

CURRICULUM VITAE



University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE
CHESAPEAKE BIOLOGICAL LABORATORY

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I. Education

- Ph.D.** 1997 Environmental and Ecological Economics, University of Maryland, College Park.
B.S. 1986 (with honors, Phi Beta Kappa), Earth Science, University of California, Santa Cruz.

II. Professional Background

- 2013-present *Research Professor and Mgr. Spatial Data Analysis Lab*, University of Maryland, Center for Environmental Science
2006-2013 *Research Associate Professor*, Univ. of Maryland, Ctr for Environmental Science
2008-2013 *Economics Advisor*, US EPA, ORD, Ecosystem Services Research Program
1998–2007 *Project Manager*, King and Associates, Inc. Solomons, MD
2004–2006 *Associate Research Scientist*, Univ. of Maryland, Ctr for Environmental Science
1998–2004 *Assistant Research Scientist*, University of Maryland, Ctr for Environmental Science
1995–1998 *Assistant Research Scientist/Project Manager*, University of Maryland, Institute for Ecological Economics, Center for Environmental Science

III. Research

A. Areas of Professional Expertise

- Integrated ecological and economic evaluation of policy/management options
- Water quality economics
- Ecosystem service trading, mitigation & offsets
- Mapping and valuation of ecosystem services
- Performance-based metrics for environmental restoration targeting
- Invasive species risk assessment
- GIS and spatial data statistical modeling

B. Publications

Journal Articles

- Mazzotta, M.J. and L.A. Wainger, S. Sifleet, J.T. Petty, and B. Rashleigh, (accepted). Benefit transfer with limited data: An application to recreational fishing losses from surface mining. *Ecological Economics*.
- Munns, W. R., A. W. Rea, M. J. Mazzotta, L. A. Wainger, and K. Saterson. 2015. Toward a standard lexicon for ecosystem services. *Integrated Environmental Assessment and Management*. Preprint online.

- Koch, B. J., C. M. Febria, M. Gevrey, L. A. Wainger, and M. A. Palmer. 2014. Nitrogen Removal by Stormwater Management Structures: A Data Synthesis. *JAWRA Journal of the American Water Resources Association* 50:1594–1607.
- Lookingbill, T. R., E. S. Minor, J. R. Ferrari, N. Bukach & L. A. Wainger. 2014. Using Risk of Reinvasion to Prioritize Invasive Plant Species Management. *Natural Areas Journal*. 34(3):268-281.
- Costanza, R., K. Chichakly, V. Dale, S. Farber, D. Finnigan, K. Grigg, S. Heckbert, I. Kubiszewski, H. Lee, S. Liu, P. Magnuszewski, S. Maynard, N. McDonald, R. Mills, S. Ogilvy, P. L. Pert, J. Renz, L. Wainger, M. Young, C. R. Ziegler. 2014. Simulation games that integrate research, entertainment, and learning around ecosystem services. *Ecosystem Services* 10:195–201.
- Wainger, L. A., and Shortle, J.S. 2013. Local Innovations in Water Protection: Experiments with Economic Incentives. *Choices: The Magazine of Food, Farm & Resource Issues* 28.
- Wainger, L. A., G. Van Houtven, R. Loomis, J. Messer, R. Beach, and M. Deerhake. 2013. Tradeoffs among Ecosystem Services, Performance Certainty, and Cost-efficiency in Implementation of the Chesapeake Bay Total Maximum Daily Load. *Agricultural and Resource Economics Review* 42:196–224.
- Boynton, W. R., C. L. S. Hodgkins, C. A. O’Leary, E. M. Bailey, A. R. Bayard, and L. A. Wainger. 2013. Multi-decade Responses of a Tidal Creek System to Nutrient Load Reductions: Mattawoman Creek, Maryland USA. *Estuaries and Coasts*:1–17.
- Setterfield, S. A., N. A. Rossiter-Rachor, M. M. Douglas, L. Wainger, A. M. Petty, P. Barrow, I. J. Shepherd, and K. B. Ferdinands. 2013. Adding Fuel to the Fire: The Impacts of Non-Native Grass Invasion on Fire Management at a Regional Scale. *PLoS ONE* 8:e59144.
- Wainger, L. A. 2012. Opportunities for Reducing Total Maximum Daily Load (TMDL) Compliance Costs: Lessons from the Chesapeake Bay. *Environmental Science & Technology* 46:9256–9265.
- Suarez-Rubio, M., T. Lookingbill, and L. Wainger. 2012. Modeling exurban development near Washington, DC, USA: comparison of a pattern-based model and a spatially-explicit econometric model. *Landscape Ecology* 27:1045–1061.
- Tallis, H., S. Lester, M. Ruckelshaus, M. Plummer, K. McLeod, A. Guerry, S. Andelman, M.R Caldwell, M. Conte, S. Copps, D. Fox, R. Fujita, S. D Gaines, G. Gelfenbaum, B. Gold, P. Kareiva, C. Kim, K. Lee, M. Papenfus, S. Redman, B. Silliman, L. Wainger, C. White. 2012. New Metrics for Managing and Sustaining the Ocean's Bounty. *Marine Policy* 36:303-306.
- Wainger, L., and M. Mazzotta. 2011. Realizing the Potential of Ecosystem Services: A Framework for Relating Ecological Changes to Economic Benefits. *Environmental Management* 48:710-733.
- Wainger, Lisa A., Dennis M. King, Richard N. Mack, Elizabeth W. Price, and Thomas Maslin. 2010. Can the concept of ecosystem services be practically applied to improve natural resource management decisions? *Ecological Economics* 69, no. 5 (March 15): 978-987. doi: 10.1016/j.ecolecon.2009.12.011.
- Mehaffey, Megan, Lisa Wainger, Timothy Wade, Dennis Yankee, Elizabeth Smith, Vicki Bott, Rebecca Yarbrough. 2008. Assessing vulnerabilities from alternative development patterns. *Landscape and Urban Planning* 87:84–95.
- Chornesky, E.A. & 15 coauthors, 2005. Science priorities to reduce the threat of invasive species to sustainable forestry. *BioScience* 55(4): 335-349.
- Wainger, Lisa A., Dennis M. King, Sandra L. Bird and Joyce A. Cantrell, 2004. Indicators for Assessing Economic Vulnerabilities to Changes in Ecosystem Services: Case Study of Counties in Maryland, USA. *Environmental Management* 34(5):730-747.
- Wainger, Lisa A. and Elizabeth W. Price, 2004. Evaluating Quality of Life, Economic Vulnerabilities and Drivers of Ecosystem Change. *Environmental Monitoring and Assessment*. 94:69-84.
- Boyd, J. and L.A. Wainger, 2002. Landscape Indicators of Ecosystem Service Benefits. *American Journal of Agricultural Economics* 84(5):1371-1378.

- Boyd, J. and L.A. Wainger, 2002. Measuring Ecosystem Service Benefits for Wetland Mitigation. *National Wetlands Newsletter* 24(6):1. Environmental Law Institute.
- Shabman, L., L. Zepp, L. Wainger and D. King, 2002. Incentives for reforestation of agricultural land: What will a market for carbon sequestration credits contribute? *Journal of Sustainable Agriculture* 17(2): 116-124).
- Costanza R., A. Voinov, R. Boumans, T. Maxwell, F. Villa, L. Wainger, H. Voinov, 2002. Integrated ecological economic modeling of the Patuxent River watershed, Maryland. *Ecological Monographs* 72(2):203-231.
- Wainger, L. A., D. M. King, J. Salzman and J. Boyd, 2001. Wetland Value Indicators for Scoring Mitigation Trades. *Stanford Environmental Law Journal* 20(2):413-478.
- Geoghegan, J., L. Wainger and N. Bockstael, 1997. Spatial landscape indices in a hedonic framework: An ecological economics analysis using GIS. *Ecological Economics* 23(3): 251-264.
- Bockstael, N., R. Costanza, I. Strand, W. Boynton, K. Bell and L. Wainger, 1995. Ecological economic modeling and valuation of ecosystems. *Ecological Economics* 14: 143-159.
- Costanza, R., L. Wainger, C. Folke and K.-G. Maler, 1993. Modeling complex ecological and economic systems: Towards an evolutionary, dynamic understanding of people and nature. *BioScience* 43(8): 545-555.

Online Products

- The Federal Resource Management and Ecosystem Services Guidebook*. Contributor to overall effort and developer of two chapters (listed under peer-reviewed reports). <https://nespguidebook.com>
- Spatial Economic Decision Support Tool. Developed for the National Park Service. <http://dev1.timmons.com/seds/>
- Visual Literature Review. Invasive Species Impacts. <http://waingerlab.cbl.umces.edu/review.html>

Book Chapters

- Johnston, R. and L. Wainger. (in press) *Benefit Transfer for Ecosystem Service Valuation: An Introduction to Theory and Methods*. Chapter 12 In: *Handbook of Environmental Benefit Transfer* (R. Johnston, J. Rolfe, R. Rosenberger, and R. Brouwer, eds.). Springer.
- Wainger, L. A. and J. Boyd, 2009. Valuing Ecosystem Services. Chapter 6 In: *Ecosystem-Based Management for the Oceans: Applying Resilience Thinking* (K. McLeod, and H. Leslie, eds.) Island Press.
- Lookingbill, T., R. Gardner, L. Wainger and C. Tague. 2008. Landscape Modelling. In: *Encyclopedia of Ecology* (Sven Erik Jorgensen, editor). Elsevier.
- King, D. M. and L. A. Wainger, 2001. Assessing the economic value of biodiversity using indicators of site conditions and landscape context. In: *Valuation of Biodiversity Benefits: Selected Studies*, pp. 121-150. Paris, France, Organization for Economic Cooperation and Development.
- Wainger, L. A. and D. M. King, 2001. Priorities for Weed Risk Assessment: Using A Landscape Context to Assess Indicators of Functions, Services and Values. In: *Weed Risk Assessment*. R.H. Groves, F.D. Panetta and J.G. Virtue (eds). pp. 34-51. Victoria, Australia, CSIRO Publishing.
- Costanza, R., L. Wainger and N. Bockstael, 1995. Integrated ecological economic systems modeling: Theoretical issues and practical applications. In: *Integrating Economic and Ecological Indicators: Practical Methods for Environmental Policy Analysis*. J. W. Milon and J. F. Shogren (eds.). Westport, CN, Praeger.
- Costanza, R. and L. Wainger, 1991. Ecological Economics. In: *Mending the Earth: a World for Our Grandchildren*. P. Rothkrug and R. L. Olsen (eds.). Berkeley, North Atlantic Books.

Peer-reviewed Reports

- Murray, E. O., G. F. Mendoza, L. Wainger, H. Griscom, and J. Cushing. (in press). Ecosystem Goods and Services (EGS) Models and Tools: A Synthesis Report of information in the EGS Model and Tools Catalog. US Army Corps of Engineers, Engineer Research and Development Center.
- Wainger, L. A. 2014. *Benefit-Relevant Indicators*. In: *The Federal Resource Management and Ecosystem Services Guidebook* (Olander, L. et al. eds.). National Ecosystem Services Partnership, Nicholas School of the Environment, Duke University. <https://nespguidebook.com/assessment-framework/benefit-relevant-indicators/>.
- Wainger, L. A., R. J. Johnston, K. J. Bagstad, C. F. Casey, and T. Vegh. 2014. *Social Impact Analysis: Monetary Valuation*. In: *The Federal Resource Management and Ecosystem Services Guidebook* (Olander, L. et al. eds.). National Ecosystem Services Partnership, Nicholas School of the Environment, Duke University. <https://nespguidebook.com/assessment-framework/monetary-valuation/>.
- Ribaudo, M., C. Abdalla, K. Stephenson, and L. Wainger. 2014. Critical Issues in Implementing Nutrient Trading Programs in the Chesapeake Bay Watershed. STAC Workshop Report. Chesapeake Research Consortium, Annapolis, MD.
- Wainger, L., S. Sifleet, D. Shafer and S. Bourne. 2013b. *Ecosystem service benefits of USACE ecological restoration projects in the coastal Northeast: Hurricane Sandy case study*. Draft Report. Vicksburg, MS: U.S. Army Engineer and Research Development Center.
- Murray, E., J. Cushing, L. Wainger, and D. Tazik. 2013a. Incorporating Ecosystem Goods and Services in Environmental Planning – Definitions, Classification and Operational Approaches. Technical Report, USACE ERDC.
- Murray, E., J. Cushing, L. Wainger, and D. Tazik. 2013b. Incorporating Ecosystem Goods and Services in Environmental Planning – Definitions, Classification and Operational Approaches. Technical Note, USACE ERDC.
- Tazik, D., E. Murray, J. Cushing, and L. Wainger. 2013. Incorporating Ecosystem Goods and Services in Environmental Planning: A Literature Review of Definitions, Classification and Operational Approaches. Technical Report, USACE ERDC.
- Wainger, L.A., T. Lookingbill, and E. Minor. 2012. To Weed or Not to Weed? An Economic Decision Support Tool for National Capital Region Parks. Prepared for: National Park Service, Center for Urban Ecology. Cooperative agreement #: NPS: H399060006, UMCES 075-25595.
- Wainger, Lisa A., Jay J. Messer, Mary C. Barber, Robert M. Wolcott and Andrew L. Almeter. 2012. *Lowering Barriers to Achieving Multiple Environmental Goals in the Chesapeake Bay*. U.S. Environmental Protection Agency (US EPA) Ecosystem Services Research Program (ESRP). <http://www.epa.gov/research/ecoscience/eco-services.htm>
- Wainger, L.A. and A.R. Bayard. 2012. *Spatial Analysis of Water Quality Conditions and Drivers*, Chapter 4, in Ecosystem Processes Component (EPC). Maryland Chesapeake Bay Water Quality Monitoring Program, Level 1 report No. 29. In draft.
- Wainger, L. and M. Barber. 2011. Innovations Suggested by Case Studies. Chapter 1 in: *Lowering Barriers to Achieving Multiple Environmental Goals in the Chesapeake Bay*: EPA ORD Report. <http://www.epa.gov/research/ecoscience/eco-services.htm>
- U.S. EPA 2011. An Optimization Approach to Evaluate the Role of Ecosystem Services in Chesapeake Bay Restoration Strategies. US EPA/600/R-11/001
- Luckenbach, M., L. Wainger, S. Bell, M. Fonseca, K. Heck, H. Neckles, M. Smart, C. Pickerell, and D. Weller. 2011. *Evaluation of the Effectiveness of SAV Restoration Approaches in the Chesapeake Bay* (CRC# STAC 11-03). STAC.
- Paolisso, M., E. Van Dolah, T.W. Hartley, L.A. Wainger, J. Pease, D. Lipton, S. Julius. 2011. *Integrating Social Science Research into Chesapeake Bay Restoration* (CRC# STAC 11-05). STAC.

Wainger, L.A. and A.R. Bayard. 2011. *Spatial Analysis of Water Quality Conditions*, Chapter 4, in Ecosystem Processes Component (EPC). Maryland Chesapeake Bay Water Quality Monitoring Program, Level 1 report No. 28. Ref. No. [UMCES] CBL 11-024. [UMCES Technical Series No. TS-620-11-CBL].

Other Reports, Discussion Papers, and Draft Manuscripts

- Wainger, L. A., A. McMurray, H. Griscom, E. Murray, and J. Cushing. (in review). A Proposed Ecosystem Services Analysis Framework for the US Army Corps of Engineers. USACE ERDC.
- Wainger, L., J. Richkus, and M. Barber 2015. Additional beneficial outcomes of implementing the Chesapeake Bay TMDL: Quantification and description of ecosystem services not monetized. Report to EPA ORD and National Center for Environmental Economics. OTIE, Oak Ridge, TN.
- Mazzotta, M. J., and L. A. Wainger. 2014. Economic theory and methods for developing non-monetary ecosystem service benefit indicators. US EPA ORD.
- Wainger, L.A. and K. Politano 2009. Economic Benefit and Damage Functions. Chesapeake Biological Laboratory (CBL), Univ. of Maryland Center for Environmental Science, Solomons, MD 20688. Report to National Park Service, Center for Urban Ecology.
- Palmer, M.A., L.A. Wainger, L.S. Craig, K.K. Politano, J. Hosen, A.P Davis, and J.M. Olszewski. 2010. Promoting Successful Watershed Restoration through Effective Monitoring and Assessment. Chesapeake Biological Laboratory (CBL), Univ. of Maryland Center for Environmental Science, Solomons, MD 20688-0038. CBL report: CBL11-061
- Mazzotta, M. and L.A. Wainger. 2010. Policy-Relevant Wetlands Valuation at the Local, Regional, and National Level. Presented at the Workshop on Wetlands Management, Economics and Policy. Hotel Grand Pacific, Victoria, British Columbia, January 13-15, 2010.
- Wainger, Lisa A., Jillian Rayburn, and Elizabeth W. Price, 2007. *Review of Land Use Change Models Applicability to Projections of Future Energy Demand in the Southeast United States*. Report to EPA Regional Vulnerability Assessment Program, Betsy Smith, Director, Southeast Energy Futures 07-02, March 28, 2007.
- Wainger, Lisa A., Elizabeth W. Price, and Abby W. H. Lund. 2007. *How Quality of Life Affects Economies: Firm Location Decisions and Potential Economic Impacts*. Report to EPA Regional Vulnerability Assessment Program, Betsy Smith, Director, March 26, 2007
- Wainger, Lisa A. and Elizabeth Price, 2007. *Fiscal Impact Analysis of the Future Charlotte Metropolitan Statistical Area (SEQL Region)*. Technical Report to EPA Regional Vulnerability Assessment Program, Betsy Smith, Director, SEQL 01-04E. March 31, 2007.
- Wainger, Lisa A., Elizabeth W. Price, and Jillian K. Rayburn. 2007. *Economic Impacts of Alternative Growth Scenarios in the Charlotte Metropolitan Region in 2030*. Report to EPA Regional Vulnerability Assessment Program, Betsy Smith, Director, March 27, 2007.
- King, Dennis, Lisa Wainger, and Peter Kuch, 2007. Strategy for Assessing Impacts of Land Use, Transportation, Energy, and Greenhouse Gas Policies on Local/County Energy Demand in Eight Southeast States. Report to EPA, Tim Johnson Project Manager. SE Energy Futures Report 07-01, March 28, 2007
- Wainger, Lisa A. and Dennis M. King, 2007. Establishing Trading Ratios for Point – Non-Point Source Water Quality Trades: Can we Capture Environmental Variability without Breaking the Bank? University of Maryland Center for Environmental Science Technical Report No. TS-523-07, Manuscript CBL 07-056 on file at Chesapeake Biological Lab and available at http://www.cbl.umces.edu/cms108/images/stories/user_content/ScoringWatQualityTrades_TechRpt.pdf.

Wainger, Lisa A., Elizabeth W. Price and Dennis M. King, 2006. James and Barren Islands Restoration Projects Feasibility Study and Environmental Impact Statement: Report on Existing Conditions and Impacts: Noise, Light, Socioeconomics, Aesthetics and Recreational Resources, (Revised Report). Prepared for: Maryland Port Administration under contract to Maryland Environmental Service, MES Contract # 05-07-16. November 2006.

Price, Elizabeth W., Lisa A. Wainger, and Dennis M. King, 2006. Masonville Dredged Material Containment Facility Restoration Projects Feasibility Study and Environmental Impact Statement: Report on Existing Conditions and Impacts: Noise, Light, Socioeconomics, Aesthetics and Recreational Resources. Prepared for: Maryland Port Administration under contract to Maryland Environmental Service, MES Contract # 06-07-24. November 2006.

C. Contracts and Grants (current or recently completed)

Coastal SEES Collaborative Research: Integrating stakeholder objectives with natural system models to promote sustainable natural resource policy. NSF. (co_PI; lead PI Elizabeth North). 2015-2020.

Science to Inform Corporate Environmental Sustainability. NSF subaward through SESYNC. (PI) 2014-2015.

Impacts of Climate Change on Phenology on Linked Agriculture-Water. NSF Water Sustainability and Climate (WSC). (co-PI with Bill Ball and Mike Kemp). Oct. 2013.

Incorporating Ecosystem Services into Corps of Engineers Restoration Planning. USACE ERDC. (PI) 2011-2015.

Analysis of Costs/Risks/Benefits of Harbor Dredging and Development Alternatives. Maryland Port Administration. 2014-2016.

Integrating Socio-Ecological Research and Collaborative Learning to Promote Marsh and Community Resilience. NOAA National Estuarine Research Reserve System Science Collaborative. (Co-Investigator). 2012-2014.

Interactive Games to Value Ecosystem Services. National Academies Keck *Futures Initiative* (NAKFI). Co-PI. 2012-2013.

Advancing tools and visualization techniques for representing modeled ecosystem service outcomes in simulated multi-player game environments. Socio-Environmental Synthesis Center (SESYNC). Co-PI. 2012-2014.

Ecosystem services as an alternative foundation for development, urban planning, and water infrastructure in the U.S. National Academies Keck *Futures Initiative* (NAKFI). Co-Investigator. 2012-2014.

D. Invited Seminars and Presentations (recent)

June 2, 2015. *Methods for Spatial Integration*. (Panel). NRC Landscape and Multi-Resource Analysis Workshop. Washington, DC.

May 13, 2015. *Sustainability Metrics for Biodiversity Management by Electric Power Companies*. Env-Vision. Crystal City, VA.

December 8, 2014. *Integrating Social Value through Metrics Development*. In *Workshop: Methods for Incorporating Ecosystem Services into Planning and Decision-Making*. A Community on Ecosystem Services (ACES) meeting. Washington, DC.

June 2, 2014. *Assessing Lost Ecosystem Service Benefits Due to Mining-Induced Stream Degradation in the Appalachian Region: Economic Approaches to Valuing Recreational Fishing Impacts* co-presenter with Marisa Mazzotta (US EPA). Northeastern Agricultural and Resource Economics Association Meetings. Morgantown, WV.

May 29, 2014. *Benefits of the Chesapeake Bay TMDL: Creating a Fuller Picture*. Chesapeake Modeling Symposium. Annapolis, MD.

November 18, 2013. *Ecosystem Services of Coastal Restoration*. White House Council on Environmental Quality. Principles and Requirements Workgroup.

August 29, 2013. *Application of Ecosystem Goods and Services Assessment to Coastal Restoration Projects: Three Case Studies*. USACE webinar series.

July 22, 2013. *Overcoming barriers to restoring multiple ecosystem services in the Chesapeake Bay*. SCB International Congress for Conservation Biology. Baltimore, MD.

July 9, 2013. *Ecosystem Service Benefits of USACE Ecological Restoration Projects in the Coastal Northeast Hurricane Sandy Case Study*. North Atlantic Coast Comprehensive Study webinar series. (Webinar with stakeholders). USACE sponsored.

April 18, 2013. *Accounting for Ecosystem Services from Aquatic Ecosystems*. Ecosystem Services Symposium. University of Maryland. Wye Research and Education Center.

April 10, 2013. *Opportunities for Reducing TMDL Compliance Costs & Promoting Ecosystem Service Co-Benefits*. Ecosystem Services and Planning Workshop. Sponsored by NAKFI and Duke University. Chapel Hill, NC.

March 26, 2013. *Opportunities for Reducing TMDL Compliance Costs & Promoting Ecosystem Service Co-Benefits*. CNREP. New Orleans, LA.

March 11, 2013. *Incorporating Ecosystem Goods & Services in US Army Corps Planning and Benefits Evaluation*. Incorporating Values and Assessing Social and Environmental Trade-offs in Managing for Ecosystem Services Workshop. Socio-Environmental Synthesis Center. Annapolis, MD.

February 24, 2013. *Framework for Ecosystem Service Assessment for the US Corps of Engineers*. Workshop on *Standard Assessment Framework for Ecosystem Services* National Center for Ecological Analysis and Synthesis, Santa Barbara, CA.

November 2, 2012. *Opportunities for Reducing Total Maximum Daily Load (TMDL) Compliance Costs*. Maryland State Water Quality Advisory Committee (SWQAC). Maryland Department of the Environment, Baltimore, MD.

October 25, 2012. *Ecosystem Services in Cost-Effective TMDL Design*. US EPA Sustainable and Healthy Communities Research Program. Webinar.

October 12, 2012. *Valuing the Ecosystem Service Benefits of Non-native Invasive Plant Control Spatial Economic Methods and Software Tool*. Natural Areas Conference. Norfolk, VA.

October 10, 2012. *Considering performance risk in economic benefit assessments: Examples from wetlands, streams and estuaries*. U.S. Army Engineer Institute for Water Resources. Alexandria, VA.

August 30, 2012. *Costs and Ecosystem Service Benefits under Alternative TMDL Policies*. US EPA ORD, US EPA Chesapeake Bay Program and multiple Bay non-governmental organizations. Annapolis, MD.

July 11, 2012. *Practical Application of Ecosystem Service Concepts to Resource Management*. Business Services Roundtable Ecosystem Services Working Group.

June 13, 2012. *Tradeoffs among Ecosystem Services, Performance Certainty, and Cost-Efficiency in the Chesapeake Bay TMDL*. Northeastern Agricultural and Resource Economics Association Workshop on Ecosystem Services. Lowell, MA.

E. Workshops and Symposia Organized/Chaired (recent)

December 11, 2014. Balancing the Perfect with the Practical – Creating Meaningful Values and Quantities of Ecosystem Service Benefits. A Community on Ecosystem Services (ACES) meeting. Washington, DC.

Ecosystem Goods and Services Framework Workshop. August 26-28, 2014. USACE Portland District Office and Willamette Basin Field Sites, Oregon.

Making the Connections: Modelling Living Resources, Economics, and Social Aspects of Estuary Protection and Restoration (co-organizer with Howard Townsend). Chesapeake Modeling Symposium. May 28-29, 2014, Annapolis, MD.

Incorporating Values and Assessing Social and Environmental Trade-offs in Managing for Ecosystem Services, (co-organizer) March 11-15, 2013. Sesync, Annapolis, MD.

Considerations for an Ecosystem Goods and Services Guiding Framework for US Army Corps of Engineers Civil Works Planning. Workshop. March 15-16, 2012. Sesync, Annapolis, MD.

Methods for sustaining ecosystem services: Combining landscape ecology and spatial economics to prioritize actions. International Association of Landscape Ecologists. April 2011. Portland, OR.

Beyond Water Quality in the Chesapeake Bay: Lowering barriers to achieving multiple environmental goals. Workshop. June 17, 2010, Washington, DC

Ecosystem Service Endpoints for Decision Making. A Community on Ecosystem Services. December 6, 2010. Gila River Indian Community, AZ.

F. Active Memberships in Professional Societies

- Northeastern Agricultural and Resource Economics Association
- Society for Risk Analysis
- International Society for Ecological Economics
- Society for Conservation Biology

V. Service

Federal/State/Local Government and Non-Governmental Organizations

Chesapeake Bay Program Scientific and Technical Advisory Committee (STAC), 2007 – present

Elected to Vice-Chair in 2013

Elected to Executive Board in 2010

Water Quality Trading subcommittee (active 2013-2014)

Social Sciences Subcommittee

National Ecosystem Services Partnership – FRMES, 2012-present. Co-organizer of economics section, in collaboration with faculty from Duke Nicholas School of the Environment. Developing technical guidance for federal agencies to use in decision-making related to ecosystem services.

White House Council on Environmental Quality,

Interagency Guidelines on Ecosystem Services. Invited Presenter. November 12, 2013.

Washington, DC.

Principles and Guidelines Roundtable on Systems, Watershed, and Ecosystem Approaches in Project Planning. Invited Reviewer. October 27, 2010.

US EPA, Economics Advisor, to the ORD Sustainable and Healthy Communities Research Program - ongoing.

Keck Futures Initiative: Ecosystem Services – Advancing Research. Invited participant. National Academies of Science. Nov. 11-13, 2011. Irvine, CA.

St. Mary's County Recreation and Parks Citizen's Advisory Board, 2006-2014. President from 2010-2012.