FEATURES

434 The Golden State's preservation program
Doug Snyder

438 SWCS adopts wetland policy statement

441 Translating science into policy
Chris Elfring

444 Control mechanisms to reduce fertilizer nitrogen movement into groundwater
D.D. Francis

449 Development and conservation of water resources in Garhwal Himalaya
Anil Kumar

VIEWPOINT

432 Gender equity session stimulates dialogue
Ray Gildea

COMMENTARY

452 Wetlands is not a ducks vs. farmers issue
Ann Robinson, Marta Cleaveland, and Terry Jacobson

RESEARCH

475 Land use change in three San Francisco Bay Area counties: Implications for ranching at the urban fringe
Larry Forero, Lynn Huntsinger, and W. James Clawson

481 Inspection and maintenance of infiltration facilities
Greg Lindsay, Les Roberts, and William Page

496 Estimating the yield effect of soil degradation
Stefano Pagiola

491 Productivity Index model comparison for selected soils in North Central United States
M.J. Lindstrom, T.E. Schumacher, A.J. Jones, and C. Gantzer

495 A mesh-bag method for field assessment of soil erosion
Yuch-Ping Hsieb

499 Community participation for forest watershed management in Laos
Prem M. Sharma

DEPARTMENTS

430 SWCS view
433 Pen points
451 Personal enrichment
456 In the news
467 Classified ads
470 Books, etc.
473 Upcoming

Cover
A sediment pond in Iowa invites a pair of swans.
Soil Conservation Service Photo.
As a multidisciplinary membership organization, we advocate the protection, enhancement, and wise use of soil, water and related natural resources. Through education and example, we promote an ethic that recognizes the interdependence of people and the environment.

OFFICERS
President
Ron Hicks, Edmonton, Alberta
Vice-president
William J. Brune, Victoria, Minnesota
Secretary-Treasurer
Calvin J. Perkins, Broadalbin, New York
Board Representative on Executive Committee
Anthony G. Burns, New Castle, Kentucky
Executive Vice-president
Douglas M. Klein, Des Moines, Iowa

DIRECTORS
Calvin J. Perkins, Broadalbin, New York
Robert G. "Robbie" Robson, Athens, Georgia
Anthony G. Burns, New Castle, Kentucky
Gary C. Steinhardt, West Lafayette, Indiana
William J. Brune, Victoria, Minnesota
John A. Knapo, Lajolla, Colorado
O. R. "Reggie" Jones, Bushland, Texas
Jan Jirings, Petersburg, Virginia
Ron Hicks, Edmonton, Alberta
Jodie Lloyd, College Station, Texas
Lloyd Mielke, Arlington, Virginia

Editor
Paula Porter
Assistant Editor
Doug Snyder
Research Editor
James F. Power
Production Assistant
Anne Hamness

EDITORIAL BOARD
David B. Baker, Uplin, Ohio
Alfred Beele, Edmonton, Alberta
Blair T. Bower, Arlington, Virginia
David R. Cressman, Kitchener, Ontario
George Foster, Oxford, Mississippi
N. W. Hudson, Silsoe, England
Dennis R. Kenney, Ames, Iowa
Fred B. Knight, Orofino, Maine
Don K. McCool, Pullman, Washington
Pete V. Nowak, Madison, Wisconsin
David L. Schertz, Washington, D.C.
Gerald E. Schuman, Cheyenne, Wyoming
B. A. "Bobby" Stewart, Bushland, Texas.
Kenneth E. Trett, Woodland, California

SWCS STAFF
Executive Vice-President
Douglas M. Klein
Director of Public Affairs/Foundation Activities
Max Schepel
Director of Education/Professional Development
Tim Kautza
Director of Management Information Systems
James L. Sanders
Washington, D.C. Representative
Norman A. Berg

Journal of Soil and Water Conservation (ISSN 0002-4951) is published six times a year in January, March, May, July, September, and November by the Soil and Water Conservation Society, 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.

Copyright ©1992 by the Soil and Water Conservation Society. SWCS assumes no responsibility for statements and opinions expressed by contributors. Address all editorial and business correspondence to Journal of Soil and Water Conservation, 7515 N.E. Ankeny Road, Ankeny, Iowa 50021-9764; telephone (515) 289-2331; fax (515) 289-1227. Subscription is by membership in the Soil and Water Conservation Society or by subscription. Membership dues are $44 a year ($50 outside the United States and Canada); subscriptions are $39 a year ($45 outside the United States and Canada).
Erosion, soil architecture, and crop yields

Our major concern with land degradation worldwide chiefly relates to the decline in productive potentials of soils. It seems to me that the widespread efforts to measure soil losses from hydric erosion and attempts to relate yield losses to the results are hindering us from giving sufficient attention to a more important factor—soil structure.

Decline in productivity may follow adverse changes in physical, chemical, or biological characteristics of the soil. These features must be in optimum condition for plants to grow to the maximum of their genetic ability. Productivity loss may occur even without soil loss: consider waterlogging, salinization, nutrient imbalance, compaction. Is soil loss the best, or only, predictor of yield decline?

Accelerated soil loss is a foreseeable consequence of changed relationships between several environmental factors such as soil, slope, vegetation, soil fauna, and climate which may occur as a result of human intervention. Erosion indicates that adjustments are taking place in an agro-ecosystem from one level of equilibrium towards another. Seen in this way, it is not a primary cause but a secondary consequence of land degradation.

Runoff and associated soil loss follow from adverse changes in the soil's three-dimensional architecture—its structure—as they affect its suitability for root function and growth, in particular the conditions of aeration and the storage and release of soil moisture.

We acknowledge that structural decline is an important factor in soil degradation, but then we go on to measure consequent losses of soil particles.

It is important, however, to consider that the loss of voids in the soil-the interstitial spaces between and within soil structural units, may be at least as important as the loss of physical particles in limiting plant growth. Loss of an adequate system of spaces at any level within the potential rooting depth, starting with the top few millimeters at the soil surface, is sufficient to alter the partition of incident water between infiltration and runoff; it may hinder seedling emergence, or physically obstruct root extension.

At the recent seventh International Soil Conservation Organisation (ISCO) Conference in Sydney it was stated that six times more loss of production in Australia was due to loss of soil structure than to the much more visible soil salinity problems. On vertical soil compaction due to agricultural activities had been observed to result in as much as a 30 percent drop in cotton yields. Similar observations have been made in Brazil regarding soybean yields. It was also stated that, in South Australia change in organic carbon appeared to be the best indicator of degraded soil productivity, rather than tons of soil lost, which has also been noted in other countries.

Seen from this altered viewpoint, important questions to be answered in specific situations are:

- How does one avoid losing optimal architectural/structural conditions of a soil when they are present?
- How is it possible to rebuild soil structure with optimal arrangements of voids after these may have been lost due to collapse, compaction or pulverization?

This brings the essential role of soils' meso- and micro-organisms into sharp focus, since soil structure, once it has been degraded or destroyed, may be reconstituted only by means of physical activities of burrowing and of transforming organic materials into factors which form and stabilize soil aggregates and the spaces within and between them.

Good land husbandry pays more attention to maintenance of optimum soil conditions than it does to merely preventing soil loss. It seems to be time to reconsider research priorities and extension efforts to give the optimization of soil architecture and the management of organic materials and processes the attention they deserve.

T.F. Shaxton
Doset, England

(After 32 years residing in Malawi, India, Brazil and Lesotho, working in soil and water conservation and land husbandry, the author is now an independent consultant in these matters, and has recently been on short assignments in Italy, Ghana, Kenya, El Salvador, Mozambique, Bolivia, Uruguay).

The 1976 predecessor of this book, titled *Rural Environmental Planning*, was one of the earliest contributions to the emergence of rural planning literature. Frederic O. Sargent has now returned with three co-authors to describe a planning process intended to "serve the carrying capacity of the land." These topics are well-covered elsewhere in the planning literature, but this book cannot stand alone as a guide for rural planning without the addition of material on public services provisions and the fiscal impacts of rural development.

Other weaknesses include the lack of attention to due process issues in the chapter on planning law and the extreme simplicity of some of the analytical techniques proposed, including the "scenery classification" method. More sophisticated analyses may be required to provide a legally defensible basis for the implementation of certain community goals.

Anyone interested in rural land use issues will benefit from the practical guidance and case studies provided by *Rural Environmental Planning for Sustainable Communities*. It must be noted, however, that the key assumption of this book can be a troublesome one. In many rural places, the result of local self-determination will be to label planning an unnecessary infringement on property rights. In other communities, the short-run economic considerations reflected in the local plan will run counter to regional or national interests in the sustainability of rural landscapes. The authors acknowledge these issues (which are, in fact, illustrated in the Ganados del Valle case study), but do not grapple with them. They wisely leave their work to be used in places where there is a consensus that planning is necessary, and where at least some local people share the assumption that economic development depends on environmental quality. For such communities, this book will be a valuable resource.

**Books, Etc.**


Air

Emission Inventory Issues in the 1990s. 825 pp., 1992. Air & Waste Management Association, PO Box 2861, Pittsburgh, PA 15230. $90.00, $60.00 for association members.

Optical Remote Sensing Applications to Environmental and Industrial Safety Problems. 552 pp., 1992. Air and Waste Management Association, PO Box 2861, Pittsburgh, PA 15230. $70.00, $45.00 for association members.

Agriculture


Ecology


Energy


Fish and Wildlife


Forests


The Response of Southern Commercial Forests to Air Pollution. 352 pp., 1992. Air & Waste Management Association, PO Box 2861, Pittsburgh, PA 15230. $85.00, $55.00 for association members.

Land Use


Law, Legislation, Politics


Cooperative Clean Air Technology: Advancement through Government-Industry Partnership. 312 pp., 1992. Air & Waste Management Association, PO Box 2861, Pittsburgh, PA 15230. $70.00, $45.00 for association members.

The Right Climate for Carbon Taxes: Creating Economic
Incentives to Protect the Atmosphere. By Roger C. Dower and Mary Beth Zimmerman. 39 pp., 1992. World Resources Institute, Baltimore, MD 21211. $9.95.

Natural Areas


Pesticides
Federally Registered Pesticides. 1.000 pp., 1992. Gresham Trade Directories, 942 Military Street, Port Huron, MI 48060. $175.00, plus $8.50 shipping and handling.


Outdoor Recreation


Soils


Water Resources


Water Transfers in the West. By William Blomquist. 413 pp., 1992. ICS Press, 245 Kearny Street, San Francisco, CA 94108. $44.95, cloth $14.95, paper.

Waste Management