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Education

Ph.D. Biology, University of California, Los Angeles (UCLA), 2013
Advisor: Glen M MacDonald
Department: Ecology and Evolutionary Biology (EEB)
B.S. Biology, Loyola Marymount University (LMU), Los Angeles, 2008

Employment

Smithsonian Environmental Research Center (SERC)
Research Scientist: February 2019-Present
Ecologist: January 2018-February 2019
Postdoctoral Research Fellow: March 2015-January 2018
UCLA Institute of the Environment and Sustainability (IoES)
Postdoctoral Scholar: September 2013–May 2015
UCLA EEB
Graduate Student Researcher and Teaching Assistant: July 2008–September 2013
LMU Biology Department
Undergraduate Researcher and Teaching Assistant: May 2005–June 2008

Peer Reviewed Publications [20 articles in print, 1 in press, 5 in preparation]

Rogers, K., Kelleway, J.J., Saintilan, N., Megonigal, J.P., Adams, J.B., **Holmquist, J.R.**, et al. (2019). Wetland carbon storage controlled by millennial-scale variation in relative sea-level rise. *Nature*, 567(7746), p.91. <https://doi.org/10.1038/s41586-019-0951-7>

Holmquist, J.R. Windham-Myers, L., Bernal, B., Byrd, K.B., Crooks, S., Gonneea, M.E., Herold, N., Knox, S.H., Kroeger, K., McCombs, J., Megonigal, J.P., Meng, L., Morris, J.T., Sutton-Grier, A.E., Troxler, T.G., Weller, D. (2018). Uncertainty in U.S. Coastal Wetland National Greenhouse Gas Inventories. *Environmental Research Letters*. <https://doi.org/10.1088/1748-9326/aae157>.

Gallego-Sala, A., Charman, D. et al., including **Holmquist, J.R.** (2018). Latitudinal limits to the predicted increase of the peatland carbon sink with warming. *Nature Climate Change*.

Holmquist, J. R., Windham-Myers, L., Bliss, N., Crooks, S., Morris, J. T., Megonigal, J. P., ... & Ferner, M. C. (2018). Accuracy and Precision of Tidal Wetland Soil Carbon Mapping in the Conterminous United States. *Scientific Reports*, 8(1), 9478. <https://doi.org/10.1038/s41598-018-26948-7>

Byrd, K. B., Ballanti, L., Thomas, N., Nguyen, D., **Holmquist, J. R.**, Simard, M., & Windham-Myers, L. (2018). A remote sensing-based model of tidal marsh aboveground carbon stocks for the conterminous United States. *ISPRS Journal of Photogrammetry and Remote Sensing*, 139, 255-271.

Najjar, R. G., Herrmann, M., Alexander, et al including **Holmquist J.R.** (2018). Carbon budget of tidal wetlands, estuaries, and shelf waters of Eastern North America. *Global Biogeochemical Cycles*, 32(3), 389-416.

Thorne, K., MacDonald, G., Guntenspergen, G., Ambrose, R., Buffington, K., Dugger, B., ... & **Holmquist, J.** (2018). US Pacific coastal wetland resilience and vulnerability to sea-level rise. *Science Advances*, 4(2), eaao3270.

Rosencranz, J. A., Brown, L. N., **Holmquist, J. R.**, Sanchez, Y., MacDonald, G. M., & Ambrose, R. F. (2017). The Role of Sediment Dynamics for Inorganic Accretion Patterns in

- Southern California's Mediterranean-Climate Salt Marshes. *Estuaries and Coasts*, 40(5), 1371-1384.
- Loisel, J., van Bellen, S., Pelletier, L., Talbot, J., Hugelius, G., Karran, D., ... & **Holmquist, J.** (2017). Insights and issues with estimating northern peatland carbon stocks and fluxes since the Last Glacial Maximum. *Earth-science reviews*, 165, 59-80.
- MacDonald, G. M., Moser, K. A., Bloom, A. M., Potito, A. P., Porinchu, D. F., **Holmquist, J. R.**, ... & Kremenetski, K. V. (2016). Prolonged California aridity linked to climate warming and Pacific sea surface temperature. *Scientific reports*, 6, 33325.
- Holmquist, J. R.**, Booth, R. K., & MacDonald, G. M. (2016). Boreal peatland water table depth and carbon accumulation during the Holocene thermal maximum, Roman Warm Period, and Medieval Climate Anomaly. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 444, 15-27.
- Holmquist, J. R.**, Finkelstein, S. A., Garneau, M., Massa, C., Yu, Z., & MacDonald, G. M. (2016). A comparison of radiocarbon ages derived from bulk peat and selected plant macrofossils in basal peat cores from circum-arctic peatlands. *Quaternary Geochronology*, 31, 53-61.
- Philben, M., **Holmquist, J.**, MacDonald, G., Duan, D., Kaiser, K., & Benner, R. (2015). Temperature, oxygen, and vegetation controls on decomposition in a James Bay peatland. *Global Biogeochemical Cycles*, 29(6), 729-743.
- Willis, K. S., Beilman, D., Booth, R. K., Amesbury, M., **Holmquist, J.**, & MacDonald, G. (2015). Peatland paleohydrology in the southern West Siberian Lowlands: Comparison of multiple testate amoeba transfer functions, sites, and Sphagnum $\delta^{13}C$ values. *The Holocene*, 25(9), 1425-1436.
- Holmquist, J. R.**, Reynolds, L., Brown, L. N., Southon, J. R., Simms, A. R., & MacDonald, G. M. (2015). Marine radiocarbon reservoir values in southern California estuaries: interspecies, latitudinal, and interannual variability. *Radiocarbon*, 57(3), 449-458.
- Hargan, K. E., Rühland, K. M., Paterson, A. M., Finkelstein, S. A., **Holmquist, J. R.**, MacDonald, G. M., ... & Smol, J. P. (2014). The influence of water-table depth and pH on the spatial distribution of diatom species in peatlands of the Boreal Shield and Hudson Plains, Canada. *Botany*, 93(2), 57-74.
- Hargan, K. E., Rühland, K. M., Paterson, A. M., **Holmquist, J.**, MacDonald, G. M., Bunbury, J., ... & Smol, J. P. (2015). Long-term successional changes in peatlands of the Hudson Bay Lowlands, Canada inferred from the ecological dynamics of multiple proxies. *The Holocene*, 25(1), 92-107.
- Holmquist, J. R.**, & MacDonald, G. M. (2014). Peatland succession and long-term apparent carbon accumulation in central and northern Ontario, Canada. *The Holocene*, 24(9), 1075-1089.
- Loisel, J., Yu, Z., Beilman, D. W., Camill, P., Alm, J., Amesbury, M. J. et al **including J.R. Holmquist** (2014). A database and synthesis of northern peatland soil properties and Holocene carbon and nitrogen accumulation. *The Holocene*, 24(9), 1028-1042.
- Holmquist, J. R.**, MacDonald, G. M., & Gallego-Sala, A. (2014). Peatland initiation, carbon accumulation, and 2 ka depth in the James Bay Lowland and adjacent regions. *Arctic, Antarctic, and Alpine research*, 46(1), 19-39.

Publications in Press

- Malhotra, A., Todd-Brown, K., Nave, L. E., Batjes, N. H., **Holmquist, J.R.** et al. (In Press). The landscape of soil carbon data: emerging questions, synergies and databases. *Progress in Physical Geography*.

Publications in Preparation [In order of planned submission]

- Holmquist, J.R.** et al. Vegetation and Elevation Dynamics at the Highly Studied Global Change Research Wetland. Targeted Journal: *TBD*.
- Holmquist, J.R.** et al. A contiguous United States-scale map of relative tidal marsh elevation: an essential variable for assessing coastal resilience. Targeted Journal: *Estuaries and Coasts*.
- Holmquist, J.R.**, Brown, L.N., MacDonald, G.M. Patterns of Coastal Marsh Vulnerability to Relative Sea-Level Rise in the Conterminous U.S. Targeted Journal: *Earth's Futures*.
- Holmquist, J.R.**, Fargione, J., Kroeger, K., Megonigal, J.P., Weller, D., Windham-Myers, L. Regional Opportunities for Coastal Wetland Greenhouse Gas Emission Reduction in the Contiguous United States. Targeted Journal: *Nature Climate Change*.
- Holmquist, J.R.**, Brazolla, N., Crooks, S., Kroeger, K., Megonigal, J.P., Weller, D., Windham-Myers, L. Using Tide-Series Analysis to Detect Coastal Restoration Events and Opportunities. Targeted Journal: *Remote Sensing of the Environment*.

Datasets and Research Products

- Holmquist, J.R.** Windham-Myers, L., Bernal, B., Byrd, K.B., Crooks, S. et al. Spatial Data on U.S. Coastal Wetland Greenhouse Gas Inventory Uncertainty. Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1650>
- Holmquist, J.R.**, M. Lonneman, D. Klings (2019). [The Coastal Carbon Atlas](#).
- Holmquist, J.R.**, L. Windham-Myers, N. Bliss, S. Crooks, J.T. Morris, P.J. Megonigal, T. Troxler, D. Weller et al. (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>
- Holmquist, J.R.** (2018). [GitHub Repository] Coastal Wetland NGGI Sensitivity Analysis. <https://github.com/Smithsonian/Coastal-Wetland-NGGI-Sensitivity-Analysis>
- Holmquist, J. R.** et al. (2018). [Dataset:] Accuracy and Precision of Tidal Wetland Soil Carbon Mapping in the Conterminous United States: Public Soil Carbon Data Release. <https://doi.org/10.25572/ccrcn/10088/35684>.
- Najjar, R., et al including **Holmquist J.R.** (2018). Mean Annual Fluxes of Carbon in Coastal Ecosystems of Eastern North America. ORNL DAAC. <https://doi.org/10.3334/ORNLDAAC/1594>
- Byrd, K.B., Ballanti, L.R., Thomas, N.M., Nguyen, D.K., **Holmquist, J.R.** et al. (2017) Biomass/Remote Sensing dataset: 30m resolution tidal marsh biomass samples and remote sensing data for six regions in the conterminous United States: U.S. Geological Survey data release. <https://doi.org/10.5066/F77943K8>

Book Chapters, Reports, and Dissertation

- Byrd, K., McOwen, C., Weatherdon, L., Crooks, S., and **Holmquist, J.** (2018). [Book Chapter] Status of Tidal Marsh Mapping for Blue Carbon Inventories. *A Blue Carbon Primer: The State of Coastal Wetland Carbon Science, Practice, and Policy*. Eds. Windham-Meyers, L., Crooks, S., Troxler, T.
- Thorne, K.M., MacDonald, G.M. et al. including **Holmquist, J.R.** (2016). [Open File Report] *Effects of climate change on tidal marshes along a latitudinal gradient in California* (No. 2016-1125). US Geological Survey.
- Holmquist, J.R.** (2013). [Ph.D. Dissertation] Holocene Peatland Carbon Accumulation, Ecology, and Hydrology in the Canadian James Bay Lowlands. *University of California, Los Angeles*.

Recent Grants, Contracts, and Awards (\$619,538 total since 2017)

- Smithsonian Loeb Research Funds - \$10,000.

- Mapping Greenhouse Gas Relevant Tidal Elevation Gradients and Management Activities in U.S. Coastal Wetlands. Interagency Agreement between SERC and USGS Landcarbon - \$50,000 awarded and \$20,000 pending.
- Mapping Coastal Management Opportunities for Greenhouse Gas Reduction in Climate Alliance States. Contract between SERC and the Nature Conservancy – \$10,000.
- Research Coordination Network (RCN): Building a Collaborative Network for Coastal Wetland Carbon Cycle Synthesis. NSF-DEB-Ecosystems Program - \$499,938.
- US GHG Inventory–Impounded Wetlands. Subaward from NOAA Grant (NA16NMF4630103) via Silvestrum Climate Associates and Restore America’s Estuaries - \$29,600.

Teaching Experience

Coastal Carbon Research Coordination Network (CCRCN) Outreach: GitHub lessons for Soils Working Group (November 2018), R-Code lessons for Ocean Carbon & Biogeochemistry Lateral Flux Working Group (August 2018), Developed R-Code Lesson using CCRCN Soil Carbon Synthesis (July 2018; <https://serc.si.edu/coastalcarbon/r-coding>).

Data/Software Carpentry Instructor: Lead 2-Day Workshops at SERC (June 2019, March 2018), Training Completed (February 2018)

Undergraduate Research Mentor at SERC: Lainey Reed (Summer 2019), Nicoletta Brazzola (Fall 2017), Jefferson Riera (Summer 2016)

Undergraduate Research Supervisor at UCLA: Justine Nikeitan (2014-2015), Tongwei Weng (Summer 2014), Breeanna Bergeron-Matsumoto (2014), Alvin Li (2011-2014), Maoqiao Mao (Summer 2013), Sam Geldin (2013), Julianne Lee, Michelle Lim, Loren Quintanar (2011-2012), Scott Guzman, Nikola Kondov, Karly Wagner (2010-2011), Luis Aguilar, Jennifer Kim (2009-2010), Siduo Zhang (Summer 2009)

Private Chemistry and Biology Tutor: 2012-2013

Teaching Assistant Positions at UCLA: Introduction to Environmental Science* (Fall 2012), Plant Physiology* (Spring 2012, Winter 2010), Introduction to Life Sciences (Winter 2012, Fall 2010, Spring 2009), Marine Biology (Fall 2010)

Class Reader at UCLA for Global Change Biology: Fall 2010

Teaching Assistant Positions at LMU: Coral Reef Ecology Study Abroad in Roatán, Honduras (Summer 2008), Field Botany (Spring 2008), General Ecology (Fall 2007)

* indicates more significant contribution to curriculum development.

Awards, Scholarships, and Fellowships

Northern Research Fund

C\$3,600, to support field research at Churchill Research Center: 2012

University of Utrecht

€5,000 for 3-month research fellowship: 2011

UCLA EEB

Departmental Fellowship: Fall 2008, Winter 2009, Summer 2009

LMU

Alan R. Sedoux Prize for Field and Marine Biology: 2008

Howard Towner Memorial Scholarship: 2007-2008
Rev. Alfred J. Kilp Memorial Scholarship: 2004

Notable Recent Research Presentations

- Holmquist, JR** (2019). Data-Model Integration for Forecasting Carbon Sequestration in Coastal Wetland Soils. Ecological Forecasting Initiative, D.C.
- Holmquist JR, JP Megonigal** (2018). [Town Hall] Updates from the Coastal Carbon Research Coordination Network: Year 1. American Geophysical Union (AGU), D.C.
- Holmquist JR, J Fargione, K Kroeger, JP Megonigal, D Weller, L Windham-Myers** (2018). Opportunities for Wetland Greenhouse Gas Emission Reduction from Coastal States in the Contiguous U.S. American Geophysical Union (AGU), D.C.
- Holmquist JR** (2018). Uncertainty in United States Greenhouse Gas Inventorying. NASA Carbon Monitoring Systems September Science Team meeting.
- Holmquist JR** (2018). Accuracy and Precision of Tidal Wetland Soil Carbon Mapping in the Conterminous United States. NASA Carbon Monitoring Systems July Science Team meeting.
- Holmquist JR** (2018). Counting in Muddy Waters. SERC Science and Coffee Lightning Talk Series, Edgewater MD.
- Holmquist JR** (2018). How a little bit of math and a lot of data synthesis can show us what our next blue carbon research project needs to be. 5th Annual GCRew Symposium Villanova University, PA.
- Holmquist JR, J Tang, P Megonigal, S Crooks, J Ramos** (2017). [Town Hall] Introducing a U.S.-based Research Coordination Network for Coastal Carbon. American Geophysical Union (AGU), New Orleans, LA.
- Holmquist JR et al.** (2017). How much swamp are we talking here?: Propagating uncertainty about the area of coastal wetlands into the U.S. greenhouse gas inventory. AGU, New Orleans, LA.
- Holmquist JR, J Riera, et al.** (2017). [invited] Applying Coastal Marsh Resiliency Models at the Landscape-Scale Using Bias-Corrected Remotely-Sensed Elevation Data. Coastal & Estuarine Research Federation Annual Meeting, Providence, RI.
- Holmquist JR, J Riera, et al.** (2017). Coastal Wetland Soil Carbon Stocks Mapping and the Myth of Fingerprints: 'I've Seen Them All and Man They're All the Same'. 4th Annual Global Change Research Wetland Symposium, Edgewater, MD.
- Holmquist JR** (2016). [invited] A US 'Blue' Carbon Monitoring System: Soil Carbon Stocks, Fluxes and Uncertainties. Chesapeake Bay Sentinel Site Coalition Partners Quarterly Call.
- Holmquist JR et al.** (2016). [poster] Reducing Uncertainty and Bias in US Coastal Wetland Carbon Stock Estimates. AGU, San Francisco, CA.
- Holmquist JR et al.** (2016). [poster] Linking Satellite and Soil Data to Validate Coastal Wetland 'Blue Carbon' Inventories: Progress on Accounting for Carbon Stored in US Coastal Wetland Soils. NASA Carbon Monitoring Systems Science Team Meeting. National Center for Atmospheric Research, Boulder, CO.
- Holmquist JR, J Riera et al.** (2016). [invited] Limits to 'Upscaling' a Marsh Resiliency Model Using Remote Sensing. Coastal Wetland Change Workshop. Florida International University, Miami FL.
- Holmquist JR** (2016). [invited] Coastal Wetlands: Vulnerability and Value. Horn Point Lab, University of Maryland Center for Environmental Sciences, Cambridge, MD.

Recent Relevant Training

- Near Term Ecological Forecasting Short Course (2019)
- Media Training (Philips Media Training, LLC; 2018)

- SESYNC Bayesian Hierarchical Modeling Course (2017)
- NOAA Water-Levels Training Workshop (2017)
- Code Academy: Python, Command Line (2015-2016)
- Google Earth Engine User's-Summit (2016)

Peer Reviewer Assignments

- 2019 - Nature Communications
- 2019 - Scientific Reports
- 2018 - Journal of the American Water Resources Association
- 2018 - Science Advances
- 2017 - Global Biogeochemical Cycles
- 2017 - Biogeosciences Discussions
- 2017 - National Institute of Food and Agriculture Small Business Innovation Research Program Forests & Related Resources
- 2016 - Science of the Total Environment
- 2016 - Quaternary Research
- 2016 - Quaternary International
- 2015 - Climate Research

Press

- Interviewed for E&E News. *U.S. tidal areas could hold 800M tons of carbon — study.* 22 June 2018. [Link.](#)
- Interviewed for SERC Blog Post and Press Release. *800 Million Tons of Blue Carbon May Lie Buried in U.S. Tidal Wetlands.* 21 June 2018. [Link.](#)
- Q&A with Landsat Science. *How Much Swamp Are We Talking Here? Towards Better Mapping of Coastal Wetlands.* 13 December 2017. [Link.](#)

Other Science Outreach and Service

- 'Roving Expert' on Coastal Wetland Restoration Opportunities for the U.S. Climate Alliance Learning Lab on Natural and Working Lands – July 2018
- *Skype a Scientist* participant – December 2017
- Chesapeake Bay Sentinel Site Coalition Coordinator Hiring Committee Member – November 2017
- Volunteer Speaker to 6th Grade Science Class at Fremont Elementary School, Long Beach, CA - 2017
- Volunteer Science Fair Judge Our Lady of Refuge Long Beach, CA - 2015, 2014, 2012

Professional Affiliations

- Ecological Forecasting Initiative
- Coastal Carbon Research Coordination Network Steering Committee
- NASA Carbon Monitoring Systems Science Team Member
- Chesapeake Bay Sentinel Site Coalition
- Carbon in Peat on Earth through Time (C-PEAT) working group
- American Geophysical Union

Miscellaneous Skills

- Independent musician and songwriter
- PADI Certified Rescue Diver (2007)