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Water Quality Information Center at the National Agricultural Library
Agricultural Research Service, U.S. Department of Agriculture

Agricultural Hydrology

| Agricultural Hydrology | Best Management Practices (BMPs) | Concentrated Animal Feeding
Operations (CAFOs) |
| Total Maximum Daily Loads (TMDLs) |

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April 2003

216 citations from the AGRICOLA database
January 2001 - December 2002

Compiled by
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Water Quality Information Center

Prepared for the
Agricultural Hydrology and Water Quality Conference
May 12-14, 2003
Kansas City, Missouri

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Agricultural Hydrology

(Citations 1-98)

| Best Management Practices (BMPs) | Concentrated Animal Feeding Operations (CAFOs) |
| Total Maximum Daily Loads (TMDLs) |

1. Agricultural nonpoint source pollution : watershed management and hydrology.

Ritter, William F. and Shirmohammadi, Adel 1952

Boca Raton, Fla. : Lewis Publishers, c2001. 342 p. : ill., map:Includes bibliographical references and index

NAL Call #: TD428.A37-A362-2001

Descriptors: Agricultural pollution/ Nonpoint source pollution/ Watershed management/ Water quality management/ United States

2. Animal and Natural Resources Institute.

Beltsville Agricultural Research Center. Animal and Natural Resources Institute.

Beltsville, MD : The Institute, [2001]-:Title from caption

NAL Call #: aTX531-.B45-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=12-65-00-00

Descriptors: Beltsville Agricultural Research Center Animal and Natural Resources Institute/ Food adulteration and inspection/ United States

Abstract: ANRI Home Page. With Java enabled, various pictures from the laboratories of the Animal and Natural Resources Institute would appear. ANRI Mission Statement. The Animal and Natural Resources Institute (ANRI) is located at the Henry A. Wallace Beltsville Agricultural Research Center (BARC) in Beltsville, Maryland. The research mission of the Animal and Natural Resources Institute (ANRI), is to conduct research and to develop technology transfer programs that ensure high quality and safe food while protecting the natural resource base and the environment.

3. Appalachian Farming Systems Research Center, ARS, USDA, Beaver, WV.

Appalachian Farming Systems Research Center.

Beaver, WV : The Center, [2001]:Title from caption. "June, 2001" Includes bibliographical references

NAL Call #: aS541.5.W42-A67-2001

URL: <http://www.arserrc.gov/beckley/>

Descriptors: Soil quality/ Agroforestry/ Pastoral agriculture/ Karst/ Water quality/ Forages/ Livestock landscape interactions/ Grazing management/ Soil acidity/ Nitrogen use efficiency/ Plant ecology/ Woodlot management/ Agricultural Research Service/ Department of Agriculture/ Appalachian Region/ West Virginia/ United States

Abstract: The Appalachian Farming Systems Research Center (AFSRC) is part of the Agricultural Research Service , an agency of the United States Department of Agriculture . We serve the Appalachian region, which includes portions of thirteen states in the Eastern United States, with land use characterized by a mosaic of woodlands and family farms. The climate and varied topography of the region create a range of micro-sites supporting a tremendous variety of renewable woody and herbaceous plant resources. Watercourses originating in the region deliver more than 80 trillion gallons of water annually to downstream users and environmentally sensitive coastal estuaries and bays. Soil and water quality issues are of concern both to the agricultural community and to those interested in recreational use of land and the environment.

4. A checklist approach to evaluate the contribution of organic farms to landscape quality.

Kuiper, J.

Agriculture, Ecosystems and Environment (Jan 2000) 77 (1/2): 143-156

NAL Call #: S601.A34; ISSN: 0167-8809.

Descriptors: organic farming/ landscape/ sustainability/ checklists/ evaluation/ values/ local population/ local planning/ regional planning/ biodiversity/ land use/ hydrology/ history/ aesthetic value/ landscape ecology

5. Climatic changes in yield index and soil water deficit trends in China.

Thomas, A.

Agric-for-Meteorol (May 12, 2000) 102 (2/3): 71-81

NAL Call #: 340.8-AG8; ISSN: 0168-1923.

Descriptors: precipitation/ evapotranspiration/ hydrology/ soil water/ ecosystems/ agriculture/ yields/ cropping systems/ time/ soil water balance/ climatic change/ China

6. Coastal Plains Soil, Water, and Plant Research Center : Florence, South Carolina, USA.

Coastal Plains Soil, Water and Plant Research Center U. S.

Florence, SC : The Center, [2002]-:Title from web page. Description based on content viewed April 29, 2002. Includes bibliographical references

NAL Call #: aS599.A1-C63-2002

URL: <http://www.florence.ars.usda.gov/>

Descriptors: Soil management/ Soil mapping/ Agricultural mapping/ Cropping systems/ Cotton Breeding/ Water supply/ Animal waste management/ Constructed wetlands/ Site specific animal waste management/ Manures/ Tillage/ Irrigation/ Water quality/ Water management/ Ammonia volatilization/ Southern States/ United States

Abstract: The mission of the Coastal Plains Soil, Water, and Plant Research Center is to anticipate, identify, and solve natural resource problems in agriculture that are important to the USA in general and the SE Coastal Plain in particular. The staff conducts both basic and applied research, emphasizes total resource management, and currently focuses on three issues: soil management, the Center solves problems of erosion, soil strength, and soil fertility. In water management, the Center solves problems caused by too much or too little rain, by non-point-source agricultural pollution, and by difficulties disposing of animal waste. In plant management, we improve cotton germplasm and increase both sustainability and competitiveness of crop production. We investigate these issues on major field crops (cotton, corn, soybeans, small grains) and high-value horticultural crops. The mission is pursued in cooperation with other agencies, universities, and private.

7. Columbia Plateau Conservation Research Center.

Columbia Plateau Conservation Research Center.

Pendleton, OR : The Center, [2001]-:Title from caption. Includes bibliographical references
NAL Call #: aS541.5.A19-C65-2001

URL: http://www.ars.usda.gov/Main/site_main.htm?modecode=53-56-00-00

Descriptors: Columbia Plateau Conservation Research Center/ Agriculture/ Pacific Northwest

Abstract: Columbia Plateau Conservation Research Center in Pendleton, Oregon (CPCRC) is one of the multidisciplinary laboratories of the U.S. Department of Agriculture-Agricultural Research Service (USDA-ARS). It was established to conduct basic and applied research of regional, national, and international significance to soil and water conservation. USDA-ARS scientists at Pendleton primarily serve the dryland farming areas located in Washington, Oregon, and Idaho.

8. Constructing temporary sampling platforms for hydrologic studies.

Martinez, Manuel H., Ryan, Sandra E., and Rocky Mountain Research Station Ogden.

Ogden, UT : U.S. Dept. of Agriculture, Forest Service, Rocky Mountain Research Station, [2000] 10 p. : ill.:Cover title. "September 2000." Includes bibliographical references (p. 10)
NAL Call #: aSD144.A14-G46-no.-64

Descriptors: Stream measurements/ Suspended sediments

9. Cropping Systems and Water Quality Research Unit.

United States. Agricultural Research Service. Cropping Systems and Water Quality Research Unit.

Columbia, Mo. : USDA, ARS, The Unit, [2001]-:Title from caption. Includes bibliographical references

NAL Call #: aS494.5.P75-U55-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=36-22-15-00

Descriptors: Crop yields/ Soil conservation/ Water conservation/ Cropping systems/ Precision agriculture/ Remote sensing technology/ Alternative management systems/ Department of Agriculture/ Agricultural Research Service/ Water quality/ Herbicides/ Water quality/

Groundwater/ Surface water/ Watersheds/ Runoff/ Environmental quality/ Pollution/ Erosion/ Herbicide residues/ Corn/ Maize/ Weed biology/ Geographic information systems/ phytotoxicity/ Weed control/ Seed dormancy/ Germination/ Missouri/ Midwest/ Corn Belt/ United States

Abstract: The mission of Cropping Systems and Water Quality Research Unit is to develop knowledge and technology to optimize yields from crop production systems while minimizing erosion and enhancing water and soil quality.

10. Ecological lessons and applications from one century of low external-input farming in the pampas of Argentina.

Viglizzo, E. F., Lertora, F., Pordomingo, A. J., Bernardos, J. N., Roberto, Z. E., and Valle, H. del.

Agriculture, Ecosystems and Environment (Jan 2001) 83 (1/2): 65-81
NAL Call #: S601.A34; ISSN: 0167-8809.

Descriptors: low input agriculture/ plant ecology/ land use/ agricultural land/ ground cover/ cycling/ hydrology/ sustainability/ biomass production/ plant succession/ grasslands/ water/ pampas/ Argentina

11. An economic, hydrologic, and environmental assessment of water management alternative plans for the South Central Texas Region.

Gillig, D., McCarl, B. A., and Boadu, F.

J-Agric-Appl-Econ (Apr 2001) 33 (1): 59-78
NAL Call #: HD101.S6; ISSN: 1074-0708.

Descriptors: aquifers/ groundwater/ water supply/ water management/ environmental assessment/ linear programming/ simulation models/ economic analysis/ Texas

Abstract: Regional water scarcity has motivated the South Central Texas Regional Water Planning Group to actively develop water management plans to address long-/short-term regional water needs. This study, therefore, develops an integrated Edwards Aquifer groundwater and river system simulation model to determine the "best" choice of regional water management plans using mixed-integer linear programming. The economic, hydrologic, and environmental consequences of the "best" choice of regional and other water management plans and options are evaluated and compared. Results indicate a tradeoff between the economic and environmental benefits. A slight decrease in economic benefit results in a substantial increase in environmental benefit.

12. Energy, Soil, and Animal Resources Research Unit : Conservation & Production Research Laboratory, Bushland, Texas USA.

Conservation & Production Research Laboratory (U.S) Energy, Soil and Animal Waste Resources Research Unit.

Bushland, Tex. : The Laboratory, [2002]-:Title from web page. Description based on content viewed April 18, 2002

NAL Call #: aTD878.2-.C66-2002

URL: <http://www.cprl.ars.usda.gov/remmresearch.htm>

Descriptors: Conservation and Production Research Laboratory/ Energy Soil and Animal Resources Research Unit/ Soil pollution Management/ Renewable energy sources/ Agricultural wastes/ United States

Abstract: The Energy, Soil, and Animal Resources Research Unit is part of the Conservation & Production Research Laboratory in Bushland, Texas.

13. Environmental and Plant Dynamics Research Unit.

Kimball, Bruce A. and United States. Agricultural Research Service. Environmental and Plant Dynamics Research Unit.

[Phoenix, Ariz.] : The Unit, [2001]-:Title from caption. Includes bibliographical references.
NAL Call #: aGE149-.K56-2001

URL: <http://www.ars.usda.gov/Main/docs.htm?docid=4135>

Descriptors: United States Agricultural Research Service/ Environmental and Plant Dynamics Research Unit/ Global environmental change/ Water supply/ United States

Abstract: The Environmental and Plant Dynamics Research Unit is structured to solve critical problems caused by water supply shortages and global environmental changes and how they affect agriculture now and in the future. The aims of the multidisciplinary thrust are to increase plant water use efficiency and to conserve and improve agricultural water supplies. The Environmental and Plant Dynamics Research Unit has three main research programs: Remote Sensing, New Crops, and Carbon Dioxide-Climate.

14. Environmental geological investigations at the Van open dump site, southeastern Turkey.

Akgun, H. and Doyuran, V.

Environ-Geol (Apr 2000) 39 (6): 660-666.

NAL Call #: QE1.E5; ISSN: 1073-9106.

Descriptors: agricultural land/ hydrology/ geology/ hydrogeology/ Turkey

15. Evaluating improvements in irrigation efficiency as a salinity mitigation option in the South Australian Riverland.

Heaney, A., Beare, S., and Bell, R.

Aust-j-Agric-Resour-Econ (Sept 2001) 45 (3): 477-493.

NAL Call #: HD1401.A89; ISSN: 1364-985X.

Descriptors: groundwater/ hydrology/ salinity/ irrigation/ agricultural production/ efficiency/ externalities/ cost benefit analysis/ agricultural regions/ mathematical models/ South Australia

16. Evaluation of soluble phosphorus loading from manure-applied fields under various spreading strategies.

Walter, M. T., Brooks, E. S., Walter, M. F., Steenhuis, T. S., Scott, C. A., and Boll, J.

Journal of Soil and Water Conservation (Fourth Quarter 2001) 56 (4): 329-335.
NAL Call #: 56.8-J822; ISSN: 0022-4561.

Descriptors: phosphorus/ losses from soil/ cattle manure/ spatial variation/ application date/ application rates/ water pollution/ streams/ runoff/ dairy farms/ mathematical models/ prediction/ nonpoint source pollution/ hydrologically sensitive areas/ New York

17. Evapotranspiration from selected fallowed agricultural fields on the Tule Lake National Wildlife Refuge, California, during May to October 2000.

Bidlake, W. R. and Geological Survey (U.S.).

Tacoma, Wash. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 2002. x, 59 p. : ill. (some col.), col. maps:Shipping list no.: 2002-0193-P. Includes bibliographical references (p. 46-48). SUDOCs: I 19.42/4:02-4055.
NAL Call #: GB701-.W375-no.-2002-4055

URL: <http://purl.access.gpo.gov/GPO/LPS21617>

Note: Adobe Acrobat reader required.

Descriptors: Evapotranspiration/ Fallow land/ hydrology/ Water supply/ Tule Lake National Wildlife Refuge/ California

18. Everglades Agro-Hydrology Research Unit.: USDA Everglades Agro-Hydrology Research Unit.

United States. Dept. of Agriculture Everglades Agro Hydrology Research Unit.

Miami, Fla. : The Unit, [2001]-:Title from web page. Description based on content viewed April 29, 2002. Includes bibliographical references.

NAL Call #: aGB658.7-.U65-2001

URL: <http://www.ars.usda.gov/Main/docs.htm?docid=10134>

Descriptors: Everglades Agro Hydrology Research Unit/ Hydrology/ Drainage/ Agriculture/ Crops and water/ Department of Agriculture/ Florida/ United States

Abstract: The mission of the Everglades Agro-Hydrology Research Unit (EAHRU) is to provide hydrologic science and technology needed to sustain agricultural production and a quality environment in south Florida. The focus of the unit is primarily on the south Florida region which has a unique hydrologic system with low-gradient drainage; typically high ground water table; extensive drainage canal network; direct impact on the hydrology affecting the Everglades National Park restoration plan.

19. Examination of the wetland hydrologic criterion and its application in the determination of wetland hydrologic status.

Hunt, W. F. and Water Resources Research Institute of the University of North Carolina. Geological Survey (U.S.). North Carolina Agricultural Research Service.

Raleigh, NC : Water Resources Research Institute of the University of North Carolina, [2001] xxii, 119 p. : ill., map:"June 2001." "UNC-WRRI-2001-333." "The research on which this report is based was supported in part by the United States Department of the Interior, Geological Survey, the Water Resources Research Institute of the University of North Carolina and by the

North Carolina Agricultural Research Service." Includes bibliographical references (p. 61-63).
Water Resources Research Institute. 70137.
NAL Call #: TD201-.N6-no.-333

Descriptors: Wetland hydrology/ Water quality Standards

20. George E. Brown Jr. Salinity Laboratory.

Salinity Laboratory (U.S.).

[Riverside, Calif.] : The Laboratory, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: aGC130.U6-S25-2001

URL: <http://www.ussl.ars.usda.gov/>

Descriptors: United States Salinity Laboratory/ Salinity/ Industrial physics/ Engineering management/ Irrigation/ Precision agriculture/ Models/ Preferential flow/ Spatial variation/ Cation exchange/ Pesticides/ Crop production/ Agricultural degradation/ Surface water/ Pesticide transport/ Groundwater pollution/ Hydraulic conductivity/ Leaching

Abstract: The George E. Brown Jr. Salinity Laboratory is a National Laboratory for basic research on the chemistry, physics, biology, and assessment of salt-affected soil-plant-water systems. (Riverside CA USA).

21. A GIS based approach to modelling the effects of land-use change on soil erosion in New Zealand.

Rodda, H. J. E., Stroud, M. J., Shankar, U., and Thorrold, B. S.

Soil Use and Management (Mar 2001) 17 (1): 30-40.

NAL Call #: S590.S68; ISSN: 0266-0032.

Descriptors: water erosion/ land use/ geographic information systems/ catchment hydrology/ sediment yield/ forestry/ deer farming/ slope/ soil degradation/ New Zealand

Abstract: The problem of soil erosion is particularly evident in New Zealand, given the combination of coarse-textured soils, steep relief, high rainfall, and intensification of agriculture. A study was undertaken to assess the effects of land use change on soil erosion and sediment transport for the Ngongotaha catchment in New Zealand's North Island, using a GIS based decision support and modelling system. Model simulations considered the effect of increased catchment area under deer farming and forestry on the amount of sediment delivered to the catchment outlet, averaged over a period of six years. The simulations predicted that sediment loss from land under deer farming was considerably greater than from land under other livestock or forestry. Further model simulations testing best management practices demonstrated that sediment yield could be halved if deer farming was restricted to slopes under 20%.

22. GIS-based coupling of GLEAMS and REMM hydrology. I. Development and sensitivity.

Tucker, M. A., Thomas, D. L., Bosch, D. D., and Vellidis, G.

Transactions of the ASAE (Nov/Dec 2000) 43 (6): 1525-1534.
NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: hydrology/ groundwater pollution/ simulation models/ geographic information systems

Abstract: Movement of water from agricultural fields and into adjacent riparian areas is an important process in minimizing pollution for a large percentage of agricultural lands. Models have been developed for upland agricultural areas and for riparian zones. Creating a flexible structure for linking two different models is both desirable and needed for complete analysis of the systems. Since water is the primary mechanism for pollutant transport, creating a system which manages both surface and subsurface water movement is a first priority. An integrated model system was developed for joining the hydrologic portions of GLEAMS and REMM in a cascaded format to determine the fate of surface and subsurface water leaving an upland cultivated area and traversing a riparian forest. Data was managed within a GIS to aid in inputting and manipulating both spatial and nonspatial model parameters. Transfer of subsurface flow from the upland model to the riparian model was achieved through Darcy's equation. Partitioning of the flow was based on the hydraulic conductivity of the different layers and the depth of the water table. The model system was able to account for saturated zones encountered in the riparian area by raising the water table. The model system responded as would be expected under relatively extreme changes in precipitation for both shallow groundwater levels and runoff. The model system also exhibited expected behavior under different leaf area index (LAI) parameters within the forest. The shallow groundwater levels and runoff were not drastically affected, but the levels of response were within the range of expectations.

23. GIS-based coupling of GLEAMS and REMM hydrology. II. Field test results.

Tucker, M. A., Thomas, D. L., Bosch, D. D., and Vellidis, G.
Transactions of the ASAE (Nov/Dec 2000) 43 (6): 1535-1544.
NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: water quality/ hydrology/ simulation models

Abstract: Agricultural fields border riparian areas in many locations. These riparian areas provide important filtering capabilities for agricultural chemicals and sediment leaving upland agricultural areas. Several models have been developed for upland agricultural areas and for riparian zones. The need to integrate such models through a flexible structure which represents the field conditions is highly desirable. Since water is the primary mechanism for pollutant transport, the system must be capable of managing both surface and subsurface water movement. The hydrology components of the upland agriculturally oriented water quality model, GLEAMS, and the riparian ecosystem management model, REMM, were coupled through a GIS to allow evaluation of agricultural and forest management impacts on water movement for typical field situations in the southeastern Coastal Plain. Programs and subroutines were developed to allow delineation of field areas, identification and maintenance of data based on the field map, and incorporation of data to the input data format for each model. The model system was capable of representing the shallow groundwater levels from forest management practices of clear-cut, thinned, and mature forests in field comparisons with measured values from the Gibbs Research

Farm near Tifton, Georgia, for 27 months of comparison data between 1992 and 1994. Simulated monthly average shallow groundwater levels were within 0.14, 0.08, and 0.25 m of measured groundwater levels for the clear-cut, thinned, and mature forest treatments, respectively. Correlation results for the same treatments indicated at least an r^2 of 0.78 for all simulated versus measured monthly shallow ground water. results. The model system did not respond as well in representing field conditions on total monthly runoff. Average monthly differences in total simulated runoff were 0.73, 1.19, and 0.48 cm lower (highly significantly) than measured results for the clear-cut, thinned, and mature forest management treatments from the Gibbs Farm site, respectively. No correlation was indicated between simulated and measured total runoff. The model system did, however, indicate the runoff trends expected due to changes in forest management. As the number of trees and canopy increased, runoff decreased. The model system has the potential of providing a cost effective method of incorporating multiple model characteristics into management practice evaluations.

24. Grazinglands Research Laboratory.

Grazinglands Research Laboratory (U.S.).

El Reno, OK : The Laboratory, [2000]-:Title from web page. Description based on content viewed April 18, 2002.

NAL Call #: aSF84.865.U6-G73-2000

URL: <http://grl.ars.usda.gov/>

Descriptors: Grazinglands Research Laboratory/ Range management/ Grazing/ United States

25. Great Plains System Research Unit.

United States. Agricultural Research Service. Great Plains System Research Unit.

Fort Collins, CO : USDA, ARS, Great Plains System Research Unit, c2000.:Title from caption.

Includes bibliographical references.

NAL Call #: aS441-.U55-2000

URL: <http://gpsr.ars.usda.gov/>

Descriptors: Agricultural systems/ Computer simulation/ GPSR/ agriculture/ Models/ Decision support systems/ Precision agriculture/ GPFARM/ SPUR2/ NLEAP/ RZWQM/ SHOOTGRO/ ROOTSIM2D/ FSDMS/ Agricultural production/ Resource conservation/ Economic sustainability of agricultural systems/ Environmental sustainability of agricultural systems/ Climatic change/ Farmers/ Ranchers/ Agricultural consultants/ Agricultural Research Service/ United States

Abstract: The Great Plains System Research Unit (GPSR) is a research group of the United States Department of Agriculture (USDA) Agricultural Research Service (ARS). GPSR develops and implements state-of-the-art simulation models (GPFARM), decision support systems (GPFARM Information System), and other products (RZWQM) aimed at improving our understanding of how agricultural systems work and how we can best manage them. We are concerned with sustaining integrated agricultural production systems while minimizing destructive impacts on the environment and maintaining economic viability.

26. Groundwater phosphate dynamics in a river riparian zone: effects of hydrologic flowpaths, lithology and redox chemistry.

Carlyle, G. C. and Hill, A. R.
J-Hydrol (July 2, 2001) 247 (3/4): 151-168.
NAL Call #: 292.8-J82; ISSN: 0022-1694.

Descriptors: groundwater flow

Abstract: This study examines the influence of riparian zone hydrology, lithology and redox chemistry on groundwater phosphate dynamics. Patterns of soluble reactive phosphorus (SRP), dissolved oxygen (DO) and ferrous iron (Fe(2+)) in combination with hydrologic data and sediment characteristics were studied in a forested floodplain connected to a large upland sand aquifer in an agricultural region of southern Ontario, Canada. Groundwater discharge from the upland aquifer flowed laterally beneath peat in a 2-4 m thick zone of permeable sands across the floodplain to the river. Within the sands, low SRP concentrations (<25 microgram L(-1)) occurred in a plume of groundwater with DO concentrations >3 mg L(-1) and Fe(2+) concentrations <0.2 mg L(-1) which extended for a horizontal distance of 100-140 m across the riparian zone. High SRP concentrations (50-950 microgram L(-1)) were associated with low DO and high Fe(2+) concentrations which exceeded 1 mg L(-1) in buried channel sediments near the river bank. Sediment P fractionation indicated that the buried channel sediments contained a much higher pool of total P and Fe + Al-P than the sands. Groundwater SRP concentrations at the river bank were 25-80 microgram L(-1) compared to <10 microgram L(-1) in river water indicating that the floodplain was a source of SRP to the river. Areas of elevated SRP and Fe(2+) within the floodplain expanded in August when DO concentrations in groundwater were lower than in late spring or autumn. These data suggest that the microbial reduction of Fe(3+) to soluble Fe(2+) in anaerobic conditions influences groundwater SRP concentrations in the riparian zone. This study shows that well-organized, patterns of groundwater SRP concentrations occur in riparian zones which reflect the interaction of hydrologic flowpaths and environments of different redox state. Internal sources of P associated with buried channel sediments can also influence subsurface SRP transport and release to streams.

27. Hydrologic aspects of the 1998-99 drought in the Delaware River basin.

Paulachok, Gary N., Krejmas, Bruce E., Soden, Heidi L., and Geological Survey (U.S.).
Milford, Pa. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 2000. v, 29 p. : ill. (some col.), maps (some col.):Shipping list no.: 2001-0062-P. Includes bibliographical references (p. 29). SUDOCs: I 19.42/4:00-4112.
NAL Call #: GB701-.W375-no.-2000-4112

Descriptors: Drought/ Water supply/ Delaware River Watershed/ Delaware/ New Jersey/ New York

28. A hydrologic balance approach to saline seep remediation design.

Mankin, K. R. and Koelliker, J. K.
Applied Engineering in Agriculture (Mar 2000) 16 (2): 129-133.
NAL Call #: S671.A66; ISSN: 0883-8542.

Descriptors: seepage/ saline water/ recharge/ discharge/ water balance/ simulation models/ bioremediation/ medicago sativa/ triticum/ reclamation/ salinization/ potential yield model/ revised/ seep recharge

Abstract: Concern about saline seeps is increasing in the dryland production regions of Kansas and the North American Great Plains. To reclaim salt-affected seep areas, site hydrologic factors must be modified to reduce seep recharge. A simple method is needed to help design effective remediation treatments. A hydrologic balance model, POTYLDR (Potential Yield Model, Revised), was modified and used to estimate the water balance in a saline seep recharge area and to estimate the effectiveness of various acreages of alfalfa treatments in reducing seep recharge. This model uses readily available data, such as daily rainfall and temperature, NRCS runoff curve numbers, NRCS soil irrigation classes, Penman evapotranspiration parameters and Blaney-Criddle crop coefficients, to determine runoff, evapotranspiration, soil moisture, and percolation from the root zone. According to the assumed seep mechanism, deep percolation from the local recharge area was used to estimate seep recharge. Various percentages of the seep recharge area were shifted from the current wheat cropping to alfalfa to determine the reductions in total recharge and number of months contributing to recharge. A 50% reduction in total recharge required 14 to 32% alfalfa acreage depending upon site-specific factors of five targeted fields. A given alfalfa acreage reduced total recharge volume more effectively than it reduced the number of months contributing to recharge. The major limitation in application of these results is selection of the percentage seepage reduction needed to provide seep control. The modeling approach provides an important indication of a system's responsiveness to changes in vegetation and quantifies this response in a way that is useful for designing bioremediation treatments that require control of seepage or shallow groundwater recharge.

29. Hydrologic behavior of two engineered barriers following extreme wetting.

Porro, I.

Journal of Environmental Quality (Mar/Apr 2001) 30 (2): 655-667.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: barriers/ covers/ wetting/ rain/ snow/ meltwater/ infiltration/ waste disposal sites/ soil water content/ water balance/ evaporation/ subsidence/ capillary barriers/ thick soil barriers/ capillary biobarriers

Abstract: Many engineered barriers are expected to function for hundreds of years or longer. Over the course of time, it is likely that some barriers will experience infiltration to the point of breakthrough. This study compares the recovery from breakthrough of two storage-evapotranspiration type engineered barriers. Replicates of test plots comprising thick soil and capillary-biobarrier covers were wetted to breakthrough in 1997. Test plots were kept cleared of vegetation to maximize hydrologic stress during recovery. Following cessation of drainage resulting from the wetting irrigations, water storage levels in all plots were at elevated levels compared with pre-irrigation levels. As a result, infiltration of melting snow during the subsequent spring overloaded the storage capacity and produced drainage in all plots. Relatively rapid melting of accumulated snowfall produced the most significant infiltration events each year during the study. Capillary barriers yielded less total drainage than thick soil barriers. By limiting drainage, capillary barriers increased water storage in the upper portions of the test plots, which

led to increased evaporation from the capillary barrier plots compared with thick soil plots. Increased evaporation in the capillary barrier plots allowed more water to infiltrate in the second season following the wetting tests without triggering drainage. All thick soil plots again yielded drainage in the second season. Within two years of intentionally induced breakthrough, evaporation alone (without transpiration) restored the capability of the capillary barrier covers to function as intended, although water storage in these covers remained at elevated levels.

30. Hydrologic budgets for the Madison and Minnelusa aquifers, Black Hills of South Dakota and Wyoming, water years 1987-96.

Carter, Janet M. and South Dakota. Dept. of Environment and Natural Resources. South Dakota. West Dakota Water Development District. Geological Survey (U.S.).
Rapid City, S.D. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : U.S. Geological Survey, Information Services [distributor], 2001. iv, 53 p. : ill. (some col.), col. maps:Shipping list no.: 2001-0301-P. Includes bibliographical references (p. 51-53). SUDOCs: I 19.42/4:01-4119.
NAL Call #: GB701-.W375-no.-2001-4119

Descriptors: Hydrology/ Water balance/ Groundwater/ South Dakota/ Wyoming

31. Hydrologic conditions and water quality in an agricultural area in Kleberg and Nueces counties, Texas, 1996-98.

Ockerman, Darwin J., Petri, Brian L., and Texas Agricultural Experiment Station. Caesar Kleberg Wildlife Research Institute. Coastal Bend Bays & Estuaries Program. Geological Survey (U.S.).
Austin, Tex. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 2001. 1 v. (various pagings) : ill., col. maps:Shipping list no.: 2001-0283-P. Includes bibliographical references. SUDOCs: I 19.42/4:01-4101.
NAL Call #: GB701-.W375-no.-2001-4101

Descriptors: Water quality/ Runoff/ Agriculture/ Texas

32. Hydrologic influence on stability of organic phosphorus in wetland detritus.

Pant, H. K. and Reddy, K. R.
Journal of Environmental Quality (Mar/Apr 2001) 30 (2): 668-674.
NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: nucleotides/ sugar phosphates/ phospholipids/ typha/ wetlands/ hydrology/ flooding/ drainage/ release/ polynucleotides/ glycerophosphate/ constructed wetlands/ reflooding/ Florida

Abstract: Accretion of organic matter in wetlands provides long-term storage for nutrients and other contaminants. Water-table fluctuations and resulting alternate flooded and drained conditions may substantially alter the stability of stored materials including phosphorus (P). To study the effects of hydrologic fluctuation on P mobilization in wetlands, recently accreted detrital material (derived primarily from *Typha* spp.) was collected from the Everglades Nutrient Removal Project (ENRP), a constructed wetland used to treat agricultural drainage water in the

northern Everglades. The detrital material was subjected to different periods of drawdown and consecutive reflooding under laboratory conditions. The ^{31}P nuclear magnetic resonance (^{31}P NMR) spectroscopy analysis revealed that sugar phosphate, glycerophosphate, polynucleotides, and phospholipids (glycerophosphoethanolamine and glycerophosphocholine) were the major forms of P in the detrital material. After 30 d of drawdown, polynucleotides were reduced to trace levels, whereas sugar phosphate, glycerophosphate, and phospholipids remained the major fractions of organic P. Microorganisms seemed to preferentially utilize nucleic acid P, perhaps to obtain associated nutrients including carbon and nitrogen. At the end of the 30-d reflooding period, cumulative P flux from detritus to water column accounted for 3% of the total P (less than or equal to 15 d of drawdown) and further decreased to 2% at 30 d of drawdown, but increased to 8% at 60 d of drawdown. The drawdown (less than or equal to 30 d) not only reduced P flux to the water column, but also increased the humification and microbial immobilization of P. Excessive drawdown (60 d), however, triggered the release of P into the water column as the water content of detritus decreased from 95 to 11%.

33. Hydrologic response of a small watershed model to generated precipitation.

Harmel, R. D., Richardson, C. W., and King, K. W.

Transactions of the ASAE (Nov/Dec 2000) 43 (6): 1483-1488.

NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: watersheds/ precipitation/ simulation models

Abstract: Watershed models such as SWAT (Soil and Water Assessment Tool) simulate water quality impacts of land and water resource management alternatives. To simulate these impacts, long-term daily rainfall data are necessary. In the absence of measured rainfall data, watershed models use weather generators to simulate rainfall events. The objective of this study is to examine several daily precipitation generators in terms of the hydrologic response of SWAT. SWAT is generally applied to large river basins but has been validated and applied on the small watershed scale as well. Daily rainfall inputs included a 60-year measured rainfall record from 1939 to 1998 for Riesel, Texas, in the heart of the Blackland Prairie, and data generated with the precipitation components of three weather generation programs: WGEN, WXGEN, and USCLIMATE. Measured and generated rainfall were input into SWAT and run for a 53 ha watershed near Riesel, Texas. Rainfall totals, extreme rainfall events, and the resulting hydrologic responses of runoff volume and peak flows were then examined. For this study scenario, WXGEN was able to more closely match observed rainfall than WGEN and USCLIMATE. In terms of resulting SWAT hydrologic response, WXGEN rainfall best reproduced runoff volumes simulated with measured rainfall, and USCLIMATE performed better in reproducing peak runoff rates. These are important results as probabilities of exceeding runoff volume or peak flow thresholds are often questions of interest in watershed projects.

34. Hydrologic treatments affect gaseous carbon loss from organic soils, Twitchell Island, California, October 1995-December 1997.

Miller, Robin L., Hastings, Lauren., Fujii, Roger., and California. Dept. of Water Resources. Geological Survey (U.S.).

Sacramento, Calif. : U.S. Department of the Interior, U.S. Geological Survey ; Denver, CO : U.S. Geological Survey, Information Services [distributor], 2000. iv, 21 p. : ill., maps:Shipping list

no: 2000-0246-P. Includes bibliographical references (p. 20-21). SUDOCS: I 19.42/4:00-4042.
NAL Call #: GB701-.W375-no.-00-4042

Descriptors: Wetlands/ Carbon cycle/ Biogeochemistry/ Subsidence/ California

35. Hydrological factors for phosphorus transfer from agricultural soils.

Haygarth, P. M., Heathwaite, A. L., Jarvis, S. C., and Harrod, T. R.

Adv-Agron. San Diego, Calif. : Academic Press. 2000. V. 69 P. 153-178.

NAL Call #: 30-Ad9; ISSN: 0065-2113.

Descriptors: phosphorus/ losses from soil/ water quality

36. Hydrologically sensitive areas: variable source area hydrology implications for water quality risk assessment. [Erratum: Second Quarter 2001, v. 56 (2), p. 87].

Walter, M. T., Walter, M. F., Brooks, E. S., Steenhuis, T. S., Boll, J., and Weller, K.

Journal of Soil and Water Conservation (Third Quarter 2000) 55 (3): 277-284.

NAL Call #: 56.8-J822; ISSN: 0022-4561.

Descriptors: watersheds/ hydrology/ water quality/ risk assessment/ water supply/ runoff/ water pollution/ surface water/ cost benefit analysis/ quantitative analysis/ agriculture/ New York

37. Hydrology, water quality, and nutrient loads to Lake Catherine and Channel Lake, near Antioch, Lake County, Illinois.

Kay, Robert T., Johnson, Gary P. 1969, Schrader, David L., and Illinois. Fox Waterway Agency. Geological Survey (U.S.).

De Kalb, Ill. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 2000. vi, 128 p. : ill., maps:Shipping list no.: 2001-0012-P. Includes bibliographical references (p. 57-58). SUDOCS: I 19.42/4:00-4088.

NAL Call #: GB701-.W375-no.-00-4088

Descriptors: Water quality/ Nutrient pollution of water/ Hydrology/ Illinois

38. Hydrology, water quality, and phosphorus loading of Little St. Germain Lake, Vilas County, Wisconsin.

Robertson, Dale M., Rose, William J., and Geological Survey (U.S.).

[Reston, Va. : U.S. Dept. of the Interior, U.S. Geological Survey, 2000] 8 p. : col. ill., col. maps:Caption title. "Authors: Dale M. Robertson and William J. Rose"--P. 8. Shipping list no.: 2001-0064-P. "October 2000"--P. 1. Includes bibliographical references (p. 8). SUDOCS: I 19.42/4:00-4209.

NAL Call #: GB701-.W375-no.-2000-4209

Descriptors: Hydrology/ Water quality/ Water content/ Phosphorus content/ Wisconsin

39. Identifying critical sources of phosphorus export from agricultural watersheds.

Weld, J. L., Sharpley, A. N., Beegle, D. B., and Gburek, W. J.

Nutr-Cycl-Agroecosyst. Dordrecht, The Netherlands ; Boston : Kluwer, C1996-. Jan 2001. V.59 (1) P. 29-38.

NAL Call #: S631.F422; ISSN: 1385-1314.

Descriptors: agricultural land/ watersheds/ phosphorus/ leaching/ risk assessment/ soil fertility/ runoff/ water quality/ eutrophication/ land use/ hydrology/ water pollution/ Pennsylvania

40. Impacts of input parameter spatial aggregation on an agricultural nonpoint source pollution model.

FitzHugh, T. W. and Mackay, D. S.

J-Hydrol (Sept 10, 2000) 236 (1/2): 35-53.

NAL Call #: 292.8-J82; ISSN: 0022-1694.

Descriptors: catchment hydrology/ water pollution/ watersheds/ mathematical models/ simulation models/ wisconsin

41. The influence of grass and porous barrier strips on runoff hydrology and sediment transport.

Ghadiri, H., Rose, C. W., and Hogarth, W. L.

Transactions of the ASAE (Mar/Apr 2001) 44 (2): 259-268.

NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: grass strips/ porosity/ sediment/ transport processes/ water flow/ runoff/ erosion/ erosion control/ soil conservation/ buffer strips/ filter strips

Abstract: A series of experiments was conducted in a large tilting flume to investigate the effects of buffer strips on flow hydrology and sediment transport/deposition in and around the strips. Changes in flow depth caused by buffer strips of either nails or grass were recorded, photographed, and measured with a high degree of accuracy. Flow retardation took place at some distance ahead of the strips, causing the water level to rise. This distance is dependent upon flume slope and strip density for any given flow rate. With any increase in flume slope, the point at which water depth increased moved closer to the strip, entering it at around 6% slope. An exponential relationship exists between flume slope and backwater length. Backwater length is also dependent on strip density, and the relationship between these two factors is linear. Under our experimental conditions, sediment deposition did not take place within the strips, but before and after it. The lack of deposition inside the strips appears to be contrary to the common expectation from this technique. The bulk of sediment load in the sediment-laden flow approaching the strips was deposited ahead of the strips, commencing at the point where flow depth started to rise. The finer fraction of sediment load that entered the strip with the flow emerged from the other end unchanged. Some deposition took place as fans downstream of the strips, an indication of resistive flow velocity being slower before and after the strips than within them. When the soil or sand were not consolidated, significant erosion took place inside the strips, creating a head fall at the exit end of the strips, which moved upslope within the strips as experiments continued. For the range of slopes and strip widths studied, the efficiency of the grass or nail strips in slowing down the flow and unloading its sediment in the backwater region was independent of the width of strips in the flow direction. Grass strips thus appear to behave

more like "grass barriers" or "grass buffers" than "filter strips," as they are referred to in some literature. The process interpretation of these results is discussed in this article.

42. Integrated assessment of phosphorus in the Lake Hayes catchment, South Island, New Zealand.

Caruso, B. S.

J-Hydrol (Apr 17, 2000) 229 (3/4): 168-189.

NAL Call #: 292.8-J82; ISSN: 0022-1694.

Descriptors: water pollution/ watersheds/ agricultural land/ catchment hydrology/ groundwater pollution/ nonpoint source pollution

43. Integrated economic-hydrologic water modeling at the basin scale: the Maipo river basin.

Rosegrant, M. W., Ringler, C., McKinney, D. C., Cai, X., Keller, A., and Donoso, G.

Agric-Econ (Dec 2000) 24 (1): 33-46.

NAL Call #: HD1401.A47; ISSN: 0169-5150.

Descriptors: water allocation/ farm inputs/ decision making/ productivity/ irrigation/ demand/ water use efficiency/ resource utilization/ models/ water policy/ cost benefit analysis/ equations/ Chile

Abstract: Increasing competition for water across sectors increases the importance of the river basin as the appropriate unit of analysis to address the challenges facing water resources management; and modeling at this scale can provide essential information for policymakers in their resource allocation decisions. This paper introduces an integrated economic-hydrologic modeling framework that accounts for the interactions between water allocation, farmer input choice, agricultural productivity, non-agricultural water demand, and resource degradation in order to estimate the social and economic gains from improvement in the allocation and efficiency of water use. The model is applied to the Maipo river basin in Chile. Economic benefits to water use are evaluated for different demand management instruments, including markets in tradable water rights, based on production and benefit functions with respect to water for the agricultural and urban-industrial sectors.

44. Integrated Farming And Natural Resources Research Unit.

United States. Agricultural Research Service. Integrated Farming and Natural Resources Research Unit.

[Weslaco, Tex.? : USDA, ARS, Integrated Farming and Natural Resources Research Unit, 2000?]-:Title from caption.

NAL Call #: aS602.5-.U55-2000

URL: <http://weslaco.ars.usda.gov/ifnrru.html>

Descriptors: Cropping systems/ Pests Control/ Agricultural conservation/ United States

Abstract: The mission of the Integrated Farming and Natural Resources Research Unit (IFNRRU), an interdisciplinary research unit, is to gather scientific information and devise

technologies to facilitate development of more profitable and sustainable integrated crop production systems and area-wide pest management strategies that conserve soil, water, energy, and biological resources. This interdisciplinary management unit (MU) facilitates establishment of integrated crop production systems over large landscapes.

45. Irrigation and Water Quality Research Unit.

Clemmens, Albert J. and United States. Agricultural Research Service. Irrigation and Water Quality Research Unit.

[Phoenix, Ariz.] : USDA, ARS, Irrigation and Water Quality Research Unit, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: aTC812-.C64-2001

URL: <http://www.ars.usda.gov/Main/docs.htm?docid=4134>

Descriptors: Agricultural Research Service/ Irrigation and Water Quality Research Unit/ Irrigation/ Water quality/ United States

Abstract: Irrigated agriculture is the major user of water in the western United States. While water is considered a renewable resource, it is often in short supply or of poor quality. Increasing demands are being made on limited water supplies by agriculture, cities, and industries. Thus, the objectives of the Irrigation and Water Quality Research Unit are to develop management strategies and physical hardware needed to attain the most efficient use of irrigation water, to protect groundwater in areas where agricultural practices would have the potential for degrading water quality, and to reuse wastewater.

46. Jamie Whitten Delta States Research Center.

Jamie Whitten Delta States Research Center.

[Stoneville, Miss.] : The Center, [2001]-:Title from web page. Description based on content viewed April 19, 2002.

NAL Call #: aS541.5.M72-J36-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=64020000

Descriptors: Jamie Whitten Delta States Research Center/ Agriculture/ Mississippi

Abstract: The Jamie Whitten Delta States Research Center is one of the major research establishments of ARS. The Center consists of nine Research Units, with scientists conducting basic and applied research in several areas. The missions and goals of the Center's research are addressed through a multidisciplinary approach. Disciplines represented by the scientists include biology, genetics, engineering, chemistry, ecology, entomology, physiology, biochemistry, botany, agronomy, aquaculture, soil science, plant pathology, and application.

47. Kika de la Garza Subtropical Agricultural Research Center.

Subtropical Agricultural Research Laboratory (U.S.).

Weslaco, Tex. : The Center, [2000?]-:Title from caption.

NAL Call #: aS541.5.T42-K55-2000

URL: <http://weslaco.ars.usda.gov/>

Descriptors: Agriculture/ United States

Abstract: The mission of the Kika de la Garza Subtropical Agricultural Research Center is to increase food and fiber productivity, increase the efficiency of plant production, and preserve the quality of the product as it is delivered to the consumer. Food and water safety and water conservation are of paramount importance in this research program. The Center's work is diverse and is described in greater detail by mission statements of the individual research units.

48. Land Management & Water Conservation Research Unit.

United States. Agricultural Research Service. Land Management & Water Conservation Research Unit.

Pullman, WA : USDA, ARS, Land Management & Water Conservation Research Unit, [2001]-
:Title from caption.

NAL Call #: aS589.7-.U55-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=53-48-25-00

Descriptors: United States Agricultural Research Service/ Land Management and Water Conservation Research Unit/ Agricultural ecology/ Agricultural conservation

Abstract: The Land Management & Water Conservation Research Unit conducts multidisciplinary research on the principles and practices that enhance soil/water/air quality in economically feasible and environmentally sound agroecosystems. The Unit conducts research on 1) water erosion prediction and control under freeze/thaw and unfrozen conditions; 2) wind erosion impacts on soil degradation and air quality and its prediction and control; 3) best management practices for no-till and reduced tillage for soil quality, weed management and sustainable crop production; 4) cropping systems, alternative crop selection and microbial technology which improve plant growth and soil, water and air quality; and 5) the biology and ecology of weeds in dryland crops.

49. Model prediction of the effects of changing phosphorus loads on the Everglades Protection Area.

Munson, R. K., Roy, S. B., Gherini, S. A., MacNeill, A. L., Hudson, R. J. M., and Blette, V. L. *Water, Air, and Soil Pollution* (Feb 2002) 134 (1/4): 255-273.

NAL Call #: TD172.W36; ISSN: 0049-6979.

Descriptors: phosphorus/ water pollution/ runoff/ agricultural land/ mathematical models/ simulation models/ water flow/ wetlands/ water quality/ pollution control/ everglades phosphorus and hydrology model/ stormwater treatment areas/ everglades agricultural area/ Florida

50. Model predicts underground flow.

Stelljes, K. B.

Agricultural Research [U.S. Department of Agriculture, Agricultural Research Service] (May 2000) 48 (5): 20.

NAL Call #: 1.98-Ag84; ISSN: 0002-161X.

Descriptors: computer simulation/ simulation models/ hydrology/ hydrus

51. A modeling-GIS approach for assessing irrigation effects on soil salinisation under global warming conditions.

Utset, A. and Borroto, M.

Agric-Water-Manage. Amsterdam, The Netherlands : Elsevier Science B.V. Aug 24, 2001. V.50 (1) P. 53-63.

NAL Call #: S494.5.W3A3; ISSN: 0378-3774.

Descriptors: crop production/ irrigation/ hydrological data/ agricultural soils/ soil salinity/ salinization/ electrical conductivity/ global warming/ geographic information systems/ simulation models/ Cuba

52. Modelling decomposition of sugar cane surface residues with APSIM-Residue.

Thorburn, P. J., Probert, M. E., and Robertson, F. A.

Field-Crops-Res. Amsterdam, Elsevier. May 1, 2001. V. 70 (3) P. 223-232.

NAL Call #: SB183.F5; ISSN: 0378-4290.

Descriptors: saccharum/ crop residues/ decomposition/ simulation models/ hydrology/ nitrogen cycle/ cropping systems/ prediction/ field experimentation/ climate/ soil water content/ air temperature/ agricultural production systems simulator/ Queensland

53. Movement of water and heavy metals (Zn, Cu, Pb and Ni) through sand and sandy loam amended with biosolids under steady-state hydrological conditions.

Gove, L., Cooke, C. M., Nicholson, F. A., and Beck, A. J.

Bioresource Technology (June 2001) 78 (2): 171-179.

NAL Call #: TD930.A32; ISSN: 0960-8524.

Descriptors: zinc/ copper/ lead/ nickel/ leaching/ drying/ composting/ composts/ soil amendments/ Dewatered biosolids/ United Kingdom

Abstract: New guidelines for using biosolids in UK agriculture favour the use of enhanced treated biosolids, such as dried and composted cakes, due to concerns about the potential for transfer of pathogens into the food chain. However, there is a need to ensure that their use is environmentally acceptable and does not increase the risk to potable water supplies or the food chain from other contaminants such as heavy metals and xenobiotic organic chemicals. The objective of this study was to determine whether the use of composted and dried mesophilic anaerobically digested dewatered (MADD) biosolids would increase the risk of heavy metal leaching from cultivated horizons when compared to more conventionally used MADD cake. Three biosolids (MADD sewage sludge cake-fresh, dried and composted) were mixed with a sand (typic quartzipsamments, %OM = 3.0, pH = 6.5) or a sandy loam (typic hapludalf, %OM = 4.8, pH = 7.6) at an application rate equivalent to 250 kg N/ha/y resulting in loadings of approximately Zn:6 microgram, Cu:2 microgram, Pb:5 microgram and Ni:0.2 microgram/g of soil dry weight basis. These amended soils were repacked into columns (0.4 m by 0.1 m internal diameter) and leaching of Zn, Cu, Pb and Ni was investigated following application of two 24 h simulated rainfall events of 4.5 mm/h. Water balance data and the use of conservative tracers

(Cl- and Br-) showed that the hydrological regimes of each core were comparable and, thus, unlikely to account for differences in metal leaching observed. Although no significant difference ($P = 0.05$) was observed between biosolid amended and control soils, those amended with composted sludge consistently gave higher loss of all metals than did the control soils. Total losses of metals from compost amended soil over the two rainfall events were in the ranges, Zn:20.5-58.2, Cu:9.0-30.5, Pb:24.2-51.2 and Ni:16.0-39.8 microgram metal/kg amended soil, compared with Zn:16.4-41.1, Cu:6.2-25.3, Pb:16.9-41.7, and Ni:3.7-25.4 microgram metal/kg soil from the control soils. Losses of Zn, Cu, Pb and Ni from fresh MADD cake amended soils (19.8-41.3, 3.2-25.8, 21.6-51.6 and 7.6-36.5 microgram metal/kg amended soil, respectively) and from dry MADD cake amended soils (10.7-36.7, 1.8-23.8, 21.2-51.2 and 6.8-39.2 microgram metal/kg amended soil, respectively) were similar to the controls. Generally, quantities of metals leached followed the order $Zn = Pb > Cu > Ni$, which was consistent with the levels of metals in the original sludge/soil mixtures. These results suggest that composting or drying MADD biosolids is unlikely to increase the risk of groundwater contamination when compared to the use of MADD cake; therefore, the changes in UK sludge use in agriculture guidelines are satisfactory in this respect.

54. National Sedimentation Laboratory.

National Sedimentation Laboratory (U.S.).

Oxford, MS : The Laboratory, [2002]-:Title from Web Page. Description based on content viewed in April 22, 2002.

NAL Call #: aS626.3.U6-N37-2002

URL: http://www.ars.usda.gov/Main/site_main.htm?modecode=64-08-05-00

Descriptors: National Sedimentation Laboratory/ Sedimentation and deposition/ Soil erosion/ Water quality/ United States

Abstract: The research program at the National Sedimentation Laboratory (NSL) emphasizes interdisciplinary research on the processes of soil erosion, transport and deposition of sediment, and movement of chemicals on upland areas and in streams and the impact of agricultural practices and in-stream structures and bank protection on these processes, water quality and the ecological well-being of streams.

55. National Soil Erosion Research Laboratory (NSERL).

National Soil Erosion Research Laboratory (U.S.).

[Lafayette, Ind.] : National Soil Erosion Research Laboratory, [1999?]:Title from caption.

NAL Call #: aS626.3.U6-N38-1999

URL: <http://topsoil.nserl.purdue.edu/nserlweb/>

Descriptors: National Soil Erosion Research Laboratory/ Soil erosion/ Administrative agencies/ Laboratories/ Department of Agriculture/ United States

Abstract: The National Soil Erosion Research Laboratory (NSERL) of the United States Department of Agriculture - Agricultural Research Service is the focal point for the U.S. Government's national research program in soil erosion by water. Major program thrusts of the

NSERL include fundamental erosion process research, erosion control research, and delivery of improved erosion prediction technology.

56. National Soil Tilth Laboratory.

National Soil Tilth Laboratory (U.S.).

Ames, Iowa : The Laboratory, [1999?]-:Title from opening screen, last modified June 3, 1999 (viewed Nov. 24, 1999). Includes bibliographical references.

NAL Call #: aS591.55.U6-N38-1999

URL: <http://www.nstl.gov/>

Descriptors: National Soil Tilth Laboratory/ Soils/ United States

Abstract: Home page of the Laboratory, whose mission is to generate and integrate knowledge for the development and evaluation of management practices that enhance surface and ground water quality while ensuring the long term enhancement and conservation of the nation's soil and water resources. Included at this site is a personnel directory, NSTL publications, NSTL software and links to USDA.

57. Natural Resources Systems Research Unit.

United States. Agricultural Research Service. Natural Resources Systems Research Unit.

[Temple, Tex.?] : USDA, ARS, Natural Resources Systems Research Unit, [2001?]-:Title from caption.

NAL Call #: aS599.A1-N38-2001

URL: http://ars.usda.gov/main/site_main.htm?modecode=62-06-05-05

Descriptors: Crops and soils/ Crops and water/ Soil management/ United States

Abstract: The mission of this research unit is to develop crop growth models for optimizing the use of fertilizers, water, tillage, pesticides, and other inputs, and for forecasting crop production; develop models for assessing the quantity and quality of soil and water resources and predicting the effects of changing management practices and climatic conditions; and develop improved soil, water, and crop management practices for controlling runoff and erosion, protecting water quality, and restoring or maintaining the productivity of crop and rangelands.

58. Nitrate dynamics in relation to lithology and hydrologic flow path in a river riparian zone.

Devito, K. J., Fitzgerald, D., Hill, A. R., and Aravena, R.

Journal of Environmental Quality (July/Aug 2000) 29 (4): 1075-1084.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: nitrate nitrogen/ transport processes/ water flow/ floodplains/ hydrology/ geochemistry/ groundwater pollution/ pollution control/ nitrate mitigation/ Ontario

Abstract: The efficiency with which riparian zones remove nitrate (NO₃⁻) from contaminated ground water can vary with landscape setting. This study was conducted to determine the influence of flood plain geometry, lithology, hydrologic flow path, and nitrate transport on

mechanisms of nitrate depletion of contaminated ground water. Patterns of NO₃(-)-N, chloride, and dissolved organic carbon (DOC) concentrations and delta¹⁵N-NO₃(-) and delta¹⁸O-NO₃(-) values in combination with detailed piezometric head measurements were investigated in a river floodplain connected to a large upland sand aquifer in an agricultural region near Alliston, Ontario, Canada. Ground water discharging to the forested floodplain from the sand aquifer exhibited large spatial variability in NO₃(-)-N concentrations (10-50 mg/L). The transport and depletion of NO₃(-) was strongly influenced by floodplain geometry and lithology. Little ground water flow occurred through the low-conductivity matrix of peat in the floodplain. Plumes of NO₃(-)-rich ground water passed beneath the riparian wetland peat and flowed laterally in a 2- to 4-m-thick zone of permeable sands across the floodplain to the river. Analyses of the distribution of the NO₃(-)-N concentrations, isotopes, and DOC within the floodplain indicate that denitrification occurred within the sand aquifer near the river where nitrate-rich ground water interacted with buried channel sediments and surface water recharged from peat to the deeper sands. This study shows that the depth of permeable riparian sediments, ground water flow path, and the location of organic-rich subsurface deposits may be more important than the width of vegetated strips in influencing the ability of riparian zones to remove nitrate.

59. Nitrogen and phosphorus concentrations from agricultural catchments--influence of spatial and temporal variables.

Arheimer, B. and Liden, R.

J-Hydrol (Jan 31, 2000) 227 (1/4): 140-159.

NAL Call #: 292.8-J82; ISSN: 0022-1694.

Descriptors: agricultural land/ watersheds/ catchment hydrology/ water pollution/ mathematical models/ regression analysis

Abstract: The eutrophication problem has drawn attention to nutrient leaching from arable land in southern Sweden, and further understanding of spatial and temporal variability is needed in order to develop decision-making tools. Thus, the influence of spatial and temporal variables was analysed statistically using empirical time series of different nutrient species from 35 well-documented catchments (2-35 km²), which have been monitored for an average of 5 years. In the spatial analysis several significant correlations between winter median concentrations and catchment characteristics were found. The strongest correlation was found between inorganic nitrogen and land use, while concentrations of different phosphorus species were highly correlated to soil texture. Multiple linear regression models gave satisfactory results for prediction of median winter concentrations in unmeasured catchments, especially for inorganic nitrogen and phosphate. In the analysis of temporal variability within catchments, internal variables from a dynamic hydrological model (HBV) were linked to concentration fluxes. It was found that phosphorus and inorganic nitrogen concentrations were elevated during flow increase at low-flow conditions, while they were diluted as the wetness in the catchment increased. During unmonitored periods regression models were successful in predicting temporal variability of total phosphorus, phosphate and inorganic nitrogen, while organic nitrogen and particulate phosphorus could not be predicted with this approach. Dividing the data into different flow categories did not improve the prediction of nutrient concentration dynamics. The results and literature review presented, confirm parts of the present HBV-N model approach and will be useful for further development of nutrient routines linked to dynamic hydrological models.

60. North Appalachian Experimental Watershed (NAEW).

North Appalachian Experimental Watershed (U.S.).

Coshocton, OH : U.S. Dept. of Agriculture, Agricultural Research Service, Midwest Area, North Appalachian Experimental Watershed, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: aGB980-.N67-2001

URL: http://ars.usda.gov/main/site_main.htm?modecode=36-05-00-00

Descriptors: North Appalachian Experimental Watershed/ Watersheds/ Hydrology/ Runoff/ Groundwater Quality/ Soil erosion/ United States

Abstract: The Mission of the North Appalachian Experimental Watershed is to conduct research on hydrology, surface runoff, groundwater quality, and erosion in an agricultural context. Conservation tillage, crop rotations, reduced input management practices, and pastures nutrient management systems are evaluated using watershed and monolith lysimeters. A 60-year data base of measurements from rain gauges, watershed flumes and weirs, and automated data collection lysimeters along with soil and meteorological data provide a long-term frame of reference which is essential in the evaluation of current experimental data. Research is designed to develop knowledge of basic water sediment, and chemical movement and to develop and verify models describing their transport, while continually adding to the data base.

61. Northern Plains Agricultural Research Laboratory.

United States. Dept. of Agriculture. Northern Plains Agricultural Research Laboratory.

Sidney, Mont. : The Laboratory, [1997]-:Title from caption. "Agricultural Systems Unit & Pest Management Research Unit"

NAL Call #: aS541.5.M92-N67-1997

URL: <http://www.sidney.ars.usda.gov/>

Descriptors: Agriculture/ Biological control/ Weeds/ Rangeland agriculture/ Pest management/ Pathogens/ Great Plains

62. Northwest Irrigation & Soils Research Laboratory, Kimberly, Idaho, USA.

Northwest Irrigation & Soils Research Laboratory (U.S.).

Kimberly, ID : USDA, ARS, NWISRL, [2000?]-:Title from caption. Includes bibliographical references.

NAL Call #: aS541.5.I22-N67-2000

URL: <http://kimberly.ars.usda.gov/>

Descriptors: Agriculture/ Irrigation/ Soil laboratories/ Idaho

Abstract: The mission of the Laboratory is to develop environmentally compatible and economically sustainable new and improved integrated water, soil, plant nutrient, and crop management practices for irrigated agriculture in the United States.

63. Northwest Watershed Research Center.

Northwest Watershed Research Center (U.S.).

[Boise, ID] : The Center, [2000]-:Title from caption. Includes bibliographical references.
NAL Call #: aGB991.I2-N67-2000

URL: <http://www.nwrc.ars.usda.gov/>

Descriptors: Northwest Watershed Research Center/ Reynolds Creek Experimental Watershed/
Watersheds/ Hydrology/ Rangeland agriculture/ Frozen soils/ Watersheds/ Snowmelt/ Models/
Remote sensing/ Erosion/ Runoff/ Idaho/ United States

Abstract: The Northwest Watershed Research Center is an ARS-USDA center conducting research on weather and climate measurement and characterization systems; snow accumulation, distribution and melt; remote sensing to characterize vegetation and soil water status; invasive weed issues and revegetation strategies; wildfire effects on runoff and soil erosion; vegetation and management effects on stream temperature and sedimentation; and basic hydrologic processes from point, to field, to basin scale.

64. Parameterisation of hydrological models: a review and lessons learned from studies of an agricultural catchment (Naizin, France).

Durand, P., Gascuel Odoux, C., and Cordier, M. O.

Agronomie (Mar 2002) 22 (2): 217-228.

NAL Call #: SB7.A3; ISSN: 0249-5627.

Descriptors: agricultural land/ watersheds/ catchment hydrology/ simulation models/
mathematical models/ bayesian theory/ monte carlo method/ estimation/ hydraulic conductivity/
water flow/ soil water/ generalized likelihood uncertainty estimation/ maximum storage in root
zone/ channel flow velocity/ brittany

65. Pasture Systems and Watershed Management Research Unit.

Pasture Systems and Watershed Management Research Unit (U.S.).

University Park, PA : The Unit, [2000?]:Title from caption. Includes bibliographical references.

NAL Call #: aSB199-.P37-2000

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=19020000

Descriptors: Pasture Systems and Watershed Management Research Unit/ Pasture Management/
Watershed management/ Northeastern States/ United States

Abstract: Our mission is to conduct research leading to the development of land, water, plant, and animal management systems, which ensure the profitability and sustainability of northeastern grazing and cropping enterprises while maintaining the quality of ground and surface waters.

66. Phosphorus loading in the Frome catchment, UK: seasonal refinement of the coefficient modeling approach.

Hanrahan, G., Gledhill, M., House, W. A., and Worsfold, P. J.

Journal of Environmental Quality (Sept/Oct 2001) 30 (5): 1738-1746.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: phosphorus/ wetlands/ catchment hydrology/ simulation models/ nutrient loading/ United Kingdom

Abstract: This paper describes the results of an export coefficient modeling approach to predict total phosphorus (TP) loading in the Frome catchment, Dorset, UK from point and diffuse sources on a seasonal (monthly) basis in 1998 and on an annual basis for 1990-1998. The model predicted an annual TP load of 25605 kg yr⁻¹, compared with an observed (measured) value of 23400 kg yr⁻¹. Monthly loads calculated using the export coefficient model agreed well with monthly observed values except in months of variable discharge, when observed values were low, probably due to infrequent, and therefore unrepresentative, sampling. Comparison between filterable reactive phosphorus (FRP) and TP concentrations observed in the period 1990-1997 showed that trends in FRP could be estimated from trends in TP. A sensitivity analysis (varying individual export coefficients by +/- 10%) showed that sewage treatment works (STWs) (3.5%), tilled land (2.7%), meadow verge seminatural (1.0%), and mown and grazed turf (0.6%) had the most significant effect (percent difference from base contribution) on model prediction. The model was also used to estimate the effect of phosphorus stripping at STWs in order to comply with a pending change in the European Union wastewater directive. Theoretical reduction of TP from the largest STW in the catchment gave a predicted reduction in TP loading of 2174 kg yr⁻¹. This illustrates the value of this seasonal export coefficient model as a practical management tool.

67. Predicting field hydrology in cold conditions with DRAINMOD.

Luo, W., Skaggs, R. W., Madani, A., Cizikci, S., and Mavi, A.

Transactions of the ASAE (July/Aug 2001) 44 (4): 825-834.

NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: subsurface drainage/ water table/ depth/ meltwater/ freeze thaw cycles/ cold zones/ simulation models/ snow accumulation/ Minnesota/ Nova Scotia/ Turkey

Abstract: The field hydrology model DRAINMOD was modified for cold conditions, where soil freezing, thawing, and snow accumulation affect the hydrologic cycle. Field observations of water table depth and subsurface drainage from Carsamba, Turkey; Truro, Nova Scotia; and Lamberton, Minnesota, were used to test the modified DRAINMOD. At Carsamba, Turkey, the modified DRAINMOD correctly predicted the timing and magnitude of drainage events resulting from snow accumulation and subsequent snow melt. Although the variable weather pattern and nature of rain/snow mixture at the Nova Scotia site made it difficult to describe hydrology during winter months, the modified DRAINMOD predicted the timing and magnitude of most drainage flow events more accurately. Continuous long-term model simulations at Lamberton, Minnesota, were generally in good agreement with drainage measurements. The temperature-based approach used in the model caused some unusual rainfall events to be missed during winter. Errors from snow event predictions contributed to errors in hydrologic predictions. Overall, the modified DRAINMOD gave reasonable predictions of field hydrology. The simplified snow algorithm provided a timely prediction of snow accumulation and melting.

68. A preliminary water balance for the Colorado River delta, 1992-1998.

Cohen, M. J., Henges Jeck, C., and Castillo Moreno, G.

J-Arid-Environ. London, New York, Academic Press. Sept 2001. V. 49 (1) P. 35-48.
NAL Call #: QH541.5.D4J6; ISSN: 0140-1963.

Descriptors: rivers/ water balance/ wetlands/ deltas/ water flow/ temporal variation/ riparian vegetation/ plant communities/ hydrology/ agricultural land/ drainage/ Mexico

69. Reconnaissance of the hydrology, water quality, and sources of bacterial and nutrient contamination in the Ozark Plateaus aquifer system and Cave Springs Branch of Honey Creek, Delaware County, Oklahoma, March 1999-March 2000.

Schlottmann, Jamie L., Tanner, Ralph., Samadpour, Mansour., and Geological Survey (U.S.). Oklahoma City, OK : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 2000. vi, 66 p. : ill., maps:Shipping list no.: 2001-0079-P. Includes bibliographical references (p. 38-39). SUDOCS: I 19.42/4:00-4210.
NAL Call #: GB701-.W375-no.-2000-4210

Descriptors: Water quality/ Hydrology/ Oklahoma

70. Representing and processing uncertain soil information for mapping soil hydrological properties.

Martin Clouaire, R., Cazemier, D. R., and Lagacherie, P.
Comput-Electron-Agric (Oct 2000) 29 (1/2): 41-57.
NAL Call #: S494.5.D3C652; ISSN: 0168-1699.

Descriptors: soil/ soil physical properties/ soil water/ water holding capacity/ mapping/ geographic information systems/ databases/ fuzzy logic/ uncertainty/ theory/ possibility theory

71. Runoff and soil loss as affected by the application of manure.

Gilley, J. E. and Risse, L. M.
Transactions of the ASAE (Nov/Dec 2000) 43 (6): 1583-1588.
NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: animal wastes/ erosion/ runoff/ application to land/ losses from soil

Abstract: Manure has been used effectively to improve crop production and soil properties because it contains nutrients and organic matter. While it is generally accepted that the improved soil properties associated with manure application lead to changes in runoff and soil erosion, few studies have quantified these impacts. Water quality models used to assess watershed management and estimate total maximum daily load must accurately predict loading rates from fields where manure has been applied. This study was conducted to assemble and summarize information quantifying the effects of manure application on runoff and soil loss resulting from natural precipitation events, and to develop regression equations relating runoff and soil loss to annual manure application rates. For selected locations at which manure was added annually, runoff was reduced from 2 to 62%, and soil loss decreased from 15 to 65% compared to non-manured sites. Measured runoff and soil loss values were reduced substantially as manure application rates increased. Regression equations were developed relating runoff and soil loss to manure application for rates ranging from 11 to 45 Mg ha⁻¹, and slope lengths varying from 21

to 24 m. The equations can be used in estimating environmental impacts or to account for manure applications in water quality modeling efforts.

72. Selected hydrologic data from the Cedar Rapids area, Linn County, Iowa, April 1996 through March 1999.

Boyd, Robert A., Kuzniar, Ronald L., Schulmeyer, Peter M., and Cedar Rapids (Iowa). Geological Survey (U.S.).

Iowa City, Iowa : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, Colo. : Branch of Information Services [distributor], 1999, i.e. 2000. viii, 241 p. : col. maps:Shipping list no.: 2002-0124-M. Includes bibliographical references (p. 9). SUDOCs: I 19.76:99-461.

NAL Call #: Fiche-S-133-I-19.76:99-461

Descriptors: Hydrology/ Water quality/ Water table/ Iowa

73. Semiarid crop production from a hydrological perspective: gap between potential and actual yields.

Rockstrom, J. and Falkenmark, M.

Crit-Rev-Plant-Sci (2000) 19 (4): 319-346.

NAL Call #: QK1.C83; ISSN: 0735-2689.

Descriptors: crops/ semiarid climate/ dry farming/ rain/ water balance/ water use efficiency/ drought/ crop yield/ water harvesting/ irrigation/ yield increases/ maximum yield/ fields/ zea mays/ water requirements/ biomass production/ transpiration/ evaporation/ pennisetum glaucum/ water uptake/ percolation/ runoff/ literature reviews/ sahel/ Africa South of Sahara

74. Soil and Water Conservation Research Unit, Lincoln, Nebraska.

United States. Agricultural Research Service. Soil and Water Conservation Research Division. Lincoln, Neb. : The Unit, [2001]-:Title from title screen.

NAL Call #: aS626.3.U6-U55-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=54401000

Descriptors: Soil conservation/ Water conservation/ Precision agriculture/ Soil quality/ Soil health/ Electrical conductivity/ Nutrient management/ Soil fertility/ Phosphorus/ Nitrogen/ Conservation Reserve Program/ Crop canopy/ Management systems evaluation area/ Remote sensing/ Crop stress/ Carbon storage/ Cropping systems/ United States

Abstract: The Soil and Water Conservation Research Unit (SWCRU) in Lincoln, Nebraska is responsible for addressing questions, and solving problems, through research on crop production systems that have regional and national implications to sustainability of crop productivity and conservation of soil, water, and air resources. The mission of the Soil and Water Conservation Research Unit is to develop or improve technologies that protect the environment and promote sustainable integrated production systems.

75. Soil and Water Management Research Unit, St. Paul, Minnesota.

United States. Agricultural Research Service.

[Washington, D.C.?] : U.S. Dept. of Agriculture, Agricultural Research Service, [2001]-:Title

from caption. Includes bibliographical references.
NAL Call #: aS599.M6-U55-2001

URL: http://www.soils.agri.umn.edu/research_old/ars/Index.html

Descriptors: University of Minnesota Soil and Water Management Research Unit/ Soil management/ Watershed management/ United States

Abstract: The mission of the Soil and Water Management Research Unit is to understand the fundamental soil properties and processes affected by conservation tillage and residue management and to develop process-oriented models of these properties and processes applicable to a broad spectrum of agricultural management problems, including the quality of our ground water (potential drinking supplies).

76. Soil and Water Research Unit, Mid South Area, Agricultural Research Service, United States Department of Agriculture.

United States. Agricultural Research Service. Mid South Area. Soil and Water Research Unit. Baton Rouge, LA : The Unit, [2001?]-:Title from web page. Description based on content viewed April 24, 2002.

NAL Call #: aSB185.6-.U65-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=64-13-20-00

Descriptors: United States Agricultural Research Service/ Mid South Area Soil and Water Research Unit/ Crops and water/ Crops and soils/ Water quality management/ Agricultural chemicals/ Computer simulation/ United States

Abstract: The mission of the Soil and Water Research Unit is to: (1) characterize and quantify the transport and fate of agrochemicals in high water table soils; (2) develop integrated water and agrochemical management systems that provide profitable yields and improve water quality in high water table soils in the humid, warm-temperature areas of the U.S.; and (3) develop improved water management systems and operating criteria that enhance crop production conditions and increase the efficiency of conducting farming operations in a timely manner; and (4) develop computer models to design integrated water-agrochemical management systems by simulation and predictive techniques using localized (farm or watershed level) input data (soils, crops, weather).

77. Soil Drainage Research Unit, Columbus, Ohio.

United States. Agricultural Research Service. Soil Drainage Research Unit.

Columbus, OH : USDA, ARS, MWA, Soil Drainage Research Unit, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: aQK870-.U55-2001

URL: *Descriptors:* Soil Drainage Research Unit/ Drainage/ Corn/ Soybean/ Agricultural Research Service/ United States

Abstract: The Soil Drainage Research Unit is located at the Ohio State University in Columbus, Ohio and has been actively involved in agricultural research for over 40 years.

78. The south-west hydrological information package : understanding and managing hydrological issues on agricultural land in the south-west of Western Australia.

Tille, P. J. Peter John 1961

[Midland, W.A.] : Agriculture Western Australia, [2001] 284 p. : ill., maps:"March 2001."

"Agdex 500." Includes bibliographical references.

NAL Call #: S478.A82-W47-no.-4488

79. Southeast Watershed Research Laboratory : South Atlantic Area.

Southeast Watershed Research Laboratory (U.S.).

Tifton, GA : The Laboratory, [1999]-:Title from web page. "June 1999." Description based on content viewed April 24, 2002. Includes bibliographical references.

NAL Call #: aGB991.S13-S69-1999

URL: <http://sacs.cpes.peachnet.edu/sewrl/>

Descriptors: Southeast Watershed Research Laboratory/ Watersheds/ Water quality/ SEWRL/ Southern States/ United States

Abstract: The mission of the Southeast Watershed Research Laboratory is to develop a scientific understanding and associated technologies of watershed systems essential to maintaining or enhancing the environmental and natural resource base required for a viable, sustainable, and productive agricultural economy. The focus of the Laboratory is primarily on the Coastal Plain region of the southeastern U.S., a region with low-gradient drainage systems and extensive near-stream riparian areas. Specific objectives are to develop: (a) conceptual understanding of physical, chemical, and biological processes that impact natural resource and environmental systems; (b) methodologies to direct optimal use of soil and water resources in the production of quality food and fiber while maintaining short- and long-term productivity requirements, ecosystem stability, and environmental quality; and (c) models and information based systems to guide responsible management decisions for action and regulatory agencies at field, farm, and watershed scales.

80. Southern Regional Research Center.

United States. Agricultural Research Service. Southern Regional Research Center.

New Orleans, LA : The Service, [2002]-:Title from web page. Description based on content viewed April 24, 2002.

NAL Call #: aSB129-.U65-2002

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=64350000

Descriptors: Southern Regional Research Center/ Crops/ Postharvest technology/ Termite Control/ Biocontrol/ Oilseeds/ Cotton/ Textile/ Agricultural Research Service/ Southern States/ United States

81. Southwest Watershed Research Center, USDA, ARS.

Southwest Watershed Research Center (U.S.).

Tucson, Ariz. : Southwest Watershed Research Center, U.S. Department of Agriculture, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: aGB991.A6-U83-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=53424500

Descriptors: Southwest Watershed Research Center/ Watersheds/ Watershed management/ Research institutes/ Department of Agriculture/ Agricultural Research Service/ Arizona/ United States

Abstract: Features the Southwest Watershed Research Center, part of the Agricultural Research Service (ARS) of the U.S. Department of Agriculture (USDA), located in Tucson, Arizona. Posts contact information via street address. The Center conducts basic and applied research in global change, hydrology and water resources, erosion and sedimentation, water quality, and development of improved decision support systems. Offers information about research projects on soil erosion, global climate change, and environmental watersheds. Lists personnel and details Center publications. Links to rainfall data, Internet search engines, and the USDA and ARS home pages.

82. Stream nutrient retention in three northeastern Oklahoma agricultural catchments.

Haggard, B. E., Storm, D. E., Tejral, R. D., Popova, Y. A., Keyworth, V. G., and Stanley, E. H.

Transactions of the ASAE (May/June 2001) 44 (3): 597-605.

NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: streams/ water quality/ watersheds/ catchment hydrology/ spatial variation/ nutrient retention/ seasonal variation/ aquatic environment/ freshwater ecology/ water pollution/ Oklahoma

Abstract: Stream nutrient retention was examined in three adjacent agricultural catchments (Cherokee Creek, Cloud Creek, and Dry Creek) in the Ozark Plateau. Retention efficiency was measured using short-term nutrient and tracer injections to estimate nutrient uptake length ($S(w)$) during summer 1999 and winter 2000. A one-dimensional transport model was used to estimate dispersion, transient storage size, and exchange. Soluble reactive P (SRP) and NO_3-N concentrations were least in the stream with the lowest proportion of pasture in the upland (Dry Creek), whereas concentrations and land use were similar in Cherokee Creek and Cloud Creek. Water column SRP concentrations were similar between seasons in all streams, but NO_3-N concentrations varied significantly. Injected NO_3-N was not significantly retained in these systems, probably because the streams were saturated by ambient NO_3-N concentrations (greater than 0.1 mg L^{-1}). Phosphorus was retained during summer injections ($S(w)$ ranged from 200-900 m), but $S(w)$ regressions were not significant in winter. Variation in catchment land use was not a major determinant in P retention during summer, but stream hydrology, such as discharge and transient storage, was a regulating factor. Therefore, land use changes that alter stream hydrology may have a greater impact on P retention in these streams.

83. Succession during the re-creation of a flood-meadow 1985-1999.

McDonald, A. W.

Appl-Veg-Sci (Dec 2001) 4 (2): 167-176.

NAL Call #: QK900-.A66; ISSN: 1402-2001.

Descriptors: flood meadows/ species diversity/ grassland management/ plowing/ farming/ alopecurus pratensis/ sanguisorba officinalis/ plant communities/ botanical composition/ grazing/ cattle/ sheep/ cutting/ plant succession/ drought/ recruitment/ hydrology/ Southwest England

84. Transcending scales of space and time in impact studies of climate and climate change on agrohydrological responses.

Schulze, R.

Agriculture, Ecosystems and Environment (Dec 2000) 82 (1/3): 185-212.

NAL Call #: S601.A34; ISSN: 0167-8809.

Descriptors: agriculture/ hydrology/ environmental impact/ climatic change/ climate/ infiltration/ soil water/ evapotranspiration/ crop yield/ plant development/ erosion/ land use/ catchment hydrology/ South Africa

Abstract: The scale "jump" in hydrology and agriculture from the small scale at which individual processes such as infiltration, soil water redistribution, evapotranspiration, soil loss or crop development/yield have been studied, to the global scale at which climate change impacts and international trade in agriculture manifest themselves, has presented agrohydrologists with conceptual as well as practical problems of scales and scaling. In this context, selected scaling issues are, therefore, identified and highlighted. The paper discusses why scaling problems arise, defines concepts and types of scales, poses what are considered key questions with regard to upscaling and downscaling, as well as to dis-aggregation to homogenous landscape response units (HLRUs) and to re-aggregation. Examples from southern Africa are then given of space/time scaling approaches, ranging from country to local-scale levels, followed by an evaluation of types of errors associated with scaling. The paper concludes by identifying what, in the author's perception, some of the challenges are which relate to scaling applications of the "real world" and which hydrologists and agriculturists face in the next few years.

85. Transdisciplinarity in groundwater management-towards mutual learning of science and society.

Scholz, R. W., Mieg, H. A., and Oswald, J. E.

Water, Air, and Soil Pollution (Oct 2000) 123 (1/4): 477-487.

NAL Call #: TD172.W36; ISSN: 0049-6979.

Descriptors: groundwater pollution/ aquifers/ nitrate/ leaching/ water resources/ water management/ agricultural soils/ sociology/ hydrology/ pollution control/ college curriculum/ projects/ Baden Wurttemberg / Switzerland

86. Triazines in the Marne and the Seine rivers (France): longitudinal evolution and flows.

Garmouma, M., Blanchoud, H., Teil, M. J., Blanchard, M., and Chevreuril, M.

Water, Air, and Soil Pollution (Nov 2001) 132 (1/2): 1-17.

NAL Call #: TD172.W36; ISSN: 0049-6979.

Descriptors: water pollution/ triazine herbicides/ atrazine/ simazine/ terbuthylazine/ herbicide residues/ river water/ water flow/ rivers/ rain/ catchment hydrology/ watersheds/ agricultural land/ vineyards/ temporal variation/ France

87. U.S. Water Conservation Laboratory.

United States Water Conservation Laboratory.

Phoenix, AZ : USDA-ARS, U.S. Water Conservation Laboratory, [2001]-:Title from caption.

Includes bibliographical references.

NAL Call #: aTD223-.U8-2001

URL: http://www.ars.usda.gov/main/site_main.htm?modecode=53442000

Descriptors: United States Water Conservation Laboratory/ Water conservation/ United States

Abstract: The mission of the U. S. Water Conservation Laboratory (USWCL) is to conserve water and protect water quality in systems involving soil, aquifers, plants, and the atmosphere. Research thrusts involve developing more efficient irrigation systems, improving the management of irrigation systems, developing better methods for scheduling irrigations, developing the use of remote sensing techniques and technology, protecting groundwater from agricultural chemicals, commercializing new industrial crops, and predicting the effect of future increases of atmospheric CO₂ on climate and on yields and water requirements of agricultural crops.

88. Upland Erosion Processes Research Unit.

National Sedimentation Laboratory (U.S.) Upland Erosion Processes Research Unit.

[Oxford, MS] : U.S. Dept. of Agriculture, ARS, National Sedimentation Laboratory. Upland Erosion Processes, [2002?]-:Title from web page. Description based on content viewed April 23, 2002.

NAL Call #: aS626.3.U6-N37-2002

Host name: http://www.ars.usda.gov/Main/site_main.htm?modecode=64-08-05-30

Descriptors: National Sedimentation Laboratory/ Upland Erosion Processes Research Unit/ Soil erosion prediction/ Soil conservation/ Upland conservation/ United States

Abstract: The mission of the Upland Erosion Processes Research Unit is to quantify erosion and sediment delivery processes from agricultural lands; develop methodology for improving soil erosion predictions; develop methodology for erosion and runoff control while enabling productive and profitable land use; and study principles and processes of soil detachment and transport by rainfall and overland flow, and sediment depositions.

89. USDA-ARS, Subtropical Horticulture Research Station.

United States. Agricultural Research Service. Subtropical Horticulture Research Station.

Miami, Fla. : The Station, [2002]-:Title from web page. Description based on content viewed April 26, 2002.

NAL Call #: aSB111-.U74-2002

URL: <http://www.ars.usda.gov/Main/docs.htm?docid=10134>

Descriptors: Tropical crops/ Disease and pest resistance/ Insect resistance/ Postharvest technology/ Insects as carriers of plant disease/ Plant quarantine facilities/ Hydrology/ Florida

Abstract: The mission of the Subtropical Horticulture Research Station is to conduct and support environmentally sound research on tropical and subtropical crops through: 1) Introduction, preservation, evaluation, and distribution; 2) Development of methods to manage quarantine insect and disease pests; 3) Improvement of postharvest quality; and to provide hydrologic science and technology needed to sustain agricultural production and a quality environment in South Florida.

90. Using a basin-scale hydrological model to estimate crop transpiration and soil evaporation.

Kite, G.

J-Hydrol (Mar 27, 2000) 229 (1/2): 59-69.

NAL Call #: 292.8-J82; ISSN: 0022-1694.

Descriptors: mathematical models/ simulation models/ estimation/ irrigated sites

Abstract: Increasing populations and expectations, declining crop yields and the resulting increased competition for water necessitate improvements in irrigation management and productivity. A key factor in defining agricultural productivity is to be able to simulate soil evaporation and crop transpiration. In agribusiness terms, crop transpiration is a useful process while soil and open-water evaporations are wasteful processes. In this study a distributed hydrological model was used to compute daily evaporation and transpiration for a variety of crops and other land covers within the 17,200 km² Gediz Basin in western Turkey. The model, SLURP, describes the complete hydrological cycle for each land cover within a series of sub-basins including all dams, reservoirs, regulators and irrigation schemes in the basin. The sub-basins and land covers are defined by analysing a digital elevation model and NOAA AVHRR satellite data. In this study, the model uses the FAO implementation of the Penman-Monteith equation to simulate soil evaporation and crop transpiration. The results of the model runs provide time series of data on streamflow at many points along the river system, abstractions and return flows from crops within the irrigation schemes and areally distributed soil evaporation and crop transpiration across the entire basin on each day of an 11 year period. The results show that evaporation and transpiration vary widely across the basin on any one day and over the irrigation season and can be used to evaluate the effectiveness of the various irrigation strategies used in the basin. The advantages of using such a model as compared to deriving evapotranspiration from satellite data are. that the model obtains results for each day of an indefinitely long period, as opposed to occasional snapshots, and can also be used to simulate alternate scenarios.

91. Water Management Research Unit : Conservation and Production Research Laboratory, Bushland, Texas.

Conservation & Production Research Laboratory (U.S.). Water Management Research Unit. Bushland, Tex. : The Laboratory, 2002-:Title from web page. Description based on content viewed April 18, 2002. Includes bibliographical references.

NAL Call #: aS612.55.U6-C66-2002

URL: http://www.cprl.ars.usda.gov/swmru_research.htm

Descriptors: Conservation and Production Research Laboratory/ Water Management Research Unit/ Irrigation Management/ Irrigation farming/ Crop science/ United States

Abstract: Water Management Research Unit is part of the Conservation Production Research Laboratory in Bushland, Texas.

92. Water Management Unit.

United States. Agricultural Research Service. Water Management Unit.

[Fort Collins, Colo.] : USDA, Agricultural Research Service, Northern Plains Area, The Unit, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: aTD223-.U55-2001

URL: <http://www.ars.usda.gov/Main/docs.htm?docid=3257>

Descriptors: Water quality management/ Irrigation management/ Precision agriculture/ United States

Abstract: The Water Management Research Unit in Fort Collins develops irrigation, agricultural chemical and other management practices that protect water quality for all Americans while improving the husbandry of natural resources and the irrigator's economic viability. Research covers precision farming with center pivot sprinklers, remote sensing, and weed management for reduced applications of chemicals.

93. Water Quality & Ecological Processes Research Unit.

National Sedimentation Laboratory (U.S.) Water Quality & Ecological Processes Research Unit.

[Oxford, MS?] : The Unit, [2002?]-:Title from page. Description based on content viewed April 23, 2002. Includes bibliographical references.

NAL Call #: aTD223-.N372-2002

URL: http://ars.usda.gov/main/site_main.htm?modecode=64-08-05-15

Descriptors: National Sedimentation Laboratory/ Water Quality and Ecological Processes Research Unit/ Sediment transport/ Water Pollution/ Stream conservation/ Agricultural pollution/ Groundwater Pollution/ Water quality management/ Constructed wetlands/ United States

Abstract: The mission of the Water Quality & Ecological Processes Research Unit is to evaluate the effects of watershed practices and stream channel stabilization measures on channel ecosystems and stream water quality; determine effects of agricultural runoff; and develop concepts to improve prediction of farm chemical transport in shallow ground water flow in soils with restrictive layers.

94. Water quality monitoring and modeling : proceedings, American Water Resources Association, AWWRA, Annual Spring Specialty Conference, April 30-May 2, 2001, San Antonio, Texas.

Warwick, John J. and American Water Resources Association. Spring Specialty Conference (2001 : San Antonio, Tex. American Water Resources Association.

Middleburg, VA : The Association, c2001. x, 284 p. : ill., maps:Includes bibliographical references and indexes.

CONTENTS NOTE: Indices of water quality -- BASINS and HSPF -- Surface water quality monitoring strategies -- Characterizing ground water contaminant plumes -- Techniques in load estimating -- Surface water/ground water interactions -- Assessment of fresh water impacts on

estuaries -- Surface water quality modeling case studies -- Uncertainties in developing TMDLs -- Pesticides in surface water -- Characterization and impacts of urban runoff -- Ground water quality -- Pathogens in surface water -- Defining biological resources -- South-Central Texas systems -- Posters.

NAL Call #: TC401-.A5-no.-2001-1

Descriptors: Water quality management/ Water quality/ Mathematical models/ Environmental monitoring/ United States

95. Water science for food, health, agriculture and environment : ISOPOW 8.: ISOPOW 8.

Berk, Zeki.

Lancaster [Pa.] : Technomic Publishing Co., c2001. xv, 315 p. : ill.:Includes index.

NAL Call #: TX553.W3-W38-2001

Descriptors: Water/ Hydrology

96. Water: the potential consequences of climate variability and change for the water resources of the United States.

Gleick, Peter H. and National Assessment of the Potential Consequences of Climate Variability and Change (U.S.). Water Sector Assessment Team. U.S. Global Change Research Program. Pacific Institute for Studies in Development, Environment and Security.

Oakland, Calif. : Pacific Institute for Studies in Development, Environment, and Security, [2000] [7], 151 p. : ill., maps:"September 2000." "Final report prepared by Pacific Institute for Studies in Development, Environment, and Security"--T.p. verso. This report was supported by the U.S. Department of the Interior through the U.S. Geological Survey. Includes bibliographical references (p. 126-151).

NAL Call #: TD223-.G57-2000

URL: http://www.pacinst.org/reports/national_assessment/

Descriptors: Climatic changes/ Water supply/ Hydrology/ United States

97. Watershed vulnerability to losses of agricultural chemicals: interactions of chemistry, hydrology, and land-use.

Blanchard, P. E. and Lerch, R. N.

Environmental Science and Technology (Aug 15, 2000) 34 (16): 3315-3322.

NAL Call #: TD420.A1E5; ISSN: 0013-936X.

Descriptors: herbicides/ nitrate/ streams/ pollutants/ water pollution/ chemical properties/ catchment hydrology/ land use/ row cropping intensity/ Missouri

98. Western Regional Research Center.

United States. Agricultural Research Service. Western Regional Research Center. Title from caption. Includes bibliographical references.

NAL Call #: aS541.5.C22-W47-2001

URL: <http://www.ars.usda.gov/Main/docs.htm?docid=5819>

Descriptors: Agriculture/ United States

Abstract: With every meal you eat and every trip you take to the supermarket, you are a vital part of American agriculture. At the Western Regional Research Center of the U.S. Department of Agriculture's Agricultural Research Service, our studies benefit consumers, growers, and processors alike. Our laboratory, greenhouse and outdoor experiments offer innovations to enhance food and non-food uses of traditional and new crops, yield new strategies to help agriculture work in harmony with the environment, and ensure the healthfulness and safety of foods.

Best Management Practices (BMPs)

(Citations 99-133)

| Agricultural Hydrology | Concentrated Animal Feeding Operations (CAFOs) |
| Total Maximum Daily Loads (TMDLs) |

99. Advances in urban stormwater and agricultural runoff source controls.

Marsalek, J. Jiri 1940

Boston : Kluwer Academic Publishers, 2001. xvii, 319 p. : ill., maps:Papers presented at the NATO Advanced Research Workshop on "Source Control Measures for Stormwater Runoff," held in St. Marienthal-Ostritz, Germany. Includes index.

NAL Call #: TD657-.A348-2001

Descriptors: Runoff/ Flood control/ Best management practices/ Pollution prevention

100. Animal waste BMP impacts on sediment and nutrient losses in runoff from the Owl Run watershed.

Brannan, K. M., Mostaghimi, S., McClellan, P. W., and Inamdar, S.

Transactions of the ASAE (Sept/Oct 2000) 43 (5): 1155-1166.

NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: animal wastes/ losses from soil/ sediment/ runoff/ precipitation/ stream flow/ nitrogen/ phosphorus/ water quality/ water pollution/ watersheds/ environmental impact/ best management practices/ nutrient management

101. Best management practices to reduce non-point source pollution in the town of Plainfield, Connecticut : a guidance manual.

American Ground Water Trust. Plainfield (Conn. : Town). Planning and Engineering Dept. United States. Environmental Protection Agency. Region I.

Plainfield, Conn. : American Groundwater Trust, [2000]:Title from web page. "December 2000." Description based on content viewed June 25, 2002. Includes bibliographical references. USEPA X981114-01-0.

NAL Call #: TD225.P6-B47-2000

URL: <http://www.agwt.org/manual.pdf>

Descriptors: Nonpoint source pollution/ Best management practices/ Pollution prevention/ Water quality management/ Crop residue management/ Land use/ Connecticut/ United States

102. The Carman Lake Project.

EcoLogik, Inc.,

[Indianapolis?] : EcoLogik, c2000. 1 computer optical disc : sd., col. 1 booklet. Title from disc.

NAL Call #: TD365-.C375-2000

Descriptors: Carman Lake Project/ Water quality management/ Software/ Best management practices/ Pollution prevention/ Software

Abstract: An interactive multimedia model that allows the user to construct a lake and its watershed. After construction, the user has 20 years to restore the lake using best management practices and help from numerous experts in ecological fields.

103. A conceptual approach for integrating phosphorus and nitrogen management at watershed scales.

Heathwaite, L., Sharpley, A., and Gburek, W.

Journal of Environmental Quality (Jan/Feb 2000) 29 (1): 158-166.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: phosphorus/ nitrogen/ losses from soil/ watershed management/ nutrient management/ best management practices

Abstract: Since the late 1960s, point-sources of water pollution have been reduced due to their ease of identification and treatment. As water quality problems remain and further point-source measures become less cost-effective, attention is directed toward reducing agricultural nonpoint-sources of P and N. In the past, separate strategies for P and N were developed and implemented at farm or watershed scales. Because of differing biology, chemistry, and flow pathways of P and N in soil, these narrowly targeted strategies may lead to mixed results. In some cases, N management of manures has increased soil P and subsequent P enrichment of surface runoff, while no-till has reduced P losses but increased nitrate leaching. Thus, an integrated approach to nutrient management is needed, with best management practices (BMPs) targeted to critical areas of a watershed that contribute most of the P and N exported. We have developed indices that identify critical sources and transport pathways controlling P and N export. These indices are applied to a mixed land use watershed in Pennsylvania. Areas most vulnerable to P loss are limited to small, well-defined areas of the watershed (<20% of area) near the stream channel. In contrast to P, larger areas contribute to nitrate leaching and generally occur on the upper boundaries of the watershed (60%), where freely draining soils and high manure and fertilizer N applications are made. Thus, differing levels of nutrient management may be appropriate for different areas of a watershed.

104. Cost effectiveness of agricultural BMPs for sediment reduction in the Mississippi Delta.

Yuan, Y., Dabney, S. M., and Bingner, R. L.

Journal of Soil and Water Conservation (Sept/Oct 2002) 57 (5): 259-267.
NAL Call #: 56.8-J822; ISSN: 0022-4561.

Descriptors: water erosion/ erosion control/ tillage/ minimum tillage/ no tillage/ sediment yield/ crop production/ glycine max/ gossypium hirsutum/ cover crops/ winter wheat/ triticum/ grass strips/ ponding/ pipes/ cost effectiveness analysis/ best management practices/ water impoundment/ edge of field pipes/ Mississippi

105. Defeat runoff with BMPs and buffer strips.

Baird, J. H.

Grounds Maintenance (Apr 2001) 36 (4): g1-g2, g16.

NAL Call #: SB476.G7; ISSN: 0017-4688.

Descriptors: lawns and turf/ golf courses/ fertilizers/ runoff/ water pollution/ pollution control/ grass strips/ best management practices

106. Estimation of nitrate leaching in an Entisol under optimum citrus production.

Paramasivam, S., Alva, A. K., Fares, A., and Sajwan, K. S.

Soil Science Society of America Journal. [Madison, Wis.: Soil Science Society of America.]

NAL Call #: 56.9-So3; ISSN: 0361-5995.

Descriptors: Nitrate/ Nitrogen/ leaching/ citrus soils/ ammonium nitrate/ liquid fertilizers/ broadcasting/ fertigation/ application rates/ soil fertility/ rooting depth/ irrigation/ losses from soil/ dry granular fertilizers/ best management practices/ Florida

Abstract: Leaching of fertilizer nutrients and widespread NO₃-N contamination of drinking water wells in proximity to citrus growing regions of central Florida are a serious concern. We evaluated NO₃-N distribution in soil solution at various depths in the vadose zone, and N leaching below the root zone for two cropping seasons under the canopy of 21-yr-old Hamlin orange [*Citrus sinensis* (L.) Osbeck] trees on Cleopatra mandarin (*Citrus reticulata* Blanco) rootstock, on an entisol of central Florida. The treatments included 112, 168, 224, and 280 kg N ha⁻¹ yr⁻¹ as either dry granular fertilizer (DGF; broadcast, in 4 equal doses) or fertigation (FRT; 15 applications yr⁻¹), and 56, 112, and 168 N kg ha⁻¹ yr⁻¹ as controlled-release fertilizer (CRF; single application yr⁻¹). Irrigation was scheduled using recommended tensiometer set points as guidelines, with a target wetting depth of 90 cm. The NO₃-N was measured in soil solutions bi-weekly at 60-, 120-, and 240-cm depths using suction lysimeters (SLs) installed under the tree canopy. The 240-cm depth sample represented soil solution below the rooting depth of the trees, and the NO₃-N at this depth could contaminate groundwater. At the 60- or 120-cm depths, the NO₃-N concentrations occasionally peaked at 12 to 100 mg L⁻¹, but at 240 cm NO₃-N concentrations mostly remained below 10 mg L⁻¹. The careful irrigation management, split fertilizer application, and timing of application contributed to the low leaching of NO₃-N below the root zone. Calculated NO₃-N leaching losses below the rooting depth increased with increasing rate of N application and the amount of water drained, and accounted for 1 to 16% of applied fertilizer N.

107. An evaluation of soil water status using tensiometers in a sandy soil profile under citrus production.

Paramasivam, S., Alva, A. K., and Fares, A.

Soil Science (Apr 2000) 165 (4): 343-353.

NAL Call #: 56.8-So3; ISSN: 0038-075X.

Descriptors: citrus soils/ sandy soils/ water content/ monitoring/ available water/ microirrigation/ water management/ irrigation scheduling/ tensiometers/ best management practices/ Florida

108. Farm economics to support the design of cost-effective Best Management Practice (BMP) programs to improve water quality: nitrogen control in the Neuse River Basin, North Carolina.

Wossink, G. A. A. and Osmond, D. L.

Journal of Soil and Water Conservation (July/Aug 2002) 57 (4): 213-220.

NAL Call #: 56.8-J822; ISSN: 0022-4561.

Descriptors: agricultural land/ watersheds/ rivers/ runoff/ nitrogen/ water pollution/ water quality/ pollution control/ cost analysis/ grass strips/ cost effectiveness analysis/ grass buffers/ cost share programs/ North Carolina

109. Innovative management of agricultural phosphorus to protect soil and water resources.

Sharpley, A. N., Kleinman, P., and McDowell, R.

Communications in Soil Science and Plant Analysis (2001) 32 (7/8): 1071-1100.

NAL Call #: S590.C63; ISSN: 0010-3624.

Descriptors: phosphorus/ phosphorus fertilizers/ nitrogen/ nitrogen fertilizers/ animal manures/ losses from soil/ pollution control/ leaching/ runoff/ transport processes/ crop management/ application rates/ application methods/ soil fertility/ literature reviews/ best management practices

Abstract: Agriculture, particularly livestock agriculture, is receiving increasing public scrutiny due to non-point source phosphorus (P) pollution and eutrophication. Much of today's situation may be attributed to system level trends in specialization and intensification that result in excess P entering livestock farms. Balancing P at the farm gate represents a necessary step for long-term soil and water quality protection. Remedial P management combines source and transport control that confront critical areas of P export in surface and subsurface runoff from agricultural landscapes. Source management seeks to immobilize P in the environment through such strategies as reducing soluble P in manure, targeting P application to soils with high retention capacities, and managing soil P. Transport controls employ an understanding of loss or transfer mechanisms to avoid P application on areas with a high transport potential. Also, the potential for P transport can be reduced by implementation of conservation practices such as reduced tillage, terracing, and stream buffers. However, implementation of agricultural management strategies that minimize P export must consider the cost effectiveness of alternative measures, as low practice adoption may limit or impede water quality benefits.

110. Integrating soil phosphorus testing into environmentally based agricultural management practices.

Sims, J. T., Edwards, A. C., Schoumans, O. F., and Simard, R. R.

Journal of Environmental Quality (Jan/Feb 2000) 29 (1): 60-71.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: phosphorus/ soil testing/ agricultural soils/ best management practices

Abstract: Soil testing has been an accepted agricultural management practice for decades. Interpretations and fertility recommendations based on soil analyses and the information obtained with soil samples on cropping systems, tillage practices, soil types, manure use, and other parameters have contributed to the increased efficiency of agricultural production. Recently, however, analyses of long-term trends in soil test P values have shown that soil P in many areas of the world is now excessive, relative to crop P requirements. The role of P in the eutrophication of surface waters and emerging concerns about the human health impacts of toxic algal/dinoflagellate blooms have heightened public awareness of nonpoint source pollution by agricultural P. The greatest concerns are with animal-based agriculture, where farm and watershed-scale P surpluses and over-application of P to soils are common. The need for nutrient-management plans based on N and P is now an issue of intense debate in the U.S. and Canada. This paper addresses three issues: Should the applications of organic wastes and fertilizers be based on soil P and, if so, what is the most appropriate testing method to assess environmental risk? How can our knowledge of soil P chemistry be integrated with the expertise of hydrologists, agronomists, aquatic ecologists, and others to assess the risks that P in agricultural soils poses to surface waters? And, finally, how can we use soil P testing to evaluate new best management practices (BMPs) now being developed to reduce P transport from soil to water.

111. Nitrogen-15 and bromide tracers of nitrogen fertilizer movement in irrigated wheat production.

Ottman, M. J., Tickes, B. R., and Husman, S. H.

Journal of Environmental Quality (Sept/Oct 2000) 29 (5): 1500-1508.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: nitrate nitrogen/ leaching/ triticum/ irrigated conditions/ pollution control/ best management practices/ Arizona

Abstract: In irrigated agricultural systems, NO₃ leaching is believed to result from high fertilizer rates combined with the need to periodically leach salts from surface soil horizons. The purpose of this research is to estimate N fertilizer movement in the soil of commercial fields of flood-irrigated wheat (*Triticum* spp.) while documenting best management practices (BMPs). Potassium bromide and ¹⁵N labeled ammonium sulfate were applied as tracers of N fertilizer movement to 1- X 1-m microplots replicated 9 or 10 times in three commercial fields of flood-irrigated wheat. The soil was sampled at harvest to a depth of 2.4 to 4.0 m. More fertilizer was applied at two out of three sites and more irrigation water was applied at all sites than recommended by BMPs. Bromide recovery in the soil and plant tissue at harvest was 29, 68, and 61% of that applied at the three sites. Most of the ¹⁵N measured in the soil profile was contained

in the 0- to 0.3-m increment of soil. Recovery on 15N in the soil and plant tissue at harvest was 54, 54, and 69% of that applied. The Br recovery data suggests that 32 +/- 28% (standard deviation) of the 15N applied may have leached. The highest leaching potential was measured at the site that adhered to BMPs for N fertilizer management but had the most permeable soil. Nitrate leaching in flood-irrigated wheat production seems inevitable even if BMPs for N fertilizer management are followed.

112. Nitrogen and phosphorus management on Wisconsin farms: lessons learned for agricultural water quality programs.

Shepard, R.

Journal of Soil and Water Conservation (First Quarter 2000) 55 (1): 63-68.

NAL Call #: 56.8-J822; ISSN: 0022-4561.

Descriptors: livestock farming/ mixed farming/ zea mays/ crop production/ nitrogen/ phosphorus/ water quality/ environmental protection/ surveys/ nutrient management/ manure management/ best management practices/ wisconsin

113. Nonpoint-source pollutant load reductions associated with livestock exclusion.

Line, D. E., Harman, W. A., Jennings, G. D., Thompson, E. J., and Osmond, D. L.

Journal of Environmental Quality (Nov/Dec 2000) 29 (6): 1882-1890.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: pastures/ cattle/ pollution control/ livestock exclusion/ best management practices/ North Carolina

Abstract: Cattle (*Bos taurus*) grazing on unimproved pastures can be a significant, yet often overlooked, source of pollutants to surface waters, especially when the cattle have unlimited access to streams in the pastures. Livestock exclusion from streams has been demonstrated to reduce sediment and possibly nutrient yield from streams draining pastures. The purpose of this study was to evaluate the effects of excluding dairy cows from, and planting trees in, a 335-m-long and 10- to 16-m-wide riparian corridor along a small North Carolina stream. Analysis of 81 wk of pre-exclusion and 137 wk of post-exclusion fencing data documented 33, 78, 76, and 82% reductions in weekly nitrate + nitrite, total Kjeldahl nitrogen (TKN), total phosphorus (TP), and sediment loads, respectively, from the 14.9-ha pasture area adjacent to the fenced section of stream. Statistical analyses by t-tests and analysis of variance suggested that the reductions in mean weekly loads post-fencing were significant ($P < 0.05$) for all pollutants except nitrate + nitrite. Thus, the results indicated that livestock exclusion and subsequent riparian vegetation establishment was effective at reducing pollutant export from an intensively grazed pasture.

114. Nutrient use efficiency in plants.

Baligar, V. C., Fageria, N. K., and He, Z. L.

Communications in Soil Science and Plant Analysis (2001) 32 (7/8): 921-950.

NAL Call #: S590.C63; ISSN: 0010-3624.

Descriptors: plants/ plant nutrition/ mineral nutrition/ nutrition physiology/ use efficiency/ nutrient uptake/ nutrient transport/ cultivars/ genotype nutrition interaction/ fertilizers/

application methods/ application rates/ literature reviews/ crop management/ best management practices

Abstract: Invariably, many agricultural soils of the world are deficient in one or more of the essential nutrients needed to support healthy plants. Acidity, alkalinity, salinity, anthropogenic processes, nature of farming, and erosion can lead to soil degradation. Additions of fertilizers and/or amendments are essential for a proper nutrient supply and maximum yields. Estimates of overall efficiency of applied fertilizer have been reported to be about or lower than 50% for N, less than 10% for P, and about 40% for K. Plants that are efficient in absorption and utilization of nutrients greatly enhance the efficiency of applied fertilizers, reducing cost of inputs, and preventing losses of nutrients to ecosystems. Inter- and intra-specific variation for plant growth and mineral nutrient use efficiency (NUE) are known to be under genetic and physiological control and are modified by plant interactions with environmental variables. There is need for breeding programs to focus on developing cultivars with high NUE. Identification of traits such as nutrient absorption, transport, utilization, and mobilization in plant cultivars should greatly enhance fertilizer use efficiency. The development of new cultivars with higher NUE, coupled with best management practices (BMPs) will contribute to sustainable agricultural systems that protect and promote soil, water and air quality.

115. Phosphorus load reductions under best management practices for sugarcane cropping systems in the Everglades agricultural area.

Rice, R. W., Izuno, F. T., and Garcia, R. M.

Agricultural Water Management (July 2, 2002) 56 (1): 17-39.

NAL Call #: S494.5.W3A3; ISSN: 0378-3774.

Descriptors: saccharum officinarum/ crop production/ crop management/ agricultural soils/ drainage/ runoff/ soil chemistry/ phosphorus/ water pollution/ water quality/ Florida

116. Phosphorus transport into subsurface drains by macropores after manure applications: implications for best manure management practices.

Geohring, L. D., McHugh, O. V., Walter, M. T., Steenhuis, T. S., Akhtar, M. S., and Walter, M. F.

Soil Science (Dec 2001) 166 (12): 896-909.

NAL Call #: 56.8-So3; ISSN: 0038-075X.

Descriptors: phosphorus/ transport processes/ losses from soil/ subsurface drainage/ tile drainage/ macropore flow/ cattle manure/ liquid manures/ broadcasting/ irrigation/ plowing/ incorporation/ soil water/ New York

117. The potential impact of imposing best management practices for nutrient management on the US broiler industry.

McIntosh, C. S., Park, T. A., and Karnum, C.

Journal of Environmental Management (Oct 2000) 60 (2): 145-154.

NAL Call #: HC75.E5J6; ISSN: 0301-4797.

Descriptors: broiler production/ poultry industry/ poultry manure/ animal wastes/ waste disposal/ economic impact/ production costs/ regulations/ multivariate analysis/ time series/ United States

118. Potential of earthworm burrows to transmit injected animal wastes to tile drains.

Shipitalo, M. J. and Gibbs, F.

Soil Science Society of America Journal. [Madison, Wis.: Soil Science Society of America.]

NAL Call #: 56.9-So3; ISSN: 0361-5995.

Descriptors: agricultural soils/ animal manures/ application to land/ soil injection/ placement/ lumbricus terrestris/ animal burrows/ transport processes/ movement in soil/ tile drainage/ no tillage/ infiltration/ flow to drains/ animal manure management/ best management practices/ preferential flow/ distance to tile drain/ Ohio

Abstract: Subsurface injection of animal manure is a best management practice (BMP) that reduces odors and promotes efficient nutrient usage. In tile-drained fields, however, injected wastes have been observed emerging from tile outlets shortly after application. This appears to be a particular concern in no-till fields where *Lumbricus terrestris* L. are often numerous. Our objective was to determine if burrows created by this earthworm species can contribute to rapid movement of injected wastes to tile drains. A turbine blower was used to force smoke into a 0.6 m-deep tile line in a no-till field and 20 burrows 0.02 to 0.5 m from the tile that emitted smoke, and 18 burrows 0.8 to 4.7 m from the tile that did not produce smoke were flagged. A Mariotte device filled with dyed water was then used to measure infiltration rate for each burrow. Afterwards, plastic replicas of the burrows were made so their proximity to the tile and geometrical properties could be determined. Average infiltration rate for smoke-emitting burrows (128 mL min⁻¹) was twice that of the more distant burrows. Moreover, dyed water was observed in the tile when added to smoke-emitting burrows, but not when added to burrows that did not produce smoke. Thus, earthworm burrows in close proximity to tile lines may expedite transmission of injected wastes offsite. Movement of injected wastes to tiles via earthworm burrows and other preferential flow paths may be reduced by using precision farming to avoid waste application near tile lines or by modifying application procedures.

119. Reducing long-term atrazine runoff from south central Nebraska.

Gorneau, W. S., Franti, T. G., Benham, B. L., and Comfort, S. D.

Transactions of the ASAE (Jan/Feb 2001) 44 (1): 45-52.

NAL Call #: 290.9-Am32T; ISSN: 0001-2351.

Descriptors: atrazine/ losses from soil/ runoff/ water quality/ tillage/ weed control/ crop management/ simulation models/ best management practices/ Nebraska

Abstract: Heavy reliance on chemical weed control in field crops of South Central Nebraska has resulted in the appearance of atrazine at concentrations greater than established drinking water standards. Our objective was to evaluate the best management practices for atrazine runoff for the tillage and herbicide management practices common to the region under study. Field experiments were performed to measure edge-of-field atrazine and water loss from disk-till, ridge-till, and slot plant (no-till) management systems. Results indicated less water runoff from no-till (34% less) and ridge-till (36% less) than from disk-till. Similarly, atrazine loss was also

less: 24% less for no-till and 17% less for ridge-till than for disk-till. GLEAMS (Groundwater Loading Effect of Agricultural Management Systems) simulations were calibrated using field-measured inputs and verified against observed data from two independent sites. Fifteen different combinations of herbicide application and tillage practices were simulated using 50 years of rainfall data. Compared to pre-emergent broadcast + post application on corn with disk-till, annual reductions in simulated atrazine mass loss for the alternative practices ranged from 17% to 77%. The percent of annual atrazine lost ranged from 0.57% to 1.2%. During the 50-year simulation, annual losses from 7 to 10 years constituted >50% of the cumulative 50-year loss for broadcast and banded application. Based on recurrence interval evaluation, pre-emergent incorporation and pre-emergent banding were most effective at reducing long-term atrazine losses.

120. Reducing nitrate in water resources with modern farming systems.

Management Systems Evaluation Areas (Project).

Ames, Iowa : Iowa State University, Extension Distribution, [2000] 1 sheet : col. ill., col. maps:Caption title. At head of title: MSEA, Management Systems Evaluation Areas.
NAL Call #: S587.5.N5-W533-2000

Descriptors: Nitrogen/ agriculture/ Water quality management/ Water Nitrogen content/ Agricultural systems/ Best management practices/ Pollution prevention/ Nitrogen fertilizers/ Soils/ Leaching/ Midwest

121. REMM: The Riparian Ecosystem Management Model.

Lowrance, R., Altier, L. S., Williams, R. G., Inamdar, S. P., Sheridan, J. M., Bosch, D. D., Hubbard, R. K., and Thomas, D. L.

Journal of Soil and Water Conservation (First Quarter 2000) 55 (1): 27-34.

NAL Call #: 56.8-J822; ISSN: 0022-4561.

Descriptors: water quality/ environmental management/ riparian vegetation/ simulation models/ ecosystems/ evaluation/ water pollution/ hydrology/ cycling/ nutrients/ sediment/ transport processes/ geological sedimentation/ pollution control/ nutrient dynamics/ riparian zones/ model evaluation/ riparian buffers/ best management practices/ riparian buffers/ best management practices/ nonpoint source pollution

122. Riparian vegetation effectiveness.

Castelle, Andrew J., Johnson, A. W., and National Council for Air and Stream Improvement.

Research Triangle Park, NC : National Council for Air and Stream Improvement, Inc., c2000. 26 p. : ill.: "February 2000." Includes bibliographical references (p. 20-26).

NAL Call #: TD899.P3-N34-no.-799

Descriptors: Buffer zones/ Ecosystem management/ Streambank planting/ Riparian plants/ Grassed waterways/ Best management practices/ Pollution prevention

123. Simulation of a group incentive program for farmer adoption of best management practices.

Ipe, V. C., DeVuyst, E. A., Braden, J. B., and White, D. C.

Agric-Resour-Econ-Rev (Oct 2001) 30 (2): 139-150.
NAL Call #: HD1773.A2N6; ISSN: 1068-2805.

Descriptors: pollution control/ farm management/ innovation adoption/ lakes/ incentives/ program participants/ watersheds/ fertilizers/ time/ application rates/ simulation models/ probability/ Illinois

124. Simulation of nitrate-nitrogen dynamics for cropping systems with different rooting depths.

Delgado, J. A., Follett, R. F., and Shaffer, M. J.

Soil-Sci-Soc-Am-j. [Madison, Wis.] Soil Science Society of America. May/June 2000. V. 64 (3) P. 1050-1054.

NAL Call #: 56.9-So3; ISSN: 0361-5995.

Descriptors: cropping systems/ crop management/ rooting depth/ nitrogen cycle/ simulation models/ nitrate nitrogen/ nitrogen content/ soil depth/ model validation/ model calibration/ NLEAP/ soil nitrogen dynamics/ best management practices/ Colorado

Abstract: Most agricultural systems in the San Luis Valley of south-central Colorado include rotations that have crops with different rooting depths. The previous version of Nitrate Leaching and Economic Analysis Package (NLEAP), 1.10, was only capable of simulating the effect of management practices on the rooting zone of each crop to the nearest 0.30-m increment. Therefore, a new version of NLEAP was needed to simulate the effect of best management practices (BMPs) on residual soil NO₃(-)-N (RSN) for the root zone of each crop grown in the region and for a similar soil depth for these systems (e.g., 0-0.91 m). The improved NLEAP version 1.20 simulates maximum rooting depth to the nearest 0.03 m and RSN in multiple soil depths. These new features allowed us to simulate the effect of BMPs on RSN for the root zones of shallower-rooted crops such as lettuce (*Lactuca sativa* L.) (0-0.37 m), potato (*Solanum tuberosum* L.) (0-0.40 m), and deeper-rooted crops such as small grains (0-0.61 to 0-0.84 m). NLEAP simulated RSN for a soil depth identical for all of these cropping systems (0-0.91 m) ($P < 0.001$). This new version can be used by extension agents, farmers, consultants, and others to evaluate the effect of BMPs on soil NO₃(-)-N dynamics for different rooting zones and for similar soil depths in the agricultural system, a capability that was not available with the previous version of NLEAP.

125. Small ranch projects guide : a how-to guide on implementing best management practices on your property.

Donaldson, Susan. and Nevada Cooperative Extension.

Reno, NV : University of Nevada Cooperative Extension, [2000] 160 p. : ill. (some col.):"February, 2000." Issued with: Small ranch manual, a guide to management for green pastures and clean water. Includes bibliographical references (p. 158-159). Funded by a U.S. EPA Clean Water Act grant through the Nevada Division of Environmental Protection.

NAL Call #: SF85.35.N3-S64-2000

Descriptors: Range management/ Handbooks/ Manuals/ Nevada

126. Soybean management and the land : a best management practices handbook for growers.

Coleman, Denise. and American Soybean Association.

Saint Louis, MO : American Soybean Association, [2000] 1 portfolio : ill. (somme col.):Cover title. Contains 1 workbook (64 p.) and 1 resource book (86 p.). "7/00"--P. [3] of cover.

NAL Call #: SB205.S7-C56-2000

Descriptors: Soybean/ Best management practices/ Pollution prevention/ Farm management

127. Survey of best management practices in container production nurseries.

Fain, G. B., Gilliam, C. H., Tilt, K. M., Olive, J. W., and Wallace, B.

Journal of Environmental Horticulture (Sept 2000) 18 (3): 142-144.

NAL Call #: SB1.J66; ISSN: 0738-2898.

Descriptors: nurseries/ container grown plants/ surveys/ coastal areas/ crop management/ runoff/ water reuse/ ponds/ grass strips/ water management/ controlled release/ fertilizers/ plant oils/ herbicides/ application date/ water pollution/ pollution control/ water erosion/ Alabama

128. Trends in surface-water quality during implementation of best-management practices in Mill Creek and Muddy Run Basins, Lancaster County, Pennsylvania.: Trends in surface water quality during implementation of best management practices in Mill Creek and Muddy Run Basins, Lancaster County, Pennsylvania.

Koerkle, Edward H. and Pennsylvania. Dept. of Environmental Protection. Geological Survey (U.S.).

Lemoyne, PA : U.S. Geological Survey, [2000]:Title from title screen. "January 2000." Includes bibliographical references.

NAL Call #: TD224.P4-K64-2000

URL: <http://pa.water.usgs.gov/reports/fs168-99.pdf>

Descriptors: Water quality/ Pennsylvania

129. Use of best management practices to increase nitrogen use efficiency and protect environmental quality in a broccoli-corn rotation of central Mexico.

Castellanos, J. Z., Villalobos, S., Delgado, J. A., Munoz Ramos, J., Sosa, A., Vargas, P., Lazcano, I., Alvarez Sanchez, E., and Enriquez, S. A.

Communications in Soil Science and Plant Analysis (2001) 32 (7/8): 1265-1292.

NAL Call #: S590.C63; ISSN: 0010-3624.

Descriptors: zea mays/ crop management/ nitrogen/ nutrient uptake/ nitrogen metabolism/ use efficiency/ rotations/ crop yield/ nitrogen fertilizers/ application rates/ nitrate/ nitrogen content/ trickle irrigation/ fertilizer requirement determination/ Mexico

Abstract: Underground water reserves in Central Mexico have been declining and NO₃(-)-N concentrations of some irrigation wells have been found to exceed 10 ppm. There is the need to develop best management practices (BMPs) that can increase N and water use efficiency by vegetables such as broccoli (*Brassica oleracea* L. *Italica* Group) in this region. Three field experiments were conducted during 1996 through 1998 at the Experimental Station of INIFAP in

Celaya, Gto., Mexico to develop BMPs for the region. To determine the N sufficiency levels in the most recently fully expanded leaf (MRFEL), dry midrib and press sap were analyzed for total N and NO₃(-)-N. Maximum marketable yields of 24.5 to 27.0 ton ha⁻¹ were attained with rates of 400 to 425 kg N ha⁻¹. Sufficiency levels for N in the MRFEL were in the range of 5.5 to 6.5% at the beginning of the season, and then it was reduced to 5.5 to 6.0% at heading and then to 4.0-5.0% during the preharvest stage. The critical NO₃(-)-N concentration in the midrib ranged from 15,000 to 20,000 mg kg⁻¹ at the beginning of the season to 3,500-5,000 mg kg⁻¹ for the pre-harvest stage of development. The adequate levels of NO₃(-)-N in press sap ranged from 1,600-2,000 mg L⁻¹ at the beginning of the season to 500-800 mg L⁻¹ during pre-harvest growth stage. Broccoli fertilized with 400 kg N ha⁻¹ provided residual effects in the following crop of maize (*Zea mays* L.), equivalent to 60% of that produced with N fertilizer. This study shows that drip irrigation, spoon feeding of N, monitoring of N status during the growing season and crop rotations with grains has the potential to increase the N fertilizer use efficiency for. vegetables-grain cropping systems and contribute to protecting environmental quality in Central Mexico.

130. Use of innovative tools to increase nitrogen use efficiency and protect environmental quality in crop rotations.

Delgado, J. A., Ristau, R. J., Dillon, M. A., Duke, H. R., Stuebe, A., Follett, R. F., Shaffer, M. J., Riggensbach, R. R., Sparks, R. T., and Thompson, A.

Communications in Soil Science and Plant Analysis (2001) 32 (7/8): 1321-1354.

NAL Call #: S590.C63; ISSN: 0010-3624.

Descriptors: crops/ solanum tuberosum/ hordeum vulgare/ malting barley/ lactuca sativa/ nitrogen/ use efficiency/ nutrient uptake/ soil fertility/ nutrient availability/ cropping systems/ rotations/ crop management/ secale cereale/ cover crops/ winter/ simulation models/ losses from soil/ literature reviews/ best management practices/ nleap/ Colorado

Abstract: Cropping systems grown over sandy coarse soils are susceptible to nutrient leaching due to local thunderstorms and irrigation. Additionally, erosion can contribute to removal of nutrients, soil organic matter, and fine particles. Balancing nutrients for these systems while protecting water and soil quality requires best management practices (BMPs). Crop rotations with deeper rooted small grains and winter cover crops reduced potential losses of fine particles, soil organic matter, nitrogen, and other nutrients due to wind erosion and protected soil and water quality. The cropping system N status can be monitored by assessing chlorophyll, sap NO₃(-)-N concentrations and N indexes of the canopy. The Nitrogen Leaching Economic Analysis Package (NLEAP) model simulated residual soil NO₃(-)-N and soil water and showed that there is potential to use precision farming to improve NUE. Simulations of the system showed that BMPs increased NUE and that NO₃(-)-N can potentially be removed from the shallow underground water table protecting water quality. These results show that with the application of models, and tools to monitor the N status of the above-ground canopy, such as chlorophyll readings, sap NO₃(-)-N concentrations, N indices, and other new technologies such as precision farming and remote sensing, nutrient use efficiency in the new millennium will be significantly increased, environmental quality will be conserved, and product quality will be improved at the farm level for the benefit of producers, processors and consumers.

131. Using insurance to enhance nitrogen fertilizer application to reduce nitrogen losses to the environment.

Huang, W. Y., Heifner, R. G., Taylor, H., and Uri, N. D.

Environmental Monitoring and Assessment (May 2001) 68 (3): 209-233.

NAL Call #: TD194.E5; ISSN: 0167-6369.

Descriptors: nitrogen fertilizers/ agricultural insurance/ insurance premiums/ application date/ nitrogen/ risk/ low input agriculture/ incentives/ decision making/ production functions/ seasons/ case studies/ equations/ decision analysis/ farm results/ innovation adoption/ best management practices/ adoption insurance programs/ expected value variance analysis/ growing season/ Iowa

132. Water quality changes from riparian buffer restoration in Connecticut.

Clausen, J. C., Guillard, K., Sigmund, C. M., and Dors, K. M.

Journal of Environmental Quality (Nov/Dec 2000) 29 (6): 1751-1761.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: riparian vegetation/ nitrate nitrogen/ water quality/ water pollution/ pollution control/ best management practices/ Connecticut

Abstract: One-half of a 35- by 250-m riparian buffer cropped in corn (*Zea mays* L.) was seeded with fine leaf fescue (*Festuca* spp.) and allowed to remain idle to determine water quality changes resulting from riparian buffer restoration. A corn control was also used in this paired watershed design located in Connecticut. Water, N, and P fluxes were determined for precipitation, overland flow, and ground water. Also, an N mass balance was calculated. Total Kjeldahl nitrogen (TKN) and total phosphorus (TP) concentrations significantly ($P < 0.05$) increased as ground water flowed through the restored buffer. Nitrate N ($\text{NO}_3\text{-N}$) concentrations declined significantly but most (52%) of the decrease occurred within a 2.5-m wetland adjacent to the stream. An N mass balance for the 2.5-m strip indicated that denitrification only accounted for 1% of the N losses and plant uptake was from 7 to 13% of the N losses annually. Ground water was the dominant source of N to the buffer and also the dominant loss. Restoration of the riparian buffer decreased ($p < 0.05$) overland flow concentrations of TKN by 70%, $\text{NO}_3\text{-N}$ by 83%, TP by 73%, and total suspended solids (TSS) by 92% as compared with the control. Restoration reduced ($p < 0.05$) $\text{NO}_3\text{-N}$ concentrations in ground water by 35% as compared with the control. Underestimated denitrification and dilution by upwelling ground water in the wetland area adjacent to the stream were believed to be primarily responsible for the decreasing $\text{NO}_3\text{-N}$ concentrations observed.

133. Water quality protection : best management practices for cropland.

Devlin, Daniel L. and Kansas State University. Agricultural Experiment Station and Cooperative Extension Service.

[Manhattan, Kan.] : Kansas State University, Agricultural Experiment Station and Cooperative Service, [2000]:Title from web page. "August 2000." Description based on content viewed July 2, 2002.

NAL Call #: S544.3.K2-K3-no.-2462

URL: <http://www.oznet.ksu.edu/library/h20ql2/MF2462.pdf>

Descriptors: Water quality management/ Best management practices/ Pollution prevention/
Kansas

Concentrated Animal Feeding Operations (CAFOs)

(Citations 134-177)

| Agricultural Hydrology | Best Management Practices (BMPs) |
| Total Maximum Daily Loads (TMDLs) |

134. Analysis of oxytetracycline, tetracycline, and chlortetracycline in water using solid-phase extraction and liquid chromatography-tandem mass spectrometry.

Zhu, J., Snow, D. D., Cassada, D. A., Monson, S. J., and Spalding, R. F.

J-Chromatogr-A (Sept 14, 2001) 928 (2): 177-186.

NAL Call #: QD272.C4J68

Descriptors: feedlot effluent/ lagoons/ cattle manure/ pig manure/ drug residues/ water pollution/
groundwater pollution/ confined animal feeding operations

135. Animal Residuals 2002 Conference & Workshop : Arlington, VA, May 6-8, 2002.

F. D. Deskins Company. Animal Residuals 2002 Conference & Workshop (2002 : Arlington, Va. [Alexandria, Ind.] : F. D. Deskins Company, [2002] 1 CD-ROM : col.:Title from disc. "Animal manure liquid/solid separation with nutrient capture for all concentrated animal feeding operations (CAFOs)."

NAL Call #: TD427.N87-A56-2002

Descriptors: Manures/ Nutrient pollution of water/ Water quality management/ Animal waste/
United States

Abstract: An introduction to materials prepared for the conference and workshop.

136. Assessing potential phosphorus loss for manure management (phosphorus index assessment).

Kucera, M. J., Shapiro, C. A., Koelsch, R., and Eghball, B.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 181-191.

NAL Call #: TD899.F4-I55-2000

Descriptors: phosphorus/ indexes

137. Best management practices for animal feeding operations (AFOs and CAFOs).

Tyson, Ted W.

[Auburn, Ala.] : Alabama Cooperation Extension System, [2000] [4] p.:Caption title. "New Aug 2000"--P. [4].

NAL Call #: S544.3.A2-C47-no.-1188

138. Continuing education requirements for AFO & CAFO operators.

Tyson, Ted W.

[Auburn, Ala.] : Alabama Cooperative Extension System, Alabama A&M and Auburn Universities, 2001. 1 sheet:Caption title.

NAL Call #: S544.3.A2-C47-no.-1205

139. Cost methodology report for beef and dairy animal feeding operations : final.

United States. Environmental Protection Agency. Office of Water. United States. Environmental Protection Agency. Office of Science and Technology.

Washington, D.C. : U.S. Environmental Protection Agency, [2001] 1 v. (various pagings) : ill.:Chiefly tables. "EPA 821-R-01-019"--Cover. "January 2001." Includes bibliographical references.

NAL Call #: TD899.F4-C67-2001

URL: <http://www.epa.gov/ost/guide/cafo/pdf/BDCostReport.pdf>

Descriptors: Animal feeding/ Effluent quality/ Cost effectiveness/ Livestock Manure/ Dairy cattle Manure/ Animal waste/ Manures

140. Dairying and the environment.

Meyer, D.

Journal of Dairy Science (July 2000) 83 (7): 1419-1427.

NAL Call #: 44.8-J822; ISSN: 0022-0302.

Descriptors: dairy farming/ dairy wastes/ cattle manure/ federal government/ environmental protection/ environmental legislation/ water pollution/ discharge/ livestock numbers/ dairy cows/ United States Environmental Protection Agency

Abstract: Increases in average herd size have resulted in increased concentrations of manure at dairies. Inadequate or insufficient manure management practices and greater focus on agricultural pollution from environmental groups have increased the need for scrutiny from regulatory agencies. An overview of the sequence of activities that led to the development and final approval of the National Animal Feeding Operation Strategy is presented. The Strategy and associated policy changes serve as the foundation for new enforcement and compliance goals and probable alterations to existing permit requirements. Lastly, identified research needs and educational opportunities are presented.

141. Development document for the proposed revisions to the National Pollutant Discharge Elimination System regulation and the effluent guidelines for concentrated animal feeding operations.

Browner, Carol M. and United States. Environmental Protection Agency. Office of Science and Technology. Engineering and Analysis Division. United States. Environmental Protection Agency. Office of Water.

Washington, D.C. : Engineering and Analysis Division, Office of Science and Technology, U.S. Environmental Protection Agency, [2001] 1 v. (various pagings) : ill., map:"January 2001."

"Office of Water"--Cover. "EPA 821-R-01-003"--Cover. Includes bibliographical references.

NAL Call #: TD930.2-.D48-2001

Descriptors: Animal waste/ Animal feeding/ Effluent quality/ Feedlot runoff/ Livestock Manure

142. Development of a phosphorus index for pastures.

DeLaune, P. B., Moore, P. A., Carman, D. E., Daniel, T. C., and Sharpley, A. N.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 136-144.

NAL Call #: TD899.F4-I55-2000

Descriptors: pastures/ phosphorus/ indexes/ runoff/ eutrophication/ nutrients/ Arkansas

143. Effects of animal feeding operations on water resources and the environment : proceedings of the technical meeting, Fort Collins, Colorado, August 30-September 1, 1999.: Proceedings of the technical meeting, Fort Collins, Colorado, August 30-September 1, 1999.

Wilde, Francesca D. and Geological Survey (U.S.).

Reston, VA : U.S. Dept. of the Interior, U.S. Geological Survey, 2000.:Title from title screen.

Includes bibliographical references.

NAL Call #: TD195.A34-E44-2000

URL: http://water.usgs.gov/owq/AFO/proceedings/afo/OFR/OFR_00-204.pdf

Descriptors: Feedlots/ Livestock factories/ Animal feeding/ Animal waste/ Water quality/ United States

144. The effects of urbanization on the siting and expansion of livestock facilities in Illinois under proposed legislation: a spatial analysis.

Carver, A. D., Arthur, R. D., Beck, R. J., and Damery, N. A.

Prof-Anim-Sci (June 2000) 16 (2): 100-104.

NAL Call #: SF51.P76; ISSN: 1080-7446.

Descriptors: livestock enterprises/ livestock farming/ agricultural land/ land use planning/ legislation/ geographical distribution/ urbanization/ rural areas/ building controls/ economic impact/ concentrated animal feeding operations/ Illinois

145. Environmental and economic benefit analysis of the proposed revisions to the National Pollutant Discharge Elimination System regulation and the effluent guidelines for concentrated animal feeding operations.: Concentrated animal feeding operations.

United States. Environmental Protection Agency. Office of Water.

Washington, D.C. : U.S. Environmental Protection Agency, [2001] 1 v. (various pagings) : ill., map:"EPA 821-R-01-002"--Cover. "January, 2001." "Office of Water"--Cover. Includes bibliographical references.

NAL Call #: TD899.F4-E58-2001

Descriptors: Animal feeding/ Effluent quality/ Cost effectiveness/ Feedlots/ Livestock Manure/ Animal waste

146. Environmental assessment of proposed revisions to the National Pollutant Discharge Elimination System regulation and effluent limitations guidelines for concentrated animal feeding operations.: Concentrated animal feeding operations.

Browner, Carol M. and United States. Environmental Protection Agency. Office of Water. United States. Environmental Protection Agency. Office of Science and Technology. Washington, D.C. : Engineering and Analysis Division, Office of Science and Technology, U.S. Environmental Protection Agency, [2001] 1 v. (various pagings) : ill., maps:"January 2001." "EPA-821-B-01-001"--Cover. Includes bibliographical references.
NAL Call #: TD380-.E69-2001

Descriptors: Effluent quality/ Animal feeding/ Feedlots/ Livestock Manure/ Animal waste

147. 'Environmental justice' in CAFOs study questioned.

Cornfeld, R. S.
Feedstuffs (Oct 1, 2001) 73 (41): 1, 30.
NAL Call #: 286.81-F322; ISSN: 0014-9624.

Descriptors: pigs/ meat and livestock industry/ pig feeding/ evaluation/ methodology/ confined animal feeding operations/ North Carolina

148. Evolving policies to regulate pollution from animal feeding operations.

Centner, T. J.
Environ-Manage. New York, Springer-Verlag. Nov 2001. V. 28 (5) P. 599-609.
NAL Call #: HC79.E5E5; ISSN: 0364-152X.

Descriptors: water pollution/ livestock enterprises/ environmental legislation

149. A functional tree, shrub and grass buffer for a confined animal feeding facility.

Hunt, R., Christensen, D., Colletti, J., Dinnes, D., and Hatfield, J. L.
Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 192-200.
NAL Call #: TD899.F4-I55-2000

Descriptors: trees/ shelterbelts/ protection/ odor abatement/ aesthetic value/ Iowa

150. Hydraulic conductivity, bulk density, moisture content, and electrical conductivity of a new sandy loam feedlot surface.

McCullough, M. C., Parker, D. B., Robinson, C. A., and Auvermann, B. W.
Applied Engineering in Agriculture (July 2001) 17 (4): 539-544.
NAL Call #: S671.A66; ISSN: 0883-8542.

Descriptors: feedlots/ sandy loam soils/ surface layers/ saturated hydraulic conductivity/ bulk density/ electrical conductivity/ infiltration/ soil water content/ soil profiles/ Texas

Abstract: Infiltration of nutrients and salts into earthen feedlot surfaces is of concern because of possible groundwater contamination. An experiment was conducted at a new feedlot to quantify changes in hydraulic conductivity and bulk density in the upper 15 cm of the feedlot surface. Moisture content and electrical conductivity were also monitored in the upper 210 cm of the soil profile. Soil samples were obtained immediately after construction of the feedlot (initial samples) and again nine months after introducing animals to the pens (nine-month samples). Soil samples were collected from three areas (apron, water trough, bottom) within each of four pens and also from a control plot located just outside the pens. Undisturbed soil cores from the upper 15 cm were tested for saturated hydraulic conductivity (K(S)) and bulk density. Soil samples were collected from 210-cm deep borings in 15-cm increments for moisture content and electrical conductivity. The geometric mean K(S) of initial samples ranged from 9.3E-6 to 1.8E-5 cm/s, while nine-month samples ranged from 5.3E-7 to 1.9E-6 cm/s. Over the nine-month period, geometric mean K(S) values decreased by 23 times for the apron area, 5 times for the water trough area, and 34 times for the bottom area. There were no significant differences observed in bulk density over the same time period. The amount of water stored in the upper 210 cm of the soil profile increased during the nine-month period within the pens and the control area, ranging from 14.2 to 20.3 cm. Electrical conductivity in the pen areas increased considerably in the surface 5 cm. This research shows that K(S) values of sandy loam surfaced beef cattle feedlots can be expected to decrease by one to two orders of magnitude during the first nine months of stocking, and that some infiltration of water and salts can be expected during this time period.

151. Idaho OnePlan nutrient management planning application.

Keith, K.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 45.

NAL Call #: TD899.F4-I55-2000

Descriptors: pollution control/ farm planning/ Idaho

152. Impacts of cattle penning on groundwater quality beneath feedlots.

Maule, C. P. and Fonstad, T. A.

Can-Agric-Eng (Apr/June 2000) 42 (2): 87-93.

NAL Call #: 58.8-C164; ISSN: 0045-432X.

Descriptors: groundwater pollution/ feedlot effluent/ feedlot wastes/ cattle manure/ water quality/ potassium/ chloride/ nitrate nitrogen/ ammonium nitrogen/ phosphorus/ high water tables/ Saskatchewan

153. Implementation of a livestock systems environmental assessment tool.

Koelsch, R., Howard, L., Pritchard, S., and Hay, P.

J-Ext (Feb 2000) 38 (1): n/a.

NAL Call #: LC45.4.J682; ISSN: 1077-5315.

Descriptors: animal husbandry/ cooperative extension service/ assessment/ environmental impact/ risk factors/ surveys/ manures/ silage/ storage/ milking/ wastewater/ application to land/ odors/ feedlot effluent/ Nebraska

154. Increased animal waste production from concentrated animal feeding operations (CAFOs) : potential implications for public and environmental health.

Bowman, Angella., Mueller, Keith J. 1951, Smith, Melanie., and Nebraska Health & Human Services System. Nebraska Center for Rural Health Research.

Omaha, NE : Nebraska Center for Rural Health Research, University of Nebraska Medical Center, Dept. of Preventative & Societal Medicine, [2000] 17 p.: "This report was prepared for the Nebraska Health and Human Services System, Public Health Assurance Division, Division of Environmental, Disease and Vector Surveillance by the Nebraska Center for Rural Health Research ..." "January, 2000." Includes bibliographical references (p. 14-17).

NAL Call #: TD930.2-.B68-2000

Descriptors: Animal waste/ Feedlots/ Manure handling

155. Innovative solution to collect the first flush of stormwater runoff.

Budin, D. A.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 175-180.

NAL Call #: TD899.F4-I55-2000

Descriptors: water harvesting/ runoff/ wastewater/ equipment/ sampling/ environmental liquid sampler

156. Integrated approach for a comprehensive nutrient management plan at Pahrump Dairy, Nevada.

Ratcliff, C. D., Lazarus, J., and Goedhart, E.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 157-163.

NAL Call #: TD899.F4-I55-2000

Descriptors: dairies/ dairy effluent/ recycling/ farm planning/ animal feeding/ data collection/ environmental protection/ application to land/ Nevada

157. Managing manure: new Clean Water Act regulations create imperative for livestock producers

Ribaudo, M.

Amber Waves. [Washington, D.C.] : Economic Research Service, U.S. Department of Agriculture. (Feb 2003) 1 (1): 30-37.

Descriptors: Animal waste/ Manures/ Livestock Manure/ Clean Water Act/ Feedlots/ Nutrient pollution of water

Abstract: "In 2001, the Environmental Protection Agency (EPA) proposed new regulations that would compel operations with the largest number of animals to manage their manure according to a nutrient management plan. These regulations were signed by the Administrator of EPA on December 15, 2002, and are expected to be implemented in 2003. The new regulations were called for in the Unified National Strategy for Animal Feeding Operations, developed jointly in 1999 by USDA's Natural Resources Conservation Service and EPA. The Strategy outlined USDA and EPA actions to minimize water quality and public health impacts from improperly managed animal manure. Much of the Strategy's focus was on the largest animal feeding operations. For smaller operations, a nutrient management plan would be recommended but not required." This article gives an overview of the new regulations and discusses options open to those smaller operations.

158. Managing manure nutrients at concentrated animal feeding operations : draft guidance.

United States. Environmental Protection Agency. Office of Water.

Washington, D.C. : U.S. Environmental Protection Agency, Office of Water, [2001]:Title from title page of source document. "January 2001" Description based on content viewed August 27, 2002. "EPA 821-R-01-017" Includes bibliographical references.

NAL Call #: TD930.2-.M36-2001

URL: <http://www.epa.gov/ost/guide/cafo/pdf/PNPGuide.PDF>

Descriptors: Effluent quality/ Animal waste/ Manures/ Livestock Manure/ Feedlots/ Nutrient pollution of water

159. Manure and wastewater management for cattle feedlots.

Sweeten, J. M.

Rev-Environ-Contam-Toxicol. New York : Springer-Verlag, 1987-. 2000. V. 167 P.121-153.

NAL Call #: TX501.R48; ISSN: 0179-5953.

Descriptors: cattle manure/ runoff/ waste utilization/ application to land/ pollution control/ water quality/ water pollution/ literature reviews

160. Manure P sorption and release in semiarid soils.

Bowman, R. A. and Vigil, M. F.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 28-36.

NAL Call #: TD899.F4-I55-2000

Descriptors: cattle manure/ pig manure/ phosphorus/ sorption/ release/ semiarid soils/ Colorado

161. Nitrogen and phosphorus-based manure or compost application: corn production, soil properties, and nitrogen and phosphorus transport in runoff.

Eghball, B. and Gilley, J. E.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-

6, 2000, Denver, Colorado / (2000): 127-135.
NAL Call #: TD899.F4-I55-2000

Descriptors: maize/ phosphorus/ nitrogen/ runoff/ Nebraska

162. Nutrient conversions by photosynthetic bacteria in a concentrated animal feeding operation lagoon system.

Sund, J. L., Evenson, C. J., Strevett, K. A., Nairn, R. W., Athay, D., and Trawinski, E.
Journal of Environmental Quality (Mar/Apr 2001) 30 (2): 648-655.
NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: feedlot wastes/ pig manure/ waste treatment/ lagoons/ bacteria/ sulfur/ anions/ sulfate/ pigments/ light intensity/ depth/ nitrate/ nitrite/ ammonium/ anaerobic conditions/ aerobic conditions/ diurnal variation/ sulfide/ sulfite/ bacteriochlorophyll a/ photosynthetic purple sulfur bacteria/ Oklahoma

Abstract: A diurnal examination was conducted to determine the effect of photosynthetic bacteria on nutrient conversions in a two-stage concentrated animal feeding operation (CAFO) lagoon system in west-central Oklahoma. Changes in nutrients, microbial populations, and physical parameters were examined at three depths (0, 1.5, and 3.0 m) every 3 h over a 36-h period. The south lagoon (SL) was anaerobic (dissolved oxygen [DO] = 0.09 +/- 0.12 mg/L) while the north lagoon (NL) was facultative (DO ranged from 4.0-0.1 mg/L over 36-h period). Negative sulfide-sulfate (-0.85) and bacteriochlorophyll a (bchl a)-sulfate (-0.83) correlations, as well as positive bchl a-sulfide (0.87) and light intensity (I)-bchl a (0.89) correlations revealed that the SL was dominated by sulfur conversions driven by the photosynthetic purple sulfur bacteria (PSB). The correlation data was supported by diurnal trends for sulfate, sulfide, and bchl a. Both nitrogen and sulfur conversions played a role in the NL; however, nitrogen conversions appeared to dominate this system because of the activity of cyanobacteria. This was shown by positive chlorophyll a (chl a)-I (0.91) and chl a-nitrate (0.98) correlations and the negative correlation between ammonium and nitrite (-0.88). Correlation data was further supported by diurnal trends observed for chl a, DO, and ammonium. For both lagoons, the dominant photosynthetic microbial species determined which nutrient conversion processes were most important.

163. Nutrient management planning for small afos : broiler operations.

Mitchell, C. C.

[Auburn, Ala.] : Alabama Cooperative Extension System, [2001] 7, [1] p. : ill., maps:Caption title. "Alabama A&M and Auburn Universities.

NAL Call #: S544.3.A2-C47-no.-926

164. Organic phosphorus source effects on calcareous soil phosphorus and organic carbon.

Robbins, C. W., Freeborn, L. L., and Westermann, D. T.

Journal of Environmental Quality (May/June 2000) 29 (3): 973-978.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: phosphorus/ calcareous soils

Abstract: The loading, solubility, mobility, and plant availability of P is a growing environmental concern to regulators and planners of nutrient management plans, confined animal feeding operations, and wastewater land application permit sites. Insufficient information is available on how P reacts from different organic sources when applied to calcareous soils. A field study was conducted to determine the interactions among P application rate, source, extractability, and soil organic carbon (OC) concentration. A Portneuf silt loam (Coarse-silty, mixed, superactive, mesic Durinodic Xeric Haplocalcids) topsoil and freshly exposed subsoil were fertilized with monocalcium phosphate (MCP), cheese whey, and dairy manure. Organic matter added with the whey did not influence soil OC concentrations whereas organic matter added with the manure doubled the subsoil OC and increased the topsoil OC concentrations. Bicarbonate and saturation paste extractable ortho- and organic-P concentrations were linearly related to soil OC concentrations but were not related to the amount of ortho- or organic-P added. All forms of P increased more per unit of added P in the order manure > whey > MCP and were correlated with the soil OC concentrations. These results suggest organic waste applications should be managed from soil P test data rather than on P application rates.

165. Phosphorus accumulation in cultivated soils from long-term annual applications of cattle feedlot manure.

Whalen, J. K. and Chang, C.

Journal of Environmental Quality (Jan/Feb 2001) 30 (1): 229-237.

NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: phosphorus/ application to land/ cattle manure/ application rates/ agricultural soils/ groundwater pollution/ Canada

Abstract: Historically, manure has been recognized as an excellent soil amendment that can improve soil quality and provide nutrients for crop production. In areas of high animal density, however, the potential for water pollution resulting from improper storage or disposal of manure may be significant. The objective of this study was to determine the P balance of cultivated soils under barley (*Hordeum vulgare* L.) production that have received long-term annual manure amendments. Nonirrigated soils at the study site in Lethbridge, AB, Canada, have received 0, 30, 60, or 90 Mg manure ha⁻¹ (wet wt. basis) while irrigated plots received 0, 60, 120, and 180 Mg ha⁻¹ annually for 16 yr. The amount of P removed in barley grain and straw during the 16-yr period was between 5 and 18% of the cumulative manure P applied. There was a balance between P applied in manure and P recovered in crops and soils (to the 150-cm depth) of nonirrigated plots during the 16-yr study. In irrigated plots, as much as 1.4 Mg P ha⁻¹ added (180 Mg ha⁻¹ yr⁻¹ treatment) was not recovered over 16 yr, and was probably lost through leaching. The risk of ground water contamination with P from manure was greater in irrigated than nonirrigated plots that have received long-term annual manure amendments. Manure application rates should be reduced in nonirrigated and irrigated plots to more closely match manure P inputs to crop P requirements.

166. Phosphorus forms in manure and compost and their release during simulated rainfall. [Erratum: Nov/Dec 2000, v. 29 (6), p. 2053.]

Sharpley, A. and Moyer, B.

Journal of Environmental Quality (Sept/Oct 2000) 29 (5): 1462-1469.
NAL Call #: QH540.J6; ISSN: 0047-2425.

Descriptors: phosphorus/ animal manures/ composts/ losses from soil/ runoff/ solubility/ rain/ simulation

Abstract: The large accumulation of P in manure from animal feeding operations in localized areas has increased the potential for P export following land application. Impairment of freshwater quality by accelerated eutrophication has focused attention on manure management and the potential for P loss in runoff. Thus, we investigated the amounts and relative solubilities of P in manures and their composts using a modified Hedley fractionation and release of P during simulated rainfall (70 mm h⁻¹ for 30 min) in laboratory columns (15-cm diameter). Twenty-four samples each of dairy manure, dairy manure compost, poultry manure, poultry manure compost, poultry litter, and swine manure were collected over 2 yr. Total P concentration ranged from 2600 to 40 000 mg kg⁻¹, mostly as inorganic P (63 to 92%). The distribution of inorganic and organic P fractions depended on manure and compost type. Most of the inorganic P, 80%, was water extractable (2030 mg kg⁻¹), while 55% was hydroxide extractable in swine slurry (16620 mg kg⁻¹) and 38% acid extractable in poultry manure (9320 mg kg⁻¹). The dissolved inorganic P concentration in leachate from manure and compost (10 Mg ha⁻¹ manure application rate) during a 30-min rainfall ranged from 34 (poultry litter) to 75 mg L⁻¹ (poultry manure). The amount of P leached by five simulated rainfall events was significantly correlated to respective water extractable inorganic ($r^2 = 0.98$) or organic P ($r^2 = 0.99$) of each material. This suggests that water extractable P may be used to estimate the potential for land-applied manures or composts to enrich leachate and surface runoff P.

167. The price we pay for corporate hogs.

Halverson, Marlene. and Funding Group on Confined Animal Feeding Operations. Institute for Agriculture and Trade Policy.

Minneapolis, MN : Institute for Agriculture and Trade Policy, c2000. 154 p. : ill.:Includes bibliographical references (p. 123-140). "Sponsored by the Funding Group on Confined Animal Feeding Operations."

NAL Call #: HD9435.U52-H35-2000

URL: <http://www.iatp.org/hogreport/indextoc.html>

Descriptors: Pork industry and trade/ United States

168. Public health concerns for neighbors of large-scale swine production operations.

Thu, K. M.

J-Agric-Saf-Health (May 2002) 8 (2): 175-184.

NAL Call #: S565.J66; ISSN: 1074-7583.

Descriptors: pigs/ pig farming/ pig feeding/ intensive production/ health hazards/ confined animal feeding operations

169. Questionable methodology used in CAFO study.

Cornfeld, R. S.

Feedstuffs (Oct 8, 2001) 73 (42): 11, 18.
NAL Call #: 286.81-F322; ISSN: 0014-9624.

Descriptors: pigs/ meat and livestock industry/ evaluation/ methodology/ pig feeding/ confined animal feeding operations/ North Carolina

170. Regional nitrate leaching variability: what makes a difference in northeastern Colorado.

Hall, M. D., Shaffer, M. J., Waskom, R. M., and Delgado, J. A.
J-Am-Water-Resour-Assoc (Feb 2001) 37 (1): 4-5.
NAL Call #: GB651.W315; ISSN: 1093-474X.

Descriptors: agricultural education/ learning ability/ models/ Minnesota

Abstract: The high spatial variability of nitrate concentrations in ground water of many regions is thought to be closely related to spatially-variable leaching rates from agricultural activities. To clarify the relative roles of the different nitrate leaching controlling variables under irrigated agriculture in northeastern Colorado, we conducted an extensive series of leaching simulations with the NLEAP model using best estimates of local agricultural practices. The results of these simulations were then used with GIS to estimate the spatial variability of leachate quality for a 14,000 ha area overlying the alluvial aquifer of the South Platte River. Simulations showed that in the study area, differences in soil type might lead to 5-10 kg/ha of N variation in annual leaching rates while variability due to crop rotations was as much as 65 kg-N/ha for common rotations. Land application of manure from confined animal feeding operations may account for more than 100 kg-N/ha additional leaching. For a selected index rotation, the simulated nitrogen leaching rates across the area varied from 10 to 299 kg/ha and simulated water volumes leached ranged from 13 to 76 cm/yr depending on soil type, irrigation type, and use of manure. Resulting leachate concentrations of 3.5-140 mg/l NO₃ as N were simulated. Land application of manure was found to be the most important factor determining the mass flux of nitrate leached and the combination of sprinkler irrigation and manure application yields the highest leachate concentrations.

171. Regulation of concentrated animal feeding operations under the federal Clean Water Act.

National Center for Agricultural Law Research and Information (U.S.).
Fayetteville, Ark. : The Center, [2000]:Title from caption. "October, 2000" Includes bibliographical references.
NAL Call #: KF3790.5-.R44-2000

URL: <http://law.uark.edu/arklaw/aglaw/hottopics/cafowater.htm>

Descriptors: Water Pollution/ Law and legislation/ Animal feeding/ Agricultural pollution/ United States

172. Regulatory changes for confined feeding operations: new rules, new attitude.

Bietz, B. F.

Adv-Pork-Prod. Edmonton, Alta. : University of Alberta, Faculty of Extension, 1990-. 2002. V.

13 P. 77-86.

NAL Call #: SF391.3.B36; ISSN: 1489-1395.

Descriptors: pigs/ pig farming/ pig feeding/ regulations/ concentrated animal feeding operations

173. The role of qualified credentialed professionals under Alabama's AFO/CAFO rules.

Tyson, Ted W.

[Auburn, Ala.] : Alabama Cooperative Extension System, [2001] 3, [1] p.:Caption title. "New April 2001."--P. [4].

NAL Call #: S544.3.A2-C47-no.-1206

174. Seepage rates and nitrogen losses from animal waste lagoons: potential impacts on groundwater quality.

Ham, J. M. and DeSutter, T. M.

Innovative Technologies for Planning Animal Feeding Operations Comprehensive Nutrient Management Planning Program and Proceedings the Renaissance Denver Hotel, December 4-5-6, 2000, Denver, Colorado / (2000): 109-110.

NAL Call #: TD899.F4-I55-2000

Descriptors: animal wastes/ lagoons/ nitrogen/ losses/ seepage/ feedlots/ groundwater pollution/ water quality/ Kansas

175. Use of GIS to determine the effect of property line and water buffers on land availability.

Worley, J. W., Rupert, C., and Risse, L. M.

Applied Engineering in Agriculture (Jan 2001) 17 (1): 49-54.

NAL Call #: S671.A66; ISSN: 0883-8542.

Descriptors: geographic information systems/ pollution control/ water pollution/ surface water/ runoff/ animal wastes/ land use/ animal production/ animal feeding/ land capability/ land buffer strips/ Georgia

Abstract: Animal feeding operations are experiencing increasing pressure from neighbors, regulators, and legislative authorities to improve air and water quality. One of the most popular tools used in legislation and regulations is the placement of buffers between odor emitting sites and property lines and between potential water pollution sources and water bodies. This study was done to demonstrate how a GIS system can be used to study the effects of placing such buffers around surface water bodies and setbacks from property lines where confined animal feeding operations and their associated waste application fields would be banned. Data from three counties in southern Georgia were analyzed to determine how much land would be made unavailable by the placement of various buffers. "Available land" after restrictions ranged from 63% of total land for 30.5 m (100 ft) buffers and setbacks, to 7% of total land with 152.5 m (500 ft) buffers and setbacks. "Available land" was based strictly on the size of properties after restrictions were placed and did not include consideration of whether the property owner was interested in starting an animal feeding operation or selling the land. The possibility of combining properties to make larger tracts was also not analyzed. Although it did not provide

answers to all questions that need to be asked, the GIS system was demonstrated as a useful tool in obtaining some objective data on the cost to society of placing protective buffers.

176. Use of precision farming to improve applications of feedlot waste to increase nutrient use efficiency and protect water quality.

Masek, T. J., Schepers, J. S., Mason, S. C., and Francis, D. D.

Communications in Soil Science and Plant Analysis (2001) 32 (7/8): 1355-1369.

NAL Call #: S590.C63; ISSN: 0010-3624.

Descriptors: site specific crop management/ feedlot wastes/ cattle manure/ application to land/ spatial variation/ fields/ crop yield/ zea mays/ nitrogen content/ leaves/ nutrient deficiencies/ crop growth stage/ phosphorus/ nutrient content/ Nebraska

Abstract: Spatial variability in crop yields can be caused by many factors, which makes it difficult to determine the most limiting factors. Application of animal wastes to relatively infertile areas offers the potential to supply needed nutrients and improve soil physical properties. The objectives of this study were to test a manure application strategy to reduce spatial variability in corn (*Zea mays* L) yield and to identify the most limiting nutrients in relatively low yielding areas in a field. Fresh solid beef feedlot manure was applied in 1997 to a strip across areas with variable fertility status. No fertilizer was applied with the manure in 1997. Uniform N fertilizer, but no manure, was applied in 1998. Leaf tissue samples and chlorophyll meter readings were collected along the strips during the growing season and from adjacent strips without manure application. Grain yield was determined at plant maturity. In 1997, chlorophyll meter readings indicated season long N deficiency (<95% sufficiency index) in no-manure plots with sufficiency indices of 93, 88, 85, and 88% for the V10, V17, R2, and R3 growth stages, respectively. Only an early season N deficiency was detected in a few of the no-manure plots in 1998. Leaf tissue analyses indicated N and P were growth limiting factors in 1997, with leaf N concentrations of 25, 26, and 27 mg g⁻¹ for non-manure plots and 30, 33, and 31 mg g⁻¹ for manure plots at V12, R1, and R3 growth stages, respectively. Leaf P concentrations were 2.0, 2.0, and 1.9 mg g⁻¹ for no-manure plots versus 2.5, 2.7, and 2.3 mg g⁻¹ for manure plots, respectively. In 1998, neither N or P were identified as limiting factors. Grain yields in 1997 were 10.2 and 12.2 Mg ha⁻¹, which increased to 11.9 and 12.8 Mg ha⁻¹ in 1998 for no-manure and manure plots, respectively.

177. A watershed-based cumulative risk impact analysis: environmental vulnerability and impact criteria.

Osowski, S. L., Swick, J. D. Jr., Carney, G. R., Pena, H. B., Danielson, J. E., and Parrish, D. A.

Environmental Monitoring and Assessment (Jan 2001) 66 (2): 159-185.

NAL Call #: TD194.E5; ISSN: 0167-6369.

Descriptors: feedlots/ feedlot wastes/ watersheds/ surface water/ groundwater/ water pollution/ groundwater pollution/ water quality/ environmental impact/ risk assessment/ decision making/ screening/ federal government/ swine/ concentrated animal feeding operations/ united states environmental protection agency/ United States

Total Maximum Daily Loads (TMDLs)

(Citations 178-216)

| Agricultural Hydrology | Best Management Practices (BMPs) | Concentrated Animal Feeding Operations (CAFOs) |

178. Assessing the TMDL approach to water quality management.

National Research Council (U.S.). Committee to Assess the Scientific Basis of the Total Maximum Daily Load Approach to Water Pollution Reduction.

Washington, D.C. : National Academy Press, c2001. xii, 109 p. : ill.: "Support for this project was provided by the U.S. Environmental Protection Agency under Cooperative Agreement No. X-82880401"--T.P. verso. Includes bibliographical references.

NAL Call #: TD423-.A87-2001

URL: <http://www.nap.edu/books/0309075793/html/>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Water Pollution/ Law and legislation/ United States

179. BASINS Version 3.0.: Better assessment science integrating point and nonpoint sources.

United States. Environmental Protection Agency. Office of Science and Technology.,

Washington, D.C. : U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology, 2001. 44 CD-ROM's : col. 1 user's manual (337 p. : ill. ; 28 cm.). Title from disc. "June 2001." Region 1, EPA-823-C-01-001; Region 2, EPA-823-C-01-002; Region 3, EPA-823-C-01-003; Region 4, EPA-823-C-01-004; Region 5, EPA-823-C-01-005; Region 6, EPA-823-C-01-006; Region 7, EPA-823-C-01-007; Region 8, EPA-823-C-01-008; Region 9, EPA-823-C-01-009; Region 10, EPA-823-C-01-010. "EPA-823-B-01-001"--User's manual. Issued in ten CD-ROM cases.

NAL Call #: TC423-.B37-2001

URL: <http://www.epa.gov/ost/basins/>

Descriptors: Watersheds/ Databases/ Models/ Water quality management/ Watershed management/ Water Pollution/ Point source identification/ Nonpoint source pollution/ Total maximum daily load/ United States

Abstract: A multipurpose environmental analysis system for use by regional, state, and local agencies in performing watershed and water-quality-based studies, to address three objectives: to facilitate examination of environmental information, to provide an integrated watershed and modeling framework, and to support analysis of point and nonpoint source management alternatives.

180. Clean Water Act regulatory expansion : total maximum daily loads program.: Voice of agriculture issues.

American Farm Bureau Federation.

[Chicago?] : American Farm Bureau Federation, [2001]:Title from web page. "September 2001"

Description based on content viewed Jan. 29, 2002.
NAL Call #: TD223-.C64-2001

URL: <http://www.fb.org/issues/backgrd/cwa108.html>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality/ Water quality management/ Water/ Law and legislation/ United States

181. Debate rages over new rules for TMDLs.

Blankenship, Karl. and Alliance for the Chesapeake Bay.

Baltimore, MD : Alliance for the Chesapeake Bay, [2000]:Title from web page. "March 2000"

Description based on content viewed Jan. 30, 2002.

NAL Call #: TD223-.B64-2000

URL: <http://www.bayjournal.com/article.cfm?article=1456>

Descriptors: United States Environmental Protection Agency/ Water Pollution/ Total maximum daily load/ Water quality/ Water quality management/ Water/ Law and legislation/ United States

182. Effects of storm-sampling frequency on estimation of water-quality loads and trends in two tributaries to Chesapeake Bay in Virginia.

Sprague, Lori A. and Virginia. Dept. of Environmental Quality. Geological Survey (U.S.).

Richmond, Va. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 2001. v, 38 p. : ill. (some col.), col. map:Shipping list no.: 2001-0297-P. Includes bibliographical references (p. 36). SUDOCs: I 19.42/4:01-4136.

NAL Call #: GB701-.W375-no.-2001-4136

Descriptors: Water quality/ Water Pollution/ Total maximum daily load/ Rivers/ sediments/ Stream measurements/ Chesapeake Bay/ Maryland/ Virginia

183. EPA reasserts support for TMDL proposal despite critics.

Blankenship, Karl. and Alliance for the Chesapeake Bay.

Baltimore, MD : Alliance for the Chesapeake Bay, [2000]:Title from web page. "June 2000"

Description based on content viewed Jan. 30, 2002.

NAL Call #: TD223-.B63-2000

URL: <http://www.bayjournal.com/article.cfm?article=2202>

Descriptors: United States Environmental Protection Agency/ Water Pollution/ Total maximum daily load/ Water quality/ Water quality management/ Water/ Law and legislation/ United States

184. EPA's total maximum daily load (TMDL) program : highlights of the final revised rule.

Copeland, Claudia. and National Council for Science and the Environment (U.S.).

Washington, D.C. : National Council for Science and the Environment, [2000]:Title from caption. "July 18, 2000" Includes bibliographical references.

NAL Call #: TD223-.E63-2000

URL: <http://cnie.org/NLE/CRSreports/water/h2o-36.cfm>

Descriptors: United States Environmental Protection Agency/ Water Pollution/ Total maximum daily load/ Water Pollution/ Law and legislation/ Water quality management/ United States

Abstract: This report discusses the final rule and the key modifications of the August 1999 proposal. The final rule builds on the current TMDL regulatory program and adds details, specific requirements, and deadlines. It retains the basic elements of the 1999 proposal for more comprehensive identification of impaired waters, schedules and minimum elements for TMDLs, and new public participation requirements. At the same time, dropped from the final rule are several provisions that were most controversial in the proposal, including some potentially affecting agriculture and forestry, one that would have required pollutant discharge offsets in some circumstances, and one that would have required states to identify waters threatened but not yet impaired by pollution.

185. Evaluating TMDLs : protecting the rights of POTWs. May 2000 update.

Association of Metropolitan Sewerage Agencies.

Washington, D.C. : Association of Metropolitan Sewerage Agencies, [2000]:Title from web page. Description based on content viewed Jan. 30, 2002. Includes bibliographical references. NAL Call #: TD223-.E93-2000

URL: <http://www.p2pays.org/ref/01/00938/completedocument.pdf>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality/ Water quality management/ United States

186. Final TMDL rule : fulfilling the goals of the Clean Water Act.: Fulfilling the goals of the Clean Water Act. Total maximum daily load (TMDL) program.

United States. Environmental Protection Agency. Office of Water.

Washington, DC : U.S. Environmental Protection Agency, Office of Water, [2000]:Title from caption. "July 2000" "EPA 841-F-00-008"
NAL Call #: TD223-.F56-2000

URL: <http://www.epa.gov/owow/tmdl/finalrule/factsheet1.pdf>

Descriptors: Water Pollution/ Total maximum daily load/ Water Pollution/ Law and legislation/ Water quality management/ United States

Abstract: The U.S. Environmental Protection Agency (EPA) issued a final rule to improve the national program for identifying polluted waters, determining the sources of pollution, and designing clean-up plans.

187. The impact of the proposed total maximum daily load regulations on agriculture and silviculture : hearings before the Subcommittee on Department Operations, Oversight, Nutrition, and Forestry of the Committee on Agriculture, and the Committee on Agriculture, House of Representatives, One Hundred Sixth Congress, second session, May 22, 2000, Wingate, NC; June 19, 2000, Lonoke, AR; June 29, 2000 (H.R. 4502).

United States. Congress. House. Committee on Agriculture. Subcommittee on Department Operations, Oversight Nutrition and Forestry. United States. Congress. House. Committee on

Agriculture.

Washington : U.S. G.P.O. : [Congressional Sales Office, Supt. of Docs., U.S. G.P.O., distributor], 2000. v, 296 p. : ill., map:Distributed to some depository libraries in microfiche. Shipping list no.: 2001-0019-P. "Serial no. 106-53." Includes bibliographical references (p. 269). SUDOCs: Y 4.AG 8/1:106-53.
NAL Call #: KF27-.A332765-2000

URL: <http://commdocs.house.gov/committees/ag/hag10653.000/hag10653%5F0f.htm>
Descriptors: Water Pollution/ Total maximum daily load/ Agricultural pollution/ Government policy/ Agriculture/ Logging/ United States

188. Impaired waters and total maximum daily loads (TMDL).: Water pollution control program.

Missouri. Water Pollution Control Program.
Jefferson City, MO : Missouri Dept. of Natural Resources, Division of Environmental Quality, Water Pollution Control Program, [2001?]-:Title from caption. Includes bibliographical references.
NAL Call #: TD224.M8-I47-2001

URL: <http://www.dnr.mo.gov/env/wpp/tmdl/index.html>
Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Historic Preservation/ Geology/ Solid Waste Recycling/ Hazardous Waste/ Drinking Water/ Missouri

Abstract: Department of Natural Resources, Information concerning natural resource conservation.

189. The importance of considering biological processes when setting total maximum daily loads (TMDL) for phosphorus in shallow lakes and reservoirs.

Havens, K. E. and Schelske, C. L.
Environmental Pollution (2001) 113 (1): 1-9.
NAL Call #: QH545.A1E52; ISSN: 0269-7491.

Descriptors: phosphorus/ pollutants/ lakes/ reservoirs/ water quality/ water pollution/ nutrient loading/ biological factors/ Florida

190. Improving water quality: TMDLs in Oregon.

Oregon. Dept. of Environmental Quality. Water Quality Division. Watershed Management Section.
Portland, OR : State of Oregon, Dept. of Environmental Quality, Water Quality Division, Watershed Management Section.
URL: <http://www.deq.state.or.us/wq/wqfact/TMDLFactSheet2003.pdf>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Oregon

191. Joint statement of the Department of Agriculture and the Environmental Protection Agency addressing agricultural and silvicultural issues within EPA revisions to TMDL and

NPDES rules.

United States. Environmental Protection Agency. Office of Water. United States. Dept. of Agriculture.

[Washington, D.C.] : EPA, Office of Water, [2000]-:Title from web page.

NAL Call #: KF3790.5-.U55-2000

URL: <http://www.epa.gov/owow/tmdl/tmdlwhit.html>

Descriptors: Water Pollution/ Law and legislation/ Total maximum daily load/ Water quality management/ United States

Abstract: The Total Maximum Daily Load (TMDL) Program of the U.S. Environmental Protection Agency (EPA) Office of Water presents the "Joint Statement of the Department of Agriculture and the Environmental Protection Agency Addressing Agricultural and Silvicultural Issues Within EPA Revisions to TMDL and NPDES Rules." The May 1, 2000 paper describes the agreement between the EPA and the U.S. Department of Agriculture (USDA) concerning the development of final TMDL regulations in regards to the National Pollutant Discharge Elimination System (NPDES).

192. Kentucky's total maximum daily load (TMDL) program.: Kentucky's TMDL program.

Kentucky Natural Resources and Environmental Protection Cabinet. Division of Water. Frankfort, KY : Kentucky Division of Water, [2001?]-:Title from caption.

NAL Call #: TD224.K4-K46-2001

URL: <http://www.water.ky.gov/sw/tmdl/>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Kentucky

Abstract: Information about Kentucky's TMDL Program including maps showing the location of impaired stream segments and Kentucky's 1998 303(d) Report.

193. Legislators skeptical about TMDL proposal from EPA.

Alliance for the Chesapeake Bay.

Baltimore, MD : Alliance for the Chesapeake Bay, [2000]:Title from web page. "April 2000" Description based on content viewed Jan. 29, 2002.

NAL Call #: TD223-.L44-2000

URL: <http://www.bayjournal.com/article.cfm?article=1570>

Descriptors: United States Environmental Protection Agency/ Water Pollution/ Total maximum daily load/ Water quality/ Water quality management/ Water/ Law and legislation/ United States

194. Maryland's TMDL program.: TMDL, introduction to MD's TMDL program.

Maryland. Dept. of the Environment.

[Baltimore] : Maryland Dept. of the Environment, [2001]-:Title from caption.

NAL Call #: TD224.M3-M37-2001

URL: <http://www.mde.state.md.us/tmdl/>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Maryland

Abstract: Introduction to the state's TMDL Program from the Maryland Department of the Environment. Includes News; Environmental Issues and Related Information; Information for Business and Industry; Public Health and Safety Department Contacts; and Maryland's 303(d) List.

195. Modeling hydrodynamics and water quality in Herrington Lake, Kentucky.

Crain, Angela S. and Kentucky Natural Resources and Environmental Protection Cabinet. Geological Survey (U.S.).

Louisville, Ky. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 2000. vi, 84 p. : ill., maps:Shipping list no.: 2000-0178-P. Includes bibliographical references (p. 52-53). SUDOCs: I 19.42/4:99-4281.

NAL Call #: GB701-.W375-no.-99-4281

Descriptors: Water quality/ Mathematical models/ Water Pollution/ Total maximum daily load/ Hydrodynamics/ Kentucky

196. The new face of the Clean Water Act : a critical review of the EPA's proposed TMDL rules.: Critical review of the EPA's proposed TMDL rules.

Boyd, James 1964 and Resources for the Future.

Washington, D.C. : Resources for the Future, 2000.:Title screen title.

NAL Call #: TD223-.B69-2000

URL: <http://www.rff.org/rff/Documents/RFF-DP-00-12.pdf>

Descriptors: Water Pollution/ Total maximum daily load/ Government policy/ environmental legislation and regulations/ United States

197. Protocol for developing pathogen TMDLs, 1st ed.

United States. Environmental Protection Agency. Office of Water.

Washington, D.C. : The Office, [2001] 1 v. (various pagings) : ill.: "January 2001." Includes bibliographical references.

NAL Call #: TD427.M53-P76-2001

URL: http://www.epa.gov/owow/tmdl/pathogen_all.pdf

Descriptors: Pathogenic microorganisms/ Water Pollution/ Total maximum daily load/ United States

198. Regression analysis and real-time water-quality monitoring to estimate constituent concentrations, loads, and yields in the Little Arkansas River, south-central Kansas, 1995-99.

Christensen, Victoria G., Jian, Xiaodong., Ziegler, Andrew C., and Equus Beds Ground water Recharge Demonstration Project. Geological Survey (U.S.).

Lawrence, Kan. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Information Services [distributor], 2000. vi, 36 p. : ill. (some col.), col. maps:Shipping list no.: 2000-0367-P.

Includes bibliographical references (p. 35-36). SUDOCs: I 19.42/4:00-4126.
NAL Call #: GB701-.W375-no.-2000-4126

Descriptors: Water quality/ Regression analysis/ Water Pollution/ Total maximum daily load/
Kansas

199. Revisions to the water quality planning and management regulation and revisions to the National Pollutant Discharge Elimination System Program in support of revisions to the water quality planning and management regulation : final rules.: Federal register, part VI, Environmental Protection Agency.

United States. Office of the Federal Register.

[Washington, DC : Office of the Federal Register, 2000]:Title from web page. Description based on content viewed Jan. 31, 2002. "July 13, 2000" "40 CFR part 9 et al." Includes bibliographical reference.

NAL Call #: KF3790.5.A35-A2-2000

URL: <http://www.epa.gov/owow/tmdl/finalrule/finalrule.pdf>

Descriptors: United States Environmental Protection Agency/ Water Pollution/ Law and legislation/ Water quality management/ Water quality/ United States

200. Scientific issues in the development of total maximum daily loads (TMDLs).

Water Resources Research Institute of the University of North Carolina.

Raleigh, NC : Water Resources Research Institute, NC State University, [2001?]:Title from caption.

NAL Call #: TD223-.S35-2001

URL: <http://www2.ncsu.edu/ncsu/CIL/WRRI/news/ma97dirfor.html>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ United States

Abstract: One of the relatively new strategies for meeting ambient water quality standards is the establishment of a Total Maximum Daily Load, or TMDL. In brief, the TMDL program requires that each state identify waterbodies which fail to achieve water quality standards based on point source controls, and then develop a plan for additional (point and nonpoint source) controls to meet the standards.

201. TMDL development at SWQB.: TMDL Development Section, Surface Water Quality Bureau, New Mexico Env. Dept.

New Mexico. Surface Water Quality Bureau.

[Santa Fe] : New Mexico Environment Dept., SWQB, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: TD224.N6-T63-2001

URL: <http://www.nmenv.state.nm.us/swqb/tmdllds.html>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Surface

Water/ Waste/ Nonpoint source pollution/ Wastewater/ Watersheds/ Runoff/ Wetlands/ Clean Water Act/ Reclamation/ New Mexico

Abstract: The TMDL Development Section performs federally- and State-required surface water quality review and planning functions on a variety of watershed restoration projects throughout New Mexico.

202. TMDL development process.

North Carolina. Division of Water Quality. Modeling & TMDL Unit.

[Raleigh?] : Modeling & TMDL Unit, North Carolina Dept. of Environment and Natural Resources, Division of Water Quality, [2001?]:Title from caption.

NAL Call #: TD224.N8-T63-2001

URL: <http://h2o.enr.state.nc.us/tmdl/TMDLs.htm>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ North Carolina

Abstract: The diagram below outlines the Total Maximum Daily Load development process in North Carolina. Questions related to the process can be directed to the Modeling and TMDL Unit Supervisor.

203. TMDL information.

California. State Water Resources Control Board. Division of Water Quality.

Sacramento, CA : California Environmental Protection Agency, State Water Resources Control Board, Water Quality, c2000.:Title from caption. Includes bibliographical references.

NAL Call #: TD224.C2-T63-2000

URL: <http://www.swrcb.ca.gov/tmdl/background.html>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ State Water Resources Control Board/ Runoff/ Nonpoint source pollution/ Watersheds/ Wetlands/ Wastewater treatment/ Geographic information systems/ Impaired water bodies/ Effluent/ California

Abstract: The State Water Resources Control Board web site covers California water quality and rights regulation; board meetings, laws; funding; watershed management; enforcement; citizen involvement; news and education.

204. TMDL (total maximum daily load) development and implementation.

Iowa. Water Quality Bureau.

[Des Moines, IA?] : Iowa Water Quality Bureau, Dept. of Natural Resources, c2000.:Title from Web page. Description based on content viewed Jan. 29, 2002. Includes bibliographical references.

NAL Call #: TD224.I8-T63-2000

URL: <http://www.iowadnr.com/water/tmdlwqa/tmdl/implement.html>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Animal wastes/ Wastewater/ Feeding operations/ Nonpoint source pollution/ Iowa

205. TMDLs (Total Maximum Daily Loads).

Water Quality Information Center (U.S.).

[Beltsville, Md.] : Water Quality Information Center at the National Agricultural Library, Agricultural Research Service, U.S. Dept. of Agriculture, [2000]-:

URL: <http://hdl.handle.net/1030.28/NAL00000014>

Descriptors: Total maximum daily load/ Nonpoint source pollution/ Water quality/ Clean Water Act

Abstract: This resource provides introductory information on total maximum daily loads, as stipulated by the Clean Water Act. TMDLs are written regulatory guidances, usually produced by State government, that identify some measurement criteria and plans of action to meet established goals for improving water quality.

206. Total maximum daily load process.

Colorado. Dept. of Public Health and Environment. Water Quality Control Division.

[Denver] : Colorado Dept. of Public Health & Environment, Water Quality Control Division, [2001?]-:

NAL Call #: TD224.C6-T68-2001

URL: <http://www.cdphe.state.co.us/wq/Assessment/TMDL/tmdlmain.html>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Colorado

Abstract: The Total Maximum Daily Load (TMDL) process is designed by the Federal Water Pollution Control Act (Clean Water Act) to insure that all sources of pollutant loading are accounted for when devising strategies to meet Water Quality Standards. The TMDL itself, is an estimate of the greatest amount of a specific pollutant that a water body or stream segment can receive without violating water quality standards.

207. Total maximum daily load program.: TMDL.

Florida.

[Tallahassee?] : State of Florida, c2000.:Title from caption.

NAL Call #: TD224.F6-T68-2000

URL: <http://www.dep.state.fl.us/water/tmdl>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Florida

Abstract: The Division of Water Resource Management is working on a more comprehensive approach to protecting Florida water quality involving basin-wide assessments and the application of a full range of regulatory and non-regulatory strategies to reduce pollution. The Total Maximum Daily Load (TMDL) is the heart of this comprehensive approach.

208. Total maximum daily loads.

Kansas. Dept. of Health and Environment.

Topeka, KS : Kansas Dept. of Health & Environment, [2001]-:Title from caption.

NAL Call #: TD224.K2-T68-2001

URL: <http://www.kdheks.gov/tmdl/index.htm>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Nonpoint source pollution/ Kansas

Abstract: Includes information on Total Maximum Daily Loads in sections: Basics of TMDLs; TMDL Process; Data Analysis; Public Participation. Also provides capability to view text, maps, and other information by Kansas watershed basin. Contact: Bureau of Water, Watershed Planning Section, Forbes Field, Building 283, Topeka, Kansas 66620. FAX (785) 291-3266.

209. Total maximum daily loads (TMDL) : questions & answers.

California. State Water Resources Control Board.

[Sacramento?] : California State Water Resources Control Board, [2001]:Title from title page of source document. "April 2001"

NAL Call #: TD224.C2-.T68-2001

URL: http://www.swrcb.ca.gov/tmdl/docs/tmdl_factsheet.pdf

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ California

210. Total maximum daily loads (TMDLs).

Michigan. Dept. of Environmental Quality.

[Lansing, Mich.?] : Michigan Dept. of Environmental Quality, c2002.:Title from Web page.

Description based on content viewed April 12, 2002.

NAL Call #: TD224.M5-T68-2002

URL: http://www.michigan.gov/deq/1,1607,7-135-3313_3686_3728-12464--,00.html

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Michigan

211. Total maximum daily loads: TMDLs in Virginia.

Virginia. Dept. of Environmental Quality.

[Richmond, Va.] : Virginia Dept. of Environmental Quality, [2001]-:Title from caption.

NAL Call #: TD224.V8-T68-2001

URL: <http://www.deq.state.va.us/tmdl/>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ Virginia Department of Environmental Quality/ EPA Approval/ Virginia

Abstract: Dedicated to Protecting Virginia's Environment.

212. Total maximum daily loads (TMDLs): SD DENR total maximum daily load program.

South Dakota. Dept. of Environment and Natural Resources.

Pierre, SD : South Dakota Dept. of Environment & Natural Resources, [2001]-:Title from

caption.

NAL Call #: TD224.S8-T68-2001

URL: <http://www.state.sd.us/denr/DES/Surfacewater/TMDL.htm>

Descriptors: Water Pollution/ Total maximum daily load/ Water quality management/ South Dakota

Abstract: SD DENR Total Maximum Daily Load Program Search DENR using our topical site index or by entering keyword(s). Total Maximum Daily Loads (TMDLs); Section 303(d) of the federal Clean Water Act requires that states develop Total Maximum Daily Loads (TMDLs) for water bodies. TMDLs are calculations of the amount of pollution a waterbody can receive and still meet the applicable water quality standards . TMDLs are necessary for waterbodies that do not meet the water quality standards due to nonpoint source pollution, or might not meet water quality standards with the application of technology-based controls for point sources. In these cases, point sources of pollution would need additional water quality-based controls. Nonpoint sources of pollution are considered on a watershed basis.

213. Total maximum daily loads under the Federal Clean Water Act.

National Center for Agricultural Law Research and Information (U.S.).

Fayetteville, Ark. : NCALRI, University of Arkansas School of Law, [2001]-:Title from caption. Includes bibliographical references.

NAL Call #: KF3790-.T68-2001

Descriptors: Water Pollution/ Law and legislation/ Total maximum daily load/ Agricultural law/ National Center for Agricultural Law Research and Information/ Nonpoint source pollution/ Agricultural runoff/ Federal Clean Water Act/ United States

Abstract: Total Maximum Daily Loads under the Federal Clean Water Act.

214. Unleashing the Clean Water Act : the promise and challenge of the TMDL approach to water quality.

Boyd, Jim. and Resources for the Future.

[Washington, D.C.? : Resources for the Future, 2000]:Title from title page of source document. "Spring 2000"

NAL Call #: TD420-.B68-2000

URL: http://www.rff.org/resources_archive/pdf_files/139_boyd.pdf

Descriptors: Water Pollution/ Total maximum daily load/ Law and legislation/ United States

215. Water quality : hearing before the Committee on Agriculture, Nutrition, and Forestry, United States Senate, One Hundred Sixth Congress, second session, on water quality, February 23, 2000.

United States. Congress. Senate. Committee on Agriculture, Nutrition and Forestry.

Washington : U.S. G.P.O. : For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 2000. iv, 336 p. : ill., maps:"Printed for the use of the Committee on Agriculture, Nutrition, and Forestry." Distributed to some depository libraries in microfiche. Shipping list no.:

2001-0068-P. Includes bibliographical references. SUDOCs: Y 4.AG 8/3:S.HRG.106-699.
NAL Call #: KF26-.A35-2000a

URL: <http://purl.access.gpo.gov/GPO/LPS8952>

Descriptors: Water quality/ Water quality management/ Water Purification/ Water Pollution/
Total maximum daily load/ Water quality Measurement/ Nonpoint source pollution/ United
States

216. Water quality modeling for wasteload allocations and TMDLs.

Lung, Wu Seng.

New York : Wiley, c2001. xiii, 333 p. : ill., maps:Includes bibliographical references (p. 314-
324) and index.

NAL Call #: TD370-.L86-2001

URL (Table of Contents only): <http://www.loc.gov/catdir/toc/onix05/2001024024.html>

Descriptors: Water quality/ Mathematical models

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