The Water Quality Information Center (WQIC)
Agricultural Research Service, U. S. Department of Agriculture

Source Water Management

A bibliography compiled by the Water Quality Information Center, National Agricultural Library.

Return to the Water Quality Information Center at the National Agricultural Library.
Last update: Jun 17, 2008
The URL of this page is http://www.nal.usda.gov/wqic/Source_Water/dwindex.html

J. R. Makuch /USDA-ARS-NAL-WQIC / wqic@ars.usda.gov

The Water Quality Information Center (WQIC)
Agricultural Research Service, U. S. Department of Agriculture

About the Source Water Bibliography

Compiled by Mary Stevanus
Water Quality Information Center
National Agricultural Library

This electronic bibliography is intended primarily to provide awareness of recent investigations and discussions of a topic and is not intended to be in-depth and exhaustive.

Citations were located in the Agricola database. AGRICOLA, produced by the National Agricultural Library, indexes over 3.5 million books, articles, and reports on agricultural topics. Citations are arranged alphabetically by title and abstracts are included where available. All citations are in English unless otherwise noted.

The inclusion or omission of a particular publication or citation should not be construed as endorsement or disapproval.

Send suggestions for electronic bibliographies related to water resources and agriculture to wqic@ars.usda.gov.

To locate a publication cited in this bibliography, please contact your local, state, or university library. If you are unable to locate a particular publication, your library can contact the National Agricultural Library (please see "Request Library Services" at http://www.nal.usda.gov/services/request.shtml).

Return to the Source Water Bibliography
Last update: Jun 16, 2008
The URL of this page is http://www.nal.usda.gov/wqic/Source_Water/dwabout.html

J. R. Makuch /USDA-ARS-NAL-WQIC / wqic@ars.usda.gov

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

---

Delineating and Assessing Source Water Areas

65 citations from the Agricola Database
1984 - September 1998

Mary Stevanus
Water Quality Information Center

This electronic bibliography is intended primarily to provide awareness of recent investigations and discussions of a topic and is not intended to be in-depth and exhaustive. The inclusion or omission of a particular publication or citation should not be construed as endorsement or disapproval. Citations are arranged alphabetically by title and abstracts are included where available. All citations are in English unless otherwise noted.

Send suggestions for electronic bibliographies related to water resources and agriculture to wqic@ars.usda.gov.

To locate a publication cited in this bibliography, please contact your local, state, or university library. If you are unable to locate a particular publication, your library can contact the National Agricultural Library (please see "Document Delivery Services" at http://www.nal.usda.gov/ddsb/).

---

1. **Analytical modelling of pesticide transport from the soil surface to a drinking water well**.
   Beltman,-W.H.J.; Boesten,-J.J.T.I.; Zee,-S.E.A.T.M.-van-der.
   J-hydrol. Amsterdam : Elsevier Science B.V. July 1995. v. 169 (1/4) p. 209-228.
   NAL Call Number: 292.8-J82
   Descriptors: pesticides-. leaching-. water-flow. drinking-water. wells-. water-quality. groundwater-pollution. mathematical-models.
2. **Assessing your hazardous waste management practices**.
   Weston,-D.
   NDSU-Ext-Serv. Fargo, N.D. : The University. Apr 1994. (AE-1076) 3 p.

NAL Call Number: S544.3.N9C46
Descriptors: agricultural-wastes. groundwater-pollution. farms-. waste-disposal. pollutants-. chemicals-. drinking-water. hazards-. assessment-. safety-. north-dakota.

3. **Assessing your petroleum product storage practices**.
Weston,-D.
NDSU-Ext-Serv. Fargo, N.D. : The University. Apr 1994. (AE-1078) 4 p.
NAL Call Number: S544.3.N9C46
Descriptors: fuel-tanks. groundwater-pollution. farm-storage. pollutants-. leakage-. wells-. drinking-water. assessment-. safety-. north-dakota.
4. **Assessment of groundwater quality in England and Wales**.
Sir William Halcrow & Partners.
Great Britain. Dept. of the Environment. Laurence Gould Consultants.
London : H.M.S.O, 1988. xi, 115, xxx p., [10] p. of plates : ill. (some col.)
NAL Call Number: TD257.S57
Descriptors: Water,-Underground-England-Quality. Water,-Underground-Wales-Quality. Drinking-water-England. Drinking-water-Wales.
5. **Assessment of the reproductive and developmental toxicity of pesticide/fertilizer mixtures based on confirmed pesticide contamination in California and Iowa groundwater**.
Heindel,-J.J.; Chapin,-R.E.; Gulati,-D.K.; George,-J.D.; Price,-C.J.; Marr,-M.C.; Myers,-C.B.; Barnes,-L.H.; Fail,-P.A.; Grizzle,-T.B.
Fundam-appl-toxicol. Orlando, Fla. : Academic Press. May 1994. v. 22 (4) p. 605-621.
NAL Call Number: RA1190.F8
Descriptors: pesticide-mixtures. ammonium-nitrate. groundwater-pollution. drinking-water. toxicity-. reproduction-. feed-intake. body-weight. reproductive-performance. mice-. fetal-development. fetal-resorption. litter-size. rats-. adverse-effects. california-. iowa-.
6. **Assessment of the risk of infection by Cryptosporidium or Giardia in drinking water from a surface water source**.
Teunis,-P.F.M.; Medema,-G.J.; Kruidenier,-L.; Havelaar,-A.H.
Water-res. Oxford, U.K. : Elsevier Science Ltd. June 1997. v. 31 (6) p. 1333-1346.
NAL Call Number: TD420.W3
Descriptors: drinking-water. surface-water. water-supply. cryptosporidium-parvum. giardia-duodenalis. infection-. risk-assessment. public-health.
7. **Best management practice for fertilization of mature citrus trees on the ridge area to minimize nitrate contamination of groundwater**.
Alva,-Ashok-K.
Citrus Research and Education Center. Florida. Dept. of Environmental Protection.
Lake Alfred, FL : Citrus Research and Education Center, Institute of Food and Agricultural Sciences, University of Florida, 1997. 141 p. : ill.
NAL Call Number: S667.O7A491--1997
Descriptors: Citrus-Fertilizers-Florida. Nitrogen-fertilizers-Control-Florida. Groundwater-Pollution-Control-Florida.
8. **Comparison of models for delineating wellhead protection areas in confined to semiconfined aquifers in alluvial basins**.
Forster,-C.B.; Lachmar,-T.E.; Oliver,-D.S.

Ground-water. Westerville, Ohio : Ground Water Pub. Co. July/Aug 1997. v. 35 (4) p. 689-697.
NAL Call Number: TD403.G7
Descriptors: aquifers-. groundwater-. hydrology-. saturated-hydraulic-conductivity. computer-simulation. simulation-models. mathematical-models. wells-. groundwater-flow. groundwater-extraction. utah-.

9. **Developing a national drinking water regulation for disinfection of ground water**.
Macler,-B.A.
Ground-water-monit-remediat. Dublin, OH: Ground Water Pub. Co. Fall 1995. v. 15 (4) p. 77-84.
NAL Call Number: GB1001.G76
Descriptors: drinking-water. groundwater-. disinfection-. regulations-. microbial-contamination. public-health. waterborne-diseases. incidence-. environmental-legislation. federal-government. usa-.
10. **Developing a state wellhead protection program : a user's guide to assist state agencies under the Safe Drinking Water Act**.
United States. Environmental Protection Agency. Office of Water.
Washington, D.C. : U.S. Environmental Protection Agency, [1990] 44 p.
NAL Call Number: TD223.D4
Descriptors: Drinking-water-United-States.
11. **Development of a data base of community water-supply wells in New Jersey and a method of evaluate their sensitivity to contamination**.
Storck,-Donald-A.; Isaacs,-Kalman-N.; Vowinkel,-Eric-F.
New Jersey. Dept. of Environmental Protection. Geological Survey (U.S.).
Water-resources investigations report ; 96-4132.
West Trenton, N.J. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 1997. vi, 53 p. : ill., maps
NAL Call Number: GB701.W375--no.96-4132
Descriptors: New-Jersey-Bureau-of-Safe-Drinking-Water-Databases. Water-quality-management-New-Jersey-Databases. Water-supply-New-Jersey-Measurement. Groundwater-New-Jersey-Quality-Mathematical-models.
12. **Domestic well water quality in rural Nebraska: focus on nitrate-nitrogen, pesticides, and coliform bacteria**.
Gosselin,-D.C.; Headrick,-J.; Tremblay,-R.; Chen,-X.H.; Summerside,-S.
Ground-water-monit-remediat. Columbus, OH : Ground Water Publishing Co. Spring 1997. v. 17 (2) p. 77-87.
NAL Call Number: GB1001.G76
Descriptors: drinking-water. wells-. groundwater-. groundwater-pollution. water-quality. contaminants-. nitrate-nitrogen. pesticides-. coliform-bacteria. rural-areas. nebraska-.
13. **Drinking water and groundwater protection : proceedings National Environmental Health Association's 1990 Midyear Conference, Hyatt Orlando, Orlando, Florida, January 21-23, 1990**.
National Environmental Health Association. Midyear Conference (1990 : Orlando, Fla.).
Denver, Colo. : The Association, c1990. viii, 473 p. : ill., maps
NAL Call Number: TD224.F6N37-1990
Descriptors: Drinking-water-Florida-Congresses. Drinking-water-United-States-

Congresses. Water-quality-Florida-Congresses. Water-quality-United-States-Congresses. Water,-Underground-Pollution-Florida-Congresses. Water,-Underground-Pollution-United- States-Congresses.

14. **Effect of point-of-use, activated carbon filters on the bacteriological quality of rural groundwater supplies**.
Snyder,-J.W.-Jr.; Mains,-C.N.; Anderson,-R.E.; Bissonnette,-G.K.
Appl-environ-microbiol. Washington : American Society for Microbiology. Dec 1995. v. 61 (12) p. 4291-4295.
NAL Call Number: 448.3-Ap5
Descriptors: coliform-bacteria. coliform-count. heterotrophic-microorganisms. plate-count. microbial-contamination. groundwater-pollution. water-purification. activated-carbon. water-filters. water-quality. wells-. springs-water. rural-areas. west- virginia.
15. **Effects of agriculture on ground-water quality in five regions of the United States**.
Hamilton,-P.A.; Helsel,-D.R.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. Mar/Apr 1995. v. 33 (2) p. 217-226.
NAL Call Number: TD403.G7
Descriptors: groundwater-pollution. nitrogen-fertilizers. animal-manures. nitrate-. water-quality. groundwater-. aquifers-. irrigated-conditions. irrigated-sites. delaware-. maryland-. virginia-. new-york. kansas-. nebraska-. connecticut-.
16. **Emerging legal issues in groundwater contamination cases**.
Guilday,-T.J.; DeMeo,-R.A.
Fla-Sci. Orlando, Fla. : Florida Academy of Sciences. Summer 1989. v. 52 (3) p. 183-206.
NAL Call Number: 500-F66
Descriptors: groundwater-pollution. drinking-water. environmental-protection. federal-government. water-law. water-safety. florida-.
17. **EPA to survey agricultural pesticides in groundwater used for drinking**.
Garlitz,-N.M.
Soil-Water-Conserv-U-S-D-A-Soil-Conserv-Serv. Washington, D.C. : The Service. Sept 1985. v. 6 (6) p. 4-5.
NAL Call Number: aS622.S6
Descriptors: pesticides-. groundwater-. drinking-water. surveys-.
18. **Evaluation of ground-water contamination from nonpoint sources: a case study**.
Brink,-C.-van-den; Zaadnoordijk,-W.J.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. May/June 1995. v. 33 (3) p. 356-365.
NAL Call Number: TD403.G7
Descriptors: groundwater-pollution. pollutants-. contaminants-. nitrate-. leaching-. computer-analysis. computer-software. computer-simulation. simulation-models. groundwater-flow. geographical-information-systems. water-quality. groundwater-extraction. wells-. groundwater-. hungary-.
19. **Farm-A-Syst : farmstead assessment system**.
Jackson,-Gary.; Anderson,-Jim.; Jones,-Susan.
University of Wisconsin--Extension. Cooperative Extension Service.
Minnesota Extension Service.

United States. Environmental Protection Agency. Region V. Water Division.
Madison [Wis.] : University of Wisconsin--Extension, Cooperative Extension, College of Agricultural and Life Sciences, University of Wisconsin, [1991] 23 pamphlets : ill.
NAL Call Number: TD428.A37F37-1991
Descriptors: Farm-management-Environmental-aspects-Wisconsin. Drinking-water-Contamination-Wisconsin. Agricultural-pollution-Wisconsin. Groundwater-Pollution-Wisconsin.

20. **Farm-A-Syst : farmstead assessment system**.
Michigan State University. Extension.
East Lansing, MI : The Extension, 1994- v. : ill.
NAL Call Number: S589.757.M5F37--1994
Descriptors: Farm-management-Environmental-aspects-Michigan. Drinking-water-Contamination-Michigan. Agricultural-pollution-Michigan. Groundwater-Pollution-Michigan.

21. **Farmstead assessment for whole farm water quality protection**.
Jackson,-G.W.; Anderson,-J.L.
Agricultural research to protect water quality proceedings of the conference February 21-24, 1993 Minneapolis, Minnesota, USA /. Ankeny, IA : The Society, [1993]. p. 517-519.
NAL Call Number: TD427.A35A49-1993
Descriptors: groundwater-. wells-. drinking-water. water-quality. farms-. risk-. assessment-. educational-programs. educational-planning. plan-implementation-and-evaluation. wisconsin-. minnesota-.

22. **FAS wells**.
National Farm*A*Syst Program (U.S.).
[Wisconsin?] : Farm*A*Syst, [1995] 60 slides : col. + 1 training manual + 1 computer disk.
NAL Call Number: Slide--no.525
Descriptors: Drinking-water. Groundwater-Quality. Water-quality-management.

23. **A geographic information system for groundwater protection planning**.
Baker,-C.P.; Panciera,-E.C.
J-Soil-Water-Conserv. Ankeny, Iowa : Soil and Water Conservation Society of America. Mar/Apr 1990. v. 45 (2) p. 246-248. ill., maps.
NAL Call Number: 56.8-J822
Descriptors: groundwater-flow. protection-. drinking-water. water-management. land-use.

24. **Ground water and the Safe Drinking Water Act Amendments of 1996**.
Job,-C.
Ground-water-monit-remediat. Columbus, OH : Ground Water Publishing Co. Winter 1997. v. 17 (1) p. 49-51.
NAL Call Number: GB1001.G76
Descriptors: groundwater-. drinking-water. environmental-legislation. federal-government. usa-.

25. **Groundwater contamination by temik aldicarb pesticide: the first 8 months**.
Wartenberg,-D.

Water-Resour-Res. Washington, D.C. : American Geophysical Union. Feb 1988. v. 24 (2) p. 185-194.
NAL Call Number: 292.8-W295
Descriptors: groundwater-pollution. aldicarb-. drinking-water. environmental-protection.

26. **Groundwater contamination by toxic substances : a digest of reports : a report**.
United States. Congress. Senate. Committee on Environment and Public Works.
Library of Congress. Environment and Natural Resources Policy Division.
S. prt. ; 98-131.
Washington : U.S. G.P.O., 1983 [i.e. 1984] xxxv, 75 p.
NAL Call Number: TD223.G755-1984
Descriptors: United-States-Environmental-Protection-Agency. Geological-Survey-U.S.. Council-on-Environmental-Quality-U.S.. Water,-Underground-Pollution-United-States. Drinking-water-United-States-Contamination. Hazardous-wastes-Environmental-aspect s-United-States.
27. **Groundwater protection : the use of drinking water standards by the states : report to the Chairman, Subcommittee on Hazardous Wastes and Toxic Substances, Committee on Environment and Public Works, U.S. Senate**. United States. General Accounting Office.
United States. Congress. Senate. Committee on Environment and Public Works. Subcommittee on Hazardous Wastes and Toxic Substances.
Washington, DC : The Office, 1988. 53 p. : ill., map
NAL Call Number: TD223.G752
Descriptors: Drinking-water-Standards-United-States. Water,-Underground-Quality-United-States.
28. **Groundwater resource management and environmental protection: A case study of the Philippines**.
Munasinghe,-M.
Nat-Resour-Forum. Stoneham, Mass. : Butterworth-Heinemann Ltd. Nov 1991. v. 15 (4) p. 302-312.
NAL Call Number: HC55.N3
Descriptors: drinking-water. water-quality. water-management. salt-water-intrusion. environmental-protection. water-use. water-policy. population-pressure. economic-development. aquifers-. case-studies. water-costs. philippines-.
29. **Growth management to protect groundwater**.
Hrezo,-W.E.; Hrezo,-M.S.
J-Soil-Water-Conserv. Ankeny, Iowa : Soil and Water Conservation Society of America. Mar/Apr 1990. v. 45 (2) p. 286-287.
NAL Call Number: 56.8-J822
Descriptors: groundwater-flow. water-management. protection-. zoning-. drinking-water.

30. **Guidance for applicants for state Wellhead Protection Program assistance funds under the Safe Drinking Water Act**.
United States. Environmental Protection Agency. Office of Ground-Water Protection.
Washington, D.C. : U.S. Environmental Protection Agency, Office of Water, Office of Ground-Water Protection, [1987] 1 v. (various pagings) : ill.
NAL Call Number: TD426.G84-1987

Descriptors: Well-Head-Protection-Program. Wellheads-Protection-United-States. Water,-Underground-Quality. Drinking-water.

31. **Handbook : ground water and wellhead protection**.
Eastern Research Group, Inc.
United States. Environmental Protection Agency. Office of Drinking Water.
United States. Environmental Protection Agency. Office of Science, Planning, and Regulatory Evaluation.
Center for Environmental Research Information (U.S.).
Cincinnati, Ohio : U.S. Environmental Protection Agency, Center for Environmental Research Information, 1994. xvii, 269 p. : ill., maps, forms
NAL Call Number: TD403.H36--1994
Descriptors: Groundwater-Handbooks,-manuals,-etc. Wellheads-Handbooks,-manuals,-etc. Water-supply-Handbooks,-manuals,-etc.
32. **History of the sole source aquifer program: a community-based approach for protecting aquifers used for drinking water supply**.
McCabe,-W.J.; Job,-C.A.; Simons,-J.J.; Graves,-J.S.; Terada,-C.J.
Ground-water-monit-remediat. Westerville, OH : Ground Water Publishing Co. Summer 1997. v. 17 (3) p. 78-86.
NAL Call Number: GB1001.G76
Descriptors: drinking-water. groundwater-. aquifers-. groundwater-pollution. federal-government. environmental-legislation. new-jersey. ohio-. idaho-. pennsylvania-. usa-.
33. **How to conduct an inventory in your wellhead protection area : a training manual for use with volunteers**.
University of Idaho. Idaho Water Resources Research Institute.
[Moscow, ID] : University of Idaho, [1995?] 113 p. : ill.
NAL Call Number: TD224.I2H69--1995
Descriptors: Water-quality-management-Idaho-Citizen-participation. Drinking-water-Contamination-Idaho-Prevention-Citizen-participation.
34. **The international rivers Rhine and Meuse: recent developments in the field of the protection against pollution and of drinking water production in the Netherlands including the problems of storage and eutrophication**.
Vreedenburgh,-E.G.H.
Aqua-J-Int-Water-Supply-Assoc. Oxford : Pergamon Press. 1988. (4) p. 183-192. maps.
NAL Call Number: TD201.A72
Descriptors: rivers-. water-resource-management. water-pollution. drinking-water. water-storage. eutrophication-. surface-water. water-supplies. land-use. pollution-by-agriculture. netherlands.
35. **Is someone contaminating-- your drinking water? : an overview of potentially harmful shallow injection wells**.
United States. Environmental Protection Agency. Ground Water Protection Council (U.S.).
[Washington, DC?] : U.S. Environmental Protection Agency ; Oklahoma City, OK : Ground Water Protection Council, [1990?] 10 p. : col. ill.
NAL Call Number: TD761.I8--1990
Descriptors: Injection-wells-Environmental-aspects-Juvenile-literature. Drinking-water-

Contamination-Juvenile-literature. Water-Pollution-Juvenile-literature. Groundwater-Pollution-Juvenile-literature.

36. **Logistic model of nitrate in streams of the upper-midwestern United States**.
Mueller,-D.K.; Ruddy,-B.C.; Battaglin,-W.A.
J-environ-qual. Madison : American Society Of Agronomy, Sept/Oct 1997. v. 26 (5) p. 1223-1230.
NAL Call Number: QH540.J6
Descriptors: nitrate-nitrogen. surface-water. water-pollution.

37. **Mangement tools for preventing water pollution on farms**.
Nevers,-E.; Jackson,-G.; Castelnuovo,-R.; Knox,-D.
Environmentally sound agriculture proceedings of the second conference 20-22 April 1994 /. St. Joseph, Mich. : American Society of Agricultural Engineers, c1994. 1994. p. 30-37.
NAL Call Number: S589.7.E57-1994
Descriptors: farms-. groundwater-pollution. risk-. assessment-. wells-. drinking-water. contamination-. point-sources. water-quality. environmental-protection. pollution-control. programs-.

38. **Managing the risks of pesticides : what role for monitoring? : Wednesday, November 4, 1987, Lincoln Campus Center, Amherst, Massachusetts : a workshop for agencies and organizations involved in groundwater and drinking water monitoring for pesticid es in the Northeast**.
New England Interstate Water Pollution Control Commission.
United States. Environmental Protection Agency. Pesticide Monitoring Conference (1987 : Lincoln Campus Center).
[Boston, Mass.? : New England Interstate Water Pollution Control Commission?, 1987?]
1 v. (various foliations) : ill.
NAL Call Number: TD427.P35M3
Descriptors: Pesticides-Environmental-aspects-Northeastern-States-Congresses. Water,-Underground-Northeastern-States-Quality-Congresses.

39. **Methods for treating acid groundwater results and evaluation of long-term tests**.
Bertills,-U.; Sundlof,-B.
Water-air-soil-pollut. Dordrecht : Kluwer Academic Publishers. Dec 1995. v. 85 (3) p. 1849-1854.
NAL Call Number: TD172.W36
Descriptors: air-pollution. acid-deposition. groundwater-pollution. acidification-. groundwater-. water-quality. pollution-control. liming-. limestone-. slaked-lime. alkalinity-. wells-. drinking-water. sweden-.

40. **Modeling multiphase migration of organic chemicals in goundwater systems -- A review and assessment**.
Abriola,-L.M.
E-H-P-Environ-Health-Perspect. Research Triangle Park, N.C. : National Institute of Environmental Health Sciences. Nov 1989. v. 83 p. 117-143.
NAL Call Number: RA565.A1E54
Descriptors: groundwater-pollution. organic-compounds. kinetics-. drinking-water. models-.

41. **Natural protection of spring and well drinking water against surface microbial contamination. I. Hydrogeological parameters**.
    Robertson,-J.B.; Edberg,-S.C.
    Crit-rev-microbiol. Boca Raton, Fla. : CRC Press,. 1997. v. 23 (2) p. 143-178.
    NAL Call Number: QR1.C7
    Descriptors: microbial-contamination. groundwater-. water-quality. water-pollution.
42. **Natural protection of spring and well drinking water against surface microbial contamination. II. Indicators and monitoring parameters for parasites**.
    Edberg,-S.C.; Leclerc,-H.; Robertson,-J.
    Crit-rev-microbiol. Boca Raton, Fla. : CRC Press,. 1997. v. 23 (2) p. 179-206.
    NAL Call Number: QR1.C7
    Descriptors: microbial-contamination. groundwater-. water-quality. water-pollution. indicator-species.
43. **New Mexico Farm-A-Syst : Farmstead Assessment System**.
    New Mexico State University. Cooperative Extension Service.
    Las Cruces, NM : New Mexico State University, College of Agriculture and Home Economics, Cooperative Extension Service, Plant Sciences Dept., [1992] 1 v. (various pagings) : ill.
    NAL Call Number: S561.6.N6N49--1992
    Descriptors: Farm-management-Environmental-aspects-New-Mexico. Drinking-water-Contamination-New-Mexico. Agricultural-pollution-New-Mexico. Groundwater-Pollution-New-Mexico.
44. **Nitrates and ground water quality protection policies**.
    Aiken,-J.D.
    EC-Coop-Ext-Serv-Univ-Nebr. Lincoln, Neb. : The Service. 1990. (90-2502) p. 28-32.
    NAL Call Number: 275.29-N272EX
    Descriptors: nitrates-. groundwater-pollution. law-. drinking-water. nitrogen-fertilizers. irrigation-. regulations-. poisoning-. methemoglobinemia-. nebraska-.
45. **Occurrence of selected herbicides and herbicide degradation products in Iowa's ground water, 1995**.
    Kolpin,-D.W.; Kalkhoff,-S.J.; Goolsby,-D.A.; Sneck-Fahrer,-D.A.; Thurman,-E.M.
    Ground-water. Westerville, Ohio : Ground Water Pub. Co. July/Aug 1997. v. 35 (4) p. 679-688.
    NAL Call Number: TD403.G7
    Descriptors: triazine-herbicides. herbicide-residues. triazines-. groundwater-pollution. groundwater-. polluted-water. contamination-. wells-. surveys-. aquifers-. geographical-variation. slope-. runoff-. depth-. iowa-.
46. **On the performance of computational methods for the assessment of risk from ground-water contamination**.
    Hamed,-M.M.; Bedient,-P.B.
    Ground-water. Westerville, Ohio : Ground Water Pub. Co. July/Aug 1997. v. 35 (4) p. 638-646.
    NAL Call Number: TD403.G7
    Descriptors: groundwater-pollution. polluted-water. groundwater-. risk-. risk-assessment. neoplasms-. man-. benzene-. tetrachloroethylene-. probability-analysis. drinking-water. contamination-. probability-. california-.

47. **Pesticides and ground water protection**.
    Aller,-C.C.
    Fla-Sci. Orlando, Fla. : Florida Academy of Sciences. Summer 1989. v. 52 (3) p. 220-224.
    NAL Call Number: 500-F66
    Descriptors: pesticide-residues. ethylene-dibromide. groundwater-pollution. drinking-water. environmental-protection. water-composition-and-quality. water-law. florida-.
48. **Potential regulatory problems associated with atrazine, cyanazine, and alachlor in surface water source drinking water**.
    Nelson,-H.; Jones,-R.D.
    Weed-technol. Champaign, Ill. : The Weed Science Society of America. Oct/Dec 1994. v. 8 (4) p. 852-861.
    NAL Call Number: SB610.W39
    Descriptors: atrazine-. cyanazine-. alachlor-. herbicide-residues. water-pollution. surface-water. runoff-. rivers-. lakes-. drinking-water. contamination-. risk-. water-reservoirs. safety-. north-central-states-of-usa.
49. **The power to protect : three stories about groundwater**.
    Paly,-Melissa.
    United States. Environmental Protection Agency.
    Massachusetts Audubon Society. New England Interstate Water Pollution Control Commission.
    [Mass.?] : U.S. Environmental Protection Agency, c1990. 1 videocassette (32 min.) : sd., col. 1 workbook (36 p.).
    NAL Call Number: Videocassette--no.2071
    Descriptors: Groundwater-Pollution-New-England. Groundwater-New-England-Management. Drinking-water-Contamination-New-England.
50. **Protecting local groundwater resources**.
    Smutko,-L.S.; Hoag,-D.L.
    AG-NC-Agric-Ext-Serv. Raleigh : North Carolina Agricultural Extension Service,. May 1995. (473-21) 6 p.
    NAL Call Number: S544.3.N6N62
    Descriptors: groundwater-pollution. contaminants-. sources-. drinking-water. hazards-. pollution-control. water-management. wells-. community-action. land-use-planning. north-carolina.
51. **Public health concerns in wastewater reuse**.
    Cooper,-R.C.
    Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control. Oxford : Pergamon Press. 1991. v. 24 (9) p. 55-65.
    NAL Call Number: TD420.A1P7
    Descriptors: waste-water. water-use. water-resources. irrigation-water. groundwater-. recharge-. drinking-water. public-health. health-protection. water-pollution.
52. **Regulating pollution sources under a differential groundwater protection strategy**.
    Raucher,-R.S.
    Amer-J-Agric-Econ. Ames, Iowa : American Agricultural Economics Association. Dec 1986. v. 68 (5) p. 1225-1228.
    NAL Call Number: 280.8-J822

Descriptors: resource-management. groundwater-pollution. pollutants-. water-law. drinking-water.

53. **The regulation of agricultural practices to protect groundwater quality: the Nebraska model for controlling nitrate contamination**.
Schneider,-S.A.
Articles and publications by NCALRI staff. 1988-[199-?]. Fall 1990. [5] p. 1-44.
NAL Call Number: KF1682.A45A77
Descriptors: groundwater-. nitrate-. nitrogen-fertilizers. water-quality. environmental-protection. models-. contamination-. drinking-water. water-management. regulations-. agricultural-chemicals. nebraska-.
54. **Relating pesticides management for water quality to health-based standards**.
Hornsby,-A.G.
Proc-Great-Plains-Agric-Counc. Lincoln, Neb. : The Council. 1989. p. 98-103.
NAL Call Number: 282.9-G7992
Descriptors: pesticides-. water-composition-and-quality. health-protection. groundwater-pollution. pollution-by-agriculture. soil-pollution. drinking-water. western-states-of-usa. north-central-states-of-usa. south-central-states-of-usa.
55. **Role of groundwater recharge in treatment and storage of wastewater for reuse**.
Bouwer,-H.
Water-Sci-Technol-J-Int-Assoc-Water-Pollut-Res-Control. Oxford : Pergamon Press. 1991. v. 24 (9) p. 295-302.
NAL Call Number: TD420.A1P7
Descriptors: waste-water-treatment. water-storage. water-quality. requirements-. water-reuse. irrigation-water. irrigated-stands. vegetables-. microbial-contamination. pathogens-. groundwater-recharge. application-to-land. aquifers-. public-health. health-protection. drinking-water.
56. **Seminar publication : wellhead protection : a guide for small communities**.
Center for Environmental Research Information (U.S.).
United States. Environmental Protection Agency. Office of Science, Planning, and Regulatory Evaluation.
USEPA. Office of Ground-Water Protection.
Cincinnati, OH : USEPA, [1993] ix, 144 p. : ill., maps
NAL Call Number: TD223.S46--1993
Descriptors: Wellheads-Protection. Groundwater-Quality. Water-quality-management.
57. **Septic tank setback distances: a way to minimize virus contamination of drinking water**.
Yates,-M.V.; Yates,-S.R.
Ground-Water. Dublin, Ohio : Water Well Journal Publishers. Mar/Apr 1989. v. 27 (2) p. 202-208. maps.
NAL Call Number: TD403.G7
Descriptors: groundwater-. groundwater-pollution. drinking-water. toxic-substances. viral-diseases. septic-tank-site-assessment. wells-. hydraulic-conductivity. arizona-.
58. **Statistical analysis of rural well contamination and effects of well construction**.
Glanville,-T.D.; Baker,-J.L.; Newman,-J.K.
J-environ-qual. St. Joseph, Mich. : American Society of Agricultural Engineers 1958-. Mar/Apr 1997. v. 40 (2) p. 363-370.

NAL Call Number: 290.9-Am32T
Descriptors: atrazine-. alachlor-. metolachlor-. nitrate-nitrogen. chloride-. coliform-bacteria. wells-. groundwater-pollution. building-materials. design-. drinking-water. transport-processes. water-quality. contamination-. iowa-.

59. **A survey and analysis of states' methodologies for deriving drinking water guidelines for chemical contaminants**.
Paull,-J.M.; Joellenbeck,-L.M.; Cochran,-R.C.; Sidhu,-K.S.
J-environ-qual. Orlando, Fla. : Academic Press. Feb 1991. v. 13 (1) p. 18-35.
NAL Call Number: RA1190.R42
Descriptors: drinking-water. groundwater-pollution. chemicals-. contaminants-. surveys-. guidelines-. state-government. federal-government. usa-.

60. **Synthesis of data from studies by the National Irrigation Water-Quality Program**.
Seiler,-R.L.
J-environ-qual. Herndon, Va. : American Water Resources Association. Dec 1996. v. 32 (6) p. 1233-1245.
NAL Call Number: 292.9-Am34
Descriptors: irrigation-. drainage-water. surface-water. water-quality. contaminants-. trace-elements. selenium-. boron-. molybdenum-. arsenic-. aluminum-. uranium-. ddt-. federal-programs. databases-. western-states-of-usa.

61. **To assess progress toward the development of a national groundwater protection program : hearing before a subcommittee of the Committee on Government Operations, House of Representatives, Ninety-ninth Congress, first session, December 3, 1985**.
United States. Congress. House. Committee on Government Operations. Environment, Energy, and Natural Resources Subcommittee.
Washington, [D.C.] : U.S. G.P.O. : For sale by the Supt. of Docs., Congressional Sales Office, U.S. G.P.O., 1987. iii, 99 p.
NAL Call Number: KF27.G655-1985a
Descriptors: Water,-Underground-United-States-Quality. Water-quality-United-States. Drinking-water-United-States.

62. **Uranium contamination in the Great Miami Aquifer at the Fernald Environmental Management Project, Fernald, Ohio**.
Sidle,-W.C.; Lee,-P.Y.
Ground-water. Westerville, Ohio : Ground Water Pub. Co. Sept/Oct 1996. v. 34 (5) p. 876-882.
NAL Call Number: TD403.G7
Descriptors: uranium-. radionuclides-. groundwater-pollution. aquifers-. transport-processes. groundwater-flow. leakage-. infiltration-. drainage-channels. radioactive-wastes. redox-potential. dissolved-oxygen. chemical-speciation. ohio-.

63. **Use of geostatistics to predict wellhead protection zones in a pumping well field**.
Yates,-M.V.; Yates,-S.R.
Abstr-Annu-Meet-Am-Soc-Microbiol. Washington, D.C. : The Society. 1987. (87th) p. 297.
NAL Call Number: 448.39-SO12A
Descriptors: groundwater-pollution. wells-. viruses-. drinking-water. inactivation-. health-hazards. geophysics-.

64. **Volatile (synthetic) organic chemicals (VOCs) in groundwater/risk assessment**. Shapiro,-M.A.
Chautauqua groundwater workshop for extension agents : proceedings of the workshop held at the Chautauqua Institution, Chautauqua, New York, May 7-9, 1986 / editor, Althea Rudd. University Park, PA : Northeast Regional Center for Rural Development, 1987. p. 43-53.
NAL Call Number: TD223.1.C4-1986
Descriptors: groundwater-pollution. organic-compounds. volatile-compounds. risks. health-hazards. drinking-water.
65. **Water and sediment ecotoxicity studies in Temuco and Rapel River Basin, Chile**. Dutka,-B.J.; McInnis,-R.; Jurkovic,-A.; Liu,-D.; Castillo,-G.
Environ-toxicol-water-qual. New York, N.Y. : John Wiley & Sons, Inc. Aug 1996. v. 11 (3) p. 237-247.
NAL Call Number: RA1221.T69
Descriptors: drinking-water. river-water. sediment-. toxic-substances. toxicity-. water-quality. sampling-. sample-processing. bioassays-. immunoassay-. chile-.

Return to Source Water Bibliography

Return to the Water Quality Information Center at the National Agricultural Library.
Last update: Jun 17, 2008
The URL of this page is http://www.nal.usda.gov/wqic/Source_Water/deline.html

---

J. R. Makuch /USDA-ARS-NAL-WQIC/ wqic@ars.usda.gov

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

---

Modeling Source Water Contamination

28 citations from the Agricola Database
1984 - June 1998

Mary Stevanus
Water Quality Information Center

This electronic bibliography is intended primarily to provide awareness of recent investigations and discussions of a topic and is not intended to be in-depth and exhaustive. The inclusion or omission of a particular publication or citation should not be construed as endorsement or disapproval. Citations are arranged alphabetically by title and abstracts are included where available. All citations are in English unless otherwise noted.

Send suggestions for electronic bibliographies related to water resources and agriculture to wqic@ars.usda.gov.

To locate a publication cited in this bibliography, please contact your local, state, or university library. If you are unable to locate a particular publication, your library can contact the National Agricultural Library (please see "Document Delivery Services" at http://www.nal.usda.gov/ddsb/).

---

1. **Analytical modelling of pesticide transport from the soil surface to a drinking water well.**
   Beltman, W. H. J., Boesten, J. J. T. I., and Zee, S. E. A. T. M. van der.
   J hydrol 169: 1/4 pp. 209-228. (July 1995).
   NAL Call #: 292.8-J82
   Descriptors: pesticides- leaching- water-flow drinking-water wells- water-quality groundwater-pollution mathematical-models
   Abstract: Pesticide transport through the unsaturated zone was modelled with an analytical solution of the convection-dispersion equation assuming steady water flow, a linear sorption isotherm and first-order transtormation kinetics. Pesticide behaviour in the saturated zone was described with an analytical solution of the mass balance equation for

a cylindrical flow system assuming steady flow, no dispersion, linear sorption and first-order transformation. This simplified model for the unsatu rated-saturated soil system was developed to identify the processes and parameters with the greatest impact on the fraction of applied pesticide reaching a drinking water well. Leaching from the unsaturated zone was highly sensitive to the parameters desc ribing travel time and transformation rate. Leaching increased when heterogeneity of the soil was taken into account. Pesticide arrival in the well was only moderately sensitive to the characteristic travel time and transformation rate in the aquifer.

2. **Application of the LP-DP approach to Andong and Imha parallel reservoirs, Korea.**
   Lee, S. and Marino, M. A.
   Water resour manag 9: 4 pp. 315-333. (Dec 1995).
   NAL Call #: TC401.W27
   Descriptors: water-reservoirs optimization- linear-programming dynamic-programming water-resources water-availability irrigation-water drinking-water hydroelectric-schemes electric-power power-stations korea-republic multioptimization- multipurpos e-reservoirs
   Abstract: This paper presents an application of a previously developed linear programming-dynamic programming (LP-DP) methodology to the operation of Andong and Imha parallel reservoirs in South Korea. The model allows for multioptimization of power generation and municipal, industrial, and irrigation water use. It is shown that the annual average energy and the annual average water supply generated from the joint operation of the two parallel reservoirs by the LD-DP approach is 15.2 and 1.7% more than the contracted power production and water supply respectively.
3. **Computer modeling applications in environmental assessments: predicting movement of pesticides into drinking water.**
   Gustafson, D. I.
   Rev-pestic-toxicol. Raleigh, N.C. : North Carolina State University, c1991-. 1993. v. 2 p. 57-99.
   NAL Call #: RA1270.P4R48
   Descriptors: pesticides- drinking-water groundwater- surface-water movement-persistence- prediction- environmental-factors simulation-models
4. **A conceptural framework for an integrated operational information and decision-supported system for Thames Water Utilities.**
   Jamieson, D. G.
   NATO-ASI-Ser-Ser-G-Ecol-Sci. Berlin, W. Ger. : Springer-Verlag. 1991. v. 26 p. 283-293.
   NAL Call #: DNAL QH540.N3
   Descriptors: water-resources water-management rivers- decision-making drinking-water sewage-effluent waste-water-treatment simulation-models computer-simulation computer-software south-east-england
5. **Deep nitrate movements in the unsaturated zone of a simulated urban lawn.**
   Exner, M. E., Burbach, M. E., Watts, D. G., Shearman, R. C., and Spalding, R. F.
   J Environ Qual 20: 3 pp. 658-662. (July/Sept 1991).
   NAL Call #: QH540.J6
   Descriptors: groundwater-pollution ammonium-nitrate application-rates leaching- lawns-and-turf poa-pratensis festuca-rubra irrigation- downward-movement wells- drinking-water nebraska- sidney,-nebraska

Abstract: The increasing incidence of NO3, contamination in municipal wells is a growing concern in the Midwest. While leachates from N fertilizers applied to agricultural lands can impact the water quality in municipal wells, there is also th e potential for leachates from turfgrass fertilizers to be groundwater contaminants. In this study, five plots were treated with ammonium nitrate (34-0-0,N-P-K) at rates of 0, 1.0, 1.5, 2.0, and 2.4 kg N/100 m2 and irrigated. The turf received approximate ly 640 mm of water during the 34-d study. Analysis of soil water from 15, 6-m continuous cores showed that as much as 95% of the NO3 applied in late August leached below the turfgrass root zone. Average NO3 Concentrations in the pulse ranged from 34 to 70 mg/L NO3-N. Thirty-four days after fertilization the center of the pulse was at approximately 1.2 m with the leading edge at 2 to 2.5 m. This vertical rate of movement is similar to that predicted by the one-dimensional CNLS model. The relatively high un iform NO3 concentrations in the unfertilized plot indicated that with excessive irrigation the water alone supplies NO3 in excess of the turfgrass need.

6. **Development of a data base of community water-supply wells in New Jersey and a method of evaluate their sensitivity to contamination.**
   Storck, Donald A., Isaacs, Kalman N., Vowinkel, Eric F., and New Jersey. Dept. of Environmental Protection. Geological Survey (U.S.).
   West Trenton, N.J. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Branch of Information Services [distributor], 1997. vi, 53 p.
   NAL Call #: GB701.W375--no.96-4132
   Descriptors: New-Jersey-Bureau-of-Safe-Drinking-Water-Databases Water-quality-management-New-Jersey-Databases Water-supply-New-Jersey-Measurement Groundwater-New-Jersey-Quality-Mathematical-models
7. **Effects of climatic variations over 11 years on nitrate-nitrogen concentrations in the Raccoon River, Iowa.**
   Lucey, K. J. and Goolsby, D. A.
   J Environ Qual. 22: 1 pp. 38-46. (Jan/Mar 1993).
   NAL Call #: QH540.J6
   Descriptors: nitrate-nitrogen drinking-water seasonal-variation precipitation- stream-flow water-quality water-pollution nitrogen-fertilizers mathematical-models iowa-
   Abstract: Nitrate-nitrogen (NO3-N) concentrations at public water-supply intakes on the Des Moines and Raccoon Rivers in Iowa exceeded the maximum contaminant level (MCL) of 10 mg L-1 for public water supplies established by the USEPA for exte nded periods of time from March through early August 1990. The excessive NO3-N levels followed 2 yr of less than normal precipitation in 1988 and 1989. A multiple linear-regression model was developed to predict NO3-N concentrations in the Raccoon River from readily-obtainable streamflow and climatic data. The four-variable model explained about 70% of the variability in the concentration of NO3-N. The mean streamflow for the previous 7-d period accounted for about 50% of the total variability.
8. **Exposure to tetrachloroethylene via contaminated drinking water pipes in Massachusetts: a predictive model.**
   Webler, T. and Brown, H. S.
   Arch environ health 48: 5 pp. 293-297. (Sept/Oct 1993).
   NAL Call #: RC963.A1A7

Descriptors: drinking-water plastic-pipes contaminants- chlorinated-hydrocarbons exposure- prediction- mathematical-models massachusetts-

9. **Formation, evolution and modeling of thrihalomethanes in the drinking water of a town. I. At the municipal treatment utilities.**
   Garcia Villanova, R. J., Garcia, C., Alfonso Gomez, J., Paz Garcia, M., and Ardanuy, R.
   Water res 31: 6 pp. 1299-1308. (June 1997).
   NAL Call #: TD420.W3
   Descriptors: drinking-water disinfection- chlorine- halogenated-hydrocarbons humic-acids organic-matter ph- temperature- correlation- mathematical-models spain-chlorination-byproducts salamanca,-spain
10. **Formation, evolution and modeling of trihalomethanes in the drinking water of a town. II. In the distribution system.**
    Garcia Villanova, R. J., Garcia, C., Alfonso Gomez, J., Paz Garcia, M., and Ardanuy, R.
    Water res 31: 6 pp. 1405-1413. (June 1997).
    NAL Call #: TD420.W3
    Descriptors: drinking-water water-supply water-reservoirs disinfection- halogenated-hydrocarbons chlorine- organic-matter ph- temperature- correlation- mathematical-models spain- chorination-byproducts salamanca,-spain
11. **Formation of POX and NPOX with chlorination of fulvic acid in water: empirical models.**
    Zou, H. X., Yang, S., Xu, X., and Su, O. Y.
    Water res 31: 6 pp. 1536-1541. (June 1997).
    NAL Call #: TD420.W3
    Descriptors: drinking-water water-purification disinfection- chlorine- fulvic-acids ph-temperature- ammonium-nitrogen regression-analysis mathematical-models prediction-purgeable-organic-halide nonpurgeable-organic-halide total-organic-halide
12. **A hydrology-vegetation interaction model for predicting the occurrence of plant species in dune slacks.**
    Noest, V.
    J environ manage 40: 2 pp. 119-128. (Feb 1994).
    NAL Call #: HC75.E5J6
    Descriptors: dunes- vegetation- botanical-composition ecosystems- coastal-areas environmental-factors prediction- probability- regression-analysis mosses- climatic-factors liverworts- drinking-water groundwater- urban-areas mathematical-models net herlands- vascular-plants
13. **Impact of excreted nitrogen by grazing cattle on nitrate leaching.**
    Hack ten Broeke, M. J. D., Groot, W. J. M. de., and Dijkstra, J. P.
    Soil use manage 12: 4 pp. 190-198. (Dec 1996).
    NAL Call #: S590.S68
    Descriptors: cattle- grazing- excreta- nitrogen- losses-from-soil nitrate- leaching- risk-nitrate-nitrogen nitrogen-content spatial-distribution soil-water simulation-models grassland-soils sandy-soils soil-water-content soil-variability unsatura ted-flow water-pollution drinking-water health-hazards netherlands-
    Abstract: At De Marke experimental farm, data on water and nitrogen flows in the unsaturated zone were gathered on two grazed pastures on sandy soils during the years 1991 to 1994. These provided a basis for calibration and validation of simul ation models.

The different levels of nitrate-N concentrations of the two plots could largely be explained by differences in crop uptake and simulated denitrification as influenced by different groundwater levels. The irregular distribution of excreta was taken into account by a simulation study quantifying the variability of nitrate-N concentrations under a grazed field. The resulting distribution of simulated nitrate-N concentrations explained the average and peak values of the measured concentrations. Temporal variability of weather was used to assess the nitrate leaching risk under urine patches deposited in either July or September. At site A the probability of exceeding the EC-directive by drinking water (11.3 mg/l nitrate-N) under a urination depos ited in either July or September was respectively 10 and 25%. The average field concentration at this site will hardly ever be a high risk for the environment under the current farm management. At site B the EC-directive will be exceeded under any urine p atch in almost 100% of the years, affecting the field average concentration. In field B careful grazing management would result in less nitrate leaching, but the environmental goals would not be reached.

14. **A mathematical systems model of nitrate contamination.**
Duckstein, L., Head, K. L., and Bogardi, I.
NATO-ASI-Ser-Ser-G-Ecol-Sci. Berlin, W. Ger. : Springer-Verlag. 1991. v. 30 p. 455-476.
NAL Call #: DNAL QH540.N3
Descriptors: nitrate- nitrate-fertilizers groundwater-pollution drinking-water contamination- carcinoma- risk- mathematical-models epidemiology- simulation-models

15. **Modeling pH and ionic strength effects on proton and calcium complexation of fulvic acid: a tool for drinking water-NOM studies.**
Bose, P. and Reckhow, D. A.
Environ sci technol 31: 3 pp. 765-770. (Mar 1997).
NAL Call #: TD420.A1E5
Descriptors: drinking-water organic-matter ph- fulvic-acids mathematical-models natural-organic-matter.

16. **A multiple logistic model for predicting the occurrence of Campylobacter jejuni and Campylobacter coli in water.**
Skjerve, E. and Brennhovd, O.
J Appl Bacteriol. 73: 1 pp. 94-98. (July 1992).
NAL Call #: 448.39-SO12
Descriptors: drinking-water campylobacter-jejuni campylobacter-coli fecal-coliforms streptococcus- clostridium- prediction- mathematical-models norway- fecal-streptococci sulfite-reducing-clostridia
Abstract: A multiple logistic regression model was established to predict the occurrence of Campylobacter jejuni/coli, related to index bacteria such as faecal coliforms, faecal streptococci, and sulphite-reducing clostridia, in a water source in southern Norway. The fitted model indicated that faecal coliforms were strong predictors for C. jejuni/coli, although the water temperature also had a strong influence on results. Sulphite-reducing clostridia, faecal streptococci, and season of the ye ar had no significant influence on the results, in spite of their apparent predictor value as separate variables. The model employed offers a new approach to the relationship between index bacteria and the occurrence of pathogenic bacteria in water. Simil ar models can also be established in general food microbiology.

17. **Occurrence, sources, and fate of trichloroacetic acid in Swiss waters.**
Muller, S. R., Zweifel, H. R., Kinnison, D. J., Jacobsen, J. A., Meier, M. A., Ulrich, M. M., and Schwarzenbach, R. P.
Environ toxicol chem 15: 9 pp. 1470-1478. (Sept 1996).
NAL Call #: QH545.A1E58
Descriptors: tca- contaminants- concentration- spatial-variation temporal-variation surface-water groundwater- drinking-water waste-water rain- lakes- water-quality water-pollution switzerland-
Abstract: The occurrence, sources, and fate of trichloroacetic acid (TCA) has been investigated in surface waters, ground waters, drinking waters, wastewaters, and rainwater in Switzerland. The concentrations found in surface waters varied bet ween less than 27 ng/L (limit of quantification) and 340 ng/L, whereas the concentrations in ground water were always below 27 ng/L. It was found that the main sources of TCA in surface waters were the effluents of wastewater treatment plants (average con centration, 430 ng/L; range, 40-1060 ng/L). The average TCA concentration in rainwater was 300 ng/L range, (< 27-900 ng/L). A dynamic mathematical model revealed that TCA is not significantly degraded in a lake (half-life > 230 d). A detailed mass b alance in the catchment area of a small lake (Greifensee) and a very rough mass balance over Switzerland indicate that rain is the major source of TCA in Switzerland (> 90%), but they also show that about 60 to 80% of the TCA deposited by rain is elimi nated, most probably in the soil.
18. **On the performance of computational methods for the assessment of risk from ground-water contamination.**
Hamed, M. M. and Bedient, P. B.
Ground-water. Westerville, Ohio : Ground Water Pub. Co. July/Aug 1997. v. 35 (4) p. 638-646.
NAL Call #: TD403.G7
Descriptors: groundwater-pollution polluted-water groundwater- risk- risk-assessment neoplasms- man- benzene- tetrachloroethylene- probability-analysis drinking-water contamination- probability- california- reliability-methods
Abstract: The effect of parameter uncertainty and overly conservative measures on risk assessment has been addressed in numerous researches. Most of the work conducted to date is based on the use of the classic Monte Carlo simulation method (M CS) as a probabilistic modeling tool. Although the MCS is robust and asymptotically convergent, it lacks computational efficiency when the simulated probability is small. Furthermore, the sensitivity information can only be obtained with additional comput ational effort. First- and second-order reliability methods (FORM and SORM) have been developed in the structural analysis field and have been recently applied to ground-water contaminant transport and remediation problems. In this work, we extend the app lication of the reliability methods to the probabilistic assessment of cancer risk due to ground-water contamination. Results of the reliability methods compared well with a published case study of PCE contamination of a ground-water supply in California. The target risk level is extended over a larger range, and the sensitivity of the probability of failure to the relevant random variables is analyzed. The application of the methods to another case study, cancer risk due to the ingestion of benzene conta minated water, further illustrates a systematic way of directly accounting for the intrinsic uncertainty of the transport and

fate model parameters involved in the risk assessment procedure. The probability of exceeding the target risk level in this case was found to be most sensitive to the uncertainty in the parameters describing the ground-water transport process.

19. **Physiographic and land use characteristics associated with nitrate-nitrogen in Montana groundwater.**
Bauder, J. W., Sinclair, K. N., and Lund, R. E.
J environ qual 22: 2 pp. 255-262. (Apr/June 1993).
NAL Call #: QH540.J6
Descriptors: drinking-water wells- water-quality nitrate-nitrogen geographical-distribution dry-farming rotations- site-factors climatic-factors groundwater-pollution montana-
Abstract: Occurrence of NO3(-)-N in drinking water at concentrations > 10 mg L-1 is being reported in the literature with increasing frequency. Some occurrences of high NO3(-)-N concentrations have been attributed to irrigation and fertiliz ation practices. A private well water testing program in Montana, involving nearly 3400 well owners, found NO3-(-)N concentrations > 10 mg L-1 in nearly 6% of all tested wells. Most of the agricultural land in Montana is nonirrigated and is not subject to high rates of N fertilization. Dryland crop/fallow cereal grain rotations are the main practices. Well water test results were combined with MAPS, a geographic information system (GIS), to identify correlations between county average NO3(-)-N concentr ation in groundwater, well water sample probability of exceeding 10 mg L-1 NO3(-)-N, geographic, climatic, and geologic conditions, and land-use practices. From a list of 67 independent variables, county average well water NO3(-)-N concentration and perce ntage of tested wells in each county with NO3(-)-N concentration > 10 mg L-1 were correlated ($P < 0.10$) with 16 independent variables, most of which were associated with precipitation, soil properties, and land-use practices.

20. **Potential contribution of ploughed grassland to nitrate leaching.**
Whitmore, A. P., Bradbury, N. J., and Johnson, P. A.
Agric Ecosyst Environ 39: 3/4 pp. 221-233. (Apr 1992).
NAL Call #: S601.A34
Descriptors: leaching- nitrate-nitrogen nitrogen- plowing- grassland-soils soil-organic-matter losses-from-soil-systems runoff-water drinking-water mathematical-models england- wales-

21. **Regulating environmental health risks under uncertainty: groundwater contamination in California.**
Lichtenberg, E., Zilberman, D., and Bogen, K. T.
J Environ Econ Manage 17: 1 pp. 22-34. (July 1989).
NAL Call #: HC79.P55J6
Descriptors: dbcp- groundwater-pollution drinking-water health-hazards risk-uncertainty- regulations- decision-making probabilistic-models costs- marginal-analysis environmental-policy california- fresno-county,-california
Abstract: Our method for incorporating uncertainty into environmental health risk policy determination corresponds closely to the legal and political strictures governing these policies. An application to a case of groundwater contamination de monstrates that (1) the desirability of developing new water supplies versus cleaning up existing ones varies across locations; (2) the stringency of any given policy varies inversely with the margin

of safety required; (3) the cost premiums imposed by gr eater aversion to uncertainty may be quite large; and (4) the marginal cost of risk reduction decreases significantly as aversion to uncertainty grows, implying that assessments of policies based on average risk will tend to overestimate allowable risk. C omparing an efficient program to the current inefficient approach to risk management indicates that the cost of inefficiency is not great.

22. **The regulation of agricultural practices to protect groundwater quality: the Nebraska model for controlling nitrate contamination.**
Schneider, S. A.
Articles and publications by NCALRI staff. 1988-[199-?]. Fall 1990. [5] p. 1-44.
NAL Call #: DNAL KF1682.A45A77
Descriptors: groundwater- nitrate- nitrogen-fertilizers water-quality environmental-protection models- contamination- drinking-water water-management regulations-agricultural-chemicals nebraska-

23. **Standard setting processes and regulations for environmental contaminants in drinking water: state versus federal needs and viewpoints.**
Sidhu, K. S.
Regul Toxicol Pharmacol R T P 13: 3 pp. 293-308. (June 1991).
NAL Call #: RA1190.R42
Descriptors: drinking-water contaminants- carcinogens- standards- public-health state-government federal-government usa- risk-assessment noncarcinogens- environmental-protection-agency-epa
Abstract: The primary objective of a standard setting process is to arrive at a drinking water concentration at which exposure to a contaminant would result in no known or potential adverse health effect on human health. The drinking water sta ndards also serve as guidelines to prevent pollution of water sources and may be applicable in some cases as regulatory remediation levels. The risk assessment methods along with various decision making parameters are used to establish drinking water stan dards. For carcinogens classified in Groups A and B by the United States Environmental Protection Agency (USEPA) the standards are set by using nonthreshold cancer risk models. The linearized multistage model is commonly used for computation of potency fa ctors for carcinogenic contaminants. The acceptable excess risk level may vary from 10(-6) to 10(-4). For noncarcinogens, a threshold model approach based on application of an uncertainty factor is used to arrive at a reference dose (RfD). The RfD approac h may also be used for carcinogens classified in Group C by the USEPA. The RfD approach with an additional uncertainty factor of 10 for carcinogenicity has been applied in the formulation of risk assessment for Group C carcinogens. The assumptions commonl y used in arriving at drinking water standards are human life expectancy, 70 years; average human body weight, 70 kg; human daily drinking water consumption, 2 liters; and contribution of exposure to the contaminant from drinking water (expressed as a par t of the total environmental exposure), 20%. Currently, there are over 80 USEPA existing or proposed primary standards for organic and inorganic contaminants in drinking water. Some of the state versus federal needs and viewpoints are discussed.

24. **A statistician's view of the U.S. primary drinking water regulation on coliform contamination.**
Hamilton, M. A.

Environ sci technol 28: 11 pp. 1808-1811. (Oct 1994).
NAL Call #: TD420.A1E5
Descriptors: drinking-water coliform-count contamination- regulations- statistical-analysis probabilistic-models government-organizations usa- u s -environmental-protection-agency

25. **Toxicity of the blue-green alga (cyanobacterium) Microcystisaeruginosa in drinking water to growing pigs, as an animal model for human injury and risk assessment.**
Falconer, I. R., Burch, M. D., Steffensen, D. A., Choice, M., and Coverdale, O. R.
Environ toxicol water qual 9: 2 pp. 131-139. (May 1994).
NAL Call #: RA1221.T69
Descriptors: microcystis-aeruginosa hepatotoxins- drinking-water toxicity- risk- animal-models pigs- man-
Abstract: Hepatotoxins from blue-green algae are increasingly recognized as a potential hazard in drinking water supplies. The clinical consequences of ingestion include acute or chronic liver injury, with the possibility of enhanced suscepti bility to, and growth of, liver tumors. To establish guidelines for water safety requires the demonstration of dose-dependent effects of toxicity and experimental determination of maximum "no-adverse-effect levels." This paper describes the use of growing pigs as a model for human injury resulting from Microcystis toxins in drinking water. Risk assessment calculations using a series of safety factors are carried out, resulting in a guideline level after incorporating an additional safety facto r for tumor promotion of approximately 1.0 microgram toxins/L. With the Microcystis used for this trial, that concentration corresponds to 5000 cells/mL.

26. **Use of modeling in developing label restrictions for agricultural chemicals.**
Jones, R. L.
Weed Technol J Weed Sci Soc Am 6: 3 pp. 683-687. (July/Sept 1992).
NAL Call #: SB610.W39
Descriptors: agricultural-chemicals pesticides- simulation-models regulations- labeling-groundwater- drinking-water water-quality

27. **Use of risk assessment for development of microbial standards.**
Rose, J. B. and Gerba, C. P.
Water Sci Technol J Int Assoc Water Pollut Res Control 24: 2 pp. 29-34. (1991).
NAL Call #: DNAL TD420.A1P7
Descriptors: drinking-water microbial-contamination health-hazards assessment- viruses-protozoa- cysts- risk- models- quality-standards acceptability- safety- infection-probability-

28. **Water quality model of the lower bay of Sebago Lake. CHEMICAL ENGINEERING - 1992.**
Monasky, George A. 1966
Orono, Me., 1992. viii, 173 leaves : ill.: Includes vita. Thesis (M.S.) in Chemical Engineering--University of Maine, 1992. Bibliography: leaves 133-136.
NAL Call #: MeU Univ.-1992-M66
Descriptors: Water-quality-Maine-Sebago-Lake Drinking-water-Maine-Analysis

---

Return to Source Water Bibliography

Return to the Water Quality Information Center at the National Agricultural Library.
Last update: Jun 17, 2008
The URL of this page is http://www.nal.usda.gov/wqic/Source_Water/dwmodels.html

---

J. R. Makuch /USDA-ARS-NAL-WQIC/ wqic@ars.usda.gov

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

---

Policy Issues Relating to Source Water Protection

42 citations from the Agricola Database
1984 - June 1998

Mary Stevanus
Water Quality Information Center

This electronic bibliography is intended primarily to provide awareness of recent investigations and discussions of a topic and is not intended to be in-depth and exhaustive. The inclusion or omission of a particular publication or citation should not be construed as endorsement or disapproval. Citations are arranged alphabetically by title and abstracts are included where available. All citations are in English unless otherwise noted.

Send suggestions for electronic bibliographies related to water resources and agriculture to wqic@ars.usda.gov.

To locate a publication cited in this bibliography, please contact your local, state, or university library. If you are unable to locate a particular publication, your library can contact the National Agricultural Library (please see "Document Delivery Services" at http://www.nal.usda.gov/ddsb/).

---

1. **The 1986 amendments to the Safe Drinking Water Act : impacts on Virginia's water supply industry.**
   Cox, William Edward 1944, Sherrard, Joseph H., Gaw, Christopher D., and Virginia Water Resources Research Center. Geological Survey (U.S.).
   Blacksburg : Virginia Water Resources Research Center, Virginia Polytechnic Institute and State University, 1991. xii, 163 p. : ill.: Supported in part by U.S. Geological Survey, Dept. of Interior.
   NAL Call #: NAL TD201.V57-no.170
   Descriptors: Drinking-water-Law-and-legislation-United-States Water-supply-equipment-industry-Virginia

2. **1994 is the anniversary of the Safe Drinking Water Act.**
   Dent, J.
   Agfocus 2, 5. (May 1994).
   NAL Call #: NAL S544.3.N7A4
   Descriptors: drinking-water environmental-legislation water-quality environmental-protection-agency
3. **Amending the Safe Drinking Water Act: view from Congress.**
   Waxman, H.
   Epa-j. Washington, U.S. Environmental Protection Agency. Summer 1994. v. 20 (1/2) p. 32-33.
   NAL Call #: NAL TD171.U5
   Descriptors: drinking-water legislation- water-quality contamination- usa-
4. **The Clean Water Act: has it worked? We have a long way to go.**
   Adler, R.
   Epa-j. Washington, U.S. Environmental Protection Agency. Summer 1994. v. 20 (1/2) p. 10-14.
   NAL Call #: NAL TD171.U5
   Descriptors: water-pollution water-quality legislation- environmental-protection water-recreation drinking-water pollutants- fish- shellfish- food-contamination wetlands-
5. **Developing a national drinking water regulation for disinfection of ground water.**
   Macler, B. A.
   Ground-water-monit-remediat. Dublin, OH : Ground Water Pub. Co., c1993-. Fall 1995. v. 15 (4) p. 77-84.
   NAL Call #: NAL GB1001.G76
   Descriptors: drinking-water groundwater- disinfection- regulations- microbial-contamination public-health waterborne-diseases incidence- environmental-legislation federal-government usa- groundwater-disinfection-rule safe-drinking-water-act enviro nmental-protection-agency
   Abstract: The Safe Drinking Water Act directs EPA to promulgate requirements for disinfection of ground water-based drinking water systems. The Groundwater Disinfection Rule regulatory workgroup, made up of representatives from EPA, the states , and other interested parties, is actively considering the issues for the wide range of elements necessary to ensure a regulation that will protect public health and can be feasibly implemented. This regulation is likely to require disinfection of ground water sources and systems found to be contaminated or vulnerable to contamination.
6. **Drinking water.**
   Morandi, Larry B., Waldman, Deb., and Energy, Science and Natural Resources Program National Conference of State Legislatures National Conference of State Legislatures. Denver, Colo. : National Conference of State Legislatures, c1991. 13 p.
   NAL Call #: ArU KF5569.A1F56-1991
   Descriptors: Water-quality-management-United-States Water,-Underground-Pollution-Law-and-legislation-United-States Water-Pollution-Law-and-legislation-United-States Drinking-water-Law-and-legislation-United-States Drinking-water-Contamination
7. **Drinking water : combination of strategies needed to bring program costs in line with resources : statement of Peter F. Guerrero, Director, Environmental Protection Issues, Resources, Community, and Economic Development Division, before the**

Environ ment, Energy, and Natural Resources Subcommittee, Committee on Government Operations, House of Representatives.
Guerrero, Peter F. and United States. General Accounting Office. United States. Congress. House. Committee on Government Operations. Environment, Energy and Natural Resources Subcommittee.
Washington, D.C. : The Office ; Gaithersburg, MD: The Office [distributor, 1994] 10, [2] p.
NAL Call #: NAL KF3794.A25G824--1994
Descriptors: Drinking-water-Law-and-legislation-United-States Waterworks-Economic-aspects-United-States

8. **Drinking water: future quality requirements.**
Packham, R. F.
J Inst Water Environ Manag 7: 5 532-538. (Oct 1993).
NAL Call #: NAL TD420.W374
Descriptors: drinking-water quality- requirements- quality-standards legislation-european-communities who- uk-
Abstract: Regulations governing the quality of drinking water within the European Community must be based on Directive 80/778/EC, although Member States may impose tighter or additional limits if they so wish. The Directive is substantially derived from standards set by the World Health Organisation (WHO) in 1970. Revised 'Guidelines Values' for water contaminants were issued by WHO in 1984, and a further revision will be published in 1993. Modest changes in the guidelines set by WHO fo r microbiological parameters since 1970 have been accompanied by a large increase in the number of limits set for chemical parameters. This is particularly marked for organic compounds including pesticides and disinfection byproducts. The new WHO gu idelines will inevitably have an impact on water supplies in the UK, but the timescale for a significant change in the outmoded EC Directive is uncertain.

9. **Drinking water : key quality assurance program is flawed and underfunded : report to the Chairman, Subcommittee on Health and the Environment, Committee on Energy and Commerce, House of Representatives. Key quality assurance program is flawed and u nderfunded.**
United States. General Accounting Office. United States. Congress. House. Committee on Energy and Commerce. Subcommittee on Health and the Environment.
Washington, D.C. : The Office ; Gaithersburg, MD: The Office [distributor, 1993] 38 p.
NAL Call #: NAL KF3794.A25D75--1993
Descriptors: Drinking-water-Law-and-legislation-United-States Drinking-water-Quality-control-Standards Drinking-water-Quality-control-Evaluation

10. **Drinking water : key quality assurance program is flawed and underfunded : statement of Peter F. Guerrero, Associate Director, Environmental Protection Issues, Resources, Community, and Economic Development Division, before the Subcommittee on Heal th and the Environment, Committee on Energy and Commerce, House of Representatives. Key quality assurance program is flawed and underfunded.**
Guerrero, Peter F. and United States. General Accounting Office. United States. Congress. House. Committee on Energy and Commerce. Subcommittee on Health and the Environment.

Washington, D.C. : The Office ; Gaithersburg, MD : The Office [distributor, 1993] 7, [2] p.
NAL Call #: NAL KF3794.A25--1993
Descriptors: Drinking-water-Law-and-legislation-United-States Drinking-water-Quality-control-Education Drinking-water-Quality-control-Standards-United-States

11. **The drinking water ordinance. 2. Aufl. Trinkwasserverordnung : Leitfaden zur Verordnung uber Trinkwasser und uber Wasser fur Lebensmittelbetriebe (Trinkwasserverordnung--TrinkwV) vom 5. Dezember 1990 (BGB1. I S. 2612) : Text und amtliche Begrundung mit Erlauterungen fur die Praxis.**
Dilly, Peter. and Welsch, Michael.
Stuttgart : Wissenschaftliche Verlagsgesellschaft, 1992. 148 p.:
NAL Call #: NAL KK6189.D54-1992
Descriptors: Drinking-water-Law-and-legislation-Germany
12. **The drinking water ordinance. Trinkwasserverordnung : Leitfaden zur Verordnung uber Trinkwasser und uber Wasser fur Lebensmittelbetriebe (Trinkwasserverordnung--TrinkwV) vom 22. Mai 1986 (BGB1.I S. 760) : Text und amtliche Begrundung mit Erlauterun gen fur die Praxis.**
Dilly, Peter.
Stuttgart : Wissenschaftliche Verlagsgesellschaft, c1986. 94 p. Language: German.
NAL Call #: NAL KK6189.D54-1986
Descriptors: Drinking-water-Law-and-legislation-Germany-West
13. **Drinking water program : states face increased difficulties in meeting basic requirements : report to the Chairman, Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives. States face increased diff iculties in meeting basic requirements.**
United States. General Accounting Office. United States. Congress. House. Committee on Energy and Commerce. Subcommittee on Oversight and Investigations.
Washington, D.C. : The Office ; Gaithersburg, MD: The Office [distributor, 1993] 18 p.
NAL Call #: NAL KF3794.U55--1993
Descriptors: Drinking-water-Law-and-legislation-United-States Drinking-water-Standards-United-States-States Drinking-water-United-States-Quality-control-State-supervision
14. **Drinking water : stronger efforts needed to protect areas around public wells from contamination : report to the Chairman, Environment, Energy, and Natural Resources Subcommittee, Committee on Government Operations, House of Representatives. Strong er efforts needed to protect areas around public wells from contamination.**
United States. General Accounting Office. United States. Congress. House. Committee on Government Operations. Environment, Energy and Natural Resources Subcommittee.
Washington, D.C. : The Office ; Gaithersburg, MD: The Office [distributor, 1993] 37 p. : ill.:
NAL Call #: NAL RA592.A1D75--1993
Descriptors: Drinking-water-Contamination Wellheads-United-States Drinking-water-Law-and-legislation-United-States
15. **Farming for drinking water : nitrate pollution of water : an assessment of a regulatory regime.**

Elworthy, Sue 1943
Aldershot ; Brookfield : Avebury, c1994. ix, 123 p.: Includes bibliographical references.
NAL Call #: NAL TD427.N5E44--1994
Descriptors: Nitrates. Environmental-aspects. Nitrogen-fertilizers. Great-Britain. Water-Pollution. Law-and-legislation-Great-Britain

16. **Federal environmental policy: a summary overview.**
Carriker, R. R.
J agric appl econ 28: 1 99-107, 126-134. (July 1996).
NAL Call #: NAL HD101.S6
Descriptors: environmental-policy law- federal-government usa- national-environmental-policy-act
Abstract: The National Environmental Policy Act (NEPA), which was signed into law on January 1, 1970, has come to be regarded as the first major piece of federal legislation to call for comprehensive attention to environmental concerns in the United States. During the two decades following enactment of NEPA, Congress adopted and then refined major legislation on nearly every aspect of environmental quality concerns: air pollution, water pollution, drinking water quality, hazardous waste manage ment, wildlife protection, pesticide use, and several related problem areas. Current arguments for environmental regulatory reform are a phase in the continuing evolution of this body of federal environmental policy.

17. **German drinking wate regulations, pesticides, and axiom of concern.**
Dieter, H. H.
Environ Manage 16: 1 21-31. (Jan/Feb 1992).
NAL Call #: NAL HC79.E5E5
Descriptors: drinking-water groundwater- pesticides- regulations- public-health-legislation german-democratic-republic german-federal-republic federal-communicable-diseases-control-act-of-1979

18. **Ground water and the Safe Drinking Water Act Amendments of 1996.**
Job, C.
Ground water monit remediat 17: 1 49-51. (Winter 1997).
NAL Call #: NAL GB1001.G76
Descriptors: groundwater- drinking-water environmental-legislation federal-government usa- environmental-protection-agency

19. **Handbook of Florida water regulation.**
Olexa, M. T.
Circ-Fla-Coop-Ext-Serv. Gainesville, Fla. : The Service. Nov 1991. 44 p.
NAL Call #: NAL 275.29-F66C
Descriptors: water-policy regulations- law- water-quality water-pollution wetlands- law-enforcement drinking-water environmental-legislation pesticides- pollutants- florida-

20. **Hazard communication handbook : a right-to-know compliance guide. 1993 ed.**
Moyer, Craig A. and Francis, Michael A.
Deerfield, IL : Clark Boardman Callaghan, c1993. 1 v.
NAL Call #: ArU KF3958.M69-1993
Descriptors: Industrial-safety. Law-and-legislation. United-States. Handbooks,-manuals,-etc. Industrial-hygiene. Hazardous-substances. Chemicals.

21. **Health advisories and alternative agricutlural practices: regulatory basis for concern and its influence on legislation.**
Leslie, A. R. and Barrett, M.
A C S Symp Ser Am Chem Soc: 465 16-26. (1991).
NAL Call #: NAL QD1.A45
Descriptors: pesticide-residues groundwater- water-pollution public-health-legislation regulations- agricultural-policy groundwater-contamination
Abstract: Farming practices that require intensive use of pesticides and fertilizer are believed to contribute to groundwater contamination in agricultural areas. Dependency on these practices is attributable in part to certain requirements of the federal commodity programs that result in continuous cropping patterns to retain government subsidies. There is increasing evidence of groundwater contamination; a number of studies have examined alternative approaches to prevent further contaminatio n. The USEPA assigns risk-based advisories or regulatory standards to drinking water contaminants; this has had an important influence on legislative changes already made or being considered to provide incentives for farmers to reduce their dependence upo n agricultural chemicals.
22. **A hedonic approach to estimating operation and maintenance costs for New York municipal water systems.**
Schmit, T. M. and Boisvert, R. N.
Agric resour econ rev 26: 2 184-195. (Oct 1997).
NAL Call #: NAL HD1773.A2N6
Descriptors: drinking-water water-systems water-quality treatment- water-costs public-utilities population-density size- urban-areas legislation- water-policy descriptive-statistics production-functions mathematical-models new-york safe-drinking-w ater-act cost-function
23. **History of the sole source aquifer program: a community-based approach for protecting aquifers used for drinking water supply.**
McCabe, W. J., Job, C. A., Simons, J. J., Graves, J. S., and Terada, C. J.
Ground water monit remediat 17: 3 78-86. (Summer 1997).
NAL Call #: NAL GB1001.G76
Descriptors: drinking-water groundwater- aquifers- groundwater-pollution federal-government environmental-legislation new-jersey ohio- idaho- pennsylvania- usa-environmental-protection-agency safe-drinking-water-act-of-1974
24. **Lead in drinking water.**
St. Clair, M. B. and Zaslow, S. A.
HE-North-Carolina-Agric-Ext-Serv. Raleigh, N.C. : The Service. Mar 1992. (395) 3 p.
NAL Call #: NAL TX24.N8H46
Descriptors: lead- drinking-water legislation- north-carolina
25. **A Learning guide for state/local drinking water agreements.**
National Environmental Health Association. United States. Environmental Protection Agency. Office of Ground Water and Drinking Water.
[Washington, D.C.] : [National Environmental Health Association?, 1992?] ii, 137 p. : ill.:
NAL Call #: NAL KF3794.L43-1992
Descriptors: Drinking-water-Law-and-legislation-United-States

26. **A Legislative history of the Safe Drinking Water Act Amendments, 1983-1992, together with a section-by-section index.**
    Library of Congress. Environment and Natural Resources Policy Division. United States. Congress. Senate. Committee on Environment and Public Works.
    Washington : U.S. G.P.O. : For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1993. viii, 1152 p. : ill.:
    NAL Call #: NAL KF3794.A314A15-1993
    Descriptors: United-States. Safe-Drinking-Water-Act. Safe-Drinking-Water-Act-Amendments-of-1986. Lead-Contamination-Control-Act-of-1988.
27. **Observations on compliance and enforcement in EPA's drinking water program.**
    Hembra, Richard L. and United States. General Accounting Office. United States. Congress. House. Committee on Energy and Commerce. Subcommittee on Health and the Environment.
    [Washington, D.C.] : U.S. General Accounting Office, [1991] 15 leaves.
    NAL Call #: NAL KF3794.H45-1991
    Descriptors: Water-Pollution-Law-and-legislation-United-States Drinking-water-Law-and-legislation-United-States
28. **Priorities for the reauthorization of the Safe Drinking Water Act : : hearing before the Subcommittee on Health and Environment of the Committee on Commerce, House of Representatives, One Hundred Fourth Congress, second session, January 31, 1996.**
    United States. Congress. House. Committee on Commerce. Subcommittee on Health and the Environment.
    Washington : U.S. G.P.O. : For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1996. iii, 152
    NAL Call #: NAL Fiche--S-133-Y-4.C-73/8:104-57-
    Descriptors: Drinking-water-Law-and-legislation-United-States Drinking-water-Contamination-United-States Federal-aid-to-water-quality-management-United-States Water-quality-management-United-States-Finance
29. **Problem of nonpoint source agricultural water pollution: toward a hypothetical federal legislative solution.**
    Caulfield, H. P. Jr.
    Water Resour Bull 27: 3 447-452. (May/June 1991).
    NAL Call #: NAL 292.9-AM34
    Descriptors: groundwater-pollution agricultural-chemicals drinking-water water-quality environmental-legislation federal-government politics- decision-making
    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 chem icals. 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.
30. **Reauthorization of the Safe Drinking Water Act : hearing before the Committee on Environment and Public Works, United States Senate, One Hundred Third Congress, first session, May 3, 1993--Providence, Rhode Island.**
    United States. Congress. Senate. Committee on Environment and Public Works.

Washington : U.S. G.P.O. : For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1993. iii, 62 p.
NAL Call #: NAL KF26.E6-1993b
Descriptors: Drinking-water-Law-and-legislation-Rhode-Island Drinking-water-Contamination-Rhode-Island Water-Pollution-Rhode-Island-Physiological-effect

31. **Reconciling science and policy in setting federal drinking water standards--four states' perspectives.**
Hutcheson, M. S., Dupuy, C. J., Matyas, B., McGeorge, L., and Vanderslice, R.
Regul toxicol pharmacol. 22: 1 11-23. (Aug 1995).
NAL Call #: NAL RA1190.R42
Descriptors: drinking-water contaminants- arsenic- radon- contamination- exposure-monitoring- cost-effectiveness-analysis regulation- legislation- federal-government massachusetts- rhode-island connecticut- new-jersey safe-drinking-water-act-of-1 974 environmental-protection-agency
Abstract: After almost 20 years of experience with implementing the Safe Drinking Water Act and eight with Amendments to the Act, the individual states within the United States have gained valuable experience while trying to reconcile the lega l mandates provided by the statutes with the science underlying them. This paper presents four different topics illustrating the problems of reconciling these two issues in the regulation of toxic chemicals in drinking waters. It presents these from the p erspectives of the states of Massachusetts, Rhode Island, Connecticut, and New Jersey and offers suggestions for improved program efficiency based on considerations of comparative human health risks. The approach and schedule for controlling toxic chemica ls used through 1994 are first examined and a recommendation is made for more flexibility in the rate at which chemicals are regulated. Recent U.S. EPA proposals to more stringently control radon in drinking waters are presented in the context of all sour ces of radon exposures, illustrating the intersection of science, laws, and economic consequences of regulatory initiatives. Inhalation and dermal exposures as a result of using chemically contaminated drinking waters are then discussed with the suggestio n of the possible underprotectiveness of some present standards. Finally, the difficulty faced by the states and federal government in the control of naturally occurring arsenic exposures through drinking water is also presented and an argument is made fo r more local flexibility in the application of health-based standards.

32. **Regulations under the clean air, clean water and safe drinking acts and the need for reform : : hearing before the Subcommittee on National Economic Growth, Natural Resources, and Regulatory Affairs of the Committee on Government Reform and Ove rsight, House of Representatives, One Hundred Fourth Congress, first session, May 26, 1995.**
United States. Congress. House. Committee on Government Reform and Oversight. Subcommittee on National Economic Growth, Natural Resources and Regulatory Affairs.
Washington : U.S. G.P.O. : For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1996. iii, 240 p.
NAL Call #: NAL Fiche--S-133-Y-4.G-74/7:AI-7/27-
Descriptors: Air-Pollution-Law-and-legislation-United-States Water-Pollution-Law-and-legislation-United-States Drinking-water-Law-and-legislation-United-States Air-quality-management-United-States Water-quality-management-United-States

33. **Report on proposed drinking water protection fund.**
    Drinking Water Protection Fund Task Force. Virginia. State Water Commission.
    [Virginia : The Task Force?], 1990. 11 leaves:
    NAL Call #: ViBlbV HD4464.V8D75-1990
    Descriptors: Waterworks-Virginia-Finance Drinking-water-Law-and-legislation-Virginia
34. **A report to the Congress : activities and programs implemented under section 319 of the Clean Water Act - fiscal year 1988. Activities and programs implemented under section 319 of the Clean Water Act-fiscal year 1988.**
    United States. Environmental Protection Agency. Office of Water.
    Washington, DC : The Office, [1989] xiv, 73 p.
    NAL Call #: NAL TD424.3.R47--1989
    Descriptors: Water-Pollution. Drinking-water-Contamination. Drinking-water-Purification. Drinking-water-Standards.
35. **An SAB report : safe drinking water : future trends and challenges : an Environmental Futures report. Safe drinking water.**
    United States. Environmental Protection Agency. Drinking Water Committee. United States. Environmental Futures Committee.
    Washington, DC : The Board, [1995] 1 v.
    NAL Call #: NAL RA591.U55--1995
    Descriptors: Drinking-water-Contamination-United-States Drinking-water-Standards-United-States Water-Pollution-Law-and-legislation-United-States Water-quality-management-United-States
36. **The Safe Drinking Water Act : a pocket guide to the requirements for the operators of small water systems. [3rd ed.]. Pocket guide to the requirements for the operators of small water systems.**
    United States. Environmental Protection Agency. Region IX.
    San Francisco, CA : The Region, [1993] 1 v. (various pagings) : ill.: Cover title. "June 1993."
    NAL Call #: NAL KF3794.S25--1993
    Descriptors: Drinking-water-Law-and-legislation-United-States Water-United-States-Analysis-Handbooks,-manuals,-etc
37. **Safe Drinking Water Act Amendments of 1986.**
    Cotruvo, J. A.
    Water resour update. 77 11-14. (May 1988).
    NAL Call #: NAL TD201.U61
    Descriptors: drinking-water legislation- contaminants- pollutants- monitoring- public-health usa-
38. **Safe Drinking Water Act Amendments of 1986 : conference report (to accompany S. 124).**
    United States. Congress (99th, 2nd session 1986 House.
    [Washington, D.C.? : U.S. G.P.O., 1986] 49 p.
    NAL Call #: NAL KF3794.A25S44--1986
    Descriptors: Drinking-water-Law-and-legislation-United-States Water-Pollution-Law-and-legislation-United-States
39. **The Safe Drinking Water Act as amended by the Safe Drinking Water Act Amendments of 1986 : Public Law 99-339, June 19, 1986.**

United States. United States. Congress. Senate. Committee on Environment and Public Works. United States. Safe Drinking Water Act.
Washington : U.S. G.P.O. : For sale by the Supt. of Docs., Congressional Sales Office, 1986. iii, 63 p.
NAL Call #: NAL KF3794.A31A2--1986
Descriptors: Drinking-water-Law-and-legislation-United-States

40. **Safe Drinking Water Act : hearing before the Subcommittee on Health and the Environment of the Committee on Energy and Commerce, House of Representatives, One Hundred Third Congress, first session, on H.R. 1701 ... April 19, 1993.**
United States. Congress. House. Committee on Energy and Commerce. Subcommittee on Health and the Environment.
Washington : U.S. G.P.O. : For sale by the U.S. G.P.O., Supt. of Docs., Congressional Sales Office, 1993. iii, 232 p.
NAL Call #: NAL KF27.E553-1993
Descriptors: Drinking-water-Law-and-legislation-United-States Drinking-water-Purification-United-States Federal-aid-to-water-quality-management-United-States Water-quality-management-United-States-Finance
41. **Safe Drinking Water Amendments Act of 1995 : report of the Committee on Environment and Public Works, United States**
United States. Congress. Senate. Committee on Environment and Public Works.
Washington : U.S. G.P.O., 1995. iii, 230 p.: Distributed to some depository libraries in microfiche. Shipping list no.: 96-0083-P. "November 7, 1995." SUDOCS: Y 1.1/5:104-169.
NAL Call #: NAL Fiche--S-133-Y-1.1/5:104-169-
Descriptors: Drinking-water. Law-and-legislation. United-States. Drinking-water-Contamination-United-States Federal-aid-to-water-quality-management-United-States Water-quality-management-United-States-Finance
42. **San Francisco water district targets cattle.**
Stephens, T.
Calif agric 51: 2 7. (Mar/Apr 1997).
NAL Call #: NAL 100-C12Cag
Descriptors: cryptosporidium- water-pollution rangelands- cattle- grazing- land-management legislation- drinking-water california- san-franciso-public-utilities-commission

---

Return to Source Water Bibliography

Return to the Water Quality Information Center at the National Agricultural Library.
Last update: Jun 17, 2008
The URL of this page is http://www.nal.usda.gov/wqic/Source_Water/dwlegis.html

---

J. R. Makuch /USDA-ARS-NAL-WQIC/ wqic@ars.usda.gov

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

---

Source Water Quality Management

78 citations from the Agricola Database
1984 - June 1998

Mary Stevanus
Water Quality Information Center

This electronic bibliography is intended primarily to provide awareness of recent investigations and discussions of a topic and is not intended to be in-depth and exhaustive. The inclusion or omission of a particular publication or citation should not be construed as endorsement or disapproval. Citations are arranged alphabetically by title and abstracts are included where available. All citations are in English unless otherwise noted.

Send suggestions for electronic bibliographies related to water resources and agriculture to wqic@ars.usda.gov.

To locate a publication cited in this bibliography, please contact your local, state, or university library. If you are unable to locate a particular publication, your library can contact the National Agricultural Library (please see "Document Delivery Services" at http://www.nal.usda.gov/ddsb/).

---

1. **Analytical modelling of pesticide transport from the soil surface to a drinking water well.**
   Beltman, W. H. J., Boesten, J. J. T. I., and Zee, S. E. A. T. M. van der.
   J hydrol. 169: 1/4 209-228. (July 1995).
   NAL Call #: 292.8-J82
   Descriptors: pesticides- leaching- water-flow drinking-water wells- water-quality groundwater-pollution mathematical-models
   Abstract: Pesticide transport through the unsaturated zone was modelled with an analytical solution of the convection-dispersion equation assuming steady water flow, a linear sorption isotherm and first-order transtormation kinetics. Pesticide behaviour in the saturated zone was described with an analytical solution of the mass balance equation for

a cylindrical flow system assuming steady flow, no dispersion, linear sorption and first-order transformation. This simplified model for the unsatu rated-saturated soil system was developed to identify the processes and parameters with the greatest impact on the fraction of applied pesticide reaching a drinking water well. Leaching from the unsaturated zone was highly sensitive to the parameters desc ribing travel time and transformation rate.

2. **Application of petroleum geophysical well logging and sampling techniques for evaluating aquifer characteristics.**
   Temples, T. J. and Waddell, M. G.
   Ground-water. Columbus, Ohio : Ground Water Pub. Co. May/June 1996. v 34 (3) p. 523-531.
   NAL Call #: TD403.G7
   Descriptors: aquifers- wells- sampling- groundwater- data-collection geology- analytical-methods porosity- permeability- saturated-hydraulic-conductivity water-quality south-carolina transmissivity-
   Abstract: The Hilton Head Island Test Well #1 was drilled to a depth of 3833 feet to evaluate the upper Cretaceous section as a potential ground-water source for Hilton Head Island, South Carolina. The initial plan was to analyze continuous co nventional cores. The interval to be analyzed extended from the top of the Eocene to the base of the Cretaceous (approximately 3500 feet). However, due the high cost ($400,000), the decision was made to evaluate aquifer potential using advanced geophysica l logs with sidewall cores for calibration. The logging suite consisted of a dual induction resistivity, spontaneous potential, compensated neutron, density log, gamma ray, spectral gamma, multipole array acoustic log, caliper, high resolution dipmeter, a nd a circumferential borehole imaging log. In addition to the wireline logs, 239 sidewall cores and 12 Formation Multi-Test samples were obtained. The log, sidewall core, and FMT information were integrated into an interpretive package using computer gene rated logs and simple spreadsheets to calculate aquifer properties. Porosity, hydraulic conductivity, transmissivity, and lithogic data derived from this integrated analysis were then used to select screen zones. Water quality in relation to drinking wate r standards exceeded expectations. The information obtained from the integrated program allowed estimates to be made about the well's productivity without the expense of conventional coring, flow testing, and completion of the well.
3. **Assessing the ground water quality characteristics of the Hamlet of Carseland.**
   Saint Fort, R.
   J Environ Sci Health Part A Environ Sci Eng. A28: 5 995-1003. (1993).
   NAL Call #: TD172.J6
   Descriptors: drinking-water groundwater- water-quality ions- geochemistry- public-health risk- alberta- maximum-acceptable-limits.
4. **Chemical composition of hard- and softrock groundwaters from central Norway with special consideration of fluoride and Norwegian drinking water limits.**
   Saether, O. M., Reimann, C., Hilmo, B. O., and Taushani, E.
   Environ geol 26: 3 147-156. (Oct 1995).
   NAL Call #: QE1.E5
   Descriptors: groundwater- aquifers- water-quality fluoride- anions- cations- alluvium-glacial-deposits quaternary-deposits wells- drinking-water norway- crystalline-rocks

metamorphic-rocks
Abstract: Groundwaters from crystalline and metamorphic rocks (hardrocks) and from Quaternary deposits, i.e., alluvial and glacial deposits (softrocks) from the counties of Nord-Trondelag and Sor-Trondelag were analyzed for major and minor ele ments and ions including fluoride. The median concentration of F- in water from the hardrock aquifers is 0.28 mg/1 (14.7 microequivalents/l) in contrast to water from softrock aquifers in which it is found to be 0.05 mg/1 (2.6 microequivalents/l). More im portantly, ca. 15% of the locations where water was abstracted from hardrock wells contain 1.5 mg/l (78.9 microequivalents/l) F- or more. Thus, 15% of all hardrock wells returned F- results that are at or above the maximum recommended value for drinking w ater. Of the softrock wells, none are above 1 mg/l. Geologists would normally expect higher F- contents in groundwaters derived from acid rocks, e.g., in granitic or gneissic areas. When comparing the host lithology with the observed F- contents, however, no clear relationship between F- content and lithology is visible. The highest observed F- values actually occur in gneissic host rocks. However, wells drilled in amphibolites/greenstones, mica schists, calcareous rocks, and sedimentary rocks all returne d some analytical results above 1.5 mg/l F-. These results suggest that all hardrock wells drilled should be tested for F- and the users informed about the results and advised to take any necessary precautions.

5. **Clean well water? Not always.**
Henderson, Z. P.
Hum ecol forum. 23: 3 5-7. (Summer 1995).
NAL Call #: HV1.H8
Descriptors: drinking-water wells- septic-tanks microbial-contamination toxic-substances water-management site-factors leaching- soil-types-structural soil-types-textural waste-water waste-water-treatment monitoring- education- water-quality new-y ork surveys-

6. **Cooperative Extension System's extension educational materials : drinking water quality : well water testing : bibliography. Extension educational materials.**
USDA Extension Service Water Quality National Initiative Team.
[Washington, D.C.?] : Water Quality Initiative Team, Extension Service, U.S. Dept. of Agriculture, [1990] 46 p.
NAL Call #: aZ7935.C64--1990
Descriptors: Drinking-water-Contamination-Bibliography Groundwater-Sampling-Bibliography Water-quality-Bibliography

7. **Cotton production on the Macon Ridge: how to reduce nitrate leached into drinking water.**
Walthall, P. M., Brady, W. D., and Hutchinson, R. L.
LA agric. 39: 2 5-9. (Spring 1996).
NAL Call #: 100-L939
Descriptors: gossypium-hirsutum fields- nitrate-fertilizers nitrate-nitrogen leaching-groundwater-pollution pollution-control control-methods split-dressings cover-crops aquifers- drinking-water water-quality climatic-factors computer-simulation louisiana-

8. **Defining water quality.**
Adams, E. B.
Ext-Bull-Wash-State-Univ-Coop-Ext-Serv. Pullman, Wash. : The Service. Nov 1992. (1721) 8 p.

NAL Call #: 275.29-W27P
Descriptors: water-quality surface-water groundwater- drinking-water irrigation-water regulations- quality-standards contaminants- washington-

9. **Determination of a metabolite of the herbicide pyridate in drinking water and groundwater using high-performance liquid chromatography with amperometric detection.**
Pachinger, A., Eisner, E., Begutter, H., and Klus, H.
J Chromatogr. 558: 2 369-373. (Oct 11, 1991).
NAL Call #: 475-J824
Descriptors: water-quality drinking-water groundwater- water-pollution pyridate-metabolites- herbicide-residues hplc- determination-

10. **Development of a data base of community water-supply wells in New Jersey and a method to evaluate their sensitivity to contamination.**
Storck, Donald A., Isaacs, Kalman N., Vowinkel, Eric F., and New Jersey. Dept. of Environmental Protection. Geological Survey (U.S.).
West Trenton, N.J. : U.S. Dept. of the Interior, USGS ; Denver, CO : Branch of Information Services [distributor], 1997. vi, 53 p.
NAL Call #: GB701.W375--no.96-4132
Descriptors: New-Jersey-Bureau-of-Safe-Drinking-Water-Databases Water-quality-management-New-Jersey-Databases. Water-supply-New-Jersey-Measurement Groundwater-New-Jersey-Quality-Mathematical-models

11. **Domestic well water quality in rural Nebraska: focus on nitrate-nitrogen, pesticides, and coliform bacteria.**
Gosselin, D. C., Headrick, J., Tremblay, R., Chen, X. H., and Summerside, S.
Ground water monit remediat. 17: 2 77-87. (Spring 1997).
NAL Call #: GB1001.G76
Descriptors: drinking-water wells- groundwater- groundwater-pollution water-quality contaminants- nitrate-nitrogen pesticides- coliform-bacteria rural-areas nebraska-drinking-water-quality
Abstract: For this statewide assessment, 1808 wells were sampled and a data base compiled that included water-quality data (NO3(-1)-N, pesticides, coliform bacteria) and site-specific data collected at each location. Domestic, rural water qual ity in Nebraska varies substantially from one ground water region to another and is a function of well characteristics, distances to potential contamination sources, and hydrogeologic and site characteristics. The percentage of wells exceeding the 10 ppm MCL for NO3(-1)-N ranged from 3 to 39 percent, depending on the ground water region. This large range of values indicates the inadequacy of stating that an average of 19 percent of domestic wells in Nebraska are contaminated by nitrates. This statistic do es not describe the nature, extent, and variability of the contamination problem. Depending on the ground water region, the degree of nitrate contamination in rural domestic drinking-water wells has remained generally unchanged or has only slightly increa sed since the last statewide assessment conducted from 1985 to 1989. Bacterial contamination has either remained the same or has decreased. The percentage of wells affected by bacteria ranged from 8 to 26 percent, depending on the ground water region.

12. **Drinking recycled wastewater: can groundwater recharge safely address the drinking-water needs of rapidly growing urban areas.**

Pinholster, G.
Environ sci technol. 29: 4 174A-179A. (Apr 1995).
NAL Call #: TD420.A1E5
Descriptors: groundwater-recharge water-reuse aquifers- waste-water water-quality drinking-water

13. **Drinking water and health.**
Fundingsland, S. and Lundstrom, D.
NDSU-Ext-Serv-Publ-North-Dakota-State-Univ. Fargo, N.D. : The University. June 1988. (HE-429) 6 p.
NAL Call #: S544.3.N9C46
Descriptors: drinking-water water-quality water-intake fluoride- bacteria- nitrate- sulfate- lead- water-hardness groundwater-pollution pesticides- risk- contamination- north-dakota

14. **Drinking water contamination: understanding the risks.**
Webendorfer, B. and Jackson, G.
Publ-Univ-Wis-Coop-Ext-Serv. Madison, Wis. : The Service. 1989. (G3339) 6 p.
NAL Call #: DNAL S544.3.W6W53
Descriptors: drinking-water water-pollution water-quality pesticide-residues risk- wells- wisconsin-

15. **Drinking water in Churchill County.**
Reid, M. E.
NDSU-Ext-Serv-Publ-North-Dakota-State-Univ. Fargo, ND: The University. 1992. 4 p.
NAL Call #: S544.3.N9C46
Descriptors: drinking-water aquifers- water-quality wells- quality-standards nevada- churchill-county,-nevada

16. **Drinking water testing.**
Norris, P. E., Storm, D. E., Allen, E. R., and Smolen, M. D.
OSU-Ext-Facts-Coop-Ext-Serv-Okla-State-Univ. Stillwater, Okla. : The Service. Nov 1991. (878) 4 p.
NAL Call #: S544.3.O5O5
Descriptors: drinking-water testing- water-quality water-supply wells- oklahoma-

17. **Drinking water testing for private well owners.**
Lewis, S.
Fact-Sheet-Coll-Agric-Univ-Nev-Reno-Nev-Coop-Ext. [Reno, Nev.] : The College. Sept 1992. (92-30) 4 p.
NAL Call #: S544.3.N3C66
Descriptors: drinking-water wells- testing- water-quality contamination- coliform- bacteria.

18. **The effect of watershed, reservoir volume, and rainfall on nitrate levels in surface drinking water supplies.**
Shamblen, R. G. and Binder, D. M.
J soil water conserv. 51: 6 457-461. (Nov/Dec 1996).
NAL Call #: 56.8-J822
Descriptors: surface-water drinking-water water-supply water-quality nitrate- contamination- water-pollution nitrate-nitrogen concentration- temporal-variation catchment-hydrology rain- reservoirs- volume- agricultural-land land-management ohio- p ollutant-load

19. **Effects of agriculture on ground-water quality in five regions of the United States.**
Hamilton, P. A. and Helsel, D. R.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. Mar/Apr 1995. v. 33 (2) p. 217-226.
NAL Call #: TD403.G7
Descriptors: groundwater-pollution nitrogen-fertilizers animal-manures nitrate- water-quality groundwater- aquifers- irrigated-conditions irrigated-sites delaware- maryland-virginia- new-york kansas- nebraska- connecticut- delmarva-peninsula surf icial-aquifers
Abstract: Water-quality conditions in surficial unconsolidated aquifers were assessed in five agricultural regions in the United States. The assessment covers the Delmarva Peninsula, and parts of Long Island, Connecticut, Kansas, and Nebraska, and is based on water-quality and ancillary data collected during the 1980s. Concentrations of nitrate in ground water in these areas have increased because of applications of commercial fertilizers and manure. Nitrate concentrations exceed the maximum c ontaminant level (MCL) for drinking water of 10 milligrams per liter as nitrogen established by the U.S. Environmental Protection Agency in 12 to 46 percent of the wells sampled in the agricultural regions. Concentrations of nitrate are elevated within th e upper 100 to 200 feet of the surficial aquifers. Concentrations of nitrate are greatest in areas that are heavily irrigated or areas that are underlain by well-drained sediments; more fertilizer is typically applied on land with well-drained sediments t han on poorly drained sediments because well-drained sediments have a low organic-matter content and low moisture capacity. Concentrations of other inorganic constituents related to agriculture, such as potassium and chloride from potash fertilizers, and calcium and magnesium from liming, also are significantly elevated in ground water beneath the agricultural areas.
20. **Effects of artificial recharge on ground water quality and aquifer storage recovery.**
Ma, L. and Spalding, R. F.
J Am Water Resour Assoc. 33: 3 561-572. (June 1997).
NAL Call #: GB651.W315
Descriptors: groundwater- aquifers- groundwater-recharge groundwater-pollution water-quality pollutants- nitrates- nitrate-nitrogen atrazine- water-table infiltration- nebraska-artificial-groundwater-recharge
Abstract: Ground water nitrate contamination and water level decline are common concern in Nebraska. Effects of artificial recharge on ground water quality and aquifer storage recovery (ASR) were studied with spreading basins constructed in th e highly agricultural region of the Central Platte, Nebraska. A total of 1.10 million m3 of Platte River water recharged the aquifer through 5000 m2 of the recharge basins during 1992, 1993, and 1994. This is equivalent to the quantity needed to completel y displace the ground water beneath 34 ha of the local primary aquifer with 13 m thickness and 0.26 porosity. Ground water atrazine concentrations at the site decreased from 2 to 0.2 mg L-1 due to recharge. Both NO3-N and atrazine contamination dramatical ly improved from concentrations exceeding the maximum contaminant levels to those of drinking water quality. The water table at the site rose rapidly in response to recharge during the early stage then leveled off as infiltration rates declined.
21. **Establishing and optimizing a national database for quality of groundwater and drinking water.**
Platen, F. von

Water supply. 12: 1/2 SS8-10-SS8/13. (1994).
NAL Call #: TD201.W346
Descriptors: water-quality groundwater- drinking-water databases- denmark-

22. **Evaluation of coliforms as indicators of water quality in India.**
Ramteke, P. W., Bhattacharjee, J. W., Pathak, S. P., and Kalra, N.
J Appl Bacteriol. 72: 4 352-356. (Apr 1992).
NAL Call #: 448.39-SO12
Descriptors: drinking-water fecal-coliforms strains- heat-tolerance groundwater- surface-water wells- water-quality coliform-count indicators- tropical-climate rural-areas jammu-and-kashmir sikkim- himachal-pradesh uttar-pradesh meghalaya- mizoram - tripura-west-bengal maharashtra- piped-water-supply thermotolerant-coliform-strains
Abstract: The total and thermotolerant coliform counts in rural drinking water derived from ground water, piped supplies and surface water are reported for a number of areas in India. To evaluate these counts as indicators of recent faecal con tamination the total coliforms and thermotolerant coliforms isolated have been identified. Thermotolerant Escherichia coli formed 11.7% of the total coliforms and 75.1% of the thermotolerant coliforms. Citrobacter sp. (20.4%) and Klebsiella sp. (50.9%) we re the other common total coliforms isolated and, among the thermotolerant coliforms, Klebsiella sp. (16.4%) was the only other organism frequently encountered. The total coliform counts were significantly correlated with water temperature. The applicabil ity in tropical areas of standards developed for temperate climates is discussed.

23. **Evaluation of ground-water contamination from nonpoint sources: a case study.**
Brink, C. van den and Zaadnoordijk, W. J.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. May/June 1995. v. 33 (3) p. 356-365.
NAL Call #: TD403.G7
Descriptors: groundwater-pollution pollutants- contaminants- nitrate- leaching-computer-analysis computer-software computer-simulation simulation-models groundwater-flow geographical-information-systems water-quality groundwater-extraction wells- groundwater- hungary- shallow-groundwater flunit-program nitron-program fluzo-program arclinfo-program welcon-program triwaco-program nonpoint-source-pollution
Abstract: In many countries a substantial part of the drinking-water supply comes from subsurface-water resources. During the last several decades an increasing extent of diffuse pollution has endangered these water resources. Knowledge of the changes in ground-water quality is necessary in order to know if, and to what extent, ground-water quality is endangered. Changes in ground-water quality can be predicted by means of models describing both the ground-water flow and the transport of conta minants. A Geographic Information System is an efficient tool to handle the storage and manipulation of the large amount of data needed for the description of diffuse pollution. A methodology to predict changes in ground-water quality, which is called FLU NIT, has been built around the programs FLUZO, NITRON, ARC/INFO, dBASE, and WELCON, and the ground-water flow package TRIWACO. The method runs on a PC (with 386 processor). The system has been applied to a well field on Csepel Sziget (near Budapest, Hunga ry). The purpose was not so much the prediction of the ground-water quality, but

much more the evaluation of ground-water protection strategies based on risk analysis and effectivity of possible measures.

24. **Factors related to nitrate-nitrogen contamination of Ohio farm water wells.**
Rausch, J. N., Hitzhusen, F. J., Forster, D. L., and Elliot, W. J.
Econ-sociol-occas-pap. Columbus : Ohio State University, Dept. of Agricultural Economics and Rural Sociology. June 1992. (1953) 12 p.
NAL Call #: HD1411.O3
Descriptors: drinking-water water-quality wells- water-pollution nitrate- nitrogen- factor-analysis ohio-

25. **Farmstead assessment for whole farm water quality protection.**
Jackson, G. W. and Anderson, J. L.
Agricultural research to protect water quality proceedings of the conference February 21-24, 1993 Minneapolis, Minnesota, USA /. Ankeny, IA : The Society, [1993]. p. 517-519.
NAL Call #: TD427.A35A49-1993
Descriptors: groundwater- wells- drinking-water water-quality farms- risk- assessment-educational-programs educational-planning plan-implementation-and-evaluation wisconsin- minnesota- farmstead-assessment-program-farm*a*syst well-water.

26. **Florida's ground water quality monitoring program : background hydrogeochemistry.**
Maddox, Gary. and Florida Geological Survey. Florida. Bureau of Drinking Water and Ground Water Resources. Florida. Division of Resource Management.
Tallahassee, [Fla.] : Published for the Florida Geological Survey, 1992. 1 atlas.
NAL Call #: GB1025.F6F6--1992-Fo
Descriptors: Groundwater-Florida-Maps Hydrogeology-Florida Water-quality-Florida-Measurement Water-quality-monitoring-stations-Florida

27. **Good wells for safe water.**
Glanville, T.
PM-Iowa-State-Univ-Coop-Ext-Serv. Ames, Iowa : Iowa State University, Cooperative Extension Service. Mar 1993. (840,rev.) 4 p.
NAL Call #: 275.29-IO9PA
Descriptors: wells- safety- construction- water-quality drinking-water water-systems well-drainage regulations- iowa-

28. **Ground-water quality and flow in a shallow glaciofluvial aquifer impacted by agricultural contamination.**
Kehew, A. E., Straw, W. T., Steinmann, W. K., Barrese, P. G., Passarella, G., and Peng, W. S.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. May/June 1996. v 34 (3) p. 491-500.
NAL Call #: TD403.G7
Descriptors: aquifers- groundwater-pollution glacial-deposits nitrate- triticum- fallout-water-quality calcite- iron- groundwater-recharge lakes- wetlands- groundwater-flow fluvioglacial-soils michigan- nonpoint-source-pollution glaciofluvial-dep osits
Abstract: The Prairie Ronde fan, a discrete glaciofluvial deposit in southwestern Michigan, contains a productive but highly vulnerable unconfined aquifer used for irrigation, municipal, and domestic supply. A comprehensive hydrogeological stu dy of

the aquifer delineated shallow, local flow systems that interact with ponds and wetlands on the fan surface, overlying a deeper intermediate/regional flow system extending to the base of the glacial drift. Ground water within the shallow flow system s contains tritium concentrations indicative of a post-bomb age and is heavily impacted by nonpoint source combination. Nitrate commonly exceeds drinking water standards in the shallow flow system. Although no continuous physical barrier separates the two flow systems, the deeper flow system is generally lacking in tritium as well as nonpoint source contaminants derived from surface land uses. High capacity pumping from the deeper flow system, however, will likely draw contaminants downward from the shall ow flow system.

29. **Groundwater: a source of Alaska's drinking water.**
Publ-Univ-Alaska-Coop-Ext-Serv. Fairbanks, Alaska : The Service. Oct 1991. (100G-00948) 2 p.
NAL Call #: 275.29-AL13P
Descriptors: groundwater- drinking-water water-supply water-quality alaska-

30. **Groundwater contamination by ricefield pesticides and some influencing factors.**
Castaneda, A. R. and Bhuiyan, S. I.
J environ sci health Part A, Environ sci eng toxic hazard substance control. A31: 1 83-99. (1996).
NAL Call #: TD172.J6
Descriptors: groundwater-pollution drinking-water water-quality

31. **Groundwater quality near two cattle feedlots in Texas high plains: a case study.**
Sweeten, J. M., Marek, T. H., and McReynolds, D.
Appl eng agric. 11: 6 845-850. (Nov 1995).
NAL Call #: S671.A66
Descriptors: groundwater- water-quality contamination- determination- cattle-feeding feedlots- environmental-impact aquifers- nitrate-nitrogen ammonia- nitrites- nitrogen-content electrical-conductance alkalinity- phosphorus- potassium- chloride- sodium-texas-
Abstract: A groundwater sampling study was conducted at two cattle feedlots with capacities of 45,000 (Feedlot A) and 42,500 head (Feedlot B), respectively, in Castro and Parmer Counties in the Southern High Plains of Texas. At both feedlots, groundwater was sampled from the Ogallala Aquifer at four water wells supplying cattle drinking water and from 10 or 11 irrigation wells within a distance of 1.07 to 1.41 km (0.67 to 0.88 mile) from the feed pens or playa basins (natural depressions) used for collection of feedlot runoff. Water table depth was 82.3 to 97.5 m (270 to 320 ft). Nitrate-nitrogen (NO3N) concentrations averaged less than 1.2 mg/L at Feedlot A (maximum value of 2.23 mg/L) and 5.21 mg/L at Feedlot B (maximum value of 9.54 mg/L). These are below the USEPA primary drinking water standard of 10.0 mg/L NO3-N. Other nutrient and salinity values were low. The well water in all feedlot wells and in farm irrigation wells appears to be suitable for irrigation, livestock watering, and huma n consumption.

32. **Groundwater quality: responsible agriculture and public perceptions.**
Goss, M. J. and Barry, D. A. J.
J agric environ ethics. 8: 1 52-64. (1995).
NAL Call #: BJ52.5.J68

Descriptors: groundwater-pollution water-quality drinking-water wells- farming-agricultural-policy canada-

33. **Groundwater resource management and environmental protection: A case study of the Pilippines.**
Munasinghe, M.
Nat Resour Forum. 15: 4 302-312. (Nov 1991).
NAL Call #: HC55.N3
Descriptors: drinking-water water-quality water-management salt-water-intrusion environmental-protection water-use water-policy population-pressure economic-development aquifers- case-studies water-costs philippines- manila,-philippines

34. **Guidance for applicants for state Wellhead Protection Program assistance funds under the Safe Drinking Water Act.**
United States. Environmental Protection Agency. Office of Ground Water Protection.
Washington, D.C. : U.S. Environmental Protection Agency, Office of Water, Office of Ground-Water Protection, [1987] 1 v.
NAL Call #: TD426.G84-1987
Descriptors: Well-Head-Protection-Program Wellheads-Protection-United-States Water,-Underground-Quality Drinking-water

35. **Heterogeneities in ground-water geochemistry in a sand aquifer beneath an irrigated field.**
Kelly, W. R.
J hydrol. 198: 1/4 154-176. (Nov 1997).
NAL Call #: 292.8-J82
Descriptors: irrigated-sites water-quality groundwater-pollution
Abstract: The contamination of shallow aquifers by elevated nitrate concentrations is a common problem in many rural regions of the world. Aquifers under irrigated land are especially susceptible to this type of contamination. An intensive thr ee-dimensional investigation of water chemistry was undertaken in a shallow unconfined sand aquifer in an area of intensive irrigation in Mason County, Illinois, in order to investigate processes affecting water quality. Results reveal considerable hetero geneity in the aqueous chemistry in three spatial dimensions and temporally. Recharge is rapid in this system and the water chemistry of the recharge water is variable both spatially and temporally, being especially influenced by agricultural practices. N itrate concentrations are elevated in a zone between about 6 and 10 m beneath the surface, although in certain areas and at certain times this zone was not found. The maximum nitrate concentrations in this zone were slightly greater than 20 mg l-1 as N, w ell above the US Environmental Protection Agency's maximum contaminant level (MCL) of 10 mg l-1. Nitrate was generally absent both above and below this depth in the aquifer. Water relatively depleted in nitrate recharges the aquifer from the surface at th e site, producing a zone of dilute water near the water table.

36. **Identification of organic pollutants in Ter river and its system of reservoirs supplying water to Barcelona (Catalonia, Spain): a study by GC/MS and FAB/MS.**
Espadaler, I., Caixach, J., Om, J., Ventura, F., Cortina, M., Paune, F., and Rivera, J.
Water res. 31: 8 1996-2004. (Aug 1997).
NAL Call #: TD420.W3
Descriptors: drinking-water rivers- river-water water-reservoirs water-supply water-

quality water-pollution pollutants- organic-compounds factory-effluents gas-chromatography mass-spectrometry analytical-methods spain- closed-loop-stripping-analys is fast-atom-bombardment-mass-spectrometry

37. **The impact of land reclamation on groundwater quality and future drinking water supply in The Netherlands.**
Stuyfzand, P. J.
Water sci technol. 31: 8 47-57. (1995).
NAL Call #: TD420.A1P7
Descriptors: groundwater- water-quality reclaimed-land infiltration- surface-water rivers-polders- groundwater-recharge salt-water-intrusion netherlands-

38. **Improving home water quality.**
Langston, J.
MP-Univ-Arkansas-Coop-Ext-Serv. Little Rock, Ark. : The Service. Jan 1989. (292) 22 p.
NAL Call #: DNAL 275.29-AR4MI
Descriptors: water-quality drinking-water wells- springs- water-supply testing-treatment- chlorine- sodium-carbonate water-filters arkansas-

39. **An integrated water management concept to ensure a safe water supply and high drinking water quality on an ecologically sound basis.**
Heinzmann, B. and Sarfert, F.
Water sci technol. 31: 8 281-291. (1995).
NAL Call #: TD420.A1P7
Descriptors: groundwater-recharge water-reuse sewage-effluent drinking-water water-quality water-pollution surface-water waste-water water-management berlin- storm-water

40. **Local resource planning for water quality improvement.**
Boyd, D. A.
J Soil Water Conserv. 47: 2 136-138. (Mar/Apr 1992).
NAL Call #: 56.8-J822
Descriptors: aquifers- water-quality local-planning resource-management agricultural-chemicals application-rates irrigation-systems drinking-water illinois- mason-county,-illinois

41. **Mangement tools for preventing water pollution on farms.**
Nevers, E., Jackson, G., Castelnuovo, R., and Knox, D.
Environmentally sound agriculture proceedings of the second conference 20 22 April 1994. 30-37. (1994).
NAL Call #: S589.7.E57-1994
Descriptors: farms- groundwater-pollution risk- assessment- wells- drinking-water contamination- point-sources water-quality environmental-protection pollution-control programs- farmstead-assessment-system

42. **Methane in well water from Lake Charles, Louisiana.**
Murray, H. E. and Beck, J. N.
Bull Environ Contam Toxicol. 48: 5 768-771. (May 1992).
NAL Call #: RA1270.P35A1
Descriptors: drinking-water groundwater- wells- methane- measurement- water-quality louisiana.

43. **Migration and contamination of major and trace elements in groundwater of Madras City, India.**

Ramesh, R., Kumar, K. S., Eswaramoorthi, S., and Purvaja, G. R.
Environ geol. 25: 2 126-136. (Mar 1995).
NAL Call #: QE1.E5
Descriptors: groundwater-pollution trace-elements anions- cations- major-elements contamination- aquifers- salt-water-intrusion water-quality pollutants- infiltration-groundwater- tamil-nadu
Abstract: Groundwater samples collected from both open and bore wells in an area of about 270 km2 from Madras City, India, have been analyzed for major ions and trace elements. The study reveals that the quality of potable water has deteriorat ed to a large extent. Seawater intrusion into the aquifer has been observed in nearly 50 percent of the study area. The toxic elements (As and Se) have already exceeded the maximum permissible limits of drinking water in almost the entire city. A positive correlation of As and Se with other toxic metals such as V, Cr, Fe, B, etc., indicates that all these elements are anthropogenic in origin. Applying multivariate analysis, the source for trace elements in groundwater has been grouped into two major facto rs: pollution and mobilization factors. The groundwater in the study area is largely contaminated by organic effuents and reflects the intensity of pollution caused by the overlying soil sediment and rapid infiltration of the pollutants.

44. **Monitoring pesticide and nitrate in Virginia's groundwater--a pilot study.**
Bruggeman, A. C., Mostaghimi, S., Holtzman, G. I., Shanholz, V. O., Shukla, S., and Ross, B. B.
Trans ASAE. 38: 3 797-807. (May/June 1995).
NAL Call #: 290.9-Am32T
Descriptors: groundwater- water-quality wells- pesticides- groundwater-pollution monitoring- aquifers- nitrate- sampling- virginia-
Abstract: Between October 1992 and February 1993, a total of 359 private wells in Northampton County were sampled and data on water-quality variables (temperature, pH, and conductivity), well construction, and site characteristics were collect ed. The groundwater samples were analyzed for aldicarb, alachlor, atrazine, carbofuran, linuron, methomyl, metolachlor, metribuzin, napropamide, pendimethalin, pronamide, simazine, and nitrate. The wells were stratified into shallow wells, withdrawing wat er from the unconfined aquifer, and deep wells, withdrawing water from the deeper confined aquifers. The study was undertaken as a pilot study to demonstrate the applicability of a recently developed framework for evaluating the extent of pesticide contam ination in Virginia's groundwater. Pesticides were detected in 14% of the shallow wells and in 7% of the deep wells sampled. Pesticide detection was associated with the well depth, with a higher probability of detecting a pesticide in the shallow unconfin ed aquifer than in the deeper aquifers. Nitrate above the U.S. EPA drinking water standard of 10 mg/L was found in 17% of the shallow and 1% of the deep wells. Pesticide and nitrate detections were not significantly related to well and site characteristic s, such as crop type, location of well head, and distance to the nearest water body.

45. **National survey of pesticides in drinking water wells : phase I report. National pesticide survey.**
United States. Environmental Protection Agency. Office of Pesticides and Toxic Substances.
[Washington, D.C.] : United States Environmental Protection Agency, Office of Water,

Office of Pesticides and Toxic Substances, [1990] 1 v.
NAL Call #: TD427.P35N374-1990
Descriptors: Pesticides-Environmental-aspects-United-States Drinking-water-United-States-Contamination Wells-United-States Water-quality-United-States

46. **Natural protection of spring and well drinking water against surface microbial contamination. I. Hydrogeological parameters.**
Robertson, J. B. and Edberg, S. C.
Crit rev microbiol. 23: 2 143-178. (1997).
NAL Call #: QR1.C7
Descriptors: microbial-contamination groundwater- water-quality water-pollution
Abstract: The fate and transport of microbes in groundwater are controlled by physicochemical characteristics of the microbe and of the groundwater/aquifer media. Key characteristics of the microbe include size, inactivation (die-off) rate, an d surface electrostatic properties. Key properties of the groundwater/aquifer system include flow velocity, aquifer grain (or pore) size, porosity, solid organic carbon content, temperature, pH, and other chemical characteristics of water and mineral comp osition. Because of size and surface electrical properties, viruses are much more mobile in groundwater than Cryptosporidium and Giardia (which are about 100 times or more larger than viruses). The inactivation or die-off rate is usually the most importan t factor governing how far microbes can migrate in significant numbers in groundwater.

47. **Natural protection of spring and well drinking water against surface microbial contamination. II. Indicators and monitoring parameters for parasites.**
Edberg, S. C., Leclerc, H., and Robertson, J.
Crit rev microbiol. 23: 2 179-206. (1997).
NAL Call #: QR1.C7
Descriptors: microbial-contamination groundwater- water-quality water-pollution indicator-species pollution-indicators
Abstract: Recent outbreaks of cryptosporidiosis and reports of other newly described parasitic diseases associated with drinking water transmission prompted a reevaluation of source water monitoring criteria for public health protection. The f ield of microbial indicators was reviewed and each candidate sentinel evaluated in terms of its sensitivity, specificity, and technical feasibility. In addition, a clear distinction was made between source water monitoring and monitoring in the distributi on system. Of all potential candidate microbial sentinels, Escherichia coli is deemed the most efficacious for public health protection. Based on a conservative estimate of its half-life in groundwater for 8 d, it is recommended that at least two samples be obtained during this half-life. In addition to E. coli, two water quality indicator sentinels, which are not necessarily direct public health threats, should also be monitored at the same frequency. These are the total coliform group and the enterococc i. If E. coli is present in any source water sample, the borehole and any directly connected borehole should be embargoed. If either total coliforms or enterococci are detected, only that individual borehole should be taken off line and not used until the situation is remediated and the cause of the fecal contamination eliminated.

48. **Nitrate concentrations in Riyadh, Saudi Arabia drinking water supplies.**
Alabdula'ay, A. I.
Environ monit assess. 47: 3 315-324. (Sept 1997).

NAL Call #: TD194.E5
Descriptors: drinking-water water-supply groundwater- sea-water nitrates- contaminants-water-quality water-purification saudi-arabia

49. **Nitrate contamination of groundwater: measurement and prediction.**
Goss, M. J. and Goorahoo, D.
Fertil res. 42: 1/3 331-338. (1995).
NAL Call #: S631.F422
Descriptors: groundwater-pollution point-sources agricultural-land contamination-nitrate- farming-systems comparisons- environmental-impact groundwater- water-quality nitrate-nitrogen nitrogen-content regional-surveys budgets- estimation- ontario - non-point-source-pollution whole-farm-nitrogen-budgets
Abstract: Two approaches were adopted to evaluate management practices (within the context of the whole farming system) for their impacts on the environment: (1) measurement of the quality of groundwater under different farming systems, and (2) comparison of predictions of the impact of farming systems on water quality, obtained using whole farm N budgets, with measured values. The Ontario Farm Groundwater Quality Survey evaluated the rural groundwater quality in Ontario, with respect to commo n contaminants including NO3-. Approximately 1300 domestic farm wells were sampled, and wells were drilled in some fields of farms involved in the study. NO3- was present at concentrations above the maximum acceptable for drinking water (10 mg N l - 1) in 14% of wells, including 7% of wells that also had unacceptable concentrations of coliform bacteria. Significant levels of NO3- contamination were observed under most agricultural land use practices investigated. Calculation of N budgets was simplified by assuming that there was no net change in the N content of farm assets.

50. **The nitrate content of drinking water in Portugal.**
Cardoso, S. M.
NATO-ASI-Ser-Ser-G-Ecol-Sci. Berlin, W. Ger. : Springer-Verlag. 1991. v. 30 p. 49-54.
NAL Call #: DNAL QH540.N3
Descriptors: nitrate- nitrate-fertilizers groundwater-pollution drinking-water water-quality farmland- groundwater-recharge portugal-

51. **Nitrate in rural wells of Missouri.**
Sievers, D. M. and Fulhage, C. D.
Trans A S A E. 35: 5. 1633-1637. (Sept/Oct 1992).
NAL Call #: 290.9-AM32T
Descriptors: wells- depth- nitrates- rural-areas water-quality missouri-
Abstract: Two hundred twenty six rural wells in Missouri were tested for NO3-N. Nineteen percent exceeded Environmental Protection Agency (EPA) drinking water standards. Nitrate concentrations were most strongly related to well depth. Well con struction, depth to aquifer and well age had lesser influence. Distance from well to livestock was a poor predictor of nitrate pollution.

52. **Nitrate pollution of groundwater in northern China.**
Zhang, W. L., Tian, Z. X., Zhang, N., and Li, X. Q.
Agric ecosyst environ. 59: 3. 223-231. (Oct 1996).
NAL Call #: S601.A34
Descriptors: groundwater-pollution drinking-water water-quality nitrate- contamination-nitrate-nitrogen nitrogen-content nitrogen-fertilizers application-rates environmental-

impact farm-management pollution-control china- nutrient-management best - management-practices

53. **Nutrient-loss trends for vegetable and citrus fields in west-central Florida. II. Phosphate.**
Stanley, C. D., McNeal, B. L., Gilreath, P. R., Creighton, J. F., Graham, W. D., and Alverio, G.
J environ qual. 24: 1 101-106. (Jan/Feb 1995).
NAL Call #: QH540.J6
Descriptors: phosphates- pollutants- losses-from-soil water-table groundwater- lakes- phosphatic-clay water-quality water-pollution monitoring- crop-production florida-
Abstract: Vegetable and citrus production in west-central Florida has come under suspicion as a hazard (with respect to NO3-N and ortho-P) to local groundwater and surface-water bodies, including a 33 000-ha drinking-water supply reservoir nea r Bradenton in Manatee County. Using a combination of multilevel samplers in the shallow (surficial) aquifer beneath selected vegetable fields and citrus groves, coupled with piezometric wells around each field's periphery to assess depth-integrated solut e concentrations and direction and rate of groundwater flow, ortho-P levels have been assessed at 10 sites for three vegetable-production seasons during 1990 and 1991. Some ortho-P movement from vegetable production beds to surface waters and shallow grou ndwater appears likely, but ortho-P concentrations also are elevated at a native range site that has not received P fertilizers, and in both man-made and natural surface-water retention ponds plus nearby intermittent streams throughout the area. Naturally occurring phosphatic clays appear to be introducing considerable P into local shallow groundwater and associated surface-water bodies. Regulatory strategies requiring sizeable retention ponds for tailwater-return flow capture may be contributing to P loa dings of the surface water, whenever pond construction intercepts phosphatic clay materials.

54. **Occurrence, sources, and fate of trichloroacetic acid in Swiss waters.**
Muller, S. R., Zweifel, H. R., Kinnison, D. J., Jacobsen, J. A., Meier, M. A., Ulrich, M. M., and Schwarzenbach, R. P.
Environ toxicol chem. 15: 9. 1470-1478. (Sept 1996).
NAL Call #: QH545.A1E58
Descriptors: tca- contaminants- concentration- spatial-variation temporal-variation surface-water groundwater- drinking-water waste-water rain- lakes- water-quality water-pollution switzerland-
Abstract: The occurrence, sources, and fate of trichloroacetic acid (TCA) has been investigated in surface waters, ground waters, drinking waters, wastewaters, and rainwater in Switzerland. The concentrations found in surface waters varied bet ween less than 27 ng/L (limit of quantification) and 340 ng/L, whereas the concentrations in ground water were always below 27 ng/L. It was found that the main sources of TCA in surface waters were the effluents of wastewater treatment plants (average con centration, 430 ng/L; range, 40-1060 ng/L). The average TCA concentration in rainwater was 300 ng/L range, (< 27-900 ng/L). A dynamic mathematical model revealed that TCA is not significantly degraded in a lake (half-life > 230 d). A detailed mass b alance in the catchment area of a small lake (Greifensee) and a very rough mass balance over Switzerland indicate that rain is the major source of TCA in Switzerland (> 90%), but

they also show that about 60 to 80% of the TCA deposited by rain is elimi nated, most probably in the soil.

55. **Organochlorine residues in rural drinking water sources of northern and north eastern India.**
Kumar, S., Singh, K. P., and Gopal, K.
J environ sci health, Part A, Environ sci eng A30: 6 1211-1222. (1995).
NAL Call #: TD172.J6
Descriptors: organochlorine-pesticides pesticide-residues nitrate-nitrogen pollutants-drinking-water surface-water groundwater- water-pollution water-quality rural-areas india-

56. **Patterns of water quality in rural areas of Assyut Governorate, Egypt.**
Platenburg, R. J. P. M. and Zaki, M.
Water supply and sanitation for rural areas proceedings of the IAWPRC First Middle East Conference held in Cairo, Egypt, 23-25 February, 1992 /. 1st ed. Oxford ; New York : Pergamon Press, 1993.. p. 55-65.
NAL Call #: TD420.A1P7-v.27,-no.9
Descriptors: drinking-water water-quality rural-areas rural-communities villages-geographical-variation pumps- wells- groundwater-pollution fecal-coliforms egypt-handpumps-

57. **Pesticides, drinking water, and human health.**
PM-Iowa-State-Univ-Coop-Ext-Serv. Ames, Iowa : The Service. May 1993. (1504,rev.) 4 p.
NAL Call #: 275.29-IO9PA
Descriptors: drinking-water water-quality groundwater-pollution pesticides- toxicity-dosage-effects public-health iowa-

58. **Pesticides in eastern North Carolina rural supply wells: land use factors and persistence.**
Maas, R. P., Kucken, D. J., Patch, S. C., Peek, B. T., and Van Engelen, D. L.
J environ qual. 24: 3 426-431. (May/June 1995).
NAL Call #: QH540.J6
Descriptors: pesticides- detection- wells- persistence- spatial-distribution temporal-variation nitrate-nitrogen indicators- land-use agricultural-land drinking-water water-quality water-pollution north-carolina
Abstract: Water samples were collected from 171 rural domestic well supplies in eastern North Carolina and analyzed for eight pesticides. Information on borehole depth, wet-casing depth, distance to nearest pesticide mixing area, types of pest icides used, and distance to nearest field application was obtained for each site. Four herbicides were detected in the samples, with detection frequencies of 8.8, 8.2, 3.6, and 1.8%, respectively. About 15% of the samples contained at least one of these herbicides, with resampling indicating persistence throughout the year. Only alachlor concentrations were in excess of maximum contaminant levels (MCLs; 2.0 microgram L-1) or Health Advisory Levels (HALs; 0.4 microgram L-1) established by the U.S. Environ mental Protection Agency (USEPA). Neither atrazine nor alachlor detection exhibited statistical correlation with well depth, although both were rarely detected in wells > 100 feet deep. Atrazine concentrations and detection frequencies did not correlat e with distance to nearest application site, while alachlor had a significantly greater detection frequency for

wells further from the nearest application site. For nearly one-half of the wells with detectable atrazine and alachlor, there was no reported usage of either herbicide on the same farm during the previous three years, possibly indicating herbicide transport in groundwater or long times before degrading.

59. **Pesticides in ground water: Do atrazine metabolites matter.**
Liu, S., Yen, S. T., and Kolpin, D. W.
Water resour bull. 32: 4 845-853. (Aug 1996).
NAL Call #: 292.9-Am34
Descriptors: atrazine- metabolites- pesticides- pesticide-residues groundwater- water-quality risk- land-use mathematical-models great-plains-states-of-usa north-central-states-of-usa deethylatrazine- deisopropylatrazine-
Abstract: Atrazine and atrazine-residue (atrazine + two metabolites - deethylatrazine and deisopropylatrazine) concentrations were examined to determine if consideration of these atrazine metabolites substantially adds to our understanding of the distribution of this pesticide in groundwater of the midcontinental United States. The mean of atrazine-residue concentrations was 53 percent greater than that of atrazine alone for those observations above the detection limit (> 0.05 microgram/l). Furthermore, a censored regression analysis using atrazine-residue concentrations revealed significant factors not identified when only atrazine concentrations were used. Thus, knowledge of concentrations of these atrazine metabolites is required to obta in a true estimation of risk of using these aquifers as sources for drinking water, and such knowledge also provides information that ultimately may be important for future management policies designed to reduce atrazine concentrations in ground water.

60. **Pesticides in shallow groundwater in the Delmarva Peninsula.**
Koterba, M. T., Banks, W. S. L., and Shedlock, R. J.
J environ qual 22: 3 500-518. (July/Sept 1993).
NAL Call #: QH540.J6
Descriptors: pesticide-residues groundwater- water-quality depth- spatial-distribution wells- drinking-water groundwater-pollution delaware- maryland- virginia-
Abstract: A regional study of the areal and depth distribution of pesticides in shallow groundwater in the Delmarva Peninsula of Delaware, Maryland, and Virginia was done to (i) relate the pesticides detected to landscape and shallow subsurfac e features, and (ii) evaluate aquifer vulnerability and the potential contamination of drinking-water supplies. Water samples collected at 100 wells from 1988 to 1990 were analyzed for concentrations of 36 pesticides, four metabolites, and other constitue nts. The most commonly detected residues were atrazine, cyanazine, simazine, alachlor, metolachlor, and dicamba. Most detections occurred in samples collected from shallow wells screened within 10 m of the overlying water table. The shallow depth distrib ution of most residues is consistent with their suspected history of use (ca. 20 yr), and patterns in shallow groundwater flow in the surficial aquifer in the study area. The areal and depth distributions of detectable residues in groundwater did not corr elate with a vulnerability index, nor any of the component scores developed to estimate that index using the DRASTIC method. The shallow depth of most detections also indicates why few samples from water-supply wells in this study had measurable concentra tions of pesticides; most supply wells are deeper than 10 m below the water table. The low number of

contaminated samples from supply wells implies that deep groundwater currently (1992) used for drinking generally does not contain detectable pesticide. residues.

61. **Physiographic and land use characteristics associated with nitrate-nitrogen in Montana groundwater.**
Bauder, J. W., Sinclair, K. N., and Lund, R. E.
J environ qual. 22: 2 255-262. (Apr/June 1993).
NAL Call #: QH540.J6
Descriptors: drinking-water wells- water-quality nitrate-nitrogen geographical-distribution dry-farming rotations- site-factors climatic-factors groundwater-pollution montana-
Abstract: Occurrence of NO3(-)-N in drinking water at concentrations > 10 mg L-1 is being reported in the literature with increasing frequency. Some occurrences of high NO3(-)-N concentrations have been attributed to irrigation and fertiliz ation practices. A private well water testing program in Montana, involving nearly 3400 well owners, found NO3-(-)N concentrations > 10 mg L-1 in nearly 6% of all tested wells. Most of the agricultural land in Montana is nonirrigated and is not subject to high rates of N fertilization. Dryland crop/fallow cereal grain rotations are the main practices. Well water test results were combined with MAPS, a geographic information system (GIS), to identify correlations between county average NO3(-)-N concentr ation in groundwater, well water sample probability of exceeding 10 mg L-1 NO3(-)-N, geographic, climatic, and geologic conditions, and land-use practices. From a list of 67 independent variables, county average well water NO3(-)-N concentration and perce ntage of tested wells in each county with NO3(-)-N concentration > 10 mg L-1 were correlated ($P < 0.10$) with 16 independent variables, most of which were associated with precipitation, soil properties, and land-use practices. Results of these analy ses support the hypothesis that summer fallow practices and associated mineralization of organic matter may be. contributing to regionalized NO3(-)-N contamination of shallow groundwater in Montana.

62. **Planning your well: guidelines for safe, dependable drinking water.**
Korab, H.
Land-water. Urbana-Champaign : The Service, 1982-. Apr 1990. (14) 11 p.
NAL Call #: S624.I3L36
Descriptors: wells- homes- site-factors groundwater- planning- water-requirements construction- disinfection- regulations- permits- water-quality illinois-

63. **Problem of nonpoint source agricultural water pollution: toward a hypothetical federal legislative solution.**
Caulfield, H. P. Jr.
Water Resour Bull. 27: 3 447-452. (May/June 1991).
NAL Call #: 292.9-AM34
Descriptors: groundwater-pollution agricultural-chemicals drinking-water water-quality environmental-legislation federal-government politics- decision-making
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 chem icals. 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.

64. **Protecting your private well.**
Bonner, J.
Publ-Miss-State-Univ,-Coop-Ext-Serv. State College, Miss. : Cooperative Extension Service, Mississippi State University. May 1993. (1868) 4 p.
NAL Call #: 275.29-M68Ext
Descriptors: wells- drinking-water water-quality pollution-control

65. **Quality of well water on Tennessee poultry farms.**
Goan, H. C., Denton, P. H., and Draughon, F. A.
Environmentally sound agriculture proceedings of the second conference 20 22 April 1994 / 368-372. (1994).
NAL Call #: S589.7.E57-1994
Descriptors: water-quality drinking-water wells- regional-surveys nitrate-nitrogen nitrogen-content bacteria- fecal-flora poultry-farming tennessee-

66. **The regulation of agricultural practices to protect groundwater quality: the Nebraska model for controlling nitrate contamination.**
Schneider, S. A.
Articles and publications by NCALRI staff. 1988-[199-?]. Fall 1990. [5] p. 1-44.
NAL Call #: DNAL KF1682.A45A77
Descriptors: groundwater- nitrate- nitrogen-fertilizers water-quality environmental-protection models- contamination- drinking-water water-management regulations-agricultural-chemicals nebraska-

67. **Role of groundwater recharge in treatment and storage of wastewater for reuse.**
Bouwer, H.
Water Sci Technol J Int Assoc Water Pollut Res Control. 24: 9 295-302. (1991).
NAL Call #: DNAL TD420.A1P7
Descriptors: waste-water-treatment water-storage water-quality requirements- water-reuse irrigation-water irrigated-stands vegetables- microbial-contamination pathogens-groundwater-recharge application-to-land aquifers- public-health health-prote ction drinking-water

68. **A rule-based fuzzy-set approach to risk analysis of nitrate-contaminated groundwater.**
Dahab, M. F., Lee, Y. W., and Bogardi, I.
Water sci technol. 30: 7 45-52. (1994).
NAL Call #: TD420.A1P7
Descriptors: groundwater-pollution nitrate- contamination- risk- mathematics- decision-making water-quality neoplasms- methemoglobinemia- polluted-water drinking-water

69. **Rural domestic water supply.**
Vomocil, J. and Hart, J.
Ext-Circ-EC-Oreg-State-Univ-Ext-Serv. Corvallis, Or. : The Service. Feb 1991. (1374) 4 p.
NAL Call #: 275.29-OR32C
Descriptors: wells- water-use water-quality drinking-water oregon-

70. **Rural water quality database: educational program to collect information.**
Lemley, A. and Wagenet, L.

J-ext. Madison, Wis. : Extension Journal. Fall 1993. v. 31 p. 11-13.
NAL Call #: 275.28-J82
Descriptors: water-quality rural-communities databases- drinking-water extension-education contamination- testing- wells- program-evaluation program-effectiveness new-york

71. **Safe water in the home.**
Wright, S.
Guide-M-NM-State-Univ-Coop-Ext-Serv. Las Cruces, NM : The Service. Aug 1990. (108) 4 p.
NAL Call #: TX23.G85
Descriptors: drinking-water water-quality quality-standards groundwater- testing- new-mexico

72. **Seminar publication : wellhead protection : a guide for small communities.**
Center for Environmental Research Information (U.S.). United States. Environmental Protection Agency. Office of Science, Planning and Regulatory Evaluation. US EPA, Office of Ground Water Protection.
Cincinnati, OH : U.S. EPA, Office of Research and Development, Office of Science, Planning and Regulatory Evaluation, Center for Environmental Research Information [1993] ix, 144 p.
NAL Call #: TD223.S46--1993
Descriptors: Wellheads-Protection Groundwater-Quality Water-quality-management

73. **Statistical analysis of rural well contamination and effects of well construction.**
Glanville, T. D., Baker, J. L., and Newman, J. K.
Trans ASAE. 40: 2 363-370. (Mar/Apr 1997).
NAL Call #: 290.9-Am32T
Descriptors: atrazine- alachlor- metolachlor- nitrate-nitrogen chloride- coliform-bacteria wells- groundwater-pollution building-materials design- drinking-water transport-processes water-quality contamination- iowa- physical-properties-of-wells
Abstract: A previous statewide survey showed that 14% of rural wells in Iowa contained detectable concentrations of pesticides. To determine if improved private well construction regulations should be included in Iowa's State Pesticide Managem ent Plan, a two-year study was undertaken to determine: the effects of well construction on pesticide, nitrate-nitrogen, and bacterial contamination of wells; and the possible role of point sources of contamination. Eighty-eight rural water supply wells i n nine Iowa counties were sampled daily for five weeks during late spring and summer of 1993, and 20% of these were resampled in 1994. Short-term variation in nitrate-nitrogen concentrations was examined as a possible indicator of rapid inflow of shallow groundwater associated with well construction defects. Mean total coliform bacteria, nitrate-nitrogen, chloride, atrazine, alachlor, and metolachlor concentrations were statistically analyzed to determine if they were correlated, and t-tests also were use d to determine if these water quality parameters were affected significantly by physical well parameters such as depth, type of casing, grouting, location within frost pits, and proximity to various potential sources of contamination. Study results indica te that: short-term water quality fluctuations, by themselves, were not a reliable indicator of deteriorated or improperly constructed wells; although the magnitude and frequency of positive total coliform test results was noticeably higher in shallower w ells, a substantial

fraction (21%) of wells greater than 30.5 m (100 ft) deep also had positive coliform results; t-tests and correlation analysis failed to show significant differences in mean atrazine or alachlor concentrations.

74. **Survey of nitrate contamination in shallow domestic drinking water wells of the Inner Coastal Plain of Georgia.**
Stuart, M. A., Rich, F. J., and Bishop, G. A.
Ground-water. Columbus, OH: Ground Water Pub. Co. Mar/Apr 1995. v. 33 (2) p. 284-290.
NAL Call #: TD403.G7
Descriptors: groundwater-pollution nitrate- water-quality wells- surveys- coastal-plains contamination- aquifers- nitrogen- ph- water-temperature high-water-tables electrical-conductivity drinking-water georgia- nitrite- shallow-aquifers specific- conductivity
Abstract: Beginning in 1990, 2,588 wells were sampled within the Inner Coastal Plain of Georgia in an effort to assess the quality of ground water in this major farm belt. The project was one aspect of an EPA-sponsored program to assess ground -water quality statewide. Several variables were measured, including pH, specific conductivity, dissolved oxygen, temperature, nitrate, nitrite, total hardness, calcium, magnesium, and bicarbonate. In some wells sulfate, chloride, potassium, iron, and man ganese contents were also determined. Particular emphasis was placed, however, on pH, specific conductivity, temperature, and nitrite/nitrate content. Generally, pH was between 6 and 8, and temperatures were within a range of 18 degrees and 24 degrees Cel sius. Measurements of specific conductivity varied, but averaged 250-275 microsiemens/cm. Nitrite contamination was negligible, and nitrate contamination of the ground water within the shallow aquifers did not appear to be significant.

75. **Use of ground water monitoring data for pesticide regulation.**
Barrett, M. R., Williams, W. M., and Wells, D.
Weed technol. 7: 1 238-247. (Jan/Mar 1993).
NAL Call #: SB610.W39
Descriptors: water-quality groundwater-pollution pesticides- leaching- pesticide-residues drinking-water regulations- health-hazards contaminants- quality-standards monitoring-usa- maximum-contaminant levels-

76. **Valuing environmental quality changes using averting expenditures: an application to groundwater contamination.**
Abdalla, C. W., Roach, B. A., and Epp, D. J.
Land Econ. 68: 2 163-169. (May 1992).
NAL Call #: 282.8-J82
Descriptors: groundwater-pollution household-expenditure water-quality environmental-degradation costs- drinking-water regional-surveys value-theory pennsylvania- perkasie,-pennsylvania

77. **Water quality and private water supplies.**
McManus, M.
Publ-Univ-Tenn-Agric-Ext-Serv. Knoxville, Tenn. : The Service. Mar 1990. (1357) 19 p.
NAL Call #: S115.P82
Descriptors: wells- water-quality groundwater-pollution drinking-water standards-contaminants- health-hazards testing- tennessee-

78. **Well testing program yields encouraging results.**
Summer, K.
Agfocus 7-8. (July 1994).
NAL Call #: S544.3.N7A4
Descriptors: wells- water-quality drinking-water laboratory-tests new-york water-quality-incentive-program

---

Return to Source Water Bibliography

Return to the Water Quality Information Center at the National Agricultural Library.
Last update: Jun 17, 2008
The URL of this page is http://www.nal.usda.gov/wqic/Source_Water/dwmgt.html

---

J. R. Makuch /USDA-ARS-NAL-WQIC/ wqic@ars.usda.gov

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

---

Wells and Wellhead Protection

95 citations from the Agricola Database
1984 - June 1998

Mary Stevanus
Water Quality Information Center

This electronic bibliography is intended primarily to provide awareness of recent investigations and discussions of a topic and is not intended to be in-depth and exhaustive. The inclusion or omission of a particular publication or citation should not be construed as endorsement or disapproval. Citations are arranged alphabetiCally by title and abstracts are included where available. All citations are in English unless otherwise noted.

Send suggestions for electronic bibliographies related to water resources and agriculture to wqic@ars.usda.gov.

To locate a publication cited in this bibliography, please contact your local, state, or university library. If you are unable to locate a particular publication, your library can contact the National Agricultural Library (please see "Document Delivery Services" at http://www.nal.usda.gov/ddsb/).

---

1. **Analytical modelling of pesticide transport from the soil surface to a drinking water well.**
   Beltman, W. H. J., Boesten, J. J. T. I., and Zee, S. E. A. T. M. van der.
   J hydrol 169: 1/4 pp.209-228. (July 1995).
   NAL Call #: 292.8-J82
   Descriptors: pesticides- leaching- water-flow drinking-water wells- water-quality groundwater-pollution mathematical-models
   Abstract: Pesticide transport through the unsaturated zone was modelled with an analytical solution of the convection-dispersion equation assuming steady water flow, a linear sorption isotherm and first-order transtormation kinetics. Pesticide behaviour in the saturated zone was described with an analytical solution of the mass balance equation for

a cylindrical flow system assuming steady flow, no dispersion, linear sorption and first-order transformation. This simplified model for the unsatu rated-saturated soil system was developed to identify the processes and parameters with the greatest impact on the fraction of applied pesticide reaching a drinking water well. Leaching from the unsaturated zone was highly sensitive to the parameters desc ribing travel time and transformation rate. Leaching increased when heterogeneity of the soil was taken into account. Pesticide arrival in the well was only moderately sensitive to the characteristic travel time and transformation rate in the aquifer. How ever, this sensitivity increases if zones without pesticide application were introduced around the wells (protection zones). For representative sandy soils under average Dutch rainfall conditions, processes in the unsaturated zone had a much larger impact on pesticide arrival in the wells than processes in the saturated zone. Protection zones reduced pesticide transport to wells substantially if their half-life was much smaller than the characteristic travel time of the pesticide in the aquifer.

2. **An annotated bibliography on wellhead protection programs.**
   United States. Environmental Protection Agency. Office of Ground Water Protection.
   Washington, D.C. : U.S. Environmental Protection Agency, Office of Water, Office of Ground-Water Protection, [1987] ii, 75 p.
   NAL Call #: DNAL Z7935.A56--1987
   Descriptors: Wells-Bibliography
3. **Application of petroleum geophysical well logging and sampling techniques for evaluating aquifer characteristics.**
   Temples, T. J. and Waddell, M. G.
   Ground-water. Columbus, Ohio : Ground Water Pub. Co. May/June 1996. v 34 (3) p. 523-531.
   NAL Call #: TD403.G7
   Descriptors: aquifers- wells- sampling- groundwater- data-collection geology- analytical-methods porosity- permeability- saturated-hydraulic-conductivity water-quality south-carolina transmissivity-
   Abstract: The Hilton Head Island Test Well #1 was drilled to a depth of 3833 feet to evaluate the upper Cretaceous section as a potential ground-water source for Hilton Head Island, South Carolina. The initial plan was to analyze continuous co nventional cores. The interval to be analyzed extended from the top of the Eocene to the base of the Cretaceous (approximately 3500 feet). However, due the high cost ($400,000), the decision was made to evaluate aquifer potential using advanced geophysica l logs with sidewall cores for calibration. The logging suite consisted of a dual induction resistivity, spontaneous potential, compensated neutron, density log, gamma ray, spectral gamma, multipole array acoustic log, caliper, high resolution dipmeter, a nd a circumferential borehole imaging log. In addition to the wireline logs, 239 sidewall cores and 12 Formation Multi-Test samples were obtained. The log, sidewall core, and FMT information were integrated into an interpretive package using computer gene rated logs and simple spreadsheets to calculate aquifer properties. Porosity, hydraulic conductivity, transmissivity, and lithogic data derived from this integrated analysis were then used to select screen zones. Water quality in relation to drinking wate r standards exceeded expectations. The information obtained from the integrated program allowed estimates to

be made about the well's productivity without the expense of conventional coring, flow testing, and completion of the well.

4. **Assessing the condition of your water well and its location.**
   Weston, D.
   NDSU-Ext-Serv. Fargo, N.D. : The University. Apr 1994. (AE-1074) 6 p.
   NAL Call #: S544.3.N9C46
   Descriptors: wells- farms- groundwater- planning- water-pollution contaminants- drinking-water site-factors safety-
5. **Assessing your petroleum product storage practices.**
   Weston, D.
   NDSU-Ext-Serv. Fargo, N.D. : The University. Apr 1994. (AE-1078) 4 p.
   NAL Call #: S544.3.N9C46
   Descriptors: fuel-tanks groundwater-pollution farm-storage pollutants- leakage- wells- drinking-water assessment- safety- north-dakota
6. **Bacteriological suitability of water from Basrah wells for drinking.**
   Al Sulami, A. A. and Yaseen, H. A.
   Water Sci Technol J Int Assoc Water Pollut Res Control 24: 2 pp. 89-93. (1991).
   NAL Call #: DNAL TD420.A1P7
   Descriptors: drinking-water wells- microbial-contamination bacterial-counting health-hazards iraq-
7. **Better homes & groundwater : a homeowner's guide.**
   Stevens Point Whiting Plover Wellhead Protection Project.
   Stevens Point, WI : Stevens Point-Whiting-Plover Wellhead Protection Project, 1992.
   NAL Call #: DNAL TD224.W6B48--1992
   Descriptors: Groundwater-Pollution-Wisconsin-Citizen-participation-Handbooks,-manuals,-etc.
8. **Class I injection wells and your drinking water.**
   United States. Environmental Protection Agency. Office of Water. Underground Injection Control.
   [Washington, D.C.?] : U.S. EPA, Office of Water, [1994] 1 folded sheet (7 p.)
   NAL Call #: TD426.8.C53--1994
   Descriptors: Injection-wells-Environmental-aspects Drinking-water-United-States-Contamination
9. **Class II injection wells and your drinking water.**
   United States. Environmental Protection Agency. Office of Water. Underground Injection Control.
   [Washington, D.C.?] : U.S. EPA, Office of Water, [1994] 1 folded sheet (8 p.)
   NAL Call #: TD426.8.C532--1994
   Descriptors: Injection-wells-Environmental-aspects Drinking-water-Contamination-United-States
10. **Class III injection wells and your drinking water.**
    United States. Environmental Protection Agency. Office of Water. Underground Injection Control.
    [Washington, D.C.?] : U.S. EPA, Office of Water, [1994] 1 folded sheet (7 p.)
    NAL Call #: TD426.8.C533--1994

Descriptors: Injection-wells-Environmental-aspects Drinking-water-United-States-Contamination

11. **Class V injection wells and your drinking water.**
United States. Environmental Protection Agency. Office of Water. Underground Injection Control.
[Washington, D.C.?] : U.S. EPA, Office of Water, [1994] 1 folded sheet (7 p.)
NAL Call #: TD426.8.C535--1994
Descriptors: Injection-wells-Environmental-aspects Drinking-water-Contamination-United-States Drinking-water-Toxicology-United-States

12. **Clean well water? Not always.**
Henderson, Z. P.
Hum ecol forum 23: 3 pp. 5-7. (Summer 1995).
NAL Call #: HV1.H8
Descriptors: drinking-water wells- septic-tanks microbial-contamination toxic-substances water-management site-factors leaching- soil-types-structural soil-types-textural waste-water waste-water-treatment monitoring- education- water-quality new-y ork surveys-

13. **Community wellhead protection programs.**
Dee, N. and Austin, S.
OSU-Ext-Facts-Coop-Ext-Serv-Okla-State-Univ. Stillwater, Okla. : The Service. Dec 1992. (890) 6 p.
NAL Call #: S544.3.O5O5
Descriptors: groundwater-pollution water-supply water-resources water-purification wells- community-action prevention-

14. **Comparability of large-scale studies of agricultural chemical contamination of rural private wells.**
Ray, C. and Schock, S. C.
Ground water monit remediat. 16: 2 pp. 92-102. (Spring 1996).
NAL Call #: GB1001.G76
Descriptors: wells- groundwater- groundwater-pollution contaminants- agricultural-chemicals detection- rural-areas surveys- comparisons- usa- ontario- prince-edward-island
Abstract: Detection of agricultural chemicals in ground water has prompted numerous studies. Federal, state, and regional studies were conducted in the last 10 years in order to assess the occurrence of agricultural chemicals in ground water. The results of the studies present the number or percentage of samples with agricultural chemicals above the drinking water standard or health advisory levels as well as samples with detections of one or more compounds. Data comparison from one state or r egion to another are frequently referred to by regulatory and agency personnel involved in water quality and agriculture issues. Unless the history of pesticide use, method of chemical analyses, detection limits, statistical design of the sampling plan, w ell type, well depth, geology of the formation material, and typical land use around the wellhead are known, such comparisons can be misleading. Reporting the limitations or presenting a disclaimer should be a key element for a study so that "apples and oranges" are not compared.

15. **Comparison of an analytical model and a numerical model for delineating wellhead protection areas.**
Ramanarayanan, T. S., Storm, D. E., Smolen, M. D., and Kizer, M. A.

Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers,. Summer 1992. (922036) 15 p.
NAL Call #: 290.9-Am32P
Descriptors: wells- models- gradients-

16. **Comparison of models for delineating wellhead protection areas in confined to semiconfined aquifers in alluvial basins.**
Forster, C. B., Lachmar, T. E., and Oliver, D. S.
Ground-water. Westerville, Ohio : Ground Water Pub. Co. July/Aug 1997. v. 35 (4) p. 689-697.
NAL Call #: TD403.G7
Descriptors: aquifers- groundwater- hydrology- saturated-hydraulic-conductivity computer-simulation simulation-models mathematical-models wells- groundwater-flow groundwater-extraction utah- horizontal-hydraulic-conductivity pumping-wells salt-lak e-valley vertical-hydraulic-conductivity
Abstract: The 1986 Safe Drinking Water Act Amendments include provisions for state wellhead protection (WHP) programs that address wellhead protection areas (WHPAs). In many states, WHPAs are delineated based on time-of-travel (TOT) criteria. This study compares 250-day and 15-year TOT capture zones computed in a confined to semiconfined aquifer system in an alluvial basin using semianalytical and two- and three-dimensional numerical ground-water flow models, and evaluates the relative importa nce of several sources of uncertainty, such as aquifer hydraulic conductivity, aquitard leakance, vertical transit time, hydraulic gradients, transient pumping effects, well interference, and three-dimensional aquifer geometries. A numerical model should be used to delineate 15-year TOT capture zones for wells in confined to semiconfined aquifers in alluvial basins. A semianalytical program may be acceptable for computing the 250-day TOT capture zones; however, such codes can be applied only under a very narrow range of conditions. Hydraulic conductivity plays a critical role in controlling the sizes and shapes of capture zones computed in confined to semiconfined aquifers. Small, circular capture zones are computed in low hydraulic conductivity areas. Mo re complex geometries should be expected where hydraulic conductivities are higher and pumping wells are in close proximity to each other. Aquifers with horizontal hydraulic conductivities that are greater than 1,000 times the vertical hydraulic conductiv ity of the overlying aquitard are effectively fully confined, and larger capture zones would be computed for these aquifers than for semiconfined aquifers when significant leakage is induced by pumping. In addition, relatively. large drawdowns are comput ed in low hydraulic conductivity areas, resulting in short vertical transit times. Vertical transit times are longer where aquifer hydraulic conductivities are higher.

17. **Connecticut's Wellhead Protection Program.**
Banach, F. S.
Ground water protection alternatives and strategies in the USA. New York, N.Y. : American Society of Civil Engineers, 1997. p. 112-124.
NAL Call #: TD223.G736-1997
Descriptors: groundwater-pollution connecticut-

18. **Coping with contaminated wells.**
Glanville, T.
PM-Iowa-State-Univ-Coop-Ext-Serv. Ames, Iowa : Iowa State University, Cooperative

Extension Service. Dec 1993. (1329,rev.) 6 p.
NAL Call #: 275.29-IO9PA
Descriptors: wells- drinking-water contamination- etiology- coliform-bacteria nitrates-testing- decontamination- iowa.

19. **Delineation of wellhead protection areas in fractured rocks.**
United States. Environmental Protection Agency. Office of Water. United States. Environmental Protection Agency. Office of Ground Water Protection.
Washington, D.C. : U.S. Environmental Protection Agency, 1991. xv, 144 p.
Bibliography: p. 79-84.
NAL Call #: TD407.D46-1991
Descriptors: Wells-Protection-United-States Wellheads-

20. **Delineation of wellhead protection areas: theory and practice.**
Cleary, T. C. B. F. and Cleary, R. W.
Pollution, protection and control of groundwater proceedings of the IAWPRC International Seminar, held in Porto Alegre, Brazil, 20-21 September 1990. 1st ed.
Oxford [England] ; New York : Pergamon Press, c1992. p. 239-250.
NAL Call #: TD420.A 1P7-v.24-no.11
Descriptors: groundwater-pollution pollution-control wells- pollution- simulation-models aquifers- groundwater-flow groundwater-extraction mathematical-models pollution-sources

21. **Delineation of wellhead protection areas using particle tracking analysis and hydrogeologic mapping, northern Anne Arundel County, Maryland.**
Wilson, John M., Achmad, Grufron., and Anne Arundel County (Md.) Department of Public Works. Maryland. Department of the Environment.
[Baltimore, MD] : Geological Survey, 1995. vi, 121 p. : ill., maps (some col.): Prepared in cooperation with the Anne Arundel County Department of Public Works and the Maryland Department of the Environment.
NAL Call #: TD426.W74--1995
Descriptors: Wellheads. Maryland. Anne Arundel County. Water-Pollution. Groundwater. Groundwater-Pollution. Water-supply. Water-supply-Environmenal-aspects

22. **Dependence of aldicarb residue degradation rates on groundwater chemistry in the Wisconsin central sands.**
Kraft, G. J. and Helmke, P. A.
J Environ Qual 21: 3 pp. 368-372. (July/Sept 1992).
NAL Call #: QH540.J6
Descriptors: aldicarb- insecticide-residues degradation- oxidation- hydrolysis-groundwater- groundwater-pollution aquifers- depth- dissolved-oxygen wisconsin-aquifer-depth aldicarb-sulfoxide aldicarb-sulfone
Abstract: Aldicarb sulfoxide (ASO) (2-methyl-2-(methylsulfinyl)propanal O-[(methylamino)carbonyl]oxime) and aldicarb sulfone (ASO2) (2-methyl-2-(methylsulfonyl)propanal O-[(methylamino)carbonyl]oxime) degradation rates were measured in incubat ions simulating three depths (0.5, 5, and 10 m) of a Wisconsin central sand plain (WCSP) aquifer. The incubations differed mainly in pH (5.8, 6.5, and 7.2, respectively, for the three depths) and PO2 (20 kPa [0.2 atm] for the 0.5- and 5-m depths, 1.5 kPa [0.015 atm] for the 10-m depth). Degradation rates corresponded to half-

lives ranging from years to less than a month. Aldicarb sulfone (ASO2) degraded faster than ASO at the same depth. No ASO degradation was measured under aerobic, pH 5.8 conditions; no ASO oxidation was observed in any incubation. The shortest half-lives, 19 and 32 d for ASO and ASO2, respectively, were obtained under the low pO2 conditions. The results of this and a previous experiment provide degradation rates for a cross-section of WCSP groundwater chemistries. Thus, with knowledge of the groundwater chemistry at a given WCSP location, degradation rates can be estimated. Degradation rates of common groundwater contaminants as functions of chemical and physical controlling factors co uld prove valuable to groundwater managers for endeavors such as wellhead protection.

23. **Description and evaluation of selected methods used to delineate wellhead-protection areas around public-supply wells near Mt. Hope, Kansas.**
    Hansen, Cristi V. and United States. Environmental Protection Agency. Geological Survey (U.S.).
    Lawrence, Kan. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, Colo. : Books and Open-File Reports [distributor], 1991. x, 39 p.
    NAL Call #: GB701.W375-no.90-4102
    Descriptors: Water,-Underground-Kansas Wellheads-Protection-Kansas
24. **Determinants of ground-water quality in a multi-layer glacial drift aquifer system : implications for wellhead protection of small community water supply systems in agricultural settings. Laboratory permeability measurements of glacial drift sample s collected in Cass County Michigan. Pneumatic slug test results for selected monitoring wells in the Donnell Lake area, Cass County Michigan. Modflow simulation of the Donnell Lake area, Cass County, Michigan. Geophysics.**
    Chidester, Steven D., Chidester, Steven D., Lovett, Cole., Passero, R. N., and Michigan State University. Institute of Water Research.
    East Lansing, MI : Institute for Water Research, Michigan State University, [1993] viii, 40, [62] leaves : ill., maps: Cover title. "May 3, 1993." "Project Number 92-G2026-02." Includes bibliographical references.
    CONTENTS NOTE: Laboratory permeability measurements of glacial drift samples collected in Cass County Michigan / Steven D. Chidester -- Pneumatic slug test results for selected monitoring wells in the Donnell Lake area, Cass County Michigan / Cole Lovett -- Modflow simulation of the Donnell Lake area, Cass County, Michigan / Steven Chidester -- Geophysics.
    NAL Call #: TD224.M5D48--1993
    Descriptors: Groundwater-Michigan-Cass-County-Quality Agricultural-chemicals-Environmental-aspects-Michigan-Cass-County Wellheads-Protection-Michigan-Cass-County Hydrogeology-Michigan-Cass-County
25. **Developing a State Wellhead Protection Program : a user's guide to assist State Agencies under the Safe Drinking Water Act.**
    United States. Environmental Protection Agency. Office of Ground Water Protection.
    Washington, D.C. : U.S. Environmental Protection Agency, [1988] 42 p.
    NAL Call #: DNAL TD370.D48--1988
    Descriptors: Drinking-water-United-States Water-quality-United-States
26. **Development and applications of a wellhead protection area delineation computer program.**

Guiguer, N. and Franz, T.
Pollution, protection and control of groundwater proceedings of the IAWPRC International Seminar, held in Porto Alegre, Brazil, 20-21 September 1990. 1st ed. Oxford [England] ; New York : Pergamon Press, c1992. p. 51-62.
NAL Call #: TD420.A1P7 -v.24-no.11
Descriptors: groundwater-pollution wells- pollution-control computer-software mathematical-models aquifers- groundwater-extraction groundwater-flow water-purification pollutants- removal- simulation-models computer-simulation puerto-rico massachus etts- flowpath-software

27. **The development of a wellhead protection area program for the Beatrice, Nebraska Municipal Wellfield.**
Smith, David M.
1993. 98 leaves : ill.: Thesis (M.S.)--University of Nebraska--Lincoln, 1993. Includes bibliographical references.
NAL Call #: NBU LD3656-1993-S658
Descriptors: Wellheads-Nebraska-Beatrice Groundwater-Nebraska-Beatrice-Quality.

28. **Domestic well water quality in rural Nebraska: focus on nitrate-nitrogen, pesticides, and coliform bacteria.**
Gosselin, D. C., Headrick, J., Tremblay, R., Chen, X. H., and Summerside, S.
Ground water monit remediat 17: 2 pp. 77-87. (Spring 1997).
NAL Call #: GB1001.G76
Descriptors: drinking-water wells- groundwater- groundwater-pollution water-quality contaminants- nitrate-nitrogen pesticides- coliform-bacteria rural-areas nebraska-drinking-water-quality
Abstract: For this statewide assessment, 1808 wells were sampled and a data base compiled that included water-quality data (NO3(-1)-N, pesticides, coliform bacteria) and site-specific data collected at each location. Domestic, rural water qual ity in Nebraska varies substantially from one ground water region to another and is a function of well characteristics, distances to potential contamination sources, and hydrogeologic and site characteristics. The percentage of wells exceeding the 10 ppm MCL for NO3(-1)-N ranged from 3 to 39 percent, depending on the ground water region. This large range of values indicates the inadequacy of stating that an average of 19 percent of domestic wells in Nebraska are contaminated by nitrates. This statistic do es not describe the nature, extent, and variability of the contamination problem. Depending on the ground water region, the degree of nitrate contamination in rural domestic drinking-water wells has remained generally unchanged or has only slightly increa sed since the last statewide assessment conducted from 1985 to 1989. Bacterial contamination has either remained the same or has decreased. The percentage of wells affected by bacteria ranged from 8 to 26 percent, depending on the ground water region. Sta tewide, about 70 wells, or 4 percent of the wells sampled, had detectable-pesticide levels, of which atrazine was the most common. Eighty-two percent of the detections were in the Platte River Valley or in the South Central Plains, both of which are chara cterized by heavily irrigated corn and a statistical association between nitrate and atrazine contamination. To improve the quality of domestic drinking water will require a combination of activities, including the. application of best management practic es specific to a ground water region and

individual action at rural households, such as conducting sanitary surveys of existing wells before installing new wells.

29. **Drinking water contamination: understanding the risks.**
Webendorfer, B. and Jackson, G.
Publ-Univ-Wis-Coop-Ext-Serv. Madison, Wis. : The Service. 1989. (G3339) 6 p.
NAL Call #: S544.3.W6W53
Descriptors: drinking-water water-pollution water-quality pesticide-residues risk- wells- wisconsin.

30. **Drinking water testing.**
Norris, P. E., Storm, D. E., Allen, E. R., and Smolen, M. D.
OSU-Ext-Facts-Coop-Ext-Serv-Okla-State-Univ. Stillwater, Okla. : The Service. Nov 1991. (878) 4 p.
NAL Call #: S544.3.O5O5
Descriptors: drinking-water testing- water-quality water-supply wells- oklahoma-

31. **Drinking water testing for private well owners.**
Lewis, S.
Fact-Sheet-Coll-Agric-Univ-Nev-Reno-Nev-Coop-Ext. [Reno, Nev.] : The College. Sept 1992. (92-30) 4 p.
NAL Call #: S544.3.N3C66
Descriptors: drinking-water wells- testing- water-quality contamination- coliform-bacteria

32. **Drinking water wells.**
McCann, A. and Husband, T. P.
Nat-resour-facts. Kingston, R.I. : The University of Rhode Island, College Resource Development, Department of Natural Science. June 1990. (90-3) 3 p.
NAL Call #: TD224.R4N37
Descriptors: drinking-water wells- construction

33. **Evaluation of ground-water contamination from nonpoint sources: a case study.**
Brink, C. van den and Zaadnoordijk, W. J.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. May/June 1995. v. 33 (3) p. 356-365.
NAL Call #: TD403.G7
Descriptors: groundwater-pollution pollutants- contaminants- nitrate- leaching- computer-analysis computer-software computer-simulation simulation-models groundwater-flow geographical-information-systems water-quality groundwater-extraction wells- groundwater- hungary- shallow-groundwater flunit-program nitron-program fluzo-program arclinfo-program welcon-program triwaco-program nonpoint-source-pollution
Abstract: In many countries a substantial part of the drinking-water supply comes from subsurface-water resources. During the last several decades an increasing extent of diffuse pollution has endangered these water resources. Knowledge of the changes in ground-water quality is necessary in order to know if, and to what extent, ground-water quality is endangered. Changes in ground-water quality can be predicted by means of models describing both the ground-water flow and the transport of conta minants. A Geographic Information System is an efficient tool to handle the storage and manipulation of the large amount of data needed for the description of diffuse pollution.

A methodology to predict changes in ground-water quality, which is Called FLU NIT, has been built around the programs FLUZO, NITRON, ARC/INFO, dBASE, and WELCON, and the ground-water flow package TRIWACO. The method runs on a PC (with 386 processor). The system has been applied to a well field on Csepel Sziget (near Budapest, Hunga ry). The purpose was not so much the prediction of the ground-water quality, but much more the evaluation of ground-water protection strategies based on risk analysis and effectivity of possible measures. The system has been designed in such a way that th e important information can be used with the available resolution, and that new and more detailed data can be added efficiently. Change of the nitrogen concentrations in the extracted water can be predicted. The resolution is sufficient for the evaluation of alternative ground-water protection strategies. Moreover, detailed insight into changes in ground-water quality can be obtained quickly.

34. **Evaluation of nitrate analysis using test strips: comparison with two analytical laboratory methods.**
Bischoff, M., Hiar, A. M., and Turco, R. F.
Commun soil sci plant anal. 27: 15/17 pp.2765-2774. (1996).
NAL Call #: S590.C63
Descriptors: drinking-water wells- chemical-analysis nitrate- nitrogen-content analytical-methods evaluation- accuracy- test-procedure water-pollution contamination-determination- water-quality
Abstract: Nitrate remains a contaminant of concern for users of well water. Well-water evaluation, either to assess nitrate contamination or to evaluate sites prior to including them in a larger water quality study, often involves costly labor atory analysis. A cost effective alternative to laboratory analysis are dip-style test strips. However, the accuracy of these types of products must be reliable, as failure to identify the contaminant may, for example, persuade a homeowner to neglect to h ave a potential problem further investigated. The testing of nitrate using such strips typiCally involves dipping the strip into the water sample and reading the color development after a specific period of time. The color development is then compared to a color scale which corresponds to concentration provided with the test. The results of these types of analysis are especially open to interpretation by the evaluator of the results. An experiment was conducted to evaluate test strips in which individuals or "readers" tested water samples collected in the field and nitrate standards prepared in the laboratory with nitrate test strips. The results obtained by the "readers" were compared to analysis of nitrate by high performance liquid chromatography and colorimetric analysis using a colorimetric ion analyzer.

35. **Evaluation of wellhead protection area delineation methods on a rural farmstead in Pennsylvania.**
Doscher, C. Jr. and Robillard, P. D.
Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers,. Summer 1992. (922037) 36 p.
NAL Call #: 290.9-Am32P
Descriptors: wells- farms- rural-areas computer-simulation pennsylvania-

36. **Factors related to nitrate-nitrogen contamination of Ohio farm water wells.**
Rausch, J. N., Hitzhusen, F. J., Forster, D. L., and Elliot, W. J.
Econ-sociol-occas-pap. Columbus : Ohio State University, Dept. of Agricultural Economics and Rural Sociology. June 1992. 12 p.

NAL Call #: HD1411.O3
Descriptors: drinking-water water-quality wells- water-pollution nitrate- nitrogen- factor-analysis ohio-

37. **Farm-A-Syst: Rx for safe ground water in Wisconsin.**
Moberg, D. P.
Soil Water Conserv U S Dep Agric Soil Conserv Serv. 13: 1 pp.19. (May/June 1992).
NAL Call #: DNAL aS622.S6
Descriptors: watershed-management water-quality farm-management farm-surveys wisconsin-

38. **Farmstead assessment for whole farm water quality protection.**
Jackson, G. W. and Anderson, J. L.
Agricultural research to protect water quality proceedings of the conference February 21-24, 1993 Minneapolis, Minnesota, USA. Ankeny, IA : The Society, [1993]. p. 517-519. pp.
NAL Call #: TD427.A35A49-1993
Descriptors: groundwater- wells- drinking-water water-quality farms- risk- assessment-educational-programs educational-planning plan-implementation-and-evaluation wisconsin- minnesota- farmstead-assessment-program-farm*a*syst well-water

39. **A farmstead checklist.**
Weston, D.
NDSU-Ext-Serv. Fargo, N.D. : The University. Apr 1994. (FS-548) 4 p.
NAL Call #: S544.3.N9C46
Descriptors: wells- farms- groundwater- drinking-water safety- water-pollution site-factors waste-water-treatment waste-disposal chemicals- storage- handling- livestock-dairying- north-dakota.

40. **Good wells for safe water.**
Glanville, T.
PM-Iowa-State-Univ-Coop-Ext-Serv. Ames, Iowa : Iowa State University, Cooperative Extension Service. Mar 1993. (840, rev.) 4 p.
NAL Call #: 275.29-IO9PA
Descriptors: wells- safety- construction- water-quality drinking-water water-systems well-drainage regulations- iowa-

41. **Ground water protection alternatives and strategies in the U.S.A.**
Ahmed, Nazeer and American Society of Civil Engineers. Task Committee on Ground Water Protection.
New York, N.Y. : American Society of Civil Engineers, 1997. iv, 283 p.
NAL Call #: TD223.G736--1997
Descriptors: Groundwater-Pollution-United-States Wellhead-protection-United-States

42. **Groundwater and wellhead protection in Battle Mountain, Nevada.**
Neufeld, J.
Fact-sheet-Max-C-Fleischmann-Coll-Agric,-Coop-Ext-Serv. [Reno, Nev.] : The College,. 1993. (93-19) 4 p.
NAL Call #: S544.3.N3C66
Descriptors: groundwater- wells- water-conservation water-table aquifers- hydrology-geology- nevada- battle-mountain-well-protection-area

43. **Groundwater & public policy series.**
Soil and Water Conservation Society (U.S.). Freshwater Foundation.
[Wayzata, Minn.] : Freshwater Foundation, [1991-1993] 17 v. .
CONTENTS NOTE: 1. What is groundwater? / George H. Davis -- 2. Understanding how contaminants reach groundwater / Arthur G. Hornsby -- 3. Sources and extent of groundwater contamination / David W. Moody -- 4. The costs of groundwater contamination / Willi am B. O'Neil and Robert S. Raucher -- 5. Agricultural best management practices / Terry J. Logan -- 6. Protecting groundwater quality by managing local land use / Douglas A. Yanggen and Stephen M. Born -- 7. Groundwater quality: a public policy perspectiv e / Lawrence W. Libby -- 8. Key policy choices in groundwater quality management / Sandra S. Batie and Penelope L. Diebel -- 9. Federal policies and programs to protect groundwater quality / Leon E. Danielson and David E. M. Patte -- 10. A voluntary appr oach to reducing agrichemical contamination of groundwater / Steve Padgitt -- 11. Liability issues in groundwater quality protection / Theodore A. Feitshans -- 12. Blameless contamination / Terence J. Centner -- 13. Community wellhead protection programs / Norbert Dee and Stan Austin -- 14. Financing approaches for local groundwater protection / Norbert Dee -- 15. Local groundwater management and policy decisions / Norbert Dee and Marian Mlay -- 16. A comprehensive approach to groundwater management for r ural local governments / E. Gaynell McGary Meij and Charles W. Abdalla -- 17. Communicating water quality risk issues to the public / Clifford W. Scherer.
NAL Call #: GB1003.2.G76--1991
Descriptors: Groundwater- Groundwater-Protection Groundwater-Quality Groundwater-Pollution

44. **Groundwater quality: responsible agriculture and public perceptions.**
Goss, M. J. and Barry, D. A. J.
J agric environ ethics 8: 1 pp. 52-64. (1995).
NAL Call #: BJ52.5.J68
Descriptors: groundwater-pollution water-quality drinking-water wells- farming-agricultural-policy canada-

45. **Guidance for applicants for state Wellhead Protection Program assistance funds under the Safe Drinking Water Act.**
United States. Environmental Protection Agency. Office of Ground Water Protection.
Washington, D.C. : U.S. Environmental Protection Agency, Office of Water, Office of Ground-Water Protection, [1987] 1 v.
NAL Call #: TD426.G84-1987
Descriptors: Well-Head-Protection-Program Wellheads-Protection-United-States Water,-Underground-Quality Drinking-water

46. **Handbook : ground water and wellhead protection.**
Eastern Research Group, Inc. United States. Environmental Protection Agency. Office of Drinking Water. United States. Environmental Protection Agency. Office of Science Planning and Regulatory Evaluation. Center for Environmental Research Information U. S .
Cincinnati, Ohio : U.S. Environmental Protection Agency, Center for Environmental Research Information, 1994. xvii, 269 p.
NAL Call #: TD403.H36--1994

Descriptors: Groundwater-Handbooks,-manuals,-etc Wellheads-Handbooks,-manuals,-etc Water-supply-Handbooks,-manuals,-etc

47. **How to conduct an inventory in your wellhead protection area : a training manual for use with volunteers.**
University of Idaho. Idaho Water Resources Research Institute.
[Moscow, ID] : University of Idaho, [1995?] 113 p. : ill.: "This project was developed through a cooperative effort of the: Idaho Water Resources Research Institute, University of Idaho ... [et al.].
NAL Call #: TD224.I2H69--1995
Descriptors: Water-quality-management-Idaho-Citizen-participation Drinking-water-Contamination-Idaho-Prevention-Citizen-participation

48. **How well is your well?.**
Rasmussen, Jeanne., Liukkonen, Barbara., Kroll, Mary., and Minnesota Extension Service.
[St. Paul, Minn.] : Minnesota Extension Service, University of Minnesota, 1992. 4 p. : ill.: Cover title. "Clean water, you can make a difference." "4H-FO-5979-B."
NAL Call #: TD407.R37--1992
Descriptors: Wells- Groundwater-Testing Drinking-water-Testing

49. **Hydrogeology and results of tracer tests at the old Tampa well field in Hillsborough County, with implications for wellhead-protection strategies in west-central Florida.**
Robinson, James L. and Southwest Florida Water Management District. Geological Survey (U.S.).
Tallahassee, Fla. : U.S. Dept. of the Interior, U.S. Geological Survey ; Denver, CO : Earth Science Information Center, Open-File Reports Section [distributor], 1995. vi, 63 p.
NAL Call #: DNAL GB701.W375--no.93-4171
Descriptors: Aquifers-Florida Groundwater-flow-Florida Hillsborough-County-Fla

50. **Improving home water quality.**
Langston, J.
MP-Univ-Arkansas-Coop-Ext-Serv. Little Rock, Ark. : The Service. Jan 1989. (292) 22 p.
NAL Call #: DNAL 275.29-AR4MI
Descriptors: water-quality drinking-water wells- springs- water-supply testing- treatment- chlorine- sodium-carbonate water-filters arkansas-

51. **Is someone contaminating-- your drinking water? : an overview of potentially harmful shallow injection wells.**
United States. Environmental Protection Agency. Ground Water Protection Council (U.S.).
[Washington, DC?] : U.S. Environmental Protection Agency ; Oklahoma City, OK : Ground Water Protection Council, [1990?] 10 p.
NAL Call #: TD761.I8--1990
Descriptors: Injection-wells-Environmental-aspects-Juvenile-literature Drinking-water-Contamination-Juvenile-literature Water-Pollution-Juvenile-literature Groundwater-Pollution-Juvenile-literature

52. **Is your drinking water safe.**
Glanville, T.
PM-Iowa-State-Univ-Coop-Ext-Serv. Ames, Iowa : The Service. Aug 1991. (1334i, rev.) 2 p.

NAL Call #: 275.29-IO9PA
Descriptors: drinking-water safety- wells- testing- inspection- contaminants- sampling- iowa.

53. **Mangement tools for preventing water pollution on farms.**
Nevers, E., Jackson, G., Castelnuovo, R., and Knox, D.
Environmentally sound agriculture proceedings of the second conference 20 22 April 1994 /30-37. (1994).
NAL Call #: S589.7.E57-1994
Descriptors: farms- groundwater-pollution risk- assessment- wells- drinking-water contamination- point-sources water-quality environmental-protection pollution-control programs- farmstead-assessment-system

54. **Make sure drinking water is safe.**
Glanville, T. and Miller, L.
PM-Iowa-State-Univ-Coop-Ext-Serv. Ames, Iowa : Iowa State University, Cooperative Extension Service. Nov 1994. (1563g) 2 p.
NAL Call #: 275.29-IO9PA
Descriptors: drinking-water safety- wells- contaminants- coliform-bacteria polluted-water tests- nitrate- health-hazards iowa.

55. **Monitoring pesticide and nitrate in Virginia's groundwater--a pilot study.**
Bruggeman, A. C., Mostaghimi, S., Holtzman, G. I., Shanholz, V. O., Shukla, S., and Ross, B. B.
Trans ASAE. 38: 3 pp. 797-807. (May/June 1995).
NAL Call #: 290.9-Am32T
Descriptors: groundwater- water-quality wells- pesticides- groundwater-pollution monitoring- aquifers- nitrate- sampling- virginia-
Abstract: Between October 1992 and February 1993, a total of 359 private wells in Northampton County were sampled and data on water-quality variables (temperature, pH, and conductivity), well construction, and site characteristics were collect ed. The groundwater samples were analyzed for aldicarb, alachlor, atrazine, carbofuran, linuron, methomyl, metolachlor, metribuzin, napropamide, pendimethalin, pronamide, simazine, and nitrate. The wells were stratified into shallow wells, withdrawing wat er from the unconfined aquifer, and deep wells, withdrawing water from the deeper confined aquifers. The study was undertaken as a pilot study to demonstrate the applicability of a recently developed framework for evaluating the extent of pesticide contam ination in Virginia's groundwater. Pesticides were detected in 14% of the shallow wells and in 7% of the deep wells sampled. Pesticide detection was associated with the well depth, with a higher probability of detecting a pesticide in the shallow unconfin ed aquifer than in the deeper aquifers. Nitrate above the U.S. EPA drinking water standard of 10 mg/L was found in 17% of the shallow and 1% of the deep wells. Pesticide and nitrate detections were not significantly related to well and site characteristic s, such as crop type, location of well head, and distance to the nearest water body.

56. **National survey of pesticides in drinking water wells : phase I report.**
United States. Environmental Protection Agency. Office of Pesticides and Toxic Substances.
[Washington, D.C.] : United States Environmental Protection Agency, Office of Water, Office of Pesticides and Toxic Substances, [1990] 1 v.

NAL Call #: TD427.P35N374-1990
Descriptors: Pesticides-Environmental-aspects-United-States Drinking-water-United-States-Contamination Wells-United-States Water-quality-United-States

57. **The nitrate contamination of private well water in Iowa.**
Kross, B. C., Hallberg, G. R., Bruner, D. R., Cherryholmes, K., and Johnson, J. K.
Am J Public Health. 83: 2 pp. 270-272. (Feb 1993).
NAL Call #: 449.9-AM3J
Descriptors: water- wells- nitrates- rural-areas contamination- iowa-
Abstract: The State-Wide Rural Well-Water Survey was conducted between April 1988 and June 1989. About 18% of Iowa's private, rural drinking-water wells contain nitrate above the recommended health advisory level (levels of NO3-N greater than 10 mg/ L); 37% of the wells have levels greater than 3 mg/L, typiCally considered indicative of anthropogenic pollution. Thirty-five percent of wells less than 15 m deep exceed the health advisory level, and the mean concentration of nitrate-nitrogen for these wells exceeds 10 mg/L. Depth of well is the best predictor of well-water contamination. Individually, NO3-N levels of more than 10 mg/L occurred alone in about 4% of the private wells statewide; pesticides were present alone in about 5%. Total colif orm positives occurred alone at 27% of the sites. In a cumulative sense, these three contaminants were detected in nearly 55% of rural private water supplies.

58. **Nitrate in rural wells of Missouri.**
Sievers, D. M. and Fulhage, C. D.
Trans A S A E 35: 5 pp. 1633-1637. (Sept/Oct 1992).
NAL Call #: 290.9-AM32T
Descriptors: wells- depth- nitrates- rural-areas water-quality missouri-
Abstract: Two hundred twenty six rural wells in Missouri were tested for NO3-N. Nineteen percent exceeded Environmental Protection Agency (EPA) drinking water standards. Nitrate concentrations were most strongly related to well depth. Well con struction, depth to aquifer and well age had lesser influence. Distance from well to livestock was a poor predictor of nitrate pollution.

59. **Nitrogen loading model for wellhead protection areas.**
Horsley, S. W.
Ground-water-monit-remediat. Dublin, OH : Ground Water Pub. Co., c1993-. Winter 1995. v. 15 (1) p. 66-67.
NAL Call #: GB1001.G76
Descriptors: nitrogen- nitrate-nitrogen wells- water-quality models- massachusetts-

60. **NLEAP application for developing municipal wellhead protection strategies in the Central Wisconsin Sand Plain.**
Kaap, J. D., Ebert, W., Kraft, G., and Brodahl, M. K.
Animal waste and the land-water interface . Boca Raton : Lewis Publishers, c1995. p. 325-332. pp.
NAL Call #: TD930.A55-1995
Descriptors: nitrate-nitrogen pesticides- crop-management land-use groundwater-pollution pollution-control wisconsin- integrated-crop-management best-management-practices

61. **Occurrence of selected herbicides and herbicide degradation products in Iowa's ground water, 1995.**

Kolpin, D. W., Kalkhoff, S. J., Goolsby, D. A., Sneck Fahrer, D. A., and Thurman, E. M.
Ground-water. Westerville, Ohio : Ground Water Pub. Co. July/Aug 1997. v. 35 (4) p. 679-688.
NAL Call #: TD403.G7
Descriptors: triazine-herbicides herbicide-residues triazines- groundwater-pollution groundwater- polluted-water contamination- wells- surveys- aquifers- geographical-variation slope- runoff- depth- iowa- well-depth
Abstract: Herbicide compounds were prevalent in ground water across Iowa, being detected in 70% of the 106 municipal wells sampled during the summer of 1995. Herbicide degradation products were three of the four most frequently detected compou nds for this study. The degradation product alachlor ethanesulfonic acid was the most frequently detected compound (65.1%), followed by atrazine (40.6%), and the degradation products deethylatrazine (34.9%), and cyanazine amide (19.8%). The corn herbicide acetochlor, first registered for widespread use in the United States in March 1994, was detected in a single water sample. No reported herbicide compound concentrations for this study exceeded current U.S. Environmental Protection Agency's maximum contam inant levels or health advisory levels for drinking water, although the herbicide degradation products examined have yet to have such levels established. A significant, inverse relation was determined between total herbicide compound concentrations in g round water and the average soil slope within a 2-km radius of sampled wells. Steeper soil slopes may increase the likelihood of surface runoff occurring rather than ground-water infiltration--decreasing the transport of herbicide compounds to ground wate r.

62. **Pesticides in eastern North Carolina rural supply wells: land use factors and persistence.**
Maas, R. P., Kucken, D. J., Patch, S. C., Peek, B. T., and Van Engelen, D. L.
J environ qual 24: 3 pp. 426-431. (May/June 1995).
NAL Call #: QH540.J6
Descriptors: pesticides- detection- wells- persistence- spatial-distribution temporal-variation nitrate-nitrogen indicators- land-use agricultural-land drinking-water water-quality water-pollution north-carolina
Abstract: Water samples were collected from 171 rural domestic well supplies in eastern North Carolina and analyzed for eight pesticides. Information on borehole depth, wet-casing depth, distance to nearest pesticide mixing area, types of pest icides used, and distance to nearest field application was obtained for each site. Four herbicides [alachlor, 2-chloro-2'-6'diethyl-N-(methoxymethyl)-acetanilide; atrazine, 2-chloro-4-ethylamino-6-isopropylamino-s-triazine; metolachlor, 2-chloro-N-(2-ethy l-6-methylphenyl)-N (2-methoxy-1-methylethyl) acetamide; trifluralin, a,a,a-trifluoro-2,6-dinitro-N, N-dipropyl-p-toluidine] were detected in the samples, with detection frequencies of 8.8, 8.2, 3.6, and 1.8%, respectively. About 15% of the samples contai ned at least one of these herbicides, with resampling indicating persistence throughout the year. Only alachlor concentrations were in excess of maximum contaminant levels (MCLs; 2.0 microgram L-1) or Health Advisory Levels (HALs; 0.4 microgram L-1) estab lished by the U.S. Environmental Protection Agency (USEPA). Neither atrazine nor alachlor detection exhibited statistical correlation with well depth, although both were rarely detected in wells > 100 feet deep. Atrazine concentrations and detection fr equencies did not correlate with distance to

nearest application site, while alachlor had a significantly greater detection frequency for wells further from the nearest application site. For nearly one-half of the wells with detectable atrazine and alachl or, there was no reported usage of either herbicide on the same farm during the previous three years, possibly indicating herbicide transport in groundwater or long times before degrading. No. statistiCally significant relationships were observed between the presence of alachlor or atrazine, and distance from the well to the nearest pesticide handling and storage area. Although inconclusive by itself, this indicates that at least some contamination originated from other than point-source spills. Nitrate- N concentrations in well water were poor predictors for atrazine and alachlor presence in this study.

63. **Pesticides in shallow groundwater in the Delmarva Peninsula.**
Koterba, M. T., Banks, W. S. L., and Shedlock, R. J.
J environ qual. 22: 3 pp. 500-518. (July/Sept 1993).
NAL Call #: QH540.J6
Descriptors: pesticide-residues groundwater- water-quality depth- spatial-distribution wells- drinking-water groundwater-pollution delaware- maryland- virginia-
Abstract: A regional study of the areal and depth distribution of pesticides in shallow groundwater in the Delmarva Peninsula of Delaware, Maryland, and Virginia was done to (i) relate the pesticides detected to landscape and shallow subsurfac e features, and (ii) evaluate aquifer vulnerability and the potential contamination of drinking-water supplies. Water samples collected at 100 wells from 1988 to 1990 were analyzed for concentrations of 36 pesticides, four metabolites, and other constitue nts. The most commonly detected residues were atrazine, cyanazine, simazine, alachlor, metolachlor, and dicamba. Concentrations were low, few exceeded 3 microgram L-1. Most detections correlate with the intensive use of these herbicides in three widely di stributed and commonly rotated crops-corn (Zea mays L.), soybean [Glycine mar (L.) Merr.], and small grain-particularly if grown in well-drained soils. Most detections occurred in samples collected from shallow wells screened within 10 m of the overlying water table. The shallow depth distribution of most residues is consistent with their suspected history of use (ca. 20 yr), and patterns in shallow groundwater flow in the surficial aquifer in the study area. The areal and depth distributions of detectabl e residues in groundwater did not correlate with a vulnerability index, nor any of the component scores developed to estimate that index using the DRASTIC method. The shallow depth of most detections also indicates why few samples from water-supply wells in this study had measurable concentrations of pesticides; most supply wells are deeper than 10 m below the water table. The low number of contaminated samples from supply wells implies that deep groundwater currently (1992) used for drinking generally do es not contain detectable pesticide. residues.

64. **Physiographic and land use characteristics associated with nitrate-nitrogen in Montana groundwater.**
Bauder, J. W., Sinclair, K. N., and Lund, R. E.
J environ qual. 22: 2 pp. 255-262. (Apr/June 1993).
NAL Call #: QH540.J6
Descriptors: drinking-water wells- water-quality nitrate-nitrogen geographical-distribution dry-farming rotations- site-factors climatic-factors groundwater-pollution montana-

Abstract: Occurrence of NO3(-)-N in drinking water at concentrations > 10 mg L-1 is being reported in the literature with increasing frequency. Some occurrences of high NO3(-)-N concentrations have been attributed to irrigation and fertiliz ation practices. A private well water testing program in Montana, involving nearly 3400 well owners, found NO3-(-)N concentrations > 10 mg L-1 in nearly 6% of all tested wells. Most of the agricultural land in Montana is nonirrigated and is not subject to high rates of N fertilization. Dryland crop/fallow cereal grain rotations are the main practices. Well water test results were combined with MAPS, a geographic information system (GIS), to identify correlations between county average NO3(-)-N concentr ation in groundwater, well water sample probability of exceeding 10 mg L-1 NO3(-)-N, geographic, climatic, and geologic conditions, and land-use practices. From a list of 67 independent variables, county average well water NO3(-)-N concentration and perce ntage of tested wells in each county with NO3(-)-N concentration > 10 mg L-1 were correlated ($P < 0.10$) with 16 independent variables, most of which were associated with precipitation, soil properties, and land-use practices. The closest correlation s were with March 1 through June 30 precipitation, distribution of dryland crop production and summer fallow, soil water-holding capacity, and mapping units of the general soil map of Montana. Two-, three-, and four-variable, linear, multiple regression m odels indicated that 53 to 61% of the variability in county average well sample NO3(-)-N concentration could be accounted for by these independent variables. Results of these analyses support the hypothesis that summer fallow practices and associated mine ralization of organic matter may be. contributing to regionalized NO3(-)-N contamination of shallow groundwater in Montana.

65. **Planning your well: guidelines for safe, dependable drinking water.**
Korab, H.
Land-water. Urbana-Champaign : The Service, 1982-. Apr 1990. (14) 11 p.
NAL Call #: S624.I3L36
Descriptors: wells- homes- site-factors groundwater- planning- water-requirements construction- disinfection- regulations- permits- water-quality illinois-

66. **Proceedings, 1996 Ground Water Protection Council Annual Forum : a stakeholders conference on ground water, watershed, source water, wellhead protection and underground injection control : September 22-25, 1996, Radisson St. Paul, St. Paul, Min nesota. 1996 Ground Water Protection Council Annual Forum.**
St. Paul, Minn. : The Council, [1996?] 224 p. : ill., maps.
NAL Call #: GB1015.G76--1996
Descriptors: Groundwater-United-States-Congresses

67. **A program to support management of farmstead activities and structures: a systems approach to farm wellhead protection.**
Carpenter, J. and Miller, W.
Agricultural research to protect water quality proceedings of the conference February 21-24, 1993 Minneapolis, Minnesota, USA /. Ankeny, IA : The Society, [1993]. p. 515-516.
NAL Call #: TD427.A35A49-1993
Descriptors: groundwater-pollution wells- risk- assessment- educational-programs pollution-control program-development rural-areas farms- michigan- farmstead-assessment-program-farm*a*syst

68. **Protecting ground water from the bottom up : local responses to wellhead protection : Conference proceedings. Conference on protecting ground water from the bottom up, local responses to wellhead protection, October 1989.**
United States. Environmental Protection Agency. Region I. Underground Injection Practices Council (U.S.). Research Foundation. New England Water Works Association. [Oklahoma City, Okla.? : The Foundation?, 1989] v, 327 p.
NAL Call #: TD388.5.P76-1989
Descriptors: Water,-Underground-Pollution-New-England-Congresses Water,-Underground-Protection-New-England-Congresses Wells-New-England-Congresses
69. **Protecting local ground-water supplies through wellhead protection. Protecting local ground water supplies through wellhead protection.**
United States. Environmental Protection Agency. Office of Water.
[Washington, D.C.] : U.S. Environmental Protection Agency, Office of Water, [1991] 18 p.
NAL Call #: Fiche--S-133-EP-2.2:W-45/5-
Descriptors: Groundwater-United-States-Quality Wellhead-protection-United-States
70. **Protecting local groundwater resources.**
Smutko, L. S. and Hoag, D. L.
AG-NC-Agric-Ext-Serv. Raleigh : North Carolina Agricultural Extension Service, May 1995. (473-21) 6 p.
NAL Call #: S544.3.N6N62
Descriptors: groundwater-pollution contaminants- sources- drinking-water hazards- pollution-control water-management wells- community-action land-use-planning north-carolina groundwater-protection
71. **Protecting your private well.**
Bonner, J.
Publ-Miss-State-Univ,-Coop-Ext-Serv. State College, Miss. : Cooperative Extension Service, Mississippi State University. May 1993. (1868) 4 p.
NAL Call #: 275.29-M68Ext
Descriptors: wells- drinking-water water-quality pollution-control
72. **Protecting your well by shock chlorination.**
Thomas, J. G., Carroll, J. W., and Holder, T. S.
Publ-Miss-State-Univ,-Coop-Ext-Serv. State College, Miss. : Cooperative Extension Service, Mississippi State University. May 1993. 4 p.
NAL Call #: 275.29-M68Ext
Descriptors: wells- drinking-water chlorine- disinfection-
73. **Quality of well water on Tennessee poultry farms.**
Goan, H. C., Denton, P. H., and Draughon, F. A.
Environmentally sound agriculture proceedings of the second conference 20 22 April 1994 / pp. 368-372. (1994).
NAL Call #: S589.7.E57-1994
Descriptors: water-quality drinking-water wells- regional-surveys nitrate-nitrogen nitrogen-content bacteria- fecal-flora poultry-farming tennessee
74. **The relationship between monitoring well and aquifer solute concentrations.**
Chiang, C., Raven, G., and Dawson, C.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. Sept/Oct 1995. v. 33 (5) p.

718-726.
NAL Call #: TD403.G7
Descriptors: aquifers- groundwater-pollution monitoring- wells- pollutants-contaminants- petroleum-hydrocarbons underground-storage underground-structures industry- fuel-tanks equations- mathematics- texas- petroleum-industry
Abstract: Disparities between organic solute concentration in the aquifer and that in monitoring wells have been observed; an order of magnitude disparity had been recorded in some cases. Therefore, it is important to be able to relate concent rations between the two media for design of remediation systems. More significantly, to assess the impact of leachate from a landfill on a downgradient drinking water well, it is important to correlate aquifer concentration with that in a drinking water w ell such that the true risk is properly estimated. A three-dimensional finite-difference flow and transport model has been applied to demonstrate that the disparity between aquifer and well concentrations results primarily from advective flow phenomena an d can be quantified. The modeling shows that the concentration in the well is a function of the initial vertical concentration profile in the aquifer, the volumetric flow rate from below the partially penetrated well, the penetration fraction, and the amo unt of water purged before sampling. Under steady-state conditions, the dilution of concentrations in monitoring wells may be expressed as a simple analytic function of the above parameters. The result from this analytic function agrees well with numerica l solutions and field sampling data.

75. **Rural domestic water supply.**
Vomocil, J. and Hart, J.
Ext-Circ-EC-Oreg-State-Univ-Ext-Serv. Corvallis, Or. : The Service. Feb 1991. (1374) 4 p.
NAL Call #: 275.29-OR32C
Descriptors: wells- water-use water-quality drinking-water oregon-

76. **Rural water quality database: educational program to collect information.**
Lemley, A. and Wagenet, L.
J-ext. Madison, Wis. : Extension Journal. Fall 1993. v. 31 p. 11-13.
NAL Call #: 275.28-J82
Descriptors: water-quality rural-communities databases- drinking-water extension-education contamination- testing- wells- program-evaluation program-effectiveness new-york

77. **Seminar publication : wellhead protection : a guide for small communities.**
Center for Environmental Research Information (U.S.). United States. Environmental Protection Agency. Office of Science, Planning and Regulatory Evaluation. United States. EPA. Office of Ground Water Protection.
Cincinnati, OH : U.S. EPA, Office of Research and Development [1993] ix, 144 p.
NAL Call #: TD223.S46--1993
Descriptors: Wellheads-Protection Groundwater-Quality Water-quality-management

78. **Shallow injection well practices : Class V : well facts.**
United States. Environmental Protection Agency. Office of Drinking Water.
[Washington, D.C.?] : Office of Drinking Water, [1992?] 1 v.
NAL Call #: TD407.S32-1992
Descriptors: Injection-wells-Government-policy-United-States Wells-Government-policy-United-States

79. **A simple analytical approach for predicting nitrate concentrations in pumped ground water.**
Lerner, D. N. and Papatolios, K. T.
Ground-Water. Dublin, Ohio : Ground Water Pub. Co. May/June 1993. v. 31 (3) p. 371-375.
NAL Call #: TD403.G7
Descriptors: groundwater-pollution pollutants- nitrates- wells- groundwater-recharge concentration- prediction- models- aquifers- england- pumped-wells
Abstract: A simple analytical expression is presented which predicts how solute concentrations evolve with time in a pumped well. The basic expression is for uniform recharge and uniform concentration of a conservative solute (e.g. nitrate) in the recharge. It shows that pumped concentrations are independent of pumping rates. The expression can be developed to allow for more complex patterns of recharge and solute loading, and an example is given with three zones of recharge and concentrations , induced river recharge, and a cross-boundary inflow. Predictions are made for Edgmond Bridge, a new pumping station which lies in a drift-filled valley in the Triassic sandstone aquifer of Shropshire, UK. The model predicts that concentrations of nitrat e will stay below the drinking water limit for 78 years, although this would be substantially reduced if the aquifer were significantly layered or if nitrate loads from agriculture increased. Predictions were reevaluated after two years and found to be co nsistent with observed patterns once actual, rather than expected, conditions were incorporated in the model.

80. **Soil nitrate-N variability and distribution in the Tipton Wellhead Protection Area.**
Ramanarayanan, T. S., Storm, D. E., Smolen, M. D., Rao, M. N., Kizer, M. A., and Guertal, E. A.
Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers,. Summer 1993. (932086) 19 p.
NAL Call #: 290.9-Am32P
Descriptors: profiles- spatial-variation nitrate-nitrogen oklahoma-

81. **Some factors influencing nitrate contamination of drinking water in private wells of rural Alabama.**
Datiri, B., Ankumah, R., and Hodge, W.
Tuskegee horiz. 4: 1 pp. 20. (Fall 1993).
NAL Call #: S31.T84
Descriptors: wells- rural-communities drinking-water water-pollution nitrate- alabama-

82. **Sources of water to wells for transient cyclic systems.**
Reilly, T. E. and Pollock, D. W.
Ground-water. Westerville, Ohio : Ground Water Pub. Co. Nov/Dec 1996. v. 34 (6) p. 979-988.
NAL Call #: TD403.G7
Descriptors: wells- well-drainage groundwater-extraction groundwater-flow groundwater-recharge seasonal-variation climate- aquifers- temporal-variation simulation- flow-to-wells
Abstract: Many state agencies are currently (1995) developing wellhead protection programs. The thrust of some of these programs is to protect water supplies by determining the areas contributing recharge to water-supply wells and by specifyin g regulations to minimize the opportunity for contamination of the recharge water by

activities at the land surface. The area contributing recharge to a discharging well is the surface area at the water table through which the water flowing to the well en tered the ground-water system. In the analyses of ground-water flow systems, steady-state average conditions are commonly used to simplify the problem and make a solution tractable. However, recharge is usually cyclic in nature, with seasonal cycles and l onger term climatic cycles. The effect of these cyclic stresses on the area contributing recharge to walls is quantitatively analyzed for a hypothetical alluvial valley aquifer system that is representative of a large class of ground-water systems that ar e extensively developed for water supply. The analysis shows that, in many cases, these cyclic changes in the recharge rates do not significantly affect the location and size of the areas contributing recharge to wells. The ratio of the mean travel time t o the length of the cyclic stress period appears to be an indicator of whether the transient effects of the cyclic stress must be explicitly represented in the analysis of contributing areas to wells. For the cases examined, if the ratio of the mean trave l time to the period of the cyclic stress was much greater than one, then the transient area contributing recharge to wells was similar to the area calculated using an average steady-state condition. However, cyclic stresses on systems. with ratios less than one do have an effect on the location and size of the areas contributing recharge to walls.

83. **Statistical analysis of rural well contamination and effects of well construction.**
Glanville, T. D., Baker, J. L., and Newman, J. K.
Trans ASAE. 40: 2 pp.363-370. (Mar/Apr 1997).
NAL Call #: 290.9-Am32T
Descriptors: atrazine- alachlor- metolachlor- nitrate-nitrogen chloride- coliform-bacteria wells- groundwater-pollution building-materials design- drinking-water transport-processes water-quality contamination- iowa- physical-properties-of-wells
Abstract: A previous statewide survey showed that 14% of rural wells in Iowa contained detectable concentrations of pesticides. To determine if improved private well construction regulations should be included in Iowa's State Pesticide Managem ent Plan, a two-year study was undertaken to determine: the effects of well construction on pesticide, nitrate-nitrogen, and bacterial contamination of wells; and the possible role of point sources of contamination. Eighty-eight rural water supply wells i n nine Iowa counties were sampled daily for five weeks during late spring and summer of 1993, and 20% of these were resampled in 1994. Short-term variation in nitrate-nitrogen concentrations was examined as a possible indicator of rapid inflow of shallow groundwater associated with well construction defects. Mean total coliform bacteria, nitrate-nitrogen, chloride, atrazine, alachlor, and metolachlor concentrations were statistiCally analyzed to determine if they were correlated, and t-tests also were use d to determine if these water quality parameters were affected significantly by physical well parameters such as depth, type of casing, grouting, location within frost pits, and proximity to various potential sources of contamination. Study results indica te that: short-term water quality fluctuations, by themselves, were not a reliable indicator of deteriorated or improperly constructed wells; although the magnitude and frequency of positive total coliform test results was noticeably higher in shallower w ells, a substantial fraction (21%) of wells greater than 30.5 m (100 ft) deep also had positive coliform results; t-tests and correlation analysis failed to show significant differences in mean atrazine or alachlor concentrations. when comparing "sh allow" and "deep" wells;

increased well depth, by itself, did not ensure water supply protection from chemical or biological contaminants; mean nitrate-nitrogen and mean chloride concentrations had the strongest correlation (R = 0.57, p = 0 .0001) among any of the contaminants tested; and mean atrazine and alachlor concentrations correlated moderately well with those for the more highly-mobile nitrate-nitrogen and chloride.

84. **A study of the temporal variability of atrazine in private well water. I. Study design, implementation, and database development.**
Lorber, M., Johnson, K., Kross, B., Pinsky, P., Burmeister, L., Thurman, M., Wilkins, A., and Hallberg, G.
Environ monit assess. 47: 2 pp.175-195. (Sept 1997).
NAL Call #: TD194.E5
Descriptors: atrazine- metabolites- triazines- nitrates- wells- drinking-water water-supply sampling- design- analytical-methods temporal-variation rural-areas regional-surveys databases- costs- iowa- temporal-variability-of-atrazine-contamination -of-private-well-water-supplies

85. **A study of the temporal variability of atrazine in private well water. II. Analysis of data.**
Pinsky, P., Lorber, M., Johnson, K., Kross, B., Burmeister, L., Wilkins, A., and Hallberg, G.
Environ monit assess. 47: 2 pp. 197-221. (Sept 1997).
NAL Call #: TD194.E5
Descriptors: atrazine- metabolites- triazines- nitrates- drinking-water water-supply wells- rural-areas seasonal-variation regional-surveys data-processing databases- iowa- temporal-variability-of-atrazine-contamination-of-private-well-water-suppl ies

86. **Survey of nitrate contamination in shallow domestic drinking water wells of the Inner Coastal Plain of Georgia.**
Stuart, M. A., Rich, F. J., and Bishop, G. A.
Ground-water. Columbus, Ohio : Ground Water Pub. Co. Mar/Apr 1995. v. 33 (2) p. 284-290.
NAL Call #: TD403.G7
Descriptors: groundwater-pollution nitrate- water-quality wells- surveys- coastal-plains contamination- aquifers- nitrogen- ph- water-temperature high-water-tables electrical-conductivity drinking-water georgia- nitrite- shallow-aquifers specific- conductivity
Abstract: Beginning in 1990, 2,588 wells were sampled within the Inner Coastal Plain of Georgia in an effort to assess the quality of ground water in this major farm belt. The project was one aspect of an EPA-sponsored program to assess ground -water quality statewide. Several variables were measured, including pH, specific conductivity, dissolved oxygen, temperature, nitrate, nitrite, total hardness, calcium, magnesium, and bicarbonate. In some wells sulfate, chloride, potassium, iron, and man ganese contents were also determined. Particular emphasis was placed, however, on pH, specific conductivity, temperature, and nitrite/nitrate content. Generally, pH was between 6 and 8, and temperatures were within a range of 18 degrees and 24 degrees Cel sius. Measurements of specific conductivity varied, but averaged 250-275 microsiemens/cm. Nitrite contamination was negligible, and nitrate contamination of the ground water within the shallow aquifers did not appear to be significant. In fact, 56% of the wells sampled showed no detectable signs of nitrate or nitrite contamination. There were,

however, a few isolated wells where nitrate as nitrogen measurements exceeded the EPA's Safe Drinking Water Standard of 10 ppm. The general lack of contamination ma y be the result of the nature of the agricultural practices used in this region and/or the effect of natural denitrification.

87. **Testing of private wells.**
Wyman, J. and Kamrin, M.
Ext-Bull-Water-Qual-Ser. East Lansing, Mich. : The Service. Feb 1988. 2 p.
NAL Call #: DNAL TD224.M5E97
Descriptors: drinking-water wells- groundwater- contaminants- testing- sampling- michigan.

88. **Underground injection wells and your drinking water.**
United States. Environmental Protection Agency. Office of Water. Underground Injection Control (U.S.).
[Washington, D.C.?] : U.S. EPA, Office of Water, [1994] 1 folded sheet (10 p.)
NAL Call #: TD426.8.U53--1994
Descriptors: Injection-wells-Environmental-aspects Drinking-water-Contamination-United-States

89. **Water quality and private water supplies.**
McManus, M.
Publ-Univ-Tenn-Agric-Ext-Serv. Knoxville, Tenn. : The Service. Mar 1990. 19 p.
NAL Call #: DNAL S115.P82
Descriptors: wells- water-quality groundwater-pollution drinking-water standards- contaminants- health-hazards testing- tennessee-

90. **Watershed project models efficient farming practices.**
Miller, G. A. and Jost, M.
IFM-Iowa-State-Univ-Ext. Ames, Iowa : The Extension. July 1989. (2) 2 p.
NAL Call #: S561.6.I8I35
Descriptors: demonstration-farms water-pollution extension-education wells- drinking-water safety- watershed-management iowa- upper-bluegrass-watershed-project

91. **Well testing program yields encouraging results.**
Summer, K.
Agfocus. 7-8. (July 1994).
NAL Call #: S544.3.N7A4
Descriptors: wells- water-quality drinking-water laboratory-tests new-york water-quality-incentive-program

92. **Wellhead protection.**
Thomas, J. G. and Carroll, J.
Publ-Coop-Ext-Serv-Miss-State-Univ. State College, Miss. : The Service. Apr 1992. (1815) 3 p.
NAL Call #: 275.29-M68EXT
Descriptors: wells- groundwater-pollution construction- maintenance- mississippi-

93. **Wellhead protection area delineation using the analytic element method of ground-water modeling.**
Wuolo, R. W., Dahlstrom, D. J., and Fairbrother, M. D.
Ground-water. Dublin, Ohio : Ground Water Pub. Co. Jan/Feb 1995. v. 33 (1) p. 71-83.
NAL Call #: DNAL TD403.G7

Descriptors: aquifers- groundwater-extraction groundwater-flow simulation-models wells- water-table minnesota-

94. **Wellhead protection areas for surface factors using simulated annealing.**
Muttiah, R. S. and Engel, B. A.
Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers,. Winter 1991. (917567) 13 p.
NAL Call #: 290.9-Am32P
Descriptors: water-systems computer-simulation

95. **Wellhead protection effects on agricultural and rural areas.**
Ray, B. W.
Pap-Am-Soc-Agric-Eng. St. Joseph, Mich. : American Society of Agricultural Engineers,. Winter 1992. (92-2502/92-2520) 7 p.
NAL Call #: 290.9-Am32P
Descriptors: wells- environmental-protection groundwater

Return to Source Water Bibliography

Return to the Water Quality Information Center at the National Agricultural Library.
Last update: Jun 17, 2008
The URL of this page is http://www.nal.usda.gov/wqic/Source_water/dwwells.html

---

J. R. Makuch /USDA-ARS-NAL-WQIC/ wqic@ars.usda.gov