Chesapeake StREAM Internship
Developing a Graph Database and Knowledge Graph Visualization Application
for the Chesapeake Bay Partnership

The Chesapeake-Student Recruitment, Early Advisement, and Mentoring program (C-StREAM) is a collaboratively funded effort that develops and trains a diverse population of future leaders in environmental research, restoration, and protection by engaging them over multiple years in mentored engagement experiences. The program focuses on recruiting future leaders from populations historically excluded from the environmental field and currently under-represented in environmental research and management professions.

Project Description
The U.S. Geological Survey (USGS) Lower Mississippi-Gulf Water Science Center (https://www.usgs.gov/centers/lower-mississippi-gulf-water-science-center) and Chesapeake Research Consortium (www.chesapeake.org) supports ongoing efforts related to (1) researching and compiling data associated with real-world programmatic and scientific connections across the Chesapeake Bay Program partnership, and (2) formatting this data for use in an integrated database, enabling a range of decision support and information visualization capabilities. The intern will (1) research existing information sources and identify relationships among entities, (2) extract or otherwise format data resources (as edges, nodes, and labels) for use in the knowledge graph database, and (3) help construct an interactive cross CBP partnership visualization capable of filtering and addressing queries for specific use cases.

The Chesapeake Bay Watershed Agreement contains ten Goals and 31 Outcomes. The restoration effort encompasses a vast array of interrelated people, places, things, and concepts. These entities and relationships can be represented as nodes and edges in a graph database and represented visually in a knowledge graph. Over the past few years, there have been efforts to capture these entities and relationships through various projects, including the science needs database, the stewardship network visualization project, data and application resources through Chesapeake Data, watershed organizations and their connection to the Watershed Agreement, and the Strategy Review System Logic and Action Plans, to name a few. These initiatives are primarily represented through siloed data repositories and for the most part don't lend themselves to communicating the connections among them. Graph databases are increasingly used as an efficient information storage and retrieval approach for capturing these relationships.

This intern will be working with USGS scientists to support the Chesapeake Bay Program's efforts. The internship will culminate with the presentation of an interactive knowledge graph visualization of Chesapeake Bay watershed system complexity using one of these technologies.

Opportunities

This internship will provide a unique opportunity to contribute to large-scale, long-term natural resource management and policy development critical to understanding new ways to improve Chesapeake Bay water quality and manage Chesapeake Bay living resources most effectively and efficiently across the 64,000 square mile Chesapeake Bay watershed. The C-StREAM student will gain experience in natural resource management, restoration science, and environmental policy. In addition, this internship experience will provide insights into careers in natural resource management, policy development, and science beyond those applied for and allow students to make connections with established environmental management and science professionals.

Responsibilities and Deliverables
- Collect and summarize data from CBP reports, plans, and documents that represent connections among partnership resources.
- Manipulate environmental spreadsheets into standard graph database formats (node and edge tables).
- Develop an interactive knowledge graph visualization using knowledge graph software.
- Presentation of the project and resulting visualization at the C-StREAM end-of-summer student symposium.

Requirements
- Interest in environmental data and science, scientific communication, data visualization, and/or community engagement.
- Basic experience is desired but not required.
- Some experience with manipulating data and tables in Microsoft Excel preferred.
- Motivated self-starter with the ability to work and reason independently.
- Must be a college-level student entering sophomore, junior, or senior year of undergraduate study. Students are also eligible to participate during the immediate summer following their graduation if they are pursuing graduate studies in the fall.
- Must be a U.S. Citizen and willing to undergo a security background check.

Work Location and Duration

This position will be a hybrid position with options for remote work as needed. This hybrid and virtual opportunity will be based out of the EPA's Chesapeake Bay Program Office in Annapolis, Maryland. The internship is scheduled to begin on Monday, May 20, 2024, and end on Friday, August 9, 2024. These are our preferred dates, but the dates can be adjusted to accommodate a student's school schedule if required. We plan on providing interns with access to an EPA computer, email, and phone services if this internship is offered in person. If the internship is virtual, interns will need to have access to suitable internet, computer, and communication resources.

Compensation

The intern will be reimbursed at the end of each month (June, July, and August), for a total of up to $6,000 ($500/week) for the equivalent of 12 weeks (480 hours) of full-time activities. Candidates should expect to follow a normal weekday work schedule (roughly 9-5, M- F) with occasional variations for possible fieldwork or other activities. No benefits are provided. We help arrange local housing if the position is an in-person opportunity. A one-time housing and transportation allowance of $1,000 is available to each intern to assist with living and transportation expenses. Funds are also available to compensate interns for occasional work-related travel and professional development activities.

Diversity and Inclusion

The Chesapeake Research Consortium and EPA Chesapeake Bay Program are committed to supporting a diverse and inclusive science-oriented workforce. Our internship program endeavors to recruit from a diverse, qualified group of potential applicants to secure a high-performing workforce drawn from all segments of American society. CRC and CBP are strongly supportive of broadening the participation of historically Black colleges and universities, Hispanic serving institutions, Tribal colleges and universities, and institutions that work in underserved areas. We highly encourage applications from students at any of the above institutions as well as students that identify as Black, Indigenous, person of color, or 1st generation college student.

Application Instructions

Application instructions required materials, and the C-StREAM application portal can be found on the C-StREAM website (http://chesapeake.org/c-stream/).

The deadline for applications is by midnight on January 28, 2024. The deadline for the Reference Form is by midnight February 4, 2024.