

H.L. (LEN) VACHER
CURRICULUM VITAE (2/2017)

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School of Geosciences, NES 201, University of South Florida, 4202 E. Fowler Ave, Tampa
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Present Position

1983- University of South Florida, Department of Geology. Associate Professor (1983-1991).
Tenured (1989). Professor (1991-)

Education

BS University of Washington, 1965
MS Northwestern University, 1969
PhD Northwestern University, 1971

Academic Experience

1969-1971, Research Associate, Bermuda Biol. Station for Research, St. Georges West, Bermuda.
1971-1972, Post-doctoral Research Associate, Dept of Geology, SUNY at Binghamton, NY.
1974-1983, Washington State University, Department of Geology. Assistant Professor (1974-1980),
Tenured (1979); Associate Professor (1980-1983);

Professional Experience

1972-1974, Resident Consultant-Geologist/Hydrologist, Bermuda Public Works Department,
1974-1982, Summers. Consultant Geologist/Hydrogeologist for Bermuda Government

Professional Societies

Geological Society of America (Fellow)
National Association of Geological Teachers (Lifetime member)
Mathematical Association of America
American Statistical Association
Professional Geologist, State of Florida (PG785)

Honors and Awards

1965 Phi Beta Kappa, University of Washington
1965-1968 NSF Graduate Fellowship
1994. USF TIP Award. (competition, Teaching Incentive Program, \$5,000 base pay increase)
1998. USF TIP Award. (competition, Teaching Incentive Program, \$5,000 base pay increase)
1998. USF PEP Award. (competition, Professor Excellence Program, \$5,000 base pay increase)
2004. Neil Miner Award (National Association of Geoscience Teachers, career award)

Boards of Directors

2004-2006 – National Numeracy Network, Inc. (founding board)
2006-2008 – Karst Waters Institute
2005-2010 – National Caves and Karst Research Institute

PUBLICATIONS: Books

1997. *Geology and Hydrogeology of Carbonate Islands*. Elsevier, Amsterdam, 948 pp. (H.L. Vacher and T.M. Quinn, Editors) http://scholarcommons.usf.edu/gly_facpub/37/
ISBN 0080532470 (hardback, 1997)
ISBN 0444516441 (paperback, 2004)

PUBLICATIONS: Chapters or Parts of Books

1973. Coastal dunes of Younger Bermuda, in D. R. Coates (ed.), *Coastal Geomorphology*, Publications in Geomorphology, SUNY at Binghamton, p. 335-391. (H.L. Vacher)
1975. Bermuda, in R. W. Fairbridge (ed.), *The Encyclopedia of World Regional Geology*, Part I, Western Hemisphere, p. 117-121. (F.T. Mackenzie and H.L. Vacher)
1975. Diagenetic reactions as stochastic processes -- Application to Bermudian eolianites, in E. H. T. Whitten (ed.), *Quantitative Models in the Earth Sciences*: Geol. Soc. America Memoir, 142, p. 187-204. (G.M. Lafon and H.L. Vacher)
1987. Case history no. 12: Sea water intrusion in coral reef islands: Devonshire Lens, Bermuda. In Custodio, E. (ed.), *Groundwater problems in coastal areas*. UNESCO (Paris), p. 566-571. (H.L. Vacher and J.F. Ayers).
1992. Hydrology of meteoric diagenesis: Effect of Pleistocene stratigraphy on fresh-water lenses of Big Pine Key, Florida, in C.H. Fletcher and J.E. Wehmiller (eds.), *Quaternary Coasts of the United States: Lacustrine and Marine Systems*. Soc. Econ. Paleontologists and Mineralogists Special Publication, No. 48, p. 213-219. (H.L. Vacher, M.J. Wightman and M.T. Stewart)
1995. Karst development in the Bahamas and Bermuda, in H.A. Curran and B. White (eds.), *Terrestrial and Shallow Marine Geology of the Bahamas and Bermuda*. Geol. Soc. America Special Paper 300, p. 251-267. (J.E. Mylroie, J.L. Carew, and H.L. Vacher.)
1995. Stratigraphy of Bermuda: Nomenclature, concepts, and status of multiple systems of classification, in H.A. Curran and B. White (eds.), *Terrestrial and Shallow Marine Geology of The Bahamas and Bermuda*. Geol-Soc. America Special Paper 300, p. 271-294. (H.L. Vacher, P.J. Hearty and M.P. Rowe)
1997. Introduction: Varieties of carbonate islands and a historical perspective. Chapter 1 in Vacher and Quinn (Editors), *Geology and Hydrogeology of Carbonate Islands*, p. 1-33. (Vacher)
1997. Geology and hydrogeology of Bermuda. Chapter 2 in Vacher and Quinn (Editors), *Geology and Hydrogeology of Carbonate Islands*, p. 35-90. (Vacher and Rowe)
1997. Geology and hydrogeology of the Florida Keys. Chapter 5 in Vacher and Quinn (Editors), *Geology and Hydrogeology of Carbonate Islands*, p. 217-248. (Halley, Vacher and Shinn)
1997. Hydrogeology of Guam. Chapter 25 in Vacher and Quinn (Editors), *Geology and*

Hydrogeology of Carbonate Islands, p. 743-761. (Mink and Vacher)

- 2009 The Southeastern Coastal Plain: An Overview. In Palmer, A. N. and Palmer, M. V. (eds), *Caves and Karst of the USA: A guide to the significant cave and karst areas of the United States of America*. Huntsville AL: National Speleological Society, Inc., p. 181-184. (Florea and Vacher). http://digitalcommons.wku.edu/geog_fac_pub/22/

PUBLICATIONS: Peer-Review Journals: Peer-reviewed papers

1976. Hydrogeochemistry of Bermuda: A case history of ground-water diagenesis of biocalcarenes, *Bulletin Geological Society of America.*, v. 7, p. 1301-1316. (L.N. Plummer, H.L. Vacher, F.T. Mackenzie, O.P. Bricker, and L.S. Land) <http://bulletin.geoscienceworld.org/content/87/9/1301.short>
1978. Hydrogeology of Bermuda -- Significance of an across-the-island variation in permeability, *Journal of Hydrology*, v. 39, p. 207-226. (H.L. Vacher) <http://www.sciencedirect.com/science/article/pii/002216947890001X>
1978. Hydrology of small ocean islands -- Influence of atmospheric pressure on the water table, *Ground Water*, v. 16, p. 417-423. (H.L. Vacher) <http://onlinelibrary.wiley.com/doi/10.1111/j.1745-6584.1978.tb03256.x/abstract>
1980. Effectiveness of discriminating beach, dune, and river sands by moments and cumulative weight percentages, *Journal of Sedimentary Petrology.*, v. 50, p. 165-172. (R.W. Tucker and H.L. Vacher) <http://archives.datapages.com/data/sepm/journals/v47-50/data/050/050001/0165.htm?doi=10.1306%2F212F7996-2B24-11D7-8648000102C1865D>
1980. Hydrology of small oceanic islands -- Utility of an estimate of recharge inferred from the chloride content of fresh-water lenses, *Journal of Hydrology*, v. 45, p. 21-37. (H.L. Vacher and J.F. Ayers) <http://www.sciencedirect.com/science/article/pii/0022169480900037>
1983. U-series and amino-acid racemization geochronology of Bermuda: Implications for eustatic sea-level fluctuation over the past 250,000 years, *Paleogeography, Palaeoclimatology, Paleoecology.*, v. 44, p. 41-70. (R.S. Harmon, R.M. Mitterer, N. Kriausakul, L.S. Land, M.P. Schwarcz, P. Garrett, A.J. Larson, H.L. Vacher, and M. Rowe). http://scholarcommons.usf.edu/gly_facpub/33/
1983. A numerical model describing unsteady flow in a fresh-water lens. *Water Resources Bulletin*, v. 19, p. 785-792. (J.F. Ayers and H.L. Vacher)
1986. Hydrogeology of an atoll island: A conceptual model from detailed study of a Micronesian example. *Ground Water*, v. 24, p. 185-198. (J.F. Ayers and H.L. Vacher) <https://info.ngwa.org/GWOL/pdf/861037935.PDF>
1988. Ground water in barrier islands -- Theoretical analysis and evaluation of the unequal-sea level problem. *Journal of Coastal Research*, v. 4, p. 139-148. (H.L. Vacher) <http://www.jstor.org/stable/10.2307/4297381>

1988. Dupuit-Ghyben-Herzberg analysis of strip-island lenses. *Bulletin Geological Society of America*, v. 100, p. 580-591. (H.L. Vacher)
<http://gsabulletin.gsapubs.org/content/100/4/580>
1989. History of Stage-5 sea level in Bermuda: Review with new evidence of a brief rise to present sea level during Substage 5a. *Quaternary Science Reviews*, v. 8, p. 159-168. (H.L. Vacher and P.J. Hearty). http://scholarcommons.usf.edu/gly_facpub/25/
1989. The three-point problem in the context of elementary vector analysis. *Journal of Geological Education*, v. 37, p. 280-287. (H.L. Vacher)
1990. Hydrology of meteoric diagenesis: Residence time of meteoric groundwater in island fresh-water lenses with application to aragonite-calcite stabilization rate in Bermuda. *Bulletin Geological Society of America*, v. 102, p.223-232. (H.L. Vacher, T.O. Bengtsson, and L.N. Plummer) <http://gsabulletin.gsapubs.org/content/102/2/223.short>
1991. Time net for ground-water flow in an idealized coastal wedge. *Journal of Coastal Research*, (H.L. Vacher, T.A. Farkas, and J.L. Robinson) v. 7, p. 31-38.
1991. Predicting the thickness of fresh-water lenses in carbonate paleo-islands. *Journal of Sedimentary Petrology*, v. 61, p. 43-53. (D.A. Budd and H.L. Vacher)
1991. Hydrogeology of freshwater lens beneath a Holocene strandplain, Great Exuma, Bahamas. *Journal of Hydrology*, v. 125, p. 93-109 (T.N. Wallis, H.L. Vacher, and M.T. Stewart)
http://scholarcommons.usf.edu/gly_facpub/32/
1992. Aminostratigraphy and ages of Pleistocene limestones of Bermuda. *Bulletin Geological Society of America*, v. 104, p. 471-480. (P.J. Hearty, H.L. Vacher, and R.M. Mitterer)
http://scholarcommons.usf.edu/gly_facpub/26/
1992. Comparative hydrogeology of Bermuda and Great Exuma Island, Bahamas. *Ground Water*, v. 30, p. 15-20. (H.L. Vacher and T.N. Wallis).
http://scholarcommons.usf.edu/gly_facpub/31/
1992. The hydrogeochemistry of early meteoric diagenesis in a Holocene deposit of biogenic carbonates. *Journal of Sedimentary Petrology*, v. 62, p. 1008-1022. (M.E. McClain, P.K. Swart, and H.L. Vacher). http://scholarcommons.usf.edu/gly_facpub/28/
1993. Transport of Ca, Mg and SO₄ in the Floridan aquifer, west-central Florida: Implications to cementation rates. *Journal of Hydrology*, v. 143, p. 455-480 (I.C. Jones, H.L. Vacher and D.A. Budd). <http://www.sciencedirect.com/science/article/pii/002216949390204M>
1993. Calcite cementation in the upper Floridan aquifer: A modern example for confined-aquifer cementation models? *Geology*, v. 21, p. 33-36. (D.A. Budd, U. Hammes, and H.L. Vacher). <http://geology.geoscienceworld.org/content/21/1/33.short>
1994. The hydrogeochemistry of early meteoric diagenesis in a Holocene deposit of biogenic carbonates -- Reply. *Journal of Sedimentary Petrology*, v A64, p. 415-416. (M.E. McClain, P.K. Swart, and H.L. Vacher).
1994. Quaternary stratigraphy of Bermuda: A high-resolution pre-Sangamonian rock record.

- Quaternary Science Reviews*, v.13, p.685-697. (P.J. Hearty and H.L. Vacher)
<http://www.sciencedirect.com/science/article/pii/027737919490099X>
1997. Groundwater flow beneath a hypersaline pond, Cluett Key, Florida Bay, Florida. *Journal of Hydrology*, v. 197, p. 339-369. (T. Juster, P.A. Kramer, H.L. Vacher, P.K. Swart, and M. Stewart) http://scholarcommons.usf.edu/gly_facpub/29/
1999. A course in geological-mathematical problem solving. *Journal of Geoscience Education*, v. 48, p. 478-481. <http://nagt.org/files/quantskills/Vacher-v48n4p478.pdf>
2002. Eogenetic karst from the perspective of an equivalent porous medium. *Carbonates and Evaporites*, v. 17, n. 2, p. 182-196, DOI: 10.1007/BF03176484. (H.L.Vacher and J.E. Mylroie) <http://www.springerlink.com/content/th4g351841862154/>
2004. Variation of salinity in brackish-water lenses of two Florida keys. *Journal of Coastal Research*, v. 20, n. 2, p. 386-400. (D.G. Meadows, J.P. Caballero, S.E. Kruse, S.E., H.L. Vacher, and M. Ross). http://scholarcommons.usf.edu/gly_facpub/25/
2004. Matrix permeability of the confined Floridan Aquifer, Florida, USA. *Hydrogeology Journal*, v. 12, p. 531-549. (D.A. Budd and H.L.Vacher) <http://link.springer.com/article/10.1007/s10040-004-0341-5?null>
2004. Numerical simulation of double-diffusive finger convection. *Water Resources Research*, v. 41, W01019, doi:10.1029/2003WR002777.. (J.D. Hughes, W.E. Sanford, and H.L. Vacher). <http://www.agu.org/pubs/crossref/2005/2003WR002777.shtml>
2004. Using Spreadsheets in Geoscience Education: Survey and Annotated Bibliography of Articles in the Journal of Geoscience Education Through 2003. *Journal of Spreadsheets in Education*, 1(3): 168-194. (S.E. Fratesi and H.L. Vacher). <http://epublications.bond.edu.au/ejsie/vol1/iss3/3/>
- 2006 Metaphors and models: The ASR bubble in the Floridan aquifer. *Ground Water*, v. 44, p. 44-54. (H.L. Vacher, W.C. Hutchings, and D.A. Budd). http://scholarcommons.usf.edu/gly_facpub/35/
- 2006 Springflow hydrographs: Eogenetic vs. telogenetic karst: *Ground Water*, vol. 44, no. 3, 352-361. (L.J. Florea and H.L. Vacher). http://scholarcommons.usf.edu/gly_facpub/36/
- 2007 Eogenetic karst hydrology: Insights from the 2004 hurricanes, peninsular Florida: *Ground Water*, v. 45, no. 4, p. 439-446. (L.J. Florea and H.L. Vacher) <http://info.ngwa.org/gwol/pdf/071382322.pdf>
- 2007 Three-dimensional flow in the Florida Platform: Theoretical analysis of Kohout Convection at its type locality: *Geology*, v. 35, no. 7, p. 663-666. (J.D. Hughes, H.L. Vacher, and W.E. Sanford). http://scholarcommons.usf.edu/gly_facpub/34/
- 2007 Quaternary cave levels in peninsular Florida: *Quaternary Science Reviews*, v. 26, p. 1344-1361. (L.J. Florea, H.L. Vacher, B. Donahue, and D. Naar). http://scholarcommons.usf.edu/gly_facpub/40/
- 2008 Using ALSM to map sinkholes in the urbanized covered karst of Pinellas County, Florida –

- 1, Methodological considerations: *Environmental Geology*, v. 54, no. 5, p. 995-1005. (L.D. Seale, L. J. Florea, H.L. Vacher, and R. Brinkmann)
http://scholarcommons.usf.edu/gly_facpub/24/
- 2008 Using ALSM to map sinkholes in the urbanized covered karst of Pinellas County, Florida – 2, Accuracy statistics: *Environmental Geology*, v. 54, no. 5, p. 1007-1015. (H. L. Vacher, L.D. Seale, L. J. Florea, and R. Brinkmann).
http://scholarcommons.usf.edu/gly_facpub/36/
- 2008 Scientific journals as fossil traces of sweeping change in the structure and practice of modern geology. *Journal of Research Practice*, vol. 4, issue 1, article M1. (S.E. Fratesi and H.L. Vacher) Available at: http://scholarcommons.usf.edu/gly_facpub/41/
- 2008 Quantitative literacy on the Web of Science, 1: The bibliography and its role in the history of this journal. *Numeracy*, v1, issue 1, article 2. (H.L. Vacher and T. Chavez) Available at: <http://scholarcommons.usf.edu/numeracy/vol1/iss2/art2>
- 2009 Quantitative literacy on the Web of Science, 2: Mining the health numeracy literature for assessment items. *Numeracy*, vol. 2, issue 1, article 5. (H. L. Vacher and T. Chavez) Available at: <http://scholarcommons.usf.edu/numeracy/vol2/iss1/art5>
- 2009 Temporal response of hydraulic head, temperature, and chloride concentrations to sea-level changes, Floridan aquifer system, USA, *Hydrogeology Journal*, v. 17, no. 4, p. 793-815 (J. D. Hughes, H.L. Vacher and W.E. Sanford)
<http://www.springerlink.com/content/v5061gh161742w11/>
- 2010 Spreadsheets Across the Curriculum, 1: The Concept and the Resource. *Numeracy*, v. 3, issue 2, article 6 (H.L. Vacher and E. Lardner)
<http://scholarcommons.usf.edu/numeracy/vol3/iss2/art6/>
- 2011 Spreadsheets Across the Curriculum, 3: Finding a list of mathematical skills for quantitative literacy empirically. *Numeracy*, v. 4, issue 1, article 5. DOI: 10.5038/1936-4660.4.1.5 (H.L. Vacher and E. Lardner) Available at :
<http://scholarcommons.usf.edu/numeracy/vol4/iss1/art5/>
- 2011 Communication and 'forestructures' at the geological intersection of caves and subsurface water flow: Hermeneutics and parochialism. *Earth Sciences History*, v. 30, n. 1, p. 85-105. DOI: <http://dx.doi.org/10.17704/eshi.30.1.n76v556205141ux3> (L.J. Florea and H. L. Vacher) Available at: http://scholarcommons.usf.edu/gly_facpub/47/
- 2012 Spreadsheets Across the Curriculum, 4: Evidence of student learning and attitudes about spreadsheets in a physical geology course. *Numeracy*, v. 5. Issue 2, article 5. DOI: 10.5038/1936-4660.5.2.5. (H.L. Lehto and H.L. Vacher)
<http://scholarcommons.usf.edu/numeracy/vol5/iss2/art5/>
- 2014 Experiments and modeling of freshwater lenses in layered aquifers: Steady state interface geometry. *Journal of Hydrology*, v. 509, p. 621-630. (E. J. Dose, L. Stoeckl, G. J. Houben, H. L. Vacher, S. Vassolo, J. Dietrich, and T. Himmelsbach)
- 2016 Learning volcanology: Modules to facilitate problem solving by undergraduate volcanology

students. *Statistics in Volcanology*, , v. 2: Article 3. DOI: <http://dx.doi.org/10.5038/2163-338X.2.3> (C.B. Connor and H. L. Vacher) Available at: <http://scholarcommons.usf.edu/siv/vol2/iss1/>

- 2016 On a desert island with unit sticks, continued fractions and Lagrange. *Numeracy*, v. 9. Issue. 2, Article 8. DOI: <http://dx.doi.org/10.5038/1936-4660.9.2.8> (V. J. Ricchezza and H. L. Vacher). Available at: <http://scholarcommons.usf.edu/numeracy/vol9/iss2/art8>
- 2017 A Twenty-Year Look at “Computational Geology,” an Evolving, In-Discipline Course in Quantitative Literacy at the University of South Florida," *Numeracy*: Vol. 10 : Iss. 1 , Article 6 DOI: <http://dx.doi.org/10.5038/1936-4660.10.1.6>. . (V. J. Ricchezza and H. L. Vacher). Available at: <http://scholarcommons.usf.edu/numeracy/vol10/iss1/art6>

PUBLICATIONS: Peer-Review Journals: Editorials and Book Reviews

2001. Better math, better geology. *Geotimes* (Geoscience Education column), v. 46, n, 3, p. 13, 31.
2008. Editorial: The scope of *Numeracy*. *Numeracy*, vol. 1, issue 1, article 1. (H.L. Vacher and D. Wallace). Available at: <http://scholarcommons.usf.edu/numeracy/vol1/iss1/art1/>
2008. Review of *The Triumph of Numbers* by I. B. Cohen. *Numeracy*, vol. 1, issue 1, article 7. DOI: 10.5038/1936-4660.1.1.7. (H. L. Vacher) <http://scholarcommons.usf.edu/numeracy/vol1/iss1/art7/>
2008. Editorial: Abstracts for *Numeracy*. *Numeracy*, vol. 1, issue 2, article 1. DOI: 10.5038/1936-4660.1.2.1. (H. L. Vacher) Available at <http://scholarcommons.usf.edu/numeracy/vol1/iss2/art1/>
2010. Editorial: Five thousand downloads. *Numeracy*, vol. 3, issue 1, article 1. DOI: 10.5038/1936-4660.3.1.1. (H. L. Vacher and D. Wallace) <http://scholarcommons.usf.edu/numeracy/vol3/iss1/art1/>
2011. Editorial: A LEAP forward for quantitative literacy. *Numeracy*, v. 4, issue 2, article 1. DOI: 10.5038/1936-4660.4.2.1. (H. L. Vacher) <http://scholarcommons.usf.edu/numeracy/vol4/iss2/art1>
2013. Editorial: The scope of *Numeracy* after five years. *Numeracy*, v. 6, issue 1, article 1. DOI: 10.5038/1936-4660.6.1.1 (H. L. Vacher). <http://scholarcommons.usf.edu/numeracy/vol6/iss1/art1/>
2013. Research Spotlight: Professor Len Vacher: Comfortable with calculation. *International Innovation: Dissemination science, research and technology* (North America, October 2013), p. 21-23. <http://www.international-innovation-northamerica.com/magazines/NA17/index.html>
2014. Review of *Financial Intelligence for Entrepreneurs: What You Really Need to Know about the Numbers* by Karen Berman and Joe Knight, with John Case. *Numeracy*, vol. 7, issue 1,

- article 8. DOI: 10.5038/1936-4660.7.1.8 (H. L. Vacher)
<http://scholarcommons.usf.edu/numeracy/vol7/iss1/art8/>
2014. Editorial: Looking at the multiple meanings of numeracy, quantitative literacy, and quantitative reasoning. *Numeracy* v. 7, issue 2, article 1. (H.L Vacher)
<http://scholarcommons.usf.edu/numeracy/vol7/iss2/art1/>
2015. Editorial: Educational Assessment Is an Enduring Theme of *Numeracy*. *Numeracy*: v. 8, issue 1, article 1. DOI: <http://dx.doi.org/10.5038/1936-4660.8.1.1> (H. L. Vacher). Available at: <http://scholarcommons.usf.edu/numeracy/vol8/iss1/art1>
2015. Review of *Developing Quantitative Literacy Skills in History and the Social Sciences: A Web-Based Common Core Approach* by Kathleen W. Craver. *Numeracy*: v. 8, issue 2, article 14. DOI: <http://dx.doi.org/10.5038/1936-4660.8.2.14> (V. J. Ricchezza and H. L. Vacher) Available at: <http://scholarcommons.usf.edu/numeracy/vol8/iss2/art14>
2016. Editorial: Remembering Lynn Steen: A Steen-*Numeracy* Citation Index (2008-2015). *Numeracy* v. 9, issue 1, article 1. DOI: <http://dx.doi.org/10.5038/1936-4660.9.1.1>. (H. L. Vacher). Available at: <http://scholarcommons.usf.edu/numeracy/vol9/iss1/art>
2016. Editorial: Grassroots Numeracy. *Numeracy* v. 9, issue. 2, article 2. DOI: <http://dx.doi.org/10.5038/1936-4660.9.2.2> (H.L. Vacher). Available at: <http://scholarcommons.usf.edu/numeracy/vol9/iss2/art2>
2017. Editorial: A Madison-*Numeracy* Citation Intedx (2008-2015): Implementing a Vision for a Quantitatively Literate World. *Numeracy* v. 19, issue 1, article 1. DOI: <http://dx.doi.org/10.5038/1936-4660.10.1.1> (H. L. Vacher). Available at: <http://scholarcommons.usf.edu/numeracy/vol10/iss1/art1>

PUBLICATIONS: Peer-Review Journals: Columns

<http://nagt.org/nagt/jge/columns/compgeo.html>

1998. Computational Geology 1 -- Significant figures! *Journal of Geoscience Education*, v. 46, p. 292-295. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG1-v46n3p292.pdf>
1998. Computational Geology 2 -- Speaking logarithmically. *Journal of Geoscience Education*, v. 46, p. 383-388. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG2-v46n4p383.pdf>
1998. Computational Geology 3 -- Progressing geometrically. *Journal of Geoscience Education*, v. 46, p. 500-506. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG3-v46n5p500.pdf>
1999. Computational Geology 4 -- Mapping with vectors. *Journal of Geoscience Education*, v. 47, p. 64-72. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG4-v47n1p64.pdf>
1999. Computational Geology 5 -- If geology, then calculus. *Journal of Geoscience Education*,

- v. 47, p. 166-176. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG5-v47n2p166.pdf>
1999. Computational Geology 6 -- Solving problems. *Journal of Geoscience Education*, v. 47, p. 280-289. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG6-v47n3p280.pdf>
1998. Computational Geology 7 -- The algebra of unit conversions. *Journal of Geoscience Education*, v. 47, p. 376-382. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG7-v47n4p376.pdf>
1999. Computational Geology 8 -- The power function. *Journal of Geoscience Education*, v. 48, p. 473-481. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG8-v47n5p473.pdf>
2000. Computational Geology 9 -- The exponential function. *Journal of Geoscience Education*, v. 48, p.70-76. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG9-v48n1p70.pdf>
2000. Computational Geology 10 -- The algebra of deduction. *Journal of Geoscience Education*, v. 48, 229-238. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG10-v48n2p229.pdf>
2000. Computational Geology 11 – Uniformitarianism and the inverse problem. *Journal of Geoscience Education*, v. 48, p. 373-380. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG11-v48n3p373.pdf>
2000. Computational Geology 12 -- Cramer's rule and the three-point problem. *Journal of Geoscience Education*, v. 48, p.522-532. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG12-v48n4p522.pdf>
2000. Computational Geology 13 -- Geological-mathematical activities for college students in the Journal of Geoscience Education, 1990-1999, *Journal of Geoscience Education*, v. 48, p. 682-691
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- 2001 Computational Geology 14 -- The vector cross product and the three-point problem. *Journal of Geoscience Education*, v. 49, p. 72-82. <http://d32ogoqmya1dw8.cloudfront.net/files/nagt/jge/columns/CG14-v49n1p72.pdf>
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2009. Geology, spreadsheets, quantitative literacy, and natural resources: Spreadsheets across the Curriculum meet Research Learning Centers (Friday morning side meeting) *Rethinking Protected Areas in a Changing World*. The 2009 George Wright Society Biennial Conference on Parks, Protected Areas, and Cultural Sites, March 2-6, Portland OR, p. 120 (H.L. Vacher and B. Becker)
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1999. "Why is there a problem?" (Opening session keynote) *Project Kaleidoscope (PKAL) Workshop: Building the Quantitative Skills of Non-Majors and Majors in Earth and Planetary Science Courses*, College of William and Mary, Williamsburg, Jan. 1999
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2000. "Geological-mathematical problem solving." *National Association Geoscience Teachers Workshop: Enhancing Quantitative Skills in Geoscience courses*. Colorado College, 7/2000.
2001. "Defining the problem." *Project Kaleidoscope Institute/Workshop: Quantitative Literacy*. Snowbird, Utah, 7/2001.
2002. "Geological numeracy." *Project Kaleidoscope Institute/Workshop: Quantitative Literacy*. Williamsburg Va, 7/2002. Presentation, 7/2002
2003. "Geological Numeracy: Quantitative Literacy and Geoscience Education." *Mathematical Association of America, Florida Section* (Jacksonville) 2/03
2003. "Geology, Mathematics, and Quantitative Literacy," *USF Pi Mu Epsilon* induction ceremony (After-dinner speech to mathematics students, faculty and families), 4/24/03
2003. "Quantitative Literacy, Drug Testing and the Identification of Igneous Rocks," *Everglades Geological Society*, Calusa Nature Center, Fort Meyers, 5/20/03
2003. "Developing the QL Habit of Mind in Multiple Contexts: Geoscience Education Modules" *Washington Center for Improving the Quality of Undergraduate Education Workshop: QL across the Curriculum*, Leavenworth WA., 8/2003.
- 2004 "Developing the QL habit of mind in multiple contexts: Geoscience education modules" *QL Institute of The Washington Center for Improving the Quality of Undergraduate Education, Quantitative Literacy Across the Curriculum: Everybody's Project*, Sleeping Lady Conference Center, Leavenworth WA, 8/04
- 2005 Session I: "Developing the QL Habit of Mind in Multiple Contexts: Geoscience Education Modules" *MAA PREP Workshop: Creating and Strengthening Interdisciplinary Programs in Quantitative*, Macalester College St. Paul. MN, 6/05 (H.L. Vacher and S.E. Fratesi)
- 2005 Session IV "Hands-on math - A geologist's view of teaching QL as a lab course" *First Annual Meeting of the National Numeracy Network*, Macalester College St. Paul. MN, 6/05.
- 2005 Washington Center Institute: *Spreadsheets across the Curriculum Workshop* (4 days), Washington Center, Olympia WA, 7/05
- 2006 "Role of Geoscience Education in Promoting Quantitative Literacy" (Keynote): *Science Education Resource Center Workshop: Infusing Quantitative Literacy into Introductory Geoscience Courses* 7/06

- 2006 Washington Center Institute: *Spreadsheets across the Curriculum Workshop* (4 days), Washington Center, Olympia WA 7/06
- 2007 Washington Center Institute: *Spreadsheets across the Curriculum Workshop* (4 days), Washington Center, Olympia WA 7/07
2008. Introduction to Spreadsheets across the Curriculum. *Meeting of Research Learning Centers Directors and Education Coordinators, National Parks Service*. Congaree National Park, 1/08.
- 2008 The Published Numeracy Network. *Annual Meeting of the Northeast Consortium of Centers for Quantitative Literacy*. Colby-Sawyer College, 5/08
2008. Spreadsheets across the Curriculum. *Inventions and Impact 2: Building Excellence in Undergraduate Science, Technology, Engineering, and Mathematics (STEM) Education*. A Conference of CCLI Program, National Science Foundation, Division of Undergraduate Education, Washington D.C., 8/08/08 (H.L. Vacher and Emily Lardner)
2008. *Numeracy*, NNN's online, open-access, peer review journal. *Quantifying Quantitative Reasoning in Undergraduate Education: Alternative Strategies for the Assessment of Quantitative Reasoning*. Project Kaleidoscope Workshop (Closing Presentation). Carleton College, 10/12/08.
2009. NSF projects promoting quantitative literacy (workshop funded by SSAC). National Numeracy Network annual meeting. 4/30-5/1 Bothell WA. (H.L. Vacher and C. Manduca)
2010. Building a QR community: The future of the National Numeracy Network. *Quantifying Quantitative Reasoning in Undergraduate Education: Alternative strategies for the assessment of quantitative reasoning*. Project Kaleidoscope Workshop (Closing lunch and plenary session). Carleton College, 10/10/10. (Corrine Taylor and H.L. Vacher)
2011. Teaching with Spreadsheet Modules: Geology of National Parks. Geological Society of America Regional Meeting (North-Central and North-East Sections), Pittsburgh, PA, 3/19/2011. (Vacher, Juster, McIlrath)
2011. Teaching with Spreadsheet Modules: Geology of National Parks. *Appalachian College Association Summit*, Asheville NC, 10/14/11 (Vacher, Stringer, Amie West)
2016. Word problems: Living at the intersection of quantitative literacy and geological-mathematical problem solving (teaching demo). *Earth Educators' Rendezvous*, Madison, 2016. (Vacher, Connor, Ricchezza; demo by Ricchezza)
http://serc.carleton.edu/earth_rendezvous/2016/program/demos/thursdayA/136743.html
2016. Alumni narratives on Computational Geology (Spring 1997 – Fall 2013) (poster session). *Earth Educators' Rendezvous*, Madison, 2016. (Ricchezza and Vacher)
http://serc.carleton.edu/earth_rendezvous/2016/program/posters/thursday/136437.html

GRANTS RECEIVED

- 1974-80. *Bermuda Government*, various titles involving hydrology of Bermuda's fresh and brackish ground-water resource. Nine small grants totaling about \$66,000.
- 1984-85. *University of Guam, Water and Energy Research Institute of the Western Pacific*. Atoll

- hydrogeology, \$21,626.
1989. *National Science Foundation* (subcontract through University of Miami), Science in Developing Countries: Hydrology of meteoric diagenesis -- Holocene calcarenites of Ocean Bight, Great Exuma Island, Bahamas, ca \$6,000 (with M. T. Stewart) (total grant ca \$16,000), to R. Ginsburg and P. Swart). NSF-INT-8814493
- 1990-1991. *National Audubon Society*, Salinity in upper saturated zone of Sugarloaf Key, Florida. \$13,000. (with M.T. Stewart).
- 1990-1992. *National Science Foundation* (through U. Colorado). Actualistic model of cementation patterns in a modern regional carbonate aquifer; \$29,834 (Total grant, \$100,897, to D.A. Budd). NSF-EAR-8915562.
- 1992-1994. *National Science Foundation*. Collaborative Research: Hydrology and geochemistry of Holocene mud islands of Florida Bay. \$98,093 USF part (H.L. Vacher and M.T.Stewart). \$136,544 U. Miami part (P.K. Swart). NSF-EAR-9119770.
1994. *U.S. Geological Survey* (cooperative grant). Subsurface circulation of seawater in Florida Bay near the Keys. \$23,786.
1995. *U.S. Geological Survey* (cooperative grant). Geohydrology of marine porewaters near the Florida Keys. \$30,000.
- 1996-1997. *U.S. Geological Survey* (cooperative grant). Reconnaissance of brackish lenses in the Florida Keys. \$30,050.
- 1995-1997. *National Science Foundation*, Undergraduate Course and Curriculum Development. Fundamentals of Natural Science for Non-Science Majors: An integrated approach. \$100,000. (H. Mushinsky, H. L. Vacher, P. Mukherjee, J. Worrell, J. Eison) DUE-9455413.
- 1998-1999. *The Nature Conservancy*. Investigation of the dimensions of fresh or brackish-water lenses on the Torchwood Preserve. \$7,080. (S. Kruse and H. Vacher).
- 2002-2004. *National Science Foundation*. Spreadsheet exercises in geological-mathematical problem solving. DUE 0126500, 12 months, beginning 5/15/02, extended for 1 yr. \$58,812.
- 2003-2004. *Pinellas County Department of Public Works*. Geographic assessment of karst surface features and wetlands in Pinellas County. \$43,298. (R. Brinkmann, H.L. Vacher).
- 2005-2010. *National Science Foundation*. Spreadsheets across the curriculum. DUE 0442629, began 4/15/05, \$513,177 (including two supplemental awards and two extensions).
- 2009-2012 *National Science Foundation*. Geology of National Parks: Spreadsheets, Quantitative Literacy, and Natural Resources. DUE 0836566, starting Jan 1, 2009. \$197,688

TEACHING

Courses Taught

At WSU:

Geology for Non-Science Majors.
Geology for Science and Engineering Majors.
Geomorphology.
Sedimentology.
Advanced Topics in Sedimentary Rocks.

At USF:

Undergraduate:

Physical Geology
Introductory Hydrogeology
Stratigraphy
Scientific Concepts of Time (liberal arts exit course, with Henry Mushinsky).
Theories and Arguments about the Earth (liberal arts exit course).
Computational Geology
Geology for Engineers.
Preparing for a Career in Geology

Graduate:

Advanced Topics: Meteoric diagenesis.
Advanced Topics: Hydrology of Islands and Coasts
Physical Principles of Groundwater Flow.
Mathematical Concepts and Models in Geology.
Geological Reasoning (with Peter Harries)
Advanced Topics: Hydrogeology of Florida, Bahamas and Bermuda
Advanced Topics: Analytical Models in Hydrogeology
Advanced Topics: Mathematical flow nets.
Advanced Topics: Florida karst (with R. Oches)
Karst seminar
Advanced Topics: Math Concepts for Seismology
Advanced Topics: Geological Information Science (with Todd Chavez)
Advanced Topics: SSAC and the National Parks Service Challenge
Math Concepts for Professional Geologists

Graduate Student Supervision

At USF

Chair

PhD completed: Tom Juster (Co-Chair, 1995), Ken Trout (Co-Chair, 2002), Joe Hughes (2006), Lee Florea (2006), Beth Fratesi (2008), Heather Lehto (Co-Chair, 2012)

MS completed

Thesis: T. Bengtsson (1987), R. Stebnisky (1987), J. Trommer (1987), T. Lawrence (1989), M. Wightman (1990), T. Wallis (1990), J. Robinson (1991), I. Jones (1991), T. Farkas (1992), J. Caballero (1993), C. Langevin (1993), K. Trout (1995), D. Ciriello (1997), M.L. Becker (1998, co-advisor), J. Harden (2005, co-advisor), W. Hutchings (2005), D. Seale (2005), Denis Voytenko (2011), Amie West (2012), Vic Ricchezza (2016)

Non-thesis program (pre-1994): M. Lodato, R. Casper, L. Knockemus, A. Swancar, M. Lee.

Internship program: D. Brendle (USGS, 1994); T. Thomas (Rodriguez Inc, 1994); J. Broska (USGS, 1994); M. Lee (HLV, USF); Tamera Dew (ERM, 1995); J. Dozier (Fla Groundwater Services, 1995); H. Fowler (Metcalf & Eddy, 1995); L. Haller (Fla Groundwater Services, 1995); D. Rojas (Camp Dresser McKee, 1995); A. Spieler (Schreuder Inc, 1995); T. Spieler (Shreuder Inc, 1995); C. Reich (USGS, 1995); E. Swenson (USGS, 1995); K. Stelman (USGS, 1997); M. Elliot (SWFWMD, 1998); H. Barnette (USGS, 1999); H. Liaupaw (SWFWMD, 1999); R. Basso (SWFWMD, 2000); J. Coughlin (Qore, 2000); B. Goodwin (ERM, 2000); J. Hood (SWFWMD, 2000); V. Katoch (ECS, 2000); S. Kinnaman (Qore, 2000); R. Lamb (SWFWMD, 2000); K. Morrison (SWFWMD, 2000); J. Turner (Terra, 2000); K. Champion (SWFWMD, 2001); M. Bateman (SWFWMD, 2001); T. Skapik (HLV, USF, 2001); Gary Foster, (Qore, 2002); D. Chan (SWFWMD, 2003); B. Armstrong (SWFWMD, 2004); Joe Haber (SWFWMD, 2005), J. Kirkpatrick (MacDill, 2006)

Professional Science Masters program: John-Reid Theriac (Geosyntec, 2011), Jake Fredericks (SWFWMD, 2011), Daphanee Waters (AS&E 2012), John Ferguson (SWFWMD 2012), Joshua Yates (Cardno Entrix 2013), Marty Solomon (J Hughes, 2013), Andrew Raysin (J Hughes, 2013), Kristina Mallams (SWFWMD, 2013), Jerry Mallams (SWFWMD, 2013), Chase Swan (Arcadis, 2014), Joel Cornwall (Geoview, 2014), Wyatt Stutts (SDII Global, 2015), Brian Studiale (Jahna, 2015), Lindsey Romine (S&ME, 2016), Fran Champagne (SWFWMD, 2016), Jon Ouverson (CH2M Hill, 2016), Joel Raven (Geosyntec, 2016), Scott Lakey (ECS, 2017).

PhD in progress: Vic Ricchezza (Co-Chair with Jeff Ryan), Ming Xie (Co-Chair with Steve Reader)

Committee member:

PhD completed: Brent Nixon (Engineering, 1995), Ping Wang (Geology, 1995), Gray Mullins (Engineering, 1996), Chris Langevin (Geology, 1998), G. Masters (Engineering, 2000), Subrata Guha (2010), Dorien McGee (2010), Christina Stringer (2010), Aurel Persoiu (2011), Marianne O'Neil

Caldwell (2012), Montana Puscas (2013), Liana Boop (2014), Gregg Jones (2015), Denis Voyenko (2015)

MS completed (thesis track): R. Bretnall, A. Alamri, G. Jones, M. Starks, E. DeHaven, P. Kwiatkowski, T. Hagemeyer, T. Lizanec, M. Clasen, C. Beaudoin, K. Kemble-McKenna, K. Ryan, W. Hogg, J. Powers, J. Fuller, J. Spratt, D. Inglin, J. Burdick, D. Latham, M. Taraszki, T. Schneider, L. Roullier, G. Creaser, Jian Chen, S. Schellenberg, K. Morrison, B. Silverman, J. Pekala, A. Bahtijarevic, J. Kling, N. Kugler, M. Goddard, P. Barnard, B. Shoemaker, P. Barnard, N. Elko, N. Purcell, C. Albury, M. Thompson, D. Meadows, K. Moore, K. Wilson (ESP), J. White, L. Soto (ESP). J. LaRoche, Kali Pace-Graczyk, J. Sumrall, B. Szenay, D. Davis, D. Cleary

PhD in progress: D. Davis, D. Cleary

MS in progress (thesis):

At Other institutions

At WSU: 5 PhD committees including two chaired; 19 MS theses including five chaired.

At U. Miami: 2 PhD committees and 2 MS theses

SERVICE

Academic

A. At WSU: Assistant Chairman (1980-82)

B. At USF:

Dept. Graduate Advisor (1984-1990)

Dept. Search Committee Chair (1990)

Hydrogeology Internship Program Committee (Chair, 1994- ...)

Dept Graduate Committee (Member, 1994-1997)

Faculty Advisory Committee, Geology (Member 1985-1997; 2001-)

Faculty Advisory Committee, Geology (Chair 1996, 1997)

Faculty Advisory Committee, Geography (Member, 1994-1996)

College TIP Committee (1994/95, 1995/96)

Dept. Search Committee (Member, 1997)

Dept Undergraduate Committee (Member, 1997-2002)

Dept Graduate Committee, Interim Chair (1999)

Dept. Search Comm (Member, 1999/2000)

ESP Search Comm (Member, 2001/2001; 2002/2003)

Geology Alumni Society (Faculty Liaison, 1997-)

Math Search Comm (Member, 2003/2004)

Dept Undergraduate Committee (Member, 2003/2004)

Provost's Committee, Quality Enhancement Program (Member, 2003/2004)

Dept Search Committee (Member, 2003/2004)

Dept Search Committee, karst position (Chair, 2004-2005)

Dept Search Committee, tectonics position (Member, 2004-2005)

(not updated further)

Professional

Review papers/proposals for: *Geological Society America Bulletin*; *Journal Hydrology*; *Journal Sedimentary. Petrology*; *Ground Water*; *Geology*; *Water Resources Bulletin*; Petroleum Research Fund (Am. Chem. Society); Earth Watch; *Water Resources Research*. National Science Foundation. Louisiana Board of Regents; *Quaternary Research*; Bank of America, U. S. Geological Survey; *Journal of Coastal Research*; *Earth Science Reviews*; *Proceedings National Academy of Sciences*; *Mathematical Geology*; *Journal of Geology*, *Hydrological Processes*, *Hydrogeology Journal*, *Journal of Caves and Karst*, *Geomorphology*, *Quaternary Science Reviews*, *Geological Society of London*.

Editorial Board, *Geology* (1991 -1994).

Review Panel. Research grants for EPA Water Quality Protection Program, Florida Keys National Marine Sanctuary (1995).

Review Panel. Research grants for EPA Water Quality Protection Program, Florida Keys National Marine Sanctuary (1997).

Review Panel. National Science Foundation, Division of Undergraduate Education (2000)

Advisory Committee. National Numeracy Network (National Council of Education and the Disciplines, Woodrow Wilson Fellowship Foundation) (2001-2002)

Review Panel. National Science Foundation: National Science, Mathematics, Engineering and Technology Digital Library (NSDL) Program (2002)

Review Panel. National Science Foundation: Distinguished Teaching Scholar (DTS) Program (2004)

12/2001. Woodrow Wilson National Fellowship Foundation, National Council on Education and the Disciplines: National Forum, "Quantitative Literacy: Why numeracy matters for schools and colleges" at National Academy of Science. Invited participant.

Consultant (pro bono) for working group at Southwest Research Institute (San Antonio TX) assembling consortium of researchers and seeking funding to rethink physics of karst flow modeling for the benefit of water management agencies, including SWFWMD. (2002-2003)

Review Panel. National Science Foundation: Distinguished Teaching Scholar (DTS) Program (2005)

Steering Committee. National Caves and Karst Research Institute (2005)

Editorial Board, *Spreadsheets in Education* (journal) (2005-ongoing)

Co-editor Editor, *Numeracy* (journal of the National Numeracy Network) (2007-ongoing)

Advisory Board, NSF IUSE Project (DUE 1625771): A National Consortium for Synergistic Undergraduate Mathematics via Multi-Institutional Interdisciplinary Teaching Partnerships (SUMMIT-P) (Virginia Polytechnic Institute and State University) (2017-ongoing)