# AUDREY RUTH DOUGLAS

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# **RESEARCH INTERESTS**

- · Sources and fate of nutrients, particularly nitrogen, in coastal aquifers and estuaries
- Water quality, isotope geochemistry, faunal and floral indicators of freshwater inflows and submarine groundwater discharge (SGD)
- Applications of GIS and remote sensing for SGD in coastal environments

# EDUCATION

Texas A&M University – Corpus	Christi	December 2020
Degree:	Doctor of Philosophy in Coastal and Marine System Se	cience
Dissertation:	The Importance of Submarine Groundwater Discharg and Dissolved Organic Matter Molecular Composition	e on Nutrient Fluxes i in a Semi-arid,
	Highly Disturbed Estuary	
Honors:	Phi Kappa Phi, 2018 Outstanding Graduate Research	Assistant
University of Oregon		December 2007
Degree:	Bachelor of Science in Environment Science	
Minor:	Biology and Geography	
Thesis:	Geographic Information System Analysis of the Distrimicans (Hemiptera: Gerridae) in the Northwest Atlantic with honors	bution of <i>Halobates</i> c Ocean – passed
Honors:	Magna Cum Laude, Phi Betta Kappa	

# PROFESSIONAL EXPERIENCE

2021 – Present	
Postdoctoral Research Associate—Texas A&M University-Corpus Christi	Corpus Christi, TX
Hudes Eastern Course	

# HydroEcology Group

- +Collaborate on multiple projects including database management and quality control checks
- ✦Organize and coordinate Freshwater Inflows to Texas Bays and Estuaries virtual workshop for scientists and stakeholders from federal, state, and local agencies and non-governmental organizations
- +Contribute analysis, figures, writing, and editing to updated book "Freshwater Inflows to Texas Bays and Estuaries"

## 2014 - 2020

Research Assistant—Texas A&M University-Corpus Christi

# Dr. Dorina Murgulet Hydrology Lab

- +Collaborate on multiple projects for sample collection and lab processing
- +Manage field campaigns, lab analysis, and data analysis efforts for multiple projects
- +Develop methodologies and create Standard Operating Procedures
- +Perform Geospatial Information Systems and statistical analysis for project data
- +Train and oversee undergraduate and graduate students in field sampling and laboratory analysis methods
- Contribute analysis, figures, and writing to project progress reports and final reports for grants

Corpus Christi, TX

**Audrey Douglas** 

# 2014 - 2020 (cont.)

Instructor of Record—Texas A&M University-Corpus Christi

# ESCI/GEOL 4321 Soil and Groundwater Restoration (Fall 2018)

+Lecture instructor for a senior level environmental science/geology course

# Lab Teaching Assistant—Texas A&M University-Corpus Christi

Environmental Geology (Spring 2017 & 2018)

- +Met with students on request for assistance on writing, editing, and peer reviews
- ✦ Graded all term papers and exam essays

# Advanced Hydrogeology (Fall 2016, Spring 2018)

- +Collaborated on curriculum and updated assignments
- +Met with students on request for assistance on mastering material, additional work and grades
- ✦Graded all lab and course assignments

# Introduction to Environmental Science (Spring 2014, Fall 2020)

- ✦Created video tutorials to guide students in how to make graphs and perform calculations in Excel
- ★Assisted in adjusting the labs for social distancing and reduced face-to-face time
- +Collaborated on curriculum and assessments
- + Met with students on request for assistance on mastering material, additional work and grades
- ✦Graded all lab assignments

# 2008 - 2013

Various Management Positions-Petco

Inventory/Pricing Manager, Dog/Cat Manager, Team Lead, Sales Associate

- + Managed and supervised up to ten associates and shifts
- + Ensured quality customer service and animal care
- + Prioritized and assigned daily tasks for associates
- ✦Trained all new hires
- +Communicated policies, procedures and expectations on an as needed basis to all employees

# 2004 - 2006

Academic Assistant – University of Oregon

# **Environmental Studies, Freshman Interest Group**

- +Collaborated with Freshman Interest Group professor to create syllabus and semester assignments
- + Served as community programmer and academic resource for students living in residence hall
- + Facilitated education and recreational programs in residence halls
- ✦ Represented Residence Hall Complex on Diversity Outreach Team

# 2001 - 2002

Student Demonstration Leader - Arizona Science Center Phoenix, AZ

# Acacia and Burton Barr Libraries, Satellite Science Program

+Led groups of children, ages 4-14, through hands on science experiments at community libraries

Laveen, AZ

Eugene, OR

Corpus Christi, TX

Corpus Christi, TX

#### **RELATED EXPERIENCE**

#### 2019

Training Course on Marine Radioactivity - University of Puerto Rico-Rio Piedras, San Juan, PR

1 of 30 international graduate students and early career scientists selected to participate a threeday training workshop on marine radioactivity

2007

#### Field Study - SEA Semester - Woods Hole, MA

Cruise Track: St. Croix, USVI; to St. Georges, Bermuda; to Lunenburg, Nova Scotia; to Woods Hold, MA

✦ Project: Seasonal Variation in *Halobates micans*: Distribution and Mechanisms for Re-Population in the Northwest Atlantic

2005

Field Study - Oregon Institute of Marine Biology

Courses: Marine Birds and Mammals; Adaptations of Marine Animals

+ Developed and executed multiple research projects

- ✦Practiced marine sampling techniques
- + Contributed to long term population study of Pelagic cormorant colony at Cape Arago, OR

#### PUBLICATIONS

In Preparation

- Greige, M, D Murgulet, **AR Douglas**, and H Abdulla. "Estuarine DOM composition response to Hurricane Harvey". To be submitted to *Biogeochemistry* (IN PREP).
- **Douglas, AR**, D Murgulet, and M Wets. "Influence of submarine groundwater discharge on temporal and spatial variability of nutrients and chlorophyll- $\alpha$  in a semi-arid estuary". (IN PREP).
- Murgulet, I, **AR Douglas**, and H Abdulla. "Nutrient distribution along a river course from headwaters to discharge: inorganic and organic nutrients". (IN PREP).

#### 2021

**Douglas, AR**, D Murgulet, and H Abdulla (2021). "Impacts of hydroclimatic variability on surface water and porewater dissolved organic matter in a semi-arid estuary". *Marine Chemistry* IN REVIEW.

#### 2020

- **Douglas, AR**, D Murgulet, and P Montagna, 2020. "Hydroclimatic variability drives submarine groundwater discharge and nutrient fluxes in an anthropogenically disturbed, semi-arid estuary". *Science of the Total Environment*, 755(2): 142574. <u>https://doi.org/10.1016/j.scitotenv.2020.142574</u>
- Murgulet, D., A.R. Douglas, J.A. Herrera Silveira, I. Marino Tapia, A. Valle-Levinson. 2020 "Submarine groundwater discharge along the northern coast of the Yucatan Peninsula." Proceedings of the Sixteenth Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impact of Karst, San Juan, Puerto Rico. National Cave and Karst Research Institute Symposium 8. Carlsbad (NM): National Cave and Karst Research Institute.
- **Douglas, A**, D Murgulet, and R Peterson, 2020. "Submarine groundwater discharge in an anthropogenically disturbed, semi-arid estuary". *Journal of Hydrology*, 580: 124369. <u>https://doi.org/10.1016/j.jhydrol.2019.124369</u>

2018

Murgulet, D, M Trevino, A Douglas, N Spalt, X Hu, and V Murgulet, 2018. "Temporal and spatial fluctuations of groundwater-derived alkalinity fluxes to a semiarid coastal embayment". *Science of the Total* 

Environment, 630: 1343-1359. https://doi.org/10.1016/j.scitotenv.2018.02.333

## 2016

Murgulet, D, V Murgulet, N Spalt, **A Douglas**, and RG Hay, 2016. "Impact of hydrological alterations on rivergroundwater exchange and water quality in a semi-arid area: Nueces River, Texas". *Science of the Total Environment*, 572: 595-607. <u>https://doi.org/10.1016/j.scitotenv.2016.07.198</u>

# REPORTS

## 2019

- Murgulet, D, A Douglas, C Lopez, B Gyawali, V Murgulet, W Wolfe, Z Ruben, and M Greige. "Impacts of Temporal and Spatial Variation of Submarine Groundwater Discharge on Nutrient Fluxes to Texas Coastal Embayments". Final Report submitted to Texas General Land Office September 2019.
- Hu, X, D Murgulet, MR McCutcheon, CV Lopez, and **AR Douglas**. "*Evaluating Groundwater Exported Acidity in Copano Bay*". Final Report submitted to Texas General Land Office October 2019.

# 2018

Lopez, C, D Murgulet, **A Douglas**, and V Murgulet. "Impacts of Temporal and Spatial Variation of Submarine Groundwater Discharge on Nutrient Fluxes to Texas Coastal Embayments, Phase III (Baffin Bay)". Final Report submitted to Texas General Land Office April 2018.

## 2017

**Douglas, A**, D Murgulet, M Wetz, N Spalt, C Lopez, and H Wang. "*Evaluating Groundwater Inflow and Nutrient Transport to Texas Coastal Embayments*". Final Report submitted to Texas General Land Office April 2017.

## 2015

Murgulet, D, MS Wetz, A Douglas, N Spalt, and K Linares. "Evaluating Groundwater Inflow and Nutrient Transport to Texas Coastal Embayments". Final Draft Report submitted to Texas General Land Office August 2015.

# PRESENTATIONS

## 2020

McCutcheon, M. R., X Hu, D Murgulet, **A Douglas**, and C Lopez. Examining the relationship between alkalinity and submarine groundwater discharge in a semi-arid estuary. Poster presented at AGU Ocean Sciences Meeting, February 2020, San Diego, California

#### 2019

- Douglas, AR, D Murgulet, H Abdulla. "Seasonal trends and relationships between surface and porewater dissolved organic matter in a disturbed semi-arid estuary". Poster presented at AGU Fall Meeting, December 9-13, 2019, San Francisco, California
- Greige, M, D Murgulet, A Douglas, H Abdulla. "Hurricane Harvey's impact on the DOM composition on the south shore of Corpus Christi Bay, Texas". Oral presentation at AGU Fall Meeting, December 9-13, 2019, San Francisco, California
- Walker, L, D Murgulet, C Lopez, A Douglas. "Temporal changes in the radiogenic signature of shallow groundwater and its potential implications int eh SGD estimates in a semiarid area". Poster presented at AGU Fall Meeting, December 9-13, 2019, San Francisco, California
- **Douglas, AR**, D Murgulet, H Abdulla, and P Montagna. "Molecular characterization of dissolved organic matter in a highly disturbed semi-arid bay". Poster presentation at Texas Sea Grant Symposium, March 9, 2019, College Station, TX.
- **Douglas, AR**, D Murgulet, and R Peterson. "Spatial and temporal variability of submarine groundwater discharge to a disturbed semi-arid estuary". Oral presentation at Association for the Sciences of Limnology and Oceanography 2019 Aquatic Sciences Meeting, February 25-March 1, 2019, San Juan, Puerto Rico.

- Ruben, Z, D Murgulet, **AR Douglas**, B Gyawali, and C Lopez. "*The presence and significance of radium and radon isotopes in South Texas estuaries*". Poster presentation at Association for the Sciences of Limnology and Oceanography 2019 Aquatic Sciences Meeting, February 25-March 1, 2019, San Juan, Puerto Rico. 2017
- **Douglas, AR**, H Abdulla, C Jemison, and D Murgulet. "Molecular characterization of dissolved organic matter in surface and groundwater in a highly disturbed semi-arid secondary bay". Oral presentation at Association for the Sciences of Limnology and Oceanography 2017 Aquatic Sciences Meeting, February 26-March 3, 2017, Honolulu, HI.
- Lopez, CV, **AR Douglas**, N Spalt, and D Murgulet. "Using radium isotopes to determine residence times in Baffin Bay, Texas". Poster presentation at Association for the Sciences of Limnology and Oceanography 2017 Aquatic Sciences Meeting, February 26-March 3, 2017, Honolulu, HI.
- Pena, MM, **AR Douglas**, and D Murgulet. "Assessment of historical oil-field brine discharge influences on sedimentsupported radionuclide activities". Poster presentation at Association for the Sciences of Limnology and Oceanography 2017 Aquatic Sciences Meeting, February 26-March 3, 2017, Honolulu, HI.

# 2016

- **Douglas, A**, D Murgulet, and N Spalt. "Effects of naturally occurring radium activity and activity ratio heterogeneity on derived water mass ages and SGD: lessons learned from Nueces Bay, Texas". Oral presentation at Gulf Coast Association of Geological Societies, September 18-20, 2016, Corpus Christi, Texas.
- Spalt, N, D Murgulet, and **A Douglas**. "Variation in SGD among depositional environments in a semi-arid coastal area: lessons learned from South Texas estuaries". Oral presentation at Gulf Coast Association of Geological Societies, September 18-20, 2016, Corpus Christi, Texas.
- **Douglas, A**, D Murgulet, and N Spalt. "Effects of naturally occurring radium and radon activity heterogeneity on derived water mass ages and SGD: lessons learned from a semi-arid south Texas estuary". Poster presented at VI International Ra-Rn Workshop, July 18-21, 2016, Girona, Spain.
- Spalt, N, D Murgulet, and **A Douglas**. "Coupling 222Rn measurements and geophysical techniques to constrain SGD occurrences in relation to estuarine depositional environments". Poster presented at VI International Ra-Rn Workshop, July 18-21, 2016, Girona, Spain.
- **Douglas, A**, D Murgulet, N Spalt, and M Trevino. "The role of submarine groundwater discharge (SGD) as a pathway for nutrient discharge to Nueces Bay, Texas". Oral presentation at Texas Bays and Estuaries Meeting, April 13-14, 2016, Port Aransas, Texas
- Trevino, M, D Murgulet, X Hu, A Douglas, and N Spalt. "Alkalinity Dynamics in Groundwater Affected
- Secondary Bay in South Texas". Oral presentation at Texas Bays and Estuaries Meeting, April 13-14, 2016, Port Aransas, Texas
- Spalt, N, D Murgulet, **A Douglas**, and M Tevino. "Postulating Hydrodnamic and Geochemical Processes Associated with Nutrient Delivery in Copano Bay, Texas". Oral presentation at Texas Bays and Estuaries Meeting, April 1314, 2016, Port Aransas, Texas

# 2015

- **Douglas, A**, N Spalt, and D Murgulet. "Identifying Groundwater Discharge Sources and Associated Geochemical Influences Using Resistivity Imaging and Geochemical Tracers in a Semi-Arid Estuary in South Texas". Poster presented at AGU Fall Meeting, December 14-18, 2015, San Francisco, California
- Spalt, N, D Murgulet, and **A Douglas**. "Groundwater and Associated Solute Contribution to a Pristine Semi-Arid Estuary Using Resistivity Imaging, Naturally Occurring Radioactive Tracers, and Geochemical Methods". Poster presented at AGU Fall Meeting, December 14-18, 2015, San Francisco, California
- Murgulet, D, **A Douglas**, and N Spalt. "Processes Driving Submarine Groundwater Discharge and Nutrient Fluxes in a Semi-arid Coastal Area: Coastal South Texas". Poster presented at AGU Fall Meeting, December 14-18, 2015, San Francisco, California

Douglas, A, and D Murgulet. "The Role of Groundwater and Submarine Groundwater Discharge in Coastal Systems".

Presented to Teachers on the Estuary Workshop and Mission-Aransas NERR, University of Texas Marine Science Institute, Port Aransas, Texas

**Douglas, A**, and D Murgulet. "Linking Seasonal Variation of Submarine Groundwater Discharge to Nutrient Fluxes in Nueces Bay, Texas". Oral presentation at NGWA Groundwater Summit, San Antonio, Texas 2014

Murgulet, D, W McBee, **A Douglas**, and G Scotch. "Linking Groundwater Discharge to Increased Salinities in a Semi-Arid Coastal Area". Presented at GSA Annual Meeting, Vancouver, British Columbia

McBee, W, G Scotch, A Douglas, and D Murgulet. "Linking Seasonal Variation of Submarine Groundwater

Discharge to Hypoxia in Corpus Christi Bay". Poster presented at GSA Annual Meetings, Vancouver, British Columbia

## AWARDS

2018
Society of Independent Professional Earth Scientists Foundation Scholarship - \$1250 Texas Sea Grant GIAR - \$2000
TAMUCC Outstanding Research Assistant Award - \$1000 travel award Corpus Christi Geological Society Scholarship - \$700
2017
Corpus Christi Geological Society Scholarship – \$500
IDET 6370 Scholarship – \$1000
Texas A&M University Parent's Council – \$550
College of Science and Engineering Graduate Research Scholarship – \$1000
Texas Sea Grant GIAR - \$2000
2016
Corpus Christi Geological Society Scholarship – \$250
College of Science and Technology Graduate Research Scholarship – \$1000
Texas A&M University Parent's Council – \$500
Texas A&M University Study Abroad Scholarship – \$1000
2015
Corpus Christi Geological Society Scholarship – \$500
Texas A&M University Parent's Council – \$500
2015-2016
Texas Public Education Grant – \$2000
2014-2015
College of Science and Technology Graduate Research Scholarship – \$1000

# **PROFESSIONAL ORGANIZATIONS**

Association for the Sciences of Limnology and Oceanography (2016 – Present) American Geophysical Union Member (2015 – Present) National Groundwater Association Member (2015 – 2016) The Honor Society of Phi Kappa Phi (2015 – Present) Student Vice President (2015-2016) Marine Science Graduate Student Organization at Texas A&M University-Corpus Christi (2014 – 2020) Treasurer (2014-2016) Phi Beta Kappa Society Member (2006 – Present)

## **PROFESSIONAL REFERENCES**

Dr. Dorina Murgulet Associate Professor of Hydrogeology Department of Physical and Environmental Sciences Texas A&M University-Corpus Christi 6300 Ocean Drive Corpus Christi, TX 78412 361.825.2309 Dorina.murgulet@tamucc.edu

Dr. Hussain Abdulla Associate Professor of Chemistry Department of Physical and Environmental Sciences Texas A&M University-Corpus Christi 6300 Ocean Drive Corpus Christi, TX 78412 361.825.6050 hussain.abdulla@tamucc.edu

Dr. Paul Montagna Endowed Chair for Ecosystems Studies and Modeling Harte Research Institute Texas A&M University-Corpus Christi 6300 Ocean Drive Corpus Christi, TX 78412 361.825.2040 paul.montagna@tamucc.edu

Dr. Valeriu Murgulet Research Associate Center for Water Supply Studies Texas A&M University-Corpus Christi 6300 Ocean Drive Corpus Christi, TX 78412 361.825.3348 valeriu.murgulet@tamucc.edu