

WILLIAM A. HUBER, PH.D.
PRINCIPAL

EXPERTISE Statistical analysis
Mathematical modeling
Geographic modeling and analysis
Geographic information systems (GIS)
Environmental statistics and geostatistics
Decision analysis

EXPERIENCE **Environmental:** Assessment and interpretation of environmental data. Development of strategies to evaluate and improve the value of environmentally impaired sites. Development, application, and dissemination of improved methods to sample environmental media, assess the quality of data, interpret data, make optimal data-based decisions, present conclusions, and evaluate other interpretations. Negotiation and presentation. Peer review and strategy development for environmental investigations, remediation, and closure. Litigation support. RCRA groundwater monitoring statistics and water quality monitoring design.

General: Development and application of mathematical and statistical models to analyze and process spatial data, including transportation (network) analysis and real estate market analysis. Geographic Information Systems development and analysis. Statistical consulting, computer programming, and database management. Teaching. Theoretical and applied research in mathematics, statistics, and physics.

Dr. Huber has completed over 150 projects for Quantitative Decisions since 1997, including

Environmental liability assessment Evaluation of offsite liabilities at a former pigments manufacturing plant. Developed an offsite investigation work plan, evaluated all data, supported the defense of civil and criminal claims, and provided improved methodology to the health authorities for conducting a community survey and blood sampling program (Mexico, 2002).

Assessment of potential environmental costs for brownfields redevelopment at a former refinery. Identified regions most suitable for initial development and evaluated the extent of potential soils contamination (East Coast US, 2001).

Estimation of financial liabilities at chemical manufacturing facilities, for computing insurance cost recovery and supporting the development of investigation and remedial strategies (NJ, KY, MI).

Use of decision analysis to formulate a strategic plan to address Superfund liabilities (Puerto Rico, 1997).

*Environmental
Statistics*

Evaluate Monitored Natural Attenuation in Groundwater. Agrico Superfund Site (FL), 2009. Uses hydrological modeling and statistical theory to estimate cleanup times and confidence intervals for them. Suggests improvements to methods in US EPA guidance for MNA.

Develop alternate groundwater monitoring compliance limits (ACLs) for arsenic in groundwater at a petroleum refinery and pipeline facility, 2008.

Peer review of the US EPA Guidance on Statistical Methods for Groundwater Monitoring, 2005.

RCRA groundwater monitoring permit development for a large Midwest oil refinery, 2004: comprehensive data review, selection of monitoring wells, monitoring parameters, and statistical tests; negotiation with state and Federal regulatory agencies; creation of the written permit; and development of software to streamline permit compliance.

Peer review of the Hendry County Groundwater Flow Model for the South Florida Water Management District, 2001.

Developing and defending remedial goals and optimizing remedial designs for metals in soils at Superfund sites (NY, PA).

Evaluation of groundwater monitoring data and development of an ongoing monitoring plan at two landfills at a U.S. Army Ammunition Plant (MO, 1998).

Evaluation of soils data for investigations, waste characterization, management, and disposal (CA, CT, FL, GA, IL, IN, KY, MI, MO, NJ, NY, OH, PA, VA, WI, Canada, and The Netherlands)

Statistical plans to reduce soil and groundwater sampling costs for environmental investigations (CA, CT, DE, IL, FL, NJ, NY, PA).

Developing alternate groundwater monitoring compliance limits (ACLs) for a uranium mine regulated by the NRC (WY, 1995-7).

Consulting on RCRA groundwater monitoring issues. (AR, AZ, KS, KY, MO, NJ, OH, OK, PA, TX, VA).

- Risk Assessment** Expert reviewer for the USEPA of procedures developed to establish decision-making guidelines for residual disinfectant levels in drinking water and to set maximum contaminant levels (MCLs) for disinfectant byproducts (1999).
- Invited presenter at the Second Workshop on the Practical Issues in the Use of Probabilistic Risk Assessment sponsored by the USEPA and University of Florida (1999).
- Participation as an invited expert in the EPA's Workshop on Selecting Input Distributions for Probabilistic Risk Assessments (NY, 1998).
- Litigation Support and Negotiation** Evaluation of benzene exposure model (AZ, 2009).
- Statistical assessment of crop damage from alleged windborne contamination (ID, 2008).
- Expert witness, evaluation of principal components/factor analysis used to identify contamination sources in soils, water, sediments, and groundwater. (OK, 2008).
- Expert witness, modeling and measurement of lead solder contamination in an industrial building (CA, 2006).
- Statistical support to evaluate MTBE in public water supply wells (NY, 2006).
- Expert testimony, geostatistics. US Department of Justice (defendant). Evaluated a complex hydrological model formulated by plaintiffs to support a \$4 billion claim for natural resources damages. Discovered and testified to fundamental flaws in the estimates of a chlorinated groundwater plume extent. The client was subsequently dropped from the case (NM, 2002).
- Expert review and criticism of a complex probabilistic dose reconstruction model. Provided advice to defense counsel and helped prepare for deposing expert witnesses in hydrogeology, statistics, and risk assessment (CA, 2001-2).
- Independent review of local and regional groundwater data at an MTBE contaminated wellfield on behalf of a former gas station owner. Addressed regulatory concerns about data quality (high detection limits) and geological conditions (CA, 2000-2001).
- Development of a waste sampling and analysis program to help a landfill demonstrate attainment of Land Disposal Restriction (LDR) standards (OH, 1999-2001).
- Second opinion, peer review, and support in deposing expert witnesses for an insurance claim litigation concerning soils contamination by heavy metals at a former rail maintenance yard (PA, 2000).

Investigation strategy development, data visualization, and geostatistical analysis to help a chemical manufacturer limit liability for extensive groundwater contamination by chlorinated solvents (CA, 1997-2000).

Statistical support to defend a client against a claim of using an incorrect statistical test for RCRA groundwater monitoring at a large hazardous waste facility (OH, 1998).

Successful criticism of a probabilistic ground water model purporting to demonstrate historical landfill releases of chromium (PA, 1997).

Decision Analysis Development of a multiattribute valuation function to prioritize 8,000 sites according to suitability for cellular towers (NJ, 1999).
<http://www.quantdec.com/projects/wireless.htm>

Decision support for development of an open space preservation plan, Franklin Township, NJ, 1999. <http://www.quantdec.com/open.htm>

Modeling Statistical director, national broadband availability model. Federal Communications Commission, 2009.

Development of new techniques for interpolating and predicting demographic data. Patent applied for, 2006.

Development of new techniques to find optimal travel costs in spatially diffuse networks. Patent applied for, 2006.

Development of new methods and software to simulate, evaluate, and predict supply and demand within regional markets. In collaboration with [Fiscal Associates](#), Newark, DE, 2003-present. Patent applied for, 2006.

Development of new methods and implementation of software to optimize reallocation of agricultural lands. Alterra, Wageningen, The Netherlands, 2002-3.

Development of improved techniques and software for the computation and visualization of contaminant plumes from regional air sources (TNO-MEP, The Netherlands, 1999). <http://www.quantdec.com/projects/ammonia.htm>

The types of projects and activities previously completed include

Development of strategic management plans and financial and economic evaluations using decision theory. Applied successfully to state and federal Superfund sites, utilities management, site investigations, and remedy selection.

Review and strategic development of sampling, remediation, and closure plans for many sites across the United States in EPA Regions II, III, IV, V, VII, and IX.

Expert testimony on the interpretation of surface water and ground water data at hearings with Pennsylvania and New Jersey regulators; for manufacturing facilities.

Statistical and geostatistical (“kriging”) evaluation of contaminant patterns and quantities to support human health and ecological risk assessments; for Superfund sites, mines, manufacturing facilities, chemical treatment facilities, refineries, and landfills.

Critical evaluation and analysis of draft EPA guidance, for regulated facilities; for example, see “PCBs in Pipes” at <http://www.quantdec.com/Articles/pcbpipe/pcbpipe.pdf>.

**PREVIOUS
EXPERIENCE**

Senior Associate, Dames & Moore, Inc., Willow Grove, PA, 1992-1997: Project management, marketing, and firm-wide technical support for issues related to environmental statistics and information management. Provided written evaluations for approximately 200 projects world-wide and participated in about 200 proposal efforts. Served private sector clients and state government agencies.

Partner, Integrated Data Technologies, Inc. (IDT), Philadelphia, PA, 1986-1992: Developed and managed an environmental software, database, and statistical consulting business.

**ACADEMIC
BACKGROUND**

Haverford College, Haverford, Pennsylvania: Problem Solving Group leader, 2005-2010. <http://news.haverford.edu/blogs/mathproblemsolving/> .

Bryn Mawr College, Bryn Mawr, Pennsylvania: Lecturer in Geographic Information Systems, 2007.

Haverford College: Visiting Associate Professor in the [Department of Mathematics](#), 2005-2007. Courses include *Exploratory Data Analysis* and *Statistical Methods and Their Applications*.

Penn State University–Great Valley: Adjunct professor in the Engineering Department (1997-2004). Courses include [Special Topics in Environmental Statistics](#); [Geographic Information Systems](#). Supervised three Masters’ theses in environmental science and engineering.

St. Joseph's University, Philadelphia, Pennsylvania: Assistant Professor of Mathematics and Computer Science (1984-86).

Ph.D., 1985; M. Phil., 1980; M.A., 1979. Mathematics, Columbia University in the City of New York.

B.A., 1978. Philosophy and Mathematics double major, Haverford College, Pennsylvania, with high honors.

- College mathematics prizes 1975, 76, 77.
- Phi Beta Kappa 1977.
- Finalist, Danforth (teaching) and NSF (research) fellowships, 1978.

CITIZENSHIP United States

PROFESSIONAL AFFILIATIONS Editorial Board, *Risk Analysis*
Associate Editor, *Environmental and Ecological Statistics*
American Statistical Association
Mathematical Association of America
Society for Risk Analysis

SELECTED PROFESSIONAL ACTIVITIES Peer reviewer, *Human & Ecological Risk Assessment* (1998); *Environmental Science & Technology* (1997-2002), *Risk Assessment* (1996-99), *Risk Analysis* (2003-2010), *Journal of Hydraulic Engineering* (1994-6; 2005); *Environmental and Ecological Statistics* (1994-2000); *Geotechnical Testing Journal* (1995).

Instructor, *Spatial Statistics Workshop*, 2010. NITLE (<http://www.nitle.org/>). Developed and led a five-session Web-based course for college professors and consultants.

Best reviewer award. Society for Risk Analysis, 2009.

Peer review of the 2009 Unified Guidance, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities*, for the US EPA.

Author of over 40 publicly available [software programs](#) to perform statistical and geometric analysis and visualization of data.

ESRI (GIS) Support Center User Forums annual “MVP” Award, 2003, and all semi-annual awards, 2002-2010. <http://support.esri.com> .

Co-instructor, *Geographic Information Analysis: Spatial Statistics Workshop*. Wheaton College, Norton, MA, June 4 – 8, 2007. <http://www.nitle.org/index.php/nitle/content/view/full/1149> .

Invited speaker on *Designing Environmental Investigations with GIS* at the 2nd Annual GIS and Public Health Day: *Methods and Strategies for Enhancing Environmental Health Surveillance*. Center for Public Health Preparedness, School of Public Health, SUNY Albany, NY, May 9 – 10, 2006. http://www.ualbanycph.org/Events/GISDay_05_09_06/default.cfm .

Editor, *Directions Magazine* (<http://www.directionsmag.com/>), 2001. *Directions* is a Web magazine, focusing on geographic information systems, with about 75,000 viewers monthly.

Contributing Editor, *Directions Magazine*, 1999-2000 and 2002-2003.

Founder and owner of a 1000-member Internet [discussion group](#) focusing on technical issues in Geographic Information Systems (GIS), 1999.

Invited speaker on statistics at the [National Groundwater Association's](#) Second Theis Conference, Amelia Island, Florida, November 1999.

Invited panel member, *Workshop on Selecting Input Distributions for Probabilistic Risk Assessment*, U.S. EPA, New York City, April 21-22, 1998.

Keynote speaker, *The Nature Conservancy Mid-Atlantic Region GIS Conference*, Conshohocken, PA, March 1998.

Invited speaker, *GIS for Brownfields Redevelopment*, Arizona Department of Environmental Quality, November 1996.

Organizer and speaker, *Brownfields and Beyond*, March 1996, New York City.

Invited speaker, *Statistics in Environmental Applications*, American Statistical Association conference held at the University of Delaware, April 1995.

Developer of the Government Institutes' two-day course on *Environmental Sampling*, Washington, D.C., October 1994, and Orlando, FL, January 1995.

SELECTED PUBLICATIONS

Huber, William A, 2010. *Ignorance is Not Probability*. Risk Analysis **30** (to appear). doi: 10.1111/j.1539-6924.2010.01361.x

Huber, William A., 2010. Comment on *Why Risk is Not Variance: An Expository Note*. Risk Analysis **30** (to appear).

Guagliardo, Mark F., William A. Huber, Deborah M. Quint, and Stephen J. Teach, 2007. *Does Spatial Accessibility of Pharmacy Services Predict Compliance with Long Term Control Medications?* Journal of Asthma, 44:10, 881-883. doi: 10.1080/02770900701752680

Cox, LA and WA Huber, 2007. *Symmetry, Identifiability, and Prediction Uncertainties in Multistage Clonal Expansion (MSCE) Models of Carcinogenesis*. Risk Analysis 2007 Dec(6): 1441-53. doi: 10.1111/j.1539-6924.2007.00980.x

Sinton, Diana and William A. Huber, 2007. *Mapping Polka and Its Ethnic Heritage in the United States*. Journal of Geography **106** 41-47. doi: 10.1080/00221340701487913

Jamall, IS, T Lu, and WA Huber, 2005. [Distinguishing Between Multiple Chlorinated Solvent Plumes: A Comprehensive Approach](#). The Annual International Conference on Soils, Sediments, and Water, Amherst, MA.

Cox, LA, D Babayev, and WA Huber, 2005. *Limitations of Qualitative Risk Assessment*. Risk Analysis **25** (3), 651-662. doi: 10.1111/j.1539-6924.2005.00615.x

Huber, William A., 2002. *GIS & Steganography—Part 3: Vector Steganography*. Published on the Web in Directions Magazine at http://www.directionsmag.com/article.php?article_id=195&trv=1 , April 18, 2002.

Huber, William A., 2001. *Estimating Markov Transitions*. Journal of Environmental Management, v **61**, no. 4, pp 381-385.

Huber, William A., 2000. *Variability and Uncertainty*. Chapter 12.2 of [*The Standard Handbook of Environmental Science, Health, and Technology*](#), J. Lehr, Ed. McGraw-Hill.

Huber, William A. and W. A. S. Nijenuis, 2000. *Predictive Modeling of Ammonia Deposition from Large Numbers of Agricultural Sources* . 4th International Conference on Integrating GIS and Environmental Modeling ([GIS/EM4](#)): Problems, Prospects and Research Needs. Banff, Alberta, Canada, September 3 - 8, 2000.

Huber, William A., 1999. *Convolution*. Published in three parts on the Web in Directions Magazine at <http://www.directionsmag.com/features.asp>, October 1999.

Harkness, Bracco, Franz, Tsentas, Becker, Huber, Orient, Rich, & Figura, 1998. *Natural Attenuation of Chlorinated Aliphatics at the Naval Air Engineering Station, Lakehurst, NJ*. In *Natural Attenuation/Chlorinated and Recalcitrant Compounds*, Wickramanayake & Hinchee, Eds.

Huber, William A, 1996. Discussion: *Detection of Low-level Environmental Pollutants*. [Environmental and Ecological Statistics](#).

Huber, William A., and Douglas W. Watt, 1994. *Probabilistic Data Analysis and Soil Vacuum Extraction Used for Identifying the Location of DNAPLs*. Technical Papers of the Twelfth Annual Environmental Management and Technology Conference International, Philadelphia, PA, June 1994. Pages 492-513.

Huber, William A., 1993. Discussion: *Resampling from Stochastic Simulations for Assessing Uncertainty in Global Estimation*. [Journal of Environmental Statistics](#), v. 1, no. 2.

Huber, William A., 1993. *Graphical Techniques for Enhancing the Utility of Multivariate Environmental Statistics*. Multivariate Environmental Statistics, G.P. Patil et al., eds., North Holland/Elsevier, 1993. Pages 203-213.

Huber, William A., 1992. *Selecting a Statistical Methodology for RCRA Facilities*. Short Course, HMCRI Superfund '92, Washington, D.C.

Huber, William A., 1992. *N-factorial computations, timing, etc.* ACM SIGSMALL/PC Notes, March 1992. v 18 #1-2.
<http://doi.acm.org/10.1145/134307.134322> .

Huber, William A., and Richard N. Sands, 1989. *Regulating the Pollution of Groundwater: Lessons from a Pollution Discharge Elimination Program.* HazMat World.

Huber, William A., 1989. *Well Placement and Well Elimination.* NWWA conference on solving water problems with models, Indianapolis, Indiana. pages 187-207.

Huber, WA and C Bottcher, 1980. *Dielectronic Recombination in a Magnetic Field.* J. Phys. B: At. Mol. Phys. **13** L399-L404.