

ALICIA M. WILSON

Dept. Earth and Ocean Sciences
University of South Carolina
Columbia SC 29205

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www.geol.sc.edu/wilson/index.htm

EDUCATION

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|--------------------------------------|---|
| Johns Hopkins University, Ph.D. 1999 | Earth and Planetary Sciences (Hydrogeology) |
| Stanford University, M.S. 1993 | Applied Earth Science (Hydrogeology) |
| Dartmouth College, B.A. 1991 | Earth Science |

APPOINTMENTS

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| 2014 to present | Adjunct Associate Professor, Marine Science Program, University of South Carolina |
| 2011 to present | Senior Associate Faculty, Environment & Sustainability Program, Univ. S. Carolina |
| 2010-2011 | Blaustein Visiting Professor, Stanford University |
| 2008-2009 | Undergraduate Director, School of the Environment, University of South Carolina |
| 2008-2010 | Adjunct Associate Professor, Marine Science Program, University of South Carolina |
| 2007 to present | Associate Professor, Earth & Ocean Sciences, University of South Carolina |
| 2001 to 2007 | Assistant Professor, Geological Sciences, University of South Carolina |
| 2000 | Post-doc, Bren School of Environmental Science & Management |
| 1999 | National Research Council Post-doctoral Research Associate, USGS WRD, Reston VA |

PUBLICATIONS (* indicates Wilson student; ** indicates Wilson undergraduate student)

1. Schutte, C.A., A.M. Wilson, T.B. Evans*, W.S. Moore, S.B. Joye (submitted) Deep oxygen penetration drives nitrification in intertidal beach sands. Submitted to L&O 6/7/2016.
2. Savidge, W.B., A.M. Wilson, and G. Woodward** (in press) Using a thermal proxy to examine sediment-water exchange in mid-continental shelf sandy sediment. *Aquatic Geochemistry* (special issue, accepted May 2016).
3. Wilson, A.M., W.B. Savidge, and G. Woodward** (2016) Using heat as a tracer to estimate the depth of rapid porewater advection below the sediment-water interface. *Journal of Hydrology*.
4. *Evans, Tyler and Alicia M. Wilson (2016) Groundwater transport and the freshwater-saltwater interface below beaches. *Journal of Hydrology*.
5. Schutte, C.A., S.M. Joye, A.M. Wilson, W.S. Moore, and T.B. Evans* (2016) Methanotrophy controls groundwater methane export from a barrier island. *Geochimica et Cosmochimica Acta* 17:242-256.
6. Schutte, Charles A., S.B. Joye, A.M. Wilson, T.B. Evans*, W.S. Moore and K. Casciotti (2015). Intense nitrogen cycling in permeable intertidal sediment revealed by a nitrous oxide hotspot. *Global Biogeochemical Cycles*, 29, doi:10.1002/2014GB005052.
7. *Hughes, Wilson, and Moore (2015) Groundwater transport and radium variability in coastal porewaters. *Estuarine, Coastal and Shelf Science*, 164, p 94-104. <http://dx.doi.org/10.1016/j.ecss.2015.06.005>.
8. Wilson, Alicia M., Tyler Evans*, Willard Moore, Charles Schutte, and Samantha Joye (2015) What time scales are important for monitoring tidally-influenced submarine groundwater discharge? Insights from a salt marsh. *Water Resources Research* 51, 4198-4207, doi:10.1002/2014WR015984.
9. *Gupta, Ipsita, Alicia M. Wilson, and Benjamin J. Rostron (2015) Groundwater age, brine migration, and large-scale solute transport in the Alberta Basin, Canada. *Geofluids* 15, 608–620. doi: [10.1111/gfl.12131](http://dx.doi.org/10.1111/gfl.12131).

10. Wilson, Alicia M., T.B. Evans*, A.H. Hughes*, W.S. Moore, C.A. Schutte, S.B. Joye (2015) Groundwater controls ecological zonation of macrophytes in salt marshes. *Ecology* 96, 840-849. <http://dx.doi.org/10.1890/13-2183.1>.
11. Das, Reshmi, Michael Bizimis, and Alicia M. Wilson (2013) Tracing mercury seawater vs. atmospheric inputs in a pristine SE USA salt marsh system: Mercury isotope evidence. *Chemical Geology* 336, p. 50-61.
12. *Hughes, Andrea L.H., Alicia M. Wilson, and James T. Morris (2012) Hydrologic variability in a salt marsh: Assessing the links between drought and acute marsh dieback. *Estuarine, Coastal and Shelf Science* 111(95-106).
13. Wilson, Alicia M. and James T. Morris (2012) The influence of tidal forcing on groundwater flow and nutrient exchange in a salt marsh-dominated estuary. *Biogeochemistry* v. 108, no. 1, p. 27-38.
14. *Gupta, Ipsita, Alicia M. Wilson, and Benjamin J. Rostron (2012) Cl/Br ratios as indicators of the origin of brines: Hydrogeologic simulations of the Alberta Basin, Canada. *GSA Bulletin*, v. 124 no. 1-2, p. 200-212.
15. Wilson, Alicia M., Willard, S. Moore, Samantha B. Joye, Joseph L. Anderson*, and Charles A. Schutte (2011) Storm-driven groundwater flow in a salt marsh. *Water Resources Research*, v. 47, W02535, doi:10.1029/2010WR009496, 11 pp.
16. Wilson, Alicia M., Marcus Huettel, and Steven Klein (2008) Grain size and depositional environment as predictors of permeability in coastal marine sands, *Estuarine, Coastal and Shelf Sediments* 80(1) 193-199.
17. Carter, E.S., S.M. White, and A.M. Wilson (2008) Variation in groundwater salinity in a tidal salt marsh basin, North Inlet Estuary, South Carolina. *Estuarine, Coastal and Shelf Science* 76, 543-552.
18. Wilson, Alicia M., and Carolyn Ruppel (2007) Salt tectonics and shallow subsurface fluid convection: models of coupled fluid-heat-salt transport. *Geofluids* 7 (4), 377-386.
19. *Thornton, M. M. and Alicia M. Wilson (2007) Topography-driven flow versus buoyancy-driven flow in the U.S. mid-continent: implications for the residence time of brines, *Geofluids*, 7, 69-78.
20. Gardner, Leonard R., and Alicia M Wilson (2006) Comparison of four numerical models for simulating seepage from salt marsh sediments. *Estuarine, Coastal and Shelf Science*, 69, 427-437.
21. Wilson, A. M., and L. R. Gardner (2006), Tidally driven groundwater flow and solute exchange in a marsh: Numerical simulations, *Water Resour. Res.*, 42, W01405, doi:10.1029/2005WR004302
22. Wilson A. M., and L. R. Gardner (2005), Comment on "Subsurface flow and vegetation patterns in tidal environments" by Nadia Ursino, Sonia Silvestri, and Marco Marani, *Water Resour. Res.*, 41, W07021, doi:10.1029/2004WR003554.
23. Moore, Willard S., and Alicia M. Wilson (2005) Advective flow through the upper continental shelf driven by storms, buoyancy, and submarine groundwater discharge. *Earth and Planetary Science Letters*, Volume 235, Issues 3-4, 15 July 2005, Pages 564-576.
24. Wilson, Alicia M. (2005), Fresh and saline groundwater discharge to the ocean: A regional perspective. *Water Resources Research*, v. 41, W02016, doi:10.1029/2004WR003399.
25. Hoffman, J, S.A. Leake, D.L. Galloway, and A.M. Wilson (2003) MODFLOW-2000 ground-water model – User guide to the Subsidence and Aquifer-System Compaction (SUB) Package. U.S. Geological Survey Open-File Report 03-233, 44 p.
26. Wilson, Alicia M. (2003), The occurrence and chemical implications of geothermal convection in continental shelves: *Geophysical Research Letters*, v. 30, no. 21, 2127, doi:10.1029/2003GL018499
27. Wilson, Alicia M., Thomas Fenstemaker, and John M. Sharp, Jr. (2003) Abnormally-pressured beds as barriers to diffusive mass transport in sedimentary basins. *Geofluids* 3(3), p. 203-212.
28. Whitaker, Fiona F., Gareth Jones, Ward Sanford, Peter Smart, and Alicia M. Wilson (2002), Hydrology, geochemistry and diagenetic potential of saline groundwater: field results from the Bahamas and model studies: Special Publication of the Karst Waters Institute no. 7, p. 124-128.

29. Keller, Arturo A., Patricia Holden, and Alicia M. Wilson (2002) Modelling the seasonal variation in bioavailability of residual NAPL in the vadose zone, in Groundwater quality; natural and enhanced restoration of groundwater. S. F. Thornton and S. E. Oswald, eds., IAHS-AISH Publication vol. 275, p. 133-139.
30. Wilson, Alicia M., Ward Sanford, Fiona Whitaker, and Peter Smart (2001), Spatial patterns of diagenesis during geothermal convection in carbonate platforms: American Journal of Science, v. 301, p. 727-752.
31. Wilson, Alicia M., James R. Boles, and Grant Garven (2000), Calcium mass transport and diagenesis during compaction-driven flow in the San Joaquin Basin, California: GSA Bulletin, v. 112, no. 6, p. 845-856.
32. Wilson, Alicia M., Ward Sanford, Fiona Whitaker, and Peter Smart (2000), Geothermal convection: a mechanism for dolomitization at Enewetak Atoll?: Journal of Geochemical Exploration, v. 69-70, no. 1-3, p. 41-45.
33. Wilson, Alicia M., Grant Garven, and James R. Boles (1999), Paleohydrogeology of the San Joaquin Basin, California: GSA Bulletin, v. 111, No. 3, pp. 432-449.
34. Wilson, Alicia M., and Steven Gorelick (1996), The effects of pulsed pumping on land subsidence in the Santa Clara Valley, California: Journal of Hydrology, Vol. 184, No. 3-4, p. 375-396.

Grants (Note: All are Wilson as lead PI or sole PI, with the exception of USC internal grants)

1. National Center for Women & IT, \$2000 5/15/2016-9/15/2016. 2015 Girls Go for IT Summer Camp. Co-PI Dr. Toni Williams, UofSC School of Education.
2. South Carolina Sea Grant, \$149k. How does coastal development impact groundwater inputs to estuarine tidal creeks? 2/1/2016-1/30/2018. Lead PI Wilson, co-PI Erik Smith. Grant supports two weeks of summer salary each, field and lab work (Smith), two undergraduates, and one graduate student (Wilson).
3. National Center for Women & IT, \$2000. 10/15/2015 – 5/15/2016. Girls Go for IT Computer Club. Sole PI.
4. National Center for Women & IT, \$2000 5/15/2015-8/15/2015. 2015 Girls Go for IT Summer Camp. Co-PI Dr. Toni Williams, UofSC School of Education.
5. USC Provost's Office Research Engagement Collaborative Seed Grant, \$25k. Coastal Health, Sustainability and Adaptation. Lead PI Dr. Kirstin Dow. Wilson is co-PI (unfunded).
6. National Center for Women & IT, \$1500 4/21/2014-8/15/2014. Girls Go for IT Summer Camp. Sole PI.
7. NSF (Hydrology) \$575K. Fluid and chemical fluxes across the seafloor of a passive margin. 7/1/2013 – 6/30/2016. Lead PI Wilson, co-PIs Billy Moore and Scott White. Grant supports two weeks' summer salary each, two graduate students (Wilson and White), and significant field and lab work.
8. USC Internal funding (VPR) \$14,855 Measurement of oxygen consumption in beach face pore waters. 4/16/2012-4/15/2013. Lead PI Tim Shaw. Wilson is co-PI (unfunded).
9. NSF (Hydrology) \$574,094 (USC portion \$374,094); 9/1/2007 – 8/31/2010. Collaborative Research: Groundwater dynamics of a barrier island. USC co-PI Billy Moore. Grant supports field and lab work (Wilson and Moore), 1 mo summer salary each, 1 graduate student (Wilson), 1 undergraduate student (Moore).

10. South Carolina Sea Grant, \$42,720, 2/1/2008 – 8/31/2009. An integrated hydrologic and ecological study of salt marsh dynamics. Co-PI Jim Morris (Biology). Grant supports Wilson lab (including fieldwork), Wilson summer salary (1 mo), 1 Geology graduate student.
11. DOE (Basic Energy Science), \$158,000; 3/1/2004 – 5/15/2008. Understanding long-term solute transport in sedimentary basins: Simulating brine migration in the Alberta Basin, Canada. Sole PI. Grant supported Wilson lab, 1 mo summer salary, and 1 graduate student (Ipsita Gupta).
12. South Carolina Sea Grant, \$147,543, 3/1/2006 – 7/31/2008. An integrated hydrologic and ecological study of salt marsh dynamics. Co-PI Jim Morris (Biology). Grant supports Wilson lab (including fieldwork), Wilson summer salary (1 mo), 1 Geology graduate student (Andrea Hougham), 1 Biology graduate student (Weihong Wang).
13. USC Magellan Scholar Program \$1200 6/1/2006 – 5/15/2007. 3-D Maps of Salinity and Groundwater Composition beneath South Carolina's Coastal Plain. With Elizabeth (Ashley) Shull, USC Geology Undergraduate Major.

Abstracts (since 2007)

1. Smoak, E., S.M. White and A.M. Wilson (2015) Depositional environments during sea-level rise based on paleochannel fill offshore Charleston, SC. Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p. 266.
2. Wilson, A.M. (2015a) How far can we stretch the concept of a watershed? Groundwater-seawater exchange far from shore. Geological Society of America *Abstracts with Programs*. Vol. 47, No. 7, p. 411. **Invited.**
3. Wilson, A.M. (2015b) How does sea level rise affect salt marsh hydrogeology? Implications for ecological zonation and nutrients. Abstracts, 25th Biennial Conference of the Coastal and Estuarine Research Federation.
4. *Evans, T.B., S.M. White and A.M. Wilson (2014) Position of the freshwater-saltwater interface in a coastal confined aquifer. Abstract H23D-0912 (#22555) presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.
5. S.M. White, W.S. Moore, E. Smoak, *C. George and A.M. Wilson (2014) Fluid Exchange Across the Seafloor of the Continental Shelf in the South Atlantic Bight. Abstract H23D-0907 (#16023) presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.
6. M.C. Marvin-DiPasquale, L.M. Windham-Myers, A.M. Wilson, T. Buck, and E. Smith (2014) The influence of coastal wetland zonation on surface sediment and porewater mercury speciation. Abstract OS53E-1092 (#6839) presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.
7. M.C. Marvin-DiPasquale, L.M. Windham-Myers, A. Wilson, T. Buck, and E. Smith (2014) The Influence of Coastal Wetland Zonation on Surface Sediment and Porewater Mercury Speciation. 2014 NERRS/NERRA Annual Meeting, November 17 – 21, 2014, Shepherdstown, WV.
8. *Hughes, A.H. and A.M. Wilson (2014) Groundwater transport and radium variability in coastal porewaters. Geological Society of America *Abstracts with Programs*, Vol. 46, No. 6, p. 481.
9. Wilson, A.M. and W.S. Savidge (2014) USING HEAT AS A TRACER TO QUANTIFY TRANSIENT FLUSHING BELOW THE SEDIMENT-WATER INTERFACE IN A SANDY CONTINENTAL SHELF. Geological Society of America *Abstracts with Programs*, Vol. 46, No. 6, p. 479.

10. Wilson, A.M. (2014) **Invited**. Regional groundwater flow and energy resources: New challenges in continental shelves. Geological Society of America Abstracts with Programs, Vol. 46, No. 6, p. 230.
11. Wilson, A.M., A.H. Hughes, and W.S. Moore (2013) Radium isotopes as tracers for groundwater-surfacewater interactions in tidally-influenced creeks. Geological Society of America *Abstracts with Programs*. Vol. 45, No. 7, p.196.
12. *Evans, Tyler, A.M. Wilson, W.S. Moore (2013) Salinity and groundwater flow below beaches, Abstract 1802427 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
13. *Hughes, A.L., A.M. Wilson (2013) Improving radium-based tracer techniques: Hydrologic controls on porewater radium activity, Abstract 1817479 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
14. *Peurifoy, J. Brad, A.M. Wilson (2013) Quantifying relative changes in SGD in response to fluctuations in tidal amplitude and MSL from a fringing marsh system, North Inlet, SC, Abstract presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
15. Wilson, A.M., W.S. Moore, T.B. Evans, S.B. Joye, C.S. Schutte (2013) Groundwater controls on ecological zonation in the U.S. Southeast. H33I-02. Abstract presented at the 2013 Fall Meeting, AGU, San Francisco, CA, 9-13 Dec.
16. *Peurifoy, J. Brad, A.M. Wilson, and S.M. White (2012) Salinity and groundwater flow beneath a fringing salt marsh: Electrical resistivity tomography. GSA Abstracts with Programs, Vol 44, No. 7, p. 433.
17. *Evans, Tyler, A.M. Wilson, C. Schutte, W. Moore, and S.B. Joye (2012), GSA Abstracts with Programs, Vol 44, No. 7, p. 616.
18. *Hughes, A.L., A.M. Wilson, and J.T. Morris (2012), Natural hydrologic variability in an intertidal salt marsh and its impact on groundwater transport of select geochemical tracers and proxies. GSA Abstracts with Programs, v 44, no. 7, p. 615
19. Wilson, A.M., *T. Evans, W.S. Moore, C. Schutte, and S.B. Joye (2012) Temporal variability in submarine groundwater discharge: What time scales are important? GSA Abstracts with Programs, Vol 44, No. 7, p. 615. Schutte, C., A.M. Wilson, J. Anderson, W. Moore, and S. Joye (2012) Tidally-driven hotspots of nitrogen cycling in shallow coastal aquifers. NASA Astrobiology Science Conference, Atlanta GA, April 16-20, 2012.
20. Das, Reshmi, Michael Bizimis, and Alicia M Wilson (2011), Mass independent isotope fractionation of mercury in the sediments of a salt marsh: Cabretta Island, GA. 10th International Conference on Mercury as a Global Pollutant Abstract Volume p. 72-73. (Available at www.mercury2011.org)
21. Wilson, A.M., U. Wortmann, M. Huuse, J.C. McIntosh (2011) Reflux circulation and groundwater age below the Great Australian Bight, GSA Abstracts with Programs, Vol 43, No. 5, p. 393.
22. *Hughes, A.L., A.M. Wilson, and J.T. Morris (2011), Hydrologic variability in a salt marsh: Assessing the links between drought and acute marsh dieback. Abstracts, 21st Biennial Conference of the Coastal and Estuarine Research Federation, p. 100.
23. Wilson, A.M., J.T. Morris, W.S. Moore, S.B. Joye, J. Anderson, C. Schutte (2011) The effect of variability in tidal forcing on groundwater exchange in coastal wetlands. 21st Biennial Conference of the Coastal and Estuarine Research Federation, p. 231.
24. *Hughes, A.L. and A.M. Wilson (2010), Groundwater modeling and radium isotopes as tools for estimating coastal groundwater discharge: A field and modeling study, North Inlet Salt Marsh, Georgetown, South Carolina, Eos Trans. AGU, 91(26), Ocean Sci. Meet. Suppl., Abstract IT25D-03.

25. Schutte, C.A., W.S. Moore, A.M. Wilson, and S.B. Joye (2010), Nitrogen cycling and trace gas dynamics in coastal aquifers, Goldschmidt Conference Abstracts.
26. *Gupta, Ipsita and A.M. Wilson (2010) Using geochemical evidence to constrain hydrogeologic models of brine formation and residence time. Geological Society of America Abstracts with Programs, Vol. 42, No. 5, p. 486
27. Wilson, A.M. and J.T. Morris (2010), Groundwater-mediated feedbacks between sea level rise and marsh productivity, Abstract EP31B-0746 presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13-17 Dec.
28. Wilson, A.M., *J. Anderson, W.S. Moore, C. Schutte, S.B. Joye (2009) Storm-driven groundwater flow and nutrient transport in a barrier Island. *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract H13H-05.

Seminars (Last 5 years)

1. January 29, 2016: Florida International University
2. March 4, 2013: University of Georgia, Dept. Marine Sciences
3. March 29, 2013: Virginia Tech, Dept Geology
4. April 19, 2013: Clemson University, Dept. Environmental Engineering and Earth Science
5. Oct 11, 2013: University of Missouri, Dept. Geological Sciences
6. Nov 9, 2012: University of South Carolina, Dept. Mechanical Engineering , "The residence time of porefluids in deep sedimentary basins: Can you conduct a tracer test over millions of years?"
7. March 3, 2011: USGS Water Resources Discipline Research Seminar (Western Regional Headquarters, Menlo Park; "Hydrologic variability and the hydrogeology of salt marshes: Some insights from field and modeling studies." Video streamed nationally and archived at <http://wwwrcamnl.wr.usgs.gov/wrdseminar/pastseminarsonvideo.htm>
8. March 23, 2011: University of the Pacific, Earth and Environmental Science Dept. Seminar, "Hydrogeology of salt marshes: Some insights from field and modeling studies"
9. April 7, 2011: UC Santa Barbara, Earth Science Dept Seminar. "Hydrologic variability and salt marsh ecosystems"
10. April 27, 2011, UC Santa Cruz, Dept Earth and Planetary Sciences (brown bag) "Groundwater flow and hydrologic variability in salt marshes."
11. March 1, 2010: Skidaway Institute of Oceanography.
12. October 21, 2010: Rice University , Dept. Earth Science
13. November 17, 2010: Stanford University, Dept. Environmental Earth System Science

ADVISERS

M.S.: Prof. Steve Gorelick, Environmental Earth System Sciences, Stanford University

Ph.D.: Prof. Grant Garven, now at Tufts University

Post-doc: Dr. Ward Sanford, National Research Program, USGS Reston, Virginia

Post-doc: Profs. Patricia Holden and Arturo Keller, Bren School, UC Santa Barbara

STUDENTS ADVISED

MS students:

Carolyn Ryan (current)
Meghan Shanahan (current)
Brad Peurifoy (2013)
Joseph Anderson (2010)
Alan Mehrzad (2009)
Melissa Thornton (2005)
Justin Scheidt (2005)

Ph.D. Students:

Tyler Evans (current)
Cameron George (current)
Andrea Hughes (2016)
Ipsita Gupta (2010)

PROFESSIONAL MEMBERSHIPS

AGU, GSA, AWG (Association for Women Geoscientists)

USC Service (emphasizing last 5 years)

- Member of many dept-level committees (EOS Undergrad Committee, etc; see full file.)
- Chair of the 2011-2012 and 2012-2013 Aqueous Geochemistry searches.
- CAS Curriculum Committee (3 years)
- Chair of the E&SP Future Hires Committee 2013-2014

Professional Service

- Associate Editor, Water Resources Research 3/3014-12/2017.
- NSF Panels: Hydrology Panel 2011, 2012, 2015; MG&G, Coastal SEES,
- Chair, Geological Society of America Hydrogeology Division, 2016 Meeting.
- Geological Society of America Hydrogeology Division Management Board, 2013-present
- Geological Society of America Joint Technical Program Committee, Hydrogeology Division rep, 2010-2012 (Responsible for the Hydrogeology Div. technical program for the 2012 Annual meeting)
- Associate Editor, Hydrogeology Journal, 2005 - 2009
- Integrated Ocean Drilling Program Scientific Steering and Evaluation Panel (SSEP), 2005-2008
- Undergraduate director, USC School of the Environment, 2008-2009
- Reviewer for NSF and other funding agencies
- Reviewer for many journals. For the period 2009-2013, this included 34 reviews for:

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| Water Resources Research | J Hydrology |
| Hydrologic Processes | GRL (Geophysical Research Letters) |
| Geology | JGR (Journal of Geophysical Research) |
| Limnology and Oceanography | G ³ |
| Geochimica et Cosmochimica Acta | Marine Chemistry |
| Journal of Geology | Hydrogeology Journal |
| Estuaries and Coasts | Soil Science Society of America Journal |
| J Am. Mining and Reclamation | J. South American Earth Science |
| Wetlands Ecology and Management) | |