Chesapeake Global Collaboratory:

Preparing for the Summit

The name “Chesapeake Global Collaboratory” connotes both a regional and global focus, which may appear contradictory. But our faculty, staff, and students are increasingly applying our science both locally, and throughout the world. The word ‘collaboratory’ reflects the unique collaborative research environment that we have created at UMCES.

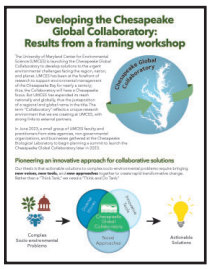
The Chesapeake Global Collaboratory will align diverse voices, employ innovative tools, and develop novel approaches to accelerate solutions to critical socio-environmental problems. The Chesapeake Global Collaborative is more than a “Think Tank,” rather it will be a “Think and Do Tank.”

This newsletter describes progress toward advancing the Collaboratory initiative; it summarizes a previous webinar held for UMCES faculty and staff.

Collaboratory report

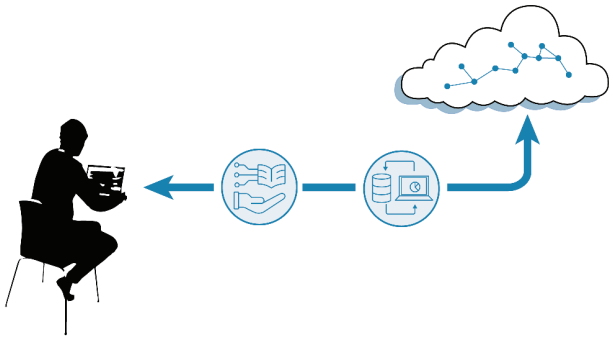
UMCES faculty conceived the Chesapeake Global Collaboratory, encompassing data science, research computing, education, and the Chesapeake Analytics Cooperative Building. A Faculty Committee report outlined the roles of all UMCES units, with the Integration and Application Network’s pivotal role highlighted.

Framing workshop summary



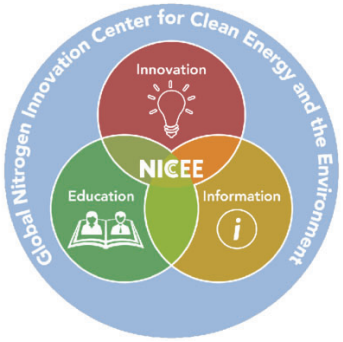
UMCES faculty, state agencies, NGOs, and business representatives met at Chesapeake Biological Laboratory to plan a 2023 summit launching the Collaboratory. The summary highlighted the push for faster actionable science development through innovation, diverse perspectives, and novel methods.

Federal programs support the Collaboratory



UMCES and UMBC were successful in obtaining a competitive grant from the National Science Foundation Strengthening the Cyberinfrastructure Professionals Ecosystem (NSF SCIPE) program. The grant is titled “Enhancing the trans-disciplinary research ecosystem for earth and environmental science with dedicated cyber infrastructure professionals” and provides 4 years of funding to develop the cyber infrastructure for the Collaboratory.

New research center will use the Collaboratory

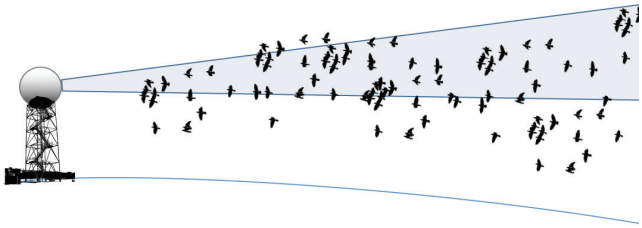


UMCES faculty were also successful in obtaining a competitive grant from the National Science Foundation entitled “Global nitrogen innovation center for clean energy and environment.” This project provides 5 years of funding to investigate the implications of developing ammonia as a fuel source for international shipping. This project will involve data analyses, stakeholder engagement, education and, training that will be enhanced by the Collaboratory.

Example Collaboratory Projects

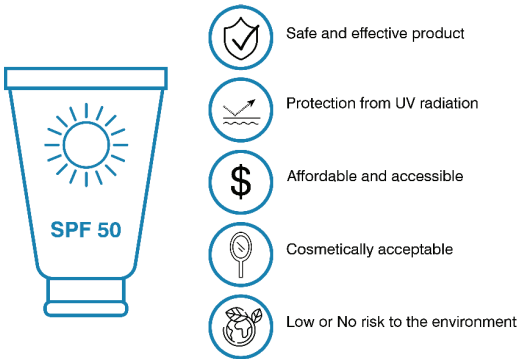
The following six research initiatives exemplify the kind of collaborative research efforts that will both derive benefits and contribute to the Collaboratory.

Appalachian Laboratory: Emily Cohen



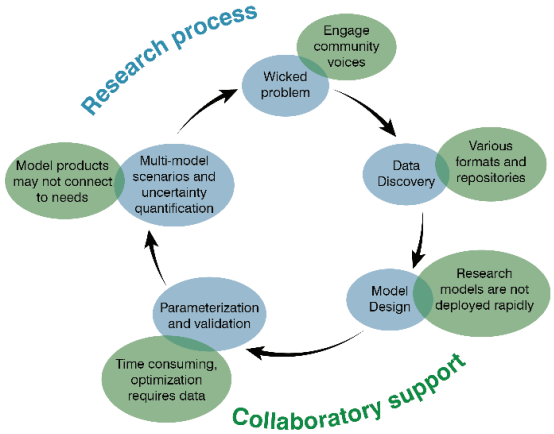
Millions of migrating birds and bats fly through the night each spring and autumn migration and they share the air with trillions of migrating insects. Radar is the only technology where it is possible to quantify the continuous movement of aerial animal movement during day and night and these data can inform placement and operation of wind energy facilities to inform wildlife-friendly expansion of this globally important energy source. Working with stakeholders, data collected by radar can also be used to help identify critical stopover habitats in need of protection or management actions.

Chesapeake Biological Laboratory: Carys Michelmore



The societal and environmental health concerns about emerging contaminants (e.g., sunscreens) require collaborations between scientists, regulators, and industry. New approaches to toxicity testing that avoid using live animals are needed to conduct chemical modeling, data mining, and synthesis using machine learning to inform regulators and industry.

Horn Point Laboratory: Victoria Coles

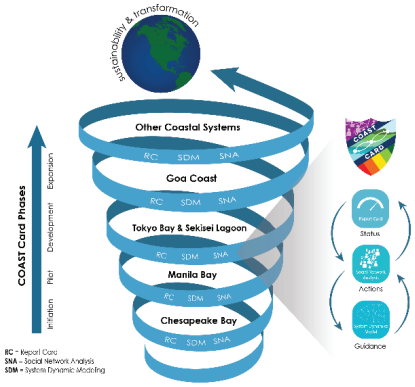


More rapid adaptation and deployment of models would enhance our ability to respond to events and to new scenarios to aid in effective management. For example, rapidly activating a response to an oil spill or harmful algal bloom could involve quickly scraping data with machine learning tools and adapting existing models to predict impacts and guide management interventions.

Example Collaboratory Projects

UMCES previous and ongoing research serves as a prime example of the collaborative atmosphere that the Collaboratory aims to nurture and expand.

Integration & Application Network: Vanessa Vargas-Nguyen



Socio-environmental report cards in Chesapeake Bay are integrating increasingly large data sets, and these report cards are being emulated globally. A transnational project (Coastal Ocean Assessment for Sustainability and Transformation: COAST Card) is using social network analysis, system dynamics models, and socio-environmental report cards to engage with local stakeholders.

Institute of Marine Environmental Technology: Al Place

The ability to rapidly sequence the genetic codes of organisms unlocks a huge potential to understand which organisms are playing important ecological roles. The data generated from genetic sequencing in the environment, often referred to as metagenomics, has created a data explosion—and new artificial intelligence and machine learning tools will be critical to integrate these data into resource management.

Maryland Sea Grant: Fredrika Moser

Maryland Sea Grant has been providing graduate fellowships, supporting stakeholder engagement and delivering science communication with a focus on building community resilience and translating science into action. The co-production models of working with a diversity of stakeholders, particularly unrepresented groups, will be enhanced with an effective Collaboratory.

Developing the Collaboratory initiative

The Chesapeake Global Collaboratory Summit will take place on September 28-29, 2023, at the Rita Rossi Colwell Center in Baltimore.

A Faculty Steering Committee is currently being established, and the launch of the Collaboratory initiative will occur during the Summit. By leveraging the existing UMCES capacity and incorporating essential cyberinfrastructure and data science support, the Collaboratory aims to accelerate the development of actionable solutions. This summit is made possible with support from the Merrill Family Foundation.

Key capacities support the Collaboratory

Cyberinfrastructure

Includes high performance computing, database management, and data security as it passes through projects and the computational cloud.

Data science support

Data science support includes statistics, ways of analyzing and visualizing data and interacting with different people around data.

Education and training

Will deliver content to more graduate students and provide resources beyond the existing educational programs to magnify our impact.

Science communication

Provides the means to publish data and results using open data approaches and effectively communicating results to non-scientists.

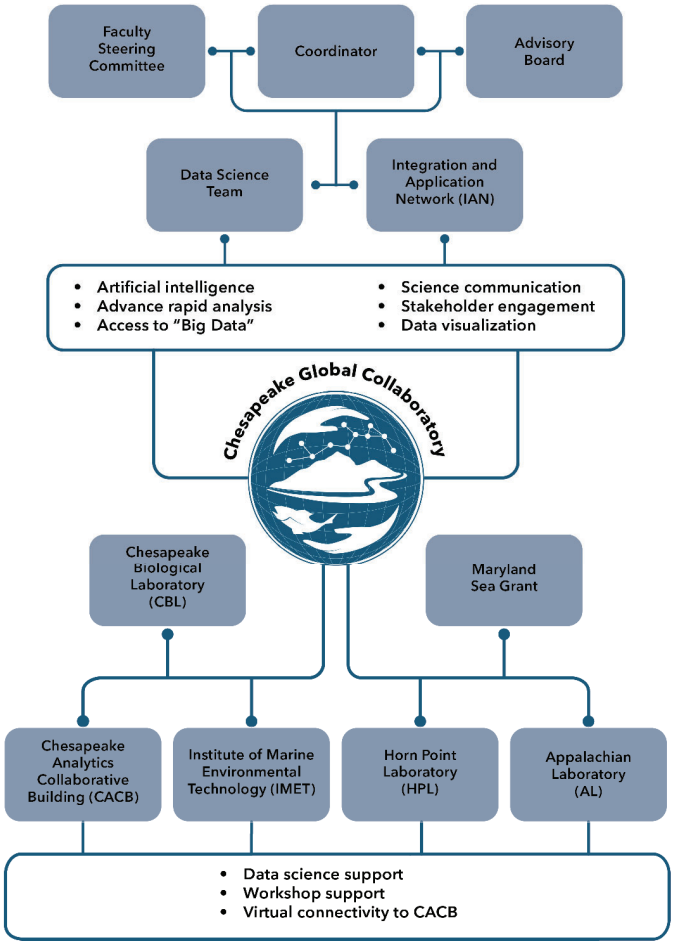
Stakeholder engagement and workshop facilitation

Stakeholder engagement will bring cyberinfrastructure to stakeholders in new and different ways. Facilitating workshops with stakeholders will help in the co-production of products that lead to actionable science.

Faculty committee will provide guidance

A Faculty Steering Committee will ensure a shared governance approach and maintain faculty engagement and support. This committee will help identify future potential Collaboratory projects, provide guidance on the operation and development of the Collaboratory and lead the effort to recruit the right people to run the operations of the Collaboratory.

Collaboratory structure



University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

August 24, 2023