

***STEPHEN E. SILLIMAN, Ph.D.***

Professor

Senior University Fellow for International Development  
Gonzaga University, Spokane, Washington

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***Contact Information***

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***Professional Vision***

Dedicated to working with university leadership, faculty, staff and students to build exceptional educational and research programs in the engineering and computer-science disciplines. This vision is based on creating exceptional opportunities, including integration of multiple stakeholders in nationally and internationally respected education and research efforts.

***Professional Summary Supporting This Vision***

- Senior Fellow for International Development, Gonzaga University, 2019
- Jefferson Science Fellowship – 2018-19
- Dean, School of Engineering and Applied Science, Gonzaga, including lead on integrating humanities-based core into curricula and redeveloping the freshman-year experience -- (2012 – 2018)
- Darcy Lecturer, National Ground Water Research and Educational Foundation, NGWA, 2011 (presented lectures at ~60 locations, world-wide during 2011)
- Creator and Director of the interdisciplinary and intercollegiate Haiti and Benin development and research programs (Notre Dame and Gonzaga) -- 1994–present
- Teaching / research career, including more than \$4m as PI or co-PI in research and education funding (Notre Dame and Gonzaga) -- 1986 – present

***Technical / Educational Accomplishments and Recognitions***

- More than 80 peer-reviewed manuscripts on technical and educational topics
- Multiple ASEE awards
- Numerous internal teaching and service awards, Notre Dame
- Member Tau Beta Pi
- Fulbright Grant for Research, Israel, 1997-98

### ***Education History***

- 1986 Ph.D. Hydrology, University of Arizona
- 1981 M.S. Hydrology, University of Arizona
- 1979 B.S.E. Civil Engineering, Princeton University
- 2013 Harvard Graduate School of Education; Management Development Program

### ***Funding and Program Development Experience***

- Contributor to development of study abroad program in Perth, Australia (Notre Dame), and co-lead on development of program with the University of Auckland (Gonzaga)
- Established and direct Benin interdisciplinary (and multi-institutional) research / service program (1997 – present) as well as Haiti service learning program (1994 – 2004)
- Principal investigator and director, REU site in civil engineering and geological sciences, 1997-2001 and REU site on water resources in developing countries, 2002-2005
- Principal Investigator, GAANNP research fellowships in civil engineering and geological sciences, \$350,000, 1994-1997
- Collaborator, Environmental Molecular Science Institute, University of Notre Dame, National Science Foundation, \$5+ Million, 2002-2007.

### ***Experience and Leadership in Interdisciplinary and Cross-Institutional Collaborations***

- As Jefferson Fellow working in the Center for Development Research at the US Agency for International Development, contributed to multiple international projects, including Purdue's LASER program and the Innovation Scholars Program with Michigan State University.
- As Dean at Gonzaga University, managed significant increase in student numbers over five years, developed substantial increase in tenure stream faculty, substantially improved existing facilities, collaborated on vision and architectural design for Integrated Science and Engineering building, and developed Executive Council of external professional and academic colleagues. Worked with University-wide committee to integrate interdisciplinary, humanities-based core requirements into engineering degree programs.
- As Associate Dean at Notre Dame, took leadership role in educational facilities within the design of the Stinson-Remick Engineering Building (then being designed).
- Benin and Haiti water resource programs: Developed interaction with faculty and students from multiple disciplines including engineering, geoscience, history, anthropology, and nursing. Developed collaborations with the Universite d'Abomey-Calavi (Benin – 20 years), Boise State University, the University of Nevada, Reno, and the WASCAL research program ([www.wascal.org](http://www.wascal.org)).
- Water Resources REU program at Notre Dame: PI and led collaboration with the University of Nevada, Reno, and the University of New Mexico.

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*Stephen E. Silliman, Chronological CV Details*

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**Professional Experience:**

- 2019: Professor, Senior University Fellow for International Development, Gonzaga University
- 2018/2019: Jefferson Science Fellow through the National Academies, working at the Center for Development Research, Global Development Lab, USAID (Washington, DC)
- 2012/2018: Dean, School of Engineering and Applied Science, Gonzaga University
- 2000/2012: Professor of Civil Engineering and Geological Sciences, University of Notre Dame  
*2009 – 2012: Associate Chair, Department of Civil Engineering and Geological Sciences*  
*2002- 2008: Associate Dean for Undergraduate Programs, College of Engineering*  
*2008 - 2013: Special Appointment to Graduate Faculty, Department of Engineering Education, Purdue University*  
*2008: Fellow of the Institute, Kellogg Institute for International Studies*
- 1990/2000: Associate Professor of Civil Engineering and Geological Sciences, University of Notre Dame
- 1986/1990: Assistant Professor of Civil Engineering, University of Notre Dame
- 1984/1986: Research Associate, Department of Hydrology and Water Resources, University of Arizona
- 1982/1984: Research Assistant, Department of Hydrology and Water Resources, University of Arizona
- 1981/1982: Hydrologist, U.S. Geological Survey, Reston, VA

**Professional Associations:**

American Society of Engineering Education

American Geophysical Union:

Member, Groundwater Committee 1992-2002, chair 2000-2002

Associate Editor, Water Resources Research, 1992-94, 1998-2002

Associate Editor for journals Hydrogeology (2000 – 2003), Ground Water (1996 – 2002), and Journal of Hydrology (1997-2000)

Geological Society of America

National Ground Water Association:

Tau Beta Pi

## **Honors and Awards:**

### External

Jefferson Science Fellowship, National Academies of Science, 2018

Darcy Lecturer, National Ground Water Research and Educational Foundation, NGWA, 2011  
(presented lectures at ~60 locations, world-wide during 2011)

Nominated, University of Oklahoma, World Water Prize, 2009

ASEE, Global Engineering and Engineering Technology Educator Award, Int'l Division, 2006

ASEE, Outstanding Teaching Award, Illinois-Indiana Section, 2006

Fulbright Grant for Research in Israel, 1997-98

### University of Notre Dame

Faculty Fellow, Kellogg Institute for International Studies, 2008-2012

Faculty Fellow, Kaneb Center for Teaching and Learning, 2009-2012

Rodney F. Ganey, Ph.D., Faculty Community-Based Research Award, 2007

College of Engineering, Outstanding Teacher of the Year, 2003, 1992

Kaneb Teacher of the Year Award in Civil Engineering and Geological Sciences, 2004

Rev. Toohey Award for Social Justice, 2004

Grenville Clark Award (peace and human rights), 2002

### **Peer-Reviewed Publications:**

#### ***Manuscripts on Technical Research***

- Lindsay, K., J. Bradford, S. Silliman, N. Yalo, and M. Boukari, 2015, “Seismic imaging to help understand and manage water quality in coastal Benin, West Africa”, *Geophysics*, 80(3), 35-41.
- Pratt, T.G., Z. Lin, S. Di Sabatino, L. Leo, N. Dodson, B. Strycker, S. Silliman, J. Fernando, 2015, “Field-scale remote sensing of soil moisture based on polarimetric characterization of microwave reflections”, *Measurement Science and Technology*, 26(10).
- Rodak, C., S.E. Silliman, D. Bolster, 2014, “Time-Dependent Health Risk from Contaminated Groundwater Including Use of Reliability, Resilience, and Vulnerability as Measures, *Journal of the American Water Resources Association*, 50(1), 14-28.
- McInnis, E., S. Silliman, M. Boukari, N. Yalo, S. Orou-Pete, C. Fertenbaugh, K. Sarre, and H. Fayomi, 2013, “Combined application of electrical resistivity and shallow groundwater sampling to assess salinity in a shallow coastal aquifer in Benin, West Africa”, *Journal of Hydrology*, 505, 335-345.
- Lindsay, K., J. Bradford, S. Silliman, N. Yalo, and M. Boukari, 2013, “Seismic imaging to help understand and manage water quality in coastal Benin, West Africa”, SEG national meeting, Houston, Texas, <http://dx.doi.org/10.1190/segam2013-1406.1>, 1249 – 1253.
- Rodak, C. and S. Silliman, 2011, “Probabilistic risk analysis and fault trees: Initial discussion of application to identification of risk at a wellhead”, *Advances in Water Resources*, <http://dx.doi.org/10.1016/j.advwatres.2011.02.005>.
- Silliman, S.E., E. Fisker, and J. Pescatore, 2011, “Potential for establishing non-vertical flow within the vadose zone”, *Vadose Zone Journal*, 10, 425 - 436.
- Silliman, S.E., M. Boukari, L. Lougbegnon, and F. Azonsi, 2011, “Overview of a Multifaceted Research Program in Benin, West Africa: An International Year of Planet Earth Groundwater Project”, Chapter 11, *Sustaining Groundwater Resources: A Critical Element in the Global Water Crisis (International Year of Planet Earth)*, Springer Publishing, ISBN13: 9789048134250, 175-186.
- Silliman, S.E., B.I. Borum, M. Boukari, N. Yalo, S. Orou-Pete, D. McInnis, C. Fertenbaugh and A. Mullen, 2010, “Issues of sustainability of coastal groundwater resources: Benin, West Africa”, *Sustainability*, 2(8), 2652-2675, doi: 10.3390/su2082652.
- Crane, P.E., S.E. Silliman, and M. Boukari, 2009, “Community-based groundwater quality monitoring: An initial discussion”, *Sustainable Groundwater Resources in Africa: Water supply and sanitation environment*, CRC Press, Xu and Braune (editors), Chapter 17, 282 pp.
- Crane, P.E., and S.E. Silliman, “Alternatives in Sampling Strategies and Methods for Estimation of Parameters of Groundwater Quality in Rural Regions of Developing Countries”, *Ground Water*, 47(5), 699-708, 2009.

- Silliman, S.E., P.E. Crane, M. Boukari, F. Azonsi, and F. Glidja, "Spatial and temporal groundwater quality monitoring in rural Benin, West Africa: An example of collaboration with local populations", Proceedings of the 2008 International Conference on Groundwater & Climate in Africa, Kampala, Uganda, IAHS publication 334-08, 2009.
- Silliman, S.E., M. Boukari, P. Crane, F. Azonsi, and C.R. Neal, "Observations on Element Concentrations of Groundwater in Central Benin", Journal of Hydrology, 335(3-4), 374-388, 2007 ([dx.doi.org/10.1016/j.jhydrol.2006.12.005](https://doi.org/10.1016/j.jhydrol.2006.12.005)).
- Petruzzi, N.M. and S.E. Silliman, "A sampling device for collection of ground water bacteria under natural gradient flow", Ground Water Monitoring and Remediation, 26(1), 85-91, Winter, 2006.
- Dunn, A.M., S.E. Silliman, S. Dhamwichukorn, and C.F. Kulpa, "Demonstration of Microbial Transport into the Capillary Fringe via Advection from Below the Water Table", Journal of Hydrology, 306(1-4), 50-58, 2005.
- Silliman, S.E., M. Boukari, and P. Crane, "A Collaborative Project in West Africa: Student Research Experience in Development", Proceedings of the Frontiers in Education National Conference, Session S1D, Paper 1627, 2005.
- Nicholl, S.; Talley, J. W., and Silliman, S., "Model verification of TPD-MS for estimation of release energy values for PAHs on mineral sorbents." J. of Env. Chem.& Tox. Vol. 23, No. 11, 203-208, 2004.
- Berkowitz, B., S.E. Silliman and A.M. Dunn, "Impact of the capillary fringe on local flow, chemical migration, and microbiology", Vadose Zone Journal, 3, 534-548, 2004.
- Dunn, A., and S.E. Silliman, "Air and Water Entrapment in the Vicinity of the Water Table: A laboratory study on heterogeneous sands", Ground Water, 41(6), 729-734, 2003.
- Silliman, S.E., B. Berkowitz, J. Simunek, and M. th. van Genuchten, "Fluid Flow and Chemical Migration Within the Capillary Fringe", Ground Water, 40(1), 76-84, 2002.
- Silliman, S.E., R. Dunlap, M. Fletcher and M.A. Schneegurt, "Bacterial transport in heterogeneous porous media: Observations from laboratory experiments", Water Resources Research, 37(11), 2699-2708, 2001.
- Silliman, S.E., "Laboratory study of chemical transport to wells within heterogeneous porous media", Water Resources Research, 37(7), 1883-1892, 2001.
- Silliman, S.E., and L. Zheng, "Comparison of observations from a laboratory model with stochastic theory: Initial analysis of hydraulic and tracer experiments", Transport in Porous Media, 42(1/2), 85-107, 2001.
- Cole, B.E., and S.E. Silliman, "Utility of simple models for capture zone delineation in heterogeneous unconfined aquifers", Ground Water, 38(5), 665-672, 2000.
- Silliman, S.E., and B. Berkowitz, "Sampling for the variogram within fractured media containing multiple fracture sets", Mathematical Geology, 32(5), 543-560, 2000.
- Zheng, L., and S.E. Silliman, "Estimating the variance and integral scale of the transmissivity field using head residual increments", Water Resources Research, 36(5), 1353-1358, 2000.

- Silliman, S.E. and G. Mantz, "The Effect of Measurement Error on Estimating the Hydraulic Gradient in Three-Dimensions", *Ground Water*, 38(1), 114-120, 2000.
- Berkowitz, B., H. Scher, and S. Silliman, "Anomalous transport in laboratory-scale, heterogeneous porous media", *Water Resources Research*, 36(1), 149-158, 2000. {Correction appeared 36(5), 1371, 2000.}
- Zheng, L. and S. Silliman, "Estimating the theoretical semivariogram from finite numbers of measurements", *Water Resources Research*, 36(1), 361-367, 2000.
- Silliman, S.E. and G. Mantz, "Incorporating data related uncertainty in the definition of wellhead capture zones", in *Interdisciplinary Perspectives on Drinking Water Risk Assessment and Management*, IAHS Publication No. 260, 53-56, 2000.
- Silliman, S.E., J. Fein, and P. Johnson, "Hydrogeology", in "Research: From the Core to the Crust", *Geotimes*, 44(7), 38-39, 1999.
- Silliman, S.E., L. Zheng, and P. Conwell, "The use of laboratory experiments for the study of conservative solute transport in heterogeneous porous media", *Hydrogeology Journal*, 6, 166-177, 1998.
- Silliman, S.E., and S. Caswell, "Observations of measured hydraulic conductivity in two artificial, confined aquifers with boundaries", *Water Resources Research*, 34(9), 2203-2213, 1998.
- Silliman, S.E., and C. Frost, "Monitoring of the hydraulic gradient using a three-point estimator", *Journal of Environmental Engineering*, 124(6), 517-523, 1998.
- Conwell, P.M., S.E. Silliman, and L. Zheng, "Design of a piezometer network for estimation of the variogram of the hydraulic gradient: The role of the instrument", *Water Resources Research*, 33(11), 2489-2494, 1997.
- Cole, B., and S. Silliman, "Capture zones for passive wells in heterogeneous unconfined aquifers", *Ground Water*, 35(1), 1997.
- Cole, B. and S. Silliman, "Estimating the horizontal gradient in heterogeneous, unconfined aquifers: Comparison of three-point schemes", *Ground Water Monitoring and Remediation*, Spring, 84-91, 1996.
- Silliman, S.E., "The importance of the third dimension on transport through saturated porous media: Case study based on transport of particles", *Jour. of Hyd.*, 179, 181-196, 1996.
- Silliman, S.E., "Sample support in a single fracture: Considering the definition and control of the support of a water sample", *Geophys. Res. Letters*, 22(11), 1145-1147, 1995.
- Silliman, S.E., J. Ramirez, and R.L. McCabe, "Quantifying downflow through creek sediments using temperature time series: One dimensional solution incorporating measured surface temperature", *Jour. of Hyd.*, 167, 99-119, 1995.
- Silliman, S.E., "Particle transport through two-dimensional, saturated porous media: influence of physical structure of the medium", *Jour. of Hyd.*, 167, 79-98, 1995.

- Silliman, S.E., C.C. Cady, and K. Snyder, "Application of a UV-Curing resin to hydrodynamic studies in porous media", *Ind. Eng. Chem. Res.*, American Chemical Society, 33(8), 1997-2001, 1994.
- Dronfield, D., and S.E. Silliman, "Velocity dependence of dispersion for transport through a single fracture of variable roughness", *Water Resources Research*, 29(10), 3477-3484, 1993.
- Cady, C.C., S.E. Silliman, and E. Shaffern, "Variation in aperture estimate ratios from hydraulic and tracer tests in a single fracture", *Water Resources Research*, 29(9), 2975-2982, 1993.
- Silliman, S.E., and D.F. Booth, "Analysis of time-series measurements of sediment temperature for identification of gaining vs. losing portions of Juday Creek, Indiana", *Journal of Hydrology*, 146, 131-148, 1993.
- Robinson, R. S. Silliman, and C. Cady, "Identifying fracture interconnections between boreholes using natural temperature profiling: II. Application to a fractured dolomite", *The Log Analyst*, 34(1), 69-77, 1993.
- Preston, S.D., V.J. Bierman, Jr., and S.E. Silliman, "Impact of flow variability on error in the estimation of tributary mass loads", *ASCE Journal of Environmental Engineering*, 118(3), 402-419, 1992.
- Silliman, S.E. and A.L. Wright, "Generation of random fields characterized by discrete regions of constant value", *Applied Mathematics and Computation*, 45, 293-311, 1991.
- Silliman, S.E., "The influence of grid geometry on structure present within discrete random fields", *Journal of Hydrology*, Vol. 113, 171-191, 1990.
- Silliman, S.E. and C.E. Neuzil, "Borehole determination of formation thermal conductivity using a thermal pulse from injected fluid", *Journal of Geophysical Research*, 95 (86), 8697-8704, 1990.
- Silliman, S. and D. Higgins, "An analytical solution for steady state flow between aquifers through an open well", *Ground Water*, 28(2), 184-191, 1990.
- Silliman, S.E., "An interpretation of the difference between aperture estimates derived from hydraulic and tracer tests in a single fracture", *Water Resources Research*, 25(10), 2275-2283, 1989.
- Silliman, S.E. and R. Robinson, "Identifying fracture interconnections between boreholes using natural temperature profiling: I. Conceptual basis", *Groundwater*, 27(3), 393-402, 1989.
- Preston, S.D., V.J. Bierman, Jr. and S.E. Silliman, "An evaluation of methods for the estimation of tributary mass loads", *Water Resources Research*, 25(6), 1379-1389, 1989.
- Silliman, S.E. and A.L. Wright, "Stochastic analysis of high-permeability paths in the subsurface", *Water Resources Research*, 24(11), 1901-1910, 1988.
- Silliman, S.E. and R. Deuell, "Observations regarding comparison of hydraulic and chemical tracer tests", *Proceedings of the 4th Canadian/American Conference on Hydrogeology*, Hitchon and Bachu (ed.), National Water Well Association, 1988.
- Silliman, S.E., L. Konikow and C. Voss, "Laboratory investigation of longitudinal dispersion in anisotropic porous media", *Water Resources Research*, 23(11), 2145-2151, 1987.



- Silliman, S.E. and E.S. Simpson, "Laboratory evidence of the scale effect on solute transport", *Water Resources Res.*, 23(8), 1667-1673, 1987.
- Hsieh, P.A., J.V. Tracy, C.E. Neuzil, J.D. Bredehoeft and S.E. Silliman, "A transient laboratory method for determining the hydraulic properties of 'tight' rocks -- I. Theory", *Int. Journal of Rock Mech. and Min. Sci. and Geomech.*, 18(3), 245-252, 1981.
- Neuzil, C.E., C. Cooley, S.E. Silliman, J.D. Bredehoeft and P.A. Hsieh, "A transient laboratory method for determining the hydraulic properties of 'tight' rocks -- II. Applications", *Int. Journal of Rock Mech. and Min. Sci. and Geomech.*, 18(3), 253-258, 1981.

### *Manuscripts on Education*

- Silliman, S., T. Boggan, V.A. Labay, G.D. Ricco, and S Girtz, 2015, "Characteristics of students self-selecting into a freshman living-learning community for engineers and computer scientists", *Proceedings, ASEE Annual Conference and Exposition*.
- Meyers, K.L., M.W. Ohland, A.L. Pawley, S.E. Silliman and K.A. Smith, 2012, "Factors relating to engineering identity", *Global Journal of Engineering Education*, 14(1), 119 - 131
- Meyers, K. et al., 2012, "How Self-Identification and Views of Engineering Change with Time A Study of Students and Professionals from a Single Institution", *Int. Jour. of Engineering Education*, 28(1), 103-112.
- Silliman, S.E., R.H. Mohtar, K.G. Paterson, and W.P. Ball, 2010, "Engineering academic program for hydrophilanthropy: Commonalities and challenges", *Journal of Contemporary Water Research and Education*, University Council on Water Resources, 145, 5-29.
- Meyers, K.L., S.E. Silliman, N.L. Gedde, and M.W. Ohland, 2010, "A comparison of engineering students' reflections on first year experience", *Journal of Engineering Education*, 99(2), 169-178.
- Silliman, S.E., 2009, "Assessing experiences of international students in Haiti and Benin", *IEEE Technology and Society Magazine*, 28(4), 16+.
- Silliman, S.E., C. Hamlin, P. Crane, and M. Boukari, "International Collaborations and Incorporating the Social Sciences in Research in Hydrology and Hydrologic Engineering", *Journal of Hydrologic Engineering*, 13(1), 13-19, 2008.
- Silliman, S.E. and K. Meyers, "Discussion of impact of different educational experiences in Haiti and Benin on undergraduate engineering students", *Proceedings of the 2008 ASEE Global Colloquium on Engineering Education*.
- Silliman, S.E., "Observations from a project to encourage multiple-year, international collaboration on research for undergraduates", *Proceedings of the 2007 Annual ASEE Conference*, Paper AC 2007-257, 2007.
- Silliman, S.E., K. Abbott, G.C. Clark, and L. McWilliams, , "Use of a Tablet PC and Wireless Connectivity for Effective Lectures in a Large Lecture Hall", *Proceedings of the 2005 Annual Conference*, American Society of Engineering Education, 2005.

- Pieronek, C., L.H. McWilliams, S.E. Silliman, J.J. Uhan, M. Gunty, C. Graf, "Monolith or Mosaic: Using Demographics and Detailed Surveys to Understand the Many and Varied Dimensions of First-Year Female Engineering Students", Proceedings of the 2005 Annual Conference, American Society of Engineering Education, 2005.
- McWilliams, L.H., C. Pieronek, S.E. Silliman, C. Graf, M. Gunty, "Survey Results for Students in a First-Year Engineering Course", Proceedings of the 2005 Annual Conference, American Society of Engineering Education, 2005.
- Uhan, J.J., Jr., S.M. Batill, and S.E. Silliman, "A curriculum renovation revisited", Proceedings of the 2005 Annual Conference, American Society of Engineering Education, 2005.
- Tyler, S., S. Silliman and M. Campana, "Undergraduate program focuses on international water issues in water resources", EOS, Transactions, American Geophysical Union, 85(9), 89,92, 2004.
- Silliman, S. and L. McWilliams, "Observations on Benefits/Limitations of an Audience Response System", Proceedings of the 2004 Annual Conference, American Society of Engineering Education, 2004.
- McWilliams, L., S. Silliman and C.L. Pieronek, "Modifications to a Freshman Engineering Course Based on Student Feedback", Proceedings of the 2004 Annual Conference, American Society of Engineering Education, 2004.
- Pieronek, C., L. McWilliams, and S. Silliman, "A Demographic Characterization of First-Year Engineering Students", Proceedings of the 2004 Annual Conference, American Society of Engineering Education, 2004.
- Silliman, S.E., "Comparison of education models for increasing student exposure to engineering in developing countries", Conference proceedings, the American Society of Engineering Education, 2003.
- Pieronek, C., L. McWilliams, and S. Silliman, "Initial Observations on Student Retention and Course Satisfaction Based on First-Year Engineering Student Surveys and Interviews", American Society of Engineering Education, Proceedings 2003 Annual Conference, 2003.
- Silliman, S.E., M. Boukari, and P. Crane, "International Student Collaboration Through Projects Using Common Software and Field Experiences: Foundation to Project Development", Proceedings, Frontiers in Education National Conference, Session S3C, paper 1524, 2006.
- Silliman, S.E., and L. Ketchum, Jr., "Student involvement in water development / treatment in rural settings", in Interdisciplinary Perspectives on Drinking Water Risk Assessment and Management, IAHS Publication No. 260, 171-173, 2000.

**---Significant Number of Invited and Submitted Presentations---**

### **Research / Educational Project Funding:**

- Co-Principal Investigator (with Diogo Bolster as lead), “Mixing and Reactions in Highly Heterogeneous Media - Can Nonlocal Models handle them?”, NSF, 2011-2014.
- Principal Investigator, “Benin Program: Proposed Field Efforts to Characterize and Manage Salt-Water Intrusion into the Godomey Well Field, Cotonou, Benin”, Private foundation funding, \$201,656, 2011-2014.
- Principal Investigator, “Foundational, Collaborative Research At the Intersection of Engineering and Economics Focused on Assessment of Evolving Risk Associated with Water Resource Development in Rural Africa”, FRSP Program, Notre Dame, \$98,127, 2011.
- Principal Investigator, “International Research on Student and Professional Reaction to Development Initiatives Related to Groundwater Resources: Taking Advantage of a Unique Opportunity”, Kellogg Institute, Notre Dame, \$9,500, 2011.
- Principal Investigator, “Funds for drilling wells in Mono Region, Benin, West Africa”, Private foundation funding, \$24,000, 2009 – 2011.
- Principal Investigator, “Groundwater protection and management in Benin, West Africa”, Private foundation funding, \$245,000, 2008-2011.
- Principal Investigator, Private support for research in Benin, \$95,000, 2006-2010.
- Principal Investigator, “International: Collaborative research in Benin: Opportunity for undergraduate engineering / geoscience students”, The National Science Foundation, \$33,400, 2005-2006
- Principal Investigator, “Benin Nitrate Project, 2005”, The West Foundation, \$30,000, 2005/6.
- Principal Investigator, Support for research and education in Benin and Haiti, \$50,000, 2005/6.
- Principal Investigator, “The Impact of Physical Heterogeneity and Connectivity on LNAPL Entrapment and Dissolution”, The National Science Foundation, \$144,026, 2004-2008.
- Co-principal Investigator (primary author), HP-mobility grant, HP Corporation, \$90,000 in support and equipment, 2004-2005.
- Principal Investigator, “Benin Nitrate Project, 2004”, The West Foundation, \$40,000, 2004-2005.
- Principal Investigator, “An REU Site on Water Resources in Developing Countries”, National Science Foundation, \$189,600, 2002-2005
- Principal Investigator, “Groundwater Characterization in Central Benin using Element Analysis”, National Science Foundation, \$26,000, 2002-2006
- Collaborator, Environmental Molecular Science Institute, University of Notre Dame, National Science Foundation, \$5+ Million, 2002-2007.
- Principal Investigator, “Air Entry Barriers: Mechanism for Creating High-Permeability Pathways Above the Water Table”, National Science Foundation, \$100,000, 2001 - 2003.
- Co-Principal Investigator, Alcoa Foundation Education Funds (includes support for work in Benin and Chile), 1998 - 2005, ~\$100,000.

Principal Investigator, Contract with U.S. Geological Survey to perform transport experiments in anisotropic media, \$24,011, 9/10/99-9/10/00.

Principal Investigator, “Planning grant: Characterization of water flow in fractured crystalline rock, Benin”, National Science Foundation, \$3,200, 10/15/99 - 10/14/00.

Principal Investigator, “An REU site in the Department of Civil Engineering and Geological Sciences at the University of Notre Dame”, NSF, \$155,000, 1997-2001.

Principal Investigator, “Impact of Measurement Instrument and Conceptual Model on Analysis of Subsurface Heterogeneity”, U.S. Department of Energy, \$389,804, 1995-1999.

Principal Investigator, “Investigation of the three-point scheme for assessment of groundwater field sites”, U.S. Geological Survey, \$48,000, 1996-1998.

Principal Investigator, “GAANNP research fellowships in CE/GEOS”, U.S. Department of Education, \$350,000 (1994-1997).

Principal Investigator, “Hydrodynamic Controls on Particle Transport Through Heterogeneous Porous Media”, U.S. Department of Energy, Supplemental Funds, \$69,000, 1994-1995.

Principal Investigator, “Hydrodynamic Controls on Particle Transport Through Heterogeneous Porous Media”, U.S. Department of Energy, \$373,322, 1992-1995.

Principal Investigator, “St. Joseph Basin Commission Juday Creek Study for MACOG”, St. Joseph River Basin Commission, \$11,200, 1992.

Principal Investigator, “Development of the Subsurface Equipment for Bioremediation of the Sandia Site”, Argonne National Laboratory, \$60,000, 1991.

Principal Investigator, “Development of a Groundwater Handbook for Well-Head Protection”, The City of Elkhart, \$10,000, 1991.

Principal Investigator, “Development of an Undergraduate Laboratory for the Hydrologic Sciences at Notre Dame”, National Science Foundation, \$161,434, 1988-1991.

Principal Investigator, “Proposed investigation of environmental effect of application of oil field brine to Michigan roadways”, KEDA, \$210,310, 1988-1991.

Co-Principal, “An NSF REU site in the Department of Civil Engineering at the University of Notre Dame”, National Science Foundation, 1987/88/90/92/94.

Principal Investigator, “Characterization of fracture geometry utilizing particulate tracers and borehole temperature”, U.S. Geological Survey, \$344,832, 1987-1990.

Principal Investigator, “Movement of Microorganisms through the subsurface”, Indiana Water Resources Research Center, \$42,500, 1987.

**Courses Taught: Gonzaga (GU) or Notre Dame (ND) unless otherwise indicated**

STEM in Developing Countries – First year interdisciplinary (all disciplines at Gonzaga) seminar  
2016, 2017 (GU)

First Year Seminar for Engineers, Laboratory Section, 2017 (co-teaching, GU)

Freshman Engineering Seminar, 2013 - 2015 (GU)

Senior Design, 2013 - 2017 (GU)

Groundwater, 2015, 2018 (GU)

Uncertainty in Environmental Systems, 2010 (ND)

Groundwater Hydrology and Hydrology Lab (ND - 25 years of teaching this course)

Introduction to Engineering Systems (ND - approximately 7 years of teaching this course)

Concepts in Civil Engineering (ND - multiple times)

Geostatistics (ND - multiple times)

Probability Theory (ND - multiple times)

Third-World Water Supply (ND - multiple times)

Advanced Groundwater (ND - multiple times)

Physical Geology (ND - 3 years)

Groundwater Modeling Course (in French and English) at the Université d'Abomey-Calavi, Benin,  
2006, 2013

Geostatistics (in French) at the Université d'Abomey-Calavi, Benin, 2003, 2005

Groundwater Field Methods (in French) at the Université d'Abomey-Calavi, Benin, 2009

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