

## Benjamin F. Schwartz

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### **EDUCATION** Virginia Polytechnic Institute and State University, Blacksburg, VA

Ph.D. Geosciences, *December, 2007.*

Dissertation: *Hydrogeophysical quantification of infiltration and recharge through soil-filled sinkholes using Time Domain Reflectometry and Electrical Resistivity Tomography*

Radford University, Radford, VA

B. S. Geology, May 2003 - *Summa cum Laude*

### **Professional Experience**

Director, Edwards Aquifer Research and Data Center, Texas State Univ., San Marcos, TX, 2013 – present

Associate Professor, Dept. of Biology, Texas State University, San Marcos, TX, 2013 – present

Assistant Professor, Dept. of Biology, Texas State University, San Marcos, TX, 2007 – present

Adjunct Asst. Professor, Dept. of Geography, Texas State University, San Marcos, TX, 2007 – present

**Google Scholar Profile:** <https://scholar.google.com/citations?user=HLBIzWIAAAAJ&hl=en>

### **Joint Appointments and Duties:**

Associate Professor, Department of Biology (50% Faculty Appointment during 9-month academic year)

As a faculty of the Biology Department, my time is allocated to research (50%), teaching (40%), and service (10%).

Director, Edwards Aquifer Research and Data Center (EARDC). (50% Administrative Appointment during 9-month academic year, 100% Administrative Appointment during summer).

As Director of the EARDC, I manage a full-time staff of 9. The primary mission of EARDC is to study the hydrogeology and biology of the Edwards Aquifer, provide NELAP-accredited laboratory services to the community, and to educate and inform the public about the aquifer (primarily via week-long summer camps, day-long field programs, and diverse public and community outreach and education activities).

### **Peer-reviewed Journal Articles (\* indicates student author)**

1. Hutchins, B. T., **Schwartz, B.F.**, and \*Coleman, W. T. Three New Microcerberids (Isopoda, Microcerberidae) from Subterranean Freshwater Habitats in Texas, USA, *In press at Journal of Natural History*: <https://doi.org/10.1080/00222933.2021.2009054>
2. Perez, K. E., \*Leal, M. S., \*Glover, H., Chastain, R. T., Hutchins, B. T., & **Schwartz, B.** 2021. Two new species of Pyrgulopsis Call and Pilsbry, 1886 (Mollusca: Caenogastropoda: Hydrobiidae) from springs in the Rio Grande watershed in Texas. *Zootaxa*, 5071(3), 384–402.  
<https://doi.org/10.11646/zootaxa.5071.3.5>

3. Camacho, A.I., Mas-Peinado, P., Hutchins, B.T., **Schwartz, B.F.**, Dorda, B.A., Casado, A., and I. Rey, I. 2021, New stygofauna from Texas, USA: three new species of Parabathynellidae (Crustacea: Bathynellacea). *Journal of Natural History*, 55:15-16, 979-1007, <https://doi.org/10.1080/00222933.2021.1928316>
4. Külköylüoğlu, O., Hutchins, B., Yavuzatmaca, M., and **Schwartz, B. F.**, 2021, Hyporheic ostracods from Texas with six new species. (Monograph). *Zootaxa* 5046 (1): 001–063: <https://doi.org/10.11646/zootaxa.5046.1>
5. Tian, L., Gao, Y., Yang, G., **Schwartz, B.F.**, Cai, B., Ray, C., Martinez, E., and Wu, H., 2021. Hydrochemical and Isotope Tracers of Sources of water for Springs from Edwards Aquifer, Central Texas, USA. *Hydrology Research* v52:3: <https://doi.org/10.2166/nh.2021.011>
6. \*Gladstone, N., Whelan, N., Hutchins, B., **Schwartz, B.**, Czaja, A., Slay, M., and Niemiller, M., 2021. Subterranean freshwater gastropod biodiversity and conservation in the United States and Mexico. *Conservation Biology*: <https://doi.org/10.1111/cobi.13722>
7. Hutchins, B.T., Gibson, J.R., Diaz, P.H., and **Schwartz, B.F.**, 2021. Stygobiont Diversity in the San Marcos Artesian Well and Edwards Aquifer Groundwater Ecosystem, Texas, USA. *Diversity*, 13, 234. <https://doi.org/10.3390/d13060234>
8. Hutchins, B.T., \*Swink, A.P., Diaz, P.H., and **Schwartz, B.F.**, 2020. Environmental influences on invertebrate diversity and community composition in the hyporheic zone ecotone in Texas, USA: contrasts between co-occurring epigean taxa and stygobionts. *Hydrobiologia*, 847: 3967–3982 <https://doi.org/10.1007/s10750-020-04379-8>
9. \*Tobin, B. T., and **Schwartz, B. F.**, 2020. Quantifying the role of karstic groundwater in a snowmelt-dominated hydrologic system. *Hydrologic Processes*. 34(16). <https://doi.org/10.1002/hyp.13833>
10. \*Alvear, D. A., Diaz, P. H., Gibson, R., Hutchins, B., **Schwartz, B. F.**, and Perez, K., 2020. Expanding the known ranges of the endemic, phreatic snails (Mollusca, Gastropoda) of Texas, USA. *Freshwater Mollusk Biology and Conservation*. 23(1):1-17 <https://doi.org/10.31931/fmbc.v22i2.2020.1-17>
11. Külköylüoğlu, O., Yavuzatmaca, M., Akdemir, D., **Schwartz, B. F.**, and Hutchins, B., 2019. Description of a New Tribe Cabralcandonini (Candonidae, Ostracoda) From Karst Aquifers in Central Texas, USA. *Journal of Cave and Karst Studies*, 81(2).
12. \*Crouch, S., Jensen, J., **Schwartz, B. F.**, and Schwinning, S., 2019. Tree Mortality After a Hot Drought: Distinguishing Density-Dependent and Independent Drivers and Why It Matters. *Frontiers in Forests and Global Change*, 2, 21.
13. **Schwartz, B. F.**, Hutchins, B., Schwartz, Z., \*Hess, A., and Bonett, R., 2019. *Cirolanides wassenichae* sp. nov., a freshwater, subterranean Cirolanidae (Isopoda, Cymothoidea) with additional records of other species from Texas, United States. *Zootaxa*, 4543(4), 498–514. <https://doi.org/10.11646/zootaxa.4543.4.2>
14. Camacho, A. I., Hutchins, B., **Schwartz, B. F.**, Dorda, B. A., Casado, A., and Rey, I., 2018. Description of a new genus and species of Bathynellidae (Crustacea: Bathynellacea) from Texas based on morphological and molecular characters. *Journal of Natural History*, 52(1-2), 29–51. <https://doi.org/10.1080/00222933.2017.1401680>

15. Klkyliglu, O., Yavuzatmaca, M., Akdemir, D., **Schwartz, B. F.**, and Hutchins, B., 2017. *Ufocandona hannaleeae* gen. et sp. nov. (Crustacea, Ostracoda) from an artesian well in Texas, USA. *European Journal of Taxonomy*, 372, 1–18.
16. Klkyliglu, O., Akdemir, D., Yavuzatmaca, M., **Schwartz, B. F.**, and Hutchins, B., 2017. *Rugosuscandona*, a new genus of Candonidae (Crustacea: Ostracoda) from groundwater habitats in Texas, North America. *Species Diversity*, 22(2), 175–185. <https://doi.org/10.12782/specdiv.22.175>
17. Klkyliglu, O., Yavuzatmaca, M., Akdemir, D., **Schwartz, B. F.**, and Benjamin, H., 2017. *Lacrimacandona* n. gen. (Crustacea: Ostracoda: Candonidae) from the Edwards Aquifer, Texas (USA). *Zootaxa*, 4277(2), 261–273. <https://doi.org/10.11646/zootaxa.4277.2.6>
18. Klkyliglu, O., Akdemir, D., Yavuzatmaca, M., **Schwartz, B. F.**, and Hutchins, B., 2017. *Cypria lacrima* sp. nov. a new Ostracoda (Candonidae, Crustacea) species from Texas, U.S.A. *Zoological Studies*, 56. <https://doi.org/10.6620/ZS.2017.56-15>
19. \*Hutchins, B. T., Engel, A. E., Nowlin, W. N., and **Schwartz, B. F.**, 2016. Chemolithoautotrophy Supports Macroinvertebrate Food Webs and Influences Diversity and Stability in Karst Aquifer Communities. *Journal of Ecology*. <https://doi.org/10.1890/15-1129.1>
20. \*Dammeyer, H. C., Schwinning, S., **Schwartz, B. F.**, and Moore, G. W., 2016. Effects of juniper removal and rainfall variation on tree transpiration in a semi-arid karst: evidence of complex water storage dynamics: Effects of juniper removal in karst. *Hydrological Processes*. <https://doi.org/10.1002/hyp.10938>
21. \*Tobin, B. W., and **Schwartz, B. F.**, 2016. Using periodic hydrologic and geochemical sampling with limited continuous monitoring to characterize remote karst aquifers in the Kaweah River basin, California, USA. *Hydrological Processes*. <https://doi.org/10.1002/hyp.10859>
22. \*Eagle, S., Orndorff, W., **Schwartz, B. F.**, Doctor, D. H., Gerst, J., and Schreiber, M., 2015. Analysis of hydrologic and geochemical time-series data at James Cave, Virginia: Implications for epikarst influence on recharge in Appalachian karst aquifers, in: Feinberg, J., Gao, Y., and Alexander, E.C., Jr., eds. *Caves and Karst Across Time: Geological Society of America Special Paper* 516.
23. \*Tobin, B. W., Kelly, M., Despain, J. D., and **Schwartz, B. F.**, 2015. Fire Retardant and Post-Fire Nutrient Mobility in a Mountain Surface Water - Karst Groundwater System: The Hidden Fire, Sequoia National Park. *Environmental Earth Sciences*. <https://doi.org/73:951-960>
24. Schreiber, M., **Schwartz, B. F.**, Orndorff, W., Doctor, D., \*Eagle, S., and Gerst, J., 2015. Instrumenting caves to collect hydrologic and geochemical data: Example from James Cave, Virginia, in: Younos T and Parece T (eds). *Advances in Watershed Science and Assessment, Handbook of Environmental Chemistry*, 33, 205–231. <https://doi.org/73:951-960>
25. \*Hutchins, B. T., **Schwartz, B. F.**, and Nowlin, W. N., 2014. Morphological and trophic specialization in a subterranean amphipod assemblage. *Freshwater Biology*, 59, 2447–2461.
26. Luhmann, A. J., Covington, M. D., Alexander, S. C., Chai, S. Y., **Schwartz, B. F.**, Groten, J. T., and Alexander Jr., C. E., 2013. Comparison of discharge, chloride, temperature, uranine, <sup>2</sup>D, and suspended sediment responses from a multiple tracer test in karst. *Carbonates and Evaporites*, 28, 191–199.
27. \*Hutchins, B. T., **Schwartz, B. F.**, and Engel, A. S., 2013. Environmental Controls on Organic Matter Production and Transport Across Surface-Subsurface and Geochemical Boundaries in the Edwards Aquifer, Texas, USA. *Acta Carsologica*, 42, 245–259.

28. \*Kukowski, K. R., Schwinning, S., and **Schwartz, B. F.**, 2013. Hydraulic responses to extreme drought conditions in three co-dominant tree species in shallow soil over bedrock. *Oecologia*, 171, 819–830.
29. \*Hutchins, B. T., \*Tovar, R. U., and **Schwartz, B. F.**, 2013. New Records of Stygobionts from the Edwards Aquifer of Central Texas. *Speleobiology Notes*, 5, 14–18.
30. \*Tobin, B. W., \*Hutchins, B. T., and **Schwartz, B. F.**, 2013. Spatial and temporal changes in invertebrate assemblage structure from the entrance to deep-cave zone of a temperate marble cave. *International Journal of Speleology*, 42(3), 203-214 <http://dx.doi.org/10.5038/1827-806X.42.3.4>
31. \*Kukowski, K. R., Schwinning, S., and **Schwartz, B. F.**, 2012, Hydraulic responses to extreme drought conditions in three co-dominant tree species in shallow soil over bedrock. *Oecologia*, 171(4), 819-30. doi: 10.1007/s00442-012-2466-x.
32. \*Luhmann, A. J., Covington, M. D., Alexander, S. C., Su Yi Chai, **Schwartz, B. F.**, Groten, J. T., Alexander, C. E., Jr., 2012, Comparing Conservative and Nonconservative Tracers in Karst and Using Them to Estimate Flow Path Geometry. *Journal of Hydrology*, V448-449, 201-211.
33. \*Tobin, B. W., **Schwartz, B. F.**, 2012, Quantifying Concentrated and Diffuse Recharge in Two Marble Karst Aquifers: Big Spring and Tufa Spring, Sequoia and Kings Canyon National Parks, California, USA. *Journal of Cave and Karst Studies*, 74(2), 186-196.
34. **Schwartz, B. F.**, W. D. Orndorff, M. J. Ficco, W. Balfour, N. W. Davis, and M. Futrell, 2009, Hydrogeology of the Mississippian Carbonate Karst System: Powell Mountain, Virginia. *Journal of Cave and Karst Studies*, 71(3), 168:179.
35. **Schwartz, B. F.**, Schreiber, M. S., 2009, Quantifying potential recharge in mantled sinkholes using ERT. *Journal of Ground Water*, 47(3), 370:381.
36. **Schwartz, B. F.**, Schreiber, M. S., Yan, T., 2008, Quantifying Field Scale Soil-moisture Using Electrical Resistivity Tomography. *Journal of Hydrology*, 362: 234-246
37. **Schwartz, B.F.**, Schreiber, M.E., Pooler, P.S. and Rimstidt, J.D., 2008. Calibrating Access-tube Time Domain Reflectometry Soil Water Measurements in Deep Heterogeneous Soils. *Soil Science Society of America Journal*, 72(4): 917-930.

### **Peer-reviewed Invited Book Chapters**

1. **Schwartz, B. F.** (2019). The Omega Cave System. In *Encyclopedia of Caves* (3rd ed., pp. 769–778). Academic Press. <https://doi.org/10.1016/B978-0-12-814124-3.00093-5>
2. **Schwartz, B. F.**, and Davis, N. W. (2015). Exploration of Barberry Cave and the Construction of Big Bucks Pit Caves and Karst of Virginia. In W. B. White (Ed.), *The Caves of Burnsville Cove; Cave and Karst Systems of the World* (pp. 151–166). Springer International Publishing Switzerland. [https://doi.org/10.1007/978-3-319-14391-0\\_1](https://doi.org/10.1007/978-3-319-14391-0_1)
3. **Schwartz, B. F.**, Orndorff, W. D., Futrell, S. M., and Lucas, P. C., 2009, Caves and Karst of Virginia. In: *Caves and Karst of North America*. A. N. Palmer and P. Palmer, editors. A book published for the 2009 International Congress of Speleology held in Kerrville, Texas.

### **Other Peer-reviewed Publications**

1. Mock, L. **Schwartz, B. F.**, Nowlin, W. H., Hutchins, B. T., Hardy, T., Bonner, T. H., 2011, The Role of Metrology in Monitoring and Preserving the Water Quality in the Edwards Aquifer in Central Texas. Proceedings of the 2011 National Conference of Standards Laboratories International (NCSLI) Symposium. August 21-25, 2011, National Harbor, MD.
2. Luhmann, A. J., Covington, M. D., Alexander, S. C., Chai, S. Y., **Schwartz, B. F.**, Groten, J. T., Alexander, E. C., Jr. 2011, Comparison of Discharge, Chloride, Temperature, Uranine,  $\delta D$ , and Suspended Sediment Responses from a Multiple Tracer Test in Karst. Proceedings of the 12<sup>th</sup> Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst. January 2011, St. Louis, Missouri.
3. Hardy, Thomas B., Nowlin, Weston, **Schwartz, Benjamin F.**, Bonner, Timothy, 2011, Implementation of the San Marcos River Observing System: a Spatially Explicit Delineation of a Spring System based on Physical, Hydrologic, Chemical, and Biological Monitoring. Proceedings of the: 8<sup>th</sup> International Symposium on Ecohydraulics, Seoul, Korea, September 12-16, 2010.
4. Doctor, D. H., **Schwartz, B. F.**, Gary, M. O., 2009, Preliminary Development of a Quantitative Karst Classification System, PHORMS. Proceedings of the 15<sup>th</sup> International Congress of Speleology, Kerrville, TX, July 19-26, 2009.
5. **Schwartz, B. F.**, Doctor, D. H., 2009, Geomorphic and Hydrogeologic Evolution of Karst in the Burnsville Cove, Virginia, U.S.A.: New Evidence and Perspectives. Proceedings of the 15<sup>th</sup> International Congress of Speleology, Kerrville, TX, July 19-26, 2009.
6. **Schwartz, B. F.** and Schreiber, M. E., 2005, New Applications of Differential Electrical Resistivity Tomography and Time Domain Reflectometry to modeling infiltration and soil moisture in agricultural sinkholes. Proceedings of the 10<sup>th</sup> Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst. September 2005.
7. Orndorff, W., Hypes, R., Lucas, P., Fagan, J., Zokaites, C., Orndorff, Z., Lucas, C., **Schwartz, B.**, 2005, Protecting Virginia's Caves and Karst through the Environmental Review Process. Proceedings of the National Cave and Karst Management Symposium, November 2005.

### **Other Publications – non-peer-reviewed**

1. **Schwartz, B. F.**, 2009, Caves and Karst of Virginia: Field Camp #37: Guidebook for a week-long field trip held prior to the 15<sup>th</sup> International Congress of Speleology in Kerrville, TX, July, 2009.
2. **Schwartz, B. F.**, 2008, Karst of the Mississippian Carbonate System – Powell Mountain, In: Field trip guidebook for the Second Appalachian Karst Symposium: The Karst of Northeastern Tennessee and Southwestern Virginia. Yongli Gao, Wil Orndorff and Robert Benfield (Editors), Eastern Tennessee State University, Johnson City, TN, May 7-10, 2008
3. **Schwartz B. F.**, Schreiber M. E., and Orndorff W., 2004. Hydrologic characterization of sinkholes in agricultural settings: Implications for best management practices. *Proceedings of the 2004 Virginia Water Resources Research Symposium*, Blacksburg, Virginia, Oct 4-6, 2004.
4. **Schwartz, B. F.**, 1999, Exploring Barberry Cave. *National Speleological Society News*, September, v. 57 no. 9. A report documenting the history of exploration in Barberry Cave, Bath County, Virginia.

5. **Schwartz, B. F.**, 1999, Project Caving and Permanent Rigging. *National Speleological Society News*, October, v. 57 no. 10. A technical report dealing with solutions to problems encountered with rigging in long-term project caving.
6. **Schwartz, B. F.**, 1993 - present, Reports, maps and articles in *The Virginia Cellars*, the official publication of the Virginia Speleological Survey.

**Funded Grants and Awards** (Total as PI or Co-PI at TX State: \$4,213,384)

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| 2021 | \$2,493,216, US Army Corps of Engineers, Engineer Research and Development Center (Preparing for the Future: Developing Next Generation Ecological Models and Tools to Predict Ecological Futures for USACE Operations). PI: Nowlin, W.N. Co-PIs: Hardy, T, Schwalb, A., and Schwartz, B.F. <i>Quantifying drivers of native and non-native aquatic species abundance and distribution in drought- and flood-prone Texas basins</i> |
| 2020 | \$2,493,216, US Army Corps of Engineers, Engineer Research and Development Center (Preparing for the Future: Developing Next Generation Ecological Models and Tools to Predict Ecological Futures for USACE Operations). PI: Nowlin, W.N. Co-PIs: Hardy, T, Schwalb, A., and Schwartz, B.F. <i>Quantifying drivers of native and non-native aquatic species abundance and distribution in drought- and flood-prone Texas basins</i> |
| 2020 | \$253,625, Texas Parks and Wildlife Department/ US Fish and Wildlife Service. PI: Schwartz, Benjamin F. Co-PIs: Hutchins, Benjamin, Perez, Kathryn. <i>Conservation status evaluation of Trans-Pecos SGCN groundwater-dependent invertebrates.</i>  |
| 2019 | \$79,926, City of Austin. PI: Schwartz, Benjamin F. Co-PIs: Nowlin, Weston, Hutchins, Benjamin, Engel, Annette. <i>Food Webs and Trophic Structure of the Groundwater Ecosystem Supporting Barton Springs and Austin Blind Salamanders.</i>   |
| 2019 | \$59,598, Texas Parks and Wildlife/US Fish and Wildlife Service. PI: Nowlin, Weston H., Co-PIs: Schwartz, Benjamin F., Nice, Chris. <i>Population Genetics of the Endangered Comal Springs Dryopid Beetle (Stygoparnus comalensis).</i>   |
| 2018 | \$64,515, Texas Parks and Wildlife/US Fish and Wildlife Service. PI: Nowlin, Weston H., Co-PI: Schwartz, Benjamin F. <i>Trophic Ecology and Environmental Tolerances of the Endangered Comal Springs Dryopid Beetle (Stygoparnus comalensis).</i>   |
| 2017 | \$156,306, Edwards Aquifer Authority – Edwards Aquifer Habitat Conservation Plan. PI: Schwartz, Benjamin F. Co-PIs: Nowlin, Weston H., Hardy, Thomas, Jeong, Jaekak, Wolfe, June. <i>Sessom Creek Sediment Export Study.</i>  |
| 2016 | \$10,000, Cave Conservancy of the Virginias. PI: Benjamin Schwartz, Co-PIs: Dr. Benjamin Hutchins (TPWD), and Mr. Aaron Swink (TSU). <i>Geographic and Physicochemical Effects on the Distribution of Rare, Groundwater Invertebrates in the Hyporheic Zone of Texas Streams.</i>   |
| 2016 | \$93,034, Edwards Aquifer Authority - Edwards Aquifer Habitat Conservation Plan. WH Nowlin (PI) and BF Schwartz (Co-PI). <i>Evaluation of the Long-Term, Elevated Temperature and Low Dissolved Oxygen Tolerances of the Comal Springs Riffle Beetle.</i>   |
| 2015 | \$73,537, Texas Parks and Wildlife Department. PI: Benjamin Schwartz, Co-PIs: Chris Nice and Weston Nowlin. <i>Status Assessment and Ecological Characterization for the Texas Troglobitic Water Slater, Lirceolus smithii.</i>   |

- 2014 \$18,998, TPWD Horned Lizard Wildlife Grant funding. PI: Benjamin Schwartz, Co-PI: Chris Nice. *Molecular and Morphological Analysis of Stygobromus sp. near San Marcos, TX.*
- 2014 \$108,552, EAA HCP funding. PI: Weston Nowlin, Co-PI: Benjamin Schwartz. *Refugia Research: Development of Husbandry and Captive Propagation Techniques for Invertebrates Covered Under the Edwards Aquifer Habitat Conservation Plan Proposal.*
- 2014 \$49,980, EAA HCP funding. PI: Thomas Hardy, Co-PIs: Benjamin Schwartz and Weston Nowlin, *Determination of Limitations of Comal Springs Riffle Beetle Plastron Use During Low Flows.*
- 2013 \$9,398, Cave Conservancy Foundation. PI: Benjamin Schwartz, Co-PI: Matthew Covington – University of Arkansas, *Instrumentation for Long Term Hydrogeochemical and Climatological Monitoring in the Omega Cave System, Wise County, Virginia.*
- 2013 \$30,000, Texas Commission on Environmental Quality, Section 319(h) NPS Water Pollution Management Program. PI: River Systems Institute, Co PI: Dr. Weston Nowlin, Co PI: Dr. Benjamin Schwartz, Texas State University. *Upper San Marcos River Watershed Protection Plan.* Start date: January 2013
- 2010 \$9,838, Cave Conservancy of the Virginias. PI: B. Schwartz. Co-PI: Dr. Garland Upchurch – Texas State University. *New Records of Karstic Landscape Evolution, Fossil Plant Assemblages, and Paleo-Hydrology as Preserved in an Ancient Appalachian Sinkhole-Lakebed*
- 2009 \$1,200,000, The San Marcos River Observing System (\$146,000 to Schwartz). B. Schwartz, W. H. Nowlin, T. Hardy, and T. H. Bonner. Initial white-paper proposal written by me and Weston Nowlin. Texas Legislature (Line Item based on Federal Stimulus Funds). Received January 2010.
- 2009 \$100,494, Water Resources Research National Competitive Grants Program. PI: B. Schwartz. Co-PI: Dr. Madeline Schreiber – Virginia Tech, Collaborator: Dr. Daniel H. Doctor – USGS. *The Role of Epikarst in Controlling Recharge, Water Quality and Biodiversity in Karst Aquifers: A Comparative Study between Virginia and Texas.* Anticipated start date of January 2010. One of 6 proposals funded nationwide.
- 2008 \$4,500, Texas State University Research Enhancement Program (REP) PI: B. Schwartz. Co-PI: Gary Upchurch – Texas State University. *New records of karstic landscape evolution, fossil plant assemblages, and paleo-hydrology as preserved in an ancient Appalachian sinkhole-lakebed.*
- 2008 \$46,278, (\$8,178 to Schwartz as Co-PI) USDA SAWC – Rio Grande Project. PI: Kevin Urbanczyk, Sul Ross State University. Co-PI's: Benjamin Schwartz – Texas State University, Jeffery Bennett – Big Bend National Park. *Evaluation of source of spring flow from Cretaceous Aquifers along the Rio Grande Wild and Scenic River.*
- 2008 \$293,689, Texas Commission on Environmental Quality, Section 319(h) NPS Water Pollution Management Program. PI: River Systems Institute, Co PI: Dr. Weston Nowlin, Co PI: Dr. Benjamin Schwartz, Texas State University. *Determination of NPS Nutrient Inputs to Spring Lake and San Marcos River Headwaters.*

- 2008 \$150,000, Texas ARP/ATP. PI: B. Schwartz. Co-PI: Susan Schwinning, TSU Dept of Biology. *Epikarst Controls on Recharge, Water Quality and Ecosystem dynamics in Central Texas Hill Country.*
- 2007 \$13,386 Cave Conservancy Foundation. *The Role of Epikarst in Controlling Recharge, Water Quality and Biodiversity in Karst Aquifer Systems of Virginia*
- 2007 \$20,000 Virginia Water Resources Research Center grant. *The Role of Epikarst in Controlling Recharge, Water Quality and Biodiversity in Karst Aquifer Systems of Virginia*
- 2007 Virginia Tech College of Science Runner-up Award for Outstanding Graduate Student of the Year.
- 2006 \$15,000 Cave Conservancy Foundation's Ph.D. Graduate Fellowship in Karst Studies. *A multi-method approach to characterizing sinkhole hydrogeology and recharge mechanisms in agricultural settings.*
- 2006 Full Research Assistantship and other funding - co-wrote grant proposal with Dr. Madeline Schreiber to Virginia Water Resources Research Center.
- 2006 Byron N. Cooper Graduate Fellowship award. Full Research Assistantship funding for one semester. Dept. of Geosciences, Virginia Tech.
- 2005 \$5,000 Cave Research Foundation's annual Karst Research Fellowship. Presented annually to one student who proposes an outstanding karst-related research project.
- 2005 \$2,000 National Speleological Society's Ralph W. Stone Award and Fellowship.
- 2005 \$2,000 Geological Society of America research grant.
- 2005 Award: GSA outstanding research proposal. One of 19 from 720 applications.
- 2005 \$250 and award: GSA Hydrogeology Division outstanding research proposal. One of three.
- 2005 \$300 Research grant from West Virginia Association for Cave Studies.
- 2005 \$250 Research grant from Virginia Tech Graduate Research Development Program.
- 2004 Awarded a US Dept. of Ed. GAANN Fellowship. Provided full Research Assistantship funding and some travel and equipment funds for three semesters.
- 2003 \$4,600 Research grant from Cave Conservancy of the Virginias for equipment. *Can Cave Sediments Predict Past Flood Magnitudes?*
- 2000 \$5,000 Cave Conservancy Foundation's Undergraduate Fellowship in Karst Studies.
- 1999 Fellow award - National Speleological Society.

### **Conference Presentations and Abstracts (\* = Ph.D., † = M. S., ‡ = B.S. student first authors)**

1. ‡Browning, C., Luhmann, A. J., Becker, S. M., Dykhous, L. J., Phinney, A. I., Childre, M. T., Covington, M. D., Gabrovsek, F., Herman, E. K., Polk, J. S., Schreiber, M. E., **Schwartz, B. F.**, and

Toran, L., 2019. Thermal Retardation in Karst Aquifers: Field Observations. AGU Fall Meeting, San Francisco, CA. December 9-13, 2019.

2. ‡Becker, S. M., Luhmann, A. J., Browning, C. K., Phinney, A. I., Childre, M. T., Covington, M. D., Gabrovsek, F., Herman, E. K., Polk, J. S., Schreiber, M. E., **Schwartz, B. F.**, and Toran, L., 2019. Field Analysis of Thermal Retardation in karst aquifers. Geological Society of America Annual Meeting, Phoenix, AZ, September 22-25, 2019.
3. **Schwartz, B. F.**, Hutchins, B., and Swink, A., 2019. Hyporheic Systems in Karst: Zones of Exceptional Biodiversity. Geological Society of America Annual Meeting, Phoenix, AZ, September 22-25, 2019.
4. **Schwartz, B. F.**, Engel, A. S., and Hutchins, B., 2019. Pinholes in a Giant Black Box: Studying a Deep, Confined, Chemolithoautotrophic System, the Edwards Aquifer, Texas, USA. Geological Society of America Annual Meeting, Phoenix, AZ, September 22-25, 2019.
5. †Ramirez, R., Castro-Arellano, I., **Schwartz, B. F.**, Milholland, M., Lopez, J., Mali, I., and Teel, P. 2019. Determining vertebrate host communities of a Relapsing Fever vector (Ornithodoros turchiae) in Central TX. 19th Annual Meeting of American Society of Mammalogists, June 28-July 2, 2019.
6. \*Coleman, W., Bell, K., Gibson, J., **Schwartz, B. F.**, and Nice, C. (2019). Patterns of genetic diversity in a genus of ecologically diverse riffle beetles. Evolution Annual Meeting, Providence, RI, June 21-25, 2019.
7. Jeong, J., Wolfe, III, J., **Schwartz, B. F.**, Loiacono, D., Nowlin, W., and Furl, C., 2019. Time-scale effects upon SWAT simulations investigating urban watershed sediment export. 2019 Vienna SWAT Conference, Vienna, Austria, June 17-19, 2019.
8. Nowlin, W., Krupka, N., **Schwartz, B. F.**, Diaz, P., 2019, Relationship Between Biodiversity and Nutrient Cycling by Subterranean Invertebrate Communities in the Edwards Aquifer, USA, Society for Freshwater Science, Salt Lake City, UT, United States, May 19-23, 2019.
9. \*Jenson, A., and **Schwartz, B. F.**, 2019. Estimating aquifer properties in a coastal karst basin from observations at the water table: Quintana Roo, Mexico. Geological Society of America, Joint 53rd South-Central/53rd North-Central/71st Rocky Mtn Section Meeting, Manhattan, KS, March 25-27, 2019.
10. †Martinez, L., and **Schwartz, B. F.** (2019). Evaluation of statistically-designed survey methods for determining karst feature density in a portion of the Edwards Aquifer Recharge Zone. Geological Society of America, Joint 53rd South-Central/53rd North-Central/71st Rocky Mtn Section Meeting, Manhattan, KS, March 25-27, 2019.
11. †Loiacono, D., **Schwartz, B. F.**, and Nowlin, W. (2019). Statistical Analysis of Factors Controlling Nonpoint Source Pollutant Loads in a Small Urban Watershed, San Marcos, TX, USA. Geological Society of America, Joint 53rd South-Central/53rd North-Central/71st Rocky Mtn Section Meeting, Manhattan, KS, March 25-27, 2019.
12. Engel, A., **Schwartz, B. F.**, Nowlin, W. H., and Hutchins, B. (2018). Profiling the Functional Diversity of Microbial Communities to Understand Development and Maintenance of the Edwards Aquifer Ecosystem. Geological Society of America Annual Meeting, Indianapolis, IN, November 4-7, 2018.
13. †Loiacono, D., **Schwartz, B. F.**, and Nowlin, W. H. (2018). Stormwater and Non-Point Source Contaminants in a Small Urban Watershed. Geological Society of America Annual Meeting, Indianapolis, IN, November 4-7, 2018.

14. †Martinez, L., and **Schwartz, B. F.** (2018). Testing Statistical and Semi-Automated Methods for Assessing and Predicting Karst Feature Density in the Edwards Aquifer Recharge Zone. Geological Society of America Annual Meeting, Indianapolis, IN, November 4-7, 2018.
15. \*Jenson, A., **Schwartz, B. F.**, Li, Y., and Gao, Y. (2018). The implications and limitations of Phreatic Overgrowths of Speleothems as sea level indicators: Quintana Roo, Mexico. Geological Society of America Annual Meeting, Indianapolis, IN, November 4-7, 2018.
16. \*Coleman, W. T., Nice, C., Nowlin, W. H., and **Schwartz, B. F.**, 2017. Cryptic, sympatric diversity uncovered in *Lirceolus* isopods at a stygobiont hot-spot, Edwards Aquifer, Texas. Society for Freshwater Science Annual Meeting, June 4-8, 2017
17. \*Jenson, A., **Schwartz, B. F.**, Li, Y., and Gao, Y., 2017. Re-evaluating Pleistocene Sea Level History and Speleogenesis in the Yucatan Peninsula: U-Th dating of POS from Quintana Roo, Mexico. Geological Society of America Annual Meeting, Seattle, WA, October 23-26, 2017.
18. **Schwartz, B. F.**, Schwinning, S., and Hiler, M., 2017. Recharge and water balance studies at Cave Without A Name, Texas: what we learn from interdisciplinary methods. Geological Society of America Annual Meeting, Seattle, WA, October 23-26, 2017.
19. \*Jenson, Aubri, **Schwartz, B. F.**, Gao, Y., and Li, Y., 2017. Shallow Speleogenesis in a Coastal Carbonate Platform: Quintana Roo, Mexico. Geological Society of America – South-Central Section Meeting, San Antonio, TX, March 13-14, 2017.
20. †Hiler, Mark D., **Schwartz, B. F.**, and Schindel, G., 2017. Delineating the Springshed of Cave Without a Name: Dye Tracing in the Lower Glen Rose Limestone. Geological Society of America – South-Central Section Meeting, San Antonio, TX, March 13-14, 2017.
21. †Ray, Christopher J, Gai, Y., Suarez, M., **Schwartz, B. F.**, Rowe, H., Li, Y., Cheng, H., and Edwards, L., 2017. Late Quaternary Stalagmite Paleoclimate Records of Helictite Cave, VA. Geological Society of America – South-Central Section Meeting, San Antonio, TX, March 13-14, 2017.
22. †Dedeaux, Lenée, **Schwartz, B. F.**, Yuan, Y., Green, R. T., and Toll, N. J., 2017. Applying Data Mining Techniques to Model Hydraulic Head in the Edwards Aquifer. Geological Society of America – South-Central Section Meeting, San Antonio, TX, March 13-14, 2017.
23. **Schwartz, B. F.**, Covington, M. D., Myre, J., Kosic, K., and Thaler, E., 2016. Two Years of Continuous Data from the Omega Cave System: What Have We Learned So Far? Geological Society of America Annual Meeting, Denver, CO, September 25-28, 2016.
24. †Zappitello, Saj, **Schwartz, B. F.**, Wierman, D. A., 2016. Aquifer Sources of the Pedernales River, Texas. Geological Society of America Annual Meeting, Denver, CO, September 25-28, 2016.
25. †Dedeaux, Lenée, **Schwartz, B. F.**, and Yuan, Y., 2016. Applying Data Mining Techniques to Capture Outliers in Hydraulic Head Data: Edwards Aquifer, Central Texas. Geological Society of America Annual Meeting, Denver, CO, September 25-28, 2016.
26. †Hiler, Mark D. and **Schwartz, B. F.**, 2016. Delineating the Springshed of Cave Without a Name: Dye Tracing in the Lower Glen Rose Limestone. Geological Society of America Annual Meeting, Denver, CO, September 25-28, 2016.
27. \*Coleman, W. T., Hutchins, B. T., and **B.F. Schwartz.** 2016. Dynamics of Detectability: Insights from high-frequency sampling at a stygobiont hot-spot, Edwards Aquifer, Texas. International Conference on

Subterranean Biology (organized by International Society for Subterranean Biology). June 13-17, 2016, Fayetteville, Arkansas. Poster presentation.

28. \*Jenson, A., Nice, C., and **B.F. Schwartz**. 2016. Molecular and Morphological Analysis of *Stygobromus* sp. near San Marcos, TX. International Conference on Subterranean Biology (organized by International Society for Subterranean Biology). June 13-17, 2016, Fayetteville, Arkansas. Oral presentation.
29. †Worsham, M.R., \*P.R. Nair, W.H. Nowlin, R. Gibson, and **B.F. Schwartz**. 2016. The effect of selection and phenotype of response to light in subterranean, epigean, and interstitial Crangonyctidae. International Conference on Subterranean Biology (organized by International Society for Subterranean Biology). June 13-17, 2016, Fayetteville, Arkansas. Oral presentation.
30. Nowlin, W.H., †L.A. Loney, \*B.T. Hutchins, and **B.F. Schwartz**. 2016. Ecological stoichiometry and consumer-driven nutrient recycling in a subterranean aquatic community. International Conference on Subterranean Biology (organized by International Society for Subterranean Biology). June 13-17, 2016, Fayetteville, Arkansas. Oral presentation.
31. \*Hutchins, B.T., A.S. Engel, W.H. Nowlin, and **B.F. Schwartz**. 2016. Biodiversity, stability, and trophic complexity in the Edwards Aquifer, United States: The influence of chemolithoautotrophy on stygobiont community structure. International Conference on Subterranean Biology (organized by International Society for Subterranean Biology). June 13-17, 2016, Fayetteville, Arkansas. Oral presentation.
32. \*Hutchins, B.T., W.H. Nowlin, †L.A. Loney, A.S. Engel, and **B.F. Schwartz**. 2016. Invertebrate diversity effects on nutrient use and nutrient recycling in groundwater systems. Association for the Sciences of Limnology and Oceanography Annual Meeting. Santa Fe, New Mexico. June 5-10, 2016 (Invited oral presentation).
33. Nowlin, W.H., †A.P. Swink, and **B.F. Schwartz**. 2016. Factors affecting phosphorus uptake in karst rivers in central Texas. Society for Freshwater Science Annual Meeting. Sacramento, California. Oral presentation.
34. †Swink, AP, W.H. Nowlin and **B.F. Schwartz**. 2016. A meta-analysis of P uptake rates in lotic ecosystems: influence of local conditions on global patterns. Society for Freshwater Science Annual Meeting. May 21-26, 2016, Sacramento, California. Oral presentation.
35. **Schwartz, B. F.**, Covington, M. D., Myre, J., Kotic, K., Thaler, E., and Perne, M. 2015. Designing, Building, and Operating a Long-Term Instrumentation Network in the Omega Cave System, VA, USA: Results After the First Year. Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.
36. \*Jenson, Aubri., **Schwartz, Benjamin F.**, 2015. Modeling Speleogenesis and Aquifer Development in a Coastal Carbonate Platform: Quintana Roo, Mexico. Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.
37. \*Jenson, Aubri., **Schwartz, Benjamin F.**, 2015. Estimating Cave Entrance Density Using GIS Analysis: Quintana Roo, Mexico. Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.
38. †Zappitello, Sarah J., **Schwartz, Benjamin F.**, 2015. Groundwater – Surface Water Interactions in the Pedernales River Basin, Texas. Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.

39. \*Tobin, Benjamin W., **Schwartz, Benjamin F.**, Springer, A. E., Stevens, L., Ledbetter, J., Valle, C. M., and Schenk, E. R., 2015. Remote Karst Spring Characterization and Grouping to Focus Long-Term Monitoring Efforts in Sequoia, Kings Canyon, and Grand Canyon National Parks. Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.
40. †Markowski, Michael, **Schwartz, Benjamin F.**, Timmins, G., and Nowlin, W., 2015. Using Stormflow-Hydrograph Separation to Understand Infiltration and Recharge Processes in the Trinity Aquifer. Geological Society of America Annual Meeting, Baltimore, MD, November 1-4, 2015.
41. \*Hutchins, B.T., **Schwartz, B.F.**, and Nowlin, W.N., 2014. Trophic Specialization in a Diverse Assemblage of Phreatic Groundwater Amphipods. National Speleological Society Annual Meeting, Biospeleology Section, Huntsville, AL, July 14-28, 2014.
42. Ray, C. J., Gao, Y., **Schwartz, B.F.**, Suarez, M. B., Rowe, B., and Edwards, R. L., 2013. Stable isotopes of a speleothem from Helictite Cave, Virginia. American Geophysical Union Fall Meeting, San Francisco, CA, Dec 9-13, 2013
43. **Schwartz, B.F.**, Gerard, Brett R., Schreiber, Madeline E., and Schwinning, Susan, 2013. A Deeper Understanding of Processes Controlling Hydrogeochemical Fluxes through Shallow Karstic Critical Zones (the Epikarst). American Geophysical Union Fall Meeting, San Francisco, CA, Dec 9-13, 2013
44. Schwinning, Susanne, Jensen, Jennifer, Lomas, Mark, **Schwartz, B.F.**, and Woodward, Ian, 2013. The Prediction of Drought-Related Tree Mortality in Vegetation Models. American Geophysical Union Fall Meeting, San Francisco, CA, Dec 9-13, 2013
45. †Stinson, Chasity L., **Schwartz, Benjamin F.**, Schwinning, Susan, Gerard, Brett R., and Ramirez, Philip. Characterization of Epikarst Storage, Infiltration, and Recharge Using Applied Tracers and Drip Water Analysis: McCarty Cave, South-Central Texas, USA. Geological Society of America Annual Meeting, Charlotte, NC, November 3-7, 2013.
46. **Schwartz, B.F.**, Ficco, M. J., Covington, M. D., 2013. 17 Years of Research and Exploration in the Omega Cave System: Joint Management of Virginia's Longest and Deepest Cave by the Cave Conservancy of the Virginias and the U.S. Forest Service. Geological Society of America Annual Meeting, Denver, CO, Oct 27-30, 2013
47. **Schwartz, B.F.**, Hutchins, B. T., and Nowlin, W. N., 2013. Temporal Variability in Species Richness and Abundance with High-Frequency Sampling from an Edwards Aquifer Artesian Well in San Marcos, TX, USA: Can Biotic Transport Provide Information About Flowpaths? Geological Society of America Annual Meeting, Denver, CO, Oct 27-30, 2013
48. \*Tobin, B. W., and **Schwartz, B.F.**, 2013. The Role of Karst Groundwater in a Snowmelt-Dominated Hydrologic System: The Kaweah River, California, USA. Geological Society of America Annual Meeting, Denver, CO, Oct 27-30, 2013
49. †Rossi, N. P., Johnson, E. A., and **Schwartz, B.F.**, 2013. U-Pb Geochronology of Grenvillian and Late Jurassic Lower Crustal Xenoliths in the Shenandoah Valley. Geological Society of America Annual Meeting, Denver, CO, Oct 27-30, 2013
50. †Helsley, J. T., Johnson, E. A., Bodnar, R. J., Farley, C., and **Schwartz, B.F.**, 2013. Ultrahigh Temperatures Recorded in Lower Crustal Xenoliths from the Shenandoah Valley, Va. Geological Society of America Annual Meeting, Denver, CO, Oct 27-30, 2013
51. †Eagle, S., Orndorff, W., **Schwartz, B.F.**, Scott, H. and Schreiber, M.E., 2013. Analysis of Hydrologic and Geochemical Time Series Data at James Cave, Virginia: Implications for Epikarst Influence on

Recharge in Appalachian Karst Aquifers. Geological Society of America Annual Meeting, Denver, CO, Oct 27-30, 2013

52. **Schwartz, B. F.**, Schwinning, S., Gerard, B., Kukowski, K. R., Stinson, C. L., and Dammeyer, H. C., 2013, Using Hydrogeochemical and Ecohydrological Responses to Understand Epikarst Processes in Semi-Arid Systems, Edwards Plateau, Texas, USA. Karst Waters Institute Conference – Carbon and Boundaries, Carlsbad, New Mexico, January 7-11, 2013.
53. ‡Wright, Amanda, Johnson, Elizabeth A., Phillips, Ron, **Schwartz, Benjamin F.**, 2013, Petrologic Investigation of Lower Crustal Xenoliths in Highland County, VA. James Madison University Student Research Symposium.
54. \*Hutchins, B. T., **Schwartz, B. F.**, Engel, A. S., 2013, Environmental Controls on Organic Matter Production and Transport Across Surface-Subsurface and Geochemical Boundaries in the Edwards Aquifer, Texas, USA. Karst Waters Institute Conference – Carbon and Boundaries, Carlsbad, New Mexico, January 7-11, 2013.
55. **Schwartz, B. F.** and Gerard, B. R. Fine-scale Hydrologic and Geochemical Responses in Continuous Data Provide Clues to Understanding Epikarst Structure and Hydrogeology in the Edwards Plateau, Texas, USA. Geological Society of America, South-Central Section Annual Meeting, Austin, TX, April 5-6, 2013.
56. †Eagle, S., Schreiber, M.E., Orndorff, W., **Schwartz, B.F.**, Gerst J.D, Scott, H. 2012. Statistical analysis of geochemical data to characterize the role of the epikarst in controlling the quantity and quality of recharge to a telogenetic karst aquifer, Geological Society of America Annual Meeting, Charlotte NC Nov 4-7, 2012
57. Schwinning, Susanne, Kukowski, Kelly, and **Schwartz, B. F.** Which traits are correlated with high drought mortality in trees? A case study from the Edwards Plateau, Texas, USA. Annual Conference of the British Ecological Society, Birmingham, UK, December 17-20, 2012.
58. \*Tobin, Benjamin W., **Schwartz, B. F.** Maintaining River Flow in an Alpine Karst Setting: The Roles of Snowmelt and Shallow and Deep Groundwater. Geological Society of America Annual Meeting, Charlotte, NC, November 3-7, 2012.
59. \*Stinson, Chasity L., **Schwartz, B. F.**, Gerard, Brett R., Schwinning, Susan, Ramirez, Philip, and Timmins, Gabrielle. Preliminary Results from a Multi-Tracer Epikarst Recharge Experiment: McCarty Cave, Texas, USA. Geological Society of America Annual Meeting, Charlotte, NC, November 3-7, 2012.
60. \*Gerard, Brett R., **Schwartz, B. F.**, Schwinning, Susan, Ramirez, Philip, Stinson, Chasity L., and Timmins, Gabrielle. Effects of Environmental Parameters and Precipitation Dynamics on Infiltration and Recharge into the Trinity Aquifer of Central Texas, USA. Geological Society of America Annual Meeting, Charlotte, NC, November 3-7, 2012.
61. \*Eagle, Sarah D., Schreiber, Madeline E., Orndorff, William D., **Schwartz, B. F.**, Gerst, Jonathan, and Scott, Heather. Statistical Analysis of Geochemical Data to Characterize the Role of Epikarst in Controlling the Quantity and Quality of Recharge to a Telogenetic Karst Aquifer. Geological Society of America Annual Meeting, Charlotte, NC, November 3-7, 2012.
62. \*Swink, Aaron, Nowlin, Weston, and **Schwartz, B. F.** Storm Mediated Changes in Nitrogen and Phosphorus Uptake Length in a Spring-Fed River. Great Plains Limnological Conference, Fayetteville, AR, October 6, 2012.

63. **Schwartz, B. F.**, Sixteen Years of Exploration in the Omega Cave System. National Speleological Society Annual Conference, Lewisburg, WV, June 25-29, 2012.
64. Benjamin T. Hutchins, Annette S. Engel, Weston H. Nowlin, and **Schwartz, B. F.**, Organic Matter Origins Influence Trophic Complexity in a Phreatic Karst Aquifer. National Speleological Society Annual Conference, Lewisburg, WV, June 25-29, 2012.
65. Benjamin Tobin and **Schwartz, B. F.**, Quantifying Geospatial, Geochemical, and Hydrologic Variability of Karst Aquifers in the Kaweah River Basin, California, USA. National Speleological Society Annual Conference, Lewisburg, WV, June 25-29, 2012.
66. Benjamin Tobin, **Schwartz, B. F.**, and Hutchins, B., Cave Without A Name, Boerne, Texas. National Speleological Society Annual Conference, Lewisburg, WV, June 25-29, 2012.
67. \*Stinson, C. L., **Schwartz, B. F.**, Tobin, B. W., Gerard, B. R., Ramirez, P., Timmins, G., Hutchins, B., and Schwinning, S. Trinity Aquifer Epikarst Study Using  $\delta^{18}\text{O}$  and  $\delta^2\text{D}$  Stable Isotope Analysis, Cave Without A Name, South-Central Texas. Geological Society of America, South-Central Section Annual Meeting, Alpine, TX, March 8-9, 2012.
68. \*Tobin, B. W., **Schwartz, B. F.**, Gerard, B. R., Ramirez, P., Timmins, G., Hutchins, B., Stinson, C. L., and Schwinning, S. Autogenic vs. Allogenic Recharge: Searching for the Source of the Stream in Cave Without A Name, Boerne, TX. Geological Society of America, South-Central Section Annual Meeting, Alpine, TX, March 8-9, 2012.
69. **Schwartz, B. F.**, Nowlin, W., Hutchins, B., Hardy, T. B., Ramirez, P., Timmins, G., Gerard, B. R., and Hoesel, K. Geochemical Trends and Storm Responses at San Marcos Springs, Texas: New Perspectives and New Questions. Geological Society of America, South-Central Section Annual Meeting, Alpine, TX, March 8-9, 2012.
70. \*Gerard, B. R., **Schwartz, B. F.**, Ramirez, P., Stinson, C. L., Tobin, B. W., Timmins, G., Hutchins, B., and Schwinning, S. The Influence of Barometric Pressure Fluctuations on Cave Drip Rates. Geological Society of America, South-Central Section Annual Meeting, Alpine, TX, March 8-9, 2012.
71. Schreiber, M. E., **Schwartz, B. F.**, Orndorff, W. D., Gerst, J., and Scott, H., Epikarst Control on Quantity and Quality of Recharge to Karst Aquifers: Current Results from Long-Term Monitoring Within James Cave, Virginia. Geological Society of America Annual Meeting, Minneapolis, MN, October 8 – 13, 2011.
72. \*Gerard, B. R., **Schwartz, B. F.**, and Schwinning, S., Modeling the Precipitation Threshold Required for Recharge in a Karst Aquifer of Central Texas. Geological Society of America Annual Meeting, Minneapolis, MN, October 8 – 13, 2011.
73. \*Tobin, B. W., **Schwartz, B. F.**, Storm-event Responses of Five Karst Springs in the Kaweah River Basin, Sierra Nevada, California. Geological Society of America Annual Meeting, Minneapolis, MN, October 8 – 13, 2011.
74. **Schwartz, B. F.**, Gerard, B. R., Tobin, B. W., Ramirez, P., Hutchins, B., Schwinning, S. and Schreiber, M. E., Hydrogeochemical Responses at in-Cave Sites as Indicators of Epikarst Processes: Cave Without A Name, Central Texas, USA. Geological Society of America Annual Meeting, Minneapolis, MN, October 8 – 13, 2011.
75. Hardy, T., Nowlin, W., **Schwartz, B. F.**, and Bonner, T. H. San Marcos River Observing System. American Fisheries Society, Annual Meeting, Seattle, WA, September 4-8, 2011.

76. Mock, L. **Schwartz, B. F.**, Nowlin, W. H., Hutchins, B. T., Hardy, T., Bonner, T. H., 2011, The Role of Metrology in Monitoring and Preserving the Water Quality in the Edwards Aquifer in Central Texas. 2011 National Conference of Standards Laboratories International (NCSLI) Symposium. August 21-25, 2011, National Harbor, MD.
77. \*Hutchins, B. and **Schwartz, B. F.**, and Engel, A. S. Hydrogeologic and Geochemical Controls on Nutrient Availability and Food Web Dynamics in the Biodiverse Karstic Edwards Aquifer, TX, USA. Ecological Society of America, Annual Meeting, Austin, TX, August 7-12, 2011.
78. Engel, A. S., Hutchins, B. **Schwartz, B. F.**, Gray, C., and Birdwell, J. E. Evidence for a Non-terrogenous Food Web Base in the Edwards Aquifer, Texas. National Speleological Society, Annual Meeting, Glenwood Springs, CO. July 18-22, 2011.
79. \*Hutchins, B.T., **Schwartz, B. F.**, and Engel A. S. Nutrient supply and chemolithoautotrophy as a possible driver of stygobiont diversity and aquifer evolution: the Edwards Aquifer of South-Central Texas. 2011 International Conference on Karst Hydrogeology and Ecosystems. Bowling Green, KY, June 8-10, 2011.
80. \*Hutchins, B. and **Schwartz, B. F.**, and Engel A. S. Linking Hydrogeology, Geochemistry, and Microbiology to Food Web Dynamics in the Biodiverse Phreatic Karstic Edwards Aquifer, TX, USA. North American Benthological Society Annual Meeting, Providence, RI, May 22-26, 2011.
81. \*Tobin, Benjamin W., **Schwartz, B. F.**, Quantifying Source Water Elevations for Karst Springs of the Sierra Nevada, California. The roles of Stable Isotopes in Water Cycle Research, Keystone, CO, March 29-31, 2011
82. \*Scott, Heather, Schreiber, M. E., **Schwartz, B. F.** Orndorff, W. D. Spatial and Temporal Patterns of Temperature at James Cave, Virginia. Paper No. 6-8. Geological Society of America – Southeastern Section Meeting, Wilmington, NC, March 23-25, 2011.
83. Schwinning, S., Goodsheller, K. R., **Schwartz, B. F.** Fractured Epikarst Bedrock as Water Source for Woody Plants in Savanna. Abstract H11H-0925. AGU Fall Meeting, San Francisco, CA, December 13-17, 2010.
84. \*Tobin, Benjamin W., **Schwartz, B. F.**, Downstream Evolution of Water Quality and Quantity in Mountain Marble Karst Aquifers Geological Society of America Annual Meeting, Denver, CO, October 31 – November 3, 2010.
85. **Schwartz, B. F.**, Gerst, J., Schreiber, M., Tobin, B. W., Orndorff, W., Doctor, D. H., Schwinning, S. Hydrologic Responses in Epikarst: A Comparative Study Between Virginia and Texas. Geological Society of America Annual Meeting, Denver, CO, October 31 – November 3, 2010.
86. Hardy, T. B., Nowlin, W., **Schwartz, B. F.**, Bonner, T. Implementation of the San Marcos River Oberving System: a Spatially Explicit Delineation of a Spring System based on Physical, Hydrologic, Chemical and Biological Monitoring. 8<sup>th</sup> International Symposium on Ecohydraulics, Seoul, Korea, September 12-16, 2010.
87. **Schwartz, B. F.**, Barton, H., Futrell, M., and Ficco, M. Tongzi 2010: A summary report on the March expedition (China). National Speleological Society Annual Conference, Essex Junction, VT, August 2-6, 2010.
88. \*Tobin, Benjamin W., **Schwartz, B. F.**, Assessing Groundwater Resources in a Mountain Setting Geological Society of America, Cordilleran Section Annual Meeting, Anaheim, CA, May 27-29, 2010.

89. †Brauch, B., Bennett, J., Urbanczyk, K., and **Schwartz, B. F.** Spring Studies in the Lower Canyons of the Rio Grande, Rio Grande Wild and Scenic River, Texas. Geological Society of America Meeting, North-Central and South Central Joint Meeting, Branson, MO, April 11-13, 2010.
90. **Schwartz, B. F.**, Doctor, D. H., Gary, M. O., and Covington, M. D. Quantifiable Characteristics for a Statistical Approach Toward Karst Classification. Geological Society of America Meeting, North-Central and South Central Joint Meeting, Branson, MO, April 11-13, 2010.
91. \*Hutchins, B., **Schwartz, B. F.**, and Heard, T. M. Unusual  $\delta^{18}\text{O}$  Values from the Edwards and Edwards Trinity Aquifers in Central Texas: Interpretations and Potential Fractionation Mechanisms. Geological Society of America Meeting, North-Central and South Central Joint Meeting, Branson, MO, April 11-13, 2010.
92. **Schwartz, B.F.**, Upchurch, G.R., Willard, D.A., Bernhardt, C.E., and Valella, P.A. 2009. A New Late Glacial Site in the Central Appalachians of Virginia. Preliminary Findings From Paleobotany, Palynology, and Geomorphology. Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract PP31C-1374. AGU Fall Meeting, San Francisco, CA, December 14-18, 2009.
93. Bennett, J., Urbanczyk, K., Brauch, B., **Schwartz, B. F.** and Shanks, W.C.P. The influence of Springs on Discharge and River Water Chemistry in the Lower Canyons, Rio Grande Wild and Scenic River, Texas. Geological Society of America Annual Meeting, Portland, OR, October 18-21, 2009.
94. Urbanczyk, K., Bennett, J., Brauch, B., Dyess, J., and **Schwartz, B. F.** Structural Geologic Features of the Lower Canyons, Rio Grande Wild and Scenic River, Texas. Geological Society of America Annual Meeting, Portland, OR, October 18-21, 2009.
95. Gao, Y., Anthony, D. M., and **Schwartz, B. F.** Development of a Karst Field School to Conduct Interdisciplinary Education and Research Activities in the Southeastern Appalachian Region. Geological Society of America Annual Meeting, Portland, OR, October 18-21, 2009.
96. †Gerst, Jonathan, **Schwartz, B. F.**, Schreiber, M. E., Doctor, D. H., Epikarst Role in Controlling the Quality of Karst Aquifer Recharge. Geological Society of America Annual Meeting, Portland, OR, October 18-21, 2009
97. †Dammeyer, H. C., Goodsheller, K., Schwinning, S., **Schwartz, B. F.** Changes in tree water status due to clear-cutting in an oak/juniper woodland on the Edwards Plateau. Texas Chapter of the Society for Ecological Restoration, New Braunfels, October 6-8, 2009.
98. †Goodsheller, K., Dammeyer, H.C., Schwinning, S., **Schwartz, B. F.** Response to extreme drought by three Edwards Plateau tree species: live oak, Ashe juniper and cedar elm. Texas Chapter of the Society for Ecological Restoration, New Braunfels, October 6-8, 2009.
99. Doctor, D. H., **Schwartz, B. F.**, Gary, M. O., Preliminary Development of a Quantitative Karst Classification System, PHORMS. 15<sup>th</sup> International Congress of Speleology, Kerrville, TX, July 19-26, 2009.
100. **Schwartz, B. F.**, Doctor, D. H., Geomorphic and Hydrogeologic Evolution of Karst in the Burnsville Cove, Virginia, U.S.A.: New Evidence and Perspectives. 15<sup>th</sup> International Congress of Speleology, Kerrville, TX, July 19-26, 2009.
101. **Schwartz, B. F.**, Doctor, D. H., Culver, D., Gerst, J., Hyde, S., Orndorff, W., Pipan, T., Reid, J. W., Schreiber, M. Characterizing epikarst hydrogeology using integrated hydrologic, geochemical and biological approaches. Geological Society of America Annual Meeting, October 4-8, 2008.

102. **Schwartz, B. F.**, Doctor, D. H., Swezey, C. S., Piatak, N. M., Geologic and Geomorphic Controls on Conduit Development in Burnsville Cove, Bath County, Virginia. Geological Society of America Annual Meeting, October 4-8, 2008.
103. †Gerst, J., **Schwartz, B. F.**, Hyde, S., Schreiber, M., The Role of Epikarst in Controlling Water Quality. Geological Society of America Annual Meeting, October 4-8, 2008.
104. **Schwartz, B. F.**, Hyde, S., Schreiber, M. E., Orndorff, Doctor, D. H., Culver, D., Pipan, T., Reid, J. W., High resolution hydrobiogeochemical response of cave drip-waters to surface conditions. Second Appalachian Karst Symposium, Eastern Tennessee State University, Johnson City, TN, May, 2008.
105. **Schwartz, B. F.**, Orndorff, W., Ficco, J., Balfour, B., Davis, N. W., Futrell, M., Hydrogeology of the Mississippian Carbonate Karst System, Powell Mountain, Virginia. Second Appalachian Karst Symposium, Eastern Tennessee State University, Johnson City, TN, May, 2008.
106. ‡Hyde, S., **Schwartz, B. F.**, Lucas, P., 2007, Characterizing discharge signals and flow mechanisms at a Virginia ebb and flow karst spring. Poster presentation at the *Geological Society of America annual meeting*, October, 2007
107. **Schwartz, B. F.**, Schreiber, M., 2007, Field scale soil moisture measurements using TDR-calibrated ERT data. Oral presentation at the *Geological Society of America annual meeting*, October, 2007
108. **Schwartz, B. F.**, Schreiber, M., 2006, Examining temporal changes in soil moisture in a karst sinkhole using differential ERT and TDR. Oral presentation at the *Virginia Water Science and Technology Symposium*, November, 2006
109. **Schwartz, B. F.**, Schreiber, M., 2006, Integrating Differential Electrical Resistivity Tomography and Time Domain Reflectometry as a tool for modeling soil moisture and infiltration in sinkholes. Oral presentation at the *Geological Society of America annual meeting*, October, 2006
110. **Schwartz, B. F.**, 2006, An update on Omega Cave System: the last 6 years of exploration and discovery in Wise County, Virginia. Oral presentation at the *National Speleological Society annual meeting*, August, 2006
111. **Schwartz, B. F.**, Schreiber, M., 2006, Integrating Differential Electrical Resistivity Tomography and Time Domain Reflectometry as a tool for modeling soil moisture and infiltration in sinkholes. Poster presented at the *SEG 2006 Hydrogeophysics Workshop*. August, 2006
112. **Schwartz, B. F.**, 2006, Techniques for measuring soil moisture in sinkholes. Oral presentation at the *Graduate Student Research Symposium*, Virginia Tech Dept. of Geosciences, March, 2006
113. **Schwartz, B. F.** and Schreiber, M. E., 2005, Using TDR and 2D Differential ERT to monitor changes in soil moisture in mantled agricultural sinkholes. Oral presentation at the *Geological Society of America Annual meeting*, October, 2005
114. **Schwartz, B. F.**, 2005, A multi-method approach to characterizing sinkhole hydrogeology and recharge mechanisms in agricultural settings. Oral presentation at the *Graduate Student Research Symposium*, Virginia Tech Dept. of Geosciences, March, 2005
115. **Schwartz, B. F.**, Schreiber, M. E., Orndorff, W. D., 2004, Hydrologic Characterization of Sinkholes in Agricultural Settings. Oral presentation at the *Geological Society of America annual meeting*, November 2004.

116. **Schwartz, B. F.**, Schreiber, M. E., Orndorff, W. D., 2004, Hydrologic Characterization of Sinkholes Using a Multi-method Approach. Oral presentation at the *Virginia Water Resources Research Center symposium*, October 2004.
117. **Schwartz, B. F.**, Schreiber, M. E., Orndorff, W. D., 2004, Hydrologic Characterization of Sinkholes Using a Multi-method Approach. Poster presented at *Geological Society of America NE-SE meeting*, March 2004.
118. Orndorff, W. D., **Schwartz, B. F.**, Orndorff, Z. W., 2004, Patterns of Karst Hydrological Systems Developed in Ordovician-aged Carbonates of the Southwestern Virginia Valley and Ridge. Oral presentation at the *Geological Society of America NE-SE meeting*, March 2004.
119. **Schwartz, B. F.**, 2004, Hydrologic characterization of sinkholes using a multi-method approach. Oral presentation at the *Graduate Student Research Symposium*, Virginia Tech Dept. of Geosciences, March, 2004

### **Invited Presentations**

1. **Schwartz, B. F.**, August 31, 2016, Exploring and Mapping the Deepest Cave in the USA: Tears of The Turtle Cave, Bob Marshall Wilderness, MT. Speaker at the University of Texas Grotto Meeting.
2. **Schwartz, B. F.**, May, 2016, Exploring and Mapping the Deepest Cave in the USA: Tears of The Turtle Cave, Bob Marshall Wilderness, MT. Speaker at Outdoor Recreation graduate class for Dr. Glenn Hanley, Texas State University.
3. **Schwartz, B. F.**, September 25, 2014, Introduction to the Amazing Biology in the Deep Artesian Edwards Aquifer. Monthly Seminar Series, Hays County Master Naturalists.
4. **Schwartz, B. F.**, October 15, 2014, Exploring and Mapping the Deepest Cave in the USA: Tears of The Turtle Cave, Bob Marshall Wilderness, MT. Speaker at the University of Texas Grotto Meeting.
5. **Schwartz, B. F.**, June 26, 2014, Epikarst Hydrogeology, Trees, and Recharge in the Trinity and Edwards Aquifers, Central TX, USA. Monthly Seminar Series, Hays County Master Naturalists.
6. **Schwartz, B. F.**, and Brett Gerrard: June 5, 2014, Measuring and Modeling Infiltration and Recharge in Central TX, USA. South Central Texas Water Research Interest Group
7. **Schwartz, B. F.**, January 30, 2013, Epikarst Hydrogeology and Deep Artesian Biology in the Trinity and Edwards Aquifers, Central TX, USA. Weekly Seminar Series, University of Minnesota, Department of Geology and Geophysics.
8. **Schwartz, B. F.**, October 5, 2012, Maximum and Ebb-and-Flow Discharge in Karst Systems: What Strange Sedimentary Deposits Can Tell Us. Weekly Soft Rock Brown-bag Lunch Seminar Series, University of Tennessee, Knoxville, Department of Earth and Planetary Sciences.
9. **Schwartz, B. F.**, October 4, 2012, Characterizing flow and recharge in epikarst systems: a multi-disciplinary, multi-year approach. Klepser Seminar Series, University of Tennessee, Knoxville, Department of Earth and Planetary Sciences.
10. **Schwartz, B. F.**, September 12, 2011, Science and Water in Spring Lake and the Upper San Marcos River: Why Does it Matter. Monthly Science Café speaker at Wake The Dead Coffee House, San Marcos, TX.

11. **Schwartz, B. F.**, November 11, 2010, Tongzi 2010, Science and Exploration in Wulong County, Chongqing Municipality, China. Monthly luncheon speaker for the South Texas Geological Society, San Antonio, TX.
12. **Schwartz, B. F.**, October 4, 2010, Tongzi 2010, Exploration and Karst Research in Wulong China. Weekly seminar speaker for the Texas State University Geology Club, San Marcos, TX.
13. **Schwartz, B. F.**, Invited guest lecturer for Groundwater Resources Class, Geography 4334, September 3, 2009.
14. **Schwartz, B. F.**, April 10, 2009, Speleology and Karst research in Virginia. Weekly Hydro Brown Bag Seminar speaker at UT Austin, Jackson School of Geosciences, Austin, TX
15. **Schwartz, B. F.**, February 26, 2009, Interdisciplinary Approaches to Speleology and Karst Studies. Weekly seminar speaker: UT Arlington Department of Earth and Environmental Sciences, Arlington, TX
16. **Schwartz, B. F.**, November 12, 2008, Omega Cave System: 13 years of exploration and discovery. Weekly seminar speaker for the Texas State University Geology Club, San Marcos, TX.
17. **Schwartz, B. F.**, March, 2007, Hydrogeophysics and Hydrogeology in Virginia's Karst. Weekly seminar speaker at USGS-Reston, Reston, VA
18. **Schwartz, B. F.**, November, 2006, Karst, hydrology and geophysics - (How to turn a sinkhole into a complex hydrogeophysical problem). Weekly seminar speaker at Eastern Tennessee State University, Department of Physics, Astronomy and Geology, Johnson City, TN.
19. **Schwartz, B. F.**, 2006, Karst, hydrology and geophysics - (How to turn a sinkhole into a complex hydrogeophysical problem). Weekly seminar speaker at Appalachian State University, Department of Geology, Boone, N.C.

### **Student Dissertations and Theses Supervised or Committees**

Supervisor / Chair, Dissertation, Status: In Progress. (2016 - Present). Texas State University.

Student: William Coleman, Doctoral.

Member, Dissertation, Status: In Progress. (2015 - Present). Texas State University.

Student: Zachary Adcock, Doctoral.

Member, Master's Thesis, Status: In Progress. (2018 - Present). Biology.

Student: Rosa Ramirez, Graduate, MS.

Member, Master's Thesis, Status: In Progress. (2018 - Present). Biology.

Student: Chase Corrington, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2018 - 2020). Biology.

Student: Alan Bond, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2018 - 2020). Biology.

Student: Michaela Bowles, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2018 - 2020). Biology.

Student: Kayla Hayes, Graduate, MS.

Member, MA Project, Status: Completed. (2018 - 2020). Sustainability

Student: Aspen Navarro, Graduate, MA.

Supervisor / Chair, Exit Exam, Status: Completed. (2017 - 2019). Biology.

Student: Evan Valenta, Graduate, MA.

Supervisor / Chair, Master's Thesis, Status: Completed. (2017 - 2019). Biology

Student: Dalila Loiacomo, Graduate, MS.

Supervisor / Chair, Master's Thesis, Status: Completed. (2017 - 2019). Biology

Student: Lorena Martinez, Graduate, MS.

Member, Dissertation, Status: Completed. (2015 - 2019). Biology.

Student: Parvathi Nair, Graduate, Doctoral.

Supervisor / Chair, Dissertation, Status: Completed. (2014 - 2019). Biology.

Student: Aubri Jenson, Graduate, Doctoral.

Member, Master's Thesis, Status: Completed. (2016 - 2018). Biology.

Student: Beth Crouchet, Graduate, MS.

Supervisor / Chair, Master's Thesis, Status: Completed. (2015 - 2017). Biology.

Student: Lenée Dedeaux, Graduate, MS.

Supervisor / Chair, Master's Thesis, Status: Completed. (2015 - 2017). Biology.

Student: Mark Hiler, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2015 - 2016). Biology.

Student: Duane Freedman, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2014 - 2016). Biology.

Student: Ovie Agare, Graduate, MS.

Supervisor / Chair, Master's Thesis, Status: Completed. (2014 - 2016). Biology.

Student: Sarah Zappitello, Graduate, MS.

Co-supervisor, Master's Thesis, Status: Completed. (2013 - 2016). Biology.

Student: Aaron Swink, Graduate, MS.

Supervisor / Chair, Master's Thesis, Status: Completed. (2013 - 2016). Biology.

Student: Michael Markowski, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2012 - 2016). Biology.

Student: Lauren Loney, Graduate, MS.

Member, Dissertation, Status: Completed. (2011 - 2015). Univ. of South Florida.

Student: Johanna Kovarik, Doctoral, Ph.D.

Member, Master's Thesis, Status: Completed. (2011 - 2015). Biology.

Student: Emrah Ozel, Graduate, MS.

Supervisor / Chair, Master's Thesis, Status: Incomplete. (2011 - 2013). Biology.

Student: Chasity Stinson, Graduate. Student withdrew from program.

Member, Master's Thesis, Status: Completed. (2011 - 2013). UT San Antonio.

Student: Mark Childre, Graduate, MS.

Supervisor / Chair, Dissertation, Status: Completed. (2009 - 2013). Biology.

Student: Benjamin Hutchins, Graduate, Doctoral.

Supervisor / Chair, Dissertation, Status: Completed. (2009 - 2013). Biology.

Student: Benjamin Tobin, Graduate, Doctoral.

Co-supervisor, Master's Thesis, Status: Completed. (2009 - 2013). Virginia Tech.

Student: Jonathan Gerst, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2011 - 2012). Biology.

Student: Laura McCalla, Graduate, MS.

Supervisor / Chair, Master's Thesis, Status: Completed. (2009 - 2012). Biology.

Student: Brett Gerard, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2009 - 2011). Biology.

Student: Goniela Iskali, Graduate.

Member, Master's Thesis, Status: Completed. (2008 - 2011). Biology.

Student: Danielle Livingston, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2008 - 2011). Biology.

Student: Joshua Ethridge, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2008 - 2010). Biology.

Student: Crystal LaBoeuf, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2008 - 2010). Biology.

Student: Heather Dammeyer, Graduate, MS.

Member, Master's Thesis, Status: Completed. (2008 - 2010). Biology.

Student: Kelly Goodsheller, Graduate, MS.

### **Courses developed and taught at TX State**

BIO 7102: Groundwater Surface Water Interactions: 2009. Taught every year.

BIO 7360T: Karst Hydrogeology and Geomorphology, lectures and field trip: 2009. Taught every-other year.

BIO 7468: Groundwater Resources, field trip, lectures, and lab exercises: 2009. Taught every-other year.

GEOL 4421: Hydrogeology, lectures, labs, field exercises and field trips: 2008. Taught every year.

### **Selected Professional Service**

2020 - present Member of National Cave and Karst Research Institute Board of Directors

- 2011 - present Member of the Karst Waters Institute Board of Directors (Treasurer since 2017).
- 2010 - present Member of the Spring Lake Environmental Committee which coordinates and oversees research activities in Spring Lake in San Marcos, TX.
- 2009 - 2017 Member of the Edwards Aquifer Authority's Aquifer Science Advisory Panel (ASAP)
- 2008 - present Associate Editor of Earth Sciences: Journal of Cave and Karst Studies
- 2005 Assisted with a four-day Project Underground workshop and field trip for VA earth science teachers where the primary emphasis was on how to incorporate karst science into SOL materials. Presented an invited talk about my research on sinkhole hydrology and hydrogeophysics and discussed how this current research could be incorporated into classroom materials.
- 2003 - present Project co-manager: Powell Mountain Karst Preserve. Responsibilities include: managing access for research and exploration to several caves (including the longest and deepest cave in VA) lying within the PMKP – owned by the Cave Conservancy of the Virginias (CCV); managing and compiling all field notes, scientific data and maps for the project in hard copy and digital formats; and compiling annual reports of activities and accomplishments for the CCV and the National Forest Service.
- 1997 – 2003 and 2006 – 2007 Director - Board of directors for Butler Cave Conservation Society. Responsibilities include a variety of duties related to operating a non-profit organization, as well as serving on many committees.
- 1993 - present Director - Board of directors for Virginia Speleological Survey. Duties include coordinating and managing research and exploration in several regions of Virginia
- Reviewer: Journal of Hydrology, Hydrogeology Journal, Lakes and Reservoirs Research and Management Journal, Journal of Cave and Karst Studies, Zookeys Journal, Groundwater Journal, National Science Foundation, US Geologic Survey, US Fish and Wildlife Service, Israel Science Foundation, and many others.

### **Other Professional Experience**

- 2001 - 2003 Full time summer employee for Virginia Department of Conservation and Recreation, Division of Natural Heritage, Karst Program in Radford, VA. Primary duties included delineation of karst drainage basins in VA with dye tracing, water sampling, geologic field observations and interpretation, managing and compiling data in a GIS, and writing annual progress reports.
- 2000 - 2001 Part time employee at Anderson and Associates Surveyors and Engineers, Blacksburg, VA. Performed high precision GPS surveys in SW VA. Position also required extensive CAD work.
- 1995 - 1999 CNC machinist for Nicholson Precision Instruments, Gaithersburg, MD. Specialized in prototyping and machining small close tolerance parts made with aluminum, plastics and exotic materials. Also specialized in precision mold making and molding of complex silicone rubber gaskets. Managed all daily operations of a machine shop.
- 1991 - 1995 Party chief, rodman, and courthouse researcher for Jeffery Hiner, Land Surveyor, Monterey, VA. Primary duties related to rural land surveying.

**Professional Affiliations**

Geologic Society of America  
American Geophysical Union  
National Speleological Society  
Karst Waters Institute  
AAAS