

*Curriculum Vitae*

**Thomas F. Ihde**

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**Research Interests:** Quantifying ecological impacts of system change & cumulative effects of multiple factors; Habitat restoration evaluation; Using citizen-based science for monitoring; Ecosystem-based fishery management; Ecosystem modeling; Estuarine & marine fisheries management; Applying stakeholder knowledge; Stakeholder outreach.

**Education:** Ph.D. College of William and Mary, Fisheries Science, September 2006  
M.S. College of William and Mary, Marine Science, May 2000  
B.S. University of Wisconsin – Milwaukee, 1987, with Honors, Zoology

**Appointments:**

*Research Assistant Professor/ Scientist-Researcher: Morgan State University at PEARL (Patuxent Environmental & Aquatic Research Laboratory).* Provide broad expertise to diverse research needs of rapidly-growing marine laboratory. Recent examples: development of: new classes to support new PEARL undergraduate degree program in Coastal Science & Policy; laboratory aquaculture methods for decreased costs and faster growth of shellfish; new metrics and analyses of long-term blue crab pot survey data for use in management; fisheries ecosystem models (Ecopath with Ecosim) of restored oyster reefs in the Chesapeake Bay, and link model outputs to an economic model (IMPLAN) to estimate the impacts of the project on the regional economy. Identify and secure new funding for PEARL. Mentor both undergraduate and graduate students. Publish in primary scientific journals and popular media. January 2017 to present.

*Member At-Large:* STAC (Scientific & Technical Advisory Committee, Chesapeake Bay Program). Elected, non-paid position. Provide independent scientific and technical support to the Chesapeake Bay Program (CBP). Work in close collaboration with other professional and academic scientists from around the Chesapeake watershed to assess and inform the CBP of the status and trends of fishery and other biological resources in the system, identify new issues of concern, identify ecological impacts of land and water management actions, and foster improved understanding of effects of management actions on living resource dynamics and recovery in the Chesapeake Bay. September 2013 to September 2021.

*Fisheries/Ecosystem Modeler and Scientist: ERT, Inc. for NOAA Chesapeake Bay Office (NCBO).* Develop models to predict the cumulative effects of a variety of ecosystem stressors (e.g., habitat loss, nutrient and sediment loadings, temperature and salinity change) on the production of animal and habitat populations of the Chesapeake Bay; initiate new, and cultivate existing collaborations with regional state, federal, academic and private-sector scientists; provide biological expertise and operational support for NCBO fisheries and ecosystem science team, lead large collaborative efforts (e.g., development of workshops, analysis of data, and synthesis of most current science); document results for publication in NOAA technical reports. Represent living resource concerns to the Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) for NCBO and the Sustainable Fisheries Goal Implementation Team. Proficiency in ecosystem modeling with Atlantis and Ecopath with Ecosim software packages. April 2009 to December 2016.

*Assistant Research Scientist (post-doctoral research position):* University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory. Research scientist and coordinator of Project FishSmart. Build and apply simulation-based decision management tool through series of workshops with stakeholders who represent a marine recreational fishery. Project enabled stakeholders to rank voluntary and regulatory strategies in terms of their shared vision developed in a series of workshops, improved relationships between stakeholder groups, and allowed stakeholders to knowledgeably inform management council of their science-based management preferences. Document results for publication in primary scientific journals and popular media. March 2007 to March 2009.

*Post-doctoral Research Associate (Scientist II):* Virginia Institute of Marine Science. Conduct original scientific research on estimators of population parameters by design and implementation of computer simulations. Write reports documenting results for publication in primary scientific journals. September 2006 to February 2007.

### **Pre-Graduate Employment Experience:**

#### *Graduate Research Assistant:*

Virginia Institute of Marine Science. PhD. Development and application of generalized index-removal models for estimating population size, exploitation and catchability: with applications to Tasmanian rock lobster *Jasus edwardsii*. Development of two new abundance estimation methods and evaluation of model performance with Monte Carlo simulation techniques. Design and implementation of field and laboratory experiments to examine perceived seasonal size- and sex-specific catchability differences in Tasmanian rock lobster survey catches. Proficiency in programming with S-PLUS, R, and SAS statistical software. May 2000 to September 2006.

Virginia Institute of Marine Science. MS. Development and implementation of sampling methodology and statistical procedures to assess population parameters for spotted seatrout, *Cynoscion nebulosus*, of the Chesapeake Bay region. Proficiency in age and growth assessment of fishes and programming with SAS statistical software. August 1996 to May 2000.

*Field Biologist:* Virginia Institute of Marine Science. Gloucester Point, VA. Crew member for multiple fisheries monitoring programs. Proficiency in seine, trawl, gillnet and pushnet collection, oyster spatfall assessment, and fish tagging; identification of adult and juvenile fishes of the Chesapeake Bay and tributaries. August 1996 to September 2006.

*Education Instructor:* John G. Shedd Aquarium, Chicago, IL. Development, implementation, and evaluation of aquatic science classes for teachers and K-12 students; training, supervision and evaluation of volunteer and paid intern staff; care of live vertebrate and invertebrate animal collection, and maintenance of marine and freshwater aquarium systems. May 1992 to July 1996.

*Aquarist:* Aquarium of the Americas, New Orleans, LA. February 1990 to May 1992.

*Research Assistant:* (NSF-REU) Center for Great Lakes Studies, Milwaukee, WI. October 1988 to October 1989.

*Naturalist:* Nature in The Parks, UW Extension, Milwaukee, WI. October 1987 to February 1990.

*Naturalist:* Hawthorn Glen Nature Center, Milwaukee Public Schools, Milwaukee, WI. September 1987 to February 1990.

## **Knowledge, Skills and Abilities:**

*Software experience:* Atlantis Ecosystem Model; Ecopath with Ecosim; R; SAS; S-PLUS; AD Model Builder; MATLAB; Maple; Oracle, SQL; BASIC; ArcView; EndNote; Adobe: PhotoShop, Acrobat Pro; *Environments:* Windows; Linux; Macintosh

### *Training:*

Ecopath 35 Training Courses: 9-11 December 2019

Temporal-Spatial Framework: Instructor Jeroen Steenbeek, 8-12am, 9 December

Ecotracer: Instructors William Walters & Shawn Booth, 1-5pm 9 December

Incorporation of uncertainty in EwE: Instructor Villy Christensen, 8-12am, 10 December

Management Strategy Evaluation: Instructor V. Christensen, 1-5pm 10 December

Socio-economic analysis (EwE value chain): Instructor V. Christensen, 8-12am 11 Dec.

Atlantis Ecosystem Model Training Workshop, The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Hobart, TAS, Australia. Dr. E.A. Fulton, 15-18 February, 2011.

Introduction to the Atlantis Ecosystem Model, NOAA Northwest Fisheries Science Center, Seattle WA. Dr. I.C. Kaplan, 8-10 September 2009.

AD Model Builder Workshop, Annapolis, MD. Dr. S. Martell. 12-16 March 2007.

Model Selection and Multimodel Inference in the Life Sciences, College of William & Mary, Williamsburg, VA. Dr. D.R. Anderson. 19-20 June 2007.

AD Model Builder Workshop, Gloucester Point, VA. Dr. R. Madsen. 11-12 November 2005.

Coaching for Success (Corporate teambuilding), Chicago, IL. 25-28 September 1995.

What Change Takes (Communication, strategic planning and meeting management training), Chicago, IL. 1-2, 9 February 1995.

The Fundamentals of Supervision, Chicago, IL. 6 December 1994.

## **Grants and Fellowships:**

“The Economic Impacts of Oyster Restoration and Seagrass Habitats of the Middle Peninsula, Virginia.” NOAA-NMFS-HCPO-2021-2006812. Principal Investigator. NOAA Chesapeake Bay Fisheries Research Program. 10-1-21 to 9-30-23. \$250,000.

“Estimating Toxic PFAS Concentrations in Seafood Spatially in the Chesapeake Bay.” Award Number 5U54MD013376. Principal Investigator. National Institute of General Medical Sciences of the National Institutes of Health, through the National Institute on Minority Health and Health Disparities. 7-8-21 to 6-7-22. \$49,879.

“Shoreline Oyster Setting System for Residents.” Prototype grant #075/2019. Principal Investigator. Office of Technology Transfer, Division of Research and Economic Development, Morgan State University. 3-18-19 to 5-31-20. \$20,000.

“Increased Growth Marine Aquaponics.” Prototype grant #2017-042. Principal Investigator. Office of Technology Transfer, Division of Research and Economic Development, Morgan State University. 1-1-2018 to 12-31-2018. \$35,000.

“Watershed group and Citizen Monitoring of Fish Habitat/SAV.” Co-Principle Investigator. Chesapeake Bay Program, Habitat-Goal Implementation Team. 1-01-2017 to 12-31-2017. \$52,000.

“Coastal SEES (Track 1), Collaborative: Chesapeake Bay Sustainability: Implications of changing climate and shifting management objectives.” Award #1325518. Co-Principal Investigator. National Science Foundation. 10-01-2013 to 8-31-2016. \$582,532.

“Developing an On/Offshore Decision Support Tool for NOAA Fisheries Management: Demonstration Project, Mid-Atlantic - Parameterizing the relationship between inshore habitat quantity and quality and summer flounder production.” Principal Investigator. NOAA Office of Science & Technology. \$100,000.

Fellowship: National Marine Fisheries Service-Sea Grant Joint Graduate Fellowship Program in Population Dynamics: “Development and application of depletion models that accommodate ancillary information.” 2002-2005. \$38,000 per annum.

“Evaluating the Effectiveness of the Marine Protected Area at Glover’s Reef, Belize.” Year II. Co-Principal Investigator. Wildlife Conservation Society. 2001-2002. \$38,700.

“Evaluating the Effectiveness of the Marine Protected Area at Glover’s Reef, Belize.” Year I. Co-Principal Investigator. Wildlife Conservation Society. 2000-2001. \$34,700.

“Evaluating the Effectiveness of the Reserve and Conservation Area at Glover’s Reef, Belize.” Research Fellow. Wildlife Conservation Society. 2000. \$20,000.

### **Peer-reviewed Publications:**

Hood, R.R., G. Shenk, R.L. Dixon, W. Ball, J. Bash, R. Batiuk, K. Boomer, D.C. Brady, C. Cerco, P. Claggett, K.d. Mutsert, Z.M. Easton, A.J. Elmore, M.A.M. Friedrichs, L. Harris, T.F. Ihde, I. Lacher, L. Li, L. Linker, A. Miller, J. Moriarty, G. Noe, G. Onyullo, K. Rose, K. Skalak, S.M.C. Smith, R. Tian, T.L. Veith, L. Wainger, D. Weller, and Y.J. Zhang. 2021. The Chesapeake Bay Program Modelling System: Overview and recommendations for future development. *Ecological Modelling* 456:109635. DOI: 10.1016/j.ecolmodel.2021.109635

Olsen, E., I.C. Kaplan, C. Ainsworth, G. Fay, S. Gaichas, R. Gamble, R. Girardin, C. Hansen, T.F. Ihde, H.N. Morzaria-Luna, K.F. Johnson, M. Savina-Rolland, H. Townsend, M. Weijerman, E.A. Fulton, J.S. Link. 2018. Ocean futures as explored using a worldwide suite of ecosystem models. *Frontiers in Marine Science* 5:64. DOI: 10.3389/fmars.2018.00064

Ihde, T.F., and H.M. Townsend. 2017. Accounting for Multiple Stressors Influencing Living Marine Resources in a Complex Estuarine Ecosystem Using an Atlantis Model. *Ecological Modelling* 365:1-9. doi.org/10.1016/j.ecolmodel.2017.09.010

J.S. Link, T.F. Ihde, C.J. Harvey, S. Gaichas, J.C. Field, J. Brodziak, H.M. Townsend, and R. Peterman. 2012. Dealing with uncertainty in ecosystem models: The paradox of use for living marine resource management. *Progress in Oceanography* 102:102-114.

Ihde, T.F., M.J. Wilberg, D.A. Loewensteiner, D.H. Secor, and T.J. Miller. 2011. The increasing importance of marine recreational fishing in the US: challenges for management. *Fisheries Research* 108:268-276.

Miller, T.J., J.A. Blair, T.F. Ihde, R.M. Jones, D.H. Secor, M.J. Wilberg. 2010. FishSmart: an innovative role for science in stakeholder-centered approaches to fisheries management. *Fisheries* 35:425-433.

Ihde, T.F., J.M. Hoenig and S.D. Frusher. 2008. An index-removal abundance estimator that allows for seasonal change in catchability, with application to rock lobster. *Transactions of the American Fisheries Society* 137:720-735.

- Ihde, T.F., J.M. Hoenig and S.D. Frusher. 2008. Evaluation of a multi-year index-removal abundance estimator, with application to a Tasmanian rock lobster fishery. *Fisheries Research* 89:26-36.
- Frusher, S.D., J.M. Hoenig and T.F. Ihde. 2007. Evaluating catchability assumptions for change-in-ratio and index-removal estimators, with application to southern rock lobster. *Fisheries Research* 84:254-262.
- Ihde, T.F., S.D. Frusher and J.M. Hoenig. 2006. Do large rock lobsters inhibit smaller ones from entering traps? – A field experiment. *Marine and Freshwater Research* 57:665-674.
- Ihde, T.F. and M.E. Chittenden, Jr. 2003. Validation of presumed annual marks on sectioned otoliths of spotted seatrout, *Cynoscion nebulosus*, in the Chesapeake Bay region. *Bulletin of Marine Science* 72:77-87.
- Ihde, T.F. and M.E. Chittenden, Jr. 2002. Comparison of calcified structures for aging spotted seatrout. *Transactions of the American Fisheries Society* 131:634-642.

### Book Chapter

- Ihde, T.F., M.J. Wilberg, D.H. Secor, and T.J. Miller. 2011. FishSmart: harnessing the knowledge of stakeholders to enhance U.S. marine recreational fisheries with application to the Atlantic king mackerel fishery. Pages 75-93 in T.D. Beard, Jr., R. Arlinghaus, and S.G. Sutton, editors. *The angler in the environment: social, economic, biological, and ethical dimensions. Proceedings of the fifth world recreational fishing conference.* American Fisheries Society, Symposium 75, Bethesda, Maryland.

### Technical Reports & Other Publications:

- Wood, Joseph, Paul Bukaveckas, Heather Galbraith, Mary Gattis, Matthew Gray, Tom Ihde, Danielle Kreeger, Rachel Mair, Shawn McLaughlin, Simeon Hahn, Annabelle Harvey. 2021. Incorporating Freshwater Mussels into the Chesapeake Bay Restoration Effort. STAC Publication Number 21-004, Edgewater, MD. 39 pp.
- Bruce, D.G., J.C. Cornwell, L. Harris, T.F. Ihde, M.L. Kellogg, S. Knoche, R.N. Lipcius, D.N. McCulloch-Prosser, S.P. McIninch, M.B. Ogburn, R.D. Seitz, J. Testa, S.R. Westby, and B. Vogt. 2021. A Synopsis of Research on the Ecosystem Services Provided by Large-Scale Oyster Restoration in the Chesapeake Bay. National Marine Fisheries Service, NOAA Tech. Memo., NMFS-OHC-8, <http://spo.nmfs.noaa.gov/tech-memos/> Office of Habitat Conservation, 52 pp.
- Knoche, S., T.F. Ihde, G. Samonte, H.M. Townsend, D. Lipton, K. A. Lewis, and S. Steinback. 2020. Estimating Ecological Benefits and Socio-Economic Impacts from Oyster Reef Restoration in the Choptank River Complex, Chesapeake Bay. NOAA Tech. Memo. NMFS-OHC-6, 68 p. (<https://spo.nmfs.noaa.gov/content/tech-memo/estimating-ecological-benefits-and-socio-economic-impacts-oyster-reef-restoration>)
- Knoche, S., and T. Ihde. 2019. Potential oyster reef restoration impacts on seafood production. *SER News. Society for Ecological Restoration.* 33(2):11-13.
- Hood, R.R., G. Shenk, R. Dixon, W. Ball, J. Bash, C. Cerco, P. Claggett, L. Harris, T.F. Ihde, L. Linker, C. Sherwood, and L. Wainger. 2019. Chesapeake Bay Program modeling in 2025 and beyond: a proactive visioning workshop. STAC Publication Number 19-002, Edgewater, MD. 62 pp.
- Knoche, S., T.F. Ihde, G. Samonte, H.M. Townsend. 2018. Estimating economic impacts for oyster reef restoration in the Choptank River Complex, Chesapeake Bay - final report.

- National Fish and Wildlife Foundation/NOAA Chesapeake Bay Office, Grant No. 0603.15.050444. Morgan State University PEARL Report #11-05. 68 pp.
- Knoche, S., G. Samonte, and T.F. Ihde. 2018. Estimating economic impacts of initial investments for oyster restoration in the Choptank region of the Chesapeake Bay. Report to the National Fish and Wildlife Service, Grant No. 0603.15.050444. Morgan State University PEARL #18-04. 10 pp.
- Hunt, G., D. Bilkovic, S. Faulkner, T.F. Ihde, M. McGinty, M. Monaco, T. O'Connell, P. Tango, B. Vogt, K.O. Maloney, J. A. Young, L. Williamson, A.K. Leight, and R. Dixon. 2018. Factors Influencing the Headwaters, Nontidal, Tidal, and Mainstem Fish Habitat Function in the Chesapeake Bay Watershed: Application to Restoration and Management Decisions. STAC Publication Number 18-006, Edgewater, MD. 112 pp.
- Massey, D.M., Moore, C., Newbold, S.C., Ihde, T., and Townsend, H. 2017. Commercial fishing and outdoor recreation benefits of water quality improvements in the Chesapeake Bay. U.S. Environmental Protection Agency National Center for Environmental Economics. Working Paper 17-02, 178 pp.
- Ihde, T.F., I.C. Kaplan, E.A. Fulton, I.A. Gray, M. Hasan, D. Bruce, W. Slacum, and H.M. Townsend. 2016. Design and Parameterization of the Chesapeake Bay Atlantis model: a Spatially Explicit End-to-end Ecosystem Model. NOAA Technical Memorandum NMFS-F/SPO-166, 145 pp. (<https://permanent.access.gpo.gov/gpo88448/tm166.pdf>)
- Ihde, T.F., E.D. Houde, C.F. Bonzek, and E. Franke. 2015. Assessing the Chesapeake Bay Forage Base: Existing Data and Research Priorities. STAC Workshop Report, 12-13 November, 2014. STAC Publication Number 15-005, Edgewater, MD. 198 pp.
- Bilkovic, D.M. and T.F. Ihde. 2014. Review of the final report of the Sustainable Fisheries Goal Implementation Team Invasive Catfish Task Force. Chesapeake Bay Program Scientific and Technical Advisory Committee. No. 14-007, Edgewater, MD. 46 pp.
- Ihde, T. and H. Townsend. 2013. Interview with Jason Link: Champion for Ecosystem Science and Management. *Fisheries*. 38:363-369.
- J.S. Link, T.F. Ihde, H.M. Townsend, K.E. Osgood, M.J. Schirripa, D.R. Kobayashi, S. Gaichas, J.C. Field, P.S. Levin, K.Y. Aydin, and C.J. Harvey (editors). 2010. Report of the 2nd National Ecosystem Modeling Workshop (NEMoW II), bridging the credibility gap - dealing with uncertainty in ecosystem models. NOAA Technical Memorandum NMFS-F/SPO-102.
- Wilberg, M.J., T.F. Ihde, D.H. Secor, and T.J. Miller. 2009. FishSmart: A stakeholder-centered approach to improve fisheries conservation and management. *ICES CM* 2009 0:15:1-38.
- Miller, T.J., T.F. Ihde, D.H. Secor, and M.J. Wilberg. FishSmart: Enhancing the sustainability of recreational fisheries through improved management and angling practices. Annual report. Gordon and Betty Moore Foundation. December, 2008.
- Atlantic King Mackerel Fishery Stakeholder Workgroup. 2008. A Vision For the King Mackerel Fishery. Report to the South Atlantic Fishery Management Council. December 4, 2008. Ref: UMCES[CBL] 08-127. 51p.
- Wilberg, M.J., T.F. Ihde, T.J. Miller, and D.H. Secor. 2008. Enhancing sustainability in marine recreational fisheries: a stakeholder-driven process for evaluating angling practices and management options for king mackerel in the US. *ICES CM* 2008(K):17.
- Hoenig, J.M., and Ihde, T.F. Virginia Sea Grant progress report. Virginia project number "T. Ihde Fellowship". NOAA Grant Nos. NA17RG2584 / NA17RG1373. July, 2006.

- Ihde, T.F., and Hoenig, J.M. Graduate fellowship program in population dynamics. Sea Grant Project Record - NOAA Grant No. NA17RG1373. Annual report. September, 2005.
- Ihde, T.F., and Hoenig, J.M. Graduate fellowship program in population dynamics. Sea Grant Project Record - NOAA Grant No. NA17RG2584. Annual report. September, 2004.
- Ihde, T.F., and Hoenig, J.M. Evaluating the effectiveness of the marine protected area at Glover's Reef. Final Report. Wildlife Conservation Society. June 2002.
- Ihde, T.F., and Hoenig, J.M. Evaluating the effectiveness of the marine protected area at Glover's Reef. 6-month Report. Wildlife Conservation Society. January 2002.
- Ihde, T.F., and Hoenig, J.M. Evaluating the effectiveness of the marine protected area at Glover's Reef. Annual Report. Wildlife Conservation Society. June 2001.
- Chittenden, M.E., Jr., Ihde, T.F., Watkins, E.S., Foster, J.R. and A.M. Sipe. Study of important recreational fishes of Chesapeake Bay. Project F-88-R-2, Final report. Virginia Marine Resource Commission. September 2001.

### **Invited and Contributed Presentations:**

- Bevans, A.T., M. Sulyman, M.S. Woodstock, S. Knoche, and T.F. Ihde. 2022. Estimating the Economic Effects of Habitat Restoration in Virginia's Middle Peninsula. Invited presentation. Chesapeake Oyster Science Symposium. Irvington, VA, 29 September,
- Ihde, T.F., and L. Blaney. Spatial estimation of contaminant burden to seafood using a biogeochemical modeling approach. Conference session: Session 8: New advances in toxic contaminant science for the Chesapeake Bay, *in* Chesapeake Bay restoration, resilience, and reflection: Progress and future challenges, 2022 Chesapeake Community Research Symposium. Annapolis, MD, 6-8 June.
- Ihde, T.F., and L. Blaney. An integrative modeling approach to support consumption advisories. Conference: Improve the Understanding and Coordination of Science Activities for PFAS in the Chesapeake Watershed. Scientific and Technical Advisory Committee Workshop, Annapolis, MD. 17 May 2022.
- Ihde, T.F., The Chesapeake Atlantis Model Design. Atlantis Summit 2022. International Conference: The Commonwealth Scientific and Industrial Research Organisation (AU)/National Oceanic and Atmospheric Administration (US), CSIRO/NOAA. 2-11 May.
- Ihde, T.F. PFAS Contamination in the Chesapeake Bay food web. Maryland Multiagency Workgroup for PFAS. 18 April 2022.
- Ihde, T., A. Bevans, A. Staples. The 50+ year PEARL Blue Crab Survey: The value of a long-term perspective. Maryland Master Naturalists, University of Maryland Extension. 18 October 2021.
- Ihde, T., A. Bevans, A. Staples. The 50+ year PEARL Blue Crab Survey: The value of a long-term perspective. Calvert Environmental Commission. 27 September 2021.
- Ihde, T. Ecology and economics of oysters and the Chesapeake Bay. Natural History Society of Maryland. 9 September 2021.
- Ihde, T., S. Knoche, H. Townsend, and G. Samonte. Estimating regional economic impacts of different management strategies for restored oyster reefs in Choptank River, MD – Linking an EwE model to IMPLAN. Ecopath35 Conference, St. Petersburg, FL. 4 December 2019.

- Ihde, T.F. Estimating the ecosystem services for estuarine resource management. Invited pres. Institute of Marine and Environmental Technology, Baltimore, MD. 3 April 2019.
- Ihde, T.F., and S. Knoche. Linking ecological and economic models for estimating the ecosystem services of oyster reef restoration – Choptank River Complex, MD. Invited pres. ASCEND Scholars Seminar Series, Morgan State University, Baltimore, 28 March 2019.
- Knoche, S., T.F. Ihde, G. Samonte, and H. Townsend. Linking Ecological and Economic Models for estimating the ecosystem services of Oyster Reef Restoration, Choptank River Complex, MD. Invited pres., Sustainable Fisheries Goal Implementation Team bi-annual meeting. Newport News, VA. 17-18 December 2018.
- Ihde, T.F., S. Knoche, H. Townsend, and G. Samonte. Estimating the ecosystem services of oyster reef restoration, *in* (ACES) A Community on Ecosystem Services 2018. Washington, DC. 3-6 December 2018.
- Ihde, T.F., S. Knoche, G. Samonte, H. Townsend, S. Steinback, and K. Lewis. Linking Ecological and Economic Models to Estimate Regional Economic Impacts of Different Management Strategies for Restored Oyster Reefs, *in* Challenges, Opportunities and Successes in Coastal Bivalve Management for Habitat Restoration, Fishery Enhancement, and Ecosystem Service Delivery. Invited pres. at 148th Ann. Meet. Amer. Fish. Soc. Atlantic City, NJ. 19-23 August 2018.
- Ihde, T. Estuarine Living Resources Modeling, *in* Chesapeake Bay Program modeling in 2025 and beyond: a proactive visioning workshop. National Conservation Training Center, Shepherdstown, WV. 17-19 January 2018.
- Ihde, T.F., and S. Knoche. Improving Metrics for Decision-Making for Today's Fisheries: Impacts of Oyster Reef Restoration, Choptank River Complex, Maryland, *in* MPE 2013+ Workshop on Chesapeake fisheries: from oysters to economics. St. Leonard, Maryland, 27-28 August 2017.
- Ihde, T.F. Chesapeake Atlantis Model: visualizing the effects of expected changes in the Chesapeake. Citizens Advisory Committee to the Chesapeake Executive Council, Chesapeake Bay Program. Horn Point, Maryland, 16 November 2016.
- Ihde, T.F. Chesapeake Atlantis Model: An adaptive management tool for visualizing productivity changes expected from workgroup efforts. Chesapeake Bay Program All-Hands meeting. Annapolis, Maryland, 17 August 2016.
- Ihde, T.F. Chesapeake Atlantis Model: An adaptive management tool for visualizing productivity changes expected from workgroup efforts. STAR (Scientific, Technical Assessment and Reporting) meeting. Annapolis, Maryland, 28 July 2016.  
<https://www.youtube.com/watch?v=vV7g5b8JX60>
- Ihde, T.F. Predicting the cumulative effects of multiple, simultaneous stressors using the Chesapeake Atlantis Model. Water Quality-Goal Implementation Team meeting. Annapolis, Maryland, 11 July 2016.
- Ihde, T.F. Integrating multiple system stressors and predicting cumulative effects of change in the Chesapeake. *In* The missing link: Connecting water quality and living resources models to support ecosystem-based decisions. Chesapeake Modeling Symposium 2016, Williamsburg, Virginia, 1-2 June 2016.



- Ihde, T.F. Predicting the cumulative effects of multiple, simultaneous stressors using the Chesapeake Atlantis Model. *In* Ecological modelling and environmental management. The International Society for Ecological Modelling Global Conference 2016, Towson, Maryland, 9 May 2016.
- B. Vogt, T.F. Ihde, and E.D. Houde. Creating a science-based strategy to manage Chesapeake Bay forage. Chesapeake Bay Program Management Board meeting, Annapolis, Maryland, 14 April 2016.
- Ihde, T.F. Cumulative Effects of Multiple Ecosystem Stressors Estimated with an Atlantis Model of the Chesapeake Bay. Tidewater American Fisheries Society Meeting, Edgewater, Maryland 7-9 April 2016.
- Ihde, T.F. Chesapeake Atlantis Model: Predicting the cumulative effects of multiple simultaneous stressors. Habitat-Goal Implementation Team bi-annual meeting. Annapolis, Maryland, 14 October 2015.
- Ihde, T.F., R. Vogel, R. Scott, and H. Townsend. Working to improve fisheries production modeling by applying satellite data to an ecosystem modeling approach. *In* Ocean Color Users and New Applications, STAR/JPSS Annual Science Meeting, 27 August 2015.
- Ihde, T.F., H. Townsend, and R.L. Scott. Estimating the effects of Climate Change within the context of other simultaneous stressors using the Chesapeake Atlantis Model. *In* Multispecies modeling (including humans!) for fisheries management: where are we now and where can we go? Invited pres. at 145th Ann. Meet. Amer. Fish. Soc. Portland, Oregon, 16-20 August 2015.
- Ihde, T.F., and H. Townsend. Climate change impacts for Chesapeake Bay fish production modeled with the Chesapeake Atlantis Model. Invited pres. Chesapeake Bay Program, Sustainable Fisheries - Goal Implementation Team bi-annual meeting. Virginia Beach, VA, 1 June 2015.
- S.K. Brown, K. Larsen, K. Blackhart, H. Townsend and T.F. Ihde. Assessing impacts of habitat stressors on fish stocks *in* American Fisheries Society Congressional Briefing "Marine Fisheries Issues - Applying Fish Habitat Knowledge to Fisheries Management", United States Capitol, 22 April 2015.
- Ihde, T.F. Assessing the Chesapeake Bay forage base: existing data and research priorities. Invited pres. Chesapeake Bay Program, Sustainable Fisheries - Goal Implementation Team bi-annual meeting. Edgewater, MD, 2 December 2014.
- Ihde, T.F., H. Townsend, Elizabeth Fulton, and Mejs Hasan. Estimating Fisheries Production of the Chesapeake Bay in the Ecosystem Context of a Variable Estuarine Habitat. *In* Improving data and tools to evaluate the connections between coastal and offshore ecosystems to support coastal resource management. Invited pres. at Restore America's Estuaries 7th National Summit on Coastal and Estuarine Restoration, 5 November 2014.
- Ihde, T.F. and H.M. Townsend. Estimating the Impacts of Cumulative Stressors on Fisheries Production in the Chesapeake Bay System with Atlantis. *In* The Next Generation of Fish Stock Assessments. Invited pres. at 144th Ann. Meet. Amer. Fish. Soc. Québec, Canada, 17-21 August 2014.
- Ihde, T.F., and H. Townsend. The ecosystem impacts of habitat loss in the Chesapeake Bay, predicted by an Atlantis model. Invited pres. *In* OneNOAA - NOS Science Seminar (series), Silver Spring, MD, 8 April 2014.

- Ihde, T.F., and H.M. Townsend. The ecosystem impacts of habitat loss in the Chesapeake Bay, predicted by an Atlantis model. *In Ecosystem connections: watershed health, anadromous species, and ocean production*. Invited pres. at 143rd Ann. Meet. Amer. Fish. Soc. Little Rock, AR, 9-13 September 2013.
- Ihde, T.F., and H.M. Townsend. The Relative Importance of Forage Fish in an Atlantis Ecosystem Model of the Chesapeake Bay. *In Role of Forage Species In Ecosystem Approaches to Management*. Invited pres. at 142nd Ann. Meet. Amer. Fish. Soc. Minneapolis-St. Paul, MN, 19-23 August 2012.
- H.M. Townsend and T.F. Ihde. Using Fisheries-Focused Ecosystem Models to Assess the Benefits of Chesapeake Bay TMDL's. *In The Economics of Water Quality Improvement in Chesapeake Bay*. Invited pres. Washington, D.C. 31 October – 1 November 2011
- H.M. Townsend and T.F. Ihde. Bracketing Uncertainty for Managers with Ecosystem Models for the Chesapeake Bay. *In Ecosystem modeling: joint modeling of human behavior and fish populations; ecosystem models to address fishery management needs*. Invited Symposium Pres. at 141th Ann. Meet. Amer. Fish. Soc. Seattle, WA 4-8 September 2011.
- Ihde, T.F., and H.M. Townsend. An ecosystem-based modeling approach: The Chesapeake Atlantis Model (CAM). Invited. Pres. US EPA, National Center for Environmental Economics, Washington, D.C. 8 August 2011.
- R. Gamble, J. Link, E. Fulton, P. Johnson, C. Ainsworth, H.N.M. Luna, T. Smith, I. Kaplan, H. Townsend, T. Ihde, C. Harvey, and P. Levin. Comparing the implications of marine mammal recovery in four large marine ecosystems using the full system model, Atlantis. *Advances in Marine Ecosystem Modelling Research (AMEMR) Symposium*, Plymouth, UK 27-30 June 2011.
- Ihde, T.F. The Atlantis modeling approach and status of the Chesapeake Atlantis Model. Invited Pres. Old Dominion University, Commonwealth Center for Coastal Physical Oceanography 2010 Fall Seminar Series 15 November 2010.
- Ihde, T.F. Atlantis. Fisheries Ecosystem Workgroup. Maryland Sea Grant College, College Park, MD 18 August 2010.
- Ihde, T.F. The Chesapeake Atlantis Model. Smithsonian Environmental Research Center 20 August 2010.
- Ihde, T.F., and H.M. Townsend. Chesapeake Atlantis Model (CAM). Chesapeake Community Modeling Program, Chesapeake Modeling Symposium 2010. Annapolis, MD. 10-11 May, 2010.
- Ihde, T.F., T.J. Miller, M.J. Wilberg and D.H. Secor. Project FishSmart: harnessing knowledge and insights of fishery shareholders through a model-informed decision making process. CAMEO End-to-end modeling workshop, Woods Hole, Massachusetts. 18-22 April, 2010.
- Ihde, T.F., and H.M. Townsend. Chesapeake Atlantis Model (CAM). Guest lecture for MEES 698F, Fisheries Oceanography, E. North, University of Maryland Center for Environmental Science Horn Point Laboratory. 7 April, 2010.
- Wilberg, M.J., T.F. Ihde, D.H. Secor, and T.J. Miller. FishSmart: A stakeholder-centered approach to improve fisheries conservation and management. Pres. at ICES 2009 Annual Science Conference, Berlin, Germany. September 2009. ICES CM 2009/O:15.

- Wilberg, M.J., T.F. Ihde, T.J. Miller, D.H. Secor. Project FishSmart-complementing fisheries management with the knowledge, insights and preferences of informed fishery stakeholders: results & lessons learned. Pres. at 139th Ann. Meet. Amer. Fish. Soc. Nashville, TN, 30 August– 3 September, 2009.
- Ihde, T.F. Chesapeake Atlantis Model. EPA, Modeling Subcommittee Meeting, 6-7 October, 2009.
- Ihde, T.F., M.J. Wilberg, D.H. Secor, and T.J. Miller. Project FishSmart: Harnessing the Knowledge and Insights of Fishery Stakeholders. NOAA Chesapeake Bay Program Office. May 2009.
- Miller, T.J., M.J. Wilberg, D.H. Secor and T.F. Ihde. FishSmart: Involving Marine Recreational Anglers in Managing Fish Stocks. NOAA Headquarters, Silver Spring, MD. 28 April, 2009.
- Miller, T.J., M.J. Wilberg, T.F. Ihde and D.H. Secor. FishSmart: Empowering marine recreational anglers in management. U. S. Environmental Protection Agency, Washington DC. January 2009.
- Wilberg, M.J., T.F. Ihde, D.H. Secor and T.J. Miller. FishSmart: Decision analysis of the king mackerel recreational fishery. South Atlantic Fishery Management Council. Scientific and Statistical Committee. December 2008
- Ihde, T.F., M.J. Wilberg, D.H. Secor, and T.J. Miller. Project FishSmart: Harnessing the Knowledge and Insights of Fishery Stakeholders. Pres. at 5th World Recreational Fishing Conference. Dania Beach, FL, 10-13 November, 2008.
- Wilberg, M. J., D. H. Secor, T.F. Ihde and T.J. Miller. FishSmart: a stakeholder driven process for evaluating fishery management options. Atlantic States Marine Fisheries Commission. Management and Science Committee. October 2008.
- Wilberg, M.J., T.F. Ihde, T.J. Miller, D.H. Secor. Enhancing sustainability in marine recreational fisheries: a stakeholder-driven process for evaluating angling practices and management options for king mackerel in the US. Pres. at ICES Annual Science Conference, Halifax, Canada, 22-26 September, 2008. ICES CM 2008/K:17 14p.
- Ihde, T.F., T.J. Miller, M.J. Wilberg, and D.H. Secor. Comparative dynamics of commercial and recreational sectors of marine fisheries. Pres. at 138th Ann. Meet. Amer. Fish. Soc. Ottawa, Canada, 17-21 August, 2008.
- Ihde, T.F. Project FishSmart: the fishing's been good...we're making it better. Chesapeake Biological Laboratory, Solomons, MD. December 2007.
- Ihde, T.F. Catchability, and estimating the relative abundance of crustaceans: with applications to Tasmanian rock lobster. Chesapeake Biological Laboratory, Solomons, MD. February 2007.
- Ihde, T.F., J.M. Hoenig and S.D. Frusher. The performance of a new index-removal model for estimating population size. Invited. Pres. at 136th Ann. Meet. Amer. Fish. Soc. Lake Placid, NY, 10-14 September 2006.
- Ihde, T.F., and J.M. Hoenig. Design of a multi-year index-removal model to estimate spawning run size of American shad, *Alosa sapidissima*, which allows for various assumptions about catchability. Invited. Pres. at 134th Ann. Meet. Amer. Fish. Soc. Madison, WI, 22-26 August 2004.

- Ihde, T.F., J.M. Hoenig and S.D. Frusher. Multi-year index-removal models which allow for various assumptions about catchability for Tasmanian rock lobster, *Jasus edwardsii*. Pres. at 7<sup>th</sup> International Conference and Workshop on Lobster Biology and Management. Hobart, Tasmania, Australia, 8-13 February 2004.
- Ihde, T.F., J.M. Hoenig and S.D. Frusher. Multi-year index-removal models allowing for various assumptions about catchability: Application to Tasmanian rock lobster *Jasus edwardsii*. Invited. Pres. at 133rd Ann. Meet. Amer. Fish. Soc. Quebec, CA., 10-14 August 2003.
- Ihde, T.F. and Chittenden, M.E., Jr. Reproductive life history, age and size composition, growth and mortality of Chesapeake Bay spotted seatrout. Pres. at 130<sup>th</sup> Ann. Meet. Amer. Fish. Soc. St. Louis, MO., 24 August 2000.
- Ihde, T.F. and Chittenden, M.E., Jr. Validation of sectioned otoliths for aging spotted seatrout, *Cynoscion nebulosus*, in the Chesapeake Bay Region. Pres. at 129<sup>th</sup> Ann. Meet. Amer. Fish. Soc. Charlotte, NC., 31 August 1999.

### Other Presentations:

- Troy, C., and T.F. Ihde. 2023. Citizen Science – Filling the Forage Data Gap for the Chesapeake Bay. Poster Pres. at Patuxent River Conference: Think Global, Act Local, Edgewater, MD, 2 February, 2023.
- Bevans, A, A. Staples, E. Perry, T. Ihde. 2021. Forecasting Blue Crab commercial landings in the Chesapeake Bay: Using the PEARL Blue Crab Survey as a pre-recruit index. Poster Pres. at 151st Ann. Meet. Amer. Fish. Soc. Baltimore, MD, 6-10 November 2021.
- Bevans, A, A. Staples, E. Perry, T. Ihde. 2021. Forecasting Blue Crab commercial landings in the Chesapeake Bay: Using the PEARL Blue Crab Survey as a pre-recruit index. Poster. Pres. at 2021 Chesapeake Watershed Forum, Alliance for the Chesapeake Bay (virtual). 1-5 November.
- Staples, A. A. Bevans, T. Ihde. 2021. Size matters: The historical decline of Blue Crab (*Callinectes sapidus*) size continues in a 50+ year fishery-independent survey in the Chesapeake Bay. Poster Pres. at 151st Ann. Meet. Amer. Fish. Soc. Baltimore, MD, 6-10 November 2021.
- Staples, A. A. Bevans, T. Ihde. 2021. Size matters: The historical decline of Blue Crab (*Callinectes sapidus*) size continues in a 50+ year fishery-independent survey in the Chesapeake Bay. Poster Pres. at 2021 Chesapeake Watershed Forum, Alliance for the Chesapeake Bay (virtual). 1-5 November.
- Aliya Adams. Modeling PFAS Biomagnification in the Chesapeake Bay, a pilot study. Student E-Posters: Environment and Ecology. American Association for the Advancement of Science (AAAS) Annual Meeting, February 1-11, 2021.
- Adams, A., and T.F. Ihde. Modeling Per- and Polyfluoroalkyl Substances Biomagnification In The Chesapeake Bay. Annual Biomedical Research Conference for Minority Students (ABRCMS) November 9-13, 2020 (Virtual poster presentation).
- Adams, A., and T. Ihde. Modeling PFAS Biomagnification in the Chesapeake Bay, a pilot study. Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) Annual Conference, October 22-24, 2020 (Virtual poster presentation).

- Adams, A., and T. Ihde. Modeling PFAS Biomagnification in the Chesapeake Bay. 92nd Annual National Technical Association (NTA) Conference, September 23-26, 2020 (Virtual poster presentation).
- Troy, C., and T.F. Ihde. 2021. Citizen Science – Filling the Forage Data Gap for the Chesapeake Bay. Poster Pres. at CitSciVirtual, May 2021.
- Troy, C., and T.F. Ihde. 2020. Citizen Science Is Filling the Forage Data Gap for the Chesapeake Bay. Poster Pres. at 150th Ann. Meet. Amer. Fish. Soc. (virtual) 14-25 September 2020.
- Troy, C., V. Agboola, T.F. Ihde, R. Lacouture, and A. DeMarr. 2020. Setting Oyster Larvae on Existing Riprap in St. Leonard Creek, Maryland. Poster Pres. at 150th Ann. Meet. Amer. Fish. Soc. (virtual) 14-25 September 2020.
- Agboola, V., C. Troy, T.F. Ihde, R. Lacouture, and A. DeMarr. 2019. Setting Oyster Larvae on Existing Riprap in St. Leonard Creek, Maryland. Poster. Pres. at 2019 Chesapeake Watershed Forum, Alliance for the Chesapeake Bay. Shepherdstown, WV, 16 November.
- Troy, C., and T.F. Ihde. 2019. Citizen Science is Filling the Forage Data Gap for the Chesapeake Bay. Poster. Pres. at 2019 Chesapeake Watershed Forum, Alliance for the Chesapeake Bay. Shepherdstown, WV, 16 November.
- Wood, K., T.F. Ihde, and R. Lacouture. 2019. Interference of Baited Blue Crab (*Callinectes sapidus*) Traps on Neighboring Traps. Poster. Pres. at 2019 Chesapeake Watershed Forum, Alliance for the Chesapeake Bay. Shepherdstown, WV, 16 November.
- Knoche, S., T. Ihde, G. Samonte, and H. Townsend. Oyster restoration impacts in Maryland. Invited Poster Pres. in Choose Clean Water Coalition “Hill Day,” National Fish and Wildlife Foundation grantees, Capitol Hill, Washington DC. 3 March 2019.
- Ihde, T.F., T.J. Miller, M.J. Wilberg, D.H. Secor, and M. Nussman. Project FishSmart: Harnessing the Knowledge and Insights of Fishery Stakeholders. Poster. Pres. at 5<sup>th</sup> World Recreational Fishing Conference. Dania Beach, FL, 10-13 November, 2008.
- Ihde, T.F., T.J. Miller, M.J. Wilberg, D.H. Secor, and M. Nussman. Project FishSmart: Harnessing the Knowledge and Insights of Fishery Stakeholders. Poster. Pres. at 138th Ann. Meet. Amer. Fish. Soc. Ottawa, Canada, 17-21 August, 2008.
- Sandgren, C.D., T.F. Ihde and Ye. V. Likhoshway. Flora and stratigraphy of fossil chrysophyte stomatocysts (statozooids) from the recent sediments of Lake Baikal, Siberia, USSR. Poster. Pres. at the Third International Chrysophyte Symposium, Queen's University, Kingston, Ontario, Canada. 1991.
- Kaster, J.L. and T.F. Ihde. Lake Baikal siliceous algal fossils: historical evidence of eutrophication. Poster. Pres. at the International Association for Great Lakes Research Annual Meeting, Center for Great Lakes Studies, Milwaukee, WI. 1989.

## **Professional Service:**

### *Symposium Convener:*

- New Advances in Toxic Contaminant Science for the Chesapeake Bay. Session Lead: T. Ihde, Co-Leads: L. Blaney, G. Allen. 2022 Chesapeake Community Research Symposium. Annapolis, MD, 6-8 June, 2022.
- Ecosystem Modeling Approaches for Living Resource Management - from “Simple” to Complex: An Introduction and Hands-on Learning Workshop. Session organizer: T.F. Ihde. Chesapeake Modeling Symposium 2016. Williamsburg, VA 1-2 June, 2016.

The missing link: Connecting water quality and living resources models to support ecosystem-based decisions. Session organizers: D. Bilkovic, and T.F. Ihde. Chesapeake Modeling Symposium 2016. Williamsburg, VA 1-2 June, 2016.

Ecosystem modeling: joint modeling of human behavior and fish populations; ecosystem models to address fishery management needs. Symposium organizers: T.F. Ihde, S.K. Gaichas, I.C. Kaplan, D.M. Orner, Y.L. deRenier, and H.M. Townsend. at 141th Ann. Meet. Amer. Fish. Soc. Seattle, WA 4-8 September, 2011.

Coping With Uncertainty in Modeling Environmental Resources: Practice, Pitfalls & Recommendations from Modelers, Restoration Biologists & Managers. Full-day symposium, conveners: T.F. Ihde and H.M. Townsend. Chesapeake Community Modeling Program, Chesapeake Modeling Symposium 2010. Annapolis, MD. 10-11 May, 2010.

Peer-reviewer for: *Bulletin of Marine Science; Estuarine, Coastal and Shelf Science; Hydrobiologia; Marine Biology; Marine & Freshwater Research; Marine Ecology Progress Series; New Zealand Journal of Marine and Freshwater Research; Progress in Oceanography; PLoS ONE; Transactions of the American Fisheries Society*

#### Federal/State/Local Government:

##### *Proposal Review Panelist – NOAA/NCCOS*

- FY22 “Understanding multi-stressor impacts on marine ecosystems under climate change”

##### *Panelist – Maryland Department of Natural Resources*

- Cownose Bay Fishery Management Plan Workgroup (2018-present)

##### *Grant Manager - Chesapeake Bay Trust*

- Forage indicators and nutritional profiles for Chesapeake Bay fishes, 2015
- Drivers of Forage Population Trends and Consumption patterns, 2016

##### *Southeast Data Assessment and Review (SEDAR) 16 - King mackerel:*

- Data workshop, February 11-15, 2008
- Assessment workshop, May 5-9, 2008
- Review workshop, August 4-7, 2008

#### Chesapeake Bay Program:

*Scientific and Technical Advisory Committee (STAC)* Member at large, September 2013 – September 2021 (term limit); Executive Board, September 2017 – September 2019

*Sustainable Fisheries - Goal Implementation Team*, Member, 2013 – present

*Habitat Goal Implementation Team*, Member, 2014 – present

*Chesapeake Bay Stock Assessment Committee* - Member, 2022 – present

- Fall 2022 Blue Crab Workshop, September 20-21, 2022

Proposal-reviewer for: Virginia Marine Resource Commission; NOAA/NMFS Fisheries Oceanography program, Fisheries and the Environment (FATE); NOAA Chesapeake Bay Office, Annual Fisheries Science Grants; Chesapeake Bay Trust, Chesapeake Bay Program Goal Implementation Team grants

#### **Professional Organizations (Offices held):**

American Association for the Advancement of Science 2007-present

American Fisheries Society 1997-present

American Institute of Fishery Research Biologists 2006-*present* (Webmaster 2010-2016,  
Governing Board member 2012-2016, Nominating Committee 2019)  
Atlantic Estuarine Research Society  
Citizen Science Association  
Chesapeake Bay Stock Assessment Committee 2022 – *present*  
Coastal and Estuarine Research Federation  
Scientific and Technical Advisory Committee (STAC), Chesapeake Bay Program 2013-2021  
(maximum term limit; Executive Board 2017 - 2019)