Jacob E. Megarity

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Education

B.S., Bioenvironmental Science, summa cum laude *May 2024*
Texas A&M University, College Station, TX, *GPA: 4.0*

Non-degree Seeking *Jan 2025 – Present*
The University of Texas at Dallas, Richardson, TX, *GPA: 4.0*

Research Interests

- Climate change and variability
- Tropical atmosphere and ocean dynamics
- Interactions between the physical processes of the ocean and marine ecosystems, and the impact of climate change on these interactions
- Influence of climate change and variability on the ocean's carbon cycle and its residual effects
- Large-scale ocean/atmosphere interactions

Research Experience

Research Assistant *January 2025 – Present*
Flow Dynamics and Turbulence Lab, The University of Texas at Dallas

- Study the small-scale turbulent structure above & below surface waves at the ocean-atmosphere interface using controlled wind-wave tunnel experiments and particle image velocimetry (PIV).
- Collaborate with Ph.D. students and PIs to develop MATLAB code for processing PIV images and calculating the velocities of water and air particles from wind-wave tunnel experiments.

Research Assistant *January 2023 – May 2024*
Spatial Ecology and Conservation Biology Lab (Dr. Wu Lab), Texas A&M University

- Collected and analyzed field data for research pertaining to the impacts of climate change and various rangeland management practices on ecosystem health, livestock production, and biodiversity in the Edwards Plateau region of Texas.
- Utilized Python, MegaDetector AI model, and Microsoft Excel to process, extract, and organize the data of over 300,000 wildlife camera trap images to examine the relationship between frequent prescribed burns and biodiversity within prairie ecosystems.
- Assisted Ph.D. students in advancing research projects and publishing scientific findings through the online, community-driven Zooniverse platform to gather valuable ecological data.

Teaching Experience

Undergraduate Teaching Assistant *August 2023 – December 2023*
Fundamentals of Ecology (ECCB 205), Texas A&M University

- Facilitated weekly study sessions to help students deepen their understanding of course material, prepare for exams, review coursework, and develop strong study habitats and techniques.
- Assisted the professor by providing instructional support in the classroom, answering student questions, and helping to teach course material to over 150 undergraduate students.

Student Memberships and Organizations

Aggie Speleological Society, Texas A&M University *August 2021 – December 2022*

Community Engagement and Service

Dallas Sierra Club *June 2025 - Present*

St. Joseph Village Retirement Community – Coppell *October 2024 – Present*

St. Ann's Thanksgiving Baskets Drive *November 2021 – November 2023*

Relevant Coursework

Differential Calculus
Integral Calculus
Multivariable Calculus (Fall 2025)
Differential Equations (Fall 2025)
Statistical Methods
Introduction to Programming: MATLAB
Physics – Mechanics
Physics – Electromagnetism and Waves (Fall 2025)
Oceanography
Geology
Planet Earth
Fundamentals of Ecology
Biology I & II (Zoology)
General Chemistry I & II
Organic Chemistry I
Geographic Information Systems

Skills and Techniques

Computational: MATLAB, Python, Version Control with Git/Github, ESRI's ArcMap & ArcGIS Pro 10.x, Microsoft Office Suite

Technical: Image Processing, Particle Image Velocimetry (PIV), Data Acquisition using NI DAQ and LabVIEW, Spatial Data Analysis and Map Creation

References

X. Ben Wu, Ph.D.
Professor, Department of Ecology and Conservation Biology

Kianoosh Yousefi, Ph.D.
Assistant Professor, Department of Mechanical Engineering

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Ecology and Conservation Biology
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