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Cover: Landsat photo of northern Africa. Note the Nile River (in red) with the Nile Delta at the top of the photo and the Aswan High Dam near the bottom (see page 297). Photo courtesy General Electric Company.

The Soil Conservation Society of America is dedicated to promoting the science and art of good land use, with emphasis on conservation of soil, water, air, and related natural resources, including all forms of beneficial plant and animal life. To this end, SCSA seeks through the *Journal of Soil and Water Conservation* and other programs to educate people so that mankind can use and enjoy natural resources forever.

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Journal of Soil and Water Conservation

(ISSN 0022-4561) is published six times

a year in January, March, May, July,

September, and November by the Soil

Conservation Society of America, 7515

N.E. Ankeny Road, Ankeny, Iowa 50021-9764.

Second class postage paid

at Ankeny, Iowa, and additional mailing

offices. POSTMASTER: Send address

changes to *Journal of Soil and Water**Conservation*, 7515 N.E. Ankeny Road,

Ankeny, Iowa 50021-9764.

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assumes no responsibility for

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Address all editorial and business

correspondence to SCSA, 7515 N.E.

Ankeny Road, Ankeny, Iowa 50021-9764;

telephone (515) 289-2331. Subscription is

by membership in SCSA

or by subscription.

Membership dues are \$37

a year (\$42 outside the

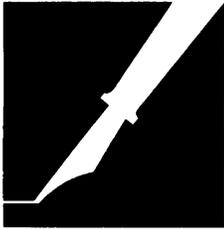
U.S. and Canada);

subscriptions are \$25 a

year (\$28 outside the U.S.

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PEN POINTS

What influence on policy?

This is just a note to compliment you and the Soil Conservation Society of America for the thoughtful and important contributions the JSWC has made to soil and water conservation policy debates of recent years.

This past year, as a resident fellow at the National Center for Food and Agricultural Policy, Resources for the Future, I initiated a book project on *The Uses of Knowledge in Food and Agricultural Policy Debates*. It is a comparative study of four cases, which include not only soil conservation policy, but also dairy policy, United States-European trade disputes, and food stamps. I am paying particularly close attention to the impact of technical information and policy ideas such as those developed within government or by experts based in universities and elsewhere.

It is remarkable how little impact on policymaking has been achieved by experts in many policy fields. All too often, political and bureaucratic pressures discourage the full venting of relevant information and ideas, or the experts themselves fail to frame their analysis with the clarity and timeliness necessary for it to reach policymakers when they could best use it.

However, in examining the debates on soil conservation policy of recent years, I have come to realize that this case is rather exceptional. Information from the National Resources Inventories, and ideas drawn from the intellectual debates over their interpretation, have played a very significant role in debates, especially debates regarding the 1985 farm bill.

In the dozens of interviews I have conducted on Capitol Hill, in USDA [U.S. Department of Agriculture], and among various others who have been involved in policy discussions, it has become clear to me that the JSWC has played a pivotal role in fostering new thinking. A series of articles and columns on such topics as the sodbuster, conservation reserve, and targeting have often been the first anywhere in print on these topics. They have been clearly written and definitely have been noticed by key policymakers. I know that it takes an active editor to seek out such

stimulating and varied articles. In the natural resources conservation field, the JSWC is distinguished for giving a platform to varied points of view that otherwise might not receive the attention they deserve.

Now that the important new soil conservation provisions have been included in the 1985 farm bill, your JSWC will face a new challenge in applying knowledge to policy. As a political scientist, I am very aware from experience that policies are not always implemented as originally envisioned. Many unforeseen complications will arise, and pressures will inevitably threaten to divert the new soil conservation provisions from their intended purposes. The JSWC will continue to fulfill its historic mission if it publishes more on the operation of these programs as they unfold. This will require authors willing to get down to ground-level operations and results. Perhaps a network of observers throughout the country could be encouraged to write on this subject; there might even be need for a special issue of the JSWC assessing the implementation of such provisions as the conservation reserve, the sodbuster, and the swampbuster.

Again, my congratulations to you and SCSA for its remarkable contributions through the JSWC in helping bring information and ideas more into policy discussions than in any other case I have come across.

Christopher K. Leman
Graduate School
of Public Affairs
University of Washington
Seattle, Washington

Don't give me a black eye!

I would like to comment on the article by Justin R. Ward and Anne E. Kinsinger, 'Building on the Farm Bill: A Tax Reform Agenda for Conservation' (JSWC, May-June 1986, pp. 169-170).

Why are some people always out to get the farmer, one way or another? I have been involved in farming all of my life and have never seen farmers treated as badly as they are now (no one wants to help them)!

I don't know where the authors dug up their information, but it would appear that just maybe they should have checked with a few Land Improvement Contractors of America. We have been drainage contractors for 20 years and have never drained the *proverbial swamp* that these writers are referring to. All of our drainage projects involve surface water control and drainage of borderline land that would not permit good farming practices. We are also involved with the Soil Conservation Service installing surface inlets, dike structures, dropwall structures, side inlet pipes, etc. (Maybe the authors should talk with some SCS officials too.)

It's obvious they don't realize if you drain the top 3½ feet of soil that in two or three years it will lose the compaction brought on by working it wet and *will soak up more water, that is, less runoff!* We have too many office people trying to tell us what to do. Why don't they get out here and deal with us face to face. They just might learn something useful.

Gail Carpenter
Farm Drainage
Services
Union City, Michigan

Common sense, but...

The recent article by Clayton Ogg and Harry Pionke [JSWC, March-April 1986, p. 85] was an excellent combination of good basic information, common sense analysis, and hopeful expectations concerning the potential environmental benefits to be derived from the conservation initiatives in the 1985 farm bill, in conjunction with recent state legislative and policy initiatives.

However, just as eternal vigilance is the price of liberty, so will vigilance and continuing political action be required to ensure realization of these benefits, for as suggested by Ervin and Blase [same issue, p. 77] agricultural producers in short-sighted pursuit of immediate personal pecuniary gain often find ways to subvert the intended purposes of governmental programs.

The comprehensive, integrated approach to soil conservation that lives in

Mel Cohee's fond memories [same issue, p. 94] was probably seldom ideally executed. But it was based on a sound, unifying principle, one which often seems lacking in our bifurcated approach to agriculture in which conservation of the natural resource base is viewed as nice but not essential; an "add on" to farmers' profit-maximizing management practices rather than an integral part of agricultural land management. All management advice given to agricultural producers, whether it pertains directly to soils, crops, animals, weeds, insects, pathogens, nematodes, or cash flow and money management, should be judged in light of its potential impacts on the quality and integrity of the land resource base, which includes both soil and water.

Leonard C. Johnson
Oregon, Wisconsin

Good issue!

I commend you for the outstanding articles in the May-June 1986 issue. I particularly enjoyed the interview with Secretary of Agriculture Lyng and the articles by Peter Myers and Don Wolf.

Keep up the good work! You have a fine publication.

Robert E. Raschke
National Association of
Conservation Districts
Lakewood, Colorado

The May-June 1986 JSWC was very good.

D. E. Hutchinson
Lincoln, Nebraska

The people speak!

The conservation reserve in the 1985 farm bill is authorized at \$10 billion a year. Best estimates at the time of passage of the act were that row crop supports were going to come in at about \$13.5 billion per year.

While the debate in Congress over the 1985 farm bill stirred complaint from many of our nation's taxpayers that too much surplus production of row crops is being sold to the government, piled up in storage and deteriorating, there was

virtually unanimous support in both houses of Congress for the conservation reserve with its \$10 billion authorization for each of the next three years.

This is the clearest signal that the American people are sold on resource protection in agriculture and they want to pay their fair share of the costs. But the challenge farmers face is (1) how to package resource protection products that attract paying consumers and (2) how to secure payment.

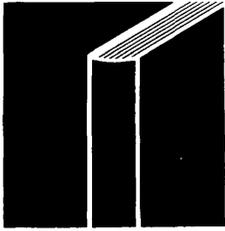
While the first phase of the packaging effort, protection for marginal lands, was launched successfully in the farm bill, water quality enhancement and soil resource protection in tilled fields wait to be packaged. Many farmers are already bearing costs of water quality enhancement with the buffers they maintain along watercourses and grassed waterways. But many farmers are prevented from diverting these acres to water quality goals because crop prices are so low, pushed low by government programs aimed at keeping costs down to consumers, that full production on every acre is mandatory. Tree buffer's for example, are rarely installed along watercourses, even though root systems retard bank erosion, because of the lowering of yields due to shading of adjacent land.

Rather than tax credits or boosts to target prices which are limited in reach to farmers who furnish these resource products, a direct payment for acres in water quality production from consumers via the government helps to pick

up the tab for resource protection that consumers will benefit from through cleaner waters downstream for their uses. This payment will not only help defray the losses to farm income from production foregone but help with the maintenance costs in these enhancement zones—trees need trimming and vegetation needs cutting back. For enrollment in such a program a minimum farm system can be offered by a farmer with auction to the government for broader expanses as might be warranted for even greater water quality protection.

The future of agriculture relations with consumers is not supports and subsidies. Rather, it is transactions.

Tom Barlow
Barlow, Kentucky



BOOKS, ETC.

Soil Conservation: Assessing the Natural Resources Inventory, Volume I and Volume II. Volume I, 112 pp., 1986; volume II, 256 pp., 1986. Committee on Conservation Needs and Opportunities, Board on Agriculture, National Research Council, National Academy Press, Washington, D.C. Volume I, \$11.50; volume II, \$22.50; two-volume set, \$30.60.

In early 1984 the U.S. Department of Agriculture's Soil Conservation Service asked the National Research Council's Board on Agriculture to do two things:

- Facilitate a discussion between SCS and natural resource experts by providing analysis and recommendations on high-priority conservation issues.

- Evaluate the potential application of the 1982 Natural Resources Inventory.

As a part of the NRI evaluation, a workshop was held in July 1984. This workshop concentrated on technical aspects of the statistical design and content of the 1982 NRI. Recognized land use and soil conservation authorities were asked to address specific topics. Their 11 papers are published in volume II of the NRI assessment, *Soil Conservation...*, which largely became the technical base for volume I.

The Board on Agriculture's Committee on Conservation Needs and Opportunities was composed of authorities on soil conservation and natural resources. This committee evaluated the NRI and illustrated how it can be analyzed, improved, and applied to natural resource and water quality problems caused by soil erosion. Some of the committee recommendations go beyond the scope of the NRI, but they point out information needs relative to erosion control and land use.

The committee complimented SCS for the timely manner in which it conducted the massive 1977 and 1982 NRIs.

During the 1982 inventory, the most intensive of several inventories completed by SCS, more than 70 observations on resource condition and land use were collected at each of an estimated one million field locations across the country. The cost of this project was about \$15 million.

For both the 1977 and 1982 NRIs, the universal soil loss equation (USLE) was used to provide estimates of gross sheet and rill erosion. Wind erosion estimates were made using the wind erosion equation (WEE). According to the committee, the WEE estimates are less reliable than those

made for water erosion with the USLE, especially when the WEE was used outside the 10 Great Plains states. The 1982 NRI is the most recent and the most intensive natural resource inventory ever made in the United States.

The 1982 NRI provides no estimates of ephemeral gully erosion—estimates that are needed to give a better picture of soil erosion. Ephemeral gully erosion, also called concentrated-flow or megarill erosion, occurs in natural draws where water flows through a field after heavy rains. These small gullies can be eliminated by normal field tillage operations, leaving little or no visible sign of the damage.

Expansion of the NRI data to cover all federal lands, in addition to privately owned lands, also would help to give a more accurate picture of the nation's land resources. Information on the condition of range and forest lands is especially needed. This could be accomplished through cooperation between SCS, the Forest Service, Bureau of Land Management, U.S. Geological Survey, Department of Defense, Department of Energy, and other relevant federal agencies.

Despite these limitations, the gross soil erosion estimates from the NRI have been helpful in locating areas of the nation with the most soil erosion problems. Policymakers have already used this information to direct programs to those areas with the greatest problem.

But gross erosion figures alone do not give a good indication of how erosion affects soil productivity. Erosion reduces soil productivity on some soils more than on other soils. In general, deep soils are affected the least and shallow soils the most.

The need to understand this relationship between erosion and productivity has spurred additional research on the short-term and long-term impacts of soil erosion. Soil-impact research, used in conjunction with the NRI data tape and SCS Soils-5 file, could be used to direct programs to those areas where soil might be damaged most by erosion.

As an example, the committee illustrates how the NRI data, when used with the Productivity Index (PI) model and Erosion-Productivity Impact Calculator (EPIC) model, can determine erosion's impacts on soil productivity. New and more precise models will help determine short- and long-term impacts of soil erosion.

The committee also points out possible

errors in soil erosion estimates due to incorrect C values in the USLE. It recommends research to ensure that C factors accurately predict the erosion control benefits of crop rotations, soil cover, and management.

According to the committee, some studies have indicated that crop residues are more effective in controlling soil erosion than the present C values indicate. Crop residues on the soil surface, residues in the top few inches of the surface soil layer, and soil roughness all contribute to reduced soil erosion.

The inaccuracy of field-level measurements and the inaccuracy of predicting the extent of soil cover provided by crop residue can lead to further errors in erosion estimates. Also, attention is needed on the development of data and practical methods to adjust the USLE in areas of the country where frozen soil, snowmelt, or irrigation substantially alter runoff, erodibility, and erosion estimates.

For the 1982 NRI, SCS did more than simply record erosion estimates for the thousands of field points. It also recorded what the erosion estimates would be if four different conservation practices were used at each location. These practices were conservation tillage, contour farming, contour stripcropping, and terraces.

The data went on to indicate that conservation management techniques are not widely used on erosion-prone soils, nor are they concentrated on the most erodible soils. Much of the land most in need of soil erosion control, as defined by the USLE, is not treated with any practice. Nearly 50 percent of the intensively cultivated cropland in the United States is treated with some conservation practice. And nearly half of these applied practices are used on land not subject to excessive soil erosion.

In addition, the 1982 NRI found that cropland with soil loss tolerance levels of 5 tons of eroded soil per acre annually represented 71.4 percent of the land studied; cropland with tolerance levels of 4 tons per acre annually represented 11.5 percent; and cropland with 3 tons per acre annually represented 12.9 percent. The 1982 NRI data also indicated that 7 percent of U.S. cropland accounts for 41 percent of the soil displacement.

Farming has changed dramatically over the past 50 years. Cropping systems have become more intensive, resulting in nearly continuous row cropping for some areas. This change, coupled with increased fertil-

izer and chemical use, has increased opportunities for surface water and groundwater pollution. Better information on how agricultural practices affect water quality is essential in developing and implementing strategies for control of nonpoint sources of pollution.

For future inventories, there will possibly be some opportunities to couple NRI results with data sources and models that evaluate off-site effects of erosion—such effects as sedimentation and other pollution. The committee recommends that steps be taken to explore fully ways to more effectively use the 1982 NRI in water quality research. Also, SCS should work with water quality and planning agencies to determine if and how collection of future NRI data can be improved to provide more useful water quality data.

In the future, conservation systems on the farm may be tailored to the dual goal of controlling soil erosion and mitigating the potential impact on water by dissolved chemicals and sedimentation. Continuing study is needed to develop or improve, test, and evaluate models for water quality.

Volume I of *Soil Conservation...* is well-stocked with additional recommendations on how to improve the NRI itself and how to ensure its greater use. Here are just two:

► Provide a supplemental computer tape containing the individual WEE factors not recorded in the basic data tape, as well as codes needed to cross-reference NRI sample points with other key data sources. These sources should include the SCS Soils-5 file and the hydrogeological data base.

► Publish a supplemental volume of 1977 and 1982 NRI statistics using a variety of tabular formats. Tables should be based on ranges of inherent erodibility rather than land capability classes.

Reading volume I of *Soil Conservation...* will be helpful to any conservationist who wants a better understanding of the NRI and its implications for maintaining soil productivity and improving water quality. The book and its companion, *Soil Conservation...*, volume II, are useful reading, especially for conservation analysts and planners.—ROBERT WALKER, *Cooperative Extension Service, University of Illinois, Urbana-Champaign.*

Water, Earth, and Fire: Land Use and Environmental Planning in the New Jersey Pine Barrens. By Jonathan Berger and John W. Sinton. 228 pp., illus., refs., index, apps., tpls., 1985. The Johns Hopkins University Press, Baltimore, Maryland 21211. \$25.00.

Water, Earth, and Fire examines the New Jersey Pine Barrens, 1,500 square miles of sparsely populated land that borders America's most densely populated eastern corridor. The authors devote suffi-

cient time to the Pinelands' resources; for example, separate chapters focus on water, earth, and fire. But of equal importance, Berger and Sinton also focus on the life and work of the human inhabitants of the region, commonly referred to as "Pineys."

After this thorough discussion of the natural and human resources, one can begin to understand the difficulty of managing this unique resource—limiting the pressures for land development or contamination of the underground aquifers from what the authors call "outsiders." The book does a good job of presenting various planning proposals for this unique ecological reserve and suggests planning that takes human ecology into consideration.

Of particular interest to most readers would be the authors' critique of the New Jersey Pinelands Commission comprehensive management plan—New Jersey's strong effort to maintain the sensitive Pinelands as pristine. The authors describe the Pinelands planning process and identify the inadequacies of that process as they see them. They also focus on the fact that many residents of the Pinelands oppose the comprehensive management plan for one reason or another. This gives further light and support to the authors' recommendations that residents' wants and needs must be considered in the planning process.

I found the book enlightening, especially because I spend considerable time ensuring that the U.S. Army meets the requirements of the Pinelands commission for any development occurring at Fort Dix, which lies completely within the ecologically sensitive Pinelands.—NICHOLAS J. CAVALARO, *U.S. Army, Fort Dix, New Jersey.*

General

BriefBook: Biotechnology and Genetic Diversity. By Steven C. Witt. 145 pp., refs., app., gloss., 1985. California Agricultural Lands Project, San Francisco, 94117. \$12.50, plus \$1.50 postage.

Resource Management: Information on the Coastal Zone Management Program. 15 pp., apps., 1986. U.S. General Accounting Office, Gaithersburg, Md. 20877.

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The Social and Environmental Effects of Large Dams. By Edward Goldsmith and Nicholas Hildyard. 416 pp., illus., refs., apps., index, 1986. Sierra Club Books, San Francisco, Calif. 94115. \$29.95.

Restoring the Earth: How Americans are Working to Renew our Damaged Environment. By John J. Berger with a foreword by Congressman Morris K. Udall. 21 pp., refs., index, 1986. Alfred A. Knopf Publishers, New York City, N.Y. 10022. \$18.95.

The Selling of Soil Conservation: A Test of the Voluntary Approach Vol. 2: Organization Survey. By Thomas J. Hoban, Peter F. Korsching, and Terry Huffman. 135 pp., 1986. Sociology Rpt. 158. Department of Sociology and Anthropology, Iowa State University, Ames, 50011.

Hydraulics in Civil Engineering. By Andrew Chadwick and John Morfett. 484 pp., illus., apps., tpls., index, 1986. Allen & Unwin, Inc., Winchester, Mass. 01890. \$50.00, cloth; \$24.95, paper.

A Primer on Integrating Resource Inventories. By Gyde Lund. 64 pp., illus., refs., 1986. Gen. Tech. Rpt. WO-49. Forest Service, U.S. Department of Agriculture, Washington, D.C. 20013.

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ART: For Environment's Sake: A Collection of Environmental Graphics. 85 pp., illus., refs., bibliog., 1986. Environmental Task Force, Washington, D.C. 20005. \$8.95, prepaid; \$11.45, postpaid.

World Development Report 1986. 320 pp., illus., tpls., maps, 1986. World Bank Publications, Washington, D.C. 20433. \$26, hard cover; \$12.95, paper cover.

Human Activity and the Environment. 375 pp., illus., tpls., maps, 1986. Catalogue No. 11-509E. Publication Sales and Services, Statistics Canada, Ottawa, Ont. K1A 0T6. \$55.00; \$45.00 in Canada.

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Nature's Place: Conservation Sites and Countryside Change. By W. M. Adams. 209 pp., illus., tpls., app., index, 1986. Allen & Unwin, Inc., Winchester, Mass. 01890. \$24.95.

Forests

Costs of Managing Nontimber Resources When Harvesting Timber in the Northern Rockies. By Robert E. Benson and Michael J. Niccolucci. 22 pp., illus., refs., apps., 1985. Research Paper INT-351. Intermountain Research Station, U.S. Forest Service, Ogden, Utah 84401.