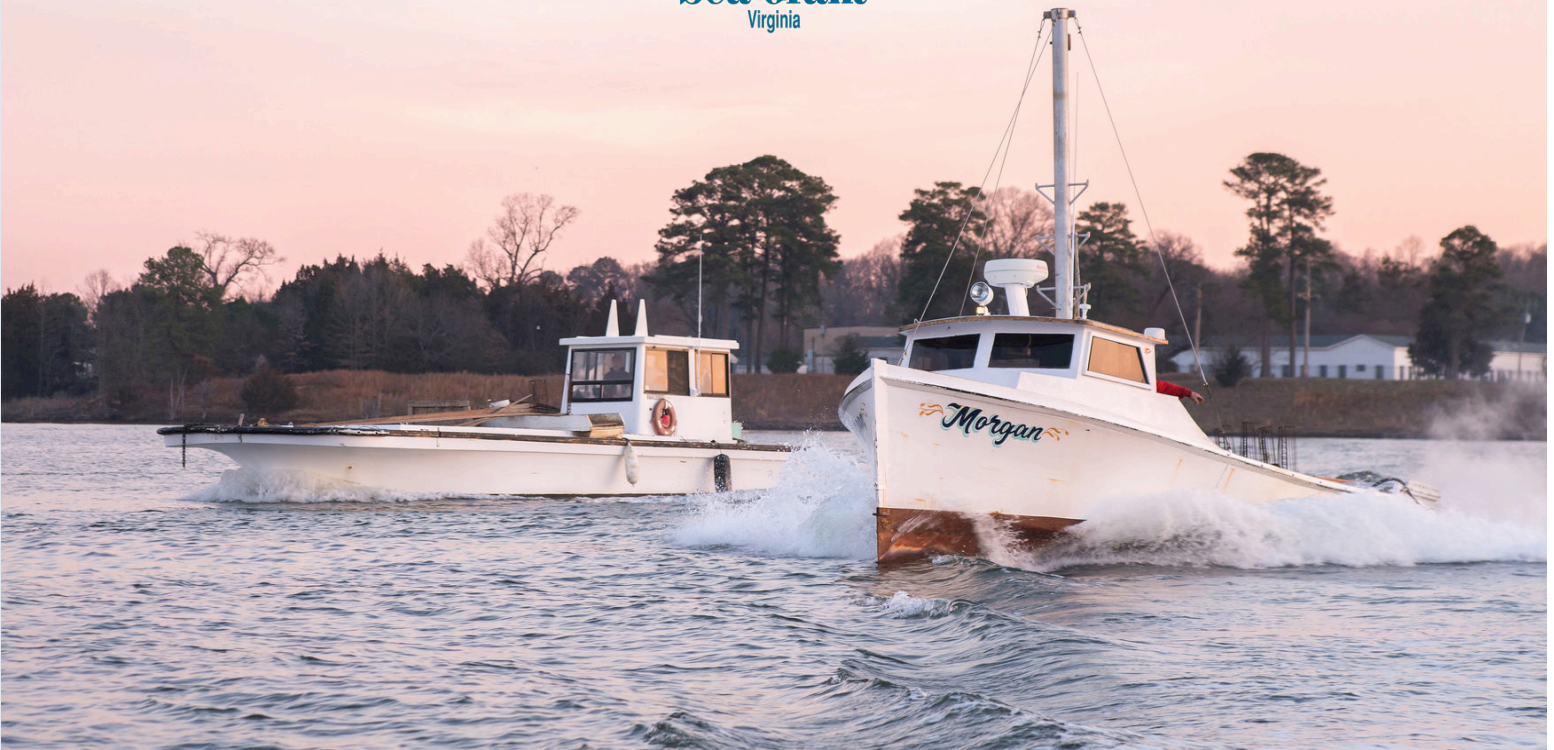


The Virginia Sea Grant 2018

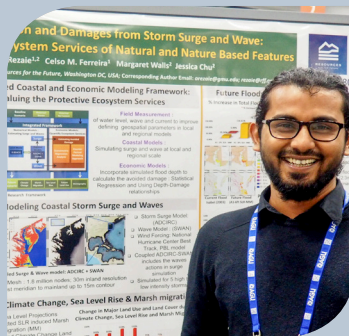
GRADUATE SYMPOSIUM

www.vaseagrant.org

TOGETHER FOR VIRGINIA



Fellowships, Internships, Careers



Science Communication Strategies



Science-Policy Insights



Networking Opportunities

On behalf of Virginia Sea Grant, and all of the 2018 Graduate Symposium participants and panel speakers we would like to thank the following sponsors for their generous support:

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A Word of Thanks

Virginia Sea Grant (VASG) is a small organization, yet we enable great things. But we could only do what we do through partnerships, through people and organizations giving of themselves. This Symposium is no different. We would like to thank our sponsors and exhibitors – who took a chance on the inaugural Commonwealth-wide VASG Graduate Symposium. These are organizations that believe in the coastal and marine research, outreach, education and communication of Virginia’s future workforce, researchers, policy-makers, managers and educators. So please, when you see a name-badge with a “sponsor” or “exhibitor” ribbon on it, join us and thank them for their support.

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Mid-Atlantic Sea Grant

NOAA Coastal Storms Program

Looking Forward



Virginia Sea Grant (VASG) launched an Annual Project Participants' Symposium in 2009. We were in the early stage of a substantial reorganization: we had just moved the VASG headquarters to VIMS, had four universities in the coalition, a new leadership team, and limited brand identity across the state. Project participants – staff, funded researchers, students, leadership, and advisory committee members – needed to get to know each other, our interests and strengths, and explore how we were going to become an effective, unified organization. Our aims were to increase awareness across our research, education, extension, and communication functions; and across our institutions. We invited outside-of-the-box keynote speakers: a historian who tracked hurricanes from 1776, a graphic facilitator who communicated science and deliberation in images, text, and colorful visualizations, and a television weather anchor who discussed the communication of climate science. The focus was intentionally inward looking, to begin the path toward today's VASG.

We successfully achieved our initial objectives, and with the addition of George Mason and Virginia Commonwealth Universities in 2011, and more recently, James Madison University in 2016, VASG expanded its goals for this Symposium. More universities lead to even greater interests in collaboration, leveraging each other's capacities and interests, and exploring opportunities to partner. VASG was negotiating its charter in those years (2010-12), and those integration principles became institutionalized – our job was to enable partnerships across organizational and functional boundaries.

So the Symposium evolved. We brought in more external stakeholders, held emerging issue workshops to flesh out potential responses and partnerships, and provided a venue for our graduate student fellows. Our keynote sought to push us further; a theater faculty guided us in acting out our science and implementing strategies for building upon each other's interests. She forced us to think differently, to listen more, and to consider partnership opportunities. The Symposium became a more outwardly looking event, enabling, facilitating, and guiding cross-boundary integration and partnerships.

Today, we take another step in the evolution of the Symposium. We are going statewide and regional. We are enabling information sharing, learning, networking and professional growth across all the great research institutions of the Commonwealth. Please enjoy the 2018 VASG Graduate Symposium! I look forward to seeing you.

Troy Hartley

Troy W. Hartley, Ph.D.
Director, Virginia Sea Grant

Today's Agenda

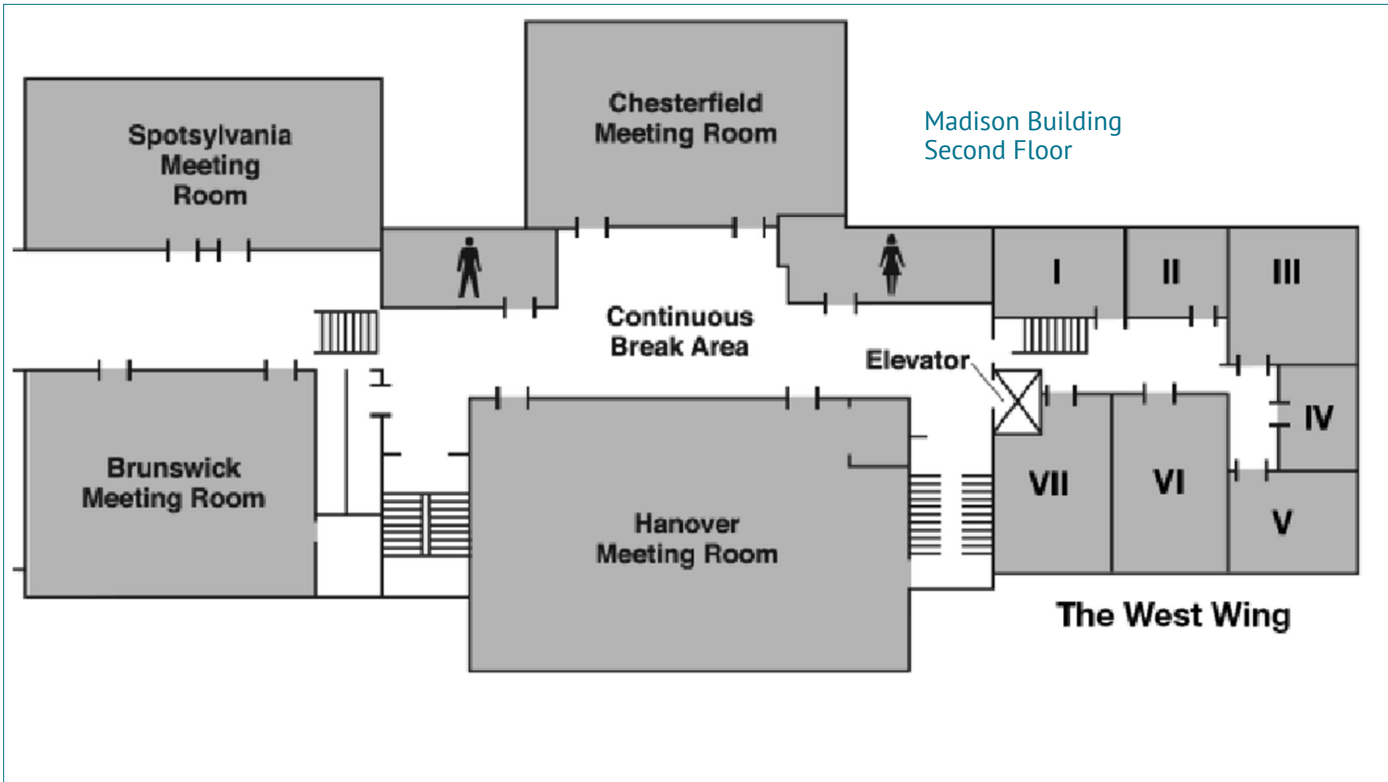
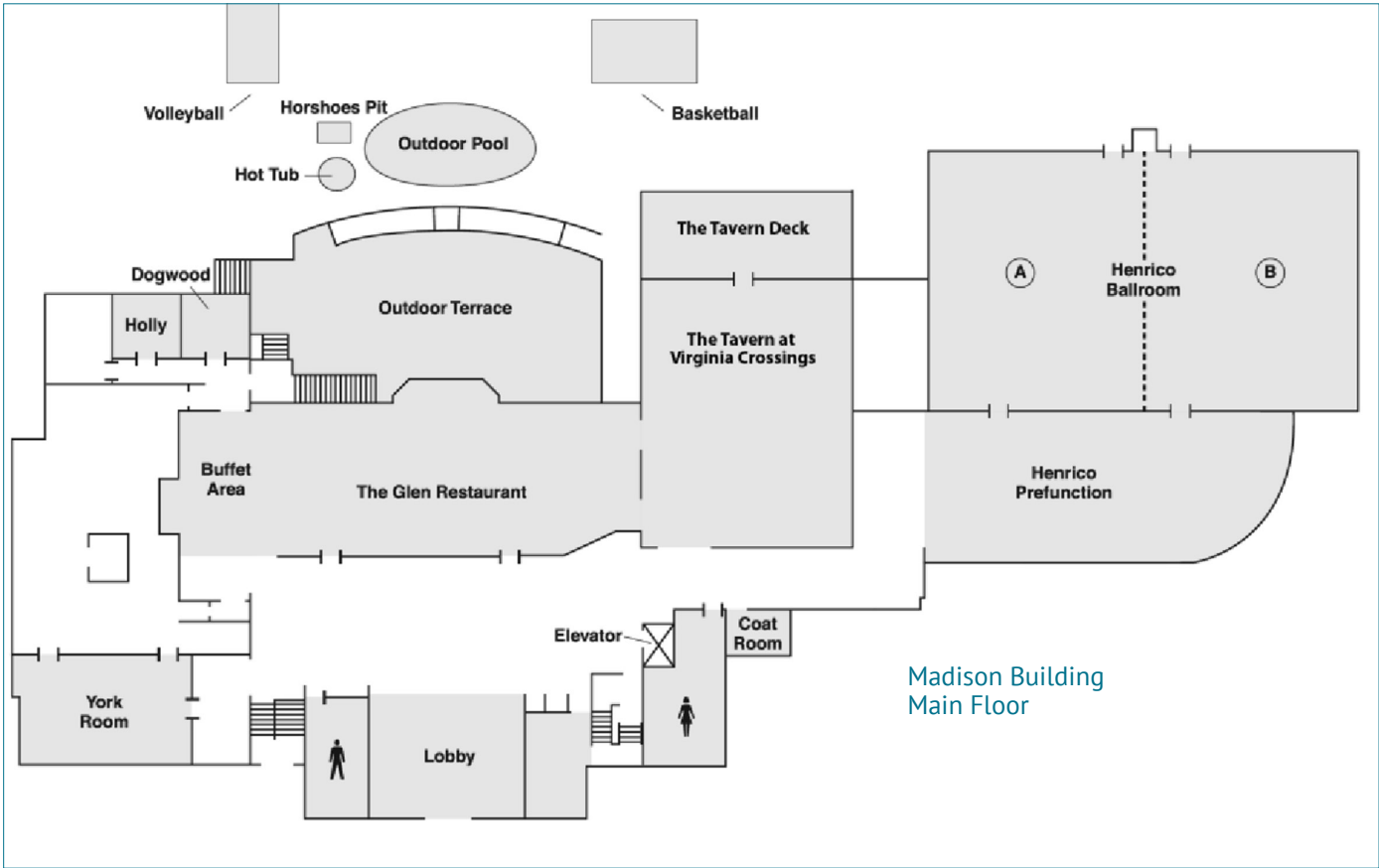
7:30 a.m.	Registration, Check In, Light Breakfast	<i>Henrico Prefunction</i>
8:00 a.m.	Welcome to the Graduate Symposium: An introduction by Virginia Sea Grant Director, Troy Hartley	<i>Henrico Ballroom</i>
8:15 a.m.	Session 1: TED-like talks from five Graduate Research Fellows	<i>Henrico Ballroom</i>
9:30 a.m.	Break	
9:45 a.m.	Session 2: TED-like talks from five Graduate Research Fellows	<i>Henrico Ballroom</i>
10:40 a.m.	Break	
11:00 a.m.	Keynote: Laura Lindenfeld - Alan Alda Mini-Workshop	<i>Henrico Ballroom</i>
12:30 p.m.	Lunch	<i>Glen Restuarant</i>
1:45 p.m.	Concurrent Sessions First Science-Policy Interface Science Communication Establish Meaningful Partnerships Science into Educational Curricula	<i>Chesterfield Room Hanover Room Brunswick Room Spotsylvania Room</i>
2:45 p.m.	Break	
3:00 p.m.	Concurrent Sessions Second Science-Policy Interface Science Communication Establish Meaningful Partnerships Science into Educational Curricula	<i>Chesterfield Room Hanover Room Brunswick Room Spotsylvania Room</i>
4:00 p.m.	Career Fair Exhibitors	<i>Henrico Prefunction</i>
6:00 p.m.	Poster Session; Advanced Science Communication Seminar exhibits; Reception and Awards	<i>Henrico Ballroom</i>

What We Do

VISION & MISSION: Virginia Sea Grant envisions a future where people live, work, and play along our coasts in harmony with the natural resources that attract and sustain them. Our mission is to provide integrated research, communication, education, extension, and legal programs to coastal communities that lead to the responsible use of the nation's ocean and coastal resources through informed personal, policy, and management decisions. Virginia Sea Grant achieves these objectives through an integrated, partnership-driven, seven-university coalition.



Campus Map



TED-like Talks

Session 1: TED-like talks from Graduate Research Fellows

Is there room for growth in oyster aquaculture? - *Jennifer Beckensteiner*: Virginia Institute of Marine Sciences, Ph.D. student in Marine Science, Graduate Research Fellow

Livin' on the edge! Can you stop your marsh from failin'? - *Maura Boswell*: Old Dominion University, Ph.D. student, Coastal Storms Fellow

How important is sediment? - *Rae Kuprenas*: Virginia Tech, M.S. student Civil Engineering, Graduate Research Fellow

The beach dune: Not just a pretty face - *Chellby Kilheffer*: State University of New York College of Environmental Science & Forestry, Ph.D. student Fish & Wildlife Biology & Management, Coastal Storms Fellow

Connecting the dots: Bacteria, humans and chickens - *Miguel Semedo*: Virginia Institute of Marine Science, Ph.D. student Marine Science, Graduate Research Fellow

Session 2: TED-like talks from Graduate Research Fellows

Coastal witchcraft - *Stephanie Dohner*: University of Delaware, Ph.D. student Oceanography, Coastal Storms Fellow

Oy-stars: How oysters are outshining their parasites - *Lauren Huey*: Virginia Institute of Marine Science, M.S. student Marine Science, Graduate Research Fellow

A Better way to classify storms - *Laura Lemke*: Stevens Institute of Technology, Ph.D. student Ocean Engineering, Coastal Storms Fellow

Creating connectivity among water, land and communities - *Chris Nack*: State University of New York College of Environmental Science & Forestry, Ph.D. student Fish & Wildlife Biology & Management, Coastal Storms Fellow

Bloom and doom - *Clara Robison*: Virginia Institute of Marine Science, M.S. student Marine Science, Graduate Research Fellow

Keynote

LAURA LINDENFELD LEADS THE ALAN ALDA FOR COMMUNICATING SCIENCE MINI-WORKSHOP



Laura Lindendorf, Ph.D.

*Director of the Alan Alda Center for Communicating Science
Stony Brook University, Stony Brook, New York.*

Dr. Laura Lindendorf is the Director of the Alan Alda Center for Communicating Science, and professor in the School of Journalism at Stony Brook University. Her work draws inspiration from the idea

that we can make better, more informed decisions about how we shape our collective future. She is passionate about supporting scientists to communicate their work in more direct and engaging ways – how we can advance meaningful, productive interactions with communities, stakeholders and decision-makers by strengthening linkages between knowledge and action.

The Alda Center's mission is to help scientists and health professionals better inform the public, media and others about their work and research through communications training. Actor, Writer and Science Advocate Alan Alda helped found the center in 2009. The center has trained more than 7,000 scientists and medical professionals, and reached more than 24,000

people. The Alan Alda Center for Communicating Science offers workshops and classes to help train student scientists to better communicate the significance of their work. The center offers conferences, lectures and coaching opportunities.

Prior to joining the Alan Alda Center, Laura directed the Margaret Chase Smith Policy Center, a nonpartisan, independent research unit of the University of Maine, which aimed to inform public policy and societal decision-making. Much of Laura's research focuses on environmental communication, especially in the area of sustainability. Her work seeks to understand how we can build strong interdisciplinary teams and communicate our science more effectively and persuasively.

Speaker Bios

SCIENCE-POLICY INTERFACE

While science remains critical to informed decision-making, policy and management of coastal and marine resources, the credibility of science and the legitimacy of sciences role in decision-making has been challenged in today's political and policy landscape. This panel will discuss how science is faring in coastal and marine policy today, when and why science makes a difference and when and why it may not, and what challenges and opportunities exist for science moving forward in the current federal environment.

Troy Hartley, Ph.D., (Moderator), Director, Virginia Sea Grant Dr. Troy Hartley serves as the Director of Virginia Sea Grant (VASG) and a research professor of Marine Science & Policy at the Virginia Institute of Marine Science and the William & Mary Public Policy Program. At VASG, Troy has overall responsibilities for the strategic priorities and direction, partnership building and relations, new initiatives, and program oversight. He has been heavily involved in professional development with VASG's fellows on the science-policy interface, transdisciplinary team science, and collaborative leadership. He has over 20 years of experience in coastal, marine, and natural resource policy and management. Dr. Hartley is a public policy scholar and his research considers collaborative governance networks and processes, stakeholder attitudes, perceptions and opinions, and change management in communities, particularly in coastal, marine and fisheries contexts. He has a Ph.D. in environmental and natural resource policy from the University of Michigan, an M.A.I.S in environmental policy from George Mason University, and a B.S. in zoology from the University of Vermont.



Constance (Stacee) Karras J.D., Program Officer, Ocean Studies Board of the National Academies of Sciences, Engineering and Medicine Research Scholar, Stanford University

Ms. Karras is a program officer with the Ocean Studies Board of the National Academies of Sciences, Engineering, and Medicine. She

began her career at the National Academies as a fellow and research associate before serving as a program officer. Stacee has staffed several consensus studies, ranging from *An Ecosystem Services Approach to Assessing the Impacts of the Deepwater Horizon Oil Spill in the Gulf of Mexico* (2013) to *Evaluating the Effectiveness of Fish Stock Rebuilding Plans in the United States* (2014). She recently served as study director on *Review of the Marine Recreational Information Program* (2017). She currently directs a study on chemical dispersants as an oil spill response measure, and leads a standing committee that advises the Bureau of Ocean Energy Management's Environmental Studies Division. Ms. Karras received her B.A. in marine affairs and policy from the University of Miami, and an M.A. in marine affairs and policy from the University of Miami's Rosenstiel School of Marine and Atmospheric Science. In 2012, she received her J.D. from the University of Virginia.



Jon Hare, Ph.D., Science & Research Director, NOAA Northeast Fisheries Science Center Dr. Jon Hare is the Science and Research Director of Northeast Fisheries Science Center. He oversees science related to NOAA Fisheries mission in the Northeast region

including wild-captured fisheries, cultured fisheries, protected species, habitat, and ecosystem science. He received a National Research Council Research Associate in 1994 to work at the NOAA Beaufort Laboratory and was hired by NOAA in 1997. Jon moved to the NOAA Narragansett Laboratory in 2005, was appointed Oceanography Branch Chief in 2008 and Lab Director in 2012. He started as NEFSC Director in 2016 and is now located at the NOAA Woods Hole Laboratory. His research has focused on fisheries oceanography: understanding the interactions between the ocean environment and fisheries populations with an aim of contributing to assessments and management. Jon also examines the effect of climate change on fish and invertebrate population dynamics. This work involves coupling the output of global climate models with population models to simulate the effects of climate change on population dynamics. He also works to move the new scientific information into the assessment and management process, and the development of new technologies for observing ocean ecosystems.



Julia Snouck-Hurgronje, M.S. Knauss Fellow, Senate Committee on Commerce, Science, and Transportation

Julia Snouck-Hurgronje started her Knauss Marine Policy Fellowship in February 2017 for U.S. Senate Committee

on Commerce, Science, and Transportation, minority staff. The Committee is composed of twenty-five Senators, led by Chairman John Thune (R-SD) and Ranking Member Bill Nelson (D-FL). The Committee is composed of six subcommittees which together oversee a vast range of issues, including communications, highways, aviation, rail, shipping, transportation security, merchant marine, the Coast Guard, oceans, fisheries, weather, disasters, science, space, interstate commerce, tourism, consumer issues, economic development, technology, competitiveness, product safety, and insurance. This Committee has responsibility for the National Sea Grant College Program's authorizing legislation. Julia earned her bachelor's degree in biological sciences from Clemson University and the Calhoun Honors College in 2010. She received her master's in public policy and master's in marine science in 2016 from the College of William & Mary, and the Virginia Institute of Marine Science.



Speaker Bios

SCIENCE COMMUNICATION

The idea that hope and positive emotional frames should be used to increase efficacy (people's assessments of their capability and perceived effectiveness of their actions) for environmental and scientific actions, has been emphasized in the broader community of research. It has also been found that positive scientific content was more likely to be shared, and that the brand for science is hope. By bringing together an interdisciplinary team representing the fields of research, advocacy and journalism to explore this topic from different perspectives, we seek to promote a conversation that expands our understanding of the processes, outcomes, boundaries and limitations of this idea in the context of science communication for the environment.



Ian Vorster, M.S., (Moderator) Communications Program Manager, Virginia Sea Grant

Ian Vorster crafts and executes the strategy for the Virginia Sea Grant communications center. He serves as a visual communications instructor on the Advanced Science Communications Seminar, supervises staff, and mentors a group of science writing, multimedia and research interns as they hone their ability to share the research and work of fellows, extension, agency and non-profit partners. In the process, this storytelling hub demystifies the marine and coastal scientific process, and connects it with relevant audiences at the community level. Mr. Vorster has degrees in photography and geography, and holds a master of science with an emphasis in environmental communications.

Ian Vorster crafts and executes the strategy for the Virginia Sea Grant communications center. He serves as a visual communications instructor on the Advanced Science Communications Seminar,



Kathy Rowan, Ph.D., Professor, Science Communication Certificate Program, George Mason University

Dr. Katherine E. Rowan is professor of communication at George Mason University in Fairfax, Virginia. Her research concerns the challenges of earning trust and explaining complexities in risk and crisis communication contexts. She has published in journals such as Health Communication, Risk Analysis, Communication Education, Journal of Applied Communication Research, and Nature Climate Change and authored or edited over 70 scholarly and governmental publications. At Mason, she teaches courses in public relations, science communication, risk communication, and crisis communication and directs Mason's graduate program in science communication. A Fellow of the American Association for the Advancement of Science, she assists scientists in outreach through grants from the National Science Foundation and Virginia Sea Grant.

Dr. Katherine E. Rowan is professor of communication at George Mason University in



Chris Volpe, Ph.D., Executive Director, ScienceCounts

Dr. Christopher Volpe, is the executive director of ScienceCounts, a 501(c)3 organization working to enhance public support for science. He is a vocal advocate for enhancing the impact science communication activities by incorporating proven marketing and sales strategies and tactics from the business sector. Over the last two decades, Dr. Volpe has been an active entrepreneur, launching several ventures to support the development and marketing of science education and outreach products and services. Prior to ScienceCounts, he was the president and co-founder of Prismatic Laser Programs, an innovative education company currently the nation's leading provider of STEM assembly programs and events to K - 12 schools, science museums, and planetariums. Before Prismatic, Dr. Volpe was executive director and partner of Hyperlearning, a California-based science education company that created novel undergraduate science education resources, until it was acquired by The Princeton Review. Besides his enthusiasm for promoting science to the public, Dr. Volpe is also a senior pilot for the Commemorative Air Force, an aviation museum that maintains the world's largest collection of

Dr. Christopher Volpe, is the executive director of ScienceCounts, a 501(c)3 organization working to

flying WWII aircraft. Dr. Volpe received his Bachelor's Degree in Chemistry from Rutgers University and Ph.D. in Oceanography from Scripps Institution of Oceanography, University of California San Diego.



Tim Wheeler, M.A., Managing Editor & Writer, Chesapeake Bay Journal

Tim Wheeler has covered the Chesapeake Bay and other environmental issues for most of his career, including nearly 32 years with the Baltimore Sun and Evening Sun. He's a former president of the Society of Environmental Journalists and has won numerous awards, including the 2010 Excellence in Journalism Award from the Renewable Natural Resources Foundation. A native of West Virginia, he grew up eating oysters and followed his taste buds to the Bay. He began his career at the Richmond Times-Dispatch, then worked for a regional news service in Washington, D.C. After that, he moved still closer to the Bay, reporting for the Norfolk Virginian-Pilot and Ledger-Star, and finally to Maryland. He earned a B.A. from the University of Virginia and a master's in journalism from Columbia University.

Tim Wheeler has covered the Chesapeake Bay and other environmental issues for most of his career, including nearly 32 years with the

Speaker Bios

ESTABLISH MEANINGFUL PARTNERSHIPS

The NOAA Coastal Storms Program has funded initiatives across the nation to bring together federal, state and local organizations that increase community resiliency and reduce the negative impacts of coastal storms. During this interactive session, panelists will showcase positive outcomes from past Coastal Storms partnerships, and share their reflections on how to develop mutually-beneficial partnerships that transfer academic research to the end-users who can benefit from the science.



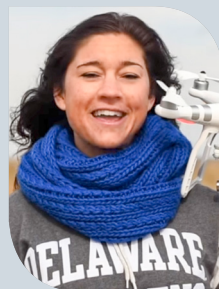
**Lindy Bezthold, M.S. (Moderator),
Senior Coastal Management
Specialist, Baldwin Group**

Lindy Betzhold is a Senior Coastal Management Specialist with The Baldwin Group on contract to the National Oceanic and Atmospheric Administration (NOAA) Office for Coastal Management in Charleston, SC. She received a Masters in Marine Science from VIMS and a Masters in Public Policy from William and Mary, allowing her to approach coastal management using science and remote sensing as well as policy and resource management. She has been with NOAA for 12 years, and currently serves as the Program Coordinator for the Coastal Resilience Grant Program and the liaison for the Georgia Coastal Management Program. She is a certified Project Management Professional and enjoys applying project management skills and experience to coastal management programs and projects.



**Nasrin Alamdari, Mid-Atlantic Coastal
Storms Fellow, Ph.D. student, Biological
Systems Engineering, Virginia Tech**

Nasrin Alamdari received her bachelor's in civil and environmental engineering from the University of Tabriz in Tabriz, Iran in 2009. She also has one master's degree at Sharif University of Technology in Tehran, Iran in 2011, and a second master's degree at Tennessee Technological University in 2014, both in civil and environmental engineering. Currently, Nasrin is a Ph.D. candidate studying biological systems engineering at Virginia Tech. Her research focuses on evaluating the impacts of climate change on water quality management and BMP resiliency particularly in urban areas. Her interest lies on development and application of water quality models and decision support systems (DSS) at different scales varying from a small urban catchment to a large basin. She is evaluating the impacts of nonstationary events such as land-use/land cover (LULC) and climate variability on water quality.



**Stephanie Dohner, Mid-Atlantic
Coastal Storms Fellow, Ph.D. Student,
Oceanography University of Delaware**

Stephanie Dohner's current work as a Ph.D. Student at the University of Delaware incorporates coastal zone mapping using robotics. From aerial drones to surface and underwater vehicles, spatial and temporal data are mapped with high-resolution and accuracy to understand coastal processes like never before. Her lab's work includes sediment dynamics, coastal morphology, coastal storm response, marsh evolution, and benthic habitat mapping, and is heavily focused on bringing robotic monitoring techniques to all environmentally-interested groups while disseminating vital information on coastal flood, risk, and resiliency.



**Russell Jackson, B.S., Senior Coastal Hazards
Specialist, NOAA Office for Coastal Management**

Russell Jackson joined NOAA in 1998 after working as an economist for over six years with the US Army Corps of Engineers. From 1998-2005, Russell worked at the NOAA Coastal Services Center (CSC) as a Coastal Hazards Specialist. In 2005, he temporarily transitioned to a regional office of NOAA CSC, the NOAA Pacific Services Center. He also served as the Executive Director of the Pacific Risk Management 'Ohana, (PRiMO), a coalition of organizations with a role in hazards risk management. He transitioned back to NOAA CSC in 2008 as a Senior Coastal Hazards Specialist working on hazards and climate resilience efforts. Russell is also the Program Manager for the NOAA Coastal Storms Program.



Greg Johnson, M.E., Stormwater Technical Services Engineer, Department of Public Works Virginia Beach City Government

a holistic approach to stormwater management and is including stormwater quantity, quality and sea level rise in the various projects the City is pursuing. Mr. Johnson is responsible for providing technical support for stormwater issues on City projects and assisting consultants working on private development. He is the project manager for the City wide Master Drainage Study, Comprehensive Recurrent Flooding Sea Level Rise Study and Analysis of and Adaption of Runoff Reduction Method criteria for the City.

Greg Johnson leads the Stormwater Technical Services Section for the City of Virginia Beach. He is a frequent and regular participant in groups and committees tackling issues related to stormwater management. He encourages



Chellby Kilheffer, Coastal Storms Fellow, Ph.D. Student, Fish & Wildlife Biology & Management, SUNY College of Environmental and Forest Biology

habitat use in Syracuse, New York. She then transitioned into a Ph.D. at SUNY ESF with Dr. Underwood for fall 2014. Ms. Kilheffer moved to Fire Island National Seashore, and worked closely with park biologists to monitor white-tailed deer movement and space use, assess vegetation growth in areas overwashed by Hurricane Sandy in 2012, and used aerial imagery to quantify landscape change over time. Her dissertation identifies influences of white-tailed deer activity to post-disturbance dune vegetation.

Chellby Kilheffer completed her B.S. in General Biology at Penn State Berks in May 2012, and immediately began a M.S. in Conservation Biology at State University of New York ESF in fall 2012 with Dr. Brian Underwood. Her thesis identified landscape characteristics that influence urban white-tailed deer



Laura Lemke, Coastal Storms Fellow, Ph.D. Student, Civil, Environmental, and Ocean Engineering, Stevens Institute of Technology

her B.E. in Civil Engineering, and M.E. in Ocean Engineering from Stevens in 2014.

Laura Lemke is a Ph.D. student of coastal engineering at Stevens Institute of Technology in Hoboken, New Jersey studying under the advisement of Dr. Jon K. Miller. Prior to attending Stevens, Ms. Lemke worked as a coastal engineer at the consulting firm, CH2M, based in New York. She received



Yi Liu, Mid-Atlantic Coastal Storms Fellow, Ph.D. Student, Civil & Environmental Engineering Virginia Tech, Blacksburg

coastal flood hazard analysis with Dr. Jennifer Irish since then. Ms. Liu received the 2016 Edna Bailey Sussman Trust Summer Internship and Exceptional Merit Award, and her research has focused on storm surge temporal evolution analysis, probabilistic surge hazard response under sea level rise, and surge timing response under sea level rise. Last but not least, Ms. Liu is constantly honing her communication skills through teaching and outreach programs. She is currently pursuing Virginia Tech's Preparing Future Professoriate Certificate, and is the instructor of record for an undergraduate section of fluid mechanics at Virginia Tech in the semester of Fall 2017.

Yi Liu is a Ph.D. candidate at the Department of Civil and Environmental Engineering at Virginia Tech. She earned her Bachelor's degree from Shanghai Jiao Tong University in China in 2013, and has been working on



Jeff Orock, B.S., Meteorologist-in-Charge, National Weather Service - Wakefield Office

Virginia. Jeff has been in the NWS for 23 years spending most of his career working with emergency managers, planners and other agencies on storm mitigation, response and recovery. He has been with the Wakefield NWS office since the summer of 2011.

Originally from Richmond, Virginia, Jeff Orock grew up around Hampton Roads. Following his degree in meteorology from Florida State University, he served with the National Weather Service (NWS) in Florida, Texas, North Carolina, and now

Speaker Bios

SCIENCE INTO EDUCATIONAL CURRICULA

Educators from the Virginia Institute of Marine Science's (VIMS) Marine Advisory Program and the Chesapeake Bay National Estuarine Research Reserve in Virginia (CBNERR) created the Virginia Scientists and Educators Alliance (VA SEA), a network of graduate students, teachers, and informal. This panel will discuss how to transfer scientific research into usable lesson plans and outreach activities.

**Lisa Lawrence M.S. (Moderator),
Marine Education Program Leader,
Marine Advisory Program
Virginia Institute of Marine Science**

Lisa Lawrence is the Marine Education Program Leader for VIMS Marine Advisory Program and Virginia Sea Grant. With 20 years of experience incorporating authentic scientific data into classroom resources and teacher professional development, she helps both veteran researchers and early

career scientists design and implement broader impact projects targeting the K-12 community. Lisa also works closely with graduate students in VA SEA and VIMS Graduate GK-12 projects, providing them with training and guidance to help them communicate their research to GK-12 audiences.



**Sarah McGuire Nuss, M.S., General Education and Outreach
Coordinator, Chesapeake Bay National Estuarine Research Reserve**

Sarah Nuss has served as the Chesapeake Bay National Estuarine Research Reserve

Education Coordinator for the past 12 years. The CBNERR System is a network of 29 coastal sites designated to protect, study, and educate about estuaries. At CBNERR, Sarah leads the Education Program which strives to enhance student, teacher and public awareness, understanding, and appreciation of estuaries by providing hands-on, investigative field experiences, curriculum and information material, multi-exposure opportunities, teacher training programs, and public outreach events. As the PI for the VA SEA, Sarah has worked with graduate students and local teachers to partner in developing high quality lesson plans related to current marine science research.



**Bruce Pfirmann, M.S., Commonwealth Fellow,
Department of Conservation and Recreation**

Bruce Pfirmann is a Coastal Policy Fellow working with the Virginia Department of Conservation and Recreation's Shoreline Erosion Advisory Service as part

of the Virginia Sea Grant Commonwealth Fellowship. His primary responsibility is the tracking and verification of shoreline management projects (e.g. living shorelines) that reduce the amount of pollutants entering Chesapeake Bay. Mr. Pfirmann completed an M.S. in marine science at the Virginia Institute of Marine Science (VIMS) in August 2017, studying the role restored oyster reefs play as habitat for economically and ecologically important finfish. While at VIMS he participated in the VA SEA program and designed a blue crab-themed lesson plan for middle students. Bruce graduated with a B.S. in Biology from William & Mary in 2013, where research experiences took him from Chesapeake Bay, to Argentina, the Dominican Republic, and Antarctica.



**Alice Besterman, Ph.D. Student, Environmental
Science Department, University of Virginia**

Alice Besterman is a fourth year Ph.D. Candidate at University of Virginia in the Department of Environmental Sciences. She is broadly interested in

community and ecosystem ecology, particularly in coastal habitats. Alice studies coastal ecology, focusing on communities living on intertidal mudflats. More specifically, she is studying the effects of a non-native macroalgae, *Gracilaria vermiculophylla*, on mudflat community structure and trophic interactions. She also studies the potential role of *Gracilaria* as a host for human pathogenic bacteria.



**Catherine Roberts, M.S., Retired
Teacher, Educator, Virginia Aquarium**

Catherine Roberts received a B.S. in Secondary Science Education and a M.S. in Biology. She taught Middle School Science for 36 years in Portsmouth and Chesapeake Public

Schools, and is National Board for Professional Teaching Standards certified in Early Adolescence Science. She served as a mentor for the Virginia Department of Education to first and second year science teachers in Tidewater Virginia schools for four years following her retirement. Ms. Roberts currently works as an educator for the Virginia Aquarium and Marine Science Center. During her career she has received the Presidential Award for Excellence in Mathematics and Science Teaching, the Disney American Teacher Award for Middle School Science, and was selected Chesapeake Public Schools Secondary Teacher of the Year.





Virginia Institute of Marine Science
Science for the Bay... Impact for the World

Advanced Science Communication Presentations

Poster Session Exhibits

Why is seagrass important to blue crabs and their fishery

Kristen Bachand, Virginia Institute of Marine Science, M.S. student Marine Science, VASG supported

Our sandy backyards: Coastal drone citizen science

Stephanie Dohner, University of Delaware, Ph.D. student Oceanography, Coastal Storms Fellow

A wrinkle in time: The legacy and current contributions of toxic polychlorinated biphenyls

Andrew Kirk, Virginia Commonwealth University, M.S. Biology student, Commonwealth Fellow

What controls the establishment and spread of an introduced fish?

Vaskar Nepal KC, Virginia Institute of Marine Science, Ph.D. Marine Science student, Graduate Research Fellow

How do we count fishes?

Cassidy Peterson, Virginia Institute of Marine Science, Ph.D. Marine Science student, NMFS-Sea Grant Population & Ecosystem Dynamics Fellow

Rising seas and eroding coasts: Protecting our shorelines in Virginia

Bruce Pfirrmann, Virginia Institute of Marine Science, M.S. Marine Science student, Commonwealth Fellow,

Role of wetlands in coastal resilience

Ali Mohammad Rezaie, George Mason University, Ph.D Engineering student, VASG supported

What the HAB is that? An Aquaculturist's guide to understanding harmful algal blooms in the lower Chesapeake Bay

Clara Robison, Virginia Institute of Marine Science, M.S. Marine Science student, Graduate Research Fellow

Urea cycling in coastal waters: Increasing relevance and tools for education

Brianna Stanley, Virginia Institute of Marine Science, M.S. Marine Science student, Graduate Research Fellow

American eels (*Anguilla rostrata*): Reconnecting coastal and inland waters of Appalachia

Jonathan Studio, James Madison University, M.S. Biology student, VASG supported

What We Do

FELLOWSHIPS & RESEARCH: Virginia Sea Grant supports the growth of future leaders in coastal and marine research, outreach and education, policy, and management through funding and professional development through undergraduate, graduate, and post-graduate fellowships and internships. We administer regional and national research competitions that enhance a healthy coastal ecosystem and economy.



Poster Presentations

Identifying potential barriers to successful spatial management of fisheries and aquaculture

Jennifer Beckensteiner, Virginia Institute of Marine Science, Graduate Research Fellow

Additional Authors: Andrew M. Scheld, David M. Kaplan

Investigating wave dissipation effects of a marsh-sill living shoreline

Maura K. Boswell, Old Dominion University, Graduate Research Fellow

Additional Authors: Navid Tahvildari

Incorporating species composition and trait-based approaches to understand coastal resilience in a changing climate

Joseph Brown, Virginia Commonwealth University

Additional Authors: Julie Zinnert

Trends in regional sea level rise over the 20th century

Alessandra Burgos, Old Dominion University

Additional Authors: Benjamin Hamlington, Phil Thompson, Felix Landerer

Submarine groundwater discharge in the Chesapeake Bay: Quantifying the importance of field parameters

Charles L. Carlson, Old Dominion University

Additional Authors: Jennifer Georgen

An examination of the effects of magnesium enriched substrates on oyster spat

Matthew S. Elder, James Madison University

Additional Authors: Patrice Ludwig

The community rating system and Virginia - learning from CRS programs around the USA

Taylor Goelz, Virginia Institute of Marine Science at William and Mary

Additional Authors: Lauren Pudvah, Peter Wells

Using short videos to bring attention to cutting edge research

Chelsea Gray, George Mason University

Pollution trade-offs for sustainable coastal agricultural management

Jacob Hagedorn, University of Maryland Center for Environmental Studies

Additional Authors: Eric Davidson

Poster Presentations

Computational analysis of flow inside a single coral colony

M.D. Monir Hossain, Virginia Tech

Additional Authors: Anne Staples

The role of seedling recruitment in the persistence of *Zostera marina* meadows

Andrew Johnson, Virginia Institute of Marine Science, VASG supported

Additional Authors: Robert Orth, Kenneth Moore

Factors affecting dune and vegetation recovery from Superstorm Sandy in the Otis Pike High Dune Wilderness Area on Fire Island National Seashore (FIIS), New York

Chellby R. Kilheffer, State University of New York, College of Environmental Science & Forestry, Coastal Storms Fellow

Additional Authors: H. Brian Underwood, Jordan Raphael, Lindsay Ries

A shear-limited flocculation model for dynamically predicting average floc size

Rachel Kuprenas, Virginia Tech, Graduate Research Fellow

Additional Authors: Duc Tran, Kyle Strom

Eastern oyster (*Crassostrea virginica*): An approach to oyster restoration utilizing interstitial space

Bailie Lavan, James Madison University

Additional Authors: Patrice Ludwig

Development of a storm erosion climatology for the mid-Atlantic coast

Laura Lemke, Stevens Institute of Technology, Coastal Storms Fellow

Additional Authors: Jon K. Miller

Characterizing hydrologic and water quality conditions of urban and non-urban streams of central Virginia

Rikki Lucas, Virginia Commonwealth University

Additional Authors: Paul Bukaveckas

Ecosystem-based approaches to modeling fish species distributions in Chesapeake Bay

Cristin Mayes, Hampton University

Additional Authors: Andrij Horodysky, Carolina A. Bonin, Deidre Gibson, Eric A. Lewallen

Poster Presentations

A comparison of eDNA and video surveillance as alternative sampling methods for river herring studies

Jessie Melton, George Mason University

Additional Authors: Kim de Mutsert

Understanding livelihood diversification within Maryland oyster aquaculture

Adriane K. Michaelis, University of Maryland College Park

Additional Authors: Donald W. Webster, Jen Shaffer,

Salinization affects the abundance of microbial N-cycling functional genes in wetland soils

Joseph C. Morina, Virginia Commonwealth University, Graduate Research Fellow

Additional Authors: Rima B. Franklin

Salinity tolerance of invasive blue catfish and implications for dispersal in the Chesapeake Bay region

Vaskar Nepal K.C., Virginia Institute of Marine Science, Graduate Research Fellow

Additional Authors: Mary C. Fabrizio

New measures of aquatic habitat for assessing restoration resilience

Hayley Oakland, University of Maryland - Baltimore County

Additional Authors: Matthew Baker

Hampton Roads residents' preferences for dune and beach Management

Seth Parker, Old Dominion University

Additional Authors: Donta Council,

Factors affecting condition of juvenile striped bass in Virginia nursery areas

Olivia Phillips, Virginia Institute of Marine Science

Additional Authors: Mary C. Fabrizio

Valuing coastal wetlands for flood protection: Impacts of storm surge, sea level rise and marsh migration on coastal community and protected areas

Ali Mohammad Rezaie, George Mason University, VASG supported

Additional Authors: Celso M. Ferreira, Margaret Walls, Alayna Bigalbal, Ziyang Chu, and Juan L. Garzon

Poster Presentations

Monitoring dam removal using aerial photographs

Alex M. Rittle, University of Maryland - Baltimore County

Additional Authors: Matthew Baker, Matthew Cashman, Andy Miller, Matthew Fagan

Carry-over effects of environmental pH and temperature on the eastern oyster, *Crassostrea virginica*

Katherine (Annie) Schatz, Virginia Institute of Marine Science

Additional Authors: Emily E. Rivest

Influence of wastewater effluent treatment and disinfection on DON and chlorophyll in a Chesapeake Bay tributary

Brianna Stanley, Virginia Institute of Marine Science, Graduate Research Fellow

Additional Authors: Rachel Sipler, Quinn Roberts, Elijah Zane Norton, Lynn Kilberg Thoreson, and Deborah Bronk

American Eels (*Anguilla rostrata*): Reconnecting coastal and inland waters of Appalachia

Jonathan A. Studio, James Madison University, VASG supported

Additional Authors: Christine L. May

Are speckled trout adapted to cold waters at their northern range limit?

Jingwei Song, Virginia Institute of Marine Science, Graduate Research Fellow

Additional Authors: Rich Brill

Water clarity and suspended particle dynamics at oyster aquaculture sites in southwestern Chesapeake Bay, Virginia

Jessica S. Turner, Virginia Institute of Marine Science

Additional Authors: Grace M. Massey, M. Lisa Kellogg, Carl T. Friedrichs

Assessing the impact of land use and climate change on streamflow and nutrient delivery to the New River

Estuary, North Carolina

Shanna C. Williamson, Virginia Institute of Marine Science

Additional Authors: Mark J. Brush

Landscape-level effects of shrub encroachment into barrier island grasslands

Lauren K. Wood, Virginia Commonwealth University

Additional Authors: Julie C. Zinnert



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Dewberry is a leading, market-facing firm with a proven history of providing professional services to a wide variety of public- and private-sector clients. Recognized for combining unsurpassed commitment to client service with deep subject matter expertise, Dewberry is dedicated to solving clients' most complex challenges and transforming their communities. Dewberry's coastal experts maximize pre- and post-disaster flood resilience by addressing prioritized risks. Established in 1956, Dewberry is headquartered in Fairfax, Virginia, with more than 50 locations and 2,000+ professionals nationwide. To learn more, visit www.dewberry.com. **Contact Brian Batten (bbatten@dewberry.com) or Laura Szczyrba (lszczyrba@dewberry.com)**

Ecology and Environment

Ecology and Environment, Inc. (E & E) is a recognized global leader in environmental management. We are a network of dedicated professionals passionate about making the world a better place by working collaboratively to solve complex environmental challenges. By carefully incorporating ecological, social, and economic considerations into its business planning and decision-making processes, E & E strives to balance the interests of the present with those of future generations. Please view our website at www.ene.com for a full listing of career opportunities and to apply online. Ecology and Environment, Inc. is an EO and AA employer – M/F/Vets/Disabled/and other protected categories. **Contact: Katherine Guttenplan (KGuttenplan@ene.com) or Cindy Shurling (CShurling@ene.com)**

Green Fin Studio

Formerly Chesapeake Environmental Communications, Green Fin Studio helps those in research, conservation, education and eco and heritage tourism better define their messages, and increase connections with their target audiences. Green Fin was founded by two marine biologists to provide marketing and communication services to clients with environmental messages. The team includes graphic designers, digital media strategists, experienced programmers and creative communicators. We speak your language so we can help you translate and target your messages. Find us online at www.GreenFinStudio.com or write to us at [Hello@GreenFinStudio.com](mailto>Hello@GreenFinStudio.com) so we can help you tell and share your story. **Contact: Paula Jasinski (paula@chesapeakeedata.com) or Gina Sawaya (gina@chesapeakeedata.com)**

National Association of Marine Laboratories

The National Association of Marine Laboratories (NAML) promotes research and education in the marine sciences, and that facilitates cooperation and coordination amongst the diverse marine and coastal research laboratories in the U.S. These laboratories constitute vital, cost-effective, community-based "windows on the sea" that help to understand and appreciate the mosaic of U.S. marine and coastal habitats. NAML represents a combined infrastructure investment worth billions of dollars from a diverse array of private, state, and federal sources. Together NAML institutions supply essential facilities for thousands of scientists each year to conduct critical research and monitoring, and provides hundreds of thousands of students with indispensable hands-on STEM research experiences. **Contact: Michael De Luca (NAML.President@naml.org)**



SCIENCE MATTERS



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Exhibitors

NOAA Chesapeake Bay Office

The NOAA Chesapeake Bay Office (NCBO) strives to achieve its vision of a healthy and productive Chesapeake Bay ecosystem by providing science, service, and stewardship to support the protection and restoration of the Bay. NCBO experts apply NOAA's wide range of capabilities to help address the problems and challenges of natural resource management in the mid-Atlantic region. Focus areas include: **Fisheries** - Expanding the understanding of fish populations in the Chesapeake Bay to ensure a balanced and healthy ecosystem by conducting and supporting research and monitoring, and coordinating policy; **Oysters** - Supporting restoration of oyster reefs, which provide needed habitat for a variety of Bay species, through funding, policy, and scientific support, and by quantifying benefits restored reefs provide; **Observations** - Maintaining the Chesapeake Bay Interpretive Buoy System, 10 buoys that collect and relay near-real-time data to users for a variety of purposes; **Environmental Literacy** - Supporting work to incorporate watershed education into state and local education policy and enabling use of best science in K-12 and nonformal education; and **Climate** - Facilitating information exchange about climate issues among researchers, resource managers, and planners, and incorporating climate into Chesapeake Bay Program work. **The Choptank Habitat Focus Area** focusses work from multiple NOAA offices in the Choptank River (Eastern Shore) watershed, highlighting science and research, restoration, and community engagement. **Contact: Bruce Vogt (bruce.vogt@noaa.gov) or Andrew Larkin (andrew.w.larkin@noaa.gov)**

NOAA National Sea Grant College Program

The National Sea Grant College Program is a federal-state partnership consisting of 33 university-based programs in every coastal and Great Lakes state as well as Puerto Rico and Guam. Sea Grant's mission is to enhance the practical use and conservation of coastal, marine and Great Lakes resources to create a sustainable economy and environment. Sea Grant is committed to developing a skilled marine and coastal workforce by providing job-based training, research funding to undergraduate and graduate students, internships, and fellowships. At the national level, Sea Grant hosts two fellowship programs, the John A. Knauss Marine Policy Fellowship and the National Marine Fisheries Service-Sea Grant Joint Fellowship Programs. The John A. Knauss Marine Policy Fellowship Program is one of the nation's most prestigious marine policy fellowship programs, offering direct experience in ocean, coastal and Great Lakes management and research. The National Marine Fisheries Service-Sea Grant Joint Fellowship Program is a focused workforce development program to train highly qualified individuals through two topic areas: population and ecosystem dynamics, and marine resource economics. To learn more about Sea Grant and our education and fellowship opportunities please visit <http://seagrants.noaa.gov/careers>. **Contact: Rebecca Briggs (Rebecca.briggs@noaa.gov) or Maddie Kennedy (maddie.kennedy@noaa.gov)**

The Nature Conservancy – Virginia Coastal Reserve

The Nature Conservancy owns 14 of the 18 barrier and marsh islands off Virginia's Eastern Shore, and protects 90 percent of the Atlantic coastline in the area. The work we do at the Virginia Coast Reserve serves as a model for how conservation can help a landscape adapt, and become more resilient in the face of a changing climate. Land Protection is at the heart of the organization's work worldwide, and our staff monitors over 40,000 acres on the Shore annually between Conservancy owned property, and privately-owned conservation easements. Working with multiple partners, our Marine Restoration team focuses on large-scale projects to re-establish historic seagrass beds and oyster reefs, and return native oysters and bay scallops to Virginia waters. Our Outreach and Education staff is working to engage our neighbors by connecting people with our work through public events and volunteer opportunities, and by providing field experiences for teachers and students on Conservancy properties in both Eastern Shore counties. **Contact: Jen David (jen.david@tnc.org) or Cristina Carollo (cristina.carollo@tnc.org)**



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Exhibitors

Virginia Department of Environmental Quality

Virginia's diverse geography and abundant natural resources benefit agriculture, industry and commerce, and provide a rich environment for people, plants and wildlife. The mission of the VADEQ is to protect and improve the environment for the wellbeing of all Virginians. VADEQ administers state and federal laws, and regulations for air quality, water quality, water supply and land protection. In addition, other agency programs cover a variety of environmental activities, such as improving the ability of businesses and local governments to protect the environment, and offering technical and financial assistance for air and water quality improvements. For more information visit www.deq.virginia.gov **Contact: Stacey Robertson (Stacey.robertson@deq.virginia.gov) or Lee Crowell (lee.crowell@deq.virginia.gov)**

Virginia Department of Health

Interactions with the environment can affect Virginian's quality and length of life, and also impact health disparities. The Office of Environmental Health Services (OEHS) is a public health program within the Virginia Department of Health whose mission is to protect public health by preventing the transmission of disease through food, milk, shellfish, water, and sewage; and to work in partnership with other agencies to protect the environment. Environmental Health is a multi-disciplinary field, and among Virginia's OEHS team are environmental health specialists, marine scientists, geologists, engineers, microbiologists, and data analysts working together to implement a broad spectrum of programs designed to promote and protect health for all Virginians. **Contact: Keith Skiles (keith.skiles@vdh.virginia.gov) or Todd Egerton (todd.egerton@vdh.virginia.gov)**

Virginia Marine Resources Commission

Virginia Marine Resources Commission serves as stewards of the Commonwealth's marine and aquatic resources. The agency manages saltwater fishing, both recreational and commercial, and works to create and maintain sustainable fisheries for the benefit of all anglers and the ecosystem. The agency also manages the state's submerged bottomlands, tidal wetlands, sand dunes, and beaches in order to preserve and protect Virginia's natural resources and the habitat our saltwater fisheries depend on. **Contact: Rachel Peabody (rachel.peabody@mrc.virginia.gov) or Sarah Blachman (sarah.blachman@mrc.virginia.gov)**

Virginia Department of Emergency Management

The Virginia Department of Emergency Management (VDEM)'s mission is to sustain a Commonwealth that is safe, secure and resilient, especially before, during and after emergencies and disasters. VDEM is seeking dynamic, high-energy professionals who can inspire others to raise the bar for performance as well as leverage expertise and resources to support emergency management. VDEM's priority is to ensure Virginia is ready for the hazards of today while preparing for the threats of tomorrow. This requires individuals who are customer-service-oriented and innovative, and willing to take on complex challenges. We are seeking candidates who approach work tasks with a "can-do" attitude and have solid qualifications. VDEM offers numerous opportunities for professional development and access to the best training to further career goals. If you are mission-focused and have the ability to work collaboratively within teams, come join us as we continue to build a more resilient Virginia. **Contact: Lori Dachille (lori.dachille@vdem.virginia.gov) or Rick Mason (rick.mason@vdem.virginia.gov)**

Professional Development

New Opportunities From Virginia Sea Grant

Virginia Sea Grant is committed to providing early-career scientists, engineers, designers, lawyers, and others in related professions the capacity to be tomorrow's coastal and marine science, management, policy, business, and community leaders. Our growing professional development portfolio is aimed at providing students with the knowledge, expertise, and skills to thrive now and in the future.

The following immediate opportunities exist, but new opportunities are announced regularly, so keep an eye on Virginia Sea Grant's Professional Development activities at www.vaseagrant.org/professional-development

COLLABORATIVE RESEARCH WORKSHOP

We are pleased to announce the availability of a one-year professional development training opportunity in the rapidly emerging area of multi-, inter-, and trans-disciplinary research through team science. These forms of cross-disciplinary research produce innovative, integrated breakthroughs and solutions that transcend individual disciplines, and are essential to solving today's grand societal challenges in coastal and marine environments. In particular, enhancing coastal resilience from sea level rise, flooding, storms and other climate change impacts is demanding cross-disciplinary solutions that emerge from a deeper level of knowledge integration than research often achieves. Funded through an NSF Innovations in Graduate Education grant; Virginia Sea Grant, Virginia Institute of Marine Science, University of Virginia, Virginia Commonwealth University, and the University of Central Florida have assembled leading 'science of team science' researchers, and a large faculty of experienced team science practitioners to develop and offer professional training to improve teamwork, build trans-disciplinary research teams and questions, and tackle coastal resilience in Virginia. The training includes two, all-expenses-paid, 2.5-day workshops (one per semester) hosted on Virginia's Eastern Shore.



POLICY FIELD TRIPS

Virginia Sea Grant is excited to offer opportunities for graduate students to explore the science-policy interface in Washington, DC and Richmond, VA through facilitated panel discussions and information sessions with current coastal, marine, and natural resource managers and policy makers.

Participating students have the opportunity to attend workshops prior to the Policy Field Trip to learn more about government structure and the nature of science and policy at the state and federal level, including challenges, opportunities, and science communication. During the spring semester break field trip attendees learn more about the development and implementation of science-based policy and the critical professional skills and competencies needed for a successful career in science-policy, including opportunities to practice professional networking skills.

During Virginia Sea Grant's most recent trip to Washington, D.C. students met with members of: Senator Kaine and Congressman Wittman's Staff, NOAA Chief Scientist Office, NOAA Office of Ocean Exploration & Research, NOAA Fisheries, USEPA Office of Water, Office of Science & Technology, Restore America's Estuaries, and The Pew Charitable Trusts.



ADVANCED SCIENCE COMMUNICATIONS SEMINAR

You know your research is valuable outside of academia, but effectively communicating the importance of your research with non-scientists can be difficult. Resource managers, watermen, community planners, and policymakers can seem as though they speak different languages. How can you translate the importance of your work to people who need to know?

The Advanced Science Communication Seminar is a semester-long professional development opportunity for graduate-level marine scientists—both Virginia Sea Grant fellows and other Commonwealth students who want to develop their skills in communicating to non-scientists. The Seminar consists of two full-day workshop events; the first involving instruction by faculty members, and the second devoted to students presenting a rough draft to receive feedback from community and industry stakeholders who might represent their audiences. Between the first and second workshop faculty members provide one-on-one counseling and coaching for each student as they explore the world of design, video animation, photography, and more to develop their product.

The final product is presented at the annual Graduate Symposium each year. The work of former participants has been aired on PBS television, presented at science museums, and displayed on government websites, and at docksides around Virginia. *If you are interested in enrolling in the Advanced Science Communications Seminar, please contact Virginia Sea Grant Communications Center Manager, Ian Vorster at igvorster@vims.edu*





Virginia Marine Resources Commission serves as stewards of the Commonwealth's marine and aquatic resources and protectors of its tidal waters and homelands, for present and future generations.

The agency manages commercial fishing and marine recreational fishing and works to create and maintain sustainable fisheries for the benefit of all anglers and the ecosystem.

The state's submerged bottomlands, tidal wetlands, sand dunes, and beaches are also managed by the agency in order to preserve and protect Virginia's natural resources and the habitat our saltwater fisheries depend on.

The Law Enforcement Division, the Virginia Marine Police, patrols the waterways to enforce state regulations and to assist citizens in need.

Please join us as protectors of our critical natural resources so that they remain for our children and grandchildren to enjoy them as we do.

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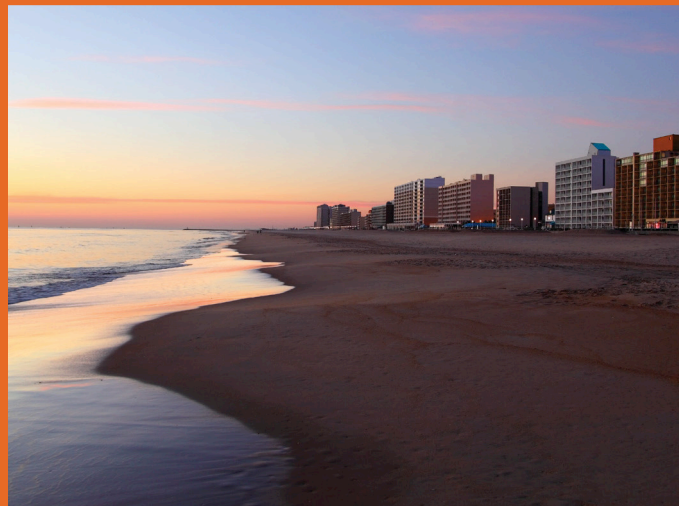


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