



United States  
Department of  
Agriculture

Forest Service

Rocky Mountain  
Research Station

General Technical  
Report  
RMRS-GTR-71WWW

December 2000

# **Watershed management contributions to land stewardship: A literature review**

**Malchus B. Baker, Jr., Peter F. Ffolliott, Carleton B. Edminster,  
Karen L. Mora, and Madelyn C. Dillon**



Baker, Malchus B., Jr.; Ffolliott, Peter F.; Edminster, Carleton B.; Mora, Karen L.; and Dillon, Madelyn C., compilers. 2000. Watershed Management Contributions to Land Stewardship: A literature review. General Technical Report RMRS-GTR-71WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 60 p.

---

## Abstract

---

An international conference to increase people's awareness of the contributions that watershed management can make to future land stewardship was held in Tucson, Arizona, March 13-16, 2000. This bibliography is a compilation of the synthesis and poster papers presented at the conference along with the literature cited in these papers on watershed research projects, applied watershed management activities, and technology transfer mechanisms. This publication furnishes a literature basis for researchers, managers, decision-makers, educators, students, and lay persons with a keen interest in watershed management and better land stewardship in the future. The proceedings from this conference, entitled "Land Stewardship in the 21st Century: The Contributions of Watershed Management," may be found on the Rocky Mountain Research Station's World Wide Web pages at [www.fs.fed.us/rm/pubs/stewardship.html](http://www.fs.fed.us/rm/pubs/stewardship.html).

**Keywords:** Watershed management, ecosystem management, watershed research, applied watershed management

---

## The Authors

---

**Malchus B. Baker, Jr.** is a hydrologist with the Rocky Mountain Research Station in Flagstaff, Arizona.

**Peter F. Ffolliott** is a professor at the School of Renewable Natural Resources, University of Arizona, Tucson.

**Carleton B. Edminster** is a project leader with the Rocky Mountain Research Station in Flagstaff, Arizona.

**Karen L. Mora** is a visual information specialist with the Rocky Mountain Research Station in Fort Collins, Colorado.

**Madelyn C. Dillon** is a technical publication editor with Content Analysis Enterprise Team, Fort Collins, Colorado.

You may order additional copies of this publication by sending your mailing information in label form through one of the following media. Please send the publication title and number.

**Telephone** (970) 498-1392

**E-mail** [rschneider@fs.fed.us](mailto:rschneider@fs.fed.us)

**FAX** (970) 498-1396

**Mailing Address** Publications Distribution  
Rocky Mountain Research Station  
240 West Prospect Road  
Fort Collins, CO 80526-2098

---

# **Watershed Management Contributions to Land Stewardship: A Literature Review**

**Malchus B. Baker, Jr., Peter F. Ffolliott, Carleton B. Edminster,  
Karen L. Mora, and Madelyn C. Dillon**

---

## **Contents**

Introduction .....	1
Watershed Management Perspectives .....	1
Issues to be Confronted in the 21st Century .....	6
Case Studies .....	11
A Retrospective Viewpoint .....	20
Watershed Management Contributions to Future Land Stewardship .....	31
Future Protocols .....	35
Watershed-Related Research Projects .....	39
Vegetation Relationships .....	39
Erosion and Sedimentation Processes .....	41
Riparian Ecosystems and Wetlands .....	42
Fire Effects .....	46
Simulation Techniques and Mathematical Modeling .....	47
Research Support Programs .....	48
Applied Watershed Management Activities .....	49
Vegetation Management Practices .....	49
Erosion and Sedimentation Controls .....	51
Riparian Ecosystems and Wetlands .....	52
Fire .....	52
Operational Management Programs .....	54
Technology Transfer Mechanisms .....	57
Geographic Information Systems .....	57
World Wide Web .....	58

---

## Introduction

---

The effectiveness of land stewardship must be enhanced to meet a growing population's need for conservation, sustainable development, and use of natural resources. Ecosystem-based, multiple-use oriented land stewardship is necessary when considering the present and future uses of land, water, and other natural resources on an operationally efficient scale. Holistically planned and carefully implemented watershed management practices and programs will always be needed to meet the increasing demands for commodities and amenities, clear water, open space, and uncluttered landscapes.

An international conference was held in Tucson, Arizona, on March 13 to 16, 2000, to examine this need. The primary purpose of the conference was to increase people's awareness of the contributions that watershed management can make to future land stewardship in the United States and internationally. Invited synthesis papers were presented by 35 speakers from research institutes, management agencies, and educational organizations in the United States and internationally. More than 50 poster papers on watershed research projects, applied watershed management activities, and technology transfer mechanisms complemented the synthesis papers to broaden the conference scope.

Proceedings of the conference, entitled "Land Stewardship in the 21st Century: The Contributions of Watershed Management," were published by and are available from the USDA Forest Service, Rocky Mountain Research Station, 240 West Prospect Road, Fort Collins, CO 80526. These proceedings are also available on the Rocky Mountain Research Station's World Wide Web pages at [www.fs.fed.us/rm/pubs/stewardship.html](http://www.fs.fed.us/rm/pubs/stewardship.html). This bibliography is a compilation of the synthesis and poster papers presented at the conference along with the literature cited in these papers. This publication furnishes a literature basis for researchers, managers, decision-makers, educators, students, and lay persons with a keen interest in watershed management and better land stewardship in the future.

Citations of the bibliography are listed alphabetically by author in categories corresponding to the plenary sessions of the conference. These sessions included the following topics:

- Watershed management perspectives,
- Issues to be confronted in the 21st century,

- A retrospective viewpoint of past lessons learned,
- Case studies,
- Watershed management contributions to future land stewardship, and
- Future protocols.

Technical themes of the poster papers included the following categories:

- Watershed-related research projects,
  - Applied watershed management activities, and
  - Technology transfer mechanisms.
- 

## Watershed Management Perspectives

---

21st Century Environment Commission. 1998. Report of the 21st Century Environment Commission. Harrisburg, PA.

Adams, C.; Noonan, T.; Newton, B. 2000. Watershed management in the 21st century: National perspectives. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 21-29.

Associates in Rural Development (ARD). 1983. Panama watershed management evaluation report. Burlington, VT.

Baker, M. B., Jr., comp. 1999. History of watershed research in the central Arizona highlands. Gen. Tech. Rep. RMRS-GTR-29. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Baker, M. B., Jr.; DeBano, L. F.; Ffolliott, P. F. 1995. Hydrology and watershed management in the Madrean archipelago. In: DeBano, L. F.; Ffolliott, P. F.; Ortega-Rubio, A.; Gottfried, G. J.; Hamre, R. H.; B. Edminster, C. G.; tech. coords. Biodiversity and management of the Madrean Archipelago: the sky islands of Southwestern United States and Northwestern Mexico. Gen. Tech. Rep. RM-GTR-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 329-337.

- Baker, M. B., Jr.; DeBano, L. F.; Ffolliott, P. F.; Gottfried, G. J. 1998. Riparian-watershed linkages in the Southwest. In: Potts, D. E., ed. Range-land management and water resources. Herndon, VA: American Water Resources Association: 347-357.
- Baker, M. B., Jr.; Ffolliott, P. F. 2000. Contributions of watershed management research in the Rocky Mountains and the Southwestern United States. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 117-128.
- Bormann, Bernard T.; [and others]. 1994. Adaptive ecosystem management in the Pacific Northwest. Gen. Tech. Rep. PNW-GTR-341. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Bottom, Daniel L.; Reeves, Gordon H.; Brookes, Martha H. 1996. Sustainability issues for resource managers. Gen. Tech. Rep. PNW-GTR-370. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Brooks, K. N. 1998. Coping with hydro-meteorological disasters: the role of watershed management. *J. Chinese Soil and Water Conservation*. 29: 219-231.
- Brooks, K. N.; Eckman, K. 2000. Global perspective of watershed management. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 11-20.
- Brooks, K. N.; Ffolliott, P. F.; Gregersen, H. M.; BeBano, L. F. 1997. Hydrology and the management of watersheds. Ames: Iowa State University Press.
- Brooks, K. N.; Ffolliott, P. F.; Wang, L. L. 1995. Completion report of seminar and workshop: water and soil conservation and environmental protection. Summary Report on file at: University of Minnesota, Department of Forest Resources, St. Paul.
- Brooks, K. N.; Gregersen, H. M.; Ffolliott, P. F.; Tejwani, K. G. 1992. Watershed management: a key to sustainability. In: Sharma, N. P., ed. Managing the world's forests. Dubuque, IO: Kendall/Hunt Publishing Company: 455-487.
- Brown, T. C.; Brown, D.; Binkley, D. 1993. Laws and programs for controlling nonpoint source pollution in forest areas. *Water Resources Bulletin*. 29: 1-13.
- Chenje, M.; Johnson, P., eds. 1996. Water in Southern Africa. Maseru: Southern African Development Community (SADC).
- Cortes, E. V.; Saplaco, S. R. 1984. ASEAN-US watershed project: a milestone in regional watershed management and research cooperation. College, Laguna, Philippines. 12 p.
- Cox, J. R.; Morton, H. L.; Johnsen, T. N., Jr.; Jordan, G. L.; Martin, S. C.; Fierro, L. C. 1984. Vegetation restoration in the Chihuahuan and Sonoran Deserts of North America. *Rangelands*. 6: 112-115.
- de Graaff, J.; Dwiwarsito, K. 1990. Economic monitoring and evaluation of Konto River Project implementation activities (cost benefit analysis of watershed development activities). Konto River Project ATA 206 Phase III—Project Communication No. 15. Malang, Indonesia: DHV Consultants.
- de Graaff, J.; Dwiwarsito, Kusrianto. 1987. Economic impact of watershed development activities. Konto River Project ATA 206 Phase III—Project Communication No. 16. Report on 1986/1987 Implementation Activities in the Konto River Watershed. Malang, Indonesia: DHV Consultants.
- Development Alternatives. 1989. Common property resource management study in Khair-K-Khala and Balad Nadi watersheds, Himachal Pradesh. Prepared for: USAID and World Bank Integrated Watershed Development Project. New Delhi: Development Alternatives.
- Development Alternatives. 1989. Common property resource management study in Phulbani District, Orissa. Prepared for: USAID and World Bank Integrated Watershed Development Project. New Delhi: Development Alternatives.
- Eckman, K. 1998. Exploring farmers' needs: report of a participatory rural assessment to improve agricultural extension support in Grenada. TCP/GRN/8821(A) Project Report. St. George's, Grenada: Food and Agriculture Organization of the United Nations (FAO).
- Eckman, K. 1997. Agroforestry practices in the Spanish and Swift River and Rio Grande watersheds of Northeastern Jamaica. Project GCP/JAM/017/NET Working Paper. Port Antonio, Jamaica: Food and Agriculture Organization of the United Nations (FAO).
- Eckman, K. 1995. Consultant report. UNDP/FAO Project MYA/93/004—Sustainable agriculture

- development and environmental rehabilitation in the dry zone. Rome: Food and Agriculture Organization.
- Eckman, K. 1994. Avoiding unsustainability in natural resources projects in developing countries: the precautionary monitoring approach. St. Paul: University of Minnesota. Dissertation.
- Eckman, K. 1987. Mission report. Integrated rural development through communes. Kigali, Rwanda: Catholic Relief Services.
- Eckman, K.; Gregersen, H.; Lundgren, A. 2000. Watershed management and sustainable development: lessons learned and future directions. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 37-44.
- Edminster, C. B., C. W. Weatherspoon, and D. G. Neary. 2000. The fire and fire-surrogate study: Providing guidelines for fire in future watershed management decisions. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 312-315.
- Edwards, D. T. 1995. Small farmers and the protection of the watersheds: the experience of Jamaica since the 1950s. UWI Centre for Environment and Development. Kingston: Canoe Press, University of the West Indies.
- Ewing, S. 1999. Land care and community-led watershed management in Victoria, Australia. J. American Water Resources Association. 35: 663-673.
- Fairchild, Warren D. 1993. A historical perspective on watershed management in the United States. In: Proceedings watershed 93: a national conference on watershed management. USEPA Center for Environmental Publications, Cincinnati, OH.
- Falkenmark, M. 1997. Society's interaction with the water cycle: a conceptual framework for a more holistic approach. Hydrological Sciences. 42(4): 451-465.
- D'Ostiani, L. 1999. Lessons Learned from an interregional experience in participatory upland development. Unasylva. 196(50): 9-11.
- Ffolliott, P. F.; Baker, M. E., Jr.; Lopes, V. L. 2000. Watershed management perspectives in the Southwest: past, present, and future. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 30-36.
- Ffolliott, P. F.; DeBano, L. F.; Strazdas, L. A.; Baker, M. B., Jr., and Gottfried, G. J. 1997. Hydrology and water resources: a changing emphasis? Hydrology and Water Resources in Arizona and the Southwest. 27: 65-66.
- Food and Agriculture Organization of the United Nations (FAO). 1982. Mae Se integrated watershed and forest land use: project findings and recommendations. Rome: FAO.
- Food and Agriculture Organization of the United Nations (FAO). 1985. FAO/Finland training course in forestry and watershed management for Asia and the Pacific. Rome: FAO.
- Food and Agriculture Organization of the United Nations. 1989. Community forestry: participatory assessment, monitoring and evaluation. community forestry. Note 2. Rome: FAO.
- Food and Agriculture Organization of the United Nations. 1990. The community's toolbox: the idea, methods and tools for participatory assessment, monitoring and evaluation. Rome: FAO.
- Gregersen, H.; Easter, W. K.; de Steiguer, J. E. 2000. Responding to increased needs and demands for water. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 238-246.
- Gregersen, Hans; Lundgren, Alan. 1993. Improving projects for sustainable development: a policy framework. EPAT/MUCIA/USAID Draft Policy Brief. St. Paul: University of Minnesota.
- Gregersen, Hans; Lundgren, Allen; Byron, Neil. 1998. Forestry for sustainable development: making it happen. Journal of Forestry. 96(3): 6-10.
- Gunderson, Lance H.; [and others]. 1995. Barriers and bridges to the renewal of ecosystems and institutions. New York: Columbia University Press.
- Gupta, T. 1988. The Kandi watershed and area development project, Punjab, India: approaches

- to financial and economic analysis. Ahmedabad: Indian Institute of Management.
- Hibbert, A. R. 1979. Managing vegetation to increase flow in the Colorado River Basin. Gen. Tech. Rep. RM-66. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Holling, C.S., ed. 1978. Adaptive environmental assessment and management. New York: John Wiley & Sons.
- Kempton, Willett; [and others]. 1995. Environmental values in american culture. Cambridge: Massachusetts Institute of Technology.
- Killeen, Tim; [and others]. 1999. The ecological crises of the 21st century. University of Michigan, p.8. Available: <http://www.sprl.umich.edu/GCL/notes2/crisis.html>(1999, June 9).
- Kundzewicz, Z. W. 1997. Water resources for sustainable development. *Journal-des Sciences Hydrologiques* [Hydrological Sciences]. 42(4): 467-480.
- Lal, R. 1997. Soils of the tropics and their management for plantation forestry. In: Nambiar, E. K. S.; Brown, A. G., eds. Management of soil, nutrients and water in tropical plantation forests. Sydney: 97-121.
- Lant, C. L. 1999. Introduction: human dimensions of watershed management. *Journal of American Water Resources Association*. 35(3): 483-486.
- Lee, Kai N. 1993. Compass and gyroscope: integrating science and politics for the environment. Washington, DC: Island Press.
- Lee, Robert G. 1992. Ecologically effective social organization as a requirement for sustaining watershed ecosystems. In: Naiman, Robert J., ed. *Watershed management*. New York: Springer-Verlag: 73-90.
- Leopold, L. 1994. Flood hydrology and the floodplain. The Universities Council on Water Resources. *Water Resources Update*. 94: 11-14.
- Lopes, V. L.; Ffolliott, P. F. 1992. Hydrology and watershed management of oak woodlands in southeastern Arizona. In: Ffolliott, P. F.; Gottfried, G. J.; Bennett, D. A.; Hernandez, V. M.; Ortega-Rubio, C. A.; Hamre, R. H., tech. coords. *Ecology and management of oak and associated woodlands: perspectives in the Southwestern United States and northern Mexico*. Gen. Tech. Rep. RM-218. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 71-77.
- Lopes, V. L.; Ffolliott, P. F.; Fogel, M. M. 1992. Integrated watershed management for sustainable use of natural resources: a frame-work for consideration. In: Castillo Gurrola, J.; Tiscareno Lopez, M.; Sanchez Cohen, I., eds. *Proceedings of the international seminar on watershed management*, Hermosillo, Sonora, Mexico: Universidad de Sonora [University of Arizona]: 105-114.
- Lugo, A. E.; Brown, Sandra, eds. 1985. *Watershed management in the Caribbean*. Proceedings of the second workshop of Caribbean foresters held in Kingstown, Saint Vincent and the Grenadines; 1984 March 19-23. Washington: USDA Forest Service and Institute of Tropical Forestry.
- Lundgren, Allen L. 1976. Planning and the law of unexpected consequences. Oslo, Norway: XVI Int. Union For. Res. Organ. World Congr. Proc. Div. IV.: 88-99.
- Lundgren, Allen. 1983. Strategies for coping with uncertainty in forest resource planning, management, and use. *New forests for a changing world. Proceedings of the 1983 Convention of The Society of American Foresters*; 1983 October 16-20; Portland, OR: 574-578.
- McCauley, David S. Watershed management in Indonesia: the case of Java's densely populated upperwatersheds. In: Easter, K. W.; Dixon, J. A.; Hufschmidt, M. M., eds. *Watershed resources management*. Singapore: ASEAN Economic Research Unit, and Honolulu: East-West Center Environment and Policy Institute: 177-190.
- Meinzen-Dick, R.; Rosegrant, M. W. 1997. Water as an economic good: incentives, institutions, and infrastructure. In: Kay, Franks, T.; Smith, L., eds. *Water: economics, management and demand*. E & FN Spon.: 312-320.
- Ministry of Forestry. 1997. Eastern Anatolia watershed rehabilitation project. Ankara, Turkey: General Directorate of Reforestation and Erosion Control.
- Morgan, J. R. 1986. Watersheds in Hawaii: an historical example of integrated watershed management. In: Easter, K. W.; Dixon, J. A.; Hufschmidt, M. M., eds. *Watershed resources management*. Singapore: ASEAN Economic Research Unit, and Honolulu: East-West Center Environment and Policy Institute.
- National Research Council. 1992. *Restoration of aquatic ecosystems*. Washington, DC: National Academy Press.
- National Survey Results: A profile of volunteer monitoring. *Volunteer Monitor*. 10(1): 30.
- Neary, D. G. 2000. Changing perceptions of watershed management from a retrospective viewpoint. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech.

- coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 167-176.
- Oechel, W. C. 1988. Seedling establishment and water relations after fire in a Mediterranean ecosystem. In: Allen, E. B., ed. The reconstruction of disturbed arid lands. Washington, DC: AAAS Selected Symposium. 109: 34-45.
- Paulson, S. G.; [and others]. 1998. Critical elements in describing and understanding our nation's aquatic resources. Journal American Water Resources Association. 34: 995-1005.
- Pimental, D.; Harvey, C.; Resosudarmo, P.; Sinclair, K.; Kurz, D.; McNair, M.; Crist, S.; Shpritz, L.; Fritton, L.; Saffouri, R.; Blair, R. 1995. Environmental and economic costs of soil erosion and conservation benefits. Science. 267: 1117-1122.
- Pinchot, Gifford. 1947. Breaking new ground. New York: Harcourt, Brace and Co. 522 p.
- Porto, M.; Porto, R. L. L.; Azevedo, L. G. T. 1999. A participatory approach to watershed management: the Brazilian system. Journal American Water Resources Association. 35: 675-683.
- Reid, L. M. 1993. Research and cumulative watershed effects. Gen. Tech. Rep. PSW-GTR-141. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station.
- Revenga, C.; Murray, S.; Abramovitz, J.; Hammond, A. 1998. Watersheds of the world: ecological value and vulnerability. Washington, DC: World Watch Institute.
- Riley, Ann L. 1998. Restoring streams in cities: a guide for planners, policy makers, and citizens. Island Press.
- Rosegrant, M. W. 1997. Water resources in the twenty-first century: challenges and implications for action. Food, Agriculture, and the Environment Discussion Paper 20. Washington, DC: International Food Policy Research Institute.
- Rosegrant, M. W.; Meinzen-Dick, R. S. 1996. Water resources in the Asia-Pacific region: managing scarcity. Asian-Pacific Economic Literature. 10(2): 32-53.
- Scherr, S. J.; Yadav, S. 1996. Land degradation in the developing world: implications for food, agriculture, and the environment in 2020. Food, Agriculture, and the Environment Discussion Paper 14. Washington, DC: International Food Policy Research Institute.
- Shindler, Bruce; Cheek, Kristin Aldred; Stankey, George H. 1999. Monitoring and evaluating citizen-agency interactions: a framework developed for adaptive management. Gen. Tech. Rep. PNW-GTR-452. Portland, OR: USDA Forest Service, Pacific Northwest Research Station.
- Thames, J. L., ed. 1977. Reclamation and use of disturbed land in the Southwest. Tuscon: University of Arizona Press.
- Turton, C.; Coulter, J.; Farrington, J.; Shah, A. 1998. Participatory watershed development in India: impact of the new guidelines. New Delhi: Overseas Development Institute (ODI), UK-Department for International Development (DFID) Rural Development Office, and Development Support Centre (Ahmedabad).
- United Nations Development Program. 1967. Pilot project in watershed management of the Nahal Shikma, Israel. General Report Volume 1. Rome: Food and Agriculture Organization and United Nations Development Program.
- United Nations Development Programme. 1994. Watershed management for three critical areas.project. Document MYA/93/005/A/01/ 12. Yangon (Myanmar): UNDP.
- USDA, Economic Research Service. 1972. A history of federal water resources programs, 1800-1960. Misc. Publ. 1233. Washington, DC.
- USDA, Natural Resources Conservation Service. 1996. A geography of hope—America's private land. Washington, DC.
- U.S. Environmental Protection Agency. 1991. The watershed protection approach: an overview. EPA 503/9-92/002.
- U.S. Environmental Protection Agency and USDA. 1998. Clean water action plan: restoring and protecting america's waters.
- Urquiza, J. E. 1999. Participation in upland development and conservation. Unasylva. 196(50):3-8.
- van Leeuwen, N. 1995. Women's development in sustainable watershed management. Consultancy Report UNDP/FAO Project MYA/ 93/005. Taunggyi (Myanmar): United Nations Development Program.
- Walters, Carl. 1986. Adaptive management of renewable resources. New York: Macmillan Publishing Company.
- White, T. A. 1992. Peasant cooperation for watershed management in Maissade, Haiti: factors associated with participation. EPAT Working Paper 4. St. Paul: University of Minnesota, College of Natural Resources.
- White, T. A. 1992. Peasant initiative for soil conservation: case studies of recent technical and social innovations from Maissade, Haiti. EPAT Working Paper 3. St. Paul: University of Minnesota, College of Natural Resources.

- White, T. A. 1994. Policy lessons from history and natural resources projects in Rural Haiti. EPAT Working Paper 17. St. Paul: University of Minnesota, College of Natural Resources.
- White, T. A.; Quinn, R. M. 1992. An economic analysis of the Maissade, Haiti, integrated watershed management project. EPAT Working Paper 2. St. Paul: University of Minnesota, College of Natural Resources.
- World Bank. 1994. Staff appraisal report: Loess Plateau watershed rehabilitation project (China). Rep. 12593-CHA. Washington: World Bank.




---

## Issues to be Confronted in the 21st Century

---

- Abbe, T. B.; Montgomery, D. R. 1996. Large woody debris jams, channel hydraulics and habitat formation in large rivers. *Regulated Rivers: Research & Management*. 12: 201-221.
- Avers, P. E.; Cleland, D. T.; McNab, W. H. 1994. National hierarchical framework of ecological units. In: *Silviculture: from the cradle of forestry to ecosystem management: proceedings of the national silviculture workshop; 1993 November 1-4; Hendersonville, NC*. Gen. Tech. Rep. SE-88. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station: 48-61. (Complete symposium proceedings available: <http://www.srs.fs.fed.us/pubs/viewpub.jsp?index=132>
- Becker, A.; Braun, P. 1999. Disaggregation, aggregation and spatial scaling in hydrological modeling. *Journal of Hydrology*. 217: 239-252.

- Benda, L. E; Cundy, T. W. 1990. Predicting depositions of debris flows in mountain channels. *Canadian Geotechnical Journal*. 27: 409-417.
- Beschta, R. L. 1978. Long-term patterns of sediment production following road construction and logging in the Oregon Coast Range. *Water Resources Research*. 14: 1011-1016.
- Bierkens, M. F. P.; Van Bakel, P. J. T.; Wesseling, J. G. 1999. Comparison of two models of surface water control using a soil water model and surface elevation data. *Geoderma*. 89: 149-175.
- Bishop, D. M.; Stevens, M. E. 1964. Landslides on logged areas, southeast Alaska. Res. Rep. NOR-I. U.S. Department of Agriculture, Forest Service.
- Boyer, D. G.; Perry, H. D. 1987. Fecal coliform concentrations in runoff from a grazed, reclaimed surface mine. *Water Resources Bulletin*. 23: 911-917.
- Brown, V. A.; McDonnell, J. J.; Burns, D. A.; Kendall, C. 1999. The role of event water, a rapid shallow flow component, and catchment size in summer stormflow. *Journal of Hydrology*. 217: 171-190.
- Burgess, S. J.; Wigmosta, M. S.; Meena, J. M. 1998. Hydrological effects of land-use change in a zero-order catchment. *Journal of Hydrological Engineering*. 3: 86-97.
- Buttle, J. M.; Peters, D. L. 1997. Inferring hydrological processes in a temperate basin using isotopic and geochemical hydrograph separation: a re-evaluation. *Hydrological Processes*. 11: 557-573.
- Cartron, J. E.; Stoleson, S. H.; Johnson, R. R. 1999. Riparian dependence, biogeographic status, and likelihood of endangerment in landbirds of the Southwest. In: Finch, D. M.; Whitney, J. C.; Kelly, J. F.; Loftin, S. R. *Rio Grande ecosystems: linking land, water and people. Towards a sustainable future for the Middle Rio Grande Basin*; 1988 June 2-5; Albuquerque, NM. Proc. RMRS-P7. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 211-215.
- Chen, C.; Wagenet, R. J. 1992. Simulation of water and chemicals in macropore soils. Part 1. Representation of the equivalent macropore influence and its effect on soilwater flow. *Journal of Hydrology*. 130: 105-126.
- Cleland, David T.; Avers, Peter E.; McNab, W. Henry; Jensen, Mark E.; Bailey, Robert G.; King, Thomas; and Russell, Walter E. published in *Ecosystem Management: Applications for Sustainable Forest and Wildlife Resources*, Boyce, Mark S. and Haney, Alan eds. Yale University Press, New Haven & London. 1997. pp 181-200. <http://econ.usfs.msu.edu/gla/reports/hierarchy.htm>

- Cognard, A. L.; Loumagne, C.; Normand, M.; Oliver, P.; Ottlé, C.; Vidal-Madjar, D.; Louahala, S.; Vidal, A. 1995. Evaluation of the ERS 1/synthetic aperture radar capacity to estimate surface soil moisture: two years results over the Naizin watershed. *Water Resources Research*. 31: 75-982.
- Congressional Research Service. 1995. Report for Congress on international forest agreements. Washington, DC: The Committee for the National Institute for the Environment.
- Committee on Sustainable Water Supplies for the Middle East. 1999. Water for the future: the West Bank and Gaza Strip. Israel, and Jordan. National Academy Press, Washington, DC.
- DeWalle, D. R.; Swistock, B. R.; Sharpe, W. E. 1988. Three-component tracer model for stormflow on a small Appalachian forested catchment. *Journal of Hydrology*. 104: 301-310.
- Dunne, T.; Black, R. D. 1970. Partial area contributions to storm runoff in a small New England watershed. *Water Resources Research*. 6: 1296-1311.
- Eshleman, K. N.; Pollard, J. S.; O'Brien, A. K. 1993. Determination of contributing areas for saturation overland flow from chemical hydrograph separations. *Water Resources Research*. 29: 3577-3587.
- Freeze, R. A. 1974. Streamflow generation. *Rev. Geophys. & Space Phys.* 12: 627-647.
- Fujieda, M.; Kudoh, T.; de Cicco, V.; de Calvarcho, J. L. 1997. Hydrologic processes at two subtropical forest catchments: the Serra do Mar, São Paulo, Brazil. *Journal of Hydrology*. 196: 26-46.
- Fujiwara, K. 1970. A study on the landslides by aerial photographs. *Res. Bull. Exp. Forest Hokkaido University*. 27: 297-345.
- Gage, M.; Black, R. D. 1979. Slope stability and geological investigations at Mangatu State Forest. Tech. Pap. 66. Wellington: New Zealand Forest Service, Forest Research Institute.
- Gardner-Outlaw, Tom; Engelman, Robert. 1997. Sustaining water, easing scarcity: a second update. Washington, DC. Population Action International Population and Environment Program.
- Gelt, Joe. 2000. Watershed management: a concept to meet new needs. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 65-73.
- Gomi, T.; Sidle, R. C.; Bryant, M. D.; Woodsmith, R. D.; Smith, R. 1999. The characteristics of woody debris and sediment accumulation related to timber harvesting in headwater streams of south-east Alaska. In: Proceedings—Skyline logging symposium; Corvallis, OR.
- Gillham, R. W. 1984. The effect of capillary fringe on water-table response. *Journal of Hydrology*. 67: 307-324.
- Gupta, R. P.; Joshi, B. C. 1990. Landslide hazard zoning using the GIS approach—a case study from the Ramganga Catchment, Himalayas. *Engineering Geology*. 28: 119-131.
- Harr, R. D. 1977. Water flux in soil and subsoil on a steep forested slope. *Journal of Hydrology*. 33: 37-58.
- Hewlett, J. D.; Hibbert, A. R. 1967. Factors affecting the response of small watersheds to precipitation in humid areas. In: Sopper, W. E.; Lull, H. W., eds. Proceedings—International symposium on forest hydrology. New York: Pergamon: 275-290.
- Hicks, B. G.; Smith, R. D. 1981. Management of steeplands impacts by landslide hazard zonation and risk evaluation. *Journal of Hydrology*. 20: 63-70.
- Howes, D. E.; Kenk, E. 1988. Terrain classification system for British Columbia. Ministry of Environment. Manual 10. Victoria, BC, Canada: Ministry of Crown Lands.
- Johnson, R. R.; Haight, L. T.; Simpson, J. M. 1977. Endangered species vs. endangered habitats: a concept. In: Johnson, R. R.; Jones, D. A., tech. coords. Importance, preservation and management of riparian habitat: a symposium. Gen. Tech. Rep. RM-43. Fort Collins, CO. U.S. Department of Agriculture Forest Service, Rocky Mountain Forest and Range Experiment Station: 68-79.
- Johnson, R. R.; Haight, L. T.; Simpson, J. M. 1987. Endangered habitats versus endangered species: a management challenge. *Western Birds*. 18(7): 89-96.
- Jones, A. 1971. Soil piping and stream channel initiation. *Water Resources Research*. 7: 602-610.
- Jones, J. A.; Grant, G. E. 1996. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon. *Water Resources Research*. 32: 959-974.
- Kauffman, J. B.; Kreuger, W. C. 1984. Livestock impacts riparian ecosystems and streamside management implications: a review. *Journal of Range Management*. 37: 430-438.

- Kaufmann, M. R.; Graham, R. T.; Boyce, D. A., Jr.; Moir, W. H.; Perry, L.; Reynolds, R. T.; Bassett, R. L.; Melhop, P.; Edminster, C. B.; Block, W. M.; Corn, P. S. 1994. An ecological basis for ecosystem management. Gen. Tech. Rep. RM-246. Fort Collins, CO: U.S. Department of Agriculture, Rocky Mountain Forest and Range Experiment Station.
- Kavvas, M. L. 1999. On the coarse-graining of hydrologic processes with increasing scales. *Journal of Hydrology*. 217: 191-202.
- Keefer, D. K.; Wilson, R. C.; Mark, R. K.; Brabb, E. E.; Brown, W. M.; Ellen, S. D.; Harp, E. L.; Wieczorek, G. F.; Alger, C. S.; Zatkin, R. S. 1987. Real-time landslide warning during heavy rainfall. *Science*. 238: 921-925.
- Kirkby, M. J.; Chorley, R. J. 1967. Throughflow, overland flow and erosion. *Bulletin International Association Science Hydrology*. 12: 5-21.
- Kitahara, H.; Nakai, Y. 1992. Relationship of pipe flow to streamflow on a first order watershed. *Journal Japanese Forest Society*. 74: 318-323.
- Lafren, J. M.; Lane, L. J.; Foster, G. R. 1991. WEPP: a new generation of erosion prediction technology. *Journal of Soil and Water Conservation*. 46(1): 34-38.
- Lisle, T. E. 1982. Effects of aggradation and degradation on riffle-pool morphology in natural gravel channels, northwestern California. *Water Resources Research*. 15: 1643-1651.
- Lyons, J. K.; Beschta, R. L. 1983. Land use, floods, and channel changes: Upper Middle Fork Willamette River, Oregon (1936-1980). *Water Resources Research*. 19: 463-471.
- McDonnell, J. J. 1990. A rationale for old water discharge through macropores in a steep, humid catchment. *Water Resources Research*. 26: 2821-2832.
- McDonnell, J. J.; Freer, J.; Hopper, R.; Kendall, C.; Burns, D.; Beven, K.; Peters, N. 1996. New method developed for studying flow on hillslopes. *EOS Trans American Geophysical Union*. 77: 465, 472.
- Megahan, W. F.; Day, N. F.; Bliss, T. M. 1978. Landslide occurrence in the western and central northern Rocky Mountain physiographic province in Idaho. In: Proceedings 5th North American forest soils conference. Fort Collins: Colorado State University: 115-139.
- Montgomery, D. R.; Dietrich, W. E. 1994. A physically based model for the topographic control on shallow landsliding. *Water Resources Research*. 30: 1153-1171.
- Montgomery, D. R.; Dietrich, W. E.; Torres, R.; Anderson, S. P.; Heffner, J. T.; Loague, K. 1997. Hydrologic response of a steep, unchannelled valley to natural and applied rainfall. *Water Resources Research*. 33: 91-109.
- Moore, I. D.; O'Loughlin, E. M.; Burch, G. J. 1988. A contour based topographic model and its hydrologic and ecological applications. *Earth Surface Proc. and Landforms*. 13: 305-320.
- Murphy, M. L.; Koski, K. V. 1989. Input and depletion of woody debris in Alaska streams and implications for streamside management. *North American Journal Fisheries Management*. 9: 427-436.
- National Research Council. 1996. Upstream, salmon and society in the Pacific Northwest. Washington, DC: National Academy Press. 452 p.
- Noguchi, S.; Tsuboyama, Y.; Sidle, R. C.; Hosoda, I. 1997. Spatially distributed morphological characteristics of macropores in forest soils of Hitachi Ohta experimental watershed, Japan. *Journal of Forest Research*. 2: 207-215.
- Noguchi, S.; Tsuboyama, Y.; Sidle, R. C.; Hosoda, I. 1999. Morphological characteristics of macropores and the distribution of preferential flow pathways in a forested slope segment. *Soil Science Society American Journal*. 63: 1413-1423.
- Nielsen, T. H.; Wright, R. H.; Vlasic, T. C.; Spangle, W. E. 1979. Relative slope stability and land-use planning in the San Francisco Bay region, California. *U.S. Geological Survey Prof. Pap.* 944.
- Ohlander, C. A. 1998. Water resources analyses, Clean Water Act—monitoring and evaluation, Part 7, stream health (T-Walk). Unpublished manuscript file at: U.S. Department of Agriculture, Forest Service, Rocky Mountain Region, Denver, CO.
- O'Loughlin, C. L.; Pearce, A. J. 1976. Influence of Cenozoic geology on mass movement and sediment yield response to forest removal, North Westland, New Zealand. *Bulletin International Association Engineering Geology*. 14: 41-46.
- O'Loughlin, E. M. 1986. Prediction of surface saturation zones in natural catchments by topographic analysis. *Water Resources Research*. 22: 794-804.
- Pearce, A. J.; Stewart, M. K; Sklash, M. G. 1986. Storm runoff generation in humid headwater catchments 1. Where does the water come from? *Water Resources Research*. 22: 1263-1272.
- Prosser, I. P.; Soufi, M. 1998. Controls on gully formation following forest clearing in a humid temperate environment. *Water Resources Research*. 34: 3661-3671.
- Regional Ecosystem Office. 1995. Ecosystem analysis at the watershed scale. Federal Guide for Watershed Analysis. P.O. Box 3623, Portland, OR.

- Rice, R. M.; Corbett, E. S.; Bailey, R. G. 1969. Soil slips related to vegetation, topography, and soil in southern California. *Water Resources Research*. 5: 647-659.
- Rosenlieb, G.; Wagner, J.; Jackson, W. Assessing functionality in riparian-wetland areas. Internet WWW page, at URL: <http://www.nature.nps.gov/wrd/tchisrpt.htm>(last updated March 3, 1998).
- Sample, V. A. 1991. Land stewardship in the next era of conservation. Milford, PA: Grey Towers Press.
- Selby, M. J. 1976. Slope erosion due to extreme rainfall: a case study from New Zealand. *Geografiska Annaler*. 58A: 131-138.
- Shasko, M. J.; Keller, C. P. 1991. Assessing large scale slope stability and failure within a geographic information system. In: Heitand, M.; Shartreid, A., eds. *GIS Applications*. GIS World, Inc.: 267-275.
- Sidle, R. C. 1988. Bedload transport regime of a small forest stream. *Water Resources Research*. 24: 207-218.
- Sidle, R. C. 1991. A conceptual model of changes in root cohesion in response to vegetation management. *Journal of Environmental Quality*. 20: 43-52.
- Sidle, R. C. 2000. Watershed challenges for the 21st Century: a global perspective for mountainous terrain. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 45-56.
- Sidle, R. C.; Amacher, M. C. 1990. Effects of mining, grazing, and roads on sediment and water chemistry in Birch Creek, Nevada. In: Riggins, R. E.; [and others], eds. *Watershed planning and analysis in action*. ASCE symposium proceedings. New York: American Society Civil Engineering: 463-472.
- Sidle, R. C.; Brown, R. W.; Williams, B. D. 1993. Erosion processes on arid minespoil slopes. *Soil Science Society of America Journal*. 57: 1341-1347.
- Sidle, R. C.; Hornbeck, J. W. 1991. Cumulative effects: a broader approach to water quality research. *Journal Soil and Water Conservation*. 46: 268-271.
- Sidle, R. C.; Pearce A. J.; O'Loughlin, C. L. 1985. Hillslope stability and land use. Washington, DC: Water Resources Monograph 11.
- Sidle, R. C.; Sharma, A. 1996. Stream channel changes associated with mining and grazing in the Great Basin. *Journal of Environmental Quality*. 25: 1111-1121.
- Sidle, R. C.; Tsuboyama, Y.; Noguchi, S.; Hosoda, I.; Fujieda, M.; Shimizu, T. 1995. Seasonal hydrologic response at various spatial scales in a small forested catchment, Hitachi Ohta, Japan. *Journal of Hydrology*. 168: 227-250.
- Sidle, R. C.; Tsuboyama, Y.; Noguchi, S.; Hosoda, I.; Fujieda, M.; Shimizu, T. 2000. Stormflow generation in steep forested headwaters: a linked hydrogeomorphic paradigm. *Hydrological Processes*. 14(3):369-385.
- Sinowski, W.; Auerswald, K. 1999. Using relief parameters in a discriminant analysis to stratify geological areas with different spatial variability of soil properties. *Geoderma*. 89: 113-128.
- Sklash, M. G.; Farvolden, R. N. 1979. The role of groundwater in storm runoff. *Journal of Hydrology*. 43: 45-65.
- Sklash, M. G.; Stewart, M. K.; Pearce, A. J. 1986. Storm runoff generation in humid headwater catchments, 2. A case study of hillslope and low-order stream response. *Water Resources Research*. 22: 1273-1282.
- Smith, R. D.; Sidle, R. C.; Porter, P. E. 1993. Effects on bedload transport of experimental removal of woody debris from a forest gravel-bed stream. *Earth Surf. Proc. & Landforms*. 18: 455-468.
- Smith, R. D.; Sidle, R. C.; Porter, P. E.; Noel, J. R. 1993. Effects of experimental removal of woody debris on the channel morphology of a forest, gravel-bed stream. *Journal of Hydrology*. 152: 153-178.
- Starkel, L. 1972. The role of catastrophic rainfall in the shaping of the relief of the lower Himalaya (Darjeeling Hills). *Geogr. Polonica*. 21: 103-147.
- Streeby, L. R. 1971. Buffer strips—considerations in the decision to leave. In: Krygier, J. T.; Hall, J. D., eds. *Forest land uses and stream environment*. Corvallis: Oregon State University: 194-198.
- Swanson, F. J.; Dryness, C. T. 1975. Impact of clearcutting and road construction on soil erosion by landslides in the western Cascades, Oregon. *Geology*. 3: 393-396.
- Thomas, R. B.; Megahan, W. F. 1998. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon: a second opinion. *Water Resources Research*. 34: 3393-3403.
- Thorud, D.B.; Brown, G. W.; Boyle, B. J.; Ryan, C. M. 2000. Watershed management in the United States in the 21st century. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13.

- Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 57-64.
- Towns, E. S. 2000. Resource integration and shared outcomes at the watershed scale. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 74-80.
- Tsuboyama, Y.; Noguchi, S.; Shimizu, T.; Sidle, R. C.; Hosoda, I. 1998. Intrastorm fluctuations of piezometric head and soil temperature within a steep forested hollow. In: Sassa, K., ed. Environmental forest science—proceedings of IUFRO Div. 8 Conference; 1998 October. Dordrecht, The Netherlands: Kluwer Academic Publisher: Forestry Sciences. 54: 475-482.
- Tsuboyama, Y.; Sidle, R. C.; Noguchi, S.; Hosoda, I. 1994. Flow and solute transport through the soil matrix and macropores of a hillslope segment. *Water Resources Research*. 30: 879-890.
- Tsuboyama, Y.; Sidle, R. C.; Noguchi, S.; Murakami, S.; Shimizu, T. 2000. A zero-order basin—its contribution to catchment hydrology and internal hydrological processes. *Hydrologic Processes*. 14(3):387-401.
- Tsukamoto, Y. 1963. Study on the growth of stream channel. *Journal Japanese Society Forestry*. 45: 186-190.
- Tsukamoto, Y.; Ohta, T. 1988. Runoff processes on a steep forested slope. *Journal of Hydrology*. 102: 165-178.
- United Nations. 1995. Statement on criteria and indicators for the conservation and sustainable management of temperate and boreal forests, Santiago, Chile. February 3, 1995. WWW page at: URL: <http://www.fs.fed.us/land/sustain/dev/sd/sfmsd.htm> (last updated June 28, 1999).
- USDA Agricultural Research Service. National Soil Erosion Research Laboratory. Water Erosion Prediction Project (WEPP). Internet WWW page at: URL: <http://topsoil.nserl.purdue.edu/> (last updated May 20, 1999)
- USDA Forest Service. 1986. Terrestrial ecosystem survey handbook. Albuquerque, NM: U.S. Department of Agriculture, Forest Service, Southwestern Region.
- USDA Forest Service, 1993. National hierarchical framework of ecological units. U.S. Department of Agriculture, Forest Service, Washington, DC.
- USDA Forest Service. 1998. Natural resource agenda. Internet WWW page at: URL: <http://www.fs.fed.us/news/agenda/nr30298.html> (last updated Oct. 22, 1998).
- USDA Forest Service. 1999. Committee of scientists report. Internet WWW page at: URL: <http://www.cofo.org/scicom/index.htm> (last updated May 18, 1999).
- USDA Forest Service. Riparian/terrestrial research. Internet WWW page at: URL: <http://www.fs.fed.us/rm/boise/riparian/riparian.htm> (last updated Feb. 01, 1999).
- U.S. Department of Defense, Department of Agriculture, and Department of the Interior. 1998. Albuquerque, NM: Southwest Strategy Coordination Office. Internet WWW page at: URL: <http://www.swstrategy.org/>
- U.S. Environmental Protection Agency. 1997. Environmental monitoring and assessment program, research strategy. Internet WWW page at: URL: <http://www.epa.gov/emap/> (last updated June 23, 1999).
- U.S. Environmental Protection Agency. 1999. Clean water action plan: restoring and protecting America's waters. Internet WWW page at: URL: <http://www.cleanwater.gov/> (last updated Jan. 22, 1999).
- U.S. Environmental Protection Agency. 1999. Surf your watershed. Internet WWW page at: URL: <http://www.epa.gov/surf/why.html> (last updated April 1999).
- Van De Griend, A. A.; Engman, E. 1985. Partial area hydrology and remote sensing. *Journal of Hydrology*. 81: 211-251.
- Verde Natural Resource Conservation District. Verde River Watershed. Internet WWW page at: URL: <http://www.verde.org/> (last updated June 18, 1999).
- Verhoest, N. E. C.; Troch, P. A.; Paniconi, C.; De Troch, F. P. 1998. Mapping basin scale variable source areas from multitemporal remotely sensed observations of soil moisture behavior. *Water Resources Research*. 34: 3235-3244.
- Walling, D. E.; Owens, P. N.; Leeks, J. L. 1999. Fingerprinting suspended sediment sources in the catchment of the River Ouse, Yorkshire, UK. *Hydrological Processes*. 13: 955-975.
- Warren, S. D.; Blackburn, W. H.; Taylor, C. A. 1986. Effects of season and stage of rotation cycle on hydrologic condition of rangeland under intensive rotation grazing. *Journal of Range Management*. 39: 486-491.
- Wigmota, M. S.; Vail, L. W.; Lettenmaier, D. P. 1994. A distributed hydrology-vegetation model

- for complex terrain. *Water Resources Research*. 30: 1665-1679.
- Wolman, M. G.; Miller, J. P. 1960. Magnitude and frequency of forces in geomorphic processes. *Journal of Geology*. 68: 54-74.
- Wright, C.; Mella, A. 1963. Modifications to the soil pattern of south central Chile resulting from seismic and associated phenomena during the period May to August 1960. *Bulletin Seismology Society of America*. 53:1367-1402.
- Wu, W.; Sidle, R. C. 1995. A distributed slope stability model for steep forested hillslopes. *Water Resources Research*. 31: 2097-2110.
- Wu, W.; Sidle, R. C. 1997. Application of a distributed shallow landslide analysis model (dSLAM) to managed forested catchments in coastal Oregon. In: Human Impact on erosion and sedimentation, Proceedings of 5th Sci. Assem. of IAHS, IAHS Publ. 245: 213-221.
- Yasuhara, M; Marui, A. 1994. Groundwater discharge from a clayey hillslope. In: Ohta, T., ed. Proceedings international symposium on forest hydrology. Japan: University of Tokyo: 241-248.

## Case Studies

- Aber, J.; [and others]. 1998. Nitrogen saturation in temperate forest ecosystems: hypotheses revisited. *BioScience*. 48: 921-934.
- Adams, M. B.; Edwards, P. J.; Wood, F.; Kochenderfer, J. N. 1993. Artificial watershed acidification on the Fernow Experimental Forest, USA. *Journal of Hydrology*. 150: 505-519.
- Adams, P. W.; Ringer, J. O. 1994. The effects of timber harvesting & forest roads on water quantity & quality in the Pacific Northwest: summary & annotated bibliography. Corvallis: Oregon State University: Forest Engineering Department.
- Agpaoa, L.; Townsend, L.; Shields, F. D. 1996. Research needs on buffer strips in Taiwan. *Journal of Soil and Water Conservation*. 28(3): 33-42.
- Aguilar, A.; Ezcurra, G. E.; García, T.; Mazari-Hiriart, M.; Pisaty, I. 1995. The Basin of Mexico. In: Kasperson, J. X.; Kasperson, R. E.; Turner, B. L., II, eds. Regions at risk, comparasions of threatened environmentas. Tokio: United Nations University Press: 305-549.
- Alexander, R. R. 1974. Silviculture of subalpine forests in the central and Southern Rocky Mountains: the status of our knowledge. *Res. Pap.* RM-121. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Bailey, S. W.; Hornbeck, J. W.; Driscoll, C. T.; Gaudette, H. E. 1996. Calcium inputs and transport in a base-poor forest ecosystem as interpreted by Sr isotopes. *Water Resources Research*. 32: 707-719.
- Baker, C. O.; Votapka, F. E. 1990. Fish passage through culverts. Rep. FHWA-FL-90-006. Washington, DC: U.S. Department of Transportation, Federal Highway Administration.
- Baker, M. B., Jr. 1975. Modeling management of ponderosa pine forest resources. In: Proceedings of the 1975 watershed management symposium; August 11-13; Logan, UT. American Society of Civil Engineers, Irrigation and Drainage Division: 478-493.
- Baker, M. B., Jr., comp. 1999. History of watershed research in the central Arizona Highlands. Gen. Tech. Rep. RMRS-GTR-29. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Baker, M. B., Jr.; Ffolliott, P. F. 1998. Multiple resource evaluations on the Beaver Creek watershed: An annotated bibliography (1956-1996). Gen. Tech. Rep., RMRS-GTR-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Baker, M. B., Jr.; Ffolliott, P. F. 2000. Contributions of watershed management research to ecosystem-based management in the Colorado River Basin. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 117-128.
- Baker, M. B., Jr.; Medina, A. L. 1997. Fisheries and stream restoration in the Southwest: a critical review. In: Warwick, J. J., ed. Proceedings of the AWRA annual symposium, water resources education, training, and practice: opportunities for the next century. TPS-97-1. Hendon, VA: American Water Resources Association: 407-415.
- Baker, T. T.; Van Lear, D.H. 1998. Relations between diversity of rhododendron thickets and diversity of riparian forest. *Forest Ecology Management*. 109: 21-32.
- Baskin, Y. 1997. Center seeks synthesis to make ecology more useful. *Science*. 275: 310-311.

- Bates, C. G.; Henry, A. J. 1928. Forest and streamflow experiment at Wagon Wheel Gap, Colorado. Supplement 30. Washington, DC: U.S. Weather Service.
- Beschta, R. L. 2000. Watershed management in the Pacific Northwest: the historical legacy. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 109-116.
- Blinn, C. R; Dahlman, R.; Hislop, L.; Thomps, M. A. 1998. Temporary stream and wetland crossing options for forest management. Gen. Tech. Rep. NC-202. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station.
- Bojorquez-Tapia, L. A.; Ffolliott, P. F.; Guertin, D. P. 1990. Multiple-resource modeling as a tool for conservation: Its applicability in Mexico. *Environmental Management*. 14: 317-324.
- Bojorquez-Tapia, L. A.; Ezcurra, E.; Mazari-Hiriart, M.; Diaz, S.; Gomez, P.; Alcantar, G.; Megarejo, D. 2000. Contributions of watershed management research to ecosystem-based management in the Colorado River Basin. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 129-137.
- Bormann, F. H.; Likens, G. E. 1979. Pattern and process in a forested ecosystem. New York: Springer-Verlag.
- Bosch, J. M.; Hewlett, J. D. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. *Journal of Hydrology*. 55: 3-23.
- Briggs, R. D.; Cormier, J.; Kimball, A. 1998. Compliance with forestry best management practices in Maine. *Northern Journal of Applied Forestry*. 15: 57-68.
- Brooks, K. N. 1998. Sustainable watershed management in Asia vulnerable to natural disasters: challenges for the 21st Century. In: Proceedings of international seminar on watershed conservation and sustainable management. Taichung, Taiwan: 1-13.
- Brown, H. E.; Baker, M. B., Jr.; Rogers, J. J.; Clary, W. P.; Kovner, J. L.; Larson, F. R.; Avery, C. C.; Campbell, R. E. 1974. Opportunities for increasing water yields and other multiple use values on ponderosa pine forest lands. Res. Pap. RM-129. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Brown, M. T.; McClanahan, T. R. 1996. Energy analysis perspectives of Thailand and Mekong River dam proposals. *Ecological Modeling*. 91(1-3): 105-130.
- Brown, M. T.; Ulgiati, S. 1997. Energy based indices and ratios to evaluate sustainability: monitoring technology and economics toward environmentally sound innovation. *Ecological Engineering*. 9: 51-69.
- Brown, T. C.; Daniel, T. C. 1984. Modeling forest scenic beauty: concepts and application to ponderosa pine. Res. Pap. RM-256. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Campbell, R. E.; Baker, M. B., Jr.; Ffolliott, P. F.; Larson, F. R.; Avery, C. C. 1977. Wildlife effects on a ponderosa pine ecosystem: an Arizona case study. Res. Pap. RM-191. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Chandra, S.; Bhatia, K. K. S. 2000. Water and watershed management in India: policy issues and priority areas for future research. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 158-165.
- Charles, D. F. 1991. Acidic deposition and aquatic ecosystems: regional case studies. Springer-Verlag.
- Cheng, J. D.; Hsu, H. K.; Ho, Way Jane; Chen, T. C. 2000. Watershed management for disaster mitigation and sustainable development in Taiwan. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 138-148.
- Cheng, J. D.; Wu, H. L.; Chen, L. J. 1997. A comprehensive debris flow hazard mitigation program in Taiwan. In: Chen, C., ed. Debris-flow hazards

- mitigation: mechanics, prediction, and assessment. Proceedings first international conference. New York: American Society of Civil Engineers: 93-102.
- Chuang, L-H; Liao, M-C; Wu, H. L. 1992. The role of soil and water conservation technical assistance in sustainable agriculture—the United States and Taiwan experiences: Proceeding of 7th ISCO (International Soil Conservation Organization) Symposium.
- Clary, W. P.; Baker, M. B., Jr.; O'Connell, P. F.; Johnsen, T. N., Jr.; Campbell, R. E. 1974. Effects of pinyon-juniper removal on natural resource products and uses in Arizona. Res. Pap. RM-128. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Cooperrider, C. K.; Hendricks, B. A. 1937. Soil erosion and stream flow on range and forest lands of the Upper Rio Grande watershed in relation to land resources and human welfare. Tech. Bull. 567. Washington, DC: U.S. Department of Agriculture, Forest Service.
- Committee of Scientists. 1999. Sustaining the people's lands: recommendations for stewardship of the national forests and grasslands into the next century. Washington DC: U.S. Department of Agriculture.
- Cordell, H. K.; Bliss, J. C.; Johnson, C. Y.; Fly, M. 1998. Voices from the South. Transactions 63rd North American Wildl. and Natur. Resource Conference: 332-347.
- Cordell, H. K.; Teasley, R. J.; Bergstrom, J. 1996. CUSTOMER: Wine Spring Creek watershed. Final Rep. Athens, GA: Southeastern Forest Experiment Station.
- Council of Agriculture (COA), Soil and Water Conservation Bureau and Chinese Soil and Water Conservation Society. 1992. Soil conservation handbook. Taiwan [in Chinese].
- Crossley, D. A., Jr.; Lamoncha, K. L. [In Press]. Response of forest soil microarthropods to a forest regeneration burn at Wine Springs (Southern Appalachians). In: Proceedings first biennial North American forest ecology workshop; 1997 June 24-26; Raleigh, NC.
- Day, F. P., Jr.; Monk, C.D. 1977. Net primary production and phenology on a Southern Appalachian watershed. American Journal of Botany. 64: 1117-1125.
- Dils, D. E. 1964. Watershed conditions problems and research needs in Taiwan. Forest Services No. 8, JCRR.
- Dils, D. E. 1977. A reassessment of watershed conditions problems and research needs in Taiwan. Journal Chinese Soil and Water Conservation. 8(1): 43-57.
- Dils, R. E. 1956. Watershed management research needs in the forests of the Lake States: a problem analysis. [Carbon copy]. Grand Rapids, MN.
- Dils, R. E. 1960. Status of college instruction in forest influences and watershed management. Journal of Forestry. 52(10): 727-729.
- Doherty, S. J.; Scatena, F. N.; Odum, H. T. 1997. Emergy evaluation of the Luquillo Experimental Forest and Puerto Rico. Final report to International Institute of Tropical Forestry, Rio Piedras, Puerto Rico.
- Douglass, J. E.; Swank, W. T. 1972. Streamflow modification through management of eastern forests. Res. Pap. SE-94. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station.
- Douglass, J. E.; Swank, W. T. 1976. Multiple use in southern Appalachian hardwoods—a ten year case history. In: Proceedings of the 16th International Union of Forestry Research Organization's World Congress; 1976; Oslo, Norway. Vienna, Austria: IUFRO Secretariat: 425-436.
- Downs, T. J.; Mazari-Hiriart, M.; Domínguez-Mora, R.; I.H. Suffet, I. H. [In press]. Least-cost policies for meeting Mexico City's future water demand are sustainable. Water Resources Research.
- Driscoll, C. T.; Likens, G. E.; Hedin, L. O.; Eaton, J. S.; Bormann, F. H. 1989. Changes in the chemistry of surface waters. Environmental Science and Technology. 23: 137-143.
- Drury, D. 1998. Baseline hydrochemical study of the Azraq Basin. In: Dutton, R. W; Clarke, J. I.; Battikhi, A., eds. Arid land resources and their management: Jordan's desert margin. London: Kegan Paul International: 81-85.
- Eagan, A. F.; Whipkey, R. D.; Rowe, J. P. 1998. Compliance with forestry best management practices in West Virginia. Northern Journal of Applied Forestry. 15: 211-215.
- Ecological Applications. 1996. Forum: perspectives on ecosystem management. 6: 692-745.
- Edwards, P. E.; Helvey, J. D. 1991. Long-term ionic increases from a central Appalachian forested watershed. Journal of Environmental Quality. 20: 250-255.
- Elliott, K. J.; Hendrick, R. L.; Major, A. E.; Vose, J. M.; Swank, W. T. 1999. Vegetation dynamics after a prescribed fire in the southern Appalachians. Forest Ecology Management. 114: 215-226.

- Eu, H. H. T. 1986. An overview of environmental conservation and engineering projects in the Republic of China. Industry of Free China. April: 11-23.
- Ezcurra, E.; Mazari-Hiriart, M. 1996. Are megacities viable? A cautionary tale from Mexico City. *Environment*: 8-35.
- Federer, C. A.; Hornbeck, J. W.; Tritton, L. M.; Hornbeck, J. W.; Pierce, R. S. 1989. Long-term depletion of calcium and other nutrients in eastern US forests. *Environmental Management*. 13: 593-601.
- Ffolliott, P. F. 1985. Application of multiple-resource modeling in watershed management. Working paper for the International Center for Integrated Mountain Development, Kathmandu, Nepal.
- Ffolliott, P. F. 1990. Small game habitat use in Southwestern ponderosa pine forests. In: Krausman, P. R.; Smith, N., eds. *Managing wildlife in the Southwest: proceedings of the symposium*. Phoenix, AZ: Arizona Chapter of the Wildlife. p. 107-117
- Ffolliott, P. F.; Baker, M. B., Jr. 1977. Characteristics of Arizona ponderosa pine stands on sandstone soils. Gen. Tech. Rep. RM-44. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Ffolliott, P. F.; Guertin, D. P. 1988. YIELD II: An interactive computer model to simulate water yield in Southwestern ecosystems. In: *Proceedings of the 1988 international symposium on modeling agriculture, forest, and rangeland hydrology*. Chicago: American Society of Agricultural Engineers: 72-78.
- Ffolliott, P. F.; Guertin, D. P. 1990. Prescribed fire in Arizona ponderosa pine forests: a 24-year case study. In: Krammes, J. S., tech. coord. *Effects of fire management of Southwestern natural resources*. Gen. Tech. Rep. RM-191. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 250-254.
- Ffolliott, P. F.; Thorud, D. B. 1975. Water yield improvement by vegetation management: Focus on Arizona. USDC National Technical Information Service Rep. UA/SRNR-75/01, PB 246 055.
- Flebbe, P. A. 1999. Trout use of woody debris and habitat in Wine Spring Creek, North Carolina. *Forest Ecology Management*. 114: 367-376.
- Ford, W. M; Menzel, M. A.; McGill, D. W.; Laerm, J.; McCay, T. S. 1999. Effects of a community restoration fire on small mammals and herpetofauna in the southern Appalachians. *Forest Ecology Management*. 114: 233-243.
- Franklin, J. F. 1989. Importance and justification of long-term studies in ecology. In: *Long-term studies in ecology: approaches and alternatives*. New York: Springer-Verlag: 3-19.
- Gary, H. L. 1975. Watershed management problems and opportunities for the Colorado Front Range ponderosa pine zone: the status of our knowledge. Res. Pap. RM-139. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Gentry, J. B.; Odum, E. P.; Mason, M.; Nabholz, V.; Marshall, S.; McGinnis, J. T. 1968. Effect of altitude and forest manipulation on relative abundance of small mammals. *Journal of Mammalogy*. 49: 539-541.
- Goodrich, D. C.; Simanton, J. R. 1995. Water research and management in semiarid environments. *Journal of Soil and Water Conservation*. 50: 416-419.
- Goodrich, D. C.; Starks, P. J.; Schnabel, R. R.; Bosch, D. D. 1994. Effective use of USDA-ARS experimental watershed. In: Richardson, C. W.; Rango, A.; Owens, L. B.; Lane, L. J., eds. *ARS conference on hydrology*. Publ. 1994-5. U.S. Department of Agriculture, Agricultural Research Service: 35-46.
- Grigal, D. F.; Bates, P. C. 1992. Forest soils. a technical paper for a generic environmental impact statement on timber harvesting and forest management in Minnesota. Tarrytown, NY: Jaakko Pyry Consulting, Inc.
- Gunderson, L. H. 1992. Spatial and temporal dynamics in the Everglades ecosystem with implications for water deliveries to Everglades National Park. University of Florida, Gainesville. Thesis.
- Harding, J. S.; Benfield, E. F.; Bolstad, P. V.; Helfman, G. S.; Jones, E. B. D., III. 1998. Stream biodiversity: the ghost of land use past. *Proceedings of the National Academy of Science, U.S.A.* 95: 14843-14847.
- Helvey, J. D.; Kochenderfer, J. N. 1988. Culvert sizes needed for small drainage areas in central Appalachians. *Northern Journal of Applied Forestry*. 5: 123-127.
- Hewlett, J. D.; Douglass, J. E. 1968. Blending forest uses. Res. Pap. SE-37 Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station.
- Hibbert, A. R. 1979. Managing vegetation to increase flow in the Colorado River Basin. Gen. Tech. Rep. RM-66. Fort Collins, Co: U.S.

- Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Hibbert, A. R.; Davis, E. A.; Scholl, D. G. 1974. Chaparral conversion potential in Arizona. Part I: water yield response and effects on other resources. Res. Pap. RM-126. Fort Collins, Co: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, 36 p.
- Hornbeck, J. W.; Adams, M. B.; Corbett, E. S.; Verry, E. S.; Lynch, J. A. 1993. Long-term impacts of forest treatments on water yield: a summary for northeastern USA. *Journal of Hydrology*. 150: 323-344.
- Hornbeck, J. W.; Martin, C. W.; Eagar, C. 1997. Summary of water yield experiments at Hubbard Brook Experimental Forest, New Hampshire. *Canadian Journal of Forest Research*. 27: 2043-2052.
- Hornbeck, J. W.; Martin, C. W.; Pierce, R. S.; Bormann, F. H.; Likens, G. E.; Eaton, J. S. 1987. The northern hardwood forest ecosystem: ten years of recovery from clearcutting. Res. Pap. NE-596. Broomall, PA. U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station.
- Hornbeck, J. W.; Martin, C. W.; Smith, C. T. 1986. Protecting forest streams during whole-tree harvesting. *Northern Journal of Applied Forestry*. 3: 97-100.
- Hornbeck, J. W.; Swank, W. T. 1992. Watershed ecosystem analysis as a basis for multiple-use management of eastern forests. *Ecological Applications*. 2: 238-247.
- Horton, J. S.; Campbell, C. J. 1974. Management of phreatophyte and riparian vegetation for maximum multiple use values. Res. Pap. RM-117. Fort Collins, Co: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Howington, T. 1999. A spatial analysis of emergy of an internationally shared drainage basin and the implications for policy decisions. University of Florida, Gainesville. Dissertation.
- Hsia Y. J.; Koh, C. C. 1982. Water yield resulting from clearcutting a small hardwood basin in central Taiwan. IAHS Publ. 140: 215-220.
- Irrigation Commission. 1972. Report of the Irrigation Commission. Volume I.
- Johnson, R. S.; Tew, R. K.; Doty, R. D. 1969. Soil moisture depletion and estimated evapotranspiration on Utah mountain watersheds. Res. Pap. INT-67. Fort Collins, Co: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Kessler, W. V.; Salwasser, H.; Cartwright, C. W., Jr.; Caplan, J. A. 1992. New perspectives for sustainable natural resources management. *Eco-logical Applications*. 2: 221-225.
- Knox, J. C. 1971. Valley alluviation in southwestern Wisconsin. *Annals of the Association of American Geographers*. 62(3): 401-410.
- Knox, J. C. 1987. Historical valley floor sedimentation in the Upper Mississippi valley. *Annals of the Association of American Geographers*. 77(2): 224-244.
- Knox, J. C. 1989. Long- and short-term episodic storage and removal of sediment in watersheds of southwestern Wisconsin and northwestern Illinois. In: *Sediment and the Environment*. IASH Publ. 184: 157-164.
- Kochenderfer, J. N. 1970. Erosion control on logging roads in the Appalachians. Res. Pap. NE-158. Upper Darby, PA. U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station.
- Kochenderfer, J. N. 1995. Using open-top pipe culverts to control surface water on steep road grades. Gen. Tech. Rep. NE-194. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station.
- Kochenderfer, J. N.; Edwards, P. E.; Wood, F. 1997. Hydrologic impacts of logging an Appalachian watershed using West Virginia's best management practices. *Northern Journal of Applied Forestry*. 14: 207-218.
- Kochenderfer, J. N.; Helvey, J. D. 1987. Using gravel to reduce soil losses from minimum-standard forest roads. *Journal of Soil and Water Conservation*. 42: 46-50.
- Kochenderfer, J. N.; Hornbeck, J. W. 1999. Contrasting timber harvesting operations illustrate the value of BMPs. In: Stringer, J. W.; Loftis, D. L., eds. *Proceedings 12th central hardwood forest conference; 1999 February 28-March 2; Lexington, KY*:128-136.
- Kochenderfer, J. N.; Wendel, G. W.; Kidd, Jr., W. E. [Undated]. Managing your woodlot using minimum standard roads. Morgantown: West Virginia University Cooperative Extension Service.
- Koh, C. C.; Cheng, J. D.; Liu, V. T. 1988. Green mountains yield clean and steady water protection forests for water regulation and erosion control in Taiwan. *International Water Resources Association*. 3: 425-432.
- Laerm, J.; Menzel, M. A.; Wolf, D. J.; Hicks, N. G. [In press]. Role of riparian zones in structuring

- small mammal communities in the Southern Appalachians. In: Proceedings first biennal North American forest ecology workshop; 1997 June 24-26, Raleigh, NC.
- Larson, F. R. 1975. Simulating growth and management of ponderosa pine stands. In: Meadows, J.; Bare, B.; Ware, K; Row, C., eds. Systems analysis and forest resources. Bethesda, MD: Society of American Foresters: 211-221.
- Larson, F. R.; Ffolliott, P. F.; Clary, W. P. 1986. Managing wildlife habitat: In Southwestern ponderosa pine forests, diverse treatments. *Journal of Forestry*. 84: 40-41.
- Larson, F. R.; Ffolliott, P. F.; Rasmussen, W. O.; Carder, D. R. 1979. Estimating impacts of silvicultural management practices on forest ecosystems. In: Best management practices for agriculture and silviculture: proceedings of the 1978 Cornell agriculture waste management conference: 281-294.
- Lawrence, G. B.; Huntington, T. G. 1999. Soil calcium depletion linked to acid rain and forest growth in the Eastern United States. Denver, CO: Geological Survey Bull. WRIR-4267. U.S. Department of the Interior.
- Leaf, C. F. 1975. Watershed management in the Rocky Mountain subalpine zone: the status of our knowledge. Res. Pap. RM-137. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Leopold, A. 1949. A Sand County Almanac. Oxford University Press.
- Leopold, L. B. 1994. A view of the river. Cambridge: Harvard University Press.
- Li, R. M.; Simons, D. B.; Carder, D. R. 1976. Mathematical modeling of overland flow soil erosion. In: Natural soil erosion conference: prediction and control; May 25-26. Special Publ. 21. Soil Conservation Society of America.
- Likens, G. E.; [and others]. 1998. The biogeochemistry of calcium at Hubbard Brook. *Biogeochemistry*. 41: 89-173.
- Likens, G. E.; Bormann, F. H. 1995. Biogeochemistry of a forested ecosystem. New York: Springer-Verlag.
- Likens, G. E.; Bormann, F. H.; Johnson, N. M.; Fisher, D. W.; Pierce, R. S. 1970. Effects of forest cutting and herbicidal treatment on nutrient budgets in the Hubbard Brook watershed-ecosystem. *Ecological Monographs*. 40: 23-47.
- Liu, C. P.; Sheu, B. H. 1997. The chemistry of precipitation and throughfall of three forest stands in central Taiwan. *Taiwan Journal Forest Science*. 12(4): 379-386.
- Lopes, V. L.; Ffolliott, P. F.; Gottfried, G. J.; Baker, M. B., Jr. 1996. Sediment rating curves for pinyon-juniper watersheds in northern Arizona. *Hydrology and Water Resources in Arizona and the Southwest*. 26: 27-33.
- Lu, Shiang-Yue. 1994. Forest harvesting effects on streamflow and flood frequency in the northern Lake States. St. Paul: University of Minnesota. Thesis.
- Lynch, J. A.; Corbett, E. S. 1990. Evaluation of best management practices for controlling nonpoint pollution from silvicultural operations. *Water Resources Bulletin*. 26: 41-52.
- Lynch, J. A.; Corbett, E. S.; Sopper, W. E. 1980. Impact of forest cover removal on water quality. Res. Pap. 23-604. University Park: Pennsylvania State University Institute for Research on Land and Water Resources.
- Marsh, G. P. 1864. Man and nature or physical geography as modified by human action. Lowenthal, D., ed. Cambridge, MA: Harvard University Press.
- Martin, C. W.; Hornbeck, J. W. 1994. Logging in New England need not cause sedimentation of streams. *Northern Journal of Applied Forestry*. 11: 17-23.
- Martin, C. W.; Noel, D. S.; Federer, C. A. 1984. Effects of forest clearcutting in New England on stream chemistry. *Journal of Environmental Quality*. 13: 204-210.
- Martinelli, M., Jr. 1975. Water-yield improvement from alpine areas: The status of our knowledge. Res. Pap. RM-138. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Mazari-Hiriart, M.; Mackay, D. M. 1993. Potential for groundwater contamination in Mexico City. *Environmental Science and Technology*. 27: 794-801.
- McNab, W. H.; Browning, S. A.; Simon, S. A.; Fouts, P. E. 1999. An unconventional approach to ecosystem unit classification in western North Carolina, USA. *Forest Ecology Management*. 114: 405-420.
- Medina, A. L. 1996. Native aquatic plants and ecological condition of Southwestern wetlands and riparian areas. In: Shaw, D. W.; Finch, D. M., tech. coords. 1996. Desired future conditions for Southwestern ecosystems: bringing interests and concerns together. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.

- Meehan, W. R. 1991. Influences of forest and range-land management on salmonid fishes and their habitats. Bethesda, MD: American Fisheries Society.
- Megahan, W. F. 1972. Logging, erosion, sedimentation—are they dirty words? *Journal of Forestry*. 70: 403-407.
- Meyer, J. L.; Swank, W. T. 1996. Ecosystem management challenges ecologists. *Ecological Applications*. 6(3): 738-740.
- MNDNR [Minnesota Department of Natural Resources]. 1989. Water quality in forest management: "best management practices in Minnesota." St. Paul, MN.
- MNDNR [Minnesota Department of Natural Resources]. 1995. Protecting water quality and wetlands in forest management: best management practices in Minnesota. St. Paul, MN.
- Minnesota Forest Resource Council. 1999. Sustaining Minnesota forest resources: voluntary site-level forest management guidelines for land-owners, loggers, and resource managers. St. Paul, MN.
- Munson, R. K.; Gherini, S. A. 1991. Processes influencing the acid-base chemistry of surface waters. In: Acidic deposition and aquatic ecosystems: regional case studies. New York: Springer-Verlag: 35-64.
- National Research Council. 1992. Restoration of aquatic ecosystems; science, technology, and public policy. Washington, DC: Committee on the Restoration of Aquatic Ecosystems-Science, Technology, and Public Policy, National Academy of Science.
- National Research Council. 1995. Wetlands: characteristics and boundaries. Washington, DC: Committee on the Characterization of Wetlands, National Academy of Science.
- National Research Council. 1996. Upstream: salmon and society in the Pacific Northwest. Washington, DC: Committee on the Protection and Management of Pacific Northwest Anadromous Salmonids, National Academy of Science.
- Noble, P. 1998. Quantification of recharge to the Azraq Basin. In: Dutton, R. W.; Clarke, J. I.; Battikhi, A., eds. Arid land resources and their management: Jordan's desert margin. London: Kegan Paul International: 103-109.
- Noel, D. S.; Martin, C. W.; Federer, C. A. 1986. Effects of forest clearcutting in New England on stream macroinvertebrates and periphyton. *Environmental Management*. 10: 661-670.
- NRCS. 1998. Erosion and sedimentation in the Nemadji river basin, final report. Natural Resources Conservation Service and U.S. Forest Service. Duluth, MN.
- O'Connell, P. F. 1971. Economic modeling in natural resource planning. *Arizona Watershed Symposium*. 14: 31-38.
- Odum, H. T. 1996. Environmental accounting: energy and environmental decision making. New York: John Wiley and Sons.
- Odum, H. T.; Odum, E. C. 1980. Energy systems of New Zealand and the use of embodied energy for evaluating benefits of international trade. *Proceedings of energy modelling symposium; 1979 November. Tech. Publ. 7. Wellington, NZ: New Zealand Ministry of Energy*.
- Odum, H. T.; Brown, M. T.; Christianson, R. A. 1986. Energy systems overview of the Amazon basin. Report to the Cousteau Society. Center for Wetlands, University of Florida.
- Odum, H. T.; Diamond, C.; Brown, M. 1987. Energy systems overview of the Mississippi River Basin. Center for Wetlands 87-1. University of Florida.
- Ontko, G. 1993. Thunder over the Ochoco: volume I, the gathering storm. Bend, OR: Maverick Publications.
- Parr, M. W. 1992. Long-term vegetation response to thinning in a southern Appalachian cove. Athens: University of Georgia. Thesis.
- Patric, J. H. 1980. Effects of wood products harvest on forest soil and water relations. *Journal of Environmental Quality*. 9: 73-80.
- Patric, J. H.; Reinhart, K. G. 1971. Hydrologic effects of deforesting two mountain watersheds in West Virginia. *Water Resources Research*. 7: 1182-1188.
- Phillips, M. J.; Swift, L. W., Jr.; Blinn, C. R. 1999 . Best management practices for riparian areas. In: Verry, E. S.; Hornbeck, J. W.; Dolloff, C. A., eds. Riparian management for forests in the Continental Eastern United States. Boca Raton, FL: Lewis Publishers: 271-284.
- Pollack, H. N.; Hurter, S. J.; Johnson, J. R. 1991. A new global heat flow compilation. Ann Arbor: University of Michigan, Department of Geological Sciences.
- Ponce, S. L. 1979. Formal education in wildland hydrology and watershed management in North America. *Water Resources Bulletin*. 15(2): 530-535.
- Rao, A. N.; Kathuria, K. K. 1992. National water resources policy—future development needs. In: Proceedings of the seminar on irrigation water management; 1993 March; Delhi. Volume I: 52-64.
- Rao, K. L. 1981. Water world. Volume III.

- Renard, K. G.; Lane, L. J.; Simanton, J. R.; Emmerich, W. E.; Stone, J. J.; Yakowitz, D. S. 1993. Agricultural impacts in an arid environment: Walnut Gulch case study. *Hydrological Science and Technology*. 9: 145-190.
- Rich, L. R. 1961. Surface runoff and erosion in the lower chaparral zone—Arizona. Station Pap. No. 66. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 15 p.
- Rich, L. R.; Thompson, J. R. 1974. Watershed management in Arizona's mixed conifer forests: the status of our knowledge. Res. Pap. RM-130. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Rogers, J. J. 1973. Design of a system for predicting effects of vegetation manipulation on water yield in the Salt-Verde Basin. Tucson: University of Arizona. Dissertation.
- Rogers, J. J.; Prosser, J. M.; Garrett, L. D. 1982. ECOSIM: A prototype system for estimating multiresource outputs under alternative forest management regimes. In: Corcoran, T.; Heij, W., eds. Proceedings IVII IUFRO World Congress: working party planning and control of forest operations S3.04.01; 1981 September 6-17; Kyoto, Japan. Misc. Rep. 264. Orono: University of Maine, Life Science and Agricultural Experiment Station: 122-127.
- Romitelli, M. S., 1997. Energy analysis of watersheds. Gainesville: University of Florida. 292 p. Dissertation.
- Romitelli, M. S.; Odum, H. T. 1996. Energy analysis of Coweeta River basin, NC. Final report to the U.S. Department of Agriculture, Coweeta Hydrologic Laboratory, Otto, NC.
- Rosgen, D. 1996. Applied river morphology. Pagosa Springs, CO: Wildland Hydrology.
- Rothrock, J. T. 1902. Statement of work done by the Pennsylvania Department of Forestry during 1901 and 1902. Chapter VIII. The black willow (*Salix nigra*, Marsh.) as a protector of river banks. Wm. Stanely Ray, State Printer of Pennsylvania: 136-137.
- Rustad, L. E.; Fernandez, I. J.; David, M. B.; Mitchell, M. J.; Nadelhoffer, K. J.; Fuller, R. B. 1996. Experimental soil acidification and recovery at the Bear Brook watershed in Maine. *Soil Science Society of America Journal*. 60: 1933-1943.
- Sanders, W. T.; Parsons, J. R.; Santley, R. S. The basin of Mexico, ecological processes in the evolution of a civilization. New York: Academic Press.
- Schaberg, R. H.; Holmes, T. P.; Lee, K. J.; Abt, R. C. 1999. Abscribing value to ecological processes: an economic view of environmental change. *Forest Ecology Management*. 114: 329-338.
- Schneider, W. J.; Ayer, G. R. 1961. Effect of reforestation on streamflow in central New York. Water Supply Pap. 1602. Washington, DC: United States Geological Survey.
- Schubert, G. H. 1974. Silviculture of Southwestern ponderosa pine: the status of our knowledge. Res. Pap. RM-123. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Shahbaz, M.; Sunna, B. 2000. Integrated studies of the Azraq Basin in Jordan. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 149-157.
- Sheffield, R. M.; Dickson, J. G. 1998. The South's forestland—on the hotseat to provide more. *Transactions 63rd North American Wildl. and Natur. Resource Conference*: 316-331.
- Shortle, W. C.; Smith, K. T. 1988. Aluminum-induced calcium deficiency syndrome in declining red spruce. *Science*. 240: 1017-1018.
- Sopper, W. E.; Lull, H. W. 1965. International symposium on forest hydrology. New York: Pergamon Press.
- Southern Appalachian Man and the Biosphere (SAMAB). 1996. The southern Appalachian assessment summary report. Rep. 1 of 5. Atlanta, GA: U.S. Department of Agriculture, Forest Service, Southern Region.
- Stouder, D. J.; Bisson, P. A.; Naiman, R. J., eds. 1997. Pacific salmon and their ecosystems: status and future options. New York: Chapman & Hall.
- Sturges, D. L. 1975. Hydrologic relations on undisturbed and converted big sagebrush lands: the status of our knowledge. Res. Pap. RM-140. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Sun, G.; McNulty, S. G. 1998. Modeling soil erosion and transport on forest landscape. In: *Winning solutions for risky problems: proceedings of conference 29. International Erosion Control Association*: 187-198.
- Sun, G.; McNulty, S. G.; Swift, L. W., Jr.; Boggs, J. [In press]. Risk assessment of sediment contribution to streams due to forest management

- using a GIS-based simulation model. Pap. 995050. 1999 ASAE annual international meeting; Toronto, Ontario, Canada.
- Swank, W. T. 1995. Current issues facing foresters in parts of North America. In: Brown, I. R. ed. Forests and water: proceedings of a discussion meeting; 1994 March 25-27; Edinburgh, Scotland. Institute of Chartered Foresters: 129-148.
- Swank, W. T. 1998. Multiple use forest management in a catchment context. In: Cresser, M.; Pugh, K., eds. Proceedings of an international conference: multiple land use and catchment management. Aberdeen, Scotland, UK: The Macaulay Land Use Research Institute: 27-37.
- Swank, W.T.; McNulty, S. G.; Swift, L. W., Jr. 1994. Opportunities for forest hydrology applications to ecosystem management. In: Ohta, T.; Fukushima, Y.; Suzuki, M., eds. Proceedings of the international symposium on forest hydrology; 1994 October 24-28; Tokyo, Japan: 19-29.
- Swank, W. T.; Swift, L. W., Jr.; Douglass, J. E. 1988. Streamflow changes associated with forest cutting, species conversions, and natural disturbances. In: Swank, W. T.; Crossley, D. A., eds. Forest hydrology and ecology at Coweeta. New York: Springer-Verlag: 297-312.
- Swank, W. T.; Tilley, D. R. 2000. Watershed management contributions to land stewardship: Case studies in the Southeast. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 93-108.
- Swank, W.T.; Van Lear, D. H. 1992. Multiple-use management: ecosystem perspectives of multiple-use management. Ecological Applications. 2: 219-220.
- Swift, L. W. Cunningham, G. B.; Douglass, J. E. 1988. Climatology and hydrology. In: Swank, W. T.; Crossley, D. A., Jr., eds. Forest hydrology and ecology at Coweeta. New York: Springer-Verlag. Ecological Studies: 35-55.
- Tabler, R. D. 1975. Estimating the transport and evaporation of blowing snow. In: Snow management on Great Plains symposium proceedings, 1975 July; Bismarck, ND.,Great Plains Agriculture Council Publication 73.
- Thomas, J. W. 1996. Forest Service perspective on ecosystem management. Ecological Applications. 6: 703-705.
- Tilley, D. R. 1999. Emergy basis of forest systems. Gainesville: University of Florida, Gainesville. Dissertation.
- Tramer, E. J. 1969. Bird species diversity: components of Shannon's formula. Ecology. 50: 927-929.
- Tramer, E. J. 1994. Breeding bird consensus at Coweeta Hydrologic Laboratory: a comparison of 1967 and 1993. Coweeta Historical Files. 1.5.
- Trimble, S. W. 1977. The fallacy of stream equilibrium in contemporary denudation studies. American Journal of Science. 277: 876-887.
- Trimble, S. W. 1983. A sediment budget for Coon Creek basin in the driftless area, Wisconsin, 1853-1977. American Journal of Science. 283: 454-474.
- Trimble, S. W. 1993. The distributed sediment budget model and watershed management in the Paleozoic plateau of the upper Midwestern United States. Physical Geography .14(3): 285-303.
- Trimble, S. W.; Lund, S. W. 1982. Soil conservation and the reduction of erosion and sedimentation in the Coon Creek basin, Wisconsin: a study of changes in erosion and sedimentation after the introduction of soil-conservation measures. Geological Survey Professional Pap. 1234. Washington, DC: United States Government Printing Office.
- Troendle, C. A.; Kaufmann, M. R.; Hamre, R. H.; and Winokur, R. P., tech. coords. 1987. Management of subalpine forests: building on 50 years of research. Gen. Tech. Rep. RM-149. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Troendle, C. A.; King, R. M. 1985. The effect of timber harvest on the Fool Creek Watershed, 30 years later. Water Resources Research. 21: 1915-1922.
- Velbel, M. A. 1985. Geochemical mass balances and weathering rates in forested watersheds of the southern Blue Ridge. American Journal of Science. 285: 904-930.
- Verry, E. S. 1972. Effect of an aspen clearcutting on water yield and quality in northern Minnesota. In: National symposium on watersheds in transition. Urbana, IL: American Water Resources Association: 276-284.
- Verry, E. S. 1986. Forest harvesting and water: the Lake States experience. Water Resources Bulletin. 22(6): 1039-1047.
- Verry, E. S. 1987. The effect of aspen harvest and growth on water yield in Minnesota. In: Forest hydrology and watershed management. Inter-

- national Association of Hydrological Sciences. 167: 553-562.
- Verry E. S.; Hornbeck, J. W.; Dolloff, A. C. 1999. Riparian management in forests of the Continental Eastern United States. Boca Raton, FL: Lewis Publishers.
- Verry E. S.; Hornbeck, J. W.; Todd, A. H. 2000. Watershed research and management in the Lake States and Northeastern United States. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 81-92.
- Verry, E. S.; Lewis, J. R.; Brooks, K. N. 1983. Aspen clearcutting increases snowmelt and storm flow peaks in north central Minnesota. Water Resources Bulletin. 19(1): 59-67.
- Verry, E. S.; Timmons, D. R. 1982. Waterborne nutrient flow through and upland-peatland watershed in Minnesota. Ecology. 63(5): 11456-1467.
- Verry, Elon S. 1999. Water flow in soils and streams: sustaining hydrologic function. In: Verry, E. S.; Hornbeck, J. W.; Dolloff, C. A., eds. Riparian Management in Forests of the Continental Eastern United States. Boca Raton, FL: Lewis Publishers: 67-99.
- Vose, J. M.; Swank, W. T.; Clinton, B. O.; Knoepp, J. D.; Swift, L. W. 1999. Using stand replacement fires to restore southern Appalachian pine-hardwood ecosystems: effects on mass, carbon, and nutrient pools. Forest Ecology Management. 114: 215-226.
- Wear, D. N.; Abt, R.; Mangold, R. 1998. People, space and time: factors that will govern forest sustainability. Transactions 63rd North American Wildl. and Natur. Resource Conference: 348-361.
- Wear, D. N.; Bolstad, P. 1998. Land use changes in southern Appalachian landscapes: Spatial analysis and forest evaluation. Ecosystems. 1: 575-594.
- Whitehead P. G.; Robinson, M. 1993. Experimental basin studies: an international and historical perspective of forest impacts. Journal of Hydrology. 145: 217-230.
- Wood, T. E.; Bormann, F. H.; Voigt, G. K. 1984. Phosphorous cycling in a northern hardwood forest: biological and chemical control. Science. 223: 391-393.
- Wu, H. L. 1998. Study of betel nut plantation on slope land as related to soil and water conservation. [In Chinese]. China: Chung Hsing University, Department of Soil and Water Conservation. Dissertation.
- Wu, H. L.; Cheng, J. D.; Yu, F. C.; Chien, P. W.; Hsiao, J. F. 1995. New roles and challenges of soil and water conservation program in Taiwan. In: Proceedings international seminar on soil conservation extension, Chiangmai, Thailand: 4-11.
- Zon, Raphael. 1927. Forest and water in the light of scientific investigation. In U. S. National Waterways Commission, Final Report. Senate Document 469. 62 Congress, 2d Session V: 205-302.
- 
- ## A Retrospective Viewpoint
- 
- Adams, D. A. 1993 Renewable resource policy: the legal-institutional foundations. Washington, DC: Island Press.
- Adams, M. B.; Edwards, P. J.; Wood, F.; Kochenderfer, J. N. 1993. Artificial watershed acidification on the Fernow Experimental Forest, USA. Journal of Hydrology. 150: 505-519.
- Adler, R. W. 1995. Addressing barriers to watershed protection. Environmental Law. 25(4): 973-1106.
- Allen, C. A. 1994. Ecological perspective: linking ecology, GIS, and remote sensing to ecosystem management, Chapter 15. In: Sample, V. A., ed. Remote sensing and GIS in ecosystem management. Washington, DC: Island Press.
- Amthor, J. S.; Hornbeck, J. W. 1999. Rising CO<sub>2</sub> and forest water use: long-term data from Hubbard Brook Experimental Forest, New Hampshire. In: Adams, D. B., ed. Potential consequences of climate variability and change to water resources of the United States. TPS-99-1. Herndon, VA: American Water Resources Association: 399-402.
- Arnold, J. G.; Srinivasen, R.; Muttiah, R. S.; Williams, J. R. 1998. Large area hydrologic modeling and assessment part I: model development. Journal of the American Water Resources Association. 34(1): 73-101.
- Aronson, J. G. 1998. Chapter 13: watershed management in Russia and the former Soviet Union. Pp. In: Reimold, R. J. . 1998. Watershed management: practice, policies, and

- coordination. New York: McGraw-Hill Company: 247-275
- Associated Press. 1995. Water crisis looms, World Bank says. Washington Post. August 3.
- Associated Press. 1999. Babbitt backs water conservation. Arizona Daily Sun. June 9.
- Austin, D. 1998. Cultural knowledge and the cognitive map. *Practicing Anthropology*. 20(3): 21-24.
- Baker, M. B., Jr. 1986. A supercritical flume for measuring sediment-laden streamflow. *Water Resources Bulletin*. 22: 847-851.
- Baker, M. B., Jr., comp. 1999. History of watershed research in the central Arizona Highlands. Gen. Tech. Rep. RMRS-29. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Baker, M. B., Jr.; Ffolliott, P. F. 1998. Multiple resource evaluations on the Beaver Creek watershed: an annotated bibliography (1956-1996). Gen. Tech. Rep. RMRS-GTR-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Baker, M. B., Jr., Huebner, D.P.; Ffolliott, P. F. 2000. Accessing a personalized bibliography with a searchable system on the World Wide Web. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 428-430.
- Baker, M. B., Jr., Huebner, D. P., and Ffolliott, P. F. 2000. An on-line image data base system: Managing image collections. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 424-427.
- Baker, M. B. Jr.; Huebner, D.; Ffolliott, P. F. 2000. Documenting historical data and accessing it on the World Wide Web. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 189-193.
- Band, L. E. 1986. Topographic partition of watersheds with digital elevation models. *Water Resources Research*. 22(1): 15-24.
- Barr, G. W. 1956. Recovering rainfall: More water for irrigation. Phoenix, AZ: Arizona State Land Department, Watershed Division.
- Bates, C. G. 1911. Forests and streamflow—an experimental study. *Proceedings Society American Forestry*. VI(1): 53-63.
- Benda, L. E.; Cundy, T. W. 1990. Predicting deposition of debris flows in mountain channels. *Canadian Geotechnology*. 27: 409-417.
- Benda, L. E.; Dunne, T. 1997. Stochastic forcing of sediment supply to channel networks from landsliding and debris flow. *Water Resources Research*. 33 (12): 2849-2863.
- Benda, L.; Dunne, T. 1997. Stochastic forcing of sediment routing and storage in channel networks. *Water Resources Research*. 33(12): 2865-2880.
- Beschta, R. L.; Bilby, R. E.; Brown, G. W.; Holtby, L. B.; Hofstra, T. D. 1987. Stream temperature and aquatic habitat: fisheries and forestry interactions. In: Salo, E. O., Cundy, T. W., eds. *Proceedings of a symposium; 1986 February; University of Washington, Seattle, WA*: 191-232.
- Beven, K.; Moore, I. D., eds. 1992. *Terrain analysis and distributed modelling in hydrology*. New York: John Wiley & Sons.
- Bloschl, G.; Sivapalan, M. 1995. Scale issues in hydrological modelling: a review. In: Kalma, J. D.; Sivapalan, M., eds. *Scale issues in hydrological modelling*. New York: John Wiley & Sons: 9-48.
- Bolton, S. B.; Ward, T. J. 1987. Recovery of a New Mexico drainage basin from a forest fire. *Forest hydrology and watershed management: [proceedings of the Vancouver symposium; 1987 August. IAHS-AISH, Publ. 167]*: 191-198.
- Bosch, J. M.; Hewlett, J. D. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. *Journal of Hydrology*. 55: 3-23.
- Breckenridge, R. P.; Kepner, W. G.; Mouat, D. A. 1995. A process for selecting indicators for monitoring conditions of rangeland health. *Environmental Monitoring and Assessment*. 36: 45-60.
- Brooks, K. N.; Ffolliott, P. F.; Gregerson, H. M.; DeBano, L. F. 1997. *Hydrology and the management of watersheds*. Ames: Iowa State University Press.
- Brooks, K. N.; Gregerson, H. M.; Ffolliott, P. F.; Tejwani, K.G. 1992. Chapter 17: watershed management: a key to sustainability. In: Sharma, N.

- P., ed. Managing the World's forests. Dubuque: Kendall/Hunt Publishing Co.: 455-487.
- Brown, G. W. 1980. Forestry and water quality. Corvallis: Oregon State Book Stores.
- Brown, H. E. 1969. A combined control-metering section for gaging large streams. *Water Resources Research*. 5: 888-894.
- Brown, H. E.; Baker, M. B., Jr.; Rogers, J. J.; Clary, W. P.; Kovner, J. L.; Larson, F. R.; Avery, C. C.; Campbell, R. E. 1974. Opportunities for increasing water yields and other multiple use values on ponderosa pine forest lands. *Res. Pap. RM-129*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Brunson, M. W. 1996 Integrating human habitat requirements into ecosystem management strategies: a case study. *Natural Areas Journal*. 16(2): 100-107.
- Brunson, M. W.; Kennedy, J. J. 1995. Redefining "multiple use": agency responses to changing social values. In: Knight, R. L.; Bates, S., eds. *A new century for natural resources management*. Washington, DC: Island Press. 186-195.
- Bunte', K.; MacDonald, L. H. 1999. Scale considerations and the detectability of sedimentary cumulative watershed effects. *Tech. Bull. 776*. National Council for Air and Stream Improvement.
- Burrough, P. A.; R.A. McDonnell, R. A. 1998. *Principles of geographic information systems*. New York: Oxford University Press.
- Burroughs, E. R. Jr.; King, J. G. 1989. Reduction of soil erosion on forest roads. *Gen. Tech. Rep. INT-264*. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.
- Chandra, S. 1990. *Hydrology in Ancient India*. Roorkee, India: National Institute of Hydrology.
- Chow, V.T. 1964. *Handbook of applied hydrology*. New York: McGraw-Hill Book Company.
- Carra, A.; Cardinali, M.; Detti, R.; Guzzetti, F.; Pasqui, V.; Reichenback, P. 1991. GIS techniques and statistical models in evaluating landslide hazard. *Earth Surface Processes and Landforms*. 16: 427-445.
- Choudry, S.; Morad, M. 1998. GIS errors and surface hydrologic modeling: an examination of effects and solutions. *Journal of Surveying Engineering*. 124(3): 134-143.
- Chen, H.; Beschta, R. 1999. Dynamic hydrologic simulation of the Bear Brook Watershed in Maine (BBWM). In: Norton, S. A.; Fernandez, I. J., eds *The Bear Brook watershed in Maine: a paired watershed experiment, the first decade* (1987-1997). Dordrecht: Kluwer Academic Publishers: 53-96.
- Clark, R. L.; Lee, R. 1998. Development of topographic maps for precision farming with kinematic GPS. *Transactions of the ASAE*. 41(4): 909-916.
- Clary, W. P.; Baker, M. B., Jr.; O'Connell, P. F.; Johnsen, T. N., Jr.; Campbell, R. E. 1974. Effects of pinyon-juniper removal on natural resource products and uses in Arizona. *Res. Pap. RM-128*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Cleary, C. R. 1988 Coordinated resource management: a planning process that works. *Journal of Soil and Water Conservation*. 43(2): 138-139.
- Cleland, D. T.; Crow, T. R.; Hart, J. B.; Padley, E. A. 1994. Resource management perspective: remote sensing and GIS support for defining, mapping, and managing forest ecosystems: Chapter 15. In: Sample, V. A., ed. *Remote sensing and GIS in ecosystem management*. Washington, DC: Island Press: 243-264.
- Cline, R.; Cole, G.; Megahan, W. F.; Patten, R.; Potyondy, John. 1981. Guide for predicting sediment yields from forested watersheds. U.S. Department of Agriculture, Forest Service, Northern Region and Intermountain Region.
- Colman, E. A. 1953. *Vegetation and watershed management*. New York: The Ronald Press Company.
- Congalton, R. G.; Green, K. 1992. The ABCs of GIS. *Journal of Forestry*. 90(1): 13-20.
- Connaughton, C. A. 1935. Forest fires and accelerated erosion. *Journal of Forestry*. 33: 751-752.
- Cortese, C. F. 1999 The social context of western water development. *Journal of American Water Resources Association*. 35(3): 567-578.
- Cortner, H. J.; Moote, M. A. 1994 Trends and issues in land and water resources management: setting the agenda for change. *Environmental Management*. 18(2): 167-173.
- Cortner, Hanna J.; Moote, Margaret A. 1999. The politics of ecosystem management. Washington, DC: Island Press.
- Corwin, D. L.; Loague, K.; Ellsworth, T. R. 1999. Advanced information technologies for assessing nonpoint source pollution in the vadose zone: conference overview. *Journal of Environmental Quality*. 28: 357-365.
- Cronan, C. S.; Schofield, C. L. 1990. Relationships between aqueous aluminum and acidic deposition in forested watersheds of North America

- and northern Europe. *Environmental Science and Technology*. 24: 1100-1105.
- Cronan, C. S.; Grigal, D. F. 1995. Use of calcium/aluminum ratios as indicators of stress in forest ecosystems. *Journal of Environmental Quality*. 24: 209-226.
- Daly, S. 1994. Watersheds: A look at the big picture. *Erosion Control*. 1(5): 32-37.
- Davis, T. J.; Keller, C. P. 1997. Modelling uncertainty in natural resource analysis using fuzzy sets and Monte Carlo simulation: slope stability prediction. *International Journal of Geographical Information Systems*. 11(5): 409-434.
- Dissmeyer, G. E. 1976. Erosion and sediment from forest land uses, management practices and disturbances in the Southeastern United States. In: Proceedings of the third federal interagency sedimentation conference, Denver, CO. Sedimentation Committee of the Water Resources Council: 1-140 to 1-148.
- Dissmeyer, G. E.; Foster, G. R. 1985. Modifying the universal soil loss equation for forest land. In: El-Swaify, S.A.; Moldenhauer, W. C.; Lo, A., eds. *Soil erosion and conservation: proceedings of the international conference on soil erosion and conservation*; Honolulu, HA. Akeny, IA: Soil Conservation Society of America: 480-495.
- Dixon, J. W. 1964. Section 26-I: Water resources Part I: Planning and developments. In: Chow, V. T. *Handbook of applied hydrology*. New York: McGraw-Hill Book Company: 26-1 — 26-29.
- Dortignac, E. . 1967. Forest water yield management opportunities. In: Sopper, W. E.; Lull, H. W. *Forest hydrology: proceedings of a national science foundation advanced seminar*; 1965 August 29-September 10; The Pennsylvania State University, University Park. Oxford: Pergamon Press: 579-592.
- Douglass, J. E.; Swank, W. T. 1972. Streamflow modification through management of eastern forests. *Res. Pap. SE-94*. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station.
- Driscoll, C. T.; Likens, G. E.; Hedin, L. O.; Eaton, J. S.; Bormann, F. H. 1989. Changes in the chemistry of surface waters. *Environmental Science and Technology*. 23: 137-143.
- Duncan, S. H. 1986. Peak stream discharge during thirty years of sustained yield timber management in two fifth order watersheds in Washington State. *Northwest Science*. 60(4): 258-264.
- Eash, D.E. 1994. A geographic information system procedure to quantify drainage-basin characteristics. *Water Resources Bulletin*. 30(1): 1-8.
- Elliot, W. J.; Luce, C. H.; Robichaud, P. R. 1996. Predicting sedimentation from timber harvest areas with the WEPP model. Sixth federal interagency sedimentation Conference; Las Vegas, NV. Moscow, ID: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: IX-46 to IX-53.
- Endicott, E., ed. 1993 Land conservation through public/private partnerships. Washington, DC: Island Press.
- Environmental Systems Research Institute. 1996. ArcView spatial analyst. ESRI, Redlands, CA.
- Evans, H. 1998 *The American Century*. New York: Knopf.
- Federer, C. A. 1995. BROOK90: a simulation model for evaporation, soil water, and streamflow, Version 3.1. Computer freeware and documentation. Durham, NH: U.S. Department of Agriculture, Forest Service, Northeastern Research Station.
- Federer, C. A.; Hornbeck, J. W.; Tritton, L. M.; Martin, C. W.; Pierce, R. S.; Smith, C. T. 1989. Long-term depletion of calcium and other nutrients in eastern US forests. *Environmental Management*. 13: 593-601.
- Findling, J. E.; Thackery, F. W., eds. 1996 *Events that changed America in the twentieth century*. Westport, CT: Greenwood Press.
- Firth, P. 1999 The importance of water resources education for the next century. *Journal of the American Water Resources Association*. 35(3): 487-492.
- Forest Ecosystem Management Assessment Team (FEMAT) 1993 *Forest ecosystem management: an ecological, economic, and social assessment*. Rep. 1993-793-071. Washington, DC: Government Printing Office.
- Fox, K. M. 1958. The Arizona watershed program. *American Forests*. 64(12): 25, 44-55.
- Francois, T. 1950. *Forest policy, law and administration*. Forestry and Forest Products Studies No. 2. Rome: Food and Agriculture Organization of the United Nations.
- Franklin, J. F. 1994. Developing information essential to policy, planning, and management decision-making: the promise of GIS. In: Sample, V. A., ed. *Remote sensing and GIS in ecosystem management*. Covelo, CA: Island Press: 18-24.
- Galambos, L. 1983 *America at middle age: a new history of the United States in the twentieth century*. New York: New Press.
- Garbrecht, J.; Starks, P. J.; Martz, L. W. 1996. New digital landscape parameterization methodologies. In: *GIS and water resources: proceedings*

- of the American Water Resources Association 32nd annual conference and symposium; 1966 September 22-26; Fort Lauderdale, FL: 357-365.
- Garraty, J. A. 1986 The Great Depression: an inquiry into the causes, course and consequences of the world-wide depression of the 1930s. San Diego, CA: Harcourt Brace Jovanovich.
- Goodchild, M. R., Parks, B. O.; Steyaert, L. T., eds. 1993. Environmental modeling with GIS. New York: Oxford University Press.
- Grieder, T.; Krannich, R. S.; Berry, E. H. 1991 Local identity, solidarity, and trust in changing rural communities. *Sociological Focus*. 24: 263-281.
- Griffin, C. B. 1999 Watershed councils: an emerging form of public participation in natural resource management. *Journal of the American Water Resources Association*. 35(3): 505-518.
- Grumbine, R. E. 1994 What is ecosystem management? *Conservation Biology*. 8: 27-38.
- Guay, B. E.; Kunzmann, M.; Grunberg, W.; Guertin, D. P. 1999. Integrating differential GPS, GIS and sonar measurements to map the bathymetry of Topock Marsh, Arizona. In: Proceedings of the 1999 ESRI users conference; 1999 July 26-30; San Diego, CA. Location at: WEB <http://www.esri.com/library/userconf/proc99/proceed/papers/pap396/p396.htm>
- Guertin, D. P.; Miller, S. N.; Goodrich, D. C. 2000. Emerging tools and technologies in watershed management. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 194-204.
- Guertin, D. P.; Womack, J. D.; MacArthur, R.; Ruyle, G. B. 1998. Geographic information system based tool for integrated allotment and watershed management. In: Proceedings of American water resources association specialty conference: rangeland management and water resources. TPS-98-1. Herndon, VA: American Water Resources Association: 35-44.
- Haan, C. T.; Barfield, B. J; Hayes, J. C. 1994. Design hydrology and sedimentation for small catchments. New York: Academic Press.
- Hamlett, J. M.; Miller, D. A.; Day, R. L.; Peterson, G. W.; Baumer, G. M.; Russo, J. 1992. Statewide GIS-based ranking of watersheds for agricultural pollution prevention. *Journal of Soil and Water Conservation*. 47(5): 399-404.
- Harr, R. D. 1979. Effects of timber harvest on streamflow in the rain-dominated portion of the Pacific northwest. In: Proceedings: workshop on scheduling timber harvest for hydrologic concerns. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region: second paper, 45 p.
- Harr, R. D. 1983. Potential for augmenting water yield through forest practices in western Washington and western Oregon. *Water Resources Bulletin*. 19(3): 383-393.
- Harr, R. D. 1986. Effects of clearcutting on rain-on-snow runoff in western Oregon: a new look at old studies. *Water Resources Research*. 22(7): 1095-1100.
- Held, R. B.; Clawson, M. 1967 Soil conservation in perspective. Baltimore, MD: Johns Hopkins University Press.
- Helsinki Process. 1994. Proceedings of the ministerial conferences and expert meetings. FIN-00171. Helsinki, Finland: Liaison Office of the Ministerial Conference on the Protection of Forests in Europe.
- Henderson, F. M.; Lewis, A. J., eds. 1998. Principles and applications of imaging radar. New York: John Wiley and Sons.
- Hewlett, J. D. 1967. Will water demand dominate forest management in the East? *Society of American Foresters Proceedings*, 1966: 154-159.
- Hibbert, A. R. 1967. Forest treatment effects on water yield. In: Sopper, W. E.; Lull, H. W., eds. International symposium for hydrology; 1965; University Park, PA. Oxford: Pergamon Press: 527-543.
- Hicks, R. 1992 Partnerships equal solutions. *Journal of Soil and Water Conservation*. 47(2): 122-124.
- Hoffman, C. 1994 Does anybody really do watershed management? *River Voices*. 5(2): 10-13.
- Hornbeck, J. W.; Adams, M. B.; Corbett, E. S.; Verry, E. S.; Lynch, J. A. 1993. Long-term impacts of forest treatments on water yield: a summary for northeastern USA. *Journal of Hydrology*. 150: 323-344.
- Hornbeck, J. W.; Bailey, S. W.; Buso, D. W.; Shanley, J. B. 1997. Streamwater chemistry and nutrient budgets for forested watersheds in New England: variability and management implications. *Forest Ecology and Management*. 93: 73-89.
- Hornbeck, J. W.; Martin, C. W.; Egger, C. 1997. Summary of water yield experiments at Hubbard Brook Experimental Forest, New Hampshire. *Canadian Journal of Forest Research*. 27: 2043-2052.

- Hornbeck, J. W.; Martin, C. W.; Pierce, R. S.; Bormann, F. H.; Likens, G. E.; Eaton, J. S. 1987. The northern hardwood forest ecosystem: ten years of recovery from clearcutting. Res. Pap. NE-596. Broomall, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station.
- Hornbeck, J. W.; Swank, W. T. 1992. Watershed ecosystem analysis as a basis for multiple-use management of eastern forests. *Ecological Applications*. 2: 238-247.
- Horwitz, E. C. J. 1974. Clearcutting: a view from the top. Washington, DC.
- Hutchinson, M. F. 1989. A new procedure for gridding elevation and stream line data with automatic removal of spurious pits. *Journal of Hydrology*. 106: 211-232.
- Illich, I. 1985. Water and the Waters of Forgetfulness. London: Boyars Press.
- Interagency Ecosystem Management Task Force (IEMTF). 1995. The ecosystem approach: healthy ecosystems and sustainable economies, Volumes I, II, and III. Washington, DC: Government Printing Office.
- Izenberg, N. R.; Arvidson, R. E.; Brackett, R. A.; Saatchi, S. S.; G.R. Osburn, G. R.; Dohrenwend, J. 1996. Erosional and depositional patterns associated with the 1993 Missouri River floods inferred from SIR-C and TOPSAR radar data. *Journal of Geophysical Research*. 101(E10): 23, 149-23, 167.
- Jenson, S. K. 1991. Application of hydrologic information automatically extracted from digital elevation models. *Hydrologic Processes*. 5: 31-44.
- Jenson, S. K.; Domingue, J. O. 1988. Extracting topographic structure from digital elevation data for geographic information system analysis. *Photogrammetric Engineering and Remote Sensing*. 54(11): 1593-1600.
- Jeton, A. E.; Smith, J. LaRue. 1993. Development of watershed models for two Sierra Nevada basins using a geographic information system. *Water Resources Bulletin*. 29(6): 923-932.
- John, D. 1994. Civic environmentalism: alternatives to regulation in states and communities. Washington, DC: Congressional Quarterly Inc.
- Johnson, J. E.; Pope, P. E.; Mroz, G. D.; Payne, N. F. 1987. Environmental impacts of harvesting wood for energy. Madison WI: Regional Biomass Energy Program Council of Great Lakes Governors.
- Johnson, M. D. 1998 Conflicting desires: private lands, public goods, and perceptions of rights. Paper presented at the who owns America? II. How land and natural resources are owned and controlled conference; Madison, WI.
- Johnson, M. D. 2000. A sociocultural perspective on the development of U.S. natural resource partnerships in the 20th century. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 205-212.
- Johnston, K. N. 1992. Consideration of watersheds in long-term forest planning models: the case of FORPLAN and its use on the national forests. In: Naiman, R. J., ed. *Watershed management: balancing sustainability and environmental change*. New York: Springer-Verlag: 47-360.
- Kaufmann, M. R.; Graham, R. T.; Boyce, D. A., Jr.; Moir, W. H.; Perry, L.; Reynolds, R. T.; Bassett, R. L.; P. Mehlhop, P.; Edminster, C. B.; Block, W. M.; Corn, P. S. 1994. An ecological basis for eco-system management. Gen. Tech. Rep. RM-246. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, and Southwest Region, Albuquerque, NM.
- Keller, M. 1994 Regulating a new society: public policy and social change in America, 1900-1933. Cambridge, MA: Harvard University Press.
- Kennedy, A. 1999. Informational briefing, proposed unified federal policy. Washington, DC: U.S. Department of Agriculture, Deputy Under Secretary Natural resources. May 27.
- Kenney, D. S. 1999 Historical and sociopolitical context of the western watersheds movement. *Journal of the American Water Resources Association*. 35(3): 493-504.
- Kerr, R. S. 1960. Land, wood, and water. New York: Fleet Publishing Company.
- Kittredge, J. 1948. Forest influences. New York: McGraw Hill Book Company.
- Ketcheson, G. L.; Megahan, W. F.; King, J. G. 1999. "R1-R4" and "BOISED" sediment yield prediction model tests using forest roads in granitics. *Journal of the American Water Resources Association*. 35(1): 83-98.
- Lachowski, H.; Fisk, H.; Brohman, R. 1998. Riparian area management—the role of remote sensing and geographic information systems. In: Proceedings of American Water Resources Association specialty conference: rangeland management and water resources. TPS-98-1.

- Herndon, VA: American Water Resources Association: 45-44.
- Lahliou, M.; Shoemaker, L.; Paquette, M.; Bo, J.; Choudhury, R.; Elmer, R.; Xiz, F. 1996. Better assessment science integrating point and nonpoint sources (BASINS), Version 1.0, user's manual, Washington, DC: U.S. Environmental Protection Agency.
- Lanari, R.; Fornaro, G.; Riccio, D.; Migliaccio, M.; Papathanassiou, K.P.; Moreira, J.R.; Schwabisch, M.; Dutra, L.; Puglisi, G.; Franceschetti, G.; Coltelli, M. 1996. Generation of digital elevation models by using SIR-C/X-SAR multifrequency two-pass interferometry: the Etna case study. *IEEE Transactions on Geoscience and Remote Sensing*. 34(4): 1097-1112.
- Lane, L. J.; Asough, J.; Hakonson, T. E. 1991. Multiobjective decision theory—decision support systems with embedded simulation models. In: ASCE irrigation and drainage proceedings; July; Honolulu, HI: 445-451.
- Lant, C. L. 1999 Introduction: human dimensions of watershed management. *Journal of the American Water Resources Association*. 35(3): 483-486.
- Lark, R. M.; Bolam, H. C. 1997. Uncertainty in prediction and interpretation of spatially variable data on soils. *Geoderma*. 77: 85-113.
- Lawrence, P. A.; Stone, J. J.; Heilman, P.; Lane, L. J. 1997. Using measured data and expert opinion in a multiple objective decision support system for semiarid rangelands. *Transactions of the American Society of Agricultural Engineers*. 40(6): 1589-1597.
- Lazarus, R. J. 1991 The tragedy of distrust in the implementation of federal environmental law. *Law and Contemporary Problems*. 54: 311.
- Leavesley, G. H.; Restrepo, P. J.; Stannard, L. G.; Frankoski, L. A.; Sautins, A. M. 1996. MMS: a modeling framework for multidisciplinary research and operational applications. In: Goodchild, M. F.; [and others], eds. *GIS and environmental modeling: progress and research issues*. Ft. Collins, CO: GIS World Books: 155-158.
- Leopold, A. 1949. A Sand County almanac and sketches here and there. New York: Oxford University Press.
- Leopold, L. B.; Maddock, T., Jr. 1954. The flood control controversy. New York: The Ronald Press Company. 278 p.
- Lorence, J. J. 1996 Organizing the unemployed: community and union activists in the industrial heartland. Albany: State University of New York Press.
- Louis, L. J. 1968 The Depression of the 1930s. Cassell, Melbourne, Australia.
- Lovejoy, S. B. 1997. Watershed management for water quality protection: are GIS and simulation models THE answer. *Journal of Soil and Water Conservation*. 52(2): 103.
- Lytle, D.J.; Bliss, N. B.; Waltman, S. W. 1996. Interpreting the state soil geographic database (STATSGO). In: Goodchild, M. R.; Steyaert, L. T.; Parks, B. O.; Johnston, C. A.; Maidment, D.; Crane, M.; Glendinning, S., eds. *GIS and environmental modeling: progress and research issues*. Fort Collins, CO: GIS World Books.
- Lull, H. W.; Reinhart, K. G. 1972. Forests and floods in the eastern United States. Res. Pap. NE-226. U.S. Department of Agriculture, Forest Service, Northeast Research Station.
- Lynch, J. A.; Corbett, E. S.; Hutnik, R. J. 1975. Chapter 5, water resources. In: *Clearcutting in Pennsylvania*. University Park: Pennsylvania State University, School of Forest Resources: 51-63.
- MacDonald, L. H.; Smart, A. W.; Wissmar, R. C. 1991. Monitoring guidelines to evaluate effects of forestry activities on streams in the Pacific Northwest and Alaska. U.S. EPA Doc. EPA/910/9-91-001.
- MacGaffey, N. 1985 The long-term effectiveness of soil conservation efforts on three Wisconsin P.L. 566 projects. University of Wisconsin-Madison. Thesis.
- Madej, M. A.; Ozaki, V. 1996. Channel response to sediment wave propagation and movement, Redwood Creek, CA, USA. *Earth Surfaces Processes and Landforms*. 21: 911-927.
- Madsen S. N.; Zebker, H. A.; Martin, J. 1993. Topographic mapping using radar interferometry: processing techniques. *IEEE Transactions on Geoscience and Remote Sensing*. 31(1): 246-255.
- Martin, C. W. 1988. Soil disturbance by logging in New England—review and management recommendations. *Northern Journal of Applied Forestry*. 5(1): 30-34.
- Martin, C. W.; Hornbeck, J. W. 1994. Logging in New England need not cause sedimentation in streams. *Northern Journal of Applied Forestry*. 11(1): 17-23.
- McCashion, J. D.; Rice, R. M. 1983. Erosion on logging roads in northwestern California: how much is avoidable? *Journal of Forestry*. 81(1): 23-26.

- McClelland, D. E.; Foltz, R. B.; Wilson, W. D.; Cundy, T. W.; Heinemann, R.; Saurbier, J. A.; Schuster, R. L. 1997. Assessment of the 1995 & 1996 floods and landslides on the Clearwater National Forest. Part 1: Landslide assessment. Report on file at: U.S. Department of Agriculture, Forest Service Report, Northern Region, Missoula, MT.
- McKinnon, S. 1999. Babbitt takes a greener turn. *Arizona Republic*. June 9.
- Megahan, W. F.; Day, N. F.; Bliss, T. M. 1979. Landslide occurrence in the western and central northern Rocky Mountain physiographic provinces in Idaho. In: *Forest soils and land use: proceedings fifth North American forest soils conference*; 1978 August 6-9; Ft. Collins, CO. Fort Collins, CO: Colorado State University: 226-239.
- Megahan, W.F.; Hornbeck, J. 2000. Lessons learned in watershed management: a retrospective view. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 177-188.
- Megahan, W.F.; Ketcheson, G. L. 1996. Predicting downslope travel of granitic sediments from forest roads in Idaho. *Water Resources Bulletin*. (32): 371-382.
- Megahan, W. F.; Kidd, W. J. 1972. Effects of logging and logging roads on erosion and sediment deposition from steep terrain. *Journal of Forestry*. 7: 136-141.
- Megahan, W. F.; Platts, W. S.; Kulesza, B. 1980. Riverbed improves over time: South Fork Salmon. In *Proceedings: symposium on watershed management*. Vol. I. 1980 July 21-23. Boise, ID: American Society of Civil Engineers: 380-395.
- Megahan, Walter F. 1977. Chapter XIV: Reducing erosional impacts of roads. In: *guidelines for watershed management: FAO conservation guide*. Rome: Food and Agricultural Organization of the United Nations: 237-261.
- Meinzer, O. E. 1942. Chapter I: Introduction. In: Meinzer, O. E., Ed. *Hydrology*. New York: Dover Publications: 1-31.
- Mencken, H. L. 1966. *A new dictionary of quotations*. New York: Knopf.
- Metternicht, G. L.; Zinck, J. A. 1998. Evaluating the information content of JERS-1 SAR and Landsat TM data from discrimination of soil erosion features. *ISPRS Journal of Photogrammetry and Remote Sensing*. 53: 143-153.
- Miller, S. N.; Guertin, D. P. 1999. Teaching spatial analysis for hydrology and watershed management. In: *Proceedings of the 1999 ESRI users conference*; 1999 July 26-30; San Diego, CA. Location on the WEB: <http://www.esri.com/library/userconf/proc99/proceed/papers/pap729/p729.htm>
- Miller, S. N.; Guertin, D. P.; Goodrich, D. C 1996. Linking GIS and geomorphologic field research at Walnut Gulch Experimental Watershed. In: *GIS and water resources: proceedings of the American Water Resources Association 32nd annual conference and symposium*; Fort Lauderdale, FL: 327-335.
- Miller, S. N.; Guertin, D. P.; Syed, K. H.; Goodrich, D. C. 1999. Using high resolution synthetic aperture radar for terrain mapping: influence on hydrologic and geomorphic investigations. In: Olsen, D. S.; Potyondy, J. P.; Wildland hydrology. TPS-99-3. Herndon, VA: American Water Resources Association: 219-226.
- Monmonier, M. 1996. *How to lie with maps*. Chicago: University of Chicago Press.
- Montgomery, D. R.; Dietrich, W. E. 1994. A physically based model for the topographic control on shallow landsliding. *Water Resources Research*. 30: 1153-1171.
- Montgomery, D. R.; Dietrich, W. E.; Sullivan, K. 1997. The role of GIS in watershed analysis. In: Lane, S. N.; Richards, K. S.; Chandler, J. H., eds. *Land monitoring, modelling and analysis*. New York: John Wiley & Sons, Inc.: 241-261.
- Montreal Process. 1995. Criteria and indicators for the conservation and sustainable management of temperate and boreal forests. Fo42-238/1995E. Hull, Quebec, Canada: Canadian Forest Service, Natural Resources Canada.
- Moody, J. A.; Martin D. A. 1999. Unsteady sediment transport after a forest fire. Poster paper presented at: The Canadian Geophysical Union meeting; 1999 May 9-13; Banff, Canada.
- Moore, I. D.; Grayson, R. B.; LadsonA. R. 1992. Digital terrain modelling: a review of hydrological, geomorphological and biological applications. In: Beven, K. J.; Moore, I. D., eds. *Terrain analysis and distributed modelling in hydrology*. New York: John Wiley & Sons: 7-34.
- Moran, M. S.; Clarke, T. R.; Kustas, W. P.; Weltz, M 1994. Evaluation of hydrologic parameters in a semiarid rangeland using remotely sensed spectral data. *Water Resources Research*. 30(5): 1287-1297.

- Moran, M. S.; Hymer, D. C.; Qi, J.; Marsett, R. C.; Helfert, M. K. 1998. Soil moisture evaluation using synthetic aperture radar (SAR) and optical remote sensing in semiarid rangeland: proceedings of the special symposium on hydrology; 1998 January 11-16; Phoenix, AZ.
- Moss, G. 1993 America in the twentieth century. Englewood Cliffs, NJ: Prentice Hall.
- Natural Resources Conservation Service (NRCS). 1996. National planning procedures handbook. Washington, DC: USDA-NRCS National Headquarters.
- Nazarea, V.; Rhoades, R.; Bontoyan, E.; Flora, G. 1998 Defining indicators which make sense to local people: intra-cultural variation in perceptions of natural resources. *Human Organization*. 57(2): 159-170.
- NCASI. 1994. Forests as nonpoint sources of pollution and effectiveness of best management practices. National Council for air and stream improvement. Tech. Bull. 672. Research Triangle Park, NC.
- NCASI. 1999. Water quality effects of forest fertilization. Tech. Bull. 782. Research Triangle Park, NC.
- Neary, D. G. 2000. Changing perceptions of watershed management from a retrospective viewpoint. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 167-176.
- Norris, L. A.; Lorz, H. W.; Gregory, S. V. 1991. Forest chemicals. In: Meehan, W. R., ed. Influences of forest and rangeland management on salmonid fishes and habitats. American Fisheries Society Special Publication. 19: 207-296.
- Nowak, P. J. 1992 Of what value are values in resource management? *Journal of Soil and Water Conservation*. 47(4): 356-359.
- NRC Committee on Watershed Management, Water Science and Technology Board, Commission on Geosciences, Environment, and Resources. 1999. New strategies for America's watersheds. Washington, DC: National Academy Press.
- Nykanen, D. K.; Foufoula-Georgiou, E.; Sapozhnikov, V. B. 1998. Study of spatial scaling in braided river patterns using synthetic aperture radar imagery. *Water Resources Research*. 34(7): 1795-1807.
- O'Connor, R.; Kyker-Snowman, T.; Lyons, P.; Spencer, B. 1995. Quabbin watershed: MDC land management plan 1995-2004. Boston: The Commonwealth of Massachusetts, Metropolitan District Commission.
- Ogrosky, H. O.; Mockus, V. 1964. Section 21: hydrology of agricultural lands. In: Chow, V. T. 1964. Handbook of applied hydrology. New York: McGraw-Hill Book Company.
- Pack, R. T.; Tarboton, D. G.; Goodwin, C. N. [In press]. The SINMAP approach to terrain stability mapping. In: Proceedings 8th Congress of the International Association of Engineering Geology; 1998 September 21-25; Vancouver, British Columbia, Canada.
- Packer, P. E. 1967. Criteria for designing and location logging roads to control sediment. *Forest Science*. 13(1): 1-18.
- Pavari, A. 1962. Forest influences. Studies No. 15. Rome: Food and Agriculture Organization of the United Nations, Forestry and Forest Products.
- Penman, H. L. 1963. Vegetation and hydrology. Technical Communication No. 53. Bucks, England: Commonwealth Bureau of Soils, Commonwealth Agricultural Bureau.
- Phillips, J. D. 1993. Pre-and post-colonial sediment sources and storage in the lower Neuse basin, North Carolina. *Physical Geography*. 14(3): 272-284.
- Pinchot, G. 1947. Breaking new ground. New York: Harcourt Brace Co. Inc.
- Poiani, K. A.; Bedford, B. L. 1995. GIS-based nonpoint source pollution modeling: considerations for wetlands. *Journal of Soil and Water Conservation*. 50(6): 613-619.
- Quinn, P.; Beven, K.; Chevallier, P.; Planchon, O. 1991. The prediction of hillslope flow paths for distributed hydrological modeling using digital terrain models. In: Beven, K. J.; Moore, I. D., eds. Terrain analysis and distributed modelling in hydrology. New York: John Wiley & Sons: 63-84.
- Rango, A. 1995. A look to the future in watershed management. In: Ward, T. J., ed. *Watershed management: planning for the 21st century: proceedings of the symposium*; 1995 August 14-16; San Antonio, TX. Watershed Management Committee, Water Resources Engineering Division, American Society of Civil Engineers: 15-22.
- Raper, J.; Livingstone, D. 1995. Development of a geomorphological spatial model using object-oriented design. *International Journal of Geographical Information Systems*. 9(4): 359-383.
- Reid, J.; Whittlesey, S. 1997. The archeology of ancient Arizona. Tucson: University of Arizona Press.

- Reid, L. M. 1993. Research and cumulative watershed effects. PSW-GTR-141. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.
- Reid, L. M.; Dunne, T. 1984. Sediment production from forest road surfaces. *Water Resources Research*. 20(11): 1753-1761.
- Reid, L.M.; Dunne, T. 1996. Rapid evaluation of sediment budgets. Reiskirchen, Germany: Catena Verlag GMBH, 35447.
- Reimold, R.J. 1998. Watershed management: practice, policies, and coordination. New York: McGraw-Hill Company.
- Reisner, M. 1986. Cadillac Desert: the American West and its disappearing water. New York: Penguin Books.
- Renard, K. G.; Foster, G. R.; Weesies, G. A.; Porter, J. P. 1991. RUSLE Revised universal soil loss equation. *Journal of Soil and Water Conservation*. 46(1): 30-33.
- Robison, E. G; Mills, K.; Paul, J.; Dent, L.; Skaugset A. 1999. Oregon Department of Forestry storm impacts and landslides of 1996: final report. Salem: Oregon Department of Forestry.
- Rodgers, W. H. 1996 The seven statutory wonders of U.S. environmental law: origins and morphology. In: Fischman, R. L., ed. An environmental law anthology. Cincinnati, OH: Anderson Publishing Company. 82-90.
- Romm, J. 1995 Tension between the science and management of watersheds: the need for a public science. In: Watersheds '94: proceedings of the fifth biennial watershed management conference. University of California-Davis: 83-85.
- Rouse, J. W.; Haas, R. H.; Schell, J. A.; Deering, D. W. 1973. Monitoring vegetation systems in the Great Plains with Third ERTS. ERTS symposium. NASA No. SP-351: 309-317.
- Ruhl, J. B. 1999 The (political) science of watershed management in the ecosystem age. *Journal of the American Water Resources Association*. 35(3): 519-526.
- Rustad, L. E.; Fernandez, I. J.; David, M. B.; Mitchell, M. J.; Nadelhoffer, K. J.; Fuller, R. B. 1996. Experimental soil acidification and recovery at the Bear Brook watershed in Maine. *Soil Science Society of America Journal*. 60: 1933-1943.
- SAF. 1944. Forestry terminology, a glossary of technical terms used in forestry. Washington, DC: Society of American Foresters, Committee on Forestry Terminology.
- Saint-Etienne, C. 1984 The great depression, 1929-1938: lessons for the 1980s. Stanford, CA: Hoover Institution Press.
- Salamon, S.; Farnsworth, R. L.; Rendziak, J. 1998. Is locally led conservation planning working? A farm town case study. *Rural Sociology*. 63(2): 214-234.
- Salminen, E. M.; Beschta, R. L. 1991. Phosphorous and forest streams: the effects of environmental conditions and management activities. Corvallis, OR: Oregon State University.
- Sampson, R. N. 1981. Farmland or wasteland: a time to choose. Emmaus, PA: Rodale Press.
- Savabi, M R.; Flanagan, D. C.; Hebel, B.; Engel, B. A. 1995. Application of WEPP and GIS-GRASS to a small watershed in Indiana. *Journal of Soil and Water Conservation*. 50(5): 477-484.
- Schott, J. R. 1997. Remote sensing: the image chain approach. New York: Oxford University Press: 394 p.
- Schultz, S.; Lincoln, R.; Cauhorn, J.; Montagne, C. 1992. Quantification of erosion from a fire and subsequent rainfall event in the northern Rocky Mountains: proceedings. Montana Academy Sciences. 52: 143-152.
- Sheng, T. C.; Barrett, R. E.; Mitchell, T. R. 1997. Using geographic information systems for watershed classification and rating in developing counties. *Journal of Soil and Water Conservation*. 52(2): 84-89.
- Shortle, W. C.; Smith, K. T. 1988. Aluminum-induced calcium deficiency syndrome in declining red spruce. *Science*. 240: 1017-1018.
- Shu-Qiang, W.; Unwin, D. L. 1992. Modelling landslide distribution on loess soils in China: an investigation. *International Journal of Geographical Information Systems*. 6(5): 391-405.
- Sidle, R.; Pearce, A. J.; O'Loughlin, C. L. 1985. Hillslope stability and land use. *Water Resources Monograph* 11.
- Simon, P. 1998. Tapped out: the coming world water crisis and what we can do about it. New York: Welcome Rain Publishers.
- Sklar, M. J. 1992. The United States as a developing country: studies in U.S. history in the progressive era and the 1920s. New York: Cambridge Press.
- Smith, G. 1984. People helping people: 50 years of SCS Northeast Technical Center conservation efforts. Chester, PA: U.S. Department of Agriculture, Soil Conservation Service.
- Srinivasen, R.; Arnold, J. G. 1994. Integration of a basin-scale water quality model with GIS. *Water Resources Bulletin*. 30(3): 453-462.
- Steen, H. K. 1976. The U.S. Forest Service, a history. Seattle: University of Washington Press.

- Steiner, F. R. 1987. Soil conservation in the United States: policy and planning. Baltimore: John Hopkins University Press.
- Stoddart, L. A.; Smith, A. D. 1943. Range management. New York: McGraw-Hill Book Company.
- Storck, P.; Bowling, L.; Wetherbee, P.; Lettenmaier, D. 1998. Application of a GIS-based distributed hydrology model for prediction of forest harvest effects on peak streamflow in the Pacific northwest. *Hydrological Processes*. 12: 889-904.
- Sullivan, K.; Tooley, J.; Doughty, K.; Caldwell, J. E.; P. Knudsen, P. 1990. Evaluation of prediction models and characterization of stream temperature regimes in Washington. Rep. TFW-WQ3-90-006. Olympia, WA: Washington Department of National Resources, Timber/Fish/Wildlife.
- Swank, W. T.; Swift, L. W., Jr.; Douglass, J. E. 1988. Streamflow changes associated with forest cutting, species conversion, and natural disturbances. In: Swank, W. T.; Crossley, D. A., eds., *Forest Hydrology and Ecology at Ceweeta*. New York: Springer-Verlag: 297-312.
- Swift, L. W., Jr. 1984. Soil losses from roadbeds and cut and fill slopes in the southern Appalachian Mountains. *Southern Journal of Applied Forestry*. 8(4): 209-216.
- Swift, L. W., Jr. 1986. Filter strip widths for forest roads in the southern Appalachians. *Western Journal of Applied Forestry*. 10: 27-34.
- Syed, K. H. 1999. The impacts of digital elevation model type and resolution on hydrologic modeling. The University of Arizona, Department of Hydrology and Water Resources. Dissertation.
- Tainter, J. A. 1988. The collapse of complex societies. New York: Cambridge University Press.
- Tapscott, D. 1999. Creating value in the network economy. Cambridge, MA: Harvard Business School Press.
- Thapa, K.; J. Bossler, J. 1992. Accuracy of spatial data used in geographic information systems. *Photogrammetric Engineering and Remote Sensing*. 58(6): 835-841.
- Thomas, R. B.; Megahan, W. F. 1998. Peak flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon: a second opinion. *Water Resources Research*. 34(12): 3393-3403.
- Tobita, M.; Fujiwara, S.; Ozawa, S.; Rosen, P. A.; Fielding, E. J.; Werner, C. L.; Murakami, M.; Nakagawa, H.; Nitta, K.; Murakami, M. 1998. Deformation of the 1996 North Sakhalin earthquake detected by JERS-1/SAR interferometry. *Earth Planets Space*. 50: 313-325.
- Tomlin, C. D. 1990. Geographic information systems and cartographic modeling. Englewood Cliffs, NJ: Prentice Hall.
- Toupal, R.; Johnson, M. D. 1998. Conservation partnerships: indicators of success. Tech. Rep. 7.1. Tucson, AZ: U.S. Department of Agriculture, Natural Resources Conservation Service, Social Sciences Institute.
- Trimble, M. 1992. It always rains after a dry spell and other short tales of the old Southwest. Tucson, AZ: Treasure Chest Publications.
- Trimble, S. W. 1981. Changes in sediment storage in the Coon Creek basin, driftless area, Wisconsin, 1853 to 1975. *Science*. 214: 181-183.
- Troendle, C. A. 1983. The potential for water yield augmentation from forest management in the Rocky Mountain region. *Water Resources Bulletin*. 19(3): 359-373.
- Troendle, C. A.; Wilcox, M. S.; Bevenger, G. S. 1998. The Coon Creek water yield augmentation pilot project. In: Proceedings 66th western snow conference; 1998 April 20-23; Snowbird, UT: 123-130.
- Twigg, D. R. 1998. The global positioning system and its use for terrain mapping and monitoring, Chapter 3. In: Lane, S. N.; Richards, K.; Chandler, J., eds. *Landform monitoring, modelling, and analysis*. Chichester, England: John Wiley and Sons: 37-61.
- Tysdal, L. M.; Elliot, W. J.; Luce, C. H.; Black, T. A. 1997. Modeling insloping road erosion processes with the WEPP watershed model. Pap. 975014. 1997 American Society of Agricultural Engineers annual international meeting. St. Joseph, MI: ASAE.
- U.S. Army Corps of Engineers. 1995. HEC-RAS River analysis system—user's manual, version 1.0. Davis, CA: Hydrologic Engineering Center.
- U.S. Bureau of Land Management. 1997. Bureau of Land Management strategic plan; 1997 September 30. Printed from BLM WWW page: <http://www.blm.gov/nhp/info/stratplan/>
- U.S. Coast Guard. 1999. US Coast Guard Navigation Center Web pages: <http://www.navcen.uscg.mil/>.
- USDA Forest Service. 1999. Sustainable forest ecosystem management. Printed from: U.S. Department of Agriculture, Forest Service WWW page: <http://www.fs.fed.us/news/agenda/sustain-ecosystem.html>
- USDA Forest Service. 1999. Healthy watersheds. U.S. Department of Agriculture, Forest Service WWW page: [http://www.fs.fed.us/news/agenda/healthy\\_watersheds.html](http://www.fs.fed.us/news/agenda/healthy_watersheds.html).

- U.S. Environmental Protection Agency, 1992. The quality of our nation's water. EPA 841-S-94-002. Washington DC: US Environmental Protection Agency.
- U.S. Navy. 1999. NAVSTAR GPS Operations Web pages. <http://tycho.usno.navy.mil/gpsinfo.html>.
- U.S. Department of Commerce. 1968. Rainfall frequency atlas of Arizona for durations of 6-24 hours and return periods from 2 to 100 years. Tech. Rep. U.S. Department of Commerce.
- Van Haveren, B. P. 1988. A reevaluation of the Wagon Wheel Gap forest watershed experiment. *Forest Science*. 34(1): 208-214.
- Von Humbolt, A. 1849. *Ansichten der natur*. Cited in Kittredge 1948.
- Walsh, W. R. 1993. Toward spatial decision support systems in water resources. *Journal of Water Resources Planning and Management*. 119(2): 158-169.
- Wang, H.; Srinivasan, R. 1997. WWW publication of HUMUS—"HUMUS on Line", annual conference and exposition proceedings of the ACSM/ASPRS, Vol 4: 578-588.
- Ward, T. J. 1985. Sediment yield modeling of roadways. In: Soil erosion and conservation. Soil Conservation Society of America, Proceedings of the conference; Malama Aina '83; Honolulu, HI: January 16-22: 188-199.
- Ward, T. J. 1994. Modeling delivery of landslide materials to streams. WRR No. 288. New Mexico State University, New Mexico Water Resources Institute.
- Warren, S. D. 1989. An erosion-based land classification system for military installations. *Environmental Management*. 13(2): 251-257.
- Western, D.; Wright, M., eds. 1994 Natural connections: perspectives on community based conservation. Washington, DC: Island Press.
- Wilkinson, G. G. 1996. A review of current issues in the integration of GIS and remote sensing. *International Journal of Geographical Information Systems*. 10(1): 85-101.
- Williams, J. R. 1975. Sediment yield prediction with universal equation with runoff energy factor. In: Present and prospective technology for predicting sediment yield and sources. ARS-S-40. U.S. Department of Agriculture: 244-252.
- Wilson, J. P.; Spangrud, D. J.; Nielsen, G. A.; Jacobsen, J. S.; Tyler, D. A. 1998. Global positioning system sampling intensity and pattern effects on computed topographic attributes. *Journal of the Soil Science Society of America*. 62(5): 1410-1417.
- Wischmeier and Smith. 1978. Predicting rainfall erosion losses. *Agric. Handb.* 537. Washington, DC: U.S. Department of Agriculture.
- Wisler, C. O.; Brater, E. F. 1963. *Hydrology*. New York: John Wiley & Sons.
- WMO/UNESCO. 1969. International glossary of hydrology. Geneva: World Meteorological Organization and United Nations Educational, Scientific, and Cultural Organization.
- Wolinsky, A. 1999 The history of the Internet and the World Wide Web. Springfield, NJ: Enslow Publishing Company.
- Wolock, D. M.; Price, C. V. 1994. Effects of digital elevation model and map scale and data resolution on a topography-based watershed model. *Water Resources Research*, 30: 3041-3052.
- Wright, K. A.; Sendek, K. H.; Rice, R. M., Thomas, R. B. 1990. Logging effects on streamflow: storm runoff at Caspar Creek in northwestern California. *Water Resources Research*. 26(7): 1657-1667.
- Yang, C.; Shropshire, G. J.; Peterson, C. L. 1997. Measurement of ground slope and aspect using two inclinometers and GPS. *Transactions of the ASAE*. 40(6): 1769-1776.
- Young, R. A., Onstad, C. A.; Bosch, D. D.; Anderson, W. P. 1989. AGNPS: a nonpoint source pollution model for evaluating watersheds. *Journal of Soil and Water Conservation*. 44: 168-172.
- Zhang, W.; Montgomery, D. R. 1994. Digital elevation model grid size, landscape representation, and hydrologic simulations. *Water Resources Research*. 30: 1019-1028.
- Ziemer, R. R.; Lewis, J.; Lisle, T. E.; Rice, R. M. 1991. Long-term sedimentation effects of different patterns of timber harvesting. In: Peters, N. E.; Walling, D. E. *Sediment and stream water quality in a changing environment: trends and explanation: proceedings of the Vienna symposium*. Publ. 203 International Association Scientific Hydrology: 143-150.
- Zwieniecki, M. A.; Newton, M. 1999. Influence of streamside cover and stream features on temperature trends I forested streams of western Oregon. *Western Journal of Applied Forestry*. 14(2): 106-113.

---

## **Watershed Management Contributions to Future Land Stewardship**

---

- Adams, Robert McC. 1981. Heartland of cities: surveys of ancient settlement and land use on the central floodplain of the Euphrates. Chicago: University of Chicago Press.
- Baker, Malchus B., Jr.; DeBano, Leonard F.; Ffolliott, Peter F.; Gottfried, Gerald J. 1998. Riparian-watershed linkages in the Southwest. In: Potts, Donald F., ed. Proceedings of the AWRA specialty conference, rangeland management and water resources; 1998 May 27-29; Reno, NV. TPS-98-1. Herndon, VA: American Water Resources Association: 347-357.
- Basso, Keith H. 1970. The Cibecue Apache. Prospect Heights, IL: Waveland Press.
- Bettinger, Pete; Johnson, K. Norman; Sessions, John. 1998. Evaluating the association among alternative measures of cumulative watershed effects on a forested watershed in eastern Oregon. Western Journal of Applied Forestry. 13: 15-22.
- Bromley, Daniel W. 1995. The Handbook of Environmental Economics. Oxford, UK: Blackwell Handbooks in Economics.
- Brooks, Kenneth N.; Ffolliott, Peter F. 1995. Watersheds as management units: an international perspective. In: West, Neil E., ed. Rangelands in a sustainable biosphere: Proceedings of the Fifth International Rangeland Congress: Vol. II; 1995 July 23-28; Salt Lake City, UT. Denver, CO: Society for Range Management: 167-169.
- Bureau of Indian Affairs. 1960. Cibecue Watershed Vegetative Modification Project. Interim Rep. Whiteriver, AZ: Fort Apache Indian Agency.
- Bureau of Indian Affairs. 1964. Annual Narrative Report. Whiteriver, AZ: Fort Apache Indian Agency, Branch of Land Operations.
- Buskirk, Winfred. 1986. The Western Apache: Living with the Land Before 1850. Norman: University of Oklahoma Press.
- Carter, Vernon Gill; Dale, Tom. 1974. Topsoil and civilization: revised edition. Norman: University of Oklahoma Press.
- Clary, W. P.; Schmidt, L.; DeBano, L. F. 2000. The watershed-riparian connection: a recent concern? In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 221-226.
- Clary, Warren P.; Shaw, Nancy L.; Dudley, Jonathan G.; Saab, Victoria A.; Kinney, John W.; Smithman, Lynda C. 1996. Response of a depleted sagebrush steppe riparian system to grazing control and woody plantings. Res. Pap. INT-RP-492. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station. 32 p.
- Crowe, Douglas. 1984. Comprehensive planning for wildlife resources. Cheyenne: Wyoming Game and Fish Commission.
- DeBano, L. F.; Brejda, J. J.; Brock, J. H. 1984. Enhancement of riparian vegetation following shrub control in Arizona chaparral. Journal of Soil and Water Conservation. 39: 317-320.
- DeBano, Leonard F.; Ffolliott, Peter F.; Brooks, Kenneth N. 1996. Flow of water and sediments through Southwestern riparian systems. In: Shaw, Douglas W.; Finch, Deborah M., tech. coords. Desired future conditions for Southwestern riparian ecosystems: bringing interests and concerns together; 1995 September 18-22; Albuquerque, NM. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 128-134.
- DeBano, Leonard F.; Schmidt, Larry J. 1989. Improving Southwestern riparian areas through watershed management. Gen. Tech. Rep. RM-182. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- DeBano, Leonard F.; Schmidt, Larry J. 1989. Interrelationship between watershed condition and health of riparian areas in Southwestern United States. In: Gresswell, Robert E.; Barton, Bruce A.; Kershner, Jeffery L., eds. Practical approaches to riparian resource management: an educational workshop; 1989 May 8-11; Billings, MT. BLM-MT-PT-89-001-4351. Billings, MT: U.S. Department of the Interior, Bureau of Land Management: 45-52.
- DeBano, Leonard F.; Schmidt, Larry J. 1990. Potential for enhancing riparian habitats in the Southwestern United States with watershed practices. Forest Ecology and Management. 33/34: 385-403.
- de Steiguer, J. E. 1994. The French national forestry school: one hundred years after Pinchot. Journal of Forestry. 92(2): 18-20

- de Steiguer, J. E. 2000. Sustaining flows of crucial watershed resources. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 215-220.
- Dobrowolski, J. P.; Thurow, T. L. 1995. A practical rationale for implementing effective watershed-scale development: the EPIO approach. In: West, Neil E., ed. Rangelands in a sustainable biosphere: proceedings of the fifth international rangeland congress: Vol. II; 1995 July 23-28; Salt Lake City, UT. Denver, CO: Society for Range Management: 170-172.
- Dobrowolski, James P. 1995. Hydrology and watershed management: chairperson's summary and comments. In: West, Neil E., ed. Rangelands in a sustainable biosphere: proceedings of the fifth international rangeland congress: Vol. II; 1995 July 23-28; Salt Lake City, UT. Denver, CO: Society for Range Management: 173-176.
- Eldridge, D. J. 1995. Predicting the effects of vegetation cover on soil hydrology: a conceptual model. In: West, Neil E., ed. Rangelands in a sustainable biosphere: proceedings of the fifth international rangeland congress: Vol. I; 1995 July 23-28; Salt Lake City, UT. Denver, CO: Society for Range Management: 132-133.
- Federal Interagency Stream Restoration Working Group (FISRWG). 1998. Stream corridor restoration: principles, processes, and practices. Washington, DC: Government Printing Office. Variously paged.
- Ffolliot, P. F.; DeBano, L. F.; Baker, M. B. 1998. History of the Arizona watershed program. In: The proceedings of the 11th annual symposium of the Arizona Hydrologic Society: 85-86.
- Fields, Barry C. 1994. Environmental economics: an introduction. New York: McGraw-Hill, Inc.
- Frasier, G. W.; Hart, R. H.; Schuman, G. E. 1995. Impact of grazing intensity on infiltration/run-off characteristics of a shortgrass prairie. In: West, Neil E., ed. Rangelands in a sustainable biosphere: proceedings of the fifth international rangeland congress: Vol. I; 1995 July 23-28; Salt Lake City, UT. Denver, CO: Society for Range Management: 159-160.
- Heede, Burchard H. 1980 (revised 1992). Stream dynamics: an overview for land managers. Gen. Tech. Rep. RM-72. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Heede, Burchard H.; Harvey, Michael D.; Laird, Jeffrey R. 1988. Sediment delivery linkages in a chaparral watershed following a wildfire. Environmental Management. 12: 349-358.
- Henderson, James M.; Quandt, Richard E. 1980. Microeconomics: a mathematical approach. New York: McGraw-Hill, Inc.
- Jennings, Francis. 1993. The founders of America. New York: W.W. Norton and Co.
- Johnson, Donald. 1995. Ecological impacts of cattle grazing on the vegetation, soils, and wildlife of the mountains of Sonora. In: DeBano, Leonard F., Ffolliott, Peter F.; Ortega-Rubio, Alfredo; Gottfried, Gerald J.; Hamre, Robert H.; Edminster, Carleton B., tech. coords. Biodiversity and management of the madrean archipelago: the sky islands of Southwestern United States and northwestern Mexico; 1994 Sept. 19-23; Tucson, AZ. Gen. Tech. Rep. RM-GTR-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 434-437.
- Krueper, David J. 1996. Effects of livestock management on Southwestern riparian ecosystems. In: Shaw, Douglas W.; Finch, Deborah M., tech. coords. Desired future conditions for Southwestern riparian ecosystems: bringing interests and concerns together; 1995 September 18-22; Albuquerque, NM. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 281-301.
- Krutilla, John V.; Bowes, Michael D. 1989. Multiple use management: the economics of public forestslands. Washington, DC: Resources for the Future.
- Lee, Danny C.; Sedell, James R.; Rieman, Bruce E.; Thurow, Russell F.; Williams, Jack E.; Burns, David; Clayton, James; Decker, Lynn; Gresswell, Robert; House, Robert; Howell, Phil; Lee, Kristine M.; MacDonald, Ken; McIntyre, John; McKinney, Shaun; Noel, Tracy; O'Connor, Jim E.; Overton, C. Kerry; Perkins, Doug; Tu, Ken; Eimeren, Pat Van. 1997. Chapter 4: Broadscale assessment of aquatic species and habitats. In: Quigley, Thomas M.; Arbelbide, Sylvia J., tech. eds. An assessment of ecosystem components in the interior Columbia basin and portions of the Klamath and Great Basins. Gen. Tech. Rep. PNW-GTR-405. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 1057-1496. Vol. 3 of 4 volumes.

- Leopold, Luna B. 1994. A view of the river. Cambridge, MA: Harvard University Press.
- Long, J. W. 2000. Cibecue watershed projects: then, now, and in the future. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 227-233.
- Loomis, John B. 1993. Integrated public lands management. New York: Columbia University Press.
- McGurin, Joseph; Forsgren, Harv. 1997. What works, what doesn't, and why. In: Williams, Jack E.; Wood, Christopher, A.; Dombeck, Michael P., eds. Watershed restoration: principles and practices. Bethesda, MD: American Fisheries Society: 459-471.
- Medina, Alvin L. 1996. Native aquatic plants and ecological condition of Southwestern wetlands and riparian areas. In: Shaw, Douglas W.; Finch, Deborah M., tech. coords. Desired future conditions for Southwestern riparian ecosystems: bringing interests and concerns together; 1995 September 18-22; Albuquerque, NM. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 329-335.
- Megahan, W. F.; Ketcheson, G. L. 1996. Predicting downslope travel of granitic sediments from forest roads in Idaho. Journal of the American Water Resources Association. 32: 371-382.
- Miller, G. Tyler. 1996. Living in the environment: people, connections and solutions. 9th ed. Belmont, CA: Wadsworth Publishing.
- National Association of Conservation Districts 1998. What is locally led conservation?: A reference. League City, TX.
- National Research Council. 1999. New strategies for America's watersheds. Washington, DC: National Academy Press.
- Office of Technology Assessment. 1992. Forest Service planning: accommodating uses, producing outputs, and sustaining ecosystems. OTA Brief Rep. Washington. DC.
- Periman, Richard D. 1996. The influence of prehistoric Anasazi cobble-mulch agricultural features on northern Rio Grande landscapes. In: Shaw, Douglas W.; Finch, Deborah M., tech. coords. Desired future conditions for Southwestern riparian ecosystems: bringing interests and concerns together; 1995 September 18-22; Albuquerque, NM. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 181-188.
- Periman, Richard D. 1999. Dynamic human landscapes of the Rio del Oso: restoration and the simulation of past ecological conditions in the Upper Rio Grande Basin. In: Finch, Deborah M.; Whitney, Jeffery C.; Kelly, Jeffery F.; Loftin, Samuel R., tech. coords. Rio Grande ecosystems: linking land, water, and people: toward a sustainable future for the Middle Rio Grande Basin; 1998 June 2-5; Albuquerque, NM. Proc. RMRS-P-7. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 12-19.
- Rieman, Bruce; Clayton, Jim. 1997. Wildfire and native fish: issues of forest health and conservation of sensitive species. Fisheries. 22: 6-15.
- Rieman, Bruce; Lee, Danny; Chandler, Gwynne; Myers, Deborah. 1997. Does wildfire threaten extinction for salmonids? Responses of redband trout and bull trout following recent large fire on the Boise National Forest. In: Greenlee, J., ed. Proceedings of the symposium on fire effects on threatened and endangered species and habitats; 1995 November 13-16; Coeur d'Alene, ID. Fairfield, WA: International Association of Wildland Fire: 47-57.
- Rinne, John N. 1995. Sky island aquatic resources: habitats and refugia for native fishes. In: DeBano, Leonard F.; Ffolliott, Peter F.; Ortega-Rubio, Alfredo; Gottfried, Gerald J.; Hamre, Robert H.; Edminster, Carleton B., tech. coords. Biodiversity and management of the Madrean Archipelago: the sky islands of Southwestern United States and northwestern Mexico; 1994 September 19-23; Tucson, AZ. Gen. Tech. Rep. RM-GTR-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 351-360.
- Rinne, John N. 1996. Desired future condition: fish habitat in Southwestern riparian-stream habitats. In: Shaw, Douglas W.; Finch, Deborah M., tech. coords. Desired future conditions for Southwestern riparian ecosystems: bringing interests and concerns together; 1995 September 18-22; Albuquerque, NM. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 336-345.
- Robinson, Robert E. 1966. The Cibecue project, a review. In: Watershed review, proceedings of the 1965 Watershed Symposium: 24-25.

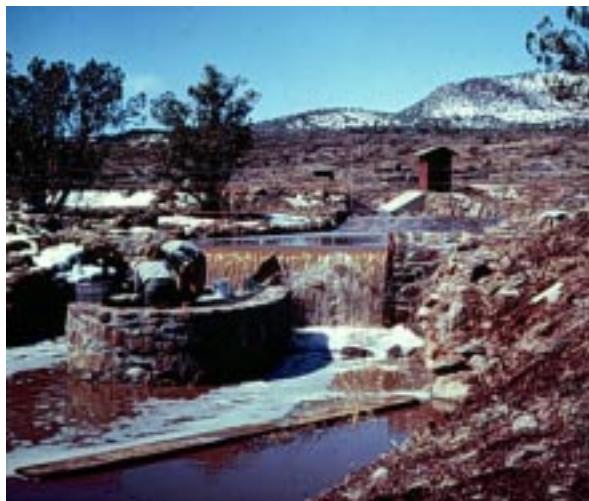
- Rosgen, D.L. 1996. Applied fluvial morphology. Pagosa Springs, CO: Wildland Hydrology.
- Sommerville, M.; DeSimone, D. 2000. Securing clean water: a secret to success. In: Ffolliott, P.F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 213-214.
- Spoerl, Patricia M.; Ravesloot, John C. 1995. From Casas Grandes to Casa Grande: prehistoric human impacts in the Sky Islands of southern Arizona and northwestern Mexico. In: DeBano, Leonard F., Ffolliott, Peter F.; Ortega-Rubio, Alfredo; Gottfried, Gerald J.; Hamre, Robert H.; Edminster, Carleton B., tech. coords. Biodiversity and management of the madrean archipelago: the sky islands of Southwestern United States and northwestern Mexico; 1994 September 19-23; Tucson, AZ. Gen. Tech. Rep. RM-GTR-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 492-501.
- State of Arizona, Watershed Management Division of the State Land Department. 1957. Arizona Watershed Program. Proceedings of the first meeting of federal, state and private agencies contributing to Arizona watershed research and management.
- Tainter, Joseph A. 1988. The collapse of complex societies. Cambridge: Cambridge University Press.
- Tainter, Joseph A.; Tainter, Bonnie Bagley. 1996. Riverine settlement in the evolution of prehistoric land-use systems in the middle Rio Grande Valley, New Mexico. In: Shaw, Douglas W.; Finch, Deborah M., tech. coords. Desired future conditions for Southwestern riparian ecosystems: bringing interests and concerns together; 1995 September 18-22; Albuquerque, NM. Gen. Tech. Rep. RM-GTR-272. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 22-32.
- Tietenberg, T. 1988. Environmental and Natural Resource Economics. Glenview, IL: Scott Foresman and Company.
- Tilt, Whitney; Williams, Cindy A. 1997. Building public and private partnerships. In: Williams, Jack E.; Wood, Christopher, A.; Dombeck, Michael P., eds. Watershed restoration: principles and practices. Bethesda, MD: American Fisheries Society: 145-157.
- U.S. Environmental Protection Agency. 1991. The watershed protection approach: an overview. Washington, DC.
- Welch, John R. 1996. Archaeological measures and social implications of agricultural commitment. Ann Arbor: University of Arizona. University Microfilms. Dissertation.
- White Mountain Apache Tribe vs United States. 1987. 11 Cl. Ct. 614.
- Whiting, Peter J.; Stamm, John F.; Moog, Douglas B.; Orndorff, Richard L. 1999. Sediment-transporing flows in headwater streams. Geological Society of America Bulletin. 111: 450-466.
- Wolman, M. Gordon. 1977. Changing needs and opportunities in the sediment field. Water Resources Research. 13: 50-54.
- Wood, Christopher A.; Williams, Jack E.; Dombeck, Michael P. 1997. Learning to live within the limits of the land: lessons from the watershed restoration case studies. In: Williams, Jack E.; Wood, Christopher, A.; Dombeck, Michael P., eds. Watershed restoration: principles and practices. Bethesda, MD: American Fisheries Society: 445-458.
- World Resources Institute. 1996. World resources: a guide to the global environment, 1996-1997. New York: Oxford University Press.
- 
- ## Future Protocols
- 
- Behan, R. W. 1990. Multiresource forest management: a paradigmatic challenge to professional forestry. Journal of Forestry. 88 (4):12-18.
- Behan, R. W. 1992. The irony of the multiple use / sustained yield concept: nothing is so powerful as an idea whose time has passed. In: Library of Congress Congressional Research Service, ed. Multiple use and sustained yield: changing philosophies for federal land management (the proceedings and summary of a workshop convened on March 5 and 6, 1992). Washington, DC: Government Printing Office: 95-106,
- Behan, R. W. 1997. The obsolete paradigm of professional forestry. Renewable Resources Journal. 15 (1): 14-19.
- Berry, Joyce K.; Gordon, John C. 1993. Environmental leadership: developing effective skills and styles. Washington, DC: Island Press.
- Boyle, Brian J.; Shannon, Margaret A.; Rose, Robert A.; Halvorsen, Kathleen; Elway, H. Stuart. 1994. Policies and mythologies of the US Forest Service:

- a conversation with employees. Seattle, WA: University of Washington, College of Forest Resources, Institute for Resources in Society.
- Brooks, David J.; Grant, Gordon E. 1992. New approaches to forest management: background, science issues and research agenda (parts one and two). *Journal of Forestry*. 90(1 and 2): 25-28, 21-24.
- Cawley; McGregor, R.; Freemuth, John. 1997. A critique of the multiple use framework in public lands decisionmaking. In: Davis, Charles, ed. *Western public lands and environmental politics*. Boulder, CO: Westview: 32-44.
- Christensen, Norman L.; Bartuska, Ann M.; Brown, James H.; Carpenter, Stephen; D'Antonio, Carla; Francis, Robert; Franklin, Jerry F.; MacMahon, James A.; Noss, Reed F.; Parsons, David J.; Peterson, Charles H.; Turner, Monica G.; Woodmansee, Robert G. 1996. The report of the ecological society of America committee on the scientific basis for ecosystem management. *Eco-logical Applications*. 6(3): 665-691.
- Clarke, Jeanne Nienaber; McCool, Daniel C. 1996. Staking out the terrain: power and performance among natural resource agencies. 2nd ed. Albany, NY: State University of New York.
- Cooperrider, Allen Y. 1996. Science as a model for ecosystem management—panacea or problem? *Ecological Applications*. 6 (3): 736-737.
- Cortner, H. J.; Moote, M. A. 2000. Ensuring the common for the goose: implementing effective watershed policies. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 247-256.
- Cortner, Hanna J.; Moote, Margaret A. 1999. The politics of ecosystem management. Washington, DC: Island Press.
- Cowart, Richard H.; Fairfax, Sally K. 1988. Public lands federalism: judicial theory and administrative reality. *Ecology Law Quarterly*. 15: 375-476.
- Cribbet, John Edward. 1986. Concepts in transition: the search for a new definition of property. *University of Illinois Law Review*. 1(1): 1-42.
- de Tocqueville, Alexis. 1900. Democracy in America. Translated by Reeve, Henry. revised ed. 2 vols. New York: Colonial Press.
- Etzioni, Amitai, ed. 1995. Rights and the common good: the communitarian perspective. New York: St. Martin's Press.
- Fischer, Frank. 1990. Technocracy and the politics of expertise. Newbury Park, CA: Sage.
- Flick, Warren A.; King, William E. 1995. Ecosystem management as American law. *Renewable Resources Journal*. 13(3): 6-11.
- Forest Ecosystem Management Assessment Team (FEMAT): an ecological, economic, and social assessment. Washington DC: Government Printing Office.
- Franklin, Jerry F. 1993. The fundamentals of ecosystem management with applications in the Pacific Northwest. In: Aplet, George H.; Johnson, Nels; Olson, Jeffery T.; Sample, V. Alaric, eds. *Defining sustainable forestry*. Washington DC: Island Press:127-144.
- Fulk, Thomas A.; Bradshaw, William G.; Colby, James M.; Mobley, Melody S.; Nelson, M. Kent; Phelps; Marcus G.; Stutler, Joseph E.; Wardle, Tom. 1990. Effectiveness of planning coordination. Vol. 6, Critique of land management planning. Washington, DC: U.S. Department of Agriculture, Forest Service, Policy Analysis Staff.
- Geisler, Charles; Kittel, Susan. 1994. Who owns the ecosystem? Property dimensions of ecosystem management. Paper read at: Institutional Problem Analysis Workshop; 1994 October 20-22; Stevenson, WA.
- Gordon, John C. 1994. From vision to policy: a role for foresters. *Journal of Forestry*. 92(7): 16-19.
- Gottfried, G. J.; Eskew, L. G.; Curtin, C. G.; Edminster, C. B., comps. 1999. Toward integrated research, land management, and ecosystem protection in the Malpai Borderlands: conference summary. Proceedings RMRS-P-10. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 136 p.
- Gregersen, H. M.; Easter, W. K; deSteiguer, J. E. 2000. Responding to increased needs and demands for water. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 238-246.
- Grumbine, R. Edward. 1994. What is ecosystem management? *Conservation Biology*. 8(1): 27-38.

- Hargrove, Eugene C. 1980. Anglo-American land use attitudes. *Environmental Ethics*. 2(Summer): 121-148.
- Holling, C. S.; Meffe, Gary K. 1996. Command and control and the pathology of natural resource management. *Conservation Biology*. 10(2): 328-337.
- IFPRI (International Food Policy Research Institute). 1995. Speeches made at the international conference: a vision for food, agriculture and the environment; 1995 June 13-15; Washington, DC. Washington, DC: IFPRI. 145 p.
- Inglehart, Ronald. 1997. Postmaterialist values and the erosion of institutional authority. In: Nye, Joseph S. Jr.; Zelikow, Philip D.; King, David C., eds. *Why people don't trust government*. Cambridge, MA: Harvard University Press: 217-236.
- Ingram, Helen; Wallace, Mary G. 1997. An 'empire of liberty': Thomas Jefferson and governing natural resources in the west. In: Ronda, James P., ed. *Thomas Jefferson and the changing west: from conquest to conservation*. Albuquerque, NM: University of New Mexico Press for the Missouri Historical Society Press: 93-106.
- Keiter, Robert. 1989. Taking account of the ecosystem on the public domain: law and ecology in the greater Yellowstone region. *University of Colorado Law Review*. 60: 923-1007.
- Keiter, Robert. 1994. Beyond the boundary line: constructing a law of ecosystem management. *University of Colorado Law Review*. 65(2): 293-333.
- Keiter, Robert B.; Milkman, Louise; Boling, Ted. 1995. Legal perspectives on ecosystem management: legitimizing a new federal land management policy. Paper read at: Ecological stewardship workshop; Tucson, AZ.
- Kennedy, James J.; Dombeck, Michael P. 1995. The evolution of public agency beliefs and behavior toward ecosystem-based stewardship. Paper read at: Ecological stewardship workshop; Tucson, AZ.
- Klyza, Christopher McGrory. 1996. Who controls public lands? Mining, forestry, and grazing policies, 1870-1990. Chapel Hill: The University of North Carolina Press.
- Kusel, Jonathan. 1996. Well-being in forest-dependent communities, part I: a new approach. In: Sierra Nevada Ecosystem Project; final report to congress, Volume II, assessments and scientific basis for management options. Davis, CA: University of California Centers for Water and Wildland Resources: 361-374.
- Kweit, Mary Grisez; Kweit, Robert W. 1987. The politics of policy analysis: the role of citizen participation in analytic decision-making. In: Desario, Jack; Langton, Stuart, eds. *Citizen participation in public decision-making*. New York: Greenwood Press: 19-37.
- Lant, C. L. 1999. Introduction: human dimensions of watershed management. In: *Journal of the American Water Resources Association*. 35(3): 483-486.
- Lazarus, Richard J. 1991. The tragedy of distrust in the implementation of federal environmental law. *Law and Contemporary Problems*. 54: 311.
- Lee, Kai N. 1993. *Compass and gyroscope: integrating science and politics for the environment*. Washington, DC: Island Press.
- Leopold, Aldo. 1949. A sand county almanac and sketches here and there. Special commemorative ed. New York: Oxford University Press.
- Lijphart, Arend. 1997. Unequal participation: democracy's unresolved dilemma (presidential address, American Political Science Association, 1996). *American Political Science Review*. 91(1): 1-14.
- Loaiciga, H. A.; Renehan, S. 1997. Municipal water use and water rates driven by severe drought: a case study. *Journal of the American Water Resources Association*. 33(6): 1313-1326.
- Loomis, J. B. 1998. Estimating the public's values for instream flow: economic techniques and dollar values. *Journal of the American Water Resources Association*. 34(5): 1007-1013.
- Machlis, Gary E. 1990. The tension between local and national conservation groups in the democratic regime. *Society and Natural Resources*. 3: 267-279.
- McDonald, Bill. 1995. The formation and history of the Malpai Borderlands Group. In: DeBano, L. F.; Ffolliott, P. F.; Ortega-Rubio, A.; Gottfried, G. J.; Hamre, R. H.; Edminster, C. B., tech. coords. *Biodiversity and management of the Madrean Archipelago: The Sky Islands of Southeastern United States and Northwestern Mexico*. Gen. Tech. Rep. GTR-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 483-486.
- McDonald, Bill. 1996. Fire and the Malpai Borderland Group: one rancher's perspective. In: Ffolliott, P. F.; L. F. DeBano, L. F.; Baker, M. B., Jr., Gottfried, G. J.; Solis-Garza, G.; Edminster, C. B.; Neary, D. G.; Allen, L. S.; Hamre, R. H., tech. coords. *Effects of fire on Madrean Province ecosystems: a symposium proceedings*. Gen. Tech. Rep. RM-GTR-289. Fort Collins, CO: U.S. Department of Agriculture, Forest Service,

- Rocky Mountain Forest and Range Experiment Station: 175-177.
- McDonald, Bill. 1999. The landscape and small-ranching economy. In: Gottfried, G. J.; Eskew, L. G.; Curtin, C. G.; Edminster, C. B., comps. Toward integrated research, land management, and ecosystem protection in the Malpai Borderlands: conference summary. Proceedings RMRS-P-10. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 5-6.
- McDonald, Bill. 2000. Anticipating future landscape conditions: A case study. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 235-237.
- Michelsen, A. M.; McGuckin, J. T.; Stumpf, D. 1999. Nonprice water conservation programs as a demand management tool. *Journal of the American Water Resources Association*. 35(3): 593-602.
- Natural Resources Law Center. 1996. The watershed source book: watershed-based solutions to natural resource problems. Boulder, CO: University of Colorado Natural Resources Law Center.
- Nye, Joseph S., Jr.; Zelikow, Philip D.; King, David C. 1997. Why people don't trust government. Cambridge, MA: Harvard University Press.
- O'Leary, Rosemary. 1994. The bureaucratic politics paradox: the case of wetlands legislation in Nevada. *Journal of Public Administration Research and Theory*. 4(4): 443-467.
- President's Council on Sustainable Development. 1996. Sustainable America: a new consensus for prosperity, opportunity, and a healthy environment for the future. Washington, DC: Government Printing Office.
- Putnam, Robert D. 1995. Bowling alone: America's declining social capital. *Journal of Democracy*. 6(1): 65-78.
- Reich, Robert. 1997. The unfinished agenda. Paper read at: Council on Excellence in Government, Washington, DC. January 9.
- Rivlin, Alice. 1993. Values, institutions and sustainable forestry. In: Aplet, Gregory H.; Johnson, Nels; Olson, Jeffery T.; Sample, V. Alaric, eds. *Defining sustainable forestry*. Washington, DC: Island Press: 255-259.
- Rohlf, Daniel J. 1994. Six biological reasons why the Endangered Species Act doesn't work—and what to do about it. In: Grumbine, R. Edward, ed. *Environmental policy and biodiversity*. Washington, DC: Island Press: 181-200.
- Rosegrant, M. W. 1997. Water resources in the twenty-first century: challenges and Implications for action. *Food, Agriculture, and the Environment Discussion Paper* 20. Washington, DC: International Food Policy Research Institute.
- Rosenbaum, Walter A. 1998. Environmental politics and policy. 4th ed. Washington, DC: CQ Press.
- Sample, V. Alaric. 1994. Building partnerships for ecosystem management on mixed ownership landscapes. *Journal of Forestry*. 92(8): 41-44.
- Sax, Joseph L. 1993. Property rights and the economy of nature: understanding Lucas v. South Carolina Coastal Council. *Stanford Law Review*. 45(5): 1433-1455.
- Scherr, S. J. 1999. Soil degradation: a threat to developing—country food security by 2020? *Food, Agriculture and the Environment Discussion Pap.* 27. Washington, DC: International Food Policy Research Institute.
- Schiff, Ashley. 1962. Fire and water: scientific heresy in the U.S. Forest Service. Cambridge, MA: Harvard University Press.
- Schneider, Anne Larason; Ingram, Helen. 1997. *Policy design for democracy*. Lawrence: University Press of Kansas.
- Senge, P. M. 1990. *The fifth discipline: the art & practice of learning organizations*. New York: Doubleday/Currency.
- Shannon, Margaret A.; Antypas, Alexios R. 1996. Civic science is democracy in action. *Northwest Science*. 70(1): 66-69.
- Sirmon, Jeff; Shands, William E.; Liggett, Chris. 1993. Communities of interests and open decisionmaking. *Journal of Forestry*. 91(7): 17-21.
- Toupal, Rebecca S.; Johnson, Michael. 1998. Conservation partnerships: indicators of success. Washington, DC: U.S. Department of Agriculture, Natural Resource Conservation Service, Social Sciences Institute.
- Weeks, W. William. 1997. Beyond the ark: tools for an ecosystem approach to conservation. Washington, DC: Island Press.
- Western, David; Wright, R. Michael, eds. 1994. *Natural connections: perspectives in community-based conservation*. Covelo, CA: Island Press.
- Wilhite, D.A. 1997. State actions to mitigate drought: lessons learned. *Journal of the American Water Resources Association*. 33(5): 961-967.

- Wilkinson, Charles F. 1992. Crossing the next meridian: land, water, and the future of the west. Washington, DC: Island Press.
- Wood, Christopher A. 1994. Ecosystem management: achieving the new land ethic. *Renewable Resources Journal*. 12(1): 6-12.
- World Bank. 1993. Water resources management. Washington, DC: The World Bank.
- World Meteorological Organization, Hydrology and Water Resources Programme. 1999. The Dublin statement on water and sustainable development. <http://www.wmo.ch/web/homs/icwedece.html#introduction> Accessed July 13.
- Yaffee, Steven L.; Phillips, Ali F.; Frentz, Irene C.; Hardy, Paul W.; Maleki, Susanne M.; Thorpe, Barbara E. 1996. Ecosystem management in the United States: an assessment of current experience. Covelo, CA: Island Press.




---

## Water-Related Research Projects

---

### Vegetation Relationships

- Attiwill, P. M. C.; Cromer, R. N. 1982. Photosynthesis and transpiration of *Pinus radiata* D. under plantation conditions in Southern Australia in response to irrigation with waste water. *Australian Journal of Plant Physiology*. 9: 749-760.
- Avery, C. C.; Dexter, L. R.; Wier, R. R.; Delinger, W. G.; Tecle, A.; Becker, R. J. 1992. Where has all the

- snow gone? Snowpack sublimation in northern Arizona. *Western Snow Conference*. 60: 84-94.
- Bialkirwicz, F. 1978. Some aspects of the purification and utilization of municipal sewage in forest plantation. *Sylvan*. 122: 7-17.
- Bohren, C. F.; Barkstrom, B. R. 1974. Theory of optical properties on snow. *Journal of Geophysical Research*. 79: 4527-4535.
- Bohren, C. F.; Thorud, D. B. 1973. Two theoretical models of radiation heat transfer between forest trees and snowpacks. *Agricultural Meteorology*. 22: 3-16.
- Brister, G. H.; Schultz, R. V. 1981. The response of a southern Appalachian forest to waste water irrigation. *Journal of Environmental Quality*. 10: 148-153.
- Brown T. C.; Fogel, M. M. 1987. Use of streamflow increases from vegetative management in the Verde River. *Water Resources Bulletin*. 23: 1149-1160.
- Cable, D. R. 1975. Influence of precipitation on perennial grass production in the semidesert Southwest. *Ecology*. 56: 981-986.
- Cable, D. R. 1976. Twenty years of changes in grass production following mesquite control and reseeding. *Journal of Range Management*. 29: 286-289.
- Cromer, R. N.; Tompkins, D.; Barr, N. J. 1983. Irrigation of *Pinus radiata* with waste water, tree growth in response to treatment. *Australian Forest Research*. 13: 57-85.
- D'Arrigo, Rosanne D.; Cook, Edward R.; Jacoby, Gordon C. 1996. Tree-ring records of subantarctic climate over the recent centuries to millennia. In: Dean, J.; Meko, D.; Swetnam, T. W., eds. *Tree rings, environment and humanity: proceedings of the international conference; 1994 May 17-21; Tucson, AZ*: 171-180.
- Diaz, H. F. 1983. Some aspects of major dry and wet periods in the contiguous United States, 1895-1081. *Journal of Climatology and Applied Meteorology*. 22: 3-16.
- Dighton, J.; Jones, H. E. 1991. The use of roots to test N, P, and K deficiencies in eucalyptus nutrition. IUFRO symposium on intensive forestry: the role of eucalyptus. Durban, South Africa: 635-643.
- Evans, M. I. 1984. Firewood versus alternatives: domestic fuel in Mexico. *Occasional Pap*. 23 ISBN 0-85074-071-1. ISSN 0141-8181.
- Ffolliott, P. F. 1983. Time-space effects of openings in Arizona forests on snowpacks. *Hydrology and Water Resources in Arizona and the Southwest*. 13: 17-20.

- Ffolliott, P. F. 1993. Snowpack dynamics in mountain areas: research findings in the Southwestern United States. In: International symposium of mountainous areas; 1992 May 28-30; Shimla, India: 129-139.
- Ffolliott, P. F.; Baker, M. B., Jr. 2000. Snowpack hydrology in the Southwestern United States: contributions to watershed management. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 274-276.
- Ffolliott, P. F.; Gottfried, G. J.; Baker, M. B., Jr. 1989. Water yield from forest snowpack management: research findings in Arizona and New Mexico. *Water Resources Research*. 25: 1999-2007.
- Ffolliott, P. F.; Rasmussen, W. O. 1979. An interactive model of snowpack accumulation and melt dynamics in forested conditions. In: Colbeck, S. C.; Ray, M., eds. *Modeling of snow cover runoff*. Hanover, NH: U.S. Army Cold Regions Research and Engineering Laboratory: 59-368.
- Fritts, Harold C., 1976. *Tree rings and climate*. London: Academic Press.
- Fritts, Harold C.; Swetnam, Thomas W., 1989. Dendroecology: a tool for evaluating variations in past and present forest environments. In: Begon, M.; Fitter, A. H.; Ford, E. D.; Macfadyen, A., eds. *Advances in ecological research*. London: Academic Press. 19: 111-188.
- Galindo-Almanza, S.; García-Moya, E. 1986. The uses of mesquite (*Prosopis* spp) in the highlands of San Luis Potosi, Mexico. *Forest Ecology and Management*. 16: 49-56.
- Heitschmidt, R. K.; Dowhower, S. L. 1991. Herbage response following control of honey mesquite within tree lysimeters. *Journal of Range Management*. 44: 144-149.
- Hopmans, P. J.; Stewart, T. L.; Flinn, D. W.; Hillman, T. J. 1990. Growth, biomass production and nutrient accumulation by seven tree species irrigated with municipal effluent at Wodonga, Australia. *Forest Ecology and Management*. 30: 203-211.
- Hughes, Malcolm K.; Vaganov, Eugene A.; Shiyatov, Stepan A.; Touchan, Ramzi; Funkhouser, Gary. 1999. Twentieth-century summer warmth in northern Yakutia in a 600-year context. *The Holocene*. 9: 603-608.
- Hughes, Malcolm K.; Wu, Xiangding; Garfin, Gregg M. 1994. A preliminary reconstruction of rainfall in north-central China since A.D. 1600 from tree-ring density and width. *Quaternary Research*. 41: 88-99.
- Karpiscak, M. M.; Gerba, C. P.; Watt, P. M.; Foster, K. E.; Falabi, J. A. 1996. Multi-species plant systems for wastewater quality improvement and habitat enhancement. *International Association on of Water Quality. Water Science and Technology*. 33: 231-236.
- Karpiscak, M. M.; Gottfried, G. J. 2000. Tree production in desert regions using effluent and water harvesting. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 261-264.
- Martin, S. C. 1975. Ecology and management of Southwestern semidesert grass-shrub ranges: the status of our knowledge. *Res. Pap. RM-156*. U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 38 p.
- Martin, S. C.; Morton, H. L. 1993. Mesquite control increases grass density and reduces soil loss in southern Arizona. *Journal of Range Management*. 46: 170-175.
- Martin, S. C.; Reynolds, H. G. 1973. The Santa Rita Experimental Range: your facility for research on semidesert ecosystems. *Arizona Academy of Science*. 8: 56-67.
- Meko, David M.; Graybill, Donald A. 1995. Tree-ring reconstruction of Upper Gila River discharge. *Water Resources Bulletin*. 31(4): 605-616.
- Mueller-Dombois, D.; Ellenberg, H. 1974. *Aims and methods of vegetation ecology*. New York: Wiley & Sons.
- Nelson, M. 1995. Conceptual design of zero discharge and safe discharge biological wastewater treatment systems using fast-growing wetland trees. Tucson: The University of Arizona, School of Renewable Natural Resources. Thesis.
- Neilsen, G. H.; Stevenson, D. S.; Fitzpatrick, J. J.; Brownlee, C. H. 1989. Nutrition and yield of young apple trees irrigated with municipal waste water. *Journal of the American Society of Horticultural Science*. 114: 377-383.
- O'Dea, M. E.; Guertin, D. P.; Reid, C. P. P. 2000. *Arbuscule mycorrhizae*: a linkage between erosion and plant processes in the Southwest grassland. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech.

- coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 257-260.
- Pease, S.; Ffolliott, P. F.; DeBano, L. F.; Gottfried, G. J. 2000. Effects of mesquite control and mulching treatments on herbage production on semi-arid shrub-grasslands. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 265-267.
- Pechanec, J. F.; Pickford, G. D. 1937. A weight estimate method for determination of range or pasture production. *Journal of the American Society of Agronomy*. 29: 894-904.
- Rzedowski, J. 1966. Vegetación del estado de San Luis Potosí. *Acta Científica Potosina*, Volumen V. Nos. 1 y 2. San Luis Potosí, S.L.P., Mex.
- Schreiner, R. P.; Mihara, K. L.; McDaniel, H.; Bethlenfalvay, G. J. 1997. Mycorrhizal fungi influence plant and soil functions and interactions. *Plant and Soil*. 188: 199-209.
- Silbert, M. S. 1988. Mesquite pod utilization for livestock feed: an economic development alternative in central Mexico. Tucson: University of Arizona, School of Renewable Natural Resources. Thesis.
- Smith, Lawrence P.; Stockton, Charles W. 1981. Reconstructed stream flow for the Salt and Verde rivers from tree-ring data. *Water Resources Bulletin*. 17(6): 939-947.
- Solomon, R. M.; Ffolliott, P. F.; Baker, M. B., Jr., Thompson, J. R. 1976. Computer simulation of snowmelt. *Res. Pap. RM-174*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Solomon, R. M.; Ffolliott, P. F.; Baker, M. B., Jr.; Gottfried, G. J.; Thompson, J. R. 1975. Snowmelt runoff efficiencies in Arizona watersheds. *Res. Pap. 274*. Arizona Agricultural Experiment Station.
- Stewart, J. T. L.; Flinn, D. W. 1984. Establishment and early growth of trees irrigated with waste water at four sites in Victoria. *Forest Ecology and Management*. 8: 81-88.
- Stockton, Charles W.; Jacoby, Gordon C. 1976. Long-term surface water supply and streamflow levels in the Upper Colorado River Basin. *Bulletin 18*. Lake Powell Research Project.
- Swetnam, Thomas W.; Baisan, Christopher H. 1996. Historical fire regime patterns in the Southwestern United States A.D. 1700. In: Proceedings, symposium on La Mesa fire, Los Alamos, NM; 1994 March 29-31. *Gen. Tech. Rep. 286*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 11-32.
- Teidemann, A. R.; Klemmedson, J. O. 1973. Effects of mesquite on physical and chemical properties of the soil. *Journal of Range Management*. 26: 27-29.
- Tennyson, L. C.; Ffolliott, P. F.; Thorud, D. B. 1974. Use of time-lapse photography to assess potential interception in Arizona ponderosa pine. *Water Resources Bulletin*. 10: 1246-1254.
- Tisdall, J. M.; Oades, J. M. 1982. Organic matter and water-stable aggregates in soil. *Journal of Soil Science*. 33(2): 141-163.
- Touchan, Ramzi; Allen, Craig D.; Swetnam, Thomas W. 1996. Fire history and climatic patterns in ponderosa pine and mixed-conifer forests of the Jemez Mountains, northern New Mexico. In: Proceedings, symposium on La Mesa Fire, Los Alamos, NM; 1994 March 29-31. *Gen. Tech. Rep. 286*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 33-46.
- Touchan, Ramzi; Hughes, Malchom. 2000. The role of dendrochronology in natural resource management. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 277-281.
- Touchan, Ramzi; Meko, David M; Hughes, Malcolm K. 1999. A 396-year reconstruction of precipitation in southern Jordan. *Journal of the American Water Resources Association*. 35(1): 45-55.
- Villanueva-Díaz, J. 1985. Distribución actual y características ecológicas del mezquite (*Prosopis laevis* H. & B. Johnst), en el estado de San Luis Potosí. *Bol. Div. Inst. Nal. Invest. For. No. 74*, México
- Villanueva-Díaz, J.; Hernandez-Reyna, A.; Ramirez-Garcia, J. A. 2000. Mesquite: a multi-purpose species in two locations of San Luis Potosí, Mexico. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L.,

- tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 268-272.
- White, M. R. 2000. Ecological transition inn Arizona's subapline and montane grasslands. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 273.
- Wilm, H. G. 1948. The influence of forest cover on snow melt. Transactions of the American Geophysical Union. 29:547-556.

## Erosion and Sedimentation Processes

- Bates, R. I.; Jackson, J. A. eds. 1987. Glossary of geology. Third edition. Alexandria, VA: American Geological Institute (AGI).
- Brooks, Kenneth N.; Ffolliott, Peter F.; Gregersen, Hans M.; DeBano, Leonard F. 1997. Hydrology and the management of watersheds. Ames: Iowa State University Press.
- Cady, John G.; Wilding, L. P.; Drees, L. R. , 1986. Petrographic microscope techniques. In: Klute, A., ed. Methods of soil analysis, Part I. Second edition. Madison, WI: Americans Society of Agronomy-Soil Science Society of America, U.S.A.: 185-218.
- Carroll, D. 1970. Rock weathering. London: Plenum Press: 89-112.
- Hoek, E.; Brown, E. F. 1981. Underground excavation in rocks, Asia edition. England Institution of Mining and Metallurgy: 391-394.
- Lal, R.; Elliot, W. 1994. Erodibility and erosivity. In Lal, R., ed. Soil erosion: research methods) A Soil and Water Conservation Society publication. Delray Beach, Fl: St. Lucie Press: 181-208
- Lee, Cheng-Yi. 1982. Basic concepts of the mechanics of slope failure and Landslide. [In Chinese]. Journal of Soil and Water Conservation. 15:1 35-141.
- Lee, Cheng-Yi. 2000. Studies on rock characteristics and timing of creep at selected landslide sites in Taiwan. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 287-291
- LinJ. C.1991. Neotectonic landforms of the Coastal Range, Eastern Taiwan. London: Kings College, Department of Geography; and University College, Department of Geological Sciences. 380 p. Ph.D. Dissertation.
- Martin-R; Martha H.; Cox, Jerry R.; Ibarra-F, Fernando. 1995. Climatic effects on buffelgrass productivity in the Sonoran Desert. Journal of Range Management. 48(1): 60-63.
- McIvor, John G.; Williams, John; Gardener, Chris J. 1995. Pasture management influences runoff and soil movement in the semi-arid Tropics. Australian Journal of Experimental Agriculture. 35: 55-65.
- Morgan, R. P. C. 1995. Soil erosion and conservation. New York: Longman Group Limited.
- Nearing, M. A.; Lane, L. J.; Lopes, Vincent L. 1994. Modeling soil erosion. In: Lal, R., ed. Soil erosion: research methods. A Soil and Water Conservation Society publication. Delray Beach, FL: St. Lucie Press: 127-156.
- Perramond, Eirc P. 1998. Buffelgrass, conservation, and soil erosion in Sonora, Mexico. 94th annual meeting of the Association of American Geographers. Boston, MA.
- Renard, K. G.; Laften, J. M.; Foster, G. R.; McCool, D. K. 1994. The revised universal soil loss equation. In: Lal, R., ed. Soil erosion: research methods. A Soil and Water Conservation Society publication. Delray Beach, FL: St. Lucie Press: 105-124
- Roberts, A. 1977. Geotechnology. Oxford: Pergamon Press.
- Saito, Michitaka; Hiroshi, Uezawa. 1966, Forecasting the time of occurrence of slope failure. [In Japanese]. Journal Society of Japan Landslide. 2(2): 7-12.
- SARH. 1994. Datos sobre Precipitación y Temperatura de la Estación Climatológica Sonoya, Municipio Plutarco Elías Calles, Sonora. Secretaría de Agricultura y Recursos Hídricos. Dir. Gral. de Estudios. Subdir. de Hidrología. Programa de Planeación. División Hidrométrica de Sonora, Mexico.
- Terzaghi, K. 1950. Mechanism of landslides. In: Paige, S., ed. Application geology to engineering practice. Geological Society of America, Engineering Geology (Berkey): 83-123.
- Tongway, D.J.; Smith, E. Lamar. 1989. Soil surface as indicators of rangeland site productivity. Australian Rangeland Journal. 11: 15-20.

- USDA. 1976. Technical Notes. Conservation Planning Note No. 11. Phoenix, AZ: U.S. Department of Agriculture, Soil Conservation Service.
- Valdez-Zamudio, D. 1994. Land cover and land use change detection in northwestern Sonora, Mexico using geographic information and system remote sensing techniques. Tuscon: University of Arizona. Thesis.
- Valdez-Zamudio, D.; Guertin, D. P. 2000. Soil erosion studies in buffelgrass pastures. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 282-286.
- Wang, Y. 1964. Clay minerals from the Tsengwen Damsite. In: Geological reports on Tsengwen Reservoir Project. Tsengwen Reservoir Construction Bureau: 177-184.
- Wang, Y. 1964. Petrographical study of some foundation rocks from Liutengtan Damsite. In: Geological reports on Tsengwen Reservoir Project. Tsengwen Reservoir Construction Bureau: 201-209.
- salmonids fishes and their habitats. Bethesda, MD: American Fisheries Society: 181-206
- Clary, W. P.; Kinney, J. W. 2000. Streambank response to simulated grazing. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 292-299.
- Clary, W. P.; Kinney, J. W. 2000. Riparian-fisheries habitat responses to late spring cattle grazing In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 296-299.
- Clary, Warren P. 1995. Vegetation and soil responses to grazing simulation on riparian meadows. *Journal of Range Management*. 48: 18-25.
- Clary, Warren P. 1999. Stream channel and vegetation responses to late spring cattle grazing. *Journal of Range Management*. 52: 218-227.
- Clary, Warren P.; Booth, Gordon D. 1993. Early season utilization of mountain meadow riparian pastures. *Journal of Range Management*. 46: 493-497.
- Clary, Warren P.; Thornton, Christopher I.; Abt, Steven R. 1996. Riparian stubble height and recovery of degraded streambanks. *Rangelands*. 18: 137-140.
- Dobrowolski, James P., eds. Riparian resources: a symposium on the disturbances, management, economics, and conflicts associated with riparian ecosystems. Logan, UT: Utah State University: 49-52.
- Dunaway, Donette; Swanson, Sherman R.; Wendel, Jeanne; Clary, Warren. 1994. The effect of herbaceous plant communities and soil textures on particle erosion of alluvial streambanks. *Geomorphology*. 9: 47-56.
- Ffolliott, P.F.; DeBano, L.F.; Baker, M.B. Jr. 1998. A short history of the Arizona watershed program. *Hydrology and Water Resources in Arizona and the Southwest*. 28: 1-12.
- Green, Douglas M.; Kauffman, J. Boone. 1995. Succession and livestock grazing in a northeastern Oregon riparian ecosystem. *Journal of Range Management*. 48: 307-313.
- Guthery, Fred S.; Bingham, Ralph L. 1996. A theoretical basis for study and management of

## Riparian Ecosystems and Wetlands

- Adams, Barry; Fitch, Lorne. 1995. Caring for the green zone: riparian areas and their grazing management. Alberta Riparian Habitat Management Project Publ. I-581. Lethbridge, Alberta, Canada: Graphcom Prints Ltd.
- Bjornn, T. C.; Reiser, D. W. 1991. Habitat requirements of salmonids in streams. In: Meehan, William R., ed. Influences of forest and rangeland management on salmonid fishes and their habitats. Spec. Pub. 19. Bethesda, MD: American Fisheries Society: 83-138.
- Branson, F. A.; Gifford, G. F.; Renard, K. G.; Hadley, R. F. 1981. Rangeland hydrology. Society of Range Management. Range Series No. 1. Dubuque, IA. Kendall/Hunt Publishing Company.
- Carder, D. R. 1977. Multiresource management research in the Southwest—the Beaver Creek Program. *Journal of Forestry*. 75: 582-584.
- Chamberlain, T. W.; Harr, R. D.; Everest, F. H. 1991. Timber harvesting, silviculture and watershed processes. In: Meehan, W. R., ed. Influences of forest and rangeland management on

- trampling by cattle. *Journal of Range Management*. 49: 264-269.
- Hawkins, Charles P. 1994. What are riparian ecosystems and why are we worried about them? In: Rasmussen, G. Allen; Dobrowolski, James P., eds. *Riparian resources: a symposium on the disturbances, management, economics, and conflicts associated with riparian ecosystems*. Logan, UT: Utah State University: 1-9.
- Hicks, J.; Hall, J. D.; Bission, P. A.; Sedell, J. R. 1991. Responses of salmonids to habitat changes. In: Meehan, W. R., ed. *Influences of forest and rangeland management on salmonids fishes and their habitats*. Bethesda, MD: American Fisheries Society: 483-518.
- Heitschmidt, R. K.; Taylor, C. A., Jr. 1991. Livestock production. In: Heitschmidt, Rodney, K.; Stuth, Jerry W. *Grazing management: an ecological perspective*. Portland, OR: Timber Press: 161-177.
- Holechek, Jerry L.; Pieper, Rex D.; Herbel, Carlton H. 1989. *Range management: principles and practices*. Englewood Cliffs, NJ: Prentice Hall.
- Jemison, R. J.; Neary, D. G. 2000. Stream channel designs for riparian and wet meadow rangelands in the Southwestern United States. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 305-306.
- Jemison, R. J.; Neary, D. G.; Pawelek, D. 1997. Re-engineered forest roads to enhance riparian ecosystems in the Zuni Mountains of New Mexico. In: Wang, S. S. Y.; Langendoen, E. J.; Shields, F. D., Jr., eds. *Proceedings of the conference of landscapes disturbed by channel incision*. Center for Computational Hydroscience and Engineering. University, MS.
- Kleinfelder, Donald; Swanson, Sherman; Norris, Gary; Clary, Warren. 1992. Unconfined compressive strength of some streambank soils with herbaceous roots. *Soil Science Society of America Journal*. 56: 1920-1925.
- Kondolf, G. Mathias; Kattelmann, Richard; Embury, Michael; Erman, Don C. 1996. Status of riparian habitat. In: *Sierra Nevada ecosystem project final report to Congress*. Vol II. Wildland Resources Center Rep. 37. Davis, CA: University of California: 1009-1030.
- Kondolf, G. M.; Micheli, E. R. 1995. Evaluating stream restoration projects. *Environmental Management*. 19(1): 1-15.
- Kovalchik, Bernard L.; Elmore, Wayne. 1992. Effects of cattle grazing systems on willow-dominated plant associations in central Oregon. In: Clary, Warren P.; McArthur, E. Durant; Bedunah, Don; Wambolt, Carl L., comps. *Proceedings—symposium on ecology and management of riparian shrub communities*; 1991 May 29-31; Sun Valley, ID; Gen. Tech. Rep. INT-289. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Research Station: 111-119.
- Kozel, Steven J.; Hubert, Wayne A.; Parsons, Milton G. 1989. Habitat features and trout abundance relative to gradient in some Wyoming streams. *Northwest Science*. 63: 175-182.
- Marlow, Clayton B.; Pogacnik, Thomas M. 1985. Time of grazing and cattle-induced damage to streambanks. In: Johnson, R. Roy; Ziebell, Charles D.; Patton, David R.; Ffolliott, Peter F.; Hamre, R. H., tech. coords. *Riparian ecosystems and their management: reconciling conflicting uses*: First North American riparian conference; 1985 April 16-18; Tucson, AZ. Gen. Tech. Rep. RM-120. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 279-284.
- Marlow, Clayton B.; Pogacnik, Thomas M.; Quinsey, Shannon D. 1987. Streambank stability and cattle grazing in southwestern Montana. *Journal of Soil and Water Conservation*. 42: 291-296.
- Martin, David; Schumaker, Joan. 1998. *Montana stream management guide for landowners, managers, and stream users*. Bozeman, MT: Montana Department of Environmental Quality.
- Meehan, W. E. 1991. *Influences of forest and rangeland management on salmonids fishes and their habitats*. American Fisheries Society Special Publ. 19: 1-751.
- Morisawa, Marie. 1968. *Streams: their dynamics and morphology*. New York: McGraw-Hill Book Co.
- Murphy, M. L.; Meehan, W. R. 1991. Stream ecosystems. In: Meehan, William R., ed. *Influences of forest and rangeland management on salmonid fishes and their habitats*. Spec. Publ. 19. Bethesda, MD: American Fisheries Society: 17-46.
- Myers, Thomas J.; Swanson, Sherman. 1995. Impact of deferred rotation grazing on stream characteristics in central Nevada: a case study. *North American Journal of Fisheries Management*. 15: 428-439.

- Pelster, Andy J. 1998. Steer diets and livestock management in a montane riparian zone. Fort Collins, CO: Colorado State University. 85 p. Thesis.
- Platts, W. S. 1991. Livestock grazing. In: Meehan, William R., ed. Influences of forest and range-land management on salmonid fishes and their habitats. Spec. Publ. 19. Bethesda, MD: American Fisheries Society: 389-423.
- Rinne, J. N. 1991. An approach to management and conservation of a declining regional fish fauna: Southwestern USA. In: Proceedings of the symposium on wildlife conservation, 5th international conference on zoology; 1990 August; Yokohama, Japan: 55-60.
- Rinne, J. N. 1994. Declining Southwestern aquatic habitats and fishes: are they sustainable? Sustainability symposium; Flagstaff, AZ. Gen. Tech. Rep. RM-247. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 256-265.
- Rinne, J. N. 1996. Short-term effects of wildfire on on fishes and aquatic macroinvertebrates: Southwestern United States. North American Journal of Fisheries Management. 16: 653-658
- Rinne, J. N. 1998. Grazing and fishes in the Southwest: confounding factors for research. In: Potts, D. F., ed. Proceedings AWRA speciality conference: rangeland management and water resources; May 26-30; Reno, NV. AWRA/SRM Specialty Conference on Rangeland and Water Resources: 75-84.
- Rinne, J. N.; Medina, A. L. 1996. Implications of multiple use management strategies on native Southwestern (USA) fishes. In: Meyer, R. M., ed. Fisheries resource utilization and policy. proceedings. World Fisheries Congress, Theme 2. New Deli: Oxford & IBH Publishing Co. Pvt. Ltd.: 110-123.
- Rinne, J. N.; Minckley, W. L. 1991. Native fishes of arid lands: a dwindling resource of the desert Southwest. Gen. Tech. Rep. RM-206. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Rinne, J. N.; Neary, D. G. 1996. Effects of fire on aquatic habitats and biota in Madrean-type ecosystems—Southwestern USA. In: Hamre, R. H., ed. Proceedings of the Madrean fire conference. Gen. Tech. Rep. RM-289. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 135-145.
- Rinne, J. N.; Neary, D. G. 2000. Watersheds and fisheries relationships: state of knowledge, Southwestern United States. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 300-303.
- Rinne, J. N.; Stefferud, J. A. 1998. Factors contributing to collapse yet maintenance of a native fish community in the desert Southwest (USA). In: Hancock, D. A.; Smith, D. C.; Grant, A.; Beumer, J. P. Developing and sustaining world fisheries resources, proceedings of the 2nd World Fisheries Congress; 1996 July 28-August 2; Brisbane, Australia: 157-162.
- Rinne, J. N.; Stefferud, J. A. 1999. Single versus multiple species management: native fishes in Arizona. Forest Ecology and Management. 114: 357-365.
- Rinne, J. N.; Stefferud, J. A.; Clark, A.; Sponholtz, P. 1998. Fish community structure in the Verde River, Arizona, 1975-1997. Hydrology and Water Resources in Arizona and the Southwest. 28: 75-80.
- Rinne, John N. 1988. Grazing effects on stream habitat and fishes: research design considerations. North American Journal of Fisheries Management. 8: 240-247.
- Rosgen, D. 1996. Applied river morphology. Pogosa Springs, CO: Wildland Hydrology.
- Siekert, Ronald E.; Skinner, Q. D.; Smith, M. A.; Dodd, J. L.; Rodgers, J. D. 1985. Channel response of an ephemeral stream in Wyoming to selected grazing treatments. In: Johnson, R. Roy; Ziebell, Charles D.; Patton, David R.; Ffolliott, Peter F.; Hamre, R. H., tech. coords. Riparian ecosystems and their management: reconciling conflicting uses: first North American riparian conference; 1985 April 16-18; Tucson, AZ. Gen. Tech. Rep. RM-120. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 276-278.
- Snider, G. B. 2000. Evaluating the ecological economic success of riparian restoration projects in Arizona. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S.

- Department of Agriculture, Forest Service, Rocky Mountain Research Station: 304.
- Trimble, Stanley W.; Mendel, Alexandra C. 1995. The cow as a geomorphic agent—a critical review. *Geomorphology*. 13: 233-253.
- USDA Forest Service. 1983. The principal laws relating to forest service activities. Agric. Handbook 453. Washington, DC: U.S. Department of Agriculture, Forest Service.
- USDA Forest Service. 1992. Integrated riparian evaluation guide. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Region. Variously paged.
- USDA Forest Service. 1992. Ecology-based multiple use management. Albuquerque, NM: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- U.S. General Accounting Office. 1988. Public rangelands: some riparian areas restored but widespread improvement will be slow. GAO/RCED-88-105. Gaithersburg, MD: U.S. General Accounting Office.
- Williams, J. E.; Wood, C. A.; Dombeck, M. P. 1997. Watershed restoration: principles and practices. Bethesda, MD: American Fisheries Society.
- Winward, Alma H. 1994. Management of livestock in riparian areas. In: Rasmussen, G. Allen; Dobrowolski, James P., eds. Riparian resources: a symposium on the disturbances, management, economics, and conflicts associated with riparian ecosystems. Logan, UT: Utah State University: 49-52.
- RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 307-310.
- DeBano, L.F.; Baker, Malchus B. Jr.; Ffolliott, Peter F.; Neary, Daniel G. 1996. Fire severity and watershed resource responses in the Southwest. *Hydrology and Water Resources in Arizona and the Southwest*. 26: 39-44.
- DeBano, L. F.; Neary, D. G.; Ffolliott P. F. 1998. Fire's effect on ecosystems. John New York: Wiley & Sons.
- Dekker, L. W.; Ritsema, C. J.; Oostindie, K; Boersma, O. H. 1998. Effect of drying temperature on the severity of soil water repellency. *Soil Science*. 163: 780-796.
- Doerr, S. H.; Shakesby, R. A.; Walsh, R. P. D. 1998. Spatial variability of soil hydrophobicity in fire-prone eucalyptus and pine forests, Portugal. *Soil Science*. 163: 313-324.
- Edminster, C. B.; Weatherspoon, C. P.; Neary, D. G. 2000. The fire and fire surrogates study: providing guidelines for fire in future watershed management decisions. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 312-315.
- Neary, Daniel G. 1995. Effects of fire on watershed resources—a review. *Hydrology and Water Resources in Arizona and the Southwest*. 22/25: 5-54.
- Parsons, David J; DeBenedetti, Steven H. 1979. Impact of fire suppression on a mixed-conifer forest. *Forest Ecology and Management*. 2: 21-33.
- Prosser, I. P.; Williams, L. 1998. The effect of runoff and erosion in native *Eucalyptus* forest. *Hydrological Processes*. 12: 251-265.
- Robichaud, P. R. 1996. Spatially-varied erosion potential from harvested hillslopes after prescribed fire in the Interior Northwest. Moscow: University of Idaho. Dissertation.
- Scott, D. F. 1993. The hydrological effects of fire in South African mountain catchments. *Journal of Hydrology*. 150: 409-432.
- Soto, B.; Diaz-Fierros, F. 1998. Runoff and soil erosion from areas of burnt scrub: comparison of experimental results with those predicted by the WEPP model. *Catena*. 31: 257-270.
- Terry, J. P. 1994. Soil loss from erosion plots of differing post-fire forest cover, Portugal. In: Sala, M.; Rubio, J. F., eds. *Soil erosion and*

## Fire Effects

- Agee, James K. 1993. Fire ecology of Pacific Northwest forests. Washington, DC: Island Press.
- Baker, M. B., Jr.; Kruse, W. H. 2000. Assessment of effects of canopy disturbance on plants in a pinyon-juniper stand. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 311.
- DeBano, L. F. 2000. Fire-induced water repellency: an erosional factor in wildland environments. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings
- RMRS-GTR-71WWW. January 2001

- degradation as a consequence of forest fires—selection of papers from the international conference on soil erosion and degradation as a consequence of forest fires; 1991; Barcelona, Spain. Logrono, Spain: Geoforma Ediciones: 133-148.
- Terry, J. P.; Shakesby, R. A. 1993. Soil hydrophobicity effects on rainsplash: simulated rainfall and photographic evidence. *Earth Surface Processes and Landforms*. 18: 519-525.
- Walsh, R. P. D.; Boakes, D.; Coelho, C. O. A.; Goncalves, A. J. B.; Shakesby, R. A.; Thomas A. D. 1994. Impact of fire-induced hydrophobicity and post-fire forest litter on overland flow in northern and central Portugal. In: Volume II. 2nd international conference on forest fire research; 1994 November 21-24; Coimbra, Portugal. Domingos Xavier Viegas: 1149-1190.
- Weatherspoon, C. Phillip; Skinner, Carl N. 1996. Landscape-level strategies for forest fuel management. In: Sierra Nevada ecosystem project: final report to Congress. Volume II: assessments and scientific basis for management options. Report 37. Davis: University of California, Wildland Research Center, Davis Centers for Water and Wildland Resources: 1471-1492.
- Wells, W. G., II. 1987. The effects of fire on the generation of debris flows in southern California. *Reviews in Engineering Geology*. VII: 105-114.
- Chorley, R. J. 1969. The drainage basin as the fundamental geomorphic unit. In: Chorley, R. J., ed. *Water, earth and man*. London: Methuen: 77-99.
- Clapp, R. B.; Hornberger, G. M. 1978. Empirical equations for some soil hydraulic properties. *Water Resources Research*. 14.(4): 601-604.
- de Steiguer, J. E. 2000. Applying EXCEL® solver to a watershed management goal-programming problem. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 316-319.
- Dykstra, Dennis P. 1984. Mathematical programming for natural resource management. New York: McGraw-Hill, Inc.
- Federer, C. A. 1995. BROOK90: a simulation model for evaporation, soil water, and streamflow. Version 3.1 computer freeware and documentation. U.S. Department of Agriculture, Forest Service, P.O. Box 640, Durham, NH 03824.
- Federer, C. A.; Vorosmarty, C.; Fekete, B. 1996. Intercomparison of methods for calculating portential evaporation in regional and global water balances. *Water Resources Research*. 32(7) 2315-2321.
- Forest Ecosystem Management Assessment Team (FEMAT). 1993. *Forest ecosystem management: an ecological, economic, and social assessment*. Report of the Forest Ecosystem Management Assessment Team. 1993-793-071. Washington, DC: U.S. Government Printing Office.
- Garbrecht, J.; Martz, L. W.; 1995. TOPAZ: An automated digital landscape analysis tool for topographic evaluation, drainage identification, watershed segmentation and subcatchment parameterization; overview. ARS Publ. NAWQL 95-1. Durant, OK: U.S. Department of Agriculture, Agricultural Research Service.
- Goodrich, D. C. 1994. SALSA-MEX: a large scale semiarid land surface-atmospheric mountain experiment. *Proceedings of the 1994 international geoscience and remote sensing symposium (IGARSS '94)*; Pasadena, CA. 1: 190-193.
- Hernandez, Mariano; Miller, S. N. 2000. Integrated landscape/hydrologic modeling tool for

## Simulation Techniques and Mathematical Modeling

- Arnold, J. G.; Williams, J. R.; Srinivasan, R.; King, K. W.; Griggs, R. H. 1994. SWAT-soil water assessment tool. Temple, TX: U.S. Department of Agriculture, Agricultural Research Service, Grassland, Soil and Water Research Laboratory.
- Bottoms, K. E.; Bartlett, E. T. 1975. Resource allocation through goal programming. *Journal of Range Management*. 28: 442-447.
- Buongiorno, Joseph; Gilless, J. Keith. 1987. *Forest management and economics*. New York: MacMillan Publishing Company.
- Branson, F. A.; Gifford, G. F.; Renard, K. G.; Hadley, R. F. 1981. *Rangeland hydrology*. Range Science Series No.1. Denver, CO: Society for Range Management. 645 p.
- Canfield, H. E.; Lopes, V. L. 2000. Simulating soil moisture change in a semiarid rangeland watershed with a process-based water-balance model. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land*

- semiarid watersheds. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 320-324.
- Li, E. A.; Schanholz, V. O.; Carson, E. W. 1976. Estimating saturated hydraulic conductivity and capillary potential at the Wetting Front. Blacksburg, VA: Virginia Polytech Institute and State University, Department of Agricultural Engineering.
- Likens, G. E.; Bormann, F. H. 1974. Linkages between terrestrial and aquatic ecosystems. BioScience. 24: 447-456.
- Lotspeich, F. B. 1980. Watersheds as the basic ecosystem: this conceptual framework provides a basis for natural classification system. Water Resources Bulletin. 16: 581-586.
- Marquardt, D. W. 1963. An algorithm for least-squares estimation of nonlinear parameters. Journal of the Society of Industrial and Applied Mathematics. 11(2): 431-441.
- McClaran, M. P.; Brady, W. W. 1994. Arizona's diverse vegetation and contributions to plant ecology. Rangelands. 16: 208-217.
- Montgomery, D. R.; Dietrich, W. E.; Sullivan, K. 1998. The role of GIS in watershed analysis. Chapter 11. In: Lane, S.; Richards, K.; Chandler, J., eds. Landform monitoring, modeling and analysis. Chichester: John Wiley & Sons.
- Montgomery, D. R.; Grant, G. E.; Sullivan, K. 1995. Watershed analysis as a framework for implementing ecosystem management. Water Resources Bulletin. 31(3): 369-386.
- Nash, J. E.; Sutcliffe, J. V. 1970. River flow forecasting through conceptual models. I. A discussion of principles. Journal of Hydrology. 10: 282-290.
- Renard, K. G.; Lane, L. J.; Simanton, J. R.; Emmerich, W. E.; Stone, J. J.; Weltz, M. A.; Goodrich, D. C.; Yakowitz, D. S. 1993. Agricultural impacts in an arid environment: Walnut Gulch studies. Hydrological Science and Technology. 9(1-4): 145-190.
- Savage, Sam. 1997. Weighing the pros and cons of decision technology in spreadsheets. ORMS Today. 24(1), <http://lionhrtpub.com/orms/orms-2-97/savage.html>.
- Schrage, Linus. 1997. Optimization Modeling with LINDO. Pacific Grove, CA: Duxbury Press. 470 p.
- Shuttleworth, W. J.; Wallace, J. S. 1985. Evaporation from sparse crops—an energy combination theory. Quarterly Journal of the Royal Meteorological Society. 111: 839-855.
- Slocombe, D. S. 1993. Implementing ecosystem-based management. BioScience. 43: 612-622.
- Smith, R. E.; Goodrich, D. C.; Woolhiser, D. A.; Unkrich, C. L. 1995. KINEROS—A kinematic runoff and erosion model. In: Singh, V. P., ed. Computer models of watershed hydrology. Highlands Ranch, CO: Water Resources Publications.
- Stanley, T. R., Jr. 1995. Ecosystem management and the arrogance of humanism. Conservation Biology. 9: 255-262.
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Climatic Data Center. 1995. Cooperative summary of the Day. TD3200—Period of record through 1993.
- USDA Soil Conservation Service. 1972. National engineering handbook, section 4, hydrology. Washington, DC: U.S. Government Printing Office.
- U.S. Geological Survey. 1999. U.S. GeoData Web Site <http://edcwww.cr.usgs.gov/doc/edchome/ndcdbl/ndcdbl.html>.
- Washington Forest Practice Board (WFPB). 1992. Standard methodology for conducting watershed analysis. Washington Forest Practice Act Board manual, Version 1.0. 13 p.
- Whitaker, M. P. L. 1993. Small-scale spatial variability of soil moisture and hydraulic conductivity in a semi-arid rangeland soil in Arizona. University of Arizona. Thesis.

## Research Support Programs

- DeBano, Leonard F.; Ffolliott, Peter F.; Ortega-Rubio, Alfredo; Gottfried, Gerald J.; Hamre, Robert H.; Edminster, Carleton B., tech. coords. 1995. Biodiversity and management of the Madrean Archipelago: the sky islands of Southwestern United States and Northwestern Mexico; 1994 September 19-23; Tucson, AZ. Gen. Tech. Rep. RM-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Edminster, Carleton B.; Gottfried, Gerald J. 1999. Achieving ecosystem management in the borderlands of the Southwestern United States through coordinated research/management partnerships: an overview of Research Unit RM-4651. In: Gottfried, Gerald J.; Eskew, Lane G.; Curtin, Charles G.; Edminster, Carleton B.,

- comps. Toward integrated research, land management, and ecosystem protection in the Malpai Borderlands: conference summary; 1999 January 6-8; Douglas, AZ. Proceedings RMRS-P-10. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station:1-4.
- Ffolliott, Peter F.; DeBano, Leonard F.; Baker, Malchus B., Jr.; Gottfried, Gerald J.; Solis-Garza, Gilberto; Edminster, Carleton B.; Neary, Daniel G.; Allen, Larry S.; Hamre, R. H., tech. coords. 1996. Effects of fire on Madrean Province ecosystems: a symposium proceedings; 1996 March 11-15; Tucson, AZ. Gen. Tech. Rep. RM-289. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Ffolliott, Peter F.; DeBano, Leonard F.; Gottfried, Gerald J.; Huebner, Daniel P.; Edminster, Carl B. 1999. A bibliography for the northern Madrean Biogeographic Province. Res. Note RMRS-RN-7. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Ffolliott, P.F.; Fisher, J. T.; Sachs, M.; DeBoer, D. W.; Dawson, J. O.; Fulbright, T. E.; Tracy, J. 2000. International arid lands consortium: better land stewardship in water and watershed management. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 335-338.
- Ffolliott, P. F.; Fisher, J. T.; Sachs, Menachem; DeBoers, D. W.; J.O. Dawson, J.O.; Fulbright, T. E. 1998. Role of demonstration projects in combating desertification. *Journal of Arid Environments*. 39: 155-163.
- Gottfried, G.J.; Edminster, C. B.; Bemis, R. J.; Allen, L. S.; Curtin, C. G. 2000. Research support for land management in the Southwestern Borderlands. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 330-334.
- Gottfried, G. J.; Edminster, C. B.; Dillon, Madelyn, comps. 1998. Cross border waters: fragile treasures for the 21st century; Ninth U.S./Mexico Border States conference on recreation, parks, and wildlife; 1998 June 3-6; Tucson, AZ. Proceedings RMRS-P-5. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Gottfried, Gerald J.; Eskew, Lane G.; Curtin, Charles G.; Edminster, Carleton B., comps. 1999. Toward integrated research, land management, and ecosystem protection in the Malpai Borderlands: conference summary; 1999 January 6-8; Douglas, AZ. Proceedings RMRS-P-10. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Hegwood, D. A., editor. 1998. International arid lands consortium: a compendium of funded projects. International Arid Lands Consortium, Tucson, AZ.
- Hoekstra, T. W.; Shachak, M., eds. 1999. Arid lands management: towards ecological sustainability. Urbana: University of Illinois Press.
- McDonald, Bill. 1995. The formation and history of the Malpai Group. In: DeBano, Leonard F.; Ffolliott, Peter F.; Ortega-Rubio, Alfredo; Gottfried, Gerald J.; Hamre, Robert H.; Edminster, Carleton B., tech. coords. Biodiversity and management of the Madrean Archipelago: the sky islands of Southwestern United States and Northwestern Mexico; 1994 September 19-23; Tucson, AZ. Gen. Tech. Rep. RM-264. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 483-486.
- Morrison, Michael L.; Krausman, Paul R.; Sureda, Maite; Fox, Lisa M. 1997. Literature on wildlife research in the Madrean Archipelago: 1800s-1994. Gen. Tech. Rep. RM-GTR-290. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Tellman, Barbara; Finch Deborah M.; Edminster, Carl; Hamre, Robert, eds. 1998. The future of arid grasslands: identifying issues, seeking solutions; 1996 October 9-13; Tucson, AZ. Proceedings RMRS-P-3. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.



---

## Applied Watershed Management Activities

---

### Vegetation Management Practices

Aiken, G.R. 1985. Isolation and concentration techniques for aquatic humic substances. In: Aiken G. R.; McKnight D. M.; Wershaw R. L.; MacCarthy P. eds.) Humic substances in soil, sediment, and water. New York: John Wiley & Sons: 363-385.

Baker, D. G. 1972. Prediction of spring runoff. Water Resources Research. 8: 966-972.

Bosch, J. M.; Hewlett, J. D. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. Journal of Hydrology. 55: 3-23.

Brooks, K. N.; Ffolliott, P. F.; Gregersen, H. M.; DeBano, L. F. 1997. Hydrology and the management of watersheds. Iowa State University Press.

Brown, D. E.; Lowe C. H. 1994. A supplementary map to biotic communities: Southwestern United States and Northwestern Mexico. Salt Lake City: University of Utah Press.

Campbell, James B. 1987. Introduction to remote sensing. New York: The Guilford Press. 551 p.

Cloudsley-Thompson, J. L. 1977. Man and the biology of arid zones. Baltimore, MD: University Park Press. 182 p.

Crowley, D. E.; Reid, C. P. P.; Szaniszlo P. J. 1988. Utilization of microbial siderophores in iron acquisition by oat. Plant Physiology. 87: 680-685.

Erdas, Inc. 1991. Erdas field guide, version 7.5. Atlanta, GA: Erdas, Inc.: 105-141.

- Ffolliott, P. F.; Brooks, K. N.; Gregersen, H. M.; Lundgren, A. L. 1995. Dryland forestry: planning and management. New York: John Wiley & Sons.
- Goodman, B. A.; Cheshire, M. V. 1972. A Mossbauer spectroscopic study of the effect of pH on the reaction between iron and humic acid in aqueous media. Journal of Soil Science. 30: 85-91.
- Griffith, S. M.; Silver J.; Schnitzer, M. 1980. Hydrazine derivaturs at Fe<sup>3+</sup> sites in humic materials. Geoderma. 23: 299-302.
- Hewlett, J. D.; Troendle, C. A. 1975. Nonpoint and diffused water sources: a variable source area problem. In: Proceedings of a symposium on watershed management, Utah State University. New York: American Society of Civil Engineers: 21-46.
- Hornbeck, J. W.; Adams, M. B.; Corbett, E. S.; Verry, E. S.; Lynch, J. A. 1993. Long-term impacts of forest treatments on water yield: a summary for northeastern USA. Journal of Hydrology. 150: 323-344.
- INEGI. 1993. Estudio Hidrologico del Estado de Sonora. Instituto Nacional de Estadistica Geografia e Informatica, Hermosillo, Mexico.
- Iverson, L. R.; Risser, P. G. 1987. Analyzing long-term changes in vegetation with geographic information and remotely sensed data. Advanced Space Research. 7(11): 183-194.
- Jensen, J. R. 1986. Introductory digital image processing. a remote sensing perspective. New Jersey: Prentice-Hall.
- Josiah, S. J.; Gregersen, H. M.; Streed, E.; Perry, C. H.; Brooks, K. N. 1998. The potential for integrating short-rotation woody crops into agroforestry systems and practices in the United States: a national assessment. St. Paul, MN: Center for Integrated Natural Resources and Agricultural Management, University of Minnesota.
- Kaster, A. R. 1999. Predicting the effect of hybrid poplar trees on a water budget: Pomme de Terre watershed. University of Minnesota. Thesis.
- Klute, A., ed. 1986. Methods of soil analysis: Part 1— physical and mineralogical methods. American Society of Agronomy.
- Lee, R. 1980. Forest hydrology. New York: Columbia University Press.
- Lillesand, Thomas M.; Kiefer, Ralph W. 1987. Remote sensing and image interpretation. New York: John Wiley & Sons.
- Lin, Chao-Yuan. 2000. Water repellency of Casuarina (*Casuarina equisetifolia* forest.) windbreaks in central Taiwan. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L.,

- tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 346-348.
- Lowrance, R. R. 1992. Nitrogen outputs from a field-sized agricultural watershed. *Journal of Environmental Quality*. 21: 602-607.
- MacDicken, K. G.; Vergara, N. T. 1990. Agroforestry: classification and management. New York: John Wiley & Sons.
- Mallik, A. U.; Rahman, A. A. 1985. Soil water repellency in regularly burned Calluna heathlands: comparison of three measuring techniques. *Journal of Environmental Management*. 20: 207-218.
- Miller, R. C. 1999. Hydrologic effects of wetland drainage and land use change in a tributary watershed of the Minnesota River Basin: a modelling approach. University of Minnesota. Thesis. Minnesota Department of Natural Resources. 1995. Short rotation woody culture: analysis of a 10,000 acres per year hybrid poplar planting program. St. Paul, MN: Division of Forestry.
- Nair, P. K. R. 1993. An introduction to agroforestry. Dordrecht, The Netherlands: Kluwer Academic Publishers.
- Page, A. L. ed. 1982 Methods of soil analysis: Part 2—chemical and microbiological properties. American Society of Agronomy.
- Perry, C. H. 1998. Hydrologic impacts of short-rotation woody crop production in northwestern Minnesota. University of Minnesota. Ph.D. Dissertation.
- Perry, C. H.; Miller, R. C.; Brooks, K. N. In preparation. Impacts of short-rotation woody crops on regional water yield. *Forest Ecology and Management* (special issue)—The science of managing forests to sustain water resources: an international conference.
- Perry, C. H.; Miller, R. C.; Kaster, A. R.; Brooks, K. N. 2000. Watershed management implications of agroforestry expansion on Minnesota's farmlands. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 339-342.
- Pilon, P.G.; Howarth, P.J.; Bullock R. A. 1988. An enhanced classification approach to change detection in semiarid environments. *Photogrammetric Engineering and Remote Sensing*. 50(12): 1709-1716.
- Ranney, J. W.; Mann, L. K. 1994. Environmental considerations in energy crop production. *Biomass and Bioenergy*. 6: 211-228.
- Rosgen, D. L. 1994. A classification of natural rivers. *Catena*. 22: 169-199.
- SARH. 1989. Diagnóstico y Alternativas de Solución para el Programa de Modernización del Campo. de Agricultura y Recursos Hídricos. Delegación Estatal en Sonora. Distrito de Desarrollo Rural 139. Sonoyta, Sonora, México.
- SARH. 1994. Datos sobre Precipitación y Temperatura de la Estación Climatológica Sonoyta, Municipio Elías Calles, Sonora. Secretaría de Agricultura y Recursos Hídricos. Dir. Gral. de Estudios. Subdir de Hidrología. Programa de Planeación. División Hidrométrica de Sonora, Mexico.
- Schultz, R. C.; Colletti, J. P.; Isenhart, T. M.; Simpkins, W. W.; Mize, C. W.; Thompson, M. L. 1995. Design and placement of a multi-species riparian buffer strip system. *Agroforestry Systems*. 29: 201-226.
- Senesi, M.; Griffith S. M.; Schnitzer, M. 1977. Binding of Fe<sup>3+</sup> by humic materials. *Geochim. Cosmochim. Acta* 41: 969-976.
- Singh, A. 1989. Digital change detection techniques using remotely-sensed data. *International Journal of Remote Sensing*. 10(6): 989-1003.
- Skogerboe, R. K.; Wilson S. A. 1981. Reduction of ionic species by fulvic acid. *Analys of Chemistry*. 53: 228-232.
- Valdez-Zamudio, D.; Castellanos-Villegas, A. and Marsh. S. 2000. Land cover changes in central Sonora, Mexico. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 349-351.
- Valdez-Zamudio. D.; Ffolliott, P. F. 2000. Agroforestry systems in the Sonora River watershed, Mexico: an example of effective land stewardship. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 343-345.
- Verry, E. S. 1986. Forest harvesting and water: the Lake States experience. *Water Resources Bulletin*. 22: 1039-1047.

- Verry, E. S.; Lewis, J. R.; Brooks, K. N. 1983. Aspen clearcutting increases snowmelt and storm flow peaks in north central Minnesota. *Water Resources Bulletin*. 19: 59-67.
- Weitzman, S.; Bay, R. R. 1963. Forest soil freezing and the influence of management practices, northern Minnesota. *Res. Pap. LS-2*. St. Paul, MN: U.S. Department of Agriculture, Forest Service.
- Whitehead, P. G.; Robinson, M. 1993. Experimental basin studies: an international and historical perspective of forest impacts. *Journal of Hydrology*. 145: 217-230.
- Winkelmann, G. 1986. Iron uptake systems in fungi. In: Swinburne, T. R., ed. *Iron, siderophores and plant diseases*. New York: Plenum Press: 7-14.
- Young, A. 1994. Agroforestry for soil conservation. Nairobi, Kenya: International Council for Research in Agroforestry.
- Lopes, V. L.; Ffolliott, P. F. 1993. Sediment rating curves for a clearcut ponderosa pine watershed in northern Arizona. *Water Resources Bulletin*. 29: 369-382.
- Lopes, V. L.; Ffolliott, P. F.; Baker, M. B., Jr. Effects of watershed management practices on sediment concentrations in the Southwestern United States: management implications. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 352-355
- Lopes, V. L.; Ffolliott, P. F.; Gottfried, G. J.; Baker, M. B., Jr. 1996. Sediment rating curves for pinyon-juniper watersheds in northern Arizona. *Hydrology and Water Resources in Arizona and the Southwest*. 26: 9-33.
- Walling, D. E. 1977. Assessing the accuracy of suspended sediment rating curves for a small basin. *Water Resources Research*. 13: 531-538.

## Erosion and Sedimentation Controls

- Baker, M. B., Jr. 1982. Hydrologic regimes of forested areas in the Beaver Creek watershed. *Gen. Tech. Rep. RM-90*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Baker, M. B., Jr. 1983. Influence of slash windrows on streamflow. *Hydrology and Water Resources in Arizona and the Southwest*. 13: 21-25.
- Baker, M. B., Jr., comp. 1999. History of watershed research in the central Arizona highlands. *Gen. Tech. Rep. RMRS-GTR-29*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Brown, H. E.; Baker, M. B., Jr.; Rogers, J. J.; Clary, W. P.; Kovner, J. L.; Larson, F. R.; Avery, C. C.; Campbell, R. E. 1974. Opportunities for increasing water yields and other multiple use values on ponderosa pine forest lands. *Res. Pap. RM-129*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Clary, W. P.; Baker, M. B., Jr.; O'Connell, P. F.; Johnsen, T. N., Jr.; Campbell, R. E. 1974. Effects of pinyon-juniper removal on natural resource products and uses. *Res. Pap. RM-128*. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Duan, N. 1983. Smearing estimate—a nonparametric retransformation method. *Journal of the American Statistical Association*. 78: 605-610.

## Riparian Ecosystems and Wetlands

- Bengston, M.; Padmanabahn, G. 1999. A hydrological model for assessing the influence of wetlands on flood hydrographs in the Red River Basin. Report submitted to: The International Joint Commission Red River Task Force. July.
- Eppich, D.; Apfelbaum, S.; Lewis, L. 1999. Small wetlands use for stormwater runoff management in the Red River of the North Basin. Applied Ecological Services, Inc.
- Leitch, J. A.; Hovde, B. 1996. Empirical valuation of prairie potholes: five case studies. *Great Plains Research*. 6: 25-39.
- Long, J. W. 2000. Restoration of Gooseberry Creek. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 356-358.
- Long, J. W.; Burnette, B. M. 2000. Restoration of Soldier Spring. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. *Land stewardship in the 21st century: The contributions of watershed management*. Proceedings RMRS-P-13. Fort Collins, CO:

- U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 361-362.
- Long, J. W.; Endfield, D. 2000. Restoration of White Springs. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 359-360.
- Long, J. W.; Lupe, C. S. 1998. A process for planning and evaluating the success of riparian-wetland restoration projects on the Fort Apache Indian Reservation. *Hydrology and Water Resources in Arizona and the Southwest*. 28: 68-74.
- Rosgen, D. L. 1996. Applied fluvial geomorphology. Pagosa Springs, CO: Wildland Hydrology.
- Shultz, S. 2000. Wetland storage to reduce flood damages in the Red River. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 363-366.
- Sip, R. L. 1998. An economic assessment of wetland mitigation in Northwest Minnesota. Fargo: North Dakota State University, Department of Agricultural Economics. Thesis.
- Soil Survey. 1981. Soil survey of Fort Apache Indian Reservation, Arizona. Parts of Apache, Gila, and Navajo Counties. U.S. Department of Agriculture, Soil Conservation Service, and U.S. Department of the Interior, Bureau of Indian Affairs, in cooperation with Arizona Agricultural Experiment Station.
- watersheds of southern California. *The Professional Geographer*. XXI: 172-177.
- Bledsoe, F. N.; Fowler, J. M. 1992. Economic evaluation of the forage-fiber response to pinyon-juniper thinning. Bull. 753. Las Cruces: New Mexico State University Agricultural Experiment Station.
- Bosch, J. M; Hewlett, J. D. 1982. A review of catchment experiments to determine the effect of vegetation changes on water yield and evapotranspiration. *Journal of Hydrology*. 55: 3-23.
- Brooks, K. N.; Ffolliott, P. F.; Gregorsen, H. M.; DeBano, L. F. 1997. *Hydrology and Management of Watersheds*. Ames: Iowa State University Press.
- Clary, W. P.; Jameson, D. A. 1981. Herbage production following tree and shrub removal in the pinyon-juniper type of Arizona. *Journal of Range Management*. 34: 109-113.
- Dalen, R. S.; Snyder, W. R. 1987. Economic and social aspects of pinyon-juniper treatment-then and now. In: Everett, R. L., comp. *Proceedings pinyon-juniper conference; 1986 January 13-16; Reno, NV*. Gen. Tech. Rep. INT-215. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 343-350
- Daubenmire, R. 1959. Canopy coverage method of vegetation analysis. *North Science*. 33: 43-64.
- DeBano, L. F. 1981. Water repellent soils: a state-of-the art. Gen. Tech. Rep. PSW-46. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Forest and Range Experiment Station.
- DeBano, L. F.; Conrad, C. E. 1978. The effect of fire on nutrients in a chaparral ecosystem. *Ecology*. 59(3): 489-497.
- DeBano, L. F.; Ffolliott, P. F.; Baker, Jr., M. B. 1996. Fire severity effects on water resources. In: *Proceedings of a symposium on effects of fire on Madrean Province Ecosystems; 1996 March 11-15; Tucson, AZ*. Gen. Tech. Rep. RM-GTR-289. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station: 77-84.
- DeBano, L. F.; Klopatka, J. M. 1988. Phosphorus dynamics of pinyon-juniper soils following simulated burning. *Soil Science Society of America Journal*. 52: 271-277.
- DeBano, L. F.; Neary, D. G.; Ffolliott, P. F. 1998. *Fire's effects on ecosystems*. New York: John Wiley and Sons, Inc.
- Everett, R. L.; Sharro, S. H. 1985. Soil water and temperature in harvested and nonharvested

## Fire

- Ahlgren, I. F.; Ahlgren, C. E. 1965. Effects of prescribed burning on soil microorganisms in a Minnesota jack pine forest. *Ecology*. 46(3): 304-310.
- Anderson, H. W.; Hoover, M. D.; Reinhart, K. G. 1976. Forests and water: effects of forest management on floods, sedimentation, and water supply. Gen. Tech. Rep. PSW-18. Berkeley, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.
- Bailey, R. G.; Rice, R. M. 1969. Soil slippage: an indicator of slope instability on chaparral

- pinyon-juniper stands. Res. Pap. INT-342. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station.
- Ffolliott, P. F.; Brooks, K. N. 1996. Process studies in forest hydrology; a world-wide review. In: Singh, V. P.; Kumar, B., eds. Surface-water hydrology. The Netherlands. Kluwer Academic Publishers: 1-18.
- Ffolliott, P. F.; Thorud, D. B. 1977. Water yield improvement by vegetation management. Water Resources Bulletin, 13: 563-571.
- Giovannini, G.; Lucchesi, S.; Giachetti, M. 1988. Effect of heating on some physical and chemical parameters related to soil aggregation and irrigability. *Soil Science*. 146(4): 244-261.
- Hartford, R. A.; Frandsen, W. H. 1992. When it's hot, it's hot—or maybe it's not (surface flaming may not portend extensive soil heating). *International Journal of Wildland Fire*. 2: 139-144.
- Miles, S. R.; Haskins, D. M.; Ranken, D. W. 1989. Emergency burn rehabilitation: cost, risk, and effectiveness. In: Berg, Neil H., tech. coord. Proceedings of the symposium on fire and watershed management; 1988 October 26-28; Sacramento, CA. Gen. Tech. Rep. PSW-109. Berkeley, CA: U. S. Department of Agriculture, Forest Service; Pacific Southwest Forest and Range Experiment Station: 97-102
- Miller, R. F.; Wigand, P. E. 1994. Holocene changes in semiarid pinyon-juniper woodlands. Response to climate, fire, and human activities in the US Great Basin. *Bioscience*. 44(7): 465-474.
- Murphy, J.; Riley J. P. 1962. A modified single solution method for determination of phosphate in natural waters. *Anal. Chim. Acta*. 27: 31-36.
- Neary, D. G.; Hornbeck, J. W. 1994. Chapter 4: Impacts of harvesting and associated practices on off-site environmental quality. In: Dyck, W. J.; Cole, D. W.; Comerford, N. B., eds. Impacts of forest harvesting on long-term site productivity. London: Chapman & Hall: 81-118.
- Neary, D. G.; Robichaud, P. R.; Beyers, J. L. 2000. Burned area emergency watershed rehabilitation: Program goals, techniques, effectiveness and future directions. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 375-378.
- Nelson, D. W.; Simmers, L. E. 1992. Total carbon, organic carbon, and organic matter. In: Page, A. L., ed. Methods of soil analysis. Part 2. Chemical and microbiological properties. Madison, WI: American Society of Agronomy and Soil Science Society of America: 539-579.
- Overby, S. T.; Moir, W. H.; Robertson, G. T. 2000. Soil and vegetation changes in a pinyon-juniper area in central Arizona after prescribed fire. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 371-374.
- Rinne, J. N. 1997. Short-term effects of wildfire on fishes and aquatic macroinvertebrates in the Southwestern United States. *North American Journal of Fisheries Management*. 16(6): 53-658.
- Robichaud, P. R.; Beyers, J. L.; Neary, D. G. [In press]. Evaluating the effectiveness of post-fire rehabilitation treatments. Gen. Tech. Rep. Fort Collins, CO. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Schuster, E. G.; Cleaves, D. A.; Bell, E. F. 1997. Analysis of USDA Forest Service fire-related expenditures 1970-1995. Res. Pap. PSW-RP-230. Albany, CA: U.S. Department of Agriculture, Forest Service.
- Smith, D. W. 1970. Concentrations of soil nutrients before and after fire. *Canadian Journal of Soil Science*. 50: 17-29.
- Stark, N. M. 1977. Fire and nutrient cycling in a douglas-fir/larch forest. *Ecology*. 58: 16-30.
- Stednick, J. D.; Tripp, L. N.; McDonald, R. J. 1982. Slash burning effects on soil and water chemistry in southeastern Alaska. *Journal of Soil and Water Conservation*. 37(2): 126-128.
- Tiedemann, A. R.; Klock, G. O. 1976. Development of vegetation after fire, reseeding, and fertilization on the Entiat Experimental Forest. Annual Proceedings of the Tall Timbers Fire Ecology Conference. 15: 171-192.
- Wells, W. G., II. 1987. The effects of fire on the generation of debris flows in southern California. *Geological Society of America Reviews in Engineering Geology*. VII: 105-114.
- Wright, H. A.; Bailey, A. W. 1982. Fire ecology, United States and Southern Canada. New York: John Wiley & Sons.
- Zwolinski, M. J. 2000. The role of fire in management of watershed responses. In: Ffolliott, P. F.;

- Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 367-370.
- Zwolinski, M.J . 1971. Effects of fire on water infiltration rates in a ponderosa pine stand. Hydrology and Water Resources in Arizona and the Southwest. 1: 107-112.

## Operational Management Programs

- Affleck, R. S. 2000. Water and land management: some examples of USDA international programs. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 407.
- Andrade, A. 1994. Zonificación ecológica como base para el estudio integral del paisaje y la planificación del uso de las tierras. Sistema de Información Geográfica Plan de Acción Forestal Para Colombia. 2: 28-31.
- Arizona Department of Environmental Quality Water Quality Division. 1997. The Arizona statewide watershed framework, draft guidance. Phoenix: Arizona Department of Environmental Quality.
- Arizona Department of Environmental Quality Water Quality Division and U.S. Department of Agriculture Natural Resources Conservation Services. 1998. The Arizona unified watershed assessment. Phoenix: Arizona Department of Environmental Quality.
- Arizona Department of Environmental Quality Water Quality Division. 1999. Arizona Department of Environmental Quality watershed framework—Verde Initiative, internal document. Phoenix: Arizona Department of Environmental Quality.
- Arizona Department of Environmental Quality Water Quality Division. 1999. FY 2000 Water Quality Division workplan. Phoenix: Arizona Department of Environmental Quality.
- AW&ST and AUVSI, 1997. 1997-98 International Guide to Unmanned vehicles. ISBN 007-607102-2. The McGraw-Hill Companies: May.
- Barrows, A. K.; Enge, P.; Parkinson, B. W.; Powell, J. D. 1995. Flight tests of a 3-D perspective-view glass-cockpit display for general aviation using GPS. Proceedings of ION GPS-95, Palm Springs, California, USA, September 12-15.
- Barrows, A. K.; Enge, P.; Parkinson, B. W.; Powell, J. D. 1996. Flying curved approaches and missed approaches: 3-D display trails onboard a light aircraft. Proceedings of ION GPS-96, Kansas City, Missouri, USA, September 17-20.
- Bridgewater P. B. 1993. Landscape ecology, geographic information system and nature conservation. Part II. In: Haines-Young, Roy; Green, David R.; Cousins, Stephen H., eds. Landscape ecology and GIS. Salisbury, Great Britain: Taylor & Francis: 23-36 p.
- Budhabhatti, J.; Fursey, R. 2000. A regional plan to protect open spaces, water quality, fish and wildlife habitat. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 387.
- Cendrero, A. 1989. Mapping and evaluation of coastal areas for planning. Ocean and Shoreline Management. 12: 427-462.
- Cendrero, A., Charlier, R. M. 1989. Resource, land-use and management of the coastal Fringe. Geolis. 3(1-2): 40-55.
- Cendrero, A., Díaz de Terán, J. R. 1987. The environmental map system of the University of Cantabria, Spain. In: Arndt, P; Luttig, G., eds. Mineral resources extraction, environmental protection and land-use planning in the industrial and developing countries. Stuttgart: 149-181.
- Chapman Homer, D.; Pratt, Parket F. 1991. Métodos de análisis para suelos, plantas y aguas. Editorial Trillas, México.
- Chen, D. Y.; Yang, J. J.; Lin, M. W.; Tsai, F.C. 1997. Management mathematics. Taipei, Taiwan, R.O.C.: National Open University.
- Chen, P. H.; Leung, Ka-Chu. 2000. Application of time series analysis for assessing reservoir trophic status. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 395-399.

- Clark, Jo. 1997. Watershed partnerships: a strategic guide for local conservation efforts in the West. Denver: Western Governors' Association.
- Clavet, D. 1993. GPS control for 1:50,000-scale topographic mapping from satellite images. Photogrammetry Engineering and Remote Sensing. 59(1): 107-111.
- Díaz de Terán, J. R. 1985. Estudio geológico ambiental de la franja costera de Cantabria y establecimiento de bases para su ordenación territorial. Tesis de doctorado. Universidad de Cantabria. Santander. España.
- Goodhue, J. 1997. Experiments aloft: balloon born payloads reach near space. GPS World. September: 34-42.
- Guan, W. L.; Hsiao, F. B.; Ho, C. S. 1997. Developing a GPS navigation system for remotely piloted vehicle. AIAA guidance, navigation and control conference; New Orleans, LA; August 11-13.
- Huang, Long-Ming. 2000. Application of remotely piloted vehicle (RPV) in monitoring and detecting watershed land use change and problem areas. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 400-406.
- Imler, B. L.; Hawkins, R. H.; Guertin, D. P.; Young, D. W. 2000. Attributes of successful stock water ponds in southern Arizona. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 383-386.
- I.N.E. 1996. Ley General del Equilibrio Ecológico y Protección al Ambiente. Instituto Nacional de Ecología.
- I.N.E.G.I. 1982. Cartas topográficas escala 1:50,000 Punta Malarrimo, Sierra los Indios, Guerrero Negro, Laguna Ojo de Liebre, Sierra Campo Nuevo, Las Bombas, Arroyo de San José y Desierto del Vizcaíno.
- I.N.E.G.I. 1989. Cartas topográficas, edafológicas, geológicas, aguas superficiales, aguas subterráneas, uso del suelo y vegetación 1:250,000 Santa Rosalía y Guerrero Negro.
- I.N.E.G.I. 1995. Espaciomapas escala 1:250,000 Santa Rosalía y Guerrero Negro.
- James, Sarah; Power, Joe; Forrest, Clyde. 1999. American Planning Association policy guide on sustainability. Electronic document at: <http://www.planning.org/govt/sustdvpg.htm> January 8, 1998; revised April 10, 1999.
- Jiménez C. 1994. Contaminación por metales pesados y metaloides en Baja California Sur y Sus Costas: Revisión Bibliográfica. Área de Ciencias del Mar, UABCs.
- López E. R. 1996. Propuesta de Ordenamiento de las Actividades de la Zona Marina de Loreto, B. C. S. México (Tesina). Facultad de Ciencias Marinas. Universidad Autónoma de Baja California. Ensenada..
- Moot, Ann, comp. 1997. Partnership handbook. Tucson: The University of Arizona, College of Agriculture, Water Resources Research Center. Electronic document at: <http://ag.arizona.edu/partners/>
- Naranjo-Pulido, A.; Ortega-Rubio, A.; Valdez-Zamudio, D.; Castellanos-Vera, A. 2000. Mining activities and arsenic in a Baja California Sur watershed. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 392-394.
- Northup, R. 2000. Arizona watershed framework in the Verde River watershed. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 379-382.
- Ortíz-Solorio C. A. y H. E. Cuanalo de la Cerda. 1984. Metodología del levantamiento fisiográfico. Un sistema de clasificación de tierras. Centro de Edafología. Colegio de Postgraduados. Chapino. México.
- Renthal, J.; Koehler, R. 2000. Sustaining flows of critical resources: one example. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 388.
- R.O.C. Committee of Water Resources. 1993. Ta-Chia-stream water quality monitoring project report. 25-Tzy-05, Taipei, Taiwan: R.O.C. Committee of Water Resources.

- ROCEPA. R.O.C. Environmental Protection Agency. 1991. Reservoir eutrophication data base and expert system (second year). EPA-80-G103-09-16. Taipei, Taiwan: R.O.C. EPA.
- R.O.C. Tai Power & Committee of Water Resources. 1988. Ta-Chia-stream water quality monitoring project fifth year report. Taipei, Taiwan: R.O.C. Tai Power & Committee of Water Resources.
- R.O.C. Tai Power & Committee of Water Resources. 1989. Ta-Chia-stream water quality monitoring project sixth year report. Taipei, Taiwan: R.O.C. Tai Power & Committee of Water Resources.
- R.O.C. Tai Power & Committee of Water Resources. 1990. Ta-Chia-stream water quality monitoring project seventh year report. Taipei, Taiwan: R.O.C. Tai Power & Committee of Water Resources.
- R.O.C. Tai Power & Committee of Water Resources. 1991. Ta-Chia-stream water quality monitoring project eighth year report. Taipei, Taiwan: R.O.C. Tai Power & Committee of Water Resources.
- R.O.C. Tai Power & Committee of Water Resources. 1992. Ta-Chia-stream water quality monitoring project ninth year report. Taipei, Taiwan: R.O.C. Tai Power & Committee of Water Resources.
- R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources. 1993. Te-Chi watershed the 3th stage watershed water quality planning: monitory and management modelling (first year) report. 25-Tzy-07. Taipei, Taiwan: R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources.
- R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources. 1994. Te-Chi watershed the 3th stage watershed water quality planning: monitory and management modelling (second year) report. 25-Tzy-07-02. Taipei, Taiwan: R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources.
- R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources. 1995. Te-Chi watershed the 3th stage watershed water quality planning: monitory and management modelling (third year) report. 25-Tzy-07-03. Taipei, Taiwan: R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources.
- R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources. 1996. Te-Chi watershed the 3th stage watershed water quality planning: monitory and management modelling (fourth year) report. 25-Tzy-07-04. Taipei, Taiwan: R.O.C. Te-Chi Reservoir Watershed Management Committee & Committee of Water Resources.
- Watershed Management Committee & Committee of Water Resources.
- Salinas-Zavala, F., A. Ortega-Rubio, D. Valdez-Zamudio, and A. Castellanos-Vera. 2000. Coastal management at Ojo de Liebre, Baja California Sur. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 389-391.
- Schauz, Jane W.; Conway, Christopher M. 1995. The self-help handbook for small town water and wastewater projects. Rensselaerville, NY: The Rensselaerville Institute.
- Sokal, R. R.; Rohlf, F. J. 1969. Biometry. San Francisco, CA: Freeman Publishing Co.
- Stow, D. A. 1993. The role of geographic information system for landscape ecological studies. Part II. In: Haines-Young, Roy; Green, David R.; Cousins, Stephen H., eds. Landscape Ecology and GIS. Salisbury, Great Britain: Taylor & Francis: 11-22 p.
- USDA Natural Resources Conservation Service and Cooperating Agencies. 1996. Verde Cooperative River Basin study summary report. Phoenix, AZ: U.S. Department of Agriculture Natural Resources Conservation Service.
- U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds. 1996. Why watersheds? EPA800-F-96-001. February. Electronic document at: <http://www.epa.gov/OWOW/watershed/why.html>
- U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds, 1998. Watershed approach—an Introduction. Electronic document at: <http://www.epa.gov/surf/why.html>
- U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds, 1996. Watershed approach framework. Electronic document at: <http://www.epa.gov/OWOW/watershed/framework.html>
- Verde River Watershed Conference Bridging Committee Water Subcommittee. 1993. Verde watershed management plan. Phoenix, AZ: Verde River Watershed Conference Bridging Committee Water Subcommittee.
- Zarate-Lomelí, D., G. Pealike-Aponte, J.L. Rojas-Galavíz y M. A. Ortíz-Pérez. 1995. La delimitación y regionalización ecológica: necesidades para el manejo de la zona costera. Jaina. 6(3): 14-15.

---

## Technology Transfer Mechanisms

---

### Geographic Information Systems

- Abrahams, A. D. 1984. Channel networks: a geomorphological perspective. *Water Resources Research*. 20(2): 161-188.
- Elmore, F. H. 1976. Shrubs and trees of the Southwest uplands. Tucson, AZ: Southwest Parks and Monuments Association.
- Environmental Systems Research Institute (ESRI). 1997. Arc/Info Ver 7.1 On-line documentation: watershed subroutine.
- Feldman, A. D. 1995. HEC-1 flood hydrograph package. Chapter 4, computer models of watershed hydrology. In: Singh, V. P., ed. Highlands Ranch, CO: Water Resources Publications.
- Guertin, D. P.; Miller, S. N.; Goodrich, D. C. 2000. Emerging tools and technologies in watershed management. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 194-204.
- HEC-1 Flood hydrograph package: user's manual. 1990. US Army Corps of Engineers, Hydrologic Engineering Center, 609 Second Street, Davis, CA 95616.
- McCormick, Frank J. 1999. Principles of ecosystem management and sustainable development. In: Peine, Jhon D., ed. Ecosystem management for sustainability. LEWIS Publishers: 3-22.
- Merrill, R. K. 1970. The glacial geology of the Mount Baldy area, Apache County, Arizona. Tempe: Arizona State University. Thesis.
- Miller, S. N.; Guertin, D. P.; Levick, L. R. 1999. Influence of map scale on drainage network representation. Proceedings of the 43rd annual meeting of the Arizona-Nevada Academy of Sciences: hydrology chapter; 1999 April 17; Flagstaff, AZ.
- Miller, S. N.; Youberg, A.; Guertin, D. P.; Goodrich, D. C. 2000. Channel morphology investigations using geographic information systems and field research. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 415-419.
- Peine, Jhon D. 1999. Ecosystem management for sustainability. LEWIS Publishers.
- Renard, K. G.; Lane, L. J.; Simanton, J. R.; Emmerich, W. E.; Stone, J. J.; M.A. Weltz, M. A.; Goodrich, D. C.; Yakowitz, D. S. 1993. Agricultural impacts in an arid environment: Walnut Gulch studies. *Hydrological Science and Technology*. 9(1-4): 145-190.
- Shultz, S. 2000. GIS soil conservation planning: a case study of a pristine central American watershed. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 414.
- Smith, R. E.; Goodrich, D. C.; Woolhiser, D. A.; Unkrich, C. L. 1995. KINEROS—a kinematic runoff and erosion model. Chapter 20, computer models of watershed hydrology. Singh, V. P., ed. Highlands Ranch, CO: Water Resources Publications.
- WEF and ASCE. 1998. Urban runoff quality management. WEF Manual No. 23 and ASCE Manual No. 87.
- Zhang, X.; Ball, G.; Halper, E. 2000. Application of remote sensing and geographic information systems to ecosystem-based urban natural resource management. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 409-413.
- Zhang, Xiaohui.; Ball, G.; Guertin, P.; Halper, E.; Zhang, L. 1998. Remote sensing derived hydrologic data and digital elevation modeling of Basin-9 in city of Scottsdale: a technical report for NASA and city of Scottsdale. ART-003-98-RPT. Tucson: University of Arizona, School of Renewable Natural Resources.
- Zhang, Xiaohui; [and others]. 1999. Integration of remote sensing and GIS with urban stormwater management, the 2nd international conference on multiple objective decision support systems for land, water & environmental management; 1999 August 1-6; Brisbane, Queensland, Australia.

Zhang, Xiaohui; [and others]. 1999. Integration of GIS and RS with urban hydrology, ESRI 19th international user conference; 1999 July 26-30; San Diego, CA.

## World Wide Web

- AIH. 1999. American Institute of Hydrology web page: <http://www.aihydro.org/>
- ARMS. 1999. American River Management Society web page: <http://www.river-management.org>
- ASAE. 1999. American Society of Agricultural Engineers web page: <http://asae.org/>
- ASCE. 1999. American Society of Civil Engineers web page: <http://www.asce.org/>
- AWRA. 1999. American Water Resources Association web page: <http://www.awra.org/>
- Baker, M. B., Jr., comp. 1999. History of watershed research in the Central Arizona Highlands. Res. Pap. RMRS-GTR-29. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Baker, M. B., Jr., Ffolliott, P. F. 1998. Multiple resource evaluations on the Beaver Creek watershed: an annotated bibliography (1956-1996). Gen. Tech. Rep., RMRS-GTR-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- Baker, M. B., Jr., Huebner, D., Ffolliott, P. F. 2000. An on-line image data base system: managing image collections. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 424-427.
- Baker, M. B., Jr.; Young, D. J. 2000. Dissemination of watershed management information through the World Wide Web. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 431-433.
- Brooks, Kenneth N., Gregerson, Hans M., Ffolliott, Peter F., Tejwani, K. G. 1992. Chapter 17: watershed management: a key to sustainability. In: Sharma, N. P., ed. Managing the world's forests. Dubuque, IA: Kendall/Hunt Publishing Co.: 455-487.
- Ditschman, E. P. 1999. Should watershed management professionals be certified? Water Resources Impact. 1(4): 2-3.
- Hilf, Bill. 1998. Media lullabies: the reinvention of the World Wide Web. [Online] Available: [http://www.firstmonday.dk/issues/issue3\\_4/hilf/](http://www.firstmonday.dk/issues/issue3_4/hilf/) [1999, May 5].
- Huebner, D.; Baker, M. B., Jr., Ffolliott, P. F. 2000. Increasing efficiency of information dissemination and collection through the World Wide Web. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 420-423.
- IAHS. 1999. International Association of Hydrological Sciences web page: <http://www.cig.ensmp.fr/~iahs/>
- IUFRO. 1999. International Union of Forestry Research Organizations web page: <http://iufro.ffa.csiro.au/iufro/>
- Lant, C. L. 1999. Introduction: human dimensions of watershed management. Journal of the American Water Resources Association. 35: 483-486.
- Lawrence, S.; Giles, C. L. 1998. Searching the World Wide Web. Science. 280: 98.
- Lee, R. 1980. Forest hydrology. New York: Columbia University Press.
- Neary, D. G. 2000. Increasing the visibility of watershed management as a land management profession. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 434-438.
- Neary, D. G. 2000. Changing perspectives of watershed management from a retrospective viewpoint. In: Ffolliott, P. F.; Baker, M. B., Jr.; Edminster, C. B.; Dillon, M. C.; Mora, K. L., tech. coords. Land stewardship in the 21st century: The contributions of watershed management. Proceedings RMRS-P-13. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station: 167-176.
- NWRA. 1999. National Water Resources Association web page: <http://www.nwra.org/>
- Paulukiewicz, J.; Norton, D. J. 1999. Certificates or certification? Water Resources Impact. 1(4): 10-13.

- Rango, A. 1995. A look to the future in watershed management. In: Ward, T.J . ed. *Watershed Management: Planning for the 21st century: proceedings of the 1995 ASCE symposium*; 1995 August 14-16; San Antonio, TX: 15-22.
- SAF 1999. Society of American Foresters web page: <http://www.safnet.org/who/index.html>.
- Seaborn, G. E. 1999. The professional hydrologists certification program. *Water Resources Impact*. 1(4): 14-16
- Simon, Paul. 1998. *Tapped out: the coming world water crisis and what we can do about it*. New York: Welcome Rain Publishers.
- SRM. 1999. Society for Range Management web page: <http://www.srm.org/>
- SWCS. 1999. Soil and Water Conservation Society web page: <http://www.swcs.org/>
- SWS. 1999. Society of Wetlands Scientists web page: <http://www.sws.org>
- Tyner, Ross. [1998, December 1-last major update]. *Sink or swim: Internet search tools & techniques*. [Online]. Available: <http://www.ouc.bc.ca/libr/connect96/search.htm> [1999, May 5].
- University of Arizona. 1999. University of Arizona Watershed Management in the Southwest web site: <http://ag.arizona.edu/OALS/watershed/>
- Watershed Management Council. 1999. Watershed Management Council web site: <http://watershed.org/wmchome>
- Witter, S. G.; Pennington, S. R.; Kline-Robach, R. 1999. A need to certify watershed managers. *Water Resources Impact*. 1(4): 17-19.
- World Wide Web Consortium. 1997. About the World Wide Web, [1999, May 5]. [Online]. Available: <http://www.w3.org/>



The Rocky Mountain Research Station develops scientific information and technology to improve management, protection, and use of forests and rangelands. Research is designed to meet the needs of National Forest managers, federal and state agencies, public and private organizations, academic institutions, industry, and individuals.

Studies accelerate solutions to problems involving ecosystems, range, forests, water, recreation, fire, resource inventory, land reclamation, community sustainability, forest engineering technology, multiple use economics, wildlife and fish habitat, and forest insects and diseases. Studies are conducted cooperatively, and applications can be found worldwide.

### **Research Locations**

Flagstaff, Arizona  
Fort Collins, Colorado\*  
Boise, Idaho  
Moscow, Idaho  
Bozeman, Montana  
Missoula, Montana  
Lincoln, Nebraska  
Reno, Nevada

Albuquerque, New Mexico  
Rapid City, South Dakota  
Logan, Utah  
Ogden, Utah  
Provo, Utah  
Laramie, Wyoming

\* Station Headquarters, 2150 Centre Avenue, Building A, Fort Collins, CO 80526

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal employment opportunity provider and employer.