

## PUBLICATIONS

Dennis R. Helsel  
Practical Stats LLC  
[www.practicalstats.com](http://www.practicalstats.com)

- Helsel, D.R., Hirsch, R.M., Ryberg, K.R., Archfield, S.A., and Gilroy, E.J., 2020, Statistical methods in water resources: U.S. Geological Survey Techniques and Methods, book 4, chapter A3, 458 p., <https://doi.org/10.3133/tm4a3>.
- Caleb J. Banta-Green, Alex J. Brewer, Christoph Ort, Dennis R. Helsel, Jason R. Williams, Jennifer A. Field, 2016. Using wastewater-based epidemiology to estimate drug consumption—Statistical analyses and data presentation. *Sci. Tot. Env.* 568, p. 856-863. <http://dx.doi.org/10.1016/j.scitotenv.2016.06.052>
- Johnsen, A.R., L. Thorling, Helsel, D.R. and L. Flemming, 2016. Comments on the article: Re-evaluation of groundwater monitoring data for glyphosate and bentazone by taking detection limits into account. *Sci.Tot.Env.* 557-558. p. 914-915. <http://dx.doi.org/10.1016/j.scitotenv.2016.02.130>
- Helsel, D.R. and E.J. Gilroy, 2012. The Unofficial Users Guide to ProUCL4. Kindle ebooks. Out of print.
- Sheppard, P.R., Helsel, D.R., Speakman, R.J., Ridenour, G., Witten, M.L., 2012. Additional analysis of dendrochemical data of Fallon, Nevada. *Chemico-Biological Interactions* 196, 96–101. <https://doi.org/10.1016/j.cbi.2011.12.009>
- Helsel, D.R., 2011. *Statistics for censored environmental data using Minitab and R*, 2<sup>nd</sup> edition. John Wiley and Sons, New York. 344 p. <https://doi.org/10.1002/9781118162729>
- Helsel, D.R., 2010. Summing Nondetects. *Integr Environ Assess and Manag* 6, 361-366. <http://dx.doi.org/10.1002/ieam.31>
- Helsel, D.R., 2010. Much Ado About Next to Nothing: Incorporating Nondetects in Science. *Ann Work Exposures and Health* 54, 257-262. <http://dx.doi.org/10.1093/annhyg/mep092>
- Gartner, J. E.; Cannon, S. H.; Helsel, D. R.; Bandurraga, M., 2009. Multivariate Statistical Models for Predicting Sediment Yields from Southern California Watersheds. US Geological Survey Open-File Report 2009-1200. 42 p. <https://doi.org/10.3133/ofr20091200>
- M.B. Goldhaber, J.M. Morrison, J.M. Holloway, R.B. Wanty, D.R. Helsel, and D.B. Smith, 2009. A regional soil and sediment geochemical study in northern California. *Applied Geochemistry* 24, 1482-1499. <https://doi.org/10.1016/j.apgeochem.2009.04.018>

- Rupert, M G.; Cannon, S. H.; Gartner, J. E.; Michael, J. A.; Helsel, D. R., 2008. Using Logistic Regression to Predict the Probability of Debris Flows in Areas Burned by Wildfires, Southern California, 2003-2006. *USGS Open-File Report 2008-1370*, 9 p.  
<https://doi.org/10.3133/ofr20081370>
- Helsel, D.R., 2008, *Detection Limits*, in Brian Everitt and Ed Melnick, eds., *Encyclopedia of Quantitative Risk Analysis and Assessment*. Wiley.  
<https://doi.org/10.1002/9780470061596.risk0261>
- Ayotte, J.; Argue, D.; McGarry, F.; Degnan, J.; Hayes, L.; Flanagan, S.; and Helsel, D., 2008. Methyl tert-Butyl Ether (MTBE) in Public and Private Wells in New Hampshire: Occurrence, Factors, and Possible Implications. *Environmental Science and Technol.* 42 (3), 677–684. <http://dx.doi.org/10.1021/es071519z>
- Lee, Lopaka, and Helsel, Dennis, 2007, Statistical analysis of water-quality data containing multiple detection limits: S-language software for nonparametric distribution modeling and hypothesis testing, *Computers & Geosciences* 33, 696-704.  
<http://dx.doi.org/10.1016/j.cageo.2006.09.006>
- Helsel, D. R. (2006). Fabricating Data: How substituting values for nondetects can ruin results, and what can be done about it. *Chemosphere* 65 (11), 2434-2439.  
<http://dx.doi.org/10.1016/j.chemosphere.2006.04.051>
- Stetson, S.J., R. B. Wanty, D. R. Helsel, and S. J. Kalkhoff (2006). Stability of low levels of perchlorate ion in drinking water and natural water samples. *Analytica Chimica Acta* 567, 108-113.  
<http://dx.doi.org/10.1016/j.aca.2006.03.030>
- Helsel, D.R. and Frans, L.M., (2006), The Regional Kendall test for trend. *Environmental Science and Technol.* 40 (13), p. 4066 - 4073.  
<http://dx.doi.org/10.1021/es051650b>
- Helsel, Dennis R., Mueller, David K. and James R. Slack (2006). Computer Program for the Kendall family of trend tests. *USGS Scientific Investigations Report 2005-5275*, 4p.  
<https://doi.org/10.3133/sir20055275>
- Helsel, Dennis R., (2005) Insider Censoring: distortion of data with nondetects. *Human and Ecological Risk Assessment* 11, 1127-1137.  
<http://dx.doi.org/10.1080/10807030500278586>
- Lee, Lopaka, and Helsel, Dennis, 2005, Statistical analysis of water-quality data containing multiple detection limits: S-language software for regression on order statistics, *Computers & Geosciences* 31, 1241-1248  
<http://dx.doi.org/10.1016/j.cageo.2005.03.012>

- Helsel, D.R., 2005. More Than Obvious: Better methods for interpreting nondetect data. *Environmental Science and Technol.* 39 (20), 419A–423A.  
<https://doi.org/10.1021/es053368a>
- Lee, L, and D. R. Helsel, 2005. Baseline models of trace elements in drinking water of the United States. *Applied Geochemistry* 20, 1560-1570.  
<http://dx.doi.org/10.1016/j.apgeochem.2005.03.008>
- Frans, L.M., and Helsel, D.R., 2005. Evaluating regional trends in ground-water nitrate concentrations of the Columbia Basin Ground Water Management Area, Washington: U.S. Geological Survey Scientific Investigations Report 2005-5078  
<https://doi.org/10.3133/sir20055078>
- Helsel, D.R., 2005. *Nondetects And Data Analysis: Statistics for censored environmental data*. John Wiley and Sons, New York. 250 p. Out of print.  
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0471671738.html>
- Helsel, D. R. and L. M. Griffith, 2003, *Assess and Interpret Data*: in the series “Seeking a common framework for water quality monitoring” edited by Robert C. Ward, *Water Resources Impact*, 5 (5), 25-29.  
[http://www.awra.org/impact/issues/0309imp\\_toc.pdf](http://www.awra.org/impact/issues/0309imp_toc.pdf)
- Ulrich, E.M., D. R. Helsel, and W. T. Foreman, 2003, Complications with using ratios for environmental data: comparing enantiomer ratios (Ers) and enantiomer fractions (Efs): *Chemosphere* v.53, 531-538.  
[http://dx.doi.org/10.1016/S0045-6535\(03\)00538-1](http://dx.doi.org/10.1016/S0045-6535(03)00538-1)
- Focazio, M.J., T. E. Reilly, M. G. Rupert, and D. R. Helsel, 2003; Assessing ground-water vulnerability to contamination: Providing scientifically defensible information for decision makers, *USGS Circular* 1224, 40 p.  
<https://doi.org/10.3133/cir1224>
- Helsel, D.R. and S.J. Ryker, 2002, Defining surfaces for skewed, highly variable data: *Environmetrics* 13, 445-452.  
<http://dx.doi.org/10.1002/env.531>
- Helsel, Dennis. R. and Robert M. Hirsch, 2002, *Statistical Methods in Water Resources, USGS Techniques of Water Resources Investigations, Book 4, Chapter A3*, 510 p. 1<sup>st</sup> edition.  
<https://doi.org/10.3133/twri04A3>
- Brumbaugh, W. G., Krabbenhoft, D. P., Helsel, D.R. Wiener, J. G., and Echols, K.R., 2001, A National Pilot Study of Mercury Contamination of Aquatic Ecosystems Along Multiple Gradients: Bioaccumulation in Fish, *USGS Biological Science Report BSR–2001-0009*, 25 p.  
<https://pubs.er.usgs.gov/publication/bsr20010009>
- Welch, A.H., Ryker, S.J., Helsel, D.R., and Hamilton, P.A., 2001, Arsenic in ground water of the

- United States-- An Overview: **Water Well Journal**, 55 (3), p. 30.
- Welch, A.H., and S.A. Watkins, D. R. Helsel, and M. J. Focazio, 2000, Arsenic in Ground Water Resources of the United States, *USGS Fact Sheet FS-063-00*, 4 p.  
<http://co.water.usgs.gov/trace/pubs/fs-063-00>
- Welch, A.H., D. B. Westjohn, D. R. Helsel and R. B. Wanty, 2000, Arsenic in Ground Water of the United States: Occurrence and Geochemistry, **Ground Water** v. 38 (4), 589-604.  
<http://dx.doi.org/10.1111/j.1745-6584.2000.tb00251.x>
- Focazio, M.J., A.H. Welch, S.A. Watkins, D.R. Helsel, and M.A. Horn, 2000, A retrospective analysis on the occurrence of arsenic in ground-water resources of the US and limitations in drinking-water-supply characterizations, *USGS Water-Resources Investigations Report 99-4279*, 34 p.  
<https://doi.org/10.3133/wri994279>
- Francy, D.S., D.N. Myers, and D.R. Helsel, 2000, Microbiological Monitoring for the U.S. Geological Survey National Water-Quality Assessment Program, *USGS Water-Resources Investigations Report 00-4018*, 34 p.  
<https://doi.org/10.3133/wri004018>
- Francy, D.S., D.R. Helsel, and R. A. Nally, 2000, Occurrence and Distribution of Microbiological Indicators in Groundwater and Stream Water, **Water Environment Research**, vol. 72 (2), 152-161.  
<http://dx.doi.org/10.2175/106143000X137220>
- Welch, A.H., D. R. Helsel, M. J. Focazio, and S.A. Watkins, 2000. Arsenic in Ground Water Supplies of the United States, *USGS Fact Sheet 063-00*, 4p.  
<https://doi.org/10.3133/fs06300>
- Welch, A.H., S.A. Watkins, D. R. Helsel, M. J. Focazio, 1999, Arsenic in Ground Water Supplies of the United States, in *Arsenic Exposure and Health Effects III*, W.R. Chappell et al., eds, Elsevier, New York, 9-17.  
<https://doi.org/10.1016/B978-008043648-7/50004-2>
- Helsel, D. R., 1998, The Value of Water Quality Information for National Environmental Policy, E. Graffy, ed., **Water Resources Update**, v. 113, Universities Council on Water Resources, 9-13.  
[http://www.ucowr.siu.edu/updates/pdf/V113\\_A2.pdf](http://www.ucowr.siu.edu/updates/pdf/V113_A2.pdf)
- Nolan, B.T., Ruddy, B.C., Hitt, K.J., and Helsel, D.R., 1998, A National Look at Nitrate Contamination of Groundwater, **Water Conditioning and Purification**, Jan. 1998, 76-79.  
<http://www.wcponline.com/request.cfm?pkArticleID=427>
- Nolan, B.T., Ruddy, B.C., Hitt, K.J., and Helsel, D.R., 1997, Risk of Nitrate in Groundwaters of the United States --A National Perspective, **Environ. Sci. Technol.** 31, 2229-2236.  
<http://dx.doi.org/10.1021/es960818d>

- Mueller, D.K., and Helsel, D.R., 1996, Nutrients in the Nation's water--Too much of a good thing?: *U.S. Geological Survey Circular 1136*, 24 p.  
<https://doi.org/10.3133/cir1136>
- Graffy, E.A., Helsel, D.R. and Mueller, D.K., 1996, Nutrients in the Nation's Waters: Identifying problems and progress. U.S. Geological Survey Fact Sheet 0218-96, 6 p.  
<https://doi.org/10.3133/fs21896>
- Helsel, D.R., Williamson, A.K., and Ryker, S.J., 1996; Pesticides in public supply wells of Washington State; in U.S. Geological Survey Yearbook 1995, p. 36.
- Helsel, D. R., 1995, Nitrate in the Nation's Waters: A Summary of Recent Studies, in The Farm Bill -- A Keystone of Environmental Policy, P. Leahy, ed., **Water Resources Update**, v. 101, Universities Council on Water Resources, 12-17.  
[http://www.ucowr.siu.edu/updates/pdf/V101\\_A2.pdf](http://www.ucowr.siu.edu/updates/pdf/V101_A2.pdf)
- Helsel, D. R., 1995, Design of a Relational Water-Quality Assessment Program, *Proceedings of the Biometrics Section, American Statistical Association*, 60-67, Am. Stat. Assoc., Alexandria, Virginia.
- Hamilton, P. A., and Helsel, D. R., 1995, Effects of Agriculture on Ground Water Quality in Five Regions of the United States, **Ground Water** v. 22, no. 2, 217-226.  
<http://dx.doi.org/10.1111/j.1745-6584.1995.tb00276.x>
- Mueller, D. K., Hamilton, P. A., Helsel, D. R. Hitt, K. J. and Ruddy, B. C. 1995, Nutrients in Ground Water and Surface Water of the United States -- An Analysis of Data Through 1992, *U.S. Geological Survey Water Resources Investigation Report 95-4031*, 74 p.  
<https://doi.org/10.3133/wri954031>
- Esterby, S., Helsel, D., Smith, E.P., and Whitfield, P., 1994, Statistical Issues in Water Quality Monitoring, *Proceedings of the 1993 American Statistical Association, Section on Environmental Statistics*, 86-90, Am. Stat. Assoc., Alexandria, Virginia.
- Schulze, P.A., Capel, P.A., Squillace, P.J., and Helsel, D.R., 1993, A Laboratory and Field Evaluation of a Portable Immunoassay Test for Triazine Herbicides in Environmental Water Samples,  
**Intl. Jour. Environmental Analytical Chemistry**, Vol. 53, 307-319.  
<http://dx.doi.org/10.1080/03067319308044435>
- Helsel, Dennis R., 1993, Statistical Analysis of Water-Quality Data, in Paulson, R. W. and others, National Water Summary 1990-91: Hydrologic Events and Stream Water Quality,  
*U. S. Geological Survey Water Supply Paper 2400*, 93-100.  
<http://pubs.er.usgs.gov/usgspubs/wsp/wsp2400>
- Hirsch, R. M., Helsel, D. R., Cohn, T. A. and Gilroy, E. J., 1993, Statistical Analysis of Hydrologic Data, Chapter 17 in the *Handbook of Hydrology*, David R. Maidment, Editor

in Chief, McGraw-Hill, Inc., New York.  
<https://www.mhprofessional.com/9780070397323-usa-handbook-of-hydrology-group?cat=113>

Helsel, Dennis R., and Hirsch, Robert M., 1992, *Statistical Methods in Water Resources*, Elsevier, 522 p. 1<sup>st</sup> edition. Out of print.

Helsel, D. R. and Andrews, E. D., 1991 Discussion of "Trends in Freshwater Inflow to San Francisco Bay From the Sacramento-San Joaquin Delta" by J. P. Fox and others, **Water Resources Bulletin** Vol. 27, No. 1, 129-131.  
<http://dx.doi.org/10.1111/j.1752-1688.1991.tb03121.x>

Helsel, Dennis R., 1990, Less Than Obvious: Statistical Treatment of Data Below the Detection Limit, **Environmental Science and Technology** 24(12), 1766-1774.  
<http://dx.doi.org/10.1021/es00082a001>

Helsel, D. R., 1990, Statistical Analysis of Data Below the Detection Limit: What have we learned?, in *Environmental Monitoring, Restoration, and Assessment*, ed. by R.H. Gray, the Twenty-Eighth Hanford Symposium on Health and the Environment, Battelle Pacific Northwest Laboratory, Richland, Washington, 231-240.

Kirby, W., Helsel, D., and Gilroy, E.J., 1990, Discussion of "Some Statistical Observations" by Geoff Kite, **Water Resources Bulletin**, v. 26 (4), 693-695.  
<http://dx.doi.org/10.1111/j.1752-1688.1990.tb01406.x>

Cain, Doug, Helsel, Dennis R., and Ragone, Stephen E., 1989, Preliminary Evaluations of Regional Ground-Water Quality in Relation to Land Use, **Ground Water** 27(2), 230-244.  
<http://dx.doi.org/10.1111/j.1745-6584.1989.tb00444.x>

Helsel, Dennis R., and Hirsch, Robert M., 1988, Discussion of "Applicability of the t-test for detecting trends in water quality variables" by Robert H. Montgomery and Jim C. Loftis, **Water Resources Bulletin**, Vol. 24, No. 1, February 1988.  
<http://dx.doi.org/10.1111/j.1752-1688.1988.tb00896.x>

Helsel, Dennis R., and Cohn, Timothy A., 1988, Estimation of Descriptive Statistics for Multiply Censored Water Quality Data, **Water Resources Research** 24(12), 1997-2004.  
<https://doi.org/10.1029/WR024i012p01997>

Helsel, Dennis R., 1987, Advantages of nonparametric procedures for analysis of water quality data, **Journal Hydrological Sciences**, 32(2), 179-190.  
<http://dx.doi.org/10.1080/02626668709491176>

Gilliom, Robert J., and Helsel, Dennis R., 1986, Estimation of distributional parameters for censored trace-level water-quality data. I. Estimation Techniques, **Water Resources Research**, v. 22, 135-146.  
<https://doi.org/10.1029/WR022i002p00135>

- Helsel, Dennis R., and Gilliom, Robert J., 1986, Estimation of distributional parameters for censored trace-level water-quality data. II: Verification and Applications, **Water Resources Research**, v. 22, 147-155.  
<https://doi.org/10.1029/WR022i002p00147>
- Helsel, Dennis R., 1986, Estimation of distributional parameters for censored water quality data, in *Statistical Aspects of Water Quality Monitoring*. Developments in Water Science, Vol. 27, A. H. El-Shaarawi and R. E. Kwiatkowski (Editors), Elsevier Science Publishers.  
[https://doi.org/10.1016/S0167-5648\(08\)70789-5](https://doi.org/10.1016/S0167-5648(08)70789-5)
- Kolton, Gregory, and Helsel, Dennis R., 1986, Influence of size-fractionating technique on concentrations of selected trace-metals in bottom materials from two streams in NE Ohio, *U.S. Geological Survey WRI Report 86-4114*.  
<https://doi.org/10.3133/wri864114>
- Helsel, D.R., and Koltun, G.F., 1986, Evaluation of size-distribution effects and laboratory precision in the analysis of bottom materials, in Selected Papers in the Hydrologic Sciences 1986, *U.S. Geological Survey Water-Supply Paper 2310*, p. 1-11.  
<https://doi.org/10.3133/wsp23101>
- Helsel, Dennis R., and Stephen E. Ragone, 1984, Evaluation of Regional Ground-Water Quality in Relation of Land Use: U.S. Geological Survey Toxic Waste -- Ground-Water Contamination Program. *U.S. Geological Survey WRI Report 84-4217*.  
<https://doi.org/10.3133/wri844217>
- Helsel, Dennis R., 1984, The Meaning of a Mean (pH): WRD Bulletin, Jan.-June, 1984, 26-29.
- Hren, J., Wilson, K. S., and Helsel, D. R., 1984, A statistical approach to evaluate the relation of coal mining, land reclamation and surface water quality in Ohio, *U.S. Geological Survey WRI 84-4117*.  
<https://doi.org/10.3133/wri844117>
- Helsel, Dennis R., 1984, Contributions of suspended sediment from highway construction and other land uses to the Olentangy River, Columbus, Ohio; *U.S. Geological WRI Report 84-4336*.  
<https://doi.org/10.3133/wri844336>
- Helsel, D. R., 1983, Mine drainage and rock type influences on eastern Ohio stream water quality, **Water Resources Bulletin**, v. 19, No. 6, 881-887.  
<http://dx.doi.org/10.1111/j.1752-1688.1983.tb05936.x>
- Helsel, D. R. 1982, Microcomputer computation of water quality discharges, *U. S. Geological Survey Open-File Report 82-901*, 48 p.  
<https://doi.org/10.3133/ofr82901>
- Helsel, D. R., and Pfaff, C. L., 1982, Surface water quality in Ohio's coal region, *Proceedings of the ASCE Conference on Water and Energy*, May 23-26, Pittsburgh, 133-138.



- Pfaff, C. L., Helsel, D. R., Johnson, D. P., and Angelo, C. G., 1981, Assessment of water quality in streams draining coal-producing areas in Ohio, *U.S. Geological Survey Open-File Report 81-409*, 98 p.  
<https://doi.org/10.3133/wri81409>
- Randall, C. W., and others, 1981, The significance of heavy metals in urban runoff entering the Occoquan reservoir, *Bulletin 132, Virginia Water Resources Research Center*, Blacksburg, Virginia, p. 252.
- Randall, C. W., Grizzard, T. J., Helsel, D. R., and Hoehn, R. C., 1981, The transport and trapping efficiencies of heavy metals in a reservoir-watershed system, *Proceedings International Conference on Heavy Metals in the Environment*, September 15-18, Amsterdam, 22-25.
- Griffin, D. M., Grizzard T. J., Randall, C. W., Helsel, D. R., and Hartigan, J. P., 1980, Analysis of non-point pollution export from small catchments, **Journal Water Pollution Control Federation**, v. 52, no. 4, 780-790.
- Helsel, et al., 1979, Land use influences on metals in storm drainage, **Journal Water Pollution Control Federation**, v. 51, no. 4, 709-711.
- Helsel, D. R., 1978, Land use influences on heavy metals in an urban reservoir system; Ph.D. dissertation, Environmental Sciences and Engineering Program, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.
- Randall, C. W., Helsel, D. R., and Grizzard, T. J., 1978, The impact of atmospheric contaminants on storm water quality in an urban area, **Progress in Water Technology**, v. 10, 417-31, Pergamon Press.
- Helsel, D. R., 1976, Lithologic control of streamwater chemistry in a portion of the Brandywine Creek, PA, Masters Thesis, Dept. of Geology, University of Delaware, Newark, DE.
- Nebel, P., and Helsel, D. R., 1975, Major ion concentrations in the Brandywine basin, an estimation of primeval conditions, *Technical Report No. 5, Tri-County Conservancy of the Brandywine*, Chadds Ford, PA., 17 p.