Nicole C. Powers (née Elledge), Ph.D.

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Curriculum Vitae

EDUCATION

Ph.D., Marine Biology

Texas A&M University - Corpus Christi, Corpus Christi, Texas (2016-2021) Dissertation: Sources, drivers, and impacts of fecal pollution in coastal Texas. Advisor: Dr. Jeffrey W. Turner

B.S., Microbiology, Cell, and Molecular Biology

Oklahoma State University, Stillwater, Oklahoma (2012-2016) Senior honors thesis: Feasibility of applying RNAi as a gene knock-down approach in anaerobic fungi. Advisor: Dr. Noha Youssef

ACADEMIC APPOINTMENTS

Assistant Research Scientist

Laboratory for Coastal Ecosystem Processes, Harte Research Institute for Gulf of Mexico Studies, Texas A&M University - Corpus Christi, Corpus Christi, Texas (2024-present)

Postdoctoral Research Associate

Micro-omics Laboratory for Microbial & Environmental Genomics, Texas A&M University - Corpus Christi, Corpus Christi, Texas (2022-2024)

Adjunct Professor

Texas A&M University - Corpus Christi, Corpus Christi, Texas (2021) Instructor of record: BIOL-241 Microbiology (86 students), BIOL-4343 Oceans and Human Health (23 students)

Graduate Research Assistant

Texas A&M University - Corpus Christi, Corpus Christi, Texas (2017-2021)

Graduate Teaching Assistant

Texas A&M University - Corpus Christi, Corpus Christi, Texas (2016-2017) Laboratory instructor: Microbiology BIOL-2421 (2 class sections; 34 students), Biology BIOL-1406 (4 class sections; 75 students)

PUBLICATIONS

Peer-Reviewed Journal Articles

- 1. Wetz MS, **Powers NC**, Turner JW, Huang Y (2022). No widespread signature of the COVID-19 quarantine period on water quality across a spectrum of estuarine systems. *Science of the Total Environment* 807:150825.
- 2. **Powers NC**, Wallgren HR, Marbach S, Pinnell LJ, Turner JW (2022). Water quality dynamics in response to rainfall along an estuarine ecocline. *ACS Environmental Science & Technology Water* 1:1503-1514.
- 3. **Powers NC**, Pinchback J, Flores L, Huang Y, Wetz MS, Turner JW (2021). Long-term water quality analysis reveals correlation between bacterial pollution and sea level rise in the northwestern Gulf of Mexico. *Marine Pollution Bulletin* 166:112231.
- 4. **Powers NC**, Wallgren HR, Marbach S, Turner JW (2020). Relationship between rainfall, fecal pollution, antimicrobial resistance, and microbial diversity in an urbanized subtropical bay. *Applied and Environmental Microbiology* 86:19.
- Bachand PT, Tallman JJ, Powers NC, Woods M, Nasr Azadani D, Zimba PV, Turner JW (2019). Genomic identification and characterization of co-occurring Harveyi clade species following a vibriosis outbreak in Pacific white shrimp, *Penaeus (litopenaeus) vannamei. Aquaculture* 734628.
- 6. Elledge NC, Eytan RI, Pinnell LJ, Pray R, Joyner J, Wares JP, Sutherland KP, Lipp EK, Turner JW (2019). Draft genome sequences of 38 *Serratia marcescens* isolates associated with acroporid serratiosis in *Acropora palmata*. *Molecular Resource Announcements* e00194-19.
- Turner JW, Tallman JJ, Macias A, Pinnell LJ, Elledge NC, Nasr Azadani D, Nilsson WB, Paranjpye RN, Armbrust EV, Strom MS (2018). Comparative genomic analysis of *Vibrio diabolicus* and six taxonomic synonyms: A first look at distribution and diversity of the expanded species. *Frontiers in Microbiology* 9:1893.
- 8. Calkins SS, **Elledge NC**, Mueller KE, Marek SM, Couger MB, Elshahed MS, Youssef NH (2018). Development of an RNA interference (RNAi) gene knockdown protocol in the anaerobic gut fungus *Pecoramyces ruminatium* strain C1A. *PeerJ* 6:e4276.
- 9. Calkins S, **Elledge NC**, Hanafy RA, Elshahed MS, Youssef N (2016). A fast and reliable procedure for spore collection from anaerobic fungi: Application for RNA uptake and long-term storage of isolates. *Journal of Microbiological Methods* 127:206-213.

Articles in Preparation and under Review

10. **Powers NC**, Bleth N, Newman M, Johnson A, Nicolay J, Ayers R, Huang Y, Turner JW. (*In preparation; pre-submission to Sustainability special issue Aquatic Biodiversity and Marine Ecosystem Sustainability*). Monitoring residential canal water quality to inform sustainable adaptive management.

- 11. Bachand P, **Powers NC**, Hayes KC, Pinnell LJ, Wetz M, Turner J. (*In preparation; Target journal: ISME Journal.*) Microbial communites' resistance to flood and freeze disturbances in a low-flow estuary bay system.
- 12. Bachand P, Pinnell LJ, **Powers NC**, Amend S, Walgren H. (*In preparation; Target journal: Environmental Microbiology*.) Microbial community response to flood disturbance in an organo-polluted hypersaline lagoon.
- 13. Gitter A, **Powers NC**, Postma S, Gregory L. (*In preparation*.) Quantitative microbial risk assessment in response to rainfall along an environmental ecocline.
- 14. Bleth N, **Powers NC**, Gitter A, Nicolay J, Gregory L, Wetz M, Turner JW. (*In preparation.*) Improving community health: Microbial source tracking and quantitative microbial risk assessment on the Texas Coast.

Technical Reports

- 1. **Powers NC**, Bleth N, Johnson A, Nicolay J, Ayers R, Turner JW. (2024) Assessment of water quality in a model coastal bend canal community. Coastal Bend Bays and Estuaries Program. Publication 2236.
- 2. Turner JW, **Elledge NC**, Wallgren HR, Amend SM (2019). A bacterial source tracking project to identify sources of fecal pollution at Little Bay: May 2018-January 2019. Coastal Bend Bays and Estuaries Program. Publication 1816.
- 3. Turner JW, **Elledge NC** (2018). A bacterial source tracking project to identify sources of fecal pollution at Cole and Ropes Parks: May 2017-May 2018. Coastal Bend Bays and Estuaries Program. Publication 1705.

Additional, Non-Peer-Reviewed Publications

- 1. Reustle J, Pena J, Schubert K, Dorin K, Brandt J, **Elledge NC**, Olvera J, Hawkins T, Turner JW (2017). A collection of STEM-inspired artwork and poetry. *Third Coast Science for You*, 2017, Fall.
- Turner JW and Peña J (2017). Coastal concerns: A collaboration between art and science students at Texas A&M University-Corpus Christi. Art contributed by 24 TAMU-CC students: Nicole Elledge, Jared Brandt, Danielle Zimmerman, Lydia Joy, Katherine Dion, Kristina Schubert, Erika Velasquez, Danielle Aquilar, Belinda Torres, Danielle DeVacque, Joanna Bolsins, Polly Hajovsky, Karla Otwell, Tiffany Hawkins, Juan Olvera, Katherine Martin, Tana Alcantara, Megan Mullis, Lucas Barraza, Marina Partain, Christibelle Neal, Rachel Weisend, Tiffany Garza, Joseph Reustle. *Self-published*.

GRANT FUNDING

Current Funding

- "Translating water quality data into human health risks for a Coastal Bend community." (2024-2025) Funder: TAMUCC Office of Research Engagement. Role: Principal Investigator. Total: \$4,107.
- "Improving community health: Microbial source tracking (MST) and quantitative microbial risk assessment (QMRA) on the Texas Coast." (2022-2025) Funder: Environmental Protection Agency (EPA) Gulf of Mexico. Role: Postdoctoral Research Associate. PI: Jeffrey Turner. Total: \$494,348.
- 3. "Evaluating source-specific health risks of fecal pollution in Little Bay." (2022-2024) Funder: Texas General Land Office Coastal Management Program; National Oceanic and Atmospheric Association. Role: Subaward Principal Investigator. Total: \$87,633.

Previous Funding

- "Assessment of water quality in a model Coastal Bend canal community." (2022-2024) Funder: Coastal Bend Bays and Estuaries Program (CBBEP). Role: Postdoctoral Research Associate. PI: Jeffrey Turner. Total: \$49,508.
- 5. "Capturing the signature of the COVID-19 quarantine on coastal water quality." (2020) Funder: Texas Sea Grant. Role: Graduate Research Assistant. PI: Michael Wetz, Co-PI: Jeffrey Turner. Total: \$10,000.
- 6. "Characterizing water quality conditions in the Texas Coastal Zone." (2020) Funder: Texas General Land Office. Role: Graduate Research Assistant. PI: Jeffrey Turner, Co-PI: Michael Wetz. Total: \$20,000.
- "A bacterial source tracking project for Little Bay." (2018-2019) Funder: Coastal Bend Bays and Estuaries Program (CBBEP). Role: Graduate Research Assistant. PI: Jeffrey Turner. Total: \$47,558.
- "A bacterial source tracking project to identify sources of fecal pollution at Cole and Ropes Park." (2017-2018) Funder: Coastal Bend Bays and Estuaries Program (CBBEP). Role: Graduate Research Assistant. PI: Jeffrey Turner. Total: \$59,892.

ADDITIONAL RESEARCH EXPERIENCE

Data Manager

Laboratory for Microbial and Environmental Genomics Texas A&M University - Corpus Christi, Corpus Christi, TX (2022-present)

Laboratory/Data Manager and Field Supervisor

Laboratory for Microbial and Environmental Genomics Texas A&M University - Corpus Christi, Corpus Christi, TX (2016-2021)

Undergraduate Researcher

Microbial Ecology and Environmental Genomics Laboratory Oklahoma State University, Stillwater, OK (2015-2016)

Laboratory Assistant Environmental Microbiology Laboratory Oklahoma State University, Stillwater, OK (2014-2015)

ADDITIONAL TEACHING EXPERIENCE

Mentor for data analysis and visualization with R

Texas A&M University - Corpus Christi, Corpus Christi, TX; Remote Teaching (2022-2024).

Provided one-on-one instruction on data analysis and visualization utilizing R for numerous research projects. Instruction was tailored to individual research needs for faculty, graduate students, and undergraduates at TAMUCC and faculty at UTHealth Houston School of Public Health in El Paso.

Instructor of droplet digital PCR (ddPCR) workshop

Texas A&M University - Corpus Christi, Corpus Christi, TX (2023) Instructed a 12-hour workshop for faculty, graduate students, and undergraduate students for using Bio-Rad QX200 Droplet Digital PCR System and QuantaSoft software for the purpose of microbial source tracking.

Instructor of QIIME 2 microbiome bioinformatics workshop

Texas A&M University - Corpus Christi, Corpus Christi, TX; Remote Teaching (2019, 2022).

Provided instruction for professors and graduate students on how to use the bioinformatic program QIIME 2 to analyze 16S rRNA microbial community data on a High Performance Computing (HPC) environment.

Instructor of genome assembly workshop

Texas A&M University - Corpus Christi, Corpus Christi, TX (2022). Led tutorial for graduate and undergraduate students on how to assemble bacterial genomes using Velvet and SPAdes *de novo* assemblers on a High Performance Computing (HPC) environment.

Mentor for honors students

Texas A&M University - Corpus Christi, Corpus Christi, TX (2017-2018). Mentored and guided undergraduate students (sample collection/field work, laboratory bench work, data analysis, writing and editing) to help them complete their Projects of Excellence.

Instructor and developer of antimicrobial resistance educational module

Oceans and Human Health, Texas A&M University - Corpus Christi, Corpus Christi, TX (2017).

Created lectures, organized interactive learning activities, and led graduate student discussions focused on natural product discovery in marine environments.

Instructor and developer of natural product discovery educational module

Oceans and Human Health, Texas A&M University - Corpus Christi, Corpus Christi, TX (2017).

Created lectures and led graduate student discussions focused on natural product discovery in marine environments.

Undergraduate academic tutor

Oklahoma State University, Stillwater, OK (2015-2016). Tutor for one-on-one and group learning sessions for microbiology, biology, organic chemistry I and II, and general chemistry I and II.

Sea Life Aquarium education team member

Sea Life Aquarium, Grapevine, TX (2013-2014). Delivered educational talks about sea life and conservation and provided guest interaction/information at an accredited Association of Zoos and Aquariums (AZA) facility.

RESEARCH PRESENTATIONS

Invited Presentations

(*Presenting Author)

- 1. ***Powers NC**, Pinchback J, Flores L, Wetz MS, Turner JW (2021). Exploring Texas Beach Water Quality. Clean Coast Texas Collaborative Meeting, virtual.
- *Elledge NC, Wallgren HR, Amend SM, Turner JW (2019). Investigating the impact of stormwater runoff on fecal indicator bacteria in Corpus Christi, Texas. Texas Master Naturalist Meeting, Corpus Christi, TX.
- 3. *Elledge NC, Wallgren HR, Amend SM, Turner JW (2018). Stormwater is a pulse disturbance that alters bacterial community composition. Eugene and Millicent Goldschmidt Graduate Student Award Presentation, Texas Branch of the American Society for Microbiology, Corpus Christi, TX.

Conference Presentations

(*Presenting Author)

- Powers NC, *Bleth N, Johnson AH, Nicolay J, Ayers R, Turner JW. Assessment of Water Quality in a Model Coastal Bend Canal Community (Abstract selected; conference dates April 3rd - 4th, 2024). Texas Bays and Estuaries Meeting, University of Texas Marine Science Institute, Port Aransas, TX.
- 2. ***Powers NC**, Pinchback J, Flores L, Wetz MS, Turner JW (2021). Long-term coastal water quality analysis reveals relationship between impaired water quality and sea level rise. MARB IDP, virtual.
- *Bachand P, Powers NC, Pinnell LJ, Hayes KC, Tominack S, Wetz MS, Turner JW (2021). Analysis of a brown tide *Aureoumbra lagunensis* harmful algal bloom microbiome. Texas Branch American Society of Microbiology, virtual.
- 4. ***Powers NC**, Pinchback J, Flores L, Wetz MS, Turner JW (2020). Historical water quality analysis throughout coastal Texas reveals relationship between degrading water quality, population growth, and sea level rise. Texas Branch American Society of Microbiology, virtual.
- 5. *Elledge NC, Wallgren HR, Amend SM, Turner JW (2019). Effect of stormwater runoff on the marine bacterial community in Corpus Christi Bay. Marine Biology Interdisciplinary Texas A&M Retreat, Corpus Christi, TX.
- 6. ***Elledge NC**, Eytan RI, Pinnell LJ, Wares JP, Sutherland KP, Lipp EK, Turner JW (2018). Genomic discovery of ecotype-specific features in *Serratia marcescens* associated with acroporid serratiosis. Benthic Ecology Meeting, Corpus Christi, TX.
- 7. *Elledge NC, Pinnell LJ, Eytan RI, Turner JW (2017). Genomic analysis of *Serratia marcescens* associated with white pox disease in elkhorn corals (*Acropora palmata*). Benthic Ecology Meeting, Myrtle Beach, SC.
- *Elledge NC, Pinnell LJ, Eytan RI, Turner JW (2017). A genomic analysis the white pox disease associated *Serratia marcescens*. Texas Branch American Society of Microbiology, New Braunfels, TX.
- 9. *Elledge NC, Pinnell LJ, Eytan RI, Turner JW (2017). Genomic analysis of *Serratia marcescens* associated with white pox disease in elkhorn corals (*Acropora palmata*). Marine Biology Interdisciplinary Texas A&M Retreat, Galveston, TX.
- *Elledge NC, Rice S, Youssef N (2015). Flooding Optimization Techniques for the Anaerobic Fungus, *Orpinomyces* C1A. Oklahoma Academy of Science, Oklahoma City, OK.

Poster Presentations

(*Presenting Author)

- Powers NC, *Bleth N, Johnson AH, Nicolay J, Ayers R, Turner JW. Assessment of Water Quality in a Model Coastal Bend Canal Community (Abstract selected; conference date April 26th, 2024). Marine Science Graduate Student Organization (MSGSO) Research Symposium, Corpus Christi, TX.
- *Johnson AH, Powers NC, Bleth N, Nicolay J, Turner JW (2023). Assessment of Water Quality in a Model Coastal Bend Canal Community. Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS) National Diversity in STEM (NDISTEM) Conference, Portland, OR.
- 3. *Garrett C, *Nicolay J, **Powers NC**, Turner JW, Dinasquet J (2023). Flying *Vibrio*: Evidence of a Marine Pathogen Surviving in the Atmosphere. Marine Science Graduate Student Organization (MSGSO) Research Symposium, Corpus Christi, TX.
- 4. *Garrett C, *Nicolay J, **Powers NC**, Turner JW, Dinasquet J (2023). Flying *Vibrio*: Evidence of a Marine Pathogen Surviving in the Atmosphere. Texas Branch American Society of Microbiology, Abilene Christian University, Abilene, TX.
- 5. *Nicolay J, Garrett C, **Powers NC**, Turner JW, Dinasquet J (2023). Flying *Vibrio*: Evidence of a Marine Pathogen Surviving in the Atmosphere. TAMUCC Internal Research Symposium, Corpus Christi, TX.
- 6. ***Powers NC**, Wallgren HR, Amend SM, Turner JW (2020). Assessing the Impact of Stormwater Runoff on Water Quality and Ecosystem Health in an Urbanized Bay. American Society for Microbiology Microbe 2020, Online.
- *Elledge NC, Wallgren HR, Amend SM, Turner JW (2019). Quantifying the effect of stormwater runoff on *Enterococcus* population structure and antimicrobial resistance in Corpus Christi Bay, Texas. Texas Sea Grant Research Symposium, College Station, TX.
- 8. *Davis H, **Elledge NC**, Wallgren H, Marbach S, Zhang D, Turner JW (2018). Identifying *Enterococcus* Isolates in Corpus Christi Bay after Rainfall. Advanced Technological Education Conference, Washington, D.C.
- 9. *Elledge NC, Wallgren HR, Marbach S, O'Donnell C, Turner JW (2018). Assessing the impact of stormwater runoff on the bacterial community structure and the prevalence of fecal indicator bacteria in an urbanized bay. Texas Branch American Society of Microbiology, New Braunfels, TX.
- *Davis H, Elledge NC, Wallgren H, Marbach S, Zhang D, Turner JW (2018). Identifying *Enterococcus* Isolates in Corpus Christi Bay after Rainfall. Texas Branch American Society of Microbiology, New Braunfels, TX.
- 11. *Elledge NC, Marbach S, Wallgren HR, O'Donnell C, Turner JW (2018). Assessing the impact of stormwater runoff on the prevalence of fecal indicator bacteria in an urbanized bay. American Association for the Advancement of Science, Austin, TX.

- 12. *Elledge NC, Turner JW (2017). Assessing the effect of stormwater runoff on the prevalence of fecal indicator bacteria in an urbanized bay. Texas Branch American Society of Microbiology, College Station, TX.
- 13. *Elledge NC, Calkins S, Youssef N (2016). Optimization of a protocol for zoospore and germinating spore collection from the anaerobic gut fungus *Orpinomyces* C1A. Microbiology and Molecular Genetics Undergraduate Research Symposium, Oklahoma State University, Stillwater, OK.

Art Exhibits

 Turner JW and Peña J (2017). Coastal concerns: A STEAM collaboration between art and science students at Texas A&M University-Corpus Christi. Art contributed by 24 TAMU-CC students: Nicole Elledge, Jared Brandt, Danielle Zimmerman, Lydia Joy, Katherine Dion, Kristina Schubert, Erika Velasquez, Danielle Aquilar, Belinda Torres, Danielle DeVacque, Joanna Bolsins, Polly Hajovsky, Karla Otwell, Tiffany Hawkins, Juan Olvera, Katherine Martin, Tana Alcantara, Megan Mullis, Lucas Barraza, Marina Partain, Christibelle Neal, Rachel Weisend, Tiffany Garza, Joseph Reustle. World Oceans Day 2017 at the Texas State Aquarium, Corpus Christi, TX.

SCHOLARSHIPS

\$400	Sea Level Rise Workshop Participation Grant (2022)
\$6,000	Rising Scholar Scholarship (2018-2019, 2019-2020, 2020-2021)
\$9,000	Eugene and Millicent Goldschmidt Award Recipient (2018)
\$800	TAMUCC Division of Research, Commercialization, and Outreach (RCO)
	Student Research Competition Award (2018)
\$1,940	Texas Sea Grant, Grants-In-Aid of Graduate Research (2017-2018)
\$550	Parents' Council Travel Award (2017)
\$4,000	TAMUCC Graduate Student Scholarship Recipient (2017, 2018, 2019,
	2020)
\$15,400	President's Distinguished Achievement Scholarship Recipient (2012-
	2016)

AWARDS

TAMUCC Outstanding Graduate (2021)
OB Williams Award, Second Place Graduate Oral Presentation (2020)
Eugene and Millicent Graduate Student Award (2018)
Charlie Gaunt Award, Second Place Graduate Student Poster (2018)
Honors College Degree, OSU (2016)
Departmental Honors Award, OSU (2016)
OSU Microbiology Undergraduate Student Symposium, First Place (2016)

Nominated for "Outstanding Undergraduate Researcher" (2016) Oklahoma Academy of Science "Best Writer" Award (2015) General Honors Award, OSU (2014) President's and Dean's List, OSU (2012-2016)

OUTREACH AND VOLUNTEERING

Organized, assembled, and hosted Little Bay, TX stakeholders' meetings (2023-2024) Islander Green Team compost and recycling (2018-2019) Coastal Bend Regional Science Fair Judge (2017, 2019) Islander Stream Team Citizen Scientist (2016-2019) Texas Branch American Society for Microbiology Conference Organizer (2018) Benthic Ecology Meeting Volunteer (2018) Third Coast Science for You magazine contribution (2017) World Oceans Day Volunteer, Texas State Aquarium (2017) Benthic Ecology Meeting Undergraduate Poster Judge (2017) Teen STEM Café, Texas State Aquarium (2017) Marine Ecology Diurnal Graduate Student Volunteer (2017) Stillwater Humane Society (2014-2016)

PROFESSIONAL MEMBERSHIPS

Gulf Estuarine Research Society American Society for Microbiology Texas Branch American Society for Microbiology American Association for the Advancement of Science Benthic Ecology Meeting Society

JOURNAL REVIEWER

Gulf and Caribbean Research Journal of Contemporary Water Research and Education

WORKSHOPS ATTENDED

Data Analysis with R For Educators, Online (2022) Gulf of Mexico Sea Level Rise Regional Workshop, Baton Rouge, LA (2022)

MEDIA

Are Texas Waters Clean Enough for Swimming? (Short Answer: Yes.)

Texas Monthly article discussing the history of bacterial pollution along the Texas Coast. <u>https://www.texasmonthly.com/travel/are-texas-waters-clean-enough-for-swimming-short-answer-yes/</u>

Evaluating health risks in Little Bay public discussion to be held Dec. 12.

Announcement for stakeholders meeting in Rockport, Texas to engage local community and present results on human health risk assessment. 2023.

https://agrilifetoday.tamu.edu/2023/11/29/little-bay-water-quality-public-meeting-set-fordec-12-in-rockport/

Evaluating health risks in Little Bay.

Website dedicated to ongoing research in Little Bay, including a human health risk assessment based on previous microbial source tracking results. 2023. https://littlebay.twri.tamu.edu/

Fecal bacteria rises with sea level on Texas beaches.

Environmental Monitor press release covering recent publication water quality publication in *Marine Pollution Bulletin*. 2021. https://www.fondriest.com/news/fecal-bacteria-rises-with-sea-level-on-texas-beaches.htm

Outstanding graduate Nicole Powers follows passion for microbes, marine life at TAMU-CC.

TAMU-CC press release detailing Spring 2021 Outstanding Graduate Award. 2021. https://www.tamucc.edu/news/2021/05/051221-ognicolepowers.php

Clean Coast Texas presents: Exploring Texas beach water quality.

Event notification about water quality in coastal Texas, courtesy of Clean Coast Texas. 2021.

https://www.eventbrite.com/e/march-lunch-learn-with-clean-coast-texas-registration-136891230355?aff=erellivmlt

New TAMU-CC study examines: With Texas beaches empty, did water quality improve?

TAMU-CC press release reporting water quality analysis in response to COVID-19. 2020.

https://www.tamucc.edu/news/2020/06/060120-quarantine-water-quality-study.php

Island University PhD student and scholarship recipient researches Corpus Christi Bay bacteria.

TAMU-CC press release reporting local bacterial source-tracking research and Goldschmidt scholarship. 2018.

https://www.tamucc.edu/news/2018/11/110518 microbiology conference.php