

Joshua L. Breithaupt, PhD

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EDUCATION

Doctor of Philosophy in Marine Science, University of South Florida (May 2017)

Co-Major Advisors: Dr. Joseph Smoak & Dr. Robert Byrne

Dissertation: Spatio-temporal Dynamics of Soil Composition and Accumulation Rates in Mangrove Wetlands

Fellowships: U.S. EPA STAR, Von Rosenstiel, & St. Petersburg Downtown Partnership

Master of Science in Environmental Science, University of South Florida (August 2012)

Co-Major Advisors: Dr. Joseph Smoak & Dr. Thomas J. Smith (US Geological Survey)

Thesis: Organic Carbon Burial Rates in Mangrove Soils: Global Context and a Preliminary Investigation of the Coastal Everglades

Bachelor of Arts in English, Wheaton College (Wheaton, IL) (May 1999)

PROFESSIONAL EXPERIENCE

Postdoctoral Associate	2017 – 2019
Aquatic Biogeochemistry Lab, University of Central Florida, Orlando, FL	
Postdoctoral Associate	2017
Florida Fish & Wildlife Conservation Commission, St. Petersburg, FL	
Graduate Research Assistant/Fellow	2012 – 2017
University of South Florida, St. Petersburg, FL	
Graduate Teaching Assistant	2010 – 2013
University of South Florida, St. Petersburg, FL	
<u>Pre-Academic Professional Career:</u>	
Advertising Agency Relations	2006 – 2010
Monster.com	
Internet Advertising	1999 – 2006
TMP Worldwide	

PEER-REVIEWED PUBLICATIONS

1. Segovia, A.P., W. Machado, D. Gutierrez, J. Smoak, **J.L. Breithaupt**, M. Saldarriaga, L. Sanders, H. Marotta, & C.J. Sanders. Carbon and nutrient accumulation in mangrove sediments affected by multiple environmental changes. *Journal of Soils and Sediments*, Accepted for Publication on 19, March 2020.
2. **Breithaupt, J.L.**, Smoak, J.M., Bianchi, T.S., Vaughn, D., Sanders, C.J., Radabaugh, K.R., Osland, M.J., Feher, L.C., Lynch, J.C., Cahoon, D.R., Anderson, G.H., Whelan, K.R.T., Rosenheim, B.E., Moyer, R.P., and Chambers, L.G. (2020). Increasing rates of carbon burial in southwest Florida coastal wetlands. *Journal of Geophysical Research: Biogeosciences*, 125, e2019JG005349. <https://doi.org/10.1029/2019JG005349>

3. **Breithaupt, J.L.**, E. Duga, M. Witt, R. Filyaw, N. Friedland, M.J. Donnelly, L.J. Walters, & L.G. Chambers. Carbon and nutrient fluxes from seagrass and mangrove wrack are mediated by soil interactions. (2019). *Estuarine, Coastal and Shelf Science*. <https://doi.org/10.1016/j.ecss.2019.106409>.
4. Tiling-Range, G., Smith III, T.J., Foster, A.M., Smoak, J.M., & **J.L. Breithaupt**. (2019). Utilizing Fossilized Charcoal to Augment the Everglades National Park Fire History Geodatabase. *Journal of Environmental Management*, 249 (1). <https://doi.org/10.1016/j.jenvman.2019.109360>
5. **Breithaupt, J.L.**, N. Hurst, H.E. Steinmuller, E. Duga, J.M. Smoak, J. Kominoski, and L.G. Chambers. Comparing the Biogeochemistry of Storm Surge Sediments and Pre-Storm Soils in Coastal Wetlands: Hurricane Irma and the Florida Everglades. (2019). *Estuaries & Coasts*, 1-14. <https://doi.org/10.1007/s12237-019-00607-0>
6. Chambers, L.G., H.E. Steinmuller, & **J.L. Breithaupt**. (2019). Toward a mechanistic understanding of “peat collapse” and its potential contribution to coastal wetland loss. *Ecology*, eo2720. <https://doi.org/10.1002/ecy.2720>
7. **Breithaupt, J.L.**, Smoak, J.M., Sanders, C.J. & Troxler, T.G (2019). Spatial variability of organic carbon, CaCO₃ and nutrient burial rates spanning a mangrove productivity gradient in the coastal Everglades. *Ecosystems*, doi.org/10.1007/s10021-018-0306-5.
8. Holmquist, JR, Windham-Myers, L, Bliss, N, Crooks, S, Morris, J, Magonigal, JP, Troxler, T, Weller, D, Callaway, J, Drexler, J, Ferner, MC, Gonnee, M, Kroeger, K, Schile-Beers, L, Woo, I, Buffington, K, **Breithaupt, JL**, Boyd, BM, Brown, LN, Dix, N, Hice, L, Horton, B, MacDonald, GM, Moyer, RP, Reay, W, Shaw, T, Smith, E, Smoak, JM, Sommerfield, C, Thorne, K, Velinsky, D, Watson, E, Grimes, KW, and Woodrey, M (2018). Accuracy and Precision of Tidal Wetlands Soil Carbon Mapping in the Coterminous United States. *Scientific Reports*, 8(1), 9478.
9. **Breithaupt, J.L.**, Smoak, J. M., Byrne, R. H., Waters, M. N., Moyer, R. P., & Sanders, C. J. (2018). Avoiding timescale bias in assessments of coastal wetland vertical change. *Limnology and Oceanography*, 63(S1), S477-S495.
10. Osland, Michael; Griffith, Kereen; Larriviere, Jack; Feher, Laura; Cahoon, Don; Enwright, Nicholas; Oster, David; Tirpak, John; Woodrey, Mark; Collini, Renee; Baustian, Joseph; **Breithaupt, Joshua**; Cormier, Nicole; Coronado-Molina, Carlos; Donoghue, Joseph; Graham, Sean; Harper, Jennifer; Hester, Mark; Howard, Rebecca; Krauss, Ken; Kroes, Daniel; Lane, Robert; McKee, Karen; Mendelsohn, Irving; Middleton, Beth; Moon, Jena; Piazza, Sarai; Rankin, Nicole; Sklar, Fred; Steyer, Greg; Swanson, Kathleen; Swarzenski, Christopher; Vervaeke, William; Willis, Jonathan; Wilson, K. (2017). Assessing coastal wetland vulnerability to sea-level rise along the northern Gulf of Mexico coast: Gaps and opportunities for developing a coordinated regional sampling network. *PloS One* 12, 9.
11. **Breithaupt, J.L.**, Smoak, J.M., Rivera-Monroy, V.H., Castañeda-Moya, E., Moyer, R.P., Simard, M., & Sanders, C.J. (2017). Partitioning the relative contributions of organic matter and mineral sediment to accretion rates in carbonate platform mangrove soils. *Marine Geology*, 390: 170-180, doi: 10.1016/j.margeo.2017.07.002.
12. Sanders, C., I. Santos, D. Maher, **J.L. Breithaupt**, J.M. Smoak, M. Ketterer, M. Call, & B.D. Eyre (2015). Examining 239+ 240 Pu, 210 Pb and historical events to determine carbon, nitrogen and phosphorus burial in mangrove sediments of Moreton Bay,

Australia, *Journal of Environmental Radioactivity*, 1–7,
doi:10.1016/j.jenvrad.2015.04.018.

13. **Breithaupt, J.L.**, J.M. Smoak, T. J. Smith III, and C. J. Sanders (2014), Temporal variability of carbon and nutrient burial, sediment accretion, and mass accumulation over the past century in a carbonate platform mangrove forest of the Florida Everglades, *Journal of Geophysical Research: Biogeosciences*, 119, doi:10.1002/2014JG002715.
14. Sanders, C.J., Eyre, B.D., Santos, I.R., Machado, W., Luiz-Silva, W., Smoak, J.M., **Breithaupt, J.L.**, Ketterer, M.E., Sanders, L., Marotta, H., Silva-Filho, E. (2014). Elevated rates of organic carbon, nitrogen and phosphorus burial in a highly impacted mangrove wetland. *Geophysical Research Letters*, 41, doi:10.1002/2014GL059789.
15. Smoak, J.M., **J.L. Breithaupt**, T.J. Smith III, and C.J. Sanders (2013). Sediment accretion and organic carbon burial relative to sea-level rise and storm events in two mangrove forests in Everglades National Park, CATENA, 104, 58–66.
16. **Breithaupt, J.L.**, J.M. Smoak, T.J. Smith III, C.J. Sanders, and A. Hoare (2012), Organic carbon burial rates in mangrove sediments: Strengthening the global budget, *Global Biogeochemical Cycles*, 26, GB3011, doi:10.1029/2012GB004375.

OTHER PUBLICATIONS

1. Melanie Parker, M, Encomio, V., Beal, J., Klarmann, P.A., Dark, E., **Breithaupt, J.** and Radabaugh, K.R. (2019). ‘Central Eastern Florida’ in Radabaugh KR, Moyer RP, and Geiger SP, eds. 2019. *Oyster integrated mapping and monitoring program report for the state of Florida*. St. Petersburg, FL: Fish and Wildlife Research Institute, Florida Fish and Wildlife Conservation Commission. FWRI Technical Report 22.
2. Tiffany Troxler, Starr, G., Boyer, J.N., Fuentes, J.D., Jaffe, R. with Malone, S., Barr., J., Davis III, S.E., Collado-Vides, L., **Breithaupt, J.**, Saha, A., Chambers, R., Madden, C., Smoak, J.M., Fourqurean, J., Koch, G.R., Kominoski, J., Scinto, L., Oberbauer, S., Rivera-Monroy, V., Castaneda-Moya, E., Schulte, N., Charles, S., Richards, J., Rudnick, D., and Whelan, K. (2019). “Carbon Cycles in the Florida Coastal Everglades Social-Ecological System” in Childers, D.L., Gaiser, E.E., and Ogden, L.A., eds. 2019. *The Coastal Everglades: The Dynamics of Social-Ecological Transformation in the South Florida Landscape*. Oxford University Press, USA.

PUBLIC DATASETS

1. Breithaupt, J. L., J. M. Smoak, T. S. Bianchi, D. Vaughn, C. J. Sanders, K. R. Radabaugh, M. J. Osland, L. C. Feher, J. C. Lynch, D. R. Cahoon, G. H. Anderson, K. R. T. Whelan, B. E. Rosenheim, R. P. Moyer, and L. G. Chambers. 2020, January 22. Dataset: Increasing rates of carbon burial in southwest Florida coastal wetlands. <https://doi.org/10.25573/serc.9894266.v1>
2. Breithaupt, Joshua L.; Smoak, Joseph M.; Sanders, Christian J.; Smith III, Thomas J. (2019): Dataset: Temporal variability of carbon and nutrient burial, sediment accretion, and mass accumulation over the past century in a carbonate platform mangrove forest of the Florida Everglades. figshare. Dataset. <https://doi.org/10.25573/serc.11310926.v1>
3. Holmquist, J.R., L. Windham-Myers, N. Bliss, S. Crooks, J.T. Morris, P.J. Megonigal, T. Troxler, D. Weller, J. Callaway, J. Drexler, M.C. Ferner, M.E. Gonnee, K. Kroeger, L. Schile-beers, I. Woo, K. Buffington, B.M. Boyd, **J.L. Breithaupt**, L.N. Brown, N. Dix, L. Hice, B.P. Horton, G.M. Macdonald, R.P. Moyer, W. Reay, T. Shaw, E. Smith, J.M.

Smoak, C. Sommerfield, K. Thorne, D. Velinsky, E. Watson, K. Grimes, and M. Woodrey. 2019. Tidal Wetland Soil Carbon Stocks for the Conterminous United States, 2006-2010. ORNL DAAC, Oak Ridge, Tennessee, USA.

<https://doi.org/10.3334/ORNLDAAC/1612>

SELECT ORAL PRESENTATIONS

Bold denotes presenting author

1. **J.M. Smoak**, J.L. Breithaupt, R.P. Moyer, K. Radabaugh, T.S. Bianchi, D. Vaughn, B.E. Rosenheim, C. Schafer, L.G. Chambers, S. Harttung, and J.S. Kominoski (2019, December). Sea-level rise and storms alter soil carbon dynamics of southwest Florida mangrove forests. AGU, San Francisco, CA.
2. **C. Schafer**, B.E. Rosenheim, J.M. Smoak, J.L. Breithaupt, and R.P. Moyer (2019, December). Increased Accommodation Space and OC Stabilization Enhance the Efficiency of the Mangrove Blue Carbon Sink. AGU, San Francisco, CA.
3. **G. McClenahan**, J.L. Breithaupt, L. Walters, and M. Witt (2019, November). Unexpected climate driven ecosystem shifts: Are oyster reefs being replaced by mangrove islands? CERF 25th Biennial Conference, Mobile, AL.
4. **Breithaupt, JL**, Anderson, GH, Whelan, KRT, Smoak, JM, Feher, LC, Osland, MJ, and Vervaeke, WC. (2019, April). Comparing rates of vertical change in mangrove and marsh soils of the coastal Everglades using measurements from surface elevation tables, marker horizons, Cs-137, Pb-210, and C-14. Oral presentation at the Greater Everglades Ecosystem Restoration conference, Coral Springs, FL, USA.
5. **Smoak, JM**, Breithaupt, JL, Radabaugh, KR, Lagomasino, D, Moyer, RP, Rosenheim, BE, Schafer, C, Chambers, LG, Harttung, S, Lynch, JC, and Cahoon, DR. (2019, April) Fate of Coastal Wetlands Under Rising Sea Level and Punctuated by Major Hurricanes. Oral presentation at the Greater Everglades Ecosystem Restoration conference, Coral Springs, FL, USA.
6. **Breithaupt, JL**, Duga, E, and Chambers LG. (2019, February). Wrack: Is it good or bad for living shorelines? Nutrient contributions and CO₂ fluxes from mangrove and seagrass wrack in Canaveral National Seashore. Oral presentation at the Indian River Lagoon Symposium.
7. **Breithaupt, JL**, Smoak, JM, Chambers, LG, Duga, E, and Sanders, CJ. (2018, April). Are carbon burial rates in the coastal everglades higher now than they were a century ago? Oral presentation at the 12th International Symposium on Biogeochemistry of Wetlands, Coral Springs, FL, USA.
8. **Smoak, J.M.**, Breithaupt, J.L., and C.J. Sanders. (2017, August). Carbon burial in mangrove forest soils of the Coastal Everglades. Oral presentation at Goldschmidt Conference, Paris, France.
9. **Breithaupt, J. L.**, Smoak, J.M., Rivera-Monroy, V.H., Castañeda-Moya, E., Moyer, R.P., Simard, M. & Sanders, C.J. (2017, January). Partitioning the relative contributions of organic matter and mineral sediment to mangrove accretion rates in southwest Florida and the Yucatan Peninsula, Mexico. Oral presentation at U.S. Fish and Wildlife Service's Florida Mangrove Working Group & Coastal Habitat Integrated Mapping and Monitoring Program (CHIMMP) Workshop, St. Petersburg, FL.
10. **Smoak, J.M.**, Breithaupt, J.L., Moyer, R.P., Sanders, C.J., Protor, M.R., Jacobs, J.A., Chappel, A.R. and K.R. Comparetto (2016, December). Organic Carbon Burial Rates in

Mangrove Soils Along Florida's Coast from Tampa Bay to Biscayne National Park. Oral presentation at AGU, San Francisco, CA.

11. **Moyer, R.P.**, Gerlach, M.J., Powell, C., Engelhart, S.E., Kemp, A.C., Smoak, J.M., and Breithaupt, J.L. (2016, September). Trace and minor elements in coastal sediments and natural waters of Tampa Bay (Florida, USA). Oral Presentation: Urban Geochemistry Session, Geological Society of America meeting in Denver, CO.
12. **Breithaupt, J. L.**, Smoak, J.M., Sanders, C.J., & Waters, M.N. (2016, July). Assessing the applicability of different timescales for quantifying coastal wetland vulnerability to sea level rise. Oral Presentation: 4th Mangrove & Macrobenthos Meeting (MMM4) in St. Augustine, FL.
13. **Anderson, G.H.**, Balentine, K.M., Tilling-Range G., Breithaupt, J.L., Smoak, J.M., Whelan, K.R.T., & Krauss, K.W. (2016, July). Ten Years After: Wilma Storm Deposits Effect on Vertical Soil Accretion in a Coastal Mangrove Forest (2005-2015), Everglades National Park, FL, USA. Oral Presentation: 4th Mangrove & Macrobenthos Meeting (MMM4) in St. Augustine, FL.
14. **Breithaupt, J. L.**, Smoak, J.M., Sanders, C.J., & Troxler, T.G. (2016, February). How Does the Burial Rate of Soil Organic Matter Relate to Salinity and Productivity in the Coastal Everglades? Oral Presentation: Ocean Sciences Meeting, New Orleans, LA.
15. **Moyer RP**, Smoak JM, Engelhart SE, Smith III TJ, Kemp AC, Breithaupt JL, Gerlach MJ, Burford MP, Chappel AR, Brendis LM, Sanders CJ (2015, November) Response of Organic Carbon Burial to Sea-Level Change in Coastal Wetlands along Florida's Gulf Coast. Oral presentation at Coastal and Estuarine Research Federation. Portland OR.
16. **Breithaupt, J. L.**, Smoak, J.M., & Smith III, T.J. (2015, April). Quantifying the Relative Contributions Made by Organic Matter and Mineral Sediment to Accretion Rates in the Coastal Everglades. Oral presentation at Greater Everglades Ecosystem Restoration Conference, Coral Springs, FL.
17. **Breithaupt, J. L.**, Smoak, J.M., Smith III, T.J., Sanders, C.J., & Peterson, L.C. & Byrne, R.H. (2014, May). Assessing 100 Years of Carbon Burial and Sediment Accretion in the Context of Sea Level Rise, Reduced Freshwater Input, and Storms in the Coastal Everglades. Oral presentation at the Joint Aquatic Sciences Meeting in Portland, OR.
18. **Breithaupt, J. L.**, Smoak, J.M., Smith III, T.J., Sanders, C.J., & Hoare, A. (2012, June). Strengthening the century-scale global estimate of mangrove organic carbon burial rates. Oral presentation at the 9th INTECOL International Wetlands Conference, Orlando, FL.

SELECT POSTER PRESENTATIONS

*Bold denotes presenting author: * denotes undergraduate mentee*

1. **Breithaupt, J.L.**, J.M. Smoak, T.S. Bianchi, D. Vaughn, C.J. Sanders, K.R. Radabaugh, M. Osland, L. Feher, J. Lynch, D. Cahoon, B. Rosenheim, G. Anderson, K.R.T. Whelan, R.P. Moyer, and L.G. Chambers (2019, November). Increasing rates of carbon burial in southwest Florida coastal wetlands. National Estuarine Research Reserve Science annual meeting, Charleston, SC.
2. **Breithaupt, J.L.**, N. Hurst, H.E. Steinmuller, E. Duga, J.M. Smoak, J. Kominoski, and L.G. Chambers (2018, November). Biogeochemical Impacts of Hurricane Irma's Storm Surge Sediment in the Florida Everglades. Poster presentation at the Rookery Bay National Estuarine Research Reserve's 40th anniversary Mangrove Symposium, Naples FL, USA.

3. **Breithaupt, J.L.**, Hurst, NR, Duga, E, Smoak, JM, Kominoski, JS, and Chambers, LG (2018, May). Did sediment deposition from Hurricane Irma suppress soil respiration in the coastal Everglades? Poster presentation at the Florida Coastal Everglades All Scientists Meeting in Miami, FL, USA.
4. **Smoak, J.M.**, Breithaupt, J.L., Sanders, C.J. (2015, December). Organic Carbon, Nitrogen and Phosphorus Accumulation Rates in the Soils of the Everglades Mangrove Ecotone. Poster presentation at AGU Meeting in San Francisco, CA.
5. **Breithaupt, J.L.**, Smoak, J.M., Smith III, T.J., Sanders, C.J., Peterson, L.C., & Byrne, R.H. (2014, March). Assessing 100 years of carbon burial and sediment accretion in the context of sea level rise, reduced freshwater input, and storms in the coastal Everglades. Poster presentation at the 2014 NSF Florida Coastal Everglades LTER All Scientists Meeting, Miami, FL.
6. **Hussein S.M.***, Breithaupt J. L., Moyers, A., Smoak J.M. (2013, June). Organic Carbon Burial Rates in Mangrove Soils: Tampa Bay in a Global Context. Poster presentation at the Annual Meeting of the Society of Wetland Scientists, Minneapolis, MN.
7. **Breithaupt, J.L.**, Smoak, J.M., Smith III, T.J., Sanders, C.J., Castaneda-Moya, E., & Rivera-Monroy, V.H. (2013, April). The relevance of organic carbon burial to soil accumulation dynamics in carbonate setting mangrove forests. Poster presentation at the joint Penrose/ Chapman Conference: Coastal Processes and Environments Under Sea-Level Rise and Changing Climate: Science to Inform Management, Galveston, TX.
8. **Breithaupt, J.L.**, Smoak, J.M., Smith III, T.J., & Sanders, C.J. (2012, June). Organic carbon burial rates in southwestern Everglades mangrove sediments. Poster presentation at the 9th INTECOL International Wetlands Conference, Orlando, FL.
9. **Breithaupt, J.L.**, Smoak, J.M., Smith III, T.J., & Sanders, C.J. (2012, February). Blue carbon in the Everglades Watershed: a preliminary measurement of century-scale burial rates in mangrove sediments. Poster presentation at the Sarasota Bay Watershed Symposium, New College of Florida, Sarasota, FL.
10. **Breithaupt, J. L.**, Smoak, J.M., Smith III, T.J., & Sanders, C.J. (2011, May). Measuring Organic Carbon Burial in Southwestern Everglades Mangrove Ecosystem. Poster presentation at the Spring 2011 Meeting of the Florida Society of Environmental Analysts, Clearwater Beach, FL.
11. **Breithaupt, J. L.**, Smoak, J.M., Smith III, T.J., & Sanders, C.J. (2011, January). Organic carbon burial within the footprint of an eddy covariance flux tower in a Southwestern Everglades mangrove ecosystem. Poster presentation at the 2011 NSF FCE LTER All Scientists Meeting, Coral Gables, FL.