

# JULIETTE L. SMITH

Virginia Institute of Marine Science / William and Mary  
Ecosystem Health, Gloucester Point, VA 23062-1346  
(804) 684-7289, [jlsmith@vims.edu](mailto:jlsmith@vims.edu)

---

## PROFESSIONAL APPOINTMENTS

- 2020-present **Associate Professor:** Virginia Institute of Marine Science, William & Mary  
2014-2020 **Assistant Professor:** Virginia Institute of Marine Science, William & Mary  
2014-present **Guest Investigator:** Biology Department, Woods Hole Oceanographic Institution  
2009-2014 **Postdoctoral Scholar/Investigator:** Woods Hole Oceanographic Institution (Donald M. Anderson)  
2004-2008 **EPA STAR Fellow:** College of Environmental Science and Forestry, SUNY  
2002-2004 **Watershed Coordinator:** University of California, San Diego (Isabelle Kay)

## EDUCATION

- 2004-2008 **Ph.D.** Environmental Science, College of Environmental Science and Forestry, SUNY (Kimberly L. Schulz, Gregory L. Boyer)  
1999-2002 **M.S.** Zoology, University of New Hampshire (James F. Haney)  
1995-1999 **B.S.** Biological Sciences, University at Buffalo

## RECENT EXTERNAL FUNDING (selected out of 11)

- 2019-2024 NOAA ECOHAB Program “ECOHAB 2019: Multidisciplinary approach to a cross-regional problem: *Dinophysis* and DSP toxicity” [Smith J.](#) (VIMS); Campbell L. (TAMU); Gobler C. (Stony Brook U.); Trainer V. (NWFSC); Deeds J. (US FDA); Brosnahan M. (WHOI); Moore S. (NWFSC) [\$4,996,326]  
2017-2020 NOAA ECOHAB Program “ECOHAB 2017: Impacts and food-web transfer of *Alexandrium monilatum* and its toxins” [Reece K.](#) (VIMS); [Smith J.](#) (VIMS); Vogelbein W. (VIMS); [Carnegie R.](#) (VIMS); [Reay W.](#) (VIMS); [Small H.](#) (VIMS) [\$749,826]  
2017-2020 2017 Sea Grant Aquaculture Initiative “Enhancing commercial sustainability in the hatchery production of oysters and clams” [Carnegie R.](#) (VIMS); [Allen S.](#) (VIMS); [Snyder R.](#) (VIMS), [Reece K.](#) (VIMS), [Shadwick E.](#) (VIMS), [Song BK.](#) (VIMS), [Smith J.](#) (VIMS), [Schwarz M.](#) (VT), [Kuhn D.](#) (VT), [Rivest E.](#) (VIMS), [Hartley T.](#) (VASG), [Hudson K.](#) (VASG) [\$998,942]  
2016-2019 2016 Sea Grant Aquaculture Research Competition “Managing the complex profile of biotoxins threatening the shellfish industry of Lower Chesapeake Bay” [Smith J.](#) (VIMS); [Reece K.](#) (VIMS); [Egerton T.](#) (VDH) [\$299,662]

## MAJOR RESEARCH INTERESTS

Current research activities are focused on the source, persistence, and fate of phycotoxins in coastal ecosystems. I lead an interdisciplinary team of environmental chemists, ecologists, and ecotoxicologists in research that focuses at the ocean – human health interface. More broadly, I am interested in 1) how humans impact the production of phycotoxins harmful algal blooms (HABs), and 2) how the chemicals, in turn, contaminate our ecosystem, alter aquatic communities, and/or threaten public health. My research has focused on anthropogenic and natural drivers of HABs and toxin production, the spatiotemporal distribution of the chemicals, food web transfer and biotransformation, and the allelopathic or toxic effect of these compounds on organisms. To support these interests, I develop analytical methods and tools (e.g., UPLC-MS/MS) and utilize in-situ oceanographic instrumentation, e.g., Imaging FlowCytobot (IFCB). My methods quantify phycotoxins that range in polarity, size, and bioactivity, including chemicals responsible for Paralytic Shellfish Poisoning, Amnesic Shellfish Poisoning, Diarrhetic Shellfish Poisoning, Azaspiracid Shellfish Poisoning, and general hepatotoxicity.

## HONORS AND PROFESSIONAL SERVICE

2023-2025	Chair of 2025 Gordon Research Seminar, Mycotoxin and Phycotoxins
2022	Plumeri Award of Excellence, William & Mary
2021-2023	Vice-Chair of Gordon Research Seminar, Mycotoxin and Phycotoxins
2020-Present	Editorial Board, Journal of Harmful Algae
2019-2023	Invited Member of the national HARNNESS Working Group (Harmful Algal Research & Response National Environmental Science Strategy)
2016-2019	Elected Member, National HAB Committee
2016-Present	Member of Virginia HAB Task Force
2016	Invited Participant of QUARTOD (NOAA IOOS)
2011	Chair of Gordon Research Seminar, Mycotoxin and Phycotoxins

## PUBLICATIONS (\*student, \*\*staff, ^W&M undergrad)

- 1) \*Strohm, V.R., \*\*Ayache, N., Millette, N., ^Menegay, A., Gobler, C.J., Campbell, L., **Smith, J.L.** (*accepted*) Role of Turbulence in *Dinophysis* spp. Growth, Feeding, and Toxin Leakage. Harmful Algae
- 2) \*\*Ayache, N., Campbell, L., Gobler, G.J., **Smith, J.L.** (*in press*) Photoacclimation and photophysiology of four species of toxicogenic *Dinophysis*. Harmful Algae
- 3) \*Pease, S.K.D., Egerton, T., Reece, K., \*\*Sanderson, M.P., \*Onofrio, M.D., Yeargan, E., Wood, A., Roach, A., \*\*Huang, I.W., Scott, G.P., Place, A., Hayes, A.M., **Smith, J.L.** (2023) Co-occurrence of marine and freshwater phycotoxins in oysters, and analysis of possible predictors. ToxiconX <https://doi.org/10.1016/j.toxcx.2023.100166>
- 4) \*\*Ayache, N., Bill, B.D., Brosnahan, M.L., Campbell, L., Deeds, J.R., Fiorendino, J.M., Gobler, C.J., Handy, S.M., Harrington, N., Kulis, D.M., McCarron, P., Miles, C.O., Moore, S.K., Nagai, S., Trainer, V.T., Wolny, J.L., Young, C.S., **Smith, J.L.** (2023) A survey of *Dinophysis* spp. and their potential to cause diarrhetic shellfish poisoning in the coastal waters of the United States. Journal of Phycology. <https://doi.org/10.1111/jpy.13331>
- 5) Gaillard, S., Réveillon, D., Mason, P.L., \*\*Ayache, N., \*\*Sanderson, M., **Smith, J.L.**, Giddings, S., McCarron, P., Séchet, V., Hégaret, H. and Hess, P., Vogelbein, W.K. (2023) Mortality and histopathology in sheepshead minnow (*Cyprinodon variegatus*) larvae exposed

to pectenotoxin-2 and *Dinophysis acuminata*. *Aquatic Toxicology*, p.106456.  
<https://doi.org/10.1016/j.aquatox.2023.106456>

- 6) \*\*Sanderson, M.P., Hudson, K.L., Gregg, L.S., Chesler-Poole, A.B., Small, J.M., Reece, K.S., Carnegie, R.B., **Smith, J.L.** (2022) Detection of toxins and harmful algal bloom cells in shellfish hatcheries and efforts toward removal. *Aquaculture* 562; <https://doi.org/10.1016/j.aquaculture.2022.738714>
- 7) \*Pease, S.K.D., Brosnahan, M., \*\*Sanderson, M., **Smith, J.L.** (2022) Effects of two toxin-producing harmful algae, *Alexandrium catenella* and *Dinophysis acuminata* (Dinophyceae), on activity and mortality of larval shellfish. *Toxins* 14(5), 335; <https://doi.org/10.3390/toxins14050335>.
- 8) Anderson, D.M., Fensin, E., Gobler, C.J., Hoeglund, A.E., Hubbard, K., Kulis, D., Landsberg, J.H., Lefebvre, K.A., Provost, P., **Smith, J.L.**, Trainer, V.L. (2021) Marine harmful algal blooms (HABs) in the United States: history, current status and future trends. *Harmful Algae* 101975; [doi.org/10.1016/j.hal.2021.101975](https://doi.org/10.1016/j.hal.2021.101975).
- 9) \*Onofrio, M.D., Egerton, T., Reece, K., Pease, S.K.D., \*\*Sanderson, M.P., Jones, W., Yeagan, E., Roach, A., ^DeMent, C., Wood, A., Reay, W.G., Place, A., **Smith, J.L.** (2021) Spatiotemporal distribution of phycotoxins and their co-occurrence within nearshore waters. *Harmful Algae* 103: 101.993; [doi.org/10.1016/j.hal.2021.101993](https://doi.org/10.1016/j.hal.2021.101993).
- 10) \*Pease, S.K.D., Reece, S.K., ^O'Brien, J., Hobbs, P.L.M., **Smith, J.L.** (2021) Oyster hatchery breakthrough of two HABs and potential effects on larval eastern oysters (*Crassostrea virginica*). *Harmful Algae* 101: 101965. <https://doi.org/10.1016/j.hal.2020.101965>
- 11) Fiorendino, J.M., Campbell, L., **Smith, J.L.** (2020) Growth response of *Dinophysis*, *Mesodinium*, and *Teleaulax* cultures to temperature, irradiance, and salinity. *Harmful Algae* 98: 101896; [doi.org/10.1016/j.hal.2020.101896](https://doi.org/10.1016/j.hal.2020.101896).
- 12) Deeds, J.R., Stutts, W.L., Celiz, M.D., MacLeod, J., Hamilton, A.E., Lewis, B.J., Miller, D.W., Kanwit, K., **Smith, J.L.**, Kulis, D.M., McCarron, P., Rauschenberg, C.D., Burnell, C.A., Archer, S., Borchert, J., Lankford, S.K., (2020) Dihydrodinophysistoxin-1 produced by *Dinophysis norvegica* in the Gulf of Maine, USA and its accumulation in shellfish. *Toxins* 12, 533; [doi:10.3390/toxins12090533](https://doi.org/10.3390/toxins12090533).
- 13) \*Onofrio, M.D., Mallet, C.R., Place, A.R., **Smith, J.L.** (2020) A screening tool for the direct analysis of marine and freshwater phycotoxins in organic SPATT extracts from the Chesapeake Bay. *Toxins* 12(5):322.
- 14) \*Friedman, J.R., Shadwick, E.H., Friedrichs, M.A.M., Najjar, R.G., De Meo, O.A., Da, F., **Smith, J.L.** (2020) Seasonal variability of the CO<sub>2</sub> system in a large coastal plain estuary. *Journal of Geophysical Research: Oceans* 125:1-17.
- 15) Wolny, J., Egerton, T.A., Handy, S., Stutts, W., **Smith, J.L.**, Whereat, E.B., Bachvaroff, T.R., Henrichs, D.W., Campbell, L., Deeds, J.R. (2020) Characterization of *Dinophysis* spp. (Dinophyceae, Dinophysiales) from the Mid-Atlantic region of the US. *Journal of Phycology* 56(2),404-424.

- 16) \*Gao, H., Tong, M., An, X., **Smith, J.L.** (2019) Prey lysate enhances growth and toxin production in an isolate of *Dinophysis acuminata*. *Toxins* 11(1):57-73.
- 17) **Smith, J.L.**, Tong, M., Kulis, D., Anderson, D.M. (2018) Effect of ciliate strain, size, and nutritional content on the growth and toxicity of mixotrophic *Dinophysis acuminata*. *Harmful algae* 78:95-105.
- 18) \*Armstrong, C.T., Erdner D.,L., McClelland, J.W., \*\*Sanderson, M.P., Anderson, D.M., Gobler, C.J., **Smith, J.L.** (2018) Impact of nitrogen chemical form on the isotope signature and toxicity of a marine dinoflagellate. *Marine Ecology Progress Series* 602:63-76.
- 19) Tong, M., **Smith, J.L.**, Kulis, D., Anderson, D.M. (2015) Role of dissolved nitrate and phosphate in isolates of *Mesodinium rubrum* and toxin-producing *Dinophysis acuminata*. *Aquatic Microbial Ecology* 75:169-185.
- 20) Tong, M., **Smith, J.L.**, Richlen, M.L., Steidinger, K., Kulis, D., Fux, E., Anderson, D.M. (2015) Characterization and comparison of toxin-producing isolates of *Dinophysis acuminata* from New England and Canada. *Journal of Phycology* 51(1):66-81
- 21) Hattenrath-Lehmann, T.K., **Smith, J.L.**, Wallace, R.B., Merlo, L., Koch, F., Mittelsdorf, H., Goleski, J.A., Anderson, D.M., Gobler, C.J. (2015) The effects of elevated CO<sub>2</sub> on the growth and toxicity of field populations and cultures of the saxitoxin-producing dinoflagellate, *Alexandrium fundyense*. *Limnology and Oceanography* 60(1):198-214
- 22) Fernandes, L.F., Hubbard, K.A., Richlen, M.L., **Smith, J.L.**, Bates, S.S., Ehrmane, J., Légerd, C., Mafra L.L. Jr., Kulis, D., Quilliam, M., Libera, K., McCauley, L., Anderson, D.M. (2014) Diversity and toxicity of the diatom *Pseudo-nitzschia* Peragallo in the Gulf of Maine, Northwestern Atlantic Ocean. *Deep Sea Research II* 103:139-162.
- 23) Anderson, D.M., Keafer, B.A., Kleindinst, J.L., McGillicuddy, D.L.Jr., Martin, J.L., Norton, K., Pilskaln, C.H., **Smith, J.L.** Sherwood, C.R., Butman, B. (2014) *Alexandrium fundyense* cysts in the Gulf of Maine: Long-term time series of abundance and distribution, and linkages to past and future blooms. *Deep Sea Research II* 103:6-26.
- 24) **Smith J.L.**, Tong M., Fux E., Anderson D.M. (2012) Toxin production, retention, and extracellular release by *Dinophysis acuminata* during extended stationary phase and culture decline. *Harmful Algae* 19:125–132.
- 25) Fux E., **Smith J.L.**, Tong M., Guzman L., Anderson D.M. (2011) Toxin profiles of five geographical isolates of *Dinophysis* spp. from North and South America. *Toxicon* 57:275-287.
- 26) Tong M., Kulis D.M., Fux E., **Smith J.L.**, Hess P., Zhou Q., Anderson D.M. (2011) The effects of growth phase and light intensity on toxin production by *Dinophysis acuminata* from the northeastern United States. *Harmful Algae* 10:254-264.
- 27) **Smith J.L.**, Schulz K.L., Zimba P.V., Boyer G.L. (2010) Possible mechanism for the foodweb transfer of covalently-bound microcystins. *Ecotoxicology and Environmental Safety* 73:757-761.
- 28) **Smith J.L.**, Boyer G.L. (2009) Standardization of microcystin extraction from fish tissues: A novel internal standard as a surrogate for polar and non-polar variants. *Toxicon* 53 (2):238-245.

- 29) **Smith J.L.**, Boyer G.L., Zimba P.V. (2008) A review of cyanobacterial odorous and bioactive metabolites: Impacts and management alternatives in aquaculture. *Aquaculture* 280:5-20.
- 30) **Smith J.L.**, Boyer G.L, Mills E., Schulz K.L. (2008) Toxicity of microcystin-LR, a cyanobacterial toxin, to multiple life stages of the burrowing mayfly, *Hexagenia*, and possible implications for recruitment. *Environmental Toxicology* 23(4):499-506.
- 31) Rinta-Kanto J.M., Saxton M.A., DeBruyn J.M., **Smith J.L.**, Marvin C.H., Krieger K.A., Sayler G.S., Boyer G.L., Wilhelm S.W. (2008) The diversity and distribution of toxigenic *Microcystis* spp. in present day and archived pelagic and sediment samples from Lake Erie. *Harmful Algae* 8:385-394.
- 32) **Smith J.L.**, Haney J.F. (2006) Foodweb transfer, accumulation, and depuration of microcystins, a cyanobacterial toxin, in pumpkinseed sunfish (*Lepomis gibbosus*). *Toxicon* 48(5):580-589.

## STUDENT MENTORING

### Graduate Student Advisees

2023 – present	Isabelle Castro, MS student
2023 – present	Olivia Hernandez, PhD student (co-advised R. Latour)
2021 – present	Joshua Garber, PhD candidate
2020 – 2023	Vanessa Strohm, MS graduate
2017 – 2020	Michelle Onofrio, MS graduate
2017 – 2019	Jaclyn Friedman, MS graduate (co-advised E. Shadwick)
2016 – 2021	Sarah Pease, PhD graduate
2014 – 2017	C. Taylor Armstrong, MS graduate