

CURRICULUM VITAE

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EDUCATION

- 1984 Ph.D., Biology, University of California, Santa Barbara, CA.
1982 M.A., Biology, University of California, Santa Barbara, CA.
1975 B.S., Biology, Arizona State University, Tempe, AZ.

PROFESSIONAL EXPERIENCE

- 2004-Present Senior Scientist, Smithsonian Environmental Research Center
1994-present Participating Faculty, Graduate Program in Marine-Estuarine-Environmental Sciences, University of Maryland System.
1999 to 2003 Curator, Marine/Estuarine Ecology, Ichthyology, The Academy of Natural Sciences, Estuarine Research Center; 1991-1999: Associate Curator; 1984-1999: Assistant Curator
1990-2014 Adjunct Professor, Associate Professor, Assistant Professor. Department of Biology, University of Maryland, College Park.
1990-1991 Graduate Faculty member, Department of Zoology, University of Maryland, College Park.

RESEARCH INTERESTS

Marine and Estuarine Ecology and Restoration:

- Human influence on estuarine and marine food webs
- Effects of low dissolved oxygen on fish, fisheries, and food webs
- Combined effects of low dissolved oxygen and acidification
- Gelatinous zooplankton ecology
- Oyster reef community ecology and restoration

Linking individual and ecosystem-level processes

Effects of multiple stressors on coastal ecosystems

PEER-REVIEWED PUBLICATIONS (*=lead authors were postdoctoral researchers, graduate students, or technicians in my laboratory)

Editor – Special Issues of Scientific Journals:

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Breitburg, D.L., T. Jordan and D. Lipton. (eds.) 2003. From Ecology to Economics: tracing human influence in the Patuxent River Estuary and its watershed. Special Issue of Estuaries. Vol 26 (2a). 229 pp.

Breitburg, D.L., S.P. Seitzinger and J.G. Sanders. (eds.) 1999. The effects of multiple stressors in marine and freshwater systems. Limnology and Oceanography (Special issue) 44 (issue 3, part 2). 233pp.

Refereed Journal Articles and Book Chapters

2016 Rick, TC, Reeder-Myers, LA, Hofman, CA, **Breitburg, D**, Lockwood, R, Henkes, G, Kellogg, L, Lowery, D, Luckenbach, M.W, Mann, R and Ogburn, MB. 2016. Millennial-scale sustainability of the Chesapeake Bay Native American oyster fishery. Proceedings of the National Academy of Sciences, p.201600019. [doi: 10.1073/pnas.1600019113](https://doi.org/10.1073/pnas.1600019113)

*Miller, SH, Breitburg, DL, Burrell, RB and Keppel, AG, 2016. Acidification increases sensitivity to hypoxia in important forage fishes. Marine Ecology Progress Series 549: 1-8. *Featured article*. [doi: 10.3354/meps11695](https://doi.org/10.3354/meps11695)

*Malek, J.C. and Breitburg, D.L., 2016. Effects of air-exposure gradients on spatial infection patterns of *Perkinsus marinus* in the eastern oyster *Crassostrea virginica*. Diseases of Aquatic Organisms 118:139-151. [doi: 10.3354/dao02964](https://doi.org/10.3354/dao02964)

*Keppel, AG, **DL Breitburg** and RB Burrell. 2016 Effects of co-varying diel-cycling hypoxia and pH on growth in the juvenile eastern oyster, *Crassostrea virginica*. PLoS ONE. <http://dx.doi.org/10.1371/journal.pone.0161088>

Porter, ET and **DL Breitburg**. Eastern oyster, *Crassostrea virginica* valve gape behavior under diel-cycling hypoxia. Marine Biology. Accepted.

2015 Isensee, K., L. Levin, **D. Breitburg**, M. Gregoire, V. Garçon and Luis Valdés. 2015. The ocean is losing its breath. Pp 25 – 30 in OCEAN AND CLIMATE, 2015 – [Scientific Notes](#). www.oceanclimate.org, 96 pages.

Levin, LA and **DL Breitburg**. 2015. Linking coasts and seas to address ocean deoxygenation. Nature Climate Change 5:401-403. [doi:10.1038/nclimate2595](https://doi.org/10.1038/nclimate2595)

Breitburg, DL, J Salisbury, JM Bernhard, W-J Cai, S Dupont, SC Doney, KJ Kroeker, LA Levin, WC Long, LM Milke, SH Miller, B Phelan, U Passow, BA Seibel, AE Todgham, and AM Tarrant. 2015. And on Top of All That...Coping with Ocean Acidification in the midst of many stressors. Oceanography. 28:48–61. <http://dx.doi.org/10.5670/oceanog.2015.31>.

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- Breitburg, DL**, D Hondorp, C Audemard, RB Carnegie, RB Burrell, M Trice and V Clark. 2015. Landscape-level variation in disease susceptibility related to shallow-water hypoxia. PLoS ONE. <http://dx.doi.org/10.1371/journal.pone.0116223>
- Levin, Lisa A., Liu, Kon-Kee, Emeis, Kay-Christian, **Breitburg, Denise L.**, Cloern, James, Deutsch, Curtis, Giani, Michele, Goffart, Anne, Hofmann, Eileen E., Lachkar, Zouhair, Limburg, Karin, Liu, Su-Mei, Montes, Enrique, Naqvi, Wajih, Ragueneau, Olivier, Rabouille, Christophe, Sarkar, Santosh Kumar, Swaney, Dennis P., Wassman, Paul and Wishner, Karen F. 2015. Comparative biogeochemistry-ecosystem-human interactions on dynamic continental margins. Journal of Marine Systems. 141: 3-17. <http://dx.doi.org/10.1016/j.jmarsys.2014.04.016>
- *Gedan, K.B., **D.L. Breitburg**, R.M. Grossinger and T.C. Rick. 2015. Historical information for ecological restoration in estuaries and coastal ecosystems. Pp 163-186 In JN Kittinger, L McClenachan,, KB Gedan and LK Blight, eds.: *Marine Historical Ecology in Conservation: Applying the Past to Manage for the Future*". University of California Press
- LP Baggett, SP Powers, RD Brumbaugh, LD Coen, BM DeAngelis, JK Greene, BT Hancock, SM Morlock, BL Allen, **DL Breitburg**, David Bushek, JH Grabowski, RE Grizzle, ED Grosholz, M La Peyre, MW Luckenbach, KA McGraw, MF Piehler, SR Westby, PSE zu Ermgassen. Guidelines for evaluating performance of oyster habitat restoration. Restoration Ecology 23:737–745. [doi: 10.1111/rec.12262](https://doi.org/10.1111/rec.12262).
- *Burrell, RB, *Keppel, AG, *Clark, VM and **DL Breitburg**. 2015. An automated monitoring and control system for flow-through diel-cycling hypoxia and pH experiments'. Limnology and Oceanography Methods. [doi:10.1002/lom3.10077](https://doi.org/10.1002/lom3.10077).
- *Keppel, AG, **DL Breitburg**, RB Burrell, G Wikfors and V Clark. The effects of co-varying diel cycling hypoxia and pH on disease susceptibility in *Crassostrea virginica*. Marine Ecology Progress Series. 538:169-183. [doi: 10.3354/meps11479](https://doi.org/10.3354/meps11479).
- 2014 Purcell JE, MB Decker, **DL Breitburg**, and KJ Broughton. 2014. Fine-scale vertical distributions of *Mnemiopsis leidyi* ctenophores: predation on copepods relative to stratification and hypoxia. Mar Ecol Prog Ser 500:103-120. [doi: 10.3354/meps10741](https://doi.org/10.3354/meps10741).
- *Gedan KB, L Kellogg and **DL Breitburg**. 2014. Accounting for Multiple Foundation Species in Oyster Reef Restoration Benefits. Restoration Ecology 22:517-524. [doi: 10.1111/rec.12107](https://doi.org/10.1111/rec.12107).
- Breitburg D** and R Burrell. 2014. Predator-mediated landscape structure: seasonal patterns of spatial expansion and prey control by *Chrysaora quinquecirrha* and *Mnemiopsis leidyi*. Mar Ecol Prog Ser 510:167-181. [doi: 10.3354/meps10850](https://doi.org/10.3354/meps10850).

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- 2013: *Richmond, C.E., KA Rose and **DL Breitburg**. 2013. Individual variability and environmental conditions: Effects on zooplankton cohort dynamics. *Marine Ecology Progress Series*. 486:59-78. [doi:10.3354/meps10418](https://doi.org/10.3354/meps10418).
- *Davas, LA, MS Kornis and **DL Breitburg**. 2013. Environmental factors influencing $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ in three fishes from Chesapeake Bay. *ICES Journal of Marine Science*. [doi: 10.1093/icesjms/fst143](https://doi.org/10.1093/icesjms/fst143).
- Duarte, C.M., K. Pitt, C.H. Lucas, J.E. Purcell, S-i Uye, K. Robinson, L. Brotz, M.B. Decker, K.R. Sutherland, A. Malej, L. Madin, H. Mianzan, J-M Gilli, V. Fuentes, D. Atienza, F. Pagés, **D. Breitburg**, J. Malek, W.M. Graham and R.H. Condon. 2013. Is global ocean sprawl a cause of jellyfish blooms? *Frontiers in Ecology and the Environment* 11:91-97. <http://dx.doi.org/10.1890/110246>
- 2012: Adamack, Aaron T., Rose, Kenneth A., **Breitburg, Denise L.**, Nice, Alex J. and Lung, WuSeng. 2012. Simulating the effect of hypoxia on bay anchovy egg and larval mortality using coupled watershed, water quality, and individual-based predation models. *Marine Ecology Progress Series*, 445: 141-160. [doi:10.3354/meps09438](https://doi.org/10.3354/meps09438).
- Díaz, R.J., N.N. Rabalais, and **D.L. Breitburg**. 2012. Agriculture's Impact On Aquaculture: Hypoxia And Eutrophication In Marine Waters. Organization of Economic Cooperation and Development. COM/TAD/CA/ENV/ EPOC 16, 45 pp. <http://www.oecd.org/greengrowth/sustainableagriculture/49841630.pdf>.
- *Rathjen, K.A., **D.L. Breitburg** and P.J. Neale. 2012. Effects of ultraviolet radiation on the growth, reproduction and survival of the lobate ctenophore *Mnemiopsis leidyi* in Chesapeake Bay. *Journal of Experimental Marine Biology and Ecology* 432-433:121-130. <http://dx.doi.org/10.1016/j.jembe.2012.06.029>.
- *Yasuhara, M., G. Hunt, **D. Breitburg**, A. Tsujimoto and K. Katsuki. 2012. Human-induced marine ecological degradation: micropaleontological perspectives. *Ecology and Evolution* 2:3242-3268. [doi: 10.1002/ece3.425](https://doi.org/10.1002/ece3.425).
- 2011: Kennedy, Victor S., **Breitburg, Denise L.**, Christman, Mary C., Luckenbach, Mark W., Paynter, Kennedy, Kramer, Jonathan, Sellner, Kevin G., Dew-Baxter, Jodi, Keller, Cherie and Mann, Roger. 2011. Lessons Learned from Efforts to Restore Oyster Populations in Maryland and Virginia, 1990 to 2007. *Journal of Shellfish Research*, 30(3): 719-731. [doi:10.2983/035.030.0312](https://doi.org/10.2983/035.030.0312).
- *Fulford, R.S., **D.L. Breitburg**, R.I.E. Newell and M. Luckenbach. 2011. Differences in relative predation vulnerability between native and non-native oyster larvae and the influence on

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- restoration planning in an estuarine ecosystem. *Estuaries and Coasts*. *Estuaries and Coasts* 34:618–629. [doi: 10.1007/s12237-010-9360-8](https://doi.org/10.1007/s12237-010-9360-8).
- 2010: *Fulford, R.S., **D.L. Breitburg**, R.I.E. Newell and M. Luckenbach. 2010. Evaluating ecosystem response to oyster restoration and nutrient load reduction with a multispecies bioenergetics model. *Ecological Applications* 20:915–934. [doi:10.1890/08-1796.1](https://doi.org/10.1890/08-1796.1).
- Najjar R., C.R. Pyke, M.B. Adams, **D. Breitburg**, C. Hershner, M. Kemp, R. Howarth, M. Mulholland, M. Paolisso, D. Secor, K.Sellner, D.Wardrop, and R.Wood. 2010. Potential climate-change impacts on the Chesapeake Bay. *Estuarine Coastal and Shelf Science* 86: 1-20. [doi:10.1016/j.ecss.2009.09.026](https://doi.org/10.1016/j.ecss.2009.09.026). *Invited feature*.
- Breitburg, D.L.**, B. Crump, J. Dabiri and C. Gallegos. 2010. Ecosystem engineers in the Pelagic Realm: Alteration of habitat by species ranging from microbes to jellyfish. *Integrative and Comparative Biology* 50:188-200. [doi:10.1093/icb/icq051](https://doi.org/10.1093/icb/icq051).
- *Hondorp, D.W., **D.L. Breitburg** and L.A. Davias. 2010. Eutrophication and fisheries: separating the effects of nitrogen loads and hypoxia on the pelagic-to-demersal ration and other measures of landings composition. *Marine and Coastal Fisheries*. 2:339-361. <http://www.bioone.org/doi/pdf/10.1577/C09-020.1>.
- *Kolesar, S.E., **D.L. Breitburg**, J.E. Purcell, and M.B. Decker. 2010. Effects of hypoxia on *Mnemiopsis leidyi*, ichthyoplankton and copepods: clearance rates and vertical habitat overlap. *Marine Ecology Progress Series* 411: 173–188. [doi: 10.3354/meps08656](https://doi.org/10.3354/meps08656).
- 2009: Diaz, R.J. and **D.L. Breitburg**. 2009. The hypoxic environment. Pp 2-23 *in* JG. Richards, A.P. Farrell and C.J. Brauner, eds. *Hypoxia. Fish Physiology Vol 27*. Academic Press. Amsterdam. [http://dx.doi.org/10.1016/S1546-5098\(08\)00001-0](http://dx.doi.org/10.1016/S1546-5098(08)00001-0).
- Breitburg, D. L.**, Craig, J.K., Fulford, R.S., Rose, K.A., Boynton, W.R., Brady, D., Ciotti, B.J., Diaz, R.J., Friedland, K.D., Hagy, J.D. III , Hart, D.R., Hines, A.H., Houde, E.D., Kolesar, S.E., Nixon, S.W., Rice, J.A., Secor, D.H., Targett, T. E. 2009. Nutrient Enrichment and Fisheries Exploitation: Interactive Effects on Estuarine Living Resources and Their Management. *Hydrobiologia* 629: 31-47. [doi: 10.1007/s10750-009-9762-4](https://doi.org/10.1007/s10750-009-9762-4). *Eutrophication in Coastal Ecosystems: Selected papers from the Second International Symposium on Research and Management of Eutrophication in Coastal Ecosystems, 20–23 June 2006, Nyborg, Denmark. Guest Editors: J.H. Andersen & D.J. Conley.*
- *Graham, E.S., D.M. Tuzzolino, R.B. Burrell, and **D.L. Breitburg**. 2009. Interannual variation in gelatinous zooplankton and their prey in the Rhode River, Maryland. *Smithsonian Contributions to Marine Science*. 38: 369-378.

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Batiuk, R.A., **D.L. Breitburg**, R.J. Diaz, T.M. Cronin, D.H. Secor and G. Thursby. 2009. Derivation of Habitat-Specific Dissolved Oxygen Criteria for Chesapeake Bay and its Tidal Tributaries. *Journal of Experimental Marine Biology and Ecology*. 381: S204-S215. doi: [10.1016/j.jembe.2009.07.023](https://doi.org/10.1016/j.jembe.2009.07.023).

Rose, K.A., A.T. Adamack, C. A. Murphy, S.E. Sable, S.E. Kolesar, J.K. Craig, **D.L. Breitburg**, P. Thomas, M.H. Brouwer, C.F. Cerco. 2009. Does hypoxia have population-level effects on coastal fish? Musings from the virtual world. *Journal of Experimental Marine Biology and Ecology*. 381:S188-S203. doi: [10.1016/j.jembe.2009.07.022](https://doi.org/10.1016/j.jembe.2009.07.022).

Published prior to this review period:

- 2009: **Breitburg, D.L.**, Hondorp, L.W. Davias, and R.J. Diaz. 2009. Hypoxia, nitrogen and fisheries: Integrating effects across local and global landscapes. *Annual Reviews in Marine Science*. (Invited review) 1: 329-350.
- 2008: Tamburri, M.N., **D.L. Breitburg**, S.M. Bonniwell and M.W. Luckenbach. 2008. Settlement of *Crassostrea ariakensis* larvae: Effects of substrate, biofilms, sediment and adult chemical cues. *Journal of Shellfish Research*. 27:601-608.
- 2007: *Fulford, R.S., **D.L. Breitburg**, R.I.E. Newell, W.M. Kemp, and M. Luckenbach. 2007. Effects of oyster population restoration strategies on phytoplankton biomass in Chesapeake Bay: A flexible modeling approach. *Marine Ecology Progress Series*. 336:43-61.

National Research Council. 2007. A Review of the Final Ocean Research Priorities Plan and Implementation Strategy. Committee to Review the JSOST Research Priorities Plan, National Research Council. The National Academies Press, Washington, DC. D. Breitburg, committee member. 148 pp.

- 2006: **Breitburg, D.L.** and R.S. Fulford. 2006. Oyster-sea nettle interdependence and altered control within the Chesapeake Bay ecosystem. *Estuaries and Coasts*. 29:776-784.

Chesapeake Bay Fisheries Ecosystem Advisory Panel (National Oceanic and Atmospheric Administration Chesapeake Bay Office). 2006. Fisheries ecosystem planning for Chesapeake Bay. American Fisheries Society, Trends in Fisheries Science and Management 3, Bethesda, Maryland. (**D. Breitburg**, Panel Member)

Breitburg, D.L. and E. Houde. 2006. Habitat, habitat requirements, and habitat management. Pages 145-188 *in* Chesapeake Bay Fisheries Ecosystem Advisory Panel (National Oceanic and Atmospheric Administration Chesapeake Bay Office). Fisheries ecosystem planning for Chesapeake Bay. American Fisheries Society, Trends in Fisheries Science and Management 3, Bethesda, Maryland.

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- National Research Council. 2006. A Review of the Draft Ocean Research Priorities Plan: *Charting the Course for Ocean Science in the United States*. Committee to Review the JSOST Research Priorities Plan, National Research Council. The National Academies Press, Washington, DC. **D. Breitburg**, committee member. 64 pp.
- 2005: **Breitburg, D.L.** and G.F. Riedel. 2005. Multiple stressors in marine systems. Pp 167-182 *In* E. Norse and L. Crowder, eds. *Marine Conservation Biology: The Science of Maintaining the Sea's Biodiversity*. Island Press, Washington.
- *Richmond, C.E., **D. L. Breitburg** and K.A. Rose. 2005. The role of environmental generalist species in ecosystem function. *Ecological Modeling*. 188: 279-295.
- *Grove, M. and **D.L. Breitburg**. 2005. Growth and reproduction of gelatinous zooplankton exposed to low dissolved oxygen. *Marine Ecology Progress Series*. 301: 185-198.
- 2004: *Decker, M.B., **D.L. Breitburg** and J.E. Purcell. 2004. Effects of low dissolved oxygen on zooplankton predation by the ctenophore *Mnemiopsis leidyi*. *Marine Ecology Progress Series*. 280:163-172.
- National Research Council. 2004. River Basins and Coastal Systems Planning within the U.S. Army corps of Engineers. (**D. Breitburg**, panel member). The National Academies Press. Washington, D.C. 167 pp.
- 2003: *Decker, M.B., **D.L. Breitburg**, and N.H. Marcus. 2003. Geographical differences in behavioral responses to hypoxia: local adaptation to an anthropogenic stressor? *Ecological Applications*. *Ecological Applications*. 13:1104–1109.
- Bundy, M.H., **D.L. Breitburg**, R.W. Osman and K.G. Sellner. 2003. The responses of Patuxent River upper trophic levels to nutrient and trace element induced changes in the lower food web. *Estuaries*. 26: 365-384.
- Riedel, G.F., J.G. Sanders and **D.L. Breitburg**. 2003. Seasonal variability in response of estuarine phytoplankton communities to stress: Linkages between toxic trace elements and nutrient enrichment. *Estuaries*. 26: 323-338.
- Wiegner, T.N., S.P. Seitzinger, **D.L. Breitburg** and J.G. Sanders. 2003. The Effects of Multiple Stressors on the Balance between Autotrophic and Heterotrophic Processes in an Estuarine System. *Estuaries*. 26:352-364.
- Breitburg, D.L.**, A. Adamack, S.E. Kolesar, M.B. Decker, K.A. Rose, J.E. Purcell, J.E. Keister, and J.H. Cowan, Jr. 2003. The pattern and influence of low dissolved oxygen in the Patuxent River, a seasonally hypoxic estuary. *Estuaries*. 26: 280-297.

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- Breitburg, D.L.**, T.E. Jordan and D. Lipton. 2003. Preface- From ecology to economics: Tracing human influence in the Patuxent River Estuary and its watershed. *Estuaries*. 26: 167-170.
- 2002: Laursen, A.E., S.P. Seitzinger, R. Dekorsey, J.G. Sanders, **D.L. Breitburg**, and R.W. Osman. 2002. Multiple stressors in an estuarine system: effects of nutrients, trace metals, and trophic complexity on benthic photosynthesis and respiration. *Estuaries*. 25:57-69.
- Breitburg, D.L.** 2002. Effects of hypoxia, and the balance between hypoxia and enrichment, on coastal fishes and fisheries. *Estuaries*. 25:767-781.
- 2001: **Breitburg, D.L.**, L. Pihl and S.E. Kolesar. 2001. Effects of low dissolved oxygen on the behavior, ecology and harvest of fishes: a comparison of the Chesapeake and Baltic systems. Pages 241267 *In* Nancy N. Rabalais and R. Eugene Turner (eds.), *Coastal Hypoxia: Consequences for Living Resources and Ecosystems*. Coastal and Estuarine Studies 58, American Geophysical Union, Washington, D.C.
- Purcell, J.E., **D.L. Breitburg**, M.B. Decker, W.M. Graham, M.J. Youngbluth, and K. Rastoff. 2001. 77-100. Pelagic Cnidarians and Ctenophores in Low Dissolved Oxygen Environments. Pages 241267 *In* Nancy N. Rabalais and R. Eugene Turner (eds.), *Coastal Hypoxia: Consequences for Living Resources and Ecosystems*. Coastal and Estuarine Studies 58, American Geophysical Union, Washington, D.C.
- Boynton, W.R., J.D. Hagy, and **D.L. Breitburg**. 2001. Issues of Scale in Land-Margin Ecosystems. Pages 299-330 *In* Robert H. Gardner, W. Michael Kemp, Victor S. Kennedy, and John E. Peterson, eds. *Scaling Relations in Experimental Ecology*. Columbia University Press, New York.
- 2000 **Breitburg, D.L.**, L.D. Coen, M.W. Luckenbach, R. Mann, M. Posey, and J.A. Wesson. 2000. Oyster Reef Restoration: Convergence of Harvest and Conservation Strategies. *Journal of Shellfish Research*. 19:371-377.
- *Keister, J.E., E.D. Houde and **D.L. Breitburg**. 2000. Effects of bottom-layer hypoxia on abundances and depth distributions of organisms in Patuxent River, Chesapeake Bay. *Marine Ecology Progress Series*. 205:43-59.
- 1999 Coen, L.D., M.W. Luckenbach, and **D.L. Breitburg**. 1999. The role of oyster reefs as essential fish habitat: a review of current knowledge and some new perspectives. Pages 438-454 in L. R. Benaka, editor. *Fish Habitat: Essential Fish Habitat and Rehabilitation*. American Fisheries Society, Symposium 22. Bethesda, Maryland.

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- Breitburg, D.L.**, J.G. Sanders, C.G. Gilmour, C.A. Hatfield, R.W. Osman, G.F. Riedel, S.P. Seitzinger and K.G. Sellner. 1999. Variability in responses to nutrients and trace elements, and transmission of stressor effects through an estuarine food web. *Limnology and Oceanography*. 44:837-863.
- Breitburg, D.L.** 1999. Are three-dimensional structure and healthy oyster populations the keys to an ecologically interesting and important fish community? Pp239-250 in M.W. Luckenbach, R. Mann and J.A. Wesson (eds.) *Oyster Reef Habitat Restoration. A Synopsis and Synthesis of Approaches*. Virginia Institute of Marine Science Press, Gloucester Point, VA.
- 1998 **Breitburg, D.L.**, J. Baxter, C. Hatfield, R.W. Howarth, C.G. Jones, G.M. Lovett and C. Wigand. 1998. Understanding effects of multiple stressors: ideas and challenges. pp 416-431. In: M. Pace and P. Groffman, eds. *Successes, Limitations and Frontiers in Ecosystem Science*. Springer, NY.
- Breitburg, D.L.** 1998. Scaling eutrophication effects between species and ecosystems: the importance of variation and similarity among species with similar functional roles. *Australian Journal of Ecology*. 23:280-286.
- Breitburg, D.L.** 1998. Scaling up from species to ecosystems: functional redundancy and complementarity. pp 263-267 in G.P. Jones, P.J. Doherty, B.D. Mapstone and L. Howlett, eds. *Recruitment and population dynamics of coral reef fishes*. CRC Reef Research Centre. Townsville, Australia. 297 pp.
- 1997 **Breitburg, D.L.**, T. Loher, C.A. Pacey, A. Gerstein. 1997. Varying effects of low dissolved oxygen on trophic interactions in an estuarine food web. *Ecological Monographs*. 67:489-507.
- 1996 **Breitburg, D.L.** 1996. Consumer mobility and the relative importance of consumption and competition following physical disturbance. *Marine Ecology Progress Series*.138:83-92.
- Bowie, G.L., J.G. Sanders, G.F. Riedel, C.C. Gilmour, **D.L. Breitburg**, G.A. Cutter and D.B. Porcella. 1996. Assessing selenium cycling and accumulation in aquatic ecosystems. *Water Air and Soil Pollution*. 90:93-104.

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- 1995 **Breitburg, D.L.** 1995. Linking ecosystem-level processes with population-level responses: the importance of variation among species in predicting effects of estuarine eutrophication. p. 47 In: P. Hill and S. Nelson (eds.), *Toward a Sustainable Coastal Watershed: The Chesapeake Experiment*. Chesapeake Research Consortium Publication 149. Solomons, MD.
- 1994 **Breitburg, D.L.**, Steinberg, N., DuBeau, S., Cooksey, C, and Houde, E.D. 1994. Effects of low oxygen on predation on estuarine fish larvae. *Marine Ecology Progress Series*. 104: 235-246.
- Breitburg, D.L.** 1994. Behavioral responses of fish larvae to low oxygen risk in a stratified water column. *Marine Biology*. 120:615-625.
- Breitburg, D.L** and T. Loher. 1994. Effects of physical disturbance on fish trophic interactions: the importance of consumer mobility. p 241-254 in D.J. Stouder, K. Fresh, and Robert J. Feller, eds. *Feeding ecology of fishes: theory and application*. Belle Baruch Library in Marine Science.
- Breitburg, D.L.**, M.A. Palmer, and T. Loher. 1995. Effects of flow, structure and larval schooling behavior on settlement behavior of oyster reef fish. *Marine Ecology Progress Series*. 125: 45-60.
- 1993 Newell, R.I.E. and **D.L. Breitburg**. 1993. Oyster reefs. pp 61-64. In: *Chesapeake Bay strategy for the restoration and protection of ecologically valuable species*. Chesapeake Bay Program, Annapolis.
- 1992 **Breitburg, D. L.** 1992. Episodic hypoxia in the Chesapeake Bay: interacting effects of recruitment, behavior and a physical disturbance. *Ecological Monographs*. 62:525-546.
- Abbe, G. R. and **D. L. Breitburg**. 1992. The influence of oyster toadfish (*Opsanus tau*) and crab (*Callinectes sapidus* and *Xanthidae*) on survival of oyster (*Crassostrea virginica*) spat in Chesapeake Bay: does spat protection always work? *Aquaculture*. 107:21-31.
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