

Appalachian Laboratory

University of Maryland Center for Environmental Science

Dr. David Nelson, Director and Professor

Chesapeake Bay Commission

May 2, 2024

The plan for the next hour

Intro to Appalachian Lab (me)

11:30 – 11:45am

Sustainable agriculture (Dr. Xin Zhang)

11:45am – noon

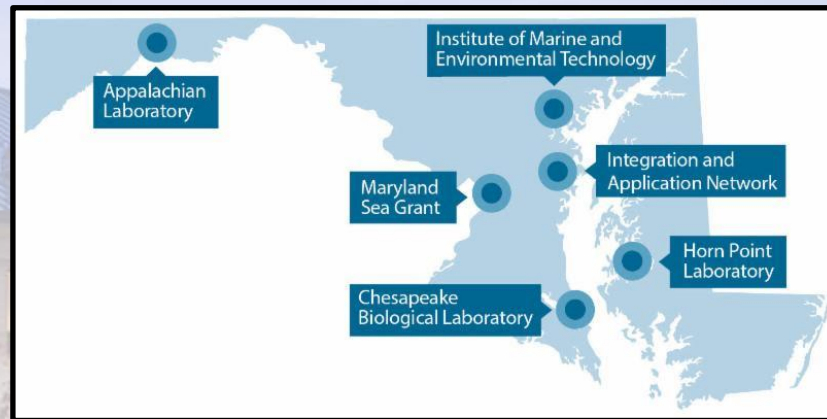
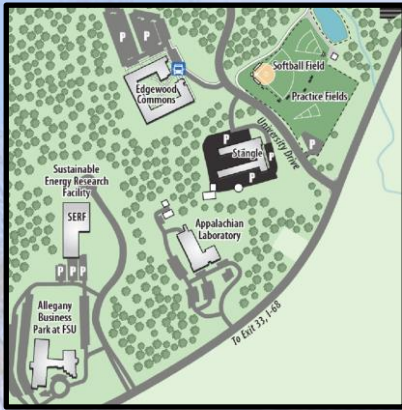
Air quality (Dr. Mark Castro)












Noon – 12:10pm

Stream restoration (Dr. Bob Hilderbrand)

Hydrology and water quality (Dr. Keith Eshleman)

12:10 – 12:30pm



	Name	Location
	Bowie State University	Bowie, MD
	Coppin State University	Baltimore, MD
	Frostburg State University	Frostburg, MD
	Salisbury University	Salisbury, MD
	Towson University	Towson, MD
	University of Baltimore	Baltimore, MD
	University of Maryland, Baltimore	Baltimore, MD
	University of Maryland, Baltimore County	Baltimore County, MD
	University of Maryland, College Park	College Park, MD
	University of Maryland Eastern Shore	Princess Anne, MD
	University of Maryland Global Campus	Headquarters in Adelphi, MD
	University of Maryland Center for Environmental Science	Headquarters in Cambridge, MD

- ~55 People
 - 14 Faculty
 - 15 Graduate students
 - 9 Admin and support staff
 - Postdocs, research staff
- Supported by: state, grants/contracts, donations
- Contribute ~\$9M/year to regional economy

Mission:

- Advance scientific knowledge (globally eminent, locally relevant)
- Train the next generation
- Advise the state and the public to inform policy related to natural resource management

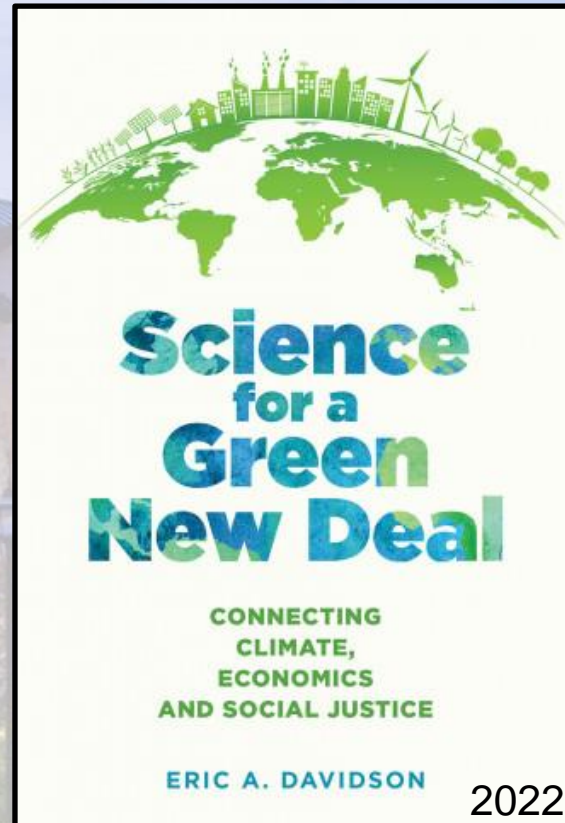
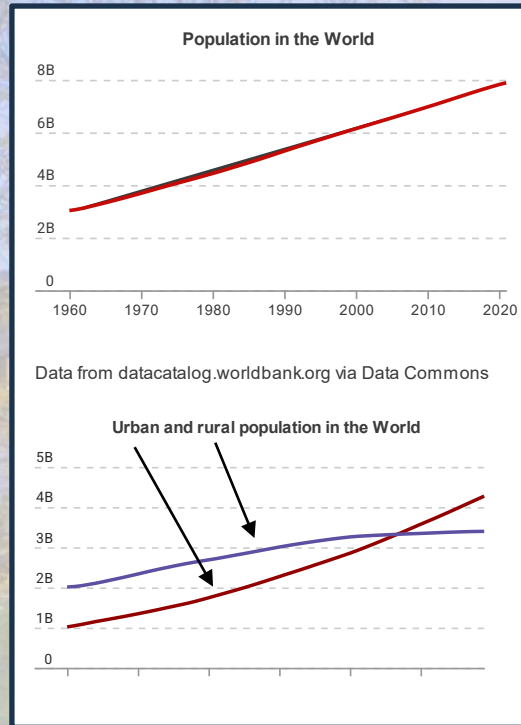
Research



Recent Examples of Science Application by Lab Faculty

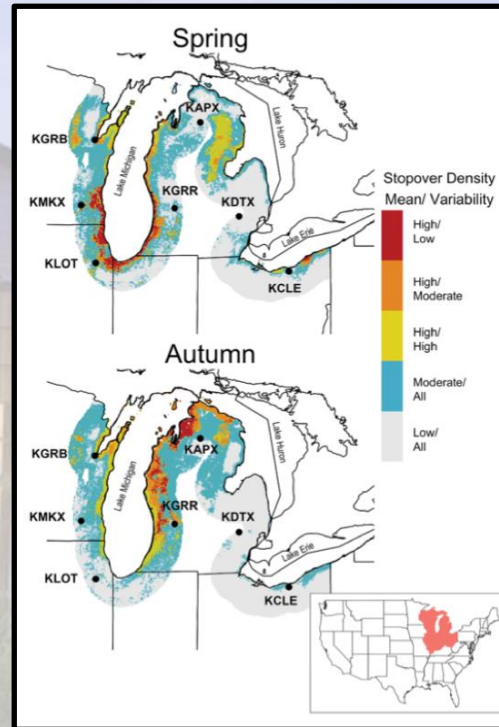
- I advised **MD SHA** on the ecological effectiveness of their stream restoration projects and on the best ways to manage stormwater so that streams are thermally protected
- I served on the **MD Climate Change Committee Biomass Working Group** to produce a Biomass-to-energy report for the state
- My work helped the **US State Department** integrate the latest science into their negotiation positions on a plastic pollution treaty and a nitrogen management resolution
- I am working with the **US National Park Service** Inventory and Monitoring Program to understand and communicate the status of grassland bird species in the National Capitol Region's Battlefield Parks
- I have been collaborating with the **United Nations** and **International Fertilizer Association** to improve the quantification of agricultural nutrient budgets

How can humanity obtain what it needs for the well-being of current and future generations of billions of people without exhausting or polluting those resources?



How can wind-energy and wildlife coexist?

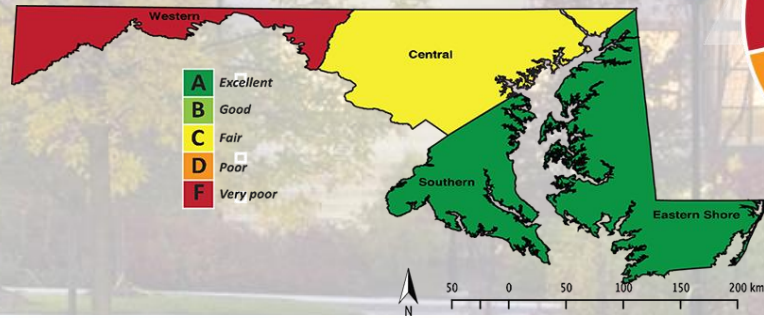
Using weather radar to help minimize wind energy impacts on nocturnally migrating birds



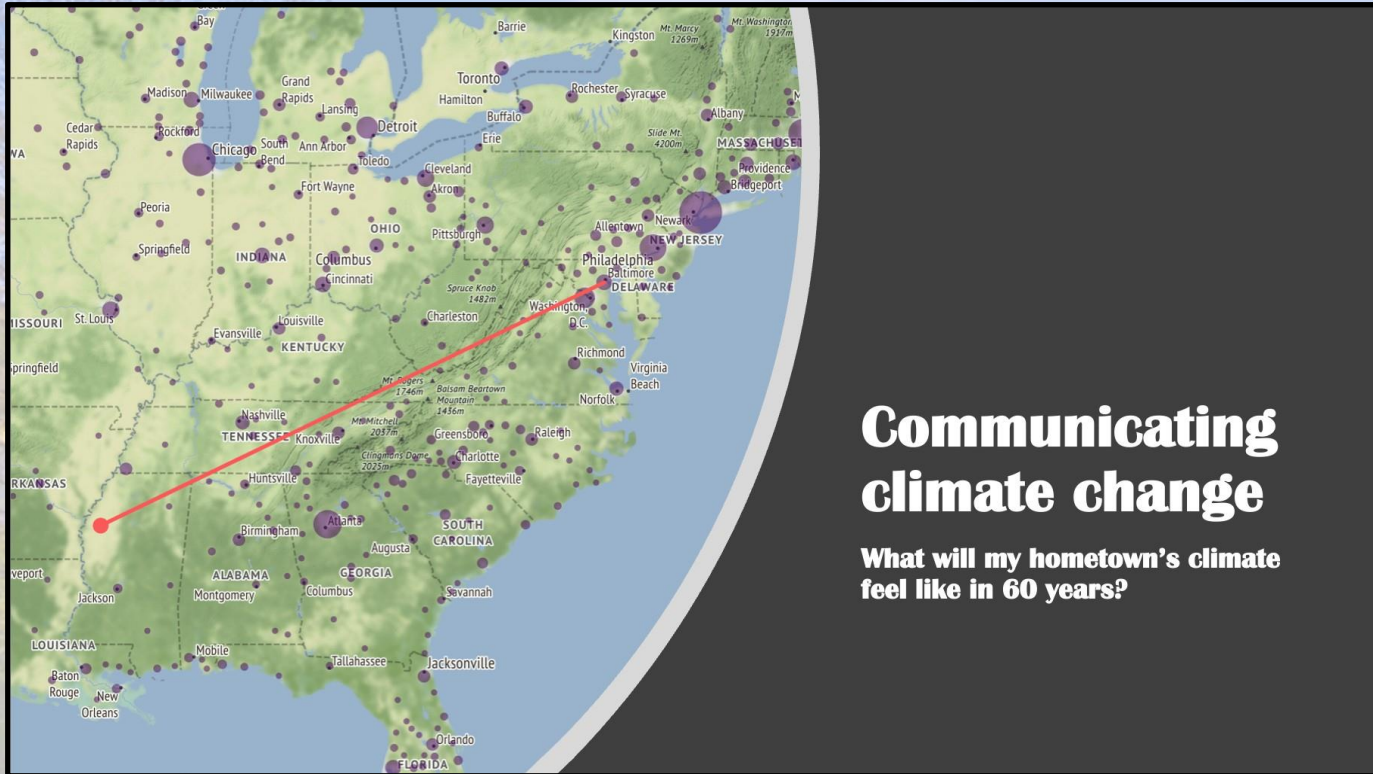
What grasses are best for Maryland roadsides?



- A** Excellent
- B** Good
- C** Fair
- D** Poor
- F** Very poor



How can scientists better communicate about climate change?



Communicating climate change

What will my hometown's climate feel like in 60 years?

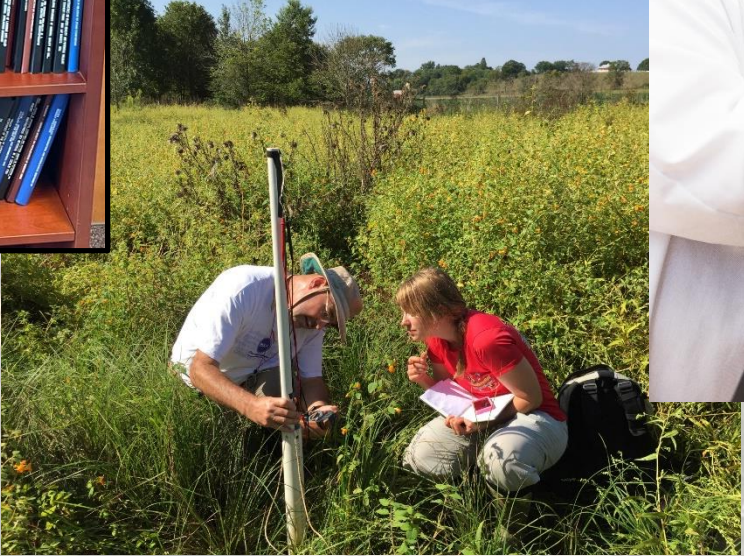


Graduate Programs

UMCP: Marine Estuarine and Environmental Science (M.S. and Ph.D.)

Frostburg State U: Biology (M.S.)

Frostburg State U: Master of Environmental Science in Sustainability



Undergraduate Internship Program

- 2022 hosted 6 interns; 2023 hosted 8 interns
- Pay \$15/hr, 40 hrs/week for 12 weeks
- Research focused (4 days/week); professional development component includes field trips, workshops and networking activities
- End-of-program presentations: www.umces.edu/al/internships



UNIVERSITY OF MARYLAND CENTER FOR ENVIRONMENTAL SCIENCE

CHESAPEAKE GLOBAL COLLABORATORY

ACCELERATING ENVIRONMENTAL SOLUTIONS



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.



Community-focused programs

- Richard Johnson Environmental Education Award
- Appalachian Laboratory STEM Inspiration Award
- Watershed Moments Community Learning Series
- Group visits



Public Engagement with Science

- Citizen science
- Environmental education and stewardship
- Scientists' engagement with stakeholders
- Educator professional development
- Integrating science in informal and K-12 learning venues



Increasing Sustainability at Lab

- First EV in fleet (2023)
- EV charging station (2023)
- Recycling and waste minimization (ongoing)
- Energy efficiency upgrades (ongoing)
 - LED lighting
 - HVAC upgrades
- Upcoming: 150 kW of solar panels on lab roof



How to Stay Connected

Become Involved with the Appalachian Laboratory

Are you committed to solving the environmental science challenges of our time? Perhaps you are passionate about science and STEM opportunities for students. Maybe you are a lifelong learner always exploring new learning opportunities. Whatever your interests, the Appalachian Laboratory of the University of Maryland Center for Environmental Science (UMCES) has an activity for you!

LEARN MORE:
www.umces.edu/al/outreach



To learn more about the ways you can become involved in and support Appalachian Laboratory initiatives, visit our [outreach website](http://www.umces.edu/al/outreach).

Thank You!

@UMCES_AL