

# JOHANNES RENKE KRAUSE

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## EDUCATION

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**Drexel University**      **PhD Environmental Sciences**      2016 – 2021  
My PhD dissertation research focuses on biogeochemical cycling (C, N) in blue carbon habitats using stable isotope, sedimentological, microbiological, and remote sensing techniques. I studied spatiotemporal trends in the extent of blue carbon habitats, their function and services on the Pacific and Atlantic coasts of North America.

**University of Glasgow**      **MSc. Marine System Science**      2014 – 2015  
For my MSc project I co-organized an expedition to the Red Sea, where I studied calcification and photosynthetic rates of coralline algae over diurnal cycles in the field and laboratory.

**University of Tübingen**      **BSc. Geo-Ecology**      2010 – 2014  
For my BSc thesis I investigated the sedimentology and benthos of a bay in the Wadden Sea, using remote sensing and sedimentological analysis.

**University of Las Palmas**      **Erasmus – Exchange**      2012 – 2013  
I spent one full year at the Dept. of Marine Science, where I achieved fluency in Spanish and learned marine sampling methods, including scientific diving techniques.

## CURRENT PROJECTS

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**Caribbean Carbon Accounting in Seagrass (CariCAS)**      2023-2024  
Postdoctoral research lead on The Nature Conservancy-funded (\$470,000) project modeling blue carbon stocks in seagrass meadows across the Greater Caribbean.

**Florida Coastal Everglades Long-term Ecological Research (FCE LTER)**      2023-  
Co-lead of the Vegetation Group of the NSF-funded (\$4,750,000) LTER program investigating functional traits of vegetation communities along environmental gradients in the Florida Everglades NP.

**The Blue Carbon Initiative – Global Seagrass Carbon Stocks**      2023-  
Postdoctoral research member of the International Blue Carbon Scientific Working Group and Seagrass Subgroup. Received funding from Conservation International to provide data analysis and synthesis to inform policy around blue carbon ecosystems, with focus on seagrass.

**Seagrass Ecosystems of the South Florida Seascape**      2021-2024  
Postdoctoral research lead for the Seagrass Ecosystems Research Lab (PI Dr. James Fourqurean), synthesizing and analyzing long-term seagrass monitoring, water quality, temperature, and sedimentary carbon data.

**Coordinated Global Research Assessment of Seagrass Systems (C-GRASS)**      2021-2023  
Data-analysis group co-lead on International Science Council / Scientific Committee on Oceanic Research-funded project synthesizing global seagrass monitoring data and formulating best practices and standards for seagrass research.

## PEER REVIEWED PUBLICATIONS

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- Krause, JR, A Roden, H Briceño, JW Fourqurean. Climate oscillations impact seagrass functional traits across the South Florida seascape. *In prep*
- Krause, JR, J Lefcheck, E Duffy, R Orth, et al. Diverging trends of coastal ecosystem extent and condition: Lessons from global seagrass monitoring highlight the need for coordinated data collection at multiple scales of observation. *In prep*
- Fourqurean, JW, JE Campbell, OK Rhoades, CJ Munson, **JR Krause**, et al. 2023. Seagrass Abundance Predicts Surficial Soil Organic Carbon Stocks Across the Range of *Thalassia testudinum* in the Western North Atlantic. *Estuaries and Coasts*. doi:10.1007/s12237-023-01210-0
- Krause JR**, AJ Oczkowski, EB Watson, 2023. Improved mapping of coastal salt marsh habitat change at Barnegat Bay (NJ, USA) using object-based image analysis of high-resolution aerial imagery. *Remote Sensing Applications: Society and Environment* 29. doi:10.1016/j.rsase.2022.100910
- Raposa KB, K Wasson, A Woolfolk, C Endris, **JR Krause**, et al. 2023. Evaluating thin-layer sediment placement as a tool for enhancing tidal marsh resilience: a coordinated experiment across eight U.S. National Estuarine Research Reserves. *Estuaries and Coasts*. doi:10.1007/s12237-022-01161-y
- Krause JR**, CC Lopes, SS Wilson, JN Boyer, HO Briceño, JW Fourqurean, 2023. Status and trajectories of soft-bottom benthic communities of the south Florida seascape revealed by 25 years of seagrass and water quality monitoring. *Estuaries and Coasts*. doi:10.1007/s12237-022-01158-7
- Krause JR**, ME Gannon, AJ Oczkowski, MJ Schwartz, LK Champlin, et al. 2022. Tidal Flushing Rather Than Non-Point Source Nitrogen Pollution Drives Nutrient Dynamics in a Putatively Eutrophic Estuary. *Water* 15(1). doi:10.3390/w15010015
- Krause JR**, A Hinojosa-Corona, AB Gray, JC Herguera, J McDonnell, MV Schaefer, SC Ying, EB Watson, 2022. Beyond habitat boundaries: organic matter cycling requires a system-wide approach for accurate blue carbon accounting. *Limnology & Oceanography*. doi:10.1002/lno.12071
- Thomsen AS, **JR Krause**, M Appiano, KE Tanner, C Endris et al., 2022. Monitoring vegetation dynamics at a tidal marsh restoration site: integrating field methods, remote sensing and modeling. *Estuaries and Coasts*. (45): 523-538. doi:10.1007/s12237-021-00977-4
- Krause JR**, A Hinojosa-Corona, EB Watson, 2021. Emerging sensor platforms allow for seagrass extent mapping in a turbid estuary, from the meadow to ecosystem scale. *Remote Sensing* 13 (18): 3681. <https://doi.org/10.3390/rs13183681>
- Watson, EB, A Hinojosa-Corona, **JR Krause**, JC Herguera, J McDonnell, KR Villegas Manríquez, ME Gannon, AB Gray, 2020. Lagoon biogeochemical processing is reflected in spatial patterns of sediment stable isotopic ratios. *Journal of Marine Science and Engineering*. (8): 874. <https://doi.org/10.3390/jmse8110874>
- Krause JR**, EB Watson, C Wigand, N Maher, 2020. Are coastal wetlands exposed to nutrient pollution more vulnerable to sea level rise? *Wetlands* (40):1539-1548. doi: 10.1007/s13157-019-01254-8
- Powell EB, **JR Krause**, EB Watson, 2020. Pond excavation reduces coastal wetland carbon dioxide assimilation. *JGR: Biogeosciences* (125). doi.org/10.1029/2019JG005187

## OTHER PUBLICATIONS

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- JW Fourqurean, JE Campbell, **JR Krause** et al. 2023. Caribbean Carbon Assessment in Seagrass Practical Field and Laboratory Guide.
- Krause JR**, JW Fourqurean, 2022. Investigator's Annual Report, Dry Tortugas National Park

- Krause JR**, 2021. Changes in Salt Marsh Extent from 1995 to 2015 at Barnegat Bay, New Jersey. Technical Report submitted to the Barnegat Bay Partnership under EPA award #RARE2062
- Krause JR**, 2021. Elemental cycling in blue carbon habitats: Investigations from the molecular to ecosystem scale. PhD Thesis.
- Krause JR**, 2020. Hester Marsh Salinity Report. Elkhorn Slough Technical Report Series 2020: 1.
- Krause JR**, 2016. Diurnal variation of *in situ* photosynthesis and calcification rates in the coralline algae *Sporolithon* in the Red Sea. MSc Thesis.
- Krause JR**, 2014. Untersuchung der Sedimente und Epifauna nord-westlich von Eiderstedt. BSc Thesis.

#### GRANTS AND CONTRACTS AT FIU

Caribbean Carbon Accounting in Seagrass (\$93,500) JR Krause, JW Fourqurean (PI)	The Nature Conservancy 01/01/24-09/15/24
<i>To facilitate conservation of critical seagrass ecosystems and their inclusion in policy and financial frameworks for climate mitigation, reliable estimates of both seagrass extent and their carbon storage at national to regional scales are needed. We established a collaborative seagrass blue carbon monitoring network covering sites across the entire Caribbean. To better understand the full climate mitigation potential of Caribbean seagrass, we will expand existing Insular Caribbean seagrass maps to the entire Caribbean Basin, leveraging TNC's partnership with Planet, to calculate a more accurate assessment of these valuable carbon stocks in this globally important region. The impacts of these new maps will be considerable, catalyzing new actions, from conservation to restoration to payments for ecosystem services and potentially securing and enhancing the critical role of seagrass in global climate mitigation.</i>	
Continuation of seagrass monitoring in FKNMS (\$577,000) JW Fourqurean, JR Krause (coPI)	EPA 10/01/23-09/30/25
<i>The program was designed to address the following objectives: 1) Define the present distribution of benthic communities within the FKNMS, 2) Provide high-quality, quantitative data on the status of the seagrasses within the FKNMS, 3) Quantify the importance of seagrass primary production in the FKNMS, 4) Define the baseline conditions for the seagrass communities, 5) Determine relationships between water quality &amp; benthic community status, and 6) Detect trends in the distribution and status of the benthic communities.</i>	
Seagrass Carbon Stocks Database QA/QC (\$9,800) JW Fourqurean, JR Krause (coPI)	Conservation Int'l 10/01/23-09/30/25
<i>This project involves the creation and analysis of a quality assured, quality controlled database of global seagrass carbon stocks for the International Blue Carbon Scientific Working Group. An early version of the database needed to be QA/QC due to missing, duplicate, or erroneous data. Data analysis results in the dissemination of findings through peer-reviewed publications and presentations at international meetings.</i>	
Dry Tortugas National Park Seagrass Communities (\$35,000) JW Fourqurean, JR Krause (PI)	NPS 10/01/23-09/30/24
<i>The goal of this project is to continue evaluating the long-term ecological status and trends of seagrass communities in Dry Tortugas National Park. This information is essential for effective stewardship of seagrass communities within the park, providing insight on recovery trajectories of seagrass communities post-hurricane disturbance and the potential arrival of the invasive seagrass <i>Halophila stipulacea</i>.</i>	

## OTHER GRANTS, AWARDS & HONORS

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2023	U.S. Carbon Program Leadership Award	\$1200
2020	Society of Wetland Scientists Student Research Grant	\$2000
2020	The Wetland Foundation Field Travel Grant	\$1000
2018, 2019	Geological Society of America Graduate Student Research Grant	\$5000
2019	American Philosophical Society Lewis & Clark Field Scholar	\$1000
2019	Association of American Geographers Marcus Fund	\$2000
2018-2019	William L. McLean III Fellowship	\$30,000
2018-2019	Claudio Elia Memorial Fellowship	\$10,000
2015	The Gilchrist Trust, Small Grant	\$2000
2015	The Royal Geographical Society, Small Grant	\$5000
2015	Glasgow Natural History Society, Small Grant	\$1000

## GRADUATE TEACHING ASSISTANCESHIPS

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GEO 312, <b>Sedimentology and Stratigraphy</b>	Fall 2020
GEO T480 /680 <b>Remote Sensing</b> , grad / undergraduate	Winter 2020
ENVS 212 <b>Evolution</b>	4 Terms 2016 - 8
ENVS 558 <b>Marine Field Methods</b>	Summer 2017
ENVS T380 /580 <b>Restoration Ecology</b> , grad / undergraduate	Summer 2018, 2020

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## TECHNICAL SKILLS

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Languages:	German (native), English (full professional) Spanish (professional working)
Programming languages:	R, Python
Software:	ArcGIS, eCognition Developer, ENVI, Metashape, Qiime2, Inkscape, MS Office suite
Diving:	AAUS Scientific Diver, European Scientific Diver, Swedish S30 (IDSA level 1), ACUC Rescue Diver, Nitrox, Deep Diver
Licences:	Clean FL driving licence with 4-wheel & trailering experience PA, FL boating licences FAA Part 107 Unmanned Aircraft Systems (UAV) pilot license

## CONTRIBUTED PRESENTATIONS

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2023	Climate oscillations drive nutrient availability and seagrass abundance across the South Florida seascape. <b>Talk</b> at CERF Biennial Meeting, Portland, OR
2023	Blue carbon in seagrass systems. <b>Invited seminar</b> at School for Field Studies, South Caicos, Turks and Caicos
2023	Global seagrass carbon stocks database. <b>Invited talk</b> at International Blue Carbon Scientific Working Group 15 <sup>th</sup> Annual Meeting, Singapore
2023	Burial flux estimates from sediment cores suggest carbonate production partially offsets blue carbon potential of seagrass meadows across South Florida seascape. <b>Talk</b> at ASLO Aquatic Sciences Meeting in Palma de Mallorca, Spain
2023	Press and pulse dynamics drive seagrass variability in the south Florida seascape: Lessons from Florida Bay and beyond. <b>Invited seminar</b> for Florida Coastal Everglades LTER Brown Bag Seminar Series (online)
2023	Nitrogen isoscapes as water quality indicators at Barnegat Bay, New Jersey. <b>Invited talk</b> at Barnegat Bay Partnership STAC Meeting (online)

- 2023 Hurricane impacts on seagrasses of the South Florida seascape. **Talk** at Florida Coastal Everglades LTER All Scientist Meeting, Miami, FL
- 2022 Are eutrophication and poor water quality threats to New Jersey's tidal wetlands? **Invited seminar** for the New Jersey DEP (online)
- 2022 Seagrass trend detection across monitoring tiers: Lessons from global monitoring programs. **Talk** at C-GRASS workshop, Smithsonian Environmental Research Center, Edgewater, MD
- 2022 Disturbance Alters the Mangrove-Associated Sediment Microbiome in an Urban Tropical Estuary. **Poster** at Ocean Sciences Meeting (online)
- 2022 20 Years of Barnegat Bay Salt Marsh Change Revealed by High-resolution Image Analysis. **Invited talk** at Barnegat Bay Partnership STAC Meeting (online)
- 2021 Spatial Dynamics of Seagrass and Blue Carbon at Bahía de San Quintín. **Invited seminar** at CICESE, Seminario de la División de Ciencias de la Tierra, Mexico
- 2021 Emerging sensor platforms support seagrass mapping in a turbid estuary, from meadow to ecosystem scale. **Poster** at CERF Biennial Meeting (online)
- 2020 Integrating acoustic and optical remote sensing for SAV mapping in a turbid estuary. **Poster** at Ocean Sciences Meeting in San Diego, CA
- 2020 The Role of Eutrophication in Coastal Wetland Fragmentation in Barnegat Bay, New Jersey. **Poster** at Restore America's Estuaries 2020 National Coastal and Estuarine Summit, Providence, RI
- 2019 A model-data synthesis of the status and trends of New Jersey's coastal wetlands for sea level rise planning. **Poster** at NJ Sea Grant Consortium
- 2019 Integrating acoustic and optical remote sensing allows for SAV mapping in a turbid estuary. **Poster** at CERF Biennial Meeting in Mobile, AL
- 2019 Blue Carbon in an Eastern Pacific reverse estuary: organic matter cycling links salt marshes and seagrass beds. **Oral Presentation** at ASLO Aquatic Sciences Meeting in San Juan, PR
- 2019 Integrating remote sensing techniques for seagrass mapping in Baja California. **Poster** at Drexel International Research Symposium, Philadelphia, PA
- 2019 Blue Carbon in seagrass and salt marsh habitats of a hypersaline lagoon. **Seminar talk** at Drexel University's Department of Biodiversity, Earth and Environmental Sciences, Philadelphia, PA
- 2018 Blue Carbon in an Eastern Pacific reverse estuary: organic matter cycling links salt marshes and seagrass beds. **Oral Presentation** at AGU Fall Meeting Washington, DC
- 2018 Comparison of organic matter sources and carbon burial rates in tidal salt marshes and seagrass beds of Bahía de San Quintín, Mexico. **Oral Presentation** at ASLO Summer Meeting Victoria, BC (Canada)
- 2018 Assessment of blue carbon stocks and storage in seagrass meadows of Bahía San Quintín, México. **Oral Presentation** at SWS Summer Meeting Denver, CO
- 2018 Assessment of blue carbon stocks and storage in seagrass meadows of Bahía San Quintín, México. **Poster** at Drexel International Research Showcase
- 2018 Strategies for the Energy Transition in COP23 Countries. **Oral Presentation** at Climate Action Panel, Drexel University, PA
- 2018 Are nutrient polluted wetlands more vulnerable to sea level rise? **Poster** at Delaware Wetlands Conference 2018, Wilmington DE
- 2017 Assessment of blue carbon stocks and storage in seagrass meadows of Bahía San Quintín, México. **Poster** at Coastal and Estuarine Research Federation 2017 Conference, Providence RI
- 2017 **Observer** at UN Framework Convent for Climate Change Conference COP23, Bonn (Germany)
- 2015 The diurnal variation of in situ photosynthesis and calcification rates in the coralline

algae *Lithophyllum kotschy anum* in the Red Sea. **Seminar talk** at University of Glasgow School of Earth Sciences Postgraduate Seminar, Glasgow SCO

#### RELEVANT EXPERIENCE

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2021 – **Postdoctoral Associate**, Florida International University, Miami  
2017 – 2021 **Graduate Research Associate**, Academy of Natural Sciences, Philadelphia  
2015 – 2016 **Freelance Science Editor**, Cactus Communications  
2013 – 2014 **Research Assistant**, Marine Geology Lab, University of Kiel  
2011 – 2012 **Research Assistant**, Paleoclimatology Lab, University of Tübingen  
2009 – 2010 **Volunteer [Peace Corps Analog]**, German Development Service, Philippines

#### SERVICE

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2022- FIU Postdoctoral Council  
2020-2021 Intersectional Nondiscrimination and Inclusion committee  
2018-2019 VP, Biology Graduate Student Association  
2017- Reviewer for Nature Communications Earth and Environment; Science of the Total Environment; Coastal, Estuarine, Shelf Science; Remote Sensing; Marine Biodiversity; Marine Environmental Research; Wetlands; Geocarto International; Anthropocene Coasts; Remote Sensing Applications: Society and Environment; Hydrological Processes; Landscape Ecology

#### PROFESSIONAL AFFILIATIONS

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American Geophysical Union (AGU)  
Society of Wetlands Scientists (SWS)  
Association for the Sciences of Limnology and Oceanography (ASLO)  
The Geological Society of America (GSA)  
Coastal and Estuarine Research Federation (CERF)