500
1973	879,400	-	-	879,400
1974	950,000	-	-	950,000
1975	380,000	137,000	37,700	554,700
1976	940,000	25,000	182,500	1,147,500
Total	3,469,400	176,500	220,200	3,866,100

### 4. Protection of Archeological and Historical Properties:

The Act of June 27, 1960, relating to the preservation of historical and archeological data, P.L. 86-523, 74 Stat. 220, as amended May 24, 1974, by P.L. 93-291, 88 Stat. 174, provides for the preservation of historical and archeological materials or data that might otherwise be lost or destroyed as a result of any Federal or Federally assisted or licensed project, activity or program. (161)

The National Historic Preservation Act, P.L. 89-665, 80 Stat. 915, as amended authorizes the Secretary of Interior to maintain and expand a National Register of Historic Places (NRHP). It also establishes the Advisory Council on Historic Preservation (ACHP). Section 106 of this Act requires that prior to the approval of any Federal or Federally-assisted or licensed undertaking, the Federal agency shall afford the ACHP a reasonable opportunity to comment, if properties listed in, or eligible for listing in, the NRHP are affected. (162)

Executive Order 11593, Protection and Enhancement of the Cultural Environment, provides that the Federal government shall furnish leadership in preserving, restoring, and maintaining the historical and cultural environment of the Nation. (163)

SCS recognizes that significant historical, archeological, and architectural resources are an important part of the Nation's heritage. It takes reasonable precautions to avoid damaging any of these and works with the National Park Service and the Advisory Council on Historic Preservation in identifying and seeking to avoid or mitigate adverse effects of SCS-assisted projects on the Nation's cultural resources. (164)

SCS assistance to individual land users under the Conservation Operations and Great Plains Programs is considered to be a nonproject undertaking. Its actions in these cases are limited to advisory activities. In the case of project-type programs, SCS determines the environmental effects including archeological and historical impacts as an integral part of the environmental assessment process. (165)

SCS works with the following agencies in carrying out its responsibilities under this program;

- Advisory Council on Historic Preservation which is national in scope. The Secretary of Agriculture is a member of this Council.
- National Park Service. This agency also works at the national level and many of its actions duplicate those of the Advisory Council. It contains the Office of Archeology and Historic Preservation and the Office of National Register of Historic Places.
- State Historic Preservation Offices.

Often there is considerable difficulty in getting agreement among each of these agencies. Archeologists want a survey of each farm before assistance is given under the Conservation Operations and Great Plains Programs. However, this is impractical.

It is estimated that this program will require a transfer of from \$1 million to \$3 million of SCS funds to the National Park Service (NPS) annually. Each SCS State Conservationist can transfer to NPS up to one percent of the Federal share of construction costs for each measure causing a problem.

## 5. Principles and Standards:

In accordance with the provisions of Section 103 of the Water Resources Planning Act, P.L. 89-80, the Water Resources Council (WRC) developed a set of Principles and Standards to form the basis for formulation and evaluation of Federal water and related land resource projects. On September 10, 1973, the WRC published the Principles and Standards as approved by the President in the Federal Register. These became effective October 25, 1973, and replaced the policies established by Senate Document 97 which had provided guidance since 1962. (166)

A fuller discussion of the Principles and Standards is contained in a later chapter. For consideration here it needs to be noted that the basic areas of concern regarding the Principles and Standards are:

- Two equal planning objectives - national economic development objective and environmental quality objective;

- A system of four accounts to be developed during the planning process - the National Economic Development Account, the Environmental Development Account, the Regional Development Account, and the Social Well-Being Account;

- Discount rates to be established in accordance with the cost of Federal borrowing;

- New plan formulation procedures which provide for developing alternative plans, one which optimizes the national economic development objective, and one which emphasizes contributions to the environmental quality objective. (Trade offs between the two plans are then made until the recommended plan is acceptable to the greatest number of people.);

- The grandfather clause which provides for bringing the large number of plans under way into conformance with the Principles and Standards. (The phase-in period was to extend to January 1, 1975, but was later extended to January 1, 1976. After that date all plans were to comply fully with the requirements of the Principles and Standards.)(167)

## 6. Agreement between the SCS and Corps of Engineers, with Respect to Flood Protection by Engineering Works:

This agreement is not a problem but rather an action taken to resolve a problem of over-lapping responsibilities between the two agencies. While SCS is limited by law as to how far downstream it can go with its program, the Corps has no limit as to how far upstream it can go. This area of overlap became more critical in river basin planning activities than in project planning. Therefore, on September 23, 1965, D. A. Williams, Administrator, SCS, and William F. Cassidy, Lt. Gen. U. S. Army, Chief of Engineers, entered into an agreement to define more clearly the area of responsibility of each agency. (168)

Briefly, this agreement provided that:

- SCS would be responsible for protecting upstream (250,000 acres and less) agricultural flood plains and those upstream urbanized areas where flood problems of minor magnitude exist;
- The Corps would be responsible for flood protection for downstream agricultural flood plains and for urbanized areas where flood problems of major magnitude exist;
- Where a flood problem of intermediate magnitude exists in an urbanized area in an upstream watershed, the two agencies would reach an agreement on a case-by-case basis as to which one would provide the needed flood protection.

More specific details can be obtained from the complete agreement. (169)

The changes since 1969 have had a significant impact on the watershed program. This has been true not only in the time and commitments required for planning but also in other respects. In the early years, 1954-1969, the watershed program was really a peoples' program. The local people determined their objectives, the scale and scope of development desired, agreed to their level of commitment, and moved ahead with their program with Federal assistance. It was truly a Federally assisted program. Under later developments, particularly the Principles and Standards and NEPA, outside influences have a significant impact on project formulation. Often they are not aware of local needs, local conditions, and local ability to pay.

Heavy public involvement of a local nature is desirable in the watershed planning process. However, the wide open arrangements of the present procedures do give rise to some pertinent questions:

- Should individuals or organizations from outside a region be able to impact decisions for which they have no financial or moral obligations for implementing?
- Should local groups which refuse to participate in project development and operation be able to impose financial and moral obligations on project sponsors which are beyond their wishes and their ability to pay?

Changes in the watershed protection program in the last several years are moving this program rapidly toward a Federal rather than a Federally assisted program. In the long run, is this in the best interest of most of the people of the Nation?

#### Watershed Operations

When a watershed project is approved by resolutions of the appropriate committees of Congress it moves into the operations phase. The land treatment program to protect the watershed can be accelerated

**PROJECTS COMPLETED  
CUMULATIVE BY YEARS**  
**PROJECTS APPROVED FOR OPERATIONS  
CUMULATIVE BY YEARS**

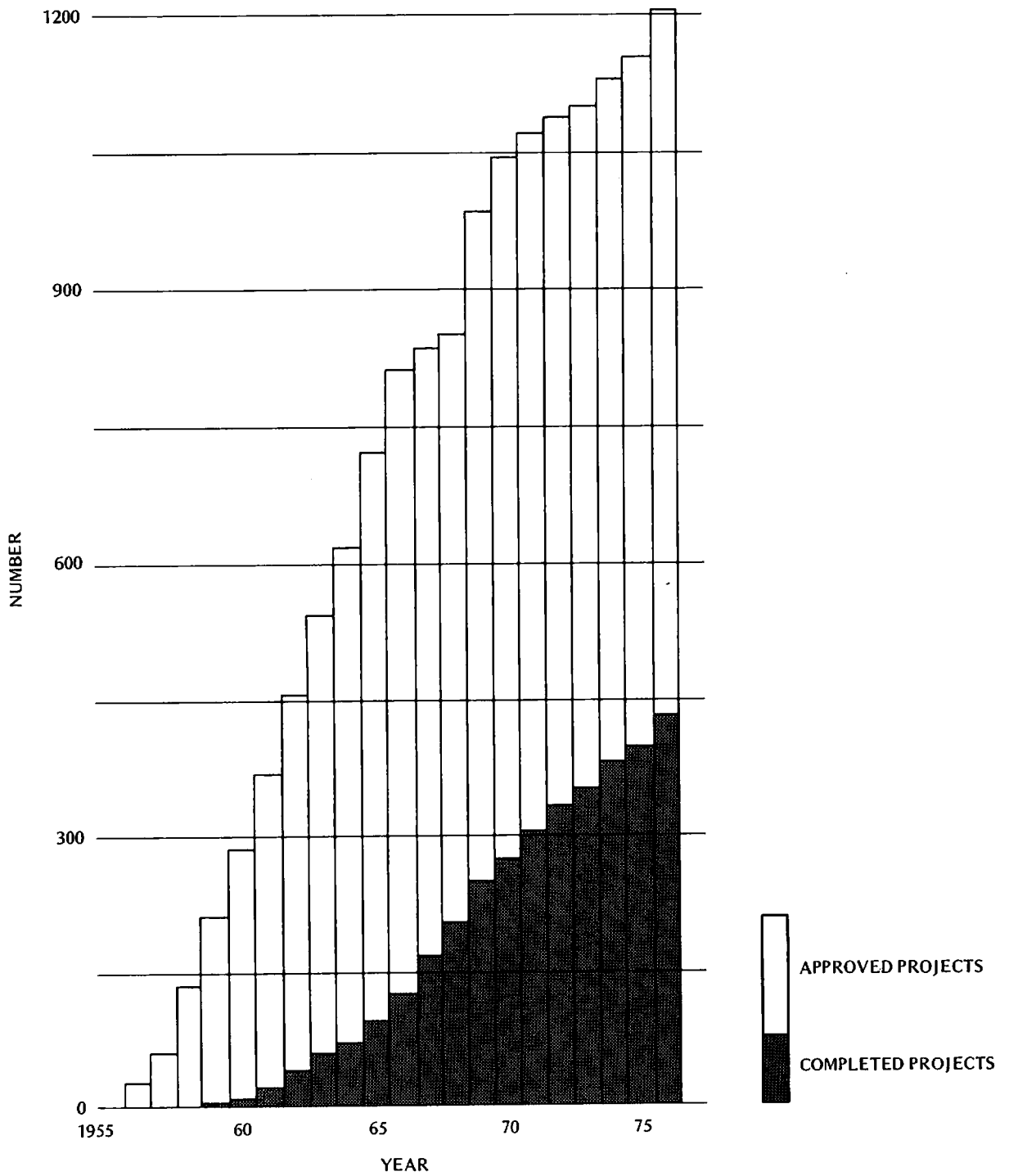


FIGURE 5



USDA OBLIGATIONS  
WATERSHED PROTECTION OPERATIONS  
ANNUAL

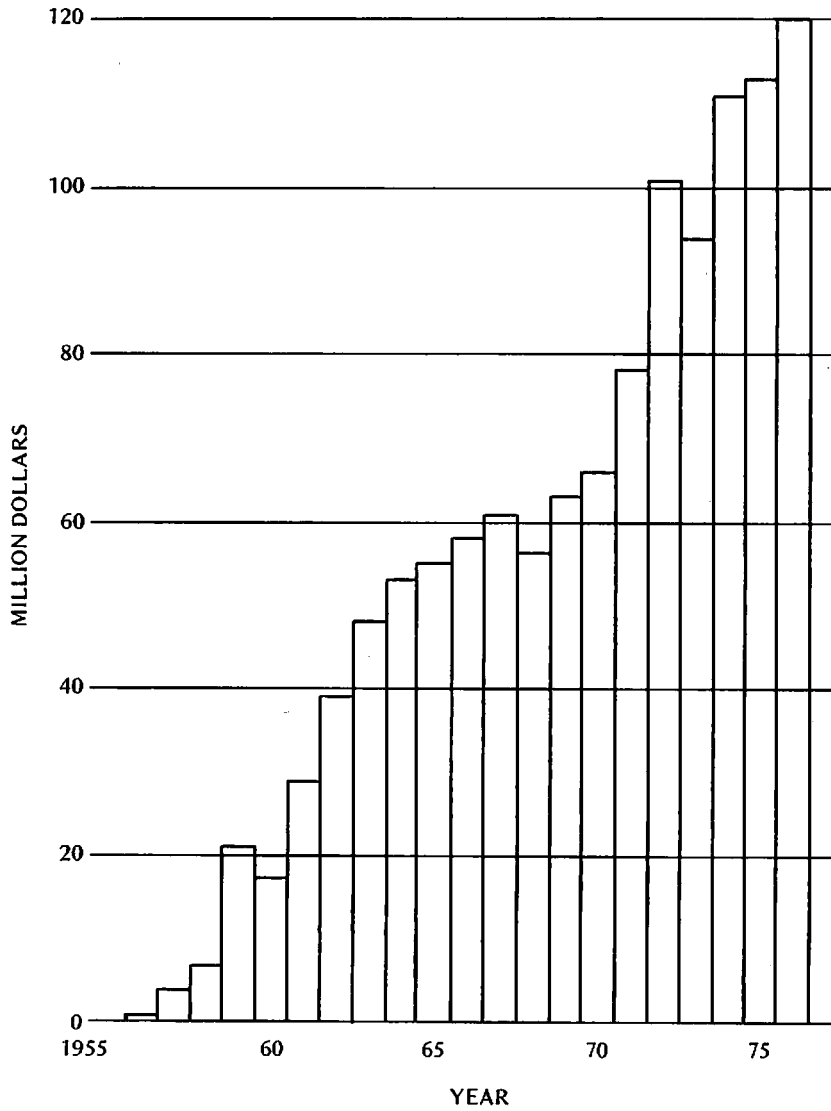


FIGURE 6

in accordance with the plan, and structural measures can be installed.

Local sponsors must provide the necessary land rights for each structural measure and have available their share of the construction costs as specified by the plan. An operation and maintenance agreement must be signed by the responsible parties. Engineering designs and specifications must be developed for each structural measure, invitations to bid advertized, and contracts let. Then construction must be supervised and a final report issued to show the measure has been installed as planned.

In the early phases of the program most land rights were granted to the sponsors. Now these often have to be purchased and, on occasion, condemnation procedures have to be followed. Demands for public access to all impoundments are becoming more common. When recreation is a planned purpose, public access is provided. Where single-purpose flood water retarding structures are constructed, public access normally is not provided. The landowner who usually continues to hold title to the structure site is not equipped to deal with the public. He has no means of providing supervision, safety and health measures, garbage and trash disposal or policing the area. The public frequently is inconsiderate of property rights and in some cases deliberately destroys property including livestock. So this demand becomes a sensitive and serious problem.

Some hunters, fishermen, and water recreation enthusiasts seem to think, because taxpayers' money is used for financial assistance, that the public owns and should have full access to the detention sites. A study made by the House Agriculture Committee several years ago showed that every sector of the National economy is subsidized to some extent by tax dollars. If the rationale for this argument used for public access to detention sites is valid, then it might be argued that the public should have access to every FHA or VA financed house, since their purchase is subsidized by tax dollars. This condition would hardly be condoned by the homeowners, just as access to privately owned detention sites is not welcomed by landowners.

By April 1, 1977, 1,185 watershed projects had been approved for operations. (170) Including major supplements as separate plans, this figure exceeded 1200. (Figure 5) Of this number 434 projects had been completed and operational activities were under way on the remaining 751 projects. Progress by years for both approved projects and completed projects is shown in Figure 5.

During the operations period (1956-1976) the USDA has obligated \$1,221,258,610. SCS obligated \$1,205,218,428 or 98.7 percent; Forest Service obligated \$12,893,601 or 1.1 percent; ERS, \$1,764,244 or about 0.1 percent; and Department of the Interior agencies have obligated \$1,382,255 or about 0.1 percent. Annual obligations are shown in Figure 6. (171)

All 1,185 watershed projects contain watershed protection as a purpose and 1,171 of these include flood prevention as a purpose. In this sense all but 14 projects are multiple purpose. However, SCS usually considers watershed protection and flood prevention as a single purpose since these purposes are so closely related. Drainage is a purpose in 282 projects; irrigation in 89; rural water supply in 2; recreation in 247; fish and wildlife in 89; municipal and industrial water supply in 152; and water quality management in 1. (172) Of the projects completed, drainage, recreation, municipal and industrial water supply, fish and wildlife, and irrigation are the most popular other purposes, in that order. There are 643 multiple purpose projects approved. This is over 54 percent of the total number.

## Problems

The major problems affecting the Watershed Operations program are the more sophisticated designs for the major structural measures. These will be discussed by measures.

### 1. Dams

Early floodwater retarding structures were limited to 5,000 acre feet total storage and were single purpose. P.L. 1018 increased the total storage to 25,000 acre feet but held flood detention storage to 5,000 acre feet. Later allowable flood detention storage was increased to 12,500 acre feet. Allowable storage for irrigation, recreation, municipal and industrial water supply, rural water supply and water quality management increased the volume of permanent storage, when included in a specific site.

Initial designs provided for corrugated pipe principal spillways and a 35 to 50-year life of structure. Larger dams and multiple purposes required carefully designed concrete or steel principal spillways and 100-year life structures. Hydraulically efficient dams required larger capacity principal spillways to reduce dewatering time. However, protection of flood plains from flooding by more frequent storms required lower release rates or larger channels. This required the use of two-stage inlets for many principal spillways in order to hold down channel sizes and provide more efficient dams. During the more recent years, dam safety has become a matter of national concern. This has required even further attention to dam design and construction.

As the planner, designer, and inspector of construction, SCS has an obligation to see that dams installed under its various program authorities are safe. Its plans and designs are based on geologic and hydrologic information pertinent to each specific site and the planned structure use. Designs are developed using the best available hydrologic and hydraulic information. Inspectors ensure that embankment material is suitable, placed, and compacted in accordance with design specifications, and that appurtenant structures are constructed as designed. (173)

Since SCS has no legal maintenance responsibility, its planning and design criteria are based on the assumption that minimum reliance on maintenance is the most economical design over the life of the structure. In the project programs each dam is inspected every three months during the first year. It is also inspected after each major storm or occurrence that might have adversely affected the structure, with a minimum of at least one annual inspection. (174)

The safety record of SCS project type dams is excellent. Failures from all causes have amounted to less than 0.5 of 1 percent.

In carrying out its many programs, the SCS has a part in the construction of more dams each year than any other agency - Federal, state or international. In the spring of 1972, SCS listed over 1,400 dams with the U. S. Committee on Large Dams. Of this number 645 had heights in excess of 50 feet. (175) This is considerably more large dams than have been built by any other agency in the world.

Woodward-Clyde Consultants stated that it is vital to their study to recognize that the dams constructed with SCS involvement are many in number but vary widely in potential hazard. (176) At the close of the 1976 fiscal year SCS had been involved in the construction of 2,566,615 various types of dams. These are classified as follows:

<u>Type</u>	<u>Number</u>
Multipurpose	9,014
Floodwater retarding structures	12,703
Total detention type structures	21,717
Debris basins	78,761
Grade stabilization structures	283,104
Irrigation pits or regulating reservoirs	49,418
Irrigation storage reservoirs	40,524
Ponds	2,093,091
Total	2,566,615 (177)

The highest SCS dam in service is 150 feet high. However, there is one in the planning stage that will be 200 feet high. It is estimated that well over 25,000 SCS-assisted structures are over 15 feet in height. (178)

## 2. Channels

When the Watershed Protection and Flood Prevention program was started in 1954, SCS engineers probably had had more experience with the design and construction of channels than any other major watershed work of improvement. The Service had been providing technical assistance on farm drainage since the 1930's. USDA agencies evidently had been involved in drainage research since about the turn of the century. In 1898, irrigation investigations were authorized by Congress under the Office of Experiment Stations. In 1902, the Division of Soils was organized into the Bureau of Soils. Research on water problems in agriculture was

emphasized. (179) In 1926, C. E. Ramser discussed drainage ditch conditions in 1924 - 1926. (180)

On December 3, 1938, by Secretary's Memorandum 799, Secretary H. A. Wallace assigned to H. H. Bennet drainage responsibilities previously held by the Bureau of Agricultural Engineering. The Service was already involved in drainage work and had been since establishment of CCC camps. CCC drainage camps assigned to SCS in 1935 were already working with organized drainage enterprises and associations. (181) So by 1954 SCS engineers were well acquainted with the design and construction of drainage channels.

Drainage run-off curves were developed from the formula

$$Q = C M^{5/6}$$

where Q = run-off in cubic feet per second

C = drainage coefficient

M = drainage area in square miles

Drainage coefficients had been established for different conditions based on some research and a wide range of experience. These were followed carefully by all drainage engineers and became the basis for project channel design. It soon became evident that they were not adequate for multiple purpose channel design. An analysis in the Southeast showed that a drainage channel designed on the coefficient for the Mississippi delta would provide a one-year level of flood protection to that area, while one designed on the coefficient for the Atlantic Coastal Region would provide a five-year level of protection in North Carolina. This was because of the wide variance in hydrologic soil groups and soil-cover complex conditions.

Agreement was finally reached in the Southeast Region to design multiple purpose channels to handle the desired level of flood flows under bank-full conditions, then check the channel to be sure it had the required drainage capacity with the hydraulic gradient at least one foot below the average bank elevation.

The current Drainage Handbook includes consideration of hydrologic soil groups and soil-cover complex conditions in the selection of the proper value for "C". (182)

Another factor in channel design which has received greater attention in the last 10 to 15 years has been the question of Channel Stability. Recommended procedures for designing stable channels are given in SCS, Engineering Division, Technical Release No. 25, Planning and Design of Open Channels.

The controversy over environmental damage resulting from channel modification also has had its effect on channel installation. However, when it is recognized that approximately 100 million acres of the best cropland in the nation (or about one-fourth of it) has excess water problems (183), it becomes imperative that adequate drainage outlets be provided.

As of June 30, 1976, SCS had given assistance in the construction of 16,971 miles of open channels. (184) Of these, 9,927 miles had been constructed under the watershed programs. (185) In addition to these open channels, SCS had assisted, through all its programs, in the installation of 388,810 miles of main farm drainage ditches and laterals.

### Summary

The SCS watershed programs have been very popular with farmers and rural communities throughout most of the nation. In some areas, some elements such as channelization, have been quite controversial among special interest groups.

Watershed projects have had a profound impact on local rural economies, stability of crop production, local water supplies, local recreational opportunities, improved living environment, local health and safety conditions and local flood protection. Opportunities for local employment have been greatly increased as a result of local industrial development made possible by dependable municipal and industrial water supplies for small towns and local flood protection.

There is still a great need for watershed program assistance as reflected by the Conservation Needs Inventory (186) and the back log of unserved applications. (187)

## CHAPTER 5

### USDA RIVER BASIN STUDIES

#### Organization

Section 6 of P.L. 566 authorized the Secretary of Agriculture, in cooperation with other Federal, state and local agencies, to make investigations and surveys of the watersheds of rivers and other waterways as a basis for the development of coordinated programs. In Secretary's Memorandum 1325, April 1, 1953, the Secretary of Agriculture had assigned the responsibility for administration of USDA water resource programs to SCS. (188) Title I, Administrative Regulations of the Department of Agriculture, assigned various responsibilities for this activity among other agencies of the Department. These responsibilities were identified in a Memorandum of Understanding between the Soil Conservation Service, Economic Research Service, and Forest Service. This Memorandum is recorded in SCS River Basins Memorandum 2 (Rev. 1), dated May 6, 1968.

The major responsibilities of the participating agencies are stated briefly as follows: (189)

#### 1. SCS

- a. Administration of USDA activities in connection with river basin investigations, preparation of reports, and development of general principles, criteria and procedures;
- b. Make physical appraisals of agricultural and rural water problems and resource development needs, and define them in terms of meeting regional and community economic needs for water-related goods and services;
- c. Determine the development potential of upstream watershed projects, the scope and scale of development needed, and coordinate this potential with other proposals for development;
- d. At National level, SCS, with ERS and FS assistance, participates in program formulation and coordination with the Water Resources Council and member agencies;
- e. SCS, with ERS and FS, participates with other agencies in WRC activities.

#### 2. FS

- a. Aspects of river basin planning related to woodlands and forest lands, Federal and non-Federal, and rangelands within and adjacent to the National Forests which are administered by the FS;
- b. Analyses and projections of economic activity related to multiple uses and products from forest, woodlands, and wild lands,

and interpretations of these projections with respect to use and requirements for water and related lands;

c. Appraisal of suitability and capability for forested lands to satisfy future demands for products and services, and determination of kinds, amounts, and costs of watershed practices needed on forest lands;

d. Estimates and evaluations of the impacts of water resource development plans upon forest resources.

### 3. ERS

a. Basin-wide economic aspects and elements of USDA program in comprehensive river basin planning;

b. Development and analyses of agricultural economic base of river basin studies to include appraisal of trends in land and water use;

c. Development of projections of agricultural production, employment, income, rural population, and land use for the economic analysis of agricultural water management, needs, and potentials;

d. Analyses of economic impact of flood prevention, land drainage, irrigation, and other water development programs on production, employment, and income in agricultural and related sectors of the economy;

e. Evaluation, with Bureau of Outdoor Recreation and other agencies, of the demand for and economic benefits of water-based recreation developments needed in river basin investigations.

Coordination of planning activities is effected through the use of advisory committees. The Washington Advisory Committee (WAC) coordinates all USDA river basin planning activities at the National level. It is composed of a member from SCS (chair agency), ERS, and FS. When any proposal affects the interests of the Farmers Home Administration, Rural Electrification Administration, Agricultural Research Service, and/or Agricultural Stabilization and Conservation Service, representatives of these agencies are invited to participate. The duties of the WAC are: (189)

1. Provides coordination and oversight of all USDA river basin activities;

2. Reviews USDA planning activities, develops planning procedures, and recommends needed administrative adjustments;

3. Formulates USDA guidelines, standards and instructions;

4. Reviews and evaluates survey proposals and recommends new planning starts;

5. Reviews and coordinates agency funding requirements (SCS is responsible for budgeting and requesting USDA funds for river basin planning activities);

6. Reviews and recommends approval of USDA plans of work for proposed studies and USDA reports of completed studies;



7. Provides other coordination needed.

The Field Advisory Committee (FAC) is composed of representatives of SCS, ERS, and FS. The SCS State Conservationist responsible for the study chairs the FAC. Usually the sponsoring State agency is invited to attend and participate in FAC meetings. These are held at least quarterly. In some states the sponsoring state agency sets up its own coordinating committee and gives active leadership to the study. In these cases the FAC members meet with this committee and usually hold a separate meeting before or after the State meeting. This arrangement is compatible with the FAC concept since its responsibilities are for intra-Departmental coordination. The duties of the FAC are: (189)

1. Field coordination of USDA agency activities;
2. Field liaison with state and other Federal agencies, when needed;
3. Preparation of survey plan of work;
4. Interpretation of National guidelines as they pertain to local study;
5. Field budget recommendation;
6. Make periodic and special reports;
7. Field guidance of USDA aspects of interagency coordination and program recommendations; and
8. Other coordination as needed.

#### Cooperative Comprehensive River Basin Studies

These studies initially were called Type 4 studies to differentiate from Type 1, interdepartmentally coordinated comprehensive framework studies, Type 2, interdepartmentally coordinated comprehensive detailed studies, and Type 3, specific project studies. They are made as a cooperative effort between USDA and a State or another Federal agency. (190)

Generally, these cooperative studies involve specific objectives of the sponsoring organization and of the USDA. They usually concentrate on recognized water-resource problems of the State concerned and on analyses of the potentials for P.L. 566 watershed projects to meet identified needs. (191) The studies are initiated at the request of the sponsoring agency, State or Federal. No specific level of funding from the sponsor is required. In fact, many studies are made without sponsor contribution except in study inputs. On the other hand, some sponsors have made major financial contributions.

The major objectives of each study are to identify and determine the nature of water and related land resource problems; determine a rational means of alleviating these problems; and identify the relative timing in which the needed activities should be initiated. The study will further identify those USDA project-type and related programs which can be used effectively to meet the needs for water-related goods and services in the river basin and to ensure that agricultural interests are identified and protected in any overall water and related land resource development program. (192)

During the last few years interest has been developing in USDA studies which emphasize analyses and solutions to individual problems or needs. When such conditions exist there is no need to spend the time and money to examine a broad range of rural and agricultural problems and needs. Some examples of such studies are specific needs in one problem area, such as for a state water plan, salinity studies in the western states, a study of special erosion and sedimentation problems in such areas as the Palouse area of south-eastern Washington. The increasing state water quality planning efforts under Section 208 of P.L. 92-500 and state land management decisions are expected to put more emphasis on these specialized river basin studies.

In the period 1969 - 1970 the Water Resource Council stopped using the terminology Type 1 and Type 2. Therefore, USDA stopped using the Type 4 designation and now refers to these studies as Cooperative River Basin Studies (CRBS).

Through fiscal year 1977, 59 Type 4 and CRBS studies had been completed and 50 such studies were under way. (193) A field survey made during the summer of 1976 showed that the following uses have been made of data developed and presented in these studies:

- Over 100 basin studies have provided input for state water plans;
- Coastal Zone Management plans have utilized data from about 25 studies;
- More than 300 state, regional, and county land use plans have relied heavily on basin study data;
- Data from basin studies are being utilized in the Section 208 planning process in almost all states when it is available;
- Basin studies have provided information for more than 50 wild and scenic river studies;
- Basin study data have facilitated the preparation of over 100 environmental impact statements;
- Almost 300 conservation districts have based parts of their long range programs on information provided by basin studies;
- Basin studies have provided data for the National Water Assessment, CCJP's, and other national water resource planning efforts of the Water Resources Council; and
- Over 100 consultants and/or regional, county or city planning commissions have utilized the water supply inventory supplied by basin plans.

In addition, these basin studies have provided information and analyses which have led to decisions to initiate;

- over 50 special studies;
- almost 130 P.L. 566 projects;

- over 900 RC&D measures;
- about 35 wild and scenic river proposals;
- almost 20 flood hazard studies.

Other decision impacts resulting from cooperative river basin studies include:

- Development of forest management guidelines to control sediment;
- Changes in some state standards for flood protection;
- Changes in proposed highway and pipeline locations to protect natural resources;
- Implementation of state reservoir site-acquisition programs;
- State flood plain management laws and regulations;
- Erosion and sediment control ordinances;
- Land use development plans;
- Changes in scope of P.L. 566 and CE projects;
- Deauthorization of some P.L. 566 and CE projects;
- Data for Sec. 303 e basin plans developed by private consultants;
- County-wide drainage plans;
- Water quality monitoring programs;
- State wetland management programs;
- Community water supply developments;
- and many others.

Examples:

1. Among the first Type 4 studies were two sponsored by the Corps of Engineers. Both of these were started in 1957.

a. The Delaware River Basin:

The Corps of Engineers was authorized to make a study of the Delaware River Basin by the Flood Control Act of 1948 (P.L. 80-858) as amended by the Flood Control Act of 1950 (P.L. 81-516) and the Flood Control Act of 1956 (P.L. 84-685). SCS was requested to assist in the study under the provisions of Sec. 6, P.L. 566. Appendix G to the "Report on the Comprehensive Survey of Water Resources of the Delaware River Basin", December 1960, was prepared by USDA. Appendix H, "Fluvial Sediment", was prepared by USGS and SCS, and Appendix R, "Water Control at Intermediate Upstream Levels", was prepared by a Joint Work Group of Corps of Engineers and SCS. This appendix visualized the use of existing Corps of Engineers and SCS authorities to install the needed upstream measures.

b. Potomac River Basin:

The authority of the Corps of Engineers to make this study was a Resolution of the Senate Public Works Committee of January 26, 1956, which requested a review of a previous report on the Potomac River and Tributaries published as House Document No. 622, 79th Cong., 2nd Session.

The Corps requested USDA participation under the provisions of Sec. 6, P.L. 566. USDA developed a watershed protection and management program for the Basin and worked with the Corps in the study of an up-stream reservoir system. The Department also supplied data on the current and projected agricultural and rural water use, use and conditions of the land and cover of the Basin subwatersheds, and an estimate of sediment yields by subwatersheds. It also prepared economic projections of farm acreage and land productivity. The results of this study are stated concisely in the Syllabus of the Report:

"A plan for flood control, water supply, quality control and recreation which would include 418 headwater reservoirs, 16 major reservoirs, 3 small flood control projects already authorized under Public Law 685; treatment of all wastes entering the Basin's streams by 2010.....; and land management and conservation measures to reduce erosion and rapid localized runoff." (194)

## 2. Joint Studies with the Corps of Engineers.

While Sec. 6, P.L. 566 authorized the Secretary of Agriculture to cooperate with the Secretary of the Army in making river basin studies, there was no authority for a joint study and joint report until the Smith Act was passed in 1962. This Act authorized and directed the Secretary of the Army and the Secretary of Agriculture to make joint investigations and surveys in accordance with existing authorities and to prepare joint reports setting forth their recommendations for the installation of the works of improvement needed for flood prevention, or the conservation, development, utilization and disposal of water, and for flood control and allied purposes. Such action could be initiated only after authorized by resolutions adopted by the Senate or House Public Works Committees. (195)

There have been only six joint studies directed under this authority:

- a. The Restudy of the Cape Fear River Basin, North Carolina, (1957 - 1975).
- b. San Gabriel River Basin, (1971 -       ).
- c. Pocatalico River Basin, West Virginia, (1972 -       ).
- d. Chickasaw Basin Joint Study, (1973 -       ).
- e. Upper Allegheny River Basin, New York, (1974 -       ).
- f. Minnesota River, (1975 -       ).

Of these, implementation action has resulted from only one study. A partial report dealing with upstream flood prevention and water supply storage in the Pocatalico River Basin has been authorized for implementation.

## 3. U. S. Study Commission surveys.

- a. U. S. Study Commission, Southeast River Basins:

The study was authorized by P.L. 85-850, August 28, 1958. The Act authorized an integrated and cooperative investigation to formulate a comprehensive and coordinated plan for:

- (1) flood control and prevention;
- (2) domestic and municipal water supplies;
- (3) improvement and safeguarding of navigation;
- (4) reclamation and irrigation of land, including drainage;
- (5) possibilities of hydroelectric power and industrial development and utilization;
- (6) soil conservation and utilization;
- (7) forest conservation and utilization;
- (8) preservation, protection and enhancement of fish and wildlife resources;
- (9) development of recreation;
- (10) salinity and sediment control;
- (11) pollution abatement and the protection of public health; and
- (12) other beneficial and useful purposes. (196)

The basins covered by the survey are: Savannah, Altamaha, Saint Marys, Apalachicola-Chattahoochee, and Perdido-Escambia River Basins (and intervening areas) in the States of South Carolina, Georgia, Florida and Alabama. (197)

The Act established a commission to be known as the United States Study Commission on the Savannah, Altamaha, Saint Marys, Apalachicola-Chattahoochee, and Perdido-Escambia River Basins and intervening areas. It became known as the Southeast River Basins Study Commission. The Commission was composed of 11 members; a chairman; six members representing Federal departments (the Army, Commerce, Health, Education and Welfare, Agriculture, the Interior and the Federal Power Commission); and four members representing the states of South Carolina, Georgia, Florida and Alabama. (198)

The Department of Agriculture was represented initially by John Short, who was also the USDA member on the AWRBIAC. He was succeeded by Cecil Chapman, SCS State Conservationist, Georgia. USDA inputs were provided by AMS, ARS, ASCS, ERS, FmHA, FS, and SCS. SCS established a full time team in Athens, Georgia, which developed field data on a watershed and subwatershed basis.

The Study concluded that:

- (1) availability of land and water is not a limiting factor in development;
- (2) long-range needs related to land and water resources can be met;
- (3) all elements of the plan need not be developed at once;
- (4) flood damages are local problems;
- (5) ground and surface waters are of good quality and adequate for foreseeable needs;
- (6) waterway facilities can be expanded to meet projected increases in waterway traffic;

(7) an increase in farm drainage and irrigation is expected;

(8) hydroelectric facilities can meet only a small part of the projected demand;

(9) industrial development and utilization are key factors for the area;

(10) soil conservation and utilization programs included in the plan will meet 75 percent of the needs;

(11) accelerated forestry programs can meet projected production needs to 2000;

(12) projected user-days of hunting and fishing can be accomodated by the plan;

(13) recreational needs can be met;

(14) sediment can be controlled by conservation measures;

(15) additional waste treatment facilities are needed;

(16) beach erosion and hurricane damage potentials need further study;

(17) special cost-sharing by the Federal government was proposed for certain projects in the early action phases;

(18) additional basic data are needed; and

(19) a Resources Advisory Board for the area is needed. (199)

The Report of this study commission consisted of several volumes. It was published as H. D. No. 51, 88th Cong., 1st Session.

b. U. S. Study Commission, Texas River Basins.

The study was authorized by P.L. 85-843 (72 Stat. 1058) as amended by P.L. 86-228 (73 Stat. 456) approved September 8, 1959. The Act authorized an integrated and cooperative investigation study and survey to formulate a comprehensive and coordinated plan of the same scope as that directed for the Southeast River Basins. (200)

The basins covered by the survey are: Neches, Trinity, Brazos, Colorado, Guadalupe-San Antonio, Nueces, and San Jacinto River Basins and intervening areas. (201)

The Act established a commission to be known as the United States Study Commission on the Neches, Trinity, Brazos, Colorado, Guadalupe-San Antonio, Nueces, and San Jacinto River Basins and intervening areas. It came to be called the U. S. Study Commission - Texas. The Commission was composed of 16 members: a chairman; six members representing Federal Departments (the Army; the Department of Health, Education and Welfare, Agriculture, the Interior, Commerce and the Federal Power Commission); a member representing the Texas Board of Water Engineers; and eight members representing each of the eight river basins covered by the study. (202)

Study assignments were made to the SCS along with other Federal planning agencies. The SCS agreed to perform work required to integrate

soil and water conservation and the upstream flood prevention facilities of USDA with water resource and flood prevention facilities on the main stems and major tributaries of Study Area streams in the formulation of the intra-basin development plans. (203)

Specific Work Assignments included:

- (1) ERS-USDA  
Projected Resource Requirements for meeting  
Projected Needs for Agricultural Production, Texas River Basins.
- (2) SCS-USDA
  - (a) 1958 Land Use by Capability Class and Sub-class and Conservation Treatment Requirements for 1975 Expected Land Use for River Basins;
  - (b) Present Crop Yields, Acreages, and Land Use for River Basins and Land Resource Areas, Texas;
  - (c) Floodwater Retarding Structures: Rate of Construction and Surface Area of Sediment Pools by Years;
  - (d) Determination of Flood Hydrology for Economic Evaluation of Upstream Flood Prevention Projects;
  - (e) Irrigation Survey Report;
  - (f) Upstream Flood Prevention and Water Resources Development; and
  - (g) Drainage Survey Report. (204)

The Commission completed its study and prepared its final report in accordance with Sec. 209, P.L. 85-843, as amended. The Report was published in March 1962 in three parts, namely: Part I - The Commission Plan; Part II - Resources and Problems; and Part III - The Eight Basins.

#### 4. Appalachia.

President Kennedy had a personal interest in and deep concern for social and economic conditions in Appalachia. After his inauguration an interagency study was made of the social and economic problems, needs, and opportunities of the region. This study resulted in proposed legislation which was passed as The Appalachian Regional Development Act of 1965, P.L. 89-4, March 9, 1965. USDA made significant contributions to the study with SCS and ERS providing most of the USDA effort.

Section 206 of the Act states in part:

"The Secretary of the Army is hereby authorized and directed to prepare a comprehensive plan for the development and efficient utilization of the water and related resources of the Appalachian region, giving special attention to the need for an increase in the production of economic goods and services within the region as a means of expanding economic opportunities and thus enhancing the welfare of its people, which plan shall constitute an integral and harmonious component of the regional economic development program authorized by the Act."  
(205)

In response to this directive, the Corps of Engineers, with other Federal, state and local, and private agency cooperation, made a survey of the water and related resources problems and potential developments of the region. Its report "Development of Water Resources in Appalachia" was published in December 1969. The Main Report was divided into six parts, 15 volumes. The Appendicies involved another 10 volumes. (206)

This survey was unique in that it set forth regional growth as a principal objective. Normally, water resource developments are evaluated on National economic benefits. Regional development and regional benefits are given only secondary consideration. However, in this study, Congress was interested in regional growth and development without concern of the impacts they might have on other regions. (207)

Part IV, Vol. 12, of the Main Report, presented the special evaluation procedures developed and used for project evaluations. This discussion also presented several methods that can be employed to analyze the expansion effects (job-producing potential) of water resource developments. (208)

USDA prepared a report on the soil, timber, and water resources of Appalachia from the standpoint of agriculture and conservation interests. Modifications of the going programs administered by various agencies within USDA were proposed. The Forest Service was requested to up date and present its plans for accelerating recreational facilities development in the 15 National Forests of Appalachia. (209)

For each of the 13 states which lay within or partially within the Appalachian Region USDA agencies provided the following information:

a. SCS

(1) Upstream Watershed Projects Completed or in Operation.

(2) Upstream Watershed Projects Authorized but needing acceleration for Early Action Program.

(3) Upstream Watershed Projects planned but which should be authorized and accelerated for Early Action.

(4) Upstream Watershed Projects which should be planned and installed under an accelerated program before 1990.

(5) Land treatment measures which should be installed or applied under an accelerated program by 1980.

b. FS

(1) An accelerated land treatment program in the National Forests.

(2) An accelerated recreation development program in the National Forests. (210)

Another unusual feature of this report is the Royalton Reservoir-Salyersville Area Interagency Project proposal. It would consist



of (1) the proposed Royalton Reservoir, and a local protection project on Licking River and State Road Fork near Salyersville to be installed by the Corps, (2) three small tributary structures to be installed by SCS, and (3) accelerated land treatment on 44,400 acres to be applied under direction and assistance by USDA agencies. (211) This is one of the few jointly planned and evaluated structural systems by the Corps and SCS which have been proposed.

There are ingrained objections within the Federal establishment to the use of regional development objectives and regional development benefits in water resource project formulation and evaluation. These have prevented proposed project construction and the resulting benefits as visualized in P.L. 89-4 and the Water Resource Development Report.

#### 5. Critical Water Problems Facing the Eleven Western States - Westwide Study.

In addition to the Corps of Engineers, US Study Commissions, and States, USDA has cooperated with the Department of the Interior in water resource studies under the provisions of Sec. 6, P.L. 83-566. The Colorado River Basin Project Act (P.L. 90-357) September 1968, directed the Secretary of the Interior to conduct reconnaissance investigations for the purpose of developing a general plan to meet the future water needs of the 11 Western States lying wholly or in part west of the Continental Divide. (212)

The Westwide Study represents the joint efforts of representatives of the 11 Western States and 43 other organizations, including Federal Departments and independent agencies, commissions representing regional and national interests, and nongovernmental organizations. Within the Federal Departments there were 12 separate agencies involved. The agencies of the Department of Agriculture which contributed to this effort are ERS, FS, and SCS. The Bureau of Reclamation of the USDI was the lead agency for the study. USDA agencies participated in both the Management and Implementation Groups. (213)

A final reconnaissance report was to be submitted to the President, the Congress, and the Water Resources Council no later than June 30, 1977. (214) However, new national priorities emerged after passage of the authorizing legislation. Satisfaction of national energy and food and fiber needs and emerging land use policies, together with the protection and enhancement of the environment, placed new demands on planning for the development of the resources of the Western States. Consequently, the Westwide Study was administratively redirected in January 1973 to identify by July 1, 1974, only the most pressing and immediate water and related land resource needs. (215)

The Westwide Study was designed initially (1) to produce a general plan to meet the future water needs of the 11 coterminous Western States, (2) to be interdisciplinary in character, and (3) to be inter-agency in participation and direction. (216)

When the Department of the Interior contacted the USDA regarding its participation in this study, USDA agreed to place an interagency team in residence at the Study Headquarters in Denver, Colorado. The USDA team consisted of a team leader (furnished by SCS), SCS, ERS, and FS personnel. The team also could call on USDA field personnel from the several states for inputs pertaining to their respective states. This arrangement proved quite satisfactory. USDA made significant and pertinent inputs regarding soil and water resources as they pertain to agricultural and forestry problems and potentials in the Westwide area. Its specific inputs are reflected in such studies as: projections of agricultural production; agricultural water needs and demands, including irrigation; erosion and sedimentation problems; salinity problems; impacts of wilderness areas on water planning; wild, scenic and recreational river requirements; and the effects of conservation and reuse on meeting water demands.

The study concluded that, from the National viewpoint, the order of priority of the most critical water and related problems in the 11 Western States is: (1) Municipal and Industrial Water Supplies, (2) Energy Development, (3) Environmental Protection and Enhancement, and (4) Agriculture and other Development Programs. (217)

## 6. State and Local Cooperative Studies

No specific examples of these studies will be discussed in this document. These studies constitute by far the majority of the cooperative River Basin Studies. The impact and use of these studies have been summarized in the first part of this chapter. The ability of the sponsoring agencies to have a major influence on the scope and scale of these studies and to participate effectively in their management contributes to their popularity and effectiveness.

Figure 7 reflects the degree of participation of USDA in these studies. While these figures also reflect USDA participation in the interagency river basin studies, the major part of this effort now is directed into the Cooperative Studies. The record of obligations as summarized by SCS makes it difficult to separate out obligations by types of studies. The 1978 fiscal year Appropriations Act keeps the annual level for this activity above \$15,000,000.

The location and identification of completed cooperative River Basin Studies as of June 1976 are shown on Plate 1. The same information for studies in progress as of June 1976 is shown on Plate 2.

COOPERATIVE RIVER BASIN SURVEYS  
Completed as of July 1978

STUDY NAME

STATES COVERED

STUDY NAME

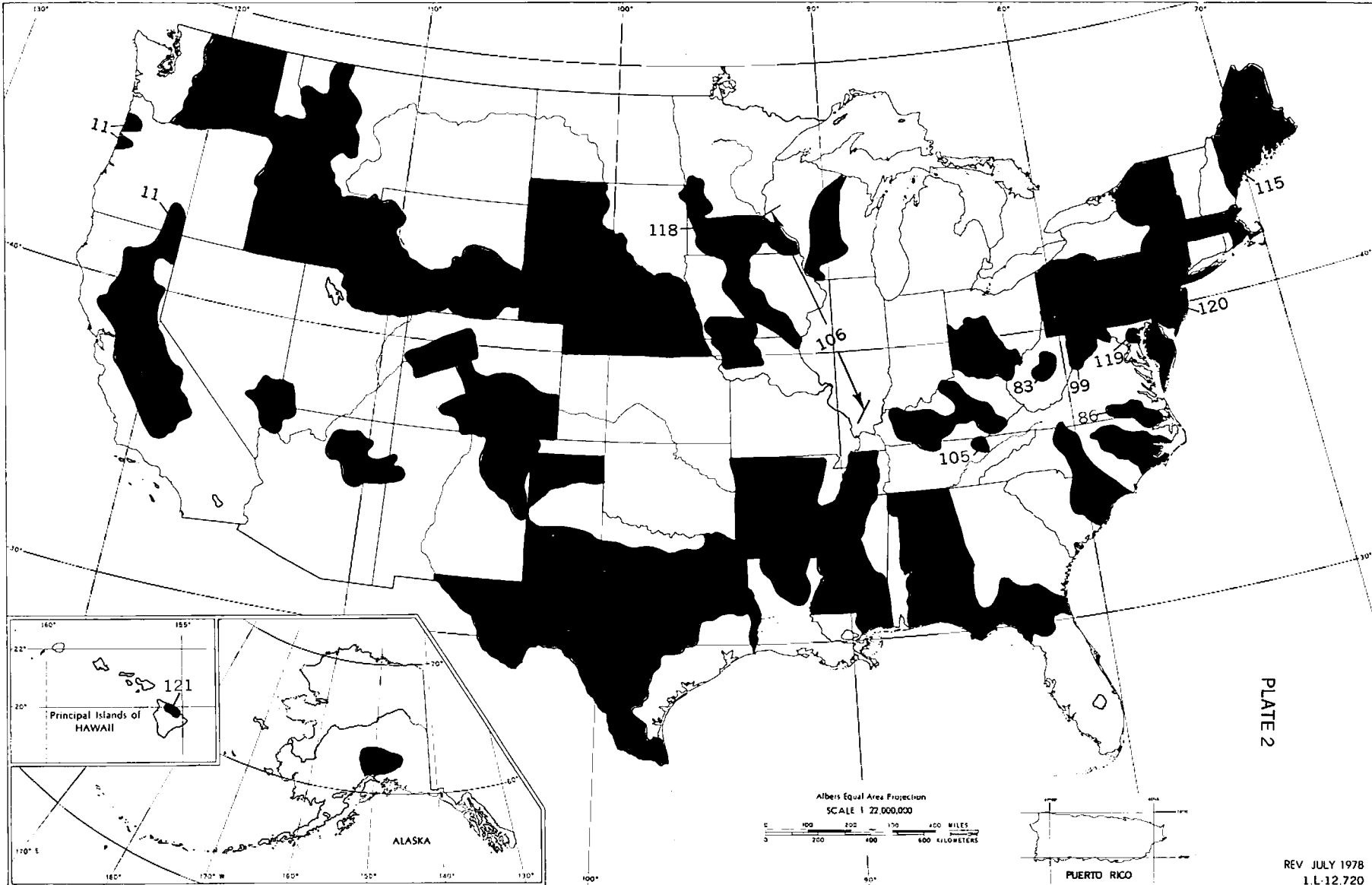
STATES COVERED

1. Lower Mississippi River & Tributaries	MS, AR, IL, LA, MO	27. Little Blue River Basin	NE
2. Kansas River Basin in Kansas	KA	28. Coastal & Independent Streams River Basin	MS, LA
3. Huron River Watershed	MI	29. North Coastal River Basins	CA, OR
4. Des Moines River - Red Rock Reservoir	IA	30. Big Sioux River Basin	SD, IA, MN
5. Savannah River - Hartwell Dam	SC	31. Arkansas River Basin in Kansas	KS
6. Delaware River Basin	PA, DE, NJ, NY	32. South Grand-Osage River Basin	MO
7. Arkansas Multiple-Purpose Project	AR, OK	33. Upper Rio Grande Basin	NM
8. Bayou Bartholomew	AR, LA	34. Central Lahontan River Basins (2 Subbasins)	NV, CA
9. Cape Fear River Basin	NC	Walker River Basin	
10. Colorado River Storage Project*	UT, AZ, CO, NM, WY	Carson River Basin	
11. Oregon Rivers (17 Subbasins)	OR	35. Lower Rio Grande Basin	TX
Middle (Central) Willamette River Basin		36. Appalachian Water Resources Study*	WV, AL, GA, KY, MD
South Coast (Coos-Coquille) Drainage Basin			NC, NY, OH, PA, SC,
Deschutes River Basin*			NE, KS
Hood Drainage Basin		37. Nemaha River Basin	NE
John Day River Basin		38. Niobrara River Basin	NE
Lower Willamette River Basin		39. Chickasaw-Metropolitan District	TN
Malheur Lake Drainage Basin		40. James River Basin	VA
Middle Coast Drainage Basin		41. Santee River Basin	SC, NC
North Coast Drainage Basin		42. Western New York River Basin	NY
Powder Drainage Basin		43. Hatchie River Basin	TN, MS
Umatilla Drainage Basin		44. Cape Fear River Basin Restudy PL 87-639	NC
Upper Willamette River Basin*		45. Muskingum River Basin	AR
Klamath Drainage Basin		46. Bayou Meto Basin	AR
Rogue-Umpqua River Basin		47. Southeast Michigan Rivers Basin	MI
Malheur-Owyhee Rivers Basin		48. Southwest Washington Rivers Basin	WA
South Coast River Basin		49. Southeast Wisconsin Rivers Basin	WI
Grande Ronde River Basin		50. Southwest Louisiana Rivers Basin	LA
12. Humbolt River Basin	NV	51. Tombigbee River Basin Restudy	MS, AL
13. Upper Mississippi River - Great Lakes*	MO, IL, IN, MI, OH, WI	55. Massachusetts Water Resources Study (1 Subbasin)	MA
14. Yazoo-Mississippi River Basin	MS	Charles Study Area	
15. Potomac River Basin	VA, MD, PA, WV	56. Hawaiian Rivers (2 Subbasins)	HI
16. Sevier River Basin	UT	Island of Hawaii	
17. Tombigbee River Basin	MS, AL	Island of Oahu	
18. Southeast River Basin*	GA, AL, FL, NC, SC	57. Wind-Bighorn, Clarks Fork River Basin	WY, MT
19. Texas Study Commission*	TX	58. Big South Fork of the Cumberland River	TN
20. Colorado Rivers (6 Subbasins)	CO, UT, WY	59. Blackwater-Lamine River Basin	MO
Colorado River Basin		61. Texas Coastal Basin	TX
Gunnison River Basin		64. Ashley-Combahee-Edisto River Basin	SC
White River Basin		65. St. Francis River Basin	AK, MO
Yampa River Basin		67. Kankakee-Elkhart River Basins	IN
San Juan River Basin		69. Iowa-Cedar Rivers Basin	IA, MN
Dolores River Basin		71. Monongahela River Basin	WV, MD, PA
21. James River Basin	SD	72. Santa Cruz-San Pedro River Basin	AZ
22. Meramec River Basin	MO	73. San Gabriel River Basin-Joint Study PL 87-639	CA
23. Poteau River Basin	OK, AK	74. Westwide Water Study	CO, AZ, CA, ID, MT,
24. Florid <sup>a</sup> Rivers (3 Subbasins)	FL, AL, GA		WA, WY
St. Johns River Basin & Intervening Coastal Areas		75. Chicago Metropolitan Area Rivers	IL
Kissimmee-Everglades Area		85. Red River Above Denison Dam	TX
25. Big Blue River Basin	NE	89. Kalamazoo River Basin	MI, IN
26. Elkhorn River Basin	NE	102. Arkansas River Drainage Within Oklahoma	OK

RIVER BASIN SURVEYS  
COOPERATIVE STUDIES  
(Type 4)  
In Progress - February 1978

U. S. DEPARTMENT OF AGRICULTURE

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USDA OBLIGATIONS  
RIVER BASIN PLANNING  
ANNUAL

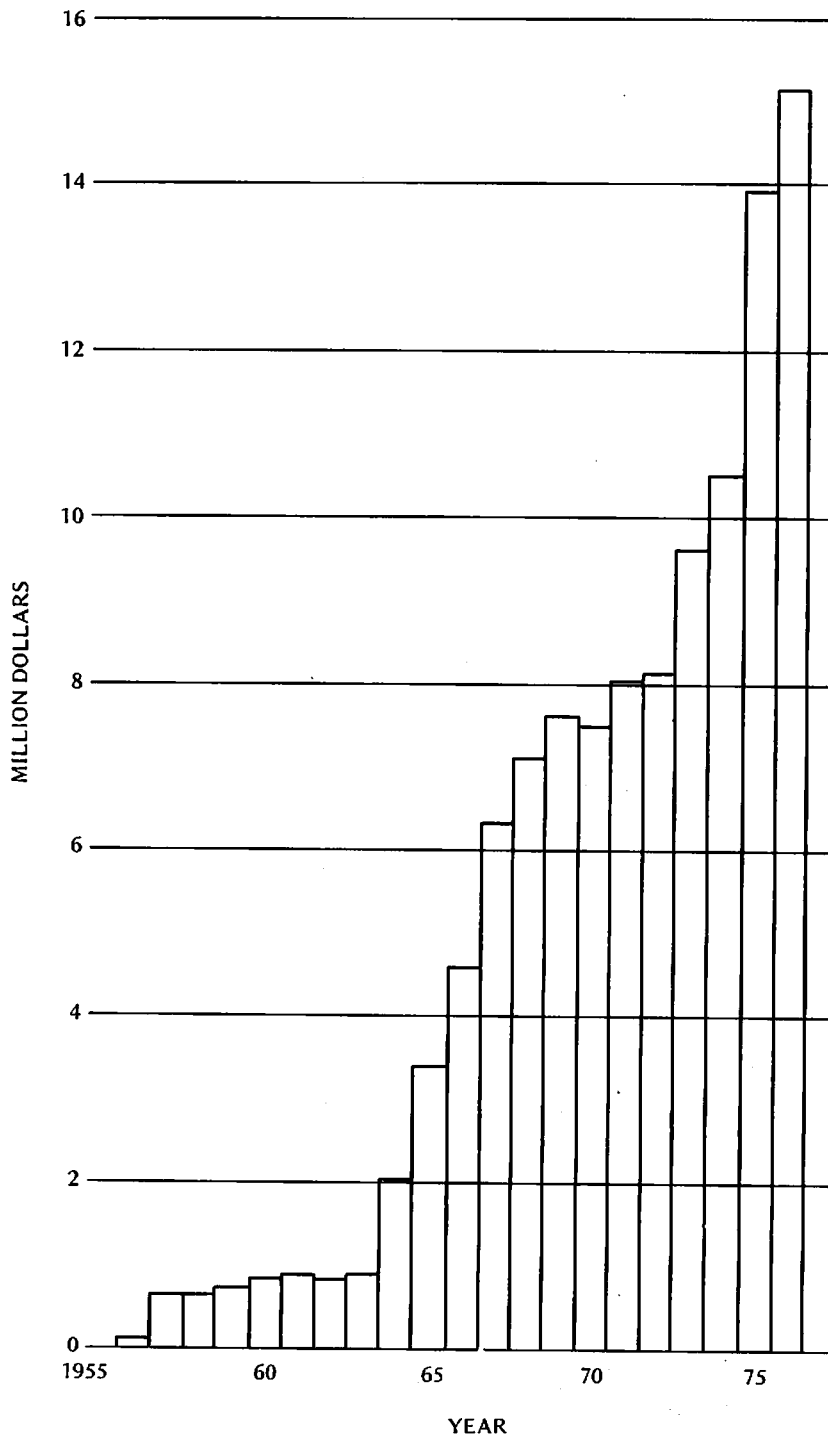
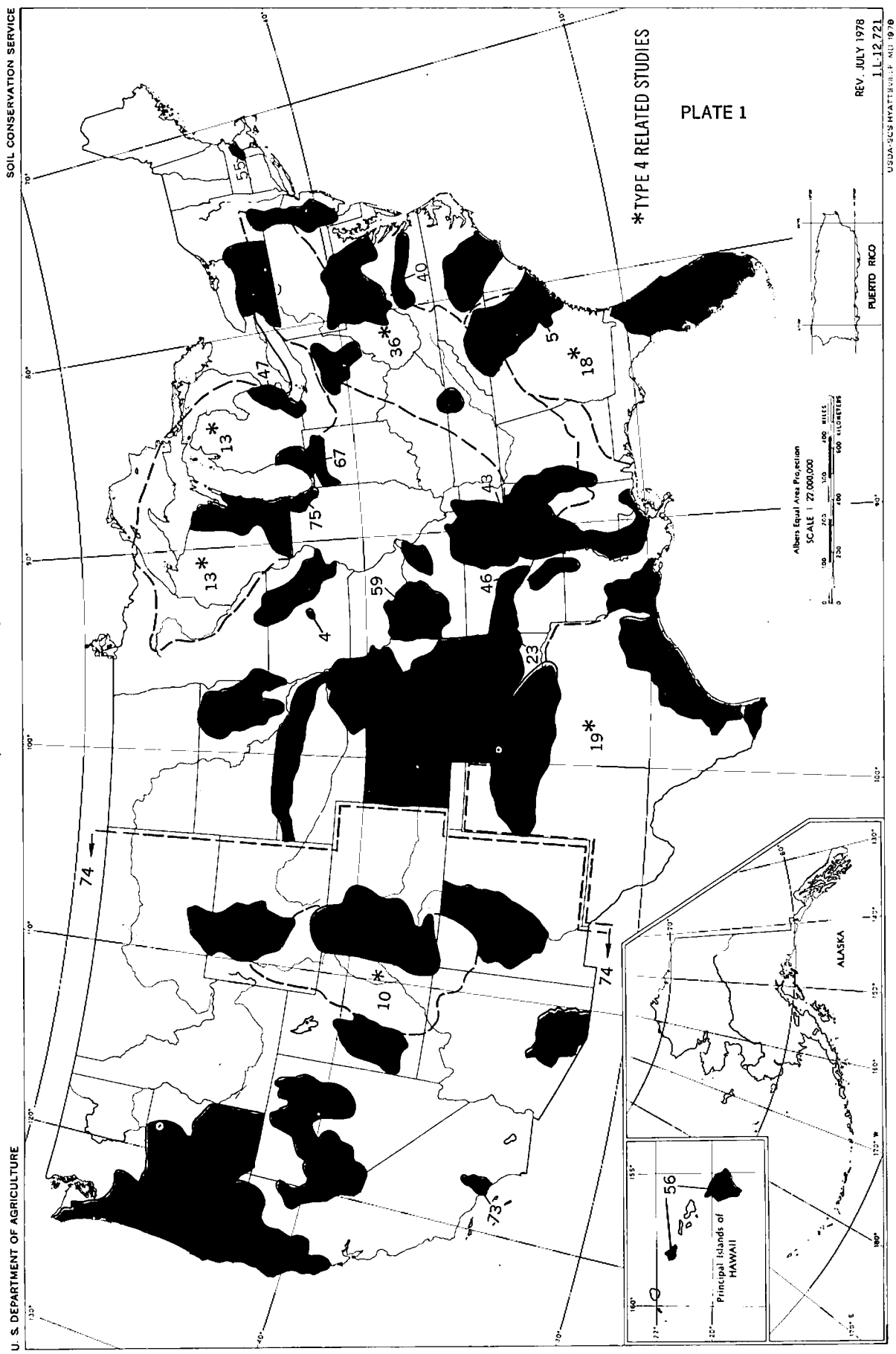


FIGURE 7

RIVER BASIN SURVEYS  
 COOPERATIVE STUDIES  
 (Type 4)  
 Completed - February 1978



U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

REV. JULY 1978  
 I.L-12.721

PUERTO RICO

Albers Equal Area Projection  
 SCALE 1:27,000,000

0 100 200 300 400 MILES  
 0 100 200 300 KILOMETERS

ALASKA

Principal Islands of  
 HAWAII

56

PLATE 1

\*TYPE 4 RELATED STUDIES

COOPERATIVE RIVER BASIN SURVEYS  
In Progress as of July 1978

<u>STUDY NAME</u>	<u>STATES COVERED</u>
11. Oregon Rivers (3 Subbasins) Tillamook Bay Goose and Summer Lakes Basin Siletz River Basin	OR
20. Colorado Rivers (1 Subbasin) Rio Grande River Basin	CO, AZ, NM, UT
24. Florida Rivers (1 Subbasin) Northeast Gulf River Basins	FL, AL, GA
52. Yazoo-Mississippi River Basin Restudy	MS
53. Loup & Republican Rivers	NE
54. Green & Kentucky River Basin	KY, TN
55. Massachusetts Water Resources Study	MA
60. Southwest Ohio River Basins	OH
62. Alabama River Basin	AL
63. Black Warrior River Basin	AL
66. Southern Minnesota Rivers Basin	MN, IA, SD
68. Eastern New York River Basins	NY
70. Obion-Forked Deer River Basins	TN
76. Bear River Basin	UT, ID, WY
77. Snake River Basin	ID, WY
78. Tar-Neuse River Basins	NC
79. Western South Dakota River Basins	SD
80. Clark Fork of the Columbia River Basin	MT
81. San Joaquin Valley Basin	CA
82. Arkansas-White-Red River Basin	NM
83. Pocatamico River Basin-Joint Study PL 87-639	WV
84. Ouachita River Basin	LA, AR
86. Chowan River Basin	VA, NC
87. Eastern Washington River Basins (3 Subbasins) Entiat River Basin Palouse River Basin Yakima River Basin	WA
88. North Platte River Basin	WY
90. Chickasaw Basin-Joint Study PL 87-639 Wolf and Loosahatchie River and Nonconnah Creek	TN, MS
91. Pennsylvania Analytical Summary	PA
92. Wisconsin River Basin	WI
93. Delmarva Peninsula Basin	MD, DE, VA
94. Mississippi Statewide Study	MS
95. Northern Missouri River Tributaries Basin	MO
96. Little Colorado River Basin	AZ, NM
97. Southern Iowa Rivers Basin	IA
98. Green River Basin	WY, MT
99. Potomac River Basin	WV
100. Virgin River Basin	NV, AZ
101. Colorado River Salinity Study	CO
103. Arkansas Statewide Study	AR
104. Sacramento Valley Basin	CA
105. New River Study-Joint Study PL 93-251	TN
106. Upper Mississippi River Basin, GREAT Studies	IA
107. Central Ohio River Basins	OH
108. Yadkin-Pee Dee River Basin	SC, NC
109. Alaska Rivers	AK
110. Arkansas River Basin	CO
111. Tennessee River Basin-Alabama Portion	AL
112. Upper Allegheny River Basin PL 87-639	NY, PA
113. Maine Agriculture Water Non-Point Pollution Study	ME
114. Texas Statewide Sedimentation	TX
115. Mount Agamenticus River Basin	ME
116. Des Moines River Basin	IA
117. Nebraska River Basins Special Study for Nebrasks State Water Plan	NE
118. Minnesota River Subbasins PL 87-639	MN
119. Patapsco River Basin	MD
120. New Jersey Statewide Sediment, Erosion, and Agricultural Waste Study	NJ
121. Hamakua Area Agricultural Water Supply Study	HI
122. Lancaster Area Water, Land and Related Resources Study	PA

RIVER BASIN SURVEYS  
 FRAMEWORK STUDIES  
 Completed Type 1 (Level A) Coordinated Comprehensive Framework Surveys - June 1976

U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

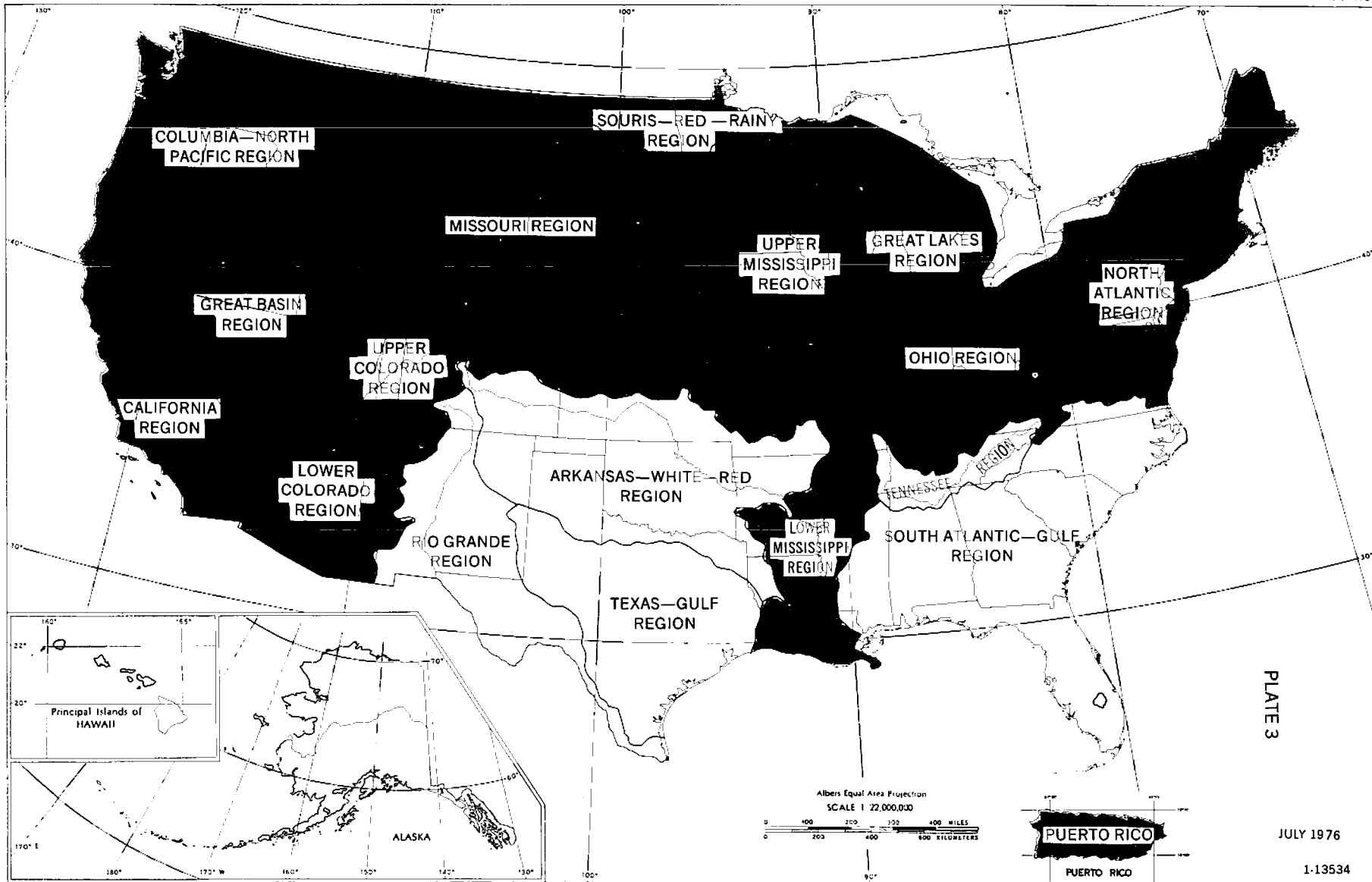


PLATE 3

JULY 1976

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