

Melissa R. McCutcheon

EDUCATION

Ph.D. Candidate, Coastal and Marine System Science

Texas A&M University-Corpus Christi (2015-anticipated graduation May 2021)
Current GPA: 4.00

M.S., Environmental Science

Texas A&M University-Corpus Christi (2013-2015)
GPA: 4.00

B.S., Biology

Slippery Rock University of Pennsylvania (2009-2013)
Minors: Marine Science, Chemistry
GPA: 3.89, *Summa Cum Laude*

SCIENCE AND RESEARCH EXPERIENCE

Doctoral Dissertation Research, Physical and Environmental Science Department, Texas A&M University-Corpus Christi

December 2015 – Present

- Dissertation titled “Spatial and temporal trends and controlling factors of CO₂ chemistry in the estuaries of the northwestern Gulf of Mexico”
- Research involves water column and sediment pore water sample collection and carbonate chemistry analyses aiming to estimate carbon fluxes and alkalinity budgets and examine relationships between environmental parameters.

Ocean Acidification Program, Ocean Conservancy; National Science Foundation Non-Academic Research Internship

July 2019 – December 2019, Washington, D.C.

- Analyzed state-level action on ocean acidification and other ocean climate issues
- Analyzed NOAA Ocean Economy data to categorize state vulnerability to acidification
- Synthesized materials about relationships between ocean acidification and harmful algal blooms
- Attended congressional hearings and Hill briefings on ocean issues
- Participated in weekly program meetings for the Ocean Acidification Program as well as Ocean Conservancy’s new Climate Program.

Research Assistant, Carbon Cycle Laboratory, Physical and Environmental Science Department, Texas A&M University-Corpus Christi

May 2014- Present (select semesters)

- Aided in data analysis and writing for technical reports and scientific manuscripts for several studies from the TAMUCC Carbon Cycle Lab group and other outside collaborations

- Operated lab equipment for the processing and/or analysis of seawater samples for alkalinity, pH, dissolved inorganic carbon, calcium, chloride, salinity, and particulate organic carbon measurements from estuarine water column and pore water samples and oceanic samples.
- Participated in field (boat) sample collections from several Texas estuaries.
- Completed training for small boat operation for university field excursions

Master's Thesis Research, Physical and Environmental Science Department, Texas A&M University-Corpus Christi

June 2014- June 2015

- Thesis entitled: "Investigating the role of nonconsumptive predator effects on calcification, respiration, and carbon cycle contribution of juvenile eastern oysters (*Crassostrea virginica*)".
- Research involved experimental design, oyster and crab husbandry, design and construction of a multiple simultaneous closed-chamber incubation setup, large-volume artificial seawater production, water sample collection and analysis for alkalinity and dissolved inorganic carbon, use of alkalinity anomaly technique to quantify respiration and calcification rates, and data analysis.

Western Atlantic Climate Study II (WACSII) Cruise

May 19-June 6, 2014

- Part of the science party for an 18-day research cruise out of the Wood's Hole Oceanographic Institution on the R.V. Knorr.
- Research tasks involved taking deep-water samples from Niskin bottles for a study on the carbonate chemistry of the North Atlantic and onboard sample and data processing.

Undergraduate Field Station Experiences

Summer 2011 and Summer 2012

- Aided in beach profiling research of Assateague Island, VA, conducted by Dr. Adrienne Oakley (Assistant Professor of geology and marine science at Kutztown University, PA)
- Aided in ecological studies including fish surveys and quadrat and line-point biodiversity assessments of the coral reef near Roatan, Honduras, with the guidance of scientists from the Roatan Institute for Marine Sciences.
- Exposed to various field methods in the fields of marine biology, biological oceanography, and marine geology.

Undergraduate Research Project, Department of Biology, Slippery Rock University

Goldenrod Gall Fly ecology study conducted in conjunction with Steven Brown under the direction of Dr. J.R. Layne.

Fall 2012- Spring 2013

- Investigation of the population dynamics and predation factors of *Eurosta solidaginis*, including bird predation, insect predator-parasitism, and physical disturbances across four goldenrod plots.
- Presented a poster of the research at the Commonwealth of Pennsylvania University Biologists (CPUB) conference, April 20, 2013.

TEACHING EXPERIENCE

Instructor of Record, Physical and Environmental Science Department, Texas A&M University-Corpus Christi

Oceanography (ESCI 3351)

Fall 2017 semester

- Responsible for the course design, development, instruction, and grading.

Environmental Biology (ESCI 3443)

Fall 2016 semester

- Responsible for the lecture and lab course design and development, lecture instruction, grading, and coordination with graduate teaching assistant.

Issues in Environmental Science (ESCI 4202)

Spring 2016 semester

- Responsible for the course design, development, instruction, and grading.

Guest Lecturer, Texas A&M University-Corpus Christi

Introduction to Geographic Information Systems (GISC 1470)

November 14, 2018

- Invited to deliver lecture titled "Using Spatial System Science for a Better Understanding of Carbonate Chemistry"

Oceanography (ESCI 3351)

April 17, 2018

- Invited to deliver lecture titled "Ocean and Estuarine Acidification"

Certifications

- Certificate of Course Design and Development (granted from the Texas A&M University-Corpus Christi Distance Education & Learning Technologies department, December 14, 2015)
- Certificate of Professional Development in Best Practices for Online Course Design (granted from the Texas A&M University-Corpus Christi Distance Education & Learning Technologies department, December 14, 2015)

Teaching Assistant, Physical and Environmental Science Department, Texas A&M University Corpus Christi

Introduction to Environmental Science Lab (ESCI1401)

Fall 2013 and Spring 2014 semesters

- Responsible for the instruction of weekly meetings of three lab sections, quiz preparation, and assignment grading.

Tutor, Academic Services, Slippery Rock University

Fall 2010- Spring 2013

- Assist students in General Biology, Principles of Biology, General Chemistry I, or Oceanography Courses.
- Responsible for several weekly sessions (average 7 hours/week) with individuals and groups for subject review and test preparation.

PEER-REVIEWED PUBLICATIONS

8. Rosenau, N. A; Galavotti, H.; Bohlen, C.; Brown, C.; Ford, T.; Hu, X.; Hunt, C. W., Johnson, Y.; Largier, J.; Liebman, M.; **McCutcheon, M. R.**; Nielsen, K.; Pacella, S.; Poach, M.; Salisbury, J.; Sherwood, E.; Steele, A.; Vasslides, J.; Yates, K. Integrating High-Resolution Coastal Acidification Monitoring Data Across Seven U.S. EPA National Estuary Programs (NEPs) (In preparation)
7. **McCutcheon, M. R.**; Yao, H.; Saryk, C. J.; Hu, X. Driving factors and variability in the carbonate system in the Mission-Aransas Ship Channel: A time-series study (In preparation)
6. Hu, X.; Yao, H.; Saryk, C.; **McCutcheon, M. R.**; Wetz, M.; Walker, L. (2020) Disparate responses of two adjacent subtropical estuaries to the influence of Hurricane Harvey – A case study. *Frontiers in Marine Science*, 7 (January), 1-13. <https://doi.org/10.3389/fmars.2020.00026>
5. Yao, H., **McCutcheon, M. R.**, Saryk, C. J., Hu, X. (2020) Hydrologic controls on CO₂ chemistry and flux in subtropical lagoonal estuaries of the northwestern Gulf of Mexico. *Limnology and Oceanography*, <https://doi.org/10.1002/lno.11394>
4. **McCutcheon, M. R.**; Saryk, C. J.; Hu, X. (2019) Characteristics of the Carbonate System in a Semi-Arid Estuary that Experiences Summertime Hypoxia. *Estuaries and Coasts*, 42(6), 1509-1523 <https://doi.org/10.1007/s12237-019-00588-0>
3. Hu, X., Nuttall, M. F., Wang, H., Yao, H., Saryk, C. J., **McCutcheon, M. R.**, Eckert, R. J., Embesi, J. A., Johnston, M. A., Hickerson, E. L., Schmahl, G. P., Mazello, D., Enochs, I. C., DiMarco, S., Barbero, L. (2018). Seasonal variability of carbonate chemistry and decadal changes in waters of a marine sanctuary in the Northwestern Gulf of Mexico. *Marine Chemistry*, 205, 16-28.
2. Scherer, A. E., Bird, C. E., **McCutcheon, M. R.**, Hu, X., & Smee, D. L. (2018). Two-tiered defense strategy may compensate for predator avoidance costs of an ecosystem engineer. *Marine Biology*, 165(8).
1. Hu, X., Beseres Pollack, J., **McCutcheon, M. R.**, Montagna, P. a., & Ouyang, Z. (2015). Long-term alkalinity decrease and acidification of estuaries in Northwestern Gulf of Mexico. *Environmental Science & Technology*, 49(6), 3401–3409.

OTHER PUBLICATIONS

Technical Reports

2. Hu, X.; Murgulet, D.; **McCutcheon, M. R.**; Lopez, C.; Douglas, A. (2019) Evaluating Groundwater Exported Acidity in Copano Bay. Texas General Land Office.
1. Hu, X.; **McCutcheon, M. R.**; Saryk, C. J. (2018) Ocean and Coastal Acidification Monitoring. Coastal Bend Bays and Estuaries Program – 122.

Popular Science Publications

1. **McCutcheon, M. R.** (2019). The other CO₂ problem: Insights on our oceans and estuaries. *Third Coast Science for You*, 4, 6-9.

PRESENTATIONS

* Denotes presenting author

31. **McCutcheon, M. R.***; Cooley, S.; Ono, R. (2020 Jul) **Invited Webinar**. Effects of Ocean Acidification on HABs: a review of what we do and don't know. NOAA National Centers for Coastal Ocean Science and Ocean Acidification Program Webinar Series.
30. **McCutcheon, M. R.***; Hu, Xinping; Murgulet, D.; Douglas, A.; Lopez, C. (2020 Feb) Poster. Examining the relationship between alkalinity and submarine groundwater discharge in a semi-arid estuary. Ocean Sciences Meeting. San Diego, CA.
29. **McCutcheon, M. R.***; Cooley, S.; Ono, R. (2020 Feb) **Invited Poster**. State-Level Action on Ocean Acidification: States Care More than You Think. Ocean Sciences Meeting. San Diego, CA.
28. **McCutcheon, M. R.***; Yao, H.; Saryk, C. J.; Hu, X. (2020 Jan). Webinar. Carbonate chemistry in two semiarid estuaries: Correlates and controls. OneNOAA Science Seminar Series.
27. **McCutcheon, M. R.***; Cooley, S.; Ono, R. (2020 Jan). Lightning Talk. Ocean Acidification State Policy Analysis. NOAA Ocean Acidification Community Meeting and Mini-Symposium. Miami, FL.
26. Hu, X.; **McCutcheon, M. R.*** (2020 Jan). Oral. Buffer capacity of estuaries in the northwestern Gulf of Mexico. NOAA Ocean Acidification Community Meeting and Mini-Symposium. Miami, FL.
25. **McCutcheon, M. R.***; Yao, H.; Saryk, C. J.; Hu, X. (2019 November) Oral. Temporal variability and driving factors of the carbonate system in an estuary with long-term acidification. Coastal and Estuarine Research Federation Meeting. Mobile, AL.
24. **McCutcheon, M. R.***; Yao, H.; Saryk, C. J.; Hu, X. (2019 February) Oral. Temporal variability and driving factors of the carbonate system in the tidal inlet of a semiarid estuary. Association for the Sciences of Limnology and Oceanography Meeting. San Juan, Puerto Rico.
23. Santoni, A. *; Liebman, M.; Vasslides, J.; Yates, K.; **McCutcheon, M.**; Vella, P. (2018 December) Oral. Long-term coastal acidification monitoring in the National Estuary Programs. 9th National Summit on Coastal and Estuarine Restoration. Long Beach, CA.
22. **McCutcheon, M. R.***; Yao, H.; Saryk, C. J.; Hu, X. (2018 November) Poster. Temporal variability and driving factors of the carbonate system in a tidal inlet of a semiarid estuary. Gulf Estuarine Research Society Meeting. Galveston, TX.
21. **McCutcheon, M. R.*** (2018 October) **Invited Speaker**. CO₂ and the Texas Estuaries. Texas Master Naturalists South Texas Chapter Meeting. Corpus Christi, TX.

20. **McCutcheon, M. R. *** (2018 July) **Invited Speaker**. CO₂ and the Coast. Oso Wetlands Preserve and Learning Center Eco-Expert Talk Series. Invited Speaker. Corpus Christi, TX.
19. **McCutcheon, M. R.***; Hu, X. (June 2018) Oral. Understanding uncertainties in the changing carbon budget of estuaries: A case study in the northwestern Gulf of Mexico. Association for the Sciences of Limnology and Oceanography Summer Meeting. Victoria, British Columbia, Canada.
18. **McCutcheon, M. R.***; Hu, X. (2018 March) Webinar. Temporal fluctuations in pH and CO₂ partial pressure in the Aransas Ship Channel, TX. Environmental Protection Agency Ocean Acidification Monitoring Webinar.
17. Hu, X*; Saryk, C. J.; **McCutcheon, M. R.**; Yao, H.; Wetz, M. S.; Montagna, P. A. (2018 February) Poster. Extreme Weather Event Induced Distinct Changes in the CO₂ system in Two Subtropical Estuaries. Ocean Sciences Meeting. Portland, Oregon
16. **McCutcheon, M. R.***; Hu, X. (2017 November) Oral. CO₂ flux and long-term *p*CO₂ trends of the estuaries of the Northwestern Gulf of Mexico. Coastal Estuaries Research Federation Meeting. Providence, Rhode Island.
15. Saryk, C. J.*; **McCutcheon, M. R.**; Hu, X. (2017 November) Oral. Seasonal hypoxia and high buffer capacity and a shallow subtropical estuary. Coastal Estuaries Research Federation Meeting. Providence, Rhode Island.
14. **McCutcheon, M. R.***; Hu, X. (2017 July) Poster. Spatial and temporal trends of *p*CO₂ and CO₂ flux in the estuaries of the Northwestern Gulf of Mexico. Gordon Research Conference in Chemical Oceanography. New London, New Hampshire
13. **McCutcheon, M. R.**; Hu, X* (2017 May) Webinar. Temporal fluctuations in pH and CO₂ partial pressure in the Aransas Ship Channel, TX. EPA OA Monitoring Webinar.
12. Heim-Ballew, H.*; **McCutcheon M. R.**; Pinnell, L. (2017 April) Oral. Third Coast Science For You: A Scientific Responsibility and Obligation of Bridging the Communication Gap. Texas Bays and Estuaries Meeting. Port Aransas, TX
11. **McCutcheon, M. R. ***; Hu, X. (2016 December) Oral. Estimating air-sea CO₂ flux and long-term *p*CO₂ trends of the Texas estuaries. 6th Annual MSGSO Student Research Forum. Corpus Christi, TX. **Awarded second place graduate student oral presentation**
10. **McCutcheon, M. R.***; Hu, X. (2016 November) Oral. Estimating air-sea CO₂ flux and long-term *p*CO₂ trends of the Northwestern Gulf of Mexico estuaries. Gulf Estuarine Research Society Meeting. Pensacola, FL
9. **McCutcheon, M. R.***; Hu, X. (2016 April) Oral. Long-term trends and spatial variability of *p*CO₂ in the Texas estuaries. Texas Bays and Estuaries Meeting. Port Aransas, TX

8. **McCutcheon, M. R.***; Hu, X. (2016 February) Poster. Exploring relationships of calcification rate with respiration rate and predator cue presence in juvenile *Crassostrea virginica*. Ocean Sciences Meeting. New Orleans, LA
7. **McCutcheon, M. R.*** (2015 June) Oral. Investigating the role of nonconsumptive predator effects on the calcification, respiration, and carbon cycle contribution of juvenile eastern oysters (*Crassostrea virginica*). Graduate Seminar. Corpus Christi, TX
6. **McCutcheon, M. R.***; Hu, X. (2015 March) Oral. Investigating Nonconsumptive Predator Effects on the Eastern Oyster. Gulf of Mexico Graduate Student Symposium, Dauphin Island, AL
5. Liu, Q.*, **McCutcheon, M. R.*** (2014 May) Oral. Carbonate Chemistry of Atlantic Water. WACSII Research Cruise Presentation Series. WACSII Research Cruise
4. **McCutcheon, M. R.***; Hu, X. (2014 December) Oral. Nonconsumptive effects of predators may alter calcification and respiration rates of the Eastern Oyster. 4th Annual MSGSO Student Research Forum. Corpus Christi, TX. **Awarded second place graduate student oral presentation.**
3. **McCutcheon, M. R.***; Hu, X.; Beseres Pollack, J.; Montagna, P.; Ouyang, Z. (2014, April) Poster. Long-term alkalinity decline in dewatering Texas estuaries. Texas Bays and Estuaries Meeting. Port Aransas, TX. **Awarded first place student poster presentation**
2. **McCutcheon, M. R.***; Brown, S.*; Layne, J. R. (2013 April) Poster. Factors affecting mortality in *Eurosta solidaginis* populations Commonwealth of Pennsylvania University Biologists Meeting. Clarion, PA
1. **McCutcheon, M. R.*** (2012 December) Oral. Sharks: Species, Senses, and Up-Close Encounters. Sugarcreek Elementary School Gifted Program Presentation Series. Franklin, PA

SERVICE AND LEADERSHIP

Third Coast Science for You – Community Science Magazine

Managing Editor, February 2016 - Present

- Involved in ensuring the direction of the journal in conjunction with the Editor-in-Chief
- Responsible for securing funding through both sponsorship and grants

Co-founder, January 2016

- Co-founded a community outreach initiative to disseminate scientific research and information that pertains to the Corpus Christi community via website and free biannual publications- first publication disseminated in April of 2017.

Reviewer, February 2016 – April 2018

- Responsible for reviewing articles for appropriate content, grammatical and formatting standards, and provided constructive comments to authors before communicating article readiness to the Editor-in-Chief

Gulf Estuarine Research Society Executive Board

- GERS Student Representative, November 2017-November 2019
- GERS 2018 Meeting Science Committee Member, July 2018 – November 2018

Women in Leadership (WIL) Mentoring Program

Member, February 2017 – August 2017

- Selected amongst women in all PhD programs at Texas A&M University-Corpus Christi. Participated in a variety of activities to advance personal and professional goals, including mentoring from university and community female leaders, self-assessment, and book studies

Academic Journal Reviews

- Marine Chemistry, Sept. 2019
- Estuarine, Coastal and Shelf Science, Jan. 2019
- Journal of Marine Systems, Jan. 2018
- Marine Pollution Bulletin, Dec. 2017

Big Brothers Big Sisters

Volunteer Big Sister, February 2018- October 2018

Texas A&M University- Corpus Christi Marine Science Graduate Student Organization (MSGSO)

Physical and Environmental Science (PENS) Department Liaison, May 2017- present

- Attended PENS faculty meetings to act as a liaison between faculty and graduate students.

President, April 2016 – May 2017, Vice President, August 2015 – April 2017

- Dictated meetings, Event planning and execution
- Research Forum Organization
 - Event Organizer for 5th Annual Student Research Forum (2015, Dec.) and 6th Annual Student Research Forum (2016, Dec.) Harte Research Institute for Gulf of Mexico Studies. Texas A&M University- Corpus Christi.
 - Student Research Forums had over 60 student presenters (oral and poster). Attendance of over 100.
 - Organized the advertisement (to multiple universities), registration, forum agenda, program book organization, application for sponsorship for refreshments and monetary prizes, volunteer sign-up, faculty judge sign-up, and gave presenter introductions.
- Canned Food Drive Event Organization
 - 2nd Annual College of Science and Engineering Canned Food Drive Departmental Competition. Event Organizer. (2016, Nov). Collected over 1900 items for donation to the Corpus Christi Food Bank
 - 1st Annual College of Science and Engineering Canned Food Drive Departmental Competition. Event Organizer. (2015, Nov). Collected over 700 items for donation to the Corpus Christi Food Bank

Member, September 2013 - Present

- Involved in several community service activities (including glass recycling events, food bank volunteering, beach cleanup, National Ocean Sciences Bowl volunteer, Coastal Bend Regional Science Fair volunteer judge, Earth-Day Bay Day volunteer, “Get into Grad School week” for undergraduate students, Family Science Night activity leader for Woodroe Petty Elementary School)

Slippery Rock University Honors Program

Member, Fall 2009-Spring 2013

- Graduated with Honors Program Distinction (May 18, 2013)
- Took classes designed for honors students
- Involved in several community service activities (including Special Olympics Volunteer in Fall 2010 and Fall 2012 and volunteer for SRU Office for Students with Disabilities from Spring 2009 to Fall 2012)

Beta Beta Beta Biology Honorary Society

Member, Fall 2009-2011

Slippery Rock University Women's Tennis Team

Varsity Member, Fall 2009-Spring 2012

Student Athletic Advisory Committee (SAAC)

Member, Fall 2009-Spring 2012

- Served as a voice for all SRU student athletes for communication with the athletic administrators
- Involved in several fundraisers for the Make-A-Wish Foundation

AWARDS AND HONORS

Science Research and Outreach Grant Awards

- Phi Kappa Phi Literacy Grant – STEM Literacy. “Third Coast Science for You – a popular science magazine outreach initiative”. \$2,500. (May 2019)
- Atlee M. and John W. Cunningham Memorial Research Award. “Investigating the impacts of substrate type on the sediment geochemistry and subsequent calcium carbonate preservation at restored oyster reef sites”. \$1,200. (December 2017)
- Texas Sea Grant's Grants-in-Aid of Graduate Research Award. “Investigating the relationship between oyster reef substrate, sediment geochemistry, and oyster shell preservation in the Mission-Aransas Estuary” \$1,940. (May 2017)

Teaching Awards

- Outstanding Teaching Assistant Award, TAMUCC. \$1000. (April 2018)

Travel Awards

- Coastal Estuarine Research Federation Travel Award. \$300. (November 2017)
- Women in Leadership Travel Award. \$455. (November 2017)
- TAMUCC Parent Council Student Travel Award. \$500. (March 2015)

Presentation Awards

- Second Place Graduate Student Oral Presentation at the 6th Annual MSGSO Student Research Forum (December 2, 2016)
- Second Place Graduate Student Oral Presentation at the 4th Annual MSGSO Student Research Forum (December 3, 2014)

- First Place Student Poster Presentation at the Texas Bays and Estuaries Meeting, held at University of Texas Marine Science Institute, for a poster entitled “Long-term alkalinity decline in dewatering Texas estuaries” (April 24, 2014)

Scholarship Awards

Texas A&M University- Corpus Christi

- Coastal and Marine System Science Research Assistant Scholarship (Spring 2020)
- TAMUCC Fall Graduate Scholarship (Fall 2019)
- Islander Leadership Scholarship Award (Fall 2019 – Spring 2020)
- Islander Leadership Scholarship Award (Fall 2018 – Spring 2019)
- TAMUCC Spring Graduate Scholarship (Spring 2018)
- TAMUCC Summer Graduate Scholarship (Summer 2017)

Slippery Rock University and Slippery Rock Biology Department

- Carl and Norma Laughner Scholarship Award (Fall 2012-Spring 2013)
- Frank A. Pugliese “Rock” Scholarship (Fall 2012-Spring 2013)
- The William R. Sigmund PJAS Award (Fall 2012-Spring 2013)
- Sophomore Biology Honors Scholarship (Fall 2010-Spring 2011)
- Freshman Biology Honors Scholarship (Fall 2009-Spring 2010)
- Slippery Rock University President’s Scholarship (Fall 2009-Spring 2013)
- Robert N. Aebersold Scholarship (Fall 2009-Spring 2013)
- Slippery Rock University Honors Program Scholarship (Fall 2009-Spring 2013)

Athletic Awards

- ITA Scholar Athlete Honor (Fall 2009-Spring 2012)

SKILLS AND TRAINING

- Small boat operations
- AAUS Scientific Diver in Training
- PADI Open Water Diver
- PADI Enriched Air Diver
- Experience with ArcGIS software suite and ArcGIS Pro
- Experience with R for statistical computing and graphics
- Experience with Camtasia for lecture capture and editing

PROFESSIONAL AFFILIATIONS

Phi Kappa Phi Honor Society

Member, Apr 2018 - Present

Gulf Estuarine Research Society

Executive Board Student Representative, Nov 2017 – Nov 2019

Member, Oct 2016 – present

Association for the Sciences of Limnology and Oceanography

Member, Feb 2018 – present

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Coastal & Estuarine Research Federation

Member, Oct 2016 – present

Texas Academy of Science

Member, Feb 2017 – Feb 2018