**Tianyin Ouyang, Ph.D.**
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## EDUCATION

University of Delaware **Ph.D.** 2020 – 2025
Marine Science/ Chemical Oceanography
Dr. Andrew S. Wozniak, Advisor

University of Maryland, College Park **B.S.** 2016 – 2020
Doubles majors: 1) Chemistry 2) Secondary Science Education

## PROFESSIONAL EXPERIENCES

**Assistant Research Scientist (Postdoctoral Researcher)** 2026 – Present
Horn Point Laboratory, University of Maryland Center for Environmental Science
Dr. Andrea Pain and Dr. Elizabeth North, Mentors

- Independently lead and conduct a series of optimization experiments to enhance calcium carbonate production in whiting events
- Support development and validation of the SequestStar Optimization Model for calcium carbonate production
- Assist the market research, commercialization of calcium carbonate products, and assembling the Input-to-Product pilot system

**Thriving Earth Exchange Fellow** 2024 – 2025
American Geophysical Union, Washington D.C.

- Led and managed a community-based science project addressing flooding challenges in the Warren County, NC
- Worked closely with community leader, Cathy Alston-Kearney, to define priorities, ensure alignment with local needs, and promote equitable community engagement
- Conducted network-based outreaches to identify and recruit volunteer scientists with relevant expertise to the community project
- Facilitated meetings and communication between scientists and community members
- Supported project documentation and reporting of outcomes

**Graduate Research Assistant** 2020 – 2025
Wozniak Marine Organic Geochemistry Laboratory, School of Marine Science and Policy, University of Delaware
Dr. Andrew S. Wozniak, Advisor

- Independently developed and led 4 field-based research projects focused on organic matter and nutrient dynamics in coastal ecosystems including bays, submarine groundwater, and salt marshes
- Skilled in carbon (organic & inorganic) and nutrient quantification, optical and molecular-level characterization
- Collaborated with stakeholders and non-profit organizations to evaluate carbon and nutrient loads and inform strategic management of coastal ecosystems
- Provided mentorship to 4 undergraduate students, supporting project design, data analysis, and scientific report
- Contributed to the Accelerating Research Translation (ART) project by supporting geoscience faculty and graduate students in effectively communicating their research to the general public and key stakeholders

**Agroecology Research Internship** 2019 – 2020
Agroecology Laboratory, Department of Plant Science and Landscape Architecture, University of Maryland – College Park
Dr. Danielle Weissman and Dr. Katherine L. Tully, Mentors

- Designed and conducted an independent field-based research project to examine the impacts of saltwater intrusion on nutrient mobilization in coastal agricultural soils
- Trained in effective communication strategies for engaging with farmers and policymakers

**Undergraduate Research Assistant** 2018 – 2019
Department of Civil and Environmental Engineering, University of Maryland – College Park
Dr. Sarah J. Fischer, Mentor

- Assisted Dr. Sarah J. Fischer in quantifying dissolved organic carbon from coastal waters and soils
- Collaborated with USDA to assess the impacts of DDT on worms and soil health
- Independently conducted a research project on quantifying carbon and nutrient stocks in Paint Branch, Maryland

**Research Project Manager** 2017 – 2018
Attention & Emotion Laboratory, Maryland Neuroimaging Center

- Assisted Dr. Dan Xiang and Dr. Joseph Dien in EEG data analysis using the EP Toolkit on MATLAB
- Gathered brain data using EEG and fMRI, maintained accurate records for the laboratory

## TEACHING & MENTORING EXPERIENCES

**Mentoring and Supervision** 2020 – Present

Graduate Students

- Zhaoxun (Nancy) Yang, Ph.D. Geochemistry, Coastal and Estuarine Research Federation Mentorship Program (2025 – Present), mentor; support professional networking and engagement in the coastal environmental science community.

Undergraduate Researchers

- Olivia Leighton, SWMS Mentorship Program (2024 – 2025); Mentored on professional growth and leadership as a woman in marine science
- Nicole Gutkowski, University of Delaware (2022 – 2023), Project WiCCED mentor; Mentored research project on spatial and temporal dynamics of dissolved organic matter in the Indian River and Rehoboth Bays
- Jacob Ukropec, University of Delaware (Summer 2023), Project WiCCED mentor; Mentored research project on characteristics of horizontal and vertical dissolved organic matter in Wharton's Bluff
- Jake Bass, University of Delaware (Summer 2021), Project WiCCED mentor; Mentored research project on dissolved organic phosphorus dynamics in the Murderkill River Estuary

Colleagues/ Lab Technion

- Katherine Eastman, General Assistant, University of Maryland Center for Environmental Science (2026 – Present); Mentored on using Apollo SciTech LI-5350A DIC analyzer and Thermo ScientificTM Orion StarTM T900 Series Potentiometric titrators

**Teaching Assistant** 2023

MAST407 Class, School of Marine Science and Policy, University of Delaware

- Delivered lectures on optical characterization of organic matter and quantification of key nutrients using fluorescence spectrophotometry
- Mentored ˜20 students in research design, literature review, and data analysis using R and Microsoft Excel

**Secondary Science Teacher Internship** 2019 – 2020

Prince George's County Public Schools, Maryland

Mr. Brian Stagg and Ms. Deborah J. Branch, Mentors

- Delivered instructional content and managed classroom activities for Honors Chemistry at Eleanor Roosevelt High School
- Collaborated with mentor teacher Deborah J. Branch to assess student progress and adapt instructional strategies for Environmental Science courses at Buck Lodge Middle School
- Designed and implemented lesson plans aligned with curriculum standards and targeted student learning objectives

**Teaching Assistant** 2019

CHEM272 Class, Department of Chemistry and Biochemistry, University of Maryland

- Delivered lab-section lectures on analytical techniques, including chromatography, UV-Vis spectroscopy, colorimetric analysis, and voltammetry
- Provided academic support and mentorship to ˜15 students, fostering their understanding of complex analytical chemistry concepts

## SCIENTIFIC CRUISE EXPERIENCES

**Hydrothermal Vent Sampling in the East Pacific Rise, N9°**

*Atlantis Research Vessel & Alvin Submersible* March 2025 – May 2025

- Duration: 45 days
- Funding: National Science Foundation
- Activities: Assisted with pre-cruise preparation and shipment of scientific equipment to the Scripps Institution of Oceanography; organized and established shipboard analytical spaces, including wet, isotopic, and dry laboratories; operated the CTD and conducted shipboard experiments including solid-phase extraction, preservation of biological samples, and laboratory cleaning protocols; collected deep-sea water, rock, and biological samples using the *Alvin* Submersible; support for writing cruise schedules and reports

**Sea Surface Microlayer Sampling in the Gulf of Mexico, the North Atlantic Ocean**

*Hugh R. Sharp Research Vessel* Summer 2024

- Duration: 14 days
- Funding: National Science Foundation
- Activities: Contributed to cruise planning and equipment preparation; organized and installed instruments and laboratory equipment on the research vessel; supported sea surface microlayer sampling and CTD operations; assisted in drafting cruise reports

**Surface Water Sampling in the Indian River Bay**

*Delaware Center for the Inland Bays Ship* 2021 – 2023

- Duration: 14 cruises, 1 day each
- Funding: National Science Foundation & Delaware Center for Inland Bays
- Activities: Organized cruise logistics, including scheduling participants and preparing sampling equipment; collected and filtered surface water samples; measured temperature, salinity, and other water quality parameters using a YSI multiparameter probe

## PEER-REVIEWED PUBLICATIONS

- **Ouyang T.** (2025) Molecular characterization of dissolved organic matter in mid-Atlantic, USA rivers and estuaries: Insights for carbon cycling in the Murderkill River and Indian River Bay. (Doctoral dissertation, University of Delaware).

- **Ouyang, T.**, A.M. McKenna, A.S. Wozniak (2024) Storm-driven hydrological, seasonal, and land use/ land cover impact on dissolved organic matter dynamics in a mid-Atlantic, USA coastal plain river system characterized by 21 T FT-ICR mass spectrometry. *Front. Environ. Sci.* 12: 1379238, doi: 10.3389/fenvs.2024.1379238.
- Czarnecki, J.I., D.F. Levia, J.R. Scudlark, **T. Ouyang**, A.S. Wozniak (2023) Regional sources and seasonal variability of rainwater dissolved organic and inorganic nitrogen at a mid-Atlantic, USA Coastal Site. *J. Geophys. Res. Biogeosci.* 128(2): e2022JG007056, doi: 10.1029/2022JG007056.
- Weissman, D., **T. Ouyang**, K.L. Tully (2021) Saltwater intrusion affects nitrogen, phosphorus and iron transformations under oxic and anoxic conditions: an incubation experiment. *Biogeochemistry* 154: 451-469, doi: 10.1007/s10533-021-00796-6.
- **Ouyang, T.**, D.S. Weissman, K.L. Tully (2020) Saltwater Intrusion Releases Iron and Phosphorus from Agricultural Soils. *Undergrad. Res. DRUM*, doi: 10.13016/0r8m-855d.

In-reviewing & preparation process:

- **Ouyang, T.**, F.E. Agblemanyo, A.M. McKenna, A.S. Wozniak (2025) Implication of negative and positive electrospray ionization mode on 21 T Fourier-transform ion cyclotron resonance mass spectrometric aquatic dissolved organic matter characteristics. [submitted to Environmental Science and Technology]
- **Ouyang, T.**, S.F. Gonski, W-J. Cai, A.S. Wozniak (2025) Dissolved organic matter dynamics and effects of its functional groups on organic alkalinity in the Inland Bay, Delaware, characterized by FTIR spectroscopy. [in preparation]
- **Ouyang, T.**, H. Michael, A.M. McKenna, A.S. Wozniak (2026) Submarine groundwater dissolved organic matter characteristics along salinity gradient in a shallow, mid-Atlantic, USA coastal embayment. [in preparation]
- Agblemanyo, F.E., **T. Ouyang**, A.M. McKenna, A.S. Wozniak (2026) Comparison of direct injection and liquid chromatography FT-ICR mass spectrometry measurements: Implications for microlayer dissolved organic matter characterization. [in preparation]

## SCHOLARSHIP & FELLOWSHIP

- Take It Further Grant (**$4,000**), Thriving Earth Exchange Program, American Geophysical Union
- Doctoral Fellowship for Excellence (**$32,667/year** for a year), Graduate College, University of Delaware
- Research Assistantship (**$27,500/year** for four years), School of Marine Science and Policy, University of Delaware
- Thriving Earth Exchange Fellowship (**$8,000**), Thriving Earth Exchange Program, American Geophysical Union
- Student Travel Award (**$400**) for ACS Spring 2024 conference, School of Marine Science and Policy, University of Delaware

- Maryland Summer Scholarship (**$5,000**), Maryland Undergraduate Research Program
- Work for Change Scholarship (**$500+**), University of Maryland

## PRESENTATIONS AT CONFERENCES, SYMPOSIA, WORKSHOPS

- **Ouyang, T.**, S. Gonski, W-J. Cai, A.S. Wozniak (2025) Dissolved organic matter and inorganic carbon dynamics impact organic alkalinity in a coastal lagoon estuary [*Oral Presentation*]. Coastal and Estuarine Research Federation 28th Biennial Conference, Richmond, Virginia
- **Ouyang, T.** (2025) Assessing sources and factors that impact carbon and nutrient cycles in the Indian River Bay, Delaware [*Invited Speech*]. Citizen Caf˝e, Center for the Inland Bay, Delaware
- **Ouyang, T.**, S. Gonski, W-J. Cai, A.S. Wozniak (2024) Temporal and spatial variations of dissolved organic matter (DOM) and their relationship with dissolved oxygen and alkalinity in a mid-Atlantic shallow coastal lagoon system [*Poster Presentation*]. AGU2024 Annual Meeting, Washington D.C., USA
- **Ouyang, T.** (2024) Storm-driven hydrological, seasonal, and land use/ land cover impact on dissolved organic matter dynamics in a mid-Atlantic, USA coastal plain river system. [*Oral Presentation*] CEOE 2024 Research Symposium, Lewes DE, USA (****First Place***)
- **Ouyang, T.**, H. Michael, E.S. Bacmeister, A.S. Wozniak (2024) Submarine groundwater dissolved organic matter characteristics along salinity gradients in a shallow, mid-Atlantic, USA coastal embayment [*Poster Presentation*]. American Chemistry Society Spring 2024 Meetings, New Orleans, Louisiana, USA
- **Ouyang, T.** (2023) Spotlight: How does groundwater impact the water quality behind scenes? [*Oral Presentation in Pitch Format*], Pitch 90, Delaware Environmental Institute (DENIN), University of Delaware – Newark Campus
- **Ouyang, T.** (2023) Dissolved organic matter dynamics in riverine and estuarine systems [*Oral Presentation*], 2023 Research Experience for Undergraduate Student Seminar, University of Delaware
- **Ouyang, T.**, A.M. Mckenna, A.S. Wozniak (2023) The Integrated Roles of River Discharge, Seasonality, and Land Use/Land Cover on Dissolved Organic Matter Dynamics in the Murderkill River Estuary, DE [*Oral Presentation*], 4th Annual Earth System Observations & Modeling Graduate Symposium, George Mason University, Fairfax MD, USA.
- **Ouyang, T.**, A.M. Mckenna, A.S. Wozniak (2023) The Integrated Roles of River Discharge, Seasonality, and Land Use/Land Cover on Dissolved Organic Matter Variations in the Murderkill River Estuary, DE [*Poster Presentation*], DENIN Research Symposium, University of Delaware – Newark Campus.

- Ukropec, J., **T. Ouyang** (2023) Characteristics of Horizontal and Vertical DOM in Wharton's Bluff [*Oral Presentation*], 2023 Marine Sciences Summer Intern Presentations, University of Delaware
- Gutkowski, N.M., **T. Ouyang**, A.S. Wozniak (2023) Spatial and Tidal Dynamics of Dissolved Organic Matter in the Indian River and Rehoboth Bays [*Poster Presentation*], 2023 DENIN Symposium, University of Delaware
- **Ouyang, T.**, A.M. Ebling, A.M. Mckenna, A.S. Wozniak (2022) The Integrated Roles of River Discharge, Seasonality, and Land Use/Land Cover on Dissolved Organic Matter Variations in the Murderkill River Estuary, DE [*Poster Presentation*], AGU2022 Meeting, Chicago IL, USA
- **Ouyang, T.**, S. Gonski, A.S. Wozniak (2022) Temporal and Spatial Variations of Dissolved Organic Matter in the Indian River Bay Region [*Poster Presentation*], CEOE 2022 Research Symposium, online. (****First Place***)
- **Ouyang, T.**, S. Gonski, A.S. Wozniak (2022) Temporal and Spatial Variations of Dissolved Organic Matter in the Indian River Bay Region, DENIN Research Symposium [*Poster Presentation*], University of Delaware – Newark Campus.
- **Ouyang, T.**, A.M. Ebling, A.S.Wozniak (2022) Dissolved organic matter dynamics in freshwater of Murderkill River Estuary: integrated role of river discharge, land use/land cover, and seasonality [*Poster Presentation*], Ocean Science Meeting 2022, online.
- Gutkowski, N.M., **T. Ouyang**, A.S.Wozniak (2022) Spatial and Temporal Dynamics of Dissolved Organic Matter in the Indian River and Rehoboth Bays [*Poster Presentation*], Undergraduate Summer Scholar Symposium, University of Delaware
- **Ouyang, T.**, A.M. Ebling, A.S. Wozniak (2021) Dissolved organic matter dynamics in Murderkill River Estuary: Integrating land cover/land use to pulse shunt concept [*Poster Presentation*], Coastal and Estuarine Research Federation 2021 Biennial Conference, online.
- **Ouyang, T.**, A.M. Ebling, A.S. Wozniak (2021) The Influence of Discharge on Dissolved Organic Matter Dynamics in Murderkill River Estuary [*Poster Presentation*], CEOE 2021 Research Symposium, online.
- **Ouyang, T.**, A.M. Ebling, A.S. Wozniak (2021) The Influence of Discharge on Dissolved Organic Matter Dynamics in Murderkill River Estuary [*Poster Presentation*], CEOE 2021 Research Symposium, online.
- **Ouyang, T.**, A.M. Ebling, A.S. Wozniak (2021) Dissolved Organic Matter Dynamics in the Murderkill River Estuary [*Poster Presentation*], DENIN Research Symposium, online. (****Third Place***)
- Bass, J., A.S.Wozniak, **T. Ouyang**, A. Ebling (2021) Dissolved Organic Phosphorus Dynamics in the Murderkill River Estuary [Poster Presentation], Undergraduate Summer Scholar Symposium, University of Delaware

- **Ouyang, T.**, D.S.Weissman, K.L. Tully (2020) Saltwater Intrusion Releases Iron and Phosphorus from Agricultural Soils [*Poster Presentation*], Undergraduate Research Day 2020, University of Maryland, online.
- **Ouyang, T.**, D. Xiang, D.J. Bolger, J. Dien (2019) A Chinese Language Study of the N450 Rhyming Effect [*Poster Presentation*], Society for Psychophysiological Research 2019 Annual Conference, Washington DC, USA.

## LEADERSHIP & ORGANIZATIONS

**Diversity, Equity, and Inclusion Committee Member**, University of Maryland Center for Environmental Science, Cambridge, MD 2026 – Present
**Citizen Advisor Committee Member**, Center for the Inland Bays, Delaware 2023 – Present
**Nominations and Leadership Development Committee Member**, Coastal and Estuarine Research Federation, Seattle, WA 2024 – 2025
**Mentorship Program Chair**, Steering Committee Member, Society for Women in Marine Science (SWMS), Massachusetts 2023 – 2026
**Academic Council Student Representative**, College of Earth, Ocean, and Environment (CEOE), University of Delaware 2023 – 2025
**SWMS UD Chapter President**, School of Marine Science and Policy, University of Delaware 2021 – 2025
**Student Senator**, Graduate Student Government, University of Delaware 2021 – 2022
**Student Representative**, College of Education, University of Maryland 2019
**Student Participant** (only selected outstanding students invited to participate), Work for Change Program, Leadership and Community Service-learning Program, Marylan 2018
**Volunteer Curriculum System Director**, I.L.E.A.D Success Program, Student UMD Chapter, University of Maryland – College Park 2017 – 2018

Ad-hoc Outreach Activities:

- **Volunteer Leader**, 2025 Governor's School for Excellence at Lewes Campus; Recruited volunteers and coordinated education and hands-on STEM activities for ~35 high-achieving high school students selected for the statewide program
- **Volunteer Presenter and Activity Assistant**, 2025 Series of Science Walk into the Bar, Lewes, Delaware; Demonstration on major coastal threats and scientific findings from my research work to the general public
- **Volunteer Presenter**, 2023 – 2025 Coast Day, Lewes, Delaware; Demonstration on saltmarsh and hydrothermal vent biogeochemistry
- **Volunteer Research Presentation and Poster Judge**, 2025 CEOE Research Symposium, University of Delaware
- **Volunteer Instructor**, 2023 – 2024 Governor's School for Excellence at Lewes Campus; Demonstration on the visualization of microbial species using microscopies and

saltmarsh biogeochemistry ~20 high-achieving high school students selected for the statewide program

- **Volunteer Demonstrator**, 2023 – 2024 Water Family Fest and Native Plant Sale; Led an interactive demonstration on the impacts of storms and flooding on estuarine runoff and presented green infrastructure solutions to reduce runoff
- **Volunteer Judges**, 2022 Sussex County STEM Alliance k-5 STEM Fair, Lewes Public Library, Delaware
- **Volunteer Essay Contest Judge**, 2021 – 2022 Delaware Coast Day [Online]
- **Volunteer**, 2021 – 2025 Chesapeake Bay Bowl
- **Volunteer**, 2021 Food Bank of Delaware in Milford, DE
- **Cat Enrichment and Adoption Volunteer**, 2023 – 2024 Brandywine Valley SPCA, Georgetown, DE

## RESEARCH PROJECTS & COLLABORATORS

**SequestStar Project PCC Optimization** 2026 – Present

- Funding: National Science Foundation Convergence Accelerator
- Mentors: Dr. Elizabeth North and Dr. Andrea Pain
- Collaborator: Dr. Greg Silsbe (UMCES), Dr. Gwendolyn Stark (UMCES), Alison Sanford (UMCES), Dilara Williams (UMCES), and Katherine Eastman (UMCES)

**Submarine Groundwater Biogeochemistry Project** 2023 – Present

- Funding: Doctoral Fellowship for Excellence
- PI: Andrew S. Wozniak (UD)
- Collaborators: Holly Michael (UD, Earth Sciences), Tom Hanson (UD, SMSP), Yael Kiro (Weizmann Institute of Science, Israel), Keren Yanuka-Golub (The Galilee Society Institute of Applied Research, Israel)

**Accelerating Research Translation Project** 2024 – 2025

- Funding: NSF Accelerating Research Translation Award
- PI: Andrew S. Wozniak (University of Delaware (UD))
- Collaborators: Christopher Petrone (Delaware Sea Grant)

**Solving the Flooding Problems in Warrenton NC Project** 2024 – 2025

- Funding: Thriving Earth Exchange Fellowship & Take It Further Grant
- Project Manager: **Tianyin Ouyang**
- Collaborator: Dr. Caren Cooper (NC State University), Dr. Manmeet Singh (UTexas at Austin), Dr. Vinicius Taguchi (NC State University), Seana Finn (NC State University), Cathy Alston-Kearney (Warrenton Community Leader)

**Carbon and Nutrient Cycles in the Indian River and Rehoboth Bays** 2021 – 2024

- Funding: NSF EPSCOR award to UD, "Project WiCCED"
- PI: Andrew S. Wozniak (UD)
- Collaborators: Wei-Jun Cai (UD), Stephen Gonski (UD), Center for the Inland Bay (Lewes, Delaware)

**Advancing DOM Characterization using 21T FT-ICR MS** 2020 – 2023

- Funding: NSF EPSCOR award to UD, "Project WiCCED"
- PI: Andrew S. Wozniak (UD)
- Collaborators: Amy M. McKenna (National High Magnetic Field Laboratory, Florida, USA)

**Carbon Cycles in the Murderkill River Estuary** 2020 – 2022

- Funding: NSF EPSCOR award to UD, "Project WiCCED"
- PI: Andrew S. Wozniak (UD)
- Collaborators: Wei-Jun Cai (UD), Stephen Gonski (UD), Department of Natural Resources and Environmental Control (Delaware, USA)

**Saltwater Intrusion Project** 2019 – 2020

- Funding: Maryland Summer Scholarship & USDA NIFA Integrated Agriculture and Natural Resources Extension and Research Program Grant
- Advisors: Danielle Weissman & Katherine L. Tully (University of Maryland)

**Biosolid Project** 2018 – 2019

- Funding: Environmental Protection Agency
- Mentor: Sarah J. Fischer (University of Maryland)

## ANALYTICAL & PROFESSIONAL SKILLS

- **Data analysis:** experienced in statistical analyses (linear algebra, Fourier transformation, principal component analysis, parallel factor analysis, ANOVA, Tukey's honestly significant difference test) and scientific writing
- **Coding and programming:** R, MATLAB, LaTeX, Overleaf, GitHub (touyang98 repos), and Microsoft Excel
- **Wet lab experience**: sample filtration, centrifugation, titration, pH measurement and adjustment, solid phase extraction, solution preparation, inorganic nitrogen and phosphorus digestions
- **Analytical Instruments:** Expertise with fluorescence spectrophotometry (i.e., Aqualog), total organic carbon (TOC) analyzer (dissolved carbon quantification), CHNS elemental analyzer (particulate carbon and nitrogen quantification), DIC analyzer (i.e., Apollo

SciTech LI-5350A), potentiometric titrators, Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES), nutrient (nitrate/nitrite, ammonium, phosphate) quantification, atomic absorption spectroscopy (AAS), ultraviolet-visible (UV-Vis) spectrophotometry, Fourier-transform ion cyclotron resonance mass spectrometry (FT-ICR MS), Fourier transform infrared spectroscopy (FTIR spec), CTD sensors, Gas/Liquid Chromatography (GC/ LC), Electroencephalogram (EEG)

- **Teaching:** B.S. in education degree; Passed the teacher certification exam series in 2020
- **Field Collections:** Land and ship-based water sample collections, microlayer sample collection, soil coring, groundwater collection, hydrothermal vent sampling
- **Languages:** Fluent in English and Mandarin