

United States  
Department of  
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Soil  
Conservation  
Service



# Readings in the History of the Soil Conservation Service

Economics and  
Social Sciences  
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## Introduction

The articles in this volume relate in one way or another to the history of the Soil Conservation Service. Collectively, the articles do not constitute a comprehensive history of SCS, but do give some sense of the breadth and diversity of SCS's missions and operations. They range from articles published in scholarly journals to items such as "Soil Conservation: A Historical Note," which has been distributed internally as a means of briefly explaining the administrative and legislative history of SCS. To answer reference requests I have made reprints of the published articles and periodically made copies of some of the unpublished items. Having the materials together in a volume is a very convenient way to satisfy these requests in a timely manner. Also, since some of these articles were distributed to SCS field offices, many new employees have joined the Service. I wanted to take the opportunity to reach them. SCS employees are the main audience.

We have produced this volume in the rather unadorned and inexpensive manner so that we can distribute the volume widely and have it available for training sessions and other purposes. Also we can readily add articles in the future.

If anyone should wish to quote or cite any of the published articles, please use the citations provided at the beginning of the article. For other articles please cite this publication.

Steven Phillips, a graduate student in history at Georgetown University and a 1992 summer intern here with SCS, converted the articles to this uniform format, and is hereby thanked for his very professional efforts. Jim Todd of Electronic Scanning and Design created the cover.

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## Two Centuries of Soil Conservation

Reprinted from *OAH Magazine of History* (Winter 1991): 24-28.

by Douglas Helms,  
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Patrick Henry reportedly remarked after the American Revolution that "since the achievement of our independence, he is the greatest patriot who stops the most gullies."<sup>1</sup> If the quote is not so evocative of patriotism as Henry's other oratorical flourishes, it nonetheless illustrates the early concern over soil erosion and what it portended for the nation. The connection of national welfare to the ability to produce food was already firmly rooted in the young nation.

Soil erosion concerned Americans more than their European ancestors for several reasons. Many of the American staple crops for export--cotton and tobacco--were planted in rows as was corn. Hoeing or plowing between the rows eliminated weeds that might sop moisture. The clean cultivation left the land bare to the impact of the falling raindrop. Rainfall on the eastern seaboard is more intense than in Europe, falling with greater force and splashing up soil particles. Sloping and hilly land which abounds in New England and the piedmont of the South, is particularly susceptible to soil erosion. Soil erosion removed fertility in the top soil, but there was a greater problem--it also removed the soil body, the medium for the growth of plant roots.

Turning up the soil also exposed the organic matter of the top soil to the sun and air, thereby increasing oxidation. Organic matter improves soil tilth, increasing the infiltration of rainfall into the soil as well as helping bind soil particles together. Farmers began discovering a decline in crop production with repeated plantings. The phenomenon was due in part to soil erosion, but it also resulted from not returning anything to the soil in the form of manure, green cover crops plowed back into the soil, or legumes that fix nitrogen in the soil through nodules on the roots.

Farmers could respond to this problem in several ways. They could rotate fields, letting old fields revert to grass, brush, or woodland, and then burning them off. The accumulated organic matter would then support several crops until the process had to be repeated. Or they could abandon the farm and move west to claim new farms. Indeed the availability of land to the west and the scarcity of labor are often seen by historians as the main impediments to the adoption of farming methods that conserve the soil and restore its fertility. Peter Kala, an eighteenth-century Swedish naturalist, saw farm land abandonment and clearing of new ground in New York and observed, "This kind of agriculture will do for a time, but it will afterwards have bad consequences, as every one may clearly see."<sup>2</sup>

A number of commentators and agricultural reformers began proposing various soil conserving practices. Some of the earliest conservationists, such as Jared Eliot, Samuel Deane, and John Taylor, relied on observations and personal experiences in advocating systems of pasture, legumes, and crop rotations, to increase fertility and lessen erosion by maintaining ground cover and improving soil tilth. Though he invented neither, Thomas Mann Randolph perceived the advantages of the hillside plow and horizontal plowing.<sup>3</sup> More often called contour farming these days, this method of plowing involved running the furrows around the hillside on a horizontal plane, rather than up and down hills. Each ridge formed a little dam to check erosion. As a convert to the idea, Randolph's father-in-law, Thomas Jefferson, believed that, "In point of beauty nothing can exceed that of the waving lines and rows winding along the faces of the hills and valleys. The horses draw much easier on the dead level, and it is in fact a conversion of hilly ground into a plain."<sup>4</sup> Farmers could also

build terraces or channels that ran around the hill to intercept and carry off water. Nicholas Sorsby combined horizontal farming with the early precursor of the terrace--the hillside ditch--and greatly popularized "level culture" throughout the South.<sup>5</sup> After the Civil War, Priestly Mangum of Wake Forest, North Carolina, perfected the broadbased Mangum terraces.<sup>6</sup>

Edmund Ruffin of Virginia developed the most elaborate system of what today might be called sustainable agriculture. He used a mixture of decaying sea-shells and clay--marl--that made the acidic soils of the South more productive. He further demonstrated the value of crop rotations and legumes in maintaining fertility. Ruffin especially wanted to stem the tide of farmers leaving Virginia. Though he succeeded locally to some extent, he never revolutionized or reformed agriculture in the South.<sup>7</sup>

While some Americans practiced soil conservation, soil erosion continued to be a problem in the late nineteenth and early twentieth centuries. A few scientists and academics such as W. J. McGee and N. S. Shaler wrote about the problem. A University of Chicago geologist, T. C. Chamberlain, spoke at the White House in 1908 about the dangers of erosion. But the creation of an awareness in the early twentieth century required something of a crusader. Hugh Hammond Bennett, a soil scientist with the U. S. Department of Agriculture, took on the challenge and came to be regarded as the father of soil conservation.

Several facets of Bennett's personality and background suited him to the role of crusader. First, he had the understanding of the problem due to experience; he grew up in North Carolina, in one of the more erodible areas of the state. In his work as a soil surveyor, and later as supervisor of surveys in the South, he saw the effects of erosion and its impacts on agriculture. By the 1920s, he was actively trying to do something about the problem. His skill as a writer was invaluable in the crusade. Along with W. R. Chapline, he coauthored a USDA publication, *Soil Erosion: A National*

*Menace* (1928), that was a call to action.<sup>8</sup> Other more popular articles reached a wider, and potentially influential, audience. He published articles in *Nature Magazine*, *North American Review*, *Holland's*, *Geographic Review*, *Country Gentleman*, *American Forests and Forest Life*, and *Farm Journal*.

Finally, Bennett was ready to work on pushing his ideas legislatively and administratively. He maneuvered to gain support for a group of research stations that would develop methods of conserving soil. The legislation was included in an amendment to the appropriations bill of the Department of Agriculture in 1929.

The crisis brought on by the Great Depression further provided Bennett with an opportunity when the Works Projects Administration and the Civilian Conservation Corps were created to put people to work. John Collier, Commissioner of Indian Affairs, and Harold Ickes, Secretary of the Department of the Interior, particularly wanted assistance in improving the condition of land deteriorating from overgrazing and erosion on the Indian reservations.

Bennett received \$5 million to carry out some soil conservation projects in September 1933. In the new Soil Erosion Service, Bennett located soil conservation projects in the watersheds near erosion experiment stations so that the directors of the stations could utilize the research information. Farmers in the watersheds signed five-year cooperative agreements to install conservation measures. The Soil Erosion Service furnished equipment, seed, seedlings, assistance in planning the measures, and labor from the Civilian Conservation Corps or the Works Projects Administration.

Many of the conservation practices were not new, but the new service planned to utilize numerous methods in a mutually supporting conservation system tailored to the individual farm. Contour farming was strongly emphasized. Many farmers used contour terraces but needed to be introduced to grassed outlets and grassed waterways. Where farmers included hay and

small grains in their operation, strip-cropping under crop rotations was emphasized. To encourage a greater use of grass in the farming operation, the projects introduced the concept of pasture management relying in part on fertilizer. In hilly areas, fencing off woodland from grazing benefitted the cropland below by reducing runoff.

The CCC also collected seed for nursery production of seedlings to reforest areas and carried out thinning and timber stand improvement. Likewise, collecting native grass seed for revegetating rangeland played a large part in demonstration projects in semi-arid areas. Contour furrows and water-spreading systems were introduced to increase infiltration. Springs were developed and stock-watering ponds were sited to distribute grazing. Grass cover for orchards was encouraged. In Pacific orchards, the young conservationists emphasized contour furrows to spread irrigation water rather than letting it run downhill.<sup>9</sup>

The Soil Conservation Act of 27 April 1935 transformed the soil conservation work from a temporary status to a permanent agency--the Soil Conservation Service--with authority to expand the work beyond the demonstration projects to a program converting the entire nation. Bennett, ever the showman, dramatized the need for soil conservation when a dust storm from the southern Great Plains passed over Washington as he was testifying before the Senate Public Lands Committee.<sup>10</sup>

After the passage of the act some people began to examine the best approach to get farmers interested in soil conservation. The most prominent person seeking an alternative to the demonstration idea was M. L. (Milburn Lincoln) Wilson, Assistant Secretary of Agriculture. Under the demonstration projects, the government had supplied not only trained people to give advice, but also some equipment to do the work, and the labor of the CCC, the WPA and supplies. Obviously, such labor would not always be available. Wilson simply believed if the work were to spread nationwide and have an impact on the way people farmed, farmers would be more interested and in-

involved in planning and carrying out of the work.

Wilson conceived of a conservation district, a governmental subdivision of the state, that the local people would organize for the district. The directors or supervisors of the district would be elected or appointed and would direct the activities concerning soil and water conservation within the district. The federal government could supply equipment and technical assistance through trained soil conservation personnel. Henry A. Wallace and President Franklin D. Roosevelt endorsed the proposal, and FDR transmitted the Standard State Soil Conservation Districts Law to governors of the states on 27 February 1937, with the recommendation that the state legislatures enact a law based upon it. Arkansas passed the first such act on 3 March 1937. The Brown Creek Soil Conservation District in North Carolina signed the first agreement with the U. S. Department of Agriculture on 4 August 1937.

Since then, nearly 3,000 conservation districts have been organized. The Soil Conservation Service has nearly 2,700 field offices where technically trained soil conservation personnel work with districts, land owners, and other land users on conservation problems. The districts banded together in 1946 to form the National Association of Soil Conservation Districts, which has been a force in shaping nation conservation policies.<sup>11</sup>

Government, of course, has not been the only force affecting the course of soil conservation in America. Throughout history, prices, markets, transportation facilities, and other factors have contributed to expansions or retractions in using land for crops. Europeans settled New England and removed forests so that by the middle of the nineteenth century, nearly three-fourths of the land was in fields and pasture. After completion of the Erie Canal, New England farmers keenly felt the competition of midwestern farms where the rich prairie soils produced grain crops and cattle in profusion. Industrialization further nudged New England toward reforestation, a

transformation that is now so complete it beckons tourists to gaze at the luxuriant colors in the fall.<sup>12</sup>

Down the Atlantic coast in the "land of cotton," the fall of the fleecy king in mid-twentieth century caused a similar change, though not so dramatic and complete. Pasture land in the South increased from 19.5 million acres in 1929 to 44 million acres in 1977. Cropland shrank from 65.5 million acres in 1929 to 53 million acres in 1977.<sup>13</sup> On the predominantly treeless Great Plains, shifts to cropland were easily made in response to weather and prices. Unfortunately, restoring grass cover is a chancy proposition in the land of uncertain rain.

Some government programs have encouraged shifts from cropland to grass and trees. Actually, reducing the surplus of crops that were costing the government money in price support payments was often the greater impetus rather than soil conservation. The Soil Bank (1956-1964) of the late 1950s and the early 1960s offered farmers three- to ten-year contracts. Not surprisingly the programs were most popular in the Great Plains and the South. Land owners in South Carolina, Georgia, and Alabama put 1,255,531 acres in pine trees under the program.<sup>14</sup> A more recent program, the Conservation Reserve Program of the 1985 farm bill, offers contracts to landowners to restore grass or tree cover on land judged to be highly erodible.

The logic of shifting land that is very susceptible to water or wind erosion to uses for which it is better suited is indisputable. Equally indisputable is that this is not a long-term solution to soil erosion. Acres upon acres of land are needed for crops, yet require some measures that will prevent permanent degradation. Twentieth-century agriculture had been buffeted by a mixture of factors that simultaneously made soil conservation more difficult and yet possible.

What is sometimes called mixed farming, including some field crops and livestock, is good for soil conservation. The dense cover provided by hay, legumes, and pasture,

increases water infiltration and reduces runoff that causes erosion. In crop rotations this improves or maintains soil tilth, which again promotes infiltration rather than overland flow of water. Used in strips around the hills or across slopes (strip-cropping), these close growing crops stop the runoff from the clean cultivated row crops such as corn, cotton, tobacco, and soybeans. In the Great Plains a mixture of cattle, wheat, range, and irrigated pasture can mean that strip-cropping is possible, that range land is not overgrazed during drought, and that erodible sandy land is not planted wheat.

The fact is that Americans have tended more to specialization. Wide expanses of wheat fields, dotted with a few large cattle feeding operations, are more often the norm than the diversified farmer-rancher ideal. The Midwest, too, shows the specialization of agriculture. In 1920 two-fifths of the cropland in four cornbelt states (Iowa, Illinois, Indiana, and Ohio) was in corn. By 1982 half of the cropland and more than a third in soybeans--both clean cultivated row crops on which erosion could be a problem.<sup>15</sup>

Technology can cause soil erosion problems, as well as mitigating them. The large tractors pulling wide plows and planting equipment are products of Midwestern factories and Midwestern landscape. Often the equipment is ill-suited to farming on the contour in steeper areas of small farms. Where timeliness and power are valuable for conservation, as in the Great Plains where a tractor can pull large blades just under the earth surface, they are valuable for conservation. The operation leaves stubble on the surface to retard wind erosion, while at the same time cutting off roots that deplete moisture needed for the next crop. Various methods of conservation tillage utilize herbicides to kill weeds and cover crops, yet leave the dead vegetation on the surface. The crop is then planted into this residue.

Technology in the form of improved seed and fertilizers has increased per acre production tremendously since World War



II. Occasionally, the bounty caused some analysts to question whether we need even be concerned about topsoil. Any medium, given enough amendments of fertilizers, should suffice for food production, they contend. Fortunately, this is not the majority opinion, as most Americans continue to believe that the soil and its bounty are a national resource heritage.

#### Endnotes

- <sup>1</sup> Arthur R. Hall, *Early American Erosion-Control Practices in Virginia*, U.S. Department of Agriculture Miscellaneous Publication No. 256 (Washington: GPO, 1937), 2.
- <sup>2</sup> William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983), 169.
- <sup>3</sup> Angus McDonald, *Early American Soil Conservationists*, USDA Miscellaneous Publication No. 449 (Washington: U. S. Department of Agriculture, 1941), 1-26.
- <sup>4</sup> Hugh H. Bennett, *Thomas Jefferson: Soil Conservationist*, USDA Miscellaneous Publication No. 548 (Washington: U. S. Department of Agriculture, 1944), 16, back cover.
- <sup>5</sup> McDonald, *Early American Soil Conservationists*, 33-42.
- <sup>6</sup> Hugh H. Bennett, *Soil Conservation* (New York: McGraw-Hill Book Company, Inc., 1939), 890.
- <sup>7</sup> McDonald, *Early American Soil Conservationists*, 42-57.
- <sup>8</sup> Hugh H. Bennett and W.R. Chapline, *Soil Erosion: A National Menace*. U. S. Department of Agriculture Circular No. 33 (Washington: April 1928), 1-36.
- <sup>9</sup> Douglas Helms, "The Civilian Conservation Corps: Demonstrating the Value of Soil Conservation," *Journal of Soil and Water Conservation* 40 (March-April 1985): 184-188.
- <sup>10</sup> Jonathan Daniels, *Tar Heels: A Portrait of North Carolina* (New York: Dodd, Mead & Company, 1941), 188.
- <sup>11</sup> R. Neil Sampson, *For Love of the Land: A History of the National Association of Conservation Districts* (League City, Texas: National Association of Conservation Districts, 1985), 49-60.
- <sup>12</sup> Cronon, *Changes in the Land*, 169.
- <sup>13</sup> Douglas Helms, "Soil and Soil Conservation," in *Encyclopedia of Southern Culture*, ed. Charles R. Wilson and William Ferris. (Chapel Hill: University of North Carolina Press, 1989), 361-363.
- <sup>14</sup> *Ibid.*, 362.
- <sup>15</sup> John Fraser Hart, "Changes in the Corn Belt." *Geographic Review* 76 (January 1986): 61-62.

## The Soil Conservation Service: A Historical Note

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*This unnecessary wastage of soil concerns you--and me...Neither as individuals nor collectively can we deny our responsibility...If you will take the trouble to ascertain the facts about our farmland--and other natural resources--and then lend your support to our conservation programs we will get results and hold on to them.*

Hugh Hammond Bennett  
from *The Hugh Bennett Lectures*

The Soil Conservation Act (Public Law 46-74) of April 27, 1935, specifically directed the Secretary of Agriculture to "establish an agency known as the Soil Conservation Service," which would "provide permanently for the control and prevention of soil erosion."

Some Americans were concerned about soil erosion in the 19th century and even earlier. Southerners, for example, developed an indigenous system of terracing. Some state experiment stations worked on solutions. The Extension Service instructed farmers in terracing methods in some states. Two U.S. Department of Agriculture scientists, Hugh H. Bennett and William R. Chapline, published an influential pamphlet, *Soil Erosion: A National Menace*, in 1928. Congress authorized a series of experiment stations devoted to soil conservation research in 1929. In Texas, beginning in 1929, the Southwest Soil and Water Conservation Conference called attention to the problem.

Despite these early efforts, soil erosion was hardly a matter of national concern and united efforts until the onset of the Great Depression caused a questioning of numerous aspects of American life. The connection between poor, eroded land and poor people came into focus. New programs, the Civilian Conservation Corps (CCC) and the Federal Emergency Relief Administration, were created to provide jobs on projects in the national interest, and natural resource projects received a

great deal of support. The National Industrial Recovery Act of June 16, 1933, permitted work on erosion control. Secretary of the Interior Harold L. Ickes selected Hugh H. Bennett to head the new Soil Erosion Service in September 1933. Bennett, a USDA soil scientist, had called attention to the problem through articles and speeches.

Bennett located erosion control work in watersheds near the erosion experiment stations so that the heads of the stations could utilize the research information. Farmers in the watersheds could sign five-year cooperative agreements to install conservation measures. The Soil Erosion Service furnished equipment, seed, seedlings, assistance in planning the measures and labor through the CCC or WPA. Many of the conservation practices were not new, but the new service planned to utilize numerous methods in a mutually supportive conservation system tailored to the individual farm. Contour farming was strongly emphasized. Many farmers used contour terraces but needed to be introduced to grassed outlets, grassed waterways, and grade stabilization structures. Where farmers included hay and small grains in their operations, strip-cropping under longer rotation was emphasized. To encourage a greater use of grass in the farming operation, the projects introduced the concept of pasture management relying in part on fertilizer. In hilly areas, fencing off woodland from grazing benefitted the cropland below by reducing runoff.

The CCC boys also collected seeds for nursery production of seedlings to reforest the areas, as well as carrying out thinning and timberstand improvement. Likewise, collecting native grass seed for revegetating rangeland played a large part in demonstration projects in semi-arid areas. Contour furrows and water-spreading systems were introduced to increase infiltration. Spring development and stock-watering ponds were utilized to distribute grazing. Grass cover for orchards was encouraged. In Pacific Coast orchards the young conservationists emphasized the use of contour furrows to spread irrigation water rather than letting it run downhill.

The Service also operated demonstrations on Indian reservations--most notably the Navajo, where they tried to improve the range through range management while reducing the number of animals and improving the quality of sheep.

The successful works attracted attention from the public as well as from farmers and their congressmen, who sought similar projects for their counties. In fact, the success of the Service became a point of contention between the Secretaries of the Departments of the Interior and Agriculture. Secretary of the Interior Ickes wanted to keep the Service as part of a Department of Conservation, while the Secretary of Agriculture contended it properly belonged with other agricultural programs. President Roosevelt decided in favor of USDA, and the Soil Erosion Service moved to the Department of Agriculture on March 25, 1935. The conservation work emerged from its temporary status to become an enduring activity when Congress passed, and President Roosevelt signed, the Soil Conservation Act of April 27, 1935.

The move to centralize soil conservation work in SCS led to a rapid increase in personnel, funds, and responsibilities. When the Soil Erosion Service moved to USDA in April, there were 40 demonstration projects with 51 CCC camps and some WPA labor. Upon transfer to USDA, SCS assumed supervision of more than 150 Forest Service CCC camps that had been working on ero-

sion control. The Secretary of Agriculture transferred the ten experiment stations from the Bureau of Chemistry and Soils and the Bureau of Agricultural Engineering to SCS, as well as the nurseries for producing plant cover from the Bureau of Plant Industry. Additional work-relief funds enlarged the programs so that, by mid-1936, there were 147 demonstration projects, 48 nurseries, 23 experiment stations, 454 CCC camps, and over 23,000 WPA workers on the job. In locating new projects, the agency relied on the national Reconnaissance Erosion Survey undertaken by SES in 1934.

Consolidation of activities continued through the thirties and early forties. SCS, along with the Forest Service and the Bureau of Agricultural Economics investigated soil conservation measures and runoff control on specified watersheds under the Flood Control Act of 1936. In July 1938, the Service took over the construction aspects of the Water Facilities Program in the western states. The Land Utilization Program, transferred to SCS in November 1938, involved the purchase and rehabilitation of submarginal lands. Also in 1938, the Service assumed responsibility for advising farmers on forestry matters under the Cooperative Farm Forestry Act of 1937. Irrigation and drainage began assuming a larger part in the agency's operations when, in 1939, responsibility for investigations and demonstrations was transferred from the Bureau of Agricultural Engineering. There were some losses in the reorganizations--most notably the withdrawal of authority in 1940 to work on public lands and Indian reservations under the Department of the Interior.

During the Depression, the leaders of the soil conservation program had to look to the future of conservation; thought had to be given to the long-range working arrangements with farmers. CCC and WPA labor would not be available forever. Nor was conservation a matter of simply fixing a problem. Sustained interest among farmers must be promoted. While the demonstration projects proved the value of conservation application on a watershed and did attract many visitors, many farmers were not

located in the CCC and demonstration work areas. Farmers who visited the areas often left desiring similar assistance.

The mechanism for providing for a continuing program was the conservation district, largely credited to M. L. Wilson, Under Secretary of Agriculture. Wilson's brand of agrarian democracy included government assistance to farmers, but also provided for local direction of much of the assistance. His thoughts on the means to involve farmers in the conservation program were embodied in the "Standard State Soil Conservation Districts Law" which President Roosevelt sent to the states' governors on February 27, 1937. If the state legislatures and governors enacted a law which included the basic elements of the standard act then local groups could organize conservation districts. Then the Department of Agriculture would provide assistance, primarily trained personnel, while the districts set the priorities and directed the work.

Arkansas passed the first state act on March 3, 1937, and the Brown Creek Soil Conservation District, which included Bennett's homeplace, signed the first agreement with USDA on August 4, 1937. The conservation district was a novel concept in the federal, state, and local relationship, and it required a great deal of explanation and education. Some states questioned the wisdom of the land-use ordinances in the standard act. Some farm organizations, agricultural agencies, and universities regarded the conservation districts as an unnecessary intrusion into already well-established means of working with farmers. Even in the face of resistance, the district concept proceeded. Not surprisingly, many of the demonstration and CCC work areas quickly organized districts. At the end of 1939 there were 88 million acres in districts. The acreage in districts topped the 1 billion mark in 1947 and the 2 billion mark in 1973.

The fifties brought new programs to the countryside. The Small Watershed Program, enacted in 1954, endorsed the fact that soil and water resources are interrelated and helped reorient conservation programs toward the community approach--an un-

derstanding that conservation concerned not only the individual farm but also the community. An understanding of the need to control floods on upper reaches of streams and the need to link conservation measures on the farm to flood control structures for the benefit of the entire watershed was hardly new, having been promoted in the publications *Little Waters* in 1936 and *Headwaters Control and Use* in 1937. The Flood Control Act of 1944 had authorized 11 watersheds for accelerated conservation application. The two programs emphasized a combination of dams for flood control and soil conservation systems on farms in the watershed above the structure. The Small Watershed Program provided assistance--financial and technical--to local groups for watershed improvement and flood control. By 1984, work had been completed on 602 watersheds, while work continues on another 462 watersheds. Since 1982, the Small Watershed Program has increased the proportion of funds devoted to cost-share farm conservation measures and decreased emphasis on building structures for flood control.

The 1956 Great Plains Conservation Program (GPCP), born out of the 1950s drought, gave renewed emphasis to the need to plan conservation for an entire farm or ranch. The program provided a new type of assistance through a ten-year contract. USDA shared the cost of conservation measures, while the farmer agreed to treat the entire farm and to maintain the conservation measures for the period of the contract. The objective, however, was a long-term change, far beyond the length of the contract. The success of contracting with farmers in the GPCP led to adoption of long-term agreements in other conservation programs where the government shared the cost of a conservation measure with the farmers.

The Resource Conservation and Development (RC&D) program was authorized in the 1962 Farm Bill. RC&D promoted the wise use and conservation of resources as a means to increase rural income. A local council of private citizens and the coordinator supplied by SCS initiated a vast array

of innovative projects under their sponsorship. At present 194 areas have organized local councils.

The new programs of the 1950s and 1960s relied on the use of soils information. The merger of the National Soil Survey into SCS in 1952 linked scientific knowledge of soil characteristics to field observations of soil behavior under various uses. The result, in the 1960s and 1970s, was an expansion of interpretations of soil survey information for agricultural and nonagricultural uses. Suburban growth, increased nonfarm rural population, small town and industrial growth created environmental problems and a demand for local, county, and even regional planning assistance as exemplified in the Soil, Water, and Suburbia Conference on 1967. SCS became involved in many non-agricultural activities. Not everyone cheered this expanded role for SCS and its personnel, feeling that sufficient technical assistance was not available to every farmer needing and wanting assistance and that the farmland conservation effort should not be diluted.

In the late 1960s and early 1970s, the SCS programs received increased attention from the environmental movement, not all of it favorable. The watershed program was the object of the first substantial criticism of the agency from former allies. Conservation and environmental groups had been inclined to view SCS's onfarm activities favorably. The channelization phase of the watershed work provoked some criticism for its effects on wildlife and fish population, but it was a broader question predating the watershed program--the effects of drainage and the loss of wetlands--which really spurred the criticism. After Congress enacted the National Environmental Policy Act of 1969, SCS revised the watershed planning process to insure that all effects on the environment were considered. The question of wetlands retention--how much should be protected and who should pay--is still a national concern.

Conservationists received a shock in the early 1970s. In 1973, grain exports nearly doubled over the previous year. With sur-

pluses being depleted, the 1974 prices of corn and soybeans were more than double those of 1970 and wheat prices trebled. Farmers harvested 24 million acres more in 1974 than in 1972. Sixty million acres of new cropland were cultivated between 1972 and 1982--much of it more erodible than the cropland already in production. The increased erosion problem rekindled an interest in conservation among people outside the traditional conservation action groups. In some ways the last decade has been reminiscent of earlier days of the conservation movement when the interest in conservation was shared by many people not directly involved in farming.

The renewed interest in soil conservation led to the 1977 Soil and Water Resources Conservation Act and to intensified study and inventory of resource problems as a basis for directing conservation programs. The studies were new, but the central question was as old as the conservation movement. How do we deal with conservation nationwide, and at the same time direct our attention and efforts to the most severe problem areas? The RCA program, as announced on December 21, 1982, established six objectives: reduce excessive soil erosion, improve water management, reduce upstream flood damage, improve range condition, and improve water quality. The RCA appraisal had identified areas of critical resource degradation. USDA targeted these areas to receive accelerated technical assistance, while maintaining support nationally to all conservation districts.

The events of the 1970s, the study and analysis in the RCA, and the interest of public interest groups resulted in a strong conservation title in the Food Security Act of 1985. The act added a tremendous workload for SCS staff. The law is designed to eliminate the possibility that commodity price support programs encourage poor soil conservation practices or the loss of wetlands. Thus, if farmers do not comply, they are denied certain USDA program benefits. The highly erodible lands provision included both conservation compliance and sodbuster. Under conservation compliance, farmers have until 1990 to begin applying a

conservation plan on highly erodible land and until 1995 to fully install the conservation plan. Under sodbuster, landowners must apply a conservation plan if they wish to bring land into production that had not been used for an annual crop between December 31, 1980 and December 23, 1985. The swampbuster provision, officially titled wetland conservation, was an attempt to slow drainage of wetlands and their conversion to cropland. Farmers who converted wetlands and produced agricultural commodities after December 23, 1985, the date of the passage of the act, would be ineligible for USDA program benefits. Under another provision, the Conservation Reserve Program, farmers are putting highly erodible land into grass, trees, or other cover under long-term contracts.

Beginning in 1988, SCS became increasingly involved in a government-wide Presidential effort to improve and enhance water quality. SCS's part has been to develop means to reduce agriculture's adverse impacts on water quality and to assess the effectiveness of voluntary programs.

For over half a century, research in conservation spread from the work of a few interested individuals to a federal network of research stations, increased emphasis at the state experiment stations, and a realization by industry that farmers want, need, and will purchase equipment designed to conserve land while farming it. The information generated by research must be applied to land by the farmer working cooperatively with a professional well versed in the sciences--the soil conservationist.

## Soil and Soil Conservation

Reprinted from Wilson, Charles Reagan, and William Ferris, eds. *Encyclopedia of Southern Culture*. Chapel Hill, N.C.: The University of North Carolina Press, 1989. pp. 361-363.

by Douglas Helms,  
National Historian, Soil Conservation Service

Intertwined physical, climatic, economic, and cultural factors brought on severe soil erosion in the South. The Piedmont, the loessial bluff lands east of the Mississippi River, and the red clay hills of Alabama and Mississippi have been the areas of severest erosion. Farming steep slopes with cultivated row crops was the main cause, but soil characteristics also contributed to the erosiveness of these areas. Geologic processes washed the soil particles from the Piedmont uplands to form the Coastal Plain. The erosion plus the intense weathering process left the Piedmont with thin topsoils having little water-holding capacity. Impermeable clay-rich subsoils hastened erosion of topsoil.

The South has the highest annual precipitation in the United States, and the predominance of cultivated staple crops, especially tobacco and cotton, exposed the soil to intense summer thunderstorms. The use of close-growing grain crops, such as wheat and oats, and pasture and hay to support meat and dairying enterprises would have reduced erosion, but such crops held a minor place in southern agriculture. Availability of new lands to the west and south inhibited development of intensive agriculture employing fertilizers and conservation measures. An alternative to moving was to let fields rest for a few years and then extract the accumulated fertility in the organic matter. It was, and still is, a system prevalent in climates where high temperatures and rainfall accelerate leaching and decomposition of organic material, thus creating soils of low fertility and high erodibility.

In the 19th century southerners developed most of their means of contending with erosion. Thomas Jefferson observed horizontal plowing (contour farming) in France.

He and his son-in-law Thomas Mann Randolph introduced the method in Virginia. A Jefferson correspondent, William Dunbar, popularized the method in the Natchez District of Mississippi. Another Mississippian, Joseph Gray, invented a level for precision layout of contour rows. By 1850 horizontal plowing was common in the South. In the two decades preceding the Civil War the hillside ditch--forerunner of the terrace--was widely used as an adjunct to horizontal plowing. Nicholas Sorsby devised the most elaborate of these systems and popularized his ideas through a series of publications on "Level Culture."

Several influential southerners, notably John Taylor and Edmund Ruffin, perceived conservation of the soil as necessary to the preservation of southern agrarian life. Ruffin, more than any predecessor, emphasized lime and drainage of level bottom lands. Adoption of Ruffin's teachings had an impact in the Tidewater of Virginia, where the use of green manures, fertilizers, and rotations restored depleted tobacco fields.

After the Civil War short-term sharecropping and rental arrangements aggravated the erosion problem. Piedmont farmers increasingly turned to commercial fertilizers as an alternative to resting fields. Structural measures of erosion control evolved into terracing. The Mangum Terrace, designed about 1885 by Priestly Mangum of Wake Forest, N.C., came into general use. Between 1880 and 1920 most farmers on steep lands in the Piedmont and upper Coastal Plain installed some type of terrace. Faulty design and construction as well as poor maintenance limited their value and occasionally created additional erosion problems.

The present programs of soil conservation began with the crusade of Hugh Hammond Bennett. A native of Anson County, N.C., Bennett proposed using vegetative controls and good land use, along with structural controls in a coordinated conservation plan designed specifically for each farm. Bennett became the first chief of the Soil Erosion Service (SES) in 1933. In 1934 the new agency conducted a reconnaissance erosion survey to ascertain the extent and conditions of soil erosion in Virginia, Tennessee, the Carolinas, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas. The results of the survey are shown in Table I.

The SES's successor, the Soil Conservation Service, moved from working on demonstration projects to cooperation with local conservation districts organized under state laws. The South became the national leader in organizing conservation districts. The obvious need for conservation and Bennett's evangelistic style and moral persuasion appealed to the farmers. District supervisors served without pay and set priorities for the conservationists supplied by SCS. The conservationist relied on an ever-expanding body of knowledge concerning structural design, the value of vegetation, and planting and tillage techniques to assist farmers.

In addition to improved technical expertise, the decline of cotton under the tenant system, mechanization of agriculture, and land use changes have influenced conservation since the 1930s. For example, tractors allowed frequent and deeper plowings that readied the soil for erosion, and large farm equipment was incompatible with the traditional serpentine terraces. As farmers eliminated these terraces, conservationists assisted farmers in installing parallel ones. Such land use changes in the last 50 years have both reshaped the southern landscape and benefited soil conservation.

Animal disease control, purebred cattle, and the introduction and spread of annual pasture grasses by SCS and other federal and state agencies expanded the cattle industry and brought pasture acreage from 19.5 million acres in 1929 to 44 million acres in

1977. High soybean and grain prices and a drop in cattle prices in the early 1970s reversed this trend, but livestock continues to be a major enterprise.

Pine tree occupancy of unprofitable hilly fields is no longer a nuisance to farmers, and expanded forest acreage results in part from developments in forest products technology, and higher prices. Artificial regeneration through planting seedlings has replaced natural reforestation. Under one federal program, the Soil Bank (1956-64), landowners in South Carolina, Georgia, and Alabama planted 1,255,531 acres of the 2,154,428 acres of cropland reforested in the United States.

Cropland shrank from 65.5 million acres in 1929 to 53 million acres in 1977. Erosion-inducing row crops still predominate over close-growing crops, particularly because soybeans occupy much of the acreage formerly devoted to cotton. Regionally, farmers have shifted row crops to the gentler slopes of the lower Coastal Plain, deltas, and bottom lands. With the increase in fertilizer usage, the lower fertility of many Coastal Plain soils, compared to the Piedmont, is no longer a deterrent. Drainage systems, however, are necessary on many of the level fields. Southerners artificially drained 11.3 million acres by 1930 and 36.7 million acres by 1978. The rush to convert the fertile, easily farmed, bottom land hardwood areas to cropland is causing concern among some southerners who want to preserve portions of the area for its aesthetic, historical, recreational, and scientific value.

Along with farmers throughout the United States, southern farmers have increased acreage planted with conservation tillage systems that utilize herbicides to eliminate weed competition. In 1979 farmers used conservation tillage on 22 percent of the cropland, a figure that rose to 35 percent in 1981. In addition to retarding erosion and providing humus to the soil, the system permits double cropping in the southern climate. In traditional small farm areas of the South, where farmers rent widely



scattered tracts of farm land, the time saved is a major inducement.

Southern farmers continue to cite soil erosion as their major resource problem. Twenty-two million of the 54 million cropland acres erode at a rate greater than soil formulation. The fertile, heavily farmed, loessial bluffs erode at four times that rate. But the 32 million acres of cropland on which soil erosion is negligible represent an evolution from an extractive, pioneering ethos to a permanent agriculture.

Table I  
Conditions of Southern Soil Erosion, 1934

<u>Erosion condition</u>	<u>Acres</u>	<u>Percentage of total</u>
Total area exclusive of large cities and water)	300,967,150	100
Area with little or no erosion	147,256,748	48.9
Total area affected by sheet erosion	130,226,130	43.3
One-fourth to three-fourths of topsoil lost	94,415,128	31.4
Over three-fourths of topsoil lost	35,801,001	11.9
Total area affected by gullying	127,880,121	42.5
Occasional gullies	110,527,582	36.7
Severe gullies	16,073,713	5.3
Destroyed by gullies	1,548,826	.5

Source: Natural Resources Board, *Soil Erosion: A Critical Problem in American Agriculture* (1935).

the South" (Ph.D. dissertation, University of Georgia, 1971).

Further Reading: Arthur R. Hall, "Soil Erosion and Agriculture in the Southern Piedmont" (Ph.D. dissertation, Duke University, 1948); John Hebron Moore, *Agriculture in Ante-Bellum Mississippi* (1958); Arthur F. Raper, *Preface to Peasantry: A Tale of Two Black Belt Counties* (1936); *Soil Erosion: A Critical Problem in American Agriculture* (1935); U.S. Department of Agriculture, Soil Conservation Service, *Early American Soil Conservationists*, Misc. Pub. 449 (1941), *Soil, Water and Related Resources in the United States: Part I* (1981); Rupert B. Vance, *Human Geography of the South* (1932); Frank B. Vinson, "Conservation and

## Soil: How We Have Tried to Conserve It

by Douglas Helms  
National Historian, Soil Conservation Service

Recognition that Americans should conserve soil to maintain the Nation's capacity to produce food is neither a new, nor an out-dated idea. Colonial Americans became aware of the exhaustible, erodible qualities of the new land. Today, even in the face of scientific and technological advances that have dramatically raised per-acre production and cast doubt on the profitability of some soil-conserving farming practices, none, save the most optimistic, believe soil conservation has become irrelevant. There has been, however, much less unanimity of thought on the best means to achieve soil conservation. Through the years, especially during the 20th century, Americans have devised a number of ways to promote soil conservation. Opinions differ as to the effectiveness of each method. When government is involved, individual attitudes about the proper role of government often determine opinions about the desirability of a particular method of promoting soil conservation. None of the methods proved a panacea, but each added to the possibilities. Let's look for a moment at the various methods we have tried.

### Science and Research

Americans for the most part have tried to rely on a better understanding of the soil, its responses under various uses, and the influence of various farming practices and machinery to devise ways of reducing erosion. Some few individuals, often unrecorded in history, made original discoveries in wise land use. Walter Lowdermilk found one such individual on his travels, which he recounted in *Conquest of the Land Through 7,000 Years*. He came upon J. Mack Gowder in Hall County, Georgia, who defied local custom in plowing his land so as to leave crop litter on the surface to retard erosion.

Certainly many individuals learned to leave the hilliest land covered with trees or use it for pasture, while cultivating the gentler

slopes. Even so, much of the cropland had some erosion hazards. Some of the earliest conservationists, such as Jared Eliot, Samuel Deane, and John Taylor, relied on observations and personal experience in advocating various systems of pasture, legumes, and crop rotations to increase fertility and lessen erosion by maintaining ground cover and improving soil tilth. Though he invented neither, Thomas Mann Randolph, Thomas Jefferson's son-in-law quickly perceived the advantages of the hillside plow and horizontal, or contour, plowing. As a convert to the idea, Jefferson believed that "In point of beauty nothing can exceed that of the waving lines and rows winding along the face of the hills and valleys."

Nicholas Sorsby combined horizontal farming with the early progenitor of the terrace--the hillside ditch, and greatly popularized "level culture" throughout the South. The most outstanding of the pre-Civil War agricultural reformers, Edmund Ruffin, experimented on his farms learning the effects of green manures, liming on soil conservation and soil fertility. After the Civil War, Priestly Mangum of Wake Forest, North Carolina, perfected the broad-based Mangum terrace.

Few agriculturalists looked upon soil conservation as a key part of the research directed toward increased agricultural productivity in the public agricultural institutions that were created in latter half of the 19th century--the U. S. Department of Agriculture, the land-grant colleges, and the state agricultural experiment stations. USDA and the state experiment stations and extension services did however publish some bulletins on the subject. Eventually, two state experiment stations, those at Columbia, Missouri and Spur, Texas concentrated on soil erosion.

Hugh Hammond Bennett, who led the soil conservation movement in the 20th century,

may best be remembered for his emotional appeals, but it should also be remembered that he first called for research. Knowledge should come before action. Largely at his prodding, the USDA appropriation act for 1929 included provisions for soil erosion and moisture conservation research stations. Bennett's first assistant at the Soil Conservation Service, Walter Lowdermilk, had made some of the seminal discoveries in the relationship of forest litter to runoff. Through the years soil conservation assumed a higher place on the state experiment station agendas. Individuals such as Edward Faulkner, author of *Plowman's Folly*, made contributions as did chemical and implement companies. The prospect of cost efficient and effective methods of conservation still occupies a major place on the agricultural research agenda.

### Education

Those who would presume to advise farmers to change farming methods face a basic reality. In a country and a time when the number of farmers has declined, the potential convert has persisted. Often several generations have farmed the same land. Any suggestions for drastic change require persuasion and demonstration.

Edmund Ruffin, the apostle of marl (lime), eventually had considerable impact on American agriculture. But during his lifetime, he had little influence outside his Virginia Tidewater homeland. Terracing gained a foothold in the South, but the frontier of new land burdened any call for conservation that involved labor and capital intensive methods.

When Hugh Hammond Bennett, a soil scientist in the USDA, began his crusade for soil conservation, he proposed to use demonstration methods so that farmers would observe proven methods of soil conservation, then go forth and do likewise. He located the earliest demonstration projects near the erosion and moisture conservation experiment stations, where the results of the research could be put to use.

The Soil Conservation Act of 1935 made possible a continuing commitment to soil

conservation and an expanded effort. At first the newly designated Soil Conservation Service added additional demonstration projects. But Milburn L. Wilson, then Assistant Secretary of Agriculture, had a plan for making conservation expertise more readily available for farmers. His plan, the soil conservation district, also provided for more local participation in planning operations and in so doing secured political support from farmers who would be critical to the continuation of the soil conservation activities. On February 27, 1937, President Franklin D. Roosevelt, transmitted to the governors the "Standard State Conservation Districts Law." After each state passed an enabling law, local areas, based on a watershed, or later on county boundaries, organized districts and elected supervisors. The districts then signed agreements with USDA. Through the years, the primary form of assistance from USDA to the nearly 3,000 conservation districts has been supplying trained soil conservationists to the districts to work directly with farmers. The districts or states can also supply additional personnel. The districts provide training and information, including buying and renting out equipment. In addition to the active state programs to expand staffs in Pennsylvania, Minnesota, Illinois, Iowa, and Missouri, some states such as Nebraska have increased the responsibilities and powers of the districts to include practically all resource concerns.

### Sharing the Costs

Expenditures on soil conservation, at all levels of government, are premised on the idea that society has an interest in preventing erosion. Providing part of the cost is viewed not only as a matter of equity, but also as a means of achieving society's goal by inducing farmers to practice conservation. In early demonstration projects, SCS provided labor--Civilian Conservation Corps enrollees or Work Projects Administration laborers--seed, seedlings, lime, and fertilizer to help make useful adjustments such as establishing pastures, vegetating gullied areas, or working close growing hay crops into crop rotations, building terraces, and fencing, and improving woodland.

Sharing the cost of conservation became a major part of agricultural programs with the passage of the Soil Conservation and Domestic Allotment Act in 1936. As part of a plan to reduce surplus crop production by reducing acreage, participating farmers shifted some land from soil-depleting crops to soil-building crops. Another part of this effort involved making payments to install soil conservation practices on croplands and to improve grasslands. This Agricultural Conservation Program, administered by what is now the Agricultural Stabilization and Conservation Service, added numerous practices as technology became available or cropping patterns shifted. The ACP funds along with the funds spent by SCS in assisting farmers constitute the largest part of the federal contribution to soil conservation. Some state governments, notably Missouri, Alabama, and Iowa have active cost-share programs.

USDA and Congress added new concepts to cost-sharing. In response to drought, Congress authorized a Great Plains Conservation Program in 1956. The program sought a readjustment in farming and ranching operations that would not only conserve soil, but also foster more stable farming operations in an area of extreme climatic variability. Long-term contracts between farmers and USDA helped farmers convert erodible cropland back to grassland. Under the contracts, farmers had to carry out conservation on the whole unit--not just on the land on which the farmers received cost-sharing. The objective was to induce, with society bearing part of the cost, a shift in farming practices that would persist long after the contract expired. There were benefits and obligations on both sides, and farmers had to forego some options in farming operations.

Contracting never supplanted annual cost-sharing, but it was successful enough to be tried in other areas. The Water Bank Program tried to resolve disputes over drainage of "potholes" in the upper Mid-West and the Great Plains. Essentially, society placed a value on migratory birds, and paid farmers under a contract to maintain the

wetlands that sustained the annual migrations. The concern over water quality, and part played by agriculture led to the Experimental Rural Clean Waters Program. This small pilot program used contracts with farmers to examine or demonstrate the relationship of soil and water conservation to water quality. USDA now uses long-term contracts in its land-treatment watersheds that emphasize land-treatment rather than floodwater-retarding structures.

#### Land Use Conversion Programs

Converting very erodible cropland to forests or grasslands has had a great appeal to people concerned about soil erosion. Frequently called "land retirement" programs, these programs generally had as a goal not retirement, but conversion of land to another use. Congress and USDA often had objectives in addition to soil conservation when instituting such programs.

The Land Utilization Program, begun under the Federal Emergency Relief Administration in 1933, and continued under Title III of the Bankhead-Jones Farm Tenant Act of 1937, purchased "submarginal" lands. The submarginal land concept involved susceptibility to erosion, but it also implied inherent qualities that limited the land's potential for profitable agriculture. In some cases, the readjustment meant consolidation of small units of cropland into larger units that could be leased as grazing land. The purchased areas created, or expanded, federal and state parks and forests and wildlife refuges. Some of the purchased areas in the Great Plains eventually became part of the National Grasslands system.

The "conservation reserve" segment of the Soil Bank (1956-1960) had dual objectives--conserving soil and alleviating surplus production by a long-term reduction in cropland. Farmers, at the zenith of program participation in 1960, had placed over 28,000,000 acres in the program under 3-, 5-, or 10-year contracts. In addition to the annual rental payments, farmers received cost-share assistance to seed grasses and legumes, plant trees, establish wildlife cover, manage water and marsh for wildlife, and construct dams and ponds for

livestock, irrigation water and fish on nearly 21,000,000 acres. Congress did not limit the Soil Bank to erodible land, but the program won greatest acceptance in the Southeast and Great Plains where susceptibility of erosion often coincided with low productivity or risky agriculture.

The current cropland reduction effort, the Conservation Reserve Program authorized in the 1985 farm bill, limited the program to "highly erodible" land. Crop surpluses again gave impetus to paying farmers to convert cropland to other uses. But other forces caused eligibility to be limited to erosion-prone land. Understanding of the erosion processes has increased, enabling conservationists to estimate sensitivity to erosion damage, and progress in making soil surveys made it possible to identify highly erodible land. Secondly, a coalition of environmental groups influenced Congress to restrict the conservation reserve to the most erodible land. In addition to their long-standing emphasis on wetlands, wildlife interests focused on cropland conversion as a means of increasing the variety and distribution of upland wildlife.

#### Profitability

The profitability of conserving topsoil appeared to be a much simpler question before the benefits of scientific agriculture became available. The ever-increasing effectiveness and use of fertilizers especially clouded the perception that expenditures for conservation would be repaid in the farmer's life-time. Horizontal plowing, as Jefferson observed, strained the horse less than plowing up hill. Certainly, farmers suffered economic losses from gullies which not only removed the topsoil entirely, but left the remaining land more difficult to farm. But what about that almost imperceptible amount of soil lost through the process we know as sheet erosion? At what cost should the farmer maintain that soil in place?

Under a general, less specialized, farming involving livestock, both for sale and horsepower, the pasture and hay fit nicely in conservation plans to provide cover on erodible land and to maintain soil tilth. As

the contributions of science and technology became available, the ratios of cost of production shifted dramatically. The amount of labor and land needed to produce a given amount decreased, as the machinery, seed, fertilizer, and pesticide components in crop production increased. Improved seed varieties and powerful fertilizers raised productivity and called into question the need for soil conservation measures. Amidst this trend, conservation tillage offered savings to farmers. Because of the objective of leaving crop residues on the surface, farmers forego the cost of several rounds of seedbed preparation and weed-killing cultivation.

Costs of erosion are not limited to the lost productivity; there are costs away from the field, or off-site, that should be counted. Sedimentation specialists in the 1930s studied filtration reservoirs in order to understand erosional processes; their studies also illuminated the off-site costs. Currently, there is much interest in measuring these off-site costs throughout the system from detachment to deposition.

#### Stewardship

According to some sources, Patrick Henry proclaimed shortly after the American Revolution, "since the achievement of our independence, he is the greatest patriot who stops the most gullies." The sentiment that conservation should be viewed not only as a matter of self-interest, but as an obligation, had, and continues to have many forms of expression. Certainly, a dispassionate case can be made for soil conservation, but like many another movement that came to be enacted into a national program by Congress, it involved emotions. Given the backdrop of the human drama of tenancy, poverty, aimless migration, and dust storms, Hugh Hammond Bennett made his case for soil conservation. Contemporaries who heard those speeches remembered the feeling he brought to the task. To one he was the "fiery apostle;" another remembered that he "loved to carry the message;" another recalled that Bennett left no doubt that conservation was good--erosion an evil.

Bennett's contemporary, Aldo Leopold, pioneer in wildlife management in the Forest Service, influenced the wildlife programs of early SCS demonstration projects but is best remembered for his writings that called upon us to maintain a "land ethic."

Soil conservation as a religious duty found expression in "Soil Stewardship Week." *Farm and Ranch* magazine sponsored a "Soil and Soul Sunday" from 1946 until 1954. The National Association of Conservation Districts assumed responsibility in 1955 and elicits support from many denominations.

### Problem Areas

Let it not be said that Americans have not studied the location of problem areas. As early as 1931, Hugh Hammond Bennett mapped "Regional Soil Erosion Areas," during his travels to select sites for soil erosion and moisture conservation experiment stations. In 1934, the Soil Erosion Service carried out a national erosion reconnaissance under the aegis of the National Resources Board. The Soil Conservation Service published national "inventories of conservation needs" (1945, 1958, 1967) and "national resources inventories" (1977 and 1982). The idea that soil conservation funds and efforts should be concentrated on the most erodible land has had great appeal among critics of current programs, but considerably less political appeal and support. The Great Plains Conservation Program represents the difficulty of focusing on specific areas. For the most part the program received favorable reviews, and at one time served as the model for an attempt to legislate additional "special areas." Congress did not authorize additional special areas, however, and GPCP remained small compared to national programs providing technical assistance and cost-sharing. The conservation reserve authorized in the 1985 farm bill is directed toward erodible areas, but generally Congress and conservation districts believe that all states should receive federal assistance and hold that soil erosion is only one of the resource problems with which the districts deal.

### Conservation and the Law

The Federal government has generally left any question of land-use ordinances to states. The standard state conservation districts law included provisions for land-use regulations governing use of lands within the district in the interest of conserving soil and controlling erosion. Districts have most often used the provisions where the actions of an individual affected the community, especially in the Great Plains. Adjoining land owners often bore the cost of dealing with dirt from wind erosion-prone lands that should have been left in grass. Not surprisingly agitation for the conservation compliance provisions of the 1985 farm bill came from areas subject to wind erosion in the Great Plains. The provisions deny participation in USDA commodity price support, loan, and credit programs to farmers who crop highly erodible land without carrying out conservation measures.

### Conclusion

When a national soil conservation program began in the 1930s, the young group of conservationists attacked their job with enthusiasm. Being optimists, and no better seers than we are today, they were perhaps unmindful of how a dynamic agriculture could undermine some of their good works. But they did establish an objective by which to judge various conservation methods--an enduring agriculture. Enduring didn't imply a static agriculture, but it held that the means to sustain agriculture, the physical integrity of the soil resource must be maintained. We should be mindful of the interplay of the qualities of the land and of people and their institutions in our quest to mix the best existing with the most promising new means to conserve topsoil.

## Soil Conservation Is an Old-Time Religion

Reprinted from *Our American Land: 1987 Yearbook of Agriculture*. Washington, D.C.: U.S. Department of Agriculture, 1987. pp. 175-180.

by Douglas Helms,  
National Historian, Soil Conservation Service

The idea that Americans should conserve soil to maintain the Nation's capacity to produce food is neither new nor outdated. Some colonial Americans knew the dangers of exhausting the land and undertook conservation measures even then. Some of the earliest conservationists increased fertility and lessened erosion by maintaining ground cover, improving soil tilth, and instituting pasture, legume, and crop rotation systems.

Though he invented neither, Thomas Mann Randolph, Thomas Jefferson's son-in-law, quickly perceived the advantages of the hillside plow and horizontal, or contour, plowing. As a convert to the idea, Jefferson believed that "In point of beauty nothing can exceed that of the waving lines and rows winding along the face of the hills and valleys."

Nicholas Sorsby combined horizontal farming with the early progenitor of the terrace--the hillside ditch--and greatly popularized "level culture" throughout the South.

The most outstanding of the pre-Civil War agricultural reformers, Edmund Ruffin, experimented to learn the effects of green manures and liming on soil conservation and soil fertility. After the Civil War, Priestly Mangum of Wake Forest, North Carolina, perfected the broadbased Mangum terrace for managing surface runoff.

Few agriculturalists viewed soil conservation as vital in the public agricultural institutions created in the latter half of the 19th century. These were the U.S. Department of Agriculture (USDA), the land-grant colleges, and the State agricultural experiment stations. USDA and the State experiment stations and Extension Service did publish bulletins on the subject.

Eventually, two State experiment stations, those at Columbia, Missouri and Spur, Texas, concentrated on soil erosion.

Hugh Hammond Bennett, who led the soil conservation movement in the 20th century, first called for research. Largely at his prodding, the USDA appropriation act for 1929 included provisions for soil erosion and moisture conservation research stations. Bennett's first assistant at the Soil Erosion Service, Walter Lowdermilk, made seminal discoveries in the relationship of forest litter to runoff.

### Education

When Hugh Hammond Bennett began his crusade for soil conservation as a soil scientist in the USDA, he proposed to use demonstration methods so that farmers would observe proven methods of soil conservation, then go forth and do likewise. He located the earliest demonstration projects near the erosion and moisture conservation experiment stations, where the results of the research could be put to use.

The Soil Conservation Act of 1935 enabled Assistant Secretary of Agriculture Milburn L. Wilson to make conservation expertise more readily available to farmers through soil conservation districts. This provided for local participation in planning operations and attracted political support from farmers. On February 27, 1937, President Franklin D. Roosevelt transmitted the "Standard State Conservation District Law" to the governors. Each State then enabled local people to organize districts and elect supervisors. The district then signed agreements with USDA.

Trained USDA soil conservationists work directly with farmers in the nearly 3,000



conservation districts. The districts or States sometimes provide additional personnel.

### Sharing the Costs

Sharing the cost of conservation became a major part of agricultural programs with the passage of the Soil Conservation and Domestic Allotment Act in 1936. Spending public money on soil conservation is premised on society's having an interest in preventing erosion. It is viewed not only as a matter of equity, but also as an inducement for farmers to practice conservation. In early demonstration projects, SCS provided Civilian Conservation Corps enrollees or Work Projects Administration laborers. Additionally, SCS provided seed, seedlings, lime, and fertilizer to help farmers to establish pastures, restore gullied areas, and work hay crops into crop rotations, and helped to build terraces and fencing, and improve woodland.

### Land Use Conversion Programs

Converting very erodible cropland to forests or grasslands has had a great appeal to people concerned about soil erosion. Frequently called "land retirement" programs, these programs generally had as a goal not retirement, but conversion of land to another use. Congress and USDA often had objectives in addition to soil conservation when instituting such programs.

The current cropland reduction effort, the Conservation Reserve Program authorized by the 1985 farm bill, limits the program to "highly erodible" land. Crop surpluses again gave impetus to paying farmers to convert cropland to other uses. But other forces caused eligibility to be limited to erosion-prone land. Understanding of the erosion processes has increased, enabling conservationists to estimate sensitivity to erosion damage, and progress in making soil surveys made it possible to identify highly erodible land. Then too, a coalition of environmental groups influenced Congress to restrict the conservation reserve to the most erodible land. In addition to their long-standing emphasis on wetlands, wildlife interests now focus on cropland conversion as a means of increasing the variety and distribution of upland wildlife.

### Profitability

The profitability of conserving topsoil appeared to be a much simpler question before benefits of scientific agriculture became available. Effective use of fertilizers clouds the perception that expenditures for conservation will be captured in the farmer's lifetime.

Costs of erosion are not limited to the lost productivity; costs away from the field, or offsite, also should be counted. Sedimentation specialists in the 1930s studied siltation reservoirs in order to understand erosional processes; their studies also illuminated the offsite costs.

### Stewardship

According to some sources, Patrick Henry proclaimed shortly after the American Revolution, "since the achievement of our independence, he is the greatest patriot who stops the most gullies." The sentiment that conservation should be viewed not only as a matter of self-interest, but as an obligation, had, and continues to have many forms of expression. Certainly, a dispassionate case can be made for soil conservation, but like many another movement that came to be enacted into a national program by Congress, it involved emotions.

Soil conservation as a religious duty found expression in "Soil Stewardship Week." *Farm and Ranch* magazine sponsored a "Soil and Soul Sunday" from 1946 until 1954. The National Association of Conservation Districts assumed responsibility in 1955 and elicits support from many denominations.

### An Enduring Agriculture

When a national soil conservation program began in the 1930s, the young group of conservationists attacked their job with enthusiasm. Being optimists, and no better seers than we are today, they perhaps were unmindful of how a dynamic agriculture could undermine some of their good works. But they did establish an objective by which to judge various conservation methods--an enduring agriculture. Enduring did not imply a static agriculture, but it held that the means to sustain agriculture,

the physical integrity of the soil resource,  
must be maintained.

## How SCS Came to Be

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Those brief, exciting, often hectic 20 months between September 19, 1933, when Hugh Hammond Bennett became Director of the Soil Erosion Service (SES), and April 27, 1935, when the Soil Conservation Act was passed, were important times for the future course of the conservation movement. That there would be national legislation to provide for a continued commitment to soil conservation was by no means assured. Current friends of the conservation movement can look to that period with a sense of admiration; not with a feeling that no mistakes were made, but with an appreciation for the early leaders who transformed vision into reality.

Certainly, Hugh Bennett foresaw and worked for a government organization dedicated to soil conservation. His vision of a permanent agriculture had no room for a brief flurry of emergency employment activities that would fade from the tapestry of conservation once the crisis had passed. Shortly after taking up the new work he wrote to his second in command, Walter C. Lowdermilk: "We are getting into a line of work which I think is bound to carry on...We have no insurmountable wall of prejudice standing out in front of us. The road is wide open, and if all of us are duly consumed with the magnitude of the undertaking, the importance of succeeding in our plan, and the absolute necessity of not giving an inch until we have really accomplished something on a large scale, then we are bound to carry on until we have completed the task laid out for us."

It was as though Bennett's career had been an apprenticeship for the work he was now beginning. His experience--and opinions as to corrective measures--was SES's main asset as the young group went about its work in a manner that enhanced its chance for permanence, rather than in a manner

that ensured its demise after the Depression. Through the years of reading, corresponding, and conversing with the handful of people active in soil conservation, Bennett knew to whom he would entrust the field work--the work that would actually determine the success or failure of the program. These were the people who believed as he did in a coordinated approach to conservation employing "all practical measures of control in accordance with the adaptability of the land." His early correspondence makes clear that he thought the coordinated farm plan would involve the cooperative efforts of agronomists, foresters, range specialists, soil experts, engineers, and economists.

Equally important to the future of the work was his determination that the money be spent on conserving farm lands with a future, and demonstrating that expensive land restoration would not be necessary under proper land use.

The watershed-shed projects--demonstrational as well as experimental--would reveal the benefits of conservation area wide, beyond the individual farm. Another important tactic in the early days involved Bennett's attitude toward educating the public. He wanted to influence the body politic, not just the farmers. It was his ability to communicate, with the written and the spoken word, at all levels which started and sustained the movement during its early days.

To be sure, there were factors beyond SES's control which created a climate favorable to continuing the work: the persistent Depression, the dust storms blown eastward, and the magazines and newspapers with heart-rending photographs which documented poor land and poor people in a clearer focus than ever before.

Out in the field the demonstration projects were popular. Requests by farmers and their Congressional representatives for Civilian Conservation Corps camps and projects further enhanced the reputation of the Service. But the Congressional authorization for spending would expire on June 15, 1935. The impending deadline, combined with Bennett's desire for a permanent organization, brought things to a head.

Agricultural groups argued that such work belonged in the Department of Agriculture (USDA). Conservation friends in Congress stood ready to introduce legislation including all the authorities needed for a soil conservation agency. The prospect of legislation forced President Roosevelt to deal with the situation. He summoned Bennett to the White House in March 1935.

The conversation (as recounted by Bennett) showed how successful he had been. The President thought Bennett's group must be doing a good job since they had become the object of desire for acquisition. It seemed to the President that the agricultural nature of the work merited a change to USDA. With the President's blessing, events moved quickly and smoothly. On March 25, 1935, he transferred SES from the Department of the Interior to USDA. After brief hearings Congress passed the Soil Conservation Act which the President signed on April 27, 1935. All who had taken part in the movement could take pride in the charge of the Service, which was "to provide permanently for the control and prevention of soil erosion and thereby to preserve natural resources."

## Conservation Districts: Getting to the Roots

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The theme of this conference, "People Protecting Their Land," addresses the crucial link in any soil conservation program, the landholder. Governments may try various means to promote soil conservation such as research, financial and technical assistance to landholders, education, moral appeals, and regulation. But if governments are to succeed, they must take into account the attitudes and motivations of the landholders and ultimately enlist their cooperation. Implicit, if not always elucidated, in calls for conservation is belief that conservation has values for society as a whole and that we must conserve resources for future generations. Often these values fit nicely with the everyday objectives of the landholder, but not always. The question then becomes how to satisfy these various objectives equitably.

The soil conservation movement in the United States established a government agency, the Soil Conservation Service (SCS), numbering about 13,000 employees spread throughout the country. SCS works in cooperation with nearly 3,000 conservation districts to assist landholders in the districts.

The districts, which are often coterminous with counties, are organized under state law and are directed by locally elected directors or supervisors. This partnership sustained the conservation movement in the United States. This paper will focus on the historical experiences of working with local groups, specifically conservation districts, in achieving conservation. The purpose is not to promote districts as an ideal instrument worldwide, but to increase awareness of this system so that others may further

examine its elements if the district concept seems promising.

Hugh Hammond Bennett, more than any other person, influenced the development of the soil conservation movement in the United States. Study and observation during his career as a soil scientist in the U. S. Department of Agriculture convinced him that soil erosion was a menace to long-term productivity of the land. The Great Depression provided Bennett with an opportunity when public works programs were created to put people to work. Beginning in 1933, as head of the Soil Erosion Service, he received some of the emergency employment money to demonstrate soil and water conservation methods in selected watersheds. The work proved popular and the Congress then created the Soil Conservation Service with the Soil Conservation Act of 1935. For the most part the early agency continued to promote soil conservation through the demonstration projects as trained soil conservationists worked directly with farmers. The availability of labor and equipment greatly facilitated the adoption of these measures (Helms, 1985).

Meanwhile, M. L. (Milburn Lincoln) Wilson, assistant secretary of the U. S. Department of Agriculture (USDA) and one of America's most innovative agricultural policy-makers, had been thinking about ways to spread soil conservation beyond the scattered demonstration projects, and to make it a force for agricultural reform. Several principles guided his thinking. Farmers had to feel that they had an active role in promoting soil conservation if they were to accept it as a goal and ultimately a regular part of their farming operations.

Also, Wilson recognized that the acceptance of conservation in the demonstration projects rested partly on the fact that equipment, labor, and the assistance of trained soil conservationists were available to farmers. This kind of assistance was not available outside the demonstration projects. Belief in soil conservation was insufficient to spread adoption of conservation measures outside the projects. Wilson's dilemma was how to make farmers feel more involved and in control, and how to provide the assistance, not just on demonstration projects, but nationwide to bring soil conservation to all the Nation's farmlands (Glick, 1990).

With the assistance of Philip M. Glick, a lawyer in the U. S. Department of Agriculture, Wilson's ideas were embodied in the "Standard State Soil Conservation District Law." The conservation district, as outlined in the standard law, was a new device in American federalism. It was classified as a "special district" because it had limited purposes and was not a local unit of general government as is the county or city. Just to list a few of the powers of the district, it could conduct surveys and research, disseminate information, conduct demonstrations, carry out prevention and control measures, acquire land and property, sue and be sued, and promulgate land-use regulations. In some instances these authorities paralleled the authorities of the Soil Conservation Service, thus accommodating cooperative ventures. In other cases the districts could do things which the federal government could not do. In short, adding the districts enhanced and expanded the soil conservation movement. Philip Glick has suggested that this type of American federalism with cooperation among federal, state, and local entities resembled not so much a layered cake, but a marble cake (Glick, 1967 and 1990).

Organization of districts proceeded after state legislatures passed a law based on the "standard law." If the local people then voted for the district in a referendum, they elected directors and supervisors of the district. Then the districts signed an agreement with USDA. The working relationship

that has developed over the years is for the districts to sign agreements with individual farmers and ranchers. Then trained soil conservationists from the Soil Conservation Service field offices worked individually with them on conservation problems.

A few examples can illustrate the work of districts. For instance, they helped apply conservation to the land by making specialized equipment available. Districts often purchased specialized equipment such as grass seeders, spriggers, or tree planters and rented them to farmers. Most farmers would need such equipment only a few times. During the last couple of decades, districts have promoted various reduced tillage systems which leave crop residues on the land surface and thus reduce soil erosion. The technique required specialized equipment or modifications in conventional planting equipment in order to plant through crop residues. Advocates of conservation tillage have tried to gain converts by getting them to use the technique on a few acres. If the farmers are satisfied that it works well and profitably with their particular cropping systems, then they may well be inclined to purchase equipment. Some districts purchased equipment and rented it to farmers for field trials with the idea of promoting a revolution in tillage systems.

In addition to making equipment available, some districts provided services such as tree planting. The operations of the Southern Soil Conservation District in West Virginia in the early 1970s provided examples of what districts might do. The district's tree planting crew planted seedlings for district cooperators for a fee. The district employees helped construct watering troughs and develop springs. These activities promoted grassland farming over tilled crops on the steeper land. District crews also helped in reclamation of gullied areas. Districts acquired plants which provided habitat for wildlife from the state Department of Natural Resources and supplied them to the farmers at a fee. For farmers who wanted to develop stock watering facilities from springs, the districts lent equipment as well as selling supplies which were not available on the local market