

The 30th Annual
MARYLAND WATER MONITORING COUNCIL
Conference



MWMC
@ 30:

**CELEBRATING SUCCESSES &
TACKLING EMERGING CHALLENGES**

NOVEMBER 21, 2024 MARITIME CONFERENCE CENTER LINTHICUM, MD



2024 MWMC Annual Conference Sponsors and Exhibitors

The Maryland Water Monitoring Council would like to recognize the support of KCI, who again have sponsored the Student Poster Contest and the after-conference social at Heavy Seas Brewery.



Many thanks to our exhibitors for their support of the conference.



Be sure to stop by their tables and thank them for their support of the 30th annual conference!

On the Cover – Original art by Claire Hirt (Carroll County Government)

MARYLAND WATER MONITORING COUNCIL
30th Annual Conference - Thursday, November 21, 2024

MWMC @ 30:
Celebrating Successes and Tackling Emerging Challenges

7:30 Registration/Poster Set-up/Continental Breakfast – Registration in Room A-100

Morning Plenary Session (8:30-10:00) in the Auditorium

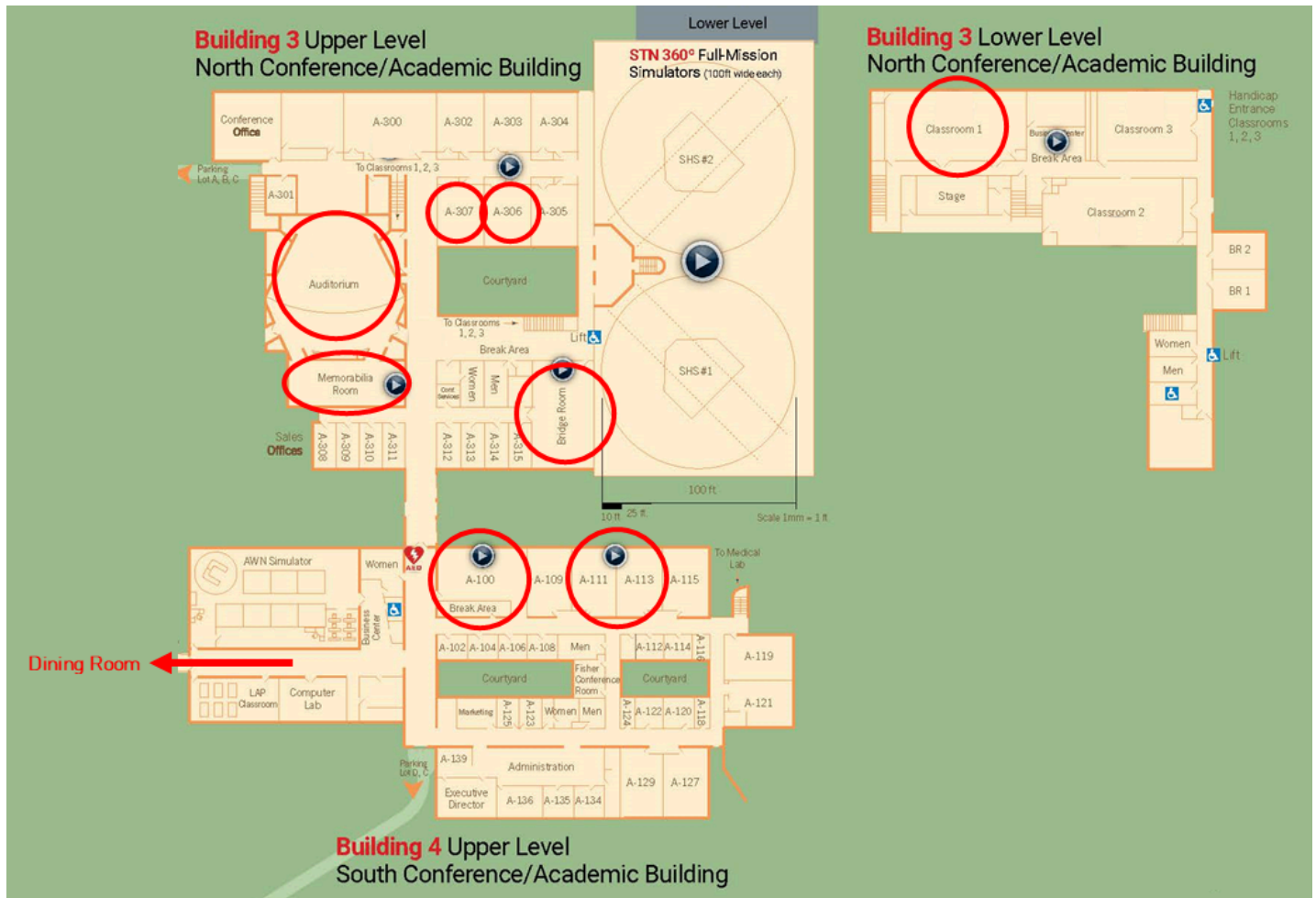
8:30 *MWMC Board Chair's Call to Order* – Matt Stover – Maryland Department of the Environment; Chair, MWMC Board of Directors

8:45 *Plenary Speaker* - Rich Batiuk, Associate Director, Science, Analysis, and Implementation, U.S. Environmental Protection Agency, Chesapeake Bay Program Office (retired), Co-founder, CoastWise Partners

9:15 *Plenary Speaker* - Bob Shedlock, Scientist Emeritus at US Geological Survey, Emeritus Director of USGS MDDE-DC Water Science Center

9:45 *Carl S. Weber Award* – Clark Howells; Washington Suburban Sanitary Commission

10:00 Break/Poster Session – Authors Present



Thanks to the 2024 MWMC Annual Conference Planning Committee – Andy Becker (KCI), Megan Brosh (Baltimore Co.), Lindsay DeMarzo (Howard Co.), Jason Dubow (MDP), Katherine Hanna (MDNR), Clark Howells (WSSC), Ken Mack (Montgomery Co.), Mike McMahon (MDE), Becky Monahan (MDE), Mat Pajerowski (USGS), Nancy Roth (Tetra Tech), Mark Southerland (Tetra Tech), Matt Stover (MDE), and Mark Trice (MDNR).

Only the primary presenter is listed for oral and poster presentations. The online conference Program will contain the full list of authors, co-authors, contact information, and abstracts. Following the conference, this agenda will contain links to presentation files, if available.

Concurrent Sessions - 10:30 –12:00

AUDITORIUM – Restoration I

TWO SAMPLING METHODS SHOW SIMILAR TRENDS IN THE BENTHIC COMMUNITY OF A RESTORED URBAN STREAM - Dennis Genito, Baltimore County Department of Environmental Protection & Sustainability

TRACKING THE CHANGES IN STREAM HEALTH FROM RESTORATION PRACTICES IN THE CHESAPEAKE BAY - Maya Sterett, Alliance for the Chesapeake Bay

WILD CELERY (*VALLISNERIA AMERICANA*) RESTORATION IN DEEP CREEK LAKE, MARYLAND - Mike Naylor, Maryland DNR

Classroom 1 - Emerging Concerns for Water Utilities

QUANTIFYING FOUR DECADES OF CHLORIDE INPUTS FROM DEICING SALT TO THE BALTIMORE CITY REGION DRINKING WATER RESERVOIRS - Kyle Hurley, Towson University

DEVELOPING AND EVALUATING OPERATIONAL HYDROLOGICAL DROUGHT ONSET, DURATION AND INTENSITY FORECASTS FOR THE EASTERN UNITED STATES - John Hammond, U.S. Geological Survey, Maryland-Delaware-D.C. Water Science Center

UNDERSTANDING THE FACTORS AFFECTING PFAS VARIABILITY IN THE POTOMAC RIVER WATERSHED - Christina Davis, Loudoun Water

Bridge Room - Pain in my PFAS

CURRENT STATUS OF USGS WATER MISSION AREA EFFORTS IN GW AND SW FIELD METHODS FOR PFAS - Gerolamo (Jerry) Casile, U.S. Geological Survey, Maryland-Delaware-D.C. Water Science Center

ENVIRONMENTAL AND MODELING APPROACHES TO ASSESS AND PREDICT PFAS FISH TISSUE CONCENTRATIONS IN VARIABLE ENVIRONMENTS - Krista Kraskura, Towson University, Environmental Science & Studies Program

NAVIGATING PFAS LITIGATION: SECURING MUNICIPAL REMEDIATION FUNDS - Michael G. Stag, Stag Liuzza

Room A-111/A-113 - Bioassessment I: What's Bugging You?

SEASONAL VARIABILITY OF BENTHIC MACROINVERTEBRATE ASSEMBLAGES IN URBAN LANDSCAPES - Chris Ruck, Fairfax County, VA, Watershed Assessment Branch

BACK RIVER NUISANCE MIDGE CONTROL PROGRAM - Kevin D Brittingham, Baltimore County Department of Environmental Protection & Sustainability

AN ANALYSIS OF THE ADEQUACY OF THE MARYLAND BENTHIC INDEX OF BIOTIC INTEGRITY (BIBI) IN ASSESSING THE HEALTH OF SMALL STREAMS SELECTED FROM A FINER MAP SCALE - Mary Genovese, Maryland DNR

Room A-306 - Agriculture

MARYLAND AGRICULTURE AND WATERSHED RESTORATION – LOOKING BEYOND 2025 - Elizabeth Hoffman, Maryland Department of Agriculture

AGRICULTURE, DEVELOPMENT, AND LOCAL FISH HABITAT CONDITIONS IN CHESAPEAKE BAY - Jim Uphoff, Maryland DNR, Fishing & Boating Services

HOW THE ENDANGERED SPECIES ACT COULD DRIVE THE IMPLEMENTATION OF AGRICULTURAL CONSERVATION MEASURES - Niranjana Krishnan, University of Maryland, College Park

Concurrent Sessions - 10:30 –12:00 ctd.

Room A-307 – Data Management & Modeling
ENSURING DATA QUALITY AND INTEGRITY IN ENVIRONMENTAL MONITORING - Najma Khokhar, TechZone MD LLC
RELATING MANAGEMENT PRACTICE IMPLEMENTATION AND MODELED LOAD REDUCTIONS IN THE CHESAPEAKE BAY WATERSHED - Helen Golimowski, Devereux Consulting
VISUALIZING AND COMMUNICATING MONITORING DATA FOR POSITIVE CHANGE - Alexandra Fries, University of Maryland Center for Environmental Science

Lunch A - 12:00 – 12:45

Lunch B - 12:45 – 1:30

Poster Session – 1:00 – 1:30

Student Posters to present to judges at 1:00 in the Memorabilia Room

Concurrent Sessions – 1:30 –3:00

AUDITORIUM – Restoration II
"BUT THE STREAM LOOKS FINE TO ME." EFFORTS TOWARD COMMUNICATING AN UNDERSTANDING OF STREAM HEALTH AND WATERSHED FUNCTION - Adam Nabors, Maryland Stream Restoration Association
MAPPING EROSION: USING DEM DIFFERENCING TO GUIDE RESTORATION EFFORTS - Brennan Smith, Anne Arundel County Bureau of Watershed Protection & Restoration
A TALE OF TWO WATERSHEDS: WATER QUALITY IN FOSTER BRANCH AND PLUMTREE RUN, HARFORD COUNTY, MD - Alex Soroka and Jennifer Olszewski, U.S. Geological Survey

Classroom 1 - Stormwater
LONG-TERM MONITORING OF SUBURBAN DEVELOPMENT AND STORMWATER MANAGEMENT IN CLARKSBURG, MONTGOMERY COUNTY, MARYLAND - Marina Metes, U.S. Geological Survey
QUANTIFYING IMPACTS OF SUMMER STORMS ON THE THERMAL REGIME OF AN URBAN STREAM SYSTEM AT THE WATERSHED SCALE - Claire Welty, University of Maryland, Baltimore County
STORMWATER AND BIORETENTION: PAST, PRESENT, AND FUTURE? - Allen P. Davis, University of Maryland, College Park

Bridge Room - Community Science
CONNECTING COMMUNITIES TO ACCESSIBLE WATER MONITORING - Matthew Kierce, Izaak Walton League of America
PERFECTING PARTNERSHIPS FOR SMART SALT SUCCESSES - Abby Hileman, Izaak Walton League of America
ASSESSING WATER QUALITY CONDITIONS IN VULNERABLE COMMUNITIES IN THE CHESAPEAKE BAY WATERSHED - Leah Staub, U.S. Geological Survey

Concurrent Sessions – 1:30 –3:00 ctd.

Room A-111/A-113 - Bioassessment II: Critters (and MBSS) in the Creeks
MARYLAND BIOLOGICAL STREAM SURVEY ROUND FOUR RESULTS INVESTIGATING POTENTIAL CHANGES OVER TIME IN STREAM CONDITIONS - Kyle Hodgson, Maryland DNR
STONECAT: USING MARYLAND BIOLOGICAL STREAM SURVEY DATA TO IMPROVE OUR UNDERSTANDING - Tomas Ivasauskas, Maryland DNR
MBSS COMPLETES SIXTEEN YEARS OF BIOLOGICAL MONITORING ON THE PATAPSCO RIVER COINCIDENT WITH DAM REMOVALS - William Harbold, Maryland DNR

Room A-306 - Microplastics
FRAMEWORK FOR MONITORING PLASTIC POLLUTION IN THE CHESAPEAKE BAY - Mark Southerland, Tetra Tech
ASSESSING BIOLOGICAL EFFECTS OF PLASTIC ON STRIPED BASS - Bob Murphy, Tetra Tech
A COMPARISON OF CHESAPEAKE BAY MICROPLASTIC CONCENTRATIONS, MORPHOLOGIES AND TYPES IN FOUR MARYLAND AQUATIC ENVIRONMENTS - Mark Trice, Maryland DNR

Room A-307 – E(ww) coli and Other Water Management Problems
COMMUNITY SCIENCE RECREATIONAL WATER QUALITY MONITORING IN ANACOSTIA TRIBUTARIES - Maureen Mitchell, Anacostia Riverkeeper
SOURCING E. COLI IN THE ANACOSTIA WATERSHED: USING WATER QUALITY MEASUREMENTS AND MORE AS A PROXY INDICATOR - Jessie Ribera, Smithsonian Environmental Research Center
IMPACTS OF CLIMATE CHANGE ON LAKE ECOLOGY - Michael Hartshorne, Princeton Hydro, LLC

3:00 – 3:30 Break/Poster Session – Authors Present

3:00 Announcement of Student Poster Award Winners in the Auditorium

Concurrent Sessions – 3:30 –4:30

AUDITORIUM – Restoration III: Biochar-ging Ahead
BIOCHAR FOR CLEAN WATER, HEALTHY SOILS AND CLIMATE RESILIENCY - Lori Lilly, Howard EcoWorks
BIOCHAR: A MULTIFACETED TOOL FOR ENHANCING CHESAPEAKE BAY WATER QUALITY AND CLIMATE RESILIENCY - Charles Hegberg, Scaling Up Biochar & Infinite Solutions

Classroom 1 - Session Canceled

Bridge Room - Water Quality
SALTIER RIVERS IN NATIONAL PARKS ARE A GROWING CONCERN - Dan Myers, Stroud Water Research Center
CHLORIDE AND HEAVY METALS IN HCC'S STREAM SYSTEMS - Dr. Rebecca Carmody, Howard Community College

Concurrent Sessions – 3:30 –4:30 ctd.

Room A-111/A-113 - Bioassessment III: Fishing for Results

ASSESSING MARYLAND'S LIVE BAIT TRADE AS AN AQUATIC INVASIVE SPECIES PATHWAY - Gregory Mathews, Maryland DNR

CHANGES IN THE TIMING OF MARYLAND STRIPED BASS SPAWNING RUNS - Angela Giuliano, Maryland DNR

Room A-306 - Student Lightning Talks

USING STABLE ISOTOPES ($\delta^{15}\text{N}$, $\delta^{18}\text{O}$, $\Delta^{17}\text{O}$) TO EVALUATE SOURCES AND CYCLING OF NITRATE IN SUBURBAN MARYLAND WATERSHEDS - Grace O'Hara, University of Maryland Center for Environmental Science

CHARGED WITH CONTAMINATION: UNPACKING PFAS POLLUTION IN LITHIUM-ION BATTERIES - Neal Goturi, River Hill High School

MICROBIAL CONTAMINATION IN THE GUNPOWDER RIVER WATERSHED: ASSESSING WATER QUALITY AND PUBLIC HEALTH RISKS - Chichedo Duru, Morgan State University

BIOMIMICRY TECHNIQUES IN DESIGN OF STORMWATER MANAGEMENT WITHIN FOUR CRITICAL AREAS OF THE CHESAPEAKE BAY - Clara McKnight, River Hill High School

CHARACTERIZATION OF LIVER DNA DAMAGE IN THE ANACOSTIA RIVER USING FUNDULUS HETEROCLITUS - Hana Chytil, University of Maryland

THE IMPACT OF RAINBOW DARTER ABUNDANCE ON MICROHABITAT USE OF OTHER DARTERS IN THE MONOCACY RIVER WATERSHED - Austin Kaplan, Hood College

Room A-307 – Monitoring Water from the Depths

DESCRIPTION OF THE USGS GW MONITORING NETWORK IN MARYLAND, DELAWARE, AND THE DISTRICT OF COLUMBIA - Samantha Woomer, U.S. Geological Survey

EVALUATING AND MITIGATING THERMAL IMPACTS OF SMALL PONDS IN MARYLAND TROUT WATERSHEDS - Jason Cessna, Maryland DNR

4:30 Adjourn –



SOCIAL AT HEAVY SEAS BREWERY STARTING AT 5:00 (registration required)

Posters

THE NATURAL HISTORY AND LIFE OF URBAN STREAMS - Ken T. Belt, US Forest Service (Ret.), Natural History Society of Maryland, UMBC

MONITORING AND MODELING OF FECAL INDICATOR BACTERIA USING HIGH-FREQUENCY SAMPLING IN URBAN WATERS OF THE NORTHEASTERN UNITED STATES - Jason Chase, U.S. Geological Survey

AN ANALYSIS OF BEAVER DAM ANALOGS ON FISH COMMUNITIES AT LITTLE GUNPOWDER FALLS - Katherine Chase, Maryland DNR

<STUDENT POSTER> CHARACTERIZATION OF LIVER DNA DAMAGE IN THE ANACOSTIA RIVER USING *FUNDULUS HETEROCLITUS* - Hana Chytil, University of Maryland

MICROBIAL CONTAMINATION IN THE GUNPOWDER RIVER WATERSHED: ASSESSING WATER QUALITY AND PUBLIC HEALTH RISKS - Chichedo Duru, Morgan State University

IMPACTS OF REGENERATIVE STORMWATER CONVEYANCE ON IRON CONCENTRATIONS AND AQUATIC COMMUNITIES: A COMBINED LAB AND FIELD STUDY - Neil Fuller, EA Engineering, Science, and Technology Inc., PBC

IMPACT OF HIGH pH ON CYANOBACTERIA GROWTH IN THE LINGANORE LAKES - Catherine Gaudlip, Hood College - Center for Coastal & Watershed Studies

PROMOTING ADVANCES IN HYDROLOGICAL MODELING THROUGH DEVELOPMENT OF THE OPEN-SOURCE, TIME-VARIANT WATER QUALITY MODELING SYSTEM RSPARROW 2.0 - Lillian Gorman Sanisaca, U.S. Geological Survey

DEVELOPING NEW IMAGING TECHNOLOGY PROCEDURES AT MARYLAND DNR'S PHYTOPLANKTON LABORATORY - Amy Hamilton, Maryland DNR

<STUDENT POSTER> THE IMPACT OF RAINBOW DARTER ABUNDANCE ON MICROHABITAT USE OF OTHER DARTERS IN THE MONOCACY RIVER WATERSHED - Austin Kaplan, Hood College

<STUDENT POSTER> INFLUENCE OF IRON AND POTASSIUM ON THE GROWTH OF *MICROCYSTIS AERUGINOSA* AND *ANABAENA VARLABILIS* AT DIFFERENT TEMPERATURES - Alexander Koo, Mount St. Mary's University

BIODEGRADATION OF PFOS WITH A DEHALOGENATING CULTURE - Michelle M. Lorah, U.S. Geological Survey

APPROACH AND METHODOLOGY FOR CONTINUOUS *E. COLI* BACTERIA MONITORING IN THE LOWER ANACOSTIA RIVER, WASHINGTON D.C. - Jeremy Malen, U.S. Geological Survey

COMPARATIVE REPRODUCTIVE AND HEPATIC DNA DAMAGE IN ANACOSTIA RIVER *FUNDULUS* SPECIES - Sabine Malik, University of Maryland College Park

IS SALINIZATION OF FRESHWATER A DRIVER OF INVASIVE CRAYFISH SUCCESS IN MARYLAND? - Faith Matthews, Towson University

EPIBENTHIC COLONIZATION AND TEMPORAL SHIFTS IN ABUNDANCE AND DIVERSITY AT POPLAR ISLAND - Martha McCauley, EA Engineering, Science, and Technology, Inc., PBC

<STUDENT POSTER> CHESAPEAKE WATER WATCH: VOLUNTEER MONITORING OF WATER CLARITY IN TIDAL TRIBUTARIES - Rebecca McClenahan, Davis & Elkins College/ Smithsonian Environmental Research Center

<STUDENT POSTER> BIOMIMICRY TECHNIQUES IN DESIGN OF STORMWATER MANAGEMENT WITHIN FOUR CRITICAL AREAS OF THE CHESAPEAKE BAY - Clara McKnight, River Hill High School

HIGH-FREQUENCY WATER QUALITY OBSERVATIONS ALONG AN URBAN TO RURAL GRADIENT IN BALTIMORE: AN UPDATE - Mary McWilliams, University of Maryland, Baltimore County

LEVERAGING THE BENEFITS OF LONG-TERM HYDROLOGIC MONITORING OF SENSITIVE WETLANDS - Kelley Moxley, WSP

GREY TO GREEN; INCREASED URBANIZATION SUGGESTS AN ELEVATION IN PHOSPHORUS PRESENCE AND GREATER ALGAE GROWTH IN THE CHESAPEAKE BAY WATERSHED - August Mullican, Hood College

ECOLOGICAL INDICATORS: EXPLORING THE USE OF ENVIRONMENTAL DNA TO ENHANCE BROOK TROUT CONSERVATION IN MARYLAND - Patience Odeh, Towson University

ONE WATER - Rich Ortt, Maryland DNR

THE MARYLAND SAFE DRINKING WATER STUDY: AN INITIATIVE TO PROTECT MARYLAND'S WATER - Georgia Parolski, University of Maryland, School of Public Health

CHLORIDE AND HEAVY METALS IN HCC'S STREAM SYSTEMS - Dr. Hannah Pie, Howard Community College

CHLAMYDOMONAS AND *MICROCYSTIS* GROWTH AND COMPETITION WITH TRACE AMOUNTS OF MOLYBDENUM - Callie Polanka, Mount St. Mary's University

AN AGE AND GROWTH STUDY OF BLUE CATFISH POPULATIONS IN MD TRIBUTARIES - Evangeline Sawyers, Maryland DNR

DOES THE TYPE OF DESIGN FIRM DRIVE ECOSYSTEM SERVICE BUNDLES IN STORMWATER GREEN INFRASTRUCTURE? - Rahat Sharif, University of Maryland, College Park

CHESAPEAKE WATER WATCH: VOLUNTEERS ENHANCING SATELLITE REMOTE SENSING OF WATER QUALITY - Tara Sill, Smithsonian Environmental Research Center

INTERACTIONS OF OYSTER AQUACULTURE AND SEAGRASS: EFFECTS OF FLOATING OYSTER CAGES ON LIGHT PENETRATION - Owen Skirtich, University of Maryland Eastern Shore

INNOVATIVE APPROACH FOR BIOREMEDIATION OF NITRATE-CONTAMINATED BRINE USING HALOPHILIC DENITRIFIERS FOR WATER QUALITY RESTORATION - Leonardo Soto, Institute of Marine and Environmental Technology, University System of Maryland

<STUDENT POSTER> INVESTIGATING THE IMPACT OF INCREASED FLOODING & GROUNDWATER TABLE RISE ON PATHOGEN REMOVAL IN THE SOIL TREATMENT AREA OF COASTAL SEPTIC SYSTEMS - Emily Speierman, University of Maryland

SUSQUEHANNA RIVER BASIN COMMISSION – NEW AND CONTINUING ACTIVITIES IN MARYLAND - Luanne Steffy, Susquehanna River Basin Commission

A NOVEL AQUATIC INVERTEBRATE MODEL: USING JUVENILE ODONATES TO BETTER UNDERSTAND SALINITY AND PFAS STRESSORS - Talia Tanner, Towson University

HIDDEN NEUROTOXINS IN BENTHIC CYANOBACTERIA MATS - Catherine Wazniak, Maryland DNR

THE ROLE OF UNMANNED AERIAL VEHICLES IN CHARACTERIZING STREAM FLOW DYNAMICS - Gregory Zuknick, EA Engineering, Science, and Technology, Inc., PBC