

Curriculum Vitae

Christian D. Langevin, Research Hydrologist

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Other Affiliations

Courtesy Faculty, University of Florida, Tropical Research and Education Center
Graduate Faculty, University of Alabama, Department of Geology
Graduate Faculty, Florida International University, Department of Earth Science

Research Interests: Variable-density groundwater flow and solute transport modeling; saltwater intrusion; submarine groundwater discharge; aquifer storage and recovery; deep-well injection; applied geophysics

EDUCATION

Ph.D. in Geology	1998	University of South Florida-Tampa
M.S. in Geology	1993	University of South Florida-Tampa
B.S. in Geology	1991	University of Wisconsin-Madison

PUBLICATIONS

EDITED VOLUMES

Sanford, W., **Langevin, C.D.**, Polemio, M., and Povinec, P., eds., 2007, A new focus on groundwater-seawater interactions: IAHS Publication 312, Oxfordshire, United Kingdom, 344 p.

Langevin, C.D., Lebbe, L., Bakker, M., and Voss, C., eds., 2008. 20th Salt Water Intrusion Meeting, Program and Proceedings, June 23-27, 2008, Naples, Florida, U.S.A., 340 p.

BOOK CHAPTERS

Langevin, C.D., 2007. Section 2.1.2. Numerical simulation of submarine groundwater discharge: In Submarine Groundwater, Zektser, I.S., and Dzhamalov, R.G. (eds.), CRC Press.

Langevin, C.D., 2007. Section 4.6. Groundwater discharge to Biscayne Bay, Florida: In Submarine Groundwater, (eds.) I. Zektser and R. Dzhamalov, CRC Press.

Langevin, C.D., Oude Essink, G.H.P., Panday, S., Bakker, M., Prommer, H., Swain, E.D., Jones, W., Beach, M., and Barcelo, M. 2004. Chapter 3, MODFLOW-based tools for simulation of variable-density groundwater flow: In Coastal Aquifer Management: Monitoring, Modeling, and Case Studies, (eds.) A. Cheng and D. Ouazar, Lewis Publishers, p. 49-76.

Obeysekera, J., Ahmed, S., Chang, M.L., Engel, V., Kubler, L., **Langevin, C.D.**, Swain, E., Wan, Y., (in press). Hydrologic and hydrodynamic modeling. Chapter to be published in special book on Biogeochemistry of the Everglades, 45 p. manuscript.

REFEREED ARTICLES

- Langevin, C.D.**, Dausman, A.M., and Sukop, M.C., (in journal review) Solute and heat transport model of the Henry and Hilleke laboratory experiment: invited submission to Ground Water for special theme issue on 2008 MODFLOW conference, 29 p. manuscript.
- La Licata, I., **Langevin, C.D.**, Dausman, A.M., Alberti, L., (in journal review) Effect of tidal fluctuations on transient dispersion of simulated contaminant concentrations in a coastal aquifer: submitted to the Journal of Hydrology, 23 p. manuscript.
- Hughes, J.D., **Langevin, C.D.**, and Brakefield-Goswami, L., (in journal review) Effect of hypersaline cooling canals on aquifer salinization: invited submission to Hydrogeology Journal for special theme issue on Coastal Aquifer and Saltwater Intrusion, 62 p. manuscript.
- Langevin, C.D.**, 2008. Modeling axisymmetric flow and transport: Ground Water vol. 46, no. 4:579-590.
- La Licata, I., **Langevin, C.D.**, Dausman, A.M., 2007, Effect of tidal fluctuations on contaminant transfer to the ocean, in Sanford, W., Langevin, C.D., Polemio, M., and Povinec, P., eds., 2007, A new focus on groundwater-seawater interactions: IAHS Publication 312, Oxfordshire, United Kingdom, p. 334-341.
- Dausman, A.M., **Langevin, C.D.**, Sukop, M.C., 2007, Simulation of submarine groundwater discharge salinity and temperature variations: implications for remote detection, in Sanford, W., Langevin, C.D., Polemio, M., and Povinec, P., eds., 2007, A new focus on groundwater-seawater interactions: IAHS Publication 312, Oxfordshire, United Kingdom, p. 272-280.
- Langevin, C.D.**, Sanford, W., Polemio, M., and Povinec, P., 2007, Background and summary, in Sanford, W., Langevin, C.D., Polemio, M., and Povinec, P., eds., 2007, A new focus on groundwater-seawater interactions: IAHS Publication 312, Oxfordshire, United Kingdom, p. 3-10.
- Langevin, C.D.**, Lebbe, L., Bakker, M., and Voss, C.I., 2007, Ground Water Readers' Forum: Twentieth salt water intrusion meeting planned for June 23 to 27, 2008, in Naples, Florida. Ground Water 46, no. 6: 657-658.
- Swain, E.D., Langevin, C.D., and Wang, J.D., 2008. Utilizing spectral analysis of coastal discharge computed by a numerical model to determine boundary influence. Journal of Coastal Research, vol. 24, no. 6: 1418-1429.
- Langevin, C.D.**, Sanford, W., Polemio, M., and Povinec, P., 2007, Background and summary, in Sanford, W., Langevin, C.D., Polemio, M., and Povinec, P., eds., 2007, A new focus on groundwater-seawater interactions: IAHS Publication 312, Oxfordshire, United Kingdom, p. 3-10.
- Dausman, A.M., **Langevin, C.D.**, Sukop, M.C., 2007, Simulation of submarine groundwater discharge salinity and temperature variations: implications for remote detection, in Sanford, W., Langevin, C.D., Polemio, M., and Povinec, P., eds., 2007, A new focus on groundwater-seawater interactions: IAHS Publication 312, Oxfordshire, United Kingdom, p. 272-280.
- La Licata, I., **Langevin, C.D.**, Dausman, A.M., 2007, Effect of tidal fluctuations on contaminant transfer to the ocean, in Sanford, W., Langevin, C.D., Polemio, M., and Povinec, P., eds., 2007, A new focus on groundwater-seawater interactions: IAHS Publication 312, Oxfordshire, United Kingdom, p. 334-341.
- Thorne, D., **Langevin, C.D.**, and Sukop, M.C., 2006. Addition of simultaneous heat and solute transport and variable fluid viscosity to SEAWAT: Computer and Geosciences vol. 32, 1758-1768.
- Langevin, C.D.**, and Guo, W., 2006. MODFLOW/MT3DMS-based simulation of variable density ground water flow and transport: Ground Water vol. 44, no. 3:339-351.
- Langevin, C.D.**, Swain, E.D., and Wolfert, M.A. 2005. Simulation of integrated surface-water/groundwater flow and salinity for a coastal wetland and adjacent estuary: Journal of Hydrology 314, 212-234.

- Mao, X., Prommer, H., Barry, D.A., **Langevin, C.D.**, Panteleit, B., and Li, L., 2006. Three-dimensional model for multi-component reactive transport with variable density groundwater flow: *Environmental Modelling & Software* vol. 21, no. 5:615-628.
- Langevin, C.D.**, and Bean, D.M., 2005, Software Spotlight/Ground Water Vistas: A graphical user interface for the MODFLOW family of ground water flow and transport models. *Ground Water* 43, no. 2:1-4.
- Bakker, M., Oude Essink, G.H.P., and **Langevin, C.D.**, 2004, The rotating movement of three immiscible fluids - a benchmark problem. *Journal of Hydrology* 287, 270-278.
- Langevin, C.D.** 2003. Simulation of submarine ground water discharge to a marine estuary: Biscayne Bay, Florida. *Ground Water* 41, no. 6: 758-771.
- Langevin, C.D.** 2003. Stochastic ground water flow simulation with a fracture zone continuum model. *Ground Water* 41, no. 5: 587-601.
- Stewart, M.T., and **Langevin, C.D.** 2000. Author's Reply. *Ground Water* 38, no. 1: 6-6.
- Stewart, M.T., and **Langevin, C.D.**, 1999. Post Audit of a numerical prediction of wellfield drawdown in a semiconfined aquifer system: *Ground Water* 37, no. 2:245-252.
- Langevin, C.D.**, Stewart, M.T., and Beaudoin, C.M., 1998. Effects of dredge and fill canals on freshwater resources of small oceanic islands. An example from Big Pine Key, Florida: *Ground Water* 36, no. 3: 503-513.

PUBLISHED USGS REPORTS

- Yager, R.M., Misut, P., **Langevin, C.D.**, 2009, Brine migration from a flooded salt mine in Livingston County, New York. *Geochemical modeling and simulation of variable-density flow*. U.S. Geological Survey Professional Paper.
- Dausman, A., **Langevin, C.D.**, Thorne, D., Sukop, M.C., 2009. Six benchmark problems for testing heat and solute transport with variable viscosity using SEAWAT Version 4: U.S. Geological Survey Scientific Investigations Report 2009-5028, 72 p.
- Wolfert-Lohmann, M.A., **Langevin, C.D.**, Jones, S.A., Reich, C.D., Wingard, G.L., Kuffner, I.B., and Cunningham, K.J., 2008. U.S. Geological Survey science support strategy for Biscayne National Park and surrounding areas in Southern Florida: U.S. Geological Survey Open-File Report 2007-1288, 47 p.
- Langevin, C.D.**, Thorne, D.T., Jr., Dausman, A.M., Sukop, M.C., and Guo, Weixing, 2007, SEAWAT Version 4: A Computer Program for Simulation of Multi-Species Solute and Heat Transport: U.S. Geological Survey Techniques and Methods Book 6, Chapter A22, 39 p.
- Wang, J.D., Swain, E.D., Wolfert, M.A., **Langevin, C.D.**, James, D.E., and Telis, P.A., 2007. Application of FTLOADDS to Simulate Flow, Salinity, and Surface-Water Stage in the Southern Everglades, Florida: U.S. Geological Survey Scientific Investigations Report 2007-5010, 112 p.
- Dausman, A.M. and **Langevin, C.D.** 2005. Movement of the saltwater interface in the Surficial Aquifer System in response to hydrologic stresses and water-management practices, Broward County, Florida: U.S. Geological Survey Scientific Investigations Report 2004-5256.
- Swarzenski, P.W., Charette, M., and **Langevin, C.D.** 2004. An autonomous, electromagnetic seepage meter to study coastal groundwater/surface water exchange: U.S. Geological Survey Open-File Report 2004-1369.
- Langevin, C.D.**, Swain, E.D., and Wolfert, M.A. 2004, Simulation of integrated surface-water/ground-water flow and salinity for a coastal wetland and adjacent estuary, U.S. Geological Survey Open-File Report 2004-1097.

- Langevin, C.D.**, Swain, E.D., Wang, J.D., Wolfert, M.A., Schaffranek, R.W., and Riscassi, A.L. 2004. Development of coastal flow and transport models in support of Everglades restoration: U.S. Geological Survey Fact Sheet 2004-3130.
- Wolfert, M.A., **Langevin, C.D.**, and Swain, E.D. 2004. Assigning boundary conditions to the Southern Inland and Coastal Systems (SICS) model using results from the South Florida Water Management Model (SFWMM): U.S. Geological Survey Open-File Report 2004-1195, 30 p.
- Langevin, C.D.**, Shoemaker, W.B., and Guo, W. 2003. MODFLOW-2000, the U.S. Geological Survey modular ground-water model—Documentation of the SEAWAT-2000 version with the variable-density flow process (VDF) and the integrated MT3DMS Transport Process (IMT): U.S. Geological Survey Open-File Report 03-426, 43 p.
- Guo, Weixing, and **Langevin, C.D.** 2002. User's guide to SEAWAT: A computer program for simulation of three-dimensional variable-density ground-water flow: U.S. Geological Survey Techniques of Water Resources Investigations Book 6, Chapter A7, 79 p.
- Guo, Weixing, and **Langevin, C.D.** 2002. User's guide to SEAWAT: A computer program for simulation of three-dimensional variable-density ground-water flow: U.S. Geological Survey Open-File Report 01-434, 79 p.
- Langevin, C.D.** 2001. Simulation of ground-water discharge to Biscayne Bay, Southeastern Florida: U.S. Geological Survey Water-Resources Investigations Report 00-4251, 127 p.

PROCEEDINGS

- Brakefield, L.K., Abarca, E., **Langevin, C.D.**, and Clement, T.P., 2008. Physical and numerical modeling of buoyant groundwater plumes: In Proceedings of the 20th Salt Water Intrusion Meeting, June 23-27, 2008, Naples, Florida, U.S.A.
- La Licata, I., **Langevin, C.D.**, Dausman, A.M., and Alberti, L., 2008. Tidal effects on transient dispersion of simulated contaminant concentrations in coastal aquifers: In Proceedings of the 20th Salt Water Intrusion Meeting, June 23-27, 2008, Naples, Florida, U.S.A.
- Zygnerski, M.R., and **Langevin, C.D.**, 2008. Quantifying effects of natural and anthropogenic stresses on long-term saltwater intrusion in a coastal aquifer: In Proceedings of the 20th Salt Water Intrusion Meeting, June 23-27, 2008, Naples, Florida, U.S.A.
- Dausman, A.M., **Langevin, C.D.**, Sukop, M.C., and Walsh, V., 2008b. Saltwater/freshwater interface movement in response to deep-well injection in a coastal aquifer: In Proceedings of the 20th Salt Water Intrusion Meeting, June 23-27, 2008, Naples, Florida, U.S.A.
- Bittner, L.D., Richardson, E., **Langevin, C.D.**, England, S.M., and Stevens, G.T., 2008. Using density-dependent numerical models to evaluate regional groundwater flow patterns in South Florida: In Proceedings of The World Environmental & Water Resources Congress, May 12-16, 2008, Honolulu, Hawaii.
- Sukop, M.C., S. Anwar, J.S. Lee, K.J. Cunningham, and **Langevin, C.D.**, 2008. Modeling ground-water flow and solute transport in karst with Lattice Boltzmann Methods: Proceedings of the U.S. Geological Survey Karst Interest Group Workshop, May 27-29, 2008, Bowling Green, Kentucky, Western Kentucky University Campus. <http://pubs.usgs.gov/sir/2008/5023/32sukop.htm>.
- Dausman, A., Doherty, J., **Langevin, C.D.**, and Sukop, M.C., 2008. Quantifying data contributions toward reducing predictive uncertainty in a variable-density flow and solute/heat transport model: In MODFLOW and More 2008: Ground Water and Public Policy - Conference Proceedings, Golden, Colorado, May 19-21, 2008.
- Langevin, C.D.**, Dausman, A.M., Thorne, D., and Sukop, M.C., 2008. Modeling solute and heat transport with SEAWAT: In MODFLOW and More 2008: Ground Water and Public Policy - Conference Proceedings, Golden, Colorado, May 19-21, 2008.
- Zygnerski, M.R., and **Langevin, C.D.**, 2007. Long-term saltwater intrusion in a coastal limestone aquifer: quantifying effects of natural and anthropogenic stress: In Proceedings of the 3rd International

Symposium on Technology of Seawater Intrusion into Coastal Aquifers, Almeria, Spain, October 16-19, 2007.

- Langevin, C.D.**, and Zygnerski, M., 2006. Axisymmetric simulation of aquifer storage and recovery with SEAWAT and the Sea Water Intrusion (SWI) Package for MODFLOW: In Proceedings of MODFLOW and More 2006, Managing Ground-Water Systems, Golden, Colorado, May 22-24, 2006.
- Thorne, D., **Langevin, C.D.**, and Sukop, M.C., 2006. MODFLOW/MT3DMS-based simulation of variable-density groundwater flow with simultaneous heat and solute transport: In Proceedings of the 2006 Conference on Computational Methods in Water Resources XVI, Copenhagen, Denmark, June 19-22, 2006.
- Langevin, C.D.** and Dausman, A.M. 2005. Numerical simulation of saltwater intrusion in response to sea-level rise: In Proceedings of the World Water & Environmental Resources Congress, Impacts of Global Climate Change, American Society of Civil Engineers, Anchorage, Alaska, May 15-19, 2005.
- Langevin, C.D.**, Swain, E.D., and Wolfert, M.A. 2002. Numerical simulation of integrated surface-water/ground-water flow and solute transport in the southern Everglades in Florida. Second Federal Interagency Hydrologic Modeling Conference, Las Vegas, Nevada, July 28 – August 1, 2002.
- Dausman, A., and **Langevin, C.D.** 2002. Representing hydrodynamic dispersion in saltwater intrusion models of different temporal scales. American Water Resources Association's Spring Specialty Conference on "Coastal Water Resources", May 13-15, 2002, New Orleans, Louisiana.
- Swain, E.D., **Langevin, C.D.**, and Wolfert, M.A. 2002. Cooperative linking of numerical models for coastal wetland planning. American Water Resources Association's Spring Specialty Conference on "Coastal Water Resources," May 13-15, 2002, New Orleans, Louisiana.
- Guo, Weixing, **Langevin, C.D.**, and Bennett, G.D. 2001. Improvements to SEAWAT and application of the variable-density modeling program in southern Florida, in Poeter, E., and others, MODFLOW 2001 and Other Modeling Odysseys Conference, Colorado School of Mines, Golden, Colorado, v. 2, p. 621-627.

GRADUATE WORK

- Langevin, C.D.** 1994. Numerical model of porewater fluxes in a hypothetical Florida Bay mud island. Master's Thesis, University of South Florida.
- Langevin, C.D.** 1998. Stochastic methods for evaluating the potential for wetland rehydration in covered-karst terranes. Ph.D. Dissertation, University of South Florida.

SCIENTIFIC LEADERSHIP

PROFESSIONAL SERVICE

Associate Editor: Ground Water (2006 to present)

Peer Reviewer: Water Resources Research; Advances in Water Resources; Ground Water; Hydrogeology Journal; Journal of Hydrology; Water Resources Planning and Management; Hydrological Sciences Journal; Computers and Geosciences; Earth and Planetary Science Letters; Journal of Geophysical Research - Oceans; The Handbook of Groundwater Engineering, CRC Press; NSF proposals; U.S. Geological Survey journal articles, reports, and abstracts; University of Wisconsin, Water Resources Institute (proposals); University of Florida, Water Resources Research Center (proposals); Department of Interior, Critical Ecosystem Studies Initiative (proposals); National Institutes for Water Resource (proposals)

Memberships: American Geophysical Union, Geological Society of America, National Ground Water Association, South Florida Hydrologic Society

MEETINGS ORGANIZED

20th Salt Water Intrusion Meeting, Naples, Florida, July 23-27, 2008.

GRADUATE STUDENT ADVISING

Ph.D.

Dorina Murgulet, University of Alabama
William Hutchings, University of South Florida
Katie Bardsley, Florida International University
Alyssa Dausman, Florida International University
Joseph Chandler, University of Alabama

Master's Degree

Michael Byrnes, Florida International University (graduated 1999)
Donald Thompson, University of South Florida (graduated 2003)
William Hutchings, University of South Florida (graduated 2005)

Summer Intern Advising

Joseph Chandler, Ph.D. Candidate, University of Alabama, summer 2005
Ivana La Licata, Ph.D. Candidate, Polytechnic Institute of Milan, Italy, summer 2006
Linzy Brakefield, M.S. Student, University of Alabama, summer 2007
Daan Herckenrath, M.S. Student, Wageningen University, summer 2008
Carlos Duque, Ph.D. Candidate, University of Granada, Spain, summer 2008

TEACHING

- USGS National Training Center: Introduction to Three-Dimensional Variable-Density Groundwater Modeling Using SEAWAT (2005 and 2007)
- SEAWAT workshops: University of South Florida (2000), USGS Massachusetts Office (2001), South Florida Water Management District (2003), 5th Washington Hydrogeologic Symposium (2005), SWIM-SWICA Conference, Italy (2006), USGS San Diego Office (2006)
- University of Puerto Rico-Rio Piedras, Department of Environmental Studies, 2003 Summer Semester. Introduction to Groundwater Modeling.
- University of South Florida, Geology Department, Tampa, FL, 1994, 1995, 1996 Fall Semesters. Applied Hydrogeology.

AWARDS

- John Hem Award, National Ground Water Association, 2008
- USGS Performance-Based Award, 2008
- USGS Star Award, 2001, 2007, 2008
- USGS Quality Step Increase, November 2006
- Sigma Xi Honor Society Member, University of South Florida Chapter
- William V. Storch Award, American Water Resources Association, December 1995

SPECIAL ASSIGNMENTS

- Expert consultant for the Bureau of Indian Affairs regarding a SEAWAT modeling study, Lummi Indian Reservation, Washington State (November 2002)
- International expert consultant, United Nations Food and Agricultural Organization, Rabat, Morocco, July 22 August 4, 2002. I served as an international expert on saltwater intrusion for the Moroccan government applying SEAWAT to examine water supply issues for two coastal aquifers in Morocco.
- Panel Member on saltwater intrusion discussion, 5th Washington Hydrogeologic Symposium, April 12-14, 2005, Tacoma, Washington.
(<http://www.ecy.wa.gov/events/hg/Program/workshops.htm#w3>)