

Havalend E. Steinmuller

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Education

2019	Ph.D. in Conservation Biology, University of Central Florida, Orlando, FL. Dissertation Title: <i>Biogeochemical Response to Sea Level Rise-Induced Transitions in Coastal Wetlands</i> (advisor: Dr. Lisa G. Chambers)
2015	M.S. in Oceanography and Coastal Sciences, Louisiana State University, Baton Rouge, LA. Thesis Title: <i>Anthropogenic Impacts on Microbial Processes in Coastal Wetlands: Nutrient Loading and Rising CO₂ Levels</i> (advisor: Dr. John R. White)
2013	B.S. in Coastal Environmental Science, Louisiana State University, Baton Rouge, LA. Focus: Environmental Science and Research Thesis Title: <i>Effects of Fertility Gradients on the Net Primary Productivity of Typha sp in Newly Forming Wetlands</i> (advisor: Dr. Victor H. Rivera-Monroy)

Professional Experience

August 2021 – Present	Postdoctoral Scholar, Coastal and Marine Laboratory, Florida State University
November 2020 – June 2021	Postdoctoral Scholar, Aquatic Ecology and Global Change Laboratory, Department of Watershed Sciences, Utah State University
December 2019 - October 2020	Postdoctoral Research Scholar, Freshwater Biogeochemistry Laboratory, Florida International University, Miami, FL
May 2019 – December 2019	Research Scientist, Aquatic Biogeochemistry Laboratory, Department of Biology, University of Central Florida, Orlando, FL
August 2018 – May 2019 & August 2015 – May 2016	Graduate Teaching Assistant (General Biology I), Department of Biology, University of Central Florida, Orlando, FL
May 2018 – August 2018	Graduate Research Assistant (Aquatic Biogeochemistry Laboratory), Department of Biology, University of Central Florida, Orlando, FL
August 2017 – May 2018	Graduate Teaching Assistant/Instructor of Record (Wetland Ecology and Biogeochemistry), Department of Biology, University of Central Florida, Orlando, FL
August 2016 – July 2017 & May 2016 – August 2016	Graduate Research Assistant (Aquatic Biogeochemistry Laboratory), Department of Biology, University of Central Florida, Orlando, FL
August 2013 – July 2015	Graduate Research Assistant (Wetland and Aquatic Biogeochemistry Laboratory), Department of Oceanography and Coastal Sciences, Louisiana State University, Baton Rouge, LA

January 2015 – May 2015

Non-Primary Instructor (Wetlands and Water Quality), Department of Oceanography and Coastal Sciences, Louisiana State University, Baton Rouge, LA

Refereed Journal Articles and Book Chapters

13. **Steinmuller, H.E.**, S. L. Stoffella, R. Vidales, M.S. Ross, S. Dattamudi, and L.J. Scinto. "Characterizing hydrologic effects on soil physicochemical variations within coastal tree islands and marshes in the Florida Everglades". *Soil Science Society of America Journal*, (2021).
12. **Steinmuller, H.E.**, T.E. Foster, C.R. Hinkle, L.G. Chambers. "Herbaceous encroachment increases soil nutrient content and supports higher rates of biogeochemical processing in a coastal marsh". *Science of the Total Environment* (2020).
11. **Steinmuller, H.E.**, M.P. Hayes, N.R. Hurst, Y. Sapkota, R.L. Cook, J.R. White, X. Zuo, L.G. Chambers. "Does edge erosion alter coastal wetland soil properties? A multi-method biogeochemical study". *Catena* 187 (2020).
10. **Steinmuller, H.E.**, T. E Foster, P. Boudreau, C.R. Hinkle, L.G. Chambers. "Tipping points in the mangrove march: Characterization of biogeochemical cycling along the mangrove – salt marsh ecotone". *Ecosystems* (2019).
9. Breithaupt, J.L., N.R. Hurst, **H.E. Steinmuller**, E. Duga, J.M. Smoak, J. Kominoski, L.G. Chambers. "Comparing the biogeochemistry of storm surge sediments and pre-storm soils in coastal wetlands: Hurricane Irma and the Florida Everglades". Accepted within a special issue (Impact of 2017 Hurricanes on Estuaries and Coasts in the Caribbean and the Gulf Coast States) of *Estuaries and Coasts* (2019).
8. **Steinmuller, H. E.**, and Lisa G. Chambers. "Characterization of coastal wetland soil organic matter: Implications for wetland submergence." *Science of the Total Environment* 677 (2019): 648-659.
7. Chambers, L.G., **H.E. Steinmuller**, J. Breithaupt. "Toward a mechanistic understanding of peat collapse and its contribution to coastal wetland loss". *Ecology* (2019) 100 (7):e02720.
6. **Steinmuller, H.E.**, K. Dittmer, J.R. White, L.G. Chambers. "Understanding the fate of soil organic matter in submerging coastal wetland soils: a microcosm approach." *Geoderma* 337 (2019): 1267-1277.
5. **Steinmuller, H. E.**, and Lisa G. Chambers. "Can saltwater intrusion accelerate nutrient export from freshwater wetland soils? An experimental approach." *Soil Science Society of America Journal* 82.1 (2018): 283-292.
4. White, J.R., **H.E. Steinmuller**. "El ciclo del Nitrogeno en los humedales". *Humedales de tratamiento: alternativa de tratamiento de aguas residuales aplicable en America Latina* (2018).
3. Dittmer, K. M., **Steinmuller, H.E.**, Chambers, L.G. "Temperature effects on greenhouse gas production from treatment wetland soils along a nutrient gradient." *UCF Undergraduate Research Journal* 9 (2017).
2. Chambers, L.G., Gaspar, S.A., Pilato, C.J., **Steinmuller, H.E.**, McCarthy, K.J., Sacks, P.E., Walters, L.J. "How well do restored intertidal oyster reefs support key biogeochemical properties in a coastal lagoon?" *Estuaries and Coasts* (2017).
1. **Steinmuller, H.E.**, M.B. McKee, J.R. White, S. A. Graham, I.A. Mendelssohn. "A Decadal Scale Nutrient Loading Study in a Coastal Wetland: Impacts on Soil Microbial Processes". *Ecological Engineering* (2016). 97:58-63.

Manuscripts in review:

1. Briethaupt, J.L., K. Engelbert, J.M. Smoak, L.G. Chambers, **H.E. Steinmuller**, S. Harttung, K. Radabaugh, R. P. Moyer, A. Chappel, K. Comparetto, D. Vaughn, T.S. Bianchi. "Estimating organic carbon using loss-on-ignition in mangrove soils". Submitted to a special issue (Carbon sequestration in aquatic ecosystems) of *Limnology and Oceanography*.
2. Hurst, N.R., Locher, B., **Steinmuller, H.E.**, Walters, L.J. and Chambers, L.G. "Carbon Dynamics and Microbial Community Response to Oyster Reef Restoration: Implications for Carbon Storage". Submitted to *Limnology and Oceanography*.

Manuscripts in preparation:

6. Steinmuller, H. E., J.L. Breithaupt, K. Engelbert, P. Assavanuvatt, T. S. Bianchi. "Comparing mangrove (*Avicennia germinans* and *Rhizophora mangle*) and salt marsh (*Juncus roemerianus* and *Spartina alterniflora*)

soil carbon density in Apalachicola Bay, Florida. In prep, to be submitted to a special issue (Mangroves in the Anthropocene) of *Frontiers in Forests and Global Change*.

5. **Steinmuller, H. E.**, Briethaupt, J.L., K. Engelbert, J.M. Smoak, L.G. Chambers, S. Harttung, K. Radabaugh, R. P. Moyer, A. Chappel, K. Comparetto, D. Vaughn, T.S. Bianchi. "Leveraging a conversion between soil organic matter and total N within mangrove soils." In prep, to be submitted to *Estuaries and Coasts*.
4. **Steinmuller, H.E.**, C. Stagg, J.R. White. "Elevated atmospheric CO₂ and salinity interactively mediate organic matter degradation within vegetated and non-vegetated wetland soils". In prep, to be submitted to *Geoderma*.
3. **Steinmuller, H.E.**, J. Vaccare, A. Chauhan, J. R. White. "Impacts of dispersant COREXIT EC9500A on microbial activity and community structure within coastal wetland soils". In prep, to be submitted to *Chemosphere*.
2. **Steinmuller, H.E.**, U. Adulwahab, J. Adkins, J. Draper, C. McClure, M. Wolf, J. Young, E. Hammill and T. Atwood. "Aiming for success: Addressing the mismatches in restoration action and conservation goals". In prep, to be submitted to *Conservation Letters*.
1. **Steinmuller, H.E.**, J. L. Breithaupt, and L. G. Chambers. "Controls on enzyme activity within coastal wetland soils". In prep, to be submitted to *Soil Biology and Biochemistry*.

Presentations

* denotes presenting author

24. Briethaupt, J.L.* , J.M. Smoak, A.R. Chappel, L.G. Chambers, **H.E. Steinmuller**, S. Harttung, K.R. Radabaugh, R.P. Moyer, T.S. Bianchi, and D. Vaughn. "Guidelines and insights for using loss-on-ignition to estimate organic carbon content in mangrove soils and sediments." 13th International Symposium on Biogeochemistry of Wetlands, March 2021.
23. Chambers, L.G.* , **H.E. Steinmuller**, M.P. Hayes, N.R. Hurst, Y. Sapkota, R.L. Cook, J.R. White, and Z. Xue. "Soil carbon loss through submergence: understanding the biogeochemistry of edge erosion in coastal wetlands." 13th International Symposium on Biogeochemistry of Wetlands, March 2021.
22. Scinto, L. J.* , **H.E. Steinmuller**, M.S. Ross, S. Stofella, R. Vidales, S. Dattamudi. "Variation in soils and soil biogeochemistry along a coastal ecogeomorphic setting." 13th International Symposium on Biogeochemistry of Wetlands, March 2021.
21. **Steinmuller, H.E.*** "Coastal wetlands and the rising tide: evaluating biogeochemical response to sea-level rise induced transitions." Invited seminar, University of South Alabama, February 2021.
20. **Steinmuller, H.E.*** "Evaluating the biogeochemical response to sea-level rise induced transitions within coastal wetlands". Invited seminar, Florida International University Graduate Seminar Series, Miami, FL. October 2020.
19. **Steinmuller, H.E.*** and L.G. Chambers. "Characterizing coastal wetland soil organic matter: implications for wetland submergence." 13th International Symposium on Biogeochemistry of Wetlands, Baton Rouge, LA. April 2020. (Cancelled).
18. Breithaupt, J.L.* , N.R. Hurst, **H.E. Steinmuller**, E. Duga, J.M. Smoak, J.S. Kominoski, L.G. Chambers. "Biogeochemical impacts of storm surge sediments in mangroves of the coastal Everglades." Oral presentation. Coastal and Estuarine Research Federation, Mobile, AL. November 2019.
17. **Steinmuller, H.E.***, L.G. Chambers. "Impacts of vegetation transitions on biogeochemical cycling within coastal wetlands". Oral presentation. Society of Wetland Scientists Annual Meeting, Denver, CO. June 2018.
16. Chambers, L.G.* , **H.E. Steinmuller**, C. Wang, C. Tong, T. Z. Osborne, K. Ramesh Reddy. "Short-term response of freshwater wetland soils to saltwater intrusion." Invited oral presentation, 12th International Symposium on Biogeochemistry of Wetlands, Coral Springs, FL. April 2018.
15. Hurst, N.R.* , J.L. Breithaupt, **H.E. Steinmuller**, L.G. Chambers. "Biogeochemical responses to hurricane Irma in a mangrove-encroached Florida salt marsh". Poster Presentation, 12th International Symposium on Biogeochemistry of Wetlands, Coral Springs, FL. April 2018.

14. **Steinmuller, H.E.***, L.G. Chambers, K. Dittmer, J.R. White. "Fate of soil carbon following sea level rise-induced coastal wetland submergence: a microcosm experiment". Oral presentation. 12th International Symposium on Biogeochemistry of Wetlands, Coral Springs, FL. April 2018.
13. White, J. R.*, **Steinmuller, H.E.**, Chambers, L. G., Fontenot, A. "The Fate and Stability of Eroding Wetland Soil Carbon in a Subsiding Deltaic Coastal Plain." 2017 AGU Fall Meeting. 2017.
12. **Steinmuller, H.E.**, L.G. Chambers *, K. Dittmer, J.R. White. "Fate of soil carbon following sea level rise-induced coastal wetland submergence". Invited oral presentation. Soil Science Society of America Annual Meeting, Tampa, FL. October 2017.
11. **Steinmuller, H.E.***, L.G. Chambers. "Can saltwater intrusion accelerate nutrient export from freshwater wetland soils? An experimental approach" Invited oral presentation. Soil Science Society of America Annual Meeting, Tampa, FL. October 2017.
10. **Steinmuller, H.E.***, L.G. Chambers. "Effects of mangrove expansion on biogeochemical cycling". Invited oral presentation within symposium "Storms, sea level, climate, and humans: spatial and temporal impacts of disturbance to mangrove forests" at the Society of Wetland Scientists annual meeting, San Juan, Puerto Rico. June 2017.
9. **Steinmuller, H.E.*** "Wetland Biogeochemistry". Invited oral presentation, Central Florida Association of Environmental Professionals, Orlando, FL. April 2017.
8. Steinmuller, H.E.*, L.G. Chambers. "Can saltwater intrusion accelerate nutrient export from freshwater wetland soils?" Poster presentation, University of Central Florida Graduate Research Forum, Orlando, FL. April 2017.
7. **Steinmuller, H.E.***, L.G. Chambers. "Impacts of Increased Salinity on Nutrient Dynamics in Freshwater Wetland Soils." Oral presentation. Society of Wetland Scientists – Gulf Estuarine Research Society Joint Meeting, Pensacola, FL. October 2016.
6. Barker, V., K. Foss, **H.E. Steinmuller***. "Coastal Connections in Chile: School of the Coast and Environment Global Expansion". Invited oral presentation, LSU School of the Coast and Environment Seminar Series. September 2015.
5. Barker, V., K. Foss, **H.E. Steinmuller ***. "Researching Louisiana's Disappearing Coastline". Invited oral presentation, Center for the Study of Multiple Drivers on Marine Socio-Ecological Systems (MUSELS), Concepcion, Chile. May 2015.
4. **Steinmuller, H.E. ***, C.L. Stagg, J.R. White. "Impacts of elevated CO2 levels on soil microbial activity in vegetated and non-vegetated wetland soils". Graduate Student Research Forum, Baton Rouge, LA. April 2015.
3. **Steinmuller, H.E. ***, M. B. McKee, J.R. White, S.A. Graham, I.A. Mendelsohn. "A decadal scale nutrient loading study in a coastal wetland: impacts on soil microbial processes". Oral presentation. Graduate Student Symposium, Dauphin Island, AL. April 2015.
2. **Steinmuller, H.E. ***, M. B. McKee, J.R. White, S.A. Graham, I.A. Mendelsohn. "A decadal scale nutrient loading study in a coastal wetland: impacts on soil microbial processes". Oral presentation. Soil Science Society of America, Long Beach, CA. March 2015.
1. **Steinmuller, H.E. ***, M.B. McKee, J.R. White, S. A. Graham, I.A. Mendelsohn. "A Decadal Scale Nutrient Loading Study in a Coastal Wetland: Impacts on Soil Microbial Processes". Oral presentation. Louisiana Association of Public Biologists, Baton Rouge, LA. August 2014.

Datasets

Steinmuller, H. E., White, J. R., Cook, R. L., Xue, Z., Chambers, L. G. (2021) Soil physicochemical properties of coastal wetland soil cores collected in June 2018 from Barataria Bay, Louisiana. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-02-10 [if applicable, indicate subset used]. doi:10.26008/1912/bco-dmo.840246.1

Steinmuller, H. E., White, J. R., Cook, R. L., Xue, Z., Chambers, L. G. (2021) Nutrient properties of coastal wetland soil cores collected in June 2018 from Barataria Bay, Louisiana. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-02-10 [if applicable, indicate subset used]. doi:10.26008/1912/bco-dmo.840293.1

Steinmuller, H. E., White, J. R., Cook, R. L., Xue, Z., Chambers, L. G. (2021) Microbial gene abundance of coastal wetland soil cores collected in June 2018 from Barataria Bay, Louisiana. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-02-10 [if applicable, indicate subset used]. doi:10.26008/1912/bco-dmo.840278.1

Chambers, L. G., **Steinmuller, H. E.,** Dittmer, K., White, J. R., Cook, R. L., Xue, Z. (2019) Barataria Bay carbon mineralization and biogeochemical properties from nine soil cores. Biological and Chemical Oceanography Data Management Office (BCO-DMO). Dataset version 2019-09-05. doi:10.1575/1912/bco-dmo.775547.1

Chambers, L. G., White, J. R., Cook, R. L., Xue, Z. (2021) Soil physicochemical properties of coastal wetland soil cores collected in June 2018 from Barataria Bay, Louisiana. Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-02-10. <http://lod.bco-dmo.org/id/dataset/840246>. (Data corresponds to first-author publication).

Awards and Grants

2020	University of Central Florida Outstanding Dissertation Award, Honorable Mention
2018	Florida Sea Grant Elise B. Newell Scholarship Program Recipient
2018	University of Central Florida Department of Biology Research Award
2018	University of Central Florida Graduate Presentation Scholarship
2018	Society of Wetland Scientists, South Atlantic Chapter Student Travel Award
2016	Society of Wetland Scientists, South Atlantic Chapter/Gulf Estuarine Research Society Student Travel Award
2015	Louisiana State University, College of the Coast and Environment Outstanding Thesis Award
2015	3 rd Place Graduate Student Oral Presentation, Graduate Student Symposium, Dauphin Island Sea Lab, AL.
2014	1 st Place Graduate Student Oral Presentation, Join Meeting of the CSA, ASA, SSSA. Wetland Soils Division, Long Beach, CA.

Student Mentorship

2017 – 2019	Chelsea Nitsch; trained in laboratory and field techniques, assisted with directed independent research: <i>Impacts of saltwater intrusion on denitrification rates and nitrogen availability in two intertidal wetland soils</i>
2017 – 2018	Hayden Denton; trained in laboratory techniques
2016 – 2019	Kevin McCarthy; trained in laboratory and field techniques, assisted with directed independent research: <i>Can nutrient additions 'prime' soil microbial activity at depth within freshwater wetland soils?</i>
2017 – 2019	Paul Boudreau; trained in laboratory and field techniques
2015 – 2017	Kyle Dittmer; trained in laboratory and field techniques, assisted with completion of directed undergraduate research: <i>Temperature Effects on Greenhouse Gas Production along a Nutrient Gradient in Treatment Wetland Soils</i>
2015 – 2016	John Heiland; trained in laboratory techniques, as well as completion of UCF EXCEL/COMPASS program

Relevant Community Service

2021	Skype-A-Scientist Presentation, Gateway Charter School
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- 2020 Skype-A-Scientist Presentation, Holy Rosary High School and Battlefield High School (cancelled due to COVID-19 pandemic)
- 2018 UCF STEM DAY - Educational session, Orlando, FL
- 2018 Science Education, "Digging up the Dirt on Soil" at Carillon Elementary School
- 2017 UCF STEM DAY - Educational session, Orlando, FL
- 2016 UCF Faculty and Family Fun Day- interactive display booth, Orlando, FL

Media Coverage

- "Saltwater Intrusion of Coastal Soils" —Crops, Soils, Agronomy (CSA) News Magazine, Feature 7/5/18
(<https://dl.sciencesocieties.org/publications/csa/articles/63/7/8>)
- "How Wetlands Help Protect Against Climate Change" —UCF Today 6/7/18
(<https://today.ucf.edu/how-wetlands-help-protect-against-climate-change/>)

Leadership Activities

- 2020-2021 Chair-Elect, Biogeochemistry Section of the Society of Wetland Scientists
- 2016-2017 Secretary, Biology Graduate Student Association, University of Central Florida
- 2014-2015 Sustainability Chair, Coastal and Environmental Graduate Organization, Louisiana State University
- 2014-2015 Seminar Committee, School of the Coast and Environment, Louisiana State University
- 2014-2015 Mentor, Louisiana State University Environmentors

Professional Organizations

- Society of Wetland Scientists (2013-Present)
- Soil Science Society of America (2013-Present)
- American Association for the Advancement of Science (2018-Present)

Technical Skills

Operation, maintenance, and troubleshooting:

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| - Shimadzu TOC-V with TN Unit | - Elementar Vario Micro Cube |
| - Shimadzu TOC-L | - AQ2 Discrete Analyzer |
| - Shimadzu GC-2014 | - Shimadzu GC-ECD and GC-FID |
| - BioTek Microplate Reader | - CFX96 Touch Real-Time PCR Detection System |
| - Costech Elementar Analyzer | |
| - LiCor 8100A, 7810, 8150 | |

Use of JMP, DeltaGraph, SAS 9.4, R in RStudio, HoboWare, SoilFluxPro, ArcMap, ArcScene, BioRad CFX Manager

Special Skills

- Certified Small Craft Operator, United States Power Squadron (active in all states)
- CPR/First Aid Certified
- Wilderness First Aid Certified
- Wilderness First Responder (WFR, January 2021)
- Open Water Diver (PADI)

References

- Dr. Lisa Chambers
Assistant Professor
Aquatic Biogeochemistry Laboratory
Department of Biological Sciences

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Dr. John R. White

Associate Dean of Research, College of Coast & Environment

John & Catherine Day Professor of Oceanography & Coastal Sciences

Wetlands & Aquatic Biogeochemistry Laboratory

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Dr. Leonard J. Scinto

Associate Professor and Chair of the Department of Earth and Environment

Freshwater Biogeochemistry Laboratory

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Dr. Melanie Beazley

Assistant Professor

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