

## 2023 Virginia HAB Task Force Meeting - Session Titles, Speakers, and Bios; in order from 9a-3p

### Student Lightning Talks – Session 1:

**Dante M. L. Horemans VIMS, “Real-time Forecasts of Harmful Algal Blooms Using Empirical Habitat Suitability Models”.** Before starting as a Postdoctoral Research Associate at Virginia Institute of Marine Science, I obtained a Bachelor's and Master's degree in theoretical physics and did my Ph.D. research at the Department of Biology (Antwerp, Belgium) in close collaboration with Delft Institute of Applied Mathematics (Delft, Netherlands). I have been combining theoretical work and application, including outreach to stakeholders, both in Europe and the U.S.A. This using numerical process-based models and statistical machine learning techniques, applied to both physical and biochemical estuarine and coastal systems, and their interactions. I am especially intrigued by biophysical interactions and feedback mechanisms, such as the impact of estuarine phytoplankton on suspended sediment through flocculation, which I extensively studied during my Ph.D, or the effect of changes in environmental conditions on harmful algal blooms, which I currently study at Virginia Institute of Marine Science.

**Josh Garber VIMS, “Insights into the stability of three phycotoxins in response to various environmental conditions”.** Josh is a third year Ph.D. student in Dr. Juliette Smith's lab in the Ecosystem Health section at VIMS. He is studying the distribution and fate of phycotoxins within the Chesapeake Bay. Josh received his undergraduate degree in chemistry and has been studying phytoplankton compounds since his undergraduate research.

**Lex Berger GMU, “Linking biological and functional microbial diversity with environmental conditions within the Chesapeake Bay Watershed”.** Lex Berger is a fourth-year PhD candidate in Dr. Jennifer Salerno's Integrative Microbial Ecology Lab at George Mason University. Lex's research interests cover a broad range of microbial ecology topics – from bioluminescent microbial symbioses to bacterioplankton dynamics in estuaries. They earned their BS in Marine Science at Eckerd College and MS in Marine Science at Nova Southeastern University. Their PhD work is focused on characterizing the biological and functional diversity of the microbial communities found in the Shenandoah and Potomac Rivers across a range of environmental gradients. Bacterioplankton dynamics in both rivers have been severely understudied and have become a major concern in water quality.

**Riley Hines Ferrum College, “Preliminary Report on Correlations of Selected Cyanobacteria and Abiotic Variables in Smith Mountain Lake 2022-2023.”** I am from Fauquier County, Virginia. I am currently a junior at Ferrum College where I am studying environmental science and agriculture with an emphasis in crop science and a minor in biology. I am hoping to obtain a master's degree after undergrad and then I plan on going into ecology or water conservation.

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### ODU – Mulholland Lab Marine Recap 2023

#### **Margaret Mulholland, Professor, Old Dominion University (ODU), Department of Ocean, Earth and Atmospheric Sciences**

Margie is a professor in Oceanography at ODU. She is a biogeochemist and leads the Water Column Biogeochemistry Group as well as the Phytoplankton Analysis Laboratory in the Department of Ocean and Earth Sciences. She has worked on harmful algal blooms for over 30 years.

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### **VDH - Marine Biotoxin Recap 2023**

#### **Todd Egerton, Marine Science Supervisor, Virginia Department of Health (VDH), Office of Environmental Health Services, Division of Shellfish Safety and Waterborne Hazards**

Todd has worked with VDH as the Marine Science Supervisor for eight years. He is a member of the ISSC Biotoxin Committee and has worked with Harmful Algal Blooms and phytoplankton monitoring in the Chesapeake Bay since 2001.

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### **VIMS - Reece Lab Marine Recap 2023**

#### **Kim Reece, Professor, Ecosystem Health, Virginia Institute of Marine Science (VIMS)**

Kim has been at VIMS for more than 29 years and has served on the HAB Task Force for more than 21 years. During this time she and her lab members have been working with the Department of Health to monitor the lower Chesapeake Bay waters for HAB organisms using microscopy and PCR assays. Her lab also conducts molecular genetic studies on aquacultured shellfish species and aquatic pathogens of humans and shellfish. A primary focus of her research is examining the biological impacts of harmful algae on aquatic organisms. A key component is the development and optimization of molecular diagnostic assays for viral, bacterial, and protistan organisms, including the HAB species, in various environmental matrices including water, sediments, and shellfish tissues.

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### **Cyanobacteria Advisory Recap 2023**

#### **Lyndia Branch, Statistical Analyst, Virginia Department of Health (VDH), Office of Environmental Health Services, Division of Shellfish Safety and Waterborne Hazards**

Lyndia has worked with VDH for two years and migrated from Local Health to Division of Shellfish Safety and Waterborne Hazards in March 2023. Lyndia has a diverse background spanning public and environmental health with experience in data management.

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### **Field Strip Test for Benthic Mats**

#### **Boris Polyak, Director of Research and Development, Gold Standard Diagnostics Horsham, PA**

A biotechnology engineer with over 20 years of experience in biological sensing, immunoassays, and lateral flow-based rapid detection systems. Boris leads Gold Standard Diagnostics Horsham R&D on strategic and operational activities focusing on product development and commercialization, product support, and contract R&D. He is also responsible for building an ecosystem of cross-industry, academic, and government alliances and partnerships while engaging in business transformation to improve the spectrum and quality of environmental, food, and life sciences test systems.

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### **GMU SPATT Collab with Shenandoah River Water Utilities 2023**

#### **Samantha Mohney, Ph.D. Student, George Mason University**

Samantha is an Environmental Science and Public Policy Ph.D. Student at George Mason University studying benthic cyanobacteria and toxin production within the Potomac River Basin and its tributary, the Shenandoah River. Her work involves investigating regional benthic cHAB occurrence, seasonality,

and toxin production in order build an initial framework for predicting how shifts in regional water quality, climate, and policy will shape the future impact of benthic cHABs on environmental and public health.

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### **Student Lightning Talks – Session 2:**

**Lilly Blume VIMS, “Metagenomic insights into microbial stratification during a harmful algal bloom event in the York River Estuary”.** I got my undergraduate degree from Cardiff University in the UK, in Marine Geography. I joined VIMS in summer 2021 and am now a Ph.D. candidate in my third year. I am co-advised by Kim and Dr. BK Song. I study harmful algal bloom dynamics and their associations with aquatic microbial communities.

**Katherine Crider ODU, "Mapping a *Margalefidinium polykrikoides* bloom transported to the Virginia Beach oceanfront with high resolution multispectral imagery".** Katherine ("Katie") Crider is a PhD student in Oceanography at Old Dominion University in the Mulholland Nitrogen and Carbon Biogeochemistry Laboratory, and a previous student of the Chappell Marine Molecular Ecology Laboratory. Katie received her BS in Biology from James Madison University in 2020, where she first experienced phytoplankton research, conducting culture growth experiments with *Microcystis aeruginosa* and *Aureococcus anophagefferens* and their respective bacteria under the direction of Dr. Louie Wurch. Her broad research interests are in coastal microbial ecology, with an emphasis on harmful algal blooms and microbial nitrogen and carbon cycling. She is finishing up a project that focused on coastal nitrogen fixation in the Outer Banks, NC, and also working on a project to investigate carbon and nitrogen metabolism in field populations of *Margalefidinium polykrikoides* using gene expression studies and stable isotope uptake experiments. She is also collaborating with Dr. Margaret Mulholland on a NOAA MERHAB grant to facilitate the building, distribution, and operation of PlanktoScopes to end-users around the Chesapeake Bay, as well as mapping harmful algal blooms in the lower bay using multispectral imagery.

**Savannah Mapes, PhD Candidate at VIMS, “Advancements with FlowCam and Planktoscope”.** Samantha Mapes is originally from Texas, received my Bachelor’s in Marine Biology from Texas A&M Galveston. Before VIMS I studied gulf of Mexico phytoplankton, and microalgae for biofuel. I discovered my passion in the harmful phytoplankton, and decided to travel to VIMS and the Chesapeake Bay to become a specialist in them. Now I am advised by Kim Reece and I’m studying the dynamics of York River HABs.

**Kayla Marciniak ODU, “FlowCam: Sample Collection and Monitoring HAB Species of the Chesapeake Bay”.** I am a senior undergraduate student at ODU. My work the past three years has consisted of FlowCam operation, taxonomic identification of HAB species, and imaging classification on EcoTaxa, IFCB, and FlowCam dashboards. My current position includes field work and working with the Mulholland Lab on the MERHAB project as one of their FlowCam imaging specialists.

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### **Group Session 1 - General Assembly House Bill 30 HAB Investigations**

#### **Overview**

Andrew “Drew” Garey, Department of Environmental Quality (DEQ)

Andrew Garey is a Water Quality Monitoring Team Leader at Virginia DEQ. Andrew coordinates agency field activities associated with HABS and activities of DEQ with HAB Task Force Partners.

## **Lake Anna**

Carly Maas, United States Geological Survey (USGS)

Carly Maas is a hydrologist at the US Geological Survey's Virginia-West Virginia Water Science Center. She graduated from the University of Maryland in 2022 with a Masters in Geology and joined the USGS in 2023. She is currently studying harmful algal blooms at Lake Anna and the Shenandoah River.

## **Shenandoah River**

Gordon "Mike" Selckmann, Interstate Commission on the Potomac River Basin (ICPRB)

**Bio:** coming soon...

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## **Group Session 2 - Laboratory Updates on HAB Research**

### **Mulholland Laboratory**

Margie Mulholland, Professor, Old Dominion University (ODU), Department of Ocean, Earth and Atmospheric Sciences

*Please see the bio from the morning session given by this speaker.*

### **Reece Laboratory**

Kim Reece, Professor, Ecosystem Health, VIMS

*Please see the bio from the morning session given by this speaker.*

### **Smith Laboratory**

Juliette Smith, Associate Professor, Ecosystem Health, VIMS

The Smith HAB Lab at VIMS investigates the chemistry, ecology, and ecotoxicology of bioactive compounds synthesized by harmful algal blooms in freshwater, estuarine and marine environments. We are collectively interested in 1) how we impact harmful algal blooms (HABs) and the production of their associated toxins, and 2) how they, in turn, contaminate our ecosystem, alter aquatic communities or ecological function, impact fisheries, and/or threaten public health.

[https://www.vims.edu/research/departments/eaah/programs/aquatic\\_toxinology/index.php](https://www.vims.edu/research/departments/eaah/programs/aquatic_toxinology/index.php)

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