Nonpoint-Source Pollution Issues

January 1990 - November 1994
Quick Bibliography Series: QB 95-01
196 citations from AGRICOLA

Joe Makuch
Water Quality Information Center

Quick Bibliography Series

Bibliographies in the Quick Bibliography series of the National Agricultural Library (NAL), are intended primarily for current awareness, and as the title of the series implies, are not in-depth and exhaustive. However, the citations are a substantial resource for recent investigations on a given topic. They also serve the purpose of bringing the literature of agriculture to the interested user who, in many cases, could not access it by any other means. The bibliographies are derived from online searches of the AGRICOLA database. Timeliness of topic and evidence of extensive interest are the selection criteria. Send suggestions for Quick Bibliographies on water-related topics to wqic@nal.usda.gov

The author/searcher determines the purpose, length, and search strategy of the Quick Bibliography. Information regarding these is available from the author/searcher. The inclusion or omission of a particular publication or citation should not be construed as endorsement or disapproval. An author and subject index is provided along with the search strategy.

PLEASE NOTE: Information on document delivery services, interlibrary loan requests and copyright restrictions is appended to this bibliography. If Quick Bibliography files are copied and/or distributed, please include this information in all copies.

********************************************************************
Nonpoint-Source Pollution Issues

1 NAL Call. No.: aTD223.A26 1993
Accomplishments of the USDA hydrologic unit area projects.
Ebodaghe, Denis Abumere,

Language: English

Descriptors: Water quality management; Nonpoint source pollution; Agricultural pollution

2 NAL Call. No.: TD420.A1P7
Addressing nonpoint sources of water pollution must become an international priority.
Duda, A.M.

Language: English

Descriptors: Water pollution; Sources; Agricultural production

3 NAL Call. No.: HD1773.A2N6
Aggregate analysis of site-specific pollution problems: the case of groundwater contamination from agriculture.
Opaluch, J.J.; Segerson, K.

Language: English

Descriptors: Groundwater; Contamination; Water pollution; Agricultural sector; Agricultural policy; Microeconomic analysis; Aggregate data; Site factors; Spatial distribution; Information systems; Mathematical models

4 NAL Call. No.: aTD428.A37M34 1992
Agricultural nonpoint source pollution and economic incentive policies issues in the reauthorization of the Clean Water Act: water quality. Malik, Arun S.; Larson, Bruce A.; Ribaudo, Marc
United States, Dept. of Agriculture, Economic Research
Agricultural nonpoint-source runoff and sediment yield water quality (NPSWQ) models: modeler's perspective.
Rose, C.W.; Dickinson, W.T.; Ghadiri, H.; Jorgensen, S.E.

Language: English

Descriptors: Soil water movement; Models; Runoff water; Sediment; Agricultural chemicals; Water quality; Literature reviews

Agriculture, agricultural chemicals, and water quality.
Carey, A.E.

Language: English

Descriptors: Water quality; Agricultural production; Pesticides; Environmental impact; Water pollution; Point sources; Environmental management; Environmental protection


Language: English
Agriculture's role in addressing nonpoint source pollution.
Burt, J.P.
Agriculture outlook (70th): p. 47-52; 1994. Meeting held
November 30 -December 1, 1993, Washington, DC.

Albemarle-Pamlico: case study in pollutant trading. Most of
the nutrients came from nonpoint sources.
Hall, J.; Howett, C.

Application of a GIS-based nonpoint source nutrient loading
model for assessment of land development scenarios and water
quality in Owasco Lake, New York.
Heidtke, T.M.
Water science and technology : a journal of the International
Association on Water Pollution Research v. 28 (3/5): p.
595-604; 1993. Paper presented at the IAWQ First
International Conference on "Diffuse (Nonpoint) Pollution:
Sources, Prevention, Impact, Abatement." September 19-24,

Assessment of nonpoint source pollution in stormwater runoff
in Louisville, (Jefferson County) Kentucky, USA.
Marsh, J.M.


Language: English

Descriptors: Pesticides

15 NAL Call. No.: Z5862.2.W3F58 1993
A bibliography of selected nonpoint source literature.
Flippo, Herbert N.; Jackson, Donald R.
Susquehanna River Basin Commission
Harrisburg, PA (1721 N. Front St., Harrisburg 17102) :
Susquehanna River Basin Commission,; 1993; PY S9642.2 B5825.
i, 81 p. ; 28 cm. (Publication (Susquehanna River Basin
Commission) ; no. 148.). January 1993.

Language: English; English

Descriptors: Nonpoint source pollution

16 NAL Call. No.: QH96.8.B5R53 1991
Biological metric development for the assessment of nonpoint
pollution in the Snake River ecoregion of Southern Idaho
Wayne
Pocatello : Idaho : Dept. of Biological Sciences, Idaho State
University,; 1991.
75 p. : ill., map ; 28 cm. 23 April 1991. Includes
bibliographical references (p. 70-71).

Language: English

Descriptors: Water quality bioassay; Water quality management;
Environmental monitoring

17 NAL Call. No.: TD420.A1P7
Biomonitoring and amelioration of nonpoint source pollution in
some aquatic bodies.
Chandra, P.; Tripathi, R.D.; Rai, U.N.; Sinha, S.; Garg, P.
Water science and technology : a journal of the International
Association on Water Pollution Research v. 28 (3/5): p.
323-326; 1993. Paper presented at the IAWQ First
International Conference on "Diffuse (Nonpoint) Pollution:
Sources, Prevention, Impact, Abatement." September 19-24,

Language: English

Descriptors: Orissa; Cabt; Uttar pradesh; Cabt; Body water;
Water pollution; Water purification; Aquatic plants

18 NAL Call. No.: TD224.W6B46 1993
Brown water, green weeds familiar signs of nonpoint source
pollution. Bennett, Steve
Wisconsin Nonpoint Source Water Pollution Abatement Program
Madison, Wis. : University of Wisconsin Extension, [1993?];
"I-05-93-10M-20-S"--P. [4].  "GWQ003"--P. [4].

Language:  English
Descriptors: Nonpoint source pollution; Water; Urban runoff;
Agricultural pollution

19                                   NAL Call. No.: S631.F422
Changing farm practice to meet environmental objectives of
nutrient loss to Oyster Harbour.
Weaver, D.M.; Prout, A.L.
Fertilizer research v. 36 (2): p. 177-184; 1993. In the
special issue: Fertilizers and eutrophication in South-Western
Australia / edited by E.P. Hodgkin and J.S. Yeates. Includes
references.

Language:  English
Descriptors: Western australia; Cabt; Watershed management;
Agricultural land; Nutrients; Phosphorus; Losses from soil;
Point sources; Farm management; Environmental management;
Water quality; Eutrophication

Abstract:  Eutrophication problems in waterbodies in south-
western Australia are primarily caused by inputs of nutrients
from diffuse sources within the agricultural catchments of
these waterbodies. To reduce the algal growth and seagrass
decline caused by these inputs, it is essential to modify land
management to minimize nutrient losses. Permanent reduction in
nutrient losses from agricultural catchments should involve
voluntary changes in farm management practices based on
improved land management. Specifically, these include on-farm
nutrient management such as soil testing, fertilizer
management, the use of perennial plants, and water and erosion
control measures to reduce nutrient loss from rural land. This
paper describes the management of nutrient loss from the
catchment of Oyster Harbour on the south coast of Western
Australia using a co-operative approach.

20                            NAL Call. No.: TD224.T4N48 1992
Characterization of non-point sources and loadings to
Galveston Bay. Newell, Charles J.; Rifai, H. S.; Bedient,
Philip B.,
Galveston Bay National Estuary Program
Clear Lake, Tex. : Galveston Bay National Estuary Program,;
1992; W1137.7 G139 no.15.
Vol. 2: 28 x 45 cm. Includes bibliographical references (v.
1, p. 155-162).


Coastal nonpoint pollution control program program development and approval guidance. United States, National Oceanic and Atmospheric
A comparison of runoff quality effects of organic and inorganic fertilizers applied to fescuegrass plots.

Edwards, D.R.; Daniel, T.C.
Bethesda, Md.: American Water Resources Association; 1994
Includes references.

Abstract: Application of fertilizer can degrade quality of runoff, particularly during the first post-application, runoff-producing storm. This experiment assessed and compared runoff quality impacts of organic and inorganic fertilizer application for a single simulated storm occurring seven days following application. The organic fertilizers used were poultry (Gallus gallus domesticus) litter, poultry manure, and swine (Sus scrofa domesticus) manure. All fertilizers were applied at an application rate of 217.6 kg N/ha. Simulated rainfall was applied at 50 mm/h for an average duration of 0.8 h. Runoff samples were collected, composited, and analyzed for nitrate N (NO3-N), ammonia N (NH3-N), total Kjeldahl N (TKN), ortho-P (PO4-P), total P (TP), chemical oxygen demand (COD), total suspended solids (TSS), fecal coliforms (FC), and fecal streptococci (FS). Application of the fertilizers did not alter the hydrologic characteristics of the receiving plots relative to the control plots. Concentrations of fertilizer constituents were almost always greater from treated than from control plots and were usually much greater. Flow-weighted mean concentrations of NH3-N, PO4-P, and TP were highest for the inorganic fertilizer treatment (42.0, 26.6, and 27.9 mg/L respectively). Runoff COD and TSS concentrations were greatest for the poultry litter treatment. Concentrations of FC and FS were greater for fertilized than for control plots with no differences among fertilized plots, but FC concentrations for all treatments were in excess of Arkansas' primary and secondary contact standards. Mass losses of fertilizer constituents were low (< 3 kg/ha) and were small proportions (< 3 percent) of amounts applied.
Lehman, D.A.; Shirmohammadi, A.; Shoraka, S.
Paper - American Society of Agricultural Engineers (90-2038):
Meeting, June 24-27, 1990, Columbus, Ohio. Includes
references.

Language: English

Descriptors: Groundwater pollution; Simulation models

27 NAL Call. No.: LU378.76 L930 1992 cock
A comprehensive assessment of groundwater nitrate pollution
from point and non-point sources.
Cockrell, Charles W.
vii, 67 leaves : ill., maps (some folded) ; 29 cm. Vita.
Abstract. Includes bibliographical references (leaves 65-66).

Language: English; English

Descriptors: Water, Underground; Hazardous waste sites; Wells

28 NAL Call. No.: S539.5.J68
The concept and need for a phosphorus assessment tool.
Lemunyon, J.L.; Gilbert, R.G.
Journal of production agriculture v. 6 (4): p. 483-486; 1993
Oct. Paper presented at the "Symposium on assessment of
potential phosphorus losses from a field site", November 4,
1992, Minneapolis, Minnesota. Includes references.

Language: English

Descriptors: Resource management; Phosphorus; Losses from
soil; Eutrophication; Water pollution; Risk; Assessment;
Indexes

29 NAL Call. No.: TD223.C73 1993
Created and natural wetlands for controlling nonpoint source
pollution. Olson, Richard K.
United States, Environmental Protection Agency, Office of
Research and Development, United States, Environmental
Protection Agency, Office of Wetlands, Oceans, and Watersheds
and Development, and Office of Wetlands, Oceans, and
Watersheds. Includes bibliographical references.

Language: English

Descriptors: Water quality management; Water; Wetland
conservation; Constructed wetlands
Current southern state programs for control of forestry nonpoint source pollution.
Lickwar, P.M.; Cubbage, F.W.; Hickman, C.A.
Bethesda, Md. : Society of American Foresters; 1990 May.

Language: English

Descriptors: South eastern states of U.S.A.; South central states of U.S.A.; Forestry; Pollution; Water composition and quality; Surveys

A decision support system for soil conservation planning.
Montas, H.; Madramootoo, C.A.

Language: English

Descriptors: Quebec; Soil conservation; Watersheds; Land use planning; Decision making; Expert systems; Information systems; Erosion; Simulation models; Rain; Soil types


Language: English

Descriptors: Iowa; Cabt; Water pollution; Sources; Agricultural production; Water quality

Development and implementation of the Virginia agronomic land use evaluation system (values).
34  NAL Call. No.: TD420.A1P7  v.28 no.3-5
Olem, Harvey
International Association of Water Quality

35  NAL Call. No.: TD420.A1P7
The distributed modelling of agricultural nonpoint pollution at basin scale: experimental research and model validation.
Preti, F.; Lubello, C.

36  NAL Call. No.: TD223.N36 1992
Document it! Procedures for the documentation of nonpoint source project data--land treatment.
Hermmeyer, B.
Drying interval effects on quality of runoff from fescue plots treated with poultry litter.
Edwards, D.R.; Daniel, T.C.; Moore, P.A. Jr; Vendrell, P.F.
St. Joseph, Mich. : American Society of Agricultural Engineers
Includes references.

Abstract: Land application of poultry (Gallus gallus domesticus) litter can lead to elevated runoff concentrations of organic matter and nutrients. This experiment was conducted to determine the impacts of poultry litter treatment (0 and 218 kg of N ha⁻¹) and drying interval (4, 7, and 14 days) between litter application and simulated rainfall on quality of runoff from fescue grass (Festuca arundinacea Schreb.) plots. Runoff was generated from simulated rainfall (50 mm h⁻¹) and sampled at 0.08-h intervals during runoff. Composite runoff samples from each treatment and replication were analyzed for nitrate N (NO₃-N), ammonia N (NH₃-N), total Kjeldahl N (TKN), orthor-P (PO₄-P), total P (TP), chemical oxygen demand (COD), and total suspended solids (TSS). One set per treatment of the noncomposited runoff samples was also analyzed. Runoff concentrations of all parameters except NO₃-N were significantly (p < 0.05) higher for the litter-treated plots than for the control plots. Drying interval did not significantly (p < 0.05) affect either concentration or total mass of any constituent lost in the runoff. Concentrations of NH₃-N, TKN, PO₄-P, and TP decreased uniformly with increasing runoff rate and thus with time after beginning of runoff. Temporal variation in runoff concentrations of NO₃-N, COD, and TSS followed no identifiable general pattern.

Dynamic simulation of nonpoint source pollutant transport in agricultural watersheds.
Ashraf, M.S.; Borah, D.K.
Economic incentives for agricultural nonpoint source pollution control. Malik, A.S.; Larson, B.A.; Ribaudo, M.
Includes references.

Abstract: The limited success of command-and-control policies for reducing nonpoint source (NPS) water pollution mandated under the Federal Water Pollution Control Act (FWPCA) has prompted increased interest in economic incentive policies as an alternative control mechanism. A variety of measures have been proposed ranging from fairly minor modifications of existing policies to substantial revisions including watershed-wide policies that rely on economic incentives. While greater use of economic incentive policies, such as environmental bonds and point/nonpoint source trading is being advocated in the reauthorization of the CWA, the expected effects of individual proposals will be modest. The characteristics of NPS pollution, namely uncertainty and asymmetrical information, underscores that there is no single, ideal policy instrument for controlling the many types of agricultural NPS water pollution. Some of the usual incentive-based policies, such as effluent taxes, are not well suited to the task. Individual incentive policies proposed for the reauthorized CWA, such as pollution trading or deposit/refund systems, are not broadly applicable for heterogeneous pollution situations. Economic incentive policies may be appropriate in some cases, and command-and-control policies will be preferable in others and may in fact complement incentive policies.

Economical monitoring procedure for assessing agrochemical nonpoint source loading in unconsolidated aquifers.
Spalding, R.F.; Exner, M.E.; Burbach, M.E.
Includes references.
Abstract: Multilevel samplers (MLSs) consisting of piezometers and tube samplers, a logical approach for determining the direction of groundwater flow and chemistry in shallow (< 6 m) nonpoint source (NPS) groundwater investigations. These MLSs have evolved from fastening the tubing to conduit at specific depths while the conduit was lowered into the hollow stem auger train to the present method of installing preassembled MLSs in boreholes drilled by the reverse circulation rotary method without the use of drilling additives. This method allows the aquifer to be sectioned into discrete layers and provides an instantaneous snapshot of both flow and chemistry in three dimensions. The procedure has been used successfully at several sites in Nebraska. The method is cheap, fast, and accurate in areas where the depth to water is less than 6 m. While the same procedure can be used where depths to water exceed 6 m, the need for gas-driven samplers substantially increases the cost.

41 NAL Call. No.: 56.8 J822
The effect of CRP enrollment on sediment loads in two southern Illinois streams.
Davie, D.K.; Lant, C.L.

Language: English
Descriptors: Illinois; Cabt; Soil conservation; Erosion control; Federal programs; Participation; Environmental impact; Sediment; Streams; Water pollution; Point sources

42 NAL Call. No.: TD420.A1P7
Effective monitoring strategies for demonstrating water quality changes from nonpoint source controls on a watershed scale.
Spooner, J.; Line, D.E.

Language: English
Descriptors: U.S.A.; Cabt; Water quality; Pollution; Sources; Watersheds; Agricultural production; Agricultural land; Treatment

43 NAL Call. No.: 292.9 Am34
Effects of agricultural nutrient management on nitrogen fate
and transport in Lancaster County, Pennsylvania.
Hall, D.W.; Risser, D.W.
Bethesda, Md. : American Water Resources Association; 1993
Includes references.

Language: English

Descriptors: Pennsylvania; Cabt; Nitrogen; Nitrates;
Application to land; Movement in soil; Losses from soil; Water
budget; Precipitation; Groundwater; Manures; Fertilizers;
Hydrology; Groundwater pollution

Abstract: Nitrogen inputs to, and outputs from, a 55-acre
site in Lancaster County, Pennsylvania, were estimated to
determine the pathways and relative magnitude of loads of
nitrogen entering and leaving the site, and to compare the
loads of nitrogen before and after the implementation of
nutrient management. Inputs of nitrogen to the site were
manure fertilizer, commercial fertilizer, nitrogen in
precipitation, and nitrogen in ground-water inflow; and these
sources averaged 93, 4, 2, and 1 percent of average annual
nitrogen additions, respectively. Outputs of nitrogen from the
site were nitrogen in harvested crops, loads of nitrogen in
surface runoff, volatilization of nitrogen, and loads of
nitrogen in ground-water discharge, which averaged 37, less
than 1, 25, and 38 percent of average annual nitrogen removals
from the site, respectively. Virtually all of the nitrogen
leaving the site that was not removed in harvested crops or by
volatilization was discharged in the ground water.
Applications of manure and fertilizer nitrogen to 47.5 acres
of cropped fields decreased about 33 percent, from an average
of 22,700 pounds per year (480 pounds per acre per year)
before nutrient management to 15,175 pounds of nitrogen per
year (320 pounds per acre per year) after the implementation
of nutrient management practices. Nitrogen loads in ground-
water discharged from the site decreased about 30 percent,
from an average of 292 pounds of nitrogen per million gallons
of ground water before nutrient management to an average of
203 pounds of nitrogen per million gallons as a result of the
decreased manure and commercial fertilizer applications.
Reductions in manure and commercial fertilizer applications
caused a reduction of approximately 11,000 pounds (3,760
pounds per year; 70 70 pounds per acre per year) in the load
of nitrogen discharged in ground water from the 55-acre site
during the three-year period 1987-1990.

The effects of temporal and spatial variability on monitoring
agricultural nonpoint source pollution.
Johengen, T.H.; Beeton, A.M.
Proceedings: the National RCWP Symposium : 10 years of
controlling agricultural nonpoint source pollution : the RCWP
experience : Sept 13-17, 1992, Orlando, Florida. p. 89-95;

Environmental auditing for nonpoint source pollution control in a region of New South Wales (Australia).
Turner, G.W.; Ruffio, R.M.C.

Environmental concerns associated with livestock, dairy, and poultry production.. Issues for the 1990's, environment
Christensen, L. A.; Krause, Kenneth R.,

Environmental concerns associated with livestock, dairy, and poultry production.. Issues for the 1990's, environment
Christensen, L. A.; Krause, Kenneth R.,
Estimating changes in recreational fishing participation from national water quality policies.

Ribaudo, M.O.; Piper, S.L.
Includes references.

Language: English

Descriptors: Water quality; Water policy; Water pollution; Angling; Participation; Estimation; Models

Abstract: The complete evaluation of the offsite effects of national policies or programs that affect levels of agricultural nonpoint source pollution requires linking extensive water quality changes to changes in recreational activity. A sequential decision model is specified to describe an individual's decisions about fishing. A participation model for recreational fishing that includes a water quality index reflecting regional water quality is developed and estimated as a logit model with national level data. A visitation model for those who decide to fish that also includes the water quality index is estimated using ordinary least squares. The water quality index is found to be significant in the participation model but not in the visitation model. Together, the two models provide a means of estimating how changes in water quality might influence the number of recreation days devoted to fishing. The model is used to estimate changes in fishing participation for the Conservation Reserve Program.

Estimating daily nutrient fluxes to a large Piedmont reservoir from limited tributary data.

Nearing, M.A.; Risse, R.M.; Rogers, L.F.

Language: English

Descriptors: Georgia; Cabt; Lakes; Water quality; Watersheds; Pollution; Land use; Agricultural land; Stream flow; Nitrate nitrogen; Nitrogen; Phosphorus; Chemical oxygen demand; Variation

Abstract: Physically based models of lakes require estimates of daily, spatially varied water and nutrient fluxes into the lake from surrounding watersheds. Often, however, only a selected set of streams are periodically (monthly or biweekly) sampled. The objective of this study was to develop and test a method for estimating daily flux of nutrients into a large reservoir using data from sampling of selected watersheds. Flow rate, nitrate (NO3-N), total nitrogen (TN), soluble
reactive phosphorus (SRP), total phosphorus (TP), and chemical oxygen demand (COD) were measured monthly during 1991 for eight watersheds that feed Lake Lanier in northern Georgia. Daily stream flow in the eight streams was correlated to data from nearby USGS gauged stream stations, and daily nutrient concentrations were related to watershed land use and monthly variation in measured concentrations. Fraction of agricultural land in the watershed (AG) was the only land use parameter that correlated to nonpoint-source loads. Coefficients of determination for linear regressions between AG and NO3-N, TN, SRP, TP, and COD were 0.74, 0.73, 0.47, 0.84, and 0.52, respectively. The relationships were tested on an independent data set consisting of two samples from 19 additional streams. Coefficients of determination ($r^2$) between measured and predicted data for the independent test data was 0.77, 0.52, 0.66, 0.64, 0.69, and 0.76 for stream flow, NO3-N, TN, SRP, TP, and COD, respectively. Percentages of nutrient loads attributable to nonpoint-source loads ranged between 76% for TN to 92% for TP and COD, whereas those attributable to agricultural nonpoint source were about 15% for COD, 28% for TN, 34% for NO3-N, 40% for TP, and 70% for SRP.


Language: English

Descriptors: Forest management; Water pollution; Water composition and quality; Clearcutting; Silviculture


Language: English

Descriptors: Maryland; Cabt; Cooperative extension service; Volunteers; Environmental education; Educational programs; Water quality; Water pollution; Fertilizers; Runoff; Mass media; Extension education; Technology transfer

52 NAL Call. No.: 290.9 Am32T Evaluation of GLEAMS and PRZM for predicting pesticide leaching under field conditions. Zacharias, S.; Heatwole, C.D.
Abstract: Pesticide simulation models, GLEAMS and PRZM, were evaluated for their ability to predict pesticide behavior using field data from a plot under no-till corn in the Coastal Plain region of Virginia. The models were evaluated in an uncalibrated mode as well as with adjustment of important hydrology parameters. The evaluation of model performance was based on graphical displays and statistical measures. Difference in evapotranspiration (ET) predictions by the two models caused the simulated results from their hydrology components to vary. Runoff and soil moisture measured in the field were predicted reasonably well after adjusting important hydrology parameters. Except for differences in magnitude, both models predicted the chemical concentration profiles similarly. Overall, GLEAMS represented pesticide behavior in soil better than PRZM. The models, GLEAMS and PRZM, performed well in predicting pesticide mass in the root zone, but were less reliable in predicting pesticide concentration distributions in soil. Model predictions of pesticide fate and transport were not greatly affected by changes in curve number and the water holding capacity of the soil.

53 NAL Call. No.: HD1761.A1M5 no.90-62
An evaluation of options for micro-targeting acquisition of cropping rights to reduce nonpoint source water pollution.
Kozloff, Keith
St. Paul, Minn. : University of Minnesota, Institute of Agriculture, Forestry and Home Economics; 1990.

Language: English

54 NAL Call. No.: 290.9 AM3Ps (IR)
Evaluation of runoff and erosion models.
Wu, T.H.; Hall, J.A.; Bonta, J.V.

Language: English

Descriptors: Erosion; Runoff; Sediment yield; Measurement; Simulation models
Evaluation of the accuracy and precision of annual phosphorus load estimates from two agricultural basins in Finland.
Rekolainen, S.; Posch, M.; Kamari, J.; Ekholm, P.
Includes references.

Language: English

Descriptors: Finland; Agricultural land; Drainage; Runoff; Pollution; Phosphorus; Transport processes; Flow; Estimates; Sampling; Frequency; Monitoring; Mathematical models; Comparisons

Abstract: The accuracy and precision of phosphorus load estimates from two agricultural drainage basins in western Finland were evaluated, based on continuous flow measurements and frequent flow-proportional sampling of total phosphorus concentration during a 2 year period. The objective was to compare different load calculation methods and to evaluate alternative sampling strategies. An hourly data set of concentrations was constructed by linear interpolation, and these data were used in Monte Carlo runs for producing replicate data sets for calculating the accuracy and precision of load estimates. All estimates were compared with reference values computed from the complete hourly data sets. The load calculation methods based on summing the products of regularly sampled flows and concentrations produced the best precision, whereas the best accuracy was achieved using methods based on multiplying annual flow by flow-weighted annual mean concentration. When comparing different sampling strategies, concentrating sampling in high runoff periods (spring and autumn) was found to give better accuracy and precision than strategies based on regular interval sampling throughout the year. However, the best result was obtained by taking samples flow-proportionally within the highest peak flows plus additional regular interval (e.g. biweekly) samples outside these flow peaks. Using this strategy, which calls for automatic sampling equipment, accuracies better than 5% and precisions better than 10% can be achieved with only 30-50 samples per year.

Extending the RCWP knowledge base to future nonpoint source control projects. Robillard, P.D.

Language: English

Descriptors: U.S.A.; Water quality; Pollution control

Language: English

Descriptors: U.S.A.; Cabt; Canada; Cabt; Water pollution; Streams; Water quality; Forest influences; Forest management

Abstract: Forest management activities may substantially alter the quality of water draining forests, and are regulated as nonpoint sources of pollution. Important impacts have been documented, in some cases, for undesirable changes in stream temperature and concentrations of dissolved oxygen, nitrate-N, and suspended sediments. We present a comprehensive summary of North American studies that have examined the impacts of forest practices on each of these parameters of water quality. In most cases, retention of forested buffer strips along streams prevents unacceptable increases in stream temperatures. Current practices do not typically involve addition of large quantities of fine organic material to streams, and depletion of streamwater oxygen is not a problem; however, sedimentation of gravel streambeds may reduce oxygen diffusion into spawning beds in some cases. Concentrations of nitrate-N typically increase substantially after forest harvesting and fertilization, but only a few cases have resulted in concentrations approaching the drinking-water standard of 10 mg of nitrate-N/L. Road construction and harvesting increase suspended sediment concentrations in streamwater, with highly variable results among regions in North America. The use of best management practices usually prevents unacceptable increases in sediment concentrations, but exceptionally large responses (especially in relation to intense storms) are not unusual.

Forest water quality protection: a comparison of regulatory and voluntary programs.

Language: English

Descriptors: Maryland; Virginia; Forests; Water quality; Legislation; Resource conservation

Forestry's role in clean water.
Strickler, J.K.

Language: English
Descriptors: Kansas; Water quality; Forestry; Riparian forests

Freshwater wetlands, urban stormwater, and nonpoint pollution control a literature review and annotated bibliography., 2nd ed., rev. and updated.. Stockdale, Erik C.
Washington (State), Dept. of Ecology

Language: English
Descriptors: Wetlands; Urban runoff; Water; Water quality management

GIS-based watershed rankings for nonpoint pollution in Pennsylvania. Hamlett, J.M.; Petersen, G.W.; Russo, J.; Miller, D.A.; Baumer, G.M.; Day, R.L.

Language: English
Descriptors: Pennsylvania; Watersheds; Water pollution; Information systems

Ground water contamination from agricultural sources: implications for voluntary policy adherence from Iowa and Virginia farmers' attitudes. Halstead, J.M.; Padgitt, S.; Batie, S.S.
Greenbelt, Md. : Institute for Alternative Agriculture; 1990.

Language: English
Descriptors: Iowa; Virginia; Groundwater pollution; Contamination; Agricultural chemicals; Dairy wastes; Water quality; Farmers' attitudes; Questionnaires; Interviews; Farm management; Public opinion; Risk; Health hazards; Environmental impact; Economic impact; Crop production; Dairy farming; Agricultural policy; Programs; Incentives
Abstract: Contamination of ground water from agricultural sources has been documented in a majority of the contiguous United States. In this study, we examine the potential for voluntary adoption of management practices that reduce risk of ground water contamination and discuss how farm operators' attitudes regarding the environment might affect the success of voluntary programs. Farmers' behavior and attitudes in Rockingham County, Virginia, and Big Spring Basin, Iowa, reveal that both groups consider the ground water issue to be a serious problem to which they are contributing. This awareness is a significant first step in prompting consideration of management practices that reduce the threat to ground water quality. We also found that the worst offenders—that is, farmers applying nitrogen well above agronomic recommendations—were those with the least concern about the problem. If major shifts in farming practices are to occur voluntarily, major incentives or disincentives are needed. Even though the concern about ground water quality is high, the documented risks perceived by farmers are not strongly convincing. The economic incentives for change are questionable at best. Voluntary adoption of best management practices is only one of several policy options. Ultimately, policies designed to reduce ground water contamination may need a mix of strategies, including economic incentives and disincentives, zoning and land use restrictions, environmental regulations, and bans on agricultural chemicals.

63 NAL Call. No.: S590.C63
Ground water nonpoint source management in Nebraska.
Link, M.
Language: English
Descriptors: Nebraska; Groundwater pollution; Programs; State government; Water quality; Nitrate; Contamination

64 NAL Call. No.: 292.8 W295
Groundwater as a nonpoint source of atrazine and deethylatrazine in a river during base flow conditions.
Squillace, P.J.; Thurman, E.M.; Furlong, E.T.
Language: English
Descriptors: Iowa; Cabt; Atrazine; Metabolites; Groundwater;
River water; Rivers; Discharge; Water flow; Aquifers; Water pollution

Abstract: Alluvial groundwater adjacent to the main stem river is the principal nonpoint source of atrazine and deethylatrazine in the Cedar River of Iowa after the river has been in base flow conditions for 5 days. Between two sites along a 116-kin reach of the Cedar River, tributaries contributed about 25% of the increase in the atrazine and deethylatrazine load, whereas groundwater from the alluvial aquifer contributed at least 75% of the increase in load. Within the study area, tributaries aggregate almost all of the discharge from tile drains, and yet the tributaries still only contribute 25% of the increase in loads in the main stem river. At an unfarmed study site adjacent to the Cedar River, the sources of atrazine and deethylatrazine in the alluvial groundwater are bank storage of river water and groundwater recharge from areas distant from the river. Atrazine and deethylatrazine associated with bank storage water will provide larger concentrations to the river during early base flow conditions. After the depletion of bank storage, stable and smaller concentrations of atrazine and deethylatrazine, originating from groundwater recharge, continue to be discharged from the alluvial aquifer to the river; thus these results indicate that alluvial aquifers are an important nonpoint source of atrazine and deethylatrazine in rivers during base flow.

Groundwater discharge and its impact on surface water quality in a Chesapeake Bay inlet.
Reay, W.G.; Gallagher, D.L.; Simmons, G.M. Jr
Bethesda, Md. : American Water Resources Association; 1992
Nov. Includes references.

Language: English

Descriptors: Virginia; Groundwater; Discharge; Surface water; Interactions; Sediment; Seepage; Nitrogen; Phosphorus; Agricultural land; Land use; Water quality; Water pollution; Estuaries; Seasonal fluctuations

Abstract: Surface water, groundwater, and groundwater discharge quality surveys were conducted in Cherrystone Inlet, on Virginia's Eastern Shore. Shallow groundwater below agricultural fields had nitrate concentrations significantly higher than inlet surface waters and shallow groundwater underlying forested land. This elevated nitrate groundwater discharged to adjacent surface waters. Nearshore discharge rates of water across the sediment-water interface ranged from 0.02 to 3.69 liters. m-2.hr-1 during the surveys. The discharge was greatest nearshore at low tide periods, and decreased markedly with increasing distance offshore. Vertical hydraulic heads, Eh, and inorganic nitrogen flux in the sediments followed similar patterns. Nitrate was the
predominant nitrogen species discharged nearshore adjacent to agricultural land use, changing to ammonium farther offshore. Sediment nitrogen fluxes were sufficient to cause observable impacts on surface water quality; nitrate concentrations were up to 20 times greater in areas of groundwater discharge than in the main stem inlet water. Based on DIN:DIP ratios, nitrogen contributions from direct groundwater discharge and tidal creek inputs appear to be of significant ecological importance. This groundwater discharge links land use activity and the quality of surface water, and therefore must be considered in selection of best management practices and water quality management strategies.


Language: English
Descriptors: Groundwater; Groundwater pollution; Models; Agricultural chemicals; Leaching


Language: English
Descriptors: Water; Coastal zone management; Marine pollution; Nonpoint source pollution


Language: English
Abstract: A hydrologic investigation to determine vertical and seasonal variation of atrazine, alachlor, cyanazine, and nitrate at one location and to relate the variation to ground-water movement in the Iowa River alluvium was conducted in Iowa County, Iowa, from March 1986 to December 1987. Water samples were collected at discrete intervals through the alluvial sequence from the soil zone to the base of the aquifer. Alachlor, atrazine, and cyanazine were detected most frequently in the soil zone but also were present in the upper part of the alluvial aquifer. Alachlor was detected sporadically, whereas, atrazine, cyanazine, and nitrate were present throughout the year. In the alluvial aquifer, the herbicides generally were not detected during 1986 and were present in detectable concentrations for only a short period of time in the upper 1.6 meters of the aquifer during 1987. Nitrate was present throughout the alluvium and was stratified in the alluvial aquifer. The largest nitrate concentrations were detected in the middle part of the aquifer. Nitrate concentrations were variable only in the upper 2 meters of the aquifer. Vertical movement of herbicides and nitrate in the soil correlated with precipitation and degree of saturation. A clay layer retarded vertical movement of atrazine but not nitrate from the soil layer to the aquifer. Vertical movement could not account for the chemical variation in the alluvial aquifer.
Abstract: The hydrologic responses from an agricultural watershed in southeast Nebraska were investigated under an array of physiographic, hydrologic, meteorologic, and management conditions. For analytical purposes, the hydrologic responses were narrowed to include only runoff and sediment yield. The study was performed by utilizing the ANSWERS (Area Nonpoint Source Watershed Environment Response Simulation) hydrologic-simulation model. Results of this study indicate that, generally, nonstructural (agronomic) Best Management Practices (BMPs) have a more significant impact in controlling erosion and nonpoint-source pollution than structurally oriented BMPs. The percentage of reduction in average soil loss as a result of changing tillage systems from conventional to chisel plow was in the mid-40s. The corresponding percentages of reduction in sediment yield from the watershed under minimum tillage and no-till systems were in the mid-60s and mid-80s, respectively. The impact of these management strategies on runoff varied considerably. That is primarily based on the watershed's antecedent soil moisture condition, land use, and the growth stage of crops. Generally, an intense, short, thunderstorm type of rainfall event had more relative impact on runoff, and therefore sediment yield than a long, gentle, and steady event.

Language: English

Descriptors: Pollution; Runoff water; Water quality; Waste water

73 NAL Call. No.: S601.A34

Language: English

Descriptors: Virginia; Agricultural land; Hapludults; Silt loam soils; Nitrogen; Losses from soil systems; Sediment; Runoff; Water pollution; No-tillage; Tillage; Nitrogen fertilizers; Subsurface application; Application methods; Artificial precipitation; Rain; Yields; Nitrate nitrogen; Ammonium nitrogen; Kjeldahl method; Eutrophication; Surface water; Movement in soil

74 NAL Call. No.: S590.C63

Language: English

Descriptors: Glycine max; Cropping systems; Tillage; Conservation tillage; Herbicides; Losses from soil; Runoff; Water pollution

75 NAL Call. No.: S494.5.S86S8

Language: English

Descriptors: Virginia; Groundwater pollution; Nitrates; Stochastic models; Stochastic programming; Agricultural policy; Costs
The importance of precise rainfall inputs in nonpoint source pollution modeling.

Language: English

Descriptors: Ontario; Agricultural wastes; Losses from soil; Models; Pollutants; Rain; Soil properties

Abstract: Rainfall data provide a prime input in nonpoint source pollution (nps) modeling. The sensitivity of model outputs to variations in the time step selected for rainfall data has been explored for two nps models, a field-scale continuous model, and an event-based watershed-scale model, for the temperate climatic conditions of Southern Ontario, Canada. This study has revealed that model outputs regarding runoff, soil loss and sediment yield, and calibrated parameters representing soil hydraulic properties and erosion characteristics are extremely sensitive to small variations in the rainfall time step. Model users must use caution therefore to take these variations into account during the calibration and application of such models.


Language: English

Descriptors: Atrazine; Metolachlor; Water pollution; Subsurface drainage


Language: English
Language: English

Land use and incentive schemes for nonpoint pollution control in a spatial equilibrium setting.
Graham-Tomasi, Theodore
St. Paul, Minn. : University of Minnesota, Institute of Agriculture, Forestry and Home Economics; 1990.
31 p. ; 28 cm. (Staff paper P ; 90-31). April 1990. Includes bibliographical references (p. 31).
Language: English

Land use and nonpoint source phosphorus pollution in the Tualatin Basin, Oregon a literature review. A literature review : land use and nonpoint phosphorus pollution in the Tualatin Basin, Oregon
Wolf, Donald W.
Oregon State University, Water Resources Research Institute, Oregon State University, Extension Service
Language: English; English

Land use change in California, USA: nonpoint source water quality impacts. Charbonneau, R.; Kondolf, G.M.
Includes references.

Language: English

Descriptors: California; Land use; Water quality; Environmental impact; Erosion; Land diversion; Farmland; Watershed management; Water pollution

83


Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Water quality; Pollution control; Monitoring; Legislation; Programs; State government; Federal government

Abstract: Recent federal legislation strengthened nonpoint source pollution regulations and helped to support and standardize pollution control efforts. A comprehensive review of current state and federal programs for forest areas reveals a substantial increase in agency water quality protection activities. These new efforts emphasize monitoring to assess the use and effectiveness of best management practices (BMPs). Recent monitoring reveals that BMP use is increasing and that such use typically maintains water quality within standards. However, information is generally lacking about the cost effectiveness of BMP programs. Carefully designed and executed monitoring is the key to better specification of BMPs and more cost effective water quality protection.

84


Language: English

Descriptors: Agriculture; Sustainability; Environmental impact; Soil conservation; Water conservation

85

Managing agricultural chemicals in groundwater.
Jones, R.L.

Managing agricultural phosphorus for protection of surface waters: issues and options.

Abstract: The accelerated eutrophication of most freshwaters is limited by P inputs. Nonpoint sources of P in agricultural runoff now contribute a greater portion of freshwater inputs, due to easier identification and recent control of point sources. Although P management is an integral part of profitable agrisystems, continued inputs of fertilizer and manure P in excess of crop requirements have led to a build-up of soil P levels, which are of environmental rather than agronomic concern, particularly in areas of intensive crop and livestock production. Thus, the main issues facing the establishment of economically and environmentally sound P management systems are the identification of soil P levels that are of environmental concern; targeting specific controls for different water quality objectives within watersheds; and balancing economic with environmental values. In developing effective options, we have brought together agricultural and
limnological expertise to prioritize watershed management practices and remedial strategies to mitigate nonpoint-source impacts of agricultural P. Options include runoff and erosion control and P-source management, based on eutrophic rather than agronomic considerations. Current soil test P methods may screen soils on which the aquatic bioavailability of P should be estimated. Landowner options to more efficiently utilize manure P include basing application rates on soil vulnerability to P loss in runoff, manure analysis, and programs encouraging manure movement to a greater hectareage. Targeting source areas may be achieved by use of indices to rank soil vulnerability to P loss in runoff and lake sensitivity to P inputs.


Language: English

Descriptors: Pollution; Agriculture; Simulation models; Geographical information systems; Computer software; Prediction

Abstract: This study documents the development of a link between a geographical information system (GIS) and a non-point source pollution model. The GIS ARC/INFO was linked to the agricultural non-point source pollution model and ORACLE data sources. Application of the system is demonstrated using the Bedford-Ouse catchment as a suitable case study. Water quality impacts are predicted from source data describing topography, soils, land use and river network. The model results were in agreement with observed nitrate concentrations at the catchment outlet, and more appropriate data sources are considered to be the main priority for improving model predictive ability. Management scenarios were established to assess the impact of changing agricultural management practices on predicted water quality. The approach has significant potential for the management of agricultural pollution in the UK.


Language: English
Marginal cost effectiveness analysis for agricultural nonpoint source water quality control.

Walker, D.J.; Calkins, B.L.; Hamilton, J.R.

Language: English

Descriptors: Water quality; Water pollution; Pollution control; Sediment; Marginal analysis; Cost effectiveness analysis; Farm management; Furrow irrigation; Return flow

Market and bargaining approaches to nonpoint source pollution abatement problems.

Netusil, N.R.; Braden, J.B.

Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Sources; Agricultural land; Erosion; Sediment yield; Erosion control; Costs; Contracts; Marketing techniques

Maryland farmers' adoption of best management practices for nonpoint source pollution control.

Lichtenberg, E.; Lessley, B.V.; Howar, H.D.

Language: English

Descriptors: Maryland; Water pollution; Water quality; Farm management; Runoff; Soil chemistry; Cost analysis
Metamodels and nonpoint pollution policy in agriculture.
Bouzaher, A.; Lakshminarayan, P.G.; Cabe, R.; Carriquiry, A.;
Gassman, P.W.; Shogren, J.F.
Includes references.

Language: English

Descriptors: Herbicides; Agricultural chemicals; Groundwater;
Surface water; Water pollution; Water quality; Simulation
models; Statistical analysis

Abstract: Complex mathematical simulation models are
generally used for quantitative measurement of the fate of
agricultural chemicals in soil. But it is less efficient to
use them directly for regional water quality assessments
because of the large number of simulations required to cover
the entire region and because the entire set of simulation
runs must be repeated for each new policy. To make regional
water quality impact assessment on a timely basis, a
simplified technique called metamodeling is suggested. A
metamodel summarizes the input-output relationships in a
complex simulation model designed to mimic actual processes
such as groundwater leaching. Metamodels are constructed and
validated to predict groundwater and surface water
concentrations of major corn and sorghum herbicides in the
Corn Belt and Lake States regions of the United States. The
usefulness of metamodeling in the evaluation of agricultural
nonpoint pollution policies is illustrated using an integrated
environmental economic modeling system. For the baseline
scenario, we estimate that 1.2% of the regional soils will
lead to groundwater detection of atrazine exceeding 0.12
micrograms/L, which compares well with the findings of an
Environmental Protection Agency monitoring survey. The results
suggest no-till practices could significantly reduce surface
water concentration and a water quality policy, such as an
atrazine ban, could increase soil erosion despite the
conservation compliance provisions.
Microtargeting the acquisition of cropping rights to reduce nonpoint source water pollution.
Kozloff, K.; Taff, S.J.; Wang, Y.
Language: English
Descriptors: Minnesota; Agricultural land; Land use; Land management; Watersheds; Water pollution; Water quality; Erosion; Sediment yield; Simulation models; Cost effectiveness analysis

Abstract: Targeting cropland retirement programs to reduce agricultural nonpoint source pollution is accomplished by employing disaggregated information about physical and economic factors that influence the benefits and costs of adopting specific erosion control practices on specific land parcels. The agricultural nonpoint source (AGNPS) model is used in a Minnesota watershed to simulate the relative effectiveness of alternative targeting schemes with respect to budget outlays for annual payments to landowners, reduction in downstream sediment yield and nutrient loss, and reduction in on-site erosion. Cost-effectiveness increased with information on economic factors (the opportunity cost of retiring a parcel of land) as well as on physical factors (contribution of a parcel to downstream sediment yield). The marginal cost-effectiveness of all schemes decreased as the enrolled proportion of watershed land increased.
pollution

Mitigating nonpoint-source nitrate pollution by riparian-zone denitrification. Schipper, L.A.; Cooper, A.B.; Dyck, W.J.

Language: English

Descriptors: Nitrate; Nitrate fertilizers; Water pollution; Runoff; Drainage; Denitrification; Denitrifying microorganisms; Lakes; Rivers; Surface water; Soil types (ecological)

Modeling linked watershed and lake processes for water quality management decisions.
Summer, R.M.; Alonso, C.V.; Young, R.A.

Language: English

Descriptors: Watersheds; Lakes; Agricultural land; Simulation models; Water quality; Sediment; Nitrogen; Phosphorus; Chlorophyll; Wetlands; Watershed management; Weather; Trends; Farming systems

Abstract: A physically based modeling approach is used to link watershed with lake processes and to simulate their responses to land management and weather conditions. Components of the watershed model, AGNPS (agricultural nonpoint-source model), are hydrology, erosion, sediment transport, transport of nitrogen and phosphorus, and chemical oxygen demand. Using a cellular structure, runoff, sediment, and chemical variables from the watershed provide input to a lake model. This one-dimensional model of water bodies simulates temperature stratification, mixing by wind, sedimentation, inflow density current, and algal growth. Unsteady advection-diffusion equations characterize the dynamics of suspended sediment, soluble and sediment-attached N and P, and chlorophyll. This model, AGNPS-LAKE, is driven by random generation of weather conditions on a daily basis. Resulting impacts of alternative management plans are simulated by changing agricultural practices and land use, thereby modifying inflow characteristics to a lake. Modeling capabilities are being tested on eutrophic lakes in Minnesota
for the purpose of simulating long-term trends and impacts of best management practices.

NAL Call. No.: aS21.R44A7

Language: English
Descriptors: Runoff water; Agricultural chemicals; Sediment; Nutrients; Pesticides; Models; Hydrology

NAL Call. No.: TD1.E2 no.91/039

Language: English
Descriptors: Water

NAL Call. No.: 290.9 AM3PS (IR)

Language: English
Descriptors: U.S.A.; Groundwater; Groundwater pollution; Pollutants; Movement in soil; Transport processes; Seepage; Soil water content; Simulation; Probabilistic models; Deterministic models; Comparisons

NAL Call. No.: SB482.A4U55 1994
National Park Service activities outside park borders have caused damage to resources and will likely cause more : report to the chairman, Subcommittee on National Parks, Forests, and Public Lands, Committee on Natural Resources, House of Representatives.. Activities outside park borders have caused damage to resources and will likely cause more

Language: English; English

Descriptors: Nonpoint source pollution; Water quality; Watershed management


Language: English

Descriptors: Nebraska; Nitrate; Nitrate fertilizers; Groundwater pollution; Groundwater recharge; Farmland; Simulation models

Nonpoint pollution from animal sources and shellfish sanitation. Stelma, G.N. Jr; McCabe, L.J.
Literature review. Includes references.
Language: English
Descriptors: Shellfish; Food sanitation; Water pollution; Fecal flora; Epidemiology; Foodborne diseases; Literature reviews; Zoonoses

Abstract: Many of the microorganisms pathogenic to both animals and man are transmitted via the fecal-oral route. Most of these pathogens could conceivably be transmitted through a shellfish vector. Bacteria potentially transmitted from animal to man via shellfish include most of the salmonellae. Yersinia enterocolitica, Yersinia pseudotuberculosis, Escherichia coli 0157:H7, Campylobacter jejuni, and Listeria monocytogenes. The protozoa most likely to be transmitted this way are Giardia lamblia and Cryptosporidium spp. Because the enteric viruses are highly species-specific, they are not likely to be transmitted from animals to humans. There are environmental data showing that bacterial pathogens shed by both domestic and wild animals have been isolated from shellfish. However, there is little epidemiological evidence that illness outbreaks have been caused by shellfish harvested from waters polluted by animals. Unfortunately, epidemiological observations are of limited value because most illnesses are probably not recorded. In addition, more than half of the recorded outbreaks are of unknown etiology, and more than half of the shellfish implicated in illness outbreaks cannot be traced to their points of origin. More lenient bacteriological standards should not be established for waters affected only by animal pollution until health effects studies have been performed, and an indicator that differentiates between human and nonhuman fecal pollution is available. Most of the pollution that originates from domestic animals could be eliminated by simple and inexpensive measures.
109 NAL Call. No.: TD420.A1P7
Nonpoint source evaluation for shellfish contamination in the Santa Barbara Channel.
Kolb, H.E.; LaBuddle, G.
Language: English
Descriptors: California; Cabt; Shellfish; Microbial contamination; Pollution; Sources; Water pollution

110 NAL Call. No.: TD424.8.N65
Terrene Institute
Washington, D. C. : Terrene Institute,; 1993-19999. v. ; 28 cm. Description based on: #29 (May 1993); title from caption.
Language: English; English
Descriptors: Nonpoint source pollution; Water quality; Watershed management

111 NAL Call. No.: TD420.A1P7
Nonpoint source (NPS) pollution modeling using models integrated with geographic information systems (GIS).
Language: English
Descriptors: U.S.A.; Cabt; Pollution; Sources; Watersheds;
Nonpoint source phosphorus loads to Delaware's lakes and streams. Ritter, W.F.
New York, N.Y. : Marcel Dekker; 1992 May.
Language: English
Descriptors: Delaware; Lakes; Rivers; Water pollution; Phosphorus; Watersheds; Farmland; Forest soils

Nonpoint source pollution.. Nonpoint source Doyle, Paul; Morandi, Larry B.
Language: English; English
Descriptors: Water quality management; Water, Underground; Water

Language: English
Descriptors: Illinois; CAbb; Erosion; Carbon; Nutrient balance; Rotations; Water pollution; No-tillage; Alternative farming; Innovation adoption; Simulation models; Zea mays; Glycine max; Crop yield; Nitrogen; Phosphorus; Runoff

Nonpoint source pollution model for agricultural watersheds. Borah, D.K.; Ashraf, M.S.

Language: English; English

Descriptors: Water; Water, Underground; Agricultural pollution; Agriculture


Language: English

Descriptors: Water quality; Water quality management; Water

119 NAL Call. No.: TD419.R47
Nonpoint sources.
Spooner, J.; Coffey, S.W.; Brichford, S.L.; Arnold, J.A.; Smolen, M.D.; Jennings, G.D.; Gale, J.A.

Language: English
Descriptors: Water pollution; Groundwater; Surface water; Land use; Activity; Agricultural land; Forest soils; Urban areas; Economics; Planning; Water quality; Water resources; Models; Reviews

120 NAL Call. No.: TD419.R47
Nonpoint sources.
Line, D.E.; Osmond, D.L.; Coffey, S.W.; Arnold, J.A.; Gale, J.A.; Spooner, J.; Jennings, G.D.

Language: English
Descriptors: Water pollution; Soil pollution; Water quality; Water resources; Pollutants; Pesticides; Biodegradation; Pollution control; Models; Monitoring; Literature reviews

121 NAL Call. No.: S671.A66
Nutrient losses through tile drains from two potato fields.
Madramootoo, C.A.; Wiyo, K.A.; Enright, P.

Language: English
Descriptors: Quebec; Solanum tuberosum; Agricultural soils; Tile drainage; Nutrients; Losses from soil; Water pollution; Water quality
Abstract: Two tile-drained potato (Solanum tuberosum L.) fields, approximately 5 ha (12.35 ac) each, at St. Leonard d’Aston, Quebec, were instrumented to measure tile drain flow over two growing seasons (April to November). The soil type was a St. Jude sandy loam. Nitrogen (N), phosphorus (P), and...
potassium (K) concentrations in tile drain flow were monitored throughout the growing seasons. Nitrogen concentrations ranging from 1.70 to 40.02 mg/L were observed. Phosphorus concentrations ranged from 0.002 to 0.052 mg/L. On one field, it was found that K concentrations were always less than 10 mg/L. However, on the other field, concentrations were mostly greater than 10 mg/L. At the end of the growing season, in the final year of the project, the total amounts of N which were removed by the subsurface drainage systems of the two fields were 14 kg/ha (12.5 lb/ac) and 70 kg/ha (62.5 lb/ac).
Partitioning solute transport between infiltration and overland flow under rainfall.

Havis, R.N.; Smith, R.E.; Adrian, D.D.


Includes references.

Language:  English

Descriptors: Pollutants; Solutes; Transport processes; Infiltration; Overland flow; Rain; Surface water; Soil depth; Interactions; Mathematical models; Field experimentation

Abstract: Solute transport from soil to overland flow is an important source of nonpoint pollution and was investigated through tracer studies in the laboratory and at an outdoor laboratory catchment. The depth of surface water interaction with soil, defined as the mixing zone is a useful value for approximate estimation of potential solute transport into surface water under rainfall. It was measured in the laboratory for a noninfiltration case (0.90 to 1.0 cm) and estimated through mass balance modeling for an infiltration case (0.52 and 0.73 cm). At an outdoor laboratory catchment, mixing zones were calculated through calibration of a numerical model that describes unsteady, uniform, infiltration and chemical transport. Overland flow was simulated using kinematic wave theory. Mixing zone depths ranged from 0.47 to 1.02 cm and were a linear function of rainfall intensity. Also, the fraction of solute present in the mixing zone at the time of ponding which was extracted into overland flow was a linear function of the initial soil moisture content. A steady state analytical approximation of the solute transport model was also developed which overpredicted solute transport into overland flow by 1 to 60%.

Patterns of periphyton chlorophyll a in an agricultural nonpoint source impacted stream.

Delong, M.D.; Brusven, M.A.


Includes references.

Language:  English

Descriptors: Idaho; Streams; Water pollution; Agriculture; Nutrients; Pollutants; Algae; Chlorophyll

Abstract: An agricultural nonpoint source polluted stream in northern Idaho was examined to determine seasonal and longitudinal patterns of periphyton chlorophyll alpha. Chlorophyll alpha was measured at eight sites along Lapwai
Creek, a fifth order stream impacted by agricultural runoff containing nutrients and eroded soils. Seasonally, periphyton chlorophyll alpha was lowest in the spring (cumulative x(−) = 60.4 mg m(−2)) and highest in the summer (cumulative average = 222 mg m(−2)). Winter concentrations were higher than expected (cumulative average = 168.6 mg m(−2)). The headwaters, flowing through an open grassy meadow, had the lowest concentrations of the study (two-year average = 49.7 mg m(−2)). Immediately below a small, eutrophic reservoir, periphyton chlorophyll alpha increased markedly (two-year average = 155.8 mg m(−2)) and remained high through a deep canyon (two year average = 135.5 mg m(−2)) and down to the mouth of the stream (two-year average = 172.3 mg m(−2)). Periphyton chlorophyll alpha in Lapwai Creek was at least two times greater than values reported in the literature for comparable, undisturbed Idaho streams. We suggest that increased nutrient concentrations via agricultural nonpoint source pollution and increased light penetration from the removal of large, woody riparian vegetation have resulted in high periphyton chlorophyll alpha along the continuum of Lapwai Creek.
diazinon, dibromochloropropane, 1,2-dibromoethane, dicamba, 1,2-dichloropropane, diuron, prometon, prometryn, propazine and simazine. All are soil applied except diazinon. Pesticide leaching is dependent on use patterns, soil texture, total organic carbon in soil, pesticide half-life and depth to water table. Leaching is enhanced by flood-irrigation methods except where the pesticide is foliar applied such as diazinon. Soils in the western San Joaquin Valley are fine grained and are derived primarily from marine shales of the Coast Ranges. Although shallow ground water is present, the fewest number of pesticides were detected in this region. The fine-grained soil inhibits pesticide leaching because of either low vertical permeability or high surface area; both enhance adsorption on to solid phases. Soils of the valley floor tend to be fine grained and have low vertical permeability. Soils in the eastern part of the valley are coarse grained with low total organic carbon and are derived from Sierra Nevada granites. Most pesticide leaching is in these alluvial soils, particularly in areas where depth to ground water is less than 30 m. The areas currently most susceptible to pesticide leaching are eastern Fresno and Tulare Counties. Tritium in water molecules is an indicator of aquifer recharge with water of recent origin. Pesticide residues transported as dissolved species were not detected in non-tritiated water. Although pesticides were not detected in all samples containing high tritium, these samples are indicative of the presence of recharge water that interacted with agricultural soils.

129 NAL Call. No.: TD420.A1P7
Phosphorus export from nonpoint sources in the Berg River, Western Cape Province, South Africa.
Bath, A.J.; Marais, G.V.R.
Language: English
Descriptors: South Africa; Cabt; River water; Water pollution; Phosphorus; Pollution; Sources; Models

130 NAL Call. No.: QH540.J6
Phosphorus loads from selected watersheds in the drainage area of the Northern Adriatic Sea.
Vighi, M.; Soprani, S.; Puzzarini, P.; Menghi, G.
Language: English
Abstract: The Po Valley is one of the most productive agricultural areas in Europe and P losses from fertilizers are often accused of being among the main factors responsible for eutrophication of the Northern Adriatic Sea. To quantify nonpoint phosphorus loads in this area, 15 small watersheds were studied. Thirteen watersheds were in the intensive agricultural area near the coast and two watersheds were in the forested mountains. Land use in the watersheds was carefully examined and P loads from various sources were theoretically evaluated and experimentally measured. The results indicate fertilization does not increase the losses of P through leaching from the coastal soils, where the measured release were in the range 0.03 to 0.21 kg P/ha per year with a mean value of about 0.1 kg P/ha per year. There is, however, a greater loss of P through soil erosion from the mountain watersheds (0.6 kg/ha per year). It can be concluded that the control of point sources must take priority over nonpoint sources in efforts to reduce accelerated eutrophication of the Northern Adriatic Sea.
Malik, A.S.; Letson, D.; Crutchfield, S.R.
Ames, Iowa : American Agricultural Economics Association; 1993
Language: English

Descriptors: U.S.A.; Cabt; Pollution control; Law enforcement; Costs; Water quality; Trading; Uncertainty; Mathematical models; Ratios

Abstract: In programs for trading pollution abatement between point and nonpoint sources, the trading ratio specifies the rate at which nonpoint source abatement can be substituted for point source abatement. The appropriate value of this ratio is unclear because of qualitative differences between the two classes of sources. To identify the optimal trading ratio, we develop and analyze a model of point/nonpoint trading. We find the optimal trading ratio depends on the relative costs of enforcing point versus nonpoint reductions and on the uncertainty associated with nonpoint loadings. The uncertainty does not imply a lower bound for the optimal trading ratio.

Letson, David; Crutchfield, Stephen R.; Malik, Arun S.
United States, Dept. of Agriculture, Economic Research Service
Language: English

Descriptors: Water quality management; Agricultural pollution; Nonpoint source pollution

Roberts, R.S.; Lighthall, D.R.
Bethesda, Md. : American Water Resources Association; 1991
Language: English

Descriptors: Corn belt of U.S.A.; Iowa; Groundwater pollution; Water quality; Agricultural chemicals; Agricultural production; Water management; Agricultural research; Agricultural policy

Abstract: The growing problem of nonpoint source ground water
contamination from agricultural chemicals is conceptualized as an historical outcome of the production environment of capitalist agriculture in the Corn Belt. Chronic overproduction and ground water contamination reveal different aspects of the same technological treadmill. The debate over Iowa's 1987 Ground Water Protection Act symbolizes the contradiction between popular demand for clean water and structural limits on policymaking. Although the Act does provide for expanded research, education, and monitoring, a coalition of commercial farmers, local chemical dealers, and the national chemical industry defeated a tax on pesticide use. Analysis of alternate policy responses--Best Management Practices (BMPs), cross compliance, site-specific regulation of chemical use, and taxation of synthetic chemicals--reveals that all tend to founder on the same structural constraints.

Without practical, profitable, low-input technologies that farmers, over time, would choose to adopt, both voluntary and regulatory approaches encounter major political or implementation difficulties. The public agricultural research agenda, therefore, emerges as a central control variable for ground water quality management and a central focus for political struggle.

Poplar tree buffer strips grown in riparian zones for biomass production and nonpoint source pollution control.

Licht, Louis Arthur
1990; 1990.
xviii, 173 leaves : ill., maps ; 28 cm. Includes bibliographical references (leaves 166-173).

Language: English

Descriptors: Water quality management; Biomass energy; Soils; Riparian flora

Prababilistic cost effectiveness in agricultural nonpoint pollution control.

McSweeney, W.T.; Shortle, J.S.

Language: English

Descriptors: Virginia; Maize; Soybeans; Wheat; Nitrogen; Pollution by agriculture; Water pollution; Runoff control; Water composition and quality; Farm management; Watersheds; Cost analysis; Tillage; No-tillage; Linear programming; Probabilistic models; Case studies

Abstract: Conceptual weaknesses in the use of costs of average abatement as a measure of the cost effectiveness of agricultural nonpoint pollution control are examined. A
probabilistic alternative is developed. The focus is on methods for evaluating whole-farm pollution control plans rather than individual practices. As a consequence, the analysis is presented in a chance-constrained activity analysis framework because activity analysis procedures are a practical and well developed device for screening farm plans. Reliability of control is shown to be as important as reduction targets in designing farm plans for pollution control. Furthermore, broad-axe prescriptions of technology in the form of Best Management Practices may perform poorly with respect to cost effectiveness.

138 NAL Call. No.: S590.C63
Precision nutrient management--impact on the environment and needs for the future.
Swader, F.; Woodward, M.
New York, N.Y. : Marcel Dekker; 1994.

Language: English
Descriptors: U.S.A.; Cabt; Water quality; Water pollution; Point sources; Pollution control; Nutrients; Management; Application to land; Environmental protection; Profitability; Trends; Regulations; Sustainability

139 NAL Call. No.: TD420.A1P7
Predicting attainable water quality using the ecoregional approach. Schonter, R.; Novotny, V.

Language: English
Descriptors: Wisconsin; Cabt; Water quality; Body water; Protection; Integrated systems; Water resources; Water management; Ecosystems; Prediction; Models

140 NAL Call. No.: 56.8 J822
Preferences of nonpoint source groundwater protection programs by Nebraska's Natural Resources Districts.

Trewhitt, Thomas R.

University of Nebraska--Lincoln thesis : Community and Regional Planning

vi, 131 leaves : ill. ; 28 cm. Includes bibliographical references.

Prescription planning: an approach to nonpoint pollution problems.

Carlson, C.G.; Dean, R.; Lemme, G.


Problem of nonpoint source agricultural water pollution: toward a hypothetical federal legislative solution.

Caulfield, H.P. Jr


Abstract: A conceptual framework of politics is set forth in relation to the federal environmental legislative process. This framework for analysis is then related to a hypothetical public problem--ground water pollution from agricultural chemicals. The public problem from the perspective of political analysis is found to involve several different types
of difficult issues with which the legislative process must
deal if legislation is to be enacted.

144
Language: English
Descriptors: Water quality; Water; Water-supply, Rural

145
Production systems to reduce nonpoint source pollution.
Language: English
Descriptors: Alabama; Poultry manure; Agricultural wastes; Composting; Feed supplements; Pollution; Waste utilization

146
Language: English; English
Descriptors: Coastal zone management; Water; Marine pollution
Quantifying soil erosion for the Shihmen Reservoir watershed, Taiwan. Lo, K.F.A.

Language: English

Descriptors: Taiwan; Cabt; Watersheds; Erosion; Sediment; Nutrients; Flow; Transport processes; Sediment yield; Simulation models

Regional assessment of nonpoint-source pesticide residues in ground water, San Joaquin Valley, California.
Domagalski, Joseph L.; Dubrovsky, N. M.
Geological Survey (U.S.), San Joaquin Valley Drainage Program
v, 64 p.: ill., maps; 28 cm. (Water-resources investigations report; 91-4027 Regional aquifer-system analysis). Includes bibliographical references (p. 38-41).

Language: English

Descriptors: Water, Underground; Pesticides

Edwards, Rick; Partee, Grover; Fleming, Fred

Language: English

Descriptors: Nonpoint source pollution; Watershed management

Regulation and perceived compliance: nonpoint pollution reduction programs in four states.
Floyd, D.W.; MacLeod, M.A.
Bethesda, Md.: Society of American Foresters; 1993 May.

Language: English
The regulation of non-point source pollution under imperfect and asymmetric information.

Cabe, R.; Herriges, J.A.

Abstract: This paper develops a Bayesian framework for discussing the role of information in the design of non-point-source pollution control mechanisms. An ambient concentration tax is examined, allowing for spatial transport among multiple zones. Imposition of the tax requires costly measurement of concentrations in selected zones, and the selection of zones for measurement must be undertaken without perfect information regarding several parameters of the problem. Potentially crucial information issues discussed include: (a) the impact of asymmetric priors regarding fate and transport, (b) the cost of measuring ambient concentration, and (c) the optimal acquisition of information regarding fate and transport.
154 NAL Call. No.: TD223.N36 1992
Research needs and future vision for nonpoint source projects.
Robillard, P.D.; Clausen, J.C.; Flaig, E.G.; Martin, D.M.

Language: English

Descriptors: U.S.A.; Water quality; Pollution control; Water management

155 NAL Call. No.: aS21.R44A7
A review of groundwater models for assessment and prediction of nonpoint-source pollution.
Duffy, C.J.; Kincaid, C.T.; Huyakorn, P.S.

Language: English

Descriptors: Groundwater; Groundwater pollution; Models; Leaching; Assessment

156 NAL Call. No.: TD426.R49 1991
A review of methods for assessing nonpoint source contaminated ground-water discharge to surface water.

Language: English

Descriptors: Water; Water, Underground

157 NAL Call. No.: 1.98 AG84
Reviving the Chesapeake Bay.
Comis, D.
Agricultural research - U.S. Department of Agriculture,
158
NAL Call. No.: HD1750.W4
Risk considerations in the reduction of nitrogen fertilizer use in agricultural production.
Lambert, D.K.

Language: English
Descriptors: Arizona; Cotton; Farm income; Nitrogen fertilizers; Pollution; Economic impact; Application rates; Quantity controls; Production functions; Crop production; Taxes

159
NAL Call. No.: TD420.A1P7
River salination due to non-point contribution of irrigation return flow in the Breede River, Western Cape Province, South, Africa.
Flugel, W.A.

Language: English
Descriptors: South Africa; Cabt; River water; Salinization; Pollution; Sources; Irrigation; Irrigation systems; Return flow

160
NAL Call. No.: TD224.W6L56 1993
Rural conservation practices for cleaner water.
Linguist, Perry; Korb, Gary; Katona, Juli

Language: English
Descriptors: Agricultural pollution; Nonpoint source pollution
Salicaceae family trees in sustainable agroecosystems.
Licht, L.A.
Ottawa : Canadian Institute of Forestry; 1992 Apr.

Language: English

Descriptors: Iowa; Salicaceae; Populus; Sustainability; Strip cropping; Groundwater; Water quality; Nitrates; Nitrogen; Nutrient uptake; Ecosystems

Abstract: Research at the University of Iowa is testing the ECOLOTREE BUFFER, a prototype wooded buffer strip planted between a creek and row-cropped land with roots grown intentionally deep enough to intersect the near-surface water table. This project demonstrates that Populus spp. trees cultured by using this technique are both ecologically sustaining and productive. Measured data prove that nitrate is removed from near-surface groundwater and that the nitrogen uptake is present as protein in the leaves and the woody stems. The tree's physiological attributes contribute to a harvested value that can "pay its way"; these include fast wood growth, cut-stem rooting, resprouting from a stump, phreatophytic roots, and a high protein content in the leaves. The wooded riparian strip changes the local agroecosystem by reducing fertilizer nutrients causing surface water eutrophication, by diversifying wildlife habitat, by reducing soils erosion caused by wind and water, by diversifying the crop base, by creating an aesthetic addition in the landscape. This idea is a potential technique for managing non-point source pollutants created by modern farming practices.

Language: English

Descriptors: Georgia; Cabt; Coastal plain soils; Agricultural soils; Phosphorus; Losses from soil; Runoff; Water pollution

164 NAL Call. No.: QD241.T6
Septic tank and agricultural non-point source pollution within a rural watershed.

Language: English

Descriptors: Texas; Water pollution; Watersheds; Reservoirs; Rural areas; Septic tank effluent; Pollution by agriculture; Chemical analysis; Ammonia; Phosphates; Fecal coliforms; Streptococcus; Aerial photography

165 NAL Call. No.: aZ5071.N3

Language: English

Descriptors: Simulation models; Agricultural chemicals; Water quality; Bibliographies

166 NAL Call. No.: aZ5071.N3

Language: English

Descriptors: Simulation models; Information systems; Groundwater pollution; Agricultural chemicals; Bibliographies
Simulation of sediment and plant nutrient losses by the CREAMS water quality model.
Yoon, K.S.; Yoo, K.H.; Soileau, J.M.; Touchton, J.T.
Bethesda, Md. : American Water Resources Association; 1992

Language: English

Descriptors: Alabama; Gossypium hirsutum; Conservation tillage; Tillage; Erosion; Runoff; Nitrogen; Phosphorus; Losses from soil; Water quality; Water pollution; Catchment hydrology; Simulation models; Prediction

Abstract: CREAMS was applied to a field-sized watershed planted to cotton in the Limestone Valley region of northern Alabama. The field was cultivated for three years with conventional tillage (CvT) followed by three years of conservation tillage (CsT). CREAMS is composed of three components: hydrology, erosion, and chemistry. Surface runoff and losses of sediment, N and P were simulated and results were compared with the observed data from the watershed. Curve numbers recommended in the CREAMS user's guide were not adequate for the watershed conditions. The hydrology submodel improved runoff simulation from CvT and CsT when field-data based curve numbers were used. The erosion submodel demonstrated that CsT reduced sediment loss more than CvT, even though CsT had higher runoff than CvT. The nutrient submodel based on the simulated runoff and sediment underpredicted N loss for both CvT and CsT. This submodel, however, accurately predicted P loss for CvT, but underpredicted for CsT (50 percent lower than the observed). The results of CREAMS simulation generally matched the observed order of magnitude for higher runoff, lower sediment, and higher N and P losses from CsT than from CvT.
Abstract: A spatial decision support system (SDSS) was developed to assess agricultural nonpoint source (NPS) pollution using an NPS pollution model and geographic information systems (GIS). With minimal user interaction, the SDSS assists with extracting the input parameters for a distributed parameter NPS pollution model from user-supplied GIS base layers. Thus, significant amounts of time, labor, and expertise can be saved. Further, the SDSS assists with visualizing and analyzing the output of the NPS pollution simulations. Capabilities of the visualization component include displays of sediment, nutrient, and runoff movement from a watershed. The input and output interface techniques/algorithms used to develop the SDSS, along with an example application of the SDSS, are described.

Language: English; English

Descriptors: Forest management; Forests and forestry


Language: English

Descriptors: Sustainability; Farming; Farming systems; Natural resources; Use efficiency; Pollution control


Language: English

Descriptors: Ontario; Pollution by agriculture; Erosion; Sedimentation; Losses from soil systems; Erosion control; Soil and water conservation; Sediments; Watersheds; Upland areas; Lowland areas; Computer software


Language: English

Descriptors: Water quality; Pollution

176  NAL Call. No.: 282.9 G7992
Task force findings and recommendations for enhancing Great Plains water quality.
Lacewell, R.D.

Language: English

Descriptors: Northern plains states of U.S.A.; Southern plains states of U.S.A.; Groundwater; Surface water; Water quality; Environmental impact; Water pollution; Water policy

177  NAL Call. No.: 275.9 N213
Teaching soil conservation and non-point source pollution.
Dickinson, W.T.; Rudra, R.P.; Wall, G.J.

Language: English

Descriptors: Agricultural education; Teaching; Soil conservation; Simulation models; Soil pollution

178  NAL Call. No.: TD420.A1P7
Technical guidance for implementing BMPS in the Coastal zone.
Frederick, R.E.; Dressing, S.A.

Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Coastal areas; Technical aid; Guidelines; Pollution; Sources

179  NAL Call. No.: TD224.I2R63  1991
Ten year report.. Rock Creek Rural Clean Water Program final
Terrain analysis: integration into the agricultural nonpoint source (AGNPS) pollution model.
Panuska, J.C.; Moore, I.D.; Kramer, L.A.

Language: English
Descriptors: Terrain; Pollution; Water quality; Erosion; Computer simulation

Three types of approaches to controlling non-point source pollution of agrochemicals from golf links in water resources management. Morioka, T.
Toxicity of sediments containing atrazine and carbofuran to larvae of the midge Chironomus tentans.  
Douglas, W.S.; McIntosh, A.; Clausen, J.C.  
Tarrytown, N.Y. : Pergamon Press; 1993 May.  

A tracking index for nonpoint source implementation projects.  
Dressing, S.A.; Clausen, J.C.; Spooner, J.  

Use of the Black Creek database to analyze techniques for estimating nonpoint source loadings from small watersheds (May 1988).  
Morrison, James; Christensen, Ralph G.  

Using the phosphorus assessment tool in the field.  
Stevens, R.G.; Sobicki, T.M.; Spofford, T.L.  

Language: English

Descriptors: Illinois; Cabt; Watersheds; Pollution; Runoff; Sediment; Erosion; Catchment hydrology; Simulation models; Geographical information systems; Integrated systems; Topography

Abstract: The AGNPS (Agricultural NonPoint Source) model was evaluated for predicting runoff and sediment delivery from small watersheds of mild topography. Fifty sediment yield events were monitored from two watersheds and five nested subwatersheds in East Central Illinois throughout the growing season of four years. Half of these events were used to calibrate parameters in the AGNPS model. Average calibrated parameters were used as input for the remaining events to obtain runoff and sediment yield data. These data were used to evaluate the suitability of the AGNPS model for predicting runoff and sediment yield from small, mild-sloped watersheds. An integrated AGNPS/GIS system was used to efficiently create the large number of data input changes necessary to this study. This system is one where the AGNPS model was integrated with the GRASS (Geographic Resources Analysis Support System) GIS (Geographical Information System) to develop a decision support tool to assist with management of runoff and erosion from agricultural watersheds. The integrated system assists with the development of input GIS layers to AGNPS, running the model, and interpretation of the results.

Language: English; English

Descriptors: Water; Water quality


Language: English

Descriptors: Mississippi; Water quality; Agricultural production; Agricultural land; Environmental impact; Environmental degradation; Water pollution; Pollutants; Sediment; Nutrients; Pesticides; Coliform bacteria; Losses from soil systems; Soil conservation; Water conservation; Erosion control; Runoff; Eutrophication; Animal wastes; Waste treatment; Case studies


Language: English

Descriptors: Water quality; Pollution
192 NAL Call. No.: Z5862.2.W3W38  1993
Water quality effects and nonpoint source control for forestry
an annotated bibliography.
Craig, John
United States, Environmental Protection Agency, Office of
Wetlands, Oceans, and Watersheds, Nonpoint Source Control
Branch, Tetra Tech, inc Washington, DC : Nonpoint Source
Control Branch, Office of Wetlands, Oceans, and Watersheds,
U.S. Environmental Protection Agency;; 1993. ii, 241 p. ; 28
"EPA-841/B-93-005"--Cover.

Language:  English

Descriptors: Water quality; Forests and forestry

193 NAL Call. No.: QH540.J6
Water quality impacts associated with sorghum culture in
Southern Plains. Sharpley, A.N.; Smith, S.J.; Williams, J.R.;
Jones, O.R.; Coleman, G.A. Madison, Wis. : American Society of
Jan. Includes references.

Language:  English

Descriptors: Sorghum bicolor; Nitrogen fertilizers; Phosphorus
fertilizers; Runoff; Sediment; Surface water; Tillage;
Transport processes; Water pollution; Water quality;
Watersheds; Environmental impact; Eutrophication

194 NAL Call. No.: aSD11.A42
Water quality management tools for national and western
nonpoint source control.
Dean, R.
Fort Collins, Colo. : Rocky Mountain Forest and Range
Experiment Station, Forest Service, U.S. Department of
Agriculture; 1993.
General technical report RM / (226): p. 3-7; 1993. In the
series analytic: Riparian management: common threads and
shared interests. Paper presented at a conference on Feb. 4-6,
1993, Albuquerque, New Mexico.

Language:  English

Descriptors: U.S.A.; Cabt; Water pollution; Environmental
policy; Finance; Regulations

195 NAL Call. No.: TC424.M6T43  no.132
Water quality modeling terrain analysis and the agricultural
non-point source pollution (AGNPS) model.. Terrain analysis
and the agricultural non-point source pollution (AGNPS) model
Panuska, John C.; Moore, Ian D.
University of Minnesota, Water Resources Research Center, Geological Survey (U.S.)

Language: English

Descriptors: Water quality management; Agricultural pollution

Zelivka river storage and treatment complex supplying the Prague Agglomeration with drinking water: addressing point and non-point pollution problems. Chour, V.; Holas, J.; Korab, J.; Srba, O.

Language: English

Descriptors: Czechoslovakia; Cabt; River water; Reservoirs; Water pollution; Sources; Eutrophication; Agricultural land

AUTHOR INDEX

Adelman, D. 105
Adrian, D.D. 125
Alonso, C.V. 99
Arnold, J. 111
Arnold, J.A. 45, 119, 120
Ashraf, M.S. 38, 115
Baglio, J.V. 114
Baker, D.B. 127
Baker, J.C. 33
Bath, A.J. 129
Batie, S.S. 62, 75
Bauereis, E.I. 21
Baumer, G.M. 61, 171
Beasley, D.B. 100
Bedient, Philip B., 20
Beeton, A.M. 44
Bengtson, R.L. 77
Bennett, Steve  18
Benson, V.W.  114
Biddix, R.W.  175
Binkley, D.  57, 83
Bogardi, I.  66
Bonta, J.V.  54
Borah, D.K.  38, 115
Bouzaher, A.  93
Braden, J.B.  91
Brichford, S.L.  119
Brodahl, M.K.  140
Brown, D.  83
Brown, S.J.  111
Brown, T.C.  57, 83
Brusven, M.A.  "22, 126
Burbach, M.E.  40, 162
Burt, J.P.  8
Cabe, R.  93, 151
Calkins, B.L.  90
Cardwell, John  71
Carey, A.E.  6
Carlson, C.G.  142
Carochi, J.  85
Carriquiry, A.  93
Carsel, R.F.  78
Carter, C.E.  77
Caulfield, H.P. Jr  143
Chandra, P.  17
Chapra, S.C.  87
Charbonneau, R.  82
Chen, Y.D.  78
Cherryholmes, K.L.  68
Chour, V.  196
Christensen, L. A.  47
Christensen, Ralph G.  185
Clausen, J.C.  154, 183, 184
Clausen, John C.  124
Cockrell, Charles W.  27
Coffey, S.W.  45, 119, 120
Coleman, G.A.  193
Comis, D.  157
Conservation Technology Information Center, United States,
Soil Conservation Center  117
Contant, C.K.  32
Cooper, A.B.  98
Cooper, C.M.  190
Corbett, E.S.  50
Craig, John  192
Crutchfield, S.R.  133
Crutchfield, Stephen R.  134
Cubbage, F.W.  30, 58
Curtis, B.  105
Daniel, T.C.  25, 37, 87, 131
Davie, D.K.  41
Davis, J.G.  163
Day, R.L.  61, 171
Dean, K.  164
Dean, R.  142, 194
Deichert, L.A.  106
Delong, M.D.  22, 126
Detroy, M.G.  68
Dickinson, W.T.  5, 76, 174, 177
Diebel, P.L.  75
Dillworth, M.E.  23
Domagalski, J.L.  128
Domagalski, Joseph L.  148
Donald, J.O.  145
Donigian, Anthony S.  101
Donohue, S.J.  33
Douglas, W.S.  183
Doyle, Paul  113
Dressing, S.A.  178, 184
Dubois, D.  140
Dubrovsky, N. M.  148
Dubrovsky, N.M.  128
Duda, A.M.  2
Duffy, C.J.  155
Duffy, M.D.  32
Dyck, W.J.  98
Eatherall, A.  88
Ebodaghe, Denis Abumere,  1
Edwards, C. A.  7
Edwards, D.R.  25, 37, 131
Edwards, Rick  149
Ehrman, R.L.  170
Ekholm, P.  55
Emmert, B.  165
Engel, B.A.  111, 169, 187
Enright, P.  121
Environmental Research Laboratory (Athens, Ga.)  101
Euw, E.L. von  76
Exner, M.E.  40, 162
Flagg, J.M.  175
Flaig, E.G.  154
Fleming, Fred  149
Flippo, Herbert N.  15
Floyd, D.W.  150
Flugel, W.A.  159
Frederick, R.E.  178
Fried, J.J.  66
Frind, E.  66
Furlong, E.T.  64
Gale, J.A.  45, 119, 120
Gallagher, D.L.  65
Galveston Bay National Estuary Program  20
Garg, P.  17
Gascho, G.J.  163
Gassman, P.W.  93
Geological Survey (U.S.), San Joaquin Valley Drainage Program  148
Ghadiri, H.  5
Gilbert, R.G.  28
Gilliam, C.H.  145
Gottula, J.J.  170
Graham-Tomasi, Theodore  80
Hall, D.W.  43
Hall, J.  9
Hall, J.A.  54
Halstead, J.M.  62, 75
Hamilton, J.R.  90
Hamlett, J.M.  61, 106, 171
Hampton Roads Planning District Commission (Va.)  188
Haney, H.L. Jr  58
Hardin, P.D.  114
Hariston, J.E.  74
Hatfield, J.L.  173
Havis, R.N.  125
Hawkins, G.W.  33
Hawks, L.J.  58
Hayes, S.  164
Heatwole, C.D.  52, 75
Heidtke, T.M.  10
Helgesen, John O.  12
Hermesmeyer, B.  36
Herriges, J.A.  151
Hession, W.C.  175
Hickman, C.A.  30
Holas, J.  196
Holloway, D.  166
Holub, M.A.  32
Hostettler, F.D.  108
Howar, H.D.  92
Howett, C.  9
Hubbard, R.K.  95
Huber, Wayne C.  101
Humenik, F.J.  45
Huyakorn, P.S.  155
Idaho, Division of Environmental Quality  71
International Association of Water Quality  34
Jackson, Donald R.  15
Jakubauskas, M.E.  23
Jenkins, A.  88
Jennings, G.D.  119, 120
Johengen, T.H.  44
Johnsen, Fred Hakon  122
Johnson, K.  152
Jones, O.R.  193
Jones, R.L.  86
Jorgensen, S.E.  5
Kalkhoff, S.J.  68
Kamari, J.  55
Katona, Juli  160
Kelly, W.E.  66, 105
Kincaid, C.T.  155
Kolb, H.E.  109
Kondolf, G.M.  82
Konyar, K.  79
Korab, J.  196
Korb, Gary  160
Kozloff, K.  96
Kozloff, Keith  53
Kramer, L.A.  180
Kramer, R.A.  75
Krause, Kenneth R.  47
Kuske, J.  89
Kuzniar, R.L.  68
LaBuddie, G.  109
Lacewell, R.D.  176
Lakshminarayan, P.G.  93
Lambert, D.K.  158
Lant, C.L.  41
Larson, B.A.  39
Larson, Bruce A.  4
Leavesley, G.H.  100
Lehman, D.A.  26
Lemme, G.  142
Lemunyon, J.L.  28
Leonard, R.A.  100
Lessley, B.V.  92
Letson, D.  132, 133
Letson, David  134
Licht, L.A.  161
Licht, Louis Arthur  136
Lichtenberg, E.  92
Lickwar, P.M.  30
Lighthall, D.R.  135
Line, D.E.  42, 45, 120
Link, M.  63
Link, M.L.  170
Linguist, Perry  160
Lipe, W.M.  190
Lo, K.F.A.  147
Lowrance, R.  95
Lubello, C.  35
Lynch, J.A.  50
MacLeod, M.A.  150
Madramootoo, C.A.  31, 121
Makuch, J.  165, 166
Malik, A.S.  39, 133
Malik, Arun S.  4, 134
Marais, G.V.R.  129
Marsh, J.M.  11
Martin, D.M.  154
Martin, J.B.  145
Martinko, E.A.  23
Martinson, S.M.  191
McCabe, L.J.  107
McCutcheon, S.C.  78
McIntosh, A.  183
McKissack, D.  51
McSweeney, W.T.  137
Menghi, G.  130
Miller, D.A.  61, 171
Miller, G.A.  168
Minnesota Pollution Control Agency  97
Minshall, G. Wayne  16
Mitchell, J.K.  187
Monnett, M.M.  33
Montas, H.  31
Moore, I.D.  180
Moore, Ian D.  195
Moore, P.A. Jr  37
Morandi, Larry B.  113
Morgan, K.  164
Morioka, T.  182
Morrison, James  185
Morse, G.  88
Mostaghi, S.  73
National Center for Agricultural Law Research and Information
(U.S.), Arkansas Water Resources Research Center  116
National Conference of State Legislatures  113
Nearing, M.A.  49
Netusil, N.R.  91
Newell, Charles J.  20
Newland, L.  164
Newman, D.H.  58
Novotny, V.  139
Nutter, W.L.  78
Olem, Harvey  34
Olson, Richard K.  29
Opaluch, J.J.  3
Oregon State University, Water Resources Research Institute,
Oregon State University, Extension Service  81
Osborn, C.T.  79
Osmond, D.L.  45, 120
Padgitt, S.  62
Panuska, J.C.  180
Panuska, John C.  195
Partee, Grover  149
Pereira, W.E.  108
Petersen, G.W.  61
Peterson, G.W.  171
Phillips, D.L.  114
Pionke, H.B.  100
Piper, S.L.  48
Posch, M. R55
Preti, F.  35
Prout, A.L.  19
Puzzarini, P.  130
Rai, U.N.  17
Rasmussen, T.C.  78
Razavian, D.  70
Reay, W.G.  65
Reddy, K.R.  87
Rekolainen, S.  55
Relf, P.D.  51
Rewerts, C.  111
Ribaudo, M.  39
Ribaudo, M.O.  48, 79
Ribaudo, Marc  4
Richards, R.P.  127
Rifai, H. S.  20
Rijtema, P.E.  66
Risse, R.M.  49
Risser, D.W.  43
Ritter, W.F. 112
Roberts, R.S. 135
Robillard, P.D. 56, 154
Robinson, Christopher T. 16
Rock Creek Rural Clean Water Program (Idaho) 179
Rogers, L.F. 49
Rose, C.W. 5
Rudra, R.P. 76, 174, 177
Ruffio, R.M.C. 46
Russell, Clifford S. 181
Russo, J. 61, 171
Rutledge, A. T. 12
Saepk, A. 13
Saepk, B. 13
Schipper, L.A. 98
Schonter, R. 139
Segerson, K. 3
Shaffer, M.J. 140
Shaffer, R.M. 58
Shanholtz, V.O. 175
Sharpley, A.N. 87, 131, 193
Shaw, D.R. 74
Shirmohammadi, A. 26
Shogren, J.F. 93
Shogren, Jason F. 181
Shoraka, S. 26
Shortle, J.S. 137
Simmons, G.M. Jr 65
Simpson, T.W. 33
Sims, J.T. 87
Sinha, S. 17
Smith, C.A. 74
Smith, M.C. 95
Smith, R.E. 123, 125
Smith, S.J. 193
Smolen, M.D. 119
Sobecki, T.M. 186
Soileau, J.M. 167
Soprani, S. 130
South Florida Water Management District, United States, Environmental Protection Agency 144
Southwick, L.M. 77
Spalding, R.F. 40, 162
Spoofford, T.L. 186
Spooner, J. 42, 45, 119, 120, 184
Spooner, Jean 124
Squillace, P.J. 64, 69
Srb, O. 196
Srinivasan, R. 111, 169, 187
Steed, Robert 71
Stelma, G.N. Jr 107
Stevens, R.G. 186
Stockdale, Erik C. 60
Strickler, J.K. 59
Stullken, Lloyd E. 12
Summer, R.M. 99
Susquehanna River Basin Commission 15
Swader, F. 138
Taff, S.J. 96
Taylor, D.B. 75
Terrene Institute 110
Tetra Tech, Inc, United States, Environmental Protection Agency, Office of Water, United States, Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds 172
Thurman, E.M. 64, 69
Tim, U.S. 73
Touchton, J.T. 167
Tracy, J.C. 102
Trewhitt, Thomas R. 141
Tripathi, R.D. 17
Truman, C.C. 163
Turner, G.W. 46
United States, Agricultural Stabilization and Conservation Service, United States, Extension Service, United States, Soil Conservation Service 1
United States, Congress, House, Committee on Natural Resources, Subcommittee on National Parks, Forests, and Public Lands 103
United States, Congress, House, Committee on Public Works, Subcommittee on Investigations and Oversight 189
United States, Dept. of Agriculture 179
United States, Dept. of Agriculture, Economic Research Service 47, 134
United States, Dept. of Agriculture, Economic Research Service, Resources and Technology Division 4
United States, Environmental Protection Agency 97
United States, Environmental Protection Agency, Ground-Water Protection Division, United States, Environmental Protection Agency, Office of Water 156
United States, Environmental Protection Agency, Office of Research and Development 14
United States, Environmental Protection Agency, Office of Research and Development, United States, Environmental Protection Agency, Office of Water, Center for Environmental Research Information (U.S.), Eastern Research Group, Inc 118
United States, Environmental Protection Agency, Office of Research and Development, United States, Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Nonpoint Source Control Branch, Tetra Tech, Inc 192
United States, Environmental Protection Agency, Region V, Northeastern Illinois Planning Commission 153
United States, National Oceanic and Atmospheric Administration, United States, Environmental Protection Agency, Office of Water 24
United States. Environmental Protection Agency 67
United States. General Accounting Office 103, 189
University of Minnesota, Water Resources Research Center, Geological Survey (U.S.)  195
Valentine, J.  85
Vellidis, G.  95
Vendrell, P.F.  37
Vighi, M.  130
Wagner, D.G.  140
Walker, D.J.  90
Wall, G.J.  174, 177
Wang, S.S.Y.  187
Wang, Y.  96
Warriner, M.R.  72
Washington (State), Dept. of Ecology  60
Wauchope, R.D.  163
Weaver, D.M.  19
Webster, K.T.  94
Wedepohl, R.  87
Weinberg, A.C.  84
Whistler, J.L.  23
Williams, J.R.  193
Willis, G.H.  77
Wilson, S.D.  175
Winter, Gerry  71
Wisconsin Nonpoint Source Water Pollution Abatement Program  18
Wiyo, K.A.  121
Wolf, Donald W.  81
Woodward, M.  138
Wu, T.H.  54
Wylie, B.K.  140
Yoo, K.H.  167
Yoon, K.S.  167
Young, R.A.  99
Younos, T.M.  73
Zacharias, S.  52
Zlotnik, V.A.  162

SUBJECT INDEX

Activity  119
Adriatic sea  130
Aerial photography  164
Aggregate data  3
Agricultural chemicals  5, 35, 40, 62, 66, 68, 71, 86, 93, 94, 100, 111, 135, 143, 151, 165, 166
Agricultural education  177
Agricultural land  19, 36, 42, 49, 55, 65, 68, 70, 73, 79, 91, 96, 99, 119, 127, 131, 140, 157, 190, 196
Agricultural policy  3, 62, 75, 135
Agricultural pollution  1, 4, 18, 47, 116, 134, 160, 179, 181, 195
Agricultural production  2, 6, 8, 13, 32, 42, 135, 190
Agricultural research  135
Agricultural sector  3
Agricultural soils  121, 128, 163
Agricultural wastes  76, 145
Composting 145
Computer simulation 123, 180
Computer software 88, 174
Computer techniques 171
Concentration 69, 162
Conservation tillage 74, 167
Constructed wetlands 29
Contamination 3, 62, 63, 140
Contracts 91
Control 85
Control methods 151
Cooperation 85
Cooperative extension service 51
Corn belt of U.S.A. 135
Cost analysis 92, 137
Cost control 132
Cost effectiveness analysis 90, 96
Costs 75, 91, 133, 151
Cotton 158
Crop management 70, 87
Crop production 62, 158
Crop yield 114
Cropping systems 74
Cyanazine 68
Czechoslovakia 196
Dairy farming 62
Dairy wastes 62
Data collection 23
Databases 33, 171
Decision making 31, 143
Delaware 112, 157
Denitrification 98
Denitrifying microorganisms 98
Deterministic models 102
Discharge 64, 65
Documentation 36
Drainage 55, 98
Drinking water 143
Drying 37
Ecology 78
Economic impact 62, 158
Economic policy 39
Economics 119
Ecosystems 139, 161
Educational programs 51
Environmental assessment 46
Environmental degradation 9, 190
Environmental education 51
Environmental factors 168
Environmental impact 6, 41, 62, 82, 84, 176, 190, 193
Environmental impact statements 20
Environmental legislation 8, 39, 143
Environmental management 6, 19
Environmental monitoring 16
Environmental policy 194
Environmental protection 6, 33, 138
Epidemiology 107
Habitats 22, 85
Hapludults 73
Hazardous waste sites 27
Health hazards 62
Herbicide residues 69, 108
Herbicides 74, 93
Hydrology 20, 43, 100, 123
Idaho 22, 126
Illinois 41, 114, 187
Incentives 39, 62
Indexes 28, 186
Infiltration 125
Information 151
Information systems 3, 22, 31, 61, 166
Innovation adoption 114
Integrated systems 139, 169, 187
Interactions 65, 125
Interviews 62
Iowa 32, 62, 64, 68, 69, 135, 161, 168
Irrigation 159, 162
Irrigation systems 159
Italy 35, 130
Japan 182
Kansas 23, 59
Kentucky 11
Kjeldahl method 73
Lakes 10, 49, 98, 99, 112
Land diversion 79, 82
Land evaluation 33
Land management 36, 96
Land use 10, 12, 20, 33, 49, 65, 82, 96, 106, 119, 127
Land use planning 31
Landsat 23
Landscape 131
Landscape architecture in water conservation 188
Law enforcement 133
Leaching 52, 66, 86, 128, 130, 140, 155
Legislation 58, 83, 150
Linear programming 137
Literature reviews 5, 107, 120, 132
Loads 10
Losses from soil 19, 28, 43, 74, 76, 87, 121, 131, 163, 167, 186
Losses from soil systems 73, 174, 190
Lowland areas 174
Maize 137
Maize soils 68
Management 33, 89, 138
Manures 43, 87
Mapping 22
Marginal analysis 90
Marine pollution 67, 146
Marketing techniques 91
Maryland 21, 51, 58, 92, 157
Mass media 51
Mathematical models 3, 55, 79, 125, 133, 151
Measurement 54
Metabolites 64
Politics 143
Pollutants 9, 76, 102, 120, 123, 125, 126, 127, 190
Pollution 8, 22, 25, 30, 37, 38, 42, 46, 49, 55, 68, 70, 72, 87, 88, 89, 109, 111, 115, 123, 129, 145, 151, 158, 159, 169, 171, 175, 178, 180, 182, 187, 191
Pollution by agriculture 137, 164, 174
Pollution control 9, 33, 36, 39, 44, 45, 46, 56, 78, 79, 83, 87, 90, 94, 95, 120, 133, 138, 150, 152, 154, 173, 182, 184
Populus 161
Poultry manure 25, 37, 145
Precipitation 43
Prediction 88, 139, 140, 167
Probabilistic models 102, 137
Problem solving 85
Production functions 158
Profiles 168
Profitability 138
Programs 62, 63, 83
Protection 78, 139, 170
Public agencies 85
Public opinion 62
Quantity controls 158
Quebec 31, 121
Questionnaires 62
Rain 31, 73, 76, 111, 125
Rainfall simulators 37
Ranking 171
Ratios 133
Reclamation 95
Regulations 138, 150, 151, 152, 194
Reliability 151
Remote sensing 23
Reservoirs 164, 196
Residues 36
Resource conservation 58
Resource management 28, 186
Return flow 90, 159
Reviews 119
Riparian flora 136
Riparian forests 59, 95
Riparian vegetation 22
Risk 28, 62, 78, 186
River water 64, 69, 108, 129, 159, 196
Rivers 35, 64, 98, 112, 127
Rotations 114
Runoff 25, 37, 51, 54, 55, 70, 73, 74, 87, 92, 95, 98, 114, 127, 131, 157, 163, 167, 169, 183, 187, 190, 193
Runoff control 137
Runoff water 5, 11, 72, 100, 111
Rural areas 46, 164
Salicaceae 161
Salinization 159
Sampling 40, 55, 162
Seasonal fluctuations 65
Seasonal variation 68
Sediment 5, 41, 65, 73, 90, 99, 100, 147, 187, 190, 193
Sediment yield 54, 70, 91, 96, 147
Sedimentation 174
Sediments 174
Seepage 65, 102
Septic tank effluent 164
Sewage effluent 157
Shellfish 107, 109
Silt loam soils 73
Silviculture 50
Simulation 102
Simulation models 23, 26, 31, 52, 54, 70, 88, 93, 96, 99, 105, 114, 123, 140, 147, 165, 166, 167, 169, 177, 187
Site class assessment 186
Site factors 3, 186
Social costs 79
Soil and water conservation 174
Soil chemistry 92
Soil conservation 31, 41, 84, 177, 190
Soil depth 125
Soil fertility 87
Soil management 87
Soil parent materials 168
Soil pollution 120, 177
Soil properties 76, 128
Soil surveys 168
Soil testing 33
Soil texture 168
Soil types 31, 168
Soil types (ecological) 98
Soil water content 102
Soil water movement 5
Soils 136
Solanum tuberosum 121
Solutes 125
Sorghum bicolor 193
Sources 2, 32, 42, 46, 89, 91, 109, 111, 129, 159, 178, 182, 196
South Africa 129, 159
South central states of U.S.A. 30
South eastern states of U.S.A. 30
Southern plains states of U.S.A. 176
Soybeans 137
Spatial distribution 3, 140
Spatial variation 44
State government 63, 83, 85
Statistical analysis 93
Stochastic models 75
Stochastic programming 75
Storms 11, 127
Stream flow 49
Streams 41, 57, 85, 126
Streptococcus 164
Strip cropping 161
Subsurface application 73
Subsurface drainage 77
Surface water 65, 73, 93, 98, 119, 125, 142, 176, 193
Surveys 30
Sustainability 21, 84, 138, 161, 173
The National Agricultural Library has established document delivery service policies for three user categories. They are 1) individuals; 2) libraries, other information centers, and commercial organizations; and 3) foreign libraries, information centers, and commercial organizations. Available services for each user category are given below. For information on electronic access for interlibrary loan requests, the "Interlibrary Loan"
1) DOCUMENT DELIVERY SERVICES TO INDIVIDUALS

The National Agricultural Library (NAL) supplies agricultural materials not found elsewhere to other libraries. Filling requests for materials readily available from other sources diverts NAL's resources and diminishes its ability to serve as a national source for agricultural and agriculturally related materials. Therefore, NAL is viewed as a library of last resort. SUBMIT REQUESTS FIRST TO LOCAL OR STATE LIBRARY SOURCES PRIOR TO SENDING TO NAL. In the United States, possible sources are public libraries, land-grant university or other large research libraries within a state. In other countries submit requests through major university, national, or provincial institutions. If the needed publications are not available from these sources, submit requests to NAL with a statement indicating their non-availability. Submit one request per page following the instructions for libraries below.

NAL'S DOCUMENT DELIVERY SERVICE INFORMATION FOR THE LIBRARY

The following information is provided to assist your librarian in obtaining the required materials.

LOAN SERVICE -- Materials in NAL's collection are loaned only to other U.S. libraries. Requests for loans are made through local public, academic, or special libraries.

The following materials are not available for loan: serials (except USDA serials); rare, reference, and reserve books; microforms; and proceedings of conferences or symposia. Photocopy or microform of non-circulating publications may be purchased as described below.

DOCUMENT DELIVERY SERVICE -- Photocopies of articles are available for a fee. Make requests through local public, academic, or special libraries. The library will submit a separate interlibrary loan form for each article or item requested. If the citation is from an NAL database (CAIN/AGRICOLA, "Bibliography of Agriculture," or the NAL Catalog) and the call number is given, put that call number in the proper block on the request form. Willingness to pay charges must be indicated on the form. Include compliance with copyright law or a statement that the article is for "research purposes only" on the interlibrary loan form or letter. Requests cannot be processed without these statements. Please read copyright notice below.

CHARGES:

* Photocopy, hard copy of microfilm and microfiche - $5.00 for the first 10 pages or fraction copied from a single article or publication. $3.00 for each additional 10 pages or fraction.

* Duplication of NAL-owned microfilm - $10.00 per reel.

* Duplication of NAL-owned microfiche - $5.00 for the first
fiche and $.50 for each additional fiche per title.

BILLING - Charges include postage and handling, and are subject to change. Invoices are issued quarterly by the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161. Establishing a deposit account with NTIS is encouraged. DO NOT SEND PREPAYMENT.

Send Requests to:
USDA, National Agricultural Library
Document Delivery Services Branch, ILL, PhotoLab
10301 Baltimore Blvd., NAL Bldg.
Beltsville, Maryland 20705-2351

Contact the Head, Document Delivery Services Branch in writing or by calling (301) 504-5755 with questions or comments about this policy.

3) DOCUMENT DELIVERY SERVICES AVAILABLE TO FOREIGN LIBRARIES, INFORMATION CENTERS AND COMMERCIAL ORGANIZATIONS.

The National Agricultural Library (NAL) accepts requests from libraries and other organizations in accordance with the national and international interlibrary loan code and guidelines.

In its national role, NAL supplies copies of agricultural materials not found elsewhere. Filling requests for materials readily available from other sources diverts NAL's resources and diminishes its ability to serve as a national source for agricultural and agriculturally related materials. Therefore, NAL is viewed as a library of last resort.

Submit requests to major university libraries, national or provincial institutions or network sources prior to sending requests to NAL. If the needed publications are not available from these sources, submit requests to NAL with a statement indicating their non-availability.

AGLINET -- Requesters in countries with an AGLINET library are encouraged to make full use of that library and its networking capabilities. As an AGLINET participant, NAL provides free document delivery service for materials published in the United States to other AGLINET participants.

REQUESTS -- Submit requests on the American Library Association (ALA) or the International Federation of Library Associations and Institutions (IFLA) interlibrary loan form or via electronic mail or telefacsimile (see over for more details). Include the complete name of the person authorizing the request on each form; the standard bibliographic source which lists the title as owned by NAL; and the call number if the citation is from an NAL database (CAIN/AGRICOLA, "Bibliography of Agriculture", or the NAL catalog).

DOCUMENT DELIVERY SERVICE -- Submit a separate completed interlibrary loan form for each article requested. Indicate willingness to pay charges on the form, and compliance with copyright law or include a statement that the article is for "research purposes only". Requests cannot be processed without these statements. Please read copyright notice below.
CHARGES:

* Photocopy, hard copy of microfilm and microfiche - $5.00 for the first 10 pages or fraction copied from a single article or publication. $3.00 for each additional 10 pages or fraction.

* Duplication of NAL-owned microfilm - $10.00 per reel.

* Duplication of NAL-owned microfiche - $5.00 for the first fiche and $.50 for each additional fiche per title.

BILLING - Charges include postage and handling, and are subject to change. Invoices are issued quarterly by the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161. Establishing deposit account with NTIS is encouraged. Annual billing is available to foreign institutions on request by contacting NAL at the address below. DO NOT SEND PREPAYMENT.

Send Requests to:
USDA, National Agricultural Library
Document Delivery Services Branch, ILL, PhotoLab
10301 Baltimore Blvd., NAL Bldg.
Beltsville, Maryland  20705-2351

Contact the Head, Document Delivery Services Branch at (301) 504-5755 with questions or comments about this policy.

ELECTRONIC MAIL ACCESS FOR INTERLIBRARY LOAN (ILL) REQUESTS

The National Agricultural Library (NAL), Document Delivery Services Branch accepts ILL requests from libraries via several electronic services. All requests must comply with established routing and referral policies and procedures. The transmitting library will pay all fees incurred during the creation of requests and communication with NAL. A sample format for ILL requests is printed below along with a list of the required data/format elements.

ELECTRONIC MAIL  -  (Sample form below)

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>ADDRESS CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERNET</td>
<td><a href="mailto:LENDING@NALUSDA.GOV">LENDING@NALUSDA.GOV</a></td>
</tr>
<tr>
<td>EASYLINK</td>
<td>62031265</td>
</tr>
<tr>
<td>ONTYME</td>
<td>NAL/LB</td>
</tr>
<tr>
<td>TWX/TELEX</td>
<td>Number is 710-828-0506 NAL LEND.</td>
</tr>
<tr>
<td></td>
<td>This number may only be used for</td>
</tr>
<tr>
<td></td>
<td>ILL requests.</td>
</tr>
<tr>
<td>FTS2000</td>
<td>A12NALLEND</td>
</tr>
<tr>
<td>OCLC</td>
<td>NAL's symbol AGL need only be entered once, but it must be the last entry in the Lender string. Requests from USDA and Federal libraries may contain AGL anywhere in the Lender String.</td>
</tr>
</tbody>
</table>

June 1993
SAMPLE ELECTRONIC MAIL REQUEST
=================================================================
| AG University/NAL       ILLRQ 231     4/1/93     NEED BY:  6/1/93 |
| Interlibrary Loan Department |
| Agriculture University       |
| Heartland, IA  56789         |
| Dr. Smith   Faculty   Ag School |
| DeJong, R. Comparison of two soil-water models under |
| semi-arid growing conditions |
| Ver:  AGRICOLA |
| Remarks: Not available at IU or in region. |
| NAL CA:  56.8 C162 |
| Auth:  C. Johnson      CCL Maxcost: $15.00 |
| MORE |
=================================================================

TELEFACSIMILE - Telephone number is 301-504-5675. NAL accepts ILL requests via telefacsimile. Requests should be created on standard ILL forms and then faxed to NAL. NAL does not fill requests via Fax at this time.

REQUIRED DATA ELEMENTS/FORMAT

1. Borrower's address must be in block format with at least two blank lines above and below so form may be used in window envelopes.
2. Provide complete citation including verification, etc.
3. Provide authorizing official's name (request will be rejected if not included).
4. Include statement of copyright compliance if applicable. Please read copyright notice below.
5. Indicate willingness to pay applicable charges.
6. Include NAL call number if available. Contact the Document Delivery Services Branch at (301) 504-6503 if additional information is required.

****************************************************************

Photocopy Warning:

NOTICE WARNING CONCERNING COPYRIGHT RESTRICTIONS

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted material.

Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specific conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction
for purposes in excess of "fair use," that user may be liable for copyright infringement.

This institution reserves the right to refuse to accept a copying order if, in its judgement, fulfillment of the order would involve violation of copyright law.

37 C.F.R. 201.14

****************************************************************

The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact the USDA Office of Communications at (202) 720-5881 (voice) or (202) 720-7808 (TDD). To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call (202) 720-7327 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

Return to Bibliographies

Return to the Water Quality Information Center at the National Agricultural Library.

Last update: April 27, 1998
The URL of this page is http://www.nal.usda.gov/wqic/Bibliographies/qb9501.html

J. R. Makuch /USDA-ARS-NAL-WQIC

Disclaimers

[U.S. Department of Agriculture (USDA)] [Agricultural Research Service (ARS)] [National Agricultural Library (NAL)]