

LYDIA HAYES-GUASTELLA

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EDUCATION

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|------------|---|----------|
| MS | Texas A&M University- Corpus Christi, Marine Biology
Thesis: "Assessment and valuation of nitrogen mitigation ecosystem services in natural and restored wetlands of the Texas Coastal Bend"
Advisor: Dr. Lin Zhang | May 2020 |
| BS | Michigan State University, Microbiology | May 2018 |
| AGS | Lansing Community College, General Studies
Graduated Summa Cum Laude | May 2018 |

PROFESSIONAL EXPERIENCE

Graduate Research Assistant

University of South Alabama, Kiel Reese Lab, Mobile, AL July 2022- Present

- Open ocean sampling, multicore sampling for cell counts, single cell amplified genomes, metatranscriptomes, metagenomes.
- Experimental design

Process Support Scientist II

September 2021-June 2022

Neogen, Lansing, MI

- Troubleshooting lateral flow analytical devices
- Improving processes for mycotoxin quantification in agricultural products
- Conjugation of mycotoxins
- Biotinylation of mycotoxins
- Improving mycotoxin extraction techniques
- Troubleshooting lateral flow analysis for bacterial pathogen detection

Laboratory Manager

June 2020 to April 2021

TAMUCC, Zhang Lab, Corpus Christi, TX

- Measured nutrient concentrations using discrete nutrient analyzer
- Prepared environmental samples for $\delta^{15}\text{N}$ stable isotope analysis of nitrate, nitrite, and ammonium using PT-IRMS
- Extract intracellular fluid for collection of free amino acids in algae culture using Ion Chromatography
- Organized and managed monthly fieldwork excursions
- Field sample collection including water samples for nutrient concentrations, stable isotope analysis, and caffeine analysis

- Preparation of analytical stock solutions, and secondary stock solutions
- Develop analysis methods for a variety of gasses and column types for Thermo TRACE 1310 Gas Chromatograph
- Monitoring and changing instrument gasses
- Managed and trained undergraduate researchers on multiple research projects, laboratory procedures, and analytical methodologies
- Collect and organize data for multiple research projects
- Maintain and operate instrumentation, report, and preform repairs when necessary
- Experience maintaining and organizing large data sets
- Prepared quarterly reports on findings for projects funded by the Texas General Land Office
- Technical writing experience preparing final report for Texas General Land Office, and dissemination of data.
- Grant writing experience

Graduate Research Assistant

Jan 2019 to May 2020

TAMUCC, Zhang Lab, Corpus Christi, TX

- Measured denitrification by microbes in sediments using Thermo TRACE 1310 Gas Chromatograph
- Measured nutrient concentrations in water samples with SEAL AQ300 discrete nutrient analyzer
- Prepared environmental samples for $\delta^{15}\text{N}$ stable isotope analysis of nitrate, nitrite, and ammonium using PT-IRMS
- Preparation of analytical stock solutions, and secondary stock solutions
- Monitoring and changing instrument gasses
- Organized and managed monthly wetland fieldwork excursions
- Organize and manage data collection for multiple projects
- Field sample collection including water samples for nutrient analysis, and stable isotope analysis, sediment samples, and dissolved gas samples.
- Managed, and trained 15 undergraduate researchers on two different projects, laboratory procedures, and analytical methodologies
- Interpretation, compilation, and statistical analysis of data
- Write, and adapt operating procedures based on new methods
- Experience managing large data sets
- Operate and maintain instrumentation, report, and preform repairs as needed
- Prepared quarterly reports on findings for projects funded by the Texas General Land Office

Graduate Teaching Assistant

Aug 2018 to Dec 2018

TAMUCC, College of Science and Engineering, Corpus Christi, TX

- Taught BIOL 2421 Microbiology lab, two sections of 18 students
- Preparing and instructing lab experiments
- Teaching techniques in microbiology, including aseptic technique, and culturing
- Teaching selective and differential methods in microbiology
- Demonstrating and practicing biochemical testing

- Writing quizzes and short lectures
- Grading lab reports and practical exams

Undergraduate Research Assistant

Sep 2016 to Aug 2018

MSU, Schrenk Geomicrobiology Lab, East Lansing, MI

- Culturing and isolating bacteria from water and soil samples from serpentinizing systems.
- Extracting DNA, running PCR, and analyzing DNA sequences.
- DNA Quantification using Qubit Fluorometer
- Polymerase Chain Reaction using C1000 Thermal Cycler
- Preparing Gel Electrophoresis
- Preparing primers, buffers, and polymerases for PCR
- Cell numeration through standard methods including plate counting and UV microscopy
- Testing physiological responses of bacteria to a variety of stimuli and environments.
- Organizing the lab's culture library.
- Experience managing large datasets of cell culture morphology, environmental parameters, and DNA and RNA sequences
- Fieldwork, including soil sampling, and taking field notes
- Mentoring high school students to complete their own research projects
- Outreach to high school students

Undergraduate Teaching Assistant

Sep 2017 to Dec 2017

MSU, East Lansing, MI

- Teaching assistant for GLG 435 Geomicrobiology
- Preparing media and supplies for the Geomicrobiology Lab.
- Demonstrating lab techniques including pipetting, DNA extraction, and quantifying DNA using a Qubit Fluorometer to small groups of students.
- Inoculating isolated colonies in preparation for class periods, for use in DNA extraction.

PRESENTATIONS

Lee, C., **Hayes, L.**, Kreider-Mueller, A., Kuhnel E., Baca, J., Shaw, C., Swonke, R., Altabet, M., Zhang, L., Histidine Intramolecular Nitrogen Isotope Analysis- A Potential New Tracer of Ecosystem Nitrogen Sources. American Geophysical Union 2020 Annual Meeting. Virtual Meeting. December 8, 2020.

Hayes, L. Assessment and economic evaluation of nitrogen mitigation ecosystem services in natural and restored wetlands of the Texas Coastal Bend. Thesis Defense Seminar. Texas A&M University-Corpus Christi. Corpus Christi, TX, USA. March 6, 2020.

Hayes, L., Williams, L., and Zhang, L., Assessment of temporal patterns on nitrogen mitigation in wastewater influenced restored and natural wetlands along the Texas coast.

MARB IDP 2020 Winter Retreat. Texas A&M University- Galveston. Galveston, TX, USA. January 11, 2020.

Hayes, L., Kuhnel, E., Mier, M., Shaw, C., Williams, L., and Zhang, L., Seasonal patterns of nitrogen removal in restored and natural wetlands influenced by wastewater along the Texas coast. American Geophysical Union 2019 Annual Meeting. San Francisco, CA, USA. December 11, 2019.

Hayes, L., Williams, L., and Zhang, L., Assessment of seasonal patterns on nitrogen mitigation in wastewater influenced restored and natural wetlands along the Texas coast. Soil Science Society of America 2019 Annual Meeting. San Antonio, TX, USA. November 12, 2019.

Hayes, L., Williams, L., and Zhang, L., Assessment and economic valuation of nitrogen mitigation ecosystem services in restored wetland of the Texas coastal bend. Coastal Bend Bays Foundation Coastal Issues Forum. Corpus Christi, TX, USA. October 14, 2019.

Hayes, L. Assessment and valuation of nitrogen mitigation ecosystem services in restored wetlands of the Texas Coastal Bend. Marine Science Graduate Student Organization 8th Annual Research Forum. Texas A&M University-Corpus Christi. Corpus Christi, TX, USA. April 19, 2019.

Hayes, L., Seyler, L.M., and Schrenk, M.O., Microbial adaptations to extremely high pH: insights from serpentinization-associated ecosystems. Midwest Geobiology 2017 Symposium. Indiana University- Purdue University Indianapolis. Indianapolis, IN, USA. September 30, 2017

Hayes, L., and Schrenk, M.O., Alkaliphilic and Alkalitolerant Heterotrophic Microorganisms. University Undergraduate Research and Arts Forum. Michigan State University. East Lansing, MI, USA. April 7, 2017.

PUBLICATIONS

Hayes, L., Hutch Williams, L., Shaw, C., Mier, M., Zhang, L. Valuation of nitrogen mitigation ecosystems services in restored and natural wetlands along the Texas Coastal Bend. *Journal of Environmental Management (Submitted)*.

Hayes, L., Sams, K., Shaw, C., Hutch Williams, L., Zhang, L. Nitrogen removal and other cycling processes in restored and natural wetlands along the Texas Coastal Bend. (*In Prep*).

TECHNICAL REPORTS

Zhang, L., Hutch Williams, L., and **Hayes, L.** 2021. Assessment and Economic Valuation of Nitrogen Mitigation in Texas Coastal Bend Restored Marsh. Final Report submitted to Texas General Land Office. Texas A&M University - Corpus Christi. 84 pp.

FIELD EXPERIENCE

Research Cruises

August 2022 R/V Pelican, Gulf of Mexico, S. Rahman (Colorado) Chief Scientist

HONORS AND AWARDS

Third Place Graduate Student Oral Presentation Competition, SSSA 2019	2019
TAMUCC Competitive Academic Scholarship	2018-2019
TAMUCC College of Science and Technology Graduate Scholarship	2018
MSU Michigan Competitive Scholarship	2017-2018
Dr. Frank Peabody Microbiology Student Research Fund Award	2017
EMU Recognition of Excellence Scholarship	2014
LCC Board of Trustees Scholarship	2012-2014
LCC Dean's List	Spring 2014- Fall 2016
LCC President's List	Fall 2012 and Fall 2013

COMMUNITY SERVICE

Okemos High School STEM Outreach STEM Outreach Speaker, Okemos, MI	May 2018
McLaren Greater Lansing Hospital Volunteer on the Medical Surgical Floor, Lansing, MI	Oct 2016-Dec 2016
Kate Van Allsburg's Music Studio Work Study Music Library Organizer, Williamston, MI	Apr 2012-Aug 2014
Williamston High School Volunteer Boy's Diving Coach, Williamston, MI	Nov 2010-Mar 2011
Take Note! Volunteer Musician for Nursing Homes, Williamston, MI	Jan 2011-Nov 2011

COMPUTER SKILLS

Programs

- Microsoft Office including Word, Excel, PowerPoint, and Microsoft Access Suite
- DNASTAR Lasergene software
- Mothur Bioinformatics software
- Chromeleon Chromatography Data System software
- SEAL AQ300 software
- R for statistical analysis