

## **Kirk J. Havens**

Director, Virginia Institute of Marine Science, Center for Coastal Resources Management.  
Marine science research Professor, William & Mary Batten School of Coastal & Marine Sciences.

## **EDUCATION**

Ph.D. George Mason University (Environmental Science and Public Policy) 1996

M.S. Old Dominion University (Oceanography) 1987

B.S. Old Dominion University (Biology) 1981

The Center for Coastal Resources Management (CCRM) exists to provide objective policy guidance and to support informed management of coastal resources in Virginia and the greater mid-Atlantic region. CCRM primarily serves agencies at all levels of government, as well as the general citizenry of the Commonwealth. The Center manages its diverse activities under three broad areas: 1) **Wetlands research** to support informed management of tidal and nontidal wetland and riparian resources. This activity inventories and monitors these resources, conducts applied research on natural and managed systems, provides direct advice to relevant regulatory programs, and offers training for managers in a variety of formats; 2) **Comprehensive coastal inventory** to monitor and analyze shoreline condition. This activity develops and maintains geographic databases, creates and implements analytical tools, and supports various management applications with expertise in geographic information system (GIS) and remote sensing and; 3) **Coastal watersheds and shorescape research** to provide research to support the development of proactive policy and management guidance for coastal systems. This activity is multidisciplinary, utilizing both natural and social sciences to develop integrated approaches to emerging management issues.

## **HONORS, PRIZES, AWARDS, SPECIAL RECOGNITION**

Governor's Technology Award for the online Wetland Condition Assessment Tool (WetCAT). Government to Citizen category. Recognizes the innovative use of IT to improve citizen access to and service from governmental entities. Included are projects that improve citizens' electronic interaction with government, promote availability, usability and/or transparency of information, and increase public awareness and adoption of services. 2019.

Vice Provost Innovation Challenge Award, College of William & Mary, 2016. \$1,000.

US Environmental Protection Agency Special Recognition letter to College of William & Mary President Taylor Reveley regarding K. Havens technical assistance to EPA's Environmental Assessment and Innovation Division. 2016.

National Innovation Award. TechConnect National Innovation Summit. Top innovation for 2013 "*Environmentally Safe Microbeads for Cosmetics*".

Wetlands Condition Assessment Tool (WetCAT) recognized by the Environmental Council of

States (ECOS) as an outstanding state initiative that can serve as a model for other states. WetCAT is “one of the best examples of state innovation and ingenuity...that can be transferred across the nation,” according to ECOS President Martha Rudolph.

US Environmental Protection Agency Special Recognition letter regarding K. Havens to College of William & Mary President Taylor Reveley for contribution to EPA’s National Wetlands Assessment. 2011.

Virginia Governor Timothy Kaine Special Recognition letter of K. Havens to College of William & Mary President Taylor Reveley regarding contribution to Chesapeake Bay Program. 2010

US Environmental Protection Agency recognition of VIMS Nontidal & Tidal Wetland activities as one of the Nation’s 25 Exemplars of effective wetlands research and management. 2006.

## **CONTRIBUTIONS TO TEACHING**

ENSP 440/MSCI 498 *Plastics in Society and the Environment: Problems and Solutions*. Biopolymers. 2021-2023. Guest Lecturer.

MSCI 398/ENSP 249 *Estuarine Science & Management*. 2023. Guest Lecture.

Longwood University. Guest lecturer. Marine Debris / Plastic Pollution in the Marine Environment (plastic, microplastic, whales, worms, lost crab pots, cranberries, shotguns, beer, & bovine digestion). 2019-2022.

GIS 490 GIS Remote Sensing, W&M (Guest Lecturer) 2015 annually to 2021.

MSCI 698 Headwater Wetlands Ecology, co-instructor with D. Bilkovic & C. Hershner Virginia Coastal Policy Center (W&M Law School) Collaborating Partner and Advisor– 2013 to 2022.

LAW 339 Natural Resource Law (W&M Law School) – 2005 to 2010 (Guest Lecturer).

LAW 741 Environmental Law & Science Clinic (project with W&M Law School 1998 to 2001.

MSCI 698 Habitat Degradation VIMS (Guest Lecturer) 2002 to 2005.

MSCI 685 Practical Application of Marine Resource Management Techniques VIMS (Guest lecturer) 2002 to 2005.

BIOL 627 Wetland Ecosystems W&M (Guest Lecturer) 2002 to 2005.

MSCI 579 Wetlands Ecology VIMS (Guest Lecturer) 2002 to 2005.

MSCI 542 Principles and Theory of Resource Management, VIMS (Guest Lecturer 2002 to 2005.

EVSP 540 Wetland Policy - George Mason Univ. (Guest Lecturer) 1998 to 2000.

Nontidal Wetlands Functions and Values. Chesapeake Bay Governor’s School (invited lecture). 2000.

Christopher Wren Association Marine Science Lecture Series (invited lecture). 1999.

Tidal Wetlands (VIMS short course for the public) 1996 to 2002.

Wetlands Delineation (Public VIMS short course for the public) 1996 to 2002.

Wetland Hydrology (Public VIMS short course for the public) 1996 to 2002.

Wetland Soils (VIMS short course for the public) 1996 to 2002.

Hydrology (VIMS short course for the public) 1996 to 2002.

## **FELLOWSHIPS AND GRANTS (abbreviated to last 10 years)**

Enhancing wetland management in Virginia: Tools and community engagement. VA DEQ/EPA. PI: K. Nunez, **Co-PIs K. Havens**, D. Bilkovic, P. Mason, M. Mitchell. 2024-2027.

Resilient Wetlands: Science to enhance understanding and support decision-making. EPA. PI M. Mitchell, **Co-PIs: K. Havens**, D. Bilkovic, R. Isdell, K. Nunez. 2024-2027.

No discharge zones – Phase 2, Virginia DEQ. PI: C. Tombleson, **Co-PI: K. Havens**. 2023-2025.

National Fishing Trap Removal, Assessment, & Prevention (TRAP) Program. NOAA Marine Debris Program. 2022-2026. **PI: K. Havens**, Co-PIs: D. Bilkovic, A. Scheld.

Building capacity for Coastal Resilience for Chickahominy Tribal properties. National Fish & Wildlife Foundation. 2022-2025. **PI: K. Havens**.

VDH Wastewater hotspot analysis Western Virginia. VA Dept of Health. PI: M. Mitchell, **Co-PIs: K. Havens**, R. Isdell. 2023-2024.

Modeling & mapping septic system life expectancy in Virginia coastal plain. Chesapeake Bay Restoration Fund. 2022-2024. **PI: K. Havens**.

The needless drowning of North America's only estuarine turtle. Morris Animal Foundation. 2021-2022. PI: R. Chambers, **Co-PI: K. Havens**.

Tools for improving the ability of DEQ to identify, regulate, and protect wetlands in Virginia. EPA/DEQ. 2021-2023. **PI: K. Havens**, Co-PIs: D. Bilkovic, K. Nunez, M. Mitchell, P. Mason.

Increasing the resiliency of Northern Neck communities vulnerable to flood impacts. Dupont Fund 2021-2022. PI: Molly Mitchell. **Co-PI: K. Havens**.

Enhancing development of strategies for coastal wetland conservation prioritization in Virginia under climate change. EPA 2021-2023. PI: Molly Mitchell, **Co-PI: K. Havens**.

Climate change planning support for Werowocomoco Park. USDI/National Park Service. 2021-2023. PI: M. Mitchell, **Co-PI: K. Havens**

National Wetlands Assessment. EPA. 2020-2021. **PI: K. Havens**.

Enabling enhanced decision making in protecting wetland resources in Virginia. DEQ/EPA. 2020-2021. **PI: K. Havens**. Co-PI P. Mason.

Development of strategies to enhance and adapt Virginia wetlands in a changing climate. EPA. 2020-2021. **PI: M. Mitchell. Co-PIs: K. Havens, D. Bilkovic, P. Mason.**

Dungeness crab trap biohinge development – Phase II. NFWF. 2020-2021. **PI: K. Havens.** Co-PI: D. Bilkovic.

Biopolymer and biohinge development. VIMS Innovation Fund. 2020. **PI: K. Havens.**

Memorandum of Understanding. VDOT/Office of the Secretary of Natural Resources. 2019-2024. **PIs: K. Havens, C. Hershner, D. Bilkovic.**

Engaging students, citizens, and watermen in the removal of derelict blue crab traps (VA,MD). National Fish & Wildlife Foundation. **PI: K. Havens.** Co-PIs: D. Bilkovic, A. Scheld.

Engaging students and citizens in the removal of derelict blue crab traps (VA). National Fish & Wildlife Foundation. **PI: K. Havens.** Co-PIs: D. Bilkovic, A. Scheld.

Accelerating removal of derelict crab traps plaguing coastal Louisiana, and collecting data to assess their economic impact. NOAA Marine Debris Program, subcontract with Lake Pontchartrain Foundation. 2019-2021. **PI: D. Bilkovic. Co-PIs: A. Scheld, K. Havens.**

Farm Resiliency Education for At-Risk Coastal and Riparian Agricultural Lands (MD,VA). National Fish & Wildlife Foundation. 2019 -2020. **PI: K. Havens.** Co-PIs: D. Bilkovic, C. Hershner.

Bio-hinge Escape Mechanism for Dungeness Crab Traps. National Fish & Wildlife Foundation. 2019-2020. **PI: K. Havens.**

Biopolymer product development. GreenOps Ammo, Richmond, VA. 2019. **PI: K. Havens.**

Tidal Shoreline Management Policies & Procedures Handbook. 2018-2019. NOAA/DEQ Coastal Zone Management. **PI: P. Mason. Co-PI: K. Havens.**

Refining Program Capacity to Enhance and Protect Wetland Resources in Virginia. 2018-2020. EPA/DEQ. **PI: K. Havens.** Co-PIs: D. Bilkovic, C. Hershner, M. Mitchell.

An Innovative Mechanism for Reducing Nitrogen and Phosphorus Inputs to Virginia Waters. 2017-2019. Virginia Commonwealth Research Commercialization Fund. **PI: K. Havens.** Co-PIs: R. Chambers, C. Hershner, D. Bilkovic.

VIMS Donor contribution to biodegradable netting research. 2017. **PI: K. Havens.**

Building Capacity for Wetland Program Protection of Wetland Resources in Virginia. 2017-

2018, US EPA/VADEQ. PI: C. Hershner. **Co-PIs: K. Havens** D. Bilkovic, M. Berman.

Food security, energy and water in island systems: indigenous wisdom, ocean connections, global lessons W&M Commonwealth Center for Energy and the Environment. 2016. **PIs K. Havens, K. Weng.** (combined per CCEE).

Enhancing the Adaptive Capacity of VA Coastal Wetlands to Lessen Vulnerability to Climate Change. 2016-2018. US EPA. PI: D. Bilkovic. **Co-PIs: C. Hershner, K. Havens,** M. Mitchell.

National Wetlands Condition Assessment. 2016. US EPA. **PI: K. Havens.**

Regional Impact Assessment of Derelict Fishing Gear in the Chesapeake Bay. 2014-2016. NOAA – Global Science & Technology, Inc. **PI: K. Havens.** Co-PI: D. Bilkovic.

Plastics in the environment. Problems, Opportunities, and Solutions. W&M Commonwealth Center for Energy and the Environment. 2015 – 2016. PI: R. Hale. **Co-PIs: D. Luellen, B. Song, D. Bilkovic, K. Havens.**

Eliminating Plastic Shotun Wads As a Source of Hamful Aquatic Debris. 2015-2015. VA Center for Innovative Technology. **PI: K. Havens.** Co-PI: D. Bilkovic.

Development of Strategies to Improve Conservation of VA Headwater Wetland Ecosystems in the Face of Climate Change. 2014-2017. US EPA. PI: D. Bilkovic. **Co-PIs: K. Havens, C. Hershner.**

Reducing Bycatch Mortality in Crab Pots. National Fish & Wildlife Foundation. 2014-2015. **PI: K. Havens.** Co-PIs: D. Bilkovic, R. Chambers.

Market Advantage of Ocean Safe Biodegradable Microbead Sequestration in Marine Sediments. US Department of Commerce Economic Development Administration. 2014-2015. **PI: K. Havens.** Co-PI: D. Bilkovic.

Using Created Marshes to Reduce Watershed NPS Pollution. Commonwealth of Virginia, Secretary of Natural Resources. 2013-2014. PI: D. Bilkovic. **Co-PIs: K. Havens,** R. Chambers.

Removal of lost and abandoned blue crab pots from Virginia Chesapeake Bay Hotspots – 2013. Commonwealth of Virginia, Secretary of Natural Resources. 2013-2014. **PI: K. Havens.** Co-PI: D. Bilkovic.

Technical Support fo Derelict Crab Pot Removal in North Carolina. NC SeaGrant. 2014. **PI: K. Havens.** Co-PI: D. Bilkovic.

Ocean Safe Biodegradable Microspheres for the Cosmetic and Toiletries Industry. US Department of Commerce Economic Development Administration. 2013- 2014. **PI: K. Havens.**

Co-PI: D. Bilkovic.

## **RESEARCH**

Refereed publications in periodicals, chapters in books, law review articles and conference proceedings

Galyon, Hailey, Samuel Vibostok, Jane Duncan, Gonzalo Ferreira, Abby Whittington, **Kirk Havens**, Jason McDevitt, and Rebecca Cockrum. 2023. "Clearance of Biodegradable Polymer and Polyethylene Films from the Rumens of Holstein Bull Calves" *Animals* 13, no. 5: 928. <https://doi.org/10.3390/ani13050928>

Scientific and Technical Advisory Committee (STAC). 2023. Achieving water quality goals in the Chesapeake Bay: A comprehensive evaluation of system response (K. Stephenson & D. Wardrop, Eds.). STAC Publication Number 23-006, Chesapeake Bay Program Scientific and Technical Advisory Committee (STAC), Edgewater, MD. 129 pp. Contributing Author. <https://www.chesapeake.org/stac/cesr/>

Galyon, Hailey, Samuel Vibostok, Jane Duncan, Gonzalo Ferreira, Abby Whittington, **Kirk Havens**, Jason McDevitt, and Rebecca Cockrum. 2022. "Digestibility Kinetics of Polyhydroxyalkanoate and Poly(butylene succinate-co-adipate) after In Vitro Fermentation in Rumen Fluid" *Polymers* 14, no. 10: 2103. <https://doi.org/10.3390/polym14102103>

Daley, V.L., Armentano, L., Hanigan, M.D., Galyon, H., Vibostok, S., Duncan, J., Ferreira, G., Whittington, A., **Havens, K.**, McDevitt, J. and Cockrum, R., 2022. Models to predict milk fat concentration and yield of lactating dairy cows: A meta-analysis [Supplemental material]. American Dairy Science Association, *Journal of Dairy Science* <https://doi.org/10.3168/jds.2022-21777>.

Bilkovic, D.M., Mitchell, M., Mason\*\*, R., Franzluebbbers, L., **Havens, K.**, Whigham, D., and Cole, M. 2022. Assessing the water quality, habitat, and social benefits of ‘green riprap’. STAC Publication Number 22-001, Edgewater, MD. 39 pp.

Bilkovic, D.M., R.E. Isdell\*\*, D. Stanhope\*\*, K.T. Angstadt\*\*, **K.J. Havens**, and R.M. Chambers. 2021. Nursery habitat use by juvenile blue crabs in created and natural fringing marshes. *Ecological Engineering* 170:10633.

Scheld, A.M., D.M. Bilkovic, **K. J. Havens**. 2021. Evaluating optimal removal of derelict blue crab pots in Virginia, US. *Ocean and Coastal Management* 211: 105735. <https://doi.org/10.1016/j.ocecoaman.2021.105735>

Bilkovic, Donna Marie, Molly M. Mitchell, **Kirk J. Havens**, and Carl H. Hershner. "Chesapeake Bay." In *World Seas: an Environmental Evaluation*, pp. 379-404. Academic Press, 2019.

**Havens, K.J.**, C. Hershner, T. Rudnick, D. Stanhope, D. Schatt, K. Angstadt, M. Henicheck, D. Davis, D.M. Bilkovic. Virginia Wetland Condition Assessment Tool (WetCAT): A Model for Management. In John Dorney, Rick Savage, Ralph Tiner, and Paul Adamus, editors, *Wetland and Stream Rapid Assessments: Development, Validation, and Application*. Elsevier Publishing. 2018.

Brooks, R., **K.J. Havens**, H. Ingram, K. Angstadt, D. Stanhope, A. Jacobs, M. Nassry, D. Wardrop. Creating a Unified Mid-Atlantic Rapid Condition Assessment Protocol for Wetlands. In John Dorney, Rick Savage, Ralph Tiner, and Paul Adamus, editors, *Wetland and Stream Rapid Assessments: Development, Validation, and Application*. Elsevier Publishing. 2018.

Corso, A.D., Huettenmoser, J.C., Trani, O.R., Angstadt, K., Bilkovic, D.M., **Havens, K.J.**, Russell, T.M., Stanhope, D. and Chambers, R.M., 2017. Experiments with by-catch reduction devices to exclude diamondback terrapins and retain blue crabs. *Estuaries and Coasts*, 40(5), pp.1516-1522.

**Havens, K.** and E. Sharp. 2016. *Remote Sensing* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 35-62pp.

**Havens, K.** and E. Sharp. 2016. *Heat Transfer Mechanisms* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 63-73pp.

**Havens, K.** and E. Sharp. 2016. *Optical Radiation* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 75-88pp.

**Havens, K.** and E. Sharp. 2016. *Emissivity* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 89-99pp.

**Havens, K.** and E. Sharp. 2016. *Thermal Imagers and Systems Considerations* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 101-119pp.

**Havens, K.** and E. Sharp. 2016. *Imager Selection* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 121-141pp.

**Havens, K.** and E. Sharp. 2016. *Properties of Thermal Signatures* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 143-169pp.

**Havens, K.** and E. Sharp. 2016. *Thermal Imaging Applications and Experiments* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic

Press, ISBN 9780128033845, 171-244pp.

**Havens, K.** and E. Sharp. 2016. *Using Thermal Imagers for Animal Ecology* in Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 245-314pp.

Scheld, A., D.M. Bilkovic, and **K. Havens**. 2016. The dilemma of derelict gear. *Sci. Rep.* **6**, 19671; doi: 10.1038/srep19671.

Bilkovic, DM, **KJ Havens**, D Stanhope, and K. Angstadt. 2014. Derelict fishing gear in Chesapeake Bay, Virginia: Spatial patterns and implications for marine fauna. *Marine Pollution Bulletin*. <http://dx.doi.org/10.1016/j.marpolbul.2014.01.034>.

Wardrop, D.H., M. E. Kentula, R.P. Brooks, M.S. Fennessy, S.J. Chamberlain, **K.J. Havens**, and C. Hershner. 2013. Monitoring and Assessment of Wetlands: Concepts, Case Studies, and Lessons Learned, Chapter 11 in *Mid-Atlantic Freshwater Wetlands: Advances in Wetlands Science, Management, Policy, and Practice*, R.P. Brooks & D.H Wardrop (eds). Springer, New York.

Bilkovic, D.M., **K. Havens**, D. Stanhope, and K. Angstadt. 2012. Use of fully biodegradable panels to reduce derelict pot threats to marine fauna. *Conservation Biology* 26(6): 957–966. *This research was featured in Scientific American, Jan 2013.*

Bilkovic, D.M., M.R. Mitchell, C.H. Hershner, **K.J. Havens**. 2012. Transitional wetland faunal community characterization and response to precipitation-driven salinity fluctuations. *Wetlands* 32:425–437.

**Havens, K.J.**, D. Bilkovic, D. Stanhope, and K. Angstadt. 2011. Fishery Failure, Unemployed Commercial Fishers, and Lost Blue Crab Pots: An Unexpected Success Story. *Environmental Science and Policy* 14(4): 445-450.

Brooks, R., M. M. Brinson, **K.J. Havens**, C. Hershner, R. Rheinhardt, D.H. Wardrop, D. Whigham, A. D. Jacobs, and J. M. Rubbo. 2011. Proposed Hydrogeomorphic Classification for Wetlands of the Mid-Atlantic Region, USA. *Wetlands* DOI 10.1007/s13157-011-0158-7.

**Havens, K.J.**, D. Bilkovic, D. Stanhope, and K. Angstadt. 2009. Location, location, location: the importance of cull ring placement in blue crab traps. *Transactions of the American Fisheries Society* 138:720–724.

Perry, J., D.M. Bilkovic, **K. Havens**, and C. Hershner. 2009. Tidal Freshwater Marshes of the Mid-Atlantic and Southeastern United States. In *Tidal Freshwater Wetlands*, pp. 157-166. Eds: A. Barendregt, D.F. Whigham, A.H. Baldwin; Backhuys Publishers, Leiden, The Netherlands.

Hershner, C. and **K.J. Havens**. 2009. Ecosystem Services and Management of Invasive Species



in a Changing System: Response to Martin and Blossey. **Conservation Biology** 23 (2): 497-498.

Brooks, R., M. McKenney-Easterling, M. Brinson, R. Rheinhardt, **K. Havens**, D. O'Brien, J. Bishop, J. Rubbo, B. Armstrong, and J. Hite. 2009. A Stream–Wetland–Riparian (SWR) index for assessing condition of aquatic ecosystems in small watersheds along the Atlantic slope of the eastern U.S. **Environmental Monitoring and Assessment** 150: 101-117.

Hershner, C. and **K.J. Havens**. 2008. Managing invasive aquatic plants in a changing system: strategic consideration of ecosystems services. **Conservation Biology** 22 (3): 544-550.

Article recognition

Faculty of 1000 Article Recognition for Conservation Biology paper “Managing invasive aquatic plants in a changing system: strategic consideration of ecosystem services.” 2009.

Chambers, R., **K.J. Havens**, S. Killeen, and M. Berman. 2008. Common reed *Phragmites australis* occurrence along estuarine shoreline in Chesapeake Bay. **Wetlands** 28(4): 1097-1103.

**Havens, K.J.**, D.M. Bilkovic, D. Stanhope, K. Angstadt, and C. Hershner. 2008. The effects of derelict blue crab traps on marine organisms in the lower York River, Virginia **North American Journal of Fisheries Management** 28(4):1194-1200.

Hershner, C., **K.J. Havens**, D. Bilkovic, and D. Wardrop. 2007. Assessment of Chesapeake Bay Program Selection and Use of Indicators. **EcoHealth** 4(2): 187-193.

Wardrop, D., C. Hershner, K. Thornton, **K. J. Havens**, and D. Bilkovic. 2007. Developing and communicating a taxonomy of indicators of aquatic health. **EcoHealth** 4(2): 179-186.

Bilkovic, D.M., M. Roggero, C.H. Hershner, and **K. J. Havens**. 2006. Influence of land use on macrobenthic communities in nearshore estuarine habitats. **Estuaries and Coasts** 29(6B): 1185-1195. *This research featured in an edition of Coastal and Estuarine Science News (February 2007).*

Bilkovic, D.M., C.H. Hershner, M.R. Berman, **K. J. Havens**, and D. M. Stanhope. 2005. **Estuarine Indicators**, Stephen A. Bortone, Editor, *Evaluating Nearshore Communities as Indicators of Ecosystem Health*. CRC Press.

**Havens, K. J.** 2004. A comparison of *C. caroliniana*, *Q. michauxii*, *Q. pagoda* and *T. distichum* seedlings of upland and wetland stock for use in created or restored forested wetlands. **Ecological Engineering** 23: 341-349.

**Havens, K.J.**, H. Berquist, and W. I. Priest. 2003. *Phragmites* expansion into constructed wetlands: Are we mortgaging our wetland future? **Estuaries** 26(2B): 418-423.

Varnell, L.M., D.A. Evans, and **K.J. Havens**. 2003. A geomorphological model of intertidal

cove marshes with application to wetlands management. **Ecological Engineering** 19(5): 339-347.

**Havens, K.J.**, L.M. Varnell, B. Watts. 2002. Maturation of a constructed tidal marsh relative to two natural reference tidal marshes over 12 years. **Ecological Engineering**, Vol. 18 (3) pp. 305 - 315.

Perry, J.E., T.A. Barnard, J.G. Bradshaw, C. Friedrichs, **K.J. Havens**, P. Mason, W. Priest, and G. Silberhorn. 2001. Creating tidal salt marshes in the Chesapeake Bay. **Journal of Coastal Research**, *Special Issue No. 27*, 170-191.

Pyke, C.R. and **K.J. Havens**. 1999 . The distribution of the invasive reed *Phragmites australis* relative to sediment depth in a constructed wetland. **Wetlands** 19(1): 283-287.

**Havens, K.J.** and E. Sharp. 1998. Using thermal imagery in the aerial survey of animals. **Wildlife Society Bulletin** 26 (1): 17-23.

**Havens, K.J.** 1997. The effect of vegetation on soil redox within a seasonally flooded forested system. **Wetlands** 17(2): 237-242.

**Havens, K.J.**, W.I. Priest III, and H. Berquist. 1997. The investigation of *Phragmites australis* within Virginia's constructed wetland sites. **Environmental Management** 21(4): 599-605.

**Havens, K.J.**, W.I. Priest III, and A. Jennings. 1996. The use of night-vision equipment to observe wildlife in forested wetlands. **Virginia Journal of Science**, Vol. 46(4): 228-234.

**Havens, K.J.**, L.M. Varnell, and J.G. Bradshaw. 1995. An Assessment of Ecological Conditions between a Constructed Marsh and Two Natural Reference Marshes in Coastal Virginia. **Ecological Engineering** 4: 117-141.

Varnell, L.M., **K.J. Havens**, and C. Hershner. 1995. Daily Variability in Abundance and Population Characteristics of Tidal Salt Marsh Fauna. **Estuaries** 18(2):326-334.

Varnell, L.M. and **K.J. Havens**. 1995. A Comparison of Dimension-Adjusted Catch Data Methods for Assessment of Fish and Crab Abundance in Intertidal Salt Marshes. **Estuaries** 18(2):319-325.

**Havens, K.J.** and J.R. McConaugha. 1990. Molting in the Mature Female Blue Crab, *Callinectes sapidus* Rathbun. **Bulletin of Marine Science**, Vol. 46(1): 37-47.

#### Books written

**Havens, K.** and E. Sharp. 2016. Thermal Imaging Techniques to Survey and Monitor animals in the Wild: A Methodology. Academic Press, ISBN 9780128033845, 376pp.

<https://www.elsevier.com/books/thermal-imaging-techniques-to-survey-and-monitor-animals-in-the-wild/havens/978-0-12-803384-5>

Review

"...a valuable manual for biologists and resource managers interested in understanding and applying thermal imaging to current wildlife-related observation challenges...an excellent job of balancing technical information with figures, examples, and summaries of current knowledge and practice..." --**The Quarterly Review of Biology**

**Invited scholarly papers and talks (abbreviated to the last 10 years)**

**Havens, KJ.** Webinar to inform the United Nations Intergovernmental Negotiating Committee on Plastic Pollution Treaty. Presentation: "The use of Polyhydroxyalkanoate (PHA) in Natural Resource Applications". November 2024.

**Havens, KJ.** National Fish & Wildlife Foundation, Fishing for Energy Partnership. Test & Implement Commercial Grade Biodegradable hinges on Dungeness Crab Traps in Alaska & Washington State. October 2022.

**Havens, KJ.** Moananuiakea Voyage, Nainoa Thompson. VIMS Foundation Board. September 2022.

**Havens, KJ.** STAC Report presentation on *Assessing the Water Quality, Habitat, and Social Benefits of Green Riprap*. September 2022.

**Havens, KJ.** Indigenous communities & tourism, Tahiti Tourism & Chickahominy Tribe. August 2022.

**Havens, KJ.** Resiliency design, American Institute of Architects. VIMS Advancement. April 2022.

**Havens, KJ.** Blue Climate Summit. French Polynesia. VIMS, Chesapeake Bay restoration, Tribal engagement. May 2022.

**Havens, KJ.** Lecture for ENSP 440/MSCI 498 *Plastics in Society and the Environment: Problems and Solutions*. Biopolymers. April 2022.

**Havens, KJ.** Lecture for MSCI 398/ENSP 249. *Estuarine Science and Management*. April 2022.

**Havens, KJ.** Living Shorelines. Chickahominy Tribe. April 2022.

**Havens, KJ.** Mid Atlantic Action Plan Goal 2. Derelict Fishing Gear, NOAA Marine Debris Program, March 2022

**Havens, KJ.** Guest lecture at Longwood University. Marine Debris / Plastic Pollution in the Marine Environment (plastic, microplastic, whales, worms, lost crab pots, cranberries, shotguns, beer, & bovine digestion). February 2022.

**Havens, KJ.** VIMS Speakers Bureau, Institute for Learning in Retirement, Microplastics & Bioplastics. August 2021.

**Havens, KJ.** National Fish & Wildlife Foundation, Fishing for Energy Partnership. Test & Implement Commercial Grade Biodegradable hinges on Dungeness Crab Traps in Alaska & Washington State. August 2021.

**Havens, KJ.** Department of Health, Wastewater Infrastructure Workgroup, Septic vulnerability. September 2021.

**Havens, KJ.** Vulnerability and Needs Assessment for Key Resources, Northeast Regional Climate Adaptation Science Symposium. Virginia Tribal Communities. October 2021.

**Havens, K.J.** The State Arboretum of Virginia. Presentation on marine plastics pollution. “Science Café” Winchester, VA. May 2019.

Bilkovic, D.M., A. Scheld, **K. Havens**, Danielle Zaveta, H. Ward Slacum Jr. , Christopher Jeffrey, Jill Meyer, John Evans. May 2019. Managing Derelict Fishing Gear in Estuarine and Coastal Ecosystems – Case Study. The Association of Southeast Asian Nations (ASEAN) Regional Forum (ARF) Workshop on Marine Debris Management for Sustainable Fisheries and Food Security in Southeast Asia in Nha Trang, Viet Nam. 13-15 May 2019. *\*Invited and sponsored by the US State Department.*

**Havens, K.J.** National Fisheries Institute Leadership Program. Plastic Pollution in the Marine Environment. May 2019.

**Havens, K.J.** US Department of State. World Wildlife Day. Presentation on marine debris / derelict fishing gear. Special invitation from the Deputy Asst. Secretary for Oceans & Fisheries, U.S Department of State. March 2019. <https://www.state.gov/world-wildlife-day-2019/>

**Havens, K.J.**, J. McDevitt. Brandstorm Podcast. Biodegradable shotgun wads. May 2018. <https://www.platypus-ad.com/brandstorm/episode-33-jason-mcdevitt-and-kirk-havens-from-greenops-ammo/>

**Havens, K.J.** North Landing Albmarle Pamlico Sound Symposium, Virginia Beach. Wetlands in the southern watershed. April 2018.

**Havens, K.J.**, M. Henicheck. Association of State Wetlands Managers – presentation on WetCAT – Shepherdstown, West Virginia. 2017.

**Havens, K.J.** US EPA - Wetlands and long term change – Cacapon, West Virginia. 2017.

**Havens, K.J.** Virginia Department of Transportation Research Council – innovative biopolymers for pollutant removal. 2017.

**Havens, K.J., K. Weng.** Marine Debris – Malama’ Honua Summit, Honolulu, Hawaii. 2017.

**Havens, K.J.** *Phragmites australis* overview – Sea Grant Invasive species summit. 2017.

**Havens, K.J.** Presentation on WetCAT to the Mid Atlantic Wetlands Workgroup annual meeting. 2017.

**Havens, K.J.** Welcoming comments to the Albemarle-Pamlico National Estuary Partnership State of the Estuary Symposium. 2017.

**Havens, K.J.** Presentation to the VIMS Industry Partnership on biopolymer innovation. 2017.

**Havens, K.J.** VIMS After Hours Lecture. Microplastics. 2016.

**Havens, K.J.** Virginia Environmental Health Association. Derelict crab pots. 2016.

**Havens, K.J.** US Foreign Press. Derelict crab pots, plastics, biopolymers. 2016.

**Havens, K.J.** US EPA Regional Administrator press conference. VIMS. Wetlands Research. 2016.

**Havens, K.J.** Plastic Debris. Association of General Contractors. 2015.

Scheld, A.M., Bilkovic, D.M. and **Havens, K.J.**, 2015. The Effects of Derelict Gear on Blue Crab Production in the Chesapeake Bay. North American Association of Fisheries Economists, 8<sup>th</sup> Biennial Forum “Economic Sustainability, Fishing Communities, and Working Waterfronts”, Ketchikan, Alaska.

**Havens, K.J.** Plastic in the marine environment. Longwood University Invited Speaker Series. 2015.

**Havens, K.J., M. Henicheck.** Virginia Wetland Assessment: WetCAT. Virginia Association of Wetland Professionals. 2015.

**Havens, K.J.** Plastic in the marine environment. Hampton High School. 2015.

## **Published software, audio, multimedia, etc. materials**

**Ocean Bridge Educators Lesson Plan.** 2013 to present. Ghostbusting in the Chesapeake: Rounding Up Derelict Fishing Gear. C. Petrone, K.J. Havens, D. Bilkovic, D. Stanhope, K. Angstadt. [http://www2.vims.edu/bridge/DATA.cfm?Bridge\\_Location=archive1010.html](http://www2.vims.edu/bridge/DATA.cfm?Bridge_Location=archive1010.html)

**Co-Host/Co-Producer** – *A Healthy Bay for Healthy Kids: Cooking with Virginia's First Lady.* Grade school children follow along with Virginia's First Lady as a Chef shows how to make a healthy Chesapeake Bay seafood dish. First Ladies of Virginia Susan Allen (Gov. George Allen), Lisa Collis (Gov. Mark Warner), Anne Holton (Gov. Timothy Kaine), Maureen McDonnell (Gov. Robert McDonnell), Dorothy McAuliffe (Gov. Terry McAuliffe). 2002 – 2018. [http://www.vims.edu/newsandevents/topstories/healthybay\\_healthykids.php](http://www.vims.edu/newsandevents/topstories/healthybay_healthykids.php)

**Host/Producer with WVEC-** *Chesapeake BayWatch! With Dr. Kirk Havens.* 2001. Public Service Announcement television series. 12 segments, <http://www.vims.edu/bayinfo/baywatch/index.php>

**Film Documentary,** 1996, *Dans la Nature avec Stephane Peyron,* (In the Wild with Stephane Peyron), Featured in film for thermal imagery work with black bears. Canal+ Productions, France.

## **PROFESSIONAL SERVICE**

editorial board services, review panels, program reviews, national or international research programs

**Expert Witness.** Accepted in Federal Court as an expert witness in wetlands ecology. Docket No. CWA-03-2001-0021.

**US Environmental Protection Agency Science Advisory Board.** Great Lakes Restoration Initiative Action Plan Panel. 2011.

**Longwood University/Hull Springs Farm Strategic Plan Task Force.** Appointed by President Finnegan (Longwood University) to develop a long-term plan for Longwood University's 600 acre property on the Potomac River. 2010-2011.

**Proposal Reviewer:** National Science Foundation, Ecosystem Studies; National Science Foundation, Division of Earth Sciences; US Geological Survey; Sea Grant, Maryland and Delaware.

**Editor,** Technical Report Series, College of William and Mary, Virginia Institute of Marine Science, Center for Coastal Resources Management, 1990 - present.

**Editor /Founder,** Wetlands Board Bulletin, College of William & Mary, VIMS, Wetlands

Program, 1986-1990. *Restructured into the Virginia Wetlands Report.*

**Co-Editor**, Virginia Wetlands Report, College of William and Mary, Virginia Institute of Marine Science, Center for Coastal Resources Management, 1990 - 1996.

**Referee/Reviewer**: Ecological Engineering, The Journal of Ecotechnology; Wetlands, Professional Journal of the Society of Wetlands Scientists, American Fisheries Society, Marine Pollution Bulletin, Environmental Pollution, Environmental Monitoring and Assessment, Marine Policy, Fishery Bulletin, North American Journal of Fisheries Management, Estuaries and Coasts, Marine Ecology Progress Series.

## **ADVISORY SERVICE**

### **Service to agencies of the Commonwealth or federal government**

**Chesapeake Bay Program Scientific and Technical Advisory Committee.** Virginia Gubernatorial Representative (appointed by Governor Warner, Governor Kaine reappointment, Governor McDonnell reappointment, Governor McAuliffe reappointment, Governor Northam reappointment). Scientific advisory committee to the Governors of Maryland, Pennsylvania, and Virginia, the Mayor of D.C., the Administrator of the U.S. EPA, and the Chesapeake Bay Commission. Chesapeake Bay Program. 2002-2024.

- **Chair (2013 – 2015) /Vice Chair (2011 – 2012).** Chesapeake Bay Program Scientific and Technical Advisory Committee.

#### **STAC Activity as Chair.**

- **Havens, K.** (2015). STAC letter to *Governor McAuliffe, Chair, Chesapeake Bay Executive Council.*
- **Havens, K.** (2015). STAC letter to CBP re *Behavioral Economics Workshop Report, Executive Summary.*
- **Havens, K.** (2015). STAC letter to CBP re *Forage Base Workshop Report, Executive Summary.*
- **Havens, K.** (2015). STAC letter to CBP re *Management Effects on Water Quality Status and Trends, Executive Summary.*
- **Havens, K.** (2015). STAC letter to CBP re *Stream Restoration Workshop Report, Executive Summary.*
- **Havens, K.** (2015). STAC letter to CBP re *STAC Peculiarities of Pervious Cover, Executive Summary.*
- **Havens, K.** (2014). STAC letter to CBP re *Coastal Habitat Workshop Report, Executive Summary.*
- **Havens, K.** (2014). STAC letter to CBP re *Onsite Septic System Workshop Report, Executive Summary.*
- **Havens, K., N. Gardner.** (2014). STAC letter to CBP re *M3.2 Report, Executive Summary.*
- **Havens, K.** (2014). STAC letter to CBP re *Nutrient Trading Workshop Report, Executive Summary.*

- **Havens, K.** (2014). STAC letter to CBP re *STAC Recommendations on Chesapeake Bay Agreement Goal and Outcome Statements*.
- **Havens, K., C. Pyke.** (2013) STAC letter to CBP re *Marcellus Shale Workshop Report, Executive Summary*.
- **Havens, K., C. Pyke.** (2013) STAC letter to CBP re *Environmental Literacy, Executive Summary*.

**Albemarle-Pamlico National Estuary Partnership (APNEP) Leadership Council Member and Executive Board Member.** Governor Perdue, Governor McCrory, Governor Cooper Executive Orders. *The Leadership Council for the Albemarle-Pamlico National Estuary Program* works with NCDENR and the Program Office to support, evaluate, update, advocate and guide the implementation of the Comprehensive Conservation and Management Plan (CCMP) and the APNEP mission. 2010-Present. Vice Chair 2015-2017.

**Chair 2017-present.**

- **Recent APNEP activity**
  - Update and revision of Comprehensive Conservation and Management Plan.
  - Development of workplan & budget for APNEP through the Bipartisan Infrastructure Law (an additional \$5M over 5 years)
  - Havens, K. (2019). Leadership Council letter to EPA Administer Wheeler regarding waters of the United States (WOTUS) definition change.
  - Concluded MOU between VA Secretary of Natural Resources, NC Secretary of Environmental Protection, and NC Secretary of Agriculture regarding commitment to shared waterways 2020.

**Virginia Department of Health Sewage Handling and Disposal Regulations Climate Change Subcommittee – scientific advisory member.** Assessment of climate change impacts – precipitation and sea level rise on coast onsite septic systems. Multiple funded projects ongoing (see grants section). 2020 – present.

**Virginia Marine Debris Reduction Plan – Leadership Team.**

The Virginia Marine Debris Reduction Plan describes major goals and strategies to address marine debris on a statewide basis through prevention, interception, innovation, and removal for ecological, social, and economic benefits. It is designed to guide the work of a collaborative team of Virginia agencies, community groups, citizens, and other stakeholders for the next decade. The Plan identifies priorities and actions Virginia could feasibly coordinate and accomplish to measurably reduce marine debris in Mid-Atlantic waters. 2013-present.

**APNEP Scientific and Technical Advisory Committee (STAC) Member and Executive Committee Member.** The STAC supports the APNEP Policy Board. The STAC provides scientific and technical advice in various ways, including (1) technical reports and papers, (2) discussion groups, (3) assistance in organizing merit reviews of APNEP programs and projects, (4) technical conferences and workshops, and (5) service by STAC members on APNEP subcommittees and workgroups. STAC also acts proactively to bring the most recent scientific information to APNEP and its partners. 2007 – 2017.



## **Service to State Agencies**

- Report to VA DEQ Director Rolband, “Review of VERA document on nutrient credit methodology for shoreline management projects”.
- Final Report to VDOT on flooding risks association with VDOT infrastructure.
- Report to Soil and Water Conservation District on Virginia Conservation Assistance Program (VCAP) for living shoreline projects.
- Report to VA DEQ Director Rolband, “Geoprocessing Approach to Calculating Wetland Areas and Perennial Streams for DEQ” in response to SCOTUS Sackett decision. June 26, 2023.
- Review of VA Tech Natural Resources Dept. Invitation from Dean, March 30-31, 2023.
- January 9, 2023. Northern Neck Wastewater Project Sharing.
- March 12, 2022. Mid Atlantic Action Plan Goal 2. Derelict fishing gear.
- April 10, 2022. Chickahominy Tribe. Living shorelines.
- May 17, 2022. Blue Climate Summit. French Polynesia. VIMS, Chesapeake Bay restoration, Tribal engagement.
- August 12, 2022. Indigenous communities & tourism. Tahiti tourism & Chickahominy Tribe.
- September 13, 2022. STAC Report presentation on Assessing the Water Quality, Habitat, and Social Benefits of Green Riprap.
- Oct 19, 2022. National Fish & Wildlife Foundation, Fishing for Energy Partnership. Test & Implement Commercial Grade Biodegradable hinges on Dungeness Crab Traps in Alaska & Washington State.
- August 8, 2021. VIMS Speakers Bureau, Institute for Learning in Retirement, Microplastics & Bioplastics
- August 18, 2021. National Fish & Wildlife Foundation, Fishing for Energy Partnership. Test & Implement Commercial Grade Biodegradable hinges on Dungeness Crab Traps in Alaska & Washington State.
- September 8, 2021. Department of Health, Wastewater Infrastructure Workgroup, Septic vulnerability
- October 26, 2021. Vulnerability and Needs Assessment for Key Resources, Northeast Regional Climate Adaptation Science Symposium. Virginia Tribal Communities, presentation with Kenah Consulting.
- Multiple briefings to Deputy Sec. of Natural Resources Ann Jennings, Deputy Secretary of Natural Resources Joshua Zaks, Special Asst. to the Governor Ann Phillips, Deputy Commissioner of the Virginia Department of Transportation Rob Cary 2018-2021.
- Briefing for Secretary of Natural Resources Matt Strickler. May 2018.
- Briefing with the Governmental Accountability Office on marine debris and plastic pollution. 2018.
- Briefing to Virginia Department of Transportation Chief Deputy Commissioner Rob Cary on biodegradable erosion control netting. 2018.

- Briefing to Virginia Secretary of Natural Resources Molly Ward and Secretary of Transportation Aubrey Layne on biopolymer innovations for the reduction of pollutants to the Chesapeake Bay. 2017.
- Briefing to Sec. of Natural Resources Molly Ward on MOU between Virginia and North Carolina regarding shared waterways. 2017.
- WetCAT webinar briefing for EPA. 2017.
- Briefing to US Corps of Engineers Norfolk District Engineer, Col. Kelly on WetCAT. 2017.
- Briefing for VMRC Commissioner Bull. Economic and environmental impact of derelict crab pots. 2016.
- Briefing for Secretary of Natural Resources Ward. Derelict ‘ghost’ crab pot removal program. March 17, 2014.
- Commonwealth of Virginia Marine Debris Plan. Executive Committee.
- Governor McDonnell June 2013 Proclamation on Marine Debris. Contributor to draft.

## **Service to Legislature**

- Invited (Congressman Wittman (VA), Congressman Bentz (OR) – Chair, Water, Wildlife, and Fisheries Subcommittee) congressional testimony on reauthorization of the Chesapeake Bay Program and the National Fish & Wildlife Foundation 2024.  
<https://m.youtube.com/watch?v=c86JyntujoU&t=3737s&pp=2AGZHZACAQ%3D%3D>
- Rep. Luria Albemarle- Pamlico Roundtable. 2021.
- Briefing to Chris Jones, US Rep. Wittman staff member, regarding wetlands functional values. 2017.
- Briefing to VA State Senator Mason on innovative biopolymer research. 2017.
- Presentation/briefing to Federal Highway Administration on WetCAT. 2017.
- Briefing for the Chesapeake Bay Commission on plastic microbeads. 2015.
- Briefing for the VA General Assembly subcommittee on the Chesapeake on the topic of derelict crab pots and plastic microbeads. 2015
- Briefing for the Chesapeake Bay Commission on STAC microplastics report. 2016.
- Testimony at the Virginia Manufacturing Development Commission on behalf of Del. Bulova on plastic microbeads. 2015.
- Briefing to Virginia Senate Finance subcommittee on coastal shoreline activities and derelict blue crab pots. July 24, 2012.
- Briefing for VA Secretary of Natural Resources Doug Domenech and Virginia Marine Resources Commissioner Jack Travelstead. Marine Debris Removal Program June 14, 2012.
- Governor McDonnell Earth Day Event. Congressman Wittman, Secretary of Natural Resources Doug Domenech, Asst. Administrator NOAA David Kennedy, VMRC Commissioner Bowman. Derelict Crab Pots in the Bay. VIMS. April 2011.
- Briefing for NOAA Federal Disaster Funds Project Manager. Marine Debris Location and Removal Project. Newport News, VA, December 2010.
- Briefing for Maryland Department of Legislative Services. Biodegradable panels for crab

pots. March 2010.

- Briefing for VMRC Blue Crab Advisory Committee. 2010. Marine debris location and removal program.
- Briefing for VA House of Delegates, Chesapeake Subcommittee. Marine Debris. 2009
- City of Chesapeake Wetlands Board. Tidal Wetlands and Sealevel Rise. October 2009.
- VA House of Delegates, Chesapeake Subcommittee presentation. Marine Debris. 2009.
- Briefing for Congressman Wittman (VA). April 22, 2009. Development and Implementation of a Process for Establishing Chesapeake Bay Program's Monitoring Program Priorities and Objectives.
- Briefing for VA Secretary of Natural Resource, Preston Bryant and VMRC Commissioner Bowman. April 30, 2009. Marine Debris and Blue Crab Trap Removal Program.
- Report to the Governor and General Assembly of Virginia. House Document No. 7., Havens, K. J., D. Bilkovic, D. Stanhope, K. Angstadt, and C. Hershner. 2008. Study on abandoned and discarded blue crab traps., Richmond.
- Expert witness on wetlands for US EPA. 2008. Vico Construction Corp & Amelia Venture Properties, LLC vs. US EPA. Docket No. CWA-03-2001-0021.
- Briefing for VA Secretary of Natural Resources Preston Bryant . Nontidal Wetland Assessment. June 27, 2006.
- Briefing for the VMRC Blue Crab Workgroup. Derelict crab traps. Newport News, Va. 2007.
- Briefing for the Chesapeake Bay Commission. Derelict Crab Traps in the Chesapeake Bay. Virginia Beach, VA, November 10, 2006.
- Briefing for ACOE District Engineer Col. Dionysios Anninos. Nontidal Wetland Assessment. November 6, 2006.
- Special Briefing to US Senate and Va. General Assembly members, Commissioner of the VMRC, and the U.S. Asst. Secretary of Commerce. Affect of Derelict Crab Traps on Chesapeake Bay Fisheries. Yorktown, VA. August 31, 2006.
- Briefing for the Chesapeake Bay Commission. Derelict Crab Traps in the Chesapeake Bay. Chesapeake Bay Commission. Virginia Beach, VA, November 10, 2006.
- Briefing for ACOE District Engineer Col. Dionysios Anninos. VIMS Nontidal Wetland Assessment Protocol. November 6, 2006.
- Special Briefing to US Senate and Va. General Assembly members, Commissioner of the VMRC, and the United States Asst. Secretary of Commerce. Affect of Derelict Crab Traps on Chesapeake Bay Fisheries. Yorktown, VA. August 31, 2006.
- Briefing for VA Secretary of Natural Resources Preston Bryant. VIMS Nontidal Wetland Assessment Protocol. June 27, 2006.
- Briefing for VA Secretary of Natural Resources JP Woodley. Nontidal Wetlands Legislation. 2000.
- Technical Review of the proposed changes to the Federal Wetlands Delineation Manual. *Prepared for the U.S. Environmental Protection Agency.* Virginia Institute of Marine Science, College of William and Mary.

## **Service to regional, national or international management commissions or programs (Present)**

**Board of Directors of the Coastal Studies Institute.** Led by East Carolina University (ECU), The Coastal Studies Institute is a multi-institutional research and educational partnership of the UNC System including North Carolina State University, UNC-Chapel Hill, UNC Wilmington, and Elizabeth City State University. The Board promotes UNC's mission in helping it serve the people of North Carolina at a high level of excellence in every area of endeavor of the Coastal Studies Institute. 2020 – present.

**Institute Representative.** *USDA, NRCS Virginia State Technical Committee.*

The amended Food Security Act of 1985 requires that the Secretary of Agriculture establish a technical committee in each State to assist in the technical considerations and to develop the technical guidelines necessary to implement conservation provisions of the Food Security Act of 1985, as amended. The State Technical Committees are composed of individuals who represent a variety of natural resource sciences and occupations, including: soil, water, plants, wetlands and wildlife. State Technical Committees provide advice on a number of issues within a variety of conservation programs, as well as, review and rank local funding and priority area requests at the State level and to be forwarded to Regional and National levels. 1994 - Present.

**Member.** Mid Atlantic Wetlands Workgroup. MAWWG consists of participants representing federal and state regulatory personnel and scientists from the following states: Delaware, Maryland, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Virginia, and West Virginia. This focused membership includes both users and developers of monitoring and assessment tools. 2002 – Present.

## **Public outreach (abbreviated to last 10 years)**

### **Media (Abbreviated to last 10 years)**

Bay Journal, Tim Wheeler, Living Shorelines, June, 2, 2023.

Bay Journal, Tim Wheeler, Living Shorelines, May 12, 2023.

Peninsula Chronicle, Bob Flynn, Derelict traps. May 9, 2023,

Lost and abandoned crab traps. Maryland, reporter Joel McCord. March 8, 2023.

Virginia Pilot. January 20, 2023.

National TRAP Program 2023. Multiple interviews. Press release = over ½ billion media views.

KCBS Radio, San Francisco. Marine Debris. 2018.

NPR Radio interview. Marine Debris. 2017.

A. Scheld. NPR Radio interview. St. John's Fisheries Broadcast. 2016.

<http://www.cbc.ca/news/canada/newfoundland-labrador/programs/thebroadcast/torbay-man-hauls-in-400-pound-of-shark-1.3863861>

NPR Radio interview. Science Matters. Microplastics. 2016.

<https://www.facebook.com/ScienceMattersVA>

NPR Radio interview. Derelict pots. 2016. <http://wypr.org/post/searching-ghost-pots-chesapeake>  
NBC Nightly News with Brian Williams. Chesapeake Bay watermen reel in 'ghost pots'.  
<http://www.nbcnews.com/video/nightly-news/47505134#47505134>. 2012.

## Presentations (Abbreviated to last 10 years)

United States Power Squadron District 5 fall meeting about sharing passively collected shallow-water bathymetry data stored on vessel GPS chart plotting units. This collaboration with the Power Squadron is called SHOAL (Shallow-water Hydrographic Observation and Assessment Logging) Project. Nov 2023.

Wright Island March Restoration meeting. Jan 2023.

September 16, 2022. VIMS Foundation Board. Presentation on Nainoa and upcoming voyage and visit.

Tredegar CEO. Presentation on biopolymer research. Jan 2020.

VIMS Foundation Board panelist. Jan 2020.

Deborah Gates, alumna donor (VIMS Development request). Presentation on CCRM. Feb 2020.

Master Naturalist. Presentation on derelict fishing gear and CRAB TRAP APP. Mar 2020.

Youth Ocean Conservation Summit. Keynote speaker. Mar 2020.

Coastal Planning District Commission. Presentation on VDOT infrastructure resiliency work. June 2020.

The Ocean Foundation. Presentation on CCRM activities. Aug 2020.

National Fish & Wildlife Foundation. Presentation on recent research activities. Oct 2020.

State Arboretum of Virginia. Science Café. Presentation on marine debris. May 2019.

Northern Neck Sail and Power Squadron. Presentation on marine debris. Feb 2019.

Longwood University. Presentation on marine debris. Feb. 2019.

Penninsula Ski Club. Presentation on Thermal Imaging. Feb. 2019.

VIMS Marine Science Day. May 2018.

VIMS donors. Biodegradable plastics talk. May 2018.

The Nature Conservancy. Presentation on derelict fishing gear. September 2018.

VIMS Science Under Sail – Marine Debris. 2017.

Marine Debris – Virginia Yacht Club. 2017.

VIMS Marine Science Day. 2017.

Mid Atlantic Wetlands Workgroup. Presentation on WetCAT. Oct. 2017.

VIMS Innovation Partner meeting. Presentation on biopolymer innovation. Dec. 2017.

Abington Ruritan. Derelict crab pots. 2106.

*Interview for global documentary on derelict fishing gear.* World Society for the Protection of Animals. January 28, 2014. Release date scheduled for Summer 2014.

## ADDITIONAL ACTIVITIES

- **President (2006-2009). Board of Directors (2004 – 2020).** *American Canoe Association.* The American Canoe Association (ACA) is a nationwide, not for profit, 50,000 member organization that is in service to the broader paddling public (approximately 30-50 million citizens) by providing education on matters related to

paddling, supporting stewardship of the paddling environment, and enabling programs and events to support paddlesport recreation. Founded in 1880, this marks the third century that the ACA has actively promoted paddlesports across the U.S., providing programs and services to its members and the American public. The ACA is the United States National Governing Body for Olympic and Paralympic canoeing and kayaking.

- **Chair.** *King and Queen County Wetlands Board. 2002- 2021.*  
The King and Queen County Wetlands Board administers Section 28.2 of the Code of Virginia for encroachments into the intertidal zone of Virginia's water.
- **Board of Directors.** *Peninsulas Emergency Medical Services Council. 2002-2012.*  
The primary mission of the Peninsulas Emergency Medical Services Council is to assist local emergency medical services components and to assess, identify, coordinate, plan and implement an efficient regional emergency medical services delivery system in partnership with the Virginia Office of EMS and the Virginia EMS Advisory Board.