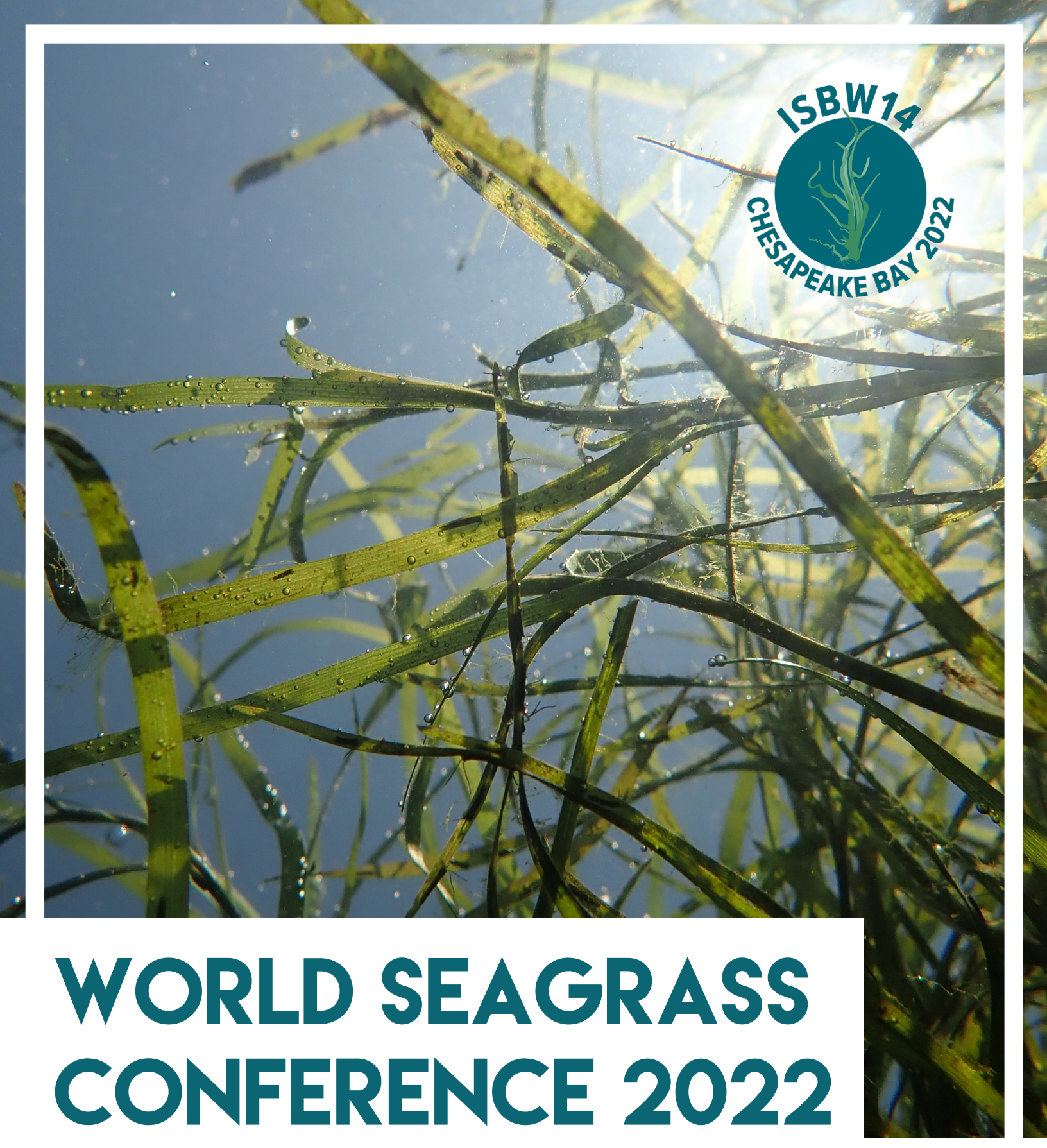
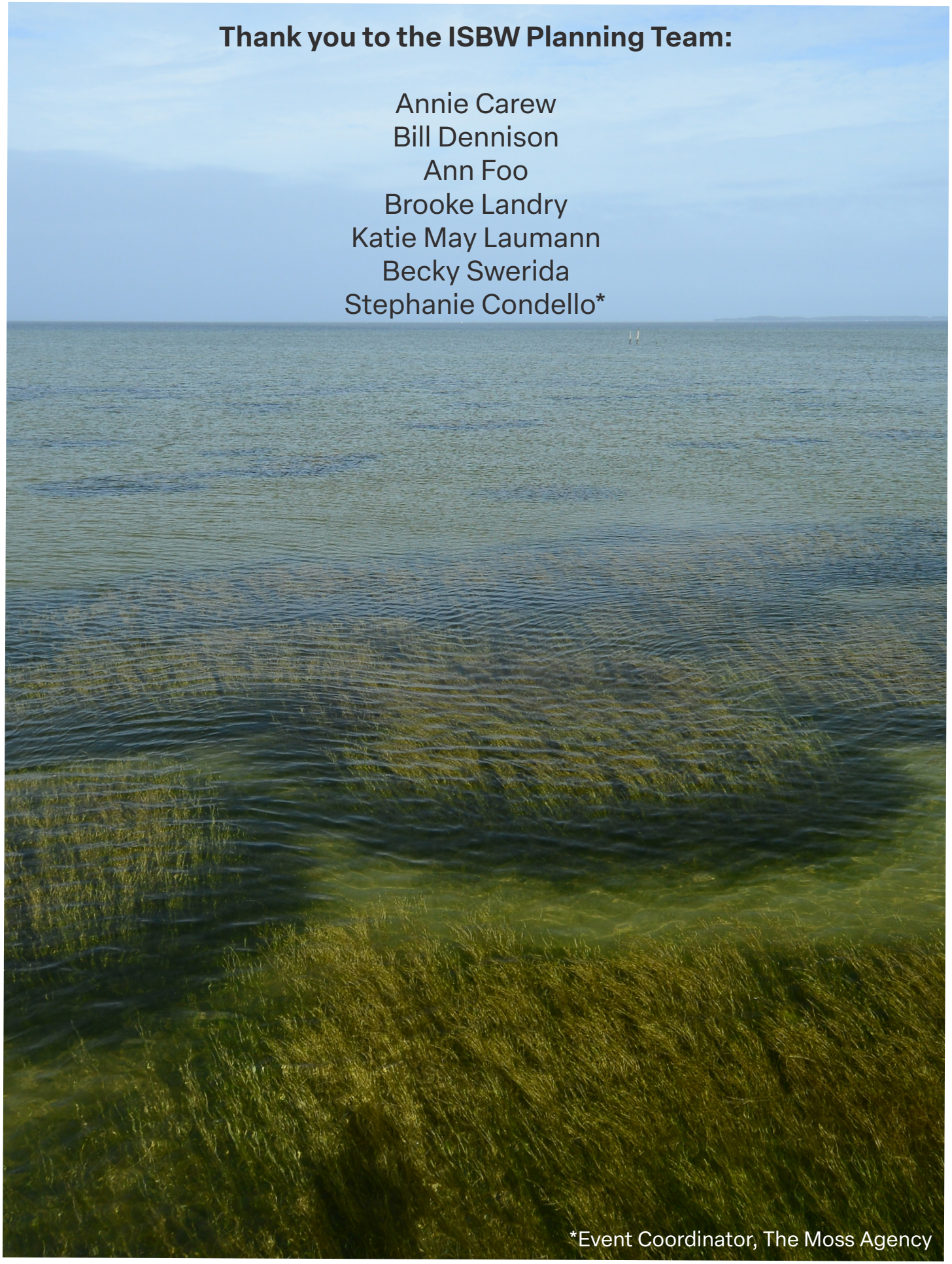


WORLD SEAGRASS CONFERENCE 2022

INTERNATIONAL SEAGRASS BIOLOGY WORKSHOP 14

ANNAPOLIS, MD

SUNDAY 7 AUGUST 2022 FRIDAY 12



Thank you to the ISBW Planning Team:

Annie Carew
Bill Dennison
Ann Foo
Brooke Landry
Katie May Laumann
Becky Swerida
Stephanie Condello*

*Event Coordinator, The Moss Agency

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WELCOME

Dear Colleagues,

Welcome to the vibrant and beautiful city of Annapolis, Maryland for the fourteenth International Seagrass Biology Workshop (ISBW14), combined with the 2022 World Seagrass Conference (WSC22). We originally scheduled this event for 2020, but after the COVID-enforced delay, we are especially happy to host this event IN PERSON!

We chose to hold this workshop and conference in Annapolis for several reasons—most importantly, Annapolis is directly on the Chesapeake Bay. It is also a walkable city, with places to eat and drink nearby, the oldest state capital in continual use in the United States (which actually served as the national capital for 11 eventful months), the US Naval Academy and numerous historic buildings. Please take some time to explore this vibrant and unique city—you will be walking in the footsteps of many notable Americans.

The Chesapeake Bay is a massive, dynamic, and vital estuarine ecosystem—the largest in the U.S.—that is home to the most expansive resurgence of submerged aquatic vegetation (SAV) in the world. The theme of this week is "Signs of Success: Reversing the Course of Degradation," which is inspired by recent successes in the conservation, resurgence, and restoration of seagrasses and other SAV around the world. The success of restoration efforts in the Chesapeake Bay, some of which you can see for yourself on one of this week's field trips, are a testament to that theme.

We at the University of Maryland Center for Environmental Science's Integration and Application Network (UMCES-IAN) are delighted to welcome you to Annapolis on behalf of WSC22 and ISBW14. UMCES-IAN is a dynamic team of Science Integrators and Science Communicators that prides itself on its approach to science communication and stakeholder engagement, both of which can be used to further seagrass monitoring and restoration to great effect. You will be meeting many of the UMCES-IAN team members this week.

I invite you to explore and appreciate the Chesapeake Bay's rich history and diversity of seagrasses and people. There is an exceptional program of speakers and workshops included in this book, and I hope that you enjoy the week!

Welcome,

Bill Dennison
Vice President for Science Application
University of Maryland Center for Environmental Science

Greetings, all! 7 August 2022

On behalf of the World Seagrass Association and the ISBW14 Organizing Committee, I'd like to personally welcome each of you to the World Seagrass Congress and the 14th International Seagrass Biology Workshop in Annapolis, Maryland USA.

Building on the success of previous meetings, the theme for WSC 2022 and ISBW 14 is "Signs of Success", and I look forward to learning the latest results from our student and professional members on seagrass conservation, management, restoration, ecology, and everything else that is presented. The program has shaped up to be excellent, and the networking opportunities will be indeed outstanding. The backdrop of the beautiful city of Annapolis, MD on the shores of the Chesapeake Bay will add to the pleasure of the meeting and provide lasting memories beyond the science.

Given the trials of the last two years, it amazes me that we can meet again as a community. That could not have happened if it wasn't for the extreme dedication of the ISBW 14 Organizing Committee. The planning stage of every scientific conference has its own trials and tribulations– but organizing a meeting during the uncertainty of COVID-19 added layers of complication that no one could have predicted. This Organizing Committee was able to adapt and move forward ensuring that not only this meeting, but future ISBW meetings, continue to bring us together, and for that I extend my sincere gratitude.

I'd also like to thank each of your for attending this conference and bringing your expertise to both WSC 2022 and ISBW 14. You each have the vision, knowledge, wherewithal, and experience to help us ensure a better future for seagrass conservation. Throughout this conference, I ask you to stay engaged, be proactive, and help us shape the future of seagrass science.

I add my best wishes for a successful and fruitful conference, and another thank you to all the organizers who went above and beyond to ensure that we could be here this week to share ideas and learn from one another.

Have an excellent conference!

Sincerely,

Jessie C. Jarvis, PhD
President, World Seagrass Association

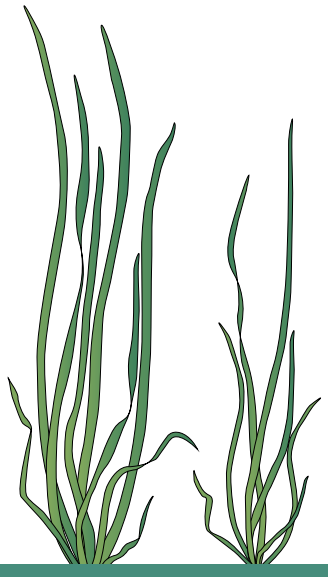
COVID INFORMATION

The ISBW14 and WSC2022 Conference Committee will be an IN-PERSON event in Annapolis, MD, USA. At the time of printing this book, we do not anticipate masking requirements on-site during the conference. SOME FIELD TRIPS DO REQUIRE YOU TO WEAR MASKS. SOME FIELD TRIPS ALSO REQUIRE PROOF OF VACCINATION. Therefore, please bring a mask AND proof of vaccination with you when you attend your field trip. Our current policy follows University of Maryland policy, and may change during the conference (depending on University policy, CDC guidelines, and State of Maryland and City of Annapolis guidelines).

Since many of you will have to take a PCR COVID test before traveling home, here are some nearby options for testing sites:

The Anne Arundel County Department of Health provides free PCR COVID testing on Tuesdays, Thursdays, and Fridays at the Annapolis Exchange, about a 10-minute drive from the hotel. Results are expected in 3-5 days, and appoinments can be made online but walk-ins are also welcome. More information and appointment registration can be found here: https://www.aahealth.org/covid19-testing/

There are also several CVS Minute Clinics in the area providing lab and rapid-result PCR testing, with appointments required. Schedule a test on the CVS website here: https://www.cvs.com/minuteclinic/covid-19-testing



ANNAPOLIS

Annapolis is home to a walkable downtown full of great restaurants, small shops, and historic sites. We hope you get to experience the city during your stay!

Restaurants near the hotel include Tsunami for sushi, Rams Head Tavern for pub food and seafood, Vida Taco for tacos and margeritas (on Tuesday for discounts), and Luna Blu Ristorante Italiano for southern Italian cuisine. GameOn Bar+Arcade features 90's themed retro games, including pinball and Pac-Man, as well as outdoor games like Giant Jenga and Connect 4.

Annapolis is also the proud home of many boutique ice cream shops, including Annapolis Ice Cream Company, The Red Bean, and Storm Bros. Ice Cream Factory. Nearby you can also find O'Brien's Oyster Bar & Seafood Tavern, Dock Street Bar & Grill, and McGarvey's to satisfy any seafood cravings you have after taking a look at the boats at the Annapolis City Dock.

For American decorative arts and architecture, try touring the William Paca House or the Hammond Harwood House, both beautifully preserved historic sites from the 1700's. The Paca House is open every day of the week, and the Hammon Harwood House is closed Tuesdays.

The Banneker-Douglass Museum is a quick 6-minute walk from the Graduate Hotel, and is the State of Maryland's official museum of African-American heritage. Their permanent exhibition, *Deep Roots, Rising Waters: A Celebration of African Americans in Maryland*, covers African-American history in Maryland from 1633 to the present day and the influence of important historical figures, including the naturalist Benjamin Banneker, Supreme Court Justice Thurgood Marshall, Frederick Douglass, Harriet Tubman, and many more. The museum is free and open Tuesday through Saturday, from 10am to 4pm.

The U.S. Naval Academy Museum houses a collection of flags, weapons, navigational instruments, model ships, and other memorabilia to highlight Annapolis's naval history. The museum is free to the public and closed Tuesdays. The Annapolis State House is a registered National Historical Landmark and is open to the public every day of the week. Stop into the Office of Interpretation on the first floor for self-tour materials to walk you through the building's rich history.

Monday, August 8 — 11:00 am–12:30 pm

SESSION 1A:
SALON A/B

Chesapeake Bay Partnership and Collaboration
Convener: Brooke Landry

The CBP's SAV Workgroup: The benefits of multi-institutional collaboration in SAV restoration and management	*Brooke Landry*
Chesapeake Bay Program: Approaches for Setting, Overseeing, and Attaining Restoration Goals	*Carin Bisland*
Chesapeake Research Consortium: Translating Science to Management	*Denice Wardrop*
Chesapeake Bay Trust: Identifying and Funding Key Barriers to Meeting Goals	*Jana Davis*
Alliance for the Chesapeake Bay: Engaging a Watershed	*Kate Fritz*
Waterkeepers Chesapeake: The role of Riverkeepers in SAV Monitoring, Restoration, Outreach, and Advocacy	*Betsy Nicholas*

SESSION 1B:
SALON C

Successful tropical/subtropical seagrass restoration: Longevity, species for various impacts, services reassembled
Convener: Anitra Thorhaug

Tropical and subtropical Southeast Asian Seagrass restoration review and analysis	*Anitra Thorhaug*
Metrics of seagrass restoration – case of *Oceana serrulata* in the Western Indian Ocean	*Manuela Amone-Mabuto*
Adaptive seagrass restoration - a habitat restoration experiment comparing stoic *Zostera marina* & opportunistic *Ruppia maritima* bed structure and function	*Enie Hensel*
A collated evidence review to identify the gaps in the restoration ecology of the seagrass *Posidonia oceanica*	*Arianna Pansini*
↯ Assessing the role of seagrasses as a socio-ecological system: A case study from Cape Verde (Gamboa Bay)	*Seydouba Soumah*
↯ Sexual Reproductive Ecology of *Thalassia testudinum* in Tampa Bay, Florida	*Sheila Scolaro*

↯ *Lightning Talks*

SESSION 2A:
SALON A/B

Trajectories of recovery after degradation in seagrass ecosystem structure, function and services
Convener: Jessie Jarvis

Widgeongrass: The seagrass of the future in a warming Chesapeake Bay	*Christopher J. Patrick*
Return of multiple ecosystem services after eelgrass (*Zostera marina*) transplantations in Danish estuaries	*Rune Christian Steinfurth*
Predicted warming intensifies the negative effects of eutrophication on tropical seagrass: implementation of lipidomic analyses as a sensitive indicator	*Gidon Winters*
Spatial and Temporal Distribution of Intertidal Seagrass Meadows at Banc d'Arguin	*Mohamed Ahmed Sidi Cheikh*
Envisioning the future for seagrass ecosystems under climate change: critical role of nutrient management for a vegetated Chesapeake Bay	*Marc Hensel*
Monitoring reveals similar recovery progress among sediment-tube-based propeller scar restoration approaches	*Savanna Barry*
Hurricanes and Humans: Conflicts in seagrass restoration and mitigation efforts	*Paul Bologna*
Degradation and recovery of seagrass carbon stocks under thermal stress: a large seagrass disturbance field experiment	*Carolyn Ewers Lewis*
A process-based modelling approach to assessing soil carbon assimilation and sequestration in eelgrass meadows	*Siti Maryam Yaakub*
Halodule uninervis above- and belowground lipids in varying environmental conditions in Tambac Bay, Philippines	*Caroline Marie Jaraula*

SESSION 2B:
SALON C

Seagrass wasting disease: understanding host-pathogen interactions to ensure success in seagrass conservation & management
Conveners: Randall Hughes, Forest Schenck, Torrance Hanley

Temperature and host characteristics predict large-scale patterns in wasting disease prevalence	*Forest Schenck*
Disease surveillance using artificial intelligence links seagrass wasting disease to ocean warming across latitudes	*Lillian Aoki*
Under every stone? Phytomyxid parasites in seagrass meadows	*Viktorie Kolátková*
Marine herbivores facilitate transmission of a seagrass pathogen	*Olivia J. Graham*
Pacific oysters are a sink and potential source of the eelgrass pathogen, *Labyrinthula zosterae*	*M. Victoria Agnew*
Effects of eelgrass (*Zostera marina*) source identity and diversity on wasting disease prevalence and restoration success	*Randall Hughes*

SESSION 3A:
SALON A/B

Ecosystem ecology: Advances in understanding seagrass and submersed aquatic vegetation ecosystem functioning
Conveners: Cassie Gurbisz, Lillian Aoki

Linkages between seagrass tissue O_2 dynamics and ecosystem oxidation and feedbacks revealed using microsensors *in situ*	*Marguerite Koch*
Assessing the role of light and epibiota in seagrass sulfide incorporation	*Katherine Haviland*
Herbivory as a driving force of seagrass species composition and resilience in Caribbean seagrass ecosystems	*Fee Smulders*
The macrobenthic invertebrate assemblage of a newly established intertidal seagrass meadow in SW England	*Oliver Thomas*
An agent-based model approach to assessing the role of vegetative fragments in seagrass connectivity	*Samantha Lai*
Local pressures alter seagrass survival to climate change	*Jessica Pazzaglia, Gabriele Procaccini*

SESSION 3B:
SALON C

General/Open Call Session 1
Conveners: Jud Kenworthy, Penny Hall

Using Seedlings to Restore Posidonia Seagrass	*Jason Tanner*
Understanding the importance of local adaptation and trait-based selection for seagrass restoration success	*Elizabeth Andrews*
Linking population genetics, connectivity, and adaptation in seagrass species with contrasting dispersal strategies	*Laura Reynolds*
Marine warming and heat waves effects on *Posidonia oceanica* across a longitudinal gradient in the Mediterranean Sea: the importance of a reconstruction technique to forecast seagrass ecology in a changing environment	*Patrizia Stipcich*
Osmotic Seagrass: Is osmotic pressure the only cause of stress responses in seagrasses under desalination brine discharges? Implications for stress biology research and biomonitoring	*Fabio Blanco-Murillo*
Impacts of Coastal Activities and Marine Protected Areas on Seagrass Cover in Zanzibar from 2006 to 2019	*Danielle Purvis*

SESSION 4A: SALON A/B

Plant-Animal Interactions that Affect Success

Conveners: Bradley J. Peterson, Ken Heck, Bradley T. Furman, John M. Carroll, Diana Chin, Allison Rugila

Herbivory on Seagrassses: an Evolving Paradigm	*Ken Heck*
Effects of CO_2, light, and invasive amphipod herbivory on eelgrass (*Zostera marina*) in San Francisco Bay, CA	*Christian Tettelbach*
Stimulated megaherbivore grazing as a driver of seagrass flowering	*Manuja Lekammudiyanse*
Multiple plant-animal interactions in an eelgrass bed: modelling the impact of shellfish on eelgrass and vice versa	*Masahiro Nakaoka*
Functional trait complementarity and dominance both determine benthic secondary production in temperate seagrass beds	*Melisa Wong*
Environmental context dependence of positive interactions between chemosymbiotic bivalves and seagrasses	*Diana Chin*
Mix or match? Choosing donor beds for eelgrass restoration in San Francisco Bay	*Katharyn Boyer*
Seagrass *Zostera marina* restoration in the German Baltic Sea enhances biodiversity while biodiversity in turn regulates transplant success	*Tadhg O Corcora*
Positive Ecological Interactions and the Success of Seagrass Restoration	*Stephanie R. Valdez*

SESSION 4B: SALON C

Advances in Seagrass and Optical Water Quality Remote Sensing

Conveners: Richard Zimmerman, Paul Carlson

Cloud-native Remotely-sensed Seagrass Extent and Blue Carbon Stock Assessment in Mozambique	*Avi Putri Pertiwi*
Spatial Changes in Guam's seagrass from 1993 to 2021	*Cara Lin*
Nationwide seagrass mapping using analysis-ready Sentinel-2 and PlanetScope data to support the Nationally Determined Contributions of Seychelles	*C. Benjamin Lee*
National scale time series of seagrass ecosystems in Vietnam over 30 years using Landsat images	*Xuan Truong Trinh*
Advances in Seagrass and Optical Water Quality Remote Sensing	*Spyridon Christofilakos*
Upscaling seagrass monitoring using underwater drones and automated image processing	*Rod Connolly*

Tuesday, August 9 — 11:00 am–12:30 pm

SESSION 5A:
SALON A/B

General/Open Call Session 2
Convener: Bob Murphy

Changes in sediment carbon stock following seagrass restoration in Shark Bay, Western Australia	*Yusmiana Rahayu*
Reactive persistence and seagrass restoration	*Chris Aiken*
Trailing vs Leading Edge Seagrasses: Influence on Meadow Resilience and Recovery	*Jessie Jarvis*
Assessing seed- and shoot-based techniques for restoring the intertidal seagrass, *Zostera muelleri*, in temperate Australia	*Craig Sherman*
Fluctuating fortunes enhance multiple stressor science for seagrass ecosystems	*Andria Ostrowski*
What turned off the lights; introduction of the non-native seagrass *Halophila stipulacea* into a bioluminescent bay, Vieques, Puerto Rico	*W. Judson Kenworthy*

SESSION 5B:
SALON C

Seagrass-Shellfish Interactions
Convener: Elizabeth Lacey

Invasion of the reef urchins: *Echinometra spp.*, runoff, and seagrass community composition in Bocas del Toro, Panamá	*Abigail Libbin Cannon*
Using floating bags for oyster farming is compatible with healthy *Posidonia australis* seagrass meadows	*Giulia Ferretto*
Nearby shellfish aquaculture can promote expansion of eelgrass beds	*Sarah Lummis*
Seagrass Shellfish fisheries in Southern Mozambique, and role of LMMAs in Sustainability of the Coastal Communities.	*Salomao Banderia*
Legacies of planted eelgrass (*Zostera marina*) density and interactions with oyster reefs on plant and invertebrate community establishment	*Margot Buchbinder*
Using oyster berms (*Crassostrea virginica*) to facilitate success of eelgrass (*Zostera marina*) restoration	*Elizabeth Lacey*

SESSION 6A:
SALON A/B

Carbon ecosystem services: The role of seagrasses in carbon cycling and climate change mitigation and adaptation

Conveners: Aurora M Ricart, Gema Hernán, Irene Olivé

Carbon ecosystem services: The role of seagrasses in carbon cycling and climate change mitigation and adaptation	*Aurora M Ricart*
Air-Water Gas Exchange in Temperate Seagrass Meadows	*Kayleigh Granville*
Carbon stocks, burial rates and environmental DNA in seagrass sediments at the Banc D'Arguin, Mauritania	*Márcio Martins*
Influence of *Cymodocea nodosa* density on community metabolism and dissolved organic carbon fluxes (DOC)	*Alba Yamuza Magdaleno*
Carbon metabolism and blue carbon sequestration potential of seagrass beds across latitudinal gradients	*Irene Olivé*
Measuring carbon sources and total sequestration by eelgrass meadows in Atlantic Canada	*Tanya Prystay*
Sedimentary carbon stocks of intertidal seagrass meadows in an impacted wetland: effects of coastal infrastructure constructions	*Isabel Casal-Porras*
Carbon stocks, carbon accumulation rates, and GHG flux dynamics of seagrass ecosystems: A systematic review	*Clint Cameron*
Bahamas-wide Seagrass Blue Carbon Assessment leveraging Modern Earth Observation Advances	*Alina Blume*
Carbon provenance and coastal connectivity: Implications for temperate seagrass carbon sequestration capacity	*Emma Ward*
Megaherbivore exclusion at a long-term monitoring site led to more complex seagrass canopies and increased sediment accretion without an effect on sediment Corg	*Jimena Samper-Villarreal*
Resilient consumers accelerate the plant decomposition in a naturally acidified seagrass ecosystem	*Juhyung Lee*
Quantifying patterns and trends in thermal vulnerability and resilience of seagrass	*Kylor Kerns*

Tuesday, August 9 — 2:00 pm–3:30 pm

SESSION 6B:
SALON C

Next generation of technologies for improved seagrass restoration
Conveners: Nicole Foster, Michelle Waycott

Reversing the Course of Seagrass Loss through Seagrass Restoration in the Indian River Lagoon, Florida, an Estuary of National Significance	*Dennis Hanisak*
Applying Molecular Tools for Seagrass Restoration	*Gabriele Procaccini*
Storm detached fragments of the endangered seagrass *Posidonia australis* can be used to restore fragmented meadows	*Giulia Ferretto*
Dispenser Injection Seeding (DIS) advances intertidal eelgrass restoration	*Laura Govers*
Assess the potential use of seagrass restoration support structures	*Mareike Taphorn*
How far can we restore seagrasses? The onset of a seagrass restoration initiative in West Africa	*Omar Sanneh*
The relationship between genetic variation and resilience for seagrass: what do we really know for actionable science?	*T. Erin Cox*
Lessons learned from trialling methods for *Zostera* restoration in the intertidal zone	*Lucy Coals*

SESSION 7A:
SALON A/B

Seagrasses into the 21st century: Insights from global coordination and a way forward
Conveners: Jonathan Lefcheck, Emmett Duffy

Seagrass habitat shapes faunal communities: A global food-web perspective	*Jonathan Lefcheck*
An empirical and predictive framework to understand eelgrass (*Zostera marina*) responses to multiple pressures	*Jillian Dunic*
A Pleistocene legacy structures global variation in modern eelgrass ecosystems	*Emmett Duffy*
A Climate Vulnerability index for World Heritage seagrass habitats	*Riccardo Losciale*
Genomic approaches to understanding the role of local adaptation of seagrasses in a changing world	*John Stachowicz*
Creating community: Efforts of the SAV Community of Practice	*Dottie Byron*
Indo-Pacific Seagrass Network (IPSN): Collaborative research to advance the understanding of seagrass fisheries	*Lina Mtwana Nordlund*
Citizen science and local ecological knowledge reveal local opportunities for seagrass conservation	*Benjamin Jones*

SESSION 7B:
SALON C

Microbial ecology in seagrass ecosystems: Uniting the microscale and macroscale perspectives
Conveners: Belinda C. Martin, Matthew W. Fraser, Sairah Y. Malkin, Stacey M. Trevathan-Tackett

Can microorganisms influence germination of seagrass seeds?	*Anne Brauer*
Investigating the feasibility of nursery cultivation of the intertidal seagrass, *Zostera muelleri*, for use in restoration	*Yi Mei Tan*
Shifts in sediment and *Zostera marina* microbiomes at early stages of seagrass restoration in the German Baltic Sea	*Katharina Kesy*
Effects of depth gradients and plant-soil interactions on trait divergence and local advantage within seagrass meadows	*Torrance Hanley*
Ocean acidification alters the composition and functional potential of *Posidonia oceanica* phyllobiome	*Ryan Mueller*
Epiphyte Biofilms: Connecting Micro to Mini Scale Indicators of Environment	*Kirk Cammarata*
Effects of epiphytes on the seagrass phyllosphere	*Kasper Elgetti Brodersen*
Does the seagrass microbiome mediate risk of disease?	*Olivia J. Graham*

POSTER SESSION AND RECEPTION

Tuesday, August 9 6:00 pm–8:00 pm

1B - Successful tropical/subtropical seagrass restoration: Longevity, species for various impacts, services reassembled

Study of Sea grass beds in Sangomar AMP and Saloum Delta National Park: ecology, diversity and role for marine turtles	*Gnilane Diogoye Diouf*
An examination of cold tolerance in *Halodule wrightii*: Is there a latitudinal gradient from Florida to North Carolina, USA?	*Lindsey Stevenson*
Marine coastal restoration: an animal eye's view	*Michael Sievers*

2A - Trajectories of recovery after degradation in seagrass ecosystem structure, function and services

How local environment and neighboring habitat influence seagrass stability – A 13 year case study	*Alyson Hall*
Where does the plastic go? Microplastic loading in seagrass	*Angela Capper*
Restoring eelgrass meadows following invasion of the European green crab in Placentia Bay, Newfoundland, Canada	*Elanor Dillabough*
Intertidal seagrass restoration in the UK – Pilot study assessing the potential for re-establishment of ecosystem services	*Emma Ward*
A trajectory of *Zostera marina* ecosystem recovery, pre- and post-Hurricane Sandy degradation in Barnegat Bay, New Jersey	*James Campanella*
A post-hurricane Sandy examination of the population genetic "health" and diversity of *Zostera marina* (eelgrass) in Barnegat Bay, New Jersey	*James Campanella*
Monitoring reveals similar recovery progress among sediment-tube-based propeller scar restoration approaches	*Savanna Barry*
Piney Point Seagrass and Macroalgae Response Monitoring	*Sheila Scolaro*
Large-scale transplantation success of *Zostera marina* in Danish estuaries through site-selection and identification of stressor thresholds	*Timi Banke*

3A - Ecosystem ecology: Advances in understanding seagrass and submersed aquatic vegetation ecosystem functioning

Trajectories of nutrient flows and ecosystem trophic status in a low-salinity freshwater submerged aquatic vegetation bed	*Cassie Gurbisz*
Thalassia hemprichii heavy metal accumulation	*Dawn Rosarie M. Fajardo*
The Impact of Artificial Shading on the Seagrasses at Sandals South Coast, Westmorland, Jamaica	*Hugh Small*
Will overgrowth of cyanobacteria hinder submerged aquatic vegetation resurgence in Chesapeake Bay?	*Judith M. O'Neil*
Changing foundation species in Chesapeake Bay: implications for faunal communities of two dominant seagrass species	*Lauren Alvaro*
Effects of epiphytes on the thermal tolerances of edge-of-range seagrasses in NC, USA	*Mike Wheeler*
Trait and taxonomic diversity of macrophytes shapes benthic community structure in mixed surfgrass, kelp, and wakame meadows	*Mizuho Namba*
Seasonal and Spatial Dynamics of the Tropical Seagrass *Halophila stipulacea* in the Gulf of Aqaba	*NetaLy Lipkin*

3B - General/Open Call Session 1

Dugong habitat preference and their threats in North Minahasa, North Sulawesi, Indonesia	*Citra Septiani*
Assessing the oxidative damage and physiological tolerance of the seagrass *Posidonia oceanica* to brine exposure: a field experiment	*Fabio Blanco-Murillo*
Persistent Clones and Local Seed Recruitment Contribute to the Resilience of *Enhalus acoroides* Populations Under Disturbance	*Jasper Dierick*
A new conservation park and changes in governance promote trampling and seagrass loss	*Joel Creed*
When Anthropogenic Sediment Disturbances Collide Over Seagrass Beds	*Kirk Cammarata*
The changing Indian River Lagoon and the pursuit of persistent seagrass beds	*Lori Morris*
Upscaling intertidal eelgrass (*Zostera marina*) restoration enhances restoration success by suppressing an unexpected negative feedback	*Max Gräfnings*
Comparative responses of a small-bodied seagrass *Halophila stipulacea* and a large-body seagrass *Posidonia oceanica* to nutrient enrichment and warming	*Mirta Teichberg*
Exploring the public perception of eelgrass in Atlantic Canada: Considerations for management	*Tanya Prystay*

POSTER SESSION AND RECEPTION

Tuesday, August 9 6:00 pm–8:00 pm

4A - Plant-animal interactions that affect success

Is biodiversity associated with eelgrass more strongly affected by the environment or by its foundation species?	*Alexandre Muller*
Impact of the catastrophic Storm Gloria on the structure and function of Mediterranean *Posidonia oceanica* meadows	*Candela Marco-Mendez*
Biodiversity of Scottish seagrass meadows across trophic levels: from infauna to avifauna	*Isabel Key*
Initial lag phase in Common Eelgrass (*Zostera marina*) growth during a restoration experiment: How will it affect plants through winter?	*Matteo Lattuada*
Using E-scapes to quantify the change in trophic function of seagrass habitats in response to large-scale seagrass die-off	*W. Ryan James*

4B - Advances in Seagrass and Optical Water Quality Remote Sensing

Mapping shallow macrophytes in fjords in Southwest Greenland using Sentinel-2 MSI imagery	*Daniel Carlson*
Development of a continuous depth-invariant vegetation index for mapping seagrass cover	*Jonathan Rodemann*
Quantifying the impact of the March 2018 nor'easter on seagrass distributions and density on the eastern shore of Virginia, through the use of use high spatial resolution satellite images from PlanetScope	*Kylie Harrison*
Quantifying variability in areal extent and percent cover of North Carolina (USA) seagrass meadows using unmanned aerial vehicles (UAV)	*Madison Lytle*
Mapping seagrass across the United States using high-resolution, commercial satellite imagery	*Megan Coffer*
Leveraging remote sensing and suitability modelling for informed site selection in seagrass restoration in Western Port, Victoria, Australia	*Oliver Dalby*
Using daily PlanetScope imagery to map annual distributions of submerged aquatic vegetation at several sites within the Chesapeake Bay.	*Victoria Hill*

5A - General/Open Call Session 2

Seagrass meadows management and restoration to address natural and societal challenges at Ria de Aveiro (Portugal)	*Ana Sousa*
Seagrass meadows under multiples natural and anthropogenic disturbances: the challenges of implementing integrated conservation and management public policies	*Fanny Kerninon*
Living on the edge; the status of a large western Atlantic seagrass ecosystem in North Carolina, USA	*Jud Kenworthy*
Exploring possibilities for subtidal eelgrass (*Z. marina*) restoration in the Dutch Wadden Sea	*Katrin Rehlmeyer*
Effects of tidal variation and light limitation on the flowering of the seagrass *Zostera muelleri*	*Manuja Lekammudiyanse*
The necessity for multidisciplinary stakeholder collaboration in increasing seagrass restoration success	*Roosmarijn van Zummeren*
Hunting for Trends in Volunteer Collected SAV Data in the Patuxent River	*Samina Soin-Voshell*
Changing Boater Behavior to Protect Seagrass	*Ben Scheelk*
Meadows of Knowledge - Putting West Africa on the Global Seagrass Map	*Marco Vinaccia*
Socio-economic context and gender affect reliance on seagrass provisioning services	*T. E. Angela L. Quiros*

6A - Carbon ecosystem services: The role of seagrasses in carbon cycling and climate change mitigation and adaptation

The role of seagrass-tidal marsh ecosystem connectivity in blue carbon sequestration	*Carolyn J. Ewers Lewis*
Contribution of seagrass meadows to blue carbon stocks along the Southwest Atlantic coast	*Joel Creed*
The role of a tropical seagrass ecosystem in allochthonous carbon burial	*Riccardo Pieraccini*
Seagrass meadows as a significant carbon stock in islands of Tawi-Tawi, Southwestern Philippines	*Sitti Zayda B. Halun*

POSTER SESSION AND RECEPTION

Tuesday, August 9 6:00 pm–8:00 pm

6B - Next generation of technologies for improved seagrass restoration

Contribution to reversing the course of the seagrass degradation by the capacity building of actors	*Alioune Faye*
Changes in *Halodule wrightii* photo-physiology, metabolism, and gene expression after a major hurricane	*Anastasia Konefal*
Landscape Genetics of Eelgrass Populations and Life History Types in the Pacific Northwest, USA	*Bryan Briones Ortiz*
Image analysis reveals environmental influences on the seagrass-epiphyte dynamic relationship	*Chi Huang*
The Global Seagrass Watch: Spatially-explicit seagrass ecosystem accounting enabled by contemporary remote sensing advances	*D. Traganos*
Evaluating multispectral UAV imagery for a multispecies intertidal seagrass environment	*Eylem Elma*
Exploring priming strategies to improve stress-tolerance and resilience of *Posidonia oceanica* seedlings	*Isabella Provera*
Rewilding the sea with domesticated seagrass	*Marieke M. van Katwijk*
A novel approach for seagrass restoration through a fertilizing biodegradable substrate	*Riccardo Pieraccini*

Zostera marina, or eelgrass, is the only true seagrass that calls the Chesapeake Bay home. Michelin-starred chef Ángel León has been endeavoring to cultivate eelgrass to harvest and cook its grains since 2019.

7A - Seagrasses into the 21st century: Insights from global coordination and a way forward

Notes from the Other Gulf: Tropical Seagrasses More Common in The Gulf of California than Previously Indicated in Published Literature	*Abigail Cannon*
Eelgrass declines and potential drivers of change in the South Slough estuary, Oregon, USA	*Alicia Helms*
Threatened seagrass beds in the French Antilles (Caribbean Sea): Feedback from 15 years of regional monitoring in the framework of adaptive management	*Fanny Kerninon*
Local thermal variation modulates resilience to warming in a marine foundation species: Evidence from seagrass seedlings	*Fiona Tomas*
ResilienSEA Project and Seagrass Protection in Cabo Verde	*Lisdalia Moreira*
Identifying cues that promote flowering in eelgrass (*Zostera marina*)	*María Eugenia Bernal Gómez*
Dynamics and Operation of the Seagrass in the Islands of Unhocomo and Unhocomozinho (Bolama Bijagós Biosphere Reserve, Guinea-Bissau)	*Noelo Cardoso*
Integrating seagrass conservation in the management of marine protected areas – Sherbro River Estuary, Sierra Leone – A case study	*Paul A. Lamin*

The Chesapeake Bay is home to several species of *Najas*, a genus first described by Carl Linnaeus in 1753. The genus is named after the naiads of Greek mythology, water nymphs who inhabited streams and springs.

FIELD TRIPS

The Chesapeake Bay is one of the most beautiful estuaries in the world, so while you're in Annapolis, we want to make sure you see some of our favorite places. Field trips will take place on Wednesday, August 10 and depart from the conference hotel between 7:30 and 8:00 am. Before the day of the field trips, check at registration for your bus time. A "ticket" listing your field trip is included in the back of your nametag. You may only attend the field trip you have signed up for.

Lunch and transportation are provided, but here are some things you'll want to bring:

- A face mask (may be REQUIRED during some portions of some field trips)
- Closed-toes shoes (REQUIRED for Poplar Island & Smithsonian Environmental Research Center)
- Water bottle (more will be available on the bus)
- Sunscreen
- Bug spray
- Clothes that you don't mind getting wet

JUG BAY NATIONAL ESTUARINE RESEARCH RESERVE BOATING AND KAYAK TOUR

Jug Bay National Estuarine Research Reserve, on the Patuxent River, is one of three components in the over 6,000-acre Maryland Chesapeake Bay National Estuarine Research Reserve (CBNERR). The tidal freshwater marshes and forested wetlands provide a beautiful habitat to a high diversity of fish, invertebrates, mammals and birds such as great blue heron, osprey, and sora rail. Coontail, hydrilla, pondweeds, star grass, and other species can be readily observed, as found during more than a decade of monitoring by the CBNERR staff. Field trip participants will explore Jug Bay's dense submerged aquatic vegetation beds from a pontoon boat tour and optional kayak paddle provided by Patuxent River Park.

SUSQUEHANNA FLATS BOAT AND SNORKEL TOUR

The Susquehanna Flats are home to one of the largest and most iconic beds of SAV in the Chesapeake Bay. During this fieldtrip, participants will take a bus to Havre de Grace, Maryland, a quaint little town right on the upper Bay. From there, we'll boat out to the Flats to explore the incredible diversity of freshwater SAV found there. While the SAV bed is dominated by wild celery (*Vallisneria americana*), you can find a dozen or more other species in any given area. We'll discuss the species present, what makes the bed so resilient, and what threats it faces. Participants will have an opportunity to swim, collect specimens to press onboard, and take beautiful pictures of the many waterfowl–including ospreys and bald eagles–that call the Susquehanna Flats home.

SMITHSONIAN ENVIRONMENTAL RESEARCH CENTER
CANOE AND HIKE TRIP

Get outside and explore the 2,600 acres at the Smithsonian Environmental Research Center campus! On this excursion, you'll experience both aquatic and terrestrial habitats! You will enjoy a 2–3 hour guided canoe trip in the Chesapeake Bay, viewing various wetland features, native plants, and animals along the way. You will also go on a guided hike along some of the beautiful SERC trails, be introduced to the biodiversity of the area, and hear about various ongoing Smithsonian research endeavors. Transportation to and from the campus is provided, as is a boxed lunch and water.

CHESAPEAKE BAY ENVIRONMENTAL CENTER
KAYAK AND HIKE TRIP

The Chesapeake Bay Environmental Center (CBEC) is a 510-acre wildlife preserve that will open your eyes, ears, mind, and heart to the wildlife and historic landscapes that characterize Maryland's Eastern Shore. During this field trip, participants will alternate between kayaking and hiking. A guided kayak tour will take you through beautiful tidal marshes and over lush beds of SAV. The guided hike will allow participants to explore native woodlands, marshes, and meadows along 4 miles of walking trails. Transportation to and from CBEC is provided, as is a boxed lunch and water. Dress appropriately!

ASSATEAGUE ISLAND
KAYAK TRIP

Join us for a tour of one of Maryland's most treasured destinations–Assateague Island. Assateague is a 37-mile long barrier island and home to Maryland's iconic wild horses, which we'll hope to see during the excursion. The trip will include an approximately 2.5-hour-long kayak paddle from Assateague Outfitters into Sinepuxent Bay over lovely SAV beds. Aside from its horses, Assateague is also well known for its colonial nesting bird habitats. Consider bringing binoculars along on this trip so that you can see the egrets, brown pelicans, herons, commons terns, and black skimmers that call Assateague home.

FIELD TRIPS

DUNDEE CREEK
KAYAK AND SNORKEL TRIP

On this excursion, you will have the opportunity to observe some of the most pristine and diverse underwater grass beds in the upper Chesapeake. Dundee Creek, a small tributary that's part of the Gunpowder River system is home to lush meadows of grasses that provide critical nursery grounds for juvenile rockfish and our own beautiful swimmers–blue crabs. We will paddle, wade, and snorkel through the beds and learn how local students have partnered with the scientific community to connect underwater grasses to required coursework.

POPLAR ISLAND
BOAT AND BUS TOUR

Poplar Island is a restored island located in the mid-Chesapeake Bay. Over the centuries, all but a few acres were lost to sea level rise and erosion, spurring the U.S. Army Corps of Engineers to lead a large-scale restoration of the island using dredged material collected from the approach channels to the Baltimore Harbor. This field trip will include two 30-minute boat rides to and from the Tilghman Island land-base dock to Poplar Island. On-island, participants will enjoy a 2-hour bus tour with stops at points of interest. The tour guide will discuss a variety of topics pertaining to Poplar Island, including the beneficial use of dredged materials for habitat restoration, salt-marsh habitat, SAV habitat, island history, and the construction timeline. If the weather cooperates, we'll also take a small-boat excursion to Harbor Cove to visit one of the island's reference SAV monitoring sites. This area generally supports dense beds of *Ruppia maritima*.

MATTAWOMAN CREEK
KAYAK TRIP

Mattawoman Creek is a beautiful tributary on Maryland's side of the Potomac River. This trip will include a relaxed kayak paddle with stops in SAV beds where participants can see and enjoy the incredible diversity of freshwater grasses in the area. The trip will be led by Atlantic Kayak and members of NOAA's National Marine Sanctuaries team.

IN CASE OF RAIN

In the case of rain or inclement weather, field trips may be cancelled. If field trips are cancelled, buses will provide free transport for conference participants to the following locations:

Baltimore Inner Harbor and National Aquarium

For Information about things to do at Baltimore's Inner Harbor: https://baltimore.org/what-to-do/museums-attractions/a-tour-of-baltimores-inner-harbor

National Aquarium Information:
- Adult admission is USD$39.95
- The aquarium may require you to show proof of COVID 19 vaccination.
- Aquarium Website: https://aqua.org/visit#admission

MetroRail Stations, from where you can take the Washington Metro into Washington DC and explore the U.S. Capital
- Metrorail tickets may be purchased using a credit card at ticket machines at the station
- A "trip planner" to guide you from place to place is available here: https://www.wmata.com
- For information about what to see and do in Washington DC: https://www.thedistrict.com/sightseeing/

ISBW14 WORKSHOPS

Thursday, August 11

Morning Plenary	9:00–10:30	
Novel species in seagrass ecosystems: a review of impacts and management in homage to Susan Williams - *Fiona Tomas Nash, A. Randall Hughes, Cascade J.B. Sorte, Adriana Verges*	11:00–5:30	Salon C
Promoting Underrepresented Voices in Seagrass Science - *Briana Yancy*	11:00–12:30	Powerhouse Room 1
Seagrass Nurseries for Research and Restoration - *Laura Govers, Emma Jackson, Sam Rees, Craig Sherman*	11:00–12:30	Powerhouse Room 3
IUCN seagrass species group: Red List expert assessment - *Brooke Sullivan, Frederick Short*	11:00–5:30	Powerhouse Room 2
Engaging international seagrass experts in a mapping and monitoring community of practice - *Jud Kenworthy, Lawrence Handley, Robert J. Orth, David J. Wilcox, Catherine Lockwood, Mark Finkbeiner, Lisa Havel, Aaron Kornbluth*	2:00–5:30	Powerhouse Room 1
Science communication: Communicate better and expand your reach - *William Dennison*	2:00–5:30	Powerhouse Room 3

Friday, August 12

Novel species in seagrass ecosystems: a review of impacts and management in homage to Susan Williams - *Fiona Tomas Nash, A. Randall Hughes, Cascade J.B. Sorte, Adriana Verges*	9:00–3:30	Salon C
Harnessing seagrass expert networks to generate better knowledge, management, and restoration of seagrass meadows - *Salomão Bandeira, Mohamed Sidi Cheikh, Iderlindo Santos*	9:00–3:30	Powerhouse Room 3
Coping with Eco-anxiety and combating environmental fatigue - *Becky Swerida, Coreen Weilminster*	9:00–10:30	Powerhouse Room 2
Crowdsourcing environmental data: the role of volunteers in SAV monitoring - *Brooke Landry, Ben Jones*	9:00–10:30	Powerhouse Room 1
Stakeholder engagement: Broaden the impact of your research - *Heath Kelsey, Katie May Laumann, Annie Carew*	11:00–12:30	Powerhouse Room 1
The Use of High-Resolution Satellite Imagery for Seagrass Detection and Mapping - *Victoria Hill*	11:00–12:30	Powerhouse Room 2
Facilitated migration and selective breeding: The future of seagrass conservation and restoration? - *Bradley Peterson, Christopher Clapp, Jon Lefcheck, Phil Colarusso, Jessie Jarvis, Erin Shields, Chantal Collier, Boze Hancock*	2:00–3:30	Powerhouse Room 1
Seagrass Mapper: An open tool for seagrass mapping using cloud computing on Google Earth - *Genki Terauchi*	2:00–3:30	Powerhouse Room 2
Closing Plenary	4:00–5:30	

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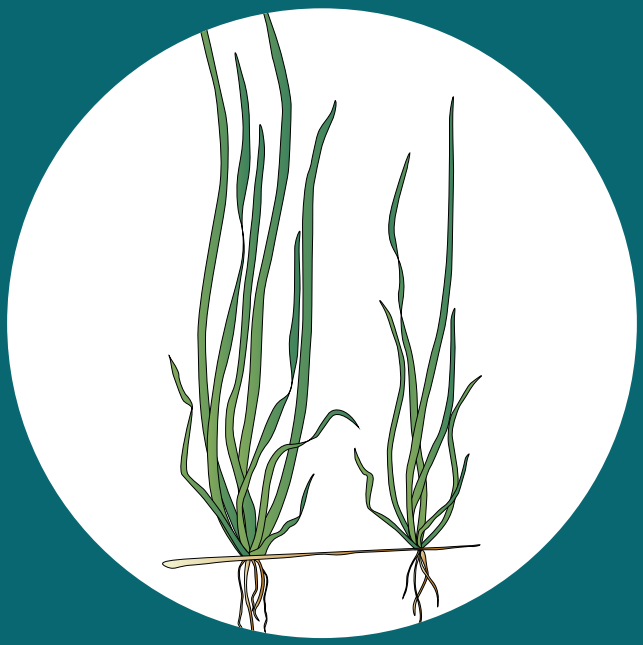

Thank you to the following sponsors for their contribution of at least $5,000!

Vallisneria americana, also known as wild celery, grows in the fresh and slightly brackish tidal waters of the Bay. It is popular as an aquarium plant for its long, ribbonlike leaves. Its flowers appear at the surface of the water on long stems, which, after pollination, coil into spirals, pulling the flowers underwater to produce their fruit.

As an environmental treaty of the United Nations, the Convention on Migratory Species (CMS) provides a global platform for the conservation and sustainable use of migratory animals and their habitats.

CMS

DUGONG MOU

Under the CMS, the Dugong MOU aims to promote internationally coordinated actions to ensure the long-term survival of dugongs and their seagrass habitats throughout their range.

The Dugong MOU is administered by a Secretariat based at the CMS Office - Abu Dhabi, funded and hosted by the Environment Agency - Abu Dhabi, on behalf of the Government of the United Arab Emirates.

The Dugong MOU has created a Dugong & Seagrass Hub that we are very proud to share with the global seagrass community: https://www.dugongseagrass.org/

To learn more about the CMS Dugong MOU and the work we do to conserve and protect dugongs as well as the seagrass habitats they depend on please also visit:
https://www.cms.int/dugong/
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Was founded in 2014 by Beau Williams after leaving a phenomenally successful seagrass restoration career with Seagrass Recovery, Inc. ATEC staff has successfully transplanted, repaired, and grown several species of seagrasses and SAV for more than 200 SAV projects within the United States and the Caribbean. Restoration projects typically achieve measurable results within 12-18 months. Techniques utilized by ATEC have been scientifically peer-reviewed and approved by NOAA as well as by the Florida Fish and Wildlife Conservation Commission. ATEC has provided solutions for submerged resource restoration with cost in mind and the environment the top priority for OVER TWO DECADES. Restoring Seagrass is Our Priority!

Visit our website at: www.AquaTechEco.com Or contact Beau Williams at Beau@aquatecheco.com ph 813-918-6169