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To advance the science and art of good land use

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Cover: Grazing is but one of many uses of land that often are integrated in the coordinated resource management planning process. See page 161. Soil Conservation Service photo by Ron Nichols.

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A comment on gravel use

Added quantification was welcomed of what has long been accepted as an engineering practice: use of a gravel base to reduce erosion/sediment yield from minimum-standard roads [*JSWC*, January-February 1987, pp. 46-50]. Some comments regarding the work seem warranted:

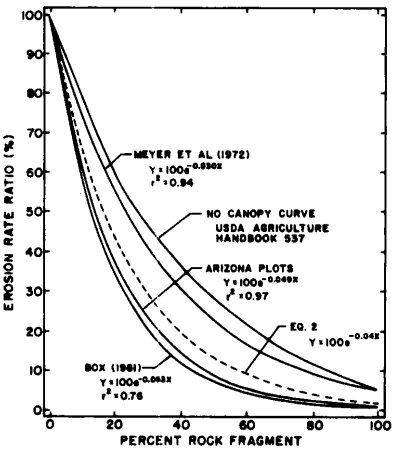
1. Results would have been more useful had they not been confused by the effect of the bank sloughing. Only at the Fernow Loop Road site did the drainage area remain constant during the 1980-84 experimental period. At the Stonelick Road site the drainage area changed in one instance by 32%. Because these changes might well have occurred during only one or two of the more unusual storms, the sediment yield data in table 2 are questionable unless the researchers can identify for sure when the changes occurred and adjust the records appropriately.

2. Sediment yield data in table 2 result from two apparent sources, bank erosion and erosion from the roadway. Figures 1, 2, and 4 illustrate some of the exposed banks, which presumably, are contributing much of the sediment yield. These exposed banks appear to be appreciable, as the cut bank height figures in table 1 indicate. Do these bank areas constitute a large portion of the drainage area in the study section? The mean sediment yield of 5.7 tons/acre from the Stonelick Road section with the 3-inch clean gravel could represent bank erosion entirely. Furthermore, the gravel may have actually filtered some of the bank erosion, especially adjacent to the bank, before the water-sediment mixture reached the measuring site, figure 3.

3. The authors mention that "the percentage of annual runoff from the instrumented road sections ranged from 41.5 to 139%." The seeps causing this additional runoff may also confuse the sediment yield, although one would expect that runoff from these seeps would be relatively free of sediment. Sediment yield from the periods where appreciable seep flow occurred should be identified separately from that occurring during other periods. Sediment yield from the storm events should only be considered in the evaluation of the road material. Thus, from a statistical sense, either all test sections should have seeps or no sections should. The results of the replications for the data presented cannot be submitted to statistical testing because they represent different results with the seeps or at least that becomes another variable and, in that sense, there were no replications (the data in the paper are incomplete for such an evaluation). Were the four years of measured precipitation normal, above, or below normal? Presumably the variability between years for any treatment (Table 2) reflects differences in the input storm characteristics.

4. The treatment headings between tables 1 and 2 are inconsistent. At the Stonelick Road site, one table says that 3-inch crusher-run gravel was used; the other says 1-inch crusher-gravel was used. This inconsistency also confuses any attempt to draw a conclusion about using clean gravel versus crusher-run gravel, especially when the conclusion says the authors previously recommended 3-inch crusher-run gravel.

At the Soil Science Society of America meeting in 1982, a session was held on "Erosion and Productivity of Soils Containing Rock Fragments." These papers (SSSA Special Publication Number 13) are noteworthy because they contain data that supplement this current work. The figure below illustrates some of the data. Don Meyer and coworkers in Indiana used rock mulches to control erosion on roadside cuts, then measured soil loss using a rainfall simulator. Jim Box made similar measurements in Georgia where the surface rock mulch was composed of a slaty material. In arid and semiarid areas of the Southwest, where soils contain a large percentage of rock fragments, erosion leaves residual rock surfaces when wind and/or water erodes the finer materials from the soil surface. Roger Simanton and associates verified the results of Box's and Meyer's work with a rainfall simulator for different rock fragment intensities on the surface and expressed the results in the figure as an exponential decay. In each of these experiments the rate of decay differs from one set of experiments to another. The data were normalized to a common base using slope length-steepness concepts, such as those used in the universal soil loss equation, and the soil erodibility term, K, was removed. Also shown is the "no canopy curve" from Agriculture Handbook 537. When Simanton and colleagues added additional years of data to the results of this original publication and included results from the Nevada test site, the exponential decay changed from the original -0.049 to -0.044. These data indicate that when a 100% rock cover is maintained one would not expect significant erosion from the road area. Erosion on the bare roadside banks would then need to be added to that estimated from the roadway.



Rock fragment cover and erosion rate ratios from simulator plots.

How can this new information be used? In the revision of the USLE now nearing completion, a subfactor approach is being used to calculate the C-factor for rangeland. The subfactor was first proposed by Walt Wischmeier and later detailed by Cal Mutchler and associates and John Laflen and co-workers for cropland. I looked at application of the approach to rangeland. The factor C is expressed as: $C = LU \cdot CC \cdot SC \cdot SR$, where LU is a land use subfactor, CC is a canopy subfactor, SC is a surface cover subfactor, and SR is a surface roughness subfactor. The surface cover subfactor is then obtained as: $SC = \exp(-4.0 \cdot M)$, where M is the surface fraction covered by nonerodible material, such as living and dead plant material and rock and large gravel (the equation is also shown in the figure).

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The Practice of State and Regional Planning. Edited by Frank S. So, Irving Hand, and Bruce D. McDowell. 649 pp., illus., tbls., 1986. American Planning Association, Chicago, Illinois. $39.95; APA members and PAS subscriber, $37.95.

Since 1941, the International City Management Association has published a series of books, five editions now, that are considered the basic texts on local government planning. These texts, known as the "green books," have been edited by various planners, beginning with Ladislas Segoe's first volume. The series represents a collaboration between the ICMA and the American Planning Association. This collaboration has now produced two new green books, the first published on the traditional topic of local planning by the ICMA and this second volume addressing the practice of state and regional planning, published by APA.

The green book series has established a high standard for excellence. *The Practice of State and Regional Planning* certainly achieves this level in terms of the quality of writing, editing, illustration, and production. It is an outstanding book, certain to be used as the fundamental text on state and regional planning like its companion book has been for local governments.

However, for readers of this journal, some caveats are necessary. Soil and water conservation-related issues are not ignored completely, but they are not addressed adequately either. The editors ignored state conservation commissions and soil conservation districts, both important state and regional planning agencies. Areawide water quality commissions receive scant attention.

Similar topics of interest to JSWC readers also receive inadequate treatment. For instance, several times the 1970's quiet revolution of state land use controls is mentioned. The issue of farmlands protection, however, is overlooked. As John DeGrove illustrates in his fine *Land, Growth and Politics,* also published by the APA, the issue of the conversion of prime farmlands to other uses played a central role in many of the state land use planning programs that were initiated during the 1970s. These programs have resulted in much planning innovation, which is not reflected in this book.

Another topic, which merits more attention, is state and regional environmental planning. There is an informative chapter on environmental protection, written by Daniel R. Mandelker, but the focus is on federal rather than state or regional programs. Likewise, a good chapter about environmental impact analysis by E. Drannon Buskirk, Jr., focuses on federal procedures.

Another potential shortcoming of this book is that some people may find the chapters extraneous. Although topics, such as criminal justice planning, are no doubt important, individuals whose primary concern is the judicious use of land and water resources may not find such topics interesting. The broad range of issues addressed in the book does illustrate the breadth of state and regional planning.

These caveats aside, it is incumbent to mention the many worthwhile aspects of this volume. Bruce D. McDowell's chapters about approaches to planning, the evolution of American planning, and regional planning today are generally excellent. There is much useful information in other chapters about implementing and managing plans. Solid waste management and emergency planning receive ample attention.

William S. Bonner of the University of Arkansas-Fayetteville contributes an especially welcome chapter on rural development—wecolme because the topic of rural planning generally has been overlooked in previous green books. The topics that Bonner addresses include the nature of rural America, patterns of rural growth and development, government policies, and state and regional approaches to regional development. The only disappointment in the chapter is, again, that land and water resources receive little attention.

On balance, I would recommend this book to may *JSWC* readers. It will be a worthwhile addition to institutional and academic libraries. *The Practice of State and Regional Planning* is packed full of information that state and regional officials as well as researchers and students will find useful.

In all likelihood this volume will follow the lead of the local planning green books and will be the first in a long series of texts about state and regional planning. As a result, I offer the following suggestion for the editors and publisher. In subsequent editions chapters are needed that address state and regional efforts to control soil erosion and sedimentation, to protect important farmlands, and to manage the environment. By adding chapters on these topics, the text more comprehensively would address state and regional planning.—*FREDERICK STEINER, Programs of Landscape Architecture and Regional Planning, Washington State University, Pullman.*

General

Economic Valuation Techniques for the Environment. Edited by John A. Dixon and Maynard M. Hufschmidt. 203 pp., illus., refs., tbls., index, 1986. John Hopkins University Press, Baltimore, Md. 21211. $25.00, hardcover; $8.95, paperback.

Environmental Planning: A Condensed Encyclopedia. By A. Gilpin. 348 pp., illus., 1986. Noyes Publications, Park Ridge, N. J. 07656. $48.00.

Bordering on Trouble: Resources and Politics in Latin America. Edited by Andrew Maquire and Janet Welsh Brown. 448 pp., 1986. Alder & Alder Publishers, Bethesda, Md. 20814. $24.95, hardcover; $14.95, paperback.

Integrated Approaches to Resource Planning and Management. Edited by Reg Lang. 302 pp., 1986. University of Calgary Press, Calgary, Alberta T2N 1N4. $17.95.

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Environmental Science: The Way the World Works (second edition). By Bernard J. Nebel. 671 pp., illus., bibliog., gloss., apps., index, 1987. Prentice-Hall, Inc., Englewood, Cliffs, N.J. 07632.

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Forests

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Grasslands

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Soils

Losing Ground—Iowa's Erosion Menace and Efforts to Combat It. 24 pp., illus., 1986. Soil Conservation Service, Des Moines, Iowa 50309.

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Soil Erosion & Conservation. By R.P.C. Morgan. 298 pp., illus., refs., index, 1986. John Wiley & Sons, Inc., New York, N.Y. 10158. $29.95.

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Thar's Water in Them Thar Hills!—Estimating Water Supply from a Catchments Geology. Leaflet 50. Water and Soil Directorate, Ministry of Works and Development, Box 12 041, Wellington North, New Zealand. $0.55.

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