Research Digest

Issue No. 11 (April - June 2024)

VIMS | William & Mary
Virginia Institute of Marine Science

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Photo credit: Virginia Sea Grant

Caption: VIMS researcher unhooks an Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) sampled during the Virginia Shark Monitoring and Assessment Program (VASMAP) fishery-independent survey.

Message from the Associate Dean of Research and Advisory Services

This Digest is intended to provide stakeholders, colleagues, and interested persons a sense of the depth and breadth of the research happening at VIMS. While we attempt to be as comprehensive as possible, it likely does not contain every article published in the issue's timespan due to differences in timelines and release dates across various publishers and databases that curate peer reviewed research.

If you are interested in reading the full text of any article that you do not have appropriate library/institution access for, please contact the VIMS author or corresponding author of the paper. Contact information for current VIMS scientists can be found on our website: www.vims.edu/about/directory/search/.

Mark W. Luckenbach, Associate Dean

Office of Research & Advisory Services
Virginia Institute of Marine Science
William & Mary

Topics In This Issue

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Navigating this document

Click on one of the headings listed above to jump to the desired section. Alternatively, search the document using keywords or an author's name. To search for words or names, simultaneously press the 'ctrl' and 'F' keys, type the desired word or name in the search field, then press 'enter' or 'return'. If the search term is in the document, it will be highlighted.

VIMS authors in this issue

(Listed alphabetically by last name. An asterisk (*) indicates VIMS student.)

Additional Topics

*(VIMS authors in **bold**, asterisk indicates VIMS student)*

Topic	**Climate change, science communication**
Title	Uncertain pathways to a future safe climate
Author(s)	Sherwood S.C., Hegerl G., Braconnot P., Friedlingstein P., Goelzer H., Harris N.R.P., Holland E., Kim H., **Mitchell M.**, Naish T., Nobre P., Otto-Bliesner B.L., Reed K.A., Renwick J., van der Wel N.P.M.
Journal	Earth's Future 12(6): e2023EF004297 (2024)
Link	https://doi.org/10.1029/2023EF004297
Summary	This paper comes from an international collaborative focused on identifying and communicating strategies leading to “safe landing” pathways under changing global conditions. Recommendations include making climate science more integrative to identify and quantify known and novel physical risks including those arising from interactions with ecosystems and society, exploring risks and opportunities associated with mitigation and adaptation responses, and making climate assessments more risk aware in their communications.

Topic	**Economics**
Title	Valuing shoreline habitats for recreational fishing
Author(s)	**Scheld A.M.**, **Bilkovic D.M.**, Stafford S., Powers K., **Musick S.**, Guthrie A.G.
Journal	Ocean and Coastal Management 253: 107150 (2024)
Link	https://doi.org/10.1016/j.ocecoaman.2024.107150
Summary	This research estimated ecosystem service values associated with recreational fishing provided by shoreline habitats. It was found that marshes and living shorelines provided $6.42M in annual benefits for recreational anglers in the Middle Peninsula, Virginia, a value more than three times greater than that provided by hardened shorelines.

Topic	**Phycology**
Title	Hypothesized life cycle of the snow algae *Chlainomonas sp*. (Chlamydomonadales, Chlorophyta) from the Cascade Mountains, USA
Author(s)	Matsumoto M., Hanneman C., Camara A.G., **Krueger-Hadfield S.A.**, Hamilton T.L., Kodner R.B.
Journal	Journal of Phycology 60(3): 724-740 (2024)
Link	https://doi.org/10.1111/jpy.13454
Summary	This manuscript uses natural history observations of snow algae throughout a bloom to be able to document its life cycle when we cannot easily cultivate these algae in the lab.

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Additional Topics

*(VIMS authors in **bold**, asterisk indicates VIMS student)*

Topic	**Science communication**
Title	Mangrove killifish are stressed for success
Author(s)	**Dichiera, A.**
Journal	Journal of Experimental Biology 227(3): JEB246576 (2024)
Link	https://doi.org/10.1242/jeb.246576
Summary	This is a short science communication article for Young, S. J., Rossi, G. S., Bernier, N. J. and Wright, P. A. (2023) summarizing how cortisol helps mangrove killifish transition from water to land by boosting oxygen intake and energy for movement.

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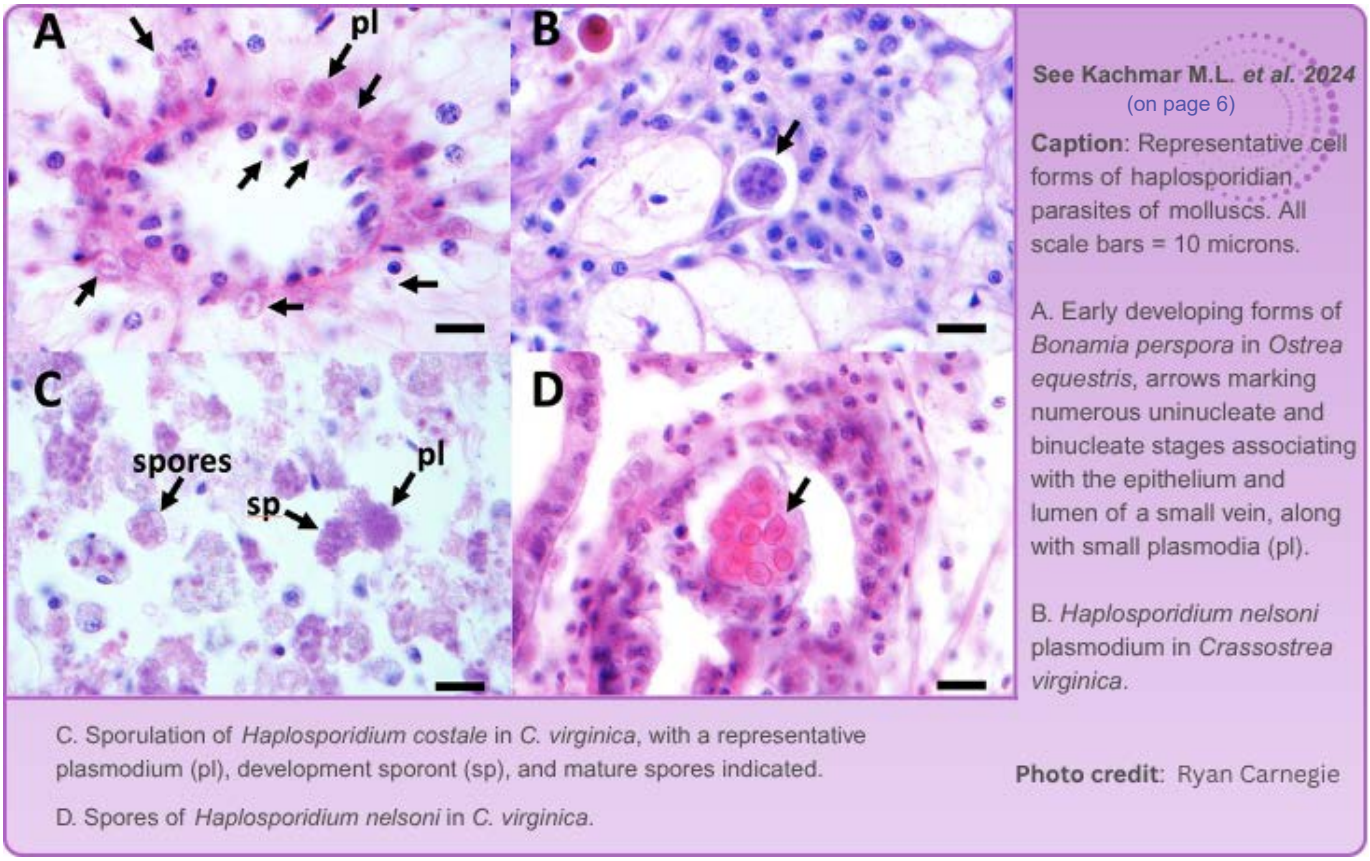

Aquaculture

*(VIMS authors in **bold**, asterisk indicates VIMS student)*

Title	A newly discovered trematode parasite infecting the bay scallop, *Argopecten irradians*
Author(s)	Boggess H.F.H., **Varney R.L.**, Freshwater D.W., Ben-Horin T., Preister C., McCurry H., Wilbur A.E., Buck J.C.
Journal	Aquaculture 589: 740960 (2024)
Link	https://doi.org/10.1016/j.aquaculture.2024.740960
Summary	A novel parasite was found infecting bay scallops (*Argopecten irradians*) in North Carolina and Florida. The parasite is trematode (family Didymozoidae, genus *Saccularina*) and uses the scallop as a first intermediate host. Histological analyses indicate that germinal sacs of *Saccularina sp*. infect and distend the afferent vessel of host gills.

Title	Efficacy and effects of three desiccation intervals on biofouling and Eastern oysters (*Crassostrea virginica*) at three commercial oyster farms in the Chesapeake Bay, MD
Author(s)	Hood S.M., **Walton W.C.**, Plough L.V.
Journal	Aquaculture 587: 740847 (2024)
Link	https://doi.org/10.1016/j.aquaculture.2024.740847
Summary	Desiccation (air-drying) to control biofouling on oyster cages was tested at three farms in Maryland: Desiccation reduced biofouling relative to no desiccation but there were minimal differences between 8 and 24 hours (with no clear impacts on growth or mortality).

Title	Susceptibility of shellfish aquaculture species in the Chesapeake Bay and Maryland coastal bays to ostreid herpesvirus 1 microvariants
Author(s)	Kachmar M.L., **Reece K.S.**, Agnew M.V., Schreier H.J., Burge C.A.
Journal	Diseases of Aquatic Organisms 157:113-127 (2024)
Link	https://doi.org/10.3354/dao03775
Summary	OsHV-1, primarily an economically devastating pathogen of Pacific oysters, can infect eastern oysters and bay scallops. OsHV-1 was not detected in any Maryland shellfish. Experiments demonstrated that eastern oysters could horizontally transmit the virus to Pacific oysters even when suffering low mortality themselves. Additional oyster stocks are being tested.

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Biogeochemistry

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Seawater intrusion effects on nitrogen cycling in the regulated Nakdong River Estuary, South Korea
Author(s)	Huang Y., **Song B.**, Zhang Q., Park Y., **Wilson S.J.***, Tobias C.R. and An S.
Journal	Frontiers in Marine Science 11:1369421 (2024)
Link	https://doi.org/10.3389/fmars.2024.1369421
Summary	Seawater intrusion alters nitrogen cycling in estuaries, impacting oxygen levels and microbial processes. In the Nakdong River Estuary (2019–2021), denitrification declined under hypoxia, while DNRA increased with seawater trapping. Metagenomic analysis showed gene shifts aligning with nitrogen transformations, influencing nitrogen retention, release, and eutrophication dynamics in coastal ecosystems.

Title	Anthropogenic impacts on mud and organic carbon cycling
Author(s)	Bianchi T.S., Mayer L.M., Amaral J.H.F., Arndt S., Galy V., Kemp D.B., **Kuehl S.A.**, Murray N.J., Regnier P.
Journal	Nature Geoscience 17(4): pg. 287-297 (2024)
Link	https://doi.org/10.1038/s41561-024-01405-5
Summary	A study on the impacts of human activities on mud and organic carbon cycling found that human interventions are linked to increased mud-organic carbon movement and burial. However, coastal wetlands may be experiencing a net decline in mud-organic carbon movement and burial.

Title	Shelf-basin connectivity drives dissolved Fe and Mn distributions in the western Arctic Ocean: A synoptic view into polar trace metal cycling
Author(s)	Jensen, L., **Colombo M.**
Journal	Oceanography 37(2): pg. 60-71 (2024)
Link	https://doi.org/10.5670/oceanog.2024.410
Summary	This paper highlights the significant achievements of the GEOTRACES international program in conducting an unprecedented study of trace element (TE) distributions in the Arctic Ocean. It offers a comprehensive integration of the key processes influencing trace element distribution in this distinctive environment.

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Biogeochemistry

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Sorption of colored vs. noncolored organic matter by tidal marsh soils
Author(s)	Neale P.J., Megonigal J.P., Tzortziou M., **Canuel E.A.**, Pondell C.R., Morrissette H.
Journal	Biogeosciences 21(10): 2599-2620
Link	https://doi.org/10.5194/bg-21-2599-2024
Summary	The objectives of this study were to (1) quantify the exchange of chromophoric dissolved organic carbon and non-colored dissolved organic carbon between the dissolved phase and tidal marsh soils, (2) identify how these exchanges are affected by salinity and soil characteristics, and (3) quantify the effect of these exchanges on the optical characteristics and inferred molecular composition of chromophoric dissolved organic matter (CDOM) exported from tidal marshes to coastal waters.

Title	Nitrification in a subterranean estuary: An ex situ and in situ method comparison determines nitrate is available for discharge
Author(s)	**Wilson S.J.***, **Song B.**, **Anderson I.C.**, Tobias C.R.
Journal	Journal of Geophysical Research: Biogeosciences 129(6): e2023JG007876 (2024)
Link	https://doi.org/10.1029/2023JG007876
Summary	Groundwater mixes with coastal waters in subterranean estuaries, supplying nitrogen and other compounds. We measured nitrification, which transforms ammonium to nitrite/nitrate, using mixing models, isotope tracers, and incubations. All methods confirmed active nitrification, influencing nitrogen transport to coastal waters and affecting groundwater-derived nitrogen's role in coastal biogeochemistry.

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Title	Exploring ecological, morphological, and environmental controls on coastal foredune evolution at annual scales using a process-based model
Author(s)	**Heminway S.S.***, Cohn N., **Davis E.H.***, White A., **Hein C.J.**, Zinnert J.C.
Journal	Sustainability 16(8): 3460 (2024)
Link	https://doi.org/10.3390/su16083460
Summary	We tested how future climate changes such as sea-level rise and increased storminess may influence dune evolution. Our results show how exploratory numerical models can inform or optimize coastal management actions, such as assessing tradeoffs for different dune designs or planting strategies.

Title	Mechanism of rapid accretion-erosion transition in a complex hydrodynamic environment based on refined in-situ data
Author(s)	Jiang J., Xie W., Zhang N., Xu Y., Zhu C., Lin J., Guo L., **Shen J.**, He Q.
Journal	Frontiers in Marine Science 11:1375085 (2024)
Link	https://doi.org/10.3389/fmars.2024.1375085
Summary	Rapid bed-level changes in the Changjiang Estuary occur at tidal-cycle timescales, driven by downstream sediment transport and horizontal advection. A dynamic critical bed shear stress was identified, varying within tidal cycles. Frequent accretion-erosion transitions impact sediment exchange, influencing navigation and construction management in the region.

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See O'Brien K.A. 2024
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Caption: VIMS researcher dehooking an Atlantic sharpnose shark (*Rhizoprionodon terraenovae*) sampled during the Virginia Shark Monitoring and Assessment Program (VASMAP) fishery-independent survey. This species is one of eight evaluated in the study.

Photo credit: Virginia Sea Grant

Fish & Fisheries

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Niche structure and habitat shifts for coastal sharks of the U.S. Southeast Atlantic and Gulf of Mexico
Author(s)	**O'Brien K.A.***, Cortés E., Driggers W.B., Frazier B.S., **Latour R.J.**
Journal	Fisheries Oceanography 33(5): e12676 (2024)
Link	https://doi.org/10.1111/fog.12676
Summary	This study investigates how environmental factors, climate change, and multidecadal variability influence shark distribution, abundance, and ecological roles, providing insights into conservation strategies and ecosystem management for these vital species. This is the first study to evaluate potential habitat shifts of data-limited sharks through ontogeny and over broad spatial scales.

Title	Thermal tolerance of larval Antarctic cryonotothenioid fishes
Author(s)	**Corso A.D.**, **Mowatt-Larssen T.***, **Brill R.W.**, **Steinberg D.K.**, **Hilton E.J.**
Journal	Polar Biology 47(8): pg. 731-740 (2024)
Link	https://doi.org/10.1007/s00300-024-03262-9
Summary	The thermal tolerance of the early-life stages of Antarctic fishes is poorly known. We measured the thermal maximum for several species of larval Antarctic fishes, finding that body length is positively correlated with thermal maximum for several species, and one species, *Neodraco skottsbergi*, shows a remarkably high thermal maximum, possibly because of its environmentally variable near-surface habitat and evolutionary history.

Title	The physiological significance of plasma-accessible carbonic anhydrase in the respiratory systems of fishes
Author(s)	Harter T.S., **Dichiera A.M.,** & Esbaugh A.J.
Journal	Journal of Comparative Physiology B: Biochemical, Systemic, and Environmental Physiology 194: 717–737 (2024)
Link	https://doi.org/10.1007/s00360-024-01562-4
Summary	This review examines the role of carbonic anhydrase (CA) in vertebrates, focusing on its absence at the gills of teleost fish. It explores the enzyme's importance in CO_2 excretion, the evolutionary distribution of paCA across fish species, and its implications for oxygen transport, while identifying gaps and suggesting future research directions.

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Management & Policy

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Biomarkers of organophosphate and polybrominated diphenyl ether (PBDE) flame retardants of American workers and associations with inhalation and dermal exposures
Author(s)	Estill C.F., Mayer A.C., Chen I.-C., Slone J., **LaGuardia M.J.**, Jayatilaka N., Ospina M., Sjodin A., Calafat A.M.
Journal	Environmental Science & Technology 58 (19): 8417-8431 (2024)
Link	https://doi.org/10.1021/acs.est.3c09342
Summary	This study provides insights into occupational exposure to flame retardants in different industries, highlighting the need for further research on exposure reduction strategies and emerging flame retardants.

Title	Nutrient reduction by eastern oysters exhibits low variability associated with reproduction, ploidy, and farm location
Author(s)	Poach M., Morse R., Meseck S.L., Alvarado A., Reichert-Nguyen J., McFarland K., Elliott H., **Kellogg M.L., Luckenbach M.W.**, Rose J.M.
Journal	Marine Pollution Bulletin 202: 116286 (2024)
Link	https://doi.org/10.1016/j.marpolbul.2024.116286
Summary	Inspired by approval of oyster aquaculture as a nutrient reduction BMP in Chesapeake Bay, this study assessed tissue dry weight and nutrient content of oysters from Maryland and Virginia farms. Findings were largely consistent with the currently implemented BMP except that ploidy-based differences in tissue dry weight were not observed.

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Marine & Estuarine Ecology

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Comparative analysis of the molecular starvation response of Southern Ocean copepods
Author(s)	Berger C.A., **Steinberg D.K.**, Copeman L.A., Tarrant A.M.
Journal	Molecular Ecology 00: e17371 (2024).
Link	https://doi.org/10.1111/mec.17371
Summary	Large lipid-storing copepods in the polar oceans form a critical link between primary production and higher trophic levels. The ecological success of these species depends on their ability to survive periods of food deprivation in a highly seasonal environment, but the molecular changes that mediate starvation tolerance in these taxa are unknown.

Title	The general relationship between mean dissolved oxygen concentrations and timescales in estuaries
Author(s)	**Shen J.**, Qin Q.
Journal	Water (Switzerland) 16(7): 969 (2024)
Link	https://doi.org/10.3390/w16070969
Summary	A general relationship between the physical and biochemical processes was proposed to interpolate mean dissolved oxygen at local/system levels to assess hypoxia in an estuary. The Lagrangian approach links timescales of physical and biochemical processes to predict hypoxia. Key factors include vertical exchange, freshwater-saltwater transport, DO consumption, and residence time.

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Title	Storm surges and extreme sea levels: Review, establishment of model intercomparison and coordination of surge climate projection efforts (SurgeMIP)
Author(s)	Bernier N.B., Hemer M., Mori N., (...), Young I., **Zhang Y.J.**
Journal	Weather and Climate Extremes 45: 100689 (2024)
Link	https://doi.org/10.1016/j.wace.2024.100689
Summary	While proper estimation of changes in storm surges is essential to estimate changes in extreme sea levels, there remains low confidence in future trends of surge contribution to extreme sea levels. SurgeMIP (surge model intercomparison) community has been established to tackle such challenges. Efforts to intercompare storm surge prediction systems and coordinate the community's prediction and projection efforts are introduced.

Title	Response of onshore oceanic heat supply to yearly changes in the Amundsen Sea icescape (Antarctica)
Author(s)	**St-Laurent P.**, Stammerjohn S.E., Maksym T.
Journal	Journal of Geophysical Research: Oceans 129(4): e2023JC020467 (2024)
Link	https://doi.org/10.1029/2023JC020467
Summary	The study examines whether ice shelf melt in west Antarctica could be mitigated by certain icescape configurations. The geometric perturbations modified the heat pathways but not the magnitude of the melt, indicating that current high melt rates are likely to continue in the next decades.

Title	Circulation and retention of river plumes around capes
Author(s)	Pareja-Roman L.F., Chant R.J., **Mazzini P.L.F.**, Cole K.
Journal	Journal of Geophysical Research: Oceans 129(4): e2023JC020645 (2024)
Link	https://doi.org/10.1029/2023JC020645
Summary	The interaction of river plumes with capes and headlands can affect the circulation and transport of substances and organisms in the coastal ocean. We conducted simulations, exploring various scenarios with differing cape shapes, constant river flow, and variable winds. Our findings underscore the roles of capes, wind, and the Earth's rotation in freshwater retention dynamics.

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(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Recommendations for advancing mixoplankton research through empirical-model integration
Author(s)	**Millette N.C.**, Leles S.G., Johnson M.D., Maloney A.E., Brownlee E.F., Cohen N.R., Duhamel S., Poulton N.J., Princiotta S.D., Stamieszkin K., Wilken S., Moeller H.V.
Journal	Frontiers in Marine Science 11:1392673 (2024)
Link	https://doi.org/10.3389/fmars.2024.1392673
Summary	In this paper, we posit that by merging conventional techniques, such as microscopy and physiological data, with innovative methods like in situ single-cell sorting and omics datasets, in conjunction with a diverse array of modeling approaches ranging from single-cell modeling to comprehensive Earth system models, we can propel mixoplankton research into the forefront of aquatic ecology.

Title	*Margalefidinium polykrikoides* dinoflagellate blooms increase mortality of *Acartia tonsa* copepods
Author(s)	Corson H.K., **Millette N.C.**
Journal	Harmful Algae 135: 102634 (2024)
Link	https://doi.org/10.1016/j.hal.2024.102634
Summary	This study explored *Acartia tonsa* (copepod) grazing during *Margalefidinium polykrikoides* (dinoflagellate) blooms. While *A. tonsa* ingested *M. polykrikoides* at low abundance, when *M. polykrikoides* abundance exceeded 2000 cells mL−1, *A. tonsa* experienced nearly 100% mortality in the prey removal experiments. This suggests bloom decline is likely caused by another factor.

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Resiliency

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Let's talk about sex: Why reproductive systems matter for understanding algae
Author(s)	**Krueger-Hadfield S. A.**
Journal	Journal of Phycology 60(3): 581–597 (2024)
Link	https://doi.org/10.1111/jpy.13462
Summary	This was an invited perspective as part of the Algae in the Anthropocene to discuss important gaps in our understanding of how algae will respond to climate change. This manuscript surveyed algae for what we know, what we think we know, and what we don't know about algal reproduction.

Title	Long-term climate and hydrologic regimes shape stream invertebrate community responses to a hurricane disturbance
Author(s)	Strickland B. A., **Patrick C.J.**, Carvallo F.R., **Kinard S.K.***, **Solis A.T.***, Reese B.K., Hogan J.D.
Journal	Journal of Animal Ecology 93(7): 823–835 (2024)
Link	https://doi.org/10.1111/1365-2656.14086
Summary	The article describes variation in responses of invertebrate communities in coastal rivers along a climatic rainfall gradient to a hurricane disturbance. We find that flood magnitude controls community response but that more mesic rivers had higher resistance to the disturbance.

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Title	Relative importance of phenotypic plasticity and carryover effects in response to small salinity shifts during oyster aquaculture production
Author(s)	**Schatz A.***, **McDowell J.**, **Biesack E.E.**, **Rivest E.B.**
Journal	Aquaculture 581: 740432 (2024).
Link	https://doi.org/10.1016/j.aquaculture.2023.740432
Summary	We examined the relative importance of within-generation carryover effects, phenotypic plasticity, and genetic diversity on the performance of juvenile oysters after experiencing small differences in salinity during the larval stage. Our results suggest that phenotypic plasticity likely underpins juvenile oyster performance during the transition from hatchery to farms.

Title	Spatial and temporal variability of Atlantic Surfclam (*Spisula solidissima*, Dillwyn 1817) population demographics along the middle Atlantic Bight
Author(s)	Díaz M.G., Hofmann E.E., Klinck J.M., Munroe D.M., Powell E.N., **Scheld A.M.**
Journal	Journal of Shellfish Research 43(1): 37-49 (2024)
Link	https://doi.org/10.2983/035.043.0104
Summary	This research explored differences in growth parameters and mortality rates of Atlantic surfclam (*Spisula solidissima*) across regions in the Mid-Atlantic Bight from the 1980s to the 2010s. Southern regions were found to have reductions in mean and asymptotic length over time though no differences in mortality were found.

Title	Co-phylogeographic structure in a disease-causing parasite and its oyster host
Author(s)	**Weatherup E.F.***, **Carnegie R.**, Strand A.E., Sotka E.E.
Journal	Parasitology 151(7): 671–678 (2024)
Link	https://doi.org/10.1017/S0031182024000611
Summary	This ground-breaking paper demonstrates for the first time that robust population genomic perspective on a key shellfish pathogen can be obtained by direct DNA sequencing from infected oysters. It will lead to important advances both in shellfish health management and in our understanding of the biology and ecology of these diseases.

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(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Spawning history, fecundity, and potential sperm limitation of female blue crabs in Chesapeake Bay
Author(s)	**Schneider A.K.***, **Shields J.D.**, **Fabrizio M.C.**, **Lipcius R.N.**
Journal	Fisheries Research 278: 107094 (2024)
Link	https://doi.org/10.1016/j.fishres.2024.107094
Summary	Fecundity was examined in ovigerous blue crabs. Primiparous crabs had higher fecundity than multiparous crabs. Fecundity was greatest in July and August, but females in June had the greatest capacity for future reproductive potential as most of these were primiparous and would become multiparous later in the season. Population level protection may be enhanced by protecting primiparous spawners early in the season.

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Water Quality

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Human activities shape global patterns of decomposition rates in rivers
Author(s)	Tiegs S.D. Capps K.A., Costello D.M., Schmidt J.P., **Patrick C.J.**, CELLDEX Consortium
Journal	Science 384: pg. 1191-1195 (2024)
Link	https://doi.org/10.1126/science.adn1262
Summary	This article describes the importance of anthropogenic and environmental factors in driving global variation in decomposition rates in rivers. We find that these factors and leaf litter traits explain 70% of the variation in published leaf litter decomposition worldwide.

Title	Comment on “Drinking boiled tap water reduces human intake of nanoplastics and microplastics”
Author(s)	**Hale R.C.**, Albert B.I.
Journal	Environmental Science Technology Letters 11(6): 648–649 (2024)
Link	https://doi.org/10.1021/acs.estlett.4c00265
Summary	Removal of MNPs in drinking water via boiling as described by Yu et al. is a novel and promising approach. However, in practice, health care professionals and health-conscious consumers should be aware of the remaining uncertainties. Polymer transition from a glassy to rubbery state, demarcated by its glass transition temperature (Tg), affects the rate of diffusion through the polymer matrix and thus additive release.

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Wetlands

(*VIMS authors in **bold**, asterisk indicates VIMS student*)

Title	Microtopographic variation as a potential early indicator of ecosystem state change and vulnerability in salt marshes
Author(s)	**Smith A.J.***, Guntenspergen G., Carr J. et al.
Journal	Estuaries and Coasts 47: pg. 2120–2134 (2024)
Link	https://doi.org/10.1007/s12237-024-01368-1
Summary	This research introduces alternative metrics of wetland vulnerability, based on commonly collected surface elevation table (SET) measurements. We find that millimeter-scale marsh surface microtopography is a potential early indicator of marsh conversion to open water and apply that metric to several vulnerable salt marsh communities across the North American Atlantic seaboard.

Title	Litter decomposition in retreating coastal forests
Author(s)	**Smith A.J.***, **Valentine K.**, Small J.M., Khan A., Gedan K., Nordio G., Fagherazzi S., **Kirwan M.L.**
Journal	Estuaries and Coasts 47: 1139–1149 (2024)
Link	https://doi.org/10.1007/s12237-024-01358-3
Summary	We conducted a litterbag experiment to measure decomposition rates of leaves and pine needles in a retreating coastal forest and found that the decomposition rate did not vary with elevation and salinity, but instead depended on the depth the litterbags were buried beneath the soil.

Title	*Spartina alterniflora* invasion benefits blue carbon sequestration in China
Author(s)	Zhang J., Mao D., Liu J., **Chen Y.**, **Kirwan M.**, Sanders C., Zhou J., Lu Z., Qin G., Huang X., Li H., Yan H., Jiao N., Su J., Wang F.
Journal	Science Bulletin 69(12): 1991-2000 (2024)
Link	https://doi.org/10.1016/j.scib.2024.04.049
Summary	*Spartina alterniflora* is the key, native species in U.S. salt marshes, but an invasive non-native species in China. Although *Spartina alterniflora* threatens some native ecosystem services, this research suggests that it at least increases carbon accumulation rates in Chinese mudflats.

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