

Peter I. May, Ph.D.
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Employment and Appointment

2/2019 – Present	University of Maryland Department of Environmental Science and Technology, College Park, Maryland, Assistant Research Professor; Faculty Researcher, Algal Ecotechnology Center; Department of Plant Science and Landscape Architecture, Affiliated Faculty in Landscape Architecture
3/2021 – Present	Specialized Content Editor, Journal of Applied Biotechnology & Bioengineering
1/2020 – Present	University of the District of Columbia, College of Agriculture, Urban Sustainability & Environmental Sciences, Washington, D.C., Adjunct Professor
8/2012 – 8/2019	University of Maryland Department of Environmental Science and Technology, College Park, Maryland, Faculty Lecturer in Ecosystem Ecology, Water Quality, Carbon Management, Applied Ecology, Ecology Natural Resources Management and Landscape Architecture in Rio de Janeiro Brazil; Faculty Researcher in Algal Ecotechnology Center; Affiliated Graduate Faculty Advisor in Landscape Architecture
8/2010 – 12/2010	Johns Hopkins University School of Advanced Academic Programs, Wash., DC, Invited Adjunct Professor, Graduate Class on Principles and Methods of Ecology
1/2006 – 5/2018	Biohabitats, Inc., Baltimore, MD, Senior Environmental Scientist, Restoration Ecologist, Chief Scientist and founding member of Bioworks R&D
3/2003 – 9/2003	Environmental Concern, Inc., St. Michaels, MD, Lead Wetland Horticultural Researcher in Mycorrhizal Associations Experimentation
5/1993 – 5/2002	Government of the District of Columbia, Environmental Health Administration, Watershed Protection Division, Washington, DC, Environmental Specialist
5/1992 – 5/1993	Smithsonian Institution National Museum of Natural History, Marine Systems Lab, Washington, DC, Everglades Mesocosm Algal Turf Scrubber Technician
Summers 1990-1992	Maryland Department of Natural Resources, MD Conservation Corps, Annapolis, MD, Mentor/Crew Chief, sponsored by ICPRB
6/1989 – 8/1992	Interstate Commission on the Potomac River Basin (ICPRB), Rockville, MD, Fisheries Technician focusing on urban watershed bioassessments

Education

Ph.D., Environmental Science, Marine-Estuarine Environmental Sciences (MEES) Graduate Program, University of Maryland, College Park, MD, 2007

B.S., Natural Resources Management Program, Aquatic Resources Emphasis, University of Maryland, College Park, MD, 1992

Professional Associations

American Ecological Engineering Society (Current)
Coastal and Estuarine Research Federation (Past)
Ecological Society of America (Past)
International Society for the Advancement of Emergy Research (Current)
Society for Ecological Restoration (Past)
Society of Wetlands Scientists (Past)

Experience

Peter has more than 30 years of experience in the environmental sector. He has an expert level knowledge base in systems ecology, functional ecology and applied ecosystem restoration science working in municipal, state and federal government, NGO's, the private and academic sectors. He has a comprehensive background in urban systems and coastal ecologies, the ecology of tidal marshes, urban stream and big river watershed system restoration. Peter has applied his skills to numerous projects throughout Maryland and Washington, DC region with a national ecological engineering firm and University of Maryland in Baltimore and DC, New York City, Philadelphia, Houston/Bay area, Phoenix, Portland, San Francisco/Bay area and recently with efforts in the cities of Niteroi and Rio de Janeiro and the State of Rio de Janeiro, Brazil. These projects have involved applications of novel ecotechnologies as well as tidal wetland restoration planning, design, implementation and monitoring, stream restoration, watershed management and neighborhood to city scale low-impact development projects in urban areas.

Peter has a strong academic and applied background in the emerging field of ecological engineering, with ecotechnologies being developed and deployed for prototype models of floating wetland islands, vertical wetland green bulkheads, boat wastewater and marina wash-water "living machine" ecosystem treatment systems. Significantly, he has worked extensively with the Algal Turf Scrubber® (ATS™) water treatment system which he was exposed to while working for its inventor, Dr. Walter Adey, at the Smithsonian Institution's Marine Systems Lab. He has applied the ATS™ ecotechnology to city wastewater treatment and estuarine macroalgal systems in New York City's Jamaica Bay, converting algal biomass to ethanol and biobutanol as well as with the Port of Baltimore converting algae to a methane biogas and electricity using a microbial fuel cell. Harvested algae has been applied to concrete for biofouling bioreceptivity experiments on urban estuarine waterfront bulkheads as well as carbon, nutrient and sediment sequestration.

Peter is an Assistant Research Professor at the University of Maryland's Department of Environmental Science and Technology and its Algal Ecotechnology Center, a collaborator with it's Waste to Energy Lab and lecturer. He is Affiliated Faculty with the Landscape Architecture Program in the UMD Department of Plant Science and Landscape Architecture having served on 11 Master's of Landscape Architecture thesis committees. Peter participated as the water and living systems faculty advisor with the winning UMD reACT entry in the 2017 US Department of Energy Solar Decathlon competition.

Peter's doctoral dissertation involved the ecological profiling and experimental manipulation of urban tidal freshwater mudflats and their role in their conversion to restored emergent marsh in Washington, DC. As a systems ecologist, his knowledge of the components of his research sites included plants, fish, birds, algae, benthic invertebrates, plankton, sediment and nutrient flux, tides, energy, political ecology, human economy, societal and cultural systems. He developed an ecological embodied energy model for tidal marsh restoration and its impacts on fisheries.

Peter has a broad background in applied experimental and theoretical ecology, systems ecology, applied restoration ecology, the history of the ecosystem concept in ecology and the energetics of ecosystems and human society. He has successfully applied his knowledge to urban sustainable design and the development and measurement of sustainability programs. He has used the environmental accounting methodology Emergy Analysis to assess the costs and benefits of applied ecosystem restoration and green infrastructure implementation projects.

University Classes Taught

Fall 2010. Principles and Methods of Ecology. Johns Hopkins University School of Advanced Academic Programs, Wash., DC. Graduate level.

Fall 2012. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Spring 2013. Water Quality. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Summer 2013. Ecology and Natural Resource Management in Rio de Janeiro, Brazil. University of Maryland Department of Environmental Science and Technology, Education Abroad. Graduate and undergraduate students for 2 weeks.

Fall 2013. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Spring 2014. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Summer 2014. Ecology and Natural Resource Management in Maryland. Lead faculty for visiting Federal Rural de Rio de Janeiro, Brazil University undergraduate and graduate students for 2 weeks.

Fall 2014. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Spring 2015. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Fall 2015. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Spring 2016. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Fall 2016. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Spring 2017. Ecosystem Ecology. University of Maryland Department of Environmental Science and Technology. Senior undergraduate level.

Summer 2017. Ecology and Natural Resource Management in Rio de Janeiro, Brazil. Lead faculty for University of Maryland Department of Environmental Science and Technology, Education Abroad. Undergraduate and graduate students for 2 weeks.

Fall 2017. Carbon Management. University of Maryland Department of Environmental Science and Technology. Undergraduate level.

Spring 2018. Applied Ecology. University of Maryland Department of Environmental Science and Technology. Undergraduate level.

Summer 2018. Ecology and Natural Resource Management in Maryland. Lead faculty for visiting Federal Rural de Rio de Janeiro, Brazil University undergraduate and graduate students for 2 weeks.

Maryland Stream Restoration Association (MSRA) Education Committee. 7 hour class in Applied Hydrologic Modeling (TR-20 & TR 55) for Ecological Restoration Projects. Course Organizer. University of Maryland, College Park, Maryland. April 14th, 2019.

Summer 2019. Ecology, Natural Resource Management and Landscape Architecture in Rio de Janeiro, Brazil. Lead faculty for University of Maryland Department of Environmental Science and Technology, Education Abroad. Graduate and undergraduate students for 2 weeks.

Fall 2019. Ecosystem Ecology. University of Maryland, Department of Environmental Science and Technology. Senior undergraduate level.

Spring 2020. Environmental Science. University of the District of Columbia, College of Agriculture, Urban Sustainability and Environmental Science. Undergraduate level.

Summer 2021. LARC 455/655: Ecological Restoration and Design: Rebuilding the Life Support System for Planet Earth. Co-taught with Kelly Fleming/RLA. University of Maryland Department of Plant Science and Landscape Architecture.

Graduate Thesis Committees Served

Kendrick, Laura Marsh. 2013. *The Purposeful Edge: Designing for Wildlife Along the Anacostia River*. Master of Landscape Architecture Thesis. University of Maryland Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Stanley, Lela. Currently. 2014. *Evaluation of the Use of a Vertical Wetland Bulkhead for Water Quality Improvement in Baltimore Harbor*. Master of Science Thesis. University of Maryland Department of Environmental Science and Technology. College Park, MD.

Gemmell, Jonathan. 2015. *Incorporating environmental education into play based stormwater low impact development techniques at an elementary school in Riverdale, Maryland*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Sorvalis, George. 2016. *Maximizing Landscape Performance at Adventist Hospital: Healing the People, Healing Sligo Creek*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Hayes, Kathleen. 2016. *Regenerative Stormwater Conveyance: Design Implications of an Urban Case Demonstration in Baltimore, Maryland*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Zerfas, Matthew. 2017. *Greenbelt Park Regenerative Stormwater Conveyance Design*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Ren, Jennifer. 2018. *Choreographing A Greenway: Exploring Experiential Design Through Choreographic Dance Principles*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Espinoza, Maria Jose. 2018. *Designing Through the Lens of Landscape Urbanism*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Shipley, Chris. 2018. *Guided Transitions: Using Gradual Controlled Changes to Allow Annapolis' Historic City Dock to Adapt to Coastal Flooding*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Zhang, Keren. 2019. *Westport Waterfront: An Alternative Approach to Post-Industrial Rejuvenation in Baltimore*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Simpson, Lotoia. 2019. *Eco-Habitats – Using Ecological Design for Amphibian and Reptile Habitats on Golf Courses: Case Study at Langston Golf Course, Washington, D.C.* Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Turner, Sarah. 2020. *A Wildlife Crossing Model for the Golden Lion Tamarin*. Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Samoray, Christopher. 2021. *Guiding Design for Seal-Level Rise and Storm Surge in National Parks: An Example at the Confluence of the Potomac and Anacostia Rivers Near the Tidal Basin in Washington, D.C.* Master of Landscape Architecture Thesis. Department of Plant Science and Landscape Architecture. University of Maryland, College Park, MD.

Delp, Danielle. In process. *Research Topic: The use of algae from an Algal Turf Scrubber for methane generation in an anaerobic digester and clean electricity production from a microbial fuel cell*. Doctoral Thesis. University of Maryland Department of Environmental Science and Technology. College Park, MD.

Faculty Service Awards

Faculty Mentor Award. 2014 Phillip Merrill Presidential Scholar University of Maryland Faculty Mentor for Barret Wessel, Undergraduate student in the Department of Environmental Science and Technology.

Distinguished Service Award. 2014-2015. University of Maryland Department of Environmental Science and Technology.

Outstanding Alumnus Award. 2015. University of Maryland College of Agriculture and Natural Resources. <https://agnr.umd.edu/news/congratulations-2015-agnr-alumni-award-winners>

Demonstration and Design Awards

2014 Best Urban BMP on the Bay Award (BUBBA). Chesapeake Stormwater Network. **1st Place Innovation Category.** Algal Turf Scrubber: An Algae Based Ecotechnology for Water Quality Improvement in Support of Chesapeake Bay TMDL Requirements. <http://www.biohabitats.com/projects/dundalk-marine-terminal-algal-turf-scrubber/>

U.S. EPA Campus Rainworks Challenge 2014. **First Place Demonstration Category.** *Historic Chapel Site: Meadows, Meanders and Meditation*. University of Maryland Landscape Architecture, Environmental Science and Technology and Civil Engineering. (64 Colleges and Universities from 23 states competing). Faculty Mentor. <https://www.epa.gov/green-infrastructure/first-place-winner-demonstration-project-category-university-maryland-college>

American Institute of Architects. AIA Baltimore Resilient Rowhouse Competition 2015. **Winner Most Resilient Concept.** The bMORE Resilient CO*OP Metrics. <http://www.aiabaltimore.org/competition/resilient/> disconnected link.

U.S. EPA Campus Rainworks Challenge 2015. **First Place Site Demonstration Category**. *Performance Parking: Reimagining Lot 11B*. University of Maryland Landscape Architecture and Civil Engineering. Faculty Mentor. https://www.epa.gov/sites/production/files/2016-04/documents/umd_narrative_508.pdf

U.S. EPA Campus Rainworks Challenge 2016. **Second Place Site Demonstration Category**. *(Un)loading Nutrients*. University of Maryland Landscape Architecture and Civil Engineering. Faculty Mentor. <https://www.epa.gov/green-infrastructure/2016-campus-rainworks-challenge#Maryland>
<https://www.umdrightnow.umd.edu/news/umd-students-win-2nd-place-national-epa-campus-rainworks-challenge>

U.S. EPA Campus Rainworks Challenge 2017. **Second Place Master Plan Category**. *Champion Gateway*. University of Maryland Landscape Architecture and Civil Engineering. Faculty Mentor. <https://www.epa.gov/green-infrastructure/2017-campus-rainworks-challenge#University%20of%20MD>

2017 American Society of Landscape Architects Professional Awards **Award of Excellence, Analysis and Planning**. *Storm + Sand + Sea + Strand – Barrier Island Resiliency Planning for Galveston Island State Park*. Team Participant/Lead Scientist. <https://www.asla.org/2017awards/324291.html>

2017 U.S. Department of Energy Solar Decathlon, **2nd Place Internationally, 1st Place US Nationally**. University of Maryland's reACT, Resilient Adaptive Climate Technologies. Water and Living Systems Faculty Mentor/Advisor. <https://arch.umd.edu/mapp/news/umd-takes-second-place-us-doe-solar-decathlon-2017>

2020 American Association of Port Authorities, **Award of Excellence for Environmental Mitigation / Demonstration Project**. *Integrated Algal Flow-Way, Digester and Fuel Cell Demonstration Project*. Awarded to Maryland Department of Transportation Maryland Port Administration. Project co-lead participant with University of Maryland Department of Environmental Science and Technology, Algal Ecotechnology Center and Waste to Energy Lab. <https://www.aapa-ports.org/unifying/content.aspx?ItemNumber=22621>

2020 Land Art Generator Initiative (LAGI) International Design Competition. Fly Ranch Burning Man Project. **A Top Ten Entry** with the top ten out of 185 international entries funded to implement their project at the site. *Ripple: A Station for the Regeneration of Human Wisdom and Native Ecosystems Alike*. Team Advisor/Mentor to Project Leads and former students Matt Lagomarsino and Jacob Mast. <https://landartgenerator.org/LAGI-2020/ripple/>

Selected Publications, Presentations & Technical Reports

Publications

Bierman, E., B. Jessup, **P.May**, J.Schaafsma, C.Streb and P.Kangas. 1999. Development of an ecological engineering design seminar. *Annals of Earth*. 17(1)17-19.

May, P.I. 2000. How (and why) to build a tidal freshwater mudflat mesocosm. In: *Proceedings of the 27th Annual Ecosystems Restoration and Creation Conference*, J. Cannizzaro (ed.) Hillsborough Community College, Tampa FL.

Kangas, P., **P. May** and S. Kassner. 2003. A case study in Anacostia River restoration. In: *Proceedings of the 30th Annual Conference on Ecosystems Restoration and Creation*, J. Cannizzaro (ed.) Hillsborough Community College, Tampa, FL.

May, P.I. 2007. *Alternate State Theory and Tidal Freshwater Mudflat Experimental Ecology on Anacostia River, Washington, D.C.* Ph.D. Dissertation. Marine Estuarine Environmental Science (MEES) Program, University of Maryland, College Park, MD. 372p.

May, P.I. and P. Kangas. 2008. Energy Analysis of Tidal Freshwater Marsh and Mudflat Sportfish Communities on Anacostia River, Washington, D.C. In: *Proceedings of the 5th Biennial Energy Research Conference: Theory, Applications, and Methodologies*. Center for Environmental Policy, University of Florida, Gainesville, FL.

Potts, T., J. Du, M. Paul, **P. May**, R. Beitle and J. Hestekin. 2011. The Production of butanol from Jamaica Bay Marco Algae. *Environmental Progress & Sustainable Energy*. American Institute of Chemical Engineers. 31:29-36.

McLaughlin, J., R. Will, **P. May**, S. Roberts. 2012. Algal turf scrubber pilot project: evaluating nutrient removal and biofuel potential. *Water Resources Impact. American Water Resources Assn.* 14(4):5-7.

Jernigan, A., M. May, T. Potts, B. Rodgers, J. Hestekin, **P.I. May**, C. Hestekin. 2013. Effects of drying and storage on year-round production of butanol and biodiesel from algal carbohydrates and lipids using algae from water remediation. *Environmental Progress & Sustainable Energy*. 32:1013-1022.

May, P.I., E. Darby, S. Lansing, B. Richardson, B. McMahon, P. Kangas, J. Smith, B. Selby. 2018. *The Innovative Use of an Algal Ecotechnology to Demonstrate Improved Water Quality, Create a Biofuel and Power a Low Emission Fuel Cell at the Port of Baltimore, Maryland, USA*. Conference Proceedings of the 2018 GreenPorts North America Congress. Baltimore Maryland.

F. Witarso, A. Yarberr, **P.I. May**, P. Kangas, S. Lansing. 2020. Complementing energy production with nutrient management: Anaerobic digestion system for algal turf scrubber biomass. *Ecological Engineering* 143 (2020) 1-10.

May, P.I., M. Lagomarsino and P. Kangas. 2021. The Green Bulkhead: A Vertical Wetland Design for Urban Harbors. *Journal of Applied Biotechnology and Bioengineering*. Vol. 8 Issue 3.

In Preparation:

May, P.I. and E. Campbell. Embodied Energy of Stream Restoration. To be submitted to *Ecological Engineering* in 2021.

S. Francis, P. Kangas, **P. May**, E. Tickle. Bioreceptivity of Alternate Types of Algae Infused Concrete for Macroinvertebrate Colonization. To be submitted to *Ecological Engineering* in 2021.

Presentations

Experimentally induced predation/disturbance influences on emergent macrophytes in Kenilworth Marsh, Washington, D.C. Oral presentation at the 20th Annual Society of Wetland Scientists Conference in Norfolk, VA. 1999.

How (and why) to build a tidal freshwater mudflat mesocosm. Oral presentation at the 27th Annual Conference on Ecosystems Restoration and Creation, Hillsborough Community College, Tampa FL. 2000.

Emergy Analysis of Tidal Freshwater Marsh and Mudflat Sportfish Communities on Anacostia River, Washington, D.C. Oral presentation at the 5th Biennial Emergy Research Conference: Theory, Applications, and Methodologies. Center for Environmental Policy, University of Florida, Gainesville, FL. 2008.

Alternate Ecosystem States Controlled by Invasive Herbivores. Oral presentation at the Society of Wetland Scientists International Conference, Washington, D.C. 2008.

Analysis of Tidal Marsh and Mudflat Sportfishery Production on Anacostia River, Washington, D.C. Oral presentation at the Cuba Wetlands Symposium in Cienaga de Zapata, Cuba. 2009.

Tidal Marsh Restoration Controlled by Invasive Species on Anacostia River, Washington, D.C. Oral presentation at the Cuba Wetlands Symposium in Cienaga de Zapata, Cuba. 2009.

Regenerating the Rock Creek Urban Watershed. Oral presentation and field tour. American Society of Landscape Architects (ASLA) Annual Conference, Washington, D.C. Sept. 10-13, 2010.

Use of an Algal Turf Scrubber to Reduce Nutrient Loadings and Produce Biofuel at a Wastewater Treatment Plant on Jamaica Bay, New York City. Oral presentation as part of a symposium on "Restoring Coastal Habitat in the Heart of New York City - Jamaica Bay" at Restore America's Estuaries Conference in Galveston, Texas. November 16, 2010.

A Pilot Ecologically Engineered Algal Treatment System Used to Improve Water Quality on Baltimore's Inner Harbor. Oral presentation at the 11th American Ecological Engineering Society Meeting in Asheville, North Carolina. June 2011.

Waterbird Utilization and Influence on Intertidal Mudflat and Restored Urban Tidal Freshwater Marsh in Washington, D.C. USA. Oral presentation at the Joint meeting of Society of Wetland Scientists, WETPOL and Wetland Biogeochemistry Symposium. Prague, Czech Republic. July 3-8, 2011.

Peter May, Patrick Kangas. *Oxygen Production in an Algae Based Water Treatment System.* Oral presentation at the 12th American Ecological Engineering Society Meeting in Syracuse, New York. June 7-9, 2012.

The Use of Natural Algae to Clean Wastewater, Reduce Estuarine Biofouling and Create a Biofuel in New York City. Oral presentation at the 12th American Ecological Engineering Society Meeting in Syracuse, New York. June 7-9, 2012.

A Pilot Ecologically Engineered Algal Treatment System Used to Improve Water Quality on Baltimore's Inner Harbor. Oral presentation at the 4th International Ecosummit: Ecological Sustainability Restoring the Planet's Ecosystem Services. Columbus, OH. September 30th – October 5th, 2012.

A Comparison of the Nutrient Removal Efficiencies of Floating Wetland Islands and an Algal Turf Scrubber Deployed on Baltimore Harbor in 2012. Oral presentation at the 13th American Ecological Engineering Society Meeting at Michigan State University. June 10-12, 2013.

Peter May, Ji Li and Patrick Kangas. 2014. *Modeling Dissolved Oxygen Refuges Created by an Algal Water Treatment System to Reduce Fish Kills in Baltimore Harbor.* Oral presentation at the 14th American Ecological Engineering Society Meeting in Charleston, S.C. June 9-11, 2014.

Peter May co-presented with Laura Bendernagal. 2014. *Using Algae to Clean Wastewater and Create a Biofuel in New York City.* 2014. Oral Presentation to the Energy Specialty Conference, New York Water Environmental Association. Albany, NY. November 20th, 2014.

Model Ecotechnologies in Urban Aquatic Environments. 2015. Earth Stewardship Initiative: Discovery Station Two. Demonstration presentation at the 100th Annual Meeting of the Ecological Society of America: Ecological Science at the Frontier. Baltimore, Maryland. August 9-14, 2015.

Design for People and Ecosystems. 2015. Earth Stewardship Initiative: Ignite Session 10. Participatory presentation at the 100th Annual Meeting of the Ecological Society of America: Ecological Science at the Frontier. Baltimore, Maryland. August 9-14, 2015.

Novel Ecotechnologies Employed in an Urban Context: The Application of Floating Wetlands, Regenerative Stream Conveyance and Algal Turf Farms in Support of Chesapeake Bay Restoration Goals. 2016. Chesapeake Water Environment Association, Using Alternative BMPs to Achieve Chesapeake Bay TMDL Requirements. Maritime Institute of Technology, Linthicum, Maryland. December 14, 2016.

Samantha Francis, Peter May, Patrick Kangas, Evelyn Tickle. *Improving biodiversity of urban waterfronts: Algae in cement to increase biofouling and colonization*. Oral presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017

Randy Aird, Peter May. *A wastewater treatment wetland at a school monitored for performance in Washington, D.C.* Oral presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

Emily Goo. P.May primary project advisor. *Net-zero water: Residential Greywater filtration*. Oral presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

Elizabeth O'Keefe. P.May primary project advisor. *Residential Food Production: Solar Decathlon 2017*. Oral presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

Witarsa, F. S. Lansing, P.Kangas, P.May and E.Darby. 2017. *Creating bioenergy from an algal flow way using anaerobic digestion*. Oral presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

Berg, J. and J. Burch., presented by P.May. 2017. *Restoration of Pope Branch: Aquatic and wetland habitat improvements, parkland enhancement, and infrastructure protection in an urban watershed*. Oral presentation at the 102nd Annual Meeting of the Ecological Society of America. Portland, Oregon. August 6th-11th, 2017.

Peter May, Olin Christy, Steve Sawyer. 2017. *Learning by Doing: Using Building Scale Wastewater Treatment Wetlands as a Tool for Educational Inspiration*. Oral presentation at the 102nd Annual Meeting of the Ecological Society of America. Portland, Oregon. August 6th-11th, 2017.

Peter May and Elliot Campbell. *Emergy of Stream Restoration*. Oral presentation at the 10th Biennial Emergy Research Conference. Center for Environmental Policy, University of Florida, Gainesville, FL. January 24-27, 2018.

Peter May, Stephanie Lansing and Bill Richardson. *Algae to Energy: Improving Water Quality While Generating a Biogas*. Oral Presentation at the 2018 Greenport Congress. Baltimore, Maryland. May 16-18th, 2018.

May, P., E., Darby, S. Lansing, B. Richardson, B. McMahon, P. Kangas, J. Smity, B. Selby. 2018. *The Innovative Use of an Algal Ecotechnology at the Port of Baltimore, Maryland USA to Demonstrate Improved Water Quality, Create a Biofuel and Power an Emission Free Fuel Cell*. Green Port Congress, Baltimore, MD. May 16-18, 2018.

Samantha Francis, Patrick Kangas, Peter May and Evelyn Tickle. 2018. *Green Concrete: A Comparison of Concrete Substrates for Macroinvertebrate Colonization*. Oral presentation at the 18th American Ecological Engineering Society Meeting. Houston, Texas. June 12-14th, 2018.

Lansing, S., F. Witarsa, A. Yarberry, P. May, P. Kangas, D. Delp. 2019. Anaerobic digestion system for algal turf scrubber biomass: Energy production with nutrient uptake for storm water management. American Society of Agricultural and Biological Engineers Conference. Boston, MA. July 8-10, 2019.

Peter May and Elliot Campbell. *An Environmental Accounting and Energy Analysis of Stream Restoration*. Oral presentation at the Baltimore Ecosystem Study 20th Anniversary Annual Research Conference. Baltimore, Maryland. October 24-25th, 2018.

Delp, D., S. Lansing, P. May, P. Kangas, F. Witarsa, A. Yarberry. 2019. Utilizing algae for the production of high-quality biomethane via anaerobic digestion. Oral Presentation at the 19th Meeting of the American Ecological Engineering Society. Asheville, North Carolina. June 3-6, 2019.

S. Francis, P. Kangas, P. May, E. Tickle. 2019. *Green Concrete: The Bioreceptivity of Algae-Concrete for Macroinvertebrates, Preferences of False Dark Mussels, and a Lesson in Adaptive Management*. Oral Presentation at the 19th Meeting of the American Ecological Engineering Society. Asheville, North Carolina. June 3-6, 2019.

J. Mast, P. Kangas, P. May. 2019. *Demeter's Abacus: Biological Nutrient Composting*. Oral Presentation at the 19th Meeting of the American Ecological Engineering Society. Asheville, North Carolina. June 3-6, 2019.

P. May and P. Kangas. 2019. *The Performance of Two Simultaneously Operated Experimental Algal Flowways Supporting Water Treatment on Anacostia River in Prince George's County, Maryland and Washington, D.C.* Oral Presentation at the 19th Meeting of the American Ecological Engineering Society. Asheville, North Carolina. June 3-6, 2019.

Lansing, S., F. Witarsa, A. Yarberry, P. May, P. Kangas, D. Delp. 2019. Anaerobic digestion system for algal turf scrubber biomass: Energy production with nutrient uptake for stormwater management. American Society of Agricultural and Biological Engineers Conference. Boston, Mass. July 8-10, 2019.

Invited Presentations

The Use of Algae to Clean Wastewater and Create a Biofuel in New York City. 2011. Invited Oral presentation at the Jamaica Bay Research Symposium. Brooklyn College of the City of New York, New York. October 20-21, 2011.

U.S. Department of State Presentation and Tour of the Sidwell Friends Middle School Wastewater Treatment Wetland as an Alternative for Use in Foreign Embassies. Sidwell Friends School, Washington, D.C. May 22nd, 2013.

Envisioning a New Model for the Anacostia: A 21st Century Visioning Charrette for the Greenbelt Station Mixed-use Project. *Regenerative Ecosystems*. Oral presentation and Primary Panel Hosted by U.S. EPA Region 3 Water Protection Division and Renard Development Company. Riggs Alumni Center, University of Maryland, College Park, Maryland. May 12th, 2015.

Studio Bronx Biolab. Spring Semester, 2016. Oral presentation on ecological engineering and ecotechnologies, LARP 702. Dept. of Landscape Architecture and Planning, University of Pennsylvania, Philadelphia, PA.

Smart Cities and Connected Communities Workshop. *Historical Context and Lessons of Rural / Urban Gradient Agroecosystems*. Oral Presentation. Sponsored by the US Department of Agriculture at the University of the District of Columbia, Washington, D.C. December 8th, 2016.

Baltimore Ecosystem Study Seminar Series. *A Proposal to Establish a Restoration Review and Research Response (Re4) Collaboration Between Restoration Practitioners, Academic Researchers and Regulators*. Oral Presentation. University of Maryland Baltimore County. December 2nd, 2016.

China/Webster University Presentation – *Cleaning Polluted Waters in Urban Environments with New Ecotechnologies*. Oral presentation. George Washington University. July 28th, 2016

Watershed Speaker Series – *Novel Ecotechnologies Applied in Urban Environments: Floating Wetlands, Algal Scrubbers and Regenerative Stream Conveyance Systems*. Oral presentation for the Anacostia Watershed Society. Washington, DC. July 20th, 2016.

International Society for Ecological Economics (ISEE) 2016 Annual Conference. Invited Keynote Speaker Plenary Panel Speaker. *Water and Justice: Collaborations Between University of Maryland and Ecological Engineering Designers in the Private Sector*. University of the District of Columbia. June 28th, 2016.

Biosphere 2/University of Arizona – *Algal Turf Scrubber: An Algae Based Ecotechnology for Water Quality Improvement*. Oral presentation at Biosphere 2. Tucson, Arizona. June 22nd, 2016.

US EPA Chesapeake Bay Program/Chesapeake Stormwater Network Webcast – *Algal Flowway Technologies (AFT) AKA Algal Turf Scrubber: An Algae Based Ecotechnology for Water Quality Improvement in Support of Chesapeake Bay TMDL Requirements*, Virtual Oral Presentation. <http://chesapeakestormwater.net/events/webcast-algal-flow-way-technologies/> April 14th, 2016.

Maryland Stream Restoration Association (MSRA) Education Committee Stream Workshop and Job Fair. *The Academic to Applied Connection in Stream Restoration*. University of Maryland, College Park, Maryland. February 18th, 2017.

Anne Arundel Watershed Stewards Academy 6th Annual Conference. *Beyond Restoration! A New View to Inspire Ecological Stewardship and Stimulate Public Policy Support*. Oral presentation. February 25th, 2017.

University of Maryland Plant Science Landscape Architecture Seminar Series in Urban Sustainability. *New Paths in Urban Ecological Sustainability*, Oral presentation. April 4th, 2017.

International Association of Landscape Ecologists, *Baltimore Harbor Eco-Tech Tour*, April 11th, 2017.

Integrating student education and applied ecotechnology in an academic context: a hands, eyes and minds on approach. Towson University Environmental Conference. Invited Presentation, April 21, 2017.

Fresh and Salty: New Approaches in Applied Technoecosystems. Invited presentation to the Yale University School of Forestry & Environmental Studies. Stamford, CT. November 14th, 2017.

Maryland Stream Restoration Association (MSRA) Education Committee Stream Workshop and Job Fair. *The Emergy of Stream Restoration*. University of Maryland, College Park, Maryland. February, 2018.

Stephanie Lansing, P. May and Larry Davis. 2018. *Algae for Energy and Cleaning the Chesapeake Bay*. Earth Day Celebration. Algal Turf Scrubber demonstration at the Robert Goddard Montessori School. Seabrook, MD. May 4th, 2018.

P. May and Stephanie Lansing. 2018. *Algal Turf Scrubber/Waste to Energy*. Algal Turf Scrubber demonstration at the Fearless Ideas UMD \$1Billion Fundraising Campaign Launch. Clarice Smith Performing Arts Center, University of Maryland. College Park, MD. May 11th, 2018.

P. May and Stephanie Lansing. 2018. *Algal Turf Scrubber/Waste to Energy*. Algal Turf Scrubber demonstration at the Fearless Ideas UMD \$1Billion Fundraising Campaign. United States Patent and Trademark Office, Alexandria, Virginia. Oct 25th, 2018.

P. May, Stephanie Lansing and Bill Richardson. *Algae to Energy: Improving Water Quality While Generating a Biogas*. Oral Presentation at the 2018 Greenport Congress. Baltimore, Maryland. May 16-18th, 2018.

Maryland Stream Restoration Association (MSRA) Education Committee Stream Workshop and Job Fair. Oral presentation. *The role of the ecologist in stream restoration*. University of Maryland, College Park, Maryland. March 3rd, 2019.

P. May, Patrick Kangas, Jim Foster. Choose Clean Water Conference. Conference Panelist for Innovative Technologies, Chesapeake Blueprint. *Algal Ecotechnologies Supporting Watershed Stewards*. Panel & Oral Presentation at the 10th Annual Choose Clean Water Conference. Baltimore, Maryland. May 20-22, 2019.

Forte International Exchange Association. Invited 6 Hour Presentation to the Central and Southern China Municipal Engineering Design & Research Institute. *Novel Ecotechnologies for Environmental Improvement*. October 14th, 2019. Falls Church, Virginia.

Maryland Stream Restoration Association (MSRA) Education Committee Stream Workshop and Job Fair. *Opportunities available for the University student in Stream Restoration*. University of Maryland, College Park, Maryland. February 22nd, 2020.

District of Columbia Master Naturalist Class. Invited 3 hour presentation. *Fundamental Ecological Principles*. University of the District of Columbia. March 26th, 2020.

2020 Chesapeake Community Research Symposium. *A Scalable BMO that Provides Verifiable Nutrient, Sediment and Carbon Load Reductions for Chesapeake Bay*. With Dr. Pat Kangas. June 8-10, 2020.

Maryland Master Naturalist Class. Invited 3 hour presentation. *Ecological Principles*. Nanjemoy Creek Environmental Education Center. July 13th, 2020.

Maryland Master Naturalist Class. Invited 3 hour presentation. *Ecological Principles*. Goucher College. February 13th, 2021.

Restoring Natural Areas in Maryland. Full Moon Seminar Series. Invited 3 hour presentation. *Restoration and the Ecologies of Ecological Engineering*. May 23, 2021.

Class in Principles of Ecology and Ecotechnologies. Invited 3 hour presentation. *Novel Approaches in Applied Ecotechnologies for Urban Technoecosystems*. Earth University, Costa Rica. May 25, 2021.

Poster Presentations

May, P.I. 2003. *Two years of vegetative data from engineered experimental goose exclosures on mudflats of Kingman marsh in Washington, D.C.* Poster presentation for the 3rd American Ecological Engineering Society Conference, University of Maryland at College Park, MD.

May, P. I. 2003. *The use of engineered exclosure design in experimental ecology and restoration of freshwater tidal marshes in Washington, D.C.* Poster Presentation at the 17th Biennial Conference of the Estuarine Research Federation: Estuaries on the Edge. Seattle, WA. September, 2003.

May, P., C. Streb and P. Kangas. 2006. *A design for a boat washwater treatment ecosystem.* Poster Presentation at the 6th American Ecological Engineering Society Conference, Berkeley, California.

Alexander, A., H. Scherr, S. David, G. Chan, D. Lam and P. May. 2014. *A Comparative Study Analyzing Water Quality in a Microcosm Iron Cyclor System and a Constructed Stream Restoration System in Rock Creek Park, Washington, D.C.* Poster presentation for the 2014 Mid-Atlantic Stream Restoration Conference, Baltimore, Maryland. September 23-25, 2014.

Smith, J., B. Selby, P. Kangas and P. May. 2014. *Controlled Algal Growth for Water Quality Improvement at the Port of Baltimore.* Poster presentation at the 14th American Ecological Engineering Society Meeting in Charleston, S.C. June 9-11, 2014.

Stanley, L., P.I. May, J. Li, and P. Kangas. 2014. *Evaluation of the Use of an Algae Based Vertical Green Bulkhead for Water Quality Improvement in Baltimore Harbor.* Poster presentation at the 14th American Ecological Engineering Society Meeting in Charleston, S.C. June 9-11, 2014.

May, P. and P. Kangas. 2014. *The Use of Mesocosms Matched with Field Analogues in an Undergraduate Water Quality Class.* Poster presentation at the 14th American Ecological Engineering Society Meeting in Charleston, S.C. June 9-11, 2014.

May, P. and P. Kangas. 2015. *A Comparison of Productivity on Two Verses Three Dimensional Substrates in an Algal Ecotechnology.* Poster presentation at the 15th American Ecological Engineering Society Meeting at Oklahoma State University, Stillwater, Oklahoma. June 3-6, 2015.

Kangas, P. and P. May. 2016. *Performance of an Experimental Algal Turf Scrubber Near Baltimore Harbor, Maryland.* Poster presentation at the 16th American Ecological Engineering Society Meeting at University of Tennessee, Knoxville, Tennessee. June 7-9, 2016.

Alexander Bauer, Samuel Cromwell, Brittany Haas, Horia Olariu, Aleah Pizarz, Patrick Kangas, Peter May and Charmaine Dahlenburg. 2016. *A Survey of a Novel Urban Estuarine Ecosystem.* Poster presentation at the 16th American Ecological Engineering Society Meeting at University of Tennessee, Knoxville, Tennessee. June 7-9, 2016.

Terrance Glover, Sarah Koskinen, John Turner, Benjamin Wells, Lionel Wilson, Patrick Kangas, Jose-Luis Izursa and Peter May. 2016. *Vermiculture Experiments Using Algal Biomass as a Substrate.* Poster presentation at the 16th American Ecological Engineering Society Meeting at University of Tennessee, Knoxville, Tennessee. June 7-9, 2016.

May, P. 2016. *Novel Ecotechnologies Employed in an Urban Context: The Application of Floating Wetlands, Regenerative Stream Conveyance and Algal Turf Farms in Support of Chesapeake Bay Restoration Goals.* Oral presentation to Chesapeake Water Environment Association (CWEA) Stormwater Fall 2016 Seminar Program. Maritime Institute of Technology, Linthicum, Maryland. December 14th, 2016.

Maile-Moskowitz, A., F.Witarsa, S.Lansing, P. Kangas and P. May. 2017. *Pre-treatment of algae from an algal flow way for anaerobic digestion.* Poster presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

May, P and P. Kangas. 2017. *A unique biofuel option from a novel algal ecotechnology*. Poster presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

May, P and P. Kangas. 2017. *An ecological survey of a novel urban estuarine ecosystem in Baltimore, Maryland*. Poster presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

May, P and P. Kangas. 2017. *A full-scale model living bulkhead design tested for deployment on Anacostia River in Washington, D.C.* Poster presentation at the 17th American Ecological Engineering Society Meeting at University of Georgia, Athens, Georgia. May 22nd-25th, 2017.

Kangas, P., Morgan Doherty, Benjamin Frys, John Huntzinger, Jay Kinnaman, Matthew Lagomarsino, Joshua Nichols, Risharda Settles, Peter May. 2018. *Sediment Removal Performance of a Green Bulkhead System*. Poster presentation at the 18th American Ecological Engineering Society Meeting at Houston, Texas. June 12-14th, 2018.

Kangas, P., Franklin Lane, Katherine Morgan, Peter May, Walter Mulbry. 2018. *The Performance of Experimental Algal Turf Scrubbers Inside of Biosphere 2*. Poster presentation at the 18th American Ecological Engineering Society Meeting at Houston, Texas. June 12th - 14th, 2018.

Yarberry, A., F.Witarsa, P.May, P.Kangas, E.Darby, S. Lansing. 2018. *Design and implementation of a pilot-scale anaerobic digestion system for biogas production from algae*. Poster presentation at the Bioresource Technology for Bioenergy, Bioproducts & Environmental Sustainability. Stiges, Spain. September 16-18, 2018.

P. Kangas, P. Hirschm H. Jowett, G. Kese, G. Krug, S. Larkin, A. Parsons, P. May. 2019. *Planning for a Medium-Scale Algal Floway for Water Treatment in Central Maryland*. Poster Presentation at the 19th American Ecological Engineering Society Meeting at Asheville, NC. June 3-6th, 2019.

Peter May, Stephanie Lansing, Patrick Kangas, Bill Bowerman. 2019. *Algal Ecotechnology Cleans Water / Creates Biogas for Clean Electricity*. Poster presentation at the 24th World Scout Jamboree at the Summit Bechtel Reserve. Summit, West Virginia. July 22-August 2nd, 2019.

Kangas, P., P. May, J. Huntzinger. 2019. *The Green Bulkhead: A vertical wetland design for urban harbors*. Poster presentation at the Marsh Resiliency Summit: From Science to Management. The Chesapeake Bay Sentinel Site Cooperative. Williamsburg, Virginia. February 5th-6th, 2019.

Lansing, S., D.Delp, P.May, P.Kangas, F. Witarsa, A. Yarberry. 2019. *Algal production to remove nutrients from the Chesapeake Bay with bioenergy production at the Port of Baltimore*. Poster presentation at the University of Maryland College of Agriculture and Natural Resources Cornerstone Event: Clean and Healthy Chesapeake Bay. College Park, MD. October 29th, 2019.

May, P., M. Langomarsino, P. Kangas. 2019. *A green bulkhead vertical wetland ecosystem*. Poster presentation at the University of Maryland College of Agriculture and Natural Resources Cornerstone Event: Clean and Healthy Chesapeake Bay. College Park, MD. October 29th, 2019.

A. Arnold and P. May. 2020. *Comparing Implementation Methods for Successful Forest Restorations: A Review of the Literature*. Poster presentation at the 20th American Ecological Engineering Society Meeting, Virtual at The Ohio State University, Columbus, Ohio. June 1st- 5th, 2020.

D. Delp, A. Yarberry, P. May, P. Kangas, F. Witarsa, S. Lansing. 2020. *Anaerobic digestion of algae harvested from an algal turf scrubber at the Port of Baltimore*. Poster presentation at the 20th American Ecological Engineering Society Meeting, Virtual at The Ohio State University, Columbus, Ohio. June 1st- 5th, 2020.

Davis, L., J. Randolph, P. May, P. Kangas. 2021. *Retrofitting Stormwater Ponds with an Algal Ecotechnology for Enhanced Water Quality Treatment*. Poster presentation at the 20th American Ecological Engineering Society Meeting, Virtual at The Ohio State University, Columbus, Ohio. May 25th - 26th, 2021.

Blevins, K., P. Forbes, C McGill, A. Phelps, S. Smith, M. Zarillo, P. Hirsch, P. Kangas. P. May. 2021. *Use of Dried Algae in Nursery Pots*. Poster presentation at the 20th American Ecological Engineering Society Meeting, Virtual at The Ohio State University, Columbus, Ohio. May 25th - 26th, 2021.

Contributions to Selected Technical Reports

Maryland Anacostia River Basin Study, Part II – Fisheries. 1989. Interstate Commission on the Potomac River Basin, ICPRB Report #90-1.

District of Columbia Fish Tissue Analysis: Distribution of Chemical Contaminants in 1993-1995 Wild Fish Species in the District of Columbia. 1996. Environmental Report. Prepared for the Government of the District of Columbia DCRA, Environmental Health Administration by the Interstate Commission on the Potomac River Basin.

Determination of the Volume of Contaminated Sediments in the Anacostia River, District of Columbia. 1997. Prepared by the Interstate Commission on the Potomac River Basin, Rockville, MD for the Environmental Regulation Administration, Government of the District of Columbia, Washington, D.C.

Seasonal transformation and fluxes of nitrogen, carbon and phosphorus in a tidal freshwater marsh. 2000. Final Report to the Interstate Commission on the Potomac River Basin. Rockville, MD.

Green Roofs in the Jamaica Bay Watershed, New York City. 2007. Final Report produced for the New York City Department of Environmental Protection. Biohabitats, Hydroqual, Hazen and Sawyer.

Design Manual. 2008. Stormwater Planter Design Showcase: Recommended Plants for Urban Stormwater Management. Peter May, Bryan Salladin and Chris May. *Wild and Tough Enough 2*. Pennsylvania Horticultural Society, Pennsylvania Water Department Office of Watersheds.

White Paper: 2008. Potential Carbon Sequestration Rates from Tidal Salt Marsh Restoration at Redwood City, San Francisco Bay, CA. Biohabitats. Author Peter May. Submitted to DMB Associates.

White Paper: 2011. Calculation of Restored Salt Marsh Offset of Vehicle Miles Traveled (VMT) for Saltworks and a Comparison to VMT Reductions from a Saltworks Transit Oriented Development (TOD) at Redwood City, San Francisco Bay, CA. Author Peter May. Submitted to DMB Associates.

White Paper: 2011. Jamaica Bay Ulva Harvest Pilot Analysis for Annual Nitrogen Removal and Biofuel Production in New York City. Author Peter May submitted to NYC Department of Environmental Protection.

Final Report. 2011. David Tilley, Elliott Campbell, Ted Weber, Peter May and Chris Streb. Ecosystem Based Approach to Developing, Simulating and Testing a Maryland Ecological Investment Corporation that Pays Forest Stewards to Provide Ecosystem Services. Final Report to the Harry Hughes Agro-Ecology Center, Maryland Department of Agriculture. HCAE Pub 2013-01.

Performance Report. New York City Algal Turf Scrubber Pilot Program. September 16, 2010 through December 13th 2011. Biohabitats, Hydroqual, Hazen and Sawyer. March 2012.

P. May and M. Zivojnovich. Algal Turf Scrubber Feasibility Study. October 11, 2013. Prepared by Biohabitats and HydroMentia for the City of Durham Stormwater Services.

Smith, J., B. Selby, P. Kangas and P. May. 2013. Progress Report on the Port of Baltimore Algal Turf Scrubber Project. Unpublished Report. Algal Ecotechnology Center, University of Maryland, College Park, Maryland.

Experimental Application of Invasive Plant Removal Techniques for the Control of Non-Native *Phragmites australis* in the Anacostia River in Washington D.C. Report of 2013-2014 results by the Anacostia Watershed Society.

White Paper. Maryland Port Administration Oyster BMP White Paper. 2014. An Investigation of Oyster Reef Restoration as a Viable Method of Nutrient and Sediment Load Reduction to Satisfy State TMDL Requirements. Author Peter May submitted to MPA Port of Baltimore, 11/04/2014.

J. Li, P. May, P. Kangas. Final Report. Modelling Dissolved Oxygen Refuges in Baltimore Harbor for Reducing Fish Kills. 2014. Submitted to the Abell Foundation of Baltimore, Maryland in fulfillment of a research grant.

May, P., P. Kangas, J. Smith and B. Selby. 2014. A Comparison of Methods for Estimating Algal Biomass Productivity at the Port of Baltimore Algal Turf Scrubber. Unpublished Draft Report. August 18, 2014. Algal Ecotechnology Center, University of Maryland, College Park, Maryland.

Environmental Protection Agency Chesapeake Bay Program (EPA CBP). 2015. Nutrient and Sediment Reductions from Algal Flow-way Technologies: Recommendations to the Chesapeake Bay Program's Water Quality Goal Implementation Team from the Algal Flow-way Technologies BMP Expert Panel. Unpublished Final Draft Report. October 21, 2015.

Kangas, P., E. Lukemire, D. Calahan, W. Mulbry and P. May. 2015. Progress Report on the Cox Creek Algal Turf Scrubber Project. Unpublished Draft Report October 2015.

Smith, J., B. Selby, P. Kangas, P. May and W. Mulbry. 2016. 2015 Final Progress Report on the Port of Baltimore Algal Turf Scrubber Project. Unpublished draft report to the Maryland Port Administration. March 27, 2016.

Selby, B., P.Kangas, P. May, W. Mulbry and S. Calahan. 2016. Algal Biomass Productivity at the Port of Baltimore Algal Turf Scrubber: Fall 2016. Unpublished Draft Report. December 6, 2016. Algal Ecotechnology Center, University of Maryland, College Park, Maryland.

Assessment of the National Aquarium of Baltimore's Floating Wetland Island Ecosystem. 2016. Technical Report to the National Aquarium in Baltimore.

Hydromentia. 2016. Hawkins Point Algal Turf Scrubber: Algal Turf Scrubber Design Model (ATSDEM) Projections. Unpublished report prepared for Biohabitats and Moffat & Nichol. January 16, 2017.

Peter May and Ed Morgereth. Maryland Port Pilot ATS 2013-2016 Years to Date Data and ATS System Performance. June 12, 2017.

White Paper: Biodiversity, Aesthetics & Public Value. Invited Professional Charette Contributor and Reviewer at the Earth Stewardship Initiative (ESI) for the Ecological Society of America (ESA) 2017 Annual Conference in Portland Oregon, USA. October 6, 2017.

S. Francis, P. Kangas, P. May, E. Tickle. Bioreceptivity of Alternate Types of Algae Infused Concrete for Macroinvertebrate Colonization. Report presented to the National Aquarium in Baltimore. 2019.

Selected Consulting Project Experience

Baltimore Harbor Algal Turf Scrubber® (ATS™), Baltimore, MD. Co-lead investigator for the development and implementation of a pilot ATS™ on Baltimore's Inner Harbor for the purposes of improving harbor water quality in keeping with the Baltimore Waterfront Partnership's Healthy Harbor Initiative.

Maryland Port Administration Dundalk Marine Terminal Algal Turf Scrubber® (ATS™), Baltimore, MD. Co-lead investigator for the development and implementation of a pilot ATS™ at the marine terminal for the purposes of improving harbor water quality in support of the Port's total maximum daily load (TMDL) reduction requirements for nitrogen, phosphorous and total suspended solids.

Modeling Dissolved Oxygen Refuges in Baltimore Harbor for Reducing Fish Kills, Baltimore, MD. Technical investigator for an Abell Foundation study grant that used existing Baltimore Harbor Algal Turf Scrubber® dissolved oxygen performance data to model the creation of dissolved oxygen refugia zones around various sized ATS™ units from one half acre to 25 acres in size.

National Aquarium Bulkhead Biohut Oyster Reef Experimental Implementation, Baltimore, MD. Working with the French firm Ecocean, senior scientist in implementing their Biohut constructed oyster reef at several locations along the bulkheads of the National Aquarium in Baltimore Harbor. Oyster shell was set with oyster spat at the University of Maryland's Horn Point Laboratory and deployed inside the Biohuts to facilitate juvenile fish recruitment with native habitat. Underwater video documentation of fish and invertebrate utilization as well as Biohut subsample removal and deconstruction to determine oyster survivorship, growth and species diversity and numbers is ongoing.

Experimental Application of Invasive Plant Removal Techniques for the Control of Non-native *Phragmites australis* in the Tidal Anacostia River, Washington, D.C. Experimental design consultant for the Anacostia Watershed Society's efforts to control *Phragmites*. The use of multiple transect plots and the stratified random treatment of two types of herbicide with mowed and unmowed plot conditions was implemented and assessed statistically for treatment success.

Algal Turf Scrubber® (ATS™) Feasibility Study, Durham, NC. Technical lead for this project that determined the feasibility of applying Algal Turf Scrubber® technology to Ellerbe and Little Lick Creeks for City of Durham. The project compiled GIS/watershed data on stream discharge, nutrient loading, topography, land ownership, wastewater treatment plant discharge, and other parameters to determine the most beneficial and cost-effective locations for a pilot study and a scaled up full-size implementation.

Jamaica Bay Ecosystem Pilot Program, New York City, NY. Provided conceptual design and technical support for the development and implementation of a suite of pilot restoration projects for the Jamaica Bay estuary in a highly urbanized portion of Brooklyn and Queens. These included field located pilot experimental projects supporting eelgrass, oyster reefs, macroalgae harvesting, bivalve filtration, wave attenuation, and the use of the ecologically engineered algal turf scrubbers® (ATS™) to remove nutrients from a wastewater treatment plant's secondary treated effluent. A significant additional component of this work that Dr. May was the lead investigator on was the conversion of harvested estuarine macroalgae and attached ATS™ microalgae into biofuels such as butanol, ethanol, and biodiesel.

Redwood City Saltworks, Redwood City, CA. Redwood City Saltworks is a 1,400-acre property proposed as a 1,000 acre mixed use city scale development that also included the designed restoration of 400 acres of salt marsh habitat on San Francisco Bay. Not only was there a significant landscape restoration and conservation component, there was also a commitment to sustainable design throughout the development. Innovative and comprehensive stormwater management strategies were weaved throughout and water harvesting and reuse was a significant component of the program. Provided technical and conceptual design support for the initial community sustainability program, and worked with all members of the design team to create an integrated approach to meet the progressive goals and

targets articulated in that program. Provided technical support for the development of hundreds of acres of salt marsh and associated habitat restoration design. Developed white papers on site and regional carbon reduction and sequestration.

Pratt Street Design Guidelines, Baltimore, MD. Assisted in the development of the guidelines for a 16 city block length of Pratt Street which is now being used to inform and direct the redevelopment of an 18 acre section of city streets and buildings that extends from Martin Luther King Jr. Boulevard in West Baltimore east past the Baltimore Inner Harbor to President Street. Biohabitats role was to support the design with the urban site ecology, stormwater management, urban forestry, aquatic habitat and environmental sustainability initiatives.

Baltimore Waterfront Floating Wetlands, Baltimore, MD. Concept originator and collaborative designer in the novel implementation of this floating wetland island project which incorporated retrieved floatable plastic bottles and a planting matrix to support emergent macrophyte growth on modular islands in Baltimore's Inner Harbor. As an educational demonstration project, local schoolchildren from the Living Classrooms Foundation were trained in the purpose, function and construction of the wetlands after which they were deployed in Baltimore's Inner Harbor. Numerous goose exclosure strategies were implemented.

Fresh Kills Park, Staten Island, NYC, NY. As project environmental scientist, identified wetland and enhancement opportunities as part of the ecological restoration of approximately 2,200 acres of the Fresh Kills landfill. Now closed as a landfill, this site will be transformed into an ecologically diverse, innovative, and culturally active new parkland over the next 30 years. Working with a team of consultants, Biohabitats led the ecological restoration portion of this project. The ecological goals for this project were to develop an invasive species management plan, and restore wetlands, native grasslands, and indigenous woodland communities that will offer wildlife habitat as well as natural open spaces and recreation opportunities for park visitors.

Jamaica Bay Watershed Protection Plan, New York City, NY. Provided technical support for the development of a comprehensive watershed management plan and restoration strategy for the Jamaica Bay watershed in a highly urbanized portion of Brooklyn and Queens on Long Island. Duties included the review and integration of existing technical research into a watershed management plan to produce a wetland and watershed restoration plan and low-impact stormwater management design.

New York City Long Term Control Plan, New York City, NY. Provided technical support including extensive GIS ground truthing and concept development for the development of New York City's Long Term Stormwater Control Plan. Biohabitats assessed opportunities to employ stormwater best management practices (BMP) that were designed to mitigate the quantity and quality of stormwater runoff entering New York City's entire sewer system. Given identified opportunities and constraints for this ultra-urban area, Biohabitats considered a wide array of technologies, including collection, filtering and treatment systems, non-structural and structural strategies; changes in existing maintenance and management practices; education tools and stakeholder awareness programs, to changes in development regulations, architectural guidelines and land use policies. New emerging technologies were also explored (green roof canopy concepts, green corridors, etc.) and "out-of-the-box" ideas were tailored to New York City's ultra-urban infrastructure and unique environmental conditions. Finally, Biohabitats prepared a report documenting the methodologies, findings and recommendations of this study. This thorough approach allowed the development of a comprehensive long term approach toward mitigating the stormwater management problems plaguing New York's five boroughs.

North Delaware Riverfront Greenway-Lardner's Point Park, Philadelphia, PA. Dr. May conducted field surveys of the site and provided technical support for concept development, 60% and final design for Biohabitats' efforts to develop a shoreline restoration and stabilization concept plan for approximately 400 linear feet of Delaware River shoreline. This work was a follow-up effort to Biohabitats final design and

construction package for the first phase of a greenway along the North Delaware riverfront at Lardner's Point. Dr. May's work on the shoreline restoration concept plan culminated in a report intended to support application of the project by the Delaware River City Corporation grant application to the NOAA Athos Oil Spill trustees to support ecological restoration of resources similar to those damaged or injured by the oil spill. He developed and implemented a 5-year post-construction riparian and nearshore aquatic monitoring plan for the park.

Ecological Sustainability Design Guidelines for Columbia Town Center, Howard County, MD. Part of the Biohabitats team that worked on the development of a set of ecological sustainability guidelines for the redevelopment of the Columbia Town Center. Combining field reconnaissance and available data, the team developed recommendations on forest preservation areas, restoration strategies, stormwater management strategies, and best building locations and practices. Helped to interpret the proposed impacts, environmental enhancements, and resulting development design options for the client.

Washington Ave. Green Waterfront Pier Design-Build, Philadelphia, PA. Provided initial technical design guidance for this design-build project along the Central Delaware River, which converted vacant industrial land along the riverfront into a vibrant public park focusing on ecological improvement, sustainable design and reconnection of the community to the river. The main project elements included impervious surface removal and stormwater run-off control, native plant community landscape and habitat improvement, invasive species management, floating wetland installation, sustainable site amenities and furnishing, environmental art integration and interpretive educational signage development.

DC WASA Pope Branch Stream Restoration, Washington, D.C. Biohabitats was a subcontractor to Black & Veatch for work contracted by DC WASA (Water and Sewer Authority) on the Pope Branch sewer improvement project. This project included the development of restoration concepts for three stream reaches, only one of which was subject to DC WASA's sewer improvement work. The two stream reaches downstream from the sewer improvement project reach were designed on the basis of an agreement between DC WASA and DC Department of the Environment (DOE). Biohabitats role involved site assessment, development of a restoration concept for review and approval by DC DOE (Dept. of Environment), Hydraulics and Hydrology modeling, development of semi-final plans, permitting services focused on the restoration design, and preparation of final construction documents. As senior environmental scientist, Dr. May provided technical design and field assessment support for this project.

DC Stream Regenerative Stream Conveyance (RSC) Design-Build, Washington, D.C. Biohabitats was contracted for three design-build stream restoration projects for the DC Department of the Environment. Two of these projects were located on tributaries to Rock Creek on National Park Service (NPS) land and required special consideration and practices to ensure compliance with NPS policies and procedures. These restoration contracts were focused on the restoration of more than one (1) mile of stream degraded by urban runoff from DC streets. The third contract consisted of the restoration of three headwater channels all entering Pope Branch in the vicinity of the DC WASA sewer improvement project, and is on DC Park land. As senior environmental scientist, Dr. May provided technical design and field assessment support for this project.

New Jersey Highlands Critical Habitat Conservation and Management Plan, NJ. Dr. May assisted the Highlands Council in this project by developing a science based literature review focused on cutting edge information related to restoration and mitigation strategies for critical habitats identified in the New Jersey Highlands. Building from the literature review, Dr. May then contributed to the development of mitigation strategies for the critical habitats, which included forests, grasslands, wetlands, streams, and riparian buffers, while also providing information on market-based incentive programs.

Blackbird National Estuarine Research Reserve Ecological Restoration Master Plan, New Castle County, DE. Provided technical and field support for this Ecological Restoration Master Plan for portions of the Blackbird area of the Delaware National Estuarine Research Reserve (DNERR). The Reserve acquired additional tracts encompassing over 400 acres of land to add to the Reserve system. Biohabitats evaluated these lands in the context of identifying the current needs of the site for ecological

restoration and management with the goal of creating a long-range plan to guide the implementation of restoration projects in phases and stages over the next few decades. Used GIS mapping and site reconnaissance to evaluate the need of the Reserve lands for ecological restoration, and to identify the location, type, extent and prioritization for restoration projects. Additionally, associated needs for restoration monitoring research and education opportunities are also being provided to help management with the ecological restoration of the reserve using an adaptive management approach.

New York City CSO-PlaNYC Green Infrastructure Initiative— Ecological Restoration Pilots, New York City, NY. Dr. May developed the pilot project recommendations in the Jamaica Bay Watershed Management Plan and subsequently provided technical support for the development and implementation of the suite of pilot restoration projects for the Jamaica Bay estuary in a highly urbanized portion of Brooklyn and Queens. These included field located experimental projects supporting eelgrass, oyster reefs, macroalgae harvesting, bivalve filtration, wave attenuation, and the use of the ecologically engineered algal turf scrubbers (ATS) to remove nutrients from a wastewater treatment plant's secondary treated effluent. A significant additional component of this work that Dr. May was the lead investigator on was the conversion of harvested macroalgae and attached ATS microalgae into biofuels such as butanol, ethanol, and biodiesel.

Rock Creek—Bingham Run, Rock Creek—Milkhouse Run & Pope Branch Regenerative Stormwater Conveyance Design-Build Projects, Washington, D.C. Biohabitats was contracted for three design-build stream restoration projects for the DC Department of the Environment. Two of these projects were located on tributaries to Rock Creek on National Park Service (NPS) land and required special consideration and practices to ensure compliance with NPS policies and procedures. These restoration contracts were focused on the restoration of more than one (1) mile of stream degraded by urban runoff from DC streets. The third contract consisted of the restoration of three headwater channels all entering Pope Branch in the vicinity of the DC WASA sewer improvement project, and is on DC Park land. As senior environmental scientist, Dr. May provided technical design and field assessment support for this project.

DC Stream RSC Design-Build, Washington, D.C. Biohabitats was contracted for three design-build stream restoration projects for the DC Department of the Environment. Two of these projects were located on tributaries to Rock Creek on National Park Service (NPS) land and required special consideration and practices to ensure compliance with NPS policies and procedures. These restoration contracts were focused on the restoration of more than one (1) mile of stream degraded by urban runoff from DC streets. The third contract consisted of the restoration of three headwater channels all entering Pope Branch in the vicinity of the DC WASA sewer improvement project, and is on DC Park land. As senior environmental scientist, Dr. May provided technical design and field assessment support for this project.

Chase Pier Feasibility and Schematic Design, Baltimore, MD. Dr. May assisted the field evaluation effort to convert an unused, dilapidated pier on the Baltimore Harbor into an ecological and sculptural public attraction that cleans polluted Harbor water and improves aquatic habitat. The concept was further developed and submitted in the Baltimore Harbor Action Plan. The project is currently in the schematic design phase.

Pier 26 Feasibility and Experimental Design, New York City, NY. Dr. May provided conceptual design review, feasibility analysis and an experimental design of a constructed city park developed on the abandoned pier structures of Pier 26 in the Hudson River.

7th Street Pier Floating Wetlands, Southeast Waterfront, Washington, D.C. Dr. May provided a resident Canada goose herbivory enclosure design for the floating wetlands structures moored by the pier.

Briers Mill Run Regenerative Stormwater Conveyance for Anacostia Watershed Society, Riverdale, *Prince George's County, MD*. Biohabitats was hired by the Anacostia Watershed Society to develop a restoration plan for the severely eroded gully discharging into Briers Mill Run, a tributary to the Northeast Branch of the Anacostia River. The stormwater outfall draining to the gully is located adjacent to William Wirt Middle School. The project length was approximately 200 linear feet with an elevation drop of nearly 18 feet. Biohabitats led the design and permitting. The restoration approach raised the stream invert with constructed riffles. Biohabitats worked with Underwood and Associates as its subcontractor to construct the project within the timeframe mandated by the grant. The project was developed as a future living laboratory for the students of the Middle School to monitor and observe with the Anacostia Watershed Society deploying a “critter” camera on the project site for resource interpretation. Dr. May provided site assessment and documentation, design input and review, construction oversight, consulted on a monitoring plan and served as a liaison with the Anacostia Watershed Society and the construction led by Underwood and Associates.

Galveston Island State Park Master Plan, *Galveston County, TX*. As a technical lead, Dr. May contributed to the Biohabitats effort as a key member of the planning team, led by Mesa of Dallas, TX. The master plan was produced for the Texas Parks and Wildlife Department to create a plan that looks out on a 50-year horizon. Dr. May's work provided key geomorphological gulf and bay side coastal process context and its effects on long term ecological relationships on important species and natural habitats of the barrier island and near-shore environments for this park that spans from the Galveston Bay side to the Gulf of Mexico shoreline. Project efforts included understanding not only the impacts of tropical storms and accelerated shoreline erosion rates, but also land use and landscape ecology considerations, as well as the implications of global climate change and projected sea level rise. After conducting an inventory and assessment of the park's ecological resources, Biohabitats performed keystone species/guild habitat analyses, and predictive modeling to project the impacts of sea level rise on the landscape, and how habitats may shift accordingly. Additional elements contributed to the planning process, including sustainability planning, an environmental system overlay and development of corresponding conservation, restoration and management strategies for terrestrial, estuarine and marine habitats including, tidal marsh, sea grass beds, oyster reefs, coastal prairie, freshwater marshes, and the beach dune/system.

Brewer's Pond Living Shoreline, *Anne Arundel County, MD*. Dr. May served as technical lead and senior environmental scientist for the evaluation of the potential breaching of a section of stone revetment constructed in 1995 and design, permitting and construction of a stable and resilient shoreline condition at Brewer Pond County Park located along the Severn River. The shoreline protection approach is to provide hybrid living shoreline through a combination of tidal marsh restoration, a marsh sill retrofitted from the existing stone revetment, and adjacent formed oyster reef structures to prevent further erosion and loss of tidal marsh habitat.

Cinnamon Lane Outfall Rehabilitation, *Parole, MD*. Dr. May served as senior environmental scientist for the Cinnamon Lane Outfall Rehabilitation project, and was integral in the oversight of the environmental assessment. Project goals for Anne Arundel County for the Department of Public Works included restoring a stormwater outfall, stabilizing the receiving stream channel, and protecting residential property by establishing a regenerative stormwater outfall, providing stormwater quality management, and safe conveyance of the 100-year storm event to the stream channel. The intent of this approach was impervious area treatment, and significant reduction of sediment and nutrient loads to the Gingerville Creek watershed.

Heritage Office Complex Stormwater BMPs Functional Assessment & Recommendations, Inspection & Maintenance Plan, and Private BMP Maintenance Sheets, Anne Arundel County, MD.

Dr. May served as senior environmental scientist in the evaluation of BMPs treating 4.7 acres of impervious area using 5 different types of water quality best management practices. The facilities were sized to provide water quality treatment and groundwater recharge of runoff from impervious surface of a portion of the County's Heritage Office Park, home of the Department of Public Works. This site has educational signage design by Biohabitats and served as the County's first demonstration site for innovative water quality best management practices based on Maryland Department of the Environment Maryland Stormwater Design Manual (2001) since completion of construction in 2002. More than 12 years after construction completion, Biohabitats along with their JV partner Century Engineering, developed inspection and maintenance protocols for the County I&M staff to conduct functional and structural inspections. Using the newly developed protocol, Biohabitats and Century conducted a functional and structural assessment of the BMPs and documented the credit available for impervious area treated and pollutant load reduction for each facility, as well as groundwater recharge.

SMECO Engineering & Operations Center, Hughesville, MD. Supported the ecological assessment of the proposed location for the Southern Maryland Electric Cooperative's new headquarters, a 215-acre agricultural site in Maryland's Coastal Plain. Supported and informed the sustainable site design of native landscaping and innovative stormwater management.

National Fish & Wildlife Foundation: DC Schools Stormwater Assessment, Washington, DC.

Supported the field assessment and design of this project serving a consortium of 11 Capitol Hill District schools engaged in a school greening effort. Led the Biohabitats team in the assessment of all 11 school sites for stormwater retrofit and related greening opportunities. Assisted in the preparation of a technical memorandum summarizing the team's findings and recommendations.

St. Mary's College Aquatic Buffer Management, St. Mary's City, MD. Supported the Biohabitats team in preparing an aquatic wetland, tidal shoreline and pond buffer management strategy for the campus. Focusing on habitat and water quality protection, the Biohabitats team assessed buffer conditions, provided photo documentation, and developed a set of strategies tailored specifically to site conditions as well as campus facilities and programs.

Duke University Central Campus Master Plan Environmental Sustainability Metrics, Durham, NC.

Provided technical support and represented the Biohabitats team with the development of sustainable design initiatives for Duke's Central Campus. The Sustainability Metrics provide architects, administrators and operations managers a clear objective and a measurable target for improving the campus' environmental quality and building performance. The metrics addressed a wide range of parameters, including targets for storm water management, water efficiency, waste reduction, energy efficiency, renewable energy generation and supply, wildlife, landscape, site design and transportation initiatives. The metrics were used as a template during the design through construction and shall be incorporated into long term operations and maintenance of the campus.

USACE Philadelphia District, Wissahickon Feasibility Study, Philadelphia, PA. Provided technical support for the valuation of restoration benefits for the 40 project restoration alternatives under consideration for the Wissahickon feasibility study performed by Biohabitats for the US Army Corps of Engineers, Philadelphia District. The valuation of restoration project benefits was based on using the U.S. Fish and Wildlife Service Habitat Evaluation Procedure (HEP). HEP provides a means to demonstrate improvements to the habitat of three representative fish species based on the projected restoration effects on the Wissahickon and its tributaries. Since this approach was narrowly focused on improvements to in-stream habitat elements for three species of fish, and the anticipated restoration benefits were broader (e.g., wetland restoration, etc.), Assisted in developing an approach that incorporated the recognition that restoration will deliver ecosystem benefits beyond those associated with in-stream habitat and the species-based valuation approach to include community and ecosystem-based restoration benefits as elements of the restoration project valuation. This information, together with the MII cost estimates for each restoration project and alternative, were used to inform the Corps Incremental Cost-Benefit Analysis and support the prioritization of restoration projects and alternatives.

Pittsburgh Regional Parks Natural Areas Study, Pittsburgh, PA. Provided technical and field assessment support for this work conducted for the City of Pittsburgh. The emphasis of the study was to assess existing vegetation, soils, wildlife habitat, wetlands and water resources conditions of the regional parks. The project also involved a management plan framework to identify ecological enhancement and restoration needs, and recommend a set of pilot demonstration projects. The project involved collaboration with various stakeholder groups, agencies and organizations, including the Pittsburgh Parks Conservancy.

Wicomico Regional Airport Wetland Mitigation, Somerset County, MD. Provided technical support for design and long term field assessment for the restoration of approximately 33 acres of forested wetland in drained farm fields on a small grain farm in Somerset County, Maryland as mitigation for improvements to the Wicomico Regional Airport in Salisbury, Maryland. Assisted in identifying restoration opportunities, including opportunities to restore groundwater through the plugging of surface drainage ditches and site grading to facilitate longer term storage/infiltration of surface waters associated with precipitation and runoff. In addition to a role in monitoring and modeling groundwater and surface water, assisted in developing a wetland plant composition for the restored forested wetland based on an evaluation of undisturbed forested wetlands in similar geomorphic conditions associated with the Wicomico, Pocomoke, and Nanticoke Rivers in Worcester and Somerset Counties, Maryland.

Sam's Branch, Harford County, MD. Performed field reconnaissance and biological, physical and chemical monitoring investigations in the Sam's Branch Watershed to assess impacts of the watershed on aquatic system health.

Moore's Branch Stream Restoration, Baltimore County, MD. Provided field assessment and conceptual design input for the mitigation restoration of this stream. The design utilized reference reach data and bankfull discharge computations. The proposed channel reestablished the riffle/pool meanders that were lost due to excessive erosion and provides for new floodplain area for the stream to access.

Watershed Management Plan for Cub Run Watershed, Fairfax County, VA. Provided field assessment and performed GIS analyses of existing in-channel and riparian ecological data to identify restoration, enhancement and preservation opportunities as mitigation for Dulles Airport expansion impacts.

Maryland State Highway Administration (SHA) Wetland Mitigation and Stream Restoration Contract (2004-16A), Inter-County Connector Baseline Environmental Mitigation, Montgomery County, MD. Dr. May assisted in providing baseline wetland and stream mitigation site design for 118 acres of wetland and approximately 5 miles of stream.

Montgomery County Biological Monitoring, Montgomery County, MD. Dr. May has been involved with the collection of aquatic invertebrates and fish at various locations throughout the county. The purpose of the collection is to monitor the aquatic life to determine overall stream health as a requirement of the County's NPDES permit. Biohabitats collected aquatic invertebrates at 41 sites and fish at 30 sites. The assessment also includes habitat assessment, water quality assessment and herpetofauna identification.

Selected Public Sector Projects

Anacostia River Watershed Habitat and Fishery Stock Assessment, Prince Georges and Montgomery Counties, MD. Served as a fisheries specialist for the Interstate Commission on the Potomac River Basin (ICPRB) in the fish, habitat and invertebrate assessment of this urban watershed outside of Washington, D.C.

Kenilworth Marsh Restoration Biological Assessment, Washington, D.C. Lead and project designer for the biological assessment of this 33 acre urban tidal freshwater marsh restoration project.

Incorporating a long term, 5 year, post-restoration monitoring plan for fish, benthic macroinvertebrates and plankton, this effort was charged with determining net changes in the aquatic biological community as compared with that of the main stem river and nearby reference marshes.

Kenilworth Marsh Nutrient Flux Study, Washington, D.C. As a part of the team that collected data in the tidal inlet to the newly restored marsh, helped to assess the seasonal transformation and fluxes of nitrogen, carbon and phosphorus between the Kenilworth Marsh and the main stem Anacostia River. Diurnal water column measurements and collections every two hours over thirty hours each month for an entire year provided one of the most detailed water quality profiles of a tidal marsh system conducted in the area.

District of Columbia Tributary Monitoring and Assessment Strategy, Washington, D.C. Lead and project designer for this comprehensive assessment of the District of Columbia's more than 30 tributaries flowing to the Potomac and Anacostia Rivers. Located entirely within the city, the study collected data utilizing the EPA's Rapid Bioassessment Protocols for benthic macroinvertebrates and fish as well as applying hydrogeomorphic assessments through the establishment of baseline longitudinal and cross-sectional profiles.

Kingman Marsh Restoration Biological Assessment, Washington, D.C. Lead and project designer for the biological assessment of this 40 acre urban tidal freshwater marsh restoration project. Incorporating a long term, 3 year, pre-restoration monitoring plan for fish, benthic macroinvertebrates, plankton and water birds, this effort was charged with determining the baseline aquatic faunal community as compared with that of the main stem river and nearby reference marshes.

Invited Expert/Plenary Panels Served

Algal Flow-Way Technologies Expert Panel. 2013-2016. US Environmental Protection Agency, Chesapeake Bay Program, Water Quality Goal Implementation Team.

Envisioning a New Model for the Anacostia: A 21st Century Visioning Charrette for the Greenbelt Station Mixed-use Project." Plenary Panel presented on *Regenerative Ecosystems*. Hosted by U.S. EPA Region 3 Water Protection Division and Renard Development Company. 2015.

Floating Treatment Wetlands Expert Panel. 2016. US Environmental Protection Agency, Chesapeake Bay Program, Water Quality Goal Implementation Team. Invited replacement for panelist Chris Streb.

International Society for Ecological Economics. 2016 Conference Plenary Panelist: *Water and Justice*. University of the District of Columbia. Center of Agriculture, Urban Sustainability and Environmental Science (CAUSES). Washington, D.C.

Choose Clean Water Conference. 2019. Invited Conference Panelist for Innovative Technologies. *Algal Ecotechnologies Supporting Watershed Stewards*. Baltimore, Maryland.

Community Service

Lives in Greenbelt, Maryland near Washington, D.C., the New Deal era government designed and built planned community which is an international model for neighborhood design. Actively participated in the stakeholder driven Greener Greenbelt Initiative to advance sustainable design in his community.

2019-present	Greenbelt Homes Inc. Cooperative Stormwater Task Force
2013-present	Board Member and present member of non-profit Maryland-Rio Partners of the Americas
2011-present	Founding board member of the nonprofit Greenbelt Community Development Corporation
2010-present	Board Member of the Friends of New Deal Café Arts, non-profit supporting art and music

2003-present Officer of the Corporation for the New Deal Café cooperative's liquor license
2002-'04,06-09 Board Member of the New Deal Café cooperative, last 4 years as President

Mentorship and Volunteer Educational / Technical Support

1994-1998 Four years of mentorship to Joy Evans, a student at H.D. Woodson Senior High School in Northeast Washington, D.C. Culminating in her winning the top honors in the citywide science fair and her completion of an undergraduate degree in teaching/biology after studying at Tuskegee University and East Carolina University.

2011-2013 Mentorship of Lina Oliveros, a Johns Hopkins University graduate student in the School of Advanced Academic Programs. Helped her to obtain a TogetherGreen Fellowship from the Audubon Society.

2011-2016 Supported the Living Classrooms Foundation education staff in the development of an environmental curriculum for their Crossroads Middle School. Baltimore, Maryland

2011-present Providing technical and advisory support to the Anacostia Watershed Society

2013-2016 Worked with Living Classrooms Foundation in developing a low energy model for urban aquaculture / aquaponics that supports environmental science after school programs in the production of organic, zero-waste shrimp and produce.

2013-2014 Undergraduate mentor to Barrett Wessel, a University of Maryland Environmental Science and Technology student and recipient of the Philip Merrill Presidential Scholar Award

2015-2016 Undergraduate mentor and internship coordinator to two returned veterans at University of Maryland Environmental Science and Technology Department studying the water quality of a wetland wastewater treatment system at a Washington, D.C. middle school

2017-2018 Undergraduate mentor for an individual student's year long independent experimental field study of algae based concrete effects on biofouling in Baltimore's Inner Harbor at the National Aquarium resulting in an offer of a paid graduate position at Ohio State Univ.

2018 Senior High School Mentor to Desmond Rodriguez on his Senior Project. Carbon Capture and Sequestration. School Without Walls SHS. Washington, D.C.

2019-present Green Mechanics Benefit LLC. Cofounder and Mentor of a student run ecotechnology startup

2019-present Vertical Wetlands Benefit LLC. Cofounder and Mentor of a student run ecotechnology startup

2019-present EcoFlo Hydropower LLC. Cofounder and Mentor of a student run ecotechnology startup

2019-present Algavore International Benefit LLC. Cofounder of an international ecotechnology startup

2019-2020 Senior High School Mentor to Ahmed Ali Abdellah on his Senior Project. Project Green Fleet: Building a Sustainable Future in Howard County with Biomass. Howard High School, Howard County, Maryland.

Continuing Education

US Army Corps of Engineers Interagency Wetland Delineation Training, Washington, D.C. 1993.

USGS Hydrogeomorphic Method Wetland Delineation Training. Laurel, Maryland. 1996.

Water Resource Information Management in Latin America and the Caribbean. United States Environmental Training Institute, Washington, D.C. 1997.

River/Stream Monitoring, Assessment, and Restoration Design training; Rogen Levels I-IV, Wildland Hydrology. Three training sessions, 1997-1999.

Unlearning Racism in Geoscience, URGE. Spring 2021. Eight Session Curriculum.

Patents

Bryon Salladin; Chris Streb; Nicole Stern; Peter May; Adam Ganser. 2010. "Floating Wetlands," (United States Patent Pending).

Travel

Academic and Professional: Belize, Brazil, Czech Republic, Cuba, Egypt, Haiti, Mexico
Pleasure: Ecuador, Hungary, Germany, Ireland, Israel, Netherlands, Palestine/Gaza, Tahiti, Tunisia
Research:

Winter 1996. Brazil. Tropical Atlantic Coastal Rainforest and Amazonian riverine systems in Rio de Janeiro, Bahia and Amazonas States, Brazil. Graduate student University of Maryland, College Park, Maryland.

Fall 2000. Egypt. Nile River and Suez Canal riverine and desert algal ecologies in support of the technology transfer of the Algal Turf Scrubber ecotechnology to Ein Shams University, Cairo University and Suez Canal University in Egypt.

Conference:

Conference US Delegate. Caribbean Constructed Wetlands Symposium in Cienaga de Zapata, Cuba. 2003.

Analysis of Tidal Marsh and Mudflat Sportfishery Production on Anacostia River, Washington, D.C. Oral presentation at the Cuba Wetlands Symposium in Cienaga de Zapata, Cuba. 2009.

Tidal Marsh Restoration Controlled by Invasive Species on Anacostia River, Washington, D.C. Oral presentation at the Cuba Wetlands Symposium in Cienaga de Zapata, Cuba. 2009.

Waterbird Utilization and Influence on Intertidal Mudflat and Restored Urban Tidal Freshwater Marsh in Washington, D.C. USA. Oral presentation at the Joint meeting of Society of Wetland Scientists, WETPOL and Wetland Biogeochemistry Symposium. Prague, Czech Republic. July 3-8, 2011.

Student Studies:

Winter 1992. Tropical Ecology in Belize. Undergraduate student in the Natural Resources Management Program. University of Maryland, College Park, Maryland. 2 weeks.

Winter 1997. Ecology, Culture and Natural Resources Management in Egypt. Graduate student in the Marine-Estuarine Environmental Sciences (MEES) Program. University of Maryland, College Park, Maryland. 3 weeks.

Winter 1998. Ecology, Culture and Natural Resources Management in Mexico. Graduate student in the Marine-Estuarine Environmental Sciences (MEES) Program. University of Maryland, College Park, Maryland. 2 weeks.

Study and Service Abroad Lead Professor:

Summer 2013. Rio de Janeiro, Brazil. Ecology and Natural Resource Management in Rio de Janeiro, Brazil. Lead faculty for University of Maryland Department of Environmental Science and Technology, Education Abroad. Graduate and undergraduate students for 2 weeks.

January 2017. Port au Prince, Haiti. Review and recommendations of reforestation, solar powered groundwater/mechanical and ultra-violet potable water treatment, wastewater anaerobic digestion/cooking gas energy production and aquaculture projects for the Church of the Brethren.

Summer 2017. Rio de Janeiro, Brazil. Ecology, Natural Resource Management in Rio de Janeiro, Brazil. Lead faculty for University of Maryland Department of Environmental Science and Technology, Education Abroad. Graduate and undergraduate students for 2 weeks.

January 2018. Freetown, Sierra Leone. University of Maryland Engineers Without Borders. Implementation of a 30,000 L rainwater capture cistern connected to a solar photovoltaic powered pump mechanical filtration and ultraviolet disinfection for dry season water supply at a primary and secondary school. Lead travel faculty for graduate and undergraduate engineering students for 2 weeks.

Summer 2019. Rio de Janeiro, Brazil. Ecology, Natural Resource Management and Landscape Architecture in Rio de Janeiro, Brazil. Lead faculty for University of Maryland Department of Environmental Science and Technology, Education Abroad. Graduate and undergraduate students for 2 weeks.

Digital Media

National Public Radio's Science Friday Video Pick: Growing a Wastewater Treatment Plant. September 16, 2011. Purifying Water with Pond Scum. <http://www.sciencefriday.com/segment/09/16/2011/video-pick-growing-a-wastewater-treatment-plant.html>

Bright Green Future: Algal Turf Scrubber. Case: Baltimore Inner Harbor. Spring 2012. Envision No.2. <https://enst.umd.edu/news/bright-green-future-algal-turf-scrubber>

Algae Scrubber Cleans Inner Harbor Waters. April 25, 2012. Video of first system pilot in Baltimore with students stimulated to create a model as part of STEM learning. <http://www.wbal.com/news/maryland/baltimore-city/Algae-scrubber-cleans-Inner-Harbor-waters/11811826>

What is an Algal Turf Scrubber? April 26, 2012. WBAL Radio 1090. <http://www.wbal.com/article/89255/7/What-Is-A-Algal-Turf-Scrubber->

Scientists Use Algae to Scrub Harbor Water. April 29, 2012. Tim Wheeler, The Baltimore Sun. <https://www.baltimoresun.com/maryland/bs-xpm-2012-04-29-bs-gr-algae-scrubber-20120429-story.html>

2014 Best Urban BMP in the Bay Award. First Place in the Innovative BMP Category: Algal Treatment Technology in Support of TMDL Reduction at the Maryland Port Administration's Dundalk Marine Terminal. Awarded by the Chesapeake Stormwater Network. <http://chesapeakestormwater.net/the-bubbas/innovative-bmps-the-bubbas/>

EPA Chesapeake Bay Program/Chesapeake Stormwater Network Webcast – *Algal Flowway Technologies (AFT) AKA Algal Turf Scrubber: An Algae Based Ecotechnology for Water Quality Improvement in Support of Chesapeake Bay TMDL Requirements*, <http://chesapeakestormwater.net/events/webcast-algal-flow-way-technologies/> April 14th, 2016.

Baltimore County Public Library Connect to Nature Interview – Floating Wetlands
<https://www.youtube.com/watch?v=xN9WwVIONk8> , October 31st, 2016.

Emerald Planet TV Interview – Anacostia Watershed Society: Remaking a River; Local Communities and the Environment, <http://www.emerald-planet.org/2016/11/20/> , November 20th, 2016.

Biosphere 2 Algal Turf Scrubber Construction with University of Maryland Eco-tech Design Class,
<https://www.youtube.com/watch?v=UAwtiu2EqkE> , Spring 2017.

Smithsonian Sidedoor Podcast. The Mean, Green, Water-Cleaning Machine. Season 2, Episode 4.
<https://www.si.edu/sidedoor/ep-4-mean-green-water-cleaning-machine> , July 31, 2017.

US Department of Energy Solar Decathlon. Team Maryland reACT. October 5-17, 2017.
<https://www.solardecathlon.gov/2017/competition-team-maryland.html>

UMD Solar Decathlon Team Takes 1st Place in the US, 2nd Place in the World. October 27th, 2017.
<https://agnr.umd.edu/news/umd-solar-decathlon-team-takes-1st-place-us-2nd-place-world>

Voice of America Video – Algae Harnessed to Make Clean Water, Clean Power.
<https://www.voanews.com/a/algae-harnessed-to-make-clean-water-clean-power/4682374.html> ,
December 3rd, 2018.

Pedal Powered Pollution Revolution: Engaging the Community in Revitalizing Local Waterways.
MomentUM Magazine Summer 2020 Issue. <https://agnr.umd.edu/momentum-magazine/summer-2020/pedal-powered-pollution-revolution>

Port of Baltimore Receives Prestigious National Environmental Award for UMD Project Benefiting the Health of the Chesapeake Bay. Samantha Watters and MDOT MPA. Feb 3, 2021.
<https://agnr.umd.edu/news/port-baltimore-receives-prestigious-national-environmental-award-umd-project-benefiting-health>

The Ripple Effects of Ripple: Planting Seeds of Environmental Awareness as Winners of the LAGI 2020 International Design Challenge. MomentUM Magazine Summer 2021 Issue.
<https://agnr.umd.edu/momentum-magazine/summer-2021/ripple-effects-ripple>

Maryland Port Administration Takes Home Top Bubba Prize. 2021. Ashley Stimpson. Chesapeake Bay Journal. July 14, 2021. https://www.bayjournal.com/news/local_government/maryland-port-administration-takes-home-top-bubba-prize/article_ee40ad88-e4a0-11eb-a1a0-37c07e587f7f.html